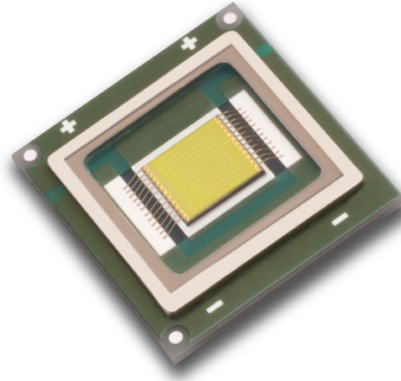


## SBT-90 LEDs



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### Introduction:

This document describes the binning and labeling nomenclature for SBT-90 specialty LED product as well as the orderable bin kits for each part.

With each build of parts, there is a distribution of performance in both flux and wavelength or chromaticity. In order to guarantee specific performance for customers, each device is measured and subsequently grouped into flux and wavelength or chromaticity bins. Each individual package or reel of parts contains only one combination of flux and wavelength or chromaticity bin. Furthermore, bins are combined into orderable bin kits comprising of a selection of flux and wavelength or chromaticity bins to ease the ordering process.

**Table of Products**

Products	Ordering Part Number	Description
SBT-90-W57S	SBT-90-W57S-F71-XX123	White specialty LED SBT-90 surface mount device consisting of a 9 mm <sup>2</sup> LED on a ceramic substrate, tray pack
SBT-90-W65S	SBT-90-W65S-F71-XX123	
SBT-90-WDLS	SBT-90-WDLS-F71-XX123	
SBR-90-W57S	SBR-90-W57S-R71-XX123	SBR-90 evaluation module consisting of a SBT-90 surface mount device mounted on an aluminum star-board
SBR-90-W65S	SBR-90-W65S-R71-XX123	
SBR-90-WDLS	SBR-90-WDLS-R71-XX123	
SBT-90-R	SBT-90-R-F75-xx123	SBT-90 surface mount device consisting of a 9.0 mm <sup>2</sup> LED on ceramic substrate
SBR-90-R	SBR-90-R-R75-xx123	SBR-90 evaluation module consisting of a SBT-90 surface mount device mounted on an aluminum star board

### SBT-90 Shipping and Labeling Nomenclature

All SBT-90 products are packaged and labeled with their respective bin as outlined in the following pages. Each package or reel will only contain one bin. The part number designation is as follows:

**A B C — 1 2 3 — D 4 5 E — F 6 7 — G H — I 8**

Product Family	Chip Area	Color	Package Configuration	Flux Bin	Chromaticity Bin
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<b>Product Family</b>	A - Package type: "S" denotes surface mount B - Lens type: "B" denotes window (no lens) C - Chip quantity: "T" denotes single chip, and "R" denotes prototyping board				
<b>Chip Area</b>	1 2 3 - Total LED chip area (mm <sup>2</sup> ) x 10: "90" denotes 9mm <sup>2</sup>				
<b>Color</b>	D - Color: "W" denotes white 4 5 - Color temperature: "65" denotes 6500K; "57" denotes 5700K E - Color rendering: "S" (standard) denotes a typical CRI of 70				
<b>Package Config.</b>	F 6 7 - Package configuration (for internal use)				
<b>Flux Bin</b>	G H - Flux bin				
<b>Chromaticity Bin</b>	I 8 - Chromaticity bin				

**Example:**

The part number SBT-90-W65S-F71-NA-G4 refers to a 6500K standard CRI white, SBT-90 emitter, with a minimum flux range from 1,590 to 1,710 lumens and a chromaticity value within the box defined by the four points (0.313, 0.338), (0.321, 0.348), (0.322, 0.336), (0.312, 0.328).

### SBT-90 Bin Kit Ordering Nomenclature

All SBT-90 White products are sold in sets of flux and chromaticity bins called bin kits. Each bin kit specifies a minimum flux bin and a specific selection of chromaticity bins. The ordering part number designation is as follows:

**A B C** — **1 2 3** — **D 4 5 E** — **F 6 7** — **G H 8 9 0**

Product Family	Chip Area	Color	Package Configuration	Bin Kit
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Product Family	A - Package type: "S" denotes surface mount B - Lens type: "B" denotes window (no lens) C - Chip quantity: "T" denotes single chip, and "R" denotes prototyping board			
Chip Area	1 2 3 - Total LED chip area (mm <sup>2</sup> ) x 10: "90" denotes 9mm <sup>2</sup>			
Color	D - Color: "W" denotes white 4 5 - Color temperature: "65" denotes 6500K; "57" denotes 5700K E - Color rendering: "S" (standard) denotes a typical CRI of 70			
Package Config.	F 6 7 - Package configuration (for internal use)			
Bin Kit	G H - Flux bin 8 9 0 - Chromaticity bin kit code			

**Example:**

The ordering part number SBT-90-W65S-F71-NA101 refers to a 6500K standard CRI white, SBT-90 emitter, with a minimum flux value of 1,590 lumens and falling in the F4, F3, G4, G3, EF, and DG chromaticity bins.

### SBT-90 Binning Structure

SBT-90 LEDs are tested for luminous flux and chromaticity at a drive current as listed in the table and placed into one of the following luminous flux (FF) and chromaticity (WW) bins:

Color	Flux Bin (FF)	Minimum Flux (lm) @ 9.0A	Maximum Flux (lm) @ 9.0A
W57S/W65S 5700K / 6500K, Standard CRI (typ. 70)	NA	1,590	1,710
	NB	1,710	1,830
	PA	1830	1966
	PB	1966	2100
	QA	2100	2260
	QB	2260	2420

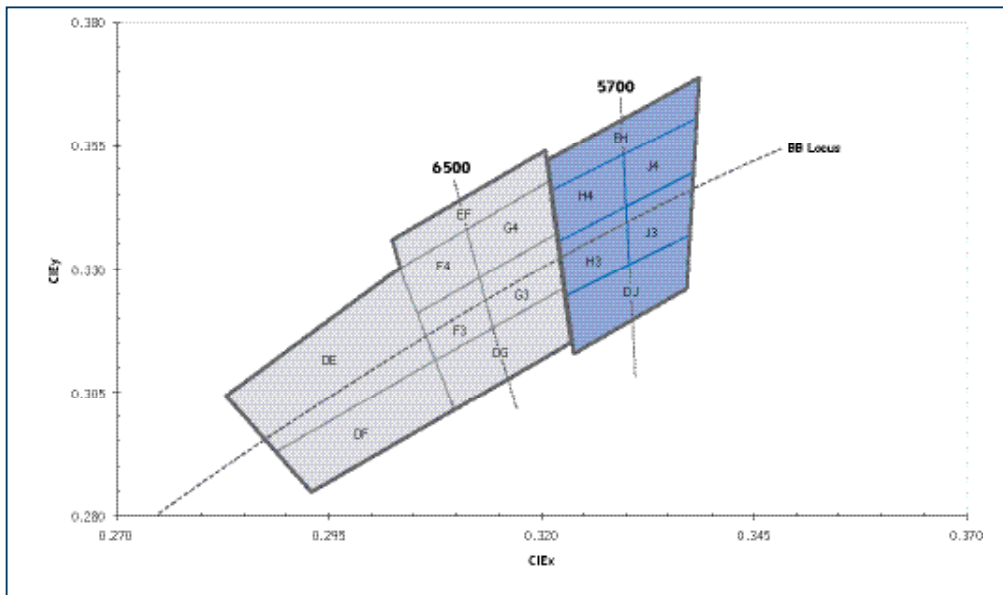
Color	Flux Bin (FF)	Minimum Flux (lm) @ 13.5A	Minimum Flux (lm) @ 13.5A
Red	BM	770	970
	BN	970	1150
	BP	1150	1350
	BQ	1350	1570
	BR	1570	1850

Color	Wavelength Bin (FF)	Minimum Wavelength @ 13.5A	Maximum Wavelength @ 13.5A
Red	R3	615	619
	R4	619	623
	R5	623	627

\*Note: Luminus maintains a +/- 6% tolerance on flux measurements. Luminus maintains a +/- 2% tolerance on CRI measurements.

### Chromaticity Bins

Luminus' Standard Chromaticity Bins: 1931 CIE Curve



The following tables describe the four chromaticity points that bound each chromaticity bin. Chromaticity bins are grouped together based on the color temperature.

6500K Chromaticity Bins		
Bin Code (WW)	CIE <sub>x</sub>	CIE <sub>y</sub>
DG	0.307	0.311
	0.322	0.326
	0.323	0.316
	0.309	0.302
F3*	0.305	0.321
	0.313	0.329
	0.315	0.319
	0.307	0.311
F4*	0.303	0.330
	0.312	0.339
	0.313	0.329
	0.305	0.321
G3*	0.313	0.329
	0.321	0.337
	0.322	0.326
	0.315	0.319
G4*	0.312	0.339
	0.321	0.348
	0.321	0.337
	0.313	0.329
EF	0.302	0.335
	0.320	0.354
	0.321	0.348
	0.303	0.330
DE	0.283	0.304
	0.303	0.330
	0.307	0.311
	0.289	0.293
DF	0.289	0.293
	0.307	0.311
	0.309	0.302
	0.293	0.285

5700K Chromaticity Bins		
Bin Code (WW)	CIE <sub>x</sub>	CIE <sub>y</sub>
DJ	0.322	0.324
	0.337	0.337
	0.336	0.326
	0.323	0.314
H3*	0.321	0.335
	0.329	0.342
	0.329	0.331
	0.322	0.324
H4*	0.321	0.346
	0.329	0.354
	0.329	0.342
	0.321	0.335
J3*	0.329	0.342
	0.337	0.349
	0.337	0.337
	0.330	0.331
J4*	0.329	0.354
	0.338	0.362
	0.337	0.349
	0.329	0.342
EH	0.320	0.352
	0.338	0.368
	0.338	0.362
	0.321	0.346

\*Sub-bins within ANSI defined quadrangles per ANSI C78.377-2008

### SBT-90 and SBR-90 Bin Kit Order Codes

The following tables describe the bin kit ordering codes for the SBT-90 and SBR-90. The flux and chromaticity bins included in the bin kit. Each kit specifies a minimum flux and the listed chromaticity bins. A maximum flux is not specified. Within each kit, Luminus may ship any part meeting or exceeding the minimum flux specification. Shipments will always meet the listed chromaticity bins. For information on ordering bin kits not listed below, please contact Luminus or an official distributor.

#### SBT-90 and SBR-90 Bin Kit Order Codes

Color	Luminous Flux		Chromaticity Bins	Kit Number
	Bin Kit Flux Code	Min. Flux		
White W57S & W65S 5700K & 6500K, Standard CRI (typ. 70)	NA	1,590	F4, F3, G4, G3, EF, DG, DE, DF	NA100
			F4, F3, G4, G3, EF, DG	NA101
			F4, F3, G4, G3	NA102
			H3, H4, J3, J4, DJ, EH	NA200
	NB	1,710	F4, F3, G4, G3, EF, DG, DE, DF	NB100
			F4, F3, G4, G3, EF, DG	NB101
			F4, F3, G4, G3	NB102
			H3, H4, J3, J4, DJ, EH	NB200
White WDL5 Combine 6500K & 5700K Standard CRI (typ. 70)	NA	1,590	F4, F3, G4, G3, EF, DG, DE, DF H4, H3, J4, J3, EH, DJ	NA150
	NB	1,710	F4, F3, G4, G3, EF, DG, DE, DF H4, H3, J4, J3, EH, DJ	NB150
Color	Luminous Flux		Wavelength Bins	Kit Number
	Bin Kit Flux Code	Min. Flux		
Red	HM	770	R3, R4, R5	HM100
			R4	HM101
	HN	970	R3, R4, R5	HN100
			R4	HN101

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