Plastic Fiber Optic 50 Mbps Photologic Detector IF-D97

Applications

- PC-to-Peripheral Data Links
- Motor Controller Triggering
- Local Area Networks
- Medical Instruments
- Automotive Electronics
- Digitized Video
- Electronic Games
- Robotics Communications
- Reduction of Lightning and Voltage Transient Susceptibility

Description

The IF-D97 is a high-speed photologic detector housed in a "connector-less" style plastic fiber optic package. The detector contains an IC with a photodiode, linear amplifier and Schmitt trigger featuring an ACT logic compatible totem pole output. Optical response of the IF-D97 extends from 400 to 1050 nm, making it compatible with a wide range of visible and IR LED and laser diode sources. The detector package features an internal micro-lens and a precision-molded PBT housing to ensure efficient optical coupling into standard 1000 µm core plastic fiber cable.

Application Highlights

The fast transition times of the IF-D97 make it suitable for medium-speed digital data links. Link distances in excess of 75 meters at data rates of 50 Mbps are possible using standard 1000 µm core plastic fiber and an IF-E98 LED. The integrated design of the IF-D97 provides simple, cost-effective implementation in a wide variety of digital applications.

Features

- No Optical Design Required
- Mates with Standard 1000 µm Core Jacketed Plastic Fiber Cable
- Internal Micro-Lens for Efficient Coupling
- Inexpensive Plastic Connector Housing
- Connector-Less Fiber Termination and Connection
- Interference-Free Transmission from Light-Tight Housing
- Totem-Pole Output
- Totally Integrated Solution
- *Lower Current Stand-by Model Available as Special Order*

Maximum Ratings

(T_A = 25°C)

Operating Temperature Range (T_{OP}) .....-10° to 70°C

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

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

Supply Voltage, (V_S)..... -.5 to 7 V

Power Dissipation (P_{TOT}) T_A=25°C .....100 mW

De-rate Above 25°C .....1.7 mW/°C

Characteristics (T_A=25°C)

Parameter	Symbol	Min	Typ	Max	Unit
Peak Sensitivity	λ_{PEAK}	–	800	–	nm
Spectral Sensitivity (S=10% of S_{MAX})	$\Delta\lambda$	400	–	1050	nm
Operating Voltage	V_{CC}	4.75	5	5.25	V
Supply Current	I_{CC}	–	–	40	mA
Light Required to Trigger (V_{CC}=5 V, λ=660 nm)	Er (+)	17 -17	– –	–	µW dBm
High Level Output Voltage (I_{OH}= -2.0 µA)	V_{OH}	2	–	–	V
Low Level Output Voltage (I_{OH}= .6 mA)	V_{OL}	–	–	1	V
Output Rise and Fall Times (f= 10.0 kHz, R_L= 10 TTL Loads)	t_r, t_f	–	–	7	ns
Propagation delay time	t_p	–	12	–	ns

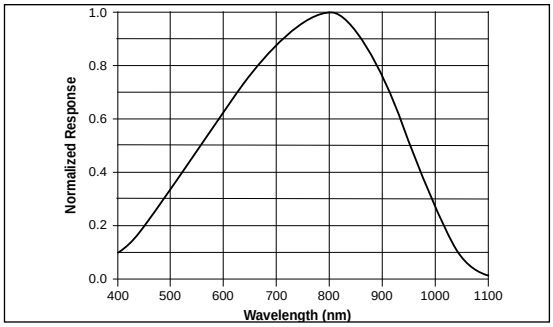


FIGURE 1. Typical detector response versus wavelength.

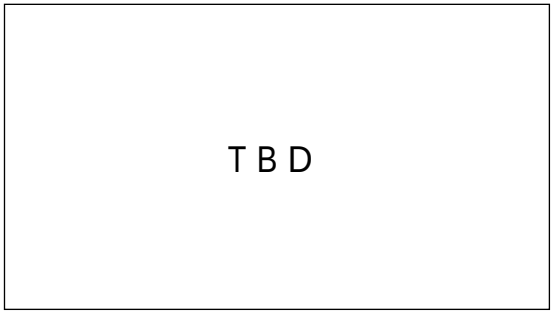


FIGURE 2. Normalized threshold irradiance vs. amb. temp.

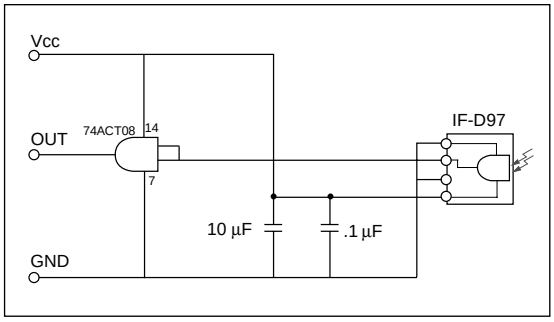
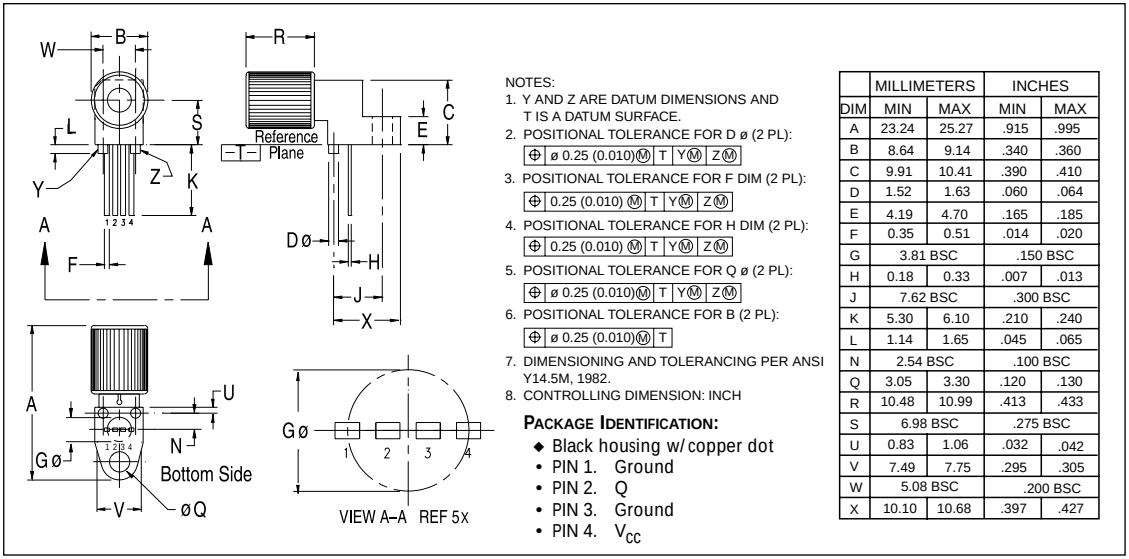


FIGURE 3. Typical interface circuit.

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

PACKAGE IDENTIFICATION:
- ◆ Black housing w/ copper dot
- • PIN 1. Ground
- • PIN 2. Q
- • PIN 3. Ground
- • PIN 4. V_{CC}

	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	0.35	0.51	.014	.020
G	3.81 BSC		.150 BSC	
H	0.18	0.33	.007	.013
J	7.62 BSC		.300 BSC	
K	5.30	6.10	.210	.240
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	7.49	7.75	.295	.305
W	5.08 BSC		.200 BSC	
X	10.10	10.68	.397	.427

FIGURE 4. Case outline.