



DESCRIPTION

The IF-E93 is a high-output, high-speed, green LED housed in a “connector-less” style plastic fiber optic package. The output spectrum of the green LED is produced by Gallium Nitride die which peaks at a wavelength of 530 nm, ideally mapping to the lowest attenuation window of PMMA plastic optical fiber. The device package features an internal LED micro-lens, and the PBT plastic housing ensures efficient optical coupling into standard 1000 μm core plastic fiber cable.

APPLICATION HIGHLIGHTS

The high output and fast transition times of the IF-E93 make it suitable for low cost digital data links. When coupled to PMMA plastic optical fiber, attenuation is less than .1 dB/m, as compared to .16 dB/m with commonly used 650 nm LEDs. Using standard 1 mm core plastic fiber, the IF-E93 LED is capable of distances in excess of 150 meters at data rates of 5 Mbps. The fast rise and fall times of the IF-E93 permit data rates up to 30 Mbps. The drive circuit design is simpler than required for laser diodes, making the IF-E93 a good, low-cost alternative in a variety of analog and digital applications.

TYPICAL APPLICATIONS

- ▶ Local Area Networks (LANs)
- ▶ Optical Sensors
- ▶ Medical Instruments
- ▶ Automotive Displays
- ▶ Audio Systems
- ▶ Electronic Games
- ▶ Robotics Communications
- ▶ Fiber Optic Modems
- ▶ Fluorescence Instruments
- ▶ Wavelength Multiplexing

FEATURES

- ◆ Ultra-Low Loss in Plastic Optical Fiber
- ◆ 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
- ◆ Visible Light Output
- ◆ Fast Rise and Fall Times

MAXIMUM RATINGS

($T_A = 25^\circ\text{C}$)

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) $t \leq 5\text{ s}$ 240°C

Reverse Voltage (V_R) 5 V

Power Dissipation

(P_{TOT}) $T_A = 25^\circ\text{C}$ 60 mW

De-rate Above 25°C 1.1 mW/ $^\circ\text{C}$

Forward Current, DC (I_F) 35 mA

Surge Current (I_{FSM})

$t \leq 10\text{ }\mu\text{s}$ 150 mA

CHARACTERISTICS ($T_A = 25^\circ\text{C}$)

Parameter	Symbol	Typ	Unit
Peak Wavelength	λ_{PEAK}	530	nm
Spectral Bandwidth (50% of I_{MAX})	$\Delta\lambda$	50	nm
Output Power Coupled into Plastic Fiber (1 mm core diameter). Lens to Fiber Distance ≤ 0.1 mm, 10 cm polished fiber, $I_F = 22$ mA	Φ_{min}	75 -11	μW dBm
Switching Times (10% to 90% and 90% to 10%) ($F = 33$ MHz, $I_F = 10$ mA) See Figure 3	t_r, t_f	3.5, 16	ns
Capacitance ($V_F = 0$, $F = 1$ MHz)	C_0	100	pF
Forward Voltage ($I_F = 20$ mA)	V_f	4.0	V
Temperature Coefficient, λ_{PEAK}	TC_λ	.17	nm/K

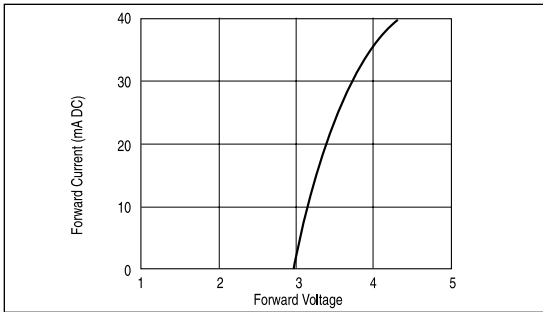


FIGURE 1. Forward current vs. forward voltage.

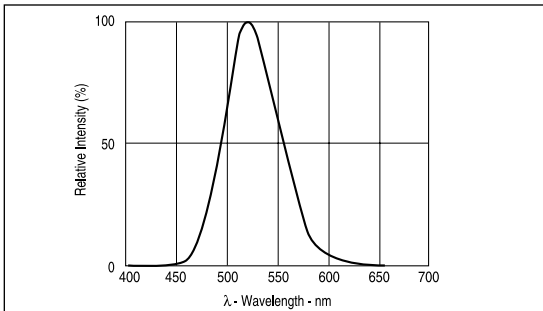


FIGURE 2. Typical spectral output vs. wavelength.

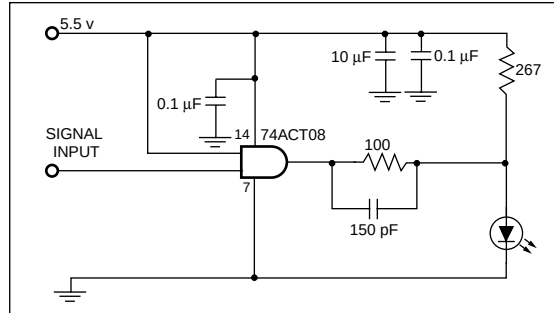


FIGURE 3. Test drive circuit ($I_F = 22\text{mA}$).

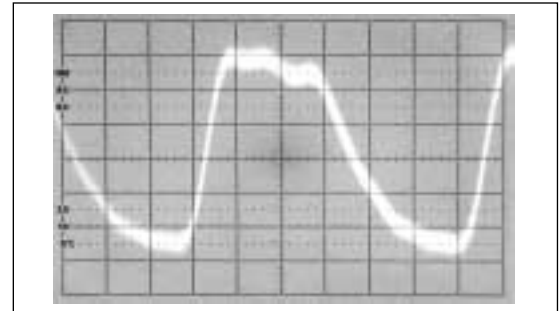
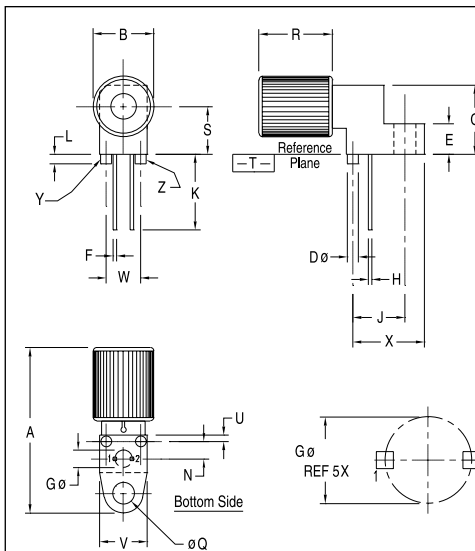


FIGURE 4. Transition times - Sweep = 5nS/div.



Notes:

1. Y and Z are DATUM DIMENSIONS AND T IS A DATUM SURFACE.
2. POSITIONAL TOLERANCE FOR D ϕ (2 PL):
 $\phi 0.25(0.010) \text{ } \textcircled{M} \text{ } \textcircled{T} \text{ } \textcircled{Y} \text{ } \textcircled{Z} \text{ } \textcircled{M}$
3. POSITIONAL TOLERANCE FOR F DIM (2 PL):
 $\phi 0.25(0.010) \text{ } \textcircled{M} \text{ } \textcircled{T} \text{ } \textcircled{Y} \text{ } \textcircled{Z} \text{ } \textcircled{M}$
4. POSITIONAL TOLERANCE FOR H DIM (2 PL):
 $\phi 0.25(0.010) \text{ } \textcircled{M} \text{ } \textcircled{T} \text{ } \textcircled{Y} \text{ } \textcircled{Z} \text{ } \textcircled{M}$
5. POSITIONAL TOLERANCE FOR Q ϕ :
 $\phi 0.25(0.010) \text{ } \textcircled{M} \text{ } \textcircled{T} \text{ } \textcircled{Y} \text{ } \textcircled{Z} \text{ } \textcircled{M}$
6. POSITIONAL TOLERANCE FOR B:
 $\phi 0.25(0.010) \text{ } \textcircled{M} \text{ } \textcircled{T}$
7. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
8. CONTROLLING DIMENSION: INCH

PACKAGE IDENTIFICATION:

- ◆ Blue housing w/ double green dot
- PIN 1. Cathode
- PIN 2. Anode

DIM	MILLIMETERS		INCHES	
	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	.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 5. Case Outline.