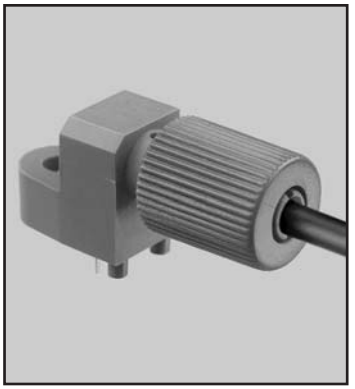
50 MHz Plastic Fiber Optic Red LED — IF-E98

5/2/06



Description

The IF-E98 is a high-speed red LED housed in a "connector-less" style plastic fiber optic package. The output spectrum of the IF-E98 is produced by a GaAlAs die that peaks at a wavelength of 650 nm, one of the optimal transmission windows of PMMA plastic optical fiber. The device 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 fast transition times of the IF-E98 make it suitable for medium-speed analog and 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 when matched to an IF-D97 photo-logic detector. The drive circuit is simpler than required for laser diodes, making the IF-E98 a good low-cost alternative in a variety of analog and digital applications.

Applications

- PC-to-Peripheral Data Links
- Motor Controller Triggering
- Local Area Networks
- Medical Instruments
- Automotive Electronics
- Digitized Video
- Electronic Games
- Robotics Communications
- Isolation from Lightning and Voltage Transients

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
- Excellent Linearity
- Visible Light Output
- RoHS Compliant

Maximum Ratings

(T_A=25°C)

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

Junction Temperature (T_J) .....85°C

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

Reverse Voltage (V_R).....5 V

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

De-rate Above 25°C .....1.75 mW/°C

Forward Current, DC (I_F) .....40 mA

Surge Current (I_{FSM}) t ≤ 10 µsec.....100 mA

Characteristics (T_A=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit
Peak Wavelength	λ_{PEAK}	640	650	660	nm
Spectral Bandwidth (50% of I_{MAX})	$\Delta\lambda$	–	20	–	nm
Output Power Coupled into Plastic Fiber (1 mm core diameter). Lens to Fiber Distance ≤0.1 mm, 1 m SH4001 fiber, I_F=20 mA	Φmin	275 -5.6	350 -4.6	425 -3.7	µW dBm
Switching Times (10% to 90% and 90% to 10%) (R_L=47 Ω, I_F=30 mA)	t_r, t_f	–	–	8	ns
Forward Voltage (I_F=20 mA)	V_f	–	1.9	2.3	V

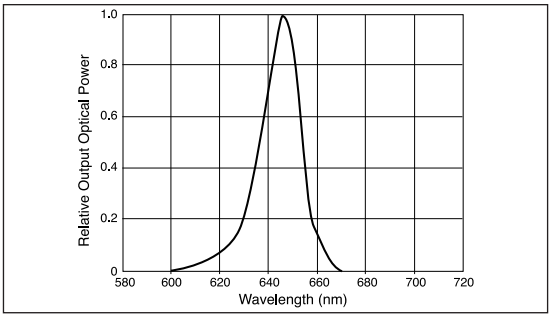


FIGURE 1. Typical spectral output versus wavelength.

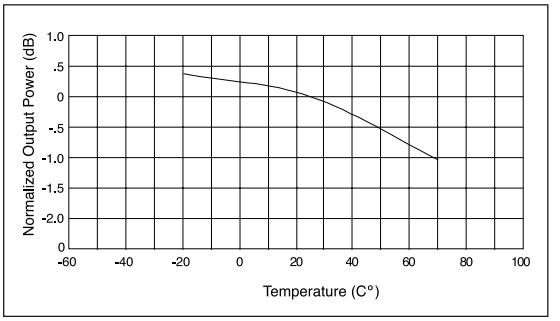


FIGURE 2. Output power versus temperature.

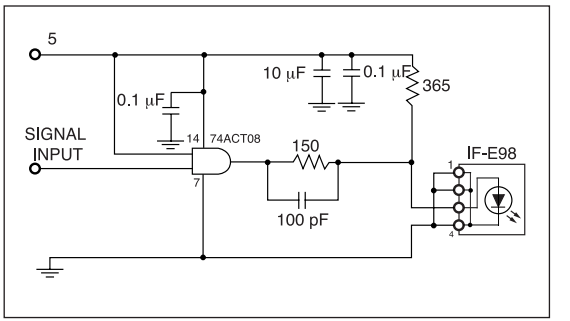
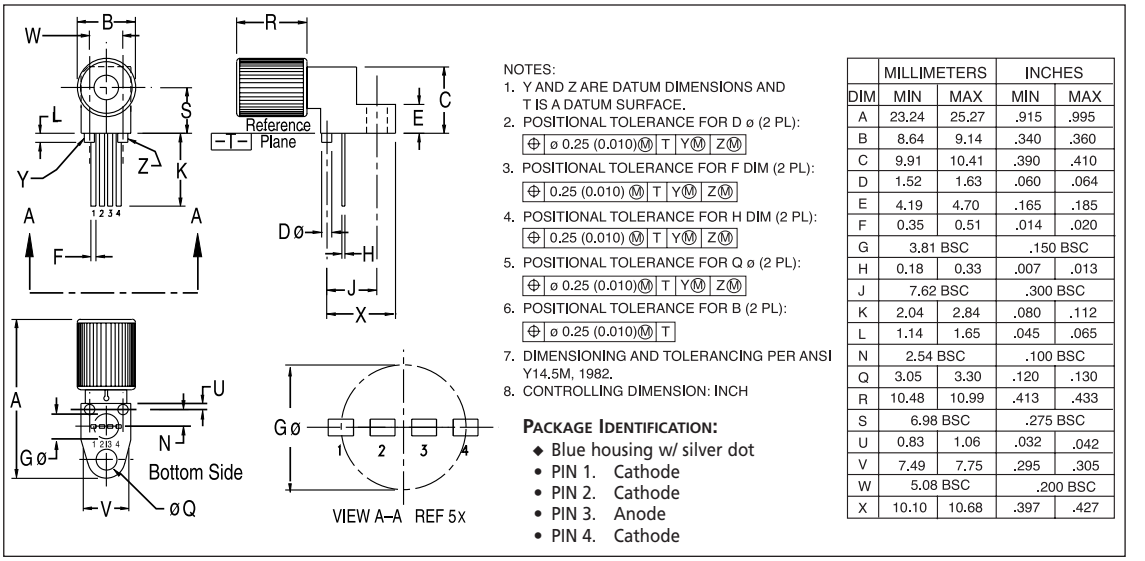


FIGURE 3. Typical interface circuit. (I_F = 30 mA)

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:
- ◆ Blue housing w/ silver dot
- • PIN 1. Cathode
- • PIN 2. Cathode
- • PIN 3. Anode
- • PIN 4. Cathode

	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	2.04	2.84	.080	.112
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.

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