UPGLED510

BRIGHT GREEN LED

PRODUCT PREVIEW

Microsemi's high brightness UPGLED510 product offers impressive brightness with industry leading thermal resisitivity. These products deliver superior thermals that keep junction temperatures low with a remarkable package thermal resisitivity of 110 degrees C/Watt. The green 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**

KEY FEATURES

- Low Thermal Resistance
- Rugged Optomite 0603 package
- High Intensity
- Broad angular coverage
- High Luminous flux efficacy
- 6.5 lumens per watt

APPLICATIONS/BENEFITS

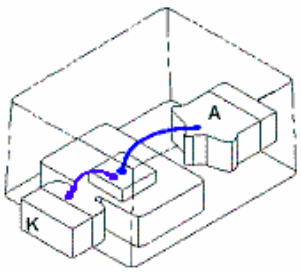
- Bright GREEN LED emitter
- Low profile Optomite 0603
- Low forward voltage
- Color uniformity
- Signage illumination

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	Tj	-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 2	

THERMAL CHARACTERISTICS (UNLESS OTHERWISE SPECIFIED)

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



Microsemi
580 Pleasant Street, Watertown, MA. 02472-2408, 617-926-0404, Fax: 617-924-1235

UPGLED510

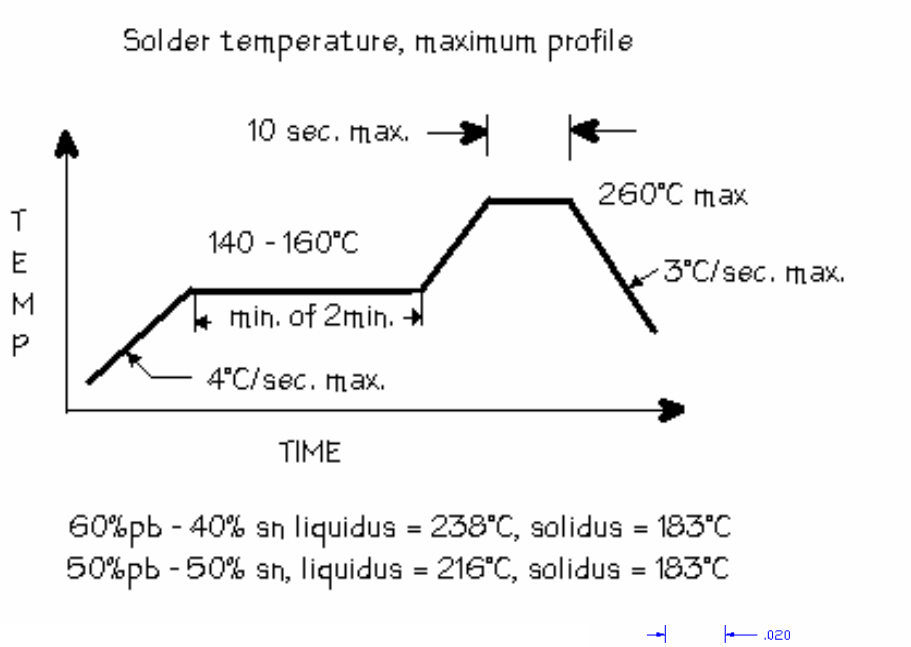
BRIGHT GREEN LED

PRODUCT PREVIEW

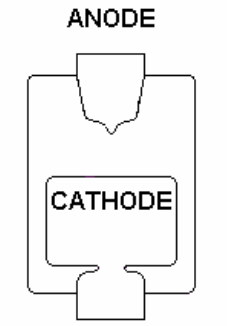
ELECTRICAL PARAMETERS @ 25°C & ID=20 mA (unless otherwise specified)						
Characteristic	**Symbol**	**Test Conditions**	**Min**	**Typ.**	**Max**	**Units**
Radiant Intensity	I_E	DC Drive Current = 20mA	350	400		µW/sr
Luminous Intensity	I_V	DC Drive Current = 10mA DC Drive Current = 20mA DC Drive Current = 30mA DC Drive Current = 50mA	155	85 160 220 330		mcd
Dominant Wavelength	λ_{DOM}	DC Drive Current = 20mA		515		nm
Peak Wavelength	λ_{PK}	DC Drive Current = 20mA		510		nm
Chrom x Chrom y		DC Drive Current = 20mA		0.126 0.667		
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		1.1		mW
Luminous Flux	Φ_V	DC Drive Current = 10mA DC Drive Current = 20mA DC Drive Current = 30mA DC Drive Current = 50mA		0.25 0.46 0.64 0.86		**Lumens**
Forward Voltage	V_F	DC Drive Current = 10mA DC Drive Current = 20mA DC Drive Current = 30mA DC Drive Current = 50mA		3.2 3.4 3.5 3.8	3.55	V
Reverse Leakage Current	I_R	Reverse Voltage = 5 V			100	nA

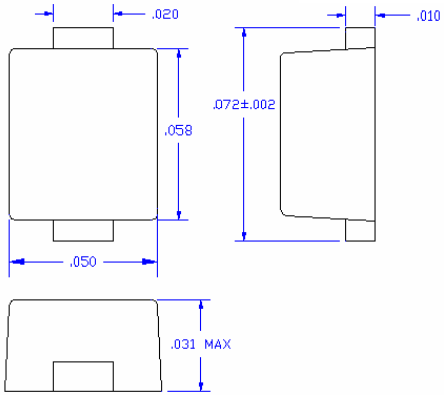
Note: Anode is identified by the underside of the LED, (smaller of the two base pads)
Mount to circuit boards using Pb/Sn 60/40 or equivalent.
Maximum solder temperature exposure is 260°C for 10 seconds.

Microsemi
580 Pleasant Street, Watertown, MA. 02472-2408, 617-926-0404, Fax: 617-924-1235

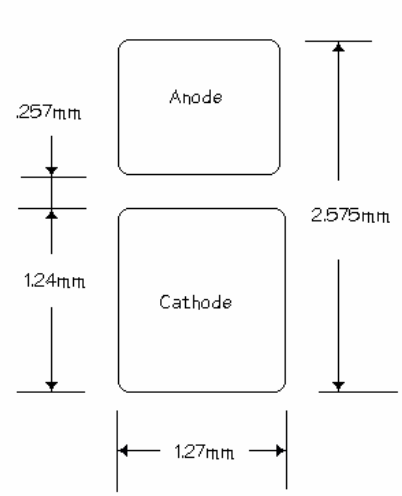


60%pb - 40% sn liquidus = 238°C, solidus = 183°C
50%pb - 50% sn, liquidus = 216°C, solidus = 183°C





BOTTOM VIEW

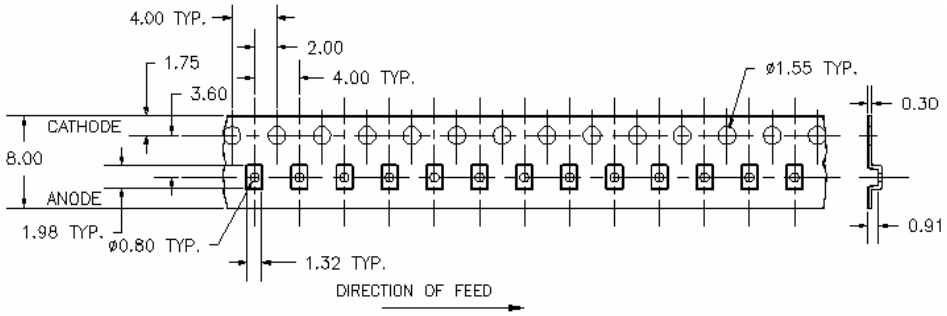


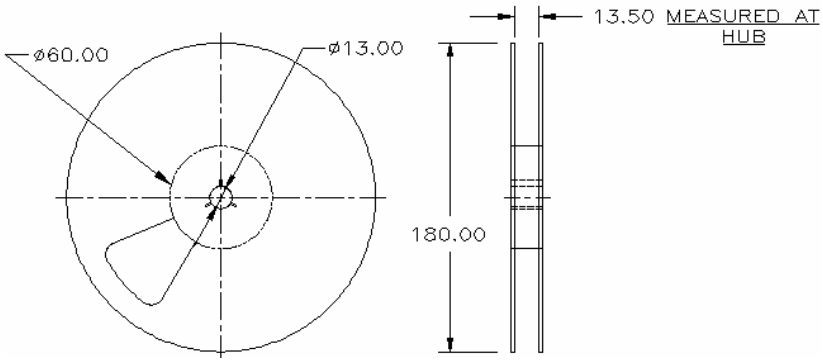
Mounting foot print

Microsemi
580 Pleasant Street, Watertown, MA. 02472-2408, 617-926-0404, Fax: 617-924-1235

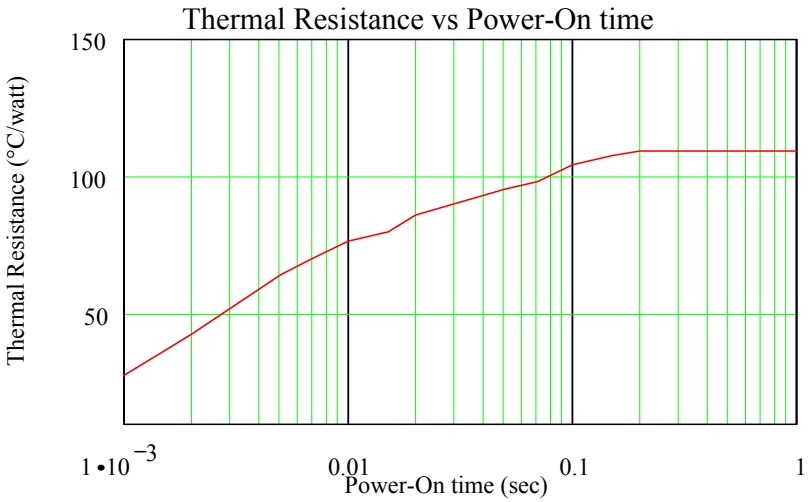
TAPE AND REEL
3,000 units/reel

Notes: Dimensions is shown in metric.





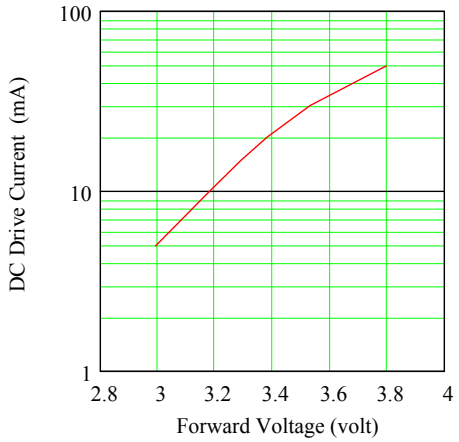
MECHANICAL

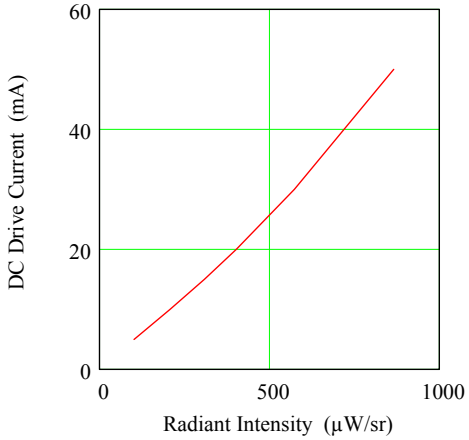


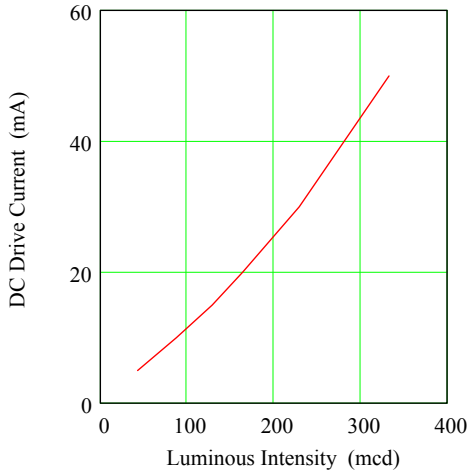
Steady State Thermal Resistance Junction-to-Optomite base metal ~ 110°C/W
Thermal time constant ~ 20 mS (@ 0.632 x R θ_{max}).
Steady state temperature at ~ 500 mS.

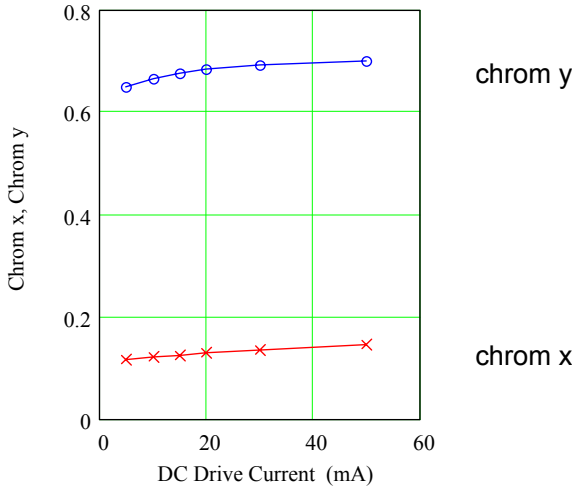
Microsemi
580 Pleasant Street, Watertown, MA. 02472-2408, 617-926-0404, Fax: 617-924-1235

Typical Characteristics









Microsemi
580 Pleasant Street, Watertown, MA. 02472-2408, 617-926-0404, Fax: 617-924-1235

***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:

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

$\mathbf{T_{Case}}$ is at a specified temperature. $\mathbf{V_F}$ and $\mathbf{I_{Dpk}}$ values are read off graph of forward voltage vs drive current. $\mathbf{t_p}$ and $\boldsymbol{\tau}$ are set by the on-time and pulse period of the drive circuit. Thermal Impedances ($\mathbf{Z\theta}$) and Thermal resistance ($\mathbf{R\theta}$) values are read from Thermal Impedance graph.