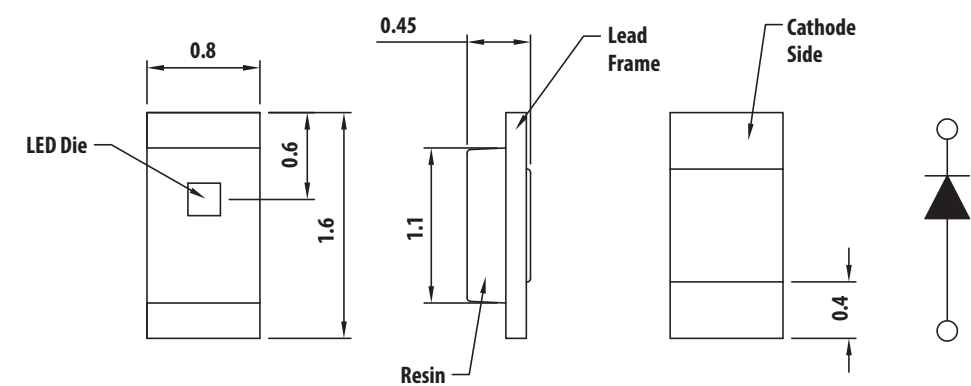


Package Dimensions



NOTE:

- 1. All dimensions are in millimeters.
- 2. Tolerance is ± 0.1 mm unless otherwise specified.

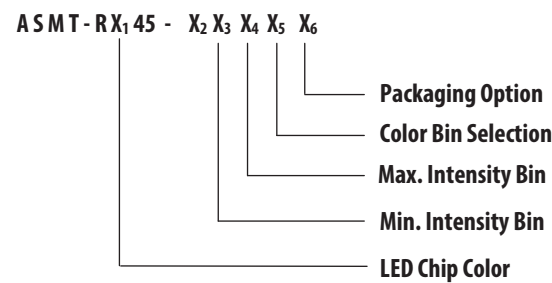
Device Selection Guide

Part Number	Min. I_v (mcd)	Typ. I_v (mcd)	Test Current (mA)	Colors	Dice Technology	Package Description
ASMT-RR45-AQ902	90.0	120.0	20	Red	AlInGaP	Untinted, Diffused
ASMT-RJ45-AQ502	71.5	130.0	20	Orange	AlInGaP	Untinted, Diffused
ASMT-RF45-AN002	28.0	60.0	20	Yellow Green	AlInGaP	Untinted, Diffused
ASMT-RA45-AP932	57.0	90.0	20	Amber	AlInGaP	Untinted, Diffused
ASMT-RH45-AQ502	71.5	110.0	20	Red Orange	AlInGaP	Untinted, Diffused

NOTE:

- 1. The luminous intensity, I_v , is measured at the peak of the spatial radiation pattern, which may not be aligned with the mechanical axis of the LED package.
- 2. Tolerance: $\pm 15\%$.

Part Numbering System



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

Parameter	ASMT-Rx45	Units
DC Forward Current ^a	20	mA
Power Dissipation	48	mW
Reverse Voltage ($I_R = 100\text{ mA}$)	5	V
LED Junction Temperature	110	$^\circ\text{C}$
Operating Temperature Range	-40 to +100	$^\circ\text{C}$
Storage Temperature Range	-40 to +100	$^\circ\text{C}$

a. Applies when a single LED is illuminated.

Electrical Characteristics at $T_A = 25^\circ\text{C}$

Part Number	Forward Voltage VF (Volts) ^a @ $I_F = 20\text{ mA}$			Reverse Breakdown VR (Volts) @ $I_R = 100\text{ }\mu\text{A}$	Thermal Resistance $R_{\theta\text{J-PIN}}$ ($^\circ\text{C/W}$)
	Min.	Typ.	Max.	Min.	Typ.
ASMT-Rx45-Axxxx	1.6	2.0	2.4	5	246

a. VF tolerance: $\pm 0.1\text{V}$.

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

Part Number	Color	Peak Wavelength λ_{peak} (nm)	Dominant Wavelength λ_d^a (nm)	Viewing Angle $2\theta_{1/2}^b$ (Degrees)
		Typical	Typical	Typical
ASMT-RR45-AQ902	Red	636	622	145
ASMT-RJ45-AQ502	Orange	612	605	145
ASMT-RF45-AN002	Yellow Green	574	573	145
ASMT-RA45-AP932	Amber	593	591	145
ASMT-RH45-AQ502	Red Orange	621	615	145

a. The dominant wavelength, λ_d , is derived from the CIE Chromaticity Diagram and represents the perceived color of the device.

b. $\theta_{1/2}$ is the off-axis angle where the luminous intensity is $\frac{1}{2}$ the peak intensity.

Figure 1: Relative Intensity vs. Wavelength

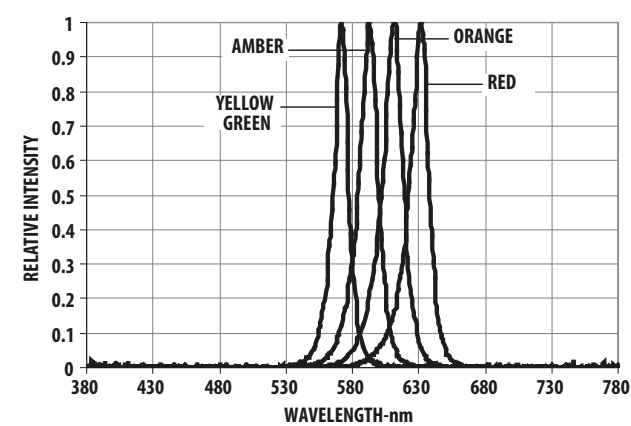


Figure 2: Forward Current vs. Forward Voltage

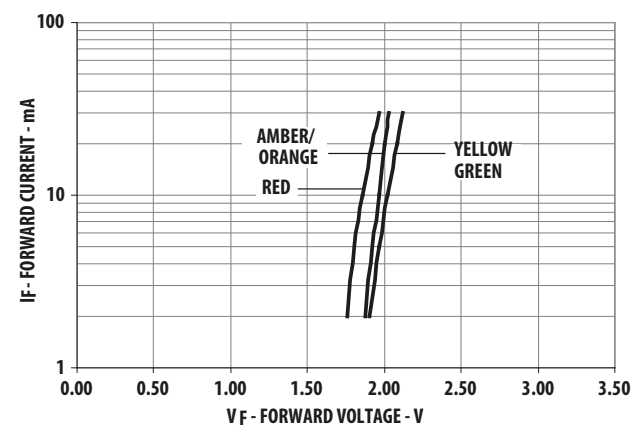


Figure 3: Luminous Intensity vs. Forward Current

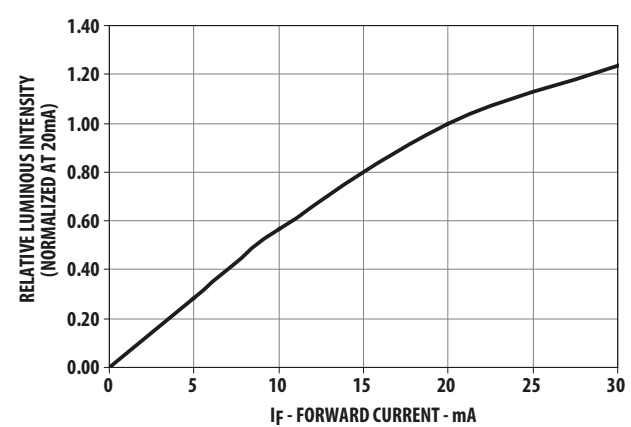


Figure 4: Maximum Forward Current vs. Ambient Temperature. Derated based on $T_{JMAX} = 110^{\circ}C$, $R_{\theta JA} = 465^{\circ}C/W$.

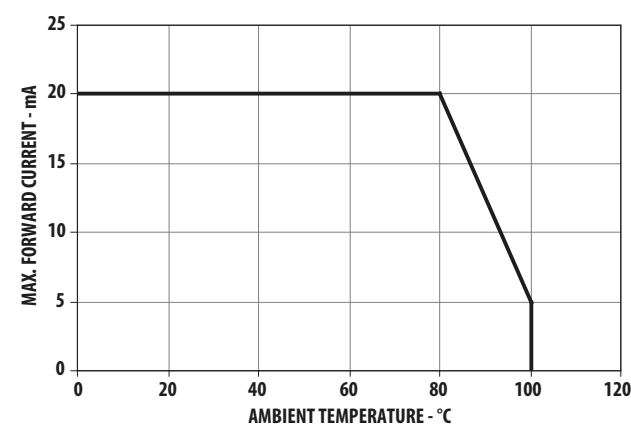


Figure 5: Radiation Pattern

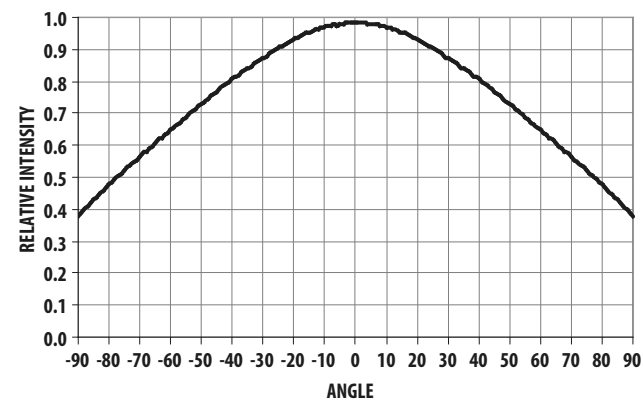
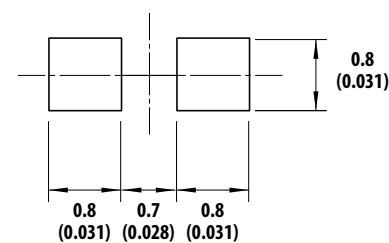


Figure 6: Recommended Soldering Land Pattern



1. All dimensions are in millimeters (inches).
2. Tolerance is ± 0.1 mm (± 0.004 in.) unless otherwise specified.

Figure 7: Recommended Reflow Soldering Profile

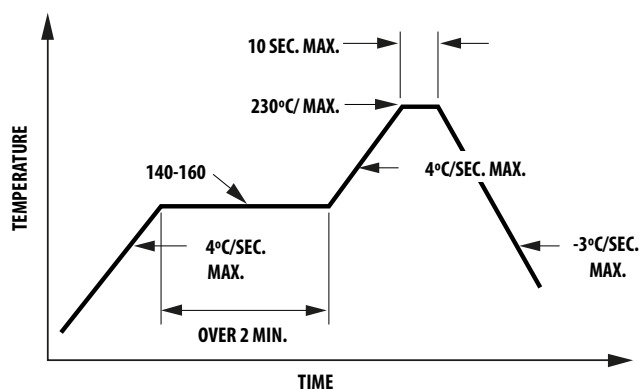
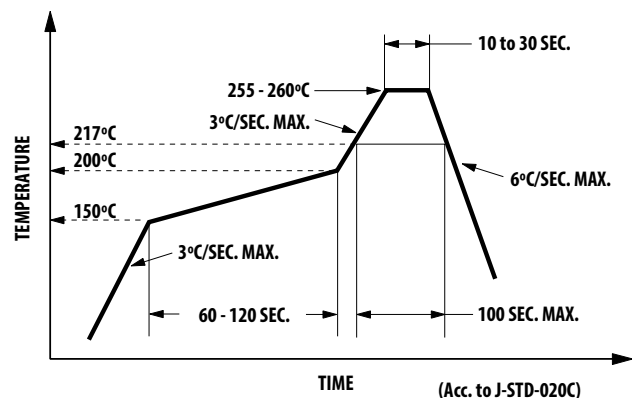


Figure 8: Recommended Pb-Free Reflow Soldering Profile



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

Figure 9: Tape Dimensions

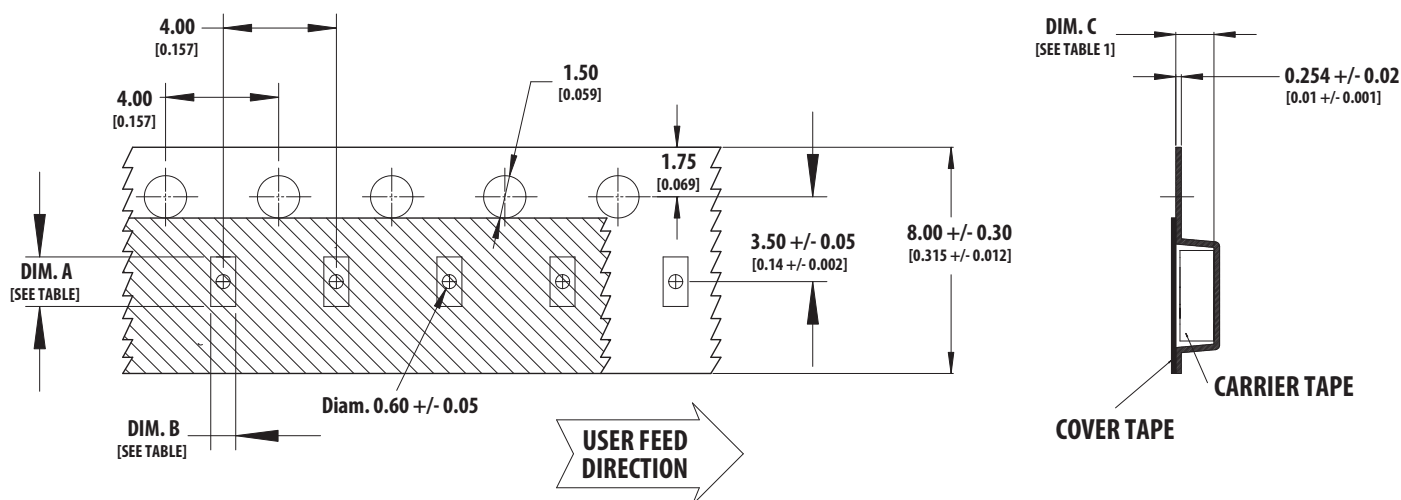
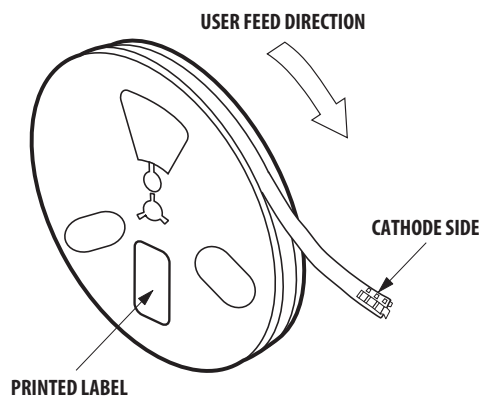


Figure 10: Reeling Orientation



Intensity Bin Select (X_3X_4)

Individual reel contains parts from one-half bin only.

X_3	Min I_V Bin
-------	---------------

X_4	Full Distribution
0	Full Distribution
2	2 half bins starting from X31
3	3 half bins starting from X31
4	4 half bins starting from X31
5	5 half bins starting from X31
6	2 half bins starting from X32
7	3 half bins starting from X32
8	4 half bins starting from X32
9	5 half bins starting from X32

Light Intensity (I_V) Bin Limits

Bin ID	Intensity (mcd)	
	Min.	Max
A1	0.11	0.14
A2	0.14	0.18
B1	0.18	0.23
B2	0.23	0.29
C1	0.29	0.36
C2	0.36	0.45
D1	0.45	0.57
D2	0.57	0.72
E1	0.72	0.90
E2	0.90	1.10
F1	1.10	1.41
F2	1.41	1.80
G1	1.80	2.24
G2	2.24	2.80
H1	2.80	3.55
H2	3.55	4.50
J1	4.50	5.70
J2	5.70	7.20
K1	7.20	9.00
K2	9.00	11.20
L1	11.20	14.20
L2	14.20	18.00
M1	18.00	22.50
M2	22.50	28.00
N1	28.00	36.00
N2	36.00	45.00
P1	45.00	57.00
P2	57.00	71.50
Q1	71.50	90.00
Q2	90.00	113.00
R1	113.00	142.00
R2	142.00	180.00
S1	180.00	227.00
S2	227.00	285.00

Tolerance: $\pm 15\%$.

Color Bin Select (X₅)

Individual reel contains parts from one full bin only.

X ₅	
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

Packaging Option (X₆)

Option	Test Current	Package Type	Reel Size
2	20 mA	Top Mount	7 Inch
H	2 mA	Top Mount	7 Inch
K	5 mA	Top Mount	7 Inch

Forward Voltage (V_F) Bin Limits

Bin ID	Forward Voltage (V)	
	Min.	Max.
1	1.60	1.80
2	1.80	2.00
3	2.00	2.20
4	2.20	2.40

Tolerance: $\pm 0.1V$.

Color Bin Limits

Yellow Green Color Bin

Bin ID	Dominant Wavelength (nm)	
	Min.	Max.
E	564.5	567.5
F	567.5	570.5
G	570.5	573.5
H	573.5	576.5

Yellow/Amber Color Bin

Bin ID	Dominant Wavelength (nm)	
	Min.	Max.
A	582.0	584.5
B	584.5	587.0
C	587.0	589.5
D	589.5	592.0
E	592.0	594.5
F	594.5	597.0

Orange Color Bin

Bin ID	Dominant Wavelength (nm)	
	Min.	Max.
A	597.0	600.0
B	600.0	603.0
C	603.0	606.0
D	606.0	609.0
E	609.0	612.0

Red Color Bin

Bin ID	Dominant Wavelength (nm)	
	Min.	Max.
Full Distribution	620.0	635.0

Red Orange Color Bin

Bin ID	Dominant Wavelength (nm)	
	Min.	Max.
A	610.0	615.0
B	615.0	620.0

Tolerance: ± 1 nm.

Moisture Sensitivity

This product is qualified as Moisture Sensitive Level 2a per JEDEC J-STD-020. Take precautions when handling this moisture sensitive product to ensure the reliability of the product. Refer to Broadcom Application Note AN5305, *Handling of Moisture Sensitive Surface Mount Devices* for details.

Storage Before Use

- An 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 humidity indicator card (HIC) indicates that baking is not required, then it is safe to reflow the LEDs per the original MSL rating.
- Do not open the MBB prior to assembly (for example, for IQC).

Control after Opening the MBB

- Read the HIC when opening the MBB.
- Keep the LEDs at < 30°C/60% RH at all times and for all high-temperature related processes, including soldering, curing, or rework that must be completed within 672 hours.

Control for the Unfinished Reel

- Store unused LEDs in a sealed MBB with desiccant or desiccator at < 5%RH.

Control of Assembled Boards

- If the PCB soldered with the LEDs is to be subjected to other high-temperature processes, store the PCB in a sealed MBB with desiccant or desiccator at <5% RH to ensure that no LEDs have exceeded their floor life of 672 hours.

Baking Is Required for the Following Conditions

- "10%" or "15%" on the HIC turns pink.
- The LEDs are exposed to conditions of > 30°C/60% RH at any time.
- The LEDs' floor life exceeded 672 hours.

The recommended baking condition is 60°C ± 5°C for 20 hours.

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