Plastic Fiber Optic Photologic Detector IF D96F

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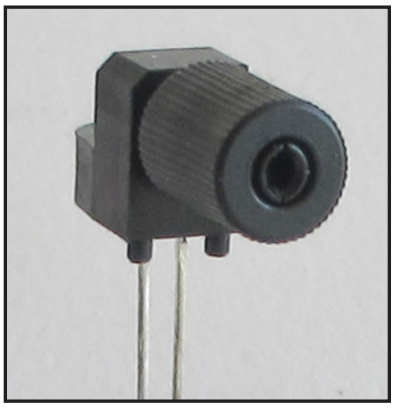


Applications

- Digital Data Links
- PC-to-Peripheral Links
- Digitized Audio
- Intra-System Links: Board-to-Board, Rack-to-Rack
- Medical Instruments
- Automotive Electronics
- Robotics Communications
- EMC/EMI Signal Isolation

Description

The IF-D96F is a medium-speed photologic detector housed in a "connector-less" style plastic fiber optic package. The detector contains an IC with a photodiode, linear amplifier, voltage comparator, and Schmitt trigger logic circuit. The IF-D96F features an inverted open-collector Schottky transistor output (active low). The device can drive up to 5 TTL loads over output (pull-up) voltages ranging from 4.5 to 15 Volts. Optimized for visible wavelengths of 600 to 780 nm. The detector package features an internal micro-lens and a precision-molded PBT housing to ensure efficient optical coupling with standard 1000 µm core plastic fiber cable.

Application Highlights

The IF-D96F is suitable for digital data links at rates up to 5 Mbps. A Schmitt trigger improves noise immunity and TTL/CMOS logic compatibility greatly simplifies interfacing with existing digital circuits. An enhanced internal electrical architecture ensures stable operation and wide dynamic range. The integrated design of the IF-D96F provides simple, cost-effective implementation in a variety of digital applications.

Features

- High Optical Sensitivity
- Mates with Standard 1000 µm Core, 2.2 mm Jacketed Plastic Fiber Optic Cable
- No Optical Design Required
- Inexpensive Plastic Connector Housing
- Internal Micro-Lens for Efficient Optical Coupling
- Connector-Less Fiber Termination
- Light-Tight Housing Provides Interference-Free Transmission
- Open Collector Output
- RoHS Compliant

Maximum Ratings

(T_A =25°C)

Operating and Storage Temperature Range (T_{OP}, T_{STG}).....-40°to 85°C

Soldering Temperature (2mm from case bottom) (T_S) t ≤ 5 s.....240°C

Supply Voltage, (V_S) .....-.5 to 15 V

Voltage at Output lead .....-.5 to 15 V

Output Sinking Current, DC.. 25 mA

Power Dissipation

T_A=25°C .....80 mW

De-rate Above 25°C ...1.33 mW/°C

CAUTION: The IF D96F is ESD sensitive. To minimize risk of damage observe appropriate precautions during handling and processing.

Characteristics (T_A=25°C) V_{CC} = 4.75 to 5.25 V unless otherwise specified

Parameter	Symbol	Min.	Typ.	Max.	Unit
Peak Sensitivity	λ_{PEAK}	–	700	–	nm
Spectral Sensitivity (Response=80% of Maximum)	$\Delta\lambda$	500	–	780	nm
Recommended Operating Voltage	V_{CC}	4.5	-	15.0	V
High Level Supply Current V_{CC}=5.25 V *	I_{CCH}	–	3.5	6	mA
Low Level Supply Current V_{CC}=5.25 V *	I_{CCL}	–	12	14.5	mA
Light Level to Trigger (R_L=1 kΩ λ=650 nm)	Er (+)	-	7 -21.6	-	µW dBm
Hysterisis Ratio	Er(+)/Er(-)	-	1.1	-	-
Light Level to Not Trigger (λ=660 nm)	Er (–)	0.1 -40	-	-	µW dBm
High Level Output Current V_{OH}= 15 V (P_{IN}=0)	I_{OH}	-	5	100	µA
Low Level Output Voltage (I_{OL}= 8 mA) (P_{IN}=10 µW)	V_{OL}	-	0.1	0.55	V
Propagation Delay, Low-High (f= 100.0 kHz, R_L= 5 TTL Loads)	t_{PLH}	-	210	250	ns
Propagation Delay, High-Low (f= 100.0 kHz, R= 5 TTL Loads)	t_{PHL}	-	110	150	ns
Output Risetime (f= 100.0 kHz, R_L= 5 TTL Loads)	t_r	-	50	-	ns
Output Falltime (f= 100.0 kHz, R_L= 5 TTL Loads)	t_f	-	5	-	ns

* Load = 620 Ohms, included in suppply current

IF D96F Plastic Fiber Optic Photologic Detector

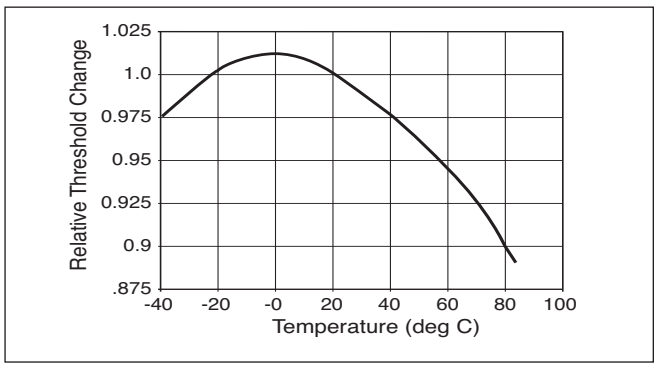


FIGURE 1. Normalized threshold irradiance vs. amb. temp.

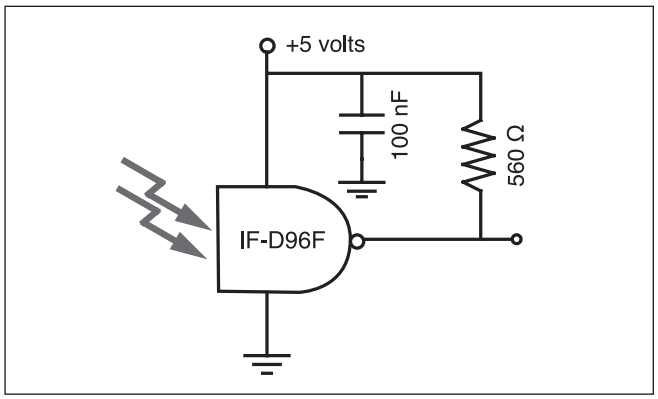
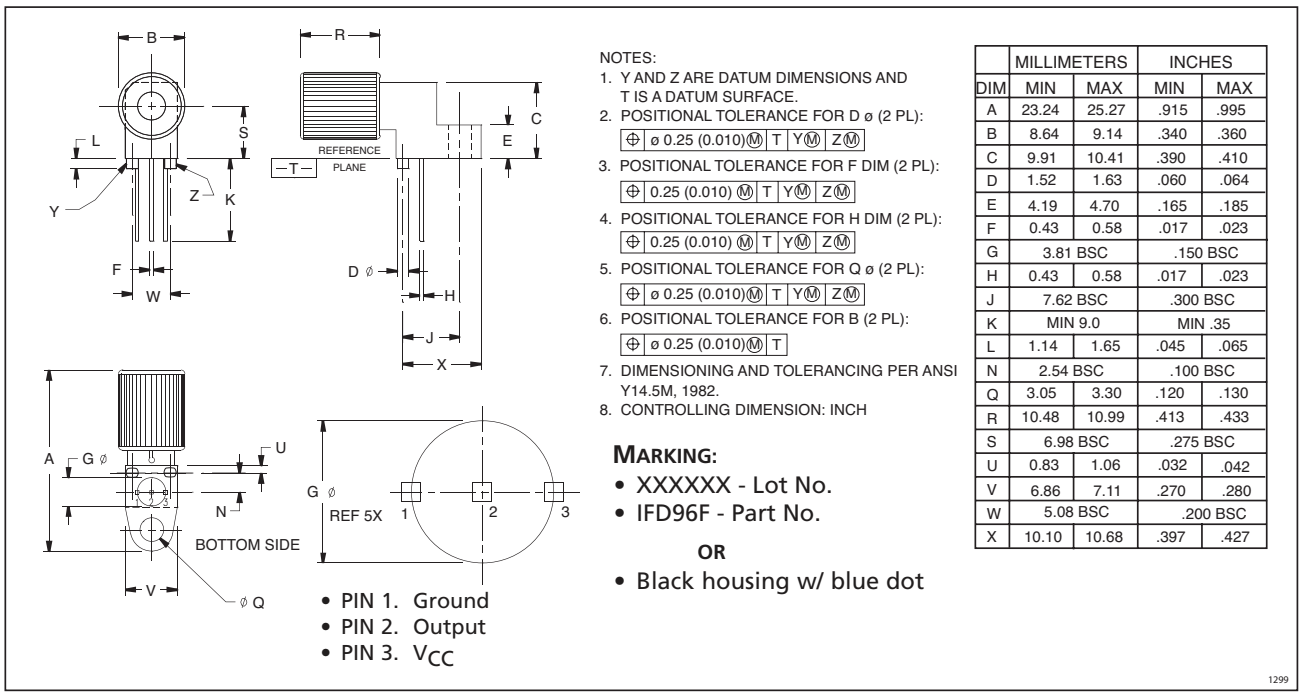


FIGURE 2. Typical operating circuit.

FIBER TERMINATION INSTRUCTIONS

1. Cut off the ends of the optical fiber with a single-edge razor blade or sharp knife. Try to obtain a precise 90-degree angle (square).
2. Insert the fiber through the locking nut and into the connector until the core tip seats against the internal micro-lens.
3. Screw the connector locking nut down to a snug fit, locking the fiber in place.



NOTES:
1. Y AND Z ARE DATUM DIMENSIONS AND T IS A DATUM SURFACE.
2. POSITIONAL TOLERANCE FOR D ø (2 PL): ⌖ | ø 0.25 (0.010)Ⓜ | T | YⓂ | ZⓂ
3. POSITIONAL TOLERANCE FOR F DIM (2 PL): ⌖ | 0.25 (0.010) Ⓜ | T | YⓂ | ZⓂ
4. POSITIONAL TOLERANCE FOR H DIM (2 PL): ⌖ | 0.25 (0.010) Ⓜ | T | YⓂ | ZⓂ
5. POSITIONAL TOLERANCE FOR Q ø (2 PL): ⌖ | ø 0.25 (0.010)Ⓜ | T | YⓂ | ZⓂ
6. POSITIONAL TOLERANCE FOR B (2 PL): ⌖ | ø 0.25 (0.010)Ⓜ | T
7. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
8. CONTROLLING DIMENSION: INCH

MARKING:
- XXXXXX - Lot No.
- IFD96F - Part No.

OR
- Black housing w/ blue dot

	MILLIMETERS		INCHES	
DIM	MIN	MAX	MIN	MAX
A	23.24	25.27	.915	.995
B	8.64	9.14	.340	.360
C	9.91	10.41	.390	.410
D	1.52	1.63	.060	.064
E	4.19	4.70	.165	.185
F	0.43	0.58	.017	.023
G	3.81 BSC		.150 BSC	
H	0.43	0.58	.017	.023
J	7.62 BSC		.300 BSC	
K	MIN 9.0		MIN .35	
L	1.14	1.65	.045	.065
N	2.54 BSC		.100 BSC	
Q	3.05	3.30	.120	.130
R	10.48	10.99	.413	.433
S	6.98 BSC		.275 BSC	
U	0.83	1.06	.032	.042
V	6.86	7.11	.270	.280
W	5.08 BSC		.200 BSC	
X	10.10	10.68	.397	.427

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FIGURE 3. Case outline.

CAUTION:
- To avoid degraded device life due to package stress, do not bend or form leads outside the orientation shown on drawing.
- Ensure that solder flux does not migrate into the device and block the optical path, degrading the performance.
- If washing the device, liquid may become trapped in the part cavity. Ensure that all potentially corrosive materials are flushed out of the device.