



Preliminary Product Datasheet

DDEB-X122-XXXX

DDEB-X124-XXXX

DDEB-X128-XXXX

### Introduction

DSEM High Power LED offers industry leading flux output per package and can handle high thermal and high driving current.

The package utilizes patented substrate technology which enables superior thermal conductivity.

It is available in Rectangle and Hexagonal shape. DSEM LEDs gives high performance and quality to many lighting applications.

These high lumen output integrated sources reduce system design complexity, enabling miniaturized cost-effective lamp and luminaries designs.

### Features

- Available in Warm White and Cool White color.
- Energy efficient
- AMS (Advanced Metal Substrate) for excellent heat transfer.
- High current operation.
- Long operation life.
- Wide viewing angle.
- Silicone encapsulation.
- Low thermal resistance: equal or less than 1.0 °C/W
- Mounting method: screw holes.
- Solder pads for wire attachment.
- RoHS compliant
- Uniform illumination

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Website: [www.dsem.com](http://www.dsem.com)

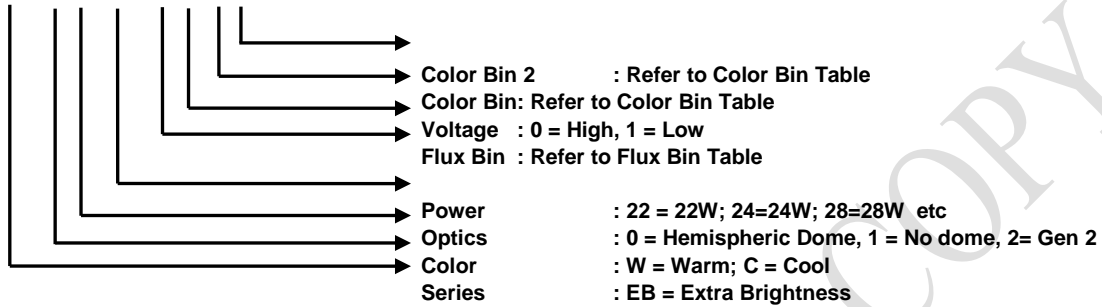
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**Part numbering**

DDXX-X X XX-XX XX



**Table 1: Flux Characteristics**

Color	Base Part Number	Typical Luminous Flux $\Phi_V$ (lm), Tcase=60°C [1]	Minimum Luminous Flux $\Phi_V$ (lm), Tj=25°C [2]	Typical Luminous Flux $\Phi_V$ (lm), Tj=25°C	Test Current (mA) [3]	Power rating (W) [3]
Cool White	DDEB-C122	1850	1920	2000	1400	22.5
	DDEB-C124	2000	2100	2200	1500	24.3
	DDEB-C128	2270	2450	2520	1750	28.8
Warm White	DDEB-W122	1300	1360	1450	1400	22.5
	DDEB-W124	1400	1450	1530	1500	24.3
	DDEB-W128	1600	1720	1800	1750	28.8

Notes :

- Flux measurement tolerance is  $\pm 7\%$
- $\Phi_V$  is the total luminous flux output as device is tested at DSEM flux tester setup. For tester detail, please contact DSEM sales representatives.
- Parts are tested in pulsed conditions, Tj = 25°C. Pulse width is 10ms at rated test current.

**Table 2: Optical Characteristics**

Color	Base Part Number	Color Temperature (CCT) [1],[2],[3]			Typical Color Rendering Index [4]	Typical Viewing Angle (Degrees) 2 $\theta_{1/2}$ [5]	Typical Center Beam Candle Power (cd) [6]
		Min	Typ	Max			
Cool White	DDEB-C122	4750 K	5600 K	7000 K	65	120	700
	DDEB-C124						
	DDEB-C128						
Warm White	DDEB-W122	2850 K	3000 K	3700 K	82	120	700
	DDEB-W124						
	DDEB-W128						

Notes :

- Parts are tested in pulsed conditions, Tj = 25°C. Pulse width is 10 ms at rated test current.
- Refer to Flux Characteristic Table for test current data.
- Product is binned for color in x y coordinates.
- Higher CRI options available upon request.
- Viewing angle is the off axis angle from the centerline where Iv is 1/2 of the peak value.
- Center beam candle power is a calculated value based on lambertian radiation pattern at nominal test current.

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**Table 3: Electrical Characteristics**

Color	Base Part Number	Forward Voltage Vf (V) [1]			Test Current (mA) [2]	Typical Thermal Resistance Junction to Case (°C/W) Rθ j-c
		Min	Typ	Max		
Cool White	DDEB-C122	15.5	16.0	17.5	1400	0.5
	DDEB-C124				1500	
	DDEB-C128				1750	
Warm White	DDEB-W122	15.5	16.0	17.5	1400	
	DDEB-W124				1500	
	DDEB-W128				1750	

Notes:

- Parts are tested in pulsed conditions, T<sub>j</sub> = 25°C. Pulse width is 10 ms at rated test current.
- DSEM maintains a tester tolerance of ± 0.10 V on forward voltage measurements.

**Table 4: Absolute Minimum and Maximum Ratings**

Part Number	Maximum DC Forward Current (mA)	Minimum DC Forward Current (mA) [1]	Maximum Peak Pulsed Current (mA) [2]	Maximum Reverse Voltage (Vr)[3]
DDEB-C122	2000	600	2800	-20 Volts
DDEB-C124				
DDEB-C128				
DDEB-W122				
DDEB-W124				
DDEB-W128				

Notes:

- Driving these high current devices at low currents can result in variations in performance. For low current operation pulse width modulation is recommended.
- DSEM recommends a maximum duty cycle of 10% when operating LED Arrays at the maximum peak pulsed current specified
- Light emitting diodes are not designed to be driven in reverse voltage.

**Table 5: Maximum Ratings**

Parameter	Maximum Rating
LED Junction Temperature	150°C
Storage Temperature	-40°C to +105°C
Operating Case Temperature	105°C
Soldering Temperature	3.5 seconds, 350°C or lower

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## Luminous Flux Binning

The table below lists the standard photometric luminous flux bins. All production testing and binning is conducted under pulsed test conditions at  $T_j = 25^{\circ}\text{C}$ .

Code	Min Flux (lm)
Q	1360
R	1420
S	1500
T	1540
V	1600
W	1700
X	1800
Y	1900
Z	2000

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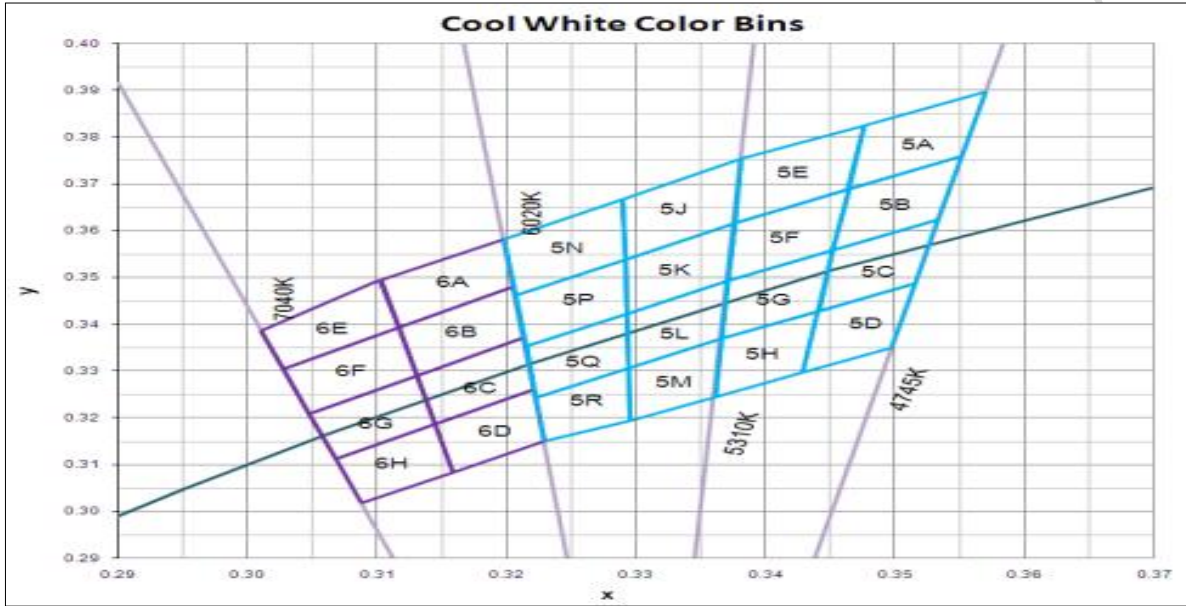
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### Color Binning

Note: Tolerance for chromaticity coordinates is  $\pm 0.01$ .



Bin	x	y	CCT (K)
6A	0.3103	0.3495	6500
	0.3198	0.3582	
	0.3205	0.3481	
	0.3117	0.3393	
6B	0.3131	0.3290	6500
	0.3213	0.3371	
	0.3205	0.3481	
	0.3117	0.3393	
6C	0.3145	0.3187	6500
	0.3221	0.3261	
	0.3213	0.3371	
	0.3131	0.3290	
6D	0.3145	0.3187	6500
	0.3221	0.3261	
	0.3229	0.3151	
	0.3159	0.3084	
6E	0.3010	0.3385	6500
	0.3103	0.3495	
	0.3117	0.3393	
	0.3028	0.3304	
6F	0.3048	0.3209	6500
	0.3131	0.3290	
	0.3117	0.3393	
	0.3028	0.3304	
6G	0.3068	0.3113	6500
	0.3145	0.3187	
	0.3131	0.3290	
	0.3048	0.3209	
6H	0.3068	0.3113	6500
	0.3145	0.3187	
	0.3159	0.3084	
	0.3088	0.3018	

Bin	x	y	CCT (K)
5J	0.3290	0.3668	5700
	0.3382	0.3754	
	0.3376	0.3616	
	0.3292	0.3539	
5K	0.3292	0.3539	5700
	0.3293	0.3423	
	0.3371	0.3493	
	0.3376	0.3616	
5L	0.3294	0.3306	5700
	0.3366	0.3369	
	0.3371	0.3493	
	0.3293	0.3423	
5M	0.3294	0.3306	5700
	0.3366	0.3369	
	0.3361	0.3246	
	0.3295	0.3194	
5N	0.3198	0.3582	5700
	0.3290	0.3668	
	0.3292	0.3539	
	0.3207	0.3462	
5P	0.3222	0.3243	5700
	0.3294	0.3306	
	0.3293	0.3423	
	0.3215	0.3353	
5Q	0.3215	0.3353	5700
	0.3293	0.3423	
	0.3292	0.3539	
	0.3207	0.3462	
5R	0.3222	0.3243	5700
	0.3294	0.3306	
	0.3295	0.3194	
	0.3229	0.3151	

Bin	x	y	CCT (K)
5A	0.3476	0.3825	5000
	0.3569	0.3897	
	0.3551	0.3760	
	0.3464	0.3688	
5B	0.3464	0.3688	5000
	0.3551	0.3760	
	0.3533	0.3624	
	0.3452	0.3558	
5C	0.3452	0.3558	5000
	0.3533	0.3624	
	0.3515	0.3487	
	0.3441	0.3428	
5D	0.3441	0.3428	5000
	0.3515	0.3487	
	0.3497	0.3351	
	0.3429	0.3298	
5E	0.3382	0.3754	5000
	0.3476	0.3825	
	0.3464	0.3688	
	0.3376	0.3616	
5F	0.3371	0.3493	5000
	0.3452	0.3558	
	0.3441	0.3428	
	0.3366	0.3369	
5G	0.3376	0.3616	5000
	0.3464	0.3688	
	0.3452	0.3558	
	0.3371	0.3493	
5H	0.3366	0.3369	5000
	0.3441	0.3428	
	0.3429	0.3298	
	0.3361	0.3246	

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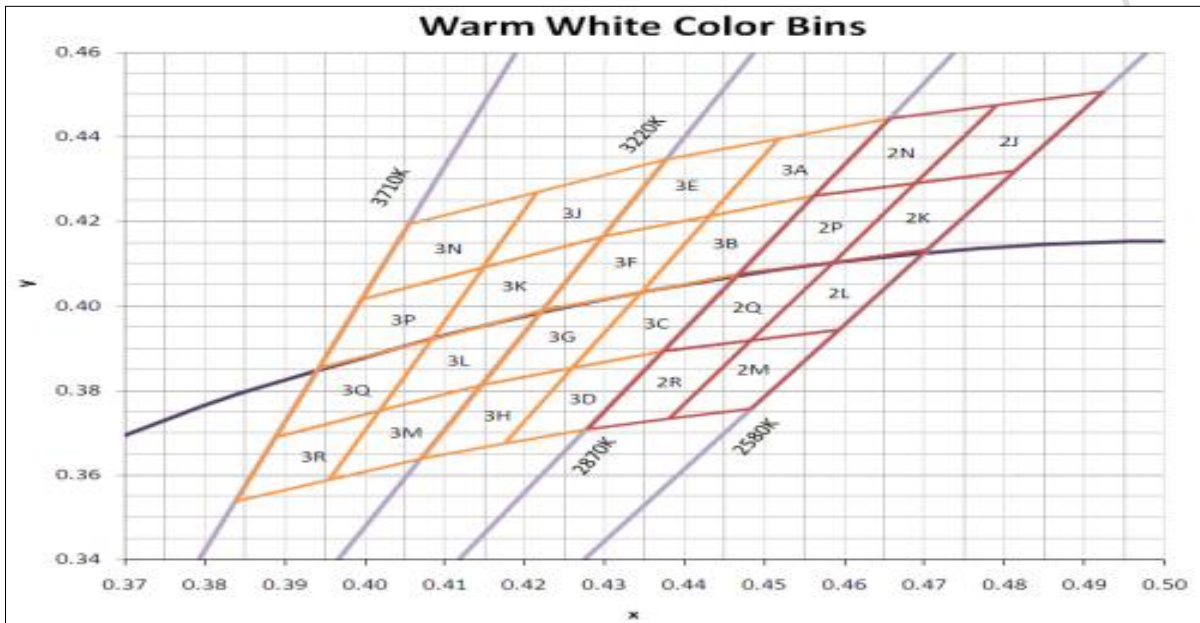
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### Color Binning

Note: Tolerance for chromaticity coordinates is  $\pm 0.01$ .



Bin	x	y	CCT (K)
3J	0.4216	0.4270	3500
	0.4378	0.4346	
	0.4299	0.4165	
	0.4148	0.4090	
3K	0.4083	0.3921	3500
	0.4148	0.4090	
	0.4299	0.4165	
	0.4223	0.3990	
3L	0.4018	0.3752	3500
	0.4083	0.3921	
	0.4223	0.3990	
	0.4147	0.3814	
3M	0.4018	0.3752	3500
	0.4147	0.3814	
	0.4071	0.3639	
	0.3955	0.3589	
3N	0.4055	0.4194	3500
	0.4216	0.4270	
	0.4148	0.4090	
	0.3996	0.4015	
3P	0.3943	0.3853	3500
	0.3996	0.4015	
	0.4148	0.4090	
	0.4083	0.3921	
3Q	0.3889	0.3690	3500
	0.3943	0.3853	
	0.4083	0.3921	
	0.4018	0.3752	
3R	0.3889	0.3690	3500
	0.4018	0.3752	
	0.3955	0.3589	
	0.3840	0.3539	

Bin	x	y	CCT (K)
3A	0.4517	0.4395	3000
	0.4657	0.4444	
	0.4562	0.4260	
	0.4431	0.4213	
3B	0.4345	0.4033	3000
	0.4431	0.4213	
	0.4562	0.4260	
	0.4468	0.4077	
3C	0.4260	0.3854	3000
	0.4345	0.4033	
	0.4468	0.4077	
	0.4373	0.3893	
3D	0.4260	0.3854	3000
	0.4373	0.3893	
	0.4279	0.3710	
	0.4175	0.3674	
3E	0.4378	0.4346	3000
	0.4517	0.4395	
	0.4431	0.4213	
	0.4299	0.4165	
3F	0.4223	0.3990	3000
	0.4299	0.4165	
	0.4431	0.4213	
	0.4345	0.4033	
3G	0.4147	0.3814	3000
	0.4223	0.3990	
	0.4345	0.4033	
	0.4260	0.3854	
3H	0.4147	0.3814	3000
	0.4260	0.3854	
	0.4175	0.3674	
	0.4071	0.3639	

Bin	x	y	CCT (K)
2J	0.4790	0.4475	2700
	0.4923	0.4507	
	0.4813	0.4319	
	0.4688	0.4290	
2K	0.4586	0.4104	2700
	0.4688	0.4290	
	0.4813	0.4319	
	0.4703	0.4132	
2L	0.4483	0.3919	2700
	0.4586	0.4104	
	0.4703	0.4132	
	0.4593	0.3944	
2M	0.4483	0.3919	2700
	0.4593	0.3944	
	0.4483	0.3757	
	0.4381	0.3733	
2N	0.4657	0.4444	2700
	0.4790	0.4475	
	0.4688	0.4290	
	0.4562	0.4260	
2P	0.4468	0.4077	2700
	0.4562	0.4260	
	0.4688	0.4290	
	0.4586	0.4104	
2Q	0.4373	0.3893	2700
	0.4468	0.4077	
	0.4586	0.4104	
	0.4483	0.3919	
2R	0.4373	0.3893	2700
	0.4483	0.3919	
	0.4381	0.3733	
	0.4279	0.3710	

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Figure 2: Typical Radiation Pattern

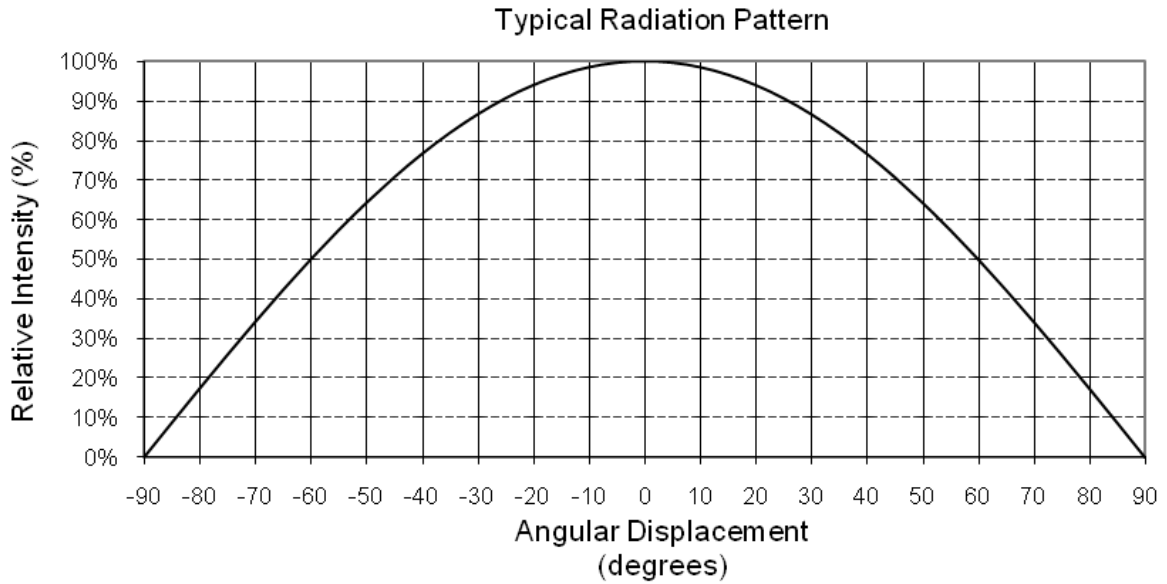
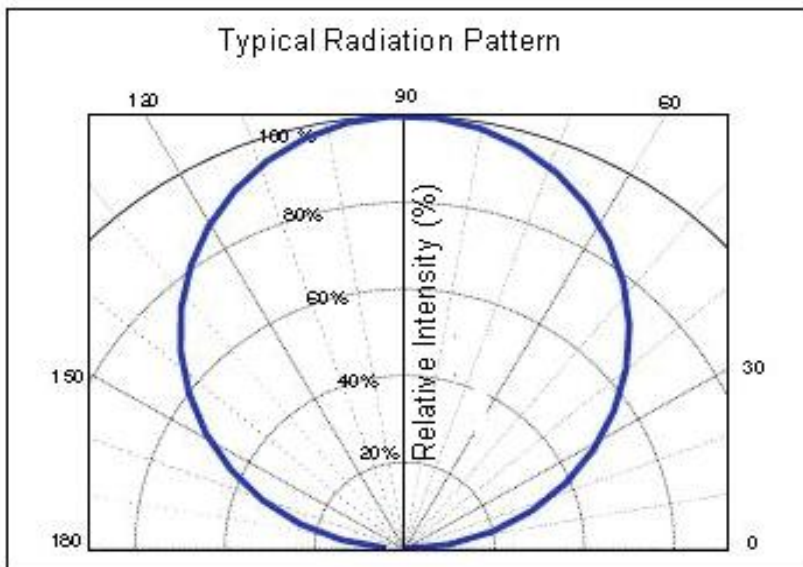


Figure 3: Typical Polar Radiation Pattern



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Figure 4: Wavelength Characteristics at Rated Test Current,  $T_j=25^\circ\text{C}$

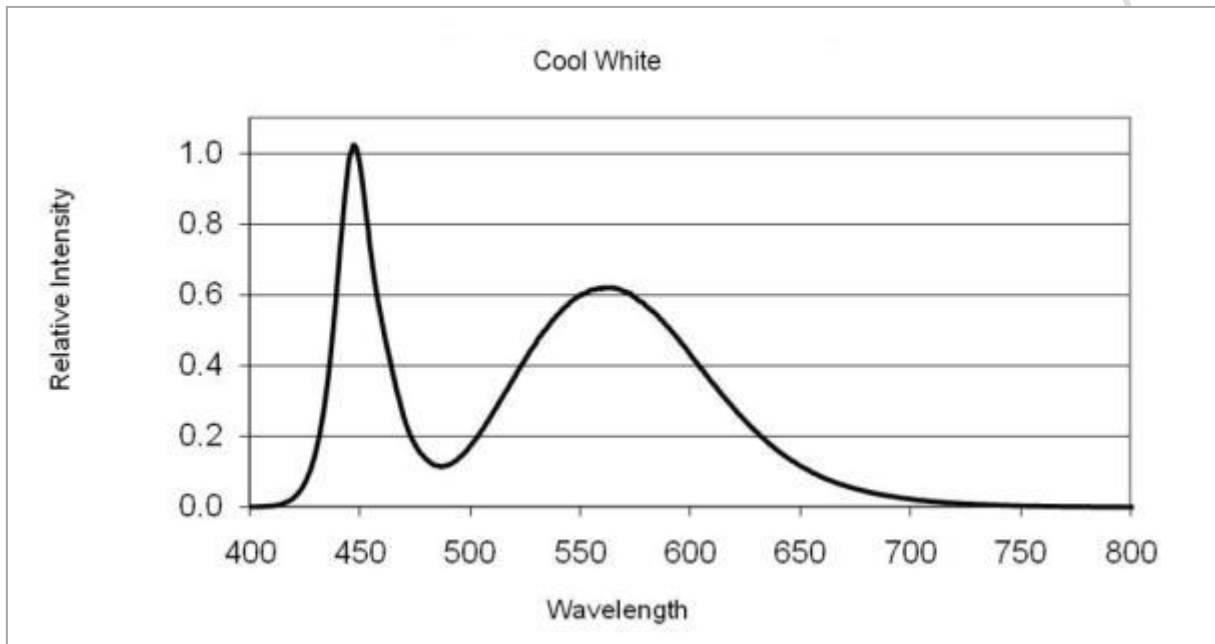


Figure 5: Typical Relative Luminous Flux vs. Current,  $T_j=25^\circ\text{C}$  (TBD)

Figure 6: Typical Light Output Characteristics vs. Temperature (TBD)

Figure 7: Typical Forward Current Characteristics at  $T_j = 25^\circ\text{C}$  (TBD)

Figure 8: Current Derating Curves (TBD)

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### Product Packaging and Labeling (Preliminary)

All DSEM LEDs are 100% tested, binned and labeled. Products are labeled by printing information on the back side of the unit. The following format is used for labeling:

X X X X  
A B C D – E F G H  
M N O P Q – Y Y W W

Where:

- X X X X – designates the bin code (G02K, etc.)
- A B C D – E F G H – designates the base part number (DDHB-C105-X0XX, etc.)
- M N O P Q – designates the production lot code (12345, etc.)
- Y Y W W – designates the date code (production year and production week, 1020, etc.)

Individual units are packaged in tubes for shipment. All products packaged within a single tube are of the same flux and color bin combination (or bin code). An example of the tube label and is included below:



#### Tube label

Where:

- X X X X – designates the bin code (G02K, etc.)
- A B C D – E F G H – designates the base part number (DDHB-C105-X0XX, etc.)
- M N O P Q – designates the production lot code (12345, etc.)
- Y Y W W – designates the date code (production year and production week, 1020, etc.)
- Z Z – designates the quantity

Tubes are packaged in bags prior to loading into boxes for shipment. One tube is loaded per bag. All products packaged within a single bag are of the same flux and color bin combination (or bin code). Each bag is labeled with the information required for effective inventory management. An example of the bag label is included below.



#### Bag Label

Where:

- X X X X – designates the bin code (G02K, etc.)
- A B C D – E F G H – designates the base part number (DDHB-C105-X0XX, etc.)
- M N O P Q – designates the production lot code (12345, etc.)
- Y Y W W – designates the date code (production year and production week, 1020, etc.)
- Z Z Z – designates the unit quantity in one bag

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### Packaging Tube Design

Figure 9a: DDEB-C110

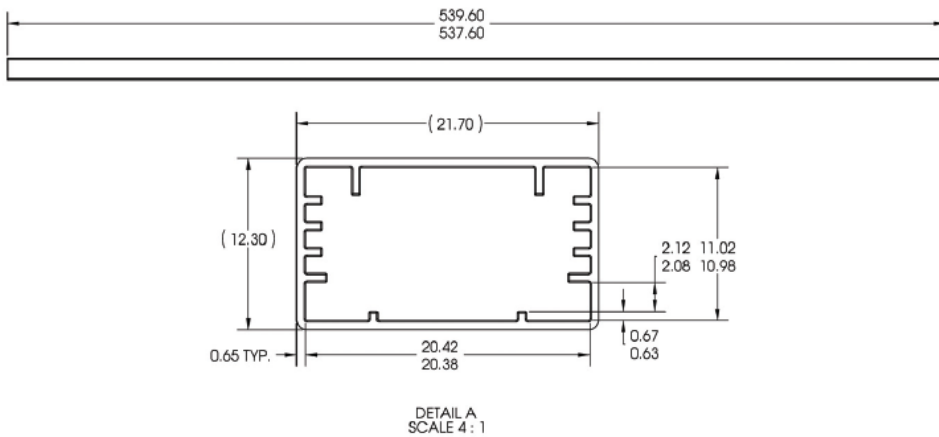
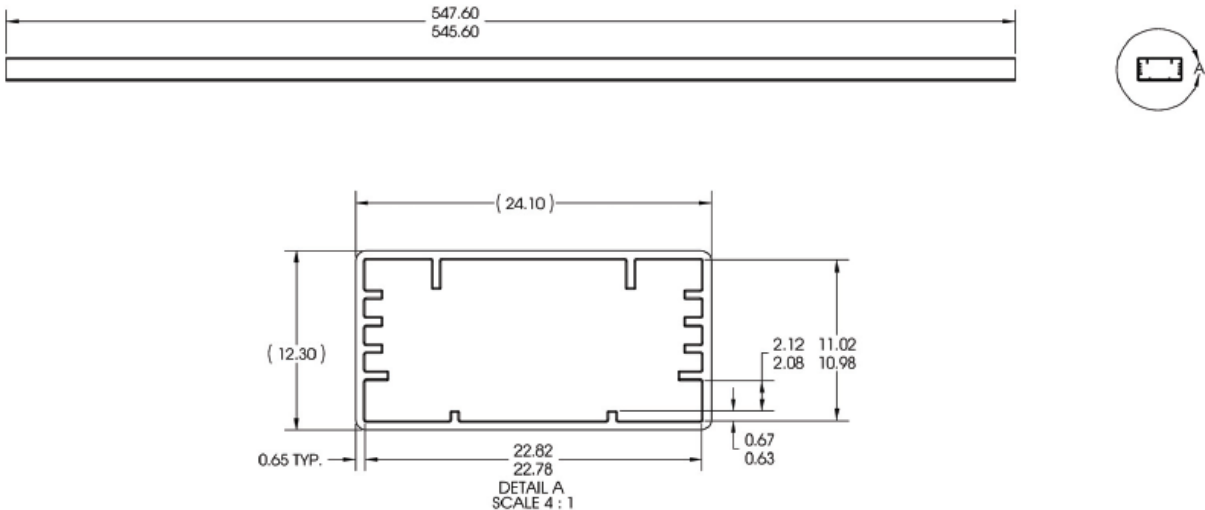


Figure 9b: DDEB-C115 and DDEB-C125



Note:

- 1. Drawings are not to scale.
- 2. Drawing dimensions are in millimeters.

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### Cautionary Statements

#### CAUTION: CONTACT WITH OPTICAL AREA

Contact with the Silicone area should be avoided. Applying stress to the Silicone area can result in damage to the product.

#### CAUTION: EYE SAFETY

Eye safety classification for the use of DSEM LED is contained in the CIE S 009/E2002 Photobiological Safety of Lamps and Lamp Systems specification. DSEM LEDs are classified under section 6 lamp classifications as Risk Group 2 (Moderate Risk). Please use appropriate precautions. It is important that employees working with LEDs are trained to use them safely. Luminaries manufacturers should refer to CIE S 009/E2002 to establish the classification of their product.

#### CAUTION: RISK OF BURN

Do not touch the LED or Silicone area during operation. Allow the LED to cool for a sufficient period of time before handling. The LED may reach elevated temperatures such that it can burn skin when touched.

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