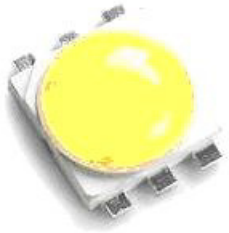
ASMT-Jx33

3W Mini Power LED Light Source

Data Sheet



Description

The 3W mini power LED light source is a high-performance, energy-efficient device that delivers high flux output and possesses a high color rendering index. This device can handle high driving current. An option with an electrically isolated metal slug is also available.

The white mini power LED is available in the range of color temperature from 2700K to 10000K.

The low profile package design and ultra small footprint is suitable for a wide variety of applications especially where space and height is a constraint.

The package is compatible with reflow soldering process. To facilitate easy pick and place assembly, the LEDs are packed in EIA-compliant tape and reel.

Features

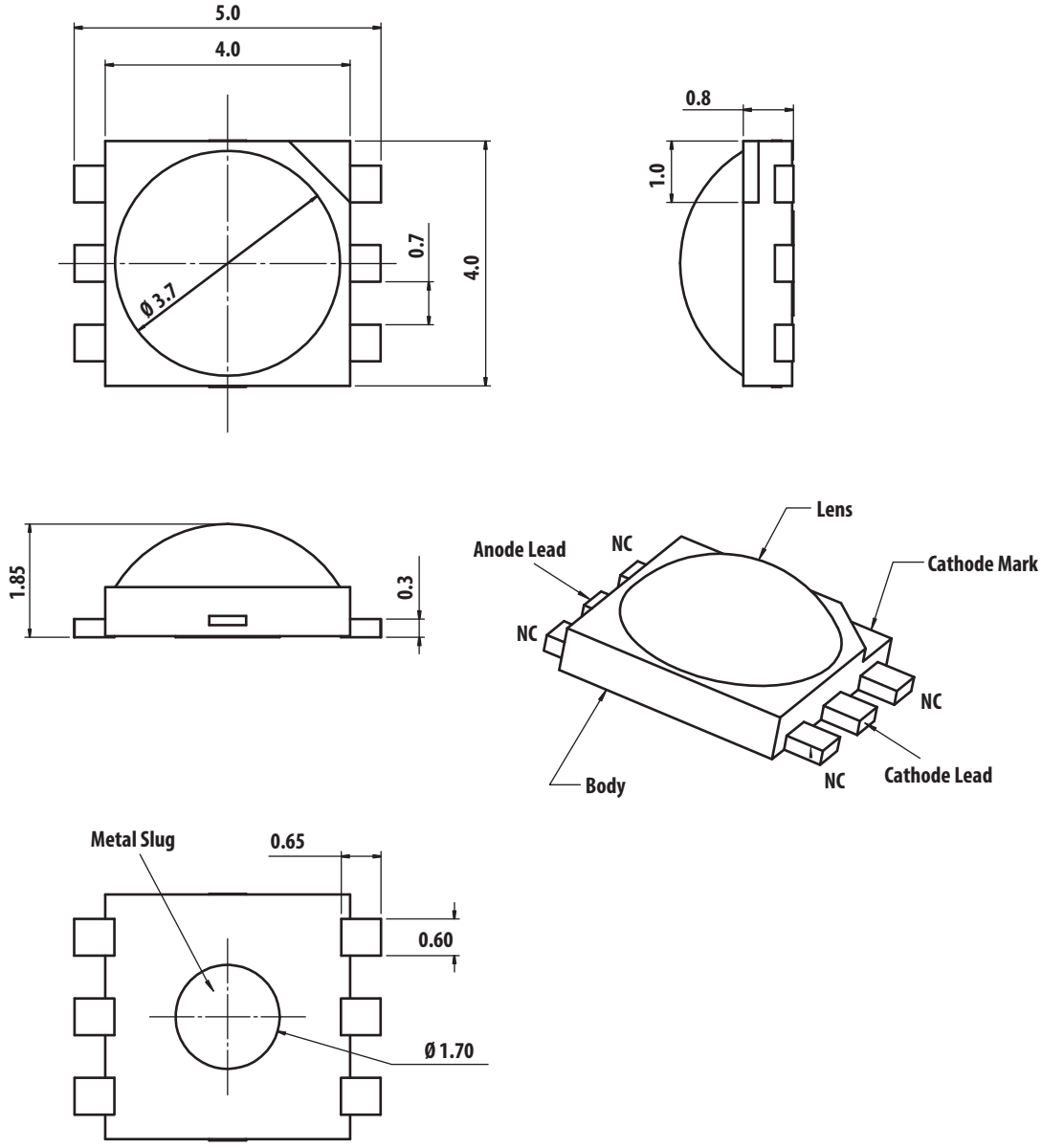
- High color rendering index (CRI)
- Available in cool white, neutral white, and warm white
- Small footprint and low profile
- Symmetrical outline
- Energy efficient
- Direct heat transfer from metal slug to mother board
- Compatible with reflow soldering process
- High current operation
- Long operation life
- Wide viewing angle
- Silicone encapsulation
- Non-ESD sensitive (threshold > 16 kV)
- MSL 1 products

Applications

- Retail lighting
- Display case lighting
- Security lighting
- Commercial lighting, such as window decorative lighting in shopping malls
- Architectural lighting

CAUTION: The customer is advised to keep the LEDs in the moisture barrier bag (MBB) when not in use as prolonged exposure to environment might cause the silver plated leads to tarnish, which might cause difficulties in soldering.

Figure 1 ASMT-Jx33 Package Outline Drawing



NOTE

1. All dimensions in millimeters.
2. Tolerance is ±0.1 mm unless otherwise specified.
3. Terminal finish: Ag plating.
4. Corresponding NC (No Connection) leads adjacent to anode and cathode leads can be electrically short.

Device Selection Guide (T_J = 25°C)

Part Number	Color	Luminous Flux (lm), Φ_V [a, b]			Test Current (mA)	Dice Technology	Electrically Isolated Metal Slug
		Min.	Typ.	Max.			
ASMT-JW33-NVW01	Cool White	99.6	110.0	129.5	350	InGaN	Yes
ASMT-JN33-NVW01	Neutral White	99.6	110.0	129.5	350	InGaN	Yes
ASMT-JY33-NTU01	Warm White	67.2	90.0	99.6	350	InGaN	Yes

a. Luminous flux, Φ_V is the total flux output measured with an integrating sphere at a single current pulse condition.

b. Flux tolerance is ±10%.

Absolute Maximum Ratings

Parameter	InGaN	Units
DC Forward Current [a]	700	mA
Peak Pulsing Current	2400	mA
Power Dissipation	2730	mW
LED Junction Temperature	135	°C
Operating Metal Slug Temperature Range at 350 mA	–40 to +120	°C
Operating Metal Slug Temperature Range at 700 mA	–40 to +105	°C
Storage Temperature Range	–40 to + 120	°C
Soldering Temperature	See Figure 17	
Reverse Voltage[b]	Not recommended	

a. Derate linearly based on Figure 13 and Figure 14.

b. Not desgined for reverse bias operation.

Optical Characteristics at 350 mA (T_J = 25°C)

Part Number	Color	Correlated Color Temperature, CCT (Kelvin)		Viewing Angle, $2\theta_{1/2}$ [a] (°)	Luminous Efficiency (lm/W)	Color Rendering Index, CRI
		Min.	Max.	Typ.	Typ.	Typ.
ASMT-JW33-NVW01	Cool White	4500	10000	140	89	80
ASMT-JN33-NVW01	Neutral White	3500	4500	140	89	80
ASMT-JY33-NTU01	Warm White	2700	3500	140	63	75

a. $\theta_{1/2}$ is the off-axis angle where the luminous intensity is half of the peak intensity.

Electrical Characteristic at 350 mA (T_J = 25°C)

Dice Type	Forward Voltage, V_F (Volts)			Thermal Resistance, $R_{\theta j\text{-}ms}$(°C/W)[a]
	Min.	Typ.	Max.	Typ.
InGaN	2.8	3.2	3.5	9

a. $R_{\theta j\text{-}ms}$ is thermal resistance from LED junction to metal slug.

Optical and Electrical Characteristic at 700 mA (T_J = 25°C)

Part Number	Color	Luminous Flux (lm), Φ_V	Forward Voltage, V_F (Volts)
		Typ.	Typ.
ASMT-JW33-NVW01	Cool White	196	3.6
ASMT-JN33-NVW01	Neutral White	196	3.6
ASMT-JY33-NTU01	Warm White	160	3.6

Part Numbering System

A	S	M	T	-	J	x_1	3	3	-	N	x_2	x_3	x_4	x_5

Code	Description	Option	
x_1	Color	W	Cool White
		N	Neutral White
		Y	Warm White
x_2	Minimum Flux Bin	Refer to Device Selection Guide	
x_3	Maximum Flux Bin		
x_4	Color Bin Selection	Refer to Color Bin Selection Table	
x_5	Packaging Option	0	Tube
		1	Tape and Reel

Bin Information

Flux Bin Limit (x_2, x_3)

Bin ID	Luminous Flux (lm) at 350 mA	
	Min.	Max.
S	51.7	67.2
T	67.2	87.4
U	87.4	99.6
V	99.6	113.6
W	113.6	129.5

Tolerance for each bin limit is ±10%.

Color Bin Selection (x_4)

Individual reel will contain parts from one color bin selection only.

Cool White

Selection	Bin ID
0	Full Distribution
H	UN, VN, U0, and V0
J	WN, VN, W0, and V0
K	XN, WN, X0, and W0
P	Y0

Warm White

Selection	Bin ID
0	Full Distribution
H	M1, N1, M0, and N0
J	P1, N1, P0, and N0
K	Q1, P1, Q0, and P0

Neutral White

Selection	Bin ID
0	Full Distribution
G	S1, R1, S0, and R0
H	TN, S1, T0, and S0

Figure 2 Color Bin Structure for Cool White

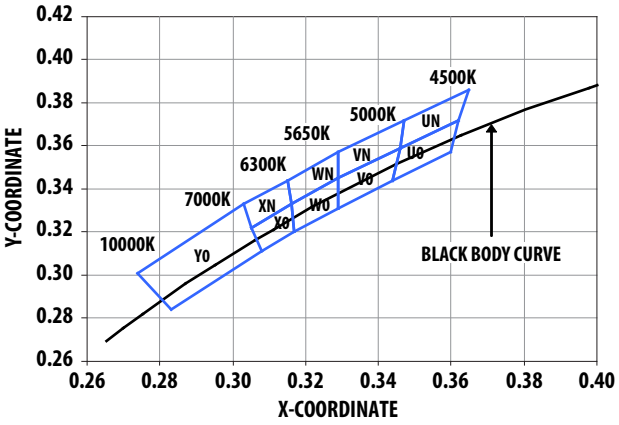


Figure 3 Color Bin Structure for Warm White

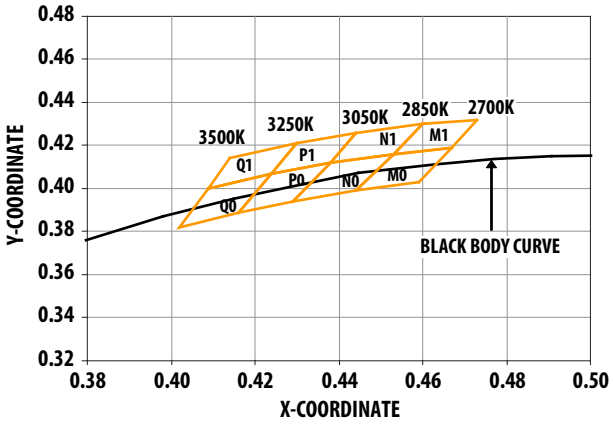
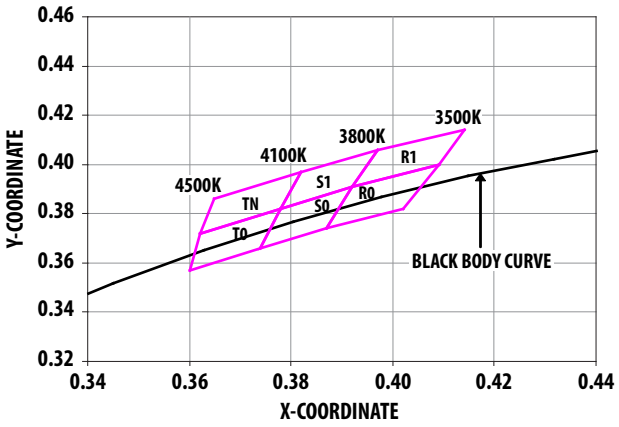


Figure 4 Color Bin Structure for Neutral White



Color Bin Limits

Cool White	Color Limits (Chromaticity Coordinates)				
Bin UN	x	0.365	0.362	0.346	0.347
	y	0.386	0.372	0.359	0.372
Bin U0	x	0.362	0.360	0.344	0.346
	y	0.372	0.357	0.344	0.359
Bin VN	x	0.329	0.329	0.347	0.346
	y	0.345	0.357	0.372	0.359
Bin V0	x	0.329	0.329	0.346	0.344
	y	0.331	0.345	0.359	0.344
Bin WN	x	0.329	0.316	0.315	0.329
	y	0.345	0.333	0.344	0.357
Bin W0	x	0.329	0.329	0.317	0.316
	y	0.345	0.331	0.320	0.333
Bin XN	x	0.305	0.303	0.315	0.316
	y	0.322	0.333	0.344	0.333
Bin X0	x	0.308	0.305	0.316	0.317
	y	0.311	0.322	0.333	0.320
Bin YO	x	0.308	0.283	0.274	0.303
	y	0.311	0.284	0.301	0.333

Tolerance: ±0.01

Neutral White	Color Limits (Chromaticity Coordinates)				
Bin R1	x	0.414	0.409	0.392	0.397
	y	0.414	0.400	0.391	0.406
Bin R0	x	0.392	0.387	0.402	0.409
	y	0.391	0.374	0.382	0.400
Bin S1	x	0.397	0.392	0.378	0.382
	y	0.406	0.391	0.382	0.397
Bin S0	x	0.392	0.387	0.374	0.378
	y	0.391	0.374	0.366	0.382
Bin TN	x	0.382	0.378	0.362	0.365
	y	0.397	0.382	0.372	0.386
Bin T0	x	0.378	0.374	0.360	0.362
	y	0.382	0.366	0.357	0.372

Tolerance: ±0.01

Warm White	Color Limits (Chromaticity Coordinates)				
Bin M1	x	0.460	0.453	0.467	0.473
	y	0.430	0.416	0.419	0.432
Bin M0	x	0.453	0.444	0.459	0.467
	y	0.416	0.399	0.403	0.419
Bin N1	x	0.444	0.438	0.453	0.460
	y	0.426	0.412	0.416	0.430
Bin N0	x	0.438	0.429	0.444	0.453
	y	0.412	0.394	0.399	0.416
Bin P1	x	0.430	0.424	0.438	0.444
	y	0.421	0.407	0.412	0.426
Bin P0	x	0.424	0.416	0.429	0.438
	y	0.407	0.389	0.394	0.412
Bin Q1	x	0.414	0.409	0.424	0.430
	y	0.414	0.400	0.407	0.421
Bin Q0	x	0.409	0.402	0.416	0.424
	y	0.400	0.382	0.389	0.407

Tolerance: ±0.01

Packaging Option (x_5)

Selection	Option
1	Tape and Reel

Example

ASMT-JW33-NVW01

ASMT-JW33-Nxxxx – Cool White, InGaN, Electrically isolated Heat Sink

$X_2 = V$ – Minimum Flux Bin V

$X_3 = W$ – Maximum Flux Bin W

$X_4 = 0$ – Full Distribution

$X_5 = 1$ – Tape and Reel Option

Figure 5 Relative Intensity vs. Wavelength

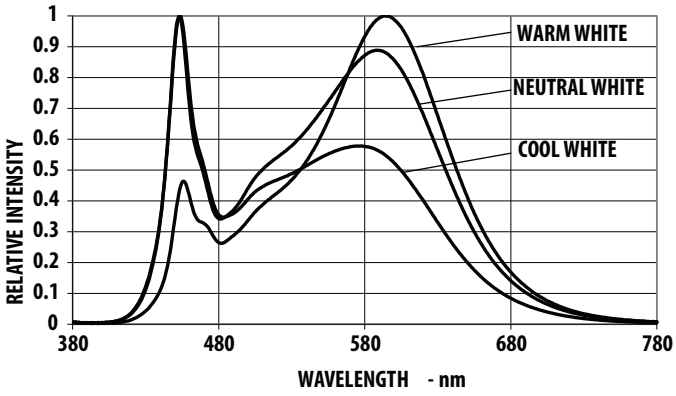


Figure 6 Relative Luminous Flux vs. Mono Pulse Current

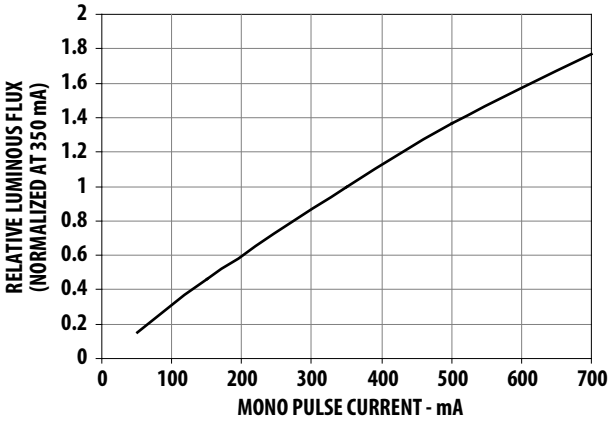


Figure 7 Forward Current vs. Forward Voltage

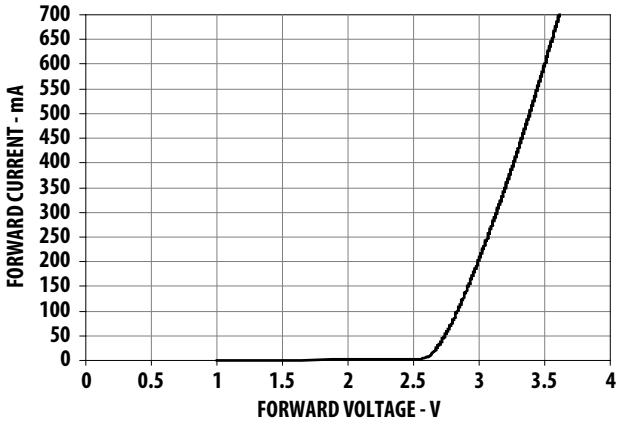


Figure 8 Radiation Pattern for Cool White, Warm White, and Neutral White

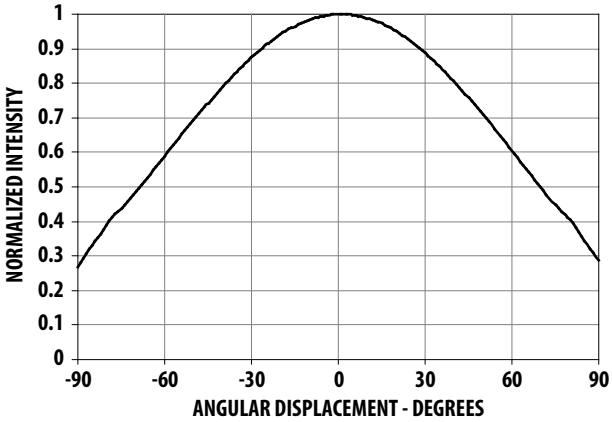


Figure 9 Maximum Pulse Current vs. Pulse Duration. Derated based on T_A = 25°C, $R_{\theta J-A}$ = 30°C/W.

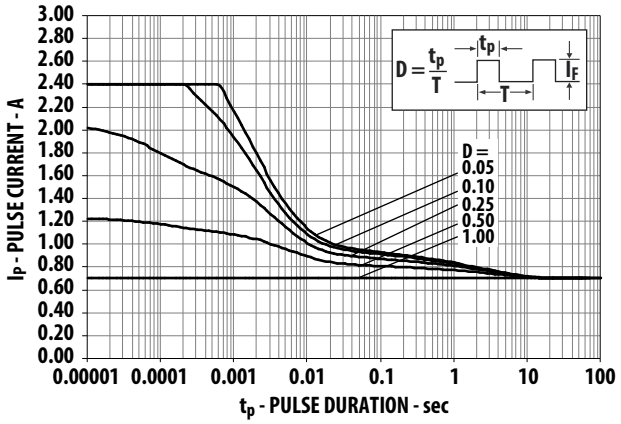


Figure 10 Maximum Pulse Current vs. Pulse Duration. Derated based on T_A = 85°C, $R_{\theta J-A}$ = 30°C/W.

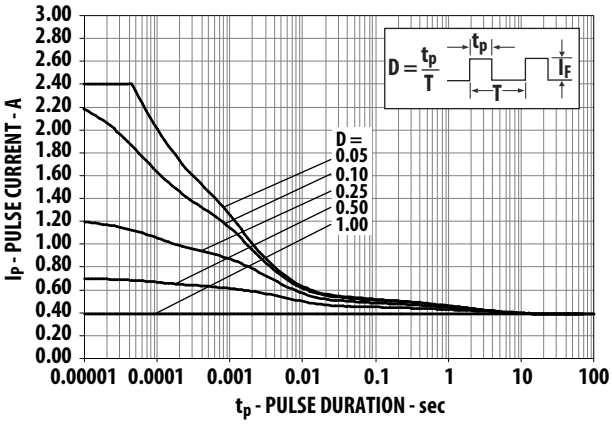


Figure 11 Relative Light Output vs. Junction Temperature

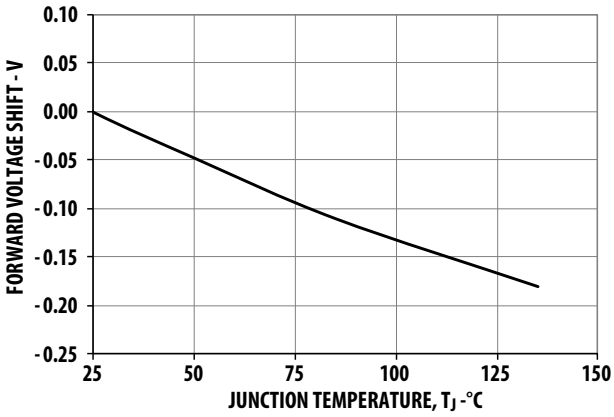


Figure 12 Forward Voltage Shift vs. Junction Temperature

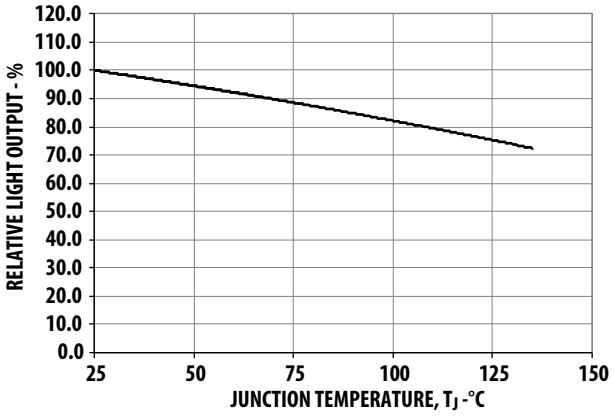


Figure 13 Maximum Forward Current vs. Ambient Temperature. Derated based on T_{JMAX} = 125°C, $R_{\theta J-A}$ = 20°C/W, 25°C/W, and 30°C/W.

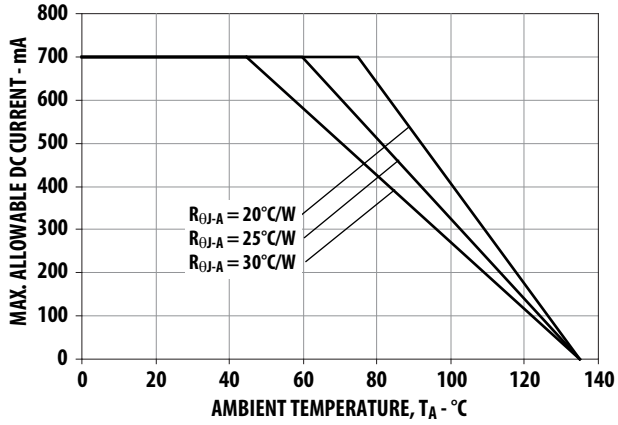


Figure 14 Maximum Forward Current vs. Metal Slug Temperature. Derated based on T_{JMAX} = 125°C, $R_{\theta J-MS}$ = 9°C/W.

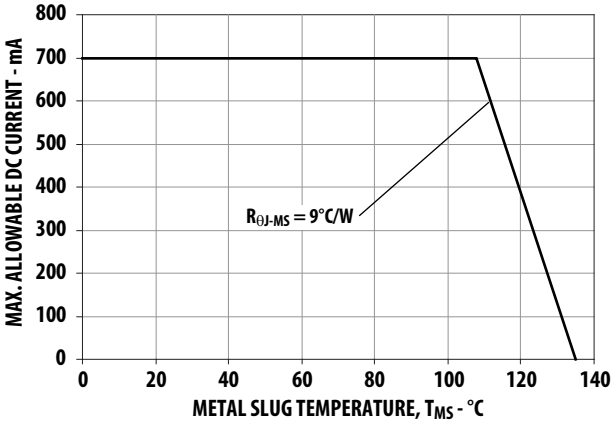


Figure 15 Recommended Soldering Land Pattern

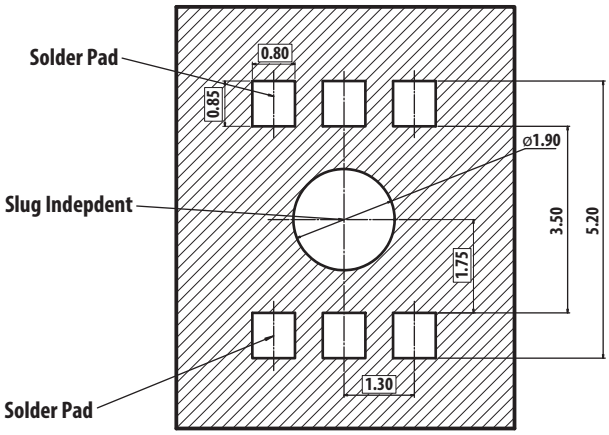


Figure 16 Recommended Pick and Place Nozzle Tip. Inner diameter = 3.2 mm.

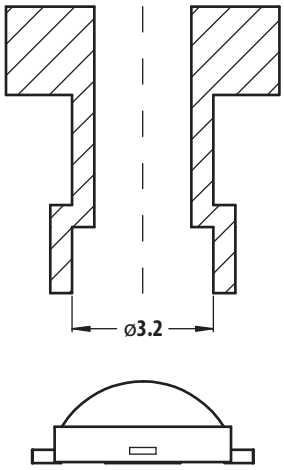
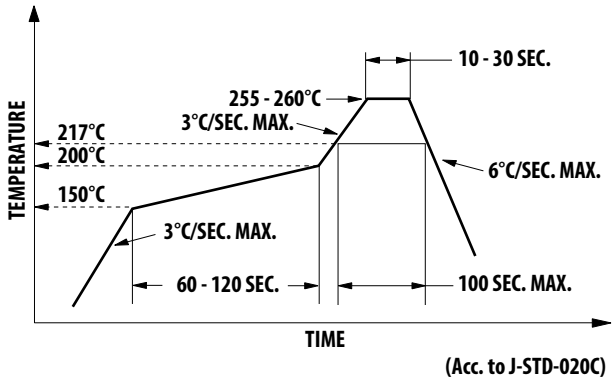


Figure 17 Recommended Soldering Profile



NOTE For detailed information on reflow soldering of Broadcom surface-mount LEDs, refer to Broadcom Application Note AN1060, S*urface Mounting SMT LED Indicator Components*.

Tape and Reel – Option 1

Figure 18 Carrier Tape Dimensions

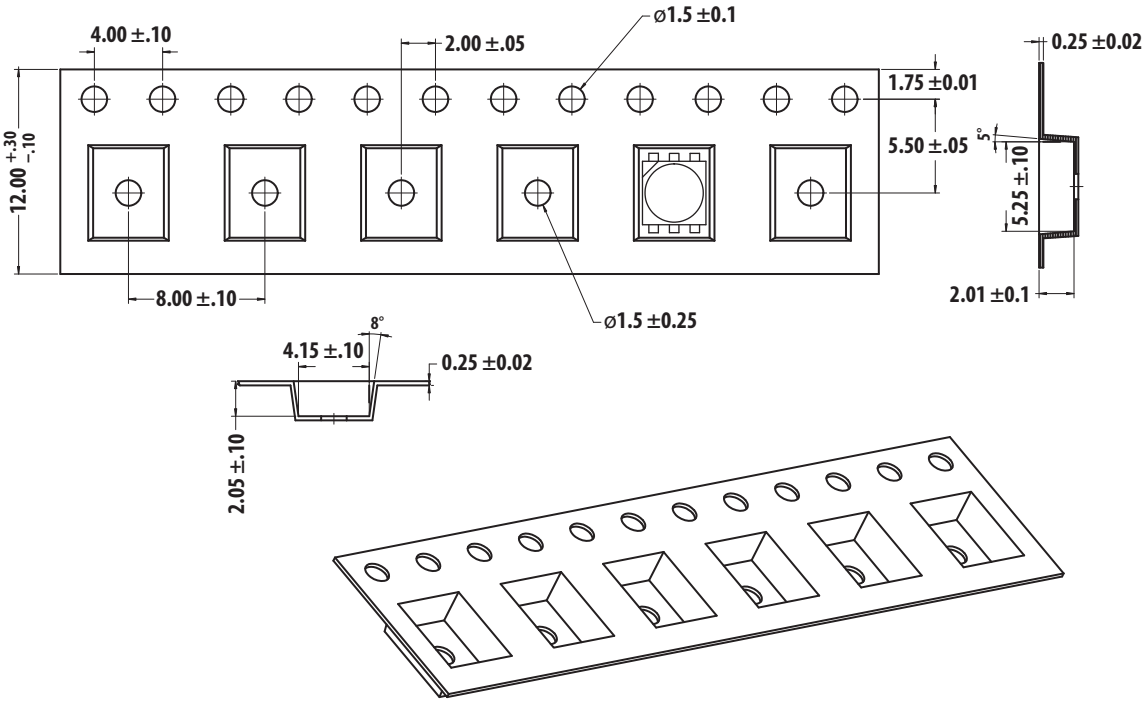
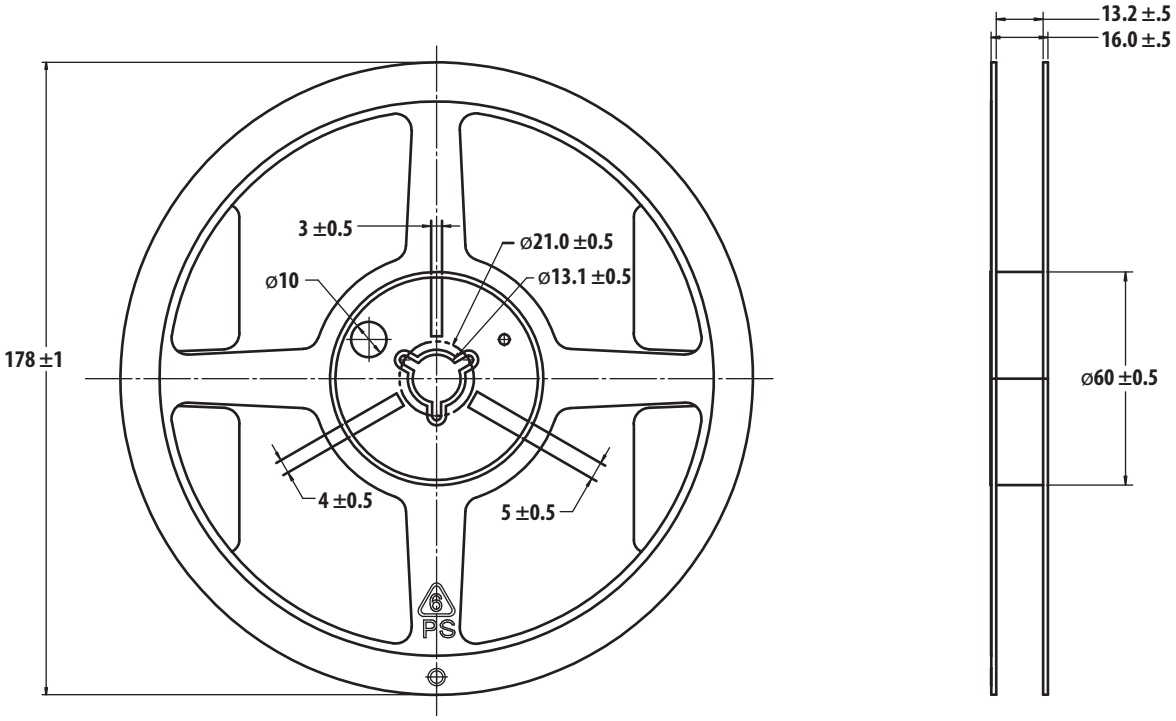


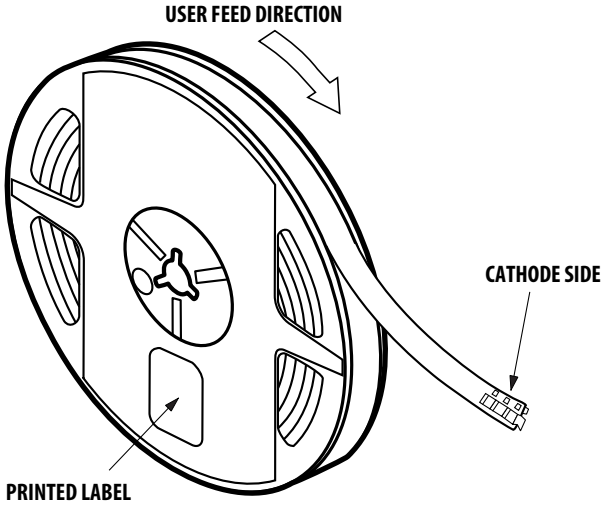
Figure 19 Reel Dimensions



NOTE

1. Empty component pockets sealed with top cover tape.
2. 250 or 500 pieces per reel.
3. Drawing not to scale.
4. All dimensions are in millimeters.

Figure 20 Reeling Orientation



DISCLAIMER: Broadcom's products and software are not specifically designed, manufactured, or authorized for sale as parts, components, or assemblies for the planning, construction, maintenance, or direct operation of a nuclear facility or for use in medical devices or applications. The customer is solely responsible, and waives all rights to make claims against Broadcom or its suppliers, for all loss, damage, expense, or liability in connection with such use.

For product information and a complete list of distributors, please go to our web site: www.broadcom.com.

AV02-2430EN – April 24, 2017

Lead (Pb) Free
RoHS 6 fully
compliant