Applications

- Low-Cost Analog and Digital Data Links
- Digitized Audio
- Optical Sensors
- Medical Instruments
- Robotics Communications
- Motor Controller Triggering
- EMC/EMI signal Isolation
- Electronic Games
- Intra-System Links: Board-to-Board, Rack-to-Rack

Description

The IF-E91A and IF-E91B are high-output medium-speed infrared LEDs in a "connector-less" style plastic fiber optic package. The output spectrum peaks at 950 nm for the IF-E91A and 880 nm for the IF-E91B. The device package features an internal micro-lens, and a precision-molded PBT housing ensures efficient optical coupling into standard 1000 µm plastic fiber cable.

Application Highlights

The high output and fast transition times of the IF-E91A and IF-E91B make them suitable for low-cost analog and digital data links. Used with an IF-D96 photologic detector, the IF-E91A and IF-E91B can achieve data rates of 500 Kbps and 1 Mbps respectively at link distances up to 7 m. The drive circuit design is simpler than required for laser diodes, making the IF-E91A and IF-E91B excellent low-cost alternatives in a variety of analog and digital applications.

Features

- Excellent Linearity
- 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

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).....3 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)
IF-E91A .....50 mA
IF-E91B .....100 mA

Surge Current (I_{FSM}) t ≤ 10 µsec
IF-E91A ..... 2 A
IF-E91B .....2 A

Characteristics (T_A=25°C)

Parameter	Symbol	IF-E91A	IF-E91B*	Unit
Peak Wavelength	λ_{PEAK}	950	880	nm
Spectral Bandwidth (50% of I_{MAX})	$\Delta\lambda$	40	80	nm
Output Power Coupled into Plastic Fiber (1 mm core diameter). Distance Lens to Fiber ≤0.1 mm, 10 cm polished fiber, I_F=20 mA	Φ_{min}	>100 -10	>75 -11.2	µW dBm
Switching Times (10% to 90% and 90% to 10%) (R_L=47 Ω, I_F=10 mA)	t_r, t_f	1.0	0.5	µs
Capacitance	C_0	25	25	pF
Forward Voltage (I_F=50 mA)	V_f	1.5 max	1.7 max	V
Temperature Coefficient, λ_{PEAK}	TC_λ	0.3	0.3	nm/K

** IF-E91D recommended for new designs*

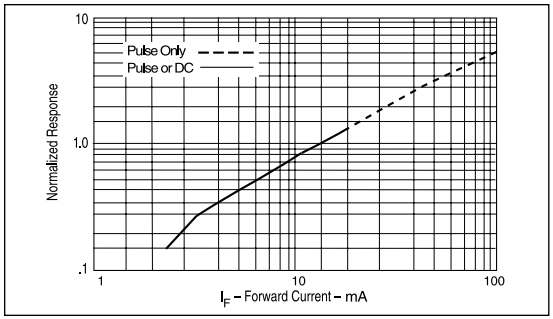


FIGURE 1. Normalized power launched versus forward current.

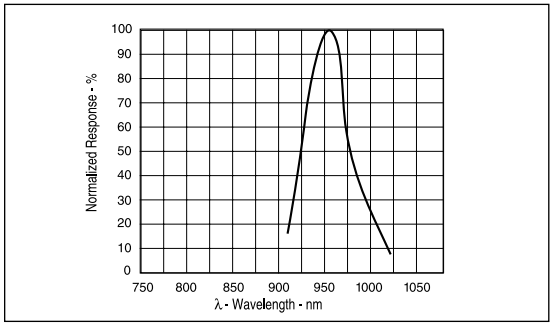


FIGURE 2. Typical spectral output vs. wavelength.

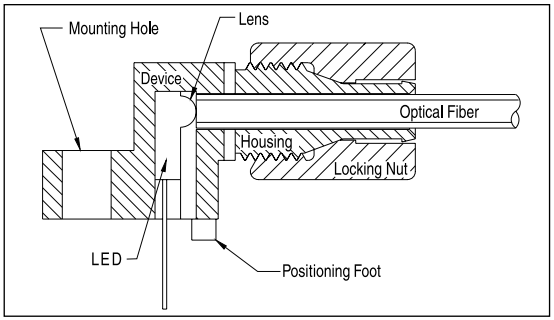
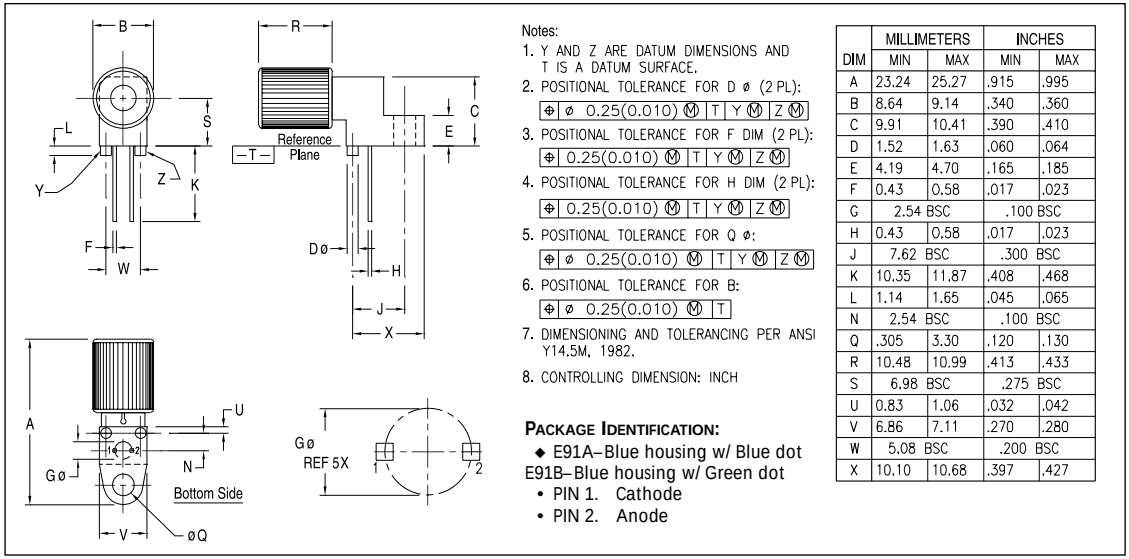


FIGURE 3. Cross-section of fiber optic device.

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: ⌖ | ø 0.25(0.010) Ⓜ | T | Y Ⓜ | Z Ⓜ
6. POSITIONAL TOLERANCE FOR B: ⌖ | ø 0.25(0.010) Ⓜ | T
7. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
8. CONTROLLING DIMENSION: INCH

PACKAGE IDENTIFICATION:
◆ E91A–Blue housing w/ Blue dot
E91B–Blue housing w/ Green dot
- PIN 1. Cathode
- PIN 2. Anode

DIM	MILLIMETERS MIN	MILLIMETERS MAX	INCHES MIN	INCHES 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	2.54 BSC		.100 BSC	
H	0.43	0.58	.017	.023
J	7.62 BSC		.300 BSC	
K	10.35	11.87	.408	.468
L	1.14	1.65	.045	.065
N	2.54 BSC		.100 BSC	
Q	.305	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

FIGURE 4. Case outline.