



UPRLED630

BRIGHT RED LED

PRODUCT PREVIEW

Microsemi's high brightness UPRLED630 product offers impressive brightness with industry leading thermal resistivity. These products deliver superior thermal performance that keep junction temperatures low with a remarkable package thermal resistivity of 110 degrees C/Watt. The red packages also deliver a very wide viewing angle able to easily integrate into optical lenses. The Optomite package performs extremely well under extreme temperature conditions with less wavelength shift and intensity degradation seen by many competitors.

IMPORTANT: For the most current data, consult MICROSEMI's website: <http://www.microsemi.com>

ABSOLUTE MAXIMUM RATINGS AT 25° C (UNLESS OTHERWISE SPECIFIED)

Parameters	Symbol	Value	Unit DC
Forward Drive Current	I_F	30	mA
Peak Forward Current	I_{FP}	100	mA
LED Operating Junction Temperature	T_J	-40 to +150	°C
Reverse Voltage	V_R	8	V
Power Dissipation	P_D	100	mW
Operating Temperature	T_{OPR}	-40 to +125	°C
Storage Temperature	T_S	-45 to +130	°C
Electrostatic Discharge	ESD	1000	V
ESD classification		Class 1	
Solder Reflow Peak Temperature (Solder 10")		225	°C

THERMAL CHARACTERISTICS (UNLESS OTHERWISE SPECIFIED)

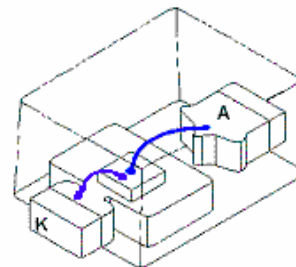
Thermal Resistance	Symbol	Value	Units
Junction-to Soldering Point	$R_{\theta JS}$	125	°C/W

KEY FEATURES

- Low Thermal Resistance
- Rugged Optomite 0603 package
- High Intensity
- Wide viewing angle
- High Luminous flux efficacy
- 14 lumens per watt

APPLICATIONS/BENEFITS

- Signage
- Backlighting
- Panel, button, switch indicators
- Market lights





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ELECTRICAL PARAMETERS @ 25°C & ID=20 mA (unless otherwise specified)

Characteristic	Symbol	Test Conditions	Min	Typ.	Max	Units
Radiant Intensity	I_E	DC Drive Current = 20mA	1000	1265		$\mu\text{W/sr}$
Luminous Intensity	I_V	DC Drive Current = 10mA DC Drive Current = 20mA DC Drive Current = 30mA DC Drive Current = 50mA	100 150	200 300 450		mcd
Dominant Wavelength	λ_{DOM}	DC Drive Current = 20mA		625		nm
Peak Wavelength	λ_{PK}	DC Drive Current = 20mA		635		nm
Chrom x Chrom y		DC Drive Current = 20mA		0.702 0.298		
Angle Coverage to 50% points	$\alpha_{1/2}$	DC Drive Current from 10mA to 50mA		170		deg.
Radiant Flux	Φ_E	DC Drive Current = 20mA		4.9		mW
Luminous Flux	Φ_V	DC Drive Current = 20mA DC Drive Current = 30mA DC Drive Current = 50mA		0.7 1.1 1.17		Lumens
Forward Voltage	V_F	DC Drive Current = 10mA DC Drive Current = 20mA DC Drive Current = 50mA		2.2 2.3 2.6	2.4	V
Reverse Leakage Current	I_R	Reverse Voltage = 5 V			100	nA

Note: Anode is identified by the underside of the LED, (smaller of the two base pads)

Mount to circuit boards using Pb/Sn 60/40 or equivalent.

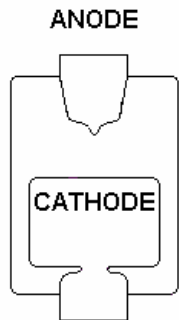
Maximum solder temperature exposure is 225°C for 10 seconds.



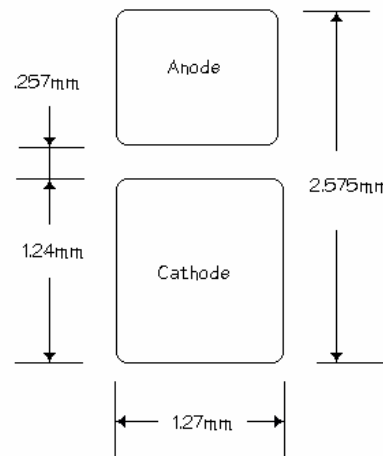
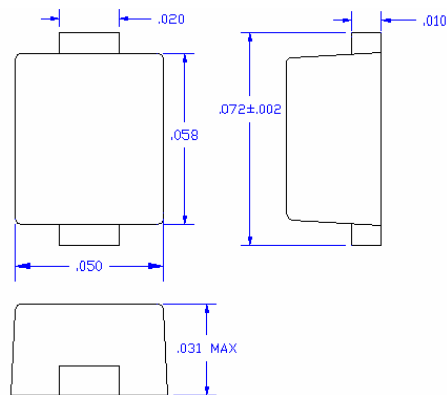
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BOTTOM VIEW



Mounting foot print



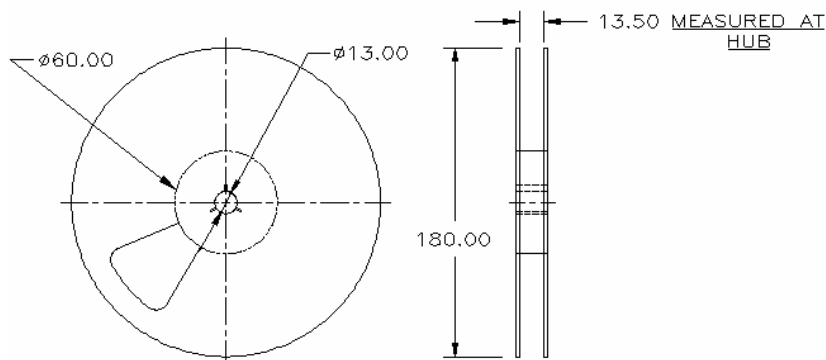
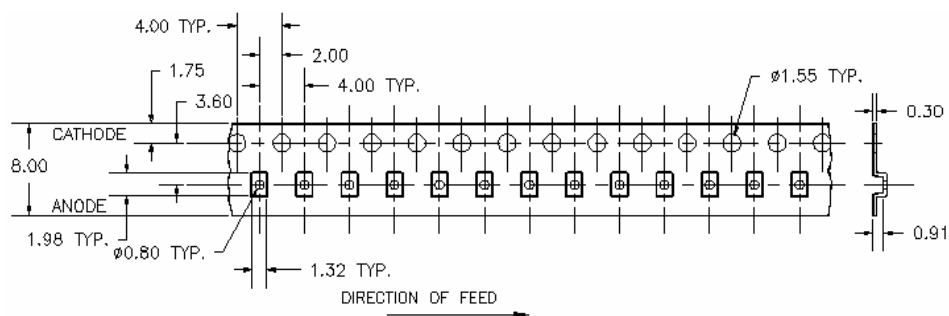
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TAPE AND REEL
3,000 units/reel

Notes: Dimensions are shown in metric.

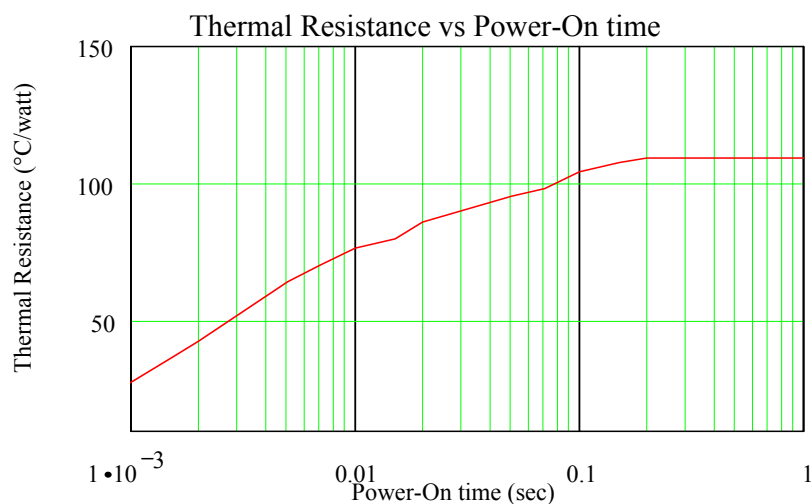




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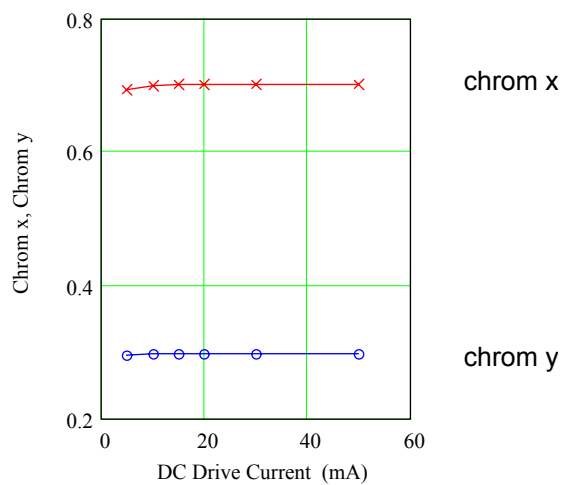
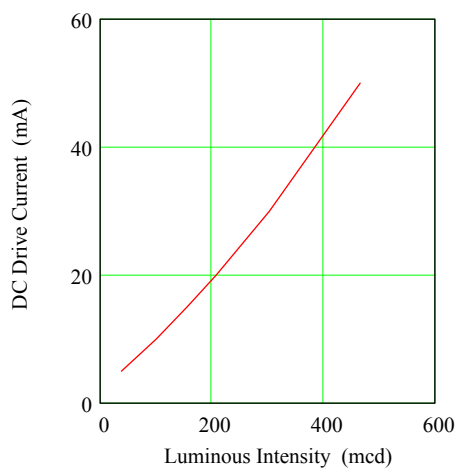
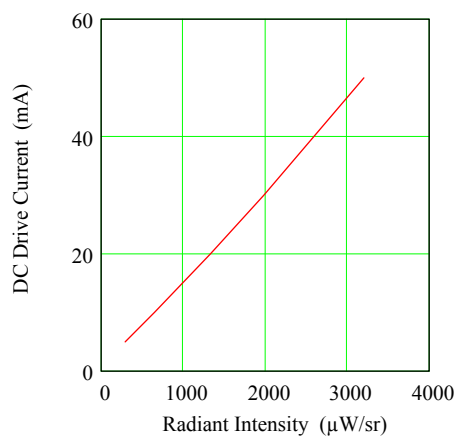
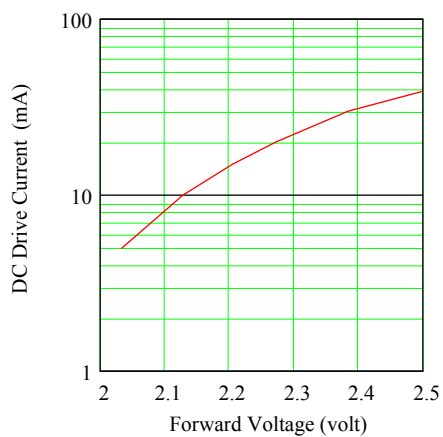
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Steady State Thermal Resistance Junction-to-Optomite base metal $\sim 110^{\circ}\text{C/W}$

Thermal time constant $\sim 20 \text{ mS} (@ 0.632 \times R_{\theta_{\text{max}}})$.

Steady state temperature at $\sim 500 \text{ mS}$.



Typical Characteristics



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CALCULATION FOR SAFE OPERATION ABOVE 20 ma dc:

The power dissipation must be held at a level to maintain the junction below the maximum specified operating temperature.

Duty cycle control may be used to establish the safe operating condition using a train of pulses.

LED Junction temperature may be calculated by use of the following:

$$T_J := T_{Case} + V_F \cdot I_{Dpk} \left[\frac{t_p \cdot R_{\theta JS}}{\tau} + \left(1 - \frac{t_p}{\tau} \right) \cdot Z_{\theta \tau + t_p} - Z_{\theta \tau} + Z_{\theta tp} \right]$$

T_{Case} is at a specified temperature. V_F and I_{Dpk} values are read off graph of forward voltage vs drive current. t_p and τ are set by the on-time and pulse period of the drive circuit. Thermal Impedances (Z_{θ}) and Thermal resistance (R_{θ}) values are read from Thermal Impedance graph.