

ASMT-Mx00

1 W Power LED Light Source



Data Sheet



Description

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.

The low profile package design is suitable for a wide variety of applications especially where height is a constraint.

The package is compatible with reflow soldering process and manual soldering. This will give more freedom and flexibility to the light source designer.

Features

- Available in White, Blue, Green 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
- ESD of 16kV
- MSL 2A

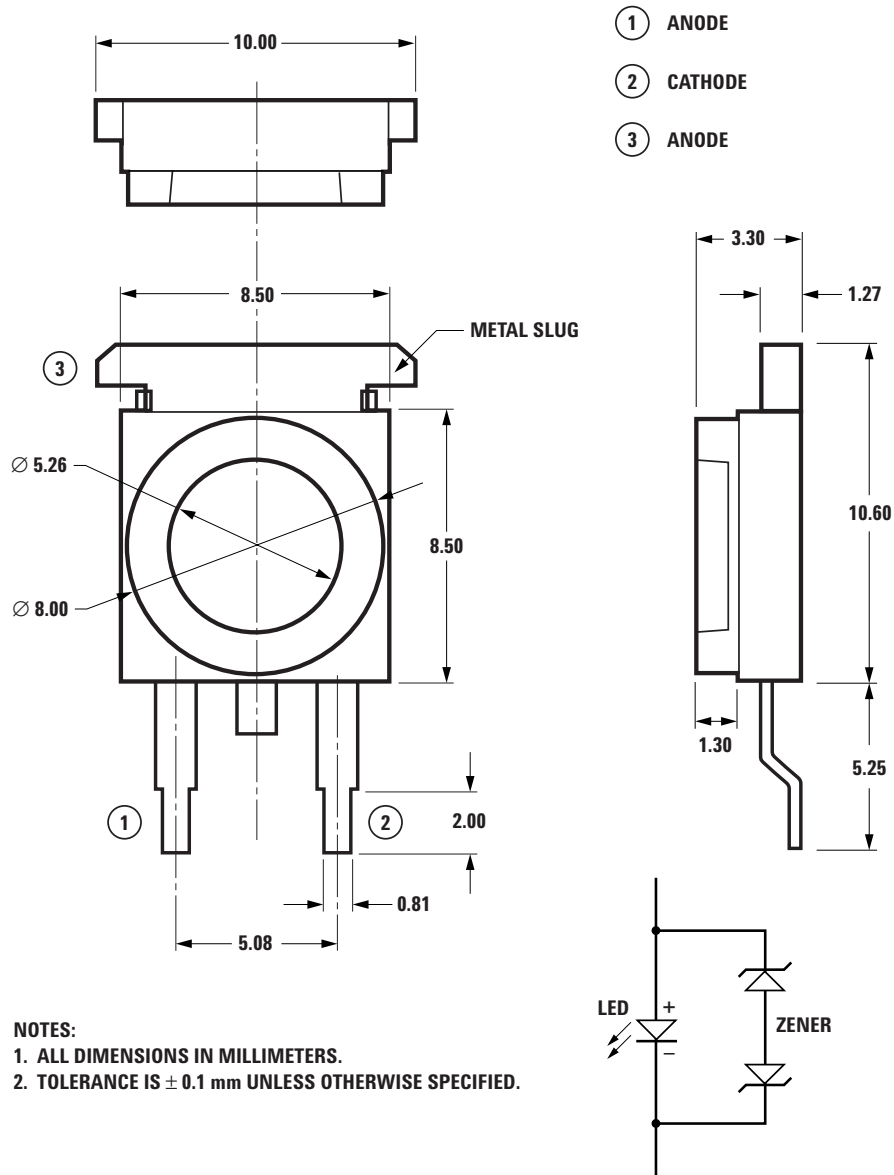
Specifications

- InGaN technology
- 3.6 V, 350 mA (typical)
- 120 viewing angle

Applications

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

Package Dimensions



- NOTES:**
1. ALL DIMENSIONS IN MILLIMETERS.
 2. TOLERANCE IS ± 0.1 mm UNLESS OTHERWISE SPECIFIED.

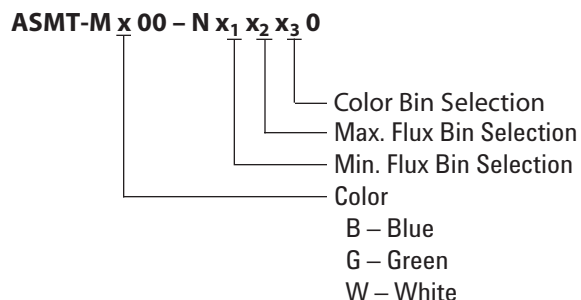
Device Selection Guide at Junction Temperature $T_j = 25^\circ\text{C}$

Color	Part Number	Luminous Flux, $\Phi_v^{[1]}$ (lm)			Test Current (mA)	Dice Technology
		Min.	Typ.	Max.		
Green	ASMT-MG00	25.5	40.0	73.0	350	InGaN
Blue	ASMT-MB00	5.5	10.0	19.5	350	InGaN
White	ASMT-MW00	33.0	45.0	56.0	350	InGaN

Notes:

1. Φ_v is the total luminous flux output as measured with an integrating sphere at mono pulse condition.
2. Flux tolerance is $\pm 15\%$.

Part Numbering System



Absolute Maximum Ratings at $T_A = 25^\circ\text{C}$

Parameter	ASMT-Mx00	Units
DC Forward Current ^[1]	350	mA
Peak Pulsing Current ^[2]	500	mA
Power Dissipation	1400	mW
LED Junction Temperature	110	$^\circ\text{C}$
Operating Board Temperature Range	-40 to +85	$^\circ\text{C}$
Storage Temperature Range	-40 to +100	$^\circ\text{C}$
Soldering Temperature	Refer to Figure 8	

Notes:

- DC forward current – derate linearly based on Figure 5.
- Pulse condition duty factor = 10%, Frequency = 1 kHz.

Optical Characteristics ($T_A = 25^\circ\text{C}$)

Part Number	Color	Peak Wavelength λ_{PEAK} (nm) Typ.	Dominant Wavelength λ_{D} ^[1] (nm) Typ.	Viewing Angle $2\theta_{1/2}$ ^[2] (Degrees) Typ.	Luminous Efficacy, η_v ^[3] (lm/W) Typ.	Luminous Efficiency (lm/W) Typ.
ASMT- MG00	Green	519	525	120	460	32
ASMT- MB00	Blue	460	467	120	58	8

Part Number	Color	Typical Chromaticity Coordinates		Viewing Angle $2\theta_{1/2}$ ^[2] (Degrees) Typ.	Luminous Efficacy, η_v ^[3] (lm/W) Typ.	Luminous Efficiency (lm/W) Typ.
		x	y			
ASMT-MW00	White	0.33	0.33	110	300	36

Notes:

- The dominant wavelength, λ_{D} , is derived from the CIE Chromaticity Diagram and represents the color of the device.
- $\theta_{1/2}$ is the off-axis angle where the luminous intensity is 1/2 the peak intensity.
- Radiant flux, Φ_e in watts, may be calculated from the equation $\Phi_e = \Phi_v / \eta_v$ where Φ_v is the luminous flux in lumens and η_v is the luminous efficacy in lumens/watt.

Electrical Characteristic ($T_A = 25^\circ\text{C}$)

Dice Type	Forward Voltage V_F (Volts) @ $I_F = 350\text{ mA}$ Typ. Max.		Reverse Voltage V_R ^[1]	Thermal Resistance $R_{\Theta j\text{-ms}}$ ($^\circ\text{C/W}$) ^[2] Typ.
InGaN	3.6	4.0	Not recommended	10

Notes:

- Not designed for reverse bias operation.
- $R_{\Theta j\text{-ms}}$ is Thermal Resistance from LED junction to metal slug.

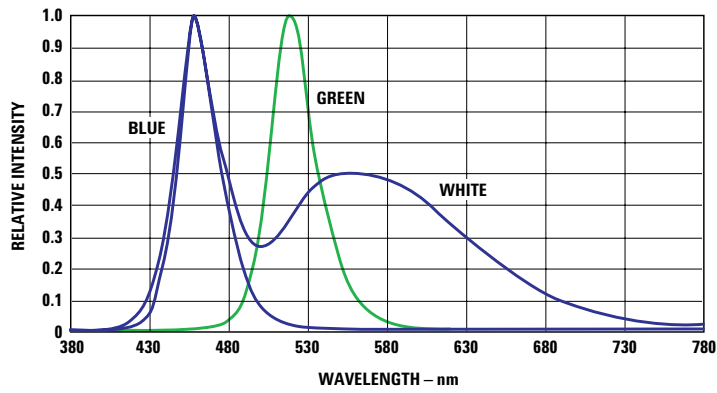


Figure 1. Relative intensity vs. wavelength

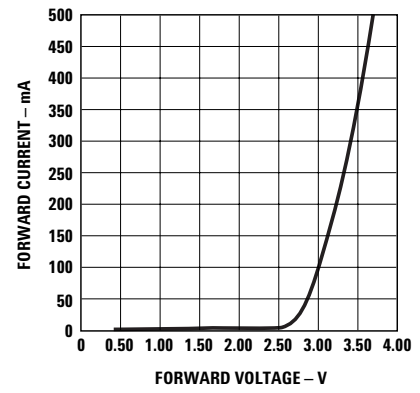


Figure 2. Forward current vs. forward voltage

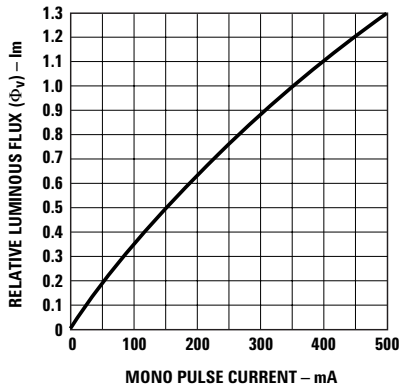


Figure 3. Relative luminous flux vs. mono pulse current

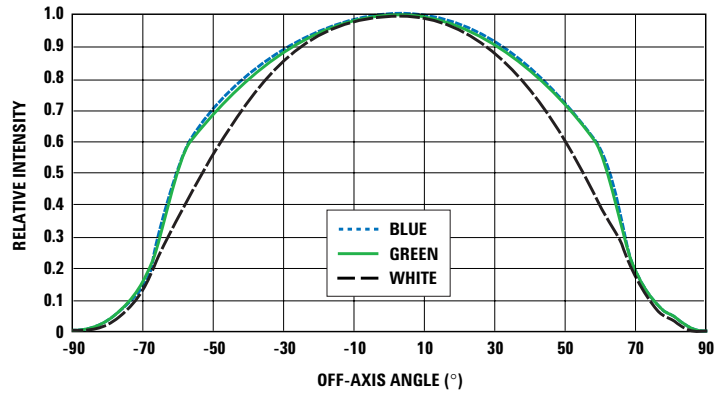


Figure 4. Radiation pattern

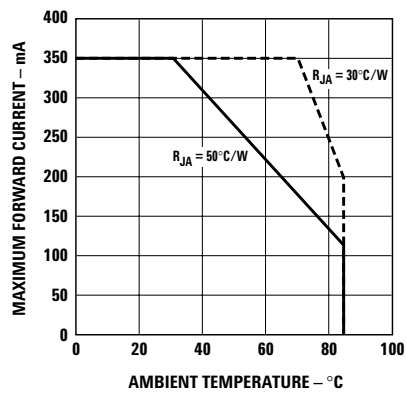


Figure 5. Maximum forward current vs. ambient temperature
Derated based on $T_{jMAX} = 110^\circ\text{C}$, $R\theta_{JA} = 30^\circ\text{C/W}$ / $R\theta_{JA} = 50^\circ\text{C/W}$

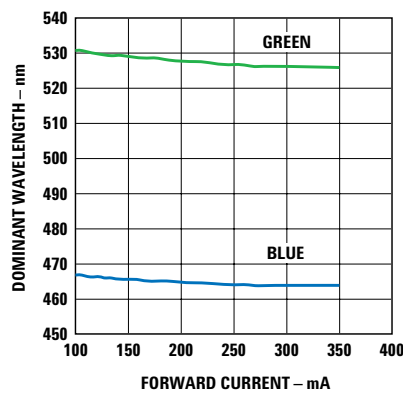


Figure 6. Dominant wavelength vs. forward current – InGaN devices

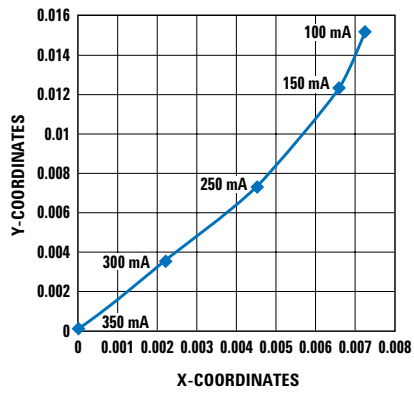


Figure 7. Chromaticity shift vs. current
 *Note: (x,y) values @ 350 mA reference to (0.0)

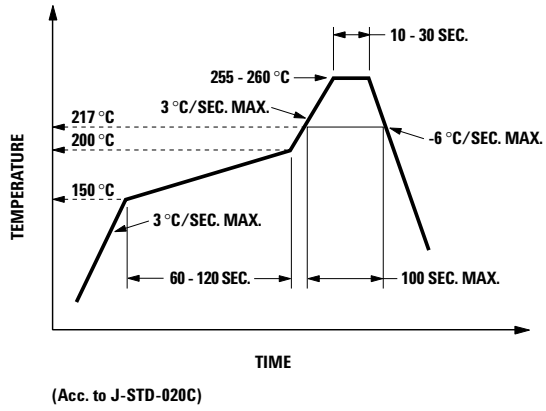


Figure 8. Recommended reflow soldering profile
 (Acc. to J-STD-020C)

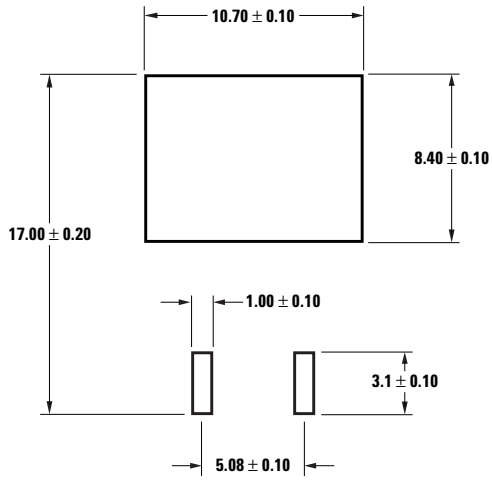


Figure 9. Recommended soldering land pattern

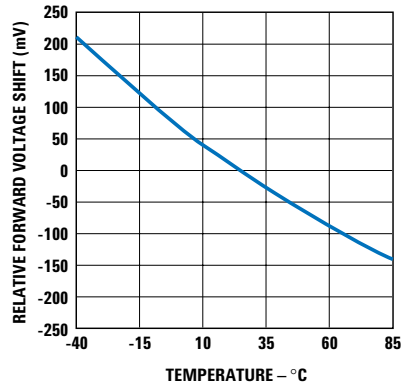


Figure 10. Temperature vs. relative forward voltage shift

Flux Bin Limit (for reference only) [x_1 x_2]

Bin	Flux (lm) at 350 mA	
	Min.	Max.
A	5.5	7.0
B	7.0	9.0
C	9.0	11.5
D	11.5	15.0
E	15.0	19.5
F	19.5	25.5
G	25.5	33.0
H	33.0	43.0
J	43.0	56.0
K	56.0	73.0

Tolerance for each bin limits is $\pm 15\%$

Color Bin Selections [X_3]

Individual reel will contain parts from one full bin only

0	Full Distribution
Z	A and B only
Y	B and C only
W	C and D only
V	D and E only
U	E and F only
T	F and G only
S	G and H only
Q	A, B and C only
P	B, C and D only
N	C, D and E only
M	D, E and F only
L	E, F and G only
K	F, G and H only
J	Special Color Bin
1	A, B, C and D only
2	E, F, G and H only
3	B, C, D and E only
4	C, D, E and F only
5	A, B, C, D and E only
6	B, C, D, E, and F only

Color Bin Limits

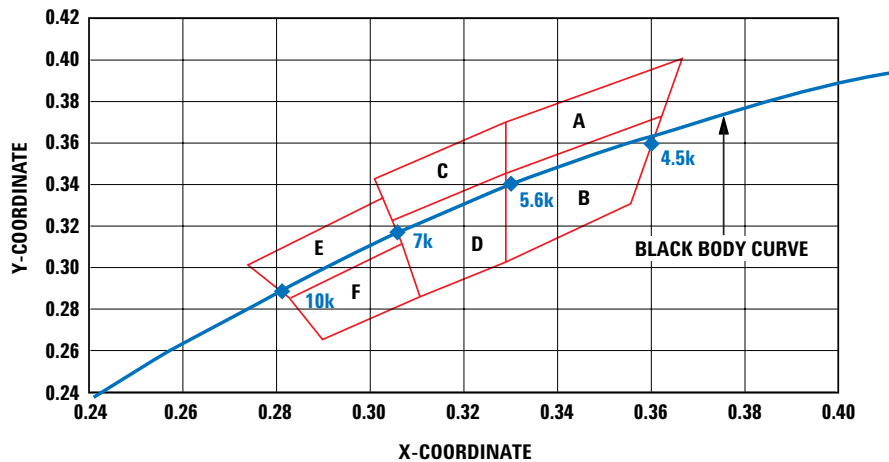
Blue	Min. (nm)	Max. (nm)
A	460.0	465.0
B	465.0	470.0
C	470.0	475.0
D	475.0	480.0

Green	Min. (nm)	Max. (nm)
A	515.0	520.0
B	520.0	525.0
C	525.0	530.0
D	530.0	535.0

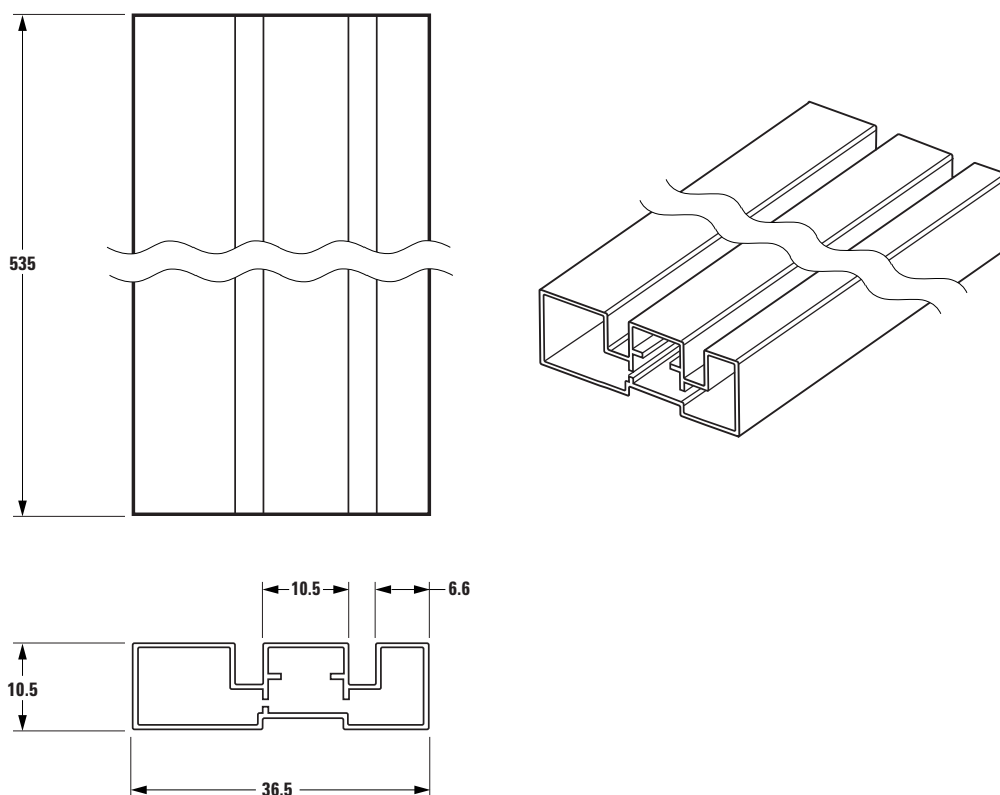
Tolerance = ± 1 nm

White	Color Limits (Chromaticity Coordinates)				
	Bin A	X	0.367	0.362	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

Tolerances ± 0.02



Package Tube 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 (white epoxy).

This product is classified as moisture sensitive level 2A

When the bag is opened, parts required to mount within 672 hours of factory conditions $\leq 30^{\circ}\text{C}/60\%$, and stored at $<10\%$ RH.

Devices required bake, before mounting if:

- The humidity indicator card is $>10\%$ when read at $23\pm 5^{\circ}\text{C}$
- The pack has been opened for more than 672 hours.

Baking recommended condition: $60 \pm 5^{\circ}\text{C}$ for 20 hours.

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