MOTOROLA
SEMICONDUCTOR
TECHNICAL DATA

Advance Information

Infrared 940 nm LED

MLED91 Series

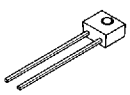
Motorola Preferred Devices

940 nm LED

The MLED91 series 940 nm LEDs are multi-purpose devices capable for use in numerous applications. These Gallium Arsenide devices are manufactured to tight tolerances for maximum performance and long lifetime. The devices can be purchased in tape and reel format (in compliance with the EIA 468-A specification) to meet auto-insertion needs.

Features:
- Low Cost
- Well Suited for Use with Any MRD900 Series Optical Detector
- Low Degradation
- New Mold Technology Improves Performance Under Variable Environmental Conditions
- New Lens Design Offers Improved Optical Performance
- EIA 468-A Compliant Tape and Reel Option Available (MLED91RLRE and MLED91ARLRE)

Applications:
- Low Bit Rate Communication Systems
- Keyboards
- Coin Handlers
- Paper Handlers
- Touch Screens
- Shaft Encoders
- General Purpose Interruptive and Reflective Event Sensors



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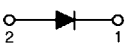

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MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Reverse Breakdown Voltage	V_R	6 0	Volts
Continuous Forward Current	I_F	100	mA
Peak Pulse Forward Current	I_F	1 0	A
Device Power Dissipation @ T_A = 25°C (1) Derate above 55°C	P_D	100 mW 2 0	mW mW/°C
Ambient Operating Temperature	T_{op}	– 40 to 100	°C
Storage Temperature	T_{stg}	– 40 to 100	°C
Lead Soldering Temperature (2)	T_L	260	°C

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
Reverse Leakage Current (V_R = 6 0 V)	I_R	—	0 05	100	μA
Forward Voltage (I_F = 50 mA)	V_F	—	1 3	1 5	Volts
Temperature Coefficient of Forward Voltage	ΔV_F	—	–1 6	—	mV/°C
Capacitance (V = 0 V, f = 1 0 MHz)	C	—	24	50	pF

(1) Measured with device soldered into a typical printed circuit board
(2) Maximum exposure time five seconds. Minimum of 1/16 inch from the case. A heat sink should be applied in order to prevent the case temperature from exceeding 100°C

This document contains information on a new product. Specifications and information herein are subject to change without notice.
Preferred devices are Motorola recommended choices for future use and best overall value.

MLED91 Series

OPTICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Characteristic		Symbol	Min	Typ	Max	Unit
Peak Emission Wavelength (I_F = 50 mA)		λ	930	940	950	nm
Spectral Half Power Wavelength			—	48	—	nm
Spectral Output Temperature Shift			—	0.3	—	nm/°C
Axial Power Output Intensity (I_F = 20 mA) (3)	MLED91	P_O	50	150	—	μW/sq cm
	MLED91A		100	—	200	μW/sq cm
Intensity Per Unit Solid Angle (I_F = 20 mA) (3)	MLED91	E_e	0.2	0.65	—	mW/Sr
	MLED91A		0.4	—	0.9	mW/Sr
Power Half-Angle		Ω	—	± 20	—	°
Rise Time and Fall Time		t_r, t_f	—	1.0	—	μS

(3) Measured using a 11.28 mm diameter detector placed 21 mm away from the device under test

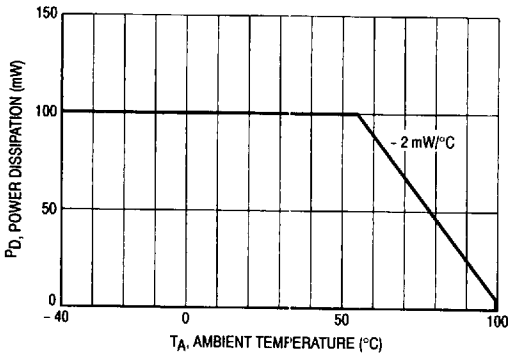

Figure 1. Power Dissipation

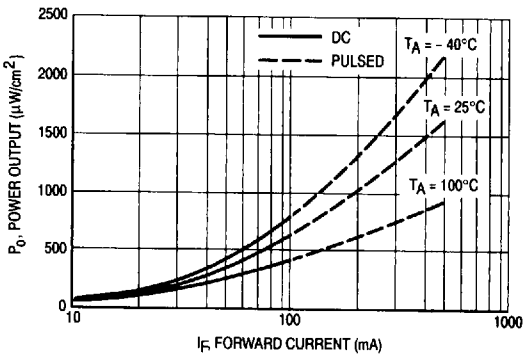

Figure 2. Power Output versus Forward Current

See Note 3 for Conditions.

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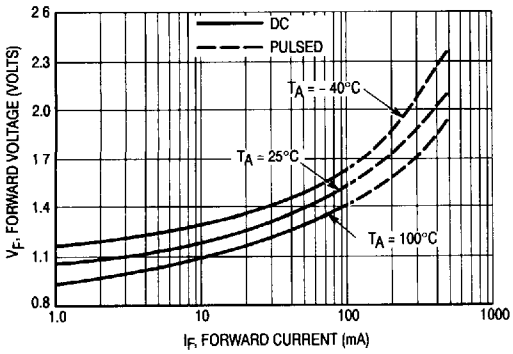

Figure 3. Forward Voltage versus Forward Current

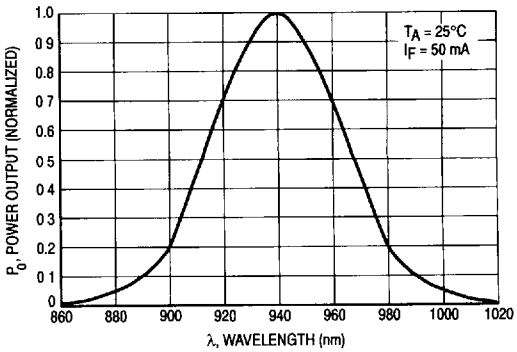

Figure 4. Relative Spectral Power Output

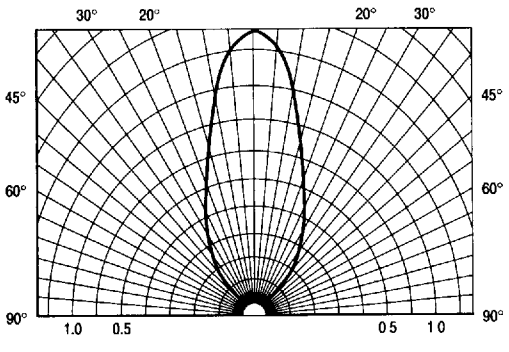

Figure 5. Spatial Radiation Pattern

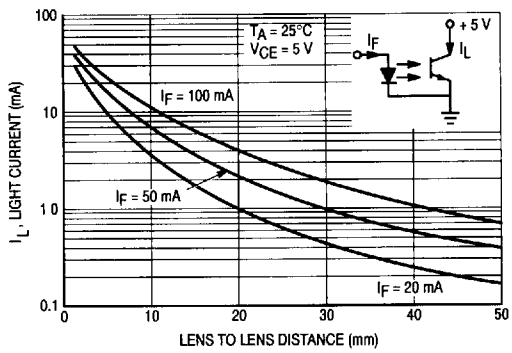

Figure 6. Coupled Characteristics of MLED91 and MRD901