



Transformers for Switching Power Supplies

Pin terminal type (For multiple outputs)

ECO series

ECO20XXSEO(Vertical/Horizontal types)

ECO22XXSEO(Vertical/Horizontal types)

ECO24XXSEO(Vertical/Horizontal types)

ECO24XXSLD(Vertical/Horizontal types)

REMINDERS FOR USING THESE PRODUCTS

Before using these products, be sure to request the delivery specifications.

SAFETY REMINDERS

Please pay sufficient attention to the warnings for safe designing when using these products.

REMINDERS

- The storage period is less than 12 months. Be sure to follow the storage conditions (Temperature: 5 to 40°C, Humidity: 10 to 75% RH or less).
If the storage period elapses, the soldering of the terminal electrodes may deteriorate.
- Do not use or store in locations where there are conditions such as gas corrosion (salt, acid, alkali, etc.).
- Soldering corrections after mounting should be within the range of the conditions determined in the specifications.
If overheated, a short circuit, performance deterioration, or lifespan shortening may occur.
- Self heating (temperature increase) occurs when the power is turned ON, so the tolerance should be sufficient for the set thermal design.
- Use a wrist band to discharge static electricity in your body through the grounding wire.
- Do not expose the products to magnets or magnetic fields.
- Do not use for a purpose outside of the contents regulated in the delivery specifications.
- The products listed on this catalog are intended for use in general electronic equipment (AV equipment, telecommunications equipment, home appliances, amusement equipment, computer equipment, personal equipment, office equipment, measurement equipment, industrial robots) under a normal operation and use condition.
The products are not designed or warranted to meet the requirements of the applications listed below, whose performance and/or quality require a more stringent level of safety or reliability, or whose failure, malfunction or trouble could cause serious damage to society, person or property.
If you intend to use the products in the applications listed below or if you have special requirements exceeding the range or conditions set forth in the each catalog, please contact us.

(1) Aerospace/Aviation equipment

(2) Transportation equipment (cars, electric trains, ships, etc.)

(3) Medical equipment

(4) Power-generation control equipment

(5) Atomic energy-related equipment

(6) Seabed equipment

(7) Transportation control equipment

(8) Public information-processing equipment

(9) Military equipment

(10) Electric heating apparatus, burning equipment

(11) Disaster prevention/crime prevention equipment

(12) Safety equipment

(13) Other applications that are not considered general-purpose applications

When designing your equipment even for general-purpose applications, you are kindly requested to take into consideration securing protection circuit/device or providing backup circuits in your equipment.

Switching Power Supply Transformers

ECO Series

Conformity to RoHS Directive
Halogen-free
Compatible with lead-free solders

Overview of the ECO Series

Development Concept

The ECO series is compliant with worldwide safety standards*. It is a pin-compatible, newly developed transformer that can be downsized and thinned.

* Applicable as of April 2007: UL/IEC/J 60065 Ver.7 (TV, DVD, STB), UL/IEC/60950 Ver.3 (printer), UL/IEC 60335-1 Ver.4 (home appliance)

■ MATERIAL

Optimum materials and core shape have been developed. No insulation-supporting material is used, and this secures the insulating distance.

While optimizing materials, TDK has further improved its proprietary core shape to develop a new-type ECO core.
TDK has downsized the product considerably in order to securing the necessary creepage distance.

■ MANUFACTURING METHOD

Since the ECO Series supports automatic winding, the product is of a high quality and can be manufactured stably.

It is designed to support automatic winding, which enables a remarkable reduction in the loss generated to achieve a proficient in manual winding until stable production.

In addition, the characteristic variations of the winding wire and creepage tape have largely been removed, stabilizing the transformer's characteristics.

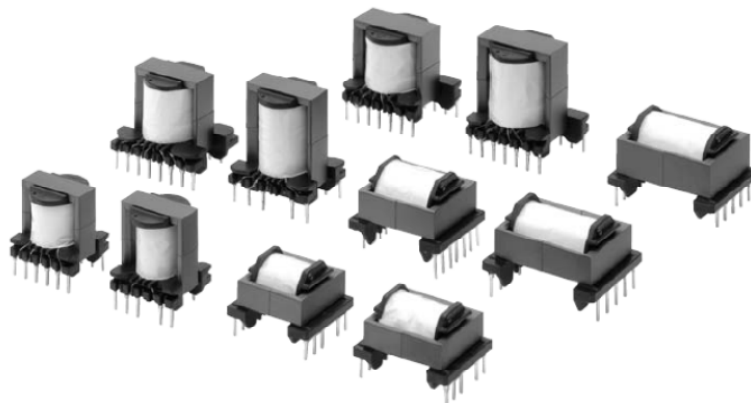
■ OPTIMIZATION DESIGN

Using design tools developed with TDK's comprehensive know-how, high-precision design has been achieved in a short period of time.

- 1) For optimization design and high-quality stable production, customers can use a specification request form.
If you provide the necessary information in the form, you will receive the optimization design in a short time.
- 2) We have prepared an individual specifications request document for the home appliance market.
- 3) TDK recommends design with a standard core gap (AL-value) for optimization and shorter trial and mass production lead time.
- 4) Plans for standard winding connection (patterns of recommended pin arrangement and winding structure) are available.
These help to speed up the design process, support automatic winding, and prevent deterioration in quality.

■ ENVIRONMENT

The ECO series is RoHS directive-compliant and halogen-free product.

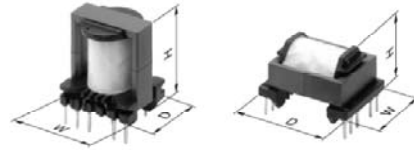


- Ferrite cores, bobbins, cases, etc. are not sold individually.
- Conformity to RoHS Directive: This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted ópir.

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Replacement Parts List

We have made a new lineup of replacement parts for products with different shapes that meet our customers' needs for smaller products. We can also provide different transformer shapes not shown in the catalog, so feel free to contact us.



REPLACEMENT PARTS LIST

| General-purpose shaped core | Existing EGG ^{*1} | New ECO ^{*1} | Bobbin type ^{*2} | Maximum external size DxWxH (mm)max. | Reference output power ^{*3} (W) | Switching frequency fsw(kHz) | Cross-sectional center leg area Ae (mm ²) | Bobbin terminal | | | | | |
|-----------------------------|----------------------------|---------------------------------|---------------------------|--------------------------------------|--|------------------------------|---|-----------------|-------------------|----------------|------|------|----|
| | | | | | | | | Pin pitch (mm) | Lead space F (mm) | Number of pins | | | |
| Vertical type | | | | | | | | | | | | | |
| EI22 EE25/19 | EGG2017 | ECO2017 | VI | 19.5x22.5x24.0 | 12 | 50 | 36.3 | 3.75 | 15.0 | 12 | | | |
| | | ECO2020 | VI | 19.5x22.5x27.0 | 20 | | | | | | | | |
| | EGG2420 | ECO2023 | VI | 19.5x22.5x30.0 | 26 | | | | | | | | |
| EED2820 EER28 | EGG2420 | ECO2219 | VI | 23.0x28.5x25.0 | 25 | 50 | 46.4 | 5.0 | 17.5 | 12 | | | |
| | | | VII | 23.0x24.0x25.0 | | | | 4.0 | 17.5 | 12 | | | |
| | | | VIII | 23.0x30.0x25.0 | 3.75 | | | 17.5 | 14 | | | | |
| | | | VI | 23.0x28.5x31.0 | 5.0 | | | 17.5 | 12 | | | | |
| | | | ECO2225 | VII | 23.0x24.0x31.0 | | | 36 | 50 | 46.4 | 4.0 | 17.5 | 12 |
| | | | | VIII | 23.0x30.0x31.0 | | | 3.75 | 17.5 | 14 | | | |
| EGG2425 | ECO2230 | VI | 23.0x28.5x36.0 | 48 | 50 | 46.4 | 5.0 | 17.5 | 12 | | | | |
| | | VII | 23.0x24.0x36.0 | | | | 4.0 | 17.5 | 12 | | | | |
| EER28L | EGG2425 | ECO2420 | VI | 24.0x28.5x26.5 | 35 | 50 | 63.8 | 5.0 | 17.5 | 12 | | | |
| | | | VII | 25.0x31.5x26.5 | | | | 4.0 | 20.0 | 14 | | | |
| | ECO2425 | VI | 24.0x28.5x31.5 | 50 | 50 | | | 63.8 | 5.0 | 17.5 | 12 | | |
| | | VII | 25.0x35.5x31.5 | | 4.0 | | | 20.0 | 16 | | | | |
| EGG2430 | ECO2430 | VI | 24.0x28.5x36.5 | 68 | 50 | 63.8 | 5.0 | 17.5 | 12 | | | | |
| | | VII | 25.0x35.5x36.5 | | | | 4.0 | 20.0 | 16 | | | | |
| EER32 | EGG2625 | Under development ^{*4} | VI | | | | | | | | | | |
| | | | VII | | | | | | | | | | |
| EER35 | EGG2833 | Under development ^{*4} | VI | | | | | | | | | | |
| | | | VII | | | | | | | | | | |
| Horizontal type | | | | | | | | | | | | | |
| EE25/19 | NEW | ECO2017 | HI | 24.5x23.5x20.0 | 5 | 50 | 36.3 | 3.75 | 20.0 | 12 | | | |
| | | ECO2020 | HI | 27.0x23.5x20.0 | 14 | | | 3.75 | 22.5 | 12 | | | |
| | | ECO2023 | HI | 29.5x23.5x20.0 | 20 | | | 3.75 | 25.0 | 12 | | | |
| EER2820 | NEW | ECO2219 | HI | 25.0x29.0x24.0 | 18 | 50 | 46.4 | 5.0 | 20.0 | 12 | | | |
| | | | HII | 25.0x26.0x24.0 | | | | 4.0 | 20.0 | 12 | | | |
| | | ECO2225 | HI | 30.5x29.0x24.0 | 30 | | | 50 | 46.4 | 5.0 | 25.0 | 12 | |
| | | | HII | 30.5x26.0x24.0 | | | | | | 4.0 | 25.0 | 12 | |
| EER28 | EGG2425 | ECO2230 | HI | 35.5x29.0x24.0 | 42 | 50 | 46.4 | | | 5.0 | 30.0 | 12 | |
| | | | HII | 35.5x26.0x24.0 | | | | | | 4.0 | 30.0 | 12 | |
| | | ECO2425 | HI | 30.5x30.0x25.0 | 41 | | | 50 | 63.8 | 5.0 | 25.0 | 12 | |
| | | | HII | 30.5x27.0x25.0 | | | | | | 4.0 | 25.0 | 12 | |
| EER28L | EGG2430 | ECO2430 | HI | 36.0x30.0x25.0 | 59 | 50 | 63.8 | | | 5.0 | 30.0 | 12 | |
| | | | HII | 36.0x27.0x25.0 | | | | | | 4.0 | 30.0 | 12 | |
| EER35 | EGG2833 | Under development ^{*4} | HI | | | | | | | | | | |

^{*1} Ferrite cores, bobbin are not sold separately.

^{*2} The bobbin is made from phenol with a flame resistance grade of 94V-2 or higher.

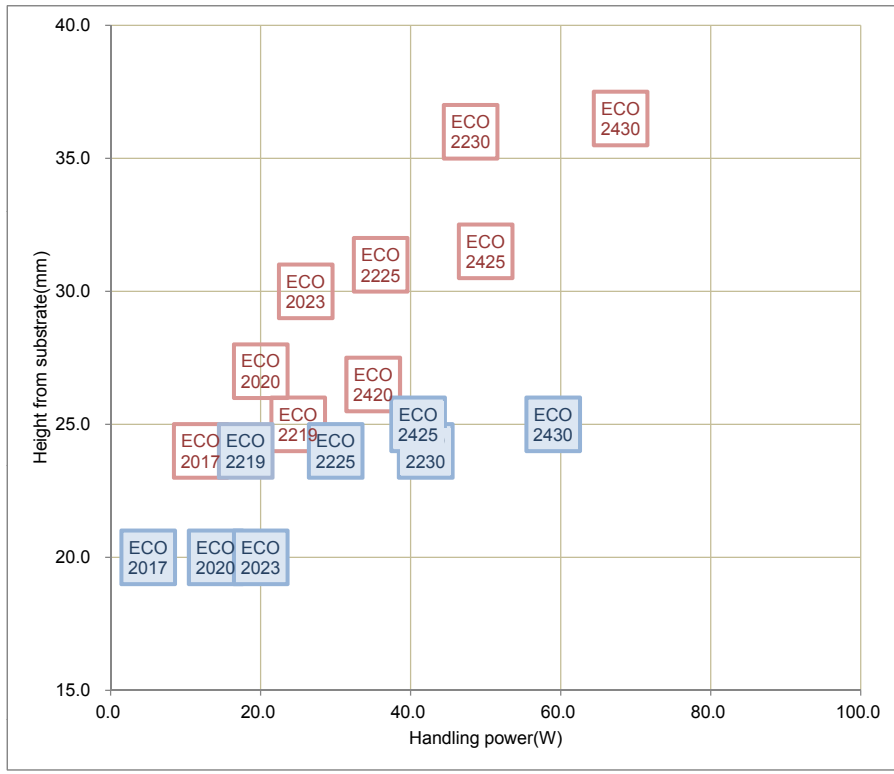
^{*3} The reference output was obtained under conditions where the frequency was 50kHz and creepage distance was 4mm. (See the relevant page for details of each shape.) The reference output differs depending on the switching device, switching frequency, transformer temperature, conditions, etc. Use this output for reference.



^{*4} Scheduled to be supported from April 2010 onwards (prior to that date, it is supported by the EGG type)

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Lineup of ECO Series



-  Vertical type
-  Horizontal type

Composition of appellation for ECO Series

■ SCOPE

This standard applies insulation transformer for switching power supply and choke-coil for Power-factor circuit of the ECO series that Magnetics Business Group takes part in the design, production, and sales.

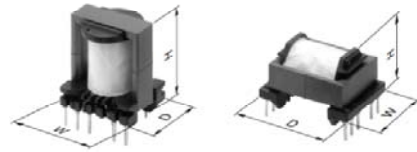
■ COMPOSITION OF APPELLATION FOR ECO SERIES

- Insulation transformer for switching power supply

ECO $\frac{\square \square \square \square}{1}$ $\frac{\blacksquare \square \square}{2}$ $\frac{\blacksquare \square \square}{3}$ $\frac{\blacksquare}{4}$ — $\frac{\square \square \square}{5}$ $\frac{\blacksquare \square}{6}$ $\frac{\blacksquare \square}{7}$ $\frac{\blacksquare \square}{8}$ $\frac{\square}{9}$ ex) ECO2225SEO-201V018

| | |
|--|--|
| 1. Core Size | ex) 2017, 2020, 2219, 2425 etc. |
| 2. Usage | ex) Switching : S, PFC : P |
| 3. Core Shape | ex) Core of ECO type : EO, Core of LQD type : LD, etc. |
| 4. Number of Bobbin sections(Nothing if 1 section) | ex) 2, 5, 9 etc. |
| 5. Serial number at each design site | Japan : 2xx, Taiwan : Txx, Xiamen : Xxx, Malaysia : Mxx, US : Uxx, Europe : Exx |
| 6. Bobbin construction | Vertical type : V, Horizontal type : H, SMD type : S |
| 7. Shielding method ※Not include a shield winding | Non : 0, Copper foil on the coil : 1, Wire shielded : 2, Copper foil on the core : 3 |
| 8. Applicable Safety regulation | No : 0, Yes : 1 |
| 9. Number of windings | ex) 2, 5, 12 etc. |

Product Line-Up



PRODUCT LINE-UP

| TDK Part No. | Core Size | Vin | Switching frequency fsw(kHz) | Out1 | Out2 | Out3 | Application |
|------------------------|-----------|-----------------|------------------------------|-----------------------|------------------|-------------|------------------|
| | | | | | | | |
| Vertical type | | | | | | | |
| ECO2017SEO-D01V017 | | 75Vdc~326Vdc | - | 12.8V/0.6A | 12V/0.09A | 15.2V/0.05A | Air Con(Outdoor) |
| ECO2017SEO-D02V016 | | 110Vac | 100KHz PWM | 12V/0.62A(1.6Ap) | - | - | Blu-Ray Player |
| ECO2017SEO-D03V014 | ECO2017 | 85Vac ~ 264Vac | - | 12V /1A typ/ 1.3A Max | - | - | Refrigerator |
| ECO2017SEO-D04V015 | | 160Vac ~ 288Vac | 100KHz PWM | 12V/0.3A | - | - | Refrigerator |
| ECO2017SEO-D05V016 | | 169Vac ~ 312Vac | - | 5V/0.25A | 15V/0.2A | - | Washing Machine |
| ECO2020SEO-D01V016 | | 70Vac ~ 265Vac | 50KHz PWM | 12.5V/0.8A | 15V/0.1A | - | Air Con(Indoor) |
| ECO2020SEO-D03V016 | ECO2020 | 85Vac~276Vac | 124KHz PWM | 12V/0.85A | 17V/0.15A | 17V/0.1 | Air Con(Outdoor) |
| ECO2020SEO-D09V015 | | 154Vac ~ 312Vac | - | 12V/0.5A | 15/0.1A | - | Refrigerator |
| ECO2020SEO-D10V017 | | 96Vac ~ 276Vac | - | 15V/0.4A | 18V/0.4A | 5V/0.1A | Washing Machine |
| ECO2219SEO-D01V018 | | 85Vac~276Vac | - | 12V/0.32A | 8V/0.3A | 8V/0.3A | Air Con(Indoor) |
| ECO2219SEO-D02V016 | ECO2219 | 264Vdc-373Vdc | 100KHz PWM | 12.4V/0.3A | 5V/0.09A | 19V/0.14 | Air Con(Indoor) |
| ECO2219SEO-D03V017 | | 170Vdc-400Vdc | - | 12V/0.54A | 5V/0.11A | 19V/0.02 | Air Con(Outdoor) |
| ECO2225SEO-D02V0112 | ECO2225 | 220Vac | 41KHz ~ | 12.3V/3.2A(5.0Ap) | - | - | Blu-Ray Recorder |
| ECO2420SEO-D01V019 | | 200Vdc-300Vdc | - | 12V/0.8A | 17V/0.17A | 17V/0.02A | Air Con(Outdoor) |
| ECO2420SEO-D02V019 | ECO2420 | 110Vac | 33KHz ~ | 12.3V/3.3A | - | - | Blu-Ray Recorder |
| ECO2420SEO-D03V018 | | 169Vac ~ 312Vac | 60KHz PWM | 12V/2.7A | 5V/0.3A | - | Refrigerator |
| ECO2420SEO-D04V0110 | | 214Vdc ~ 404Vdc | - | 12V/1.2A | 14V/0.5A | 7V/0.05A | Refrigerator |
| ECO2425SEO-D01V019 | | 264Vdc-373Vdc | 100KHz PWM | 12.7V/1.18A | 5V/0.14A | 20V/0.07A | Air Con(Outdoor) |
| ECO2425SEO-D02V016 | ECO2425 | 96Vac ~ 276Vac | - | 20V/0.2A | 18V/0.5A | 3.3V/0.7A | Washing Machine |
| ECO2425SEO-D03V014 | | 170Vac ~ 230Vac | 30KHz ~ | 36.5V/0.9A Max | - | - | Washing Machine |
| ECO2425SEO-D04V017 | | 169Vac ~ 312Vac | 65KHz PWM | 22.0V/1.5A typ/2.0Ap | 15V/0.5A | 7V/0.2A | Washing Machine |
| Horizontal type | | | | | | | |
| ECO2020SEO-D02H015 | | 75Vdc~326Vdc | - | 12.7V/0.6A | 18.5V/0.06A | - | Air Con(Indoor) |
| ECO2020SEO-D04H015 | | 110Vac | 67KHz PWM | 12V/1.5A(2.4Ap) | - | - | Blu-Ray Player |
| ECO2020SEO-D06H015 | ECO2020 | WW | 80KHz ~ | 19.7V/0.267A(0.35Ap) | - | - | LED Lamp |
| ECO2020SEO-D07H016 | | WW | 65KHz PWM | 21.5V/0.465A(1.4Ap) | - | - | Printer |
| ECO2020SEO-D08H016 | | WW | 65KHz PWM | 30.0V/0.333A(1.0Ap) | - | - | Printer |
| ECO2023SEO-D01H016 | ECO2023 | WW | 100KHz PWM | 12V/1.3A(2.2Ap) | - | - | Blu-Ray Player |
| ECO2225SEO-D01H016 | ECO2225 | WW | 67KHz PWM | 12V/1.5A(2.4Ap) | -12V/50mA(70mAp) | - | Blu-Ray Player |
| ECO2430SEO-D01H0110 | ECO2430 | 390Vdc PFC | 100KHz PWM | 12V/2.0A(2.75Ap) | 17V/0.5A(1.74p) | - | Flat-TV |
| ECO2430SEO-D03H016 | | 220Vac | 67KHz PWM | 5V/1A | 24V/2A | - | Printer |
| ECO2425SLD-D01H017 | LQD2425 | 100Vdc~370Vdc | - | 12.7V/2.33A | 16V/0.05A | - | Air Con(Indoor) |
| ECO2425SLD-D02H0111 | | WW | 67KHz PWM | 5V/2.2A(4.7Ap) | 12V/0.2A(1.5Ap) | - | Blu-Ray Player |

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General Specifications

OPERATING TEMPERATURE RANGE

| | | |
|-------------------|-----------|--|
| Temperature Range | Operating | -30 to +120°C[including self-heating] |
| | Storage | -40 to +85°C |
| Humidity Range | Operating | 10 to 95(%)RH[Maximum wet-bulb temperature 38°C, without dewing] |
| | Storage | 10 to 95(%)RH[Maximum wet-bulb temperature 38°C, without dewing] |

PACKAGE QUANTITY, PRODUCT WEIGHT

| TDK Part No. | Core Size | Package quantity (pieces/box) | Individual weight (g) |
|------------------------|-----------|----------------------------------|--------------------------|
| Vertical type | | | |
| ECO2017SEO-D01V017 | ECO2017 | 210 | 13.8 |
| ECO2017SEO-D02V016 | | 210 | 13.8 |
| ECO2017SEO-D03V014 | | 210 | 13.1 |
| ECO2017SEO-D04V015 | | 210 | 13.2 |
| ECO2017SEO-D05V016 | | 210 | 12.0 |
| ECO2020SEO-D01V016 | ECO2020 | 225 | 14.9 |
| ECO2020SEO-D03V016 | | 180 | 16.9 |
| ECO2020SEO-D09V015 | | 225 | 15.2 |
| ECO2020SEO-D10V017 | | 225 | 15.1 |
| ECO2219SEO-D01V018 | ECO2219 | 210 | 18.9 |
| ECO2219SEO-D02V016 | | 210 | 19.8 |
| ECO2219SEO-D03V017 | | 210 | 18.7 |
| ECO2225SEO-D02V0112 | ECO2225 | 150 | 32.0 |
| ECO2420SEO-D01V019 | ECO2420 | 150 | 28.2 |
| ECO2420SEO-D02V019 | | 150 | 26.6 |
| ECO2420SEO-D03V018 | | 120 | 26.5 |
| ECO2420SEO-D04V0110 | | 120 | 26.5 |
| ECO2425SEO-D01V019 | ECO2425 | 135 | 34.8 |
| ECO2425SEO-D02V016 | | 150 | 33.5 |
| ECO2425SEO-D03V014 | | 150 | 31.7 |
| ECO2425SEO-D04V017 | | 135 | 33.2 |
| Horizontal type | | | |
| ECO2020SEO-D02H015 | ECO2020 | 200 | 14.7 |
| ECO2020SEO-D04H015 | | 200 | 16.2 |
| ECO2020SEO-D06H015 | | 205 | 14.6 |
| ECO2020SEO-D07H016 | | 300 | 15.8 |
| ECO2020SEO-D08H016 | | 300 | 15.6 |
| ECO2023SEO-D01H016 | ECO2023 | 180 | 17.3 |
| ECO2225SEO-D01H016 | ECO2225 | 120 | 22.7 |
| ECO2430SEO-D01H0110 | ECO2430 | 90 | 35.4 |
| ECO2430SEO-D03H016 | | 90 | 37.8 |
| ECO2425SLD-D01H017 | LQD2425 | 192 | 23.9 |
| ECO2425SLD-D02H0111 | | 192 | 22.3 |

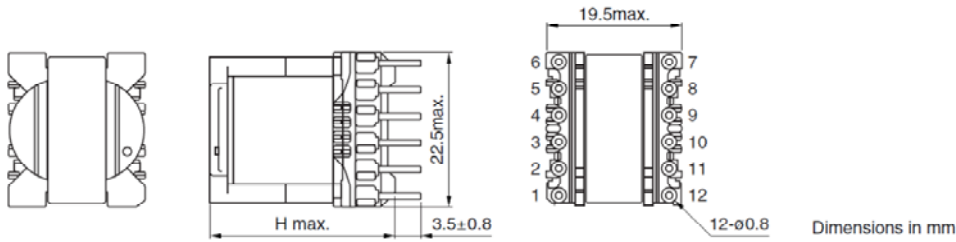
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ECO20 Series for Multiple Outputs (Vertical Type)

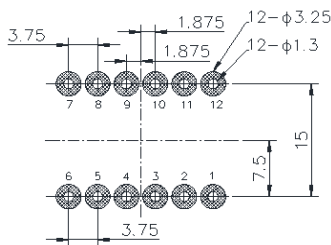
Compatible with lead-free solders

■ SHAPES AND DIMENSIONS (BOBBIN TYPE: VI)



| Part No. | Bobbin type | H max. |
|----------|-------------|--------|
| ECO2017 | VI | 24.0 |
| ECO2020 | VI | 27.0 |
| ECO2023 | VI | 30.0 |

■ RECOMMENDED BASE MATERIAL OPENING SIZE



Dimensions in mm

Default Tolerance : ± 0.1

■ ITEMS APPLICABLE

| Series | Bobbin Type | Part No. |
|---------|-------------|--------------------|
| ECO2017 | VI | ECO2017SEO-D01V017 |
| | | ECO2017SEO-D02V016 |
| | | ECO2017SEO-D03V014 |
| | | ECO2017SEO-D04V015 |
| | | ECO2017SEO-D05V016 |
| ECO2020 | VI | ECO2020SEO-D01V016 |
| | | ECO2020SEO-D03V016 |
| | | ECO2020SEO-D09V015 |
| | | ECO2020SEO-D10V017 |

· Compatible ferrite materials for this product are the PC47 family.

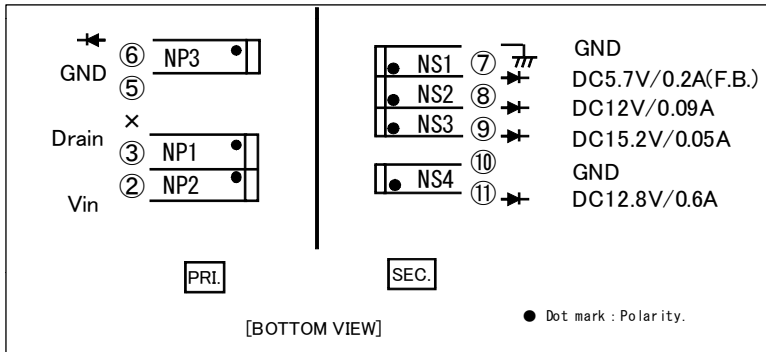
· Conformity to RoHS Directive: This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted ϕ pir.

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SPECIFICATIONS / ECO2017SEO-D01V017

Compatible with lead-free solders

■ SCHEMATICS

■ SAFETY STANDARDS

| SAFETY STANDARDS | |
|-----------------------------|------------|
| Over Surface & Air Spacings | |
| PRI. - SEC. | 2.5mm MIN. |
| PRI. - CORE | 1.3mm MIN. |
| SEC. - CORE | 1.3mm MIN. |

■ WINDING SPECIFICATIONS

| No. | Order | coil | terminal | turns | wire | note |
|-----|-------|------|----------|-------|-------------|--------------|
| 1 | 1 | N P1 | 3 - 2 | 30 | UEW 0.16 | NP1+NP2=91ts |
| 2 | 2 | N P3 | 6 - 5 | 11 | UEW 0.23 ×2 | |
| 3 | 3 | N S4 | 12 - 11 | 11 | UEW 0.23 ×2 | |
| 4 | 4 | N S3 | 10 - 9 | 2 | UEW 0.26 | |
| 5 | 5 | N S2 | 9 - 8 | 5 | UEW 0.26 | |
| 6 | 6 | N S1 | 8 - 7 | 6 | UEW 0.26 | |
| 7 | 7 | N P2 | 2 - 1 | 61 | UEW 0.16 | |

SPECIFICATIONS / ECO2017SEO-D01V017

Compatible with lead-free solders

■ ELECTRICAL CHARACTERISTICS

| (Test Conditions) | | | | | |
|---------------------|--|---------------------------------|------------------------------------|---------------------|---|
| (Temperature) | | : | 25±10°C | | |
| (Relative Humidity) | | : | 25~75%RH | | |
| No | Parameter | Test Terminal | Specification | Conditions | Test Instruments |
| 4.1 | Inductance | 3 - 1 | 1.49mH ± 10% | 10 kHz 1Vrms | LCR Meter Agilent : 4263B or Equivalent |
| 4.2 | Leakage Inductance | 3 - 1 (6,5,SEC. short) | 35.0 uH MAX | | |
| 4.3 | DC. Resistance | 2 - 1 | 2.238Ω ±15% | | Milli ohm meter ADEX : AX-114N or Equivalent |
| | | 3 - 2 | 0.744Ω ±20% | | |
| | | 6 - 5 | 74.5mΩ ±30% | | |
| | | 8 - 7 | 79.3mΩ ±30% | | |
| | | 9 - 8 | 65.3mΩ ±30% | | |
| | | 10 - 9 | 30.1mΩ ±30% | | |
| 12 - 11 | 81.1mΩ ±30% | | | | |
| 4.4 | Insulation Resistance | PRI.-SEC. PRI.,SEC. -CORE | 100 MΩ MIN. | DC 500V | Meg Ohm Meter Toa : SM-5E or Equivalent |
| 4.5 | Withstanding Voltage | PRI.-SEC. | Without Breakdown Sense:2mA | AC 1.5kVrms 1min | Puncture Tester Kikusui : TOS8650 or Equivalent |
| | | PRI.-CORE SEC.-CORE | | AC 1.0kVrms 1min | |
| 4.6 | Impulse Test | 3 - 1 | Without Breakdown | Pulse 600Vo-p 1s | Impulse Tester ECG : DWS-05 or Equivalent |
| 4.7 | Polarity & Turns Ratio X-X / 3 - 1 | 2 - 1 | STD(0.6807)±2.0% | f=10kHz | Ratio Meter Ryowa : TRM-101A or Equivalent |
| | | 6 - 5 | STD(0.1178)±5.5% | | |
| | | 10 - 9 | STD(0.0214)±15% | | |
| | | 9 - 8 | STD(0.0537)±10% | | |
| | | 8 - 7 | STD(0.0660)±10% | | |
| | | 12 - 11 | STD(0.1189)±5.5% | | |

SPECIFICATIONS / ECO2017SEO-D01V017

Compatible with lead-free solders

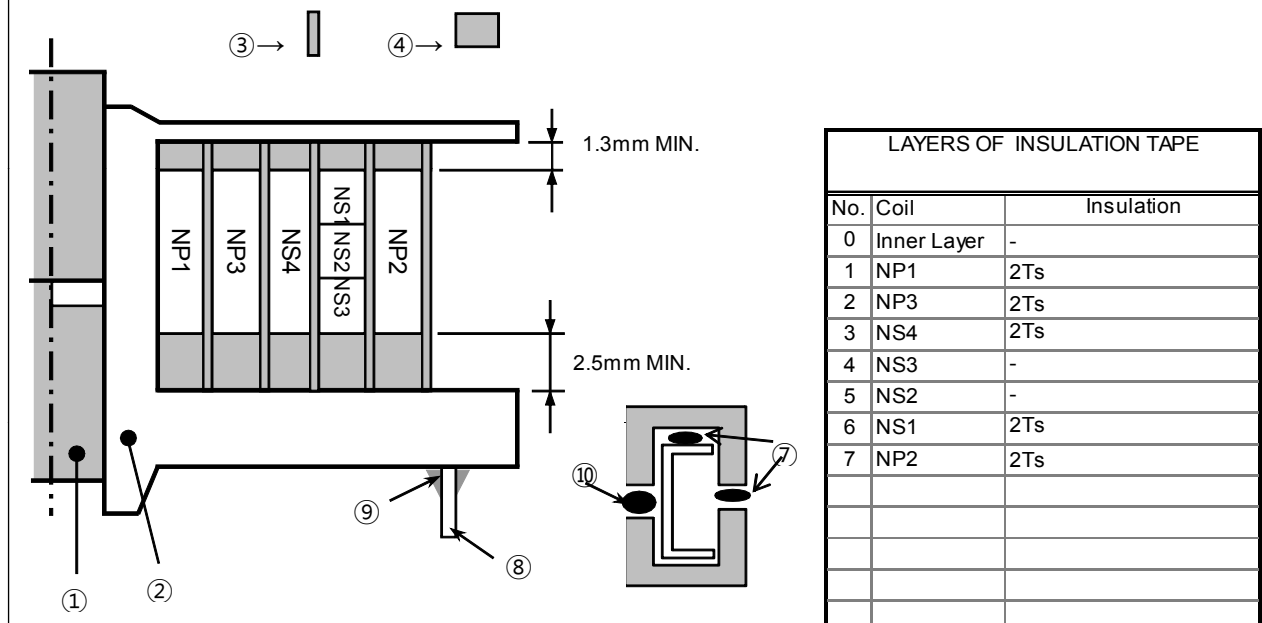
MATERIAL LIST AND INSULATING CONSTRUCTION

| No | ITEM & MATERIAL | MIN.THICKNESS OF LAYER | UL T.I (°C) | MANUFACTURER | UL FILE NO. |
|----|--|---------------------------------------|--------------|---|-------------------------------|
| ① | CORE Ferrite 20.9mm x17.6mm x7.7mm | — | — | TDK Corporation | — |
| ② | BOBBIN Phenol Resin PM-9820 | 0.65 mm MIN. | 150 94V-0 | SUMITOMO BAKELITE CO.,LTD. | E41429 |
| ③ | INSULATION TAPE Polyester Color : YELLOW | 1318 or 1350F | 130 | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | E17385 |
| ④ | FIXING TAPE FOR WIRE (Barrier Tape) Polyester | 44 or 44D or 44-18MIL or 673F or 673A | 130 | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | E17385 |
| | | | | TERAOKA SEISAKUSHO CO.,LTD. | E56086 |
| ⑤ | WINDING WIRE Polyurethane Enameled Copper Wire 0.16 mm DIAx1 : NP1,NP2 0.23 mm DIAx2 : NP3 | — | 130 | PROSPERITY ELECTRIC WIRE & CABLE CO. | E196072 |
| ⑥ | WINDING WIRE Polyurethane Enameled Copper Wire 0.26 mm DIAx1 : NS1,NS2,NS3 0.23 mm DIAx2 : NS4 | | | XIAMEN HUNG'S ENTERPRISE CO.,LTD. HANGZHOU WEIFENG ELECTRONIC CO.,LTD. SHENZHEN FUJI FINE FACTORY | E219154 E229341 E303260 |
| ⑦ | ADHESIVE Acrylic , Urethane or Epoxy | | | Optional | |
| ⑧ | TERMINAL PIN Copper Clad Steel WireΦ0.8(Soldered) Under Coating(Copper)25% Weight Ratio. (Ref)Surface Plating(Sn100%)3μm or More. | | | Optional | |
| ⑨ | SOLDER (For junction of a wire and a terminal) Lead-Free Sn-Ag-Cu | | | Optional | |
| ⑩ | ADHESIVE Polyestel, Urethane or Epoxy | | | Optional | |

※ 1. Tape Min. Thickness shows the total value. (Tape Base and Adhesive)

※ 2. Insulation Tape shall be able to withstand for 1 minute of 3000 Volts (r.m.s) Potential with 2 layers.

☆BOBBIN UL94 : 94V-0 ,CTI(IEC112) : 175~250V (UL Level 3)

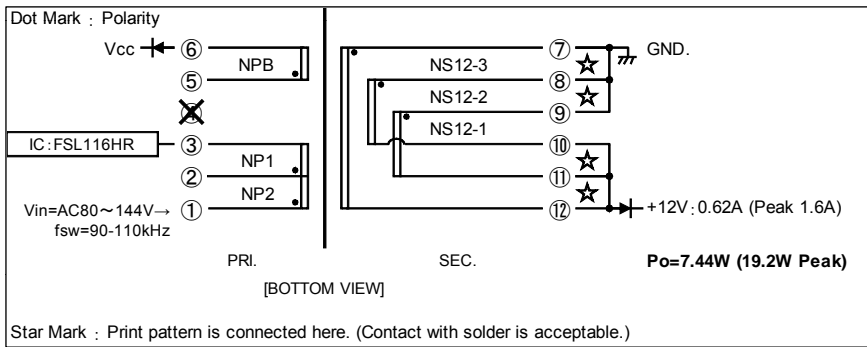


· All specifications are subject to change without notice.

Please read the precautions before using this catalog.

SPECIFICATIONS / ECO2017SEO-D02V016

Compatible with lead-free solders

■ SCHEMATICS

■ SAFETY STANDARDS

| SAFETY STANDARDS | | |
|-------------------------------|----------------|-----------------|
| *UL60065-Ed.7, *IEC60065-Ed.7 | | |
| | Inside of Coil | Outside of Coil |
| Between Pri. and Sec. | 4.8mm MIN. | 8.0mm MIN. |
| Between Pri. and Core | 2.4mm MIN. | 4.0mm MIN. |
| Between Sec. and Core | 2.4mm MIN. | 4.0mm MIN. |

■ WINDING SPECIFICATIONS

| No. | Order | Coil | Terminal | Turns | Wire | Note |
|-----|-------|---------|----------|-------|----------|---------------|
| 1 | 1 | N S12-1 | 9 - 11 | 13 | UEW 0.25 | |
| 2 | 2 | N P1 | 2 - 3 | 42 | UEW 0.23 | NP1+NP2=71Ts. |
| 3 | 3 | N S12-2 | 8 - 10 | 13 | UEW 0.25 | |
| 4 | 4 | N P2 | 1 - 2 | 29 | UEW 0.23 | |
| 5 | 5 | N S12-3 | 7 - 12 | 13 | UEW 0.25 | |
| 6 | 6 | N PB | 5 - 6 | 17 | UEW 0.20 | |

SPECIFICATIONS / ECO2017SEO-D02V016

Compatible with lead-free solders

■ ELECTRICAL CHARACTERISTICS

| Test Conditions | | Temperature | : | 25±10°C | | |
|-----------------|---|---------------------------------|--|---------------------------------------|---|--|
| | | Relative Humidity | : | 25~75%RH | | |
| No | Parameter | Test Terminal | Specification | Condition _s | Test Instruments | |
| 4.1 | Inductance | 1 - 3 | 712 μH ± 10%. | 10 kHz 1Vrms | LCR Meter Agilent : 4263B or Equivalent | |
| 4.2 | Leakage Inductance | 1 - 3 (7~12 short) | 15.0 μH MAX. | 100 kHz 1Vrms | | |
| 4.3 | DC. Resistance | 1 - 3 | 1.12 Ω ± 20%. | | Milli ohm meter ADEX : AX-114 or Equivalent | |
| | | 5 - 6 | 0.462 Ω ± 20%. | | | |
| | | 9 - 11 | 0.149 Ω ± 20%. | | | |
| | | 8 - 10 | 0.184 Ω ± 20%. | | | |
| | | 7 - 12 | 0.217 Ω ± 20%. | | | |
| 4.4 | Insulation Resistance | PRI.-SEC. PRI.,SEC. -CORE | 100 MΩ MIN. | DC 500V | Meg Ohm Meter Toa : SM-5E or Equivalent | |
| 4.5 | Withstanding Voltage | PRI.-SEC. | Without Breakdown Sense:1mA f=50or60Hz | AC 3.0kVrms 1min or AC 3.6kVrms 1s | Puncture Tester Kikusui : TOS8650 or Equivalent | |
| | | PRI.-CORE SEC.-CORE | | AC 1.5kVrms 1min or AC 1.8kVrms 1s | | |
| | | | | | | |
| 4.6 | Impulse Test | 1 - 3 | Without Breakdown | Pulse 0.8kVo-p 3--5 Pulse | Impulse Tester ECG : DWS-05 or Equivalent | |
| 4.7 | Polarity & Turns Ratio X-X/ 1 - 3 | 5 - 6 | (0.2402)± 4.7%. | f=10kHz | Ratio Meter Ryowa : TRM-101A or Equivalent | |
| | | 9 - 11 | (0.1744)± 6.1%. | | | |
| | | 8 - 10 | (0.1822)± 6.1%. | | | |
| | | 7 - 12 | (0.1835)± 6.1%. | | | |
| | | | | | | |

SPECIFICATIONS / ECO2017SEO-D02V016

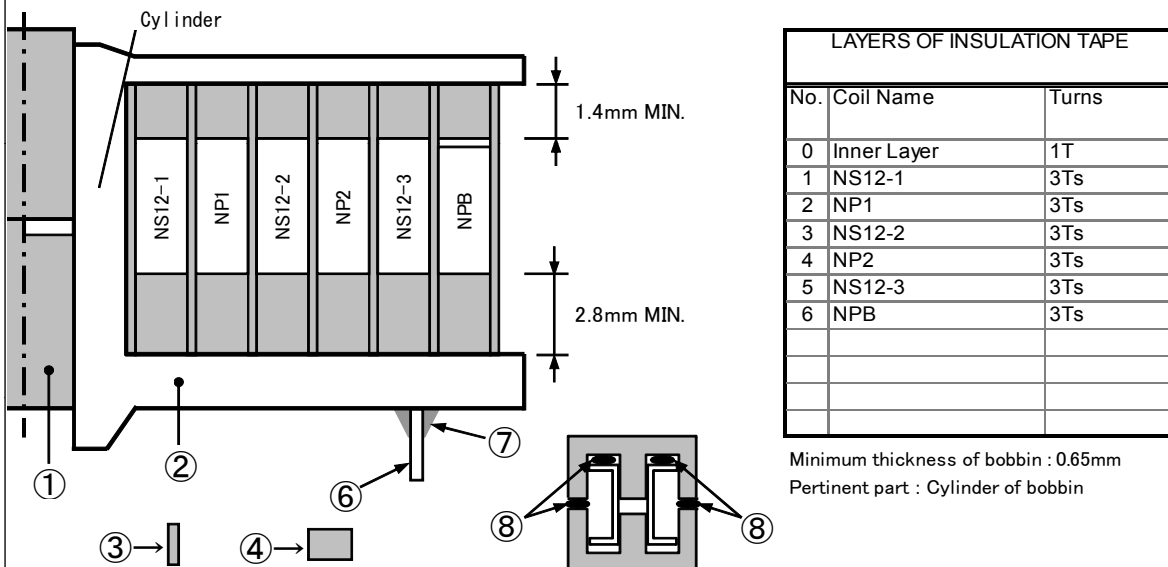
Compatible with lead-free solders

MATERIAL LIST AND INSULATING CONSTRUCTION

| No | ITEM & MATERIAL | MIN.THICKNESS OF 1 LAYER | UL T.I (°C) | MANUFACTURER | UL FILE NO. |
|----|--|-----------------------------|----------------|---|----------------|
| ① | CORE Ferrite 20.9mmx17.6mmx7.7mm | — | — | TDK-EPC Corporation | — |
| ② | BOBBIN Phenol Resin | PM-9820 | 0.65 mm | SUMITOMO BAKELITE CO.,LTD. | E41429 |
| | | T375J | | CHANG CHUN PLASTICS CO.,LTD | E59481 |
| ③ | INSULATION TAPE Polyester Material group II MIN. (400V<CTI≤600V MIN.) | 1318-1 or 1350F-1 | 0.05 mm | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | E17385 |
| | | | | | |
| ④ | FIXING TAPE FOR WIRE (Barrier Tape) Polyester Material group I (CTI≥600V) | 44D-A or 44T-A | — | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | E17385 |
| | | 343BN@@ | | NITTO DENKO CORP. | E34833 |
| | | WF with suffixes | | JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD | E165111 |
| ⑤ | WINDING WIRE (Primary) Polyurethane Enameled Copper Wire 0.23 mm DIA : NP1, NP2 0.20 mm DIA : NPB | — | 130 | PROSPERITY ELECTRIC WIRE & CABLE CO. | E196072 |
| | | | | HANGZHOU WEIFENG ELECTRONIC CO.,LTD. | E229341 |
| | | | | TAI ELECTRIC WIRE&CABLE CO LTD | E85640 |
| | | | | ZHUHAI WEIHAN WIRE CO LTD | E339217 |
| | | | | SHENZHEN FUJI FINE FACTORY | E303260 |
| | WINDING WIRE (Secondary) Polyurethane Enameled Copper Wire 0.25 mm DIA : NS12-1,-2,-3 | — | 130 | HITACHI CABLE (JOHOR) SDN BHD | E215594 |
| | | | | THAI HITACHI ENAMEL WIRE CO LTD | E137472 |
| | | | | ELEKTRISOLA (MALAYSIA) SDN BHD | E143312 |
| | | | | | |
| | | | | | |
| ⑥ | TERMINAL PIN Φ0.8 (Soldered) Copper Clad Steel Wire Under Coating(Copper)25% Weight Ratio. (Ref)Surface Plating(Sn100%)3μm or More. | — | — | Optional | — |
| ⑦ | SOLDER (For junction of a wire and a terminal) Lead-Free Sn-Ag-Cu | — | — | Optional | — |
| ⑧ | ADHESIVE Acrylic, Urethane or Epoxy | — | — | Optional | — |

※ 1. Tape Min. Thickness shows the total value. (Tape Base and Adhesive)

※ 2. Insulation Tape shall be able to withstand for 1 minute of 3000 Volts (r.m.s) Potential with 2 layers.

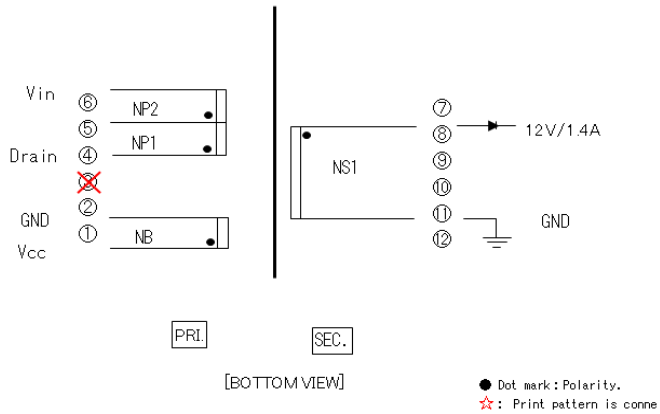


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SPECIFICATIONS / ECO2017SEO-D03V014

Compatible with lead-free solders

■ SCHEMATICS

■ SAFETY STANDARDS

| SAFETY STANDARDS | |
|-----------------------------|---------------------------|
| IEC60335-1 Ed.4 | |
| Over Surface & Air Spacings | |
| PRI. - SEC. | 4.0 mm MIN.(inside coil) |
| PRI. - CORE | 4.0 mm MIN.(outside coil) |
| SEC. - CORE | 4.0 mm MIN.(outside coil) |
| REMOVE PIN | PIN No. 3 |

■ WINDING SPECIFICATIONS

| No. | order | coil | terminal | turns | wire | WIDING METHOD | note |
|-----|-------|-----------------|----------|-------|-----------|---------------|--------------|
| 0 | | 600V \leq CTI | | | | | NP1+NP2=47ts |
| 1 | CW | N P1 | 4 - 5 | 24 | 2UEW 0.28 | 2Layer sol | |
| 2 | CW | N S1 | 8 - 11 | 6 | 2UEW 0.45 | 1Layer sol | |
| 3 | CCW | N B | 2 - 1 | 7 | 2UEW 0.28 | 1Layer sol | |
| 4 | CW | N P2 | 5 - 6 | 23 | 2UEW 0.28 | 2Layer sol | |

SPECIFICATIONS / ECO2017SEO-D03V014

Compatible with lead-free solders

■ ELECTRICAL CHARACTERISTICS

| (Test Conditions) | | | | | |
|---------------------|------------------------|---------------------------------|-------------------|--|---|
| (Temperature) | | : | 25±10°C | | |
| (Relative Humidity) | | : | 25~75%RH | | |
| No | Parameter | Test Terminal | Specification | Conditions | Test Instruments |
| 4.1 | Inductance | 4 - 6 | 555uH ± 15% | 1 kHz 1Vrms | LCR Meter Agilent : 4263B or Equivalent |
| | | | | 100 kHz 1Vrms | |
| | | | | 200 kHz 1Vrms | |
| 4.2 | Leakage Inductance | 4 - 6 (1,2,SEC. short) | 20 uH MAX | 100 kHz 1Vrms | |
| 4.3 | DC. Resistance | 4 - 5 | 0.218 ±20% | | ADEX : AX-114N or Equivalent |
| | | 8 - 11 | 0.025 ±30% | | |
| | | 1 - 2 | 0.084 ±30% | | |
| | | 5 - 6 | 0.279 ±20% | | |
| | | | | | |
| 4.4 | Insulation Resistance | PRI.-SEC. PRI.,SEC. -CORE | 100 MΩ MIN. | DC 500V | Meg Ohm Meter Toa : SM-5E or Equivalent |
| 4.5 | Withstanding Voltage | PRI.-SEC. | Without Breakdown | AC 3.0kVrms 1min or AC 3.6kVrms 1s | Puncture Tester Kikusui : TOS8650 or Equivalent |
| 4.6 | Impulse Test | 4 - 6 | Without Breakdown | Pulse 600Vo-p 3~5 pluse | Impulse Tester ECG : DWS-05 or Equivalent |
| 4.7 | Polarity & Turns Ratio | 4 - 5 | 0.5060 ±10% | f=10kHz | Ratio Meter or Equivalent |
| | | 8 - 11 | 0.1259 ±10% | | |
| | | 1 - 2 | 0.1483 ±10% | | |
| | | | | | |
| 4.8 | Inductance | 4 - 5 | 144.8 ±25% | 100 kHz 1Vrms | Agilent : 4263B or Equivalent |
| | | 8 - 11 | 9.0 ±25% | | |
| | | 1 - 2 | 12.6 ±25% | | |
| | | 5 - 6 | 137.6 ±25% | | |
| | | | | | |

SPECIFICATIONS / ECO2017SEO-D03V014

Compatible with lead-free solders

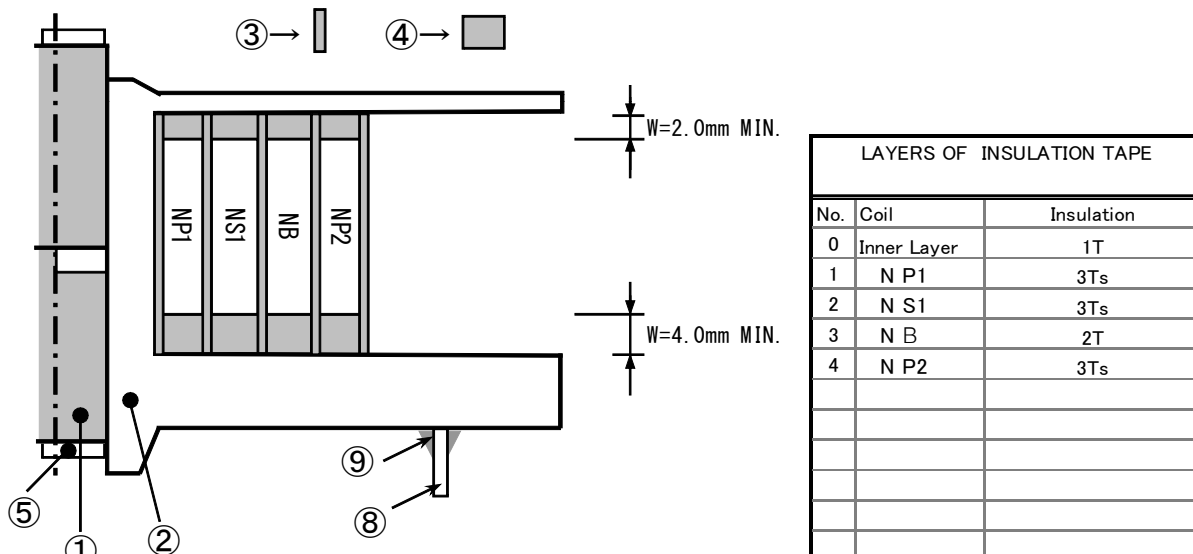
MATERIAL LIST AND INSULATING CONSTRUCTION

| No. | ITEM & MATERIAL | | MIN.THICKNESS OF LAYER | UL T1 (°C) | MANUFACTURER | UL FILE NO. |
|-----|--|----------------------|------------------------|--------------|--|-------------|
| ① | CORE PCB47 ECO2017 | | — | — | TDK Corporation | — |
| ② | BOBBIN | Phenol Resin PM-9820 | 0.65 mm MIN. | 150 94V-0 | SUMITOMO BAKELITE CO.,LTD. | E41429 |
| ③ | INSULATION TAPE Polyester Color : YELLOW | CT280 | 0.05 mm | 130 | JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD | E165111 |
| | | 35660Y | | | SYMBIO INC | E50292 |
| | | 1318-1 | | | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | E17385 |
| ④ | FIXING TAPE FOR WIRE (Barrier Tape) Polyester | 44D-A | — | 130 | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | E17385 |
| | | 35660Y | | | SYMBIO INC | E50292 |
| | | WF with suffixes | | | JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD | E165111 |
| ⑤ | FIXING TAPE FOR CORE Polyester Color : YELLOW | CT280 | 0.05 mm | 130 | JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD | E165111 |
| | | 1318-1 | | | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | E17385 |
| ⑥ | WINDING WIRE Polyurethane Enameled Copper Wire | — | — | 130 | TAI-I ELECTRIC WIRE & CABLE CO LTD | E85640 |
| | | | | | PROSPERITY ELECTRIC WIRE & CABLE CO. | E196072 |
| | | | | | XIAMEN HUNG'S ENTERPRISE CO.,LTD. | E219154 |
| ⑦ | ADHESIVE Varnish TVB2024 | | | | KYOCERA CHEMICAL CORPORATION | E83702 |
| ⑧ | TERMINAL PIN Copper Clad Steel Wire $\Phi 0.8$ (Soldered) Under Coating(Copper)25% Weight Ratio. (Ref)Surface Plating(Sn100%)3 μ m or More. | | | | Optional | |
| ⑨ | SOLDER (For junction of a wire and a terminal) Lead-Free Sn-Ag-Cu | | | | Optional | |
| ⑩ | MARKING | Laser | | | LA MARK LP-V SERIES | |

※ 1. Tape Min. Thickness shows the total value. (Tape Base and Adhesive)

※ 2. Insulation Tape shall be able to withstand for 1 minute of 3000 Volts (r.m.s) Potential with 2 layers.

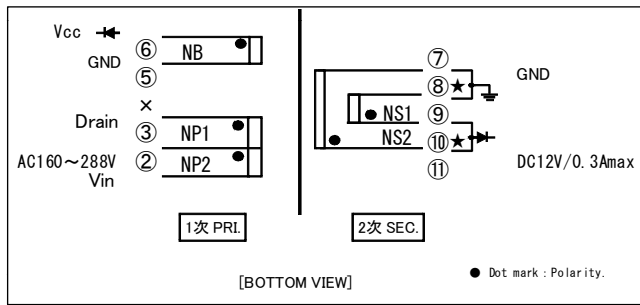
☆BOBBIN UL94:94V-0 ,CTI(IEC112):175~250V (UL Level 3)



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SPECIFICATIONS / ECO2017SEO-D04V015

Compatible with lead-free solders

■ SCHEMATICS

■ SAFETY STANDARDS

| SAFETY STANDARDS | |
|-----------------------------|------------|
| IEC60335-1 Ed.4 | |
| Over Surface & Air Spacings | |
| PRI. - SEC. | 4.0mm MIN. |
| PRI. - CORE | 4.0mm MIN. |
| SEC. - CORE | 4.0mm MIN. |

■ WINDING SPECIFICATIONS

| No. | Order | coil | terminal | turns | wire | note |
|-----|-------|-----------|----------|-------|----------|---------------|
| 0 | 0 | 600 ≤ CTI | | | | |
| 1 | 1 | N P1 | 3 - 2 | 69 | UEW 0.12 | NP1+NP2=120ts |
| 2 | 2 | N S1 | 10 - 9 | 26 | UEW 0.18 | |
| 3 | 3 | N P2 | 2 - 1 | 51 | UEW 0.12 | |
| 4 | 4 | N S2 | 11 - 8 | 26 | UEW 0.18 | |
| 5 | 5 | N B | 6 - 5 | 26 | UEW 0.18 | |

SPECIFICATIONS / ECO2017SEO-D04V015

Compatible with lead-free solders

■ ELECTRICAL CHARACTERISTICS

| (Test Conditions) | | | | | |
|---------------------|--|---------------------------------|------------------------------------|---------------------------------------|---|
| (Temperature) | | : | 25±10°C | | |
| (Relative Humidity) | | : | 25~75%RH | | |
| No | Parameter | Test Terminal | Specification | Condition _s | Test Instruments |
| 4.1 | Inductance | 3 - 1 | 3.18mH ± 13% | 10 kHz 1Vrms | LCR Meter Agilent : 4263B or Equivalent |
| 4.2 | Leakage Inductance | 3 - 1 (SEC.short) | 35 μH MAX | 100 kHz 1Vrms | |
| 4.3 | DC. Resistance | 3 - 2 | 3.06Ω ±15% | | Milli ohm meter ADEX : AX-114N or Equivalent |
| | | 10 - 9 | 0.58Ω ±20% | | |
| | | 11 - 8 | 0.70Ω ±20% | | |
| | | 6 - 5 | 0.77Ω ±20% | | |
| | | 2 - 1 | 2.80Ω ±15% | | |
| 4.4 | Insulation Resistance | PRI.-SEC. PRI.,SEC. -CORE | 100 MΩ MIN. | DC 500V | Meg Ohm Meter Toa : SM-5E or Equivalent |
| 4.5 | Withstanding Voltage | PRI.-SEC. | Without Breakdown Sense:1mA | AC 3.0kVrms 1min or AC 3.6kVrms 1s | Puncture Tester Kikusui : TOS8650 or Equivalent |
| | | PRI.-CORE SEC.-CORE | | AC 1.5kVrms 1min or AC 1.8kVrms 1s | |
| 4.6 | Impulse Test | 3 - 1 | Without Breakdown | Pulse 600Vo-p 1s | Impulse Tester ECG : DWS-05 or Equivalent |
| 4.7 | Polarity & Turns Ratio X-X / 3 - 1 | 3 - 2 | STD(0.5720) ±2.0% | f=10kHz | Ratio Meter Ryowa : TRM-101A or Equivalent |
| | | 10 - 9 | STD(0.2166) ±3.0% | | |
| | | 11 - 8 | STD(0.2171) ±3.0% | | |
| | | 6 - 5 | STD(0.2165) ±3.0% | | |

SPECIFICATIONS / ECO2017SEO-D04V015

Compatible with lead-free solders

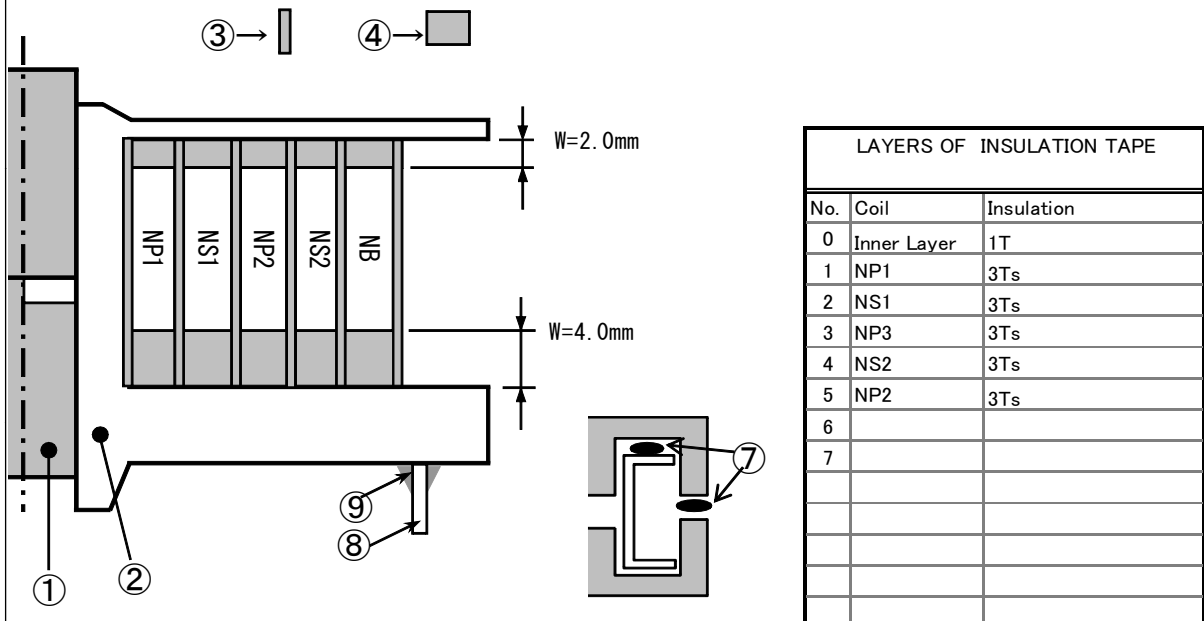
MATERIAL LIST AND INSULATING CONSTRUCTION

| No. | ITEM & MATERIAL | MIN.THICKNESS OF LAYER | UL T1 (°C) | MANUFACTURER | UL FILE NO. | |
|-----|---|--|--------------|--|--|--------|
| ① | CORE Ferrite 20.9mm x17.6mm x7.7mm | — | — | TDK-EPC Corporation | — | |
| ② | BOBBIN Phenol Resin PM-9820 | 0.65 mm MIN. | 150 94V-0 | SUMITOMO BAKELITE CO.,LTD. | E41429 | |
| ③ | INSULATION TAPE Polyester Color : WHITE | 1318 0.05 mm | 130 | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | E17385 | |
| ④ | FIXING TAPE FOR WIRE (Barrier Tape) Polyester | 44 or 44D or 44-18MIL or 673F or 673A | — | 130 | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | E17385 |
| | | | | — | TERAOKA SEISAKUSHO CO.,LTD. | E56086 |
| ⑤ | WINDING WIRE Polyurethane Enameled Copper Wire 0.12 mm DIAx1 : NP1,NP2 0.18 mm DIAx1 : NB | — | 130 | PROSPERITY ELECTRIC WIRE & CABLE CO. | E196072 | |
| ⑥ | WINDING WIRE Polyurethane Enameled Copper Wire 0.18 mm DIAx1 : NS1,NS2 | — | | HANGZHOU WEIFENG ELECTRONIC CO.,LTD. | E229341 | |
| | | | | TAI-I COPPER(GUANGZHOU) CO.,LTD | E85640 | |
| | | | | Zhuhai Wei Han Wire Co., Ltd | E339217 | |
| ⑦ | ADHESIVE Acrylic , Urethane or Epoxy | — | — | LOCTITE | — | |
| ⑧ | TERMINAL PIN Copper Clad Steel Wire Φ 0.8(Soldered) Under Coating(Copper)25% Weight Ratio. (Ref)Surface Plating(Sn100%) $3\ \mu\text{m}$ or More. | — | — | XIAMEN KEXIN ELECTRON CO.,LTD. | — | |
| ⑨ | SOLDER (For junction of a wire and a terminal) Lead-Free Sn-Ag-Cu | — | — | SENJU METAL Vendor::SOLNET METAL INDUSTRY CO.,LTD. | — | |

※ 1. Tape Min. Thickness shows the total value. (Tape Base and Adhesive)

※ 2. Insulation Tape shall be able to withstand for 1 minute of 3000 Volts (r.m.s) Potential with 2 layers.

★BOBBIN UL94: 94V-0 ,CTI(IEC112): 175~250V (UL Level 3)



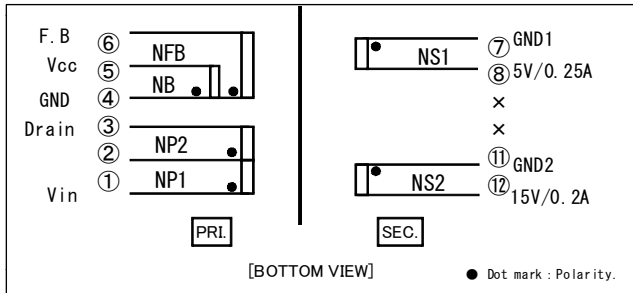
· All specifications are subject to change without notice.

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SPECIFICATIONS / ECO2017SEO-D05V016

Compatible with lead-free solders

SCHEMATICS



SAFETY STANDARDS

| SAFETY STANDARDS | |
|-----------------------------|---------------------------|
| IEC60335-1 Ed.4 | |
| Over Surface & Air Spacings | |
| PRI. - SEC. | 4.0 mm MIN.(inside core) |
| PRI. - CORE | 4.0 mm MIN.(outside core) |
| SEC. - CORE | 4.0 mm MIN.(outside core) |

WINDING SPECIFICATIONS

| No. | order | coil | terminal | turns | wire | note |
|-----|-------|-----------------|----------|-------|----------|--------------|
| 0 | 0 | 600V \leq CTI | | | | |
| 1 | 1 | N P2 | 2 - 3 | 44 | UEW 0.16 | NP1+NP2=95ts |
| 2 | 2 | N B | 4 - 5 | 12 | UEW 0.16 | |
| 3 | 3 | N FB | 4 - 6 | 5 | UEW 0.16 | |
| 4 | 4 | N S1 | 7 - 8 | 6 | UEW 0.20 | |
| 5 | 5 | N S2 | 11 - 12 | 16 | UEW 0.20 | |
| 6 | 6 | N P1 | 1 - 2 | 51 | UEW 0.16 | |

* BARRIER TAPE & INSULATION TAPE SPECIFICATIONS

Insulation tape Color : **Yellow**

| No. | order | coil | terminal | Pin side | Core side | Ts | Insulation tape 17.5mm | note |
|-----|-------|------|----------|----------|-----------|-----|------------------------|------|
| 0 | 0 | | | - | - | - | t=25u 1 ts | |
| 1 | 1 | N P2 | 2 - 3 | 4.0 | 2.0 | 2ts | t=25u 1 ts | |
| 2 | 2 | N B | 4 - 5 | 4.0 | 2.0 | 1ts | t=25u 1 ts | |
| 3 | 3 | N FB | 4 - 6 | 4.0 | 2.0 | - | t=25u 3 ts | |
| 4 | 4 | N S1 | 7 - 8 | 4.0 | 2.0 | 1ts | t=25u 1 ts | |
| 5 | 5 | N S2 | 11 - 12 | 4.0 | 2.0 | 1ts | t=25u 3 ts | |
| 6 | 6 | N P1 | 1 - 2 | 4.0 | 2.0 | 3ts | t=25u 3 ts | |

· All specifications are subject to change without notice.
Please read the precautions before using this catalog.

SPECIFICATIONS / ECO2017SEO-D05V016

Compatible with lead-free solders

■ ELECTRICAL CHARACTERISTICS

| (Test Conditions) | | | | | |
|---------------------|--|---------------------------------|------------------------------------|---------------------------------------|---|
| (Temperature) | | : | 25±10°C | | |
| (Relative Humidity) | | : | 25~75%RH | | |
| No | Parameter | Test Terminal | Specification | Conditions | Test Instruments |
| 4.1 | Inductance | 1 - 3 | 1.80mH ± 13% | 10 kHz 1Vrms | LCR Meter Agilent : 4263B or Equivalent |
| 4.2 | Leakage Inductance | 1 - 3 (4,5,6,SEC. short) | 35.0uH MAX | | |
| 4.3 | DC. Resistance | 1 - 2 | 1.716Ω ±15% | | Milli ohm meter ADEX : AX-114N or Equivalent |
| | | 2 - 3 | 1.129Ω ±15% | | |
| | | 4 - 5 | 0.351Ω ±20% | | |
| | | 4 - 6 | 0.164Ω ±20% | | |
| | | 7 - 8 | 0.133Ω ±20% | | |
| | | 11 - 12 | 0.336Ω ±20% | | |
| 4.4 | Insulation Resistance | PRI.-SEC. PRI.,SEC. -CORE | 100 MΩ MIN. | DC 500V | Meg Ohm Meter Toa : SM-5E or Equivalent |
| 4.5 | Withstanding Voltage | PRI.-SEC. | Without Breakdown Sense:1mA | AC 3.0kVrms 1min or AC 3.6kVrms 1s | Puncture Tester Kikusui : TOS8650 or Equivalent |
| | | PRI.-CORE SEC.-CORE | | AC 1.5kVrms 1min or AC 1.8kVrms 1s | |
| 4.6 | Impulse Test | 1 - 3 | Without Breakdown | Pulse 600Vo-p 1s | Impulse Tester ECG : DWS-05 or Equivalent |
| 4.7 | Polarity & Turns Ratio X-X / 1 - 3 | 4 - 5 | STD(0.1243)±7.0% | f=10kHz | Ratio Meter Ryowa : TRM-101A or Equivalent |
| | | 7 - 8 | STD(0.0632)±9.9% | | |
| | | 11 - 12 | STD(0.1700)±5.0% | | |
| | | 4 - 6 | STD(0.0529)±9.9% | | |
| 4.8 | Inductance | 1 - 2 | 534.7uH ± 13% | 10 kHz 1Vrms | LCR Meter Agilent : 4263B or Equivalent |
| | | 2 - 3 | 380.7uH ± 13% | | |
| | | 4 - 5 | 28.4uH ± 13% | | |
| | | 4 - 6 | 5.3 uH ± 13% | | |
| | | 7 - 8 | 7.3 uH ± 13% | | |
| | | 11 - 12 | 52.0uH ± 13% | | |

SPECIFICATIONS / ECO2017SEO-D05V016

Compatible with lead-free solders

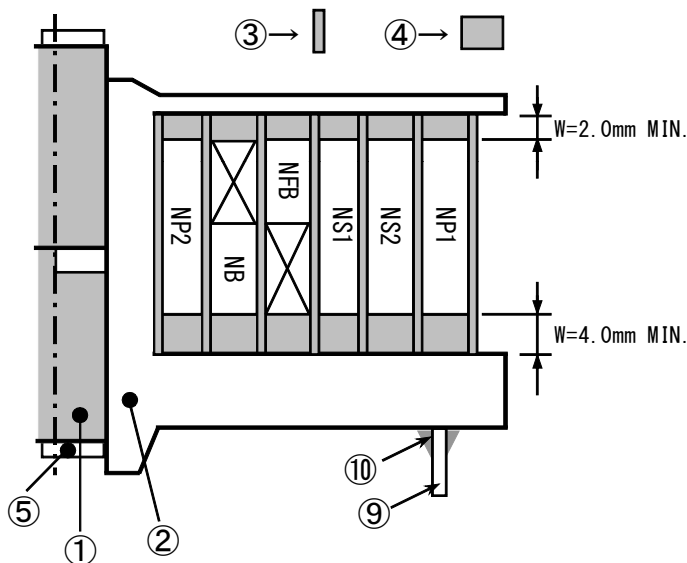
MATERIAL LIST AND INSULATING CONSTRUCTION

| No | ITEM & MATERIAL | MIN.THICKNESS OF LAYER | UL T.I (°C) | MANUFACTURER | UL FILE NO. |
|----|--|------------------------|--------------|--|--|
| ① | CORE Ferrite 20.9mm x17.6mm x7.7mm | — | — | TDK-EPC Corporation | — |
| ② | BOBBIN Phenol Resin PM-9820 | 0.65 mm MIN. | 150 94V-0 | SUMITOMO BAKELITE CO.,LTD. | E41429 |
| ③ | INSULATION TAPE Polyester Color : YELLOW | CT280 | 0.05 mm | JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | E165111 |
| | | 1318-1 | | | E17385 |
| ④ | FIXING TAPE FOR WIRE (Barrier Tape) Polyester | 44D-Aor | 130 | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | E17385 |
| | | WF with suffixes | | | JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD |
| ⑤ | FIXING TAPE FOR CORE Polyester Color : YELLOW | CT280 | 0.05 mm | JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | E165111 |
| | | 1318-1 | | | E17385 |
| ⑥ | WINDING WIRE Polyurethane Enameled Copper Wire 0.16 mm DIAx1 : NP1,NP2,NB NFB | — | 130 | PROSPERITY ELECTRIC WIRE & CABLE CO. | E196072 |
| | | | | XIAMEN HUNG'S ENTERPRISE CO.,LTD. | E219154 |
| | | | | HANGZHOU WEIFENG ELECTRONIC CO.,LTD. | E229341 |
| ⑦ | WINDING WIRE Polyurethane Enameled Copper Wire 0.20 mm DIAx1 : NS1,NS2 | — | — | — | — |
| ⑧ | IMPREGNATION Epoxy Varnish | — | — | Optional | — |
| ⑨ | TERMINAL PIN Copper Clad Steel WireΦ0.8(Soldered) Under Coating(Copper)25% Weight Ratio. (Ref)Surface Plating(Sn100%)3μm or More. | — | — | Optional | — |
| ⑩ | SOLDER (For junction of a wire and a terminal) Lead-Free Sn-Ag-Cu | — | — | Optional | — |

※ 1. Tape Min. Thickness shows the total value. (Tape Base and Adhesive)

※ 2. Insulation Tape shall be able to withstand for 1 minute of 3000 Volts (r.m.s) Potential with 2 layers.

☆BOBBIN UL94 : 94V-0 ,CT(IEC112) : 175~250V (UL Level 3)



| LAYERS OF INSULATION TAPE | | |
|---------------------------|-------------|------------|
| No. | Coil | Insulation |
| 0 | Inner Layer | 1T |
| 1 | NP2 | 1T |
| 2 | NB | 1T |
| 3 | NFB | 3Ts |
| 4 | NS1 | 1T |
| 5 | NS2 | 3Ts |
| 6 | NP1 | 3Ts |
| 7 | | |
| | | |
| | | |
| | | |
| | | |

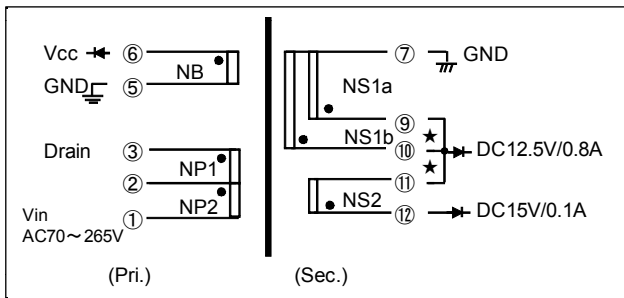
· All specifications are subject to change without notice.

Please read the precautions before using this catalog.

SPECIFICATIONS / ECO2020SEO-D01V016

Compatible with lead-free solders

■ SCHEMATICS



■ SAFETY STANDARDS

SAFETY STANDARD : IEC60335

* All products do not obtain the above standard approvals. But insulating construction and materials are designed to consider the above Standard.

■ WINDING SPECIFICATIONS

| No | COIL | TERMINAL | TURNS | WIRE | WINDING METHOD |
|----|--------|----------|-------|-----------|----------------|
| 1 | N P 1 | 3 - 2 | 28 | 1UEW 0.20 | osculation |
| 2 | N S 1a | 9 - 7 | 15 | 1UEW 0.30 | osculation |
| 3 | N S 2 | 12 - 11 | 3 | 1UEW 0.30 | equality |
| 4 | N B | 6 - 5 | 25 | 1UEW 0.20 | equality |
| 5 | N S 1b | 10 - 7 | 15 | 1UEW 0.30 | osculation |
| 6 | N P 2 | 2 - 1 | 28 | 1UEW 0.20 | osculation |

SPECIFICATIONS / ECO2020SEO-D01V016

Compatible with lead-free solders

■ ELECTRICAL CHARACTERISTICS

| No. | ITEM | TERMINAL | SPECIFICATION | TEST INSTRUMENTS |
|--|-------------------------------|--------------------|--------------------|---|
| 1 | INDUCTANCE | 3--1 | 550uH ± 10% | HP 4284A PRECISION LCR METER or EQUIVALENT f=10kHz V=1Vrms |
| 2 | LEAKAGE INDUCTANCE | 3--1 5~12 SHORT | 9.5uH MAX | HP 4284A PRECISION LCR METER or EQUIVALENT f=10kHz V=1Vrms |
| 3 | DC. RESISTANCE | 3--2 | 0.45Ω ± 20% | CHEN HWA502 AC OR AX-111A DIGITAL MILLIOHM METER or EQUIVALENT (Ta=20°C) |
| | | 9--7 | 0.12Ω ± 20% | |
| | | 12--11 | 32.2mΩ ± 30% | |
| | | 6--5 | 0.53Ω ± 20% | |
| | | 10--7 | 0.16Ω ± 20% | |
| | | 2--1 | 0.68Ω ± 20% | |
| 4 | WITHSTANDING VOLTAGE | P----S | AC3.75kVrms 1min | PUNCTURE TESTER KIKUSUI:TOS8650 or EQUIVALENT SENSE:2mA f=50 or 60Hz |
| | | P--P;P,S--CORE | AC2.0kVrms 1min | |
| | | | | |
| 5 | Insulation Resistance | PRI.-SEC. | 100 MΩ MIN. | Meg Ohm Meter Matsushita : VP2941 or Equivalent |
| | | PRI.,SEC. --CORE | DC 500V | |
| | | | | |
| 6 | POLARITY & TURNS RATIO :3---2 | 9--7 | (0.5280Vrms ±5.5%) | IKEDEN RATIO TESTER MODEL IKD3053 f=10kHz |
| | | 12--11 | (0.1063Vrms ±12%) | |
| | | 6--5 | (0.8859Vrms ±3.5%) | ECG-KOKUSAI WINDING TESTER DWX-05 or EQUIVALENT |
| | | 10--7 | (0.5276Vrms ±5.5%) | |
| | | 2--1 | (0.9893Vrms ±3.0%) | |
| Outgoing inspection data (TDK format) must be attached for each lot. | | | | |

SPECIFICATIONS / ECO2020SEO-D01V016

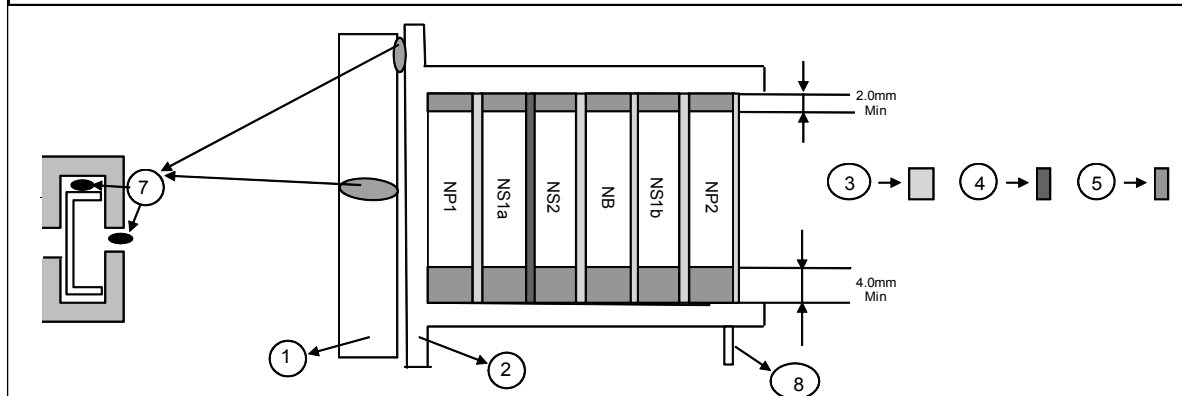
Compatible with lead-free solders

■ MATERIAL LIST AND INSULATING CONSTRUCTION

| NO. | ITEM | MATERIAL&SPEC | MANUFACTURER | MIN.THICKNESS OF TOTALLY LAYER | ULT.I. | UL FILE |
|-----|-----------------|--|---|--------------------------------|--------|--------------|
| 1 | CORE | FERRITE CORE PCB47 ECO2020 | TDK CORPORATION | — | — | — |
| 2 | BOBBIN | PHENOLIC RESIN T-357,T-375J | CHANG CHUN PLASTICS CO.,LTD. | — | 150℃ | E59481 |
| | | PM9820,PM9630 | SUMITOMO BAKELITE CO.,LTD. | | 94V-0 | E41429 |
| 3 | INSULATION TAPE | POLYESTER TAPE No.1318-1,1350F-1 | 3M COMPANY (3M) | 0.075mm (3 layers) | 130℃ | E17385 |
| | | (WRITE) No.CT286 | JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO., LTD. | | | E165111 |
| | | No.35660 | SYMBIO INC | | | E50292 |
| 4 | INSULATION TAPE | SAME AS No.3 | SAME AS No.3 | 0.050mm (2 layers) | 130℃ | SAME AS No.3 |
| 5 | BARRIER TAPE | No.44T-A 44D-A | 3M COMPANY (3M) | — | 130℃ | E17385 |
| | | No.WF2902 | JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO., LTD | | | E165111 |
| | | No.343BN | NITTO DENKO CORP. | | | E34833 |
| | | No.35661 | SYMBIO INC | | | E56086 |
| 6 | WINDING WIRE | POLYURETHANE ENAMELED COPPER WIRE | PROSPERITY ELECTRIC WIRE&CABLE CO. | — | 130℃ | E196072 |
| | | UEW φ0.20 (NP1,NB,NP2) | XIAMEN HUNG'S ELECTRIC(XIAMEN)CO.,LTD. | — | | E189722 |
| | | UEW φ0.30 (NS1a,b,NS2) | HANGZHOU WEIFENG ELECTRONIC CO.,LTD | — | | E229431 |
| | | | XIAMEN ZHICHENG ELECTRON CO.,LTD | — | | E218438 |
| | | | or other manufacturer | — | | |
| 7 | ADHESIVE | ACRYLIC , URETHANE or EPOXY | HENKEL LOCTITE CORP. | — | — | — |
| 8 | TERMINAL PIN | COPPER CLAD STEEL WIREφ0.8(SOLDERED) | OPTIONAL | — | — | — |
| | | UNDER COATING(COPPER)25% WEIGHT | | | | |
| | | RATIO.(REF) SURFACE PLATING (Sn100%) 3μm OR MORE. | | | | |

※ 1. TAPE MIN. THICKNESS SHOWS THE TOTAL VALUE. (TAPE BASE AND ADHESIVE)

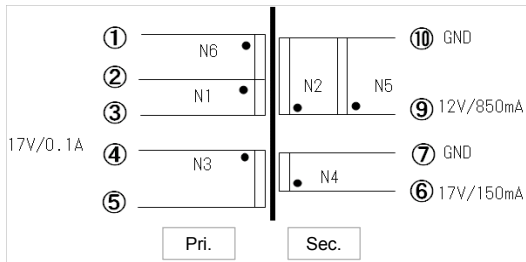
※ 2. INSULATION TAPE WITH TWO LAYERS SHALL BE ABLE TO WITHSTAND FOR 1 MINUTE OF 3000 VOLTS(r.m.s) POTENTIAL.



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SPECIFICATIONS / ECO2020SEO-D03V016

Compatible with lead-free solders

■ SCHEMATICS

■ SAFETY STANDARDS

| Safety Standards | | |
|------------------|----------------|-----------------|
| IEC60335-1 | | |
| | Inside of Coil | Outside of Coil |
| Pri. - Sec. | 4.0 mm Min. | 8.0 mm Min. |
| Pri. - Core | 2.0 mm Min. | 4.0 mm Min. |
| Sec. - Core | 2.0 mm Min. | 4.0 mm Min. |

■ WINDING SPECIFICATIONS

| No. | Terminal | Wire | Turns | Winding Method |
|-----|----------|---------------------|-------|------------------|
| N1 | 2--3 | 2UEW ϕ 0.20 | 38TS | Solenoid+Spacing |
| N2 | 9--10 | 2UEW ϕ 0.32*2P | 10TS | Solenoid |
| N3 | 4--5 | 2UEW ϕ 0.18*2P | 16TS | Solenoid |
| N4 | 6--7 | 2UEW ϕ 0.40 | 16TS | Solenoid |
| N5 | 10--9 | 2UEW ϕ 0.32*2P | 10TS | Solenoid |
| N6 | 1--2 | 2UEW ϕ 0.20 | 37TS | Solenoid+Spacing |

SPECIFICATIONS / ECO2020SEO-D03V016

Compatible with lead-free solders

■ ELECTRICAL CHARACTERISTICS

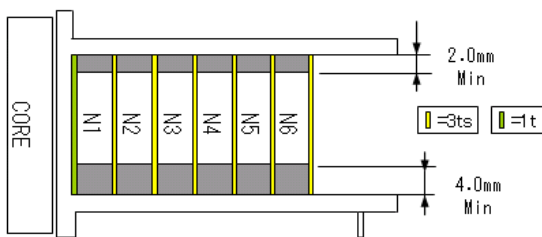
| No. | Item | Terminal | Spec | Test Instruments |
|-----|-----------------------|----------|--------------------------------------|--|
| 1 | Inductance | | 764 μ H \pm 10%(f=100kHz V=1V) | HP4284A or EQUIV. |
| 2 | Leakage Inductance | | Max 17 μ H(f=100kHz V=1V) | HP4284A or EQUIV. |
| 3 | DC Resistance | 1--2 | 1.15 Ω Max. | AX-111A or EQUIV. |
| | | 2--3 | 0.7704 Ω Max. | |
| | | 10--9 | 30 m Ω Max. | |
| | | 4--5 | 0.3096 Ω Max. | |
| | | 6--7 | 158.6 m Ω Max. | |
| 4 | Insulation Resistance | | Min 100 M Ω (500VDC) | |
| 5 | Withstanding Voltage | PRI-SEC | AC3.6KVrms 1s | Puncture Tester Kikusui : TOS8650 or Equiv. |
| | | PRI-CORE | AC2.0KVrms 1s | |
| | | SEC-CORE | AC2.0KVrms 1s | |
| 6 | Layer Short | 3--1 | AC0.8KVp-p | |

SPECIFICATIONS / ECO2020SEO-D03V016

Compatible with lead-free solders

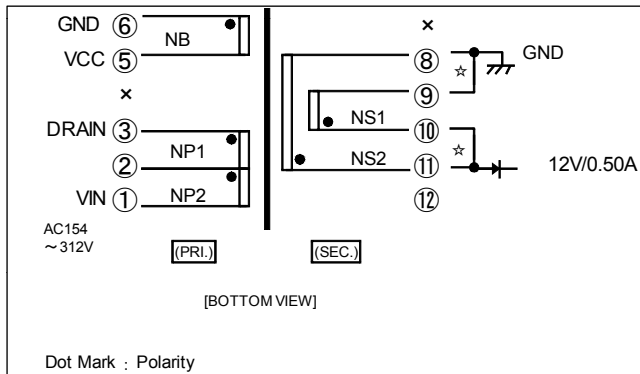
■ MATERIAL LIST AND INSULATING CONSTRUCTION

| No. | Item | Material & Spec. | Manufacturers | UL file |
|-----|-----------------|------------------------------|---------------|---------|
| 1 | BOBBIN | ECO2020 PM9820/T375J(10 PIN) | | E41429 |
| 2 | CORE | PCB47 ECO2020 | TDK-EPC | - |
| 3 | INSULATION TAPE | CT, #1318, MY 130 °C | 3M | E165111 |
| 4 | TAPE | WF2902, #44, 35661 | 3M | E165111 |
| 5 | WIRE | 2UEW ϕ 0.20 130 °C | | E85640 |
| | | 2UEW ϕ 0.32 130 °C | | |
| | | 2UEW ϕ 0.18 130 °C | | |
| | | 2UEW ϕ 0.40 130 °C | | |
| 6 | VANISH | TVB2024 | KYOCERA | E83702 |



SPECIFICATIONS / ECO2020SEO-D09V015

Compatible with lead-free solders

■ SCHEMATICS

■ SAFETY STANDARDS

| SAFETY STANDARDS | |
|-------------------|------------------------------|
| IEC60335-1 Ed.4 | |
| Creepage Distance | |
| PRI. - SEC. | 2.5mm MIN. (outside of coil) |
| PRI. - CORE. | 2.5mm MIN. (inside of coil) |
| SEC. - CORE. | 2.5mm MIN. (inside of coil) |

■ WINDING SPECIFICATIONS

| No. | coil | terminal | turns | wire | note |
|--|----------------|----------|-------|----------|--------------------|
| 0 | 600 \leq CTI | | | | |
| 1 | N P1 | 3 - 2 | 84 | UEW 0.16 | NP1 + NP2 = 200Ts. |
| 2 | N S1 | 10 - 9 | 18 | UEW 0.23 | |
| 3 | N B | 6 - 5 | 12 | UEW 0.16 | |
| 4 | N S2 | 11 - 8 | 18 | UEW 0.23 | |
| 5 | N P2 | 2 - 1 | 116 | UEW 0.16 | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| * Anti-clockwise direction is an order direction when see a transformer from the upper part. | | | | | |

SPECIFICATIONS / ECO2020SEO-D09V015

Compatible with lead-free solders

■ ELECTRICAL CHARACTERISTICS

| (Test Conditions) | | | | | |
|-------------------|--------------------------------------|---------------------------------|--|---------------------------------------|---|
| | | (Temperature) | : | 25±10°C | |
| | | (Relative Humidity) | : | 25~75%RH | |
| No | Parameter | Test Terminal | Specification | Conditions | Test Instruments |
| 4.1 | Inductance | 3 - 1 | 12.6 mH ± 20% | 10 kHz 1Vrms | LCR Meter Agilent : 4263B or Equivalent |
| 4.2 | Leakage Inductance | 3 - 1 (5,6,8,9,10,11 short) | 72 µH MAX | | |
| 4.3 | DC. Resistance | 3 - 2 | 2.18Ω ±15% | | Milli ohm meter ADEX : AX-114 or Equivalent |
| | | 10 - 9 | 258mΩ ±20% | | |
| | | 6 - 5 | 0.390Ω ±20% | | |
| | | 11 - 8 | 299mΩ ±20% | | |
| | | 2 - 1 | 4.21Ω ±15% | | |
| 4.4 | Insulation Resistance | PRI.-SEC. PRI.,SEC. -CORE | 100 MΩ MIN. | DC 500V | Meg Ohm Meter Toa : SM-5E or Equivalent |
| 4.5 | Withstanding Voltage | PRI.-SEC. | Without Breakdown Sense:1mA f=50or60Hz | AC 2.0kVrms 1min or AC 2.4kVrms 1s | Puncture Tester Kikusui : TOS8650 or Equivalent |
| | | PRI.-CORE SEC.-CORE | | AC 1.0kVrms 1min or AC 1.2kVrms 1s | |
| | | PRI.-PRI. | | AC 0.5kVrms 1min or AC 0.6kVrms 1s | |
| 4.6 | Impulse Test | 3 - 1 | Without Breakdown | Pulse 600Vo-p 1s | Impulse Tester ECG : DWS-05 or Equivalent |
| 4.7 | Polarity & Turns Ratio X-X/3-1 | 10 - 9 | STD(0.0897) ±5.0% | f=10kHz | Ratio Meter Ryowa : TRD-09 or Equivalent |
| | | 6 - 5 | STD(0.0601) ±5.5% | | |
| | | 11 - 8 | STD(0.0901) ±5.0% | | |
| | | | | | |

SPECIFICATIONS / ECO2020SEO-D09V015

Compatible with lead-free solders

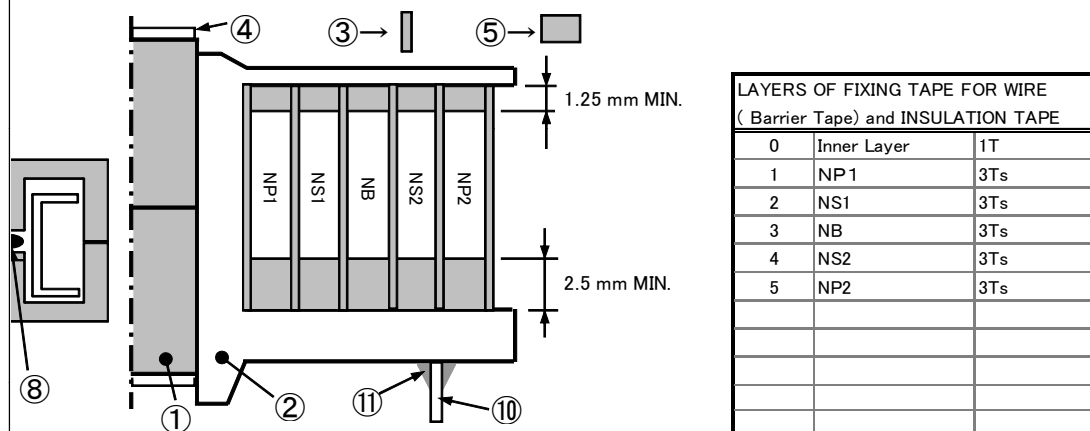
■ MATERIAL LIST AND INSULATING CONSTRUCTION

| No. | ITEM & MATERIAL | MIN.THICKNESS OF ONE LAYER | UL T1 (°C) | MANUFACTURER | UL FILE NO. |
|-----|--|----------------------------|------------|--|-------------|
| ① | CORE Ferrite 20.9mmx20.6mmx7.7mm | — | — | TDK-EPC Corporation | — |
| ② | BOBBIN Phenol Resin T375J | 0.65 mm MIN. | 150 94V-0 | CHANG CHUN PLASTICS CO.,LTD. | E59481 |
| ③ | FIXING TAPE FOR CORE Polyester Color : WHITE | 1318-1 | 130 | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | E17385 |
| | | 630F or 632S | | TERAOKA SEISAKUSHO CO.,LTD. | E56086 |
| ④ | INSULATION TAPE Polyester Color : WHITE | 1318-1 | 130 | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | E17385 |
| | | 630F or 632S | | TERAOKA SEISAKUSHO CO.,LTD. | E56086 |
| ⑤ | FIXING TAPE FOR WIRE (Barrier Tape) Polyester | 44D | 130 | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | E17385 |
| | | WF with suffixes | | JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD. | E165111 |
| ⑥ | WINDING WIRE Polyurethane Enameled Copper Wire 016 mm DIAx1 : NP1,NP2,NB | — | 130 | PROSPERITY ELECTRIC WIRE & CABLE CO. | E196072 |
| | | | | XIAMEN HUNG'S ENTERPRISE CO.,LTD. | E219154 |
| ⑦ | WINDING WIRE Polyurethane Enameled Copper Wire 0.23 mm DIAx1 : NS1,NS2 | — | — | — | — |
| ⑧ | ADHESIVE Polyester | — | — | DONGBU FINE CHEMICAL CO., LTD. | — |
| ⑨ | IMPREGNATION Epoxy Varnish | — | — | KYOCERA Chemical Corporation | — |
| ⑩ | TERMINAL PIN Copper Clad Steel Wire Φ0.8(Soldered) Under Coating(Copper)25% Weight Ratio. (Ref)Surface Plating(Sn100%)3 μm or More. | — | — | WELL FORE SPECIAL WIRE CORPORATION | — |
| ⑪ | SOLDER (For junction of a wire and a terminal) Lead-Free Sn-Ag-Cu | — | — | SENJU METAL INDUSTRY CO., LTD. | — |

※ 1. Tape Min. Thickness shows the total value. (Tape Base and Adhesive)

※ 2. Insulation Tape shall be able to withstand for 1 minute of 3000 Volts (r.m.s) Potential with 3 layers.

★BOBBIN UL94:94V-0 ,CTI(IEC112):175~250V (UL Level 3) / INSULATION TAPE CTI:600V Minimum.

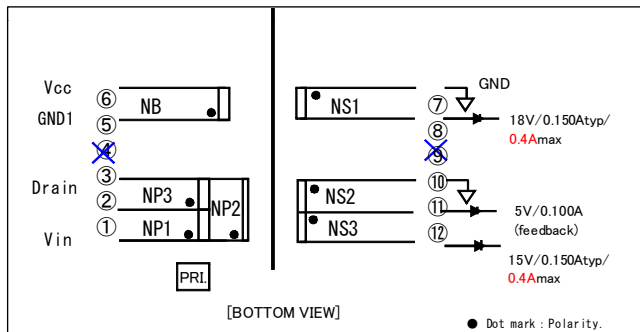


· All specifications are subject to change without notice.

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SPECIFICATIONS / ECO2020SEO-D10V017

Compatible with lead-free solders

■ SCHEMATICS

■ SAFETY STANDARDS

| SAFETY STANDARDS | |
|-----------------------------|---------------------------|
| IEC60335-1 Ed.4 | |
| Over Surface & Air Spacings | |
| PRI. - SEC. | 4.0 mm MIN.(inside coil) |
| PRI. - CORE | 4.0 mm MIN.(outside coil) |
| SEC. - CORE | 4.0 mm MIN.(outside coil) |
| REMOVE PIN | PIN No. 4 , 9 |

■ WINDING SPECIFICATIONS

| No. | order | coil | terminal | turns | wire | WIDING METHOD | note |
|-----|-------|-----------------------|----------|-------|----------|-----------------|--------------|
| 0 | 0 | 600V \leq CTI | | | | | NP1+NP2=56ts |
| 1 | 1 | N P1 | 1 - 2 | 28 | UEW 0.2 | 1Layer sol | |
| 2 | 2 | N S1 | 7 - 8 | 17 | UEW 0.25 | 1Layer sol | |
| 3 | 3 | N S2 | 10 - 11 | 6 | UEW 0.2 | 1Layer sol | |
| 4 | 4 | N S3 | 11 - 12 | 8 | UEW 0.2 | NS2 After Space | |
| 5 | 5 | N P2 | 1 - 3 | 56 | UEW 0.2 | 2Layer sol | |
| 6 | 6 | N B(V _{CC}) | 5 - 6 | 18 | UEW 0.2 | 1Layer sol | |
| 7 | 7 | N P3 | 2 - 3 | 28 | UEW 0.2 | 1Layer sol | |

SPECIFICATIONS / ECO2020SEO-D10V017

Compatible with lead-free solders

■ ELECTRICAL CHARACTERISTICS

| (Test Conditions) | | | | | |
|-------------------|------------------------|---------------------------------|------------------------------------|---------------------------------------|---|
| | | (Temperature) | : | 25±10°C | |
| | | (Relative Humidity) | : | 25~75%RH | |
| No | Parameter | Test Terminal | Specification | Condition _s | Test Instruments |
| 4.1 | Inductance | 1 - 3 | 770uH ± 15% | 10 kHz 1Vrms | LCR Meter Agilent : 4263B or Equivalent |
| 4.2 | Leakage Inductance | 1 - 3 (5,6,SEC. short) | 25.0 uH MAX | | |
| 4.3 | DC. Resistance | 1 - 3 | 0.594Ω ±20% | | ADEX : AX-114N or Equivalent |
| | | 5 - 6 | 0.433Ω ±20% | | |
| | | 7 - 8 | 0.206Ω ±20% | | |
| | | 10 -11 | 0.126Ω ±20% | | |
| | | 11 - 12 | 0.169Ω ±20% | | |
| 4.4 | Insulation Resistance | PRI.-SEC. PRI.,SEC. -CORE | 100 MΩ MIN. | DC 500V | Meg Ohm Meter Toa : SM-5E or Equivalent |
| 4.5 | Withstanding Voltage | PRI.-SEC. | Without Breakdown Sense:1mA | AC 3.0kVrms 1min or AC 3.6kVrms 1s | Puncture Tester Kikusui : TOS8650 or Equivalent |
| | | PRI.-CORE SEC.-CORE | | AC 1.5kVrms 1min or AC 1.8kVrms 1s | |
| 4.6 | Impulse Test | 1 - 3 | Without Breakdown | Pulse 600Vo-p 3~5 pluse | Impulse Tester ECG : DWS-05 or Equivalent |
| 4.7 | Polarity & Turns Ratio | 1 - 2 | 0.4934Vrms ± 5.0% | f=10kHz | Ratio Meter or Equivalent |
| | | 7 - 8 | 0.2985Vrms ± 6.5% | | |
| | | 10 - 11 | 0.1051Vrms ±11.0% | | |
| | | 11 - 12 | 0.1408Vrms ±10.0% | | |
| | | 5 - 6 | 0.3214Vrms ± 7.0% | | |
| 4.8 | Inductance | 1 - 2 | 194.0uH ± 20% | 10 kHz 1Vrms | Agilent : 4263B or Equivalent |
| | | 7 - 8 | 70.0uH ± 25% | | |
| | | 10 - 11 | 9.0uH ± 25% | | |
| | | 11 - 12 | 15.8uH ± 25% | | |
| | | 5 - 6 | 81.0uH ± 25% | | |
| | | 2 - 3 | 200.0uH ± 20% | | |

SPECIFICATIONS / ECO2020SEO-D10V017

Compatible with lead-free solders

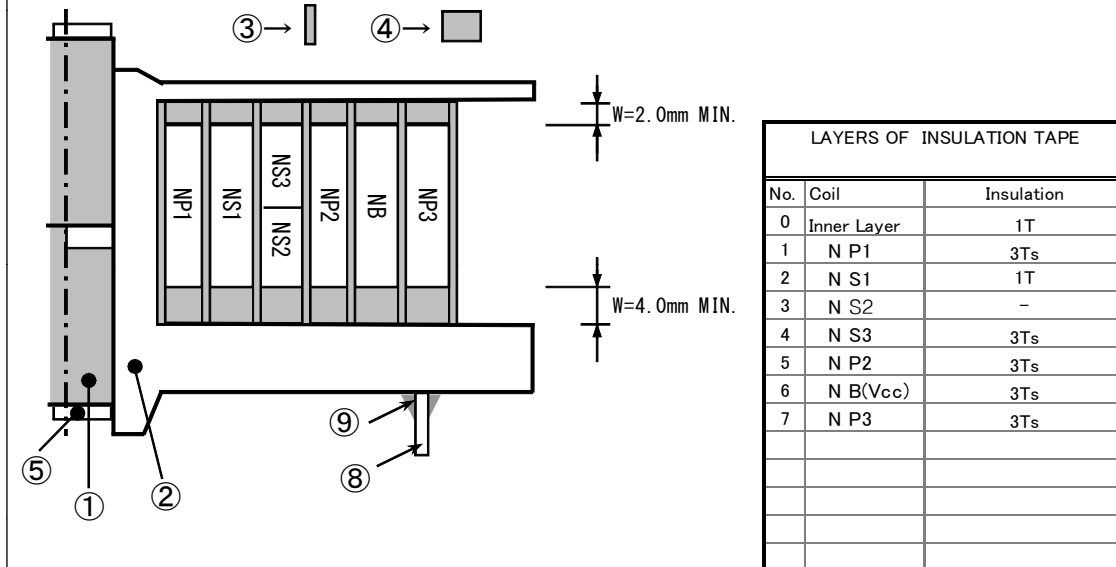
■ MATERIAL LIST AND INSULATING CONSTRUCTION

| No. | ITEM & MATERIAL | MIN.THICKNESS OF LAYER | UL T1 (°C) | MANUFACTURER | UL FILE NO. |
|-----|--|------------------------------|--------------|--|-------------|
| ① | CORE PCB47 ECO2020 | — | — | TDK-EPC Corporation | — |
| ② | BOBBIN Phenol Resin PM-9820 Phenol Resin T-375J | 0.65 mm MIN. | 150 94V-0 | SUMITOMO BAKELITE CO.,LTD. | E41429 |
| | | | | CHANG CHUN PLASTICS CO.,LTD. | E59481 |
| ③ | INSULATION TAPE Polyester Color : YELLOW | CT280 1318-1 | 0.05 mm | JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD | E165111 |
| | | | | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | E17385 |
| ④ | FIXING TAPE FOR WIRE (Barrier Tape) Polyester | 44D-A or WF with suffixes | — | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | E17385 |
| | | | | JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD | E165111 |
| ⑤ | FIXING TAPE FOR CORE Polyester | CT286 1318-1 | 0.05 mm | JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD | E165111 |
| | | | | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | E17385 |
| ⑥ | WINDING WIRE Polyurethane Enameled Copper Wire | — | 130 | TAI-I ELECTRIC WIRE & CABLE CO LTD | E85640 |
| | | | | PROSPERITY ELECTRIC WIRE & CABLE CO. | E196072 |
| | | | | XIAMEN HUNG'S ENTERPRISE CO.,LTD. | E219154 |
| ⑦ | ADHESIVE Varnish TVB2024 | | | KYOCERA CHEMICAL CORPORATION | E83702 |
| ⑧ | TERMINAL PIN Copper Clad Steel Wire $\Phi 0.8$ (Soldered) Under Coating(Copper)25% Weight Ratio. (Ref)Surface Plating(Sn100%)3 μ m or More. | | | Optional | |
| ⑨ | SOLDER (For junction of a wire and aterminal) Lead-Free Sn-Ag-Cu | | | Optional | |
| ⑩ | MARKING Laser | | | LA MARK LP-V SERIES | |

※ 1. Tape Min. Thickness shows the total value. (Tape Base and Adhesive)

※ 2. Insulation Tape shall be able to withstand for 1 minute of 3000 Volts (r.m.s) Potential with 2 layers.

★BOBBIN UL94:94V-0 ,CTI(IEC112):175~250V (UL Level 3)



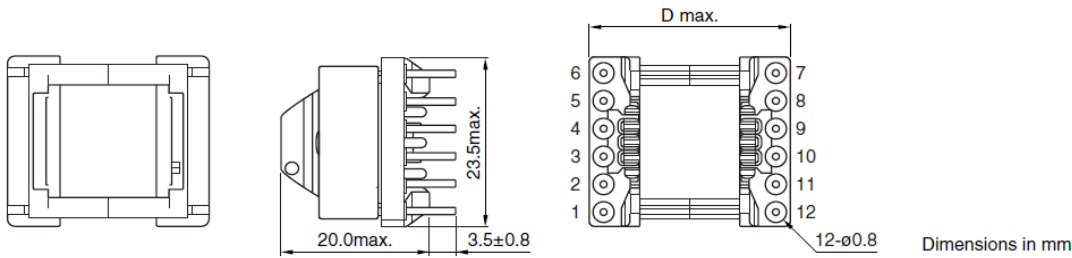
· All specifications are subject to change without notice.

Please read the precautions before using this catalog.

ECO20 Series for Multiple Outputs (Horizontal Type)

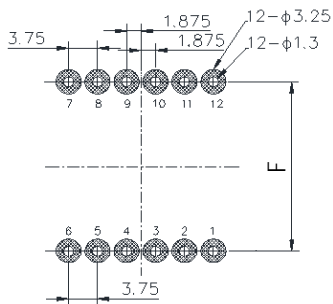
Compatible with lead-free solders

SHAPES AND DIMENSIONS (BOBBIN TYPE: HI)



| Part No. | Bobbin type | D max. | F |
|----------|-------------|--------|------|
| ECO2017 | HI | 24.5 | 20.0 |
| ECO2020 | HI | 27.0 | 22.5 |
| ECO2023 | HI | 29.5 | 25.0 |

RECOMMENDED BASE MATERIAL OPENING SIZE



Dimensions in mm

Default Tolerance : ± 0.1

ITEMS APPLICABLE

| Series | Bobbin Type | Part No. |
|---------|-------------|--------------------|
| ECO2020 | HI | ECO2020SEO-D02H015 |
| | | ECO2020SEO-D04H015 |
| | | ECO2020SEO-D06H015 |
| | | ECO2020SEO-D07H016 |
| | | ECO2020SEO-D08H016 |
| ECO2023 | | ECO2023SEO-D01H016 |

· Compatible ferrite materials for this product are the PC47 family.

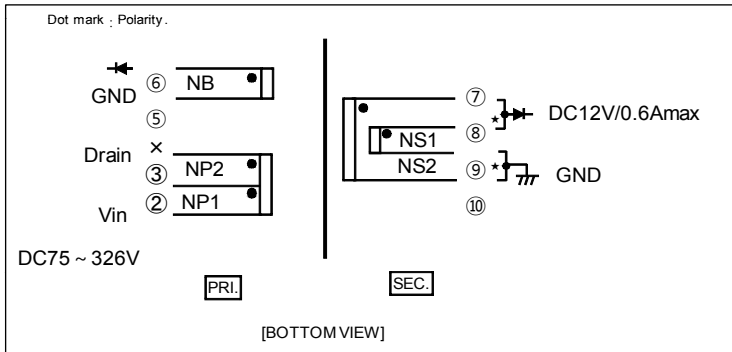
· Conformity to RoHS Directive: This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted ϕ pir.

· All specifications are subject to change without notice.

Please read the precautions before using this catalog.

SPECIFICATIONS / ECO2020SEO-D02H015

Compatible with lead-free solders

■ SCHEMATICS

■ SAFETY STANDARDS

| SAFETY STANDARDS | |
|-----------------------------|------------|
| Over Surface & Air Spacings | |
| PRI. - SEC. | 2.5mm MIN. |
| PRI. - CORE | 1.3mm MIN. |
| SEC. - CORE | 1.3mm MIN. |

■ WINDING SPECIFICATIONS

| No. | Order | coil | terminal | turns | wire | note |
|-----|-------|------|----------|-------|----------|--------------|
| 1 | 1 | N P1 | 3 - 2 | 25 | UEW 0.23 | NP1+NP2=66ts |
| 2 | 2 | N S1 | 9 - 10 | 18 | UEW 0.28 | |
| 3 | 3 | N B | 6 - 5 | 27 | UEW 0.20 | |
| 4 | 4 | N S2 | 8 - 11 | 18 | UEW 0.28 | |
| 5 | 5 | N P2 | 2 - 1 | 41 | UEW 0.23 | |

SPECIFICATIONS / ECO2020SEO-D02H015

Compatible with lead-free solders

■ ELECTRICAL CHARACTERISTICS

| (Test Conditions) | | | | | |
|---------------------|---|---------------------------------|------------------------------------|---------------------------------------|---|
| (Temperature) | | : | 25±10°C | | |
| (Relative Humidity) | | : | 25~75%RH | | |
| No | Parameter | Test Terminal | Specification | Conditions | Test Instruments |
| 4.1 | Inductance | 3 - 1 | 534 uH ± 10% | 10 kHz 1Vrms | LCR Meter Agilent : 4263B or Equivalent |
| 4.2 | Leakage Inductance | 3 - 1 (6,5,SEC. short) | 15.0 uH MAX | | |
| | | 6 - 5 (SEC. short) | 1.70 uH MAX | 100 kHz 1Vrms | Agilent : 4263B or Equivalent |
| 4.3 | DC. Resistance | 2 - 1 | 0.682Ω ±20% | | Milli ohm meter ADEX : AX-114N or Equivalent |
| | | 3 - 2 | 0.303Ω ±20% | | |
| | | 6 - 5 | 0.524Ω ±20% | | |
| | | 8 - 11 | 0.188Ω ±20% | | |
| 9 - 10 | 0.162Ω ±20% | | | | |
| 4.4 | Insulation Resistance | PRI.-SEC. PRI.,SEC. -CORE | 100 MΩ MIN. | DC 500V | Meg Ohm Meter Toa : SM-5E or Equivalent |
| 4.5 | Withstanding Voltage | PRI.-SEC. | Without Breakdown Sense:2mA | AC 1.5kVrms 1min or AC 1.8kVrms 1s | Puncture Tester Kikusui : TOS8650 or Equivalent |
| | | PRI.-CORE SEC.-CORE | | AC 1.0kVrms 1min or AC 1.2kVrms 1s | |
| 4.6 | Impulse Test | 3 - 1 | Without Breakdown | Pulse 600Vo-p 1s | Impulse Tester ECG : DWS-05 or Equivalent |
| 4.7 | Polarity & Turns Ratio X-X/ 3 - 1 | 2 - 1 | STD(0.6310)±2.5% | f=10kHz | Ratio Meter Ryowa : TRM-101A or Equivalent |
| | | 9 - 10 | STD(0.2684)±4.5% | | |
| | | 6 - 5 | STD(0.4043)±3.0% | | |
| | | 8 - 11 | STD(0.2736)±4.5% | | |

SPECIFICATIONS / ECO2020SEO-D02H015

Compatible with lead-free solders

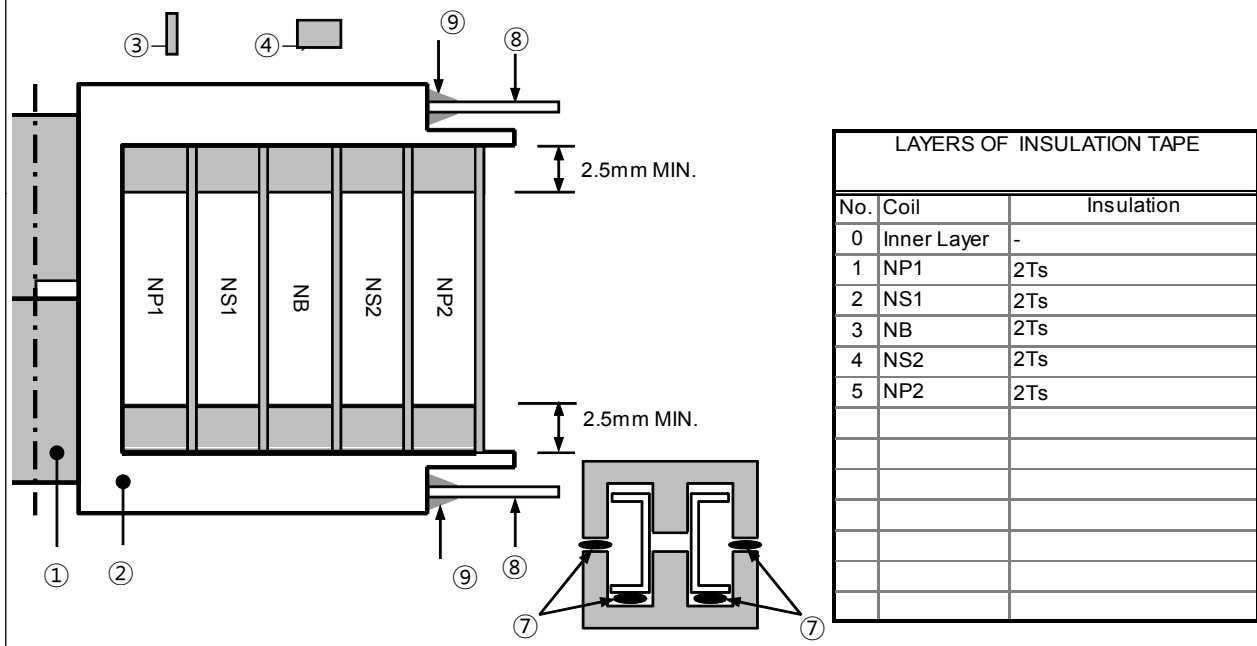
MATERIAL LIST AND INSULATING CONSTRUCTION

| No | ITEM & MATERIAL | MIN.THICKNESS OF LAYER | UL T.I (°C) | MANUFACTURER | UL FILE NO. |
|----|--|--------------------------|-------------|---|--------------------|
| ① | CORE Ferrite 20.9mm x20.6mm x7.7mm | — | — | TDK-EPC Corporation | — |
| ② | BOBBIN Phenol Resin PM-9820 | 0.65 mm MIN. | 150 94V-0 | SUMITOMO BAKELITE CO.,LTD. | E41429 |
| ③ | INSULATION TAPE Polyester Color : WHITE | 1318 or 1350F 0.05 mm | 130 | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | E17385 |
| ④ | FIXING TAPE FOR WIRE (Barrier Tape) Polyester | 44 or 44D or 44-18MIL or | 130 | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | E17385 |
| ⑤ | WINDING WIRE Polyurethane Enameled Copper Wire 0.23 mm DIAx1 : NP1, NP2 0.20 mm DIAx1 : NB | — | 130 | PROSPERITY ELECTRIC WIRE & CABLE CO. XIAMEN HUNG'S ENTERPRISE CO.,LTD. | E196072 E219154 |
| ⑥ | WINDING WIRE Polyurethane Enameled Copper Wire 0.28 mm DIAx1 : NS1, NS2 | — | | HANGZHOU WEIFENG ELECTRONIC CO.,LTD. SHENZHEN FUJI FINE FACTORY | E229341 E303260 |
| ⑦ | ADHESIVE Acrylic , Urethane or Epoxy | | | Optional | |
| ⑧ | TERMINAL PIN Copper Clad Steel WireΦ0.8(Soldered) Under Coating(Copper)25% Weight Ratio. (Ref)Surface Plating(Sn100%)3μm or More. | | | Optional | |
| ⑨ | SOLDER (For junction of a wire and a terminal) Lead-Free Sn-Ag-Cu | | | Optional | |

※ 1. Tape Min. Thickness shows the total value. (Tape Base and Adhesive)

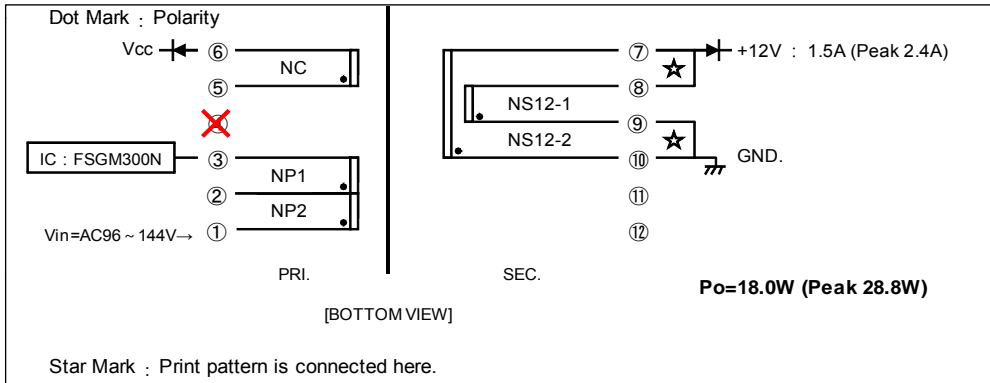
※ 2. Insulation Tape shall be able to withstand for 1 minute of 3000 Volts (r.m.s) Potential with 2 layers.

☆BOBBIN UL94 : 94V-0 ,CTI(IEC112):175~250V (UL Level 3)



SPECIFICATIONS / ECO2020SEO-D04H015

Compatible with lead-free solders

■ SCHEMATICS

■ SAFETY STANDARDS

| SAFETY STANDARDS | | |
|------------------|----------------|-----------------|
| *UL60065-Ed.7 | | |
| | Inside of Coil | Outside of Coil |
| PRI. - SEC. | 2.8mm MIN. | 4.0mm MIN. |
| PRI. - CORE | 1.4mm MIN. | 2.0mm MIN. |
| SEC. - CORE | 1.4mm MIN. | 2.0mm MIN. |

■ WINDING SPECIFICATIONS

| No. | Order | Coil | Terminal | Turns | Wire | Note |
|-----|-------|---------|----------|-------|----------|---------------|
| 1 | 1 | N P1 | 2 - 3 | 48 | UEW 0.26 | NP1+NP2=88Ts. |
| 2 | 2 | N S12-1 | 9 - 8 | 11 | UEW 0.40 | |
| 3 | 3 | N P2 | 1 - 2 | 40 | UEW 0.26 | |
| 4 | 4 | N S12-2 | 10 - 7 | 11 | UEW 0.40 | |
| 5 | 5 | N C | 5 - 6 | 16 | UEW 0.23 | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

* Clockwise direction is an order direction when see a No. 1 terminal pin side of transformer from the upper part.

SPECIFICATIONS / ECO2020SEO-D04H015

Compatible with lead-free solders

■ ELECTRICAL CHARACTERISTICS

| Test Conditions | | Temperature | : | 25±10°C | | |
|-----------------|---------------------------|--------------------------|--|---------------------------------------|---|--|
| | | Relative Humidity | : | 25~75%RH | | |
| No | Parameter | Test Terminal | Specification | Conditions | Test Instruments | |
| 4.1 | Inductance | 1 - 3 | 867μH ± 10% | 10 kHz 1Vrms | LCR Meter Agilent : 4263B or Equivalent | |
| 4.2 | Leakage Inductance | 1 - 3 (Sec.All short) | 17.8 μH MAX (Std.=12.3μH : Ref.) | 100 kHz 1Vrms | | |
| 4.3 | DC. Resistance | 1 - 3 | 1.01 Ω ±20% | | Milli ohm meter ADEX : AX-114 or Equivalent | |
| | | 5 - 6 | 0.33 Ω ±20% | | | |
| | | 9 - 8 | 57.5 mΩ ±30% | | | |
| | | 10 - 7 | 70.0 mΩ ±30% | | | |
| | | | | | | |
| 4.4 | Insulation Resistance | PRI.-SEC. | 100 MΩ MIN. | DC 500V | Meg Ohm Meter Toa : SM-5E or Equivalent | |
| | | PRI.,SEC. -CORE | | | | |
| 4.5 | Withstanding Voltage | PRI.-SEC. | Without Breakdown Sense:1mA f=50or60Hz | AC 3.0kVrms 1min or AC 3.6kVrms 1s | Puncture Tester Kikusui : TOS8650 or Equivalent | |
| | | PRI.-CORE SEC.-CORE | | AC 1.5kVrms 1min or AC 1.8kVrms 1s | | |
| | | 1 - 5 ★ 10 - 11 ★ | | AC 0.6kVrms 1s | | |
| 4.6 | Impulse Test | 1 - 3 | Without Breakdown | Pulse 0.8kVo-p 3-5 Pulse | Impulse Tester ECG : DWS-05 or Equivalent | |
| 4.7 | Polarity & Turns Ratio | 5 - 6 | (0.1838) ± 5.0% | f=10kHz | Ratio Meter Ryowa : TRM-101A or Equivalent | |
| | | 9 - 8 | (0.1252) ± 7.2% | | | |
| | | 10 - 7 | (0.1269) ± 7.2% | | | |
| | X-X/ 1 - 3 | | | | | |
| | 1 - 2 ★ | (0.4545) ± 1.2% | | | | |

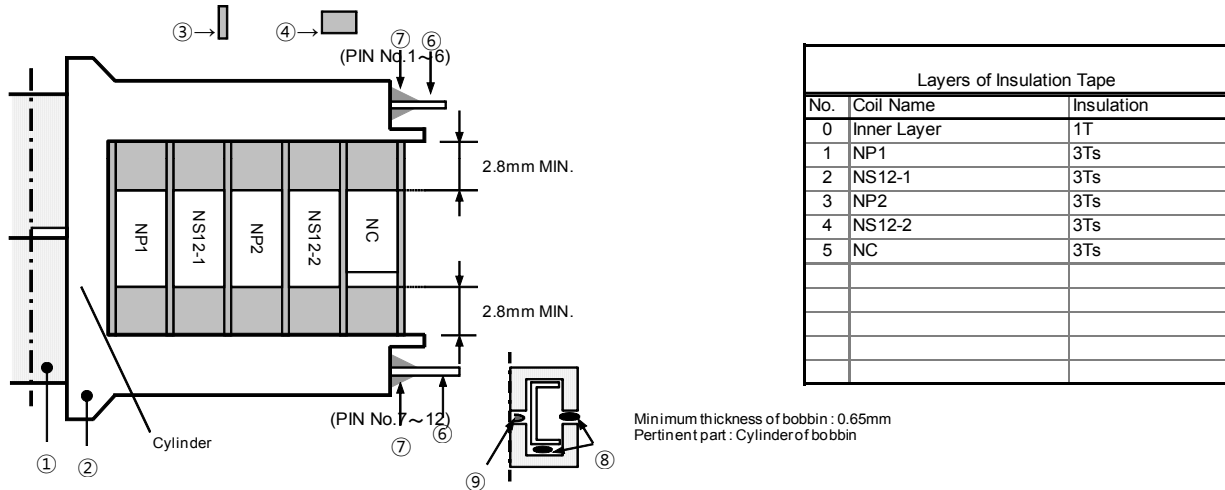
SPECIFICATIONS / ECO2020SEO-D04H015

Compatible with lead-free solders

MATERIAL LIST AND INSULATING CONSTRUCTION

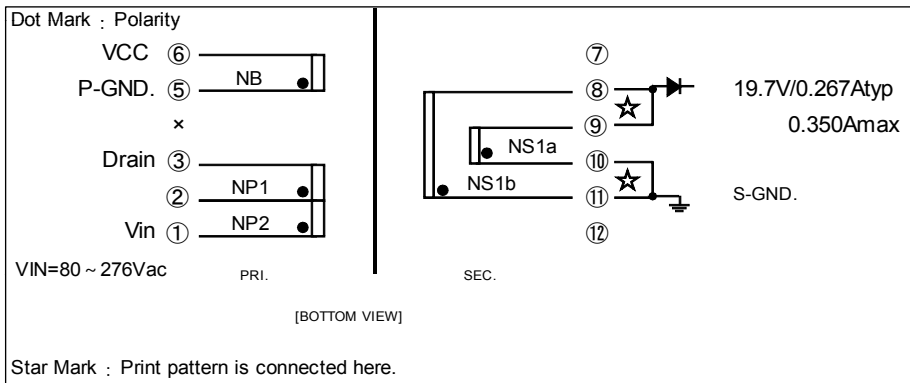
| No | ITEM & MATERIAL | MIN.THICKNESS OF 1 LAYER | UL T.I (°C) | MANUFACTURER | UL FILE NO. | |
|----|--|--------------------------|--------------|--|---|---------|
| ① | CORE Ferrite 20.9mm x 20.6mm x 7.7mm | — | — | TDK-EPC Corporation | — | |
| ② | BOBBIN PM-9820 or PM-9823 | 0.65 mm | 150 94V-0 | SUMITOMO BAKELITE CO.,LTD. | E41429 | |
| | Phenol Resin T375J | | | CHANG CHUN PLASTICS CO.,LTD | E59481 | |
| ③ | INSULATION TAPE Polyester Color : Yellow 【Material group II MIN.】 | 0.05 mm | 130 | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | E17385 | |
| | 1318-1 or 1350F-1 | | | | | |
| ④ | FIXING TAPE FOR WIRE (Barrier Tape) 【Material group I】 | — | 130 | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | E17385 | |
| | | | | 44D-A or 44T-A | NITTO DENKO CORP. | E34833 |
| | | | | 343BN@@ | JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD | E165111 |
| | | | | WF with suffixes | | |
| ⑤ | WINDING WIRE (Primary) Polyurethane Enameled Copper Wire 0.26 mm DIA : NP1, NP2 0.23 mm DIA : NC | — | 130 | PROSPERITY ELECTRIC WIRE & CABLE CO. | E196072 | |
| | | | | HANGZHOU WEIFENG ELECTRONIC CO.,LTD. | E229341 | |
| | | | | TAI-ELECTRIC WIRE&CABLE CO LTD | E85640 | |
| | | | | ZHUHAI WEIHAN WIRE CO LTD | E339217 | |
| | WINDING WIRE (Secondary) Polyurethane Enameled Copper Wire 0.40 mm DIA : NS12-1,2 | — | 130 | SHENZHEN FUJI FINE FACTORY | E303260 | |
| | | | | HITACHI CABLE (JOHOR) SDN BHD | E215594 | |
| | | | | THAI HITACHI ENAMEL WIRE CO LTD | E137472 | |
| | | | | ELEKTRISOLA (MALAYSIA) SDN BHD | E143312 | |
| ⑥ | TERMINAL PIN Copper Clad Steel Wire Under Coating(Copper)25% Weight Ratio. (Ref)Surface Plating(Sn100%)3µm or More. | — | — | Optional | — | |
| ⑦ | SOLDER (For junction of a wire and a terminal) Lead-Free Sn-Ag-Cu | — | — | Optional | — | |
| ⑧ | ADHESIVE Acrylic, Urethane or Epoxy | — | — | Optional | — | |
| ⑨ | ADHESIVE Silicon | — | — | Optional | — | |

- ※ 1. Tape Min. Thickness shows the total value. (Tape Base and Adhesive)
 ※ 2. Insulation Tape shall be able to withstand for 1 minute of 3000 Volts (r.m.s) Potential with 2 layers.



SPECIFICATIONS / ECO2020SEO-D06H015

Compatible with lead-free solders

SCHEMATICS

SAFETY STANDARDS

| SAFETY STANDARDS IEC60335-1 Ed.4 (Basic insulation) | | |
|--|----------------|-----------------|
| | Inside of Coil | Outside of Coil |
| PRI. - SEC. | 2.8mm MIN. | 4.0mm MIN. |
| PRI. - CORE | 1.4mm MIN. | 2.0mm MIN. |
| SEC. - CORE | 1.4mm MIN. | 2.0mm MIN. |

WINDING SPECIFICATIONS

| No. | Order | Coil | Terminal | Turns | Wire | Note |
|-----|-------|----------------|----------|-------|-----------|-----------------|
| 0 | 0 | $400 \leq CTI$ | | | | |
| 1 | 1 | N P1 | 2 - 3 | 52 | 1UEW 0.18 | NP1+NP2=108ts |
| 2 | 2 | N S1a | 10 - 9 | 25 | 1UEW 0.18 | Reverse winding |
| 3 | 3 | N P2 | 1 - 2 | 62 | 1UEW 0.18 | |
| 4 | 4 | N S1b | 11 - 8 | 25 | 1UEW 0.18 | Reverse winding |
| 5 | 5 | N B | 5 - 6 | 22 | 1UEW 0.18 | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

* Clockwise direction is an order direction when see a No.1 terminal pin side of transformer from the upper part.

SPECIFICATIONS / ECO2020SEO-D06H015

Compatible with lead-free solders

■ ELECTRICAL CHARACTERISTICS

| Test Conditions | | Temperature | : | 25±10°C | | |
|-----------------|---------------------------|---------------------------------|--|---------------------------------------|---|--|
| | | Relative Humidity | : | 25~75%RH | | |
| No | Parameter | Test Terminal | Specification | Conditions | Test Instruments | |
| 4.1 | Inductance | 1 - 3 | 1.30 mH ±10% | 10 kHz 1Vrms | LCR Meter Agilent : 4263B or Equivalent | |
| 4.2 | Leakage Inductance | 1 - 3 (Sec. All short) | 40.0 μH MAX. (Std.=24.9μH : Ref.参考) | 10 kHz 1Vrms | | |
| 4.3 | DC. Resistance | 2 - 3 | 1.05Ω ±15% | | Milli ohm meter ADEX : AX-114 or Equivalent | |
| | | 10 - 9 | 0.565Ω ±20% | | | |
| | | 1 - 2 | 1.55Ω ±15% | | | |
| | | 11 - 8 | 0.685Ω ±20% | | | |
| | | 5 - 6 | 0.650Ω ±20% | | | |
| 4.4 | Insulation Resistance | PRI.-SEC. PRI.,SEC. -CORE | 100 MΩ MIN. | DC 500V | Meg Ohm Meter Toa : SM-5E or Equivalent | |
| 4.5 | Withstanding Voltage | PRI.-SEC. | Without Breakdown Sense:1mA f=50or60Hz | AC 1.5kVrms 1min or AC 1.8kVrms 1s | Puncture Tester Kikusui : TOS8650 or Equivalent | |
| | | PRI.-CORE SEC.-CORE | | AC 0.8kVrms 1min or AC 0.9kVrms 1s | | |
| | | | | | | |
| 4.6 | Impulse Test | 1 - 3 | Without Breakdown | Pulse 1.0kVo-p 3--5 Pulse | Impulse Tester ECG : DWS-05 or Equivalent | |
| 4.7 | Polarity & Turns Ratio | 10 - 9 | (0.2190) ± 3.5% | f=10kHz | Ratio Meter Ryowa : TRM-101A or Equivalent | |
| | | 11 - 8 | (0.2220) ± 3.5% | | | |
| | | 5 - 6 | (0.1945) ± 3.5% | | | |
| | | | | | | |
| | X-X/ 1 - 3 | | | | | |

SPECIFICATIONS / ECO2020SEO-D06H015

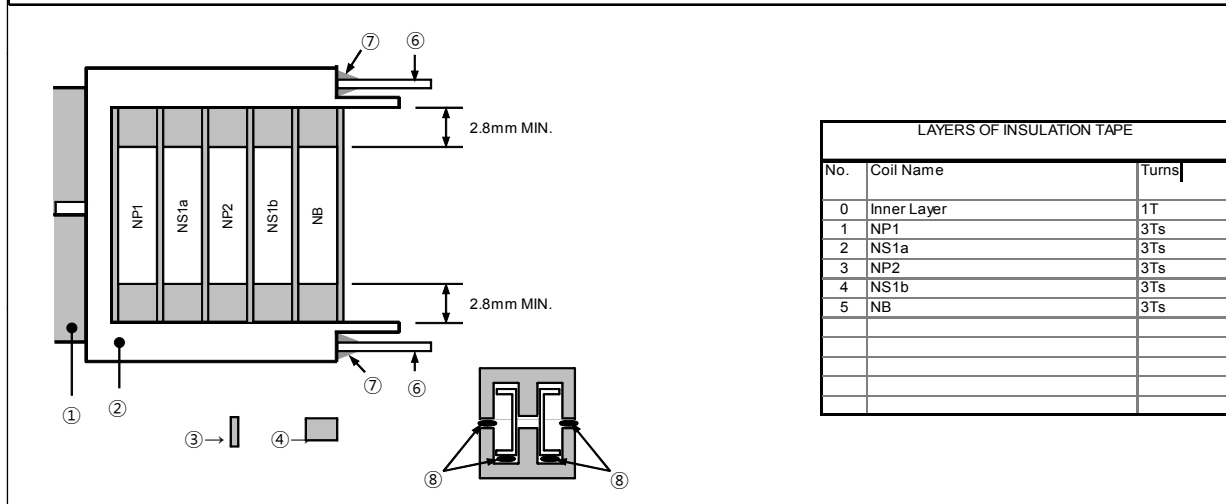
Compatible with lead-free solders

MATERIAL LIST AND INSULATING CONSTRUCTION

| No | ITEM & MATERIAL | MIN. THICKNESS OF 1 LAYER | UL T.I (°C) | MANUFACTURER | UL FILE NO. | | |
|----|--|---------------------------------|----------------|---|--|---|---------|
| ① | CORE Ferrite 20.9mm x20.6mm x7.7mm | — | — | TDK-EPC Corporation | — | | |
| ② | BOBBIN Phenol Resin | PM-9820 T375J | 0.65 mm 150 | SUMITOMO BAKELITE CO.,LTD. CHANG CHUN PLASTICS CO.,LTD | E41429 E59481 | | |
| | INSULATION TAPE Polyester or PET Color : WHITE CTI≥400V | 1318-1 | 0.05 mm | 130 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | E17385 | | |
| | INSULATION TAPE Polyester | 1318-2 | 0.07 mm | 130 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | E17385 | | |
| ④ | FIXING TAPE FOR WIRE (Barrier Tape) Polyester or PET CTI≥600V | 44D-A or 44T-A | 0.28 mm | 130 | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | | |
| | | 343BN@@ | | | | NITTO DENKO CORP. | E34833 |
| | | WF with suffixes | | | | JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD | E165111 |
| | | | | | | | |
| ⑤ | WINDING WIRE (Primary) Polyurethane Enameled Copper Wire 0.18 mm DIA : NP1, NP2,NB | — | 130 | PROSPERITY ELECTRIC WIRE & CABLE CO. | E196072 | | |
| | | | | HANGZHOU WEIFENG ELECTRONIC CO.,LTD. | E229341 | | |
| | | | | TAI-I ELECTRIC WIRE&CABLE CO LTD | E85640 | | |
| | | | | ZHUHAI WEIHAN WIRE CO LTD | E339217 | | |
| | WINDING WIRE (Secondary) Polyurethane Enameled Copper Wire 0.18 mm DIA : NS1a/b | SHENZHEN FUJI FINE FACTORY | E303260 | | | | |
| | | HITACHI CABLE (JOHOR) SDN BHD | E215594 | | | | |
| | | THAI HITACHI ENAMEL WIRE CO LTD | E137472 | | | | |
| | | ELEKTRISOLA (MALAYSIA) SDN BHD | E143312 | | | | |
| ⑥ | TERMINAL PIN Φ0.8 (Soldered) Copper Clad Steel Wire Under Coating(Copper)25% Weight Ratio. (Ref)Surface Plating(Sn100%)3μm or More. | — | — | WELL FORE SPECIAL WIRE CORPORATION SUMITOMO ELECTRIC INDUSTRIES LTD. | — | | |
| ⑦ | SOLDER (For junction of a wire and a terminal) Lead-Free Sn-Ag-Cu | — | — | SENJU METAL INDUSTRY CO., LTD. | — | | |
| ⑧ | ADHESIVE Acrylic, Urethane or Epoxy | — | — | HENKEL LOCTITE(CHINA) CO.,LTD. | — | | |
| ⑨ | FIXING TAPE FOR CORE Polyester Same as No.③ | 0.05 mm (2~3Layers) | 130 | Same as No.③ | Same as No.③ | | |
| ⑩ | CASE PBT Resin 4130 | 0.75 mm | 120 94V-0 | CHANG CHUN PLASTICS CO.,LTD. | E59481 | | |
| ⑪ | ADHESIVE Silicon | — | — | Optional | — | | |

※ 1. Tape Min. Thickness shows the total value. (Tape Base and Adhesive)

※ 2. Insulation Tape shall be able to withstand for 1 minute of 3000 Volts (r.m.s) Potential with 2 layers.

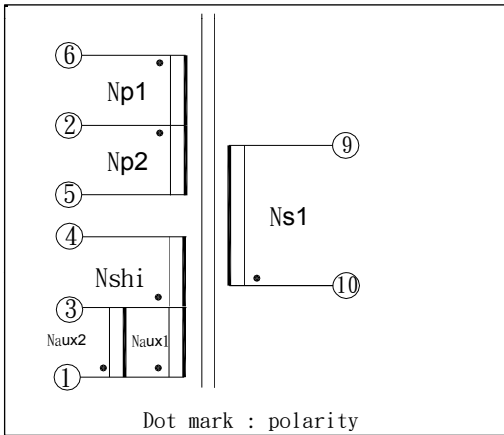


· All specifications are subject to change without notice.

Please read the precautions before using this catalog.

SPECIFICATIONS / ECO2020SEO-D07H016

Compatible with lead-free solders

■ SCHEMATICS

■ SAFETY STANDARDS

| Safety standards | | |
|------------------|-------------------|---------------|
| UL60950 | | |
| | Creepage Distance | Air Clearance |
| Pri. - Sec. | 5.2 mm Min. | 5.2 mm Min. |
| Pri. - Core. | 2.5 mm Min. | 3.6 mm Min. |
| Sec. - Core. | 2.5 mm Min. | 3.6 mm Min. |

■ WINDING SPECIFICATIONS

| No. | COIL | TERMINAL | WIRE | URNS | WINDING METHOD |
|-----|-------|----------|-------------------|-------|------------------|
| 1 | Nshi | 3 --- 4 | 1-UEW ϕ 0.10 | 27 Ts | Solenoid(1Layer) |
| 2 | Np1 | 6 --- 2 | 2-UEW ϕ 0.20 | 52 Ts | Solenoid |
| 3 | Ns1 | 10 --- 9 | 2-UEW ϕ 0.28 | 35 Ts | Solenoid |
| 4 | Naux1 | 1 --- 3 | 2-UEW ϕ 0.12 | 14 Ts | Solenoid(1Layer) |
| 5 | Np2 | 2 --- 5 | 2-UEW ϕ 0.20 | 52 Ts | Solenoid |
| 6 | Naux2 | 1 --- 3 | 2-UEW ϕ 0.12 | 14 Ts | Solenoid(1Layer) |

SPECIFICATIONS / ECO2020SEO-D07H016

Compatible with lead-free solders

■ ELECTRICAL CHARACTERISTICS

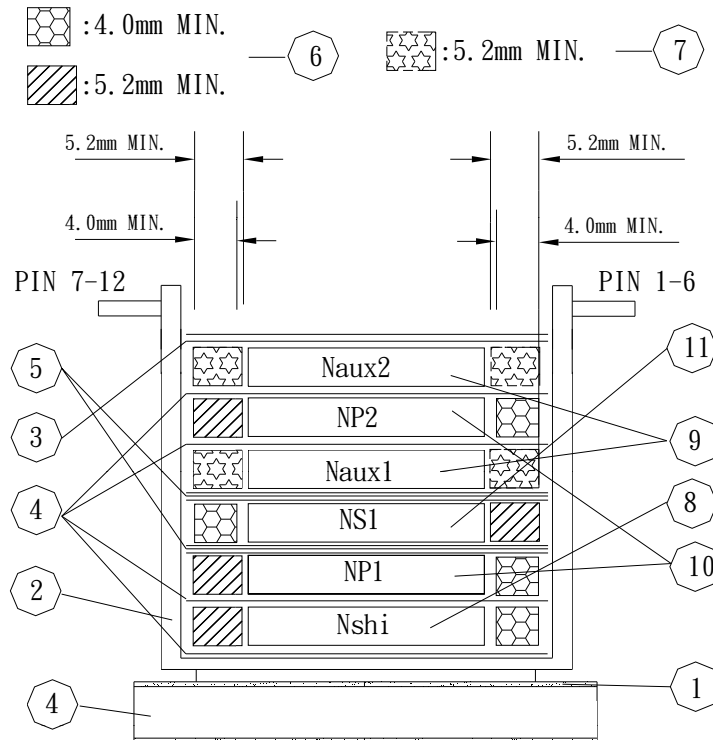
| Item | Test Condition | Terminal | Spec | Test Instruments |
|------------------------|-----------------------------|------------------------------|-----------------------------------|---|
| Inductance | 100 kHz | 6 -- 5 | 1300 μ H \pm 8 % | HP 4284A LCR METER @1.0Vrms |
| Leakage Inductance | 100 kHz (S side short) | 6 -- 5 | 80 μ H Max. | NATIONAL VP-2941A |
| Cd | 100 kHz (Cs-D) | 9 -- 3 (S side short) | 13 pF Min. | |
| RDC | | 3 -- 4 | 1.688 Ω \pm 25 % | NATIONAL AD-5812A DIGITAL MILLIOHM METER |
| | | 6 -- 2 | 885 m Ω \pm 25 % | |
| | | 10 -- 9 | 360 m Ω \pm 25 % | |
| | | 1 -- 3 | 502 m Ω \pm 25 % | |
| | | 2 -- 5 | 1.262 Ω \pm 25 % | |
| Insulation Resistance | DC 500V | P -- S | 100 M Ω Min | MEGOHM METER SM-5E |
| | | P -- CORE | | |
| | | S -- CORE | | |
| Withstand Voltage | AC 3.6kVrms | P -- S | 1 sec. Min | PT METER(f:60/50 Hz) KIKUSUI TOS8650 SENSE: 2mA |
| | AC 1.8kVrms | P -- CORE | | |
| | AC 4.0kVrms | S -- CORE | | |
| Polarity & Turns Ratio | INPUT: 6 -- 5 (20kHz) | 3 -- 4 | (0.2445 Vrms \pm 3.0%) | TURN RATIO METER TRD-09 or TRD-08 |
| | | 10 -- 9 | (0.3338 Vrms \pm 2.5%) | |
| | | 1 -- 3 | (0.1378 Vrms \pm 5.5%) | |
| Layer Short | | 6 -- 5 | AC 1.2 kVo-p Without Breakdown | INPULSETESTER ECG:DW-9505C |
| ARC | AC 3.6kVrms | P -- S | 1 sec. Min. | 9071A SENSE: 5.5mA |

SPECIFICATIONS / ECO2020SEO-D07H016

Compatible with lead-free solders

MATERIAL LIST AND INSULATING CONSTRUCTION

| NO. | ITEM | MATERIAL | LAYERS | MINIMUM THICKNESS OF TOTAL LAYERS | UL FILE NO. | MANUFACTURER |
|-----|-----------------------------|---|--------|-----------------------------------|--------------|--|
| 1 | CORE | FERRITE <i>PC47 ECO2020</i> | | | | TDK CORPORATION |
| 2 | BOBBIN | PHENOLIC RESIN T375J | | | E59481 | CHANG CHUN PLASTICS CO., LTD. |
| 3 | INSULATION TAPE | POLYESTER TAPE NO.1318-1(a) | 2 | 0.050 mm | E17385 | 3M.COMPANY. |
| 4 | INSULATION TAPE | SAME AS NO.3 | 1 | 0.025 mm | SAME AS NO.3 | |
| 5 | INSULATION TAPE | SAME AS NO.3 | 3 | 0.025 mm | SAME AS NO.3 | |
| 6 | MARGIN TAPE | POLYESTER TAPE NO.44D-A(a) or 44T-A(a) | | | E17385 | 3M.COMPANY. |
| 7 | MARGIN TAPE: Naux1,Naux2 | POLYESTER TAPE NO.44D-A(a) or 44T-A(a) or NO.1318-1(a) | | | E17385 | 3M.COMPANY. |
| | | | | | E17385 | 3M.COMPANY. |
| 8 | WIRE : Nshi | POLYURETHANE ENAMELLED COPPER WIRE 1 or 2-UEW φ0.10 | | | E196072 | PROSPERITY TRADING WIRE & CABLE CO. |
| 9 | WIRE : Naux1,Naux2 | POLYURETHANE ENAMELLED COPPER WIRE 1 or 2-UEW φ0.12 | | | E229341 | HANGZHOU WEIFENG ELECTRONIC CO., LTD. |
| 10 | WIRE : NP1,NP2 | POLYURETHANE ENAMELLED COPPER WIRE 1 or 2-UEW φ0.20 | | | E85640 | TAH JIANG CORP (GUANG ZHOU)CO.,LTD |
| 11 | WIRE : NS1 | POLYURETHANE ENAMELLED COPPER WIRE 1 or 2-UEW φ0.28 | | | E339217 | ZHUHAI WEIHAN WIRE CO., LTD |
| 12 | ADHESIVE | EPOXY ADHESIVE NO.7247 | | | | LOCTITE CO.,LTD. |
| 13 | ADHESIVE | EPOXY ADHESIVE NO.3851 or NO.ME-5080LC or NO.C-4636BKLC | | | | LOCTITE CO.,LTD. PELNOX CO.,LTD. RESINOUS KASEI CO.,LTD. |
| 14 | ADHESIVE | EPOXY ADHESIVE NO.#508 | | | | DONGBU FINE CHEMICAL CO., LTD. |

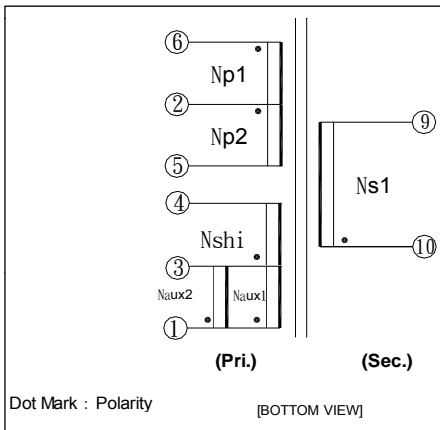


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SPECIFICATIONS / ECO2020SEO-D08H016

Compatible with lead-free solders

■ SCHEMATICS



■ SAFETY STANDARDS

| Safety standards | | |
|------------------|-------------------|---------------|
| IEC60950 | | |
| | Creepage Distance | Air Clearance |
| Pri. - Sec. | 5.4 mm Min. | 5.2 mm Min. |
| Pri. - Core. | 3.6 mm Min. | 2.6 mm Min. |
| Sec. - Core. | 3.6 mm Min. | 2.6 mm Min. |

■ WINDING SPECIFICATIONS

| No. | Order | Coil | Terminal | Turns | Wire | Note |
|-----|-------|--------|----------|-------|----------|-------|
| 1 | 1 | Nshi | 3 - 4 | 27 | UEW 0.10 | CLOSE |
| 2 | 2 | NP 1 | 6 - 2 | 52 | UEW 0.21 | CLOSE |
| 3 | 3 | NS 1 | 10 - 9 | 25 | UEW 0.35 | CLOSE |
| 4 | 4 | Naux 1 | 1 - 3 | 17 | UEW 0.12 | CLOSE |
| 5 | 5 | NP 2 | 2 - 5 | 52 | UEW 0.21 | CLOSE |
| 6 | 6 | Naux 2 | 1 - 3 | 17 | UEW 0.12 | CLOSE |
| | | | | | | |
| | | | | | | |

* Clockwise direction is an order direction when see a No.1 terminal pin side of transformer from the upper part.

SPECIFICATIONS / ECO2020SEO-D08H016

Compatible with lead-free solders

■ ELECTRICAL CHARACTERISTICS

| Test Conditions | | Temperature | : | 25±10°C | | |
|-----------------|--|---------------------------|--|-------------------|---|--|
| | | Relative Humidity | : | 25~75%.RH | | |
| No. | Parameter | Test Terminal | Specification | Conditions | Test Instruments | |
| 4.1 | Inductance | 6 - 5 | 1300μH± 5% | 100 kHz 1Vrms | Digital LCR Meter HP : 4284A or Equivalent | |
| 4.2 | Leakage Inductance | 6 - 5 (Sec. short) | 80 μH MAX. | | | |
| 4.3 | DC. Resistance | 3 - 4 | 1.610 Ω± 25% | | Digital Milli ohm meter National : AD-5812A or Equivalent | |
| | | 6 - 2 | 782 mΩ± 25% | | | |
| | | 10 - 9 | 172 mΩ± 30% | | | |
| | | 1 - 3 | 612 mΩ± 25% | | | |
| | | 2 - 5 | 1.155 Ω± 25% | | | |
| 4.4 | Insulation Resistance | Pri.-Sec. | 100 MΩ Min. | DC 500V | Meg Ohm Meter Toa : SM-5E or Equivalent | |
| | | Pri. Sec. - Core | | | | |
| 4.5 | Withstanding Voltage | Pri.-Sec. | Without Breakdown Sense:2mA f=50or60Hz | AC 3.0kVrms 1min | Puncture Tester Kikusui : TOS-8650 or Equivalent | |
| | | Pri. Sec. - Core | | or AC 3.6kVrms 1s | | |
| | | | | AC 1.5kVrms 1min | | |
| 4.6 | Polarity & Turns Ratio X-X/ 6 - 5 | 3 - 4 | STD (0.2435) ± 3.0% | f=10kHz | Ratio Meter Ineden : 3050HT or Equivalent | |
| | | 10 - 9 | STD (0.2387) ± 3.5% | | | |
| | | 1 - 3 | STD (0.1675) ± 4.5% | | | |
| | | | | | | |

SPECIFICATIONS / ECO2020SEO-D08H016

Compatible with lead-free solders

MATERIAL LIST AND INSULATING CONSTRUCTION

| NO. | ITEM | MATERIAL | LAYERS | MINIMUM THICKNESS OF TOTAL LAYERS | UL FILE NO. | MANUFACTURER |
|-----|-------------------------------|--|--------|-----------------------------------|-------------|---------------------------------------|
| 1 | CORE | FERRITE PC47 ECO2020 | | | | TDK-EPC CORPORATION |
| 2 | BOBBIN | PHENOLIC RESIN T375J | | | E59481 | CHANG CHUN PLASTICS CO., LTD. |
| 3 | INSULATION TAPE (Color:WHITE) | POLYESTER TAPE NO.1318-1(a) | 2 | 0.050 mm | E17385 | 3M.COMPANY. |
| 4 | MARGIN TAPE: | POLYESTER TAPE NO.44D-A(a) or 44T-A(a) | | | E17385 | 3M.COMPANY. |
| 5 | WIRE : Nshi | POLYURETHANE ENAMELLED COPPER WIRE 1 or 2-UEW φ0.10 | | | E196072 | PROSPERITY TRADING WIRE & CABLE CO. |
| 6 | WIRE : Naux1,Naux2 | POLYURETHANE ENAMELLED COPPER WIRE 1 or 2-UEW φ0.12 | | | E229341 | HANGZHOU WEIFENG ELECTRONIC CO., LTD. |
| 7 | WIRE : NP1,NP2 | POLYURETHANE ENAMELLED COPPER WIRE 1 or 2-UEW φ0.21 | | | E85640 | TAH JIANG CORP (GUANG ZHOU)CO.,LTD |
| 8 | WIRE : NS1 | POLYURETHANE ENAMELLED COPPER WIRE 1 or 2-UEW φ0.35 | | | E339217 | ZHUHAI WEIHAN WIRE CO., LTD |
| 9 | ADHESIVE | EPOXY ADHESIVE NO.7247 | | | | LOCTITE CO.,LTD. |
| 10 | ADHESIVE | EPOXY ADHESIVE NO.3851 | | | | LOCTITE CO.,LTD. |
| | | or NO.ME-5080LC | | | | PELNOX CO.,LTD. |
| | | or NO.C-4636BKLC | | | | RESINOUS KASEI CO.,LTD. |
| 11 | ADHESIVE | EPOXY ADHESIVE NO.#508 | | | | DONGBU FINE CHEMICAL CO., LTD. |
| | | or NO.8008 | | | | CHEMTECH CO., LTD. |

※ 1. Tape Min. Thickness shows the total value. (Tape Base and Adhesive)
 ※ 2. Insulation Tape shall be able to withstand for 1 minute of 3000 Volts (r.m.s) Potential with 2 layers.

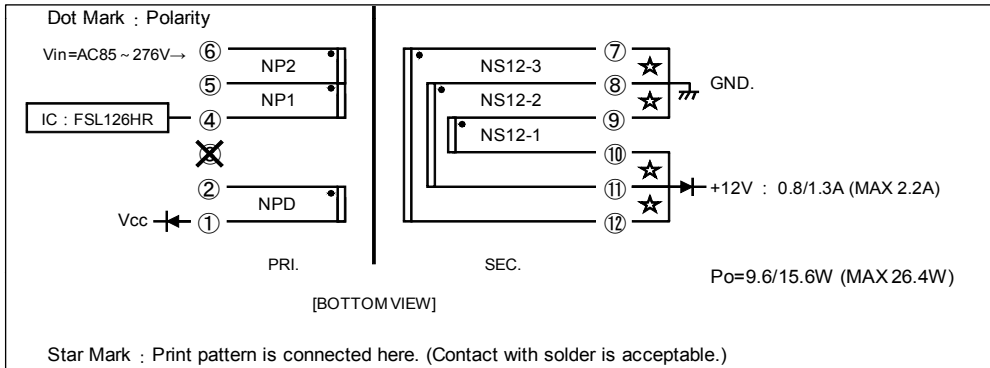
| No. | Coil | Section | Turns |
|-----|-------|---------|-------|
| 1 | | | 1 |
| 2 | Nshi | P | 1 |
| 3 | NP1 | P | 3 |
| 4 | NS1 | S | 3 |
| 5 | Naux1 | P | 1 |
| 6 | NP2 | P | 1 |
| 7 | Naix2 | P | 2 |
| | | | |
| | | | |
| | | | |

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SPECIFICATIONS / ECO2023SEO-D01H016

Compatible with lead-free solders

■ SCHEMATICS



■ SAFETY STANDARDS

SAFETY STANDARDS

*UL60065 7th, *CSA E60065-03, *J60065(H20), *IEC60065 Ed.7, *EN60065:2002

| | Inside of Coil | Outside of Coil |
|-------------|----------------|-----------------|
| PRI. - SEC. | 4.8mm MIN. | 8.0mm MIN. |
| PRI. - CORE | 2.9mm MIN. | 4.0mm MIN. |
| SEC. - CORE | 2.9mm MIN. | 4.0mm MIN. |

■ WINDING SPECIFICATIONS

| No. | Order | Coil | Terminal | Turns | Wire | Note |
|-----|-------|---------|----------|-------|----------|-----------------|
| 1 | 1 | N P1 | 4 - 5 | 28 | UEW 0.26 | NP1+NP2=67Ts. |
| 2 | 2 | N S12-1 | 10 - 9 | 9 | UEW 0.32 | |
| 3 | 3 | N S12-2 | 11 - 8 | 9 | UEW 0.32 | |
| 4 | 4 | N P2 | 5 - 6 | 39 | UEW 0.26 | |
| 5 | 5 | N S12-3 | 7 - 12 | 9 | UEW 0.32 | Reverse Winding |
| 6 | 6 | N PD | 2 - 1 | 12 | UEW 0.26 | Reverse Winding |
| | | | | | | |
| | | | | | | |

* Clockwise direction is an order direction when see a No.1 terminal pin side of transformer from the upper part.

SPECIFICATIONS / ECO2023SEO-D01H016

Compatible with lead-free solders

■ ELECTRICAL CHARACTERISTICS

| Test Conditions | | Temperature | : | 25±10°C | | |
|-----------------|---|--------------------------|--|--|---|--|
| | | Relative Humidity | : | 25~75%RH | | |
| No | Parameter | Test Terminal | Specification | Conditions | Test Instruments | |
| 4.1 | Inductance | 6 - 4 | 489 μH ± 10% | 10 kHz 1Vrms | LCR Meter Agilent : 4263B or Equivalent | |
| 4.2 | Leakage Inductance | 6 - 4 (Sec.All short) | 11.0 μH MAX. | 100 kHz 1Vrms | | |
| 4.3 | DC. Resistance | 6 - 4 | 0.82 Ω ± 20% | | Milli ohm meter ADEX : AX-114 or Equivalent | |
| | | 2 - 1 | 0.20 Ω ± 20% | | | |
| | | 7 - 12 | 94.1 mΩ ± 30% | | | |
| | | 8 - 11 | 77.2 mΩ ± 30% | | | |
| | | 9 - 10 | 72.2 mΩ ± 30% | | | |
| | | | | | | |
| 4.4 | Insulation Resistance | PRI.-SEC. | 100 MΩ MIN. | DC 500V | Meg Ohm Meter Toa : SM-5E or Equivalent | |
| | | PRI.,SEC. -CORE | | | | |
| | | | | | | |
| 4.5 | Withstanding Voltage ※ | PRI.-SEC. | Without Breakdown Sense:1mA f=50or60Hz | AC 3.0kVrms 1min or AC 3.6kVrms 1s AC 1.5kVrms 1min or AC 1.8kVrms 1s | Puncture Tester Kikusui : TOS8650 or Equivalent | |
| | | PRI.-CORE SEC.-CORE | | | | |
| | | | | | | |
| 4.6 | Impulse Test | 6 - 4 | Without Breakdown | Pulse 0.8kVo-p 3--5 Pulse | Impulse Tester ECG : DWS-05 or Equivalent | |
| 4.7 | Polarity & Turns Ratio X-X/ 6 - 4 | | | f=10kHz | Ratio Meter Ryowa : TRM-101A or Equivalent | |
| | | 2 - 1 | (0.1821) ± 6.6% | | | |
| | | 7 - 12 | (0.1364) ± 8.8% | | | |
| | | 8 - 11 | (0.1338) ± 8.8% | | | |
| | | 9 - 10 | (0.1324) ± 8.8% | | | |

※.1min or 1s is the time when the prescribed voltage is applied.

SPECIFICATIONS / ECO2023SEO-D01H016

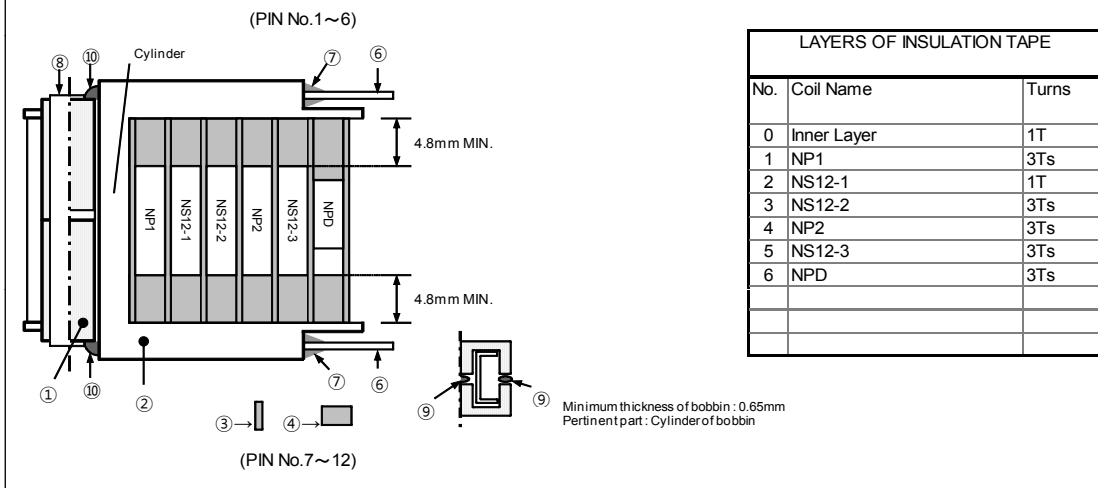
Compatible with lead-free solders

MATERIAL LIST AND INSULATING CONSTRUCTION

| No | ITEM & MATERIAL | MIN.THICKNESS OF 1 LAYER | UL T.I (°C) | MANUFACTURER | UL FILE NO. | |
|----|--|--------------------------------|--------------|---|--|--------|
| ① | CORE Ferrite 20.9mmx23.6mmx7.7mm | — | — | TDK-EPC Corporation | — | |
| ② | BOBBIN Phenol Resin | PM-9820 or | 0.65 mm | 150 | SUMITOMO BAKELITE CO.,LTD. | E41429 |
| | | PM-9823 T375J | | | | |
| ③ | INSULATION TAPE Polyester or PET Color : White 【Material group I】 | 1318-1 | 0.05 mm | 130 | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | E17385 |
| | | 1318-2 | | | | |
| ④ | FIXING TAPE FOR WIRE (Barrier Tape) Polyester or PET 【Material group I】 | 44D-A or | — | 130 | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | E17385 |
| | | 44T-A | | | | |
| | | 343BN@@ | | | | |
| | | WF with suffixes | | | | |
| ⑤ | WINDING WIRE (Primary) Polyurethane Enameled Copper Wire 0.26 mm DIA : NP1, NP2, NPD | — | 130 | PROSPERITY ELECTRIC WIRE & CABLE CO. | E196072 | |
| | | | | TAI ELECTRIC WIRE&CABLE CO LTD | E85640 | |
| | | | | SHENZHEN FUJI FINE FACTORY | E303260 | |
| | WINDING WIRE (Secondary) Polyurethane Enameled Copper Wire 0.32 mm DIA : NS12-1,2,3 | HITACHI CABLE (JOHOR) SDN BHD | E215594 | | | |
| | | ELEKTRISOLA (MALAYSIA) SDN BHD | E143312 | | | |
| | | — | — | | | |
| ⑥ | TERMINAL PIN Φ0.8 (Soldered) Copper Clad Steel Wire Under Coating(Copper)25% Weight Ratio. (Ref)Surface Plating(Sn100%)3μm or More. | — | — | XIAMEN KEXIN ELECTRON CO.,LTD. XIAMEN PINQUAN INDUSTRY&TRADE CO.,LTD. | — | |
| ⑦ | SOLDER (For junction of a wire and a terminal) Lead-Free Sn-Ag-Cu | — | — | SOLNET METAL INDUSTRY CO.,LTD. SENJU METAL INDUSTRY CO.,LTD. | — | |
| ⑧ | FIXING TAPE FOR CORE Polyester Color : Yellow | 1318-1 or | 0.05 mm | 130 | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | E17385 |
| | | 1350F-1 CT with suffixes | | | | |
| ⑨ | ADHESIVE Acrylic , Urethane or Epoxy , Silicon | — | — | RESINOUS KASEI CO.,LTD | — | |
| | | | | PELNOX LTD. | | |
| ⑩ | ADHESIVE Silicon | — | — | CEMEDINE CO.,LTD. | — | |
| ⑨ | SHIELD RING COPPER t=0.1mm., W=12mm | — | — | Optional | — | |
| ⑩ | FIXING TAPE FOR SHIELD RING Polyester SAME AS o.③ | — | — | SAME AS No.③ | SAME AS No③ | |
| ⑩ | CASE PBT Resin 4130 | 0.75 mm | 120 94V-0 | CHANG CHUN PLASTICS CO.,LTD. | E59481 | |
| | | | | | | — |

※ 1. Tape Min. Thickness shows the total value. (Tape Base and Adhesive)

※ 2. Insulation Tape shall be able to withstand for 1 minute of 3000 Volts (r.m.s) Potential with 2 layers.



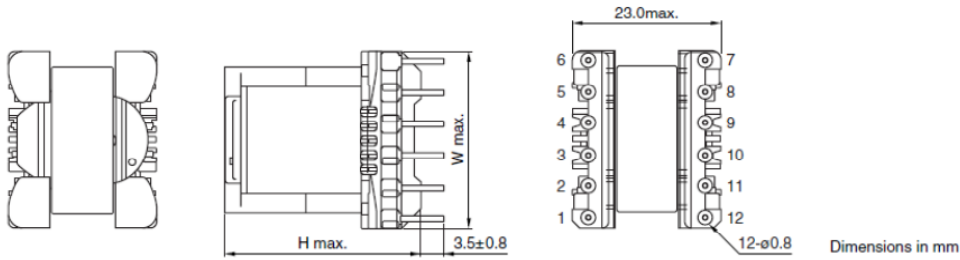
· All specifications are subject to change without notice.

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ECO22 Series for Multiple Outputs (Vertical Type)

Compatible with lead-free solders

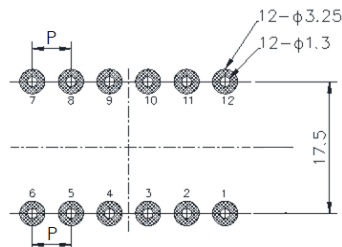
SHAPES AND DIMENSIONS (BOBBIN TYPE: VI, VII)



Dimensions in mm

| Part No. | Bobbin type | W max. | H max. | P |
|----------|-------------|--------|--------|-----|
| ECO2219 | VI | 28.5 | 25.0 | 5.0 |
| | VII | 24.0 | 25.0 | 4.0 |
| ECO2225 | VI | 28.5 | 31.0 | 5.0 |
| | VII | 24.0 | 31.0 | 4.0 |
| ECO2230 | VI | 28.5 | 36.0 | 5.0 |
| | VII | 24.0 | 36.0 | 4.0 |

RECOMMENDED BASE MATERIAL OPENING SIZE



Dimensions in mm

Default Tolerance : ±0.1

ITEMS APPLICABLE

| Series | Bobbin Type | Part No. |
|---------|-------------|---------------------|
| ECO2219 | VII | ECO2219SEO-D01V018 |
| | | ECO2219SEO-D02V016 |
| | | ECO2219SEO-D03V017 |
| ECO2225 | VI | ECO2225SEO-D02V0112 |

· Compatible ferrite materials for this product are the PC47 family.

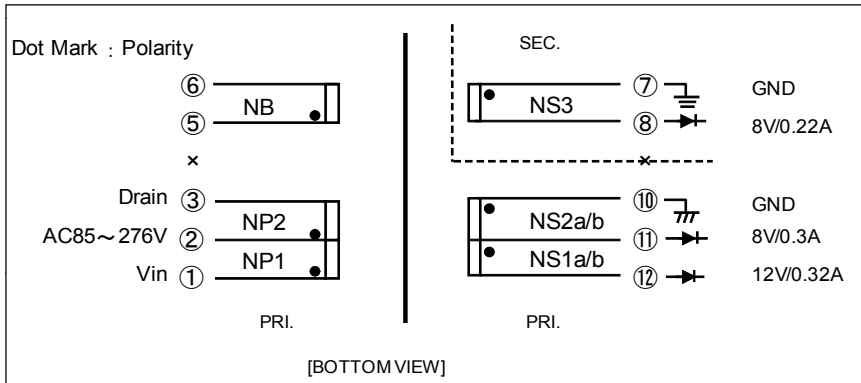
· Conformity to RoHS Directive: This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted ópir.

· All specifications are subject to change without notice.

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SPECIFICATIONS / ECO2219SEO-D01V018

Compatible with lead-free solders

■ SCHEMATICS

■ SAFETY STANDARDS

| SAFETY STANDARDS | | IEC60335-1 Ed.4 | |
|---|----------------|-----------------|--|
| *Electrical Appliance and Material Safety Act | | | |
| | Inside of Coil | Outside of Coil | |
| PRI. - SEC. | 4.1mm MIN. | 4.1mm MIN. | |
| PRI. - CORE | 2.1mm MIN. | 2.1mm MIN. | |
| SEC. - CORE | 2.1mm MIN. | 2.1mm MIN. | |

■ WINDING SPECIFICATIONS

| No. | Order | Coil | Terminal | Turns | Wire | Note |
|-----|-------|-------|----------|-------|------------|--------------|
| 1 | 1 | N P2 | 2 - 3 | 27 | UEW 0.28 | NP1+NP2=54ts |
| 2 | 2 | N S2a | 10 - 11 | 5 | UEW 0.25×2 | |
| 3 | 3 | N S1a | 11 - 12 | 3 | UEW 0.25×2 | |
| 4 | 4 | N P1 | 1 - 2 | 27 | UEW 0.28 | |
| 5 | 5 | N S2b | 10 - 11 | 5 | UEW 0.25×2 | |
| 6 | 6 | N S1b | 11 - 12 | 3 | UEW 0.25×2 | |
| 7 | 7 | N S3 | 7 - 8 | 5 | TEX-E 0.20 | |
| 8 | 8 | N B | 5 - 6 | 10 | UEW 0.20 | |
| | | | | | | |
| | | | | | | |

* Clockwise direction is an order direction when see a transformer from the upper part.

SPECIFICATIONS / ECO2219SEO-D01V018

Compatible with lead-free solders

■ ELECTRICAL CHARACTERISTICS

| Test Conditions | | Temperature | : | 25±10°C | | |
|-----------------|---|---------------------------------|--|---------------------------------------|---|--|
| | | Relative Humidity | : | 25~75%RH | | |
| No | Parameter | Test Terminal | Specification | Conditions | Test Instruments | |
| 4.1 | Inductance | 1 - 3 | 816uH ±15% | 10 kHz 1Vrms | LCR Meter Agilent : 4263B or Equivalent | |
| 4.2 | Leakage Inductance | 1 - 3 (7--12 short) | 30 uH MAX. | 10 kHz 1Vrms | | |
| 4.3 | DC. Resistance | 2 - 3 | 0.271Ω ±25% | | Milli ohm meter ADEX : AX-114 or Equivalent | |
| | | 10 - 11 | 21.0mΩ ±30% | | | |
| | | 11 - 12 | 14.1mΩ ±30% | | | |
| | | 1 - 2 | 0.330Ω ±25% | | | |
| | | 5 - 6 | 0.306Ω ±25% | | | |
| | | 7 - 8 | 0.142Ω ±25% | | | |
| 4.4 | Insulation Resistance | PRI.-SEC. PRI.,SEC. -CORE | 100 MΩ MIN. | DC 500V | Meg Ohm Meter Toa : SM-5E or Equivalent | |
| 4.5 | Withstanding Voltage | PRI.-SEC. | Without Breakdown Sense:1mA f=50or60Hz | AC 2.5kVrms 1min or AC 3.0kVrms 1s | Puncture Tester Kikusui : TOS8650 or Equivalent | |
| | | PRI.-CORE SEC.-CORE | | AC 1.3kVrms 1min or AC 1.5kVrms 1s | | |
| | | | | | | |
| 4.6 | Impulse Test | 1 - 3 | Without Breakdown | Pulse 0.8kVo-p 3--5 Pulse | Impulse Tester ECG : DWS-05 or Equivalent | |
| 4.7 | Polarity & Turns Ratio X-X/ 1 - 3 | 2 - 3 | (0.4973) ± 3.0%. | f=10kHz | Ratio Meter Ryowa : TRM-101A or Equivalent | |
| | | 10 - 11 | (0.0914) ± 11.0%. | | | |
| | | 11 - 12 | (0.0550) ± 13.0%. | | | |
| | | 5 - 6 | (0.1829) ± 8.0% | | | |
| | | 7 - 8 | (0.0920) ± 11.0%. | | | |
| | | | | | | |

SPECIFICATIONS / ECO2219SEO-D01V018

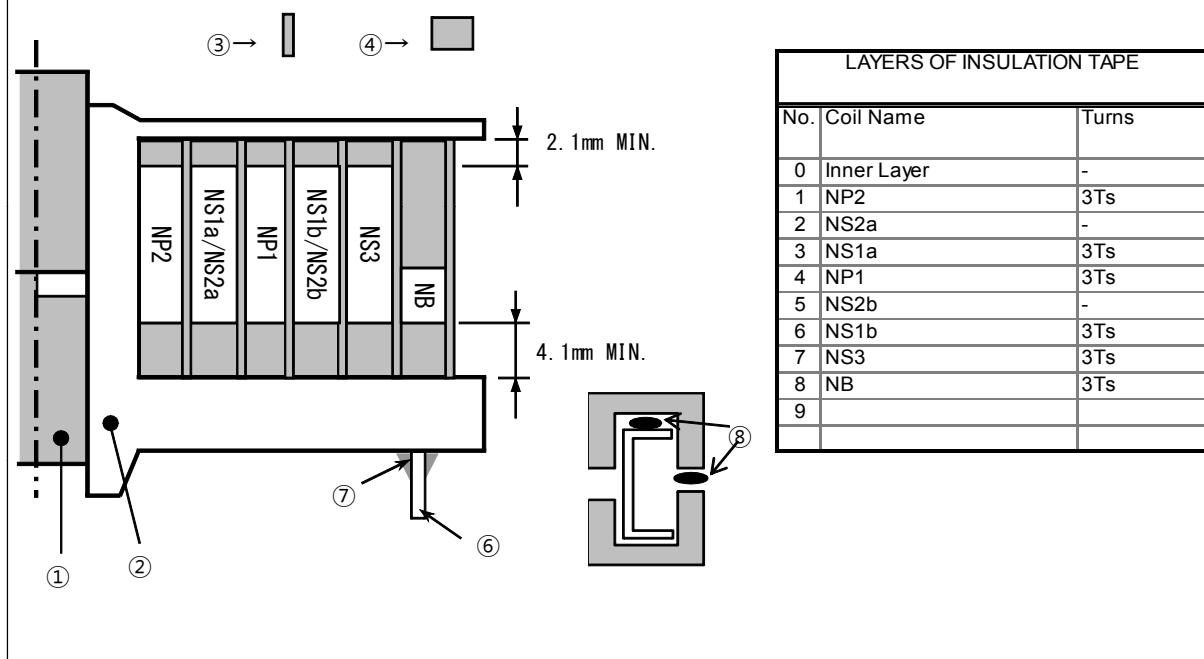
Compatible with lead-free solders

MATERIAL LIST AND INSULATING CONSTRUCTION

| No | ITEM & MATERIAL | MIN.THICKNESS OF 1 LAYER | UL T.I (°C) | MANUFACTURER | UL FILE NO. | |
|----|--|-----------------------------|----------------|---|---|-----------------------------|
| ① | CORE Ferrite 23.2mm x19.7mm x9.2mm | — | — | TDK-EPC Corporation | — | |
| ② | BOBBIN Phenol Resin | PM-9820 | 0.65 mm | 150 | SUMITOMO BAKELITE CO.,LTD. | |
| | | T375J | | | 94V-0 | CHANG CHUN PLASTICS CO.,LTD |
| ③ | INSULATION TAPE Polyester Color : YELLOW | 1318-1 or | 0.05 mm | 130 | 3M COMPANY | |
| | | 1350F-1 CT with suffixes | | | ELECTRICAL MARKETS DIV (EMD) | E17385 |
| ④ | FIXING TAPE FOR WIRE (Barrier Tape) | 44D-A or | — | 130 | 3M COMPANY | |
| | | 44T-A | | | ELECTRICAL MARKETS DIV (EMD) | E17385 |
| | | 343BN@@ | | | NITTO DENKO CORP. | E34833 |
| | | WF with suffixes | | | JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD | E165111 |
| ⑤ | WINDING WIRE (Primary) Polyurethane Enameled Copper Wire 0.28 mm DIA : NP1, NP2 0.25 mm DIA : NS1a/b, NS2a/b 0.20 mm DIA : NB | — | 130 | PROSPERITY ELECTRIC WIRE & CABLE CO. | E196072 | |
| | | | | HANGZHOU WEIFENG ELECTRONIC CO.,LTD. | E229341 | |
| | | | | TAI ELECTRIC WIRE&CABLE CO LTD | E85640 | |
| | | | | ZHUHAI WEIHAN WIRE CO LTD | E339217 | |
| | | | | SHENZHEN FUJI FINE FACTORY | E303260 | |
| | | | | HITACHI CABLE (JOHOR) SDN BHD | E215594 | |
| | | | | THAI HITACHI ENAMEL WIRE CO LTD | E137472 | |
| | | | | ELEKTRISOLA (MALAYSIA) SDN BHD | E143312 | |
| ⑥ | TERMINAL PIN $\Phi 0.8$ (Soldered) Copper Clad Steel Wire Under Coating(Copper)25% Weight Ratio. (Ref)Surface Plating(Sn100%)3 μ m or More. | — | — | Optional | — | |
| ⑦ | SOLDER (For junction of a wire and a terminal) Lead-Free Sn-Ag-Cu | — | — | Optional | — | |
| ⑧ | ADHESIVE Acrylic , Urethane or Epoxy | — | — | Optional | — | |
| ⑨ | WINDING WIRE (Secondary) Triple Insulating Winding Wire 0.20 mm DIA : NS3 | — | — | FURUKAWA ELECTRIC CO., LTD | E206440 | |

※ 1. Tape Min. Thickness shows the total value. (Tape Base and Adhesive)

※ 2. Insulation Tape shall be able to withstand for 1 minute of 3000 Volts (r.m.s) Potential with 2 layers.



· All specifications are subject to change without notice.

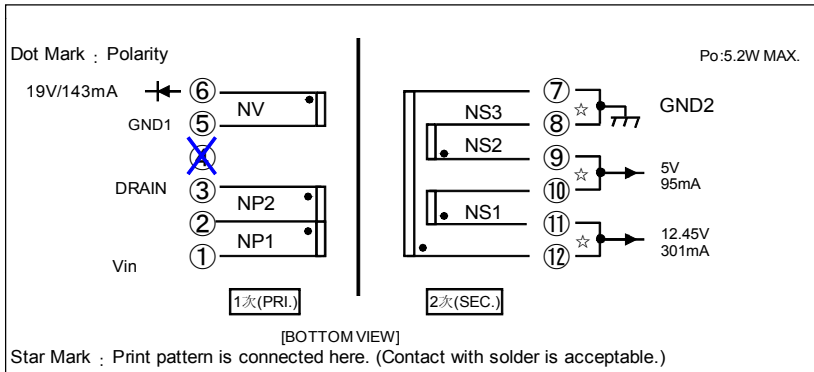
Please read the precautions before using this catalog.

TRANSFORMERS TDK

SPECIFICATIONS / ECO2219SEO-D02V016

Compatible with lead-free solders

■ SCHEMATICS



■ SAFETY STANDARDS

| SAFETY STANDARDS | | |
|-------------------------------------|----------------|-----------------|
| *IEC60335-1 Ed.4 (Basic insulation) | | |
| | Inside of Coil | Outside of Coil |
| PRI. - SEC. | 2.0mm MIN. | 4.0mm MIN. |
| PRI. - CORE | 1.0mm MIN. | 2.0mm MIN. |
| SEC. - CORE | 1.0mm MIN. | 2.0mm MIN. |

■ WINDING SPECIFICATIONS

| No. | Order | Coil | Terminal | Turns | Wire | Note |
|-----|-------|-----------------------|----------|-------|-----------|------------------|
| 0 | 0 | TAPE : CTI \geq 600 | | | | |
| 1 | 1 | N P2 | 2 - 3 | 63 | UEW 0.20 | (NP1+NP2=125Ts.) |
| 2 | 2 | N S1 | 11 - 10 | 16 | UEW 0.28 | Reverse Winding |
| 3 | 3 | N V | 6 - 5 | 40 | UEW 0.20 | Reverse Winding |
| 4 | 4 | N S2 | 9 - 8 | 11 | UEW 0.2x2 | Reverse Winding |
| 5 | 5 | N S3 | 12 - 7 | 27 | UEW 0.18 | Reverse Winding |
| 6 | 6 | N P1 | 1 - 2 | 62 | UEW 0.20 | |
| | | | | | | |
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* Clockwise direction is an order direction when see a transformer from the upper part.

· All specifications are subject to change without notice.
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SPECIFICATIONS / ECO2219SEO-D02V016

Compatible with lead-free solders

■ ELECTRICAL CHARACTERISTICS

| Test Conditions | | Temperature | : | 25±10°C | | |
|-----------------|--|--|--|--|---|--|
| | | Relative Humidity | : | 25~75%RH | | |
| No | Parameter | Test Terminal | Specification | Conditions | Test Instruments | |
| 4.1 | Inductance | 3--1 | 3.22mH ±10% | 10 kHz 1Vrms | LCR Meter Agilent : 4263B or Equivalent | |
| 4.2 | Leakage Inductance | 3--1 (5,6,7,8,9,10, 11,12 short) | 77uH MAX. | 10kHz 1Vrms | | |
| 4.3 | DC. Resistance | 3 - 2 | 1.24 Ω ±20% | | Milli ohm meter ADEX : AX-114 or Equivalent | |
| | | 11 - 10 | 0.192 Ω ±25% | | | |
| | | 6 - 5 | 0.958 Ω ±25% | | | |
| | | 9 - 8 | 147 mΩ ±30% | | | |
| | | 12 - 7 | 0.895 Ω ±25% | | | |
| | | 2 - 1 | 1.80 Ω ±20% | | | |
| 4.4 | Insulation Resistance | P - S | 100 MΩ MIN. | DC 500V | Meg Ohm Meter Toa : SM-5E or Equivalent | |
| | | P,S - CORE | | | | |
| 4.5 | Withstanding Voltage | P - S | Without Breakdown Sense:1mA f=50or60Hz | AC 1.25kVrms 1min or AC 1.5kVrms 1s | Puncture Tester Kikusui : TOS8650 or Equivalent | |
| | | P - CORE S - CORE | | AC 0.65kVrms 1min or AC 0.8kVrms 1s | | |
| 4.6 | Impulse Test | 3--1 | Without Breakdown | Pulse 0.8kVo-p 3--5 Pulse | Impulse Tester ECG : DWS-05 or Equivalent | |
| 4.7 | Polarity & Turns Ratio X-X/ 3--1 | | | f=10kHz | Ratio Meter Ryowa : TRM-101A or Equivalent | |
| | | 11 - 10 | (0.1265) ± 5.0% | | | |
| | | 6 - 5 | (0.3198) ± 3.00% | | | |
| | | 9 - 8 | (0.0881) ± 7.00% | | | |
| | | 12 - 7 | (0.2175) ± 3.50% | | | |

SPECIFICATIONS / ECO2219SEO-D02V016

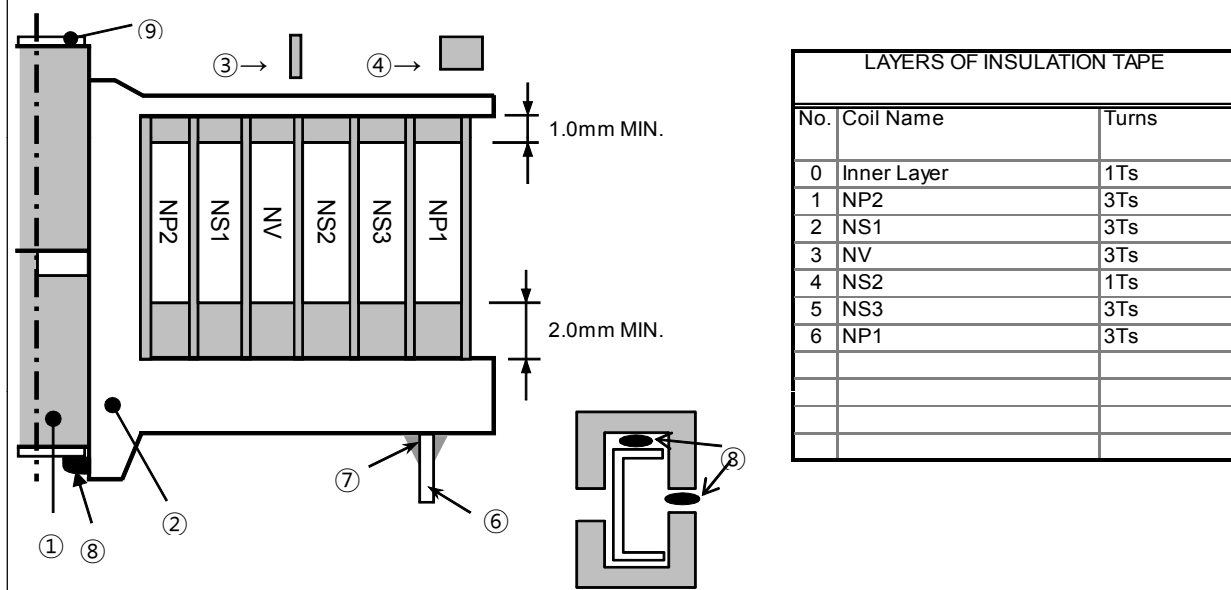
Compatible with lead-free solders

MATERIAL LIST AND INSULATING CONSTRUCTION

| No | ITEM & MATERIAL | MIN.THICKNESS OF 1 LAYER | UL T.I (°C) | MANUFACTURER | UL FILE NO. | |
|----|--|--|----------------|---|---|--------------|
| ① | CORE Ferrite | — | — | TDK-EPC Corporation | — | |
| ② | BOBBIN Phenol Resin | PM-9820 T375J | 0.65 mm | 150 94V-0 | SUMITOMO BAKELITE CO.,LTD. | E41429 |
| | | | | | CHANG CHUN PLASTICS CO.,LTD | E59481 |
| ③ | INSULATION TAPE Polyester or PET Color : Yellow CTI \geq 600V | 1318-1 | 0.039 mm | 130 | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | E17385 |
| | | CT with suffixes | | | JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD | E165111 |
| ④ | FIXING TAPE FOR WIRE (Barrier Tape) Polyester or PET CTI \geq 600V | 44D-A or 44T-A WF with suffixes | — | 130 | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | E17385 |
| | | | | | JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD | E165111 |
| ⑤ | WINDING WIRE (Primary) Polyurethane Enameled Copper Wire 0.20 mm DIA : NP1, NP2, NV | — | 130 | PROSPERITY ELECTRIC WIRE & CABLE CO. | E196072 | |
| | | | | HANGZHOU WEIFENG ELECTRONIC CO.,LTD. | E229341 | |
| | | | | TAI ELECTRIC WIRE&CABLE CO LTD | E85640 | |
| | | | | ZHUHAI WEIHAN WIRE CO LTD | E339217 | |
| | | | | SHENZHEN FUJI FINE FACTORY | E303260 | |
| | | | | HITACHI CABLE (JOHOR) SDN BHD | E215594 | |
| | WINDING WIRE (Secondary) Polyurethane Enameled Copper Wire 0.18 mm DIA : NS3 0.20 mm DIA x2 : NS2 0.28 mm DIA : NS1 | | | THAI HITACHI ENAMEL WIRE CO LTD | E137472 | |
| | | | | ELEKTRISOLA (MALAYSIA) SDN BHD | E143312 | |
| | | | | | | |
| | | | | | | |
| ⑥ | TERMINAL PIN Φ 0.8 (Soldered) Copper Clad Steel Wire Under Coating(Copper)25% Weight Ratio. (Ref)Surface Plating(Sn100%)3 μ m or More. | — | — | Optional | — | |
| ⑦ | SOLDER (For junction of a wire and a terminal) Lead-Free | — | — | Optional | — | |
| ⑧ | ADHESIVE Acrylic , Silicone , Urethane or Epoxy | — | — | Optional | — | |
| ⑨ | FIXING TAPE FOR CORE Polyester or PET Color : Yellow | Same as No.③ | 0.039 mm | 130 | Same as No.③ | Same as No.③ |

※ 1. Tape Min. Thickness shows the total value. (Tape Base and Adhesive)

※ 2. Insulation Tape shall be able to withstand for 1 minute of 3000 Volts (r.m.s) Potential with 2 layers.

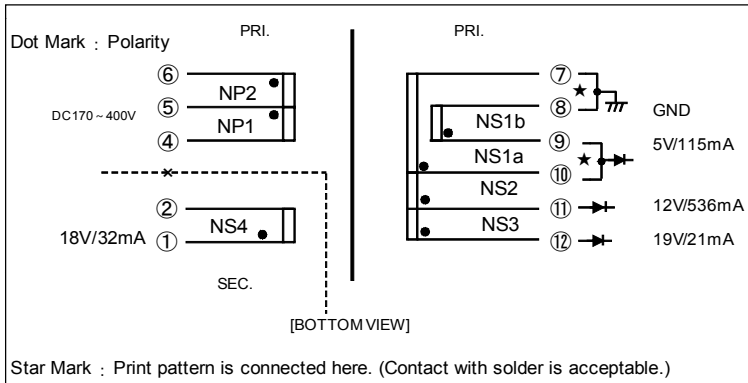


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SPECIFICATIONS / ECO2219SEO-D03V017

Compatible with lead-free solders

SCHEMATICS

SAFETY STANDARDS

| SAFETY STANDARDS | | |
|---|----------------|-----------------|
| *Electrical Appliance and Material Safety Act | | |
| | Inside of Coil | Outside of Coil |
| PRI. - SEC. | 4.0mm MIN. | 4.0mm MIN. |
| PRI. - CORE | 2.0mm MIN. | 2.0mm MIN. |
| SEC. - CORE | 2.0mm MIN. | 2.0mm MIN. |

WINDING SPECIFICATIONS

| No. | Order | Coil | Terminal | Turns | Wire | Note |
|-----|-------|-------|----------|-------|------------|------------------------------|
| 1 | 1 | N P1 | 5 - 4 | 40 | UEW 0.18 | Reverse winding NP1+NP2=75ts |
| 2 | 2 | N S1a | 7 - 10 | 7 | UEW 0.25×2 | |
| 3 | 3 | N S3 | 12 - 11 | 10 | UEW 0.23 | Reverse winding |
| 4 | 4 | N S2 | 11 - 10 | 10 | UEW 0.23 | Reverse winding |
| 5 | 5 | N S4 | 1 - 2 | 24 | TEX 0.20 | Reverse winding |
| 6 | 6 | N S1b | 9 - 8 | 7 | UEW 0.25×2 | Reverse winding |
| 7 | 7 | N P2 | 6 - 5 | 35 | UEW 0.18 | Reverse winding |
| | | | | | | |
| | | | | | | |
| | | | | | | |

* Clockwise direction is an order direction when see a transformer from the upper part.

SPECIFICATIONS / ECO2219SEO-D03V017

Compatible with lead-free solders

■ ELECTRICAL CHARACTERISTICS

| Test Conditions | | Temperature | : | 25±10°C | | |
|-----------------|---|------------------------|--|---------------------------------------|---|--|
| | | Relative Humidity | : | 25~75%RH | | |
| No | Parameter | Test Terminal | Specification | Conditions | Test Instruments | |
| 4.1 | Inductance | 6 - 4 | 1.77mH ±15% | 10 kHz 1Vrms | LCR Meter Agilent : 4263B or Equivalent | |
| 4.2 | Leakage Inductance | 6 - 4 (7--12 short) | 40 µH MAX. | 10 kHz 1Vrms | | |
| 4.3 | DC. Resistance | 6 - 5 | 1.315Ω ±15% | | Milli ohm meter ADEX : AX-114 or Equivalent | |
| | | 7 - 10 | 49.2mΩ ±30% | | | |
| | | 12 - 11 | 0.177Ω ±20% | | | |
| | | 11 - 10 | 0.176Ω ±20% | | | |
| | | 1 - 2 | 0.567Ω ±20% | | | |
| | | 9 - 8 | 63.5mΩ ±30% | | | |
| 5 - 4 | 0.931Ω ±20% | | | | | |
| 4.4 | Insulation Resistance | PRI.-SEC. | 100 MΩ MIN. | DC 500V | Meg Ohm Meter Toa : SM-5E or Equivalent | |
| | | PRI.,SEC. -CORE | | | | |
| 4.5 | Withstanding Voltage | PRI.-SEC. | Without Breakdown Sense:1mA f=50or60Hz | AC 2.0kVrms 1min or AC 2.4kVrms 1s | Puncture Tester Kikusui : TOS8650 or Equivalent | |
| | | PRI.-CORE SEC.-CORE | | AC 1.0kVrms 1min or AC 1.2kVrms 1s | | |
| | | | | | | |
| 4.6 | Impulse Test | 6 - 4 | Without Breakdown | Pulse 0.8kVo-p 3--5 Pulse | Impulse Tester ECG : DWS-05 or Equivalent | |
| 4.7 | Polarity & Turns Ratio X-X/ 6 - 4 | 10 - 7 | (0.0917) ± 12.0%. | f=10kHz | Ratio Meter Ryowa : TRM-101A or Equivalent | |
| | | 12 - 11 | (0.1300) ± 8.0%. | | | |
| | | 11 - 10 | (0.1333) ± 8.0%. | | | |
| | | 1 - 2 | (0.3187) ± 3.3% | | | |
| | | 9 - 8 | (0.0932) ± 12.0%. | | | |
| | | | | | | |

SPECIFICATIONS / ECO2219SEO-D03V017

Compatible with lead-free solders

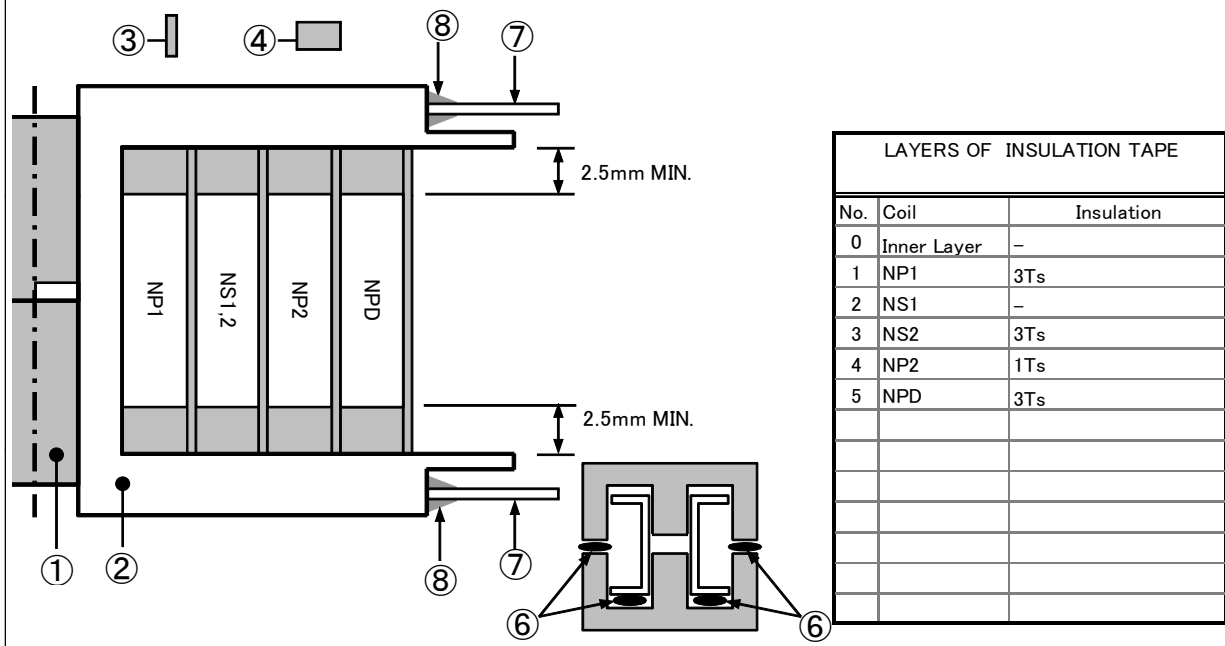
MATERIAL LIST AND INSULATING CONSTRUCTION

| No. | ITEM & MATERIAL | MIN.THICKNESS OF LAYER | UL T.I (°C) | MANUFACTURER | UL FILE NO. |
|-----|--|--------------------------|--------------|--|-------------|
| ① | CORE Ferrite 20.9mm x20.6mm x7.7mm | — | — | TDK-EPC Corporation | — |
| ② | BOBBIN Phenol Resin PM-9820 | 0.65 mm MIN. | 150 94V-0 | SUMITOMO BAKELITE CO.,LTD. | E41429 |
| ③ | INSULATION TAPE Polyester Color : WHITE | 1350F-1 | 130 FR | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | E17385 |
| | | 630F#25 | | TERAOKA SEISAKUSHO CO.,LTD. | E56086 |
| ④ | FIXING TAPE FOR WIRE (Barrier Tape) Polyester | 673F 0.5 or 673F 0.27 | 130 FR | TERAOKA SEISAKUSHO CO.,LTD. | E56086 |
| | | WF with suffixes | | JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD | E165111 |
| ⑤ | WINDING WIRE Polyurethane Enameled Copper Wire 0.26 mm DIAx1 : NP1,NP2 0.14 mm DIAx1 : NPD 0.40 mm DIAx1 : NS1,NS2 | UEW | 130 | PROSPERITY ELECTRIC WIRE & CABLE CO. | E196072 |
| | | UEW | | XIAMEN HUNG'S ENTERPRISE CO.,LTD. | E219154 |
| | | UEW or QA/130 | | HANGZHOU WEIFENG ELECTRONIC CO.,LTD. | E229341 |
| | | xxUEW-LZ@ | | SHENZHEN FUJI FINE FACTORY | E303260 |
| ⑥ | ADHESIVE Urethane | 7247 3851 | | HENKEL LOCTITE(CHINA) CO.,LTD | |
| ⑦ | TERMINAL PIN Copper Clad Steel Wire Φ0.8(Soldered) Under Coating(Copper)25% Weight Ratio. (Ref)Surface Plating(Sn100%)3 μm or More. | | | WELL FORE SPECIAL WIRE CORPORATION HALO COSMOS CORPORATION JIANG MEN IL KWANG METAL CO.,LTD. | |
| ⑧ | SOLDER (For junction of a wire and a terminal) Lead-Free Sn-Ag-Cu | | | SENJU METAL INDUSTRY CO.,LTD. | |

※ 1. Tape Min. Thickness shows the total value. (Tape Base and Adhesive)

※ 2. Insulation Tape shall be able to withstand for 1 minute of 3000 Volts (r.m.s) Potential with 2 layers.

☆BOBBIN UL94: 94V-0 ,CTI(IEC112): 175~250V (UL Level 3)

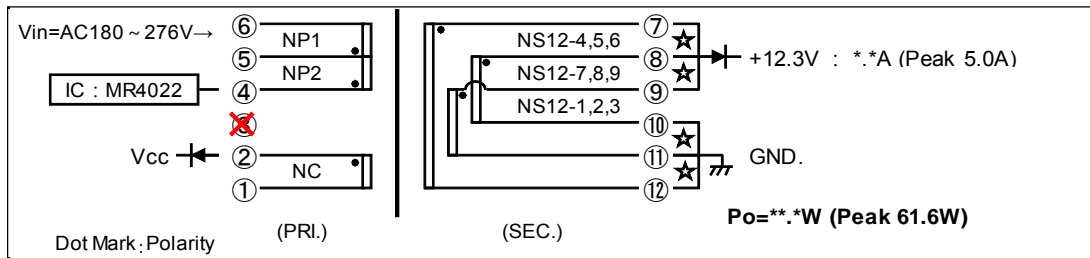


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SPECIFICATIONS / ECO2225SEO-D02V0112

Compatible with lead-free solders

■ SCHEMATICS

■ SAFETY STANDARDS

| |
|--|
| Safety Standard IEC60065-Ed.7 |
| Spacings (Pri.-Sec.) 6.4 mm MIN. |

■ WINDING SPECIFICATIONS

| No. | COIL | TERMINAL | WIRE | TURNS | WINDING METHOD | |
|-----|---------|----------|--------------|----------|-----------------|--------------------------|
| 1 | N S12-1 | 9 - 11 | 1 UEW φ 0.26 | 7 | Normal Winding | Solenoid |
| 2 | N S12-2 | 11 - 9 | 1 UEW φ 0.26 | 7 | Reverse Winding | NS12-1 Solenoid |
| 3 | N S12-3 | 9 - 11 | 1 UEW φ 0.26 | 7 | Normal Winding | NS12-2 Spacing |
| 4 | N P2 | 4 - 5 | 1 UEW φ 0.23 | 67 | Normal Winding | 1,2 Solenoid + 3 Spacing |
| 5 | N S12-4 | 7 - 12 | 1 UEW φ 0.26 | 7 | Normal Winding | Solenoid |
| 6 | N S12-5 | 12 - 7 | 1 UEW φ 0.26 | 7 | Reverse Winding | NS12-4 Solenoid |
| 7 | N S12-6 | 7 - 12 | 1 UEW φ 0.26 | 7 | Normal Winding | NS12-5 Spacing |
| 8 | N P1 | 5 - 6 | 1 UEW φ 0.26 | 42 | Normal Winding | Solenoid(1.9) |
| 9 | N S12-7 | 8 - 10 | 1 UEW φ 0.26 | 7 | Normal Winding | Solenoid |
| 10 | N S12-8 | 10 - 8 | 1 UEW φ 0.26 | 7 | Reverse Winding | NS12-7 Solenoid |
| 11 | N S12-9 | 8 - 10 | 1 UEW φ 0.26 | 7 | Normal Winding | NS12-8 Spacing |
| 12 | N C | 2 - 1 | 1 UEW φ 0.23 | 9 | Normal Winding | Solenoid |
| | | | | Np1+Np2= | 109 | Ts. |

SPECIFICATIONS / ECO2225SEO-D02V0112

Compatible with lead-free solders

■ ELECTRICAL CHARACTERISTICS

| Item | Test Condition | Terminal | Spec | Test Instruments |
|------------------------|----------------|-------------------------|-----------------------|--|
| Inductance | 10 kHz | 4-6 | 1.33 mH ± 7%. | LCR METER 4284A V=1Vrms or Equiv. |
| | 10 kHz | 4-6 | 1.33 mH ± 10%. | |
| Leakage Inductance | 100 kHz | 4-6 (SEC.ALL SHORT) | μH Max. (STD.= μH) | |
| | 100 kHz | 4-6 (SEC.ALL SHORT) | 31.0 μH Max. | |
| | 100 kHz | 2-1 (SEC.ALL SHORT) | μH Max. (STD.= μH) | |
| | 100 kHz | 2-1 (SEC.ALL SHORT) | 1.3 μH Max. | |
| Insulation Resistance | DC 500 V | P---S | 100 MΩ Min. | TOA SM-5E or SM-23GM or Equiv. |
| | | P,S---CORE | | |
| Withstand Voltage | AC 4.0 kVrms | 2,4-7,8,9 | 2 sec. (ARC=5.5mA) | PT METER (f=50/60Hz) KIKUSUI TOS8650 SENSE : 1mA or Equiv. |
| | AC 1.8 kVrms | 2,4,7,8,9-CORE | 1 sec. Min.. | |
| | AC 0.6 Vrms | 2-4 | During 1minute | |
| | AC 3.0 kVrms | P---S | | |
| | AC 1.5 kVrms | P,S---CORE | | |
| Impulse Test | | 4-6 | Pulse 0.8kVo-p | IMPULSE TESTER ECG : DWS-05 or Equiv. |
| RDC | | 4-6 | 1.76 Ω ± 20%. | Milli ohm meter ADEX : AX-114 or Equiv. |
| | | 2-1 | 0.22 Ω ± 20%. | |
| | | 9-11 | 29.0 mΩ ± 30%. | |
| | | 8-10 | 42.4 mΩ ± 30%. | |
| | | 7-12 | 35.9 mΩ ± 30%. | |
| Polarity & Turns Ratio | INPUT: 4-6 | 2-1 | (0.0814) ± 5.6% | TURN RATIO METER TRD-101A or TRD-08/09 or Equiv. |
| | | 9-11 | (0.0609) ± 7.1% | |
| | | 8-10 | (0.0642) ± 7.1% | |
| | | 7-12 | (0.0635) ± 7.1% | |
| | | 5-6 | (0.3912) ± 1.2% | |
| | INPUT: 4-6 | 2-1 | (0.0814) ± 8.9% | TURN RATIO METER IKEDEN 3050HT or Equiv. |
| | | 9-11 | (0.0609) ± 11% | |
| | | 8-10 | (0.0642) ± 11% | |
| | | 7-12 | (0.0635) ± 11% | |
| | | | | |

SPECIFICATIONS / ECO2225SEO-D02V0112

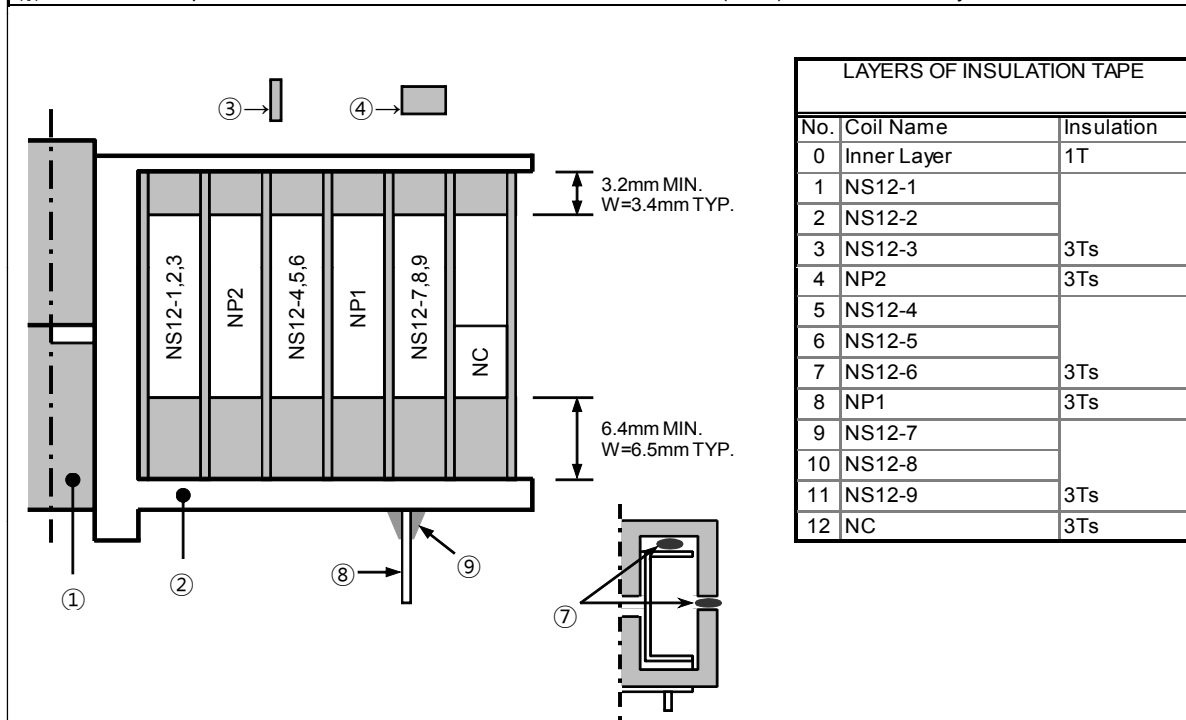
Compatible with lead-free solders

MATERIAL LIST AND INSULATING CONSTRUCTION

| No | ITEM & MATERIAL | MIN.THICKNESS OF LAYER | UL T.I (°C) | MANUFACTURER | UL FILE NO. |
|----|--|---|--------------|--|-------------------------------|
| ① | CORE Ferrite 23.2mmx25.0mmx9.2mm | — | — | TDK Corporation | — |
| ② | BOBBIN Phenol Resin | PM-9820 0.65 mm MIN. | 150 94V-0 | SUMITOMO BAKELITE CO.,LTD. | E41429 |
| ③ | INSULATION TAPE Polyester | 1318-1 or 1350F-1 0.05 mm | 130 FR | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | E17385 |
| ④ | FIXING TAPE FOR WIRE (Barrier Tape) Polyester | 44D-A or 44T-A 343BN@@ WF with suffixes | 130 FR | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) NITTO DENKO CORP. JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD | E17385 E34833 E165111 |
| ⑤ | WINDING WIRE Polyurethane Enameled Copper Wire 0.26 mm DIA : NP1 0.23 mm DIA : NP2, NC | — | 130 | PROSPERITY ELECTRIC WIRE & CABLE CO. XIAMEN HUNG'S ENTERPRISE CO.,LTD. HANGZHOU WEIFENG ELECTRONIC CO.,LTD. | E196072 E219154 E229341 |
| ⑥ | WINDING WIRE Polyurethane Enameled Copper Wire 0.26 mm DIA : NS12-1,2,3,4,5,6,7,8,9 | — | — | XIAMEN ZHI CHENG ELECTRON CO.,LTD | E218438 |
| ⑦ | ADHESIVE Acrylic , Urethane or Epoxy | — | — | Optional | — |
| ⑧ | TERMINAL PIN Copper Clad Steel WireΦ0.8(Soldered) Under Coating(Copper)25% Weight Ratio. (Ref)Surface Plating(Sn100%)3μm or More. | — | — | Optional | — |
| ⑨ | SOLDER (For junction of a wire and aterminal) Lead-Free Sn-Ag-Cu | — | — | Optional | — |

※ 1. Tape Min. Thickness shows the total value. (Tape Base and Adhesive)

※ 2. Insulation Tape shall be able to withstand for 1 minute of 3000 Volts (r.m.s) Potential with 2 layers.



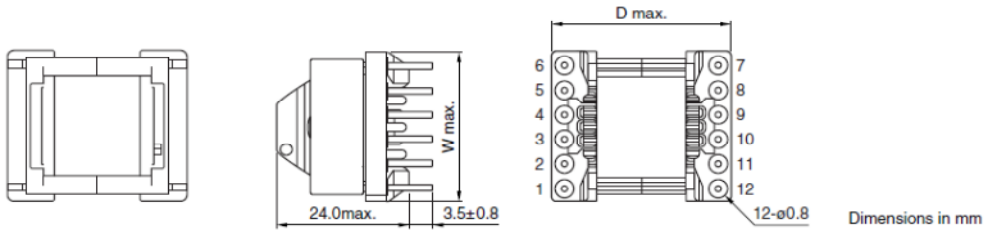
· All specifications are subject to change without notice.

Please read the precautions before using this catalog.

ECO22 Series for Multiple Outputs (Horizontal Type)

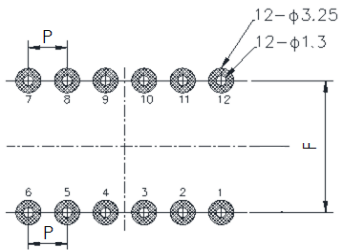
Compatible with lead-free solders

SHAPES AND DIMENSIONS (BOBBIN TYPE: HI, HI I)



| Part No. | Bobbin type | D max. | W max. | P | F |
|----------|-------------|--------|--------|-----|------|
| ECO2219 | HI | 25.0 | 29.0 | 5.0 | 20.0 |
| | HI I | 25.0 | 26.0 | 4.0 | 20.0 |
| ECO2225 | HI | 30.5 | 29.0 | 5.0 | 25.0 |
| | HI I | 30.5 | 26.0 | 4.0 | 25.0 |
| ECO2230 | HI | 35.5 | 29.0 | 5.0 | 30.0 |
| | HI I | 35.5 | 26.0 | 4.0 | 30.0 |

RECOMMENDED BASE MATERIAL OPENING SIZE



Dimensions in mm

Default Tolerance : ±0.1

ITEMS APPLICABLE

| Series | Bobbin Type | Part No. |
|---------|-------------|--------------------|
| ECO2225 | HI I | ECO2225SEO-D01H016 |

· Compatible ferrite materials for this product are the PC47 family.

· Conformity to RoHS Directive: This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted ϕ pir.

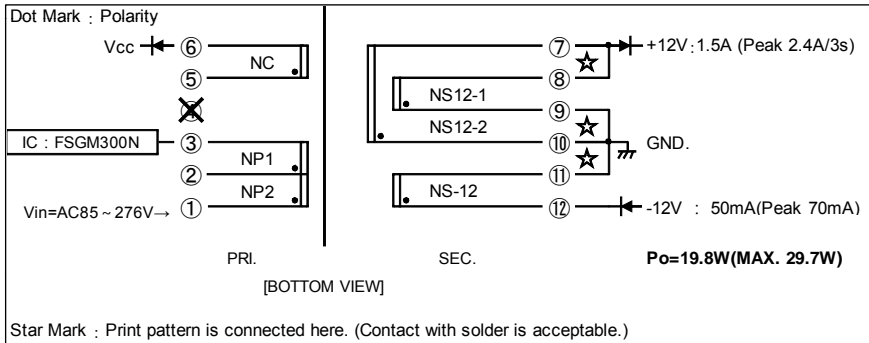
· All specifications are subject to change without notice.

Please read the precautions before using this catalog.

SPECIFICATIONS / ECO2225SEO-D01H016

Compatible with lead-free solders

■ SCHEMATICS



■ SAFETY STANDARDS

| SAFETY STANDARDS | | |
|-------------------------------|----------------|-----------------|
| *UL60065-Ed.7, *IEC60065-Ed.7 | | |
| | Inside of Coil | Outside of Coil |
| Between Pri. and Sec. | 4.8mm MIN. | 8.0mm MIN. |
| Between Pri. and Core | 2.4mm MIN. | 4.0mm MIN. |
| Between Sec. and Core | 2.4mm MIN. | 4.0mm MIN. |

■ WINDING SPECIFICATIONS

| No. | Order | Coil | Terminal | Turns | Wire | Note |
|-----|-------|---------|----------|-------|----------|-----------------|
| 1 | 1 | N P1 | 2 - 3 | 36 | UEW 0.30 | NP1+NP2=57Ts. |
| 2 | 2 | N S12-1 | 9 - 8 | 9 | UEW 0.40 | |
| 3 | 3 | N S-12 | 11 - 12 | 9 | UEW 0.23 | Reverse Winding |
| 4 | 4 | N P2 | 1 - 2 | 21 | UEW 0.30 | |
| 5 | 5 | N S12-2 | 10 - 7 | 9 | UEW 0.40 | |
| 6 | 6 | N PD | 5 - 6 | 13 | UEW 0.23 | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

* Clockwise direction is an order direction when see a No.1 terminal pin side of transformer from the upper part.

SPECIFICATIONS / ECO2225SEO-D01H016

Compatible with lead-free solders

■ ELECTRICAL CHARACTERISTICS

| Test Conditions | | Temperature | : | 25±10°C | | |
|-----------------|---|--------------------------|--|---------------------------------------|---|--|
| | | Relative Humidity | : | 25~75%RH | | |
| No | Parameter | Test Terminal | Specification | Condition _s | Test Instruments | |
| 4.1 | Inductance | 1 - 3 | 567 μH ± 10% | 10 kHz 1Vrms | LCR Meter Agilent : 4263B or Equivalent | |
| 4.2 | Leakage Inductance | 1 - 3 (Sec.All short) | 15.9 μH MAX. | 100 kHz 1Vrms | | |
| 4.3 | DC. Resistance | 1 - 3 | 0.54 Ω ± 20% | | Milli ohm meter ADEX : AX-114 or Equivalent | |
| | | 5 - 6 | 0.29 Ω ± 20% | | | |
| | | 9 - 8 | 52.2 mΩ ± 30% | | | |
| | | 10 - 7 | 62.5 mΩ ± 30% | | | |
| | | 12 - 11 | 166 mΩ ± 20% | | | |
| | | | | | | |
| 4.4 | Insulation Resistance | PRI.-SEC. | 100 MΩ MIN. | DC 500V | Meg Ohm Meter Toa : SM-5E or Equivalent | |
| | | PRI.,SEC. -CORE | | | | |
| 4.5 | Withstanding Voltage | PRI.-SEC. | Without Breakdown Sense:1mA f=50or60Hz | AC 3.0kVrms 1min or AC 3.6kVrms 1s | Puncture Tester Kikusui : TOS8650 or Equivalent | |
| | | PRI.-CORE SEC.-CORE | | AC 1.5kVrms 1min or AC 1.8kVrms 1s | | |
| | | | | | | |
| 4.6 | Impulse Test | 1 - 3 | Without Breakdown | Pulse 0.8kVo-p 3--5 Pulse | Impulse Tester ECG : DWS-05 or Equivalent | |
| 4.7 | Polarity & Turns Ratio X-X/ 1 - 3 | 5 - 6 | (0.2292) ± 6.1% | f=10kHz | Ratio Meter Ryowa : TRM-101A or Equivalent | |
| | | 9 - 8 | (0.1581) ± 8.8% | | | |
| | | 10 - 7 | (0.1596) ± 8.8% | | | |
| | | 12 - 11 | (0.1599) ± 8.8% | | | |
| | | | | | | |

SPECIFICATIONS / ECO2225SEO-D01H016

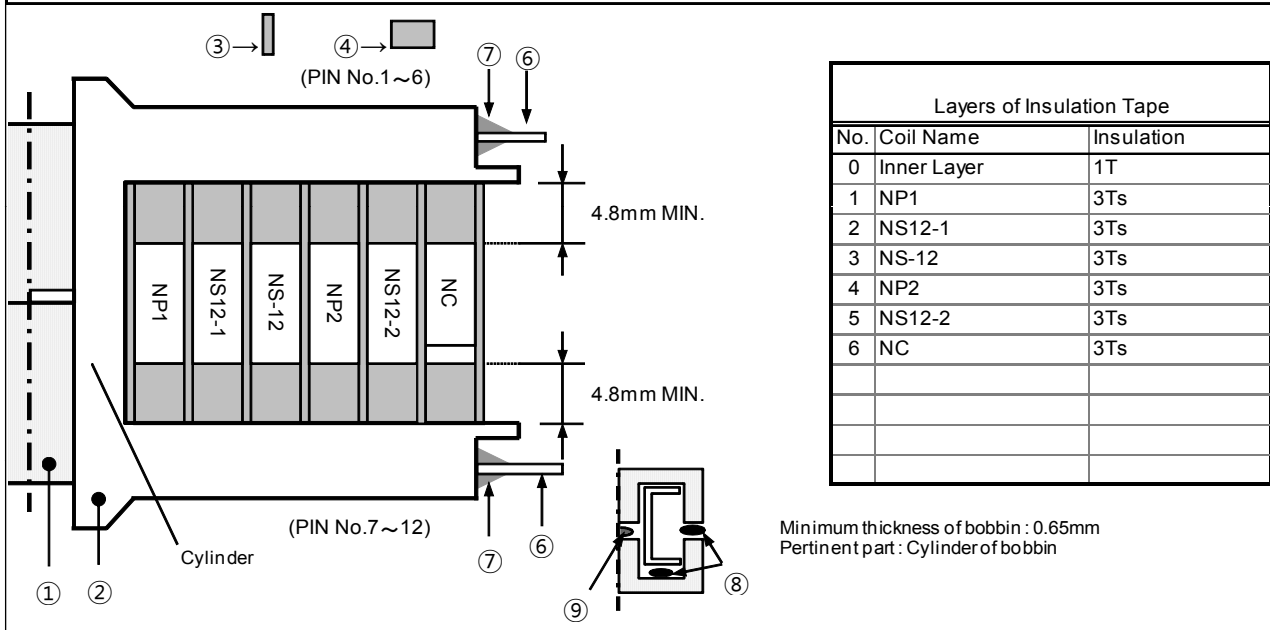
Compatible with lead-free solders

MATERIAL LIST AND INSULATING CONSTRUCTION

| No | ITEM & MATERIAL | MIN.THICKNESS OF 1 LAYER | UL T.I (°C) | MANUFACTURER | UL FILE NO. | |
|----|--|--------------------------|--------------|---|---|---------|
| ① | CORE Ferrite 23.2mm x25.0mm x9.2mm | — | — | TDK-EPC Corporation | — | |
| ② | BOBBIN PM-9820 or PM-9823 | 0.65 mm | 150 94V-0 | SUMITOMO BAKELITE CO.,LTD. | E41429 | |
| | Phenol Resin T375J | | | CHANG CHUN PLASTICS CO.,LTD | E59481 | |
| ③ | INSULATION TAPE Polyester Color : Yellow 【Material group I】 | 0.05 mm | 130 | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | E17385 | |
| | 1318-1 CT with suffixes | | | JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD | E165111 | |
| ④ | FIXING TAPE FOR WIRE (Barrier Tape) 【Material group I】 | — | 130 | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | E17385 | |
| | | | | 44D-A or 44T-A 343BN@@ WF with suffixes | NITTO DENKO CORP. | E34833 |
| | | | | | JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD | E165111 |
| | | | | | | |
| ⑤ | WINDING WIRE (Primary) Polyurethane Enameled Copper Wire 0.30 mm DIA : NP1, NP2 0.23 mm DIA : NC | — | 130 | PROSPERITY ELECTRIC WIRE & CABLE CO. | E196072 | |
| | | | | HANGZHOU WEIFENG ELECTRONIC CO.,LTD. | E229341 | |
| | | | | TAI ELECTRIC WIRE&CABLE CO LTD | E85640 | |
| | | | | ZHUHAI WEIHAN WIRE CO LTD | E339217 | |
| | WINDING WIRE (Secondary) Polyurethane Enameled Copper Wire 0.40 mm DIA : NS12-1,2 0.23 mm DIA : NS-12 | — | 130 | SHENZHEN FUJI FINE FACTORY | E303260 | |
| | | | | HITACHI CABLE (JOHOR) SDN BHD | E215594 | |
| | | | | THAI HITACHI ENAMEL WIRE CO LTD | E137472 | |
| | | | | ELEKTRISOLA (MALAYSIA) SDN BHD | E143312 | |
| ⑥ | TERMINAL PIN $\Phi 0.8$ (Soldered) Copper Clad Steel Wire Under Coating(Copper)25% Weight Ratio. (Ref)Surface Plating(Sn100%)3 μ m or More. | — | — | Optional | — | |
| ⑦ | SOLDER (For junction of a wire and a terminal) Lead-Free Sn-Ag-Cu | — | — | Optional | — | |
| ⑧ | ADHESIVE Acrylic, Urethane or Epoxy | — | — | Optional | — | |
| ⑨ | ADHESIVE Silicon | — | — | Optional | — | |

※ 1. Tape Min. Thickness shows the total value. (Tape Base and Adhesive)

※ 2. Insulation Tape shall be able to withstand for 1 minute of 3000 Volts (r.m.s) Potential with 2 layers.



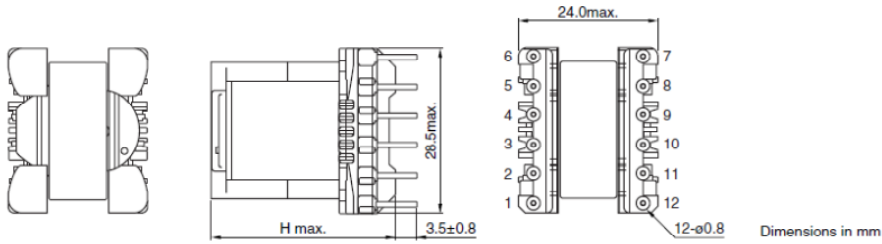
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ECO24 Series for Multiple Outputs (Vertical Type)

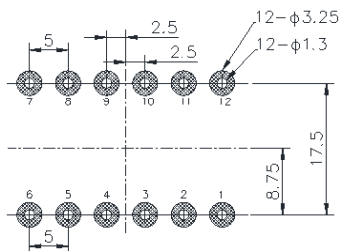
Compatible with lead-free solders

SHAPES AND DIMENSIONS (BOBBIN TYPE: VI)



| Part No. | Bobbin type | H max. |
|----------|-------------|--------|
| ECO2420 | VI | 26.5 |
| ECO2425 | VI | 31.5 |
| ECO2430 | VI | 36.5 |

RECOMMENDED BASE MATERIAL OPENING SIZE



Dimensions in mm

Default Tolerance : ±0.1

ITEMS APPLICABLE

| Series | Bobbin Type | Part No. |
|---------|-------------|--------------------|
| ECO2420 | VI | ECO2420SEO-D01V019 |
| | | ECO2420SEO-D02V019 |
| ECO2425 | | ECO2425SEO-D03V014 |
| | | ECO2425SEO-D02V016 |

· Compatible ferrite materials for this product are the PC47 family.

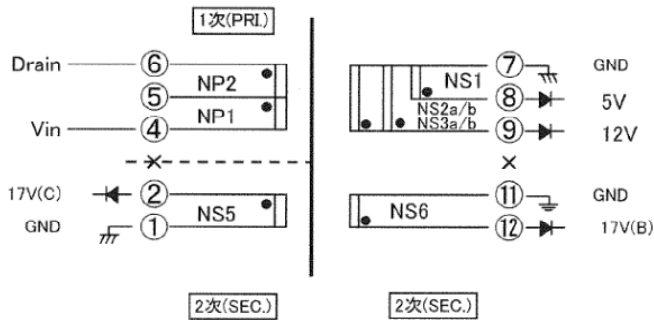
· Conformity to RoHS Directive: This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted ópir.

· All specifications are subject to change without notice.

Please read the precautions before using this catalog.

SPECIFICATIONS / ECO2420SEO-D01V019

Compatible with lead-free solders

SCHEMATICS


[BOTTOM VIEW]

Dot Mark : Polarity

SAFETY STANDARDS

| 安全規格 SAFETY STANDARDS | |
|--|------------|
| 電気用品安全法(基礎絶縁) | |
| 沿面空間距離 Creepage Distance & Air Clearance | |
| 1次PRI. - 2次SEC. | 2.5mm MIN. |
| 1次PRI. - CORE. | 1.3mm MIN. |
| 2次SEC. - CORE. | 1.3mm MIN. |

WINDING SPECIFICATIONS

| No. | 巻順 Order | コイル Coil | 端子 Terminal | 巻数 Turns | 線材 Wire | 備考 Note |
|-----|-------------|-------------|----------------|-------------|--------------|-----------------|
| 1 | 1 | N P1 | 5 - 4 | 84 | UEW 0.20 | NP1+NP2=162ts |
| 2 | 2 | N S1 | 8 - 7 | 4 | UEW 0.26 × 2 | |
| 3 | 3 | N S2a | 9 - 7 | 9 | UEW 0.35 | |
| 4 | 4 | N S2b | 7 - 9 | 9 | UEW 0.35 | Reverse winding |
| 5 | 5 | N S5 | 1 - 2 | 11 | UEW 0.26 × 2 | Reverse winding |
| 6 | 6 | N S6 | 12 - 11 | 11 | UEW 0.26 × 2 | |
| 7 | 7 | N S3a | 9 - 7 | 9 | UEW 0.35 | |
| 8 | 8 | N S3b | 7 - 9 | 9 | UEW 0.35 | Reverse winding |
| 9 | 9 | N P2 | 6 - 5 | 78 | UEW 0.20 | |
| | | | | | | |
| | | | | | | |

* 巻方向はトランスを上部から見て、時計回り方向を順方向とする。

* Clockwise direction is an order direction when see a transformer from the upper part.

SPECIFICATIONS / ECO2420SEO-D01V019

Compatible with lead-free solders

■ ELECTRICAL CHARACTERISTICS

測定条件 (Test Conditions)

温度 (Temperature)

: 25±10°C

湿度 (Relative Humidity)

: 25~75% RH

| No. | 項目 Parameter | 測定端子 Test Terminal | 規格 Specification | 条件 Conditions | 測定器 Test Instruments |
|-----|---|------------------------------------|---|---------------------------------------|---|
| 4.1 | インダクタンス Inductance | 6 - 4 | 4.72mH ± 13% | 10 kHz 1Vrms | LCR Meter Agilent : 4263B or Equivalent |
| 4.2 | リークインダクタンス Leakage Inductance | 6 - 4 (1,2,7,8,9 11,12short) | 124 uH MAX | | |
| 4.3 | 直流抵抗 DC. Resistance | 5 - 4 | 1.888 Ω ± 20% | | Ohm meter ADEX : AX114N or Equivalent |
| | | 8 - 7 | 33.7m Ω ± 30% | | |
| | | 9 - 7 | 22.7m Ω ± 30% | | |
| | | 1 - 2 | 94.7m Ω ± 30% | | |
| | | 12 - 11 | 99.4m Ω ± 30% | | |
| | | 6 - 5 | 2.592 Ω ± 20% | | |
| 4.4 | 絶縁抵抗 Insulation Resistance | PRI-SEC. PRI,SEC. -CORE | 100 M Ω MIN. | DC 500V | Meg Ohm Meter Toa : SM-5E or Equivalent |
| 4.5 | 耐電圧 Withstanding Voltage | PRI-SEC. | 異常なき事 Without Breakdown Sense:2mA f=50or60Hz | AC 2.0kVrms 1min or AC 2.4kVrms 1s | Puncture Tester Kikusui : TOS8650 or Equivalent |
| | | PRI-CORE SEC.-CORE | | AC 1.0kVrms 1min or AC 1.2kVrms 1s | |
| | | | | | |
| 4.6 | インパルステスト Impulse Test | 6 - 4 | 異常なき事 Without Breakdown | PULSE 600Vo-p 1s | Impulse Tester ECG : DWS-05 or Equivalent |
| 4.7 | 極性及び巻数比 Polarity & Turns Ratio X-X/6-4 | 8 - 7 | STD(0.0242) ± 12% | f=10kHz | Ratio Meter Ryowa : TRM-101A or Equivalent |
| | | 9 - 7 | STD(0.0555) ± 8.8% | | |
| | | 2 - 1 | STD(0.0681) ± 7.5% | | |
| | | 12 - 11 | STD(0.0681) ± 7.5% | | |

SPECIFICATIONS / ECO2420SEO-D01V019

Compatible with lead-free solders

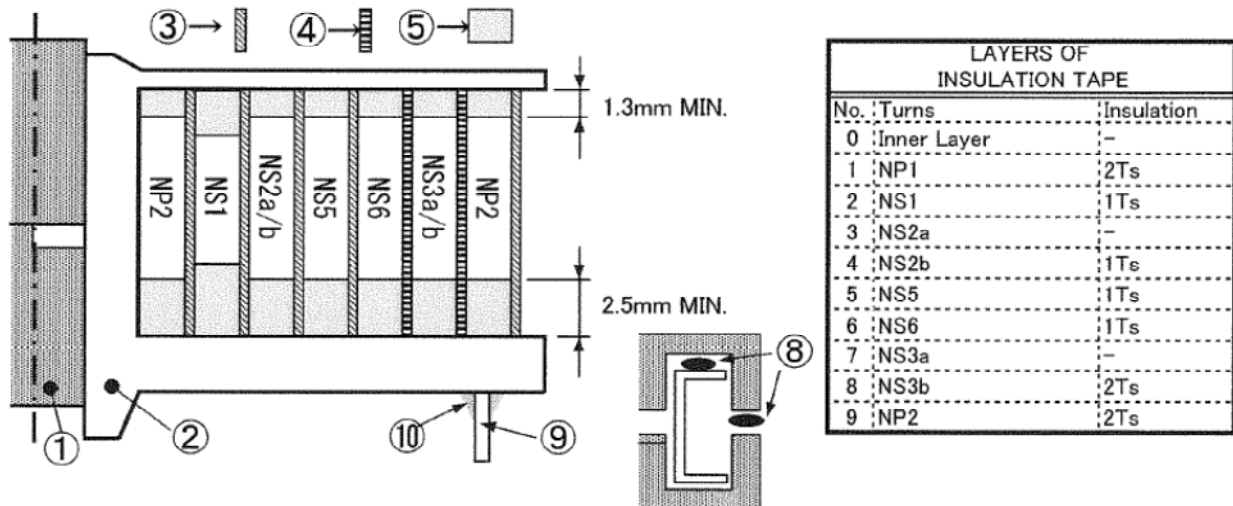
MATERIAL LIST AND INSULATING CONSTRUCTION

| No. | ITEM & MATERIAL | MIN.THICKNESS OF LAYER | UL T.I (°C) | MANUFACTURER | UL FILE No. | |
|-----|--|--|-----------------|--|---|---------|
| ① | CORE Ferrite 25.3mm x20.3mm x11.7mm | — | — | TDK-EPC Corporation | — | |
| ② | BOBBIN Phenol Resin | PM-9820 or T375J | 0.65 mm MIN. | 150 | SUMITOMO BAKELITE CO.,LTD. | E41429 |
| | | | | 94V-0 | CHANG CHUN PLASTICS CO.,LTD. | E59481 |
| ③ | INSULATION TAPE Polyester Color : YELLOW | 1318 -1 or 1350F-1 or CT with suffixes | 0.05 mm | 130 | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | E17385 |
| | | | | | JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD | E165111 |
| ④ | INSULATION TAPE Polyester Color : BLACK | 1318 -2 or 1350F-2 | 0.08 mm | 130 | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | E17385 |
| ⑤ | FIXING TAPE FOR WIRE (Barrier Tape) Polyester | 44-D or 44-T or 343BN@@ or WF with suffixes | — | 130 | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | E17385 |
| | | | | | NITTO DENKO CORP. | E34833 |
| | | | | | JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD | E165111 |
| ⑥ | WINDING WIRE Polyurethane Enameled Copper Wire 0.20 mm DIAx1 : NP1.NP2 | — | 130 | PROSPERITY ELECTRIC WIRE & CABLE CO. | E196072 | |
| ⑦ | WINDING WIRE Polyurethane Enameled Copper Wire 0.26 mm DIAx2 : NS1,NS5,NS6 0.35 mm DIAx1 : NS2a/b,NS3a/b | | | XIAMEN HUNG'S ENTERPRISE CO.,LTD. SHENZHEN FUJI FINE FACTORY | E219154 E303260 | |
| ⑧ | ADHESIVE Acrylic , Urethane or Epoxy | | | Optional | | |
| ⑨ | TERMINAL PIN Copper Clad Steel Wire Φ0.8(Soldered) Under Coating(Copper)25% Weight Ratio. (Ref)Surface Plating(Sn100%)3 μm or More. | | | Optional | | |
| ⑩ | SOLDER (For junction of a wire and aterminal) Lead-Free Sn-Ag-Cu | | | Optional | | |

※ 1. Tape Min. Thickness shows the total value. (Tape Base and Adhesive)

※ 2. Insulation Tape shall be able to withstand for 1 minute of 3000 Volts (r.m.s) Potential with 2 layers.

☆BOBBIN UL94:94V-0 ,CTI(IEC112):175~250V (UL Level 3)

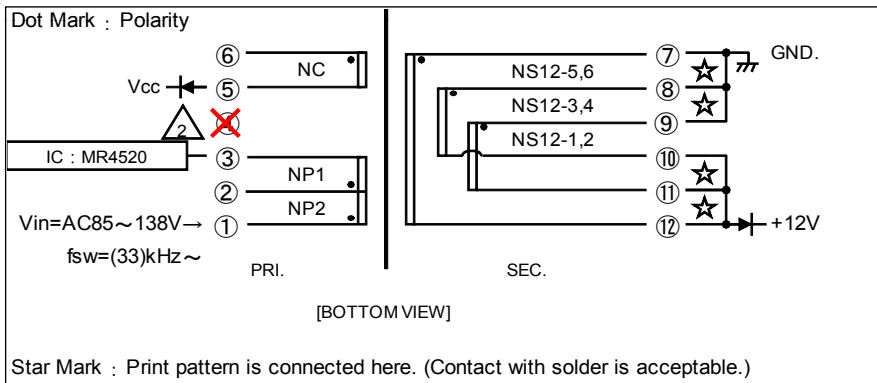


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SPECIFICATIONS / ECO2420SEO-D02V019

Compatible with lead-free solders

SCHEMATICS

SAFETY STANDARDS

| SAFETY STANDARDS | | |
|---------------------------------|----------------|-----------------|
| *UL60065-Ed.7, *CSA 22.2 E60065 | | |
| | Inside of Coil | Outside of Coil |
| PRI. - SEC. | 3.2mm MIN. | 4.0mm MIN. |
| PRI. - CORE | 1.6mm MIN. | 2.0mm MIN. |
| SEC. - CORE | 1.6mm MIN. | 2.0mm MIN. |

WINDING SPECIFICATIONS

| No. | Order | Coil | Terminal | Turns | Wire | Note |
|-----|-------|---------|----------|-------|----------|-----------------|
| 1 | 1-1 | N S12-1 | 9 - 11 | 7 | UEW 0.32 | |
| 2 | 1-2 | N S12-2 | 11 - 9 | 7 | UEW 0.32 | Reverse winding |
| 3 | 2 | N P1 | 2 - 3 | 22 | UEW 0.40 | NP1+NP2=44Ts. |
| 4 | 3-1 | N S12-3 | 8 - 10 | 7 | UEW 0.32 | |
| 5 | 3-2 | N S12-4 | 10 - 8 | 7 | UEW 0.32 | Reverse winding |
| 6 | 4 | N P2 | 1 - 2 | 22 | UEW 0.40 | |
| 7 | 5-1 | N S12-5 | 7 - 12 | 7 | UEW 0.32 | |
| 8 | 5-2 | N S12-6 | 12 - 7 | 7 | UEW 0.32 | Reverse winding |
| 9 | 6 | N C | 5 - 6 | 8 | UEW 0.23 | Reverse winding |

* Clockwise direction is an order direction when see a transformer from the upper part.

SPECIFICATIONS / ECO2420SEO-D02V019

Compatible with lead-free solders

■ ELECTRICAL CHARACTERISTICS

| Test Conditions | | Temperature | : | 25±10°C | | |
|-----------------|---|---------------------------|--|---------------------------------------|---|--|
| | | Relative Humidity | : | 25~75%RH | | |
| No | Parameter | Test Terminal | Specification | Conditions | Test Instruments | |
| 4.1 | Inductance | 1 - 3 | 278μH ± 10% | 10 kHz 1Vrms | LCR Meter Agilent : 4263B or Equivalent | |
| 4.2 | Leakage Inductance | 1 - 3 (Sec. All short) | 8.0 μH MAX. | 100 kHz 1Vrms | | |
| 4.3 | DC. Resistance | 1 - 3 | 0.31 Ω ± ±20% | | Milli ohm meter ADEX : AX-114 or Equivalent | |
| | | 6 - 5 | 0.22 Ω ± ±20% | | | |
| | | 9 - 11 | 34.2 mΩ ± ±30% | | | |
| | | 8 - 10 | 41.3 mΩ ± ±30% | | | |
| | | 7 - 12 | 47.9 mΩ ± ±30% | | | |
| | | | | | | |
| 4.4 | Insulation Resistance | PRI.-SEC. | 100 MΩ MIN. | DC 500V | Meg Ohm Meter Toa : SM-5E or Equivalent | |
| | | PRI.,SEC. -CORE | | | | |
| 4.5 | Withstanding Voltage | PRI.-SEC. | Without Breakdown Sense:1mA f=50or60Hz | AC 3.0kVrms 1min or AC 3.6kVrms 1s | Puncture Tester Kikusui : TOS8650 or Equivalent | |
| | | PRI.-CORE SEC.-CORE | | AC 1.5kVrms 1min or AC 1.8kVrms 1s | | |
| | | | | | | |
| 4.6 | Impulse Test | 1 - 3 | Without Breakdown | Pulse 0.8kVo-p 3--5 Pulse | Impulse Tester ECG ; DWS-05 or Equivalent | |
| 4.7 | Polarity & Turns Ratio X-X/ 1 - 3 | 6 - 5 | (0.1809) ± 10%. | f=10kHz | Ratio Meter Ryowa : TRM-101A or Equivalent | |
| | | 9 - 11 | (0.1491) ± 11%. | | | |
| | | 8 - 10 | (0.1572) ± 11%. | | | |
| | | 7 - 12 | (0.1592) ± 11%. | | | |
| | | | | | | |
| | | | | | | |

SPECIFICATIONS / ECO2420SEO-D02V019

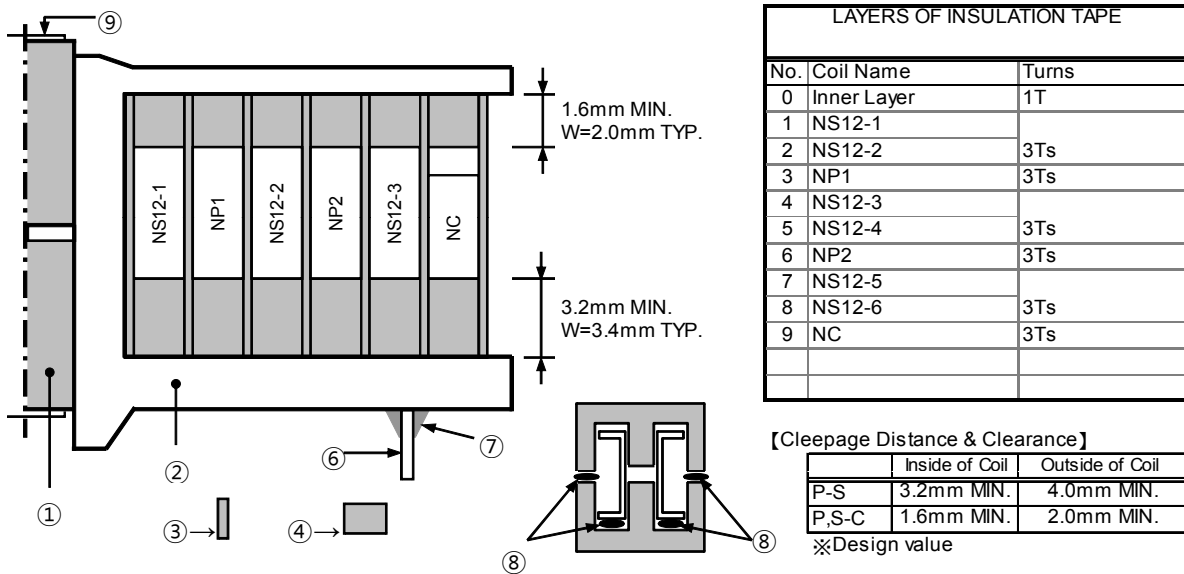
Compatible with lead-free solders

MATERIAL LIST AND INSULATING CONSTRUCTION

| No | ITEM & MATERIAL | MIN.THICKNESS OF 1 LAYER | UL T.I (°C) | MANUFACTURER | UL FILE NO. |
|----|--|---|-------------------------|---|---|
| ① | CORE Ferrite 25.3mmx20.3mmx11.7mm | — | — | TDK-EPC Corporation | — |
| ② | BOBBIN Phenol Resin | PM-9820 T375J | 0.65 mm 150 94V-0 | SUMITOMO BAKELITE CO.,LTD. CHANG CHUN PLASTICS CO.,LTD | E41429 E59481 |
| ③ | INSULATION TAPE Polyester | 1318-1 or 1350F-1 | 0.05 mm 130 | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | E17385 |
| ④ | FIXING TAPE FOR WIRE (Barrier Tape) | 44D-A or 44T-A 343BN@@ WF with suffixes | — 130 | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) NITTO DENKO CORP. JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD | E17385 E34833 E165111 |
| ⑤ | WINDING WIRE (Primary) Polyurethane Enameled Copper Wire 0.40 mm DIA : NP1, NP2 0.23 mm DIA : NC WINDING WIRE (Secondary) Polyurethane Enameled Copper Wire 0.32 mm DIA : NS12-1,2,3,4,5,6 | — | 130 | PROSPERITY ELECTRIC WIRE & CABLE CO. HANGZHOU WEIFENG ELECTRONIC CO.,LTD. TAI ELECTRIC WIRE&CABLE CO LTD ZHUHAI WEIHAN WIRE CO LTD SHENZHEN FUJI FINE FACTORY HITACHI CABLE (JOHOR) SDN BHD THAI HITACHI ENAMEL WIRE CO LTD ELEKTRISOLA (MALAYSIA) SDN BHD | E196072 E229341 E85640 E339217 E303260 E215594 E137472 E143312 |
| ⑥ | TERMINAL PIN $\phi 0.8$ (Soldered) Copper Clad Steel Wire Under Coating(Copper)25% Weight Ratio. (Ref)Surface Plating(Sn100%)3 μ m or More. | — | — | Optional | — |
| ⑦ | SOLDER (For junction of a wire and a terminal) Lead-Free Sn-Ag-Cu | — | — | Optional | — |
| ⑧ | ADHESIVE Acrylic, Urethane or Epoxy | — | — | Optional | — |
| ⑨ | FIXING TAPE FOR CORE Polyester Same as No.③ | 0.05 mm (2~3Layers) | 130 | Same as No.③ | Same as No.③ |

※ 1. Tape Min. Thickness shows the total value. (Tape Base and Adhesive)

※ 2. Insulation Tape shall be able to withstand for 1 minute of 3000 Volts (r.m.s) Potential with 2 layers.

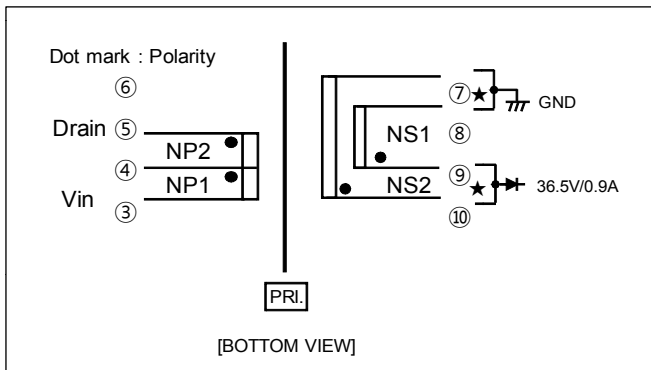


· All specifications are subject to change without notice.

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SPECIFICATIONS / ECO2425SEO-D03V014

Compatible with lead-free solders

■ SCHEMATICS

■ SAFETY STANDARDS

| |
|-----------------------------|
| SAFETY STANDARDS |
| N/A |
| Over Surface & Air Spacings |

■ WINDING SPECIFICATIONS

| No. | order | coil | terminal | turns | wire | note |
|-----|-------|------|----------|-------|----------|---------------|
| 1 | 1 | N P2 | 4 - 3 | 85 | UEW 0.26 | NP1+NP2=167ts |
| 2 | 2 | N S1 | 10 - 8 | 42 | UEW 0.26 | |
| 3 | 3 | N P1 | 3 - 2 | 82 | UEW 0.26 | |
| 4 | 4 | N S2 | 11 - 7 | 42 | UEW 0.26 | |

SPECIFICATIONS / ECO2425SEO-D03V014

Compatible with lead-free solders

■ ELECTRICAL CHARACTERISTICS

| (Test Conditions) | | | | | |
|-------------------|--|-------------------------|------------------------------------|---------------------------------------|---|
| | | (Temperature) | : | 25±10°C | |
| | | (Relative Humidity) | : | 25~75%RH | |
| No | Parameter | Test Terminal | Specification | Condition _s | Test Instruments |
| 4.1 | Inductance | 4 - 2 | 2.80mH ± 10% | 10 kHz 1Vrms | LCR Meter Agilent : 4263B or Equivalent |
| 4.2 | Leakage Inductance | 4 - 2 (NS,short) | 37 uH MAX | | |
| 4.3 | DC. Resistance | 4 - 3 | 1.178Ω ±20% | | Milli ohm meter ADEX : AX-114N or Equivalent |
| | | 3 - 2 | 1.328Ω ±20% | | |
| | | 10 - 8 | 0.597Ω ±20% | | |
| | | 11 - 7 | 0.691Ω ±20% | | |
| | | | | | |
| 4.4 | Insulation Resistance | NP-NS NP,NS -CORE | 100 MΩ MIN. | DC 500V | Meg Ohm Meter Toa : SM-5E or Equivalent |
| 4.5 | Withstanding Voltage | NP-NS | Without Breakdown Sense:1mA | AC 1.5kVrms 1min or AC 1.8kVrms 1s | Puncture Tester Kikusui : TOS8650 or Equivalent |
| | | NP-CORE NS-CORE | | AC 1.0kVrms 1min or AC 1.0kVrms 1s | |
| 4.6 | Impulse Test | 4 - 2 | Without Breakdown | Pulse 600Vo-p 1s | Impulse Tester ECG : DWS-05 or Equivalent |
| 4.7 | Polarity & Turns Ratio X-X / 4 - 2 | 10 - 8 | STD(0.2516) ±2.5% | f=10kHz | Ratio Meter Ryowa : TRM-101A or Equivalent |
| | | 11 - 7 | STD(0.2543) ±2.5% | | |
| | | | | | |
| | | | | | |

SPECIFICATIONS / ECO2425SEO-D03V014

Compatible with lead-free solders

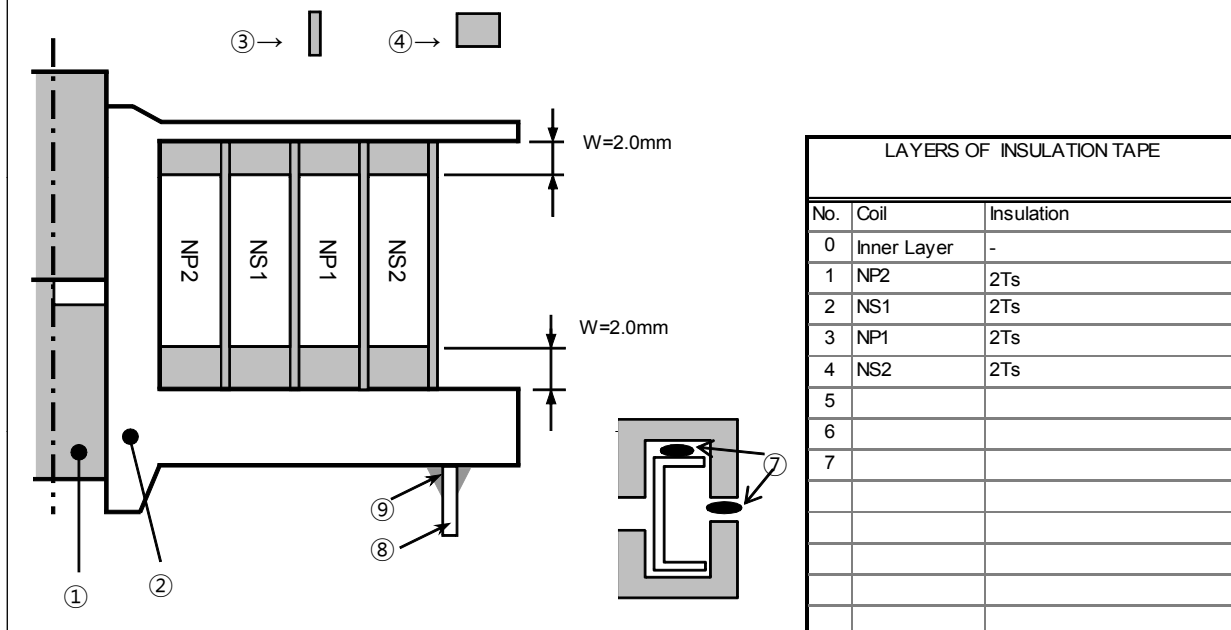
■ MATERIAL LIST AND INSULATING CONSTRUCTION

| No | ITEM & MATERIAL | MIN.THICKNESS OF LAYER | UL T.I (°C) | MANUFACTURER | UL FILE NO. |
|----|--|--|--------------|---|-------------|
| ① | CORE Ferrite 25.3mm x25.3mm x11.7mm | — | — | TDK-EPC Corporation | — |
| ② | BOBBIN Phenol Resin | PM-9820 0.65 mm MIN. | 150 94V-0 | SUMITOMO BAKELITE CO.,LTD. | E41429 |
| ③ | INSULATION TAPE Polyester Color : YELLOW | 1318 or 1350F-1 0.05 mm | 130 | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | E17385 |
| ④ | FIXING TAPE FOR WIRE (Barrier Tape) Polyester | 44D-A or 44T-A or WF with suffixes | 130 | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | E17385 |
| | | | | JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD | E165111 |
| ⑤ | WINDING WIRE Polyurethane Enameled Copper Wire 0.26 mm DIAx1 : NP1, NP2 | — | 130 | PROSPERITY ELECTRIC WIRE & CABLE CO. | E196072 |
| | | | | XIAMEN HUNG'S ENTERPRISE CO.,LTD. | E219154 |
| ⑥ | WINDING WIRE Polyurethane Enameled Copper Wire 0.26 mm DIAx1 : NS1, NS2 | — | 130 | HANGZHOU WEIFENG ELECTRONIC CO.,LTD. | E229341 |
| | | | | | |
| ⑦ | ADHESIVE Acrylic , Urethane or Epoxy | | | Optional | |
| ⑧ | TERMINAL PIN Copper Clad Steel WireΦ0.8(Soldered) Under Coating(Copper)25% Weight Ratio. (Ref)Surface Plating(Sn100%)3μm or More. | | | Optional | |
| ⑨ | SOLDER (For junction of a wire and a terminal) Lead-Free Sn-Ag-Cu | | | Optional | |

※ 1. Tape Min. Thickness shows the total value. (Tape Base and Adhesive)

※ 2. Insulation Tape shall be able to withstand for 1 minute of 3000 Volts (r.m.s) Potential with 2 layers.

☆BOBBIN UL94 : 94V-0 ,CT(IEC112) : 175~250V (UL Level 3)

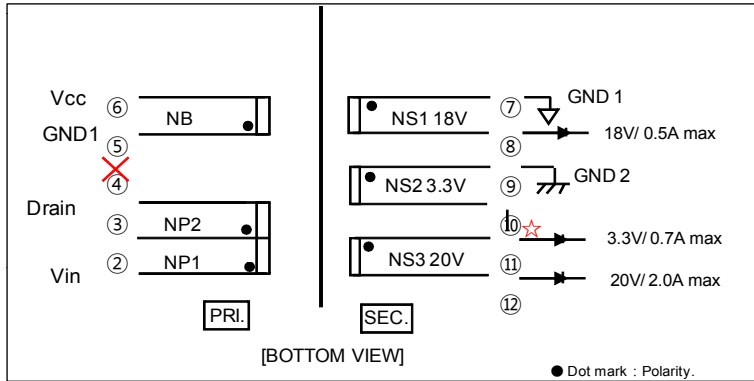


· All specifications are subject to change without notice.
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SPECIFICATIONS / ECO2425SEO-D02V016

Compatible with lead-free solders

SCHEMATICS



SAFETY STANDARDS

| SAFETY STANDARDS | |
|-----------------------------|---------------------------|
| IEC60335-1 Ed.4 | |
| Over Surface & Air Spacings | |
| PRI. - SEC. | 4.0 mm MIN.(inside coil) |
| PRI. - CORE | 4.0 mm MIN.(outside coil) |
| SEC. - CORE | 4.0 mm MIN.(outside coil) |
| REMOVE PIN | PIN No. 4 , 9 |

WINDING SPECIFICATIONS

| No. | order | coil | terminal | turns | wire | WIDING METHOD | note |
|-----|-------|------------|----------|-------|--------------|---------------|--------------|
| 0 | 0 | 600V ≤ CTI | | | | | NP1+NP2=84ts |
| 1 | 1 | N P1 | 1 - 2 | 42 | 2UEW 0.35 | 2Layer sol | |
| 2 | 2 | N S2 | 9 - 10 | 4 | 2UEW 0.4 X 2 | 1Lyer space | 3.3V |
| 3 | 3 | N S3 | 11 - 12 | 16 | 2UEW 0.4 X 2 | 2Layer sol | 20V |
| 4 | 4 | N B | 5 - 6 | 16 | 2UEW 0.25 | 1Layer sol | |
| 5 | 5 | N S1 | 7 - 8 | 18 | 2UEW 0.30 | 1Layer sol | 18V |
| 6 | 6 | N P2 | 2 - 3 | 42 | 2UEW 0.35 | 2Layer sol | |

SPECIFICATIONS / ECO2425SEO-D02V016

Compatible with lead-free solders

■ ELECTRICAL CHARACTERISTICS

| (Test Conditions) | | | | | |
|---------------------|------------------------|---------------------------------|------------------------------------|---------------------------------------|---|
| (Temperature) | | : | 25±10°C | | |
| (Relative Humidity) | | : | 25~75%RH | | |
| No | Parameter | Test Terminal | Specification | Conditions | Test Instruments |
| 4.1 | Inductance | 1 - 3 | 700uH ± 15% | 10 kHz 1Vrms | LCR Meter Agilent : 4263B or Equivalent |
| 4.2 | Leakage Inductance | 1 - 3 (7-12,SEC. short) | 38 uH MAX | | |
| 4.3 | DC. Resistance | 1 - 3 | 0.792Ω ±20% | | ADEX : AX-114N or Equivalent |
| | | 9 - 10 | 0.015Ω ±30% | | |
| | | 11 - 12 | 0.056Ω ±30% | | |
| | | 5 - 6 | 0.300Ω ±20% | | |
| | | 7 - 8 | 0.257Ω ±20% | | |
| 4.4 | Insulation Resistance | PRI.-SEC. PRI.,SEC. -CORE | 100 MΩ MIN. | DC 500V | Meg Ohm Meter Toa : SM-5E or Equivalent |
| 4.5 | Withstanding Voltage | PRI.-SEC. | Without Breakdown Sense:1mA | AC 3.0kVrms 1min or AC 3.6kVrms 1s | Puncture Tester Kikusui : TOS8650 or Equivalent |
| | | PRI.-CORE SEC.-CORE | | AC 1.5kVrms 1min or AC 1.8kVrms 1s | |
| 4.6 | Impulse Test | 1 - 3 | Without Breakdown | Pulse 600Vo-p 3~5 pluse | Impulse Tester ECG : DWS-05 or Equivalent |
| 4.7 | Polarity & Turns Ratio | 1 - 2 | 0.4770Vrms ± 7.0% | f=10kHz | Ratio Meter or Equivalent |
| | | 9 - 10 | 0.0460Vrms ±15.0% | | |
| | | 11 - 12 | 0.1887Vrms ±10.0% | | |
| | | 5 - 6 | 0.1915Vrms ±10.0% | | |
| | | 7 - 8 | 0.2190Vrms ±10.0% | | |
| | | 2 - 3 | 0.5230Vrms ± 7.0% | | |
| 4.8 | Inductance | 1 - 2 | 167.0uH ± 20% | 10 kHz 1Vrms | Agilent : 4263B or Equivalent |
| | | 9 - 10 | 1.64uH ± 25% | | |
| | | 11 - 12 | 26.3uH ± 25% | | |
| | | 5 - 6 | 28.1uH ± 25% | | |
| | | 7 - 8 | 36.0uH ± 25% | | |
| | | 2 - 3 | 200.2uH ± 20% | | |
| | | | | | |

SPECIFICATIONS / ECO2425SEO-D02V016

Compatible with lead-free solders

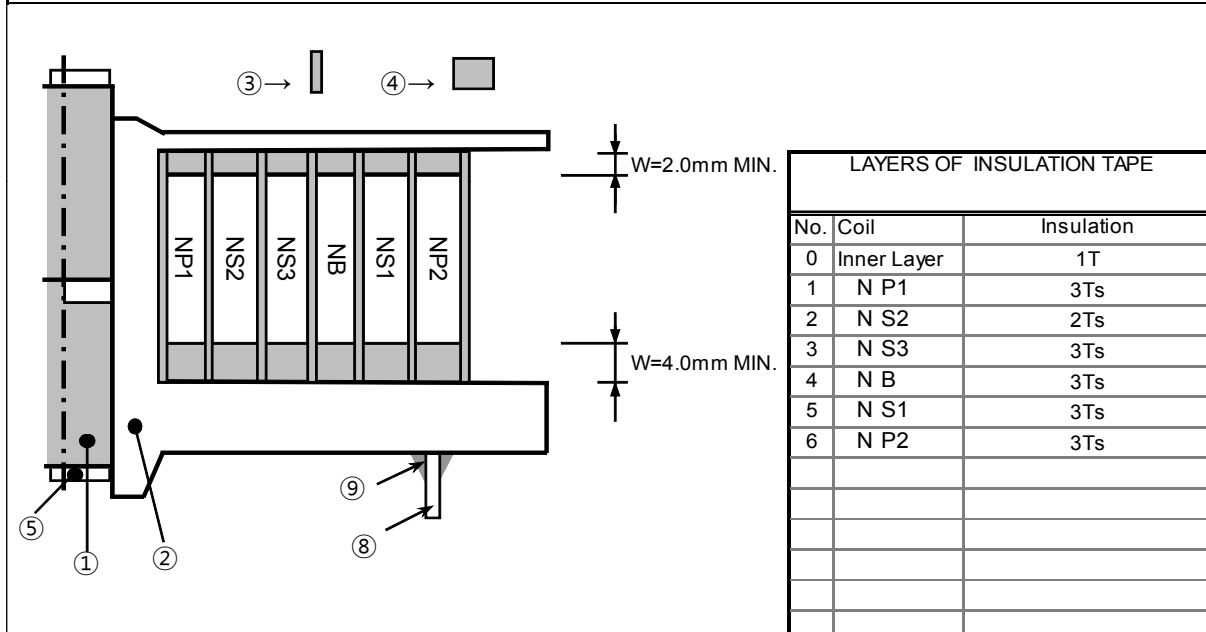
MATERIAL LIST AND INSULATING CONSTRUCTION

| No | ITEM & MATERIAL | MIN.THICKNESS OF LAYER | UL T.I (°C) | MANUFACTURER | UL FILE NO. | |
|----|--|------------------------|-------------|--|--|---------|
| ① | CORE PCB47 ECO2425 | - | - | TDK-EPC Corporation | - | |
| ② | BOBBIN Phenol Resin PM-9820 Phenol Resin T-375J | 0.65 mm MIN. | 150 94V-0 | SUMITOMO BAKELITE CO.,LTD. CHANG CHUN PLASTICS CO.,LTD. | E41429 E59481 | |
| ③ | INSULATION TAPE Polyester Color : YELLOW | CT280 | 0.05 mm | 130 | JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD | E165111 |
| | | 1318-1 | | | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | E17385 |
| ④ | FIXING TAPE FOR WIRE (Barrier Tape) Polyester | 44D-A or | - | 130 | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | E17385 |
| | | WF with suffixes | | | JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD | E165111 |
| ⑤ | FIXING TAPE FOR CORE Polyester Color : YELLOW | CT280 | 0.05 mm | 130 | JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD | E165111 |
| | | 1318-1 | | | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | E17385 |
| ⑥ | WINDING WIRE Polyurethane Enameled Copper Wire | - | 130 | TAI-ELECTRIC WIRE & CABLE CO LTD | E85640 | |
| | | | | PROSPERITY ELECTRIC WIRE & CABLE CO. | E196072 | |
| | | | | XIAMEN HUNG'S ENTERPRISE CO.,LTD. | E219154 | |
| ⑦ | ADHESIVE Varnish TVB2024 | | | KYOCERA CHEMICAL CORPORATION | E83702 | |
| ⑧ | TERMINAL PIN Copper Clad Steel WireΦ0.8(Soldered) Under Coating(Copper)25% Weight Ratio. (Ref)Surface Plating(Sn100%)3μm or More. | | | Optional | | |
| ⑨ | SOLDER (For junction of a wire and aterminal) Lead-Free Sn-Ag-Cu | | | Optional | | |
| ⑩ | MARKING Laser INK BLACK UV400 | | | LA MARK LP-V SERIES T&K TOKA CO., LTD. | | |

※ 1. Tape Min. Thickness shows the total value. (Tape Base and Adhesive)

※ 2. Insulation Tape shall be able to withstand for 1 minute of 3000 Volts (r.m.s) Potential with 2 layers.

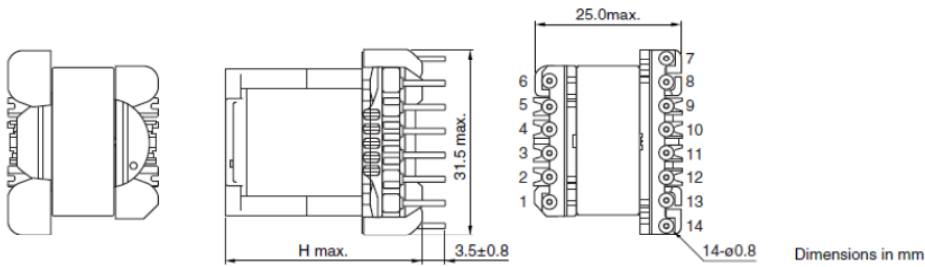
☆BOBBIN UL94 : 94V-0 ,CTI(IEC112): 175~250V (UL Level 3)



ECO24 Series for Multiple Outputs (Vertical Type)

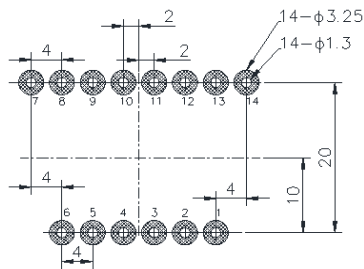
Compatible with lead-free solders

SHAPES AND DIMENSIONS (BOBBIN TYPE: V I I)



| Part No. | Bobbin type | H max. |
|----------|-------------|--------|
| ECO2420 | VII | 26.5 |

RECOMMENDED BASE MATERIAL OPENING SIZE



Dimensions in mm
Default Tolerance : ±0.1

ITEMS APPLICABLE

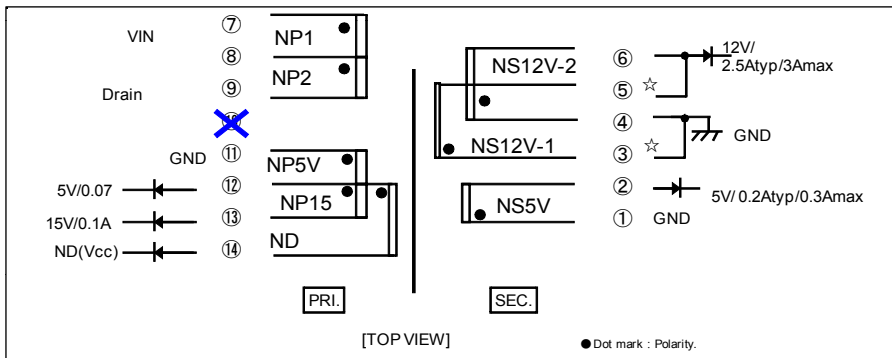
| Series | Bobbin Type | Part No. |
|---------|-------------|---------------------|
| ECO2420 | VII | ECO2420SEO-D03V018 |
| | | ECO2420SEO-D04V0110 |

- Compatible ferrite materials for this product are the PC47 family.
- Conformity to RoHS Directive: This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted ópir.

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SPECIFICATIONS / ECO2420SEO-D03V018

Compatible with lead-free solders

■ SCHEMATICS

■ SAFETY STANDARDS

| SAFETY STANDARDS | |
|-----------------------------|---------------------------|
| IEC60335-1 Ed.4 | |
| Over Surface & Air Spacings | |
| PRI. - SEC. | 4.0 mm MIN.(inside coil) |
| PRI. - CORE | 4.0 mm MIN.(outside coil) |
| SEC. - CORE | 4.0 mm MIN.(outside coil) |
| REMOVE PIN | PIN NO. 10 |

■ WINDING SPECIFICATIONS

| No. | order | coil | terminal | turns | wire | WINDING METHOD | note |
|-----|-------|-----------------|----------|-------|-------------|------------------|------|
| 0 | 0 | 600V \leq CTI | | | | | |
| 1 | 1 | NP1 | 7 - 8 | 27 | 2UEW 0.35 | FIT | |
| 2 | 2 | NS5V | 1 - 2 | 4 | 2UEW 0.2 | SPACE | |
| 3 | 3 | NS12V-1 | 3 - 5 | 7 | 2UEW 0.32*2 | FIT | |
| 4 | 4 | NS12V-2 | 4 - 6 | 7 | 2UEW 0.32*2 | FIT | |
| 5 | 5 | NP2 | 8 - 9 | 27 | 2UEW 0.35 | FIT | |
| 6 | 6 | NP5V | 11 - 12 | 5 | 2UEW 0.2 | FIT | |
| 7 | 6 | NP15V | 12 - 13 | 5 | 2UEW 0.2 | SPACE After No.6 | |
| 8 | 7 | ND | 12 - 14 | 5 | 2UEW 0.2 | SPACE | |

*** BARRIER TAPE & INSULATION TAPE SPECIFICATIONS**

Insulation tape Color : Yellow

| No. | order | coil | terminal | Pin side | Core side | Ts | Insulation tape 12.5mm | | note |
|-----|-------|---------|----------|----------|-----------|-----|------------------------|------|------|
| 0 | 0 | | | - | - | - | t=25u | 1 t | |
| 1 | 1 | NP1 | 7 - 8 | 4.0 | 2.0 | 3ts | t=25u | 4 ts | |
| 2 | 2 | NS5V | 1 - 2 | 4.0 | 2.0 | 1t | t=25u | 1 t | |
| 3 | 3 | NS12V-1 | 3 - 5 | 4.0 | 2.0 | 1ts | t=25u | 1 t | |
| 4 | 4 | NS12V-2 | 4 - 6 | 4.0 | 2.0 | 1ts | t=25u | 4 ts | |
| 5 | 5 | NP2 | 8 - 9 | 4.0 | 2.0 | 3ts | t=25u | 3 ts | |
| 6 | 6 | NP5V | 11 - 12 | 4.0 | 2.0 | 1ts | t=25u | - | |
| 7 | 6 | NP15V | 12 - 13 | - | - | - | t=25u | 1 ts | |
| 8 | 7 | ND | 12 - 14 | 4.0 | 2.0 | 1ts | t=25u | 3 ts | |

· All specifications are subject to change without notice.

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SPECIFICATIONS / ECO2420SEO-D03V018

Compatible with lead-free solders

■ ELECTRICAL CHARACTERISTICS

| (Test Conditions) | | | | | |
|---------------------|--|---------------------------------|------------------------------------|---------------------------------------|--|
| (Temperature) | | : | 25±10°C | | |
| (Relative Humidity) | | : | 25~75%RH | | |
| No | Parameter | Test Terminal | Specification | Conditions | Test Instruments |
| 4.1 | Inductance | 7 - 9 | 750uH ± 15% | 1 kHz 1Vrms | LCR Meter Agilent : 4263B or Equivalent |
| | | | 750uH ± 15% | 100 kHz 1Vrms | |
| | | | 750uH ± 15% | 200 kHz 1Vrms | |
| 4.2 | Leakage Inductance | 7 - 9 (1,2,3,4,5,6 short) | 22uH MAX | 100 kHz 1Vrms | |
| 4.3 | DC. Resistance | 7 - 9 | 0.473 Ω ± 20% | | Milli ohm meter ADEX : AX-114N or Equivalent 10kHz/1V |
| | | 7 - 8 | 0.200 Ω ± 20% | | |
| | | 1 - 2 | 0.117 Ω ± 25% | | |
| | | 3 - 5 | 0.037 Ω ± 30% | | |
| | | 4 - 6 | 0.041 Ω ± 30% | | |
| | | 8 - 9 | 0.265 Ω ± 20% | | |
| | | 11 - 12 | 0.178 Ω ± 25% | | |
| | | 12 - 13 | 0.181 Ω ± 25% | | |
| 12 - 14 | 0.187 Ω ± 25% | | | | |
| 4.4 | Insulation Resistance | PRI.-SEC. PRI.,SEC. -CORE | 100 MΩ MIN. | DC 500V | Meg Ohm Meter Toa : SM-5E or Equivalent |
| 4.5 | Withstanding Voltage | PRI.-SEC. | Without Breakdown Sense:1mA | AC 3.0kVrms 1min or AC 3.6kVrms 1s | Puncture Tester Kikusui : TOS8650 or Equivalent |
| | | PRI.-CORE SEC.-CORE | | AC 1.5kVrms 1min or AC 1.8kVrms 1s | |
| 4.6 | Impulse Test | 7 - 9 | Without Breakdown | Pulse 800Vo-p 1s | Impulse Tester ECG : DWS-05 or Equivalent |
| 4.7 | Polarity & Turns Ratio X-X / 7 - 9 | 1 - 2 | 0.0731Vrms ± 14.0% | f=10kHz | Ratio Meter Ryowa : TRM-101A |
| | | 3 - 5 | 0.1286Vrms ± 12.0% | | |
| | | 4 - 6 | 0.1296Vrms ± 12.0% | | |
| | | 11 - 12 | 0.0920Vrms ± 14.0% | | |
| | | 12 - 13 | 0.0933Vrms ± 12.0% | | |
| 12 - 14 | 0.0928Vrms ± 12.0% | | | | |
| 4.8 | Inductance | 7 - 8 | 186.5uH ± 25% | 1 kHz 1Vrms | LCR Meter Agilent : 4263B or Equivalent |
| | | 1 - 2 | 4.3 uH ± 25% | 100 kHz 1Vrms | |
| | | 3 - 5 | 12.9 uH ± 25% | | |
| | | 4 - 6 | 13.1 uH ± 25% | | |
| | | 8 - 9 | 197.0uH ± 25% | | |
| | | 11 - 12 | 7.2 uH ± 25% | | |
| | | 12 - 13 | 7.0 uH ± 25% | | |
| 12 - 14 | 7.0 uH ± 25% | | | | |

SPECIFICATIONS / ECO2420SEO-D03V018

Compatible with lead-free solders

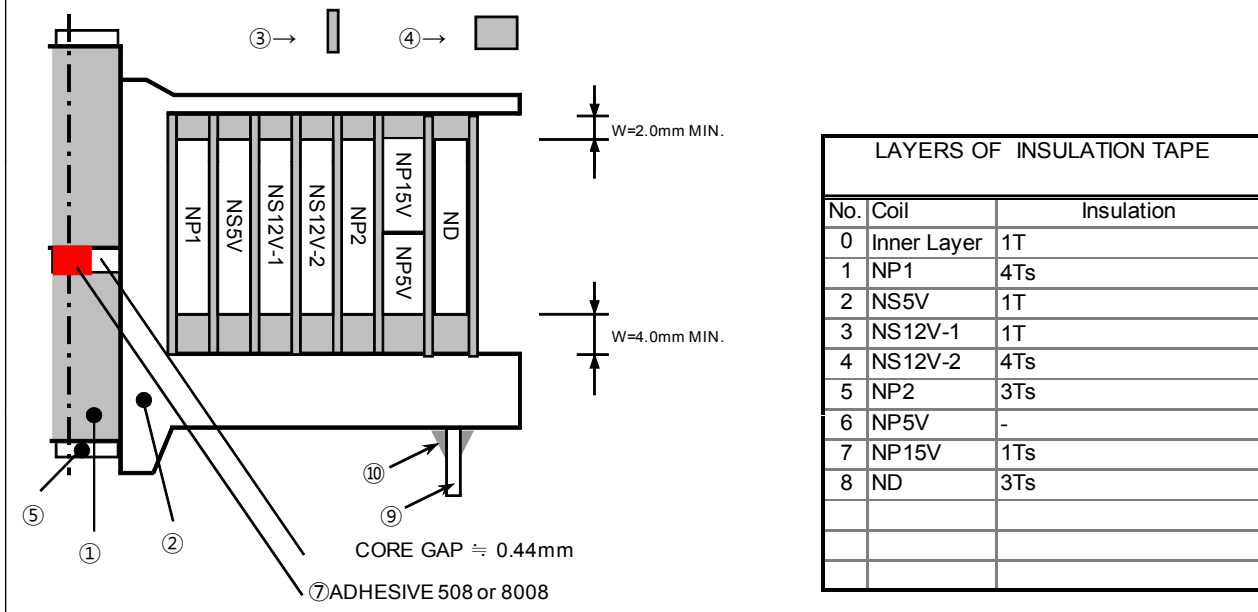
MATERIAL LIST AND INSULATING CONSTRUCTION

| No | ITEM & MATERIAL | MIN. THICKNESS OF LAYER | UL T.I (°C) | MANUFACTURER | UL FILE NO. | |
|----|--|-------------------------|--------------|---|--|---------|
| ① | FERRITE CORE ECO 2420 | — | — | TDK-EPC Corporation | — | |
| ② | BOBBIN Phenol Resin PM-9820 | 0.65 mm MIN. | 150 94V-0 | SUMITOMO BAKELITE CO.,LTD. | E41429 | |
| ③ | INSULATION TAPE Polyester Color : YELLOW | CT280 or | 0.05 mm | 130 | JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD | E165111 |
| | | 1318-1 | | | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | E17385 |
| ④ | FIXING TAPE FOR WIRE (Barrier Tape) Polyester | 44D-A | - | 130 | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | E17385 |
| | | WF with suffixes | | | JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD | E165111 |
| ⑤ | FIXING TAPE FOR CORE Polyester Color : YELLOW | CT280 or | 0.05 mm | 130 | JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD | E165111 |
| | | 1318-1 | | | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | E17385 |
| ⑥ | WINDING WIRE Polyurethane Enameled Copper Wire 0.2mm , 0.32mm , 0.35mm | — | 130 | TAI-ELECTRIC WIRE & CABLE CO LTD | E85640 | |
| ⑦ | ADHESIVE 508 NO.8008 | | | DONGBU FINE CHEMICAL CO., CEMEDINE CO., LTD. | | |
| ⑧ | VARNISH EPOXY VARNISH TVB-2024 | | | KYOCERA CHEMICAL CORPORATION | | |
| ⑨ | TERMINAL PIN Copper Clad Steel WireΦ0.8(Soldered) Under Coating(Copper)25% Weight Ratio. (Ref)Surface Plating(Sn100%)3μm or More. | | | Optional | | |
| ⑩ | SOLDER SOLDER Sn-3Ag-0.5Cu | | | Optional SENYJU METAL CO., LTD. | | |

※ 1. Tape Min. Thickness shows the total value. (Tape Base and Adhesive)

※ 2. Insulation Tape shall be able to withstand for 1 minute of 3000 Volts (r.m.s) Potential with 2 layers.

☆BOBBIN UL94: 94V-0 ,CTI(IEC112): 175~250V (UL Level 3)

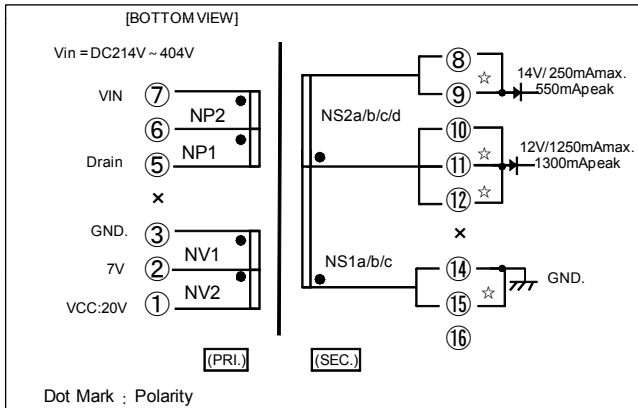


· All specifications are subject to change without notice.

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SPECIFICATIONS / ECO2420SEO-D04V0110

Compatible with lead-free solders

■ SCHEMATICS

■ SAFETY STANDARDS

| SAFETY STANDARDS | |
|-----------------------------------|-------------|
| Creepage Distance & Air Clearance | |
| PRI. - SEC. | 2.50mm MIN. |
| PRI. - CORE | 1.25mm MIN. |
| SEC. - CORE | 1.25mm MIN. |

■ WINDING SPECIFICATIONS

| No. | Order | Coil | Terminal | Turns | Wire | Note |
|-----|-------|-------|----------|-------|--------------|-----------------|
| 1 | 1 | N P1 | 6 - 5 | 53 | UEW 0.20 | |
| 2 | 2 | N S1a | 12 - 14 | 13 | UEW 0.20 x 2 | Reverse Winding |
| 3 | 3-1 | N V2 | 1 - 2 | 12 | UEW 0.20 | Reverse Winding |
| 4 | 3-2 | N V1 | 2 - 3 | 12 | UEW 0.20 | Reverse Winding |
| 5 | 4 | N S1b | 15 - 10 | 13 | UEW 0.20 x 2 | |
| 6 | 5-1 | N S2a | 8 - 11 | 2 | UEW 0.23 x 2 | Reverse Winding |
| 7 | 5-2 | N S2b | 11 - 9 | 2 | UEW 0.23 x 2 | |
| 8 | 5-3 | N S2c | 9 - 10 | 2 | UEW 0.23 x 2 | Reverse Winding |
| 9 | 5-4 | N S2d | 10 - 8 | 2 | UEW 0.23 x 2 | |
| 10 | 6 | N S1c | 14 - 11 | 13 | UEW 0.20 x 2 | |
| 11 | 7 | N P2 | 7 - 6 | 52 | UEW 0.20 | |

* Counter clockwise direction is an order direction when see a transformer from the upper part.

SPECIFICATIONS / ECO2420SEO-D04V0110

Compatible with lead-free solders

■ ELECTRICAL CHARACTERISTICS

| (Test Conditions) | | | | | |
|-------------------|-------------------------------------|---------------------------------------|--|---------------------------------------|---|
| | | (Temperature) | : | 25±10°C | |
| | | (Relative Humidity) | : | 25~75%RH | |
| No | Parameter | Test Terminal | Specification | Condition _s | Test Instruments |
| 4.1 | Inductance | 7 - 5 | 1.54 mH ± 10% | 10 kHz 1Vrms | LCR Meter Agilent : 4263B or Equivalent |
| 4.2 | Leakage Inductance | 7 - 5 (8,9,10,11,12 ,14,15 short) | 39.5 μH MAX | | |
| 4.3 | DC. Resistance | 15 - 10 | (0.180Ω) ±20% | | Milli ohm meter ADEX : AX-114 or Equivalent |
| | | 7 - 6 | (1.722Ω) ±20% | | |
| | | 14 - 11 | (96.7mΩ) ±30% | | |
| | | 10 - 8 | (19.2mΩ) ±30% | | |
| | | 9 - 10 | (19.6mΩ) ±30% | | |
| | | 11 - 9 | (18.7mΩ) ±30% | | |
| | | 8 - 11 | (18.7mΩ) ±30% | | |
| | | 2 - 3 | (0.324Ω) ±20% | | |
| | | 1 - 2 | (0.324Ω) ±20% | | |
| 4.4 | Insulation Resistance | PRI.-SEC. | 100 MΩ MIN. | DC 500V | Meg Ohm Meter Toa : SM-5E or Equivalent |
| | | PRI.,SEC. | | | |
| | | -CORE | | | |
| 4.5 | Withstanding Voltage | PRI.-SEC. | Without Breakdown Sense:1mA f=50or60Hz | AC 1.5kVrms 1min or AC 1.8kVrms 1s | Puncture Tester Kikusui : TOS8650 or Equivalent |
| | | PRI.-CORE SEC.-CORE | | AC 0.8kVrms 1min or AC 1.0kVrms 1s | |
| 4.6 | Impulse Test | 7 - 5 | Without Breakdown | Pulse 800Vo-p 1s | Impulse Tester ECG : DWS-05 or Equivalent |
| 4.7 | Polarity & Turns Ratio X:X7-5 | 15 - 10 | STD(0.1219)±7.0% | f=10kHz | Ratio Meter Ryowa : TRD-09 or Equivalent |
| | | 14 - 11 | STD(0.1221)±7.0% | | |
| | | 10 - 8 | STD(0.0188)±4.5% | | |
| | | 9 - 10 | STD(0.0189)±4.5% | | |
| | | 11 - 9 | STD(0.0189)±4.5% | | |
| | | 8 - 11 | STD(0.0188)±4.5% | | |
| | | 2 - 3 | STD(0.1137)±7.5% | | |
| | | 1 - 2 | STD(0.1081)±7.5% | | |
| | | 12 - 14 | STD(0.1228)±7.0% | | |

SPECIFICATIONS / ECO2420SEO-D04V0110

Compatible with lead-free solders

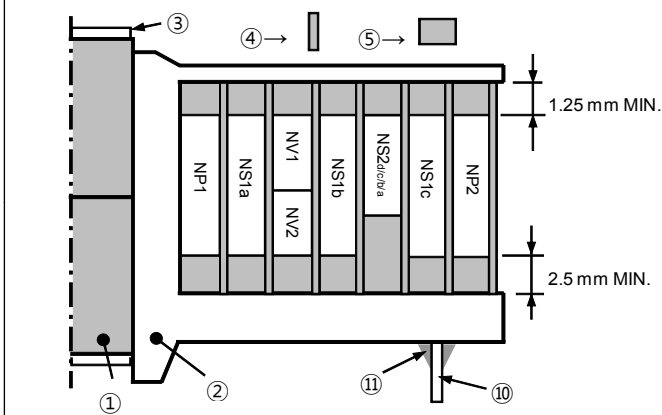
■ MATERIAL LIST AND INSULATING CONSTRUCTION

| No | ITEM & MATERIAL | MIN.THICKNESS OF ONE LAYER | UL T.I (°C) | MANUFACTURER | UL FILE NO. |
|----|--|--------------------------------|--------------|--|--|
| ① | CORE Ferrite 25.3mmx20.3mmx11.7mm | — | — | TDK-EPC Corporation | — |
| ② | BOBBIN Phenol Resin T375J | 0.65 mm MIN. | 150 94V-0 | CHANG CHUN PLASTICS CO.,LTD. | E59481 |
| ③ | FIXING TAPE FOR CORE Polyester Color : WHITE | 1318-1 | 130 | 3M COMPANY | E17385 |
| | | 1350F-1 CT with suffixes | | JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO.LTD. | E165111 |
| ④ | INSULATION TAPE Polyester Color : WHITE | 0.05 mm | 130 | 3M COMPANY | E17385 |
| | | | | 1318-1 1350F-1 CT with suffixes | JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO.LTD. |
| ⑤ | FIXING TAPE FOR WIRE (Barrier Tape) Polyester | 44D | 130 | 3M COMPANY | E17385 |
| | | WF with suffixes | | JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO.LTD. | E165111 |
| ⑥ | WINDING WIRE Polyurethane Enameled Copper Wire 0.20 mm DIAx1 : NP1,NP2,NV1,V2 | - | 130 | PROSPERITY ELECTRIC WIRE & CABLE CO. | E196072 |
| | | | | XiAMEN HUNG'S ENTERPRISE CO.,LTD. | E219154 |
| ⑦ | WINDING WIRE Polyurethane Enameled Copper Wire 0.20 mm DIAx2 : NS1a/b/c 0.23 mm DIAx2 : NS2a/b/c/d | - | - | - | - |
| ⑨ | IMPREGNATION Epoxy Varnish | - | - | Optional | — |
| ⑩ | TERMINAL PIN Copper Clad Steel WireΦ0.8(Soldered) Under Coating(Copper)25% Weight Ratio. (Ref)Surface Plating(Sn100%)3μm or More. | - | - | Optional | — |
| ⑪ | SOLDER (For junction of a wire and a terminal) Lead-Free Sn-Ag-Cu | - | - | Optional | — |

※ 1. Tape Min. Thickness shows the total value. (Tape Base and Adhesive)

※ 2. Insulation Tape shall be able to withstand for 1 minute of 3000 Volts (r.m.s) Potential with 3 layers.

☆BOBBIN UL94: 94V-0 ,CTI(IEC112): 175~250V (UL Level 3) / INSULATION TAPE CTI:250~400V.



LAYERS OF FIXING TAPE FOR WIRE
(Barrier Tape) and INSULATION TAPE

| Layer No. | Material | Thickness |
|-----------|-------------|-----------|
| 0 | Inner Layer | - |
| 1 | NP1 | 2Ts |
| 2 | NS1a | 2Ts |
| 3 | NV1/NV2 | 2Ts |
| 4 | NS1b | 1T |
| 5 | NS2a/b/c/d | 2Ts |
| 6 | NS1c | 2Ts |
| 7 | NP2 | 2Ts |
| | | |
| | | |

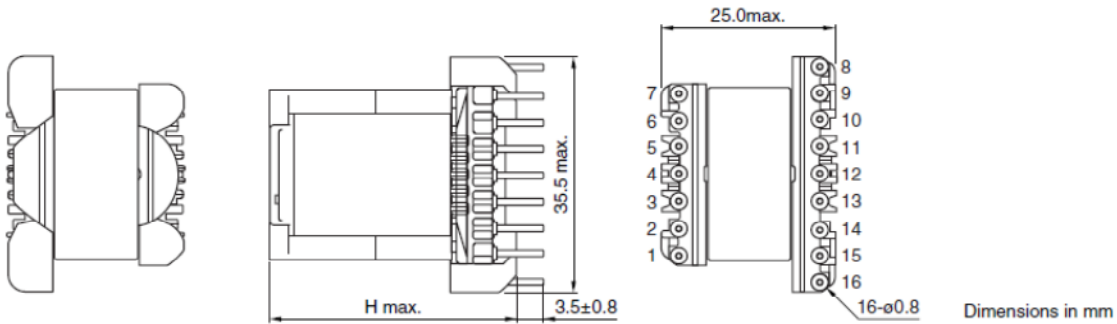
· All specifications are subject to change without notice.

Please read the precautions before using this catalog.

ECO24 Series for Multiple Outputs (Vertical Type)

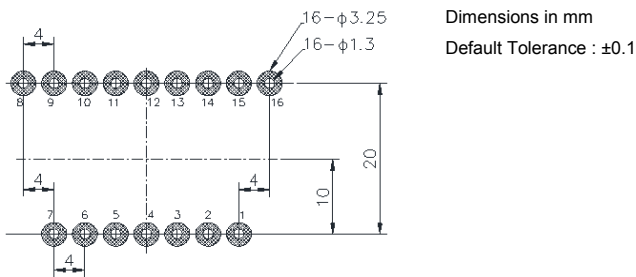
Compatible with lead-free solders

■ SHAPES AND DIMENSIONS (BOBBIN TYPE: V I I)



| Part No. | Bobbin type | H max. |
|----------|-------------|--------|
| ECO2425 | VII | 31.5 |
| ECO2430 | VII | 36.5 |

■ RECOMMENDED BASE MATERIAL OPENING SIZE



■ ITEMS APPLICABLE

| Series | Bobbin Type | Part No. |
|---------|-------------|--------------------|
| ECO2425 | VII | ECO2425SEO-D01V019 |
| | | ECO2425SEO-D04V017 |

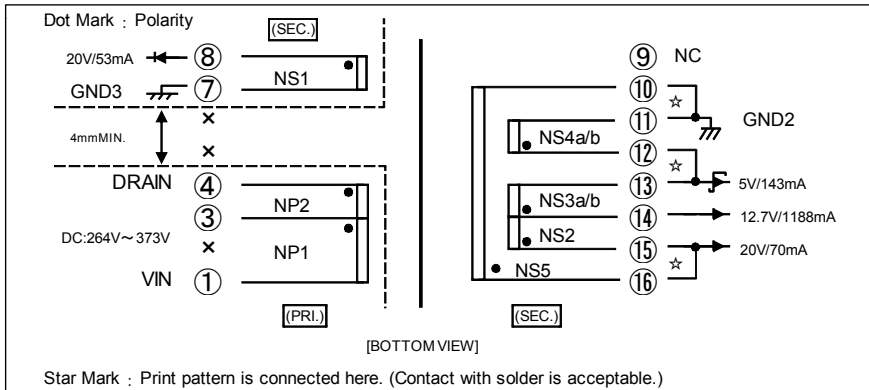
- Compatible ferrite materials for this product are the PC47 family.
- Conformity to RoHS Directive: This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted ϕ ir.

· All specifications are subject to change without notice.
Please read the precautions before using this catalog.

SPECIFICATIONS / ECO2425SEO-D01V019

Compatible with lead-free solders

SCHEMATICS



SAFETY STANDARDS

| SAFETY STANDARDS | | | |
|--|------------------|----------------|-----------------|
| *IEC60335-1 Ed.4 (Function Insulation) | | | |
| | | Inside of Coil | Outside of Coil |
| PRI. - SEC. | <Other than NS1> | 1.6mm MIN. | 3.2mm MIN. |
| PRI. - CORE | <Other than NS1> | 1.3mm MIN. | 1.6mm MIN. |
| SEC. - CORE | <Other than NS1> | 1.3mm MIN. | 1.6mm MIN. |
| PRI. -SEC. | <Only in NS1> | 2.0mm MIN. | 4.0mm MIN. |

WINDING SPECIFICATIONS

| No. | Order | Coil | Terminal | Turns | Wire | Note |
|-----|-------|-----------------------------|----------|-------|---------------|---------------------------------|
| 0 | 0 | TAPE : CTI _≥ 600 | | | | |
| 1 | 1 | N P2 | 4 - 3 | 41 | UEW 0.40 | Reverse Winding (NP1+NP2=81Ts.) |
| 2 | 2 | N S4a | 12 - 11 | 7 | UEW 0.30x2 | Reverse Winding |
| 3 | 3 | N S4b | 11 - 12 | 7 | UEW 0.30x2 | |
| 4 | 4 | N S3a | 14 - 13 | 10 | UEW 0.40 | Reverse Winding |
| 5 | 5 | N S3b | 13 - 14 | 10 | UEW 0.40 | |
| 6 | 6 | N S2 | 15 - 14 | 10 | UEW 0.20 | Reverse Winding |
| 7 | 7 | N S1 | 8 - 7 | 26 | TEX-E 0.20 ※1 | Reverse Winding |
| 8 | 8 | N S5 | 16 - 10 | 27 | UEW 0.20 | Reverse Winding |
| 9 | 9 | N P1 | 3 - 1 | 40 | UEW 0.40 | Reverse Winding |
| | | | | | | |
| | | | | | | |

※1: See page 8 [5] MATERIAL LIST & INSULATING CONSTRUCTION No. ⑩

* Clockwise direction is an order direction when see a transformer from the upper part.

SPECIFICATIONS / ECO2425SEO-D01V019

Compatible with lead-free solders

■ ELECTRICAL CHARACTERISTICS

| Test Conditions | | Temperature | : | 25±10°C | | |
|-----------------|---|---|--|--|---|--|
| | | Relative Humidity | : | 25~75%RH | | |
| No | Parameter | Test Terminal | Specification | Condition _s | Test Instruments | |
| 4.1 | Inductance | 4 - 1 | 1.06 mH ±10% | 10 kHz 1Vrms | LCR Meter Agilent : 4263B or Equivalent | |
| 4.2 | Leakage Inductance | 4 - 1 (7,8,10,11,12,13, 14,15,16 short) | 23 uH MAX. | 10 kHz 1Vrms | | |
| 4.3 | DC. Resistance | 4 - 3 | 0.245 Ω ±25% | | Milli ohm meter ADEX : AX-114 or Equivalent | |
| | | 12 - 11 | 22.1 mΩ ±30% | | | |
| | | 14 - 13 | 37.5 mΩ ±30% | | | |
| | | 15 - 14 | 0.312 Ω ±25% | | | |
| | | 8 - 7 | 0.782 Ω ±25% | | | |
| | | 16 - 10 | 0.910 Ω ±25% | | | |
| | | 3 - 1 | 0.355 Ω ±25% | | | |
| 4.4 | Insulation Resistance | P - S | 100 MΩ MIN. | DC 500V | Meg Ohm Meter Toa : SM-5E or Equivalent | |
| | | P,S - CORE | | | | |
| 4.5 | Withstanding Voltage | P - S | Without Breakdown Sense:1mA f=50or60Hz | AC 1.25kVrms 1min or AC 1.5kVrms 1s | Puncture Tester Kikusui : TOS8650 or Equivalent | |
| | | P - CORE S - CORE | | AC 0.65kVrms 1min or AC 0.8kVrms 1s | | |
| 4.6 | Impulse Test | 4 - 1 | Without Breakdown | Pulse 1.2kVo-p 3~5 Pulse | Impulse Tester ECG : DWS-05 or Equivalent | |
| 4.7 | Polarity & Turns Ratio X-X/ 4 - 1 | | | f=10kHz | Ratio Meter Ryowa : TRM-101A or Equivalent | |
| | | 12 - 11 | (0.0850) ± 10% | | | |
| | | 14 - 13 | (0.1225) ± 8.0% | | | |
| | | 15 - 14 | (0.1236) ± 8.0% | | | |
| | | 8 - 7 | (0.3234) ± 3.5% | | | |
| | | 16 - 10 | (0.3379) ± 3.5% | | | |

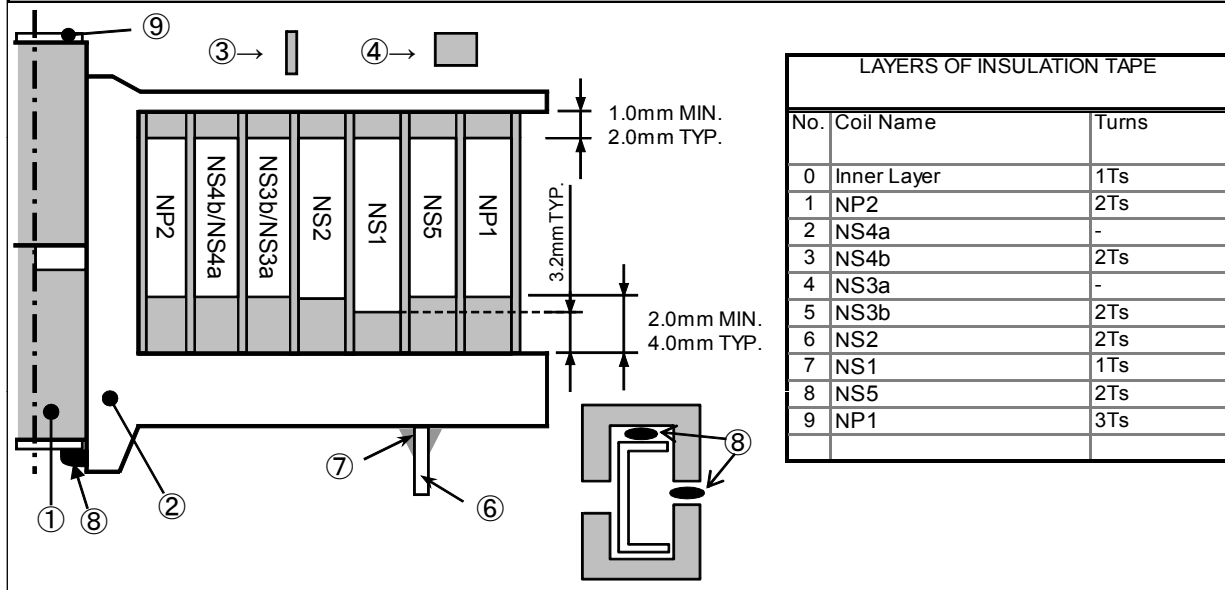
SPECIFICATIONS / ECO2425SEO-D01V019

Compatible with lead-free solders

MATERIAL LIST AND INSULATING CONSTRUCTION

| No | ITEM & MATERIAL | MIN.THICKNESS OF 1 LAYER | UL T.I (°C) | MANUFACTURER | UL FILE NO. |
|----|---|--------------------------|-------------|--------------------------------------|--|
| ① | CORE Ferrite | — | — | TDK-EPC Corporation | — |
| ② | BOBBIN Phenol Resin | PM-9820 | 0.65 mm | 150 | SUMITOMO BAKELITE CO.,LTD. |
| | | T375J | | | CHANG CHUN PLASTICS CO.,LTD |
| ③ | INSULATION TAPE Polyester or PET Color : Yellow CTI ≥ 600V | 1318-1 | 0.05 mm | 130 | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) |
| | | CT with suffixes | | | JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD |
| ④ | FIXING TAPE FOR WIRE (Barrier Tape) Polyester or PET CTI ≥ 600V | 44D-A or 44T-A | — | 130 | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) |
| | | WF with suffixes | | | JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD |
| ⑤ | WINDING WIRE (Primary) Polyurethane Enameled Copper Wire 0.40 mm DIA : NP1, NP2 | — | 130 | PROSPERITY ELECTRIC WIRE & CABLE CO. | E196072 |
| | | | | HANGZHOU WEIFENG ELECTRONIC CO.,LTD. | E229341 |
| | | | | TAI H ELECTRIC WIRE&CABLE CO LTD | E85640 |
| | | | | ZHUHAI WEIHAN WIRE CO LTD | E339217 |
| | WINDING WIRE (Secondary) Polyurethane Enameled Copper Wire 0.20 mm DIA : NS2, NS5 0.30 mm DIA x2 : NS4a, NS4b 0.40 mm DIA : NS3a,NS3b | — | 130 | SHENZHEN FUJI FINE FACTORY | E303260 |
| | | | | HITACHI CABLE (JOHOR) SDN BHD | E215594 |
| | | | | THAI HITACHI ENAMEL WIRE CO LTD | E137472 |
| | | | | ELEKTRISOLA (MALAYSIA) SDN BHD | E143312 |
| ⑥ | TERMINAL PIN Φ0.8 (Soldered) Copper Clad Steel Wire Under Coating(Copper)25% Weight Ratio. (Ref)Surface Plating(Sn100%)3μm or More. | — | — | | — |
| ⑦ | SOLDER (For junction of a wire and a terminal) Lead-Free | — | — | | — |
| ⑧ | ADHESIVE Acrylic , Silicone , Urethane or Epoxy | — | — | | — |
| ⑨ | FIXING TAPE FOR CORE Polyester or PET Color : Yellow | Same as No.③ | 0.05 mm | 130 | Same as No.③ |
| ⑩ | WINDING WIRE (Secondary) Triple Insulating Winding Wire 0.20 mm DIAx1 : NS1 | — | 130 | DAH JIN TECHNOLOGY CO., LTD. | E236542 |
| | | | | TLW-B or TEX-E | FURUKAWA ELECTRIC CO., LTD. |

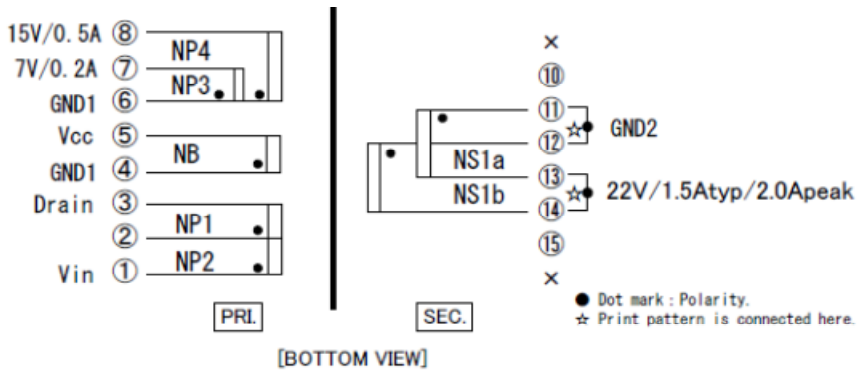
- ※ 1. Tape Min. Thickness shows the total value. (Tape Base and Adhesive)
- ※ 2. Insulation Tape shall be able to withstand for 1 minute of 3000 Volts (r.m.s) Potential with 2 layers.



All specifications are subject to change without notice.
Please read the precautions before using this catalog.

SPECIFICATIONS / ECO2425SEO-D04V017

Compatible with lead-free solders

■ SCHEMATICS

■ SAFETY STANDARDS

| SAFETY STANDARDS | |
|-----------------------------|---------------------------|
| IEC600335-1 Ed.4 | |
| Over Surface & Air Spacings | |
| PRL - SEC. | 4.0 mm MIN.(inside core) |
| PRL - CORE | 4.0 mm MIN.(outside core) |
| SEC. - CORE | 4.0 mm MIN.(outside core) |

■ WINDING SPECIFICATIONS

| No. | order | coil | terminal | turns | wire | note |
|-----|-------|------------|----------|-------|----------|-----------------|
| 0 | 0 | 600V ≤ CTI | | | | |
| 1 | 1 | N P1 | 2 - 3 | 24 | UEW 0.35 | NP1+NP2=55ts |
| 2 | 2 | N S1a | 11 - 13 | 17 | UEW 0.40 | |
| 3 | 3 | N B | 4 - 5 | 14 | UEW 0.35 | |
| 4 | 4 | N P3 | 7 - 6 | 8 | UEW 0.35 | Reverse winding |
| 5 | 5 | N P4 | 6 - 8 | 12 | UEW 0.35 | |
| 6 | 6 | N P2 | 1 - 2 | 31 | UEW 0.35 | |
| 7 | 7 | N S1b | 12 - 14 | 17 | UEW 0.40 | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

SPECIFICATIONS / ECO2425SEO-D04V017

Compatible with lead-free solders

■ ELECTRICAL CHARACTERISTICS

(Test Conditions)

(Temperature) : 25±10°C

(Relative Humidity) : 25~75% RH

| No. | Parameter | Test Terminal | Specification | Conditions | Test Instruments |
|-----|--|---------------------------------|------------------------------------|---------------------------------------|---|
| 4.1 | Inductance | 1 - 3 | 428uH ± 10% | 10 kHz 1Vrms | LCR Meter Agilent : 4263B or Equivalent |
| 4.2 | Leakage Inductance | 1 - 3 (4-8,SEC. short) | 5.5 uH MAX | | |
| 4.3 | DC. Resistance | 2 - 3 | 0.174 Ω ±20% | | Milli ohm meter ADEX : AX-114N or Equivalent |
| | | 11 - 13 | 0.106 Ω ±20% | | |
| | | 4 - 5 | 0.123 Ω ±20% | | |
| | | 6 - 7 | 75.9m Ω ±30% | | |
| | | 6 - 8 | 0.113 Ω ±20% | | |
| | | 12 - 14 | 0.142 Ω ±20% | | |
| | | 1 - 2 | 0.301 Ω ±20% | | |
| 4.4 | Insulation Resistance | PRI.-SEC. PRI.,SEC. -CORE | 100 M Ω MIN. | DC 500V | Meg Ohm Meter Toa : SM-5E or Equivalent |
| 4.5 | Withstanding Voltage | PRI.-SEC. | Without Breakdown Sense:1mA | AC 3.0kVrms 1min or AC 3.6kVrms 1s | Puncture Tester Kikusui : TOS8650 or Equivalent |
| | | PRI.-CORE SEC.-CORE | | AC 1.5kVrms 1min or AC 1.8kVrms 1s | |
| 4.6 | Impulse Test | 1 - 3 | Without Breakdown | Pulse 1000Vo-p 1s | Impulse Tester ECG : DWS-05 or Equivalent |
| 4.7 | Polarity & Turns Ratio X-X / 1 - 3 | 2 - 3 | STD (0.4248) ±3.5% | f=10kHz | Ratio Meter Ryowa : TRM-101A or Equivalent |
| | | 11 - 13 | STD (0.3042) ±4.5% | | |
| | | 4 - 5 | STD (0.2532) ±5.5% | | |
| | | 6 - 7 | STD (0.1415) ±9.9% | | |
| | | 6 - 8 | STD (0.2239) ±6.6% | | |
| | | 12 - 14 | STD (0.3141) ±4.5% | | |
| 4.8 | Inductance | 1 - 2 | 142.3uH ± 10% | 10 kHz 1Vrms | LCR Meter Agilent : 4263B or Equivalent |
| | | 2 - 3 | 78.3uH ± 10% | | |
| | | 11 - 13 | 40.4uH ± 10% | | |
| | | 4 - 5 | 28.1uH ± 10% | | |
| | | 6 - 7 | 9.9uH ± 10% | | |
| | | 6 - 8 | 21.9uH ± 10% | | |
| | | 12 - 14 | 43.9uH ± 10% | | |

SPECIFICATIONS / ECO2425SEO-D04V017

Compatible with lead-free solders

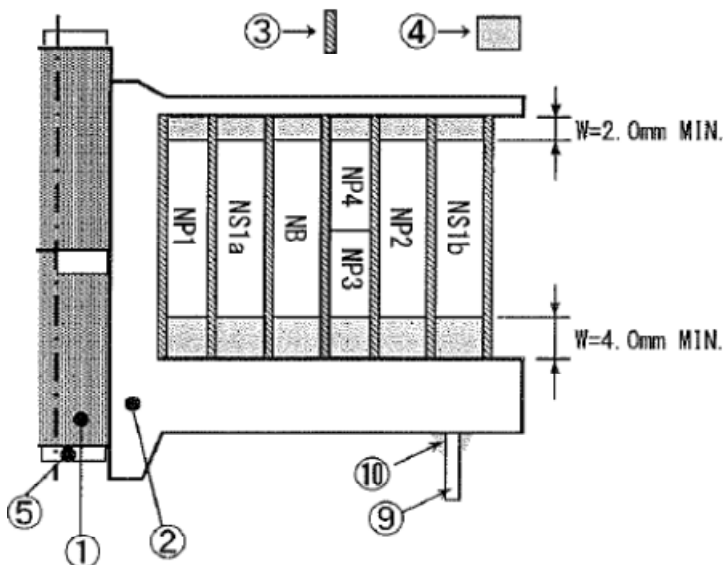
MATERIAL LIST AND INSULATING CONSTRUCTION

| No. | ITEM & MATERIAL | MIN.THICKNESS OF LAYER | UL T.I (°C) | MANUFACTURER | UL FILE NO. |
|-----|---|------------------------------|--------------|---|---|
| ① | CORE Ferrite 25.3mm x25.3mm x11.7mm | — | — | TDK-EPC Corporation | — |
| ② | BOBBIN Phenol Resin PM-9820 | 0.65 mm MIN. | 150 94V-0 | SUMITOMO BAKELITE CO.,LTD. | E41429 |
| ③ | INSULATION TAPE Polyester Color : YELLOW | 0.05 mm | 130 | JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD | E165111 |
| ④ | FIXING TAPE FOR WIRE (Barrier Tape) Polyester | 44D-A or WF with suffixes | 130 | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD | E17385 E165111 |
| ⑤ | FIXING TAPE FOR CORE Polyester Color : YELLOW | CT280 | 0.05 mm | 130 | JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD E165111 |
| ⑥ | WINDING WIRE Polyurethane Enameled Copper Wire 0.35 mm DIAx1 : NP1,NP2,NP3 NP4,NB | — | 130 | PROSPERITY ELECTRIC WIRE & CABLE CO. XIAMEN HUNG'S ENTERPRISE CO.,LTD. HANGZHOU WEIFENG ELECTRONIC CO.,LTD. | E196072 E219154 E229341 |
| ⑦ | WINDING WIRE Polyurethane Enameled Copper Wire 0.40 mm DIAx1 : NS1a,NS1b | — | | | |
| ⑧ | ADHESIVE Acrylic , Urethane or Epoxy | | | Optional | |
| ⑨ | TERMINAL PIN Copper Cled Steel WireΦ0.8(Soldered) Under Coating(Copper)25% Weight Ratio. (Ref)Surface Plating(Sn100%)3 μm or More. | | | Optional | |
| ⑩ | SOLDER (For junction of a wire and aterminal) Lead-Free Sn-Ag-Cu | | | Optional | |

※ 1. Tape Min. Thickness shows the total value. (Tape Base and Adhesive)

※ 2. Insulation Tape shall be able to withstand for 1 minute of 3000 Volts (r.m.s) Potential with 2 layers.

☆BOBBIN UL94: 94V-0 ,CTI(IEC112): 175~250V (UL Level 3)



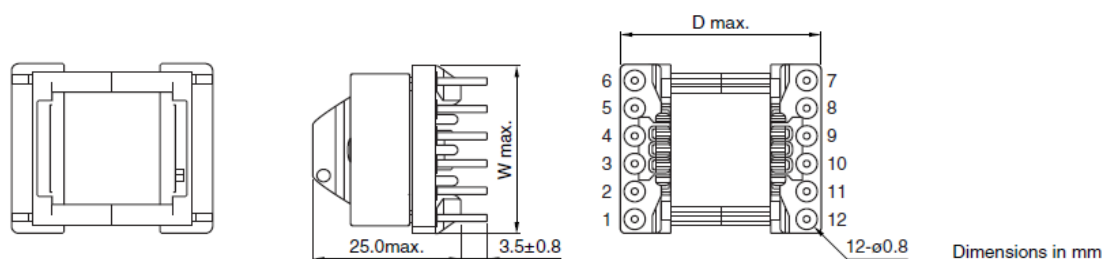
| LAYERS OF INSULATION TAPE | | |
|---------------------------|-------------|------------|
| No. | Coil | Insulation |
| 0 | Inner Layer | 1T |
| 1 | NP1 | 3Ts |
| 2 | NS1a | 3Ts |
| 3 | NB | 1T |
| 4 | NP3 | - |
| 5 | NP4 | 1T |
| 6 | NP2 | 3Ts |
| 7 | NS1b | 3Ts |
| | | |
| | | |
| | | |
| | | |

· All specifications are subject to change without notice.

Please read the precautions before using this catalog.

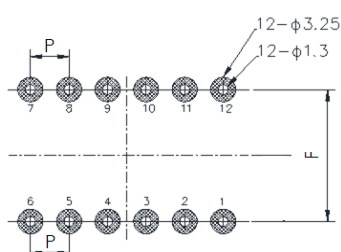
ECO24 Series for Multiple Outputs (Horizontal Type)

SHAPES AND DIMENSIONS (BOBBIN TYPE: HI, HII)



| Part No. | Bobbin type | D max. | W max. | P | F |
|----------|-------------|--------|--------|-----|------|
| ECO2425 | HI | 30.5 | 30.0 | 5.0 | 25.0 |
| | HII | 30.5 | 27.0 | 4.0 | 25.0 |
| ECO2430 | HI | 36.0 | 30.0 | 5.0 | 30.0 |
| | HII | 36.0 | 27.0 | 4.0 | 30.0 |

RECOMMENDED BASE MATERIAL OPENING SIZE



Dimensions in mm
Default Tolerance : ±0.1

ITEMS APPLICABLE

| Series | Bobbin Type | Part No. |
|---------|-------------|---------------------|
| ECO2430 | HI | ECO2430SEO-D01H0110 |
| | | ECO2430SEO-D03H016 |

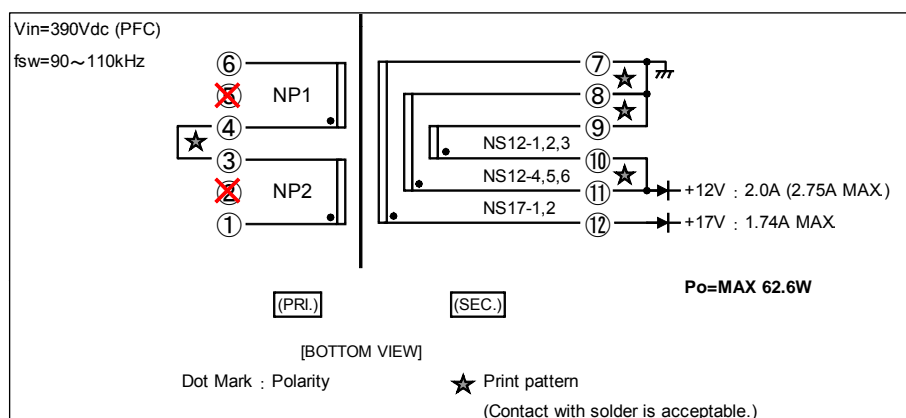
- Compatible ferrite materials for this product are the PC47 family.
- Conformity to RoHS Directive: This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted ópir.

· All specifications are subject to change without notice.
Please read the precautions before using this catalog.

SPECIFICATIONS / ECO2430SEO-D01H0110

Compatible with lead-free solders

SCHEMATICS



SAFETY STANDARDS

| Over Surface & Air Spacings | | |
|-----------------------------|----------------|-----------------|
| | Inside of coil | Outside of coil |
| PRI. - SEC. | 5.6mm MIN. | 8.0mm MIN. |
| PRI. - CORE. | 2.8mm MIN. | 4.0mm MIN. |
| SEC. - CORE. | 2.8mm MIN. | 4.0mm MIN. |

WINDING SPECIFICATIONS

| No. | order | coil | terminal | turns | wire | note |
|-----|-------|---------|----------|-------|--------------|-----------------|
| 1 | 1 | N P1 | 4 - 6 | 21 | 1UEW 0.10/15 | NP1+NP2=48ts |
| 2 | 2-1 | N S12-1 | 10 - 9 | 6 | 1UEW 0.35 | |
| 3 | 2-2 | N S12-2 | 9 - 10 | 6 | 1UEW 0.35 | Reverse Winding |
| 4 | 2-3 | N S12-3 | 10 - 9 | 6 | 1UEW 0.35 | |
| 5 | 3-1 | N S12-4 | 11 - 8 | 6 | 1UEW 0.35 | |
| 6 | 3-2 | N S12-5 | 8 - 11 | 6 | 1UEW 0.35 | Reverse Winding |
| 7 | 3-3 | N S12-6 | 11 - 8 | 6 | 1UEW 0.35 | |
| 8 | 4-1 | N S17-1 | 12 - 7 | 8 | 1UEW 0.40 | |
| 9 | 4-2 | N S17-2 | 7 - 12 | 8 | 1UEW 0.40 | Reverse Winding |
| 10 | 5 | N P2 | 3 - 1 | 27 | 1UEW 0.20/4 | Reverse Winding |

* Clockwise direction is an order direction when see a transformer from the No.1~6 terminal pin side.

SPECIFICATIONS / ECO2430SEO-D01H0110

Compatible with lead-free solders

■ ELECTRICAL CHARACTERISTICS

| (Test Conditions) | | | | | |
|-------------------|--|---|--|---------------------------------------|---|
| | | (Temperature) | : | 25±10°C | |
| | | (Relative Humidity) | : | 25~75%RH | |
| No | Parameter | Test Terminal | Specification | Conditions | Test Instruments |
| 4.1 | Inductance | 1 - 6 (3,4 short) | 450 μH ± 10% | 10 kHz 1Vrms | LCR Meter YHP : 4263A or Equivalent |
| 4.2 | Leakage Inductance | 1 - 6 (3,4 short) (11,10,9,8 short) | 12.0 μH MAX | 100 kHz 1Vrms | |
| 4.3 | DC. Resistance | 1 - 3 | 0.21Ω ±20% | | Milli ohm meter Matsushita : VP2941 or Equivalent |
| | | 4 - 6 | 0.12Ω ±20% | | |
| | | 10 - 9 | 17.3mΩ ±30% | | |
| | | 11 - 8 | 18.7mΩ ±30% | | |
| | | 12 - 7 | 30.0mΩ ±30% | | |
| | | | | | |
| 4.4 | Insulation Resistance | PRI.-SEC. | 100 MΩ MIN. | DC 500V | Meg Ohm Meter Toa : SM-5E or Equivalent |
| | | PRI.,SEC. -CORE | | | |
| 4.5 | Withstanding Voltage | PRI.-SEC. | Without Breakdown Sense:1mA f=50or60Hz | AC 3.0kVrms 1min or AC 3.6kVrms 1s | Puncture Tester Kikusui : TOS8650 or Equivalent |
| | | PRI.-CORE. SEC.-CORE. | | AC 1.5kVrms 1min or AC 1.8kVrms 1s | |
| | | | | | |
| 4.6 | Impulse Test | 1 - 6 (3,4 short) | Without Breakdown | Pulse 800Vo-p 1s | Impulse Tester ECG : DWS-05 or Equivalent |
| 4.7 | Polarity & Turns Ratio X-X/ 1 - 6 (3,4 short) | 10 - 9 | STD (0.1226) ±15% | f=10kHz | Ratio Meter Ryowa : TRM-101A or Equivalent |
| | | 11 - 8 | STD (0.1233) ±15% | | |
| | | 12 - 7 | STD (0.1656) ±8.0% | | |
| | | | | | |
| | | | | | |

SPECIFICATIONS / ECO2430SEO-D01H0110

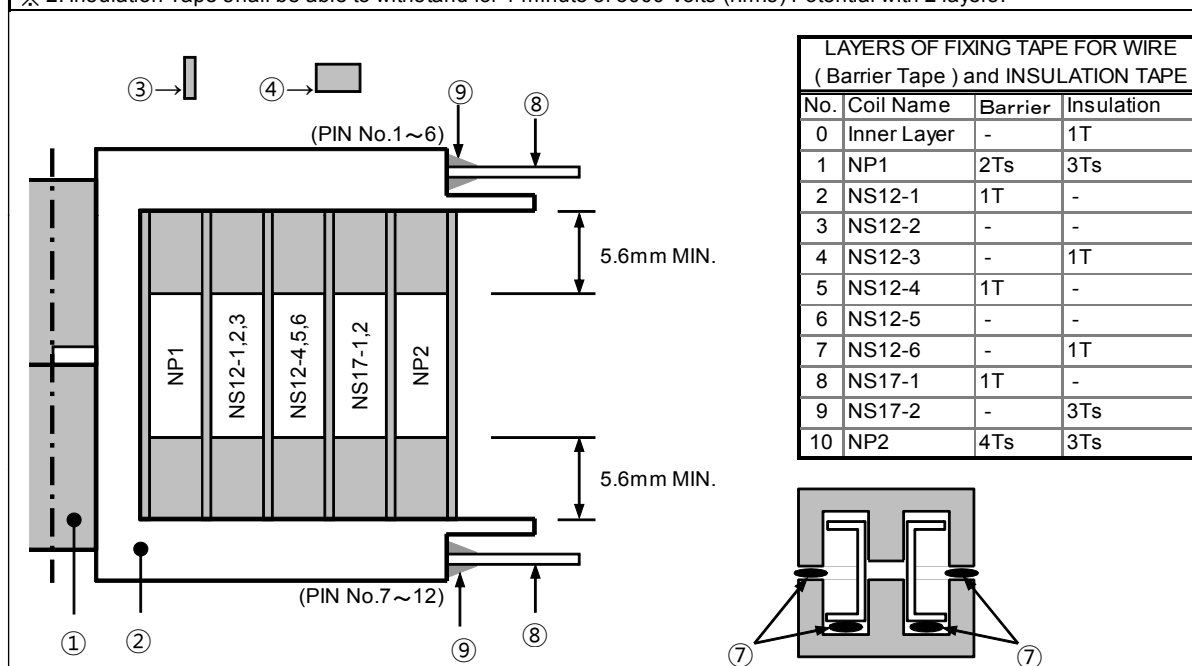
Compatible with lead-free solders

MATERIAL LIST AND INSULATING CONSTRUCTION

| No | ITEM & MATERIAL | MIN.THICKNESS OF LAYER | UL T.I (°C) | MANUFACTURER | UL FILE NO. |
|----|--|--------------------------|--------------|--|-------------|
| ① | CORE PCB47 Ferrite 25.3mm x30.3mm x11.7mm | — | — | TDK Corporation | — |
| ② | BOBBIN Phenol Resin FM-9820 | 0.65 mm MIN. | 150 94V-0 | SUMITOMO BAKELITE CO.,LTD. | E41429 |
| ③ | INSULATION TAPE Polyester CTI Grade II MIN. | 1350F-1 | 130 FR | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | E17385 |
| | | 630F #25 | | TERAOKA SEISAKUSHO CO.,LTD. | E56086 |
| ④ | FIXING TAPE FOR WIRE (Barrier Tape) Polyester CTI Grade II MIN. | WF with suffixes | 130 FR | JINGJIANG YA HUA PRESSURE SENSITIVE GLUE CO LTD | E165111 |
| | | 673F 0.5 or 673F 0.27 | | TERAOKA SEISAKUSHO CO.,LTD. | E56086 |
| ⑤ | WINDING WIRE Polyurethane Enameled Copper Wire 1UEW 15/0.10 mm DIAx1 : NP1 4/0.20 mm DIAx1 : NP2 | — | 130 | PROSPERITY ELECTRIC WIRE & CABLE CO. | E196072 |
| | | | | XIAMEN HUNG'S ENTERPRISE CO.,LTD. | E219154 |
| | | | | HANGZHOU WEIFENG ELECTRONIC CO.,LTD. | E229341 |
| ⑥ | WINDING WIRE Polyurethane Enameled Copper Wire 1UEW 0.35 mm DIAx1 : NS12-1,2,3,4,5,6 0.40 mm DIAx1 : NS17-1,2 | — | 130 | XIAMEN ZHI CHENG ELECTRON CO.,LTD | E218438 |
| | | | | SHENZHEN FUJI FINE FACTORY | E303260 |
| | | | | | |
| ⑦ | ADHESIVE ACRYLIC 3851 ACCELERATOR 7247 | — | — | HENKEL LOCTITE(CHINA) CO.,LTD. | — |
| ⑧ | TERMINAL PIN Copper Clad Steel WireΦ0.8(Soldered) Under Coating(Copper)25% Weight Ratio. (Ref)Surface Plating(Sn100%)3μm or More. | — | — | WELL FORE SPECIAL WIRE CORPORATION | — |
| | | | | HALO COSMOS CORPORATION | — |
| | | | | JIANG MEN IL KWANG METAL CO.,LTD. | — |
| ⑨ | SOLDER (For junction of a wire and a terminal) Lead-Free Sn-Ag-Cu | — | — | SENJU METAL INDUSTRY CO.,LTD. | — |

※ 1. Tape Min. Thickness shows the total value. (Tape Base and Adhesive)

※ 2. Insulation Tape shall be able to withstand for 1 minute of 3000 Volts (r.m.s) Potential with 2 layers.

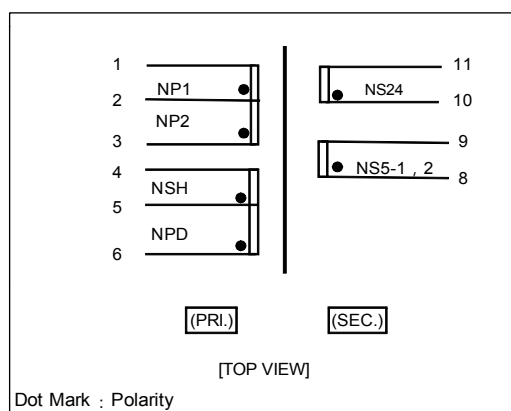


· All specifications are subject to change without notice.

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SPECIFICATIONS / ECO2430SEO-D03H016

Compatible with lead-free solders

■ SCHEMATICS

■ SAFETY STANDARDS

| Over Surface & Air Spacing | |
|----------------------------|------------|
| PRI. - SEC. | 4.3mm MIN. |
| PRI. - CORE. | 2.0mm MIN. |
| SEC. - CORE. | 2.0mm MIN. |

■ WINDING SPECIFICATIONS

| No. | order | coil name | terminal | turns | wire | note |
|-----|-------|-----------|----------|-------|------------|--------------|
| 1 | 1 | N P1 | 2 - 1 | 35 | UEW 0.32 | NP1+NP2=66ts |
| 2 | 2 | N SH | 5 - 4 | 32 | UEW 0.32 | |
| 3 | 3 | N S5-1 | 8 - 9 | 5 | UEW 0.32 | |
| 4 | 4 | N S24 | 10 - 11 | 22 | UEW 0.1/40 | |
| 5 | 5 | N PD | 6 - 5 | 13 | UEW 0.32 | |
| 6 | 6 | N S5-2 | 8 - 9 | 5 | UEW 0.32 | |
| 7 | 7 | N P2 | 3 - 2 | 31 | UEW 0.32 | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

SPECIFICATIONS / ECO2430SEO-D03H016

Compatible with lead-free solders

■ ELECTRICAL CHARACTERISTICS

| (Test Conditions) | | | | | |
|---------------------|-------------------------------------|---------------------------------|--|---------------------------------------|--|
| (Temperature) | | : | 25±10°C | | |
| (Relative Humidity) | | : | 25~75%RH | | |
| No | Parameter | Test Terminal | Specification | Condition _s | Test Instruments |
| 4.1 | Inductance | 3 - 1 | 680 μ H \pm 10% | 10 kHz 1Vrms | LCR Meter HP: 4284A or Equivalent |
| 4.2 | Leakage Inductance | 3 - 1 (Sec shorted) | 30 μ H MAX | | |
| 4.3 | DC. Resistance | 2-1 | 300m Ω \pm 20% | | Milli ohm meter ZENTECH: 502 AC or Equivalent |
| | | 8 - 9 | 31m Ω \pm 30% | | |
| | | 10 - 11 | 62m Ω \pm 30% | | |
| | | 6 - 5 | 167m Ω \pm 20% | | |
| | | 3 - 2 | 433m Ω \pm 20% | | |
| 4.4 | Insulation Resistance | PRI.-SEC. PRI.,SEC. -CORE | 100 M Ω MIN. | DC 500V | Meg Ohm Meter Toa : SM-5E or Equivalent |
| 4.5 | Withstanding Voltage | PRI.-SEC. | Without Breakdown Sense:2.0mA f=50 or 60Hz | AC 3.0kVrms 1min or AC 3.6kVrms 1s | Puncture Tester Kikusui :TOS5101 or Equivalent |
| | | PRI.-CORE. SEC.-CORE. | | AC 1.5kVrms 1min or AC 1.8kVrms 1s | |
| | | PRI.-PRI. SEC.-SEC. | | AC 0.5kVrms 1min or AC 0.6kVrms 1s | |
| | | | | | |
| 4.6 | Impulse Test | 3 - 1 | Without Breakdown | AC1.0KV _{o-p} 5 PULSES | Impulse Tester ECG: DWS-05 or Equivalent |
| 4.7 | Polarity & Turns Ratio X-X2-1 | 8 - 9 | STD(0.1421) \pm 10% | f=10kHz | Ratio Meter IKD: 3053 or Equivalent |
| | | 10 - 11 | STD(0.6259) \pm 5% | | |
| | | 6 - 5 | STD(0.3700) \pm 6% | | |
| | | 3 - 2 | STD(0.8787) \pm 3% | | |
| | | | | | |

SPECIFICATIONS / ECO2430SEO-D03H016

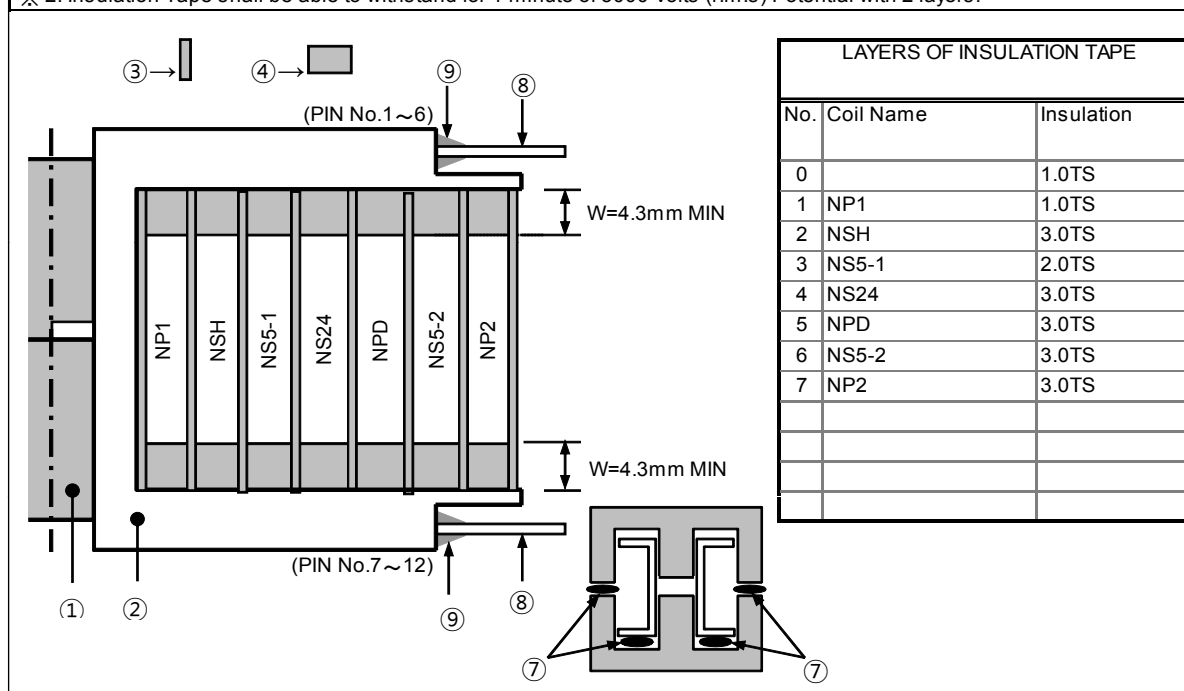
Compatible with lead-free solders

MATERIAL LIST AND INSULATING CONSTRUCTION

| No | ITEM & MATERIAL | MIN. THICKNESS OF LAYER | UL T.I (°C) | MANUFACTURER | UL FILE NO. | |
|----|--|---|-----------------|--|---|-------------------------------------|
| ① | CORE Ferrite | — | — | TDK-EPC Corporation | — | |
| ② | BOBBIN Phenol Resin | PM-9820 | 0.65 mm MIN. | 150 94V-0 | SUMITOMO BAKELITE CO.,LTD. | E41429 |
| ③ | INSULATION TAPE Polyester | 1318-1 or suffixes | 0.05 mm | 130 | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) SENSITIVE GLUE CO LTD | E17385 |
| ④ | FIXING TAPE FOR WIRE (Barrier Tape) Polyester | 44D-A or 44T-A 35661 WF with suffixes | — | 130 | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) SYMBIO INC JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD | E17385 E50292 E165111 |
| ⑤ | WINDING WIRE Polyurethane Enameled Copper Wire 0.32 mm DIA : NP1, NP2, NPD, NS5-1, 2, NSH | — | 130 | PROSPERITY ELECTRIC WIRE & CABLE CO. ZHUHAI WEIHAN WIRE CO LTD | E196072 E339217 | |
| ⑥ | WINDING WIRE Polyurethane Enameled Copper Wire 0.10 mm DIA *40 : NS24 | — | 130 | HANGZHOU WEIFENG ELECTRONIC CO.,LTD. SHENZHEN FUJI FINE FACTORY TAI-I COPPER.(GUANGZHOU) CO.,LTD. | E229341 E303260 E85640 | |
| ⑦ | ADHESIVE Acrylic , Urethane or Epoxy | — | — | Optional | — | |
| ⑧ | TERMINAL PIN | — | — | Optional | — | |
| ⑨ | SOLDER (For junction of a wire and terminal) Lead-Free | — | — | Optional | — | |

※ 1. Tape Min. Thickness shows the total value. (Tape Base and Adhesive)

※ 2. Insulation Tape shall be able to withstand for 1 minute of 3000 Volts (r.m.s) Potential with 2 layers.



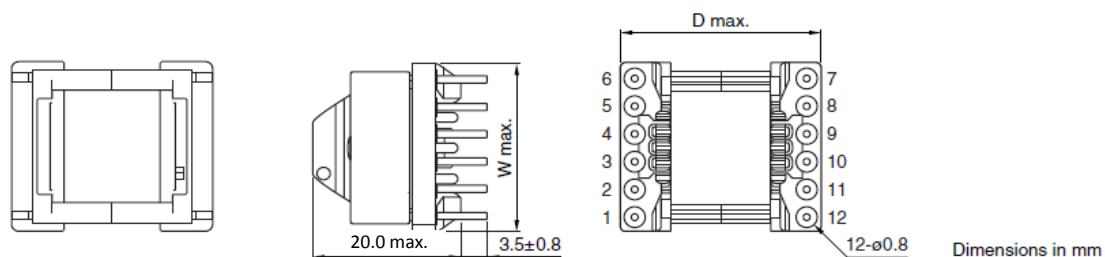
· All specifications are subject to change without notice.

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ECO24XXSLD Series for Multiple Outputs (Horizontal Type)

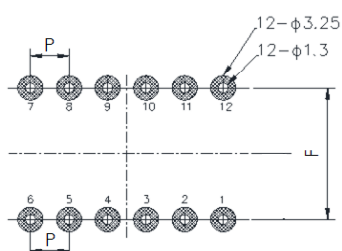
Compatible with lead-free solders

SHAPES AND DIMENSIONS



| Part No. | D max. | W max. | P | F |
|---------------------|--------|--------|-----|------|
| ECO2425SLD-D01H017 | 30.0 | 26.0 | 4.0 | 25.0 |
| ECO2425SLD-D02H0111 | | | | |

RECOMMENDED BASE MATERIAL OPENING SIZE



Dimensions in mm

Default Tolerance : ± 0.1

ITEMS APPLICABLE

| Series | Part No. |
|---------|---------------------|
| LQD2425 | ECO2425SLD-D01H017 |
| | ECO2425SLD-D02H0111 |

· Compatible ferrite materials for this product are the PC47 family.

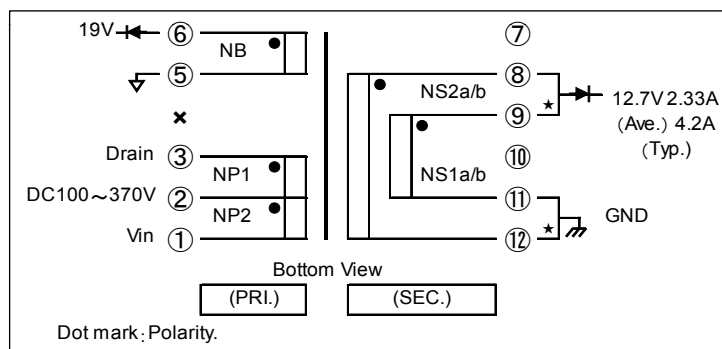
· Conformity to RoHS Directive: This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted ϕ ir.

· All specifications are subject to change without notice.

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SPECIFICATIONS / ECO2425SLD-D01H017

Compatible with lead-free solders

■ SCHEMATICS

■ SAFETY STANDARDS

| SAFETY STANDARDS | |
|-----------------------------|----------------------------------|
| IEC60335-1 Ed.4 | |
| Over Surface & Air Spacings | |
| PRI.-SEC. | 3.2 mm MINIMUM (Inside of coil) |
| PRI.-CORE | 3.2 mm MINIMUM (Outside of coil) |
| SEC.-CORE | 3.2 mm MINIMUM (Outside of coil) |

■ WINDING SPECIFICATIONS

| No | COIL | W.Dir | TERMINAL | TURNS | 2UEW | WINDING METHOD |
|----|----------------|---------|----------|-------|------|--------------------------------------|
| 0 | $600 \leq CTI$ | | | | | |
| 1 | N P1 | - | 3 - 2 | 38 | 0.35 | Solenoid+Spacing($\cong 23+15t_s$) |
| 2 | N S1a | - | 9 - 11 | 13 | 0.30 | PIN side Solenoid |
| 3 | N S1b | Reverse | 11 - 9 | 13 | 0.30 | NS1a Solenoid |
| 4 | N B | - | 6 - 5 | 19 | 0.20 | PIN side Solenoid |
| 5 | N S2a | - | 8 - 12 | 13 | 0.30 | PIN side Solenoid |
| 6 | N S2b | Reverse | 12 - 8 | 13 | 0.30 | NS2a Solenoid |
| 7 | N P2 | - | 2 - 1 | 38 | 0.35 | Solenoid+Spacing($\cong 21+17t_s$) |

SPECIFICATIONS / ECO2425SLD-D01H017

Compatible with lead-free solders

■ ELECTRICAL CHARACTERISTICS

| Test Conditions | | Temperature | : | 25±10°C | | |
|-----------------|---|--------------------------|--|---------------------------------------|---|--|
| | | Relative Humidity | : | 25~75%RH | | |
| No | Parameter | Test Terminal | Specification | Conditions | Test Instruments | |
| 4.1 | Inductance | 3 - 1 | 722 μ H \pm 10% | 10 kHz 1Vrms | LCR Meter Agilent : 4263B or Equivalent | |
| 4.2 | Leakage Inductance | 3 - 1 (SEC. short) | 15.0 μ H MAX. | 10 kHz 1Vrms | | |
| 4.3 | DC. Resistance | 3 - 2 | 0.240 Ω \pm 25% | | Milli ohm meter ADEX : AX-114 or Equivalent | |
| | | 9 - 11 | 65.0m Ω \pm 30% | | | |
| | | 6 - 5 | 0.460 Ω \pm 25% | | | |
| | | 8 - 12 | 77.0m Ω \pm 30% | | | |
| | | 2 - 1 | 0.355 Ω \pm 25% | | | |
| | | | | | | |
| 4.4 | Insulation Resistance | PRI.-SEC. | 100 M Ω MIN. | DC 500V | Meg Ohm Meter Toa : SM-5E or Equivalent | |
| | | PRI.,SEC. -CORE | | | | |
| 4.5 | Withstanding Voltage | PRI.-SEC. | Without Breakdown Sense:1mA f=50or60Hz | AC 3.0kVrms 1min or AC 3.6kVrms 1s | Puncture Tester Kikusui : TOS8650 or Equivalent | |
| | | PRI.-CORE SEC.-CORE | | AC 1.5kVrms 1min or AC 1.8kVrms 1s | | |
| | | | | | | |
| 4.6 | Impulse Test | 3 - 1 | Without Breakdown | Pulse 0.8kVo-p 3-5 Pulse | Impulse Tester ECG : DWS-05 or Equivalent | |
| 4.7 | Polarity & Turns Ratio X-X/ 3 - 1 | | | f=10kHz | Ratio Meter Ryowa : TRM-101A or Equivalent | |
| | | 9 - 11 | (0.1670) \pm 6.2%. | | | |
| | | 6 - 5 | (0.2510) \pm 4.2%. | | | |
| | | 8 - 12 | (0.1730) \pm 6.2%. | | | |
| | | 2 - 1 | (0.5130) \pm 2.5%. | | | |
| | | | | | | |

SPECIFICATIONS / ECO2425SLD-D01H017

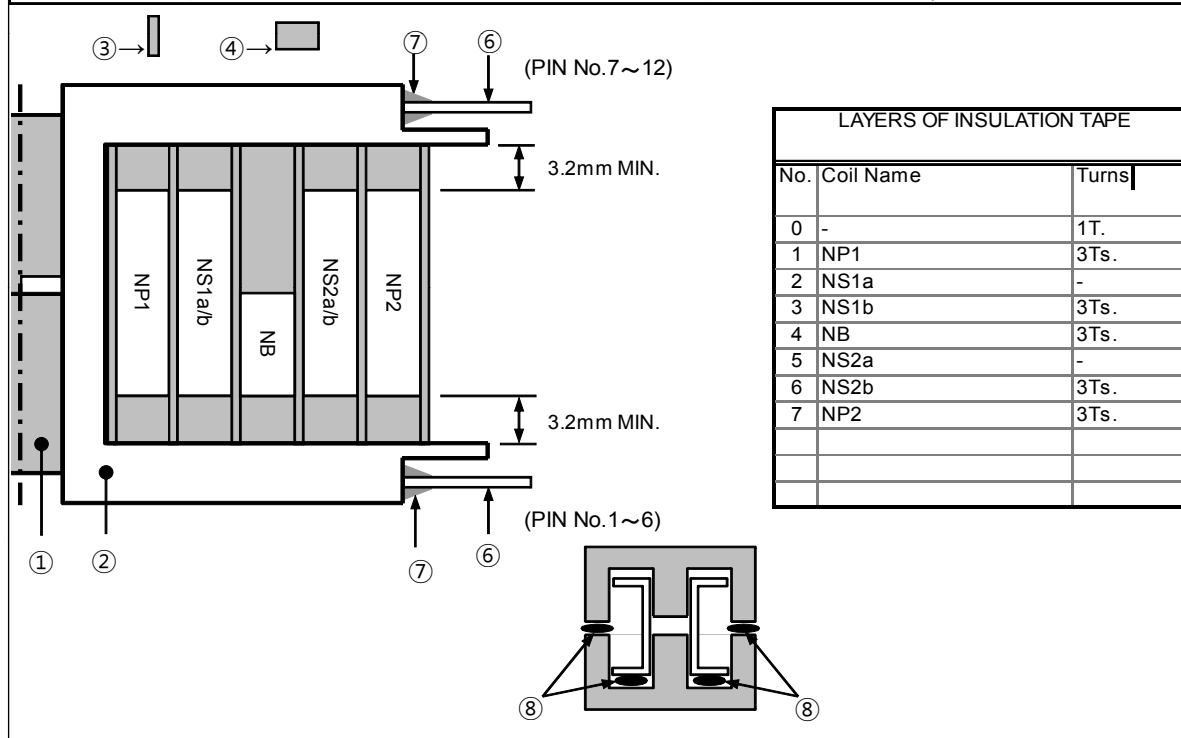
Compatible with lead-free solders

MATERIAL LIST AND INSULATING CONSTRUCTION

| No | ITEM & MATERIAL | MIN. THICKNESS OF 1 LAYER | UL T.I (°C) | MANUFACTURER | UL FILE NO. | |
|------------------------------|--|------------------------------|----------------|---|---|---------|
| ① | CORE Ferrite 24.7mmx25.6mmx8.1mm | — | — | TDK-EPC Corporation | — | |
| ② | BOBBIN Phenol Resin | PM-9820 | 0.65 mm | 150 | SUMITOMO BAKELITE CO.,LTD. | E41429 |
| ③ | INSULATION TAPE Polyester or PET Color : Yellow CTI ≥600V | CT with suffixes | 0.05 mm | 130 FR | JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD | E165111 |
| | | 630F | | | TERAOKA SEISAKUSHO CO.,LTD. | E56086 |
| ④ | FIXING TAPE FOR WIRE (Barrier Tape) Polyester or PET CTI ≥600V | WF with suffixes | — | 130 FR | JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD | E165111 |
| | | 673F | | | TERAOKA SEISAKUSHO CO.,LTD. | E56086 |
| ⑤ | WINDING WIRE (Primary) Polyurethane Enameled Copper Wire | — | 130 | PROSPERITY ELECTRIC WIRE & CABLE CO. | E196072 | |
| | 0.20 mm DIA : NB | | | TAI ELECTRIC WIRE&CABLE CO LTD | E85640 | |
| | 0.35 mm DIA : NP1, NP2 | | | | | |
| | WINDING WIRE (Secondary) Polyurethane Enameled Copper Wire | | | SHENZHEN FUJI FINE FACTORY | E303260 | |
| 0.30 mm DIA : NS1a/b, NS2a/b | HITACHI CABLE (JOHOR) SDN BHD | E215594 | | | | |
| | | | | THAI HITACHI ENAMEL WIRE CO LTD | E137472 | |
| ⑥ | TERMINAL PIN Φ0.8 (Soldered) Copper Clad Steel Wire Under Coating(Copper)25% Weight Ratio. (Ref)Surface Plating(Sn100%)3μm or More. | — | — | Optional | — | |
| ⑦ | SOLDER (For junction of a wire and a terminal) Lead-Free Sn-0.3Ag-0.7Cu | — | — | Optional | — | |
| ⑧ | ADHESIVE Acrylic , Urethane or Epoxy | — | — | Optional | — | |

※ 1. Tape Min. Thickness shows the total value. (Tape Base and Adhesive)

※ 2. Insulation Tape shall be able to withstand for 1 minute of 3000 Volts (r.m.s) Potential with 2 layers.

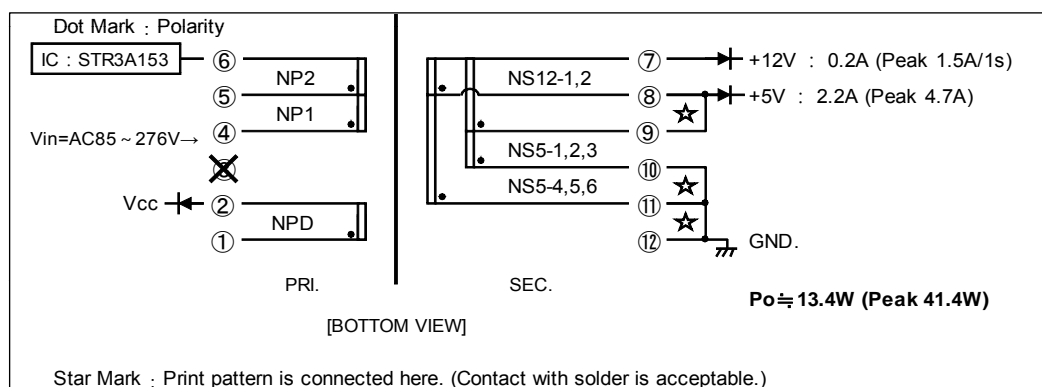


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SPECIFICATIONS / ECO2425SLD-D02H0111

Compatible with lead-free solders

■ SCHEMATICS

■ SAFETY STANDARDS

| SAFETY STANDARDS | | |
|--|----------------|-----------------|
| *IEC60065-Ed.7, *EN60065-Ed.7, GB, *E.A.M.S.Act, *UL60065-Ed.7, *CSA 22.2 No.60065 | | |
| | Inside of Coil | Outside of Coil |
| PRI. - SEC. | 4.8mm MIN. | 8.0mm MIN. |
| PRI. - CORE | 2.4mm MIN. | 4.0mm MIN. |
| SEC. - CORE | 2.4mm MIN. | 4.0mm MIN. |

■ WINDING SPECIFICATIONS

| No. | Order | Coil | Terminal | Turns | Wire | Note |
|-----|-------|---------|----------|-------|----------|-----------------|
| 1 | 1 | N P1 | 4 - 5 | 34 | UEW 0.26 | NP1+NP2=64Ts. |
| 2 | 2-1 | N S5-1 | 10 - 9 | 5 | UEW 0.30 | |
| 3 | 2-2 | N S5-2 | 9 - 10 | 5 | UEW 0.30 | Reverse Winding |
| 4 | 2-3 | N S5-3 | 10 - 9 | 5 | UEW 0.30 | |
| 5 | 3-1 | N S12-1 | 9 - 7 | 6 | UEW 0.23 | |
| 6 | 3-2 | N S12-2 | 7 - 8 | 6 | UEW 0.23 | Reverse Winding |
| 7 | 4-1 | N S5-4 | 11 - 8 | 5 | UEW 0.30 | |
| 8 | 4-2 | N S5-5 | 8 - 11 | 5 | UEW 0.30 | Reverse Winding |
| 9 | 4-3 | N S5-6 | 11 - 8 | 5 | UEW 0.30 | |
| 10 | 5 | N P2 | 5 - 6 | 30 | UEW 0.26 | |
| 11 | 6 | N PD | 2 - 1 | 17 | UEW 0.23 | Reverse Winding |

* Clockwise direction is an order direction when see a No.1 terminal pin side of transformer from the upper part.

SPECIFICATIONS / ECO2425SLD-D02H0111

Compatible with lead-free solders

■ ELECTRICAL CHARACTERISTICS

| Test Conditions | | Temperature | : | 25±10°C | | |
|-----------------|---|---------------------------------|--|---------------------------------------|---|--|
| | | Relative Humidity | : | 25~75%RH | | |
| No | Parameter | Test Terminal | Specification | Condition _s | Test Instruments | |
| 4.1 | Inductance | 4 - 6 | 446 μH ± 10%. | 10 kHz 1Vrms | LCR Meter Agilent : 4263B or Equivalent | |
| 4.2 | Leakage Inductance | 4 - 6 (Sec.All short) | 15.7 μH MAX. | 100 kHz 1Vrms | | |
| 4.3 | DC. Resistance | 1 - 2 | 0.390 Ω ±20%. | | Milli ohm meter ADEX : AX-114 or Equivalent | |
| | | 4 - 5 | 0.385 Ω ±20%. | | | |
| | | 5 - 6 | 0.478 Ω ±20%. | | | |
| | | 10 - 9 | 17.7 mΩ ±30%. | | | |
| | | 11 - 8 | 19.8 mΩ ±30%. | | | |
| | | 9 - 7 | 109.3 mΩ ±20%. | | | |
| | | 8 - 7 | 110.4 mΩ ±20%. | | | |
| 4.4 | Insulation Resistance | PRI.-SEC. PRI.,SEC. -CORE | 100 MΩ MIN. | DC 500V | Meg Ohm Meter Toa : SM-5E or Equivalent | |
| 4.5 | Withstanding Voltage | PRI.-SEC. | Without Breakdown Sense:1mA f=50or60Hz | AC 3.0kVrms 1min or AC 3.6kVrms 1s | Puncture Tester Kikusui : TOS8650 or Equivalent | |
| | | PRI.-CORE SEC.-CORE | | AC 1.5kVrms 1min or AC 1.8kVrms 1s | | |
| | | | | | | |
| 4.6 | Impulse Test | 4 - 6 (11,10 short) | Without Breakdown | Pulse 0.8kVo-p 3--5 Pulse | Impulse Tester ECG : DWS-05 or Equivalent | |
| 4.7 | Polarity & Turns Ratio X-X/ 4 - 6 | 1 - 2 | (0.2730) ± 4.7%. | f=10kHz | Ratio Meter Ryowa : TRM-101A or Equivalent | |
| | | 4 - 5 | (0.5149) ± 2.4%. | | | |
| | | 10 - 9 | (0.0772) ± 16%. | | | |
| | | 11 - 8 | (0.0788) ± 16%. | | | |
| | | 9 - 7 | (0.0941) ± 13%. | | | |
| | | 8 - 7 | (0.0933) ± 13%. | | | |

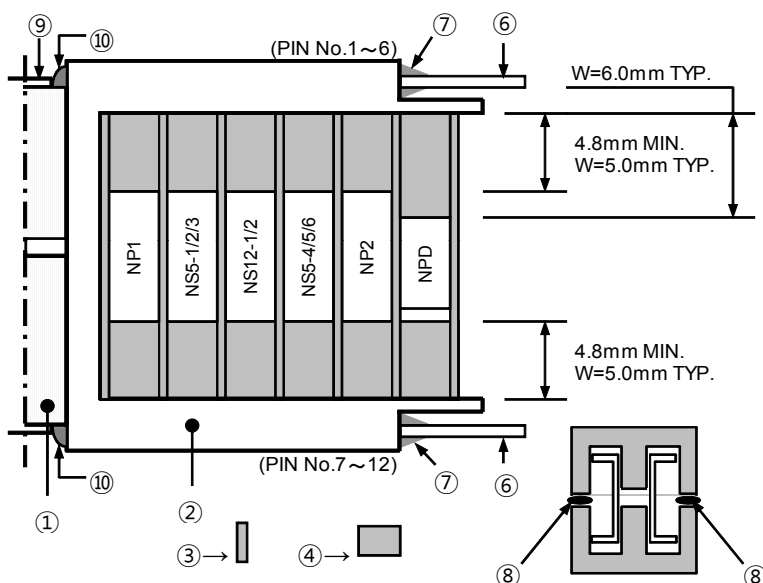
SPECIFICATIONS / ECO2425SLD-D02H0111

Compatible with lead-free solders

MATERIAL LIST AND INSULATING CONSTRUCTION

| No | ITEM & MATERIAL | MIN.THICKNESS OF 1 LAYER | UL T.I (°C) | MANUFACTURER | UL FILE NO. |
|----|--|---|--------------|--|-------------------------------|
| ① | CORE Ferrite 24.7mmx25.6mmx8.1mm | — | — | TDK-EPC Corporation | — |
| ② | BOBBIN Phenol Resin | PM-9820 T375J | 150 94V-0 | SUMITOMO BAKELITE CO.,LTD. | E41429 |
| | | | | CHANG CHUN PLASTICS CO.,LTD | E59481 |
| ③ | INSULATION TAPE Polyester Material group I (CTI≥600V) (Yellow) | 1318-1 CT with suffixes | 130 | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | E17385 |
| | | | | JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD | E165111 |
| ④ | FIXING TAPE FOR WIRE (Barrier Tape) Polyester or PET Material group I (CTI≥600V) | 44D-A or 44T-A 343BN@@ WF with suffixes | 130 | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | E17385 |
| | | | | NITTO DENKO CORP. | E34833 |
| | | | | JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD | E165111 |
| ⑤ | WINDING WIRE Polyurethane Enameled Copper Wire 0.26 mm DIA : NP1, NP2 0.23 mm DIA : NPD | — | 130 | PROSPERITY ELECTRIC WIRE & CABLE CO. | E196072 |
| | | | | HANGZHOU WEIFENG ELECTRONIC CO.,LTD. | E229341 |
| | | | | TAI ELECTRIC WIRE&CABLE CO LTD | E85640 |
| | | | | ZHUHAI WEIHAN WIRE CO LTD | E339217 |
| | | | | SHENZHEN FUJI FINE FACTORY | E303260 |
| | | | | HITACHI CABLE (JOHOR) SDN BHD THAI HITACHI ENAMEL WIRE CO LTD ELEKTRISOLA (MALAYSIA) SDN BHD | E215594 E137472 E143312 |
| ⑥ | TERMINAL PIN Copper Clad Steel Wire Under Coating(Copper)25% Weight Ratio. (Ref)Surface Plating(Sn100%)3µm or More. | — | — | Optional | — |
| ⑦ | SOLDER (For junction of a wire and a terminal) Lead-Free | — | — | Optional | — |
| ⑧ | ADHESIVE Acrylic , Urethane or Epoxy | — | — | Optional | — |
| ⑨ | FIXING TAPE FOR CORE Polyester (White) | 1318-1 or 1350F-1 CT with suffixes | 130 | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | E17385 |
| | | | | JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD | E165111 |
| ⑩ | ADHESIVE Silicon | — | — | Optional | — |

※ 1. Tape Min. Thickness shows the total value. (Tape Base and Adhesive)
 ※ 2. Insulation Tape shall be able to withstand for 1 minute of 3000 Volts (r.m.s) Potential with 2 layers.



| No. | Coil Name | Turns |
|-----|-------------|-------|
| 0 | Inner Layer | 1T |
| 1 | NP1 | 3Ts |
| 2 | NS5-1 | — |
| 3 | NS5-2 | — |
| 4 | NS5-3 | 2Ts |
| 5 | NS12-1 | — |
| 6 | NS12-2 | 2Ts |
| 7 | NS5-4 | — |
| 8 | NS5-5 | — |
| 9 | NS5-6 | 3Ts |
| 10 | NP2 | 3Ts |
| 11 | NPD | 3Ts |

[Cleepage Distance & Clearance]

| | Inside of Coil | Outside of Coil |
|-------|----------------|-----------------|
| P-S | 4.8mm MIN. | 8.0mm MIN. |
| P,S-C | 2.4mm MIN. | 4.0mm MIN. |

※Design value

· All specifications are subject to change without notice.
 Please read the precautions before using this catalog.