Unity Opto Technology Co., Ltd.

Technical Data
ALLEDs

MSL-204TXWC

08/06/2003

Features

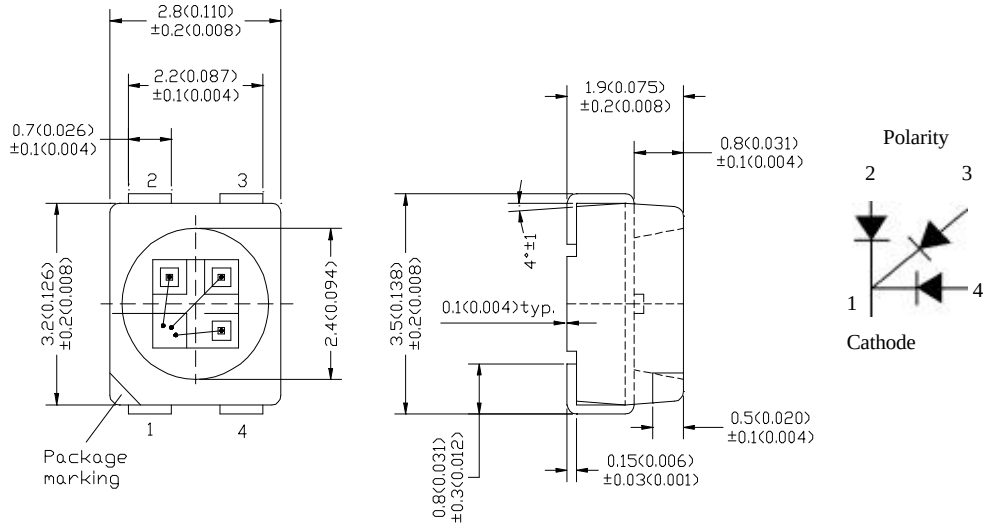
- **Package** : white topview PLCC-4 package with yellow clear epoxy.
- **Feature of the device** : extremely wide viewing angle
  ideal for backlighting and coupling in
  light guides
- **color** : x/y coordinate : 0.31/0.32
- **Viewing angle** : Lambertian Emitter (110^{o})
- **Technology** : InGaN on Sapphire (white)
- **Grouping parameter** : luminous intensity , Chromaticity
- **Assembly methods** : suitable for all SMT assembly methods
- **Soldering methods** : IR reflow soldering
- **Preconditioning** : acc. to JEDEC Level 2
- **Taping** : 8-mm tape with 2000/reel, ϕ180mm

Applications

- **Automotive** : Dashboards , stop lamps , turn signals
- **Backlighting** : LCDs , Key pads , advertising
- **Status indicators** : Comsumer & industrial electronics

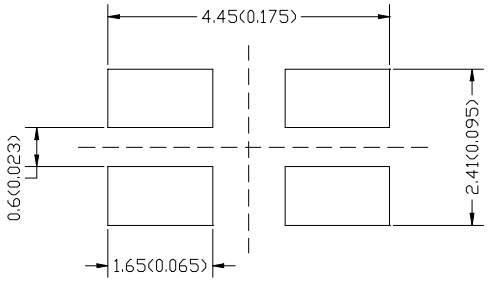
Package Dimensions

Unit : mm (inches)

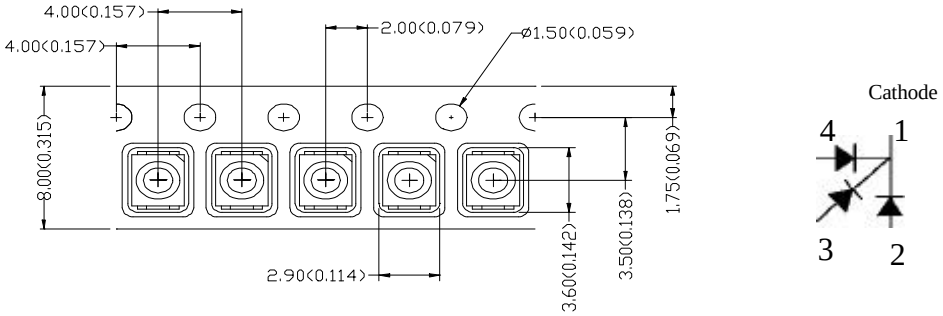


Notes : 1. All dimensions are in millimeters (inches)
2. Tolerance is ±0.1 unless other specified

Recommended Solder Patterns



Method of Taping / Polarity and Orientation Packing unit 2000/reel



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

Selection Guide

Part Number	Color of Emission	Color of the Light Emitting Area	Luminous Intensity I_V (mcd) @ 20mA
MSL-204TXWC	White	Yellowish epoxy	800

Part Number	Viewing	Optical Efficiency @I_F=20mA	Thermal Resistance R_{qJ-S}	Thermal Resistance R_{qJ-A}
	(Degrees)	(lm / W)	(oC/W)	(^{o}C/W)
	Typ.	Typ.	Typ.	Typ.
MSL-204TXWC	120	13	220	600

Part Number	Forward Voltage V_F (Volts) @IF = 20mA			Reverse Current I_R (uA) @ V_R = 5V	Chromaticity Coordinates (Typ.)	
					x	y
	Min.	Typ.	Max	Typ.	Typ.	Typ.
MSL-204TXWC		3.5	4.0	10	0.31	0.32

*The value are base on 1-die performance

Maximum Ratings

Parameter	Symbol	Value	Unit
Operating Temp. range	T_{OP}	-30 ~ +85	^{o}C
Storage Temp. range	T_{stg}	-40 ~ +100	^{o}C
Junction temperature	Tj	110	^{o}C
Forward current	I_F	30	mA
Reverse Voltage	V_R	5	V
Power dissipation	P_{tot}	100	mW

*The value are base on 1-die performance

* The maximum driven current must lower than 30mA at the same

Relative spektrale Emission $I_{rel} = f(\lambda)$, $T_A = 25^oC$, $I_F = 20mA$

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

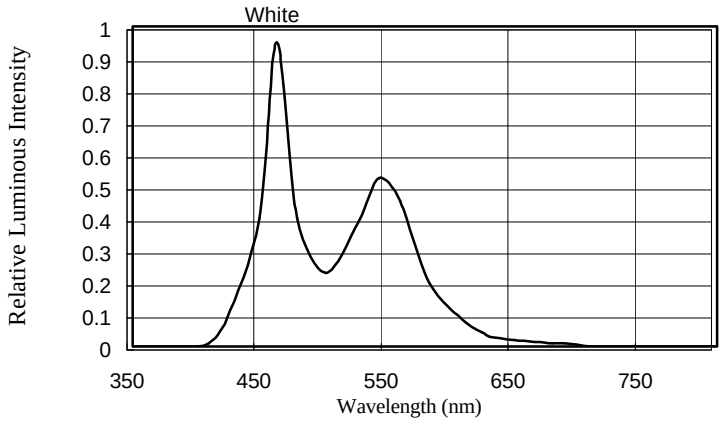
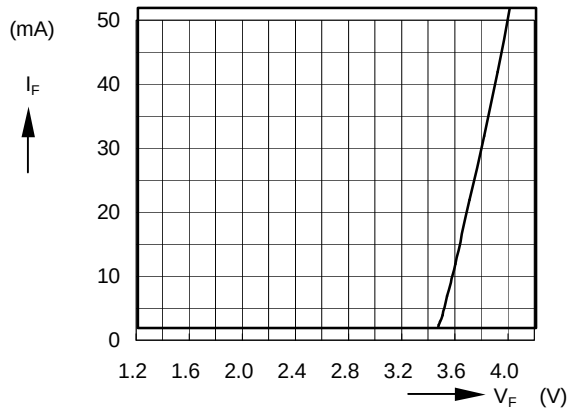


FIG.1 RELATIVE LUMINOUS INTERSITY

Forward Current $I_F = f(V_F)$

TA = 25°C

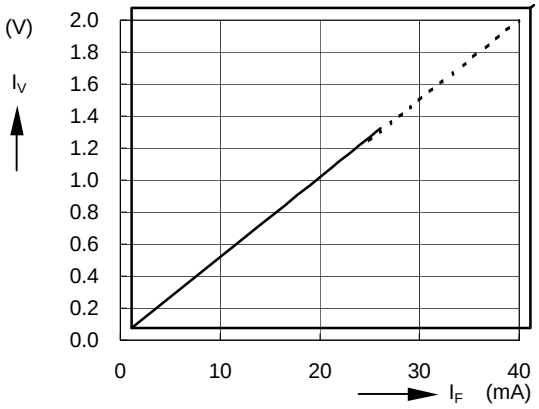


Forward Voltage (V)

FIG.2 FORWARD CURRENT VS. FORWARD VOLTAGE

Relative Luminous Intensity I_V/I_V (20mA) = f (I_F)

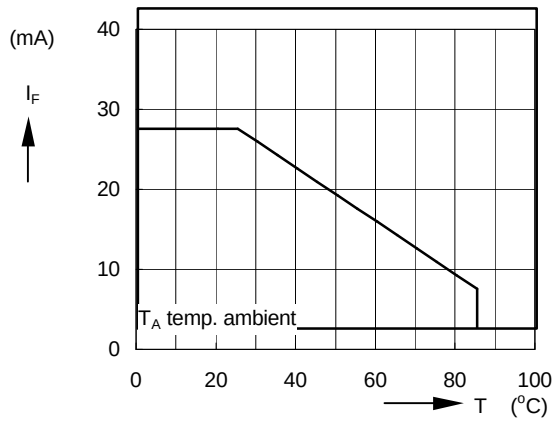
TA = 25°C



Forward Current I_F(mA)

FIG.3 RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT

Ambient Temperature VS. Allowable Forward



Ambient Temperature T_A (°C)

FIG.4 FORWARD CURRENT VS. AMBIENT TEMPERATURE

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

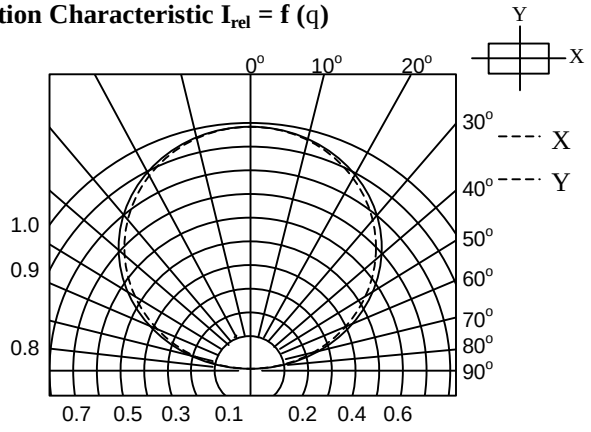
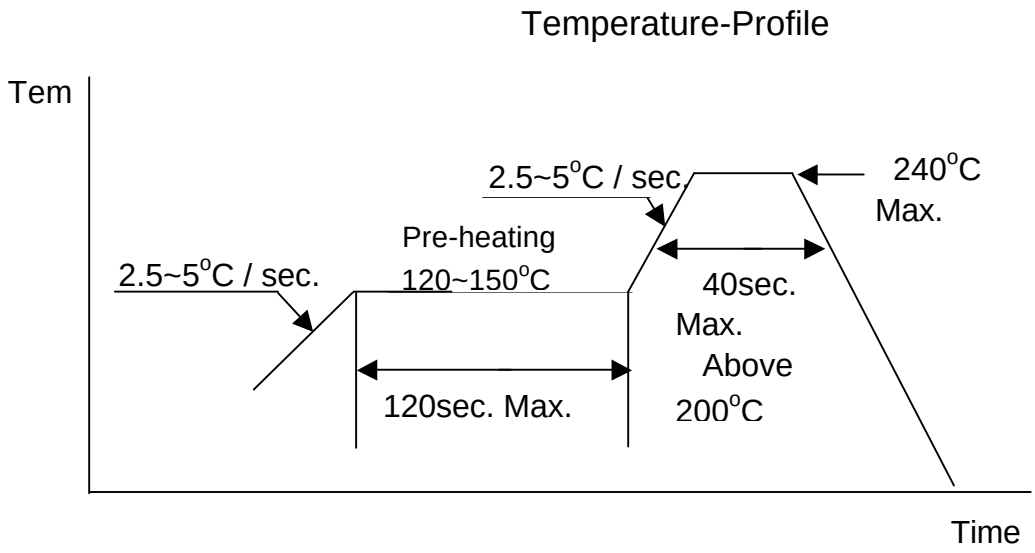


FIG.5 RADIATION DIAGRAM

IR Reflow Soldering Profile



Unity White ALLED Bin Codes

Category Code	
AA	NF

Luminous Intensity Group @ I_F = 20mA (mcd)		
Bin Code	Min.	Max.
U	450	710
V	710	1120
AA	1120	1800
BA	1800	2800
CA	2800	3550

*1.The value are base on 3-dies performance
*2.Luminous intensity is tested at a current pulse duration of 25 ms and an accuracy of ± 11%

Color coordinates @ I_F=20mA								
Bin Code	1		2		3		4	
	X	Y	X	Y	X	Y	X	Y
NA	0.264	0.317	0.283	0.353	0.283	0.305	0.264	0.267
NB	0.264	0.267	0.283	0.305	0.296	0.276	0.280	0.248
NC	0.283	0.353	0.330	0.400	0.330	0.380	0.283	0.325
ND	0.285	0.325	0.330	0.380	0.330	0.360	0.283	0.305
NE	0.283	0.305	0.330	0.360	0.330	0.339	0.287	0.295
NF	0.287	0.295	0.330	0.339	0.330	0.318	0.296	0.276
NG	0.296	0.276	0.330	0.318	0.33	0.298	0.296	0.256
NH	0.330	0.400	0.361	0.415	0.361	0.385	0.330	0.360
NI	0.330	0.360	0.361	0.385	0.361	0.351	0.330	0.318

*1.The value are base on 3-dies performance
*2.Chromaticity coordinate groups are tested at a current pulse duration of 25 ms and a tolerance of ±0.01

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.