ASMT-Mxx9

Moonstone™ 1W Power LED Light Source

Data Sheet

Lead (Pb) Free
RoHS 6 fully
compliant

Description

Moonstone™ 1W Power LED Light Source is a high performance energy efficient device which can handle high thermal and high driving current. The exposed pad design has excellent heat transfer from the package to the motherboard.

It is available in various color temperatures ranging from 2600K to 10000K.

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

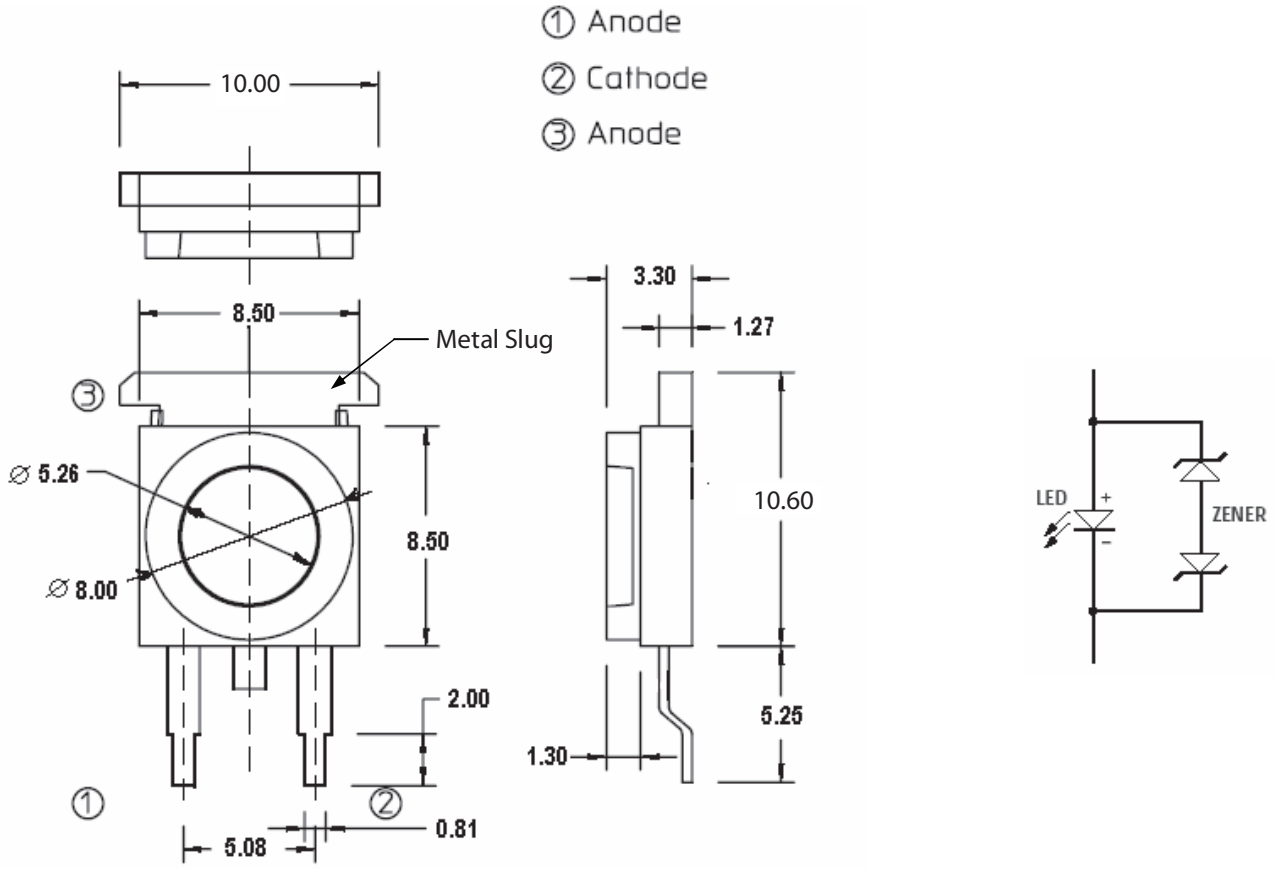
Features

- Available in Cool White & Warm White color
- Energy efficient
- Exposed pad for excellent heat transfer
- Suitable for reflow soldering process
- High current operation
- Long operation life
- Wide viewing angle
- Silicone encapsulation
- Non-ESD sensitive (threshold >16kV)
- MSL 4

Applications

- Portable (flash light, bicycle head light)
- Reading light
- Architectural lighting
- Garden lighting
- Decorative lighting

Package Dimensions



Notes:
1. All dimensions in mm.
2. Tolerance = ±0.10mm unless otherwise specified.
3. Terminal finish: Ag plating.

Device Selection Guide (T_J = 25°C)

		Luminous Flux, Φ_V[1,2] (lm)			Test Current	
Part Number	**Color**	**Min**	**Typ**	**Max**	**(mA)**	**Die Technology**
ASMT-MW09-Nxxxx	Cool White	73.0	80.0	95.0	350	InGaN
ASMT-MY09-Nxxxx	Warm White	56.0	73.0	95.0	350	InGaN
ASMT-MWB9-Nxxxx	Cool White Diffuse	56.0	73.0	95.0	350	InGaN
ASMT-MYB9-Nxxxx	Warm White Diffuse	56.0	68.0	95.0	350	InGaN

Notes:
1. Φ_V is the total luminous flux output as measured with an integrating sphere at 25ms mono pulse condition.
2. Flux tolerance is ±10 %

Part Numbering System

ASMT-M x x 9 – N x_1 x_2 x_3 x_4

- Packaging option
- Color bin selection
- Maximum flux bin
- Minimum flux bin

Refer to page 6 for selection details

Silicone Type
0 – Non-diffuse
B – Diffuse

Color
W – Cool White
Y – Warm White

Absolute Maximum Ratings

Parameter	ASMT-Mxx9	Unit
DC Forward Current [1]	500	mA
Peak Pulsing Current [2]	1000	mA
Power Dissipation	2100	mW
Reverse Voltage	5	V
LED Junction Temperature	125	°C
Operating Ambient Temperature Range	-40 to +85	°C
Storage Temperature Range	-40 to +120	°C
Soldering Temperature	Refer to figure 10	

Note:
1. Derate linearly based on Figure 8 and 9.
2. Pulse condition: duty factor = 10%, Frequency = 1kHz.

Optical Characteristics (T_J = 25°C)

		Correlated Color Temperature, CCT (Kelvin)		Viewing Angle $2\theta_{1/2}$ [1] (Degrees)	Luminous Efficiency (lm/W)
Part Number	**Color**	**Min.**	**Max.**	**Typ.**	**Typ.**
ASMT-MW09-Nxxxx	Cool White	4000	10000	120	64
ASMT-MY09-Nxxxx	Warm White	2600	4000	120	58
ASMT-MWB9-Nxxxx	Cool White Diffuse	4000	10000	120	58
ASMT-MYB9-Nxxxx	Warm White Diffuse	2600	4000	120	54

Notes:
1. $\theta_{1/2}$ is the off-axis angle where the luminous intensity is ½ the peak intensity.

Electrical Characteristic (T_J = 25°C)

	Forward Voltage, V_F (Volts) @ I_F = 350mA			Reverse Voltage, V_R (Volts)	Thermal Resistance, $R_{\theta J\text{-}MS}$ [1] (°C/W)
Part Number	**Min.**	**Typ.**	**Max.**	**Max.**	**Typ.**
ASMT-Mxx9	3.2	3.6	4.0	5	10

Note:
1. $R_{\theta J\text{-}MS}$ is the Thermal Resistance from LED junction to metal slug.

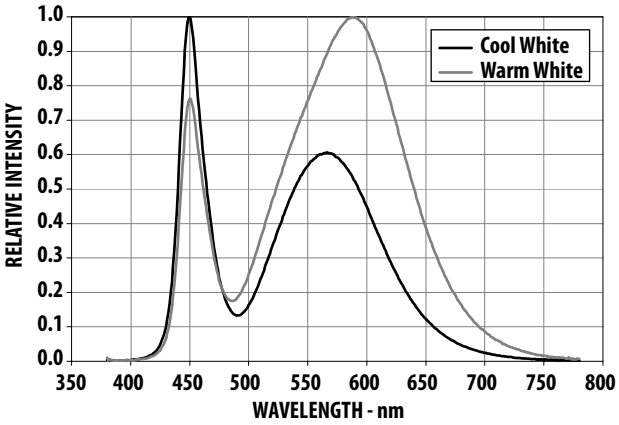


Figure 1. Relative intensity vs. wavelength

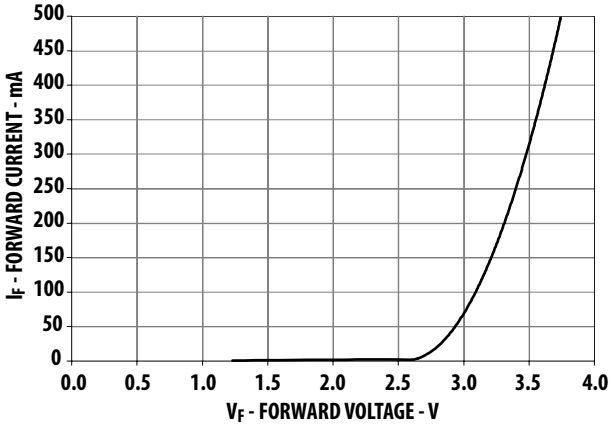


Figure 2. Forward voltage vs. forward current.

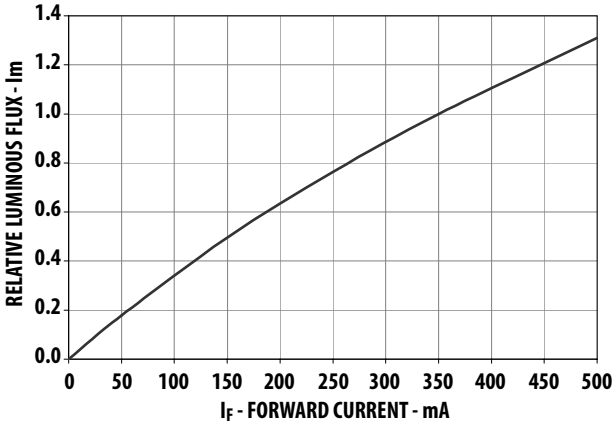


Figure 3. Relative luminous flux vs. forward current.

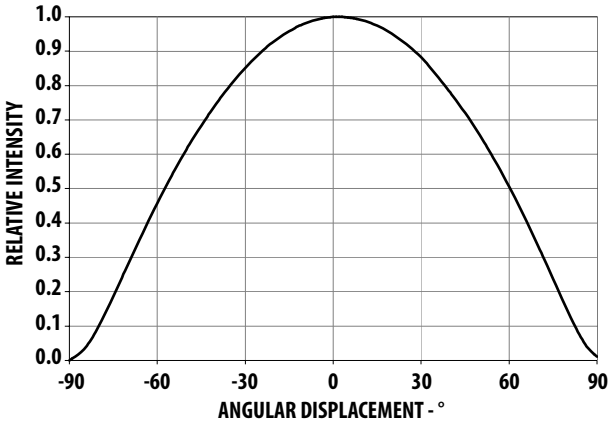


Figure 4. Radiation pattern.

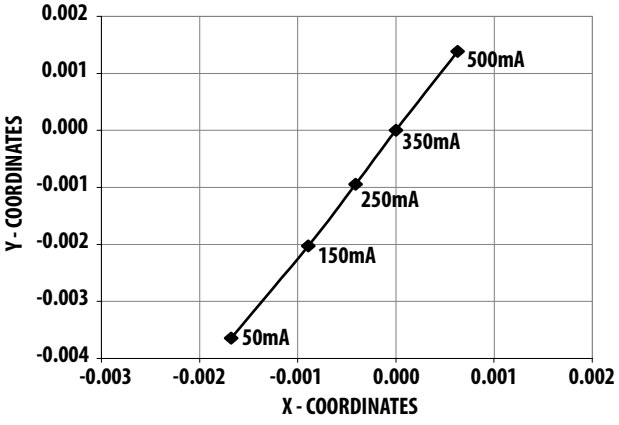


Figure 5a. Chromaticity coordinate shift vs. forward current (Cool White).

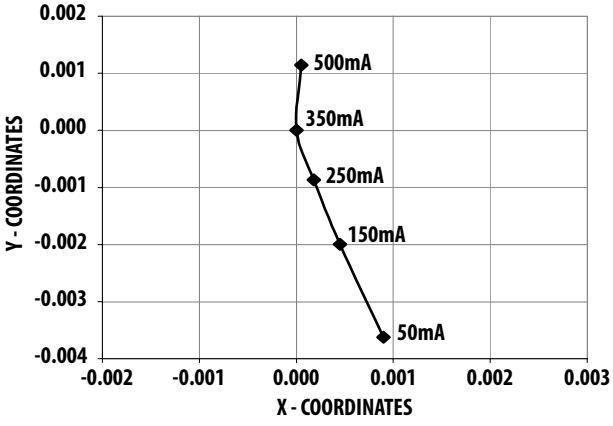


Figure 5b. Chromaticity coordinate shift vs. forward current (Warm White).

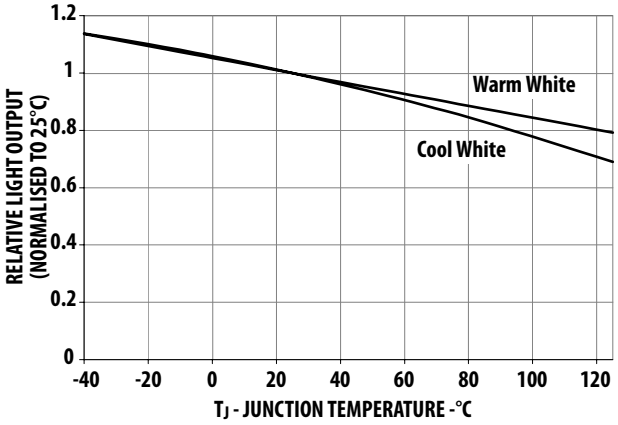


Figure 6. Relative light output vs. junction temperature.

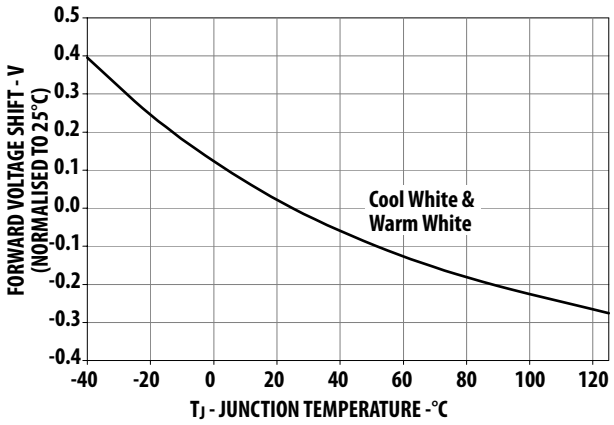


Figure 7. Forward voltage shift vs. junction temperature.

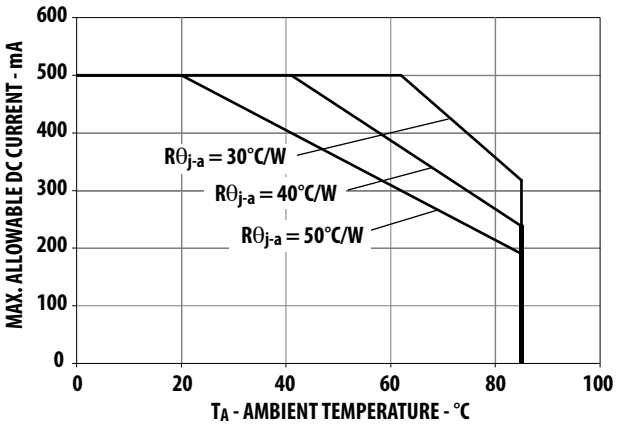


Figure 8. Maximum forward current vs. ambient temperature

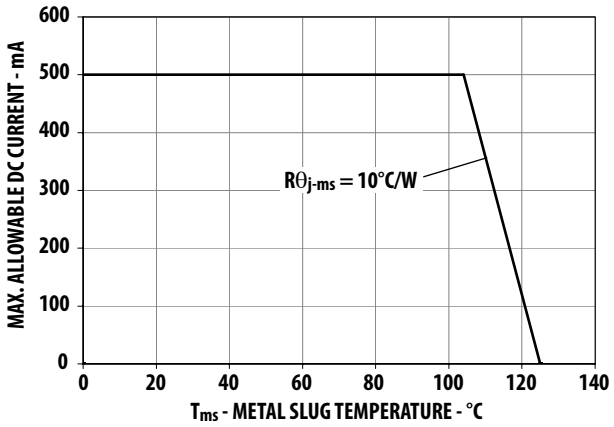


Figure 9. Maximum forward current vs. metal slug temperature

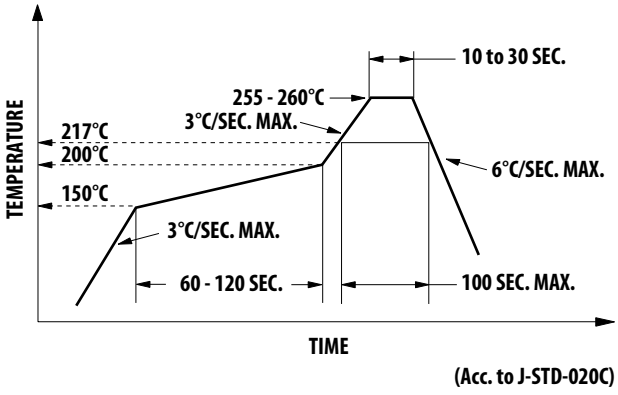


Figure 10. Recommended soldering profile.

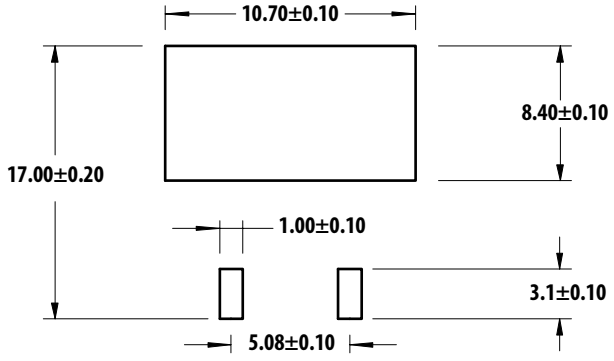


Figure 11. Recommended soldering land pattern.

Option Selection Details

ASMT-Mxx9 – N x_1 x_2 x_3 x_4

x_1 = Minimum flux bin
x_2 = Maximum flux bin

Flux Bin Limit [x_1 x_2]

	Luminous Flux (lm) @ I_F = 350mA	
Bin	**Min**	**Max**
K	56.0	73.0
L	73.0	95.0

Tolerance: ±10%

x_3 = Color bin selection

Individual reel or tube will contain LEDs from one color bin only.

Cool White

Selection	Bin
0	Full Distribution
A	A only
B	B only
C	C only
D	D only
E	E only
F	F only
G	G only
H	H only
L	A and G only
M	B and H only
N	A and C only
P	B and D only
Q	E and C only
R	F and D only
S	G and H only
U	E and F only
W	C and D only
Z	A and B only
1	A, B, C and D only
2	G, H, A and B only
4	C, D, E and F only

Warm White

Selection	Bin
0	Full Distribution
A	A only
B	B only
C	C only
D	D only
E	E only
F	F only
N	A and C only
P	B and D only
Q	E and C only
R	F and D only
U	E and F only
W	C and D only
Z	A and B only
1	A, B, C and D only
4	C, D, E and F only

Color Bin Limit

Cool White	Color Limits (Chromaticity Coordinates)				
Bin A	X	0.367	0.362	0.329	0.329
	Y	0.400	0.372	0.345	0.369
Bin B	X	0.362	0.356	0.329	0.329
	Y	0.372	0.330	0.302	0.345
Bin C	X	0.329	0.329	0.305	0.301
	Y	0.369	0.345	0.322	0.342
Bin D	X	0.329	0.329	0.311	0.305
	Y	0.345	0.302	0.285	0.322
Bin E	X	0.303	0.307	0.283	0.274
	Y	0.333	0.311	0.284	0.301
Bin F	X	0.307	0.311	0.290	0.283
	Y	0.311	0.285	0.265	0.284
Bin G	X	0.388	0.379	0.362	0.367
	Y	0.417	0.383	0.372	0.400
Bin H	X	0.379	0.369	0.356	0.362
	Y	0.383	0.343	0.330	0.372

Tolerance: ± 0.01

Warm White	Color Limits (Chromaticity Coordinates)				
Bin A	X	0.497	0.458	0.441	0.477
	Y	0.447	0.434	0.403	0.414
Bin B	X	0.477	0.441	0.428	0.459
	Y	0.414	0.403	0.376	0.384
Bin C	X	0.458	0.429	0.415	0.441
	Y	0.434	0.425	0.393	0.403
Bin D	X	0.441	0.415	0.405	0.428
	Y	0.403	0.393	0.368	0.376
Bin E	X	0.429	0.387	0.381	0.415
	Y	0.425	0.404	0.377	0.393
Bin F	X	0.415	0.381	0.373	0.405
	Y	0.393	0.377	0.349	0.368

Tolerance: ± 0.01

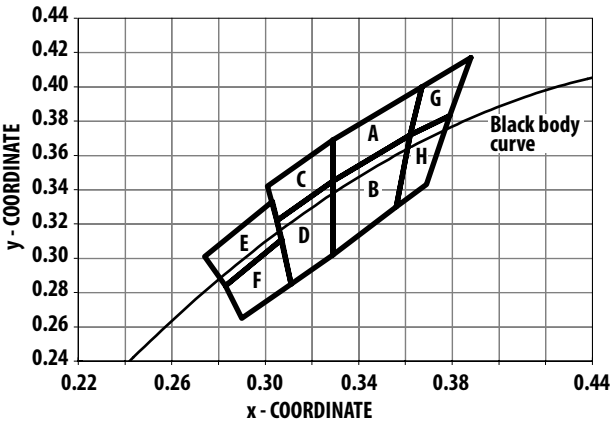


Figure 12a. Color bins (Cool White)

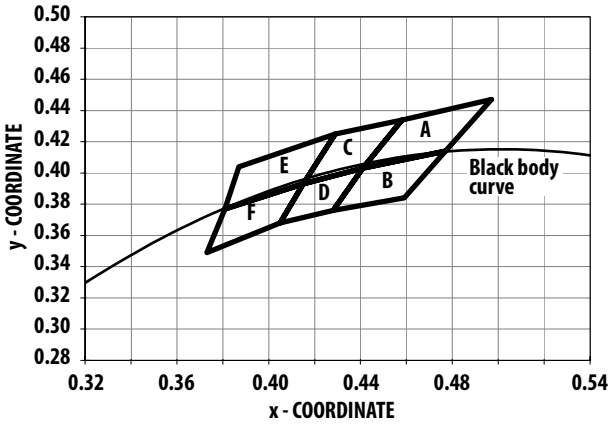


Figure 12b. Color bins (Warm White)

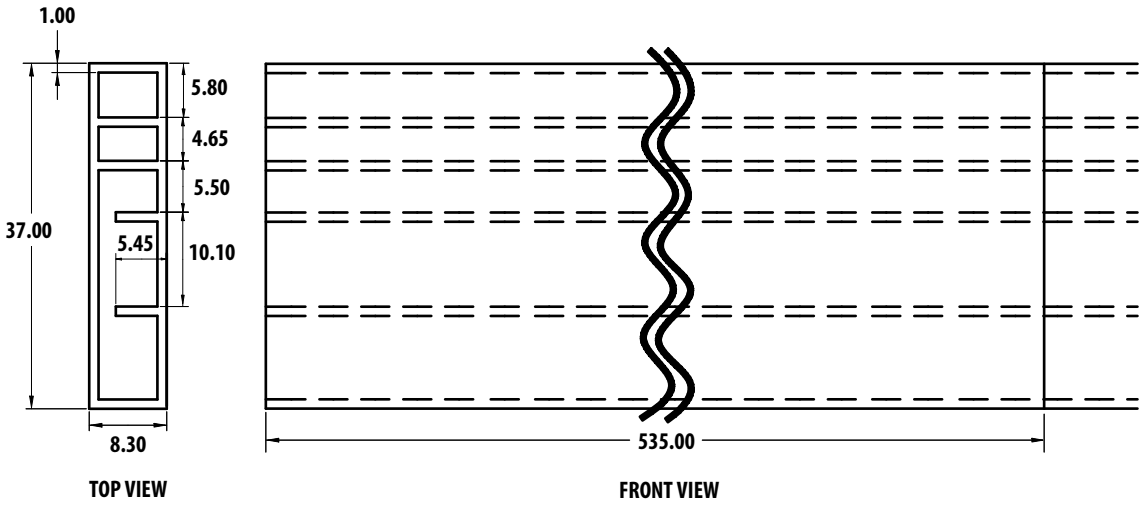
x_4 = Packaging option

Selection	Option
0	Tube
1	Tape & reel

Example

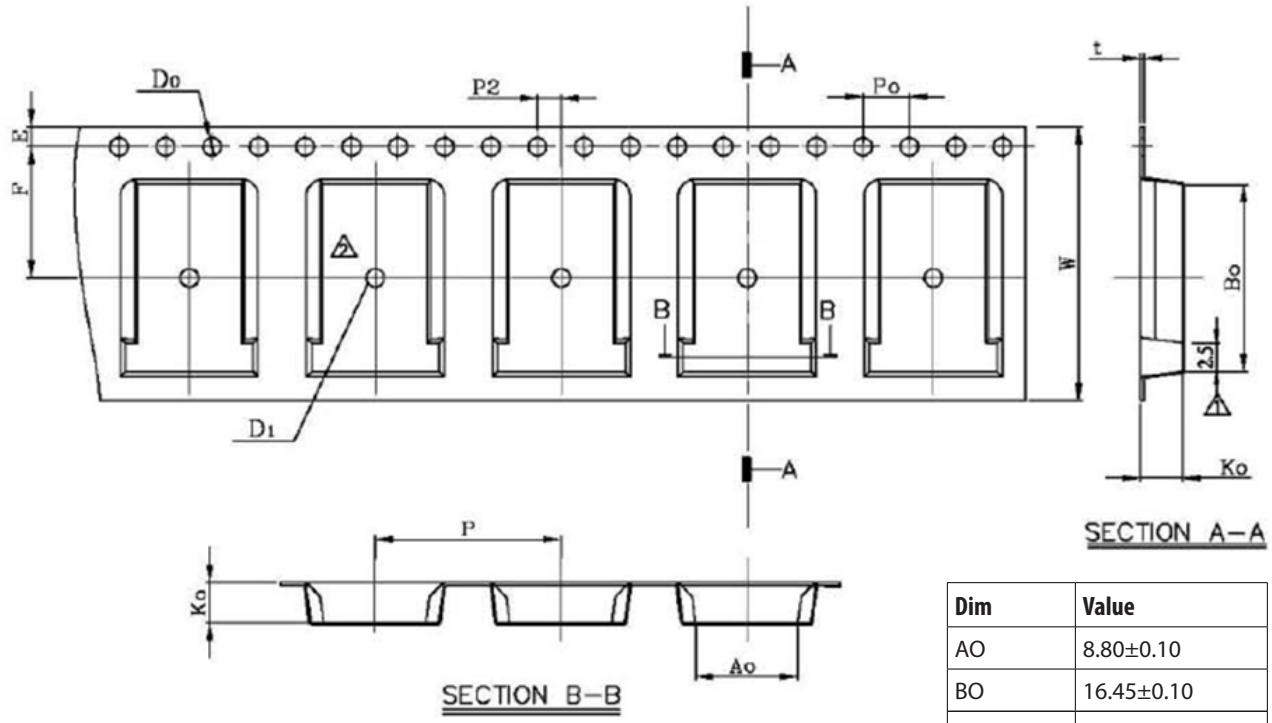
ASMT-MW09-NLLZ1

ASMT-MW09-Nxxxx	–	Cool White Non-diffuse
x_1 = L	–	Min. flux bin L
x_2 = L	–	Max. flux bin L
x_3 = Z	–	Color bin A & B only
x_4 = 1	–	Tape & reel option



Quantity per tube = 25 pcs

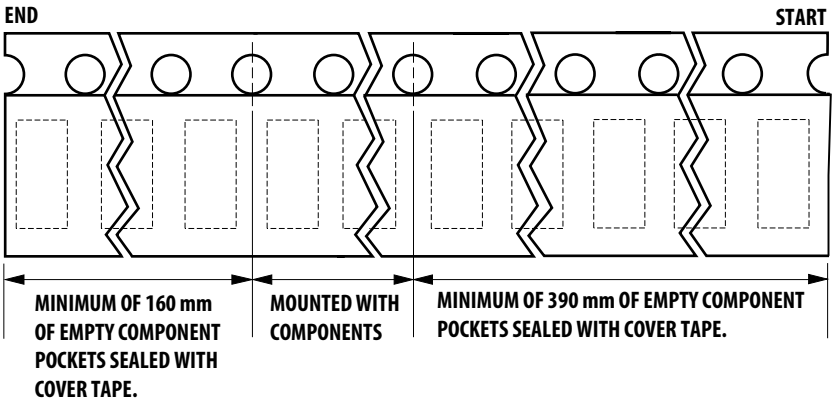
Figure 13. Tube dimensions.



Dim	Value
AO	8.80±0.10
BO	16.45±0.10
KO	3.60±0.1
E	1.75±0.10
F	11.50±0.10
W	24.0±0.10
P	16.0±0.10
Q'ty/Reel	250 units

All dimensions in mm.

Figure 14. Carrier tape dimensions.



*Note: Tape & Reel Packaging only applicable as per this datasheet only.

Figure 15. Carrier tape leader and trailer dimensions.

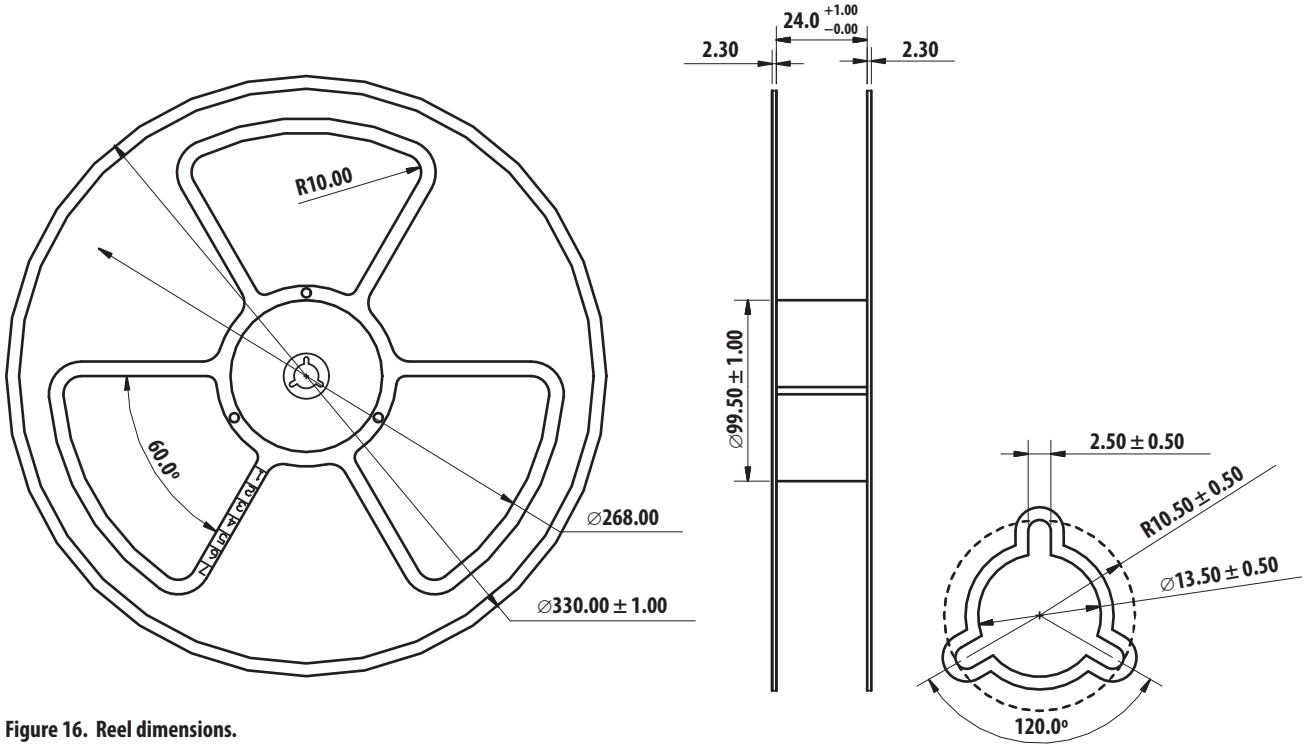


Figure 16. Reel dimensions.

Handling Precaution

The encapsulation material of the product is made of silicone for better reliability of the product. As silicone is a soft material, please do not press on the silicone or poke a sharp object onto the silicone. These might damage the product and cause premature failure. During assembly or handling, the unit should be held on the body only. Please refer to Avago Application Note AN 5288 for detail information.

Moisture Sensitivity

This product is qualified as Moisture Sensitive Level 2 per Jedec J-STD-020. Precautions when handling this moisture sensitive product is important to ensure the reliability of the product. Do refer to Avago Application Note AN5305 Handling of Moisture Sensitive Surface Mount Devices
for details.

A. Storage before use

- Unopen moisture barrier bag (MBB) can be stored at <40°C/90%RH for 12 months. If the actual shelf life has exceeded 12 months and the HIC indicates that baking is not required, then it is safe to reflow the LEDs per the original MSL rating.
- It is not recommended to open the MBB prior to assembly (e.g. for IQC).

B. Control after opening the MBB

- The humidity indicator card (HIC) shall be read immediately upon opening of MBB.
- The LEDs must be kept at <30°C/60%RH at all time and all high temperature related process including soldering, curing or rework need to be completed within 72 hours.

C. Control for unfinished reel

- For any unuse LEDs, they need to be stored in sealed MBB with desiccant or desiccator at <5%RH.

D. Control of assembled boards

- If the PCB soldered with the LEDs is to be subjected to other high temperature processes, the PCB need to be stored in sealed MBB with desiccant or desiccator at <5%RH to ensure no LEDs have exceeded their floor life of 72 hours.

E. Baking is required if:

- HIC "10%" indicator is not blue and "5%" indicator is pink.
- The LEDs are exposed to condition of >30°C/60% RH at any time.
- The LEDs floor life exceeded 72hrs.

Recommended baking condition: 60±5°C for 20hrs.

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

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