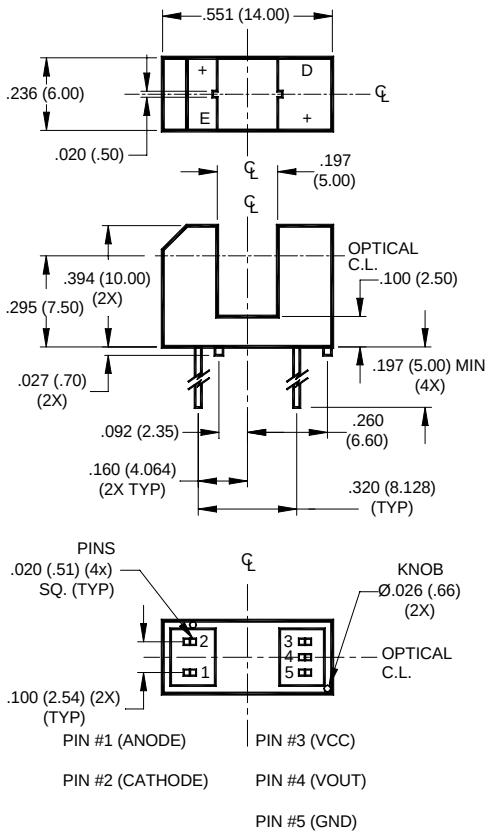
FAIRCHILD
SEMICONDUCTOR™

QVE00120

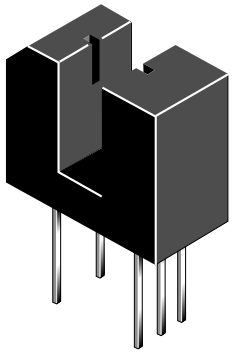
OPTOLOGIC® OPTICAL INTERRUPTER SWITCH

PACKAGE DIMENSIONS



NOTES:

1. Dimensions for all drawings are in inches (millimeters).
2. Tolerance of ± .010 (.25) on all non-nominal dimensions unless otherwise specified.



FEATURES

- No contact switching
- 5.0 mm wide slot
- 0.5 mm aperture width
- Opaque black plastic housing
- Output configuration: Buffer open-collector
- TTL/CMOS compatible output
- Locating knobs on housing base for accurate mounting

NOTES (Applies to Max Ratings and Characteristics Tables.)

1. Derate power dissipation linearly 1.67 mW/°C above 25°C.
2. Derate power dissipation linearly 2.50 mW/°C above 25°C.
3. RMA flux is recommended.
4. Methanol or isopropyl alcohols are recommended as cleaning agents.
5. Soldering iron 1/16" (1.6mm) from housing.
6. As long as leads are not under any stress or spring tension.

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C unless otherwise specified)

Parameter	Symbol	Rating	Units
Operating Temperature	T_{OPR}	-40 to +85	°C
Storage Temperature	T_{STG}	-40 to +85	°C
Lead Temperature (Solder Iron)(3,4,5,6)	T_{SOL-I}	240 for 5 sec	°C
Lead Temperature (Solder Flow)(3,4,5,6)	T_{SOL-F}	260 for 10 sec	°C
EMITTER			
Continuous Forward Current	I_F	50	mA
Reverse Voltage	V_R	5	V
Power Dissipation(1)	P_D	100	mW
SENSOR			
Output Current	I_O	50	mA
Supply Voltage	V_{CC}	16	V
Output Voltage	V_O	30	V
Power Dissipation(2)	P_D	150	mW

ELECTRICAL / OPTICAL CHARACTERISTICS (T_A =25°C)

PARAMETER	TEST CONDITIONS	SYMBOL	MIN.	TYP.	MAX.	UNITS
Operating Supply Voltage		V_{CC}	4.5		16	V
INPUT DIODE						
Forward Voltage	I_F = 20 mA	V_F	—		1.7	V
Reverse Leakage Current	V_R = 5 V	I_R	—		10	μA
COUPLED						
Operating Supply Current	I_F = 15 mA or 0 mA, V_{CC} = 16 V	I_{CC}	—		5	mA
Low Level Output Voltage	I_F = 15 mA, V_{CC} = 5 V, R_L = 360 Ω	V_{OL}	—		0.4	V
High Level Output Current	I_F = 0 mA, V_{CC} = 5 V, V_{OH} = 30 V	I_{OH}	—		100	μA
Turn on Threshold Current	V_{CC} = 5 V, R_L = 360 Ω	$I_F(+)$	—		15	mA
Turn off Threshold Current	V_{CC} = 5 V, R_L = 360 Ω	$I_F(-)$	0.50		—	mA
Hysteresis Ratio		$I_F(+) / I_F(-)$		1.2		
Propagation Delay	V_{CC} = 5 V, R_L = 360 Ω	t_{PLH}, t_{PHL}		5		μs
Output Rise and Fall Time	V_{CC} = 5 V, R_L = 360 Ω	t_r, t_f		70		ns

TYPICAL PERFORMANCE CURVES

Fig. 1 Output Voltage vs. Input Current

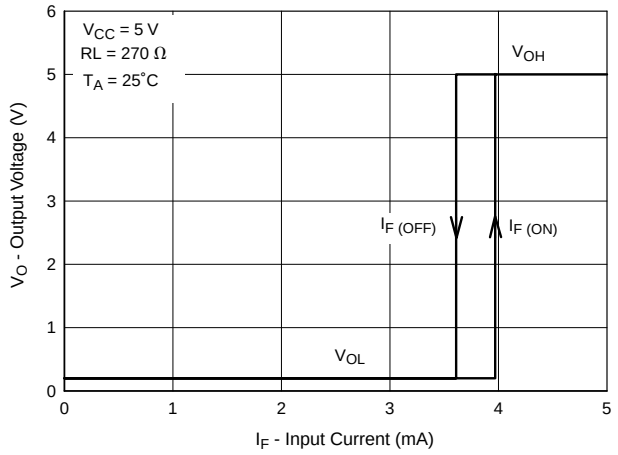


Fig. 2 Normalized Threshold Current vs. Shield Distance

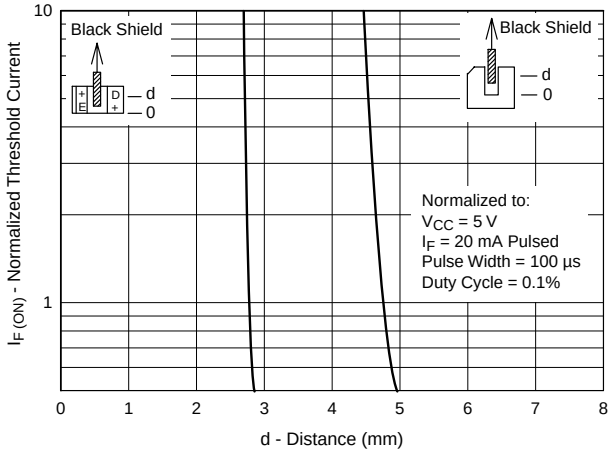


Fig. 3 Normalized Threshold Current vs. Supply Voltage

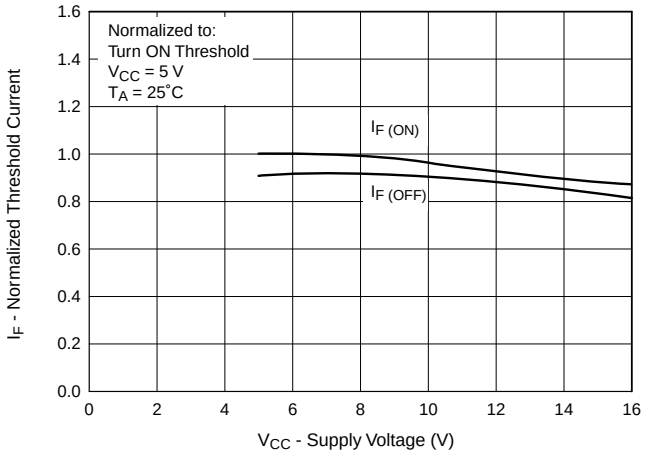


Fig. 4 Normalized Threshold Current vs. Ambient Temperature

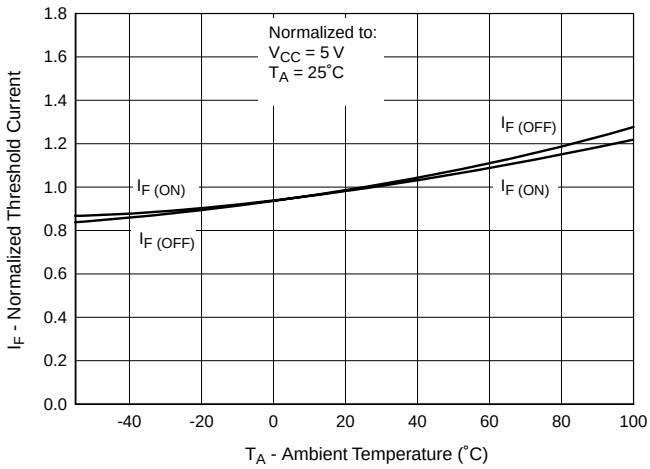


Fig. 5 Forward Current vs. Forward Voltage

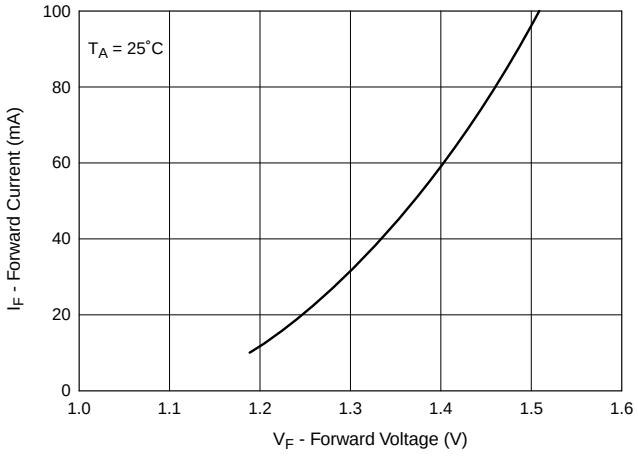


Fig. 6 Low Output Voltage vs. Output Current

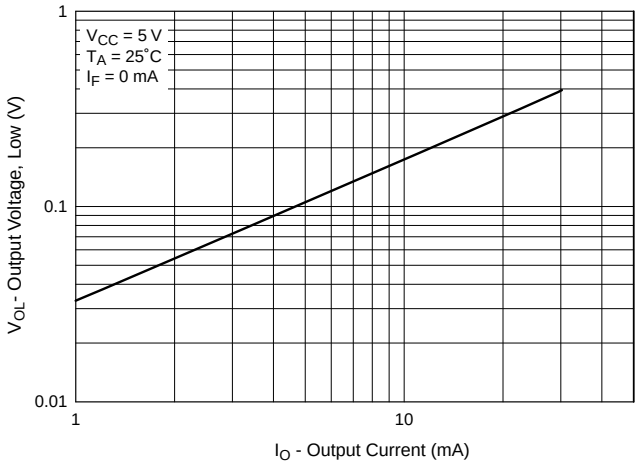


Fig. 7 Response Time vs. Forward Current

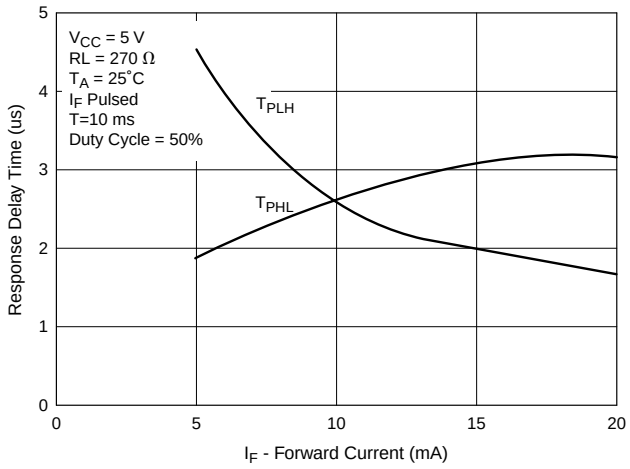
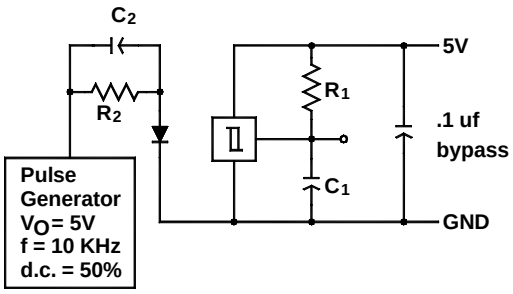


Fig. 8 Switching Speed Test Circuit



R_1= 270 Ω C_1= 15 pf $C_1$and C_2include probe and
R_2= 360 Ω C_2= 20 pf stray wire capacitance

Fig. 9 Typical Operating Circuit

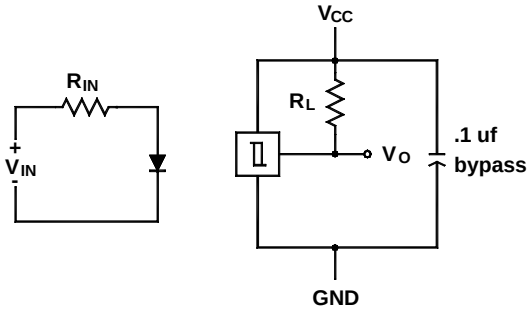


Fig. 10 Switching Test Curve for Buffers

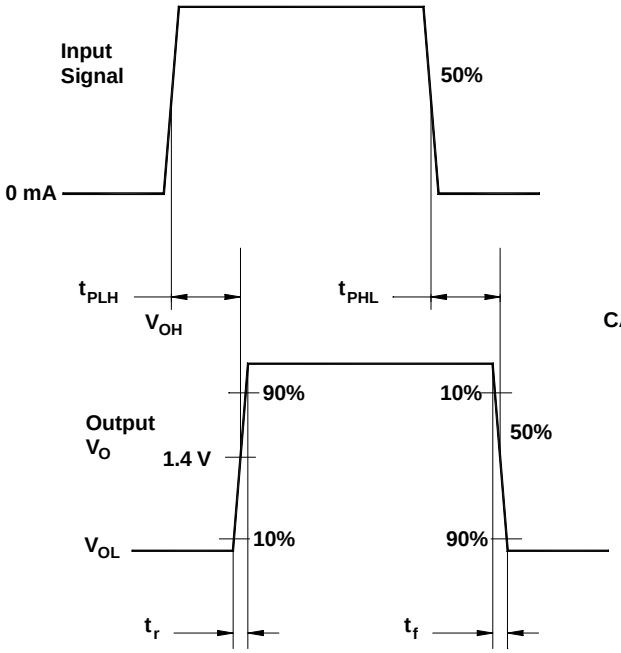
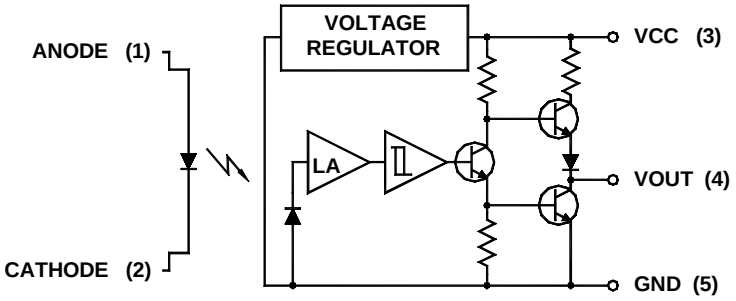


Fig. 11 Switching Test Curve for Inverters



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