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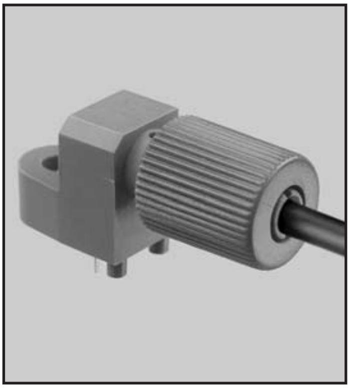
155 Mbps Plastic Fiber Optic Red LED IF-E99

12/19/06



Description

The IF-E99 is a very high-speed red LED housed in a “connector-less” style plastic fiber optic package. The output spectrum of the IF-E99 is produced by a GaAIAs 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 ensures efficient optical coupling with standard 1000 µm core plastic fiber cable.

Application Highlights

The fast transition times of the IF-E99 make it suitable for high-speed digital data links. Link distances in excess of 75 meters at data rates of 155 Mbps are possible using standard 1000 µm core plastic fiber and an IF-D98 photologic detector. The wide analog bandwidth permits direct modulation at RF frequencies exceeding 100 MHz. Drive circuit design for the IF-E99 requires good RF and digital design techniques, but is much simpler than required for laser diodes, making it a good low-cost solution in a variety of high frequency POF analog and digital applications.

Applications

- PC-to-Peripheral Data Links
- Motor Controller Triggering
- Ethernet LANs
- Medical Instruments
- Automotive Electronics
- Digitized Video and HDTV
- Sonet/SDH Transmitters
- 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 Temperature Range (T_{OP}) ....-0° to 60°C

Storage Temperature Range (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 ....1.33 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})	$\Delta\lambda$	–	10	–	nm
Output Power Coupled into Plastic Fiber (1 mm core diameter). Lens to Fiber distance ≤ .1 mm, 1m SH4001 fiber, I_F=20 mA	Φ	875 -.58	950 -.2	1050 .21	µW dBm
Switching Times (10% to 90% and 90% to 10%) (R_L=47 Ω, I_F=10 mA)	t_r, t_f	–	–	3	ns
Capacitance (V_F=0, F=1 MHz)	C_0	–	10	–	pF
Forward Voltage (I_F=30 mA)	V_f	–	2.05	2.3	V
Cut off frequency	f_C	–	100	–	MHz

Notes:

1. A bypass capacitor (0.1 µF) is connected to the lead at a position within 2 mm from the lead end, and a 4.7 µF capacitor is also connected nearby the power supply line.

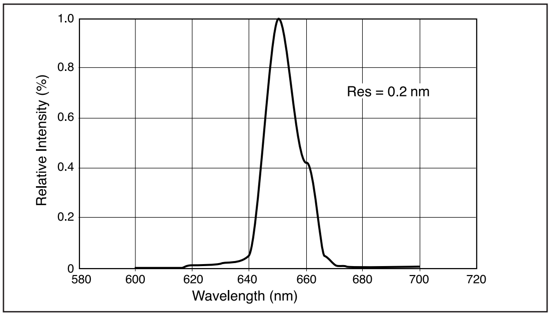


FIGURE 1. Relative intensity versus wavelength.

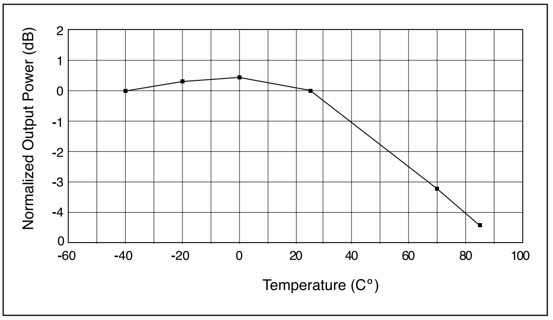


FIGURE 2. Optical Power output versus temperature (I_F=20mA)

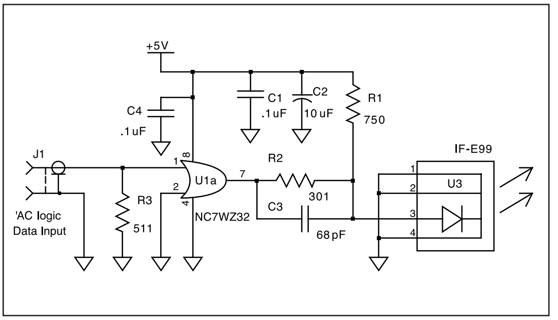
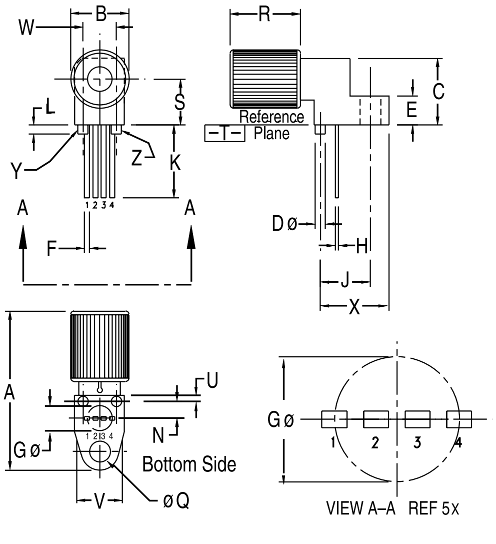


FIGURE 3. Typical interface circuit.

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:
- ◆ Blue housing w/ gold 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.