

# Technical Data

## mSideLEDs

### PRELIMINARY

MSL-510SW

09/09/2003

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### Features

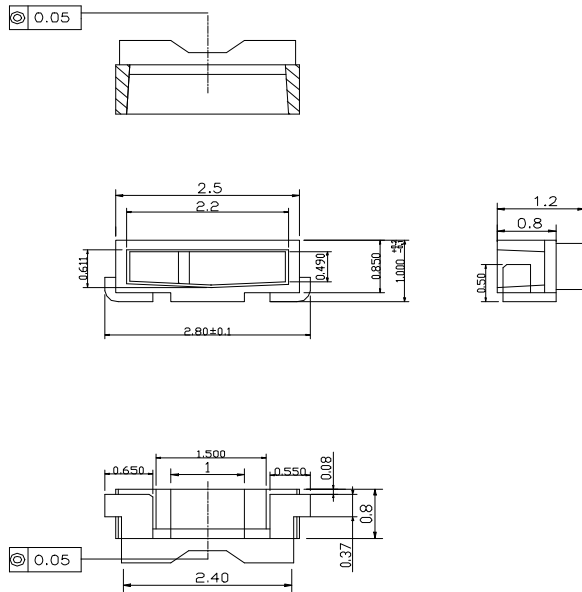
- **Package** : white micro-sideview PLCC-2 package with yellow epoxy.
- **Feature of the device** : extremely wide viewing angle  
ideal for backlighting and coupling in  
light guides
- **color** : x/y coordinate : 0.31/0.32
- **Viewing angle** : Lambertian Emitter (X : 120° / Y : 120°)
- **Technology** : InGaN on sapphire with yellow phosphor (white)
- **Grouping parameter** : luminous intensity , Chromaticity
- **Assembly methods** : suitable for all SMT assembly methods
- **Soldering methods** : IR reflow soldering
- **Taping** : 8-mm tape with 3500/reel,  $\phi$ 180mm

### Applications

- **Backlighting** : LCD Display, Key pads

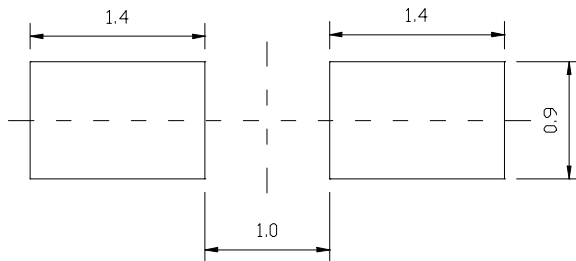
## Package Dimensions

Unit : mm (inch)

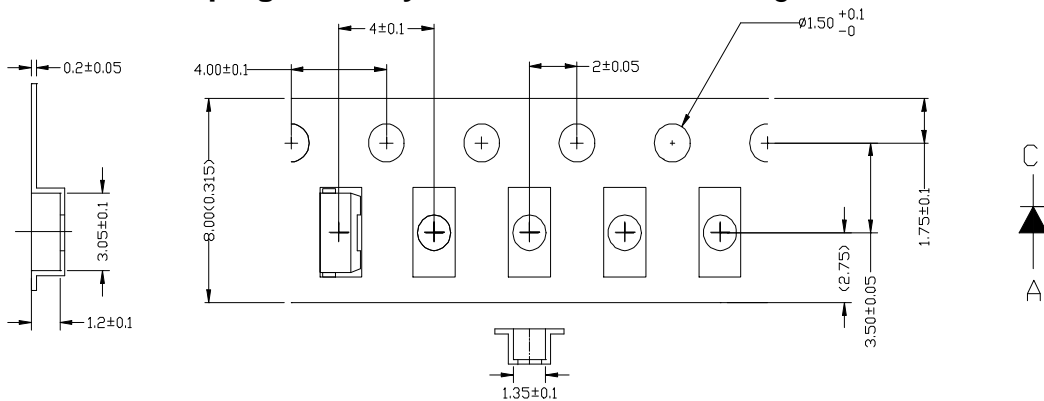


- Notes : 1. All dimensions are in millimeters (inches)  
2. Tolerance is ±0.1 unless other specified

## Recommended Solder Patterns



## Method of Taping / Polarity and Orientation Packing unit 3500/reel



- Notes : 1. All dimensions are in millimeters (inches)  
2. Tolerance is ±0.1 unless other specified

## Selection Guide

Part Number	Luminous Intensity				Chromaticity Coordinates (Typ.)		Viewing Angle 2q 1/2 (Degrees)	
					x	y	x	y
	Bin	Min.	Typ.	Max.	Typ.	Typ.	Typ.	Typ.
MSL-510SW	R	360	-	500	0.31	0.32	120	120
	S	500	-	720	0.31	0.32	120	120
	T	720		1000	0.31	0.32	120	120

Device Type	Forward Voltage $V_F$ (Volts) @ $I_F = 20\text{mA}$			Reverse Current $I_R$ (uA) @ $V_R = 5\text{V}$			Thermal Resistance $R_{qJ-S}$ ( $^{\circ}\text{C}/\text{W}$ )
	Min.	Typ.	Max	Min.	Typ.	Max	Typ.
MSL-510SW		3.3	4.0			50	220

## Maximum Ratings

Parameter	Symbol	Value	Unit
Operating Temp. range	$T_{OP}$	-30 ~ +85	$^{\circ}\text{C}$
Storage Temp. range	$T_{stg}$	-40 ~ +100	$^{\circ}\text{C}$
Forward current	$I_F$	30	mA
Peak forward current	$I_{FM}$	100	mA
Reverse Voltage	$V_R$	5	V
Power dissipation	$P_{tot}$	120	mW
Soldering Temperature	$T_{sid}$	Reflow Soldering : 260 $^{\circ}\text{C}$ , for 10 sec	
		Hand Soldering : 350 $^{\circ}\text{C}$ , for 3 sec	

IFP Conditions : Pulse Width  $\leq 10\text{msec}$  and Duty  $\leq 1/10$

**Relative Spectrum Emission  $I_{rel} = f(\lambda)$ ,  $T_A = 25^\circ\text{C}$ ,  $I_F = 20\text{mA}$**

**$V(\lambda)$  = Standard eye response curve**

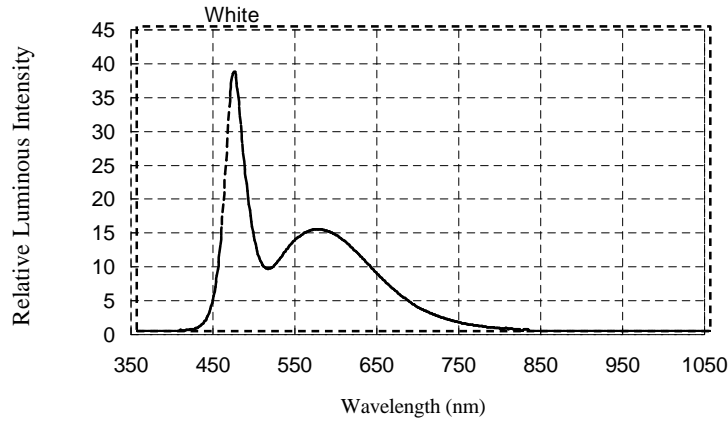


FIG.1 RELATIVE LUMINOUS INTENSITY

**Forward Current  $I_F = f(V_F)$**

**$T_A = 25^\circ\text{C}$**

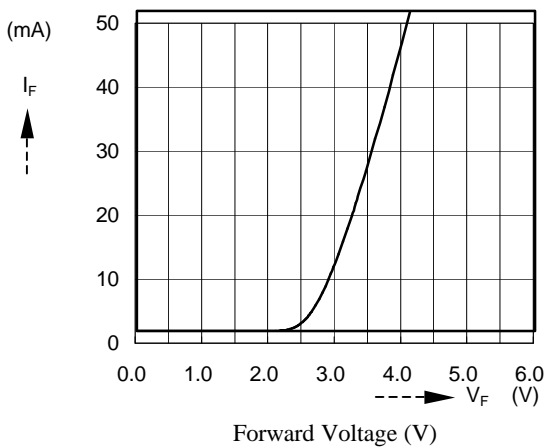


FIG.2 FORWARD CURRENT VS. FORWARD VOLTAGE

**Relative Luminous Intensity  $I_V/I_V(20\text{mA}) = f(I_F)$**

**$T_A = 25^\circ\text{C}$**

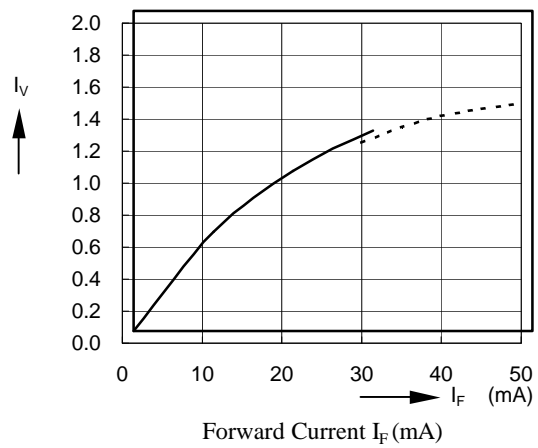


FIG.3 RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT

**Ambient Temperature VS. Allowable Forward**

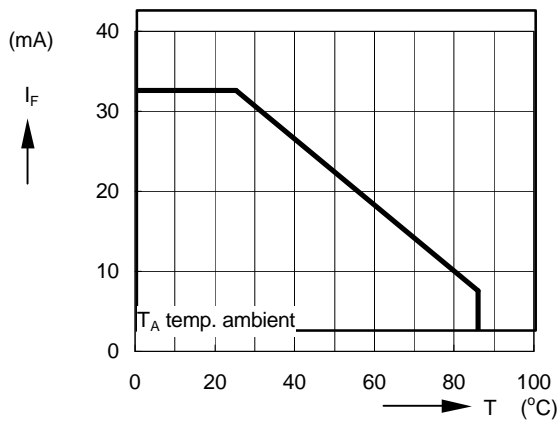


FIG.4 FORWARD CURRENT VS. AMBIENT TEMPERATURE

**Radiation Characteristic  $I_{rel} = f(\theta)$**

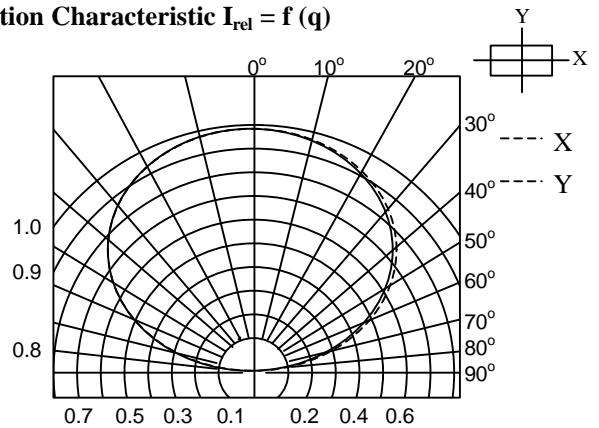
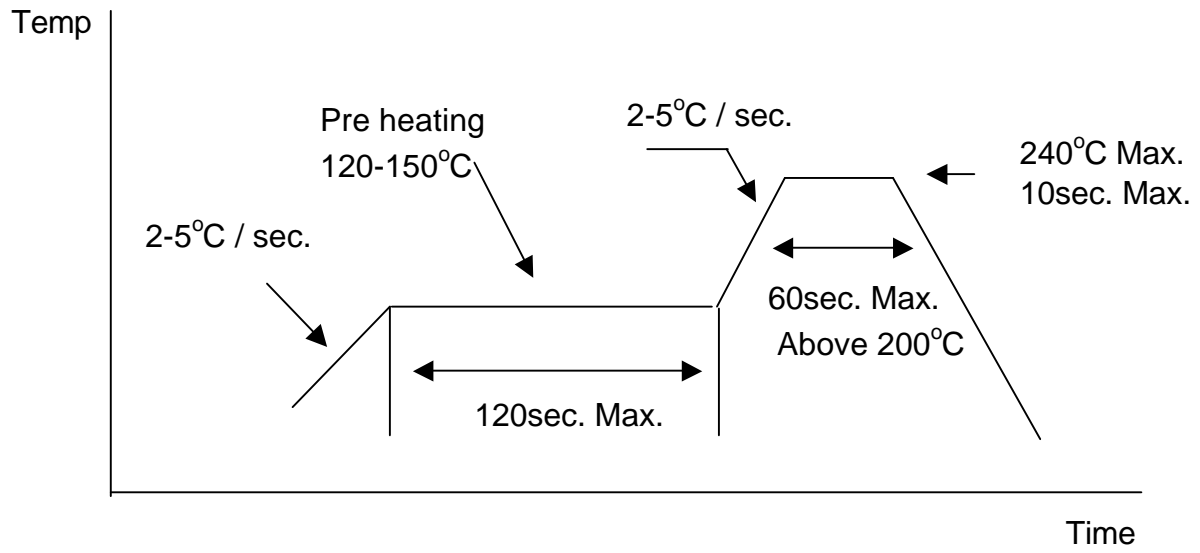


FIG.5 RADIATION DIAGRAM

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## IR Reflow Soldering Profile

### Lead Solder



## Unity White uSideLEDs Bin Codes

Category Code	
S	B3

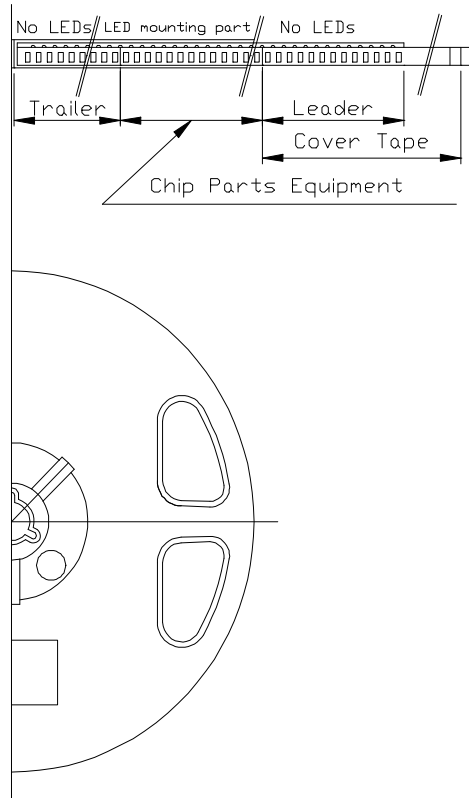
Luminous Intensity Group
R : 360 mcd ~ 500 mcd
S : 500 mcd ~ 720 mcd
T : 720 mcd ~ 1000 mcd

Luminous intensity is tested at a current pulse ( 20mA ) duration of 25 ms and an accuracy of  $\pm 10\%$

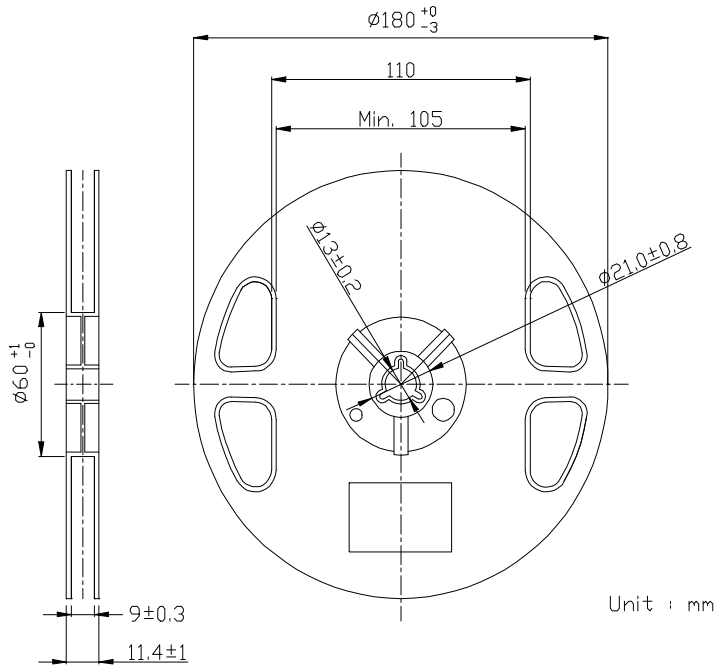
Color Coordinate @ $I_F=20mA$								
Bin Code	1		2		3		4	
	X	Y	X	Y	X	Y	X	Y
A0	0.28	0.248	0.264	0.267	0.283	0.305	0.296	0.276
B3	0.287	0.295	0.283	0.305	0.304	0.330	0.307	0.315
B4	0.307	0.315	0.304	0.330	0.330	0.360	0.330	0.339
B5	0.296	0.276	0.287	0.295	0.307	0.315	0.311	0.294
B6	0.311	0.294	0.307	0.315	0.330	0.339	0.330	0.318
C1	0.330	0.360	0.361	0.385	0.361	0.351	0.330	0.318

Chromaticity coordinate groups are tested at a current ( 20mA ) pulse duration of 25 ms and a tolerance of  $\pm 0.01$

## Tape Dimensions



## REEL Dimensions



Items		Specifications	Remarks
Leader	Cover Tape	Cover tape shall be longer than 400mm without carrier tape	The end of the carrier tape shall be adhered on the cover t
	Carrier Tape	There shall be more than 40 empties	The orientation of tape shall be as shown
Trailer		There shall be more than 40 empties	The end of the tape shall be inserted into a slit of the hub

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## Surface Mount Moisture Sensitivity Specifications

### 1. Controlling Moisture

Unity Opto Technology, in its design of packing materials and packing methods, takes into consideration the susceptibility of some Unity packages to moisture induced damage. The risk of this damage is caused when the LED lens plastic encapsulation material is exposed to increases or decreases in the Relative Humidity of the surrounding environment.

Such damage may include delamination between the die and the LED lens plastic encapsulation material, which may result in open connections due to broken wire bonds. Moisture in the package having reached a critical level will fracture the package in order to escape when exposed to peak temperature conditions, typical in soldering practices.

Therefore, the control of moisture levels in the LED package is critical to reduce the risk of moisture-induced failures. Please follow JEDEC-STD-033A standards for handling moisture sensitive devices.

### 2. Packaging SMD devices:

Unity packages all SMD devices into dry pack bags (moisture barrier bags).

Unity includes a desiccant pouch in each bag. Testing confirms that the desiccant pouch greatly reduces the presence of moisture by maintaining the environment in the bag, thus protecting the devices during shipment and storage.

### 3. Handling Dry Packed Parts

Upon receipt, the bags should be inspected for damage to ensure that the bag's integrity has been maintained. Inspection should verify that there are no holes, gouges, tears, or punctures of any kind that may expose the contents of the bag.

To open the bag, simply cut across the top of the bag as close to the original seal as possible being careful not to damage the contents. Once open the desired quantity of units should be removed and the bag resealed. If the bag is left open longer than 2 hours, the desiccant pouch should be replaced with a dry desiccant and the bag should be sealed immediately to avoid moisture damage.