Applications

- Optical Sensors
- RGB Light Sources
- Color Separation for Process Control
- Medical Instruments
- Analog and Digital Data Links
- Robotics Communications
- Display Indicators
- Electronic Games
- Wavelength Multiplexing
- Fluorescent Instruments

Description

The IF-E92A and IF-E92B are blue LEDs housed in a "connector-less" style plastic fiber optic package. The IF-E92A contains a Silicon Carbide die with a spectral output peaking at 430 nm and the IF-E92B die is made from Gallium Nitride peaking at 470 nm. 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

These LEDs are low-cost alternatives to other light sources for producing a narrowband blue light output that can be efficiently coupled into a fiber cable. They can be used in a variety of sensor and display applications that require a narrowband optical light source whose intensity can be easily adjusted or modulated without changing optical spectrum. When combined with red and green LEDs the IF-E92A and IF-92B provide an RGB source for generating white or multicolored light. Applications include process control for color identification/separation and demonstration of wavelength division multiplexing for educational purposes. The IF-E92A and IF-E92B are also capable of digital data rates of 1 Mbps and 800 kbps respectively. The electrical drive circuit design is the same as that of other LEDs, making the IF-E92A and IF-E92B cost-effective light sources in a variety of analog, digital sensor and lighting applications.

Features

- Easily Adjusted or Modulated Blue Optical Output
- Fast Transition Times
- No Optical Design Required
- Mates With Standard 1000 µm Core Jacketed Plastic Fiber Cable
- Internal Micro-Lens for Efficient Optical Coupling
- Inexpensive Plastic Connector Housing
- Connector-Less Fiber Termination

Maximum Ratings

(T_A = 25°C)

Operating and Storage Temperature Range (T_{OP}, T_{STG}) .....-40° to 60°C

Junction Temperature (T_J) .....85°C

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

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

Power Dissipation (P_{TOT}) T_A = 25°C.....60 mW

De-rate Above 25°C .....1.1 mW/°C

Forward Current, DC (I_F) .....35 mA

Surge Current (I_{FSM}) t ≤ 10 µs.....75 mA

Characteristics (T_A=25°C)

Parameter	Symbol	IF-E92A	IF-E92B	Unit
Peak Wavelength	λ_{PEAK}	430	470	nm
Spectral Bandwidth (50% of I_{MAX})	$\Delta\lambda$	65	25	nm
Output Power Coupled into Plastic Fiber (1 mm core diameter). Distance Lens to Fiber ≤0.1 mm, 10 cm polished fiber, I_F=10 mA	Φmin	25 -16	75 -11	µW dBm
Switching Times (10% to 90% and 90% to 10%) (R_L=47Ω, I_F=10 mA)	t_r, t_f	.5	.6	µs
Capacitance (V_F=0, F=1 MHz)	C_0	100	100	pF
Forward Voltage (I_F=20 mA)	V_f	4.5 max	4.0 max	V
Temperature Coefficient, λ_{PEAK}	TC_λ	.16	.16	nm/K

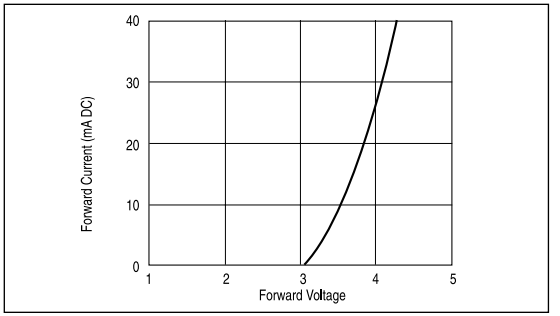


FIGURE 1. Forward current versus forward voltage.

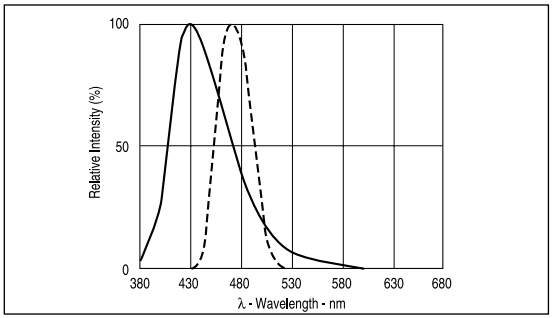


FIGURE 2. Typical spectral output vs. wavelength.

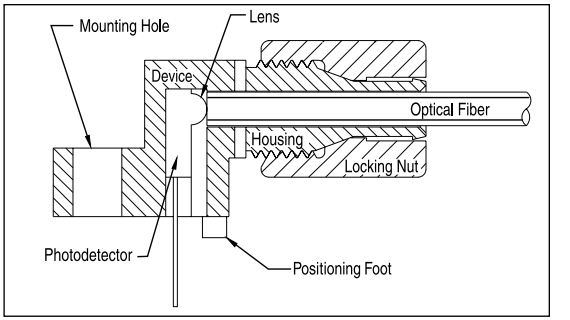
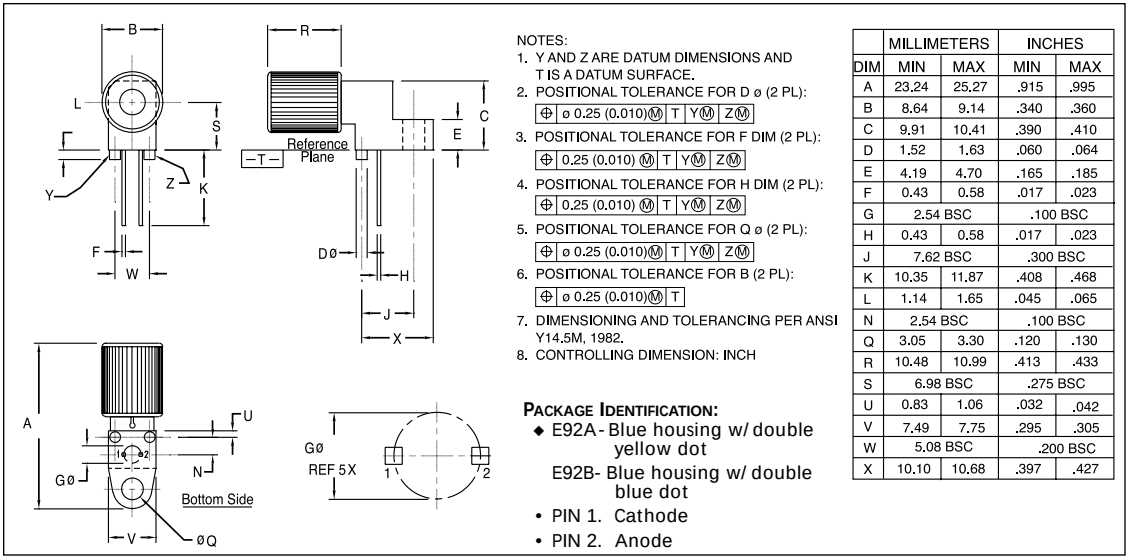


FIGURE 3. Cross-section of fiber optic device.

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 (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:
- ◆ E92A - Blue housing w/ double yellow dot
  E92B - Blue housing w/ double blue dot
- PIN 1. Cathode
- PIN 2. Anode

	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	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	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.