BROADCOM®

Data Sheet

ASMT-Jx32

3W Mini Power LED Light Source

Description

The Broadcom® 3W mini power LED light source is a high-performance, energy-efficient device that can handle high-thermal and high-driving current. The metal slug is electrically isolated.

The white mini power LED is available in a range of color temperature from 2700K to 10,000K.

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

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

Features

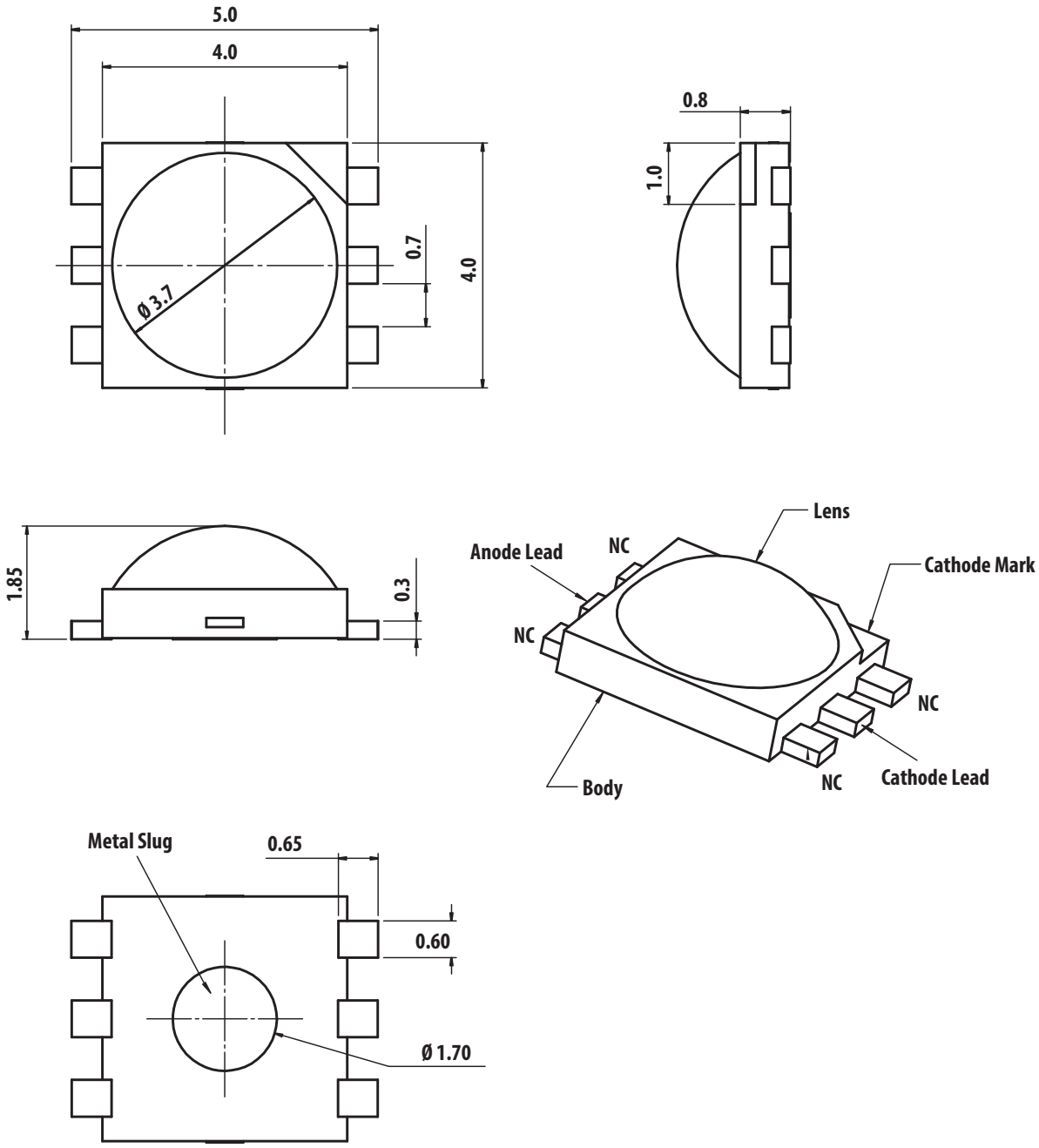
- Available in cool white, neutral white, and warm white
- Small footprint and low profile
- Symmetrical outline
- Energy efficient
- Direct heat transfer from the metal slug to the mother board
- Compatible with the reflow soldering process
- High-current operation
- Long operation life
- Wide viewing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

Applications

- Sign backlight
- Safety, exit, and emergency sign lighting
- Specialty lighting, such as task lighting and reading lights
- Retail display
- Commercial lighting
- Accent or marker lighting, strip or step lighting
- Portable lighting, bicycle head lamp, torch lights
- Decorative lighting
- Architectural lighting
- Pathway lighting
- Street lighting
- Pedestrian street lighting
- Tunnel lighting

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

Figure 1: ASMT-Jx32 Package Outline Drawing



NOTE:

- All dimensions are in millimeters.
- Tolerance is ±0.1 mm unless otherwise specified.
- Terminal finish: Ag plating.
- 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-JW32-NWY01	Cool White	113.6	140.0	168.4	350	InGaN	Yes
ASMT-JN32-NWY01	Neutral White	113.6	140.0	168.4	350	InGaN	Yes
ASMT-JN32-NWYH1		113.6	140.0	168.4	350	InGaN	Yes
ASMT-JY32-NWY01	Warm White	113.6	130.0	168.4	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 designed 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)
		Min.	Max.	Typ.	Typ.
ASMT-JW32-NWY01	Cool White	4500	10000	140	125
ASMT-JN32-NWY01	Neutral White	3500	4500	140	125
ASMT-JN32-NWYH1		3800	4500	140	125
ASMT-JY32-NWY01	Warm White	2700	3500	140	116

a. $\theta_{1/2}$ is the off-axis angle where the luminous intensity is half 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	2.9	3.5	9

a. $R_{\theta j\text{-}ms}$ is the thermal resistance from the LED junction to the 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-JW32-NWY01	Cool White	239.0	3.1
ASMT-JN32-NWY01	Neutral White	239.0	3.1
ASMT-JN32-NWYH1		239.0	3.1
ASMT-JY32-NWY01	Warm White	222.0	3.1

Part Numbering System

A S M T - J [x_1] **3 2 -** [x_2] [x_3] [x_4] [x_5] [x_6]

Code	Description	Option	
x_1	Color	W	Cool White
		N	Neutral White
		Y	Warm White
x_2	Dice Type	N	InGaN
x_3	Minimum Flux Bin	Refer to the Device Selection Guide.	
x_4	Maximum Flux Bin		
x_5	Color Bin Selection	Refer to the Color Bin Selection Table.	
x_6	Packaging Option	0	Tube
		1	Tape and Reel

Bin Information

Flux Bin Limit (x_3, x_4)

Bin ID	Luminous Flux (lm) at 350 mA	
	Min.	Max.
U	87.4	99.6
V	99.6	113.6
W	113.6	129.5
X	129.5	147.7
Y	147.7	168.4

Color Bin Selection (x_5)

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

Cool White

Selection	Bin ID
0	Full Distribution
E	VM, UM, VN, and UN
F	WM, VM, WN, and VN
G	XM, WM, XN, and WN
H	UN, VN, U0, and V0
J	WN, VN, W0, and V0
K	XN, WN, X0, and W0
L	V0, U0, VP, and UP
M	W0, V0, WP, VP, and WQ
N	X0, W0, XP, WP, and WQ
P	Y0
Q	YA

Neutral White

Selection	Bin ID
0	Full Distribution
E	SM, RM, S1, and R1
F	TM, SM, TN, and S1
G	S1, R1, S0, and R0
H	TN, S1, T0, and S0
J	S0, R0, SA, and RA
K	T0, S0, TP, and SA

Warm White

Selection	Bin ID
0	Full Distribution
E	NM, MM, N1, and M1
F	PM, NM, P1, and N1
G	QM, PM, Q1, and P1
H	M1, N1, M0, and N0
J	P1, N1, P0, and N0
K	Q1, P1, Q0, and P0
L	N0, M0, NA, and MA
M	P0, N0, PA, and NA
N	Q0, P0, QA, and PA

Figure 2: Color Bin Structure for Cool White

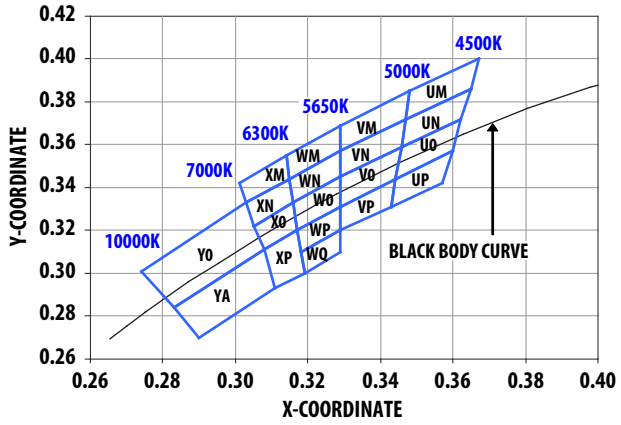


Figure 3: Color Bin Structure for Neutral White

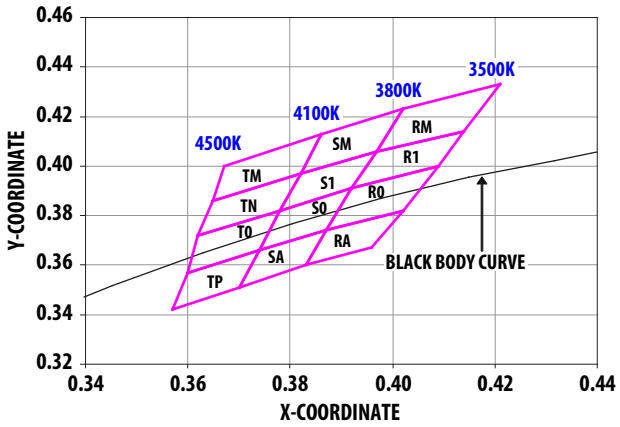
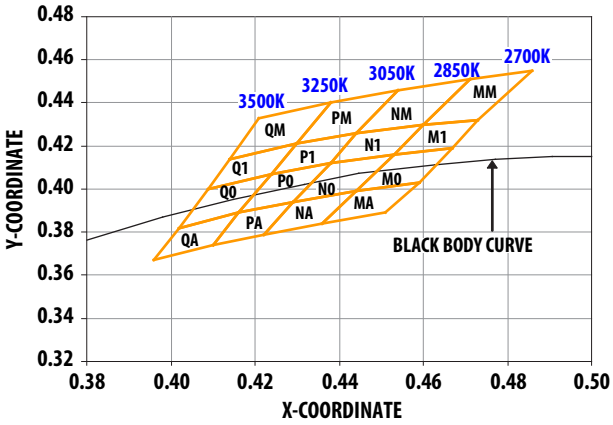


Figure 4: Color Bin Structure for Warm White



Color Bin Limits

Cool White	Color Limits (Chromaticity Coordinates)				
Bin UM	x	0.365	0.367	0.348	0.347
	y	0.386	0.400	0.385	0.372
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 UP	x	0.360	0.357	0.343	0.344
	y	0.357	0.342	0.331	0.344
Bin VM	x	0.329	0.329	0.348	0.347
	y	0.357	0.369	0.385	0.372
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 VP	x	0.329	0.344	0.343	0.329
	y	0.331	0.344	0.331	0.320
Bin WM	x	0.329	0.329	0.315	0.314
	y	0.369	0.357	0.344	0.355
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 WP	x	0.329	0.329	0.318	0.317
	y	0.331	0.320	0.310	0.320
Bin WQ	x	0.329	0.329	0.319	0.318
	y	0.320	0.310	0.300	0.310
Bin XM	x	0.301	0.314	0.315	0.303
	y	0.342	0.355	0.344	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 XP	x	0.308	0.317	0.319	0.303
	y	0.311	0.320	0.300	0.293
Bin Y0	x	0.308	0.283	0.274	0.303
	y	0.311	0.284	0.301	0.333
Bin YA	x	0.308	0.311	0.290	0.283
	y	0.311	0.293	0.270	0.284

Tolerance: ±0.01

Neutral White	Color Limits (Chromaticity Coordinates)				
Bin RM	x	0.421	0.414	0.397	0.402
	y	0.433	0.414	0.406	0.423
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 RA	x	0.387	0.383	0.396	0.402
	y	0.374	0.360	0.367	0.382
Bin SM	x	0.402	0.397	0.382	0.386
	y	0.423	0.406	0.397	0.413
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 SA	x	0.387	0.383	0.370	0.374
	y	0.374	0.360	0.351	0.366
Bin TM	x	0.386	0.382	0.365	0.367
	y	0.413	0.397	0.386	0.400
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
Bin TP	x	0.374	0.370	0.357	0.360
	y	0.366	0.351	0.342	0.357

Tolerance: ±0.01

Warm White	Color Limits (Chromaticity Coordinates)				
Bin MM	x	0.471	0.460	0.473	0.486
	y	0.451	0.430	0.432	0.455
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 M	x	0.459	0.444	0.436	0.451
	y	0.403	0.399	0.384	0.389
Bin NM	x	0.454	0.444	0.460	0.471
	y	0.446	0.426	0.430	0.451
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 NA	x	0.444	0.429	0.422	0.436
	y	0.399	0.394	0.379	0.384
Bin PM	x	0.438	0.430	0.444	0.454
	y	0.440	0.421	0.426	0.446
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 PA	x	0.429	0.416	0.410	0.422
	y	0.394	0.389	0.374	0.379
Bin QM	x	0.421	0.414	0.430	0.438
	y	0.433	0.414	0.421	0.4440
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
Bin QA	x	0.416	0.402	0.396	0.410
	y	0.389	0.382	0.367	0.374

Tolerance: ±0.01

Packaging Option (x_6)

Selection	Option
1	Tape and Reel

Example: ASMT-JW32-NWY01

ASMT-JW32-Nxxxx – Cool White, InGaN, Electrically Isolated Heat Sink

x_3 = W – Minimum Flux Bin W

x_4 = Y – Maximum Flux Bin Y

x_5 = 0 – Full Distribution

x_6 = 1 – Tape and Reel Option

Figure 5: Relative Intensity vs. Wavelength for Cool White, Neutral White, and Warm White

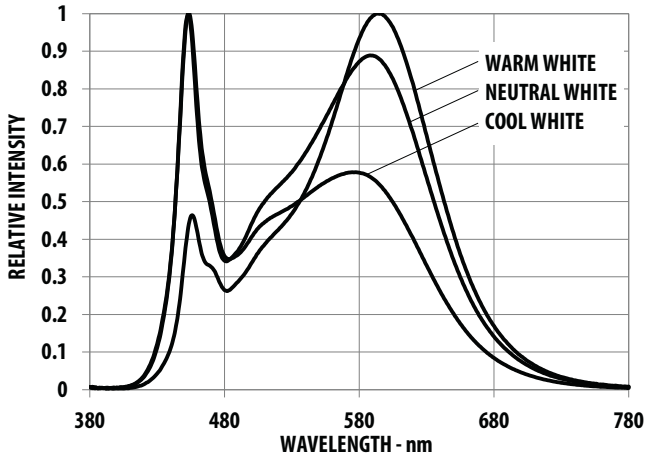


Figure 6: Relative Luminous Flux vs. Mono Pulse Current

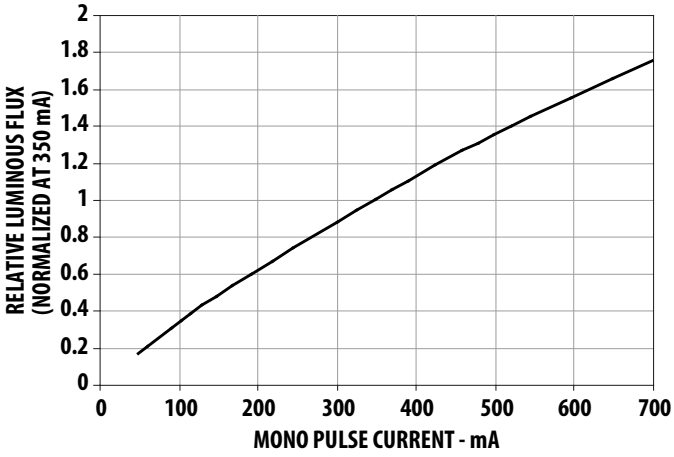


Figure 7: Forward Current vs. Forward Voltage

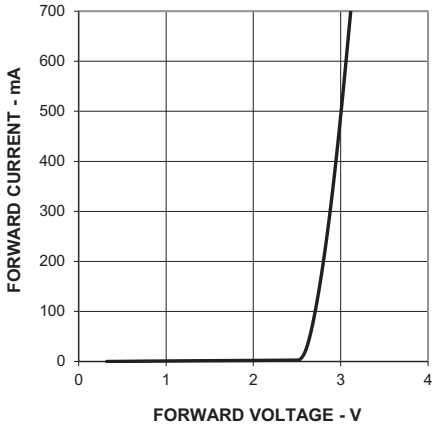


Figure 8: Maximum Pulse Current vs. Pulse Duration. Derated Based on T_A = 25°C, $R_{\theta J-A}$ = 30°C/W.

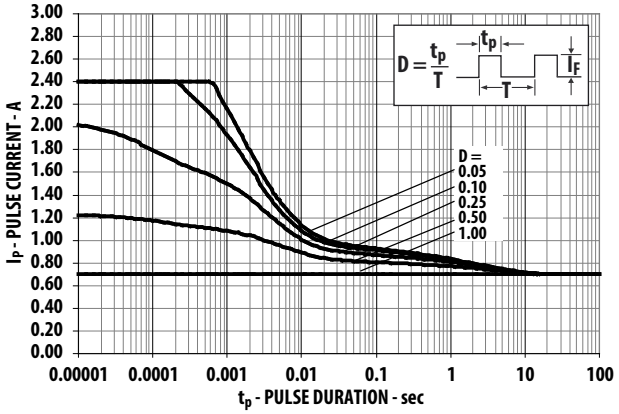


Figure 9: Maximum Pulse Current vs. Pulse Duration. Derated Based on T_A = 85°C, $R_{\theta J-A}$ = 30°C/W.

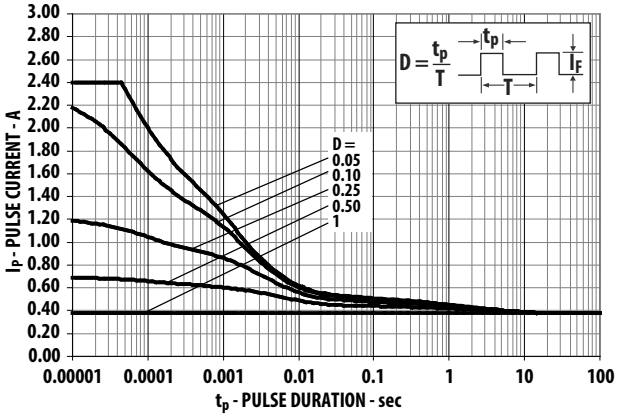


Figure 10: Radiation Pattern for Cool White, Neutral White, and Warm White

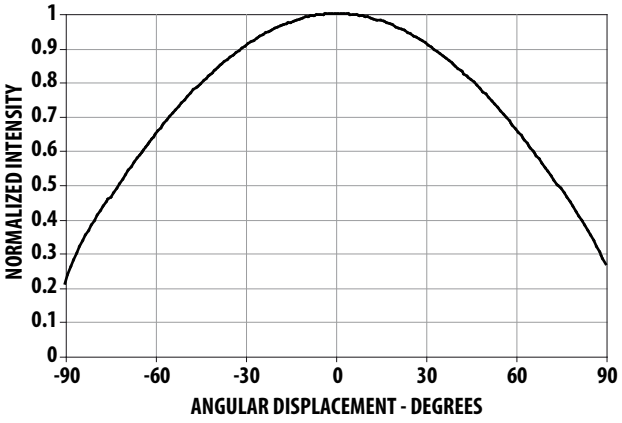


Figure 11: Relative Light Output vs. Junction Temperature

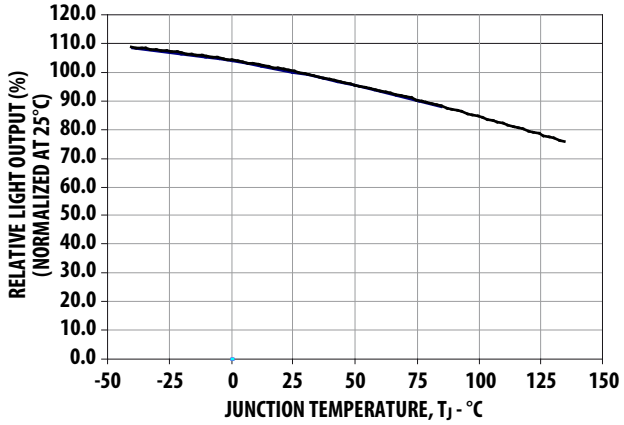


Figure 12: Forward Voltage Shift vs. Junction Temperature

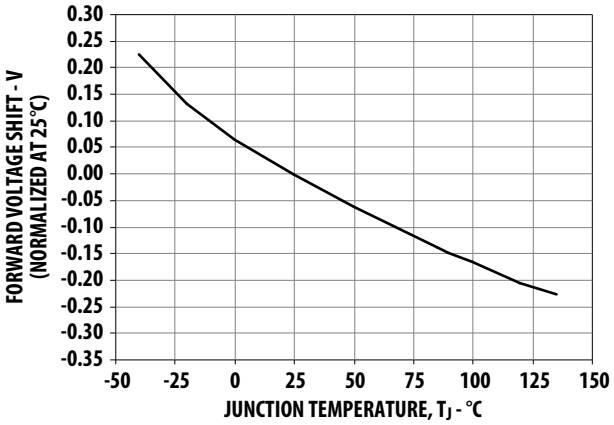


Figure 13: Maximum Forward Current vs. Ambient Temperature. Derated Based on T_{JMAX} = 125°C, $R_{\theta J-A}$ = 20°C/W, 25°C/W, and 30°C/W.

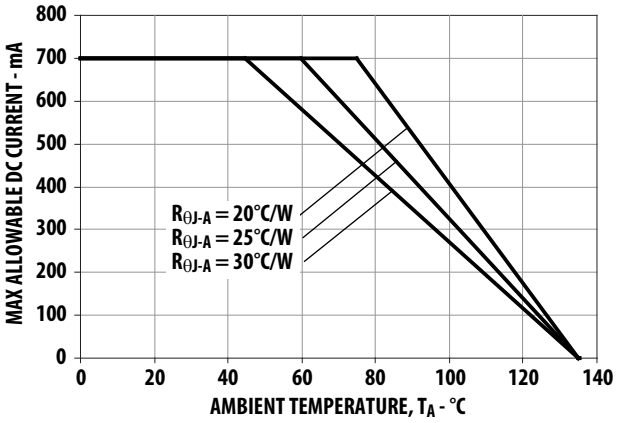


Figure 14: Maximum Forward Current vs. Metal Slug Temperature. Derated Based on T_{JMAX} = 125°C, $R_{\theta J-MS}$ = 9°C/W.

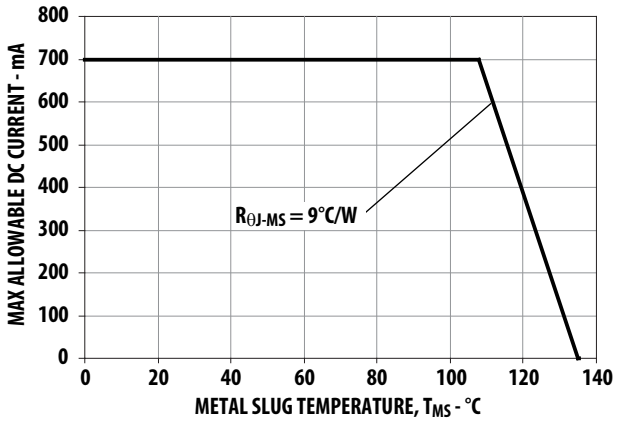


Figure 15: Recommended Soldering Land Pattern

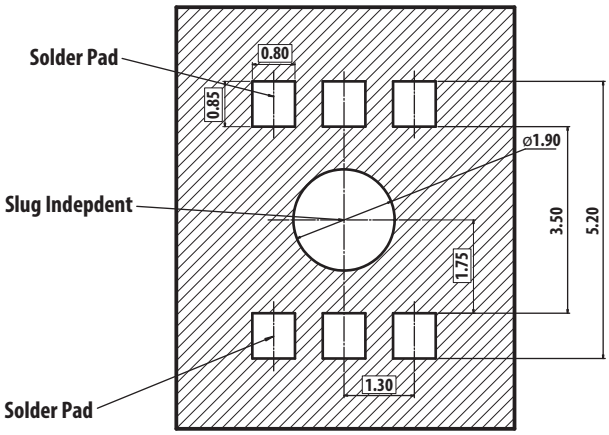


Figure 16: Recommended Pick-and-Place Nozzle Tip. Inner Diameter = 3.2 mm.

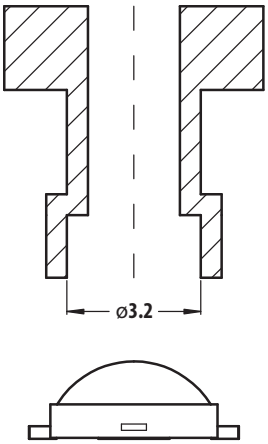
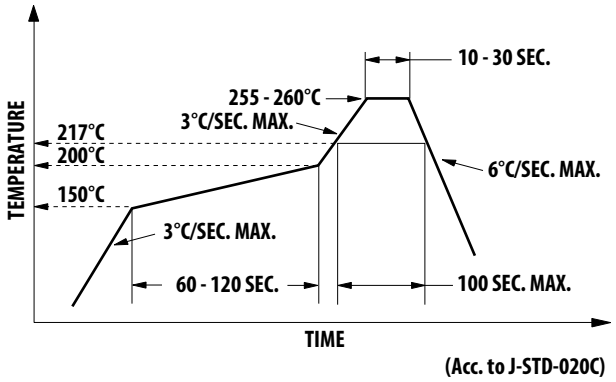


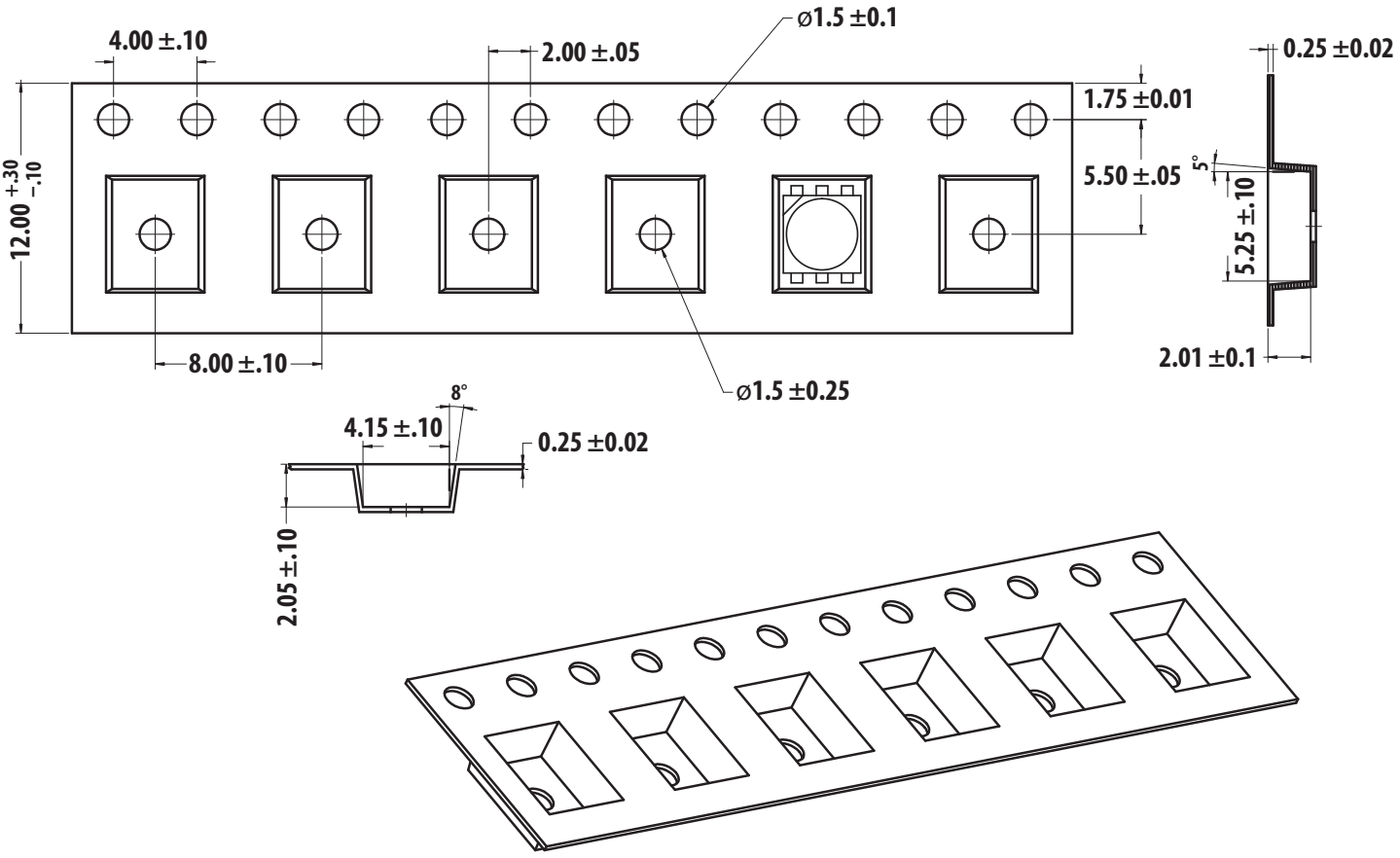
Figure 17: Recommended Soldering Profile



NOTE: For detailed information on the reflow soldering of Broadcom surface-mount LEDs, refer to Broadcom application note *Surface Mounting SMT LED Indicator Components*.

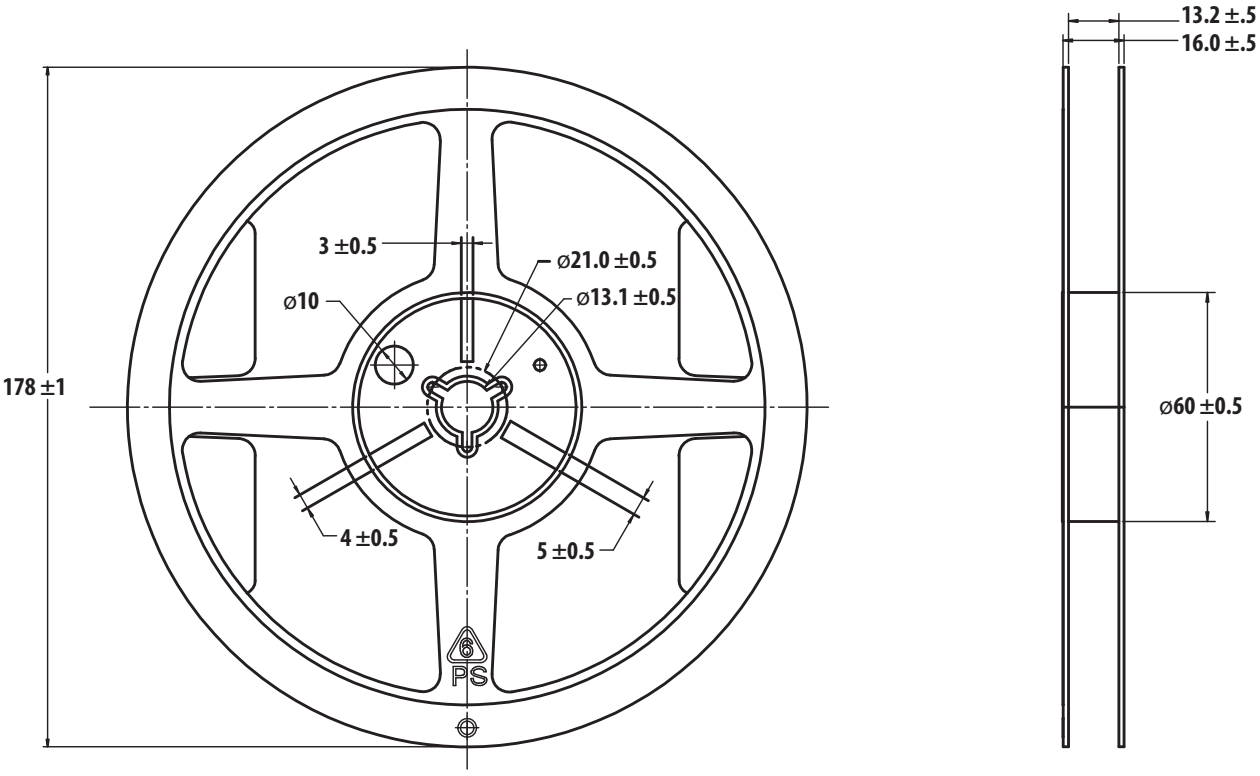
Tape and Reel – Option 1

Figure 18: Carrier Tape Dimensions



NOTE: All dimensions are in millimeters.

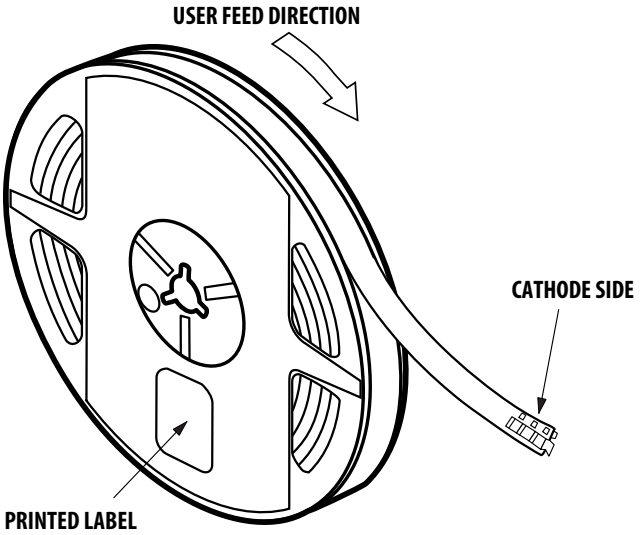
Figure 19: Reel Dimensions



NOTE:

- Empty component pockets are sealed with top cover tape.
- There are 250 or 500 pieces per reel.
- The drawing is not to scale.
- All dimensions are in millimeters.

Figure 20: Reeling Orientation



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RoHS Compliant