PRELIMINARY

UPWLEDLPxxx

HIGH BRIGHTNESS WHITE LED

PRODUCT PREVIEW

The UPWLEDLPxxx product incorporates Microsemi's unique, patented packaging concept to improve the homogeneous distribution of white light. The Optomite low profile package has low thermal resistance. The package provides a broad luminous emission, typically 120°. The packaging profile lends itself to increased life, critical to many white applications.

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

KEY FEATURES

- Low profile (0.35mm;15mils)
- Low Vf available (<3.0V @ 5mA)
- Color consistent
- Luminous Efficiency
- High Brightness
- Broad angular Emission
- Rugged Optomite package

APPLICATIONS

- Mobile Phone Keypad
- Panel, button, switch indicators.
- Backlighting
- Signage
- Signals and Marker Lights

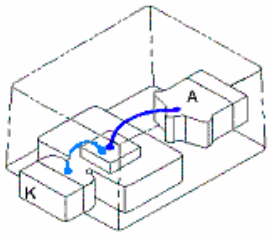
ABSOLUTE MAXIMUM RATINGS AT 25° C (UNLESS OTHERWISE SPECIFIED)

Parameters	Symbol	Value	Unit DC
Forward dc Drive Current	I_F	30	mA
Peak Forward Current (non-repetitive)	I_{FP}	100	mA
LED Operating Junction Temperature	Tj	-40 to +140	°C
Reverse Voltage	V_R	8	V
Power Dissipation @ 30mA	P_D	125	mW
Operating Temperature	T_{OPR}	-40 to +125	°C
Storage Temperature	T_S	-45 to +140	°C
Electrostatic Discharge	ESD	1000	V
ESD classification		Class 1	
Solder Reflow Peak Temperature (Solder 10")		225	°C

THERMAL CHARACTERISTICS (UNLESS OTHERWISE SPECIFIED)

Temperature Rise	Symbol	Value	Units
Junction Temperature rise at 20ma dc	TJ_{mx}	15	°C

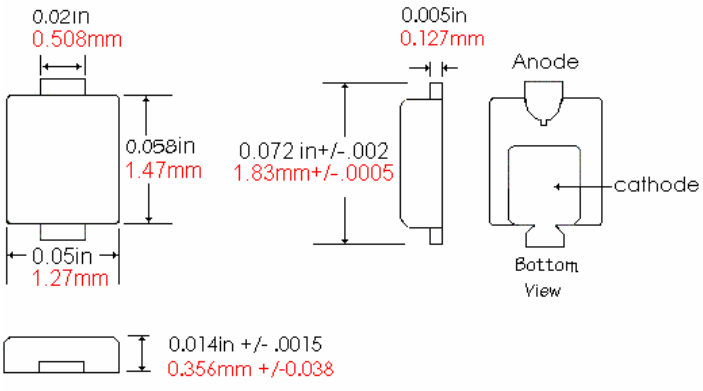
NOTE: The "x x x "trailer in the part number refers to the intensity bin followed by color Rank followed by the Vf classification. See Tables, page 2.
may be used in conjunction with Micorsemi LX1992LED Drivers.

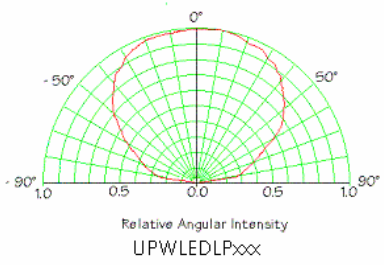


Anode is the smaller of the two base pads

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

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





Rev 3 2003-05-23

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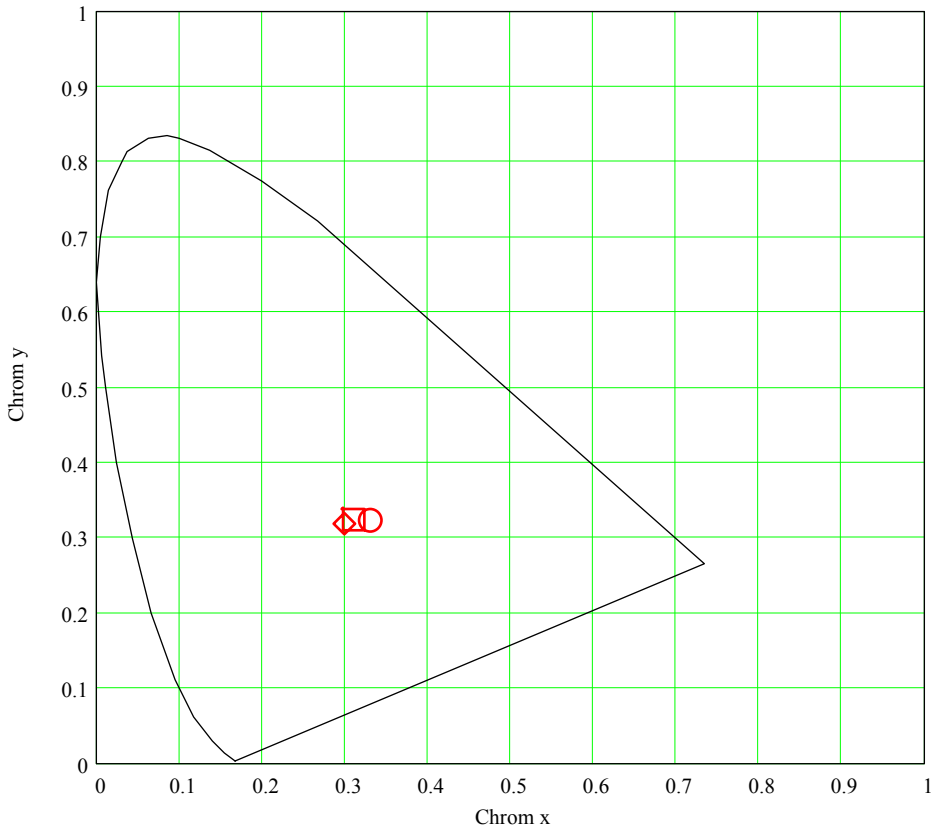
PRODUCT PREVIEW

ELECTRICAL PARAMETERS @ 25°C

Characteristic	Symbol	Test Conditions	Min	Typ.	Max	Units
Radiant Intensity	I_E	dc Drive Current = 20mA				µW/sr
Luminous Intensity, **H**	I_V	dc Drive Current = 10mA	65	80		mcd
		dc Drive Current = 20mA	125	140		
Luminous Intensity, **G**		dc Drive Current = 10mA	TBD	TBD		
		dc Drive Current = 20mA				
Luminous Intensity, **F**		dc Drive Current = 10mA	TBD	TBD		
		dc Drive Current = 20mA				
Peak Wavelength	λ_{PK}	dc Drive Current = 20mA		460		nm
Color Rank **A** Chrom x	*x*	Dc Drive Current = 10mA	0.285	0.300	0.310	
Color Rank **A** Chrom y	*y*		0.310	0.330	0.350	
Color Rank **B** Chrom x	*x*	Dc Drive Current = 20mA	0.285	0.300	0.310	
Color Rank **B** Chrom y	*y*		0.300	0.320	0.340	
Color Rank **C** Chrom x	*x*	Dc Drive Current = 10mA	0.295	0.310	0.320	
Color Rank **C** Chrom y	*y*		0.315	0.335	0.355	
Color Rank **D** Chrom x	*x*	Dc Drive Current = 20mA	0.295	0.310	0.320	
Color Rank **D** Chrom y	*y*		0.300	0.325	0.340	
Color Rank **E** Chrom x	*x*	Dc Drive Current = 10mA	0.315	0.330	0.340	
Color Rank **E** Chorm y	*y*		0.310	0.330	0.350	
Color Rank **F** Chrom x	*x*	Dc Drive Current = 20mA	0.315	0.330	0.348	
Color Rank **F** Chrom y	*y*		0.305	0.325	0.345	
Other color ranks are available upon request. Consult factory.						
Angle Coverage to 50% points	$\alpha_{1/2}$	dc Drive Current = 20mA to 50mA		120		deg.
Luminous Flux **H**	Φ_V	dc Drive Current = 20mA		0.40		lumens
Luminous Flux **G**		dc Drive Current = 20mA		TBD		
Luminous Flux **F**		dc Drive Current = 20mA		TBD		
Forward Voltage **S**	V_F	dc Drive Current = 5mA		3.4	3.5	V
		dc Drive Current = 10mA		3.5	3.7	
		dc Drive Current = 20mA Standard V_F		3.7	3.9	
Forward Voltage **L**		dc Drive Current = 5mA		2.95	3.0	
		dc Drive Current = 10mA		3.0	3.125	
		dc Drive Current = 20mA Low V_F		3.15	3.25	

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



Color Rank A - diamond
Color Rank B - box
Color Rank C - circle

Conversion of 1931 x y coordinates to 1960 *u v* coordinates:

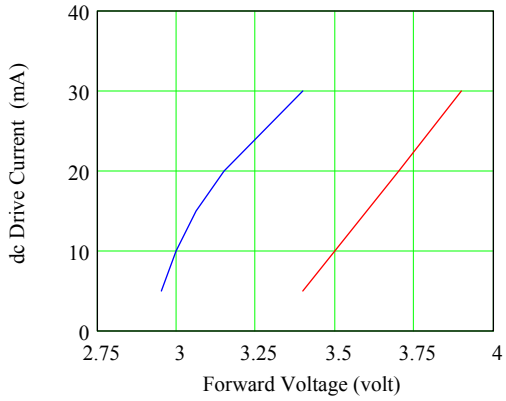
$u = 4x/(-2x + 12y + 3)$, $v = 6y/(-2x + 12y +3)$

Conversion of 1960 *u v* coordinates to 1931 *x y* coordinates:

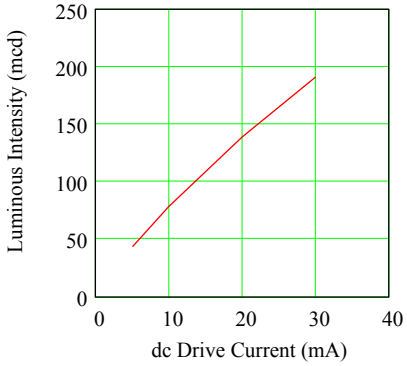
$x = 3u/(2u – 8v +4)$, $y = 2v/(2u –8v +4)$.

Consult factory for optional Intensity and color ranking.

Forward Voltage (L and S)



Luminous Intensity Rank "H"



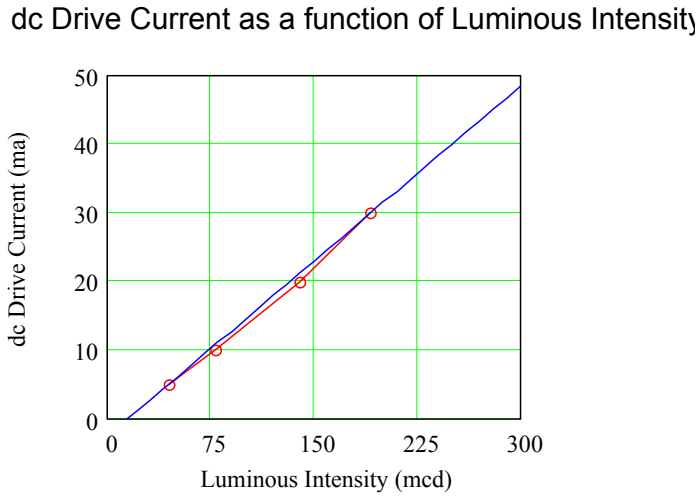
RELIABILITY STATUS

Test	Conditions	Duration	No. Rejects
Resistance to Solder heat	T_a = 230°C +5°C, -0°C	5 to 6 seconds	0/15
Vibration variable Frequency	20 G (min); 20Hz to 2,000Hz each axis; x, y and z	4 min. each axis	0/15
Storage Bake	T_a = 100°C	1,000 hrs	0/35
Temp. Cycle	T_a = +65°C to –55°C	225 cycles	0/35
Burn-In	I_D = 20 mA, Ta = 25°C	2,000 hrs	0/35
Hi Humid/Temp	T_a = 85°C, RH=85%, no bias	500 hrs	0/15

Note: Accept devices determined by reduction no greater than 70% of initial values

Adjusting dc drive current to accommodate a desired Luminous Intensity:

The equation to determine the dc drive current required to produce a desired Luminous Intensity for the Intensity Rank H is given below. The graphic for the Rank H is shown:



$I_D = m \times I_V + b$ where $\boldsymbol{m} = 0.17$, $\boldsymbol{b} = -2.512$, $\boldsymbol{I_V}$ is the value of Luminous Intensity in milli-candela

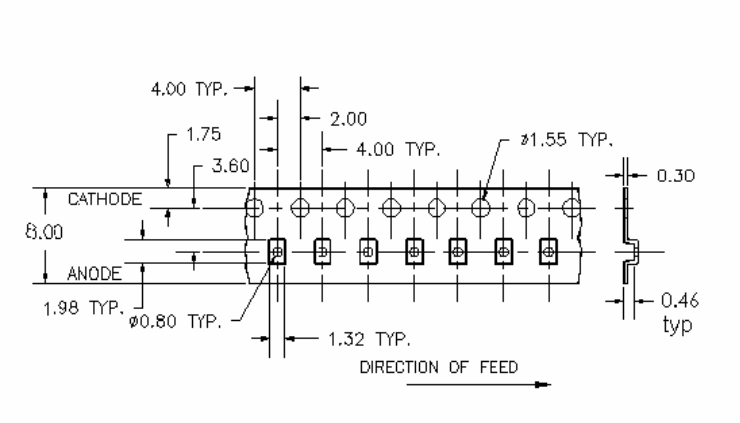
Example: Determine the dc Drive Current required to produce a nominal Luminous Intensity of 200 mcd.

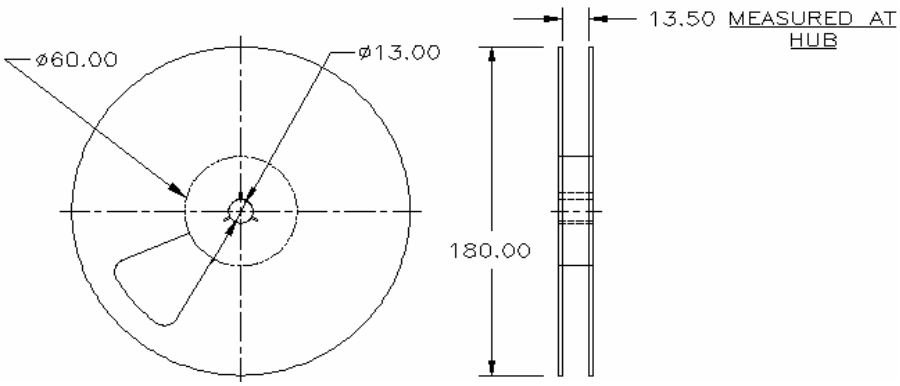
$I_D = 0.17 \times 200 - 2.512 = 31.5\ ma$

The resulting power dissipation is: ~110mW (Read the forward voltage from the "L" graph of I_D vs V_F)

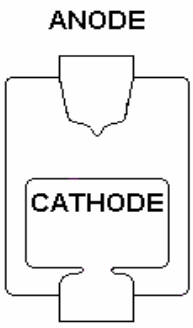
The junction temperature rise is less than 20°C above ambient (see junction temperature rise graph).

Tape and Reel (metric)

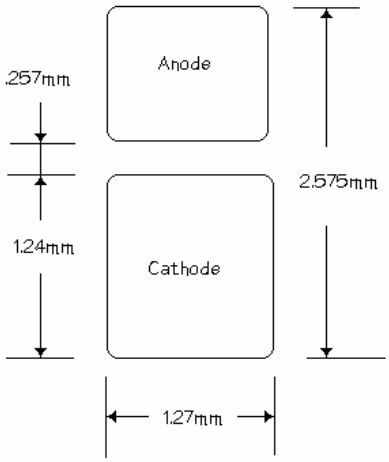




3,000 units /reel



Bottom view of low profile package



Mounting footprint, Copper(note: Silver plating will enhance Luminous Intensity)

JUNCTION TEMPERATURE RISE