

## CBT-140 LEDs



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### Introduction:

This document describes the binning and labeling nomenclature for CBT-140 Big Chip 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
CBT-140-WCS	CBT-140-WCS-C15-xx123	Big Chip LED™ CBT-140 consisting of a 14 mm <sup>2</sup> LED, connector, on a copper-core PCB
CBT-140-WDH	CBT-140-WDH-C15-xx123	
CBT-140-WTH	CBT-140-WTH-C15-xx123	

## CBT-140 Shipping and Labeling Nomenclature

All CBT-140 products are packaged and labeled with their respective bin as outlined in the following pages. Each package will only contain one bin. The part number designation is as follows:

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

Product Family	Chip Area	Color	Package Configuration	Flux Bin	Chromaticity Bin/ Wavelength
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Product Family	A - Package type: "C" denotes chip-on board B - Lens type: "B" denotes window (no lens) C - Chip quantity: "T" denotes single chip				
Chip Area	1 2 3 - Total LED chip area (mm <sup>2</sup> ) x 10: "140" denotes 14.0mm <sup>2</sup>				
Color	D - Color: "W" denotes white 4 - Color temperature: "C" denotes cool white, "D" denotes daylight white, "T" denotes tungsten white E - Color rendering: "S" (standard) and "H" (high) denote typical CRI of 70 and 92 respectively				
Package Config.	F 5 6 - Package configuration (for internal use)				
Flux Bin	G H - Flux bin				
Chromaticity Bin/ Wavelength	I 7 - Wavelength / Chromaticity bin				

### Example:

The part label CBT-140-WDH-C15-RA-D1 refers to a Daylight high CRI white, CBT-140 emitter, with a flux range from 2,420 to 2,600 lumens and a chromaticity value within the box defined by the four points (0.321, 0.327), (0.321, 0.335), (0.328, 0.341), (0.328, 0.334).

## CBT-140 Bin Kit Ordering Nomenclature

All CBT-140 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 E      —      F 5 6      —      G H 7 8 9**

Product Family	Chip Area	Color	Package Configuration	Bin Kit Code
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Product Family	A - Package type: "C" denotes chip-on board B - Lens type: "B" denotes window (no lens) C - Chip quantity: "T" denotes single chip			
Chip Area	1 2 3 - Total LED chip area (mm <sup>2</sup> ) x 10: "140" denotes 14.0 mm <sup>2</sup>			
Color	D - Color: "W" denotes white 4 - Color temperature: "C" denotes cool white, "D" denotes daylight white, "T" denotes tungsten white E - Color rendering: "S" (standard) and "H" (high) denote typical CRI of 70 and 92 respectively			
Package Config.	F 5 6 - Package configuration (for internal use)			
Bin Kit Code	G H - Flux bin 7 8 9 - Wavelength/ Chromaticity bin kit code			

### Example:

The ordering part number CBT-140-WDH-C15-RA220 refers to a daylight high CRI white, CBT-140 emitter, with a minimum flux value of 2,420 lumens and falling in the D1, D2, D1H, D2H, D1L, D2L chromaticity bins.

## CBT-140 White Binning Structure

CBT-140 white LEDs are tested for luminous flux and chromaticity at a drive current of 21.0 A (1.5 A/mm<sup>2</sup>) and placed into one of the following luminous flux (FF) and chromaticity (WW) bins:

### Flux Bins

Color	Flux Bin (FF)	Minimum Flux (lm) at 21.0A	Maximum Flux (lm) at 21.0A
WCS Cool White Standard CRI (typ. 75)	TB	3,440	3,680
	UA	3,680	3,955
	UB	3,955	4,230
WDH Daylight High CRI (typ. 92)	QA	1,965	2,260
	QB	2,260	2,420
	RA	2,420	2,600
WTH Tungsten White High CRI (typ. 92)	PB	1,965	2,100
	QA	2,100	2,260
	QB	2,260	2,420

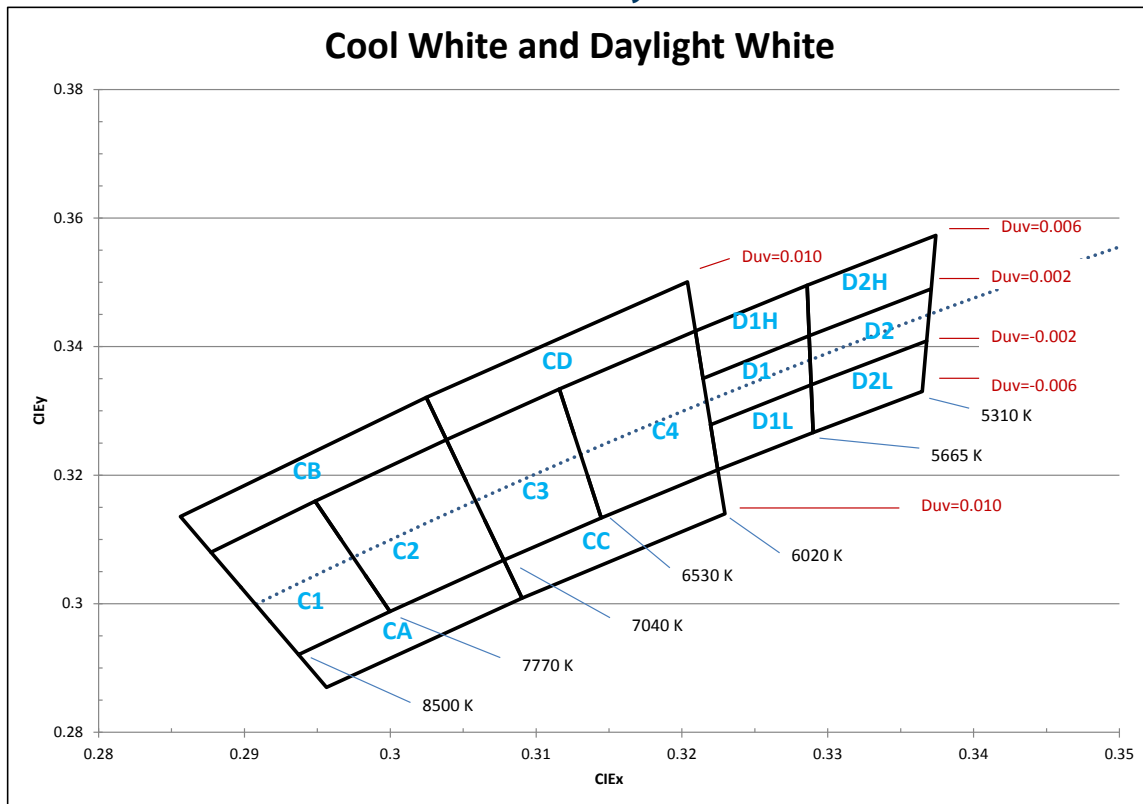
\*Note: Luminus maintains a +/- 6% tolerance on flux measurements.

Luminus maintains a +/- 2% tolerance on CRI measurements.

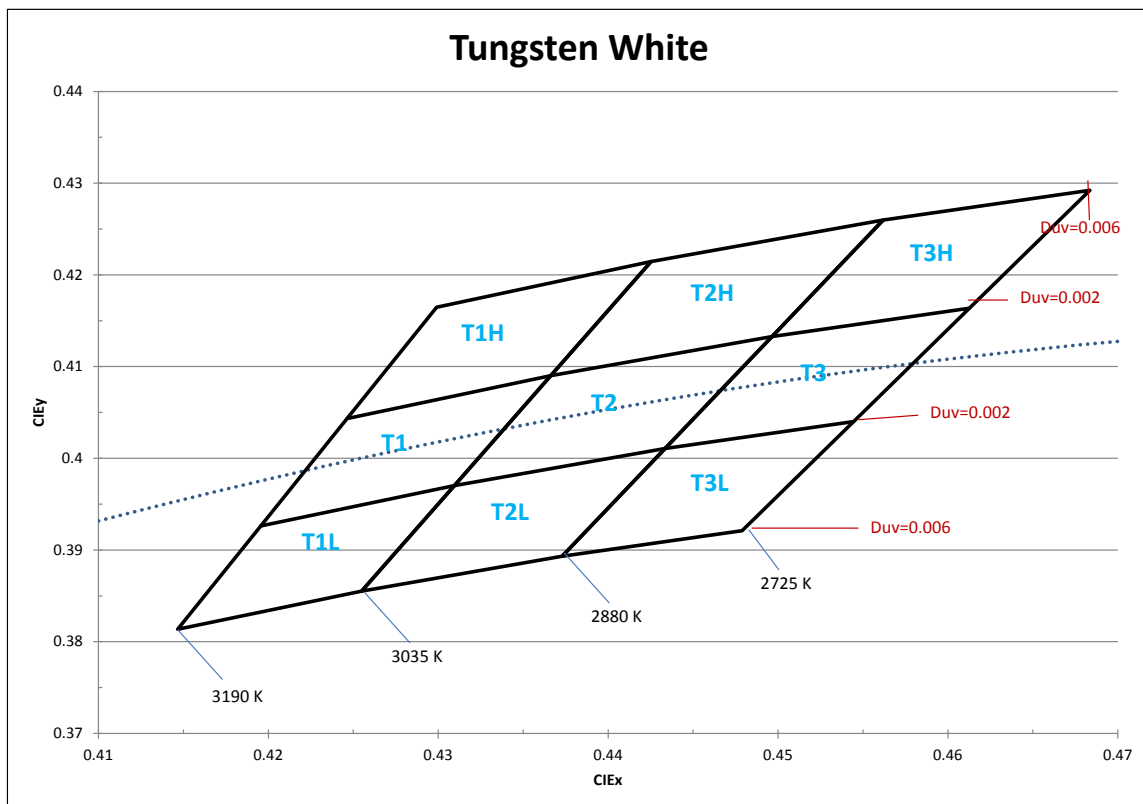


### Chromaticity Bins

#### Cool White and Daylight White



#### Tungsten White



**CBT-140 White Chromaticity Bins**

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

Cool White Chromaticity Bins		
Bin Code(WW)	CIE <sub>x</sub>	CIE <sub>y</sub>
C1	0.291	0.297
	0.289	0.302
	0.296	0.310
	0.298	0.304
C2	0.298	0.304
	0.296	0.310
	0.305	0.319
	0.306	0.312
C3	0.306	0.312
	0.305	0.319
	0.312	0.326
	0.313	0.319
C4	0.313	0.319
	0.312	0.326
	0.321	0.335
	0.321	0.327

Cool White Chromaticity Bins		
Bin Code(WW)	CIE <sub>x</sub>	CIE <sub>y</sub>
CA	0.293	0.292
	0.295	0.287
	0.309	0.300
	0.307	0.306
CB	0.287	0.307
	0.285	0.313
	0.302	0.332
	0.303	0.325
CC	0.307	0.306
	0.309	0.300
	0.322	0.313
	0.322	0.320
CD	0.303	0.325
	0.302	0.332
	0.320	0.350
	0.320	0.342

**CBT-140 White Chromaticity Bins**

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

Daylight Chromaticity Bins		
Bin Code(WW)	CIE <sub>x</sub>	CIE <sub>y</sub>
D1	0.321	0.327
	0.321	0.335
	0.328	0.341
	0.328	0.334
D2	0.328	0.334
	0.328	0.341
	0.337	0.348
	0.336	0.340
D1H	0.321	0.335
	0.320	0.342
	0.328	0.349
	0.328	0.341
D2H	0.328	0.341
	0.328	0.349
	0.337	0.357
	0.337	0.348
D1L	0.321	0.327
	0.322	0.320
	0.328	0.326
	0.328	0.334
D2L	0.328	0.334
	0.328	0.326
	0.336	0.333
	0.336	0.340

Tungsten White Chromaticity Bins		
Bin Code(WW)	CIE <sub>x</sub>	CIE <sub>y</sub>
T1	0.419	0.392
	0.424	0.404
	0.436	0.409
	0.430	0.397
T2	0.430	0.397
	0.436	0.409
	0.449	0.413
	0.443	0.401
T3	0.443	0.401
	0.449	0.413
	0.461	0.416
	0.454	0.404
T1H	0.424	0.404
	0.429	0.416
	0.442	0.421
	0.436	0.409
T2H	0.436	0.409
	0.442	0.421
	0.456	0.425
	0.449	0.413
T3H	0.449	0.413
	0.456	0.425
	0.468	0.429
	0.461	0.416
T1L	0.419	0.392
	0.414	0.381
	0.425	0.385
	0.430	0.397
T2L	0.430	0.397
	0.425	0.385
	0.437	0.389
	0.443	0.401
T3L	0.443	0.401
	0.437	0.389
	0.447	0.392
	0.454	0.404



### CBT-140 Bin Kit Order Codes

The following tables describe the bin kit ordering codes for the CBT-140. The flux and wave length or chromaticity bins included in the bin kit. Each kit specifies a minimum flux and the listed wave length or 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 wave length or chromaticity bins. For information on ordering bin kits not listed below, please contact Luminus or an official distributor.

#### CBT-140 Bin Kit Order Codes

Color	Luminous Flux		Chromaticity Bins	Kit Number
	Bin Kit Flux Code	Min. Flux		
WCS Cool white, Standard CRI (typ. 75)	TB	3,440	C1, C2, C3, C4, CA, CB, CC, CD	TB120
			C1, C2, C3, C4	TB121
			C3, C4	TB122
			C1, C2	TB123
	UA	3,680	C1, C2, C3, C4, CA, CB, CC, CD	UA120
			C1, C2, C3, C4	UA121
			C3, C4	UA122
			C1, C2	UA123
	UB	3,955	C1, C2, C3, C4, CA, CB, CC, CD	UB120
			C1, C2, C3, C4	UB121
			C3, C4	UB122
			C1, C2	UB123

**CBT-140 Bin Kit Order Codes**

Color	Luminous Flux		Chromaticity Bins	Kit Number
	Bin Kit Flux Code	Min. Flux		
WDH Daylight white, High CRI (typ. 92)	QA	2,100	D1, D2, D1H, D2H, D1L, D2L	QA220
	QB	2,260	D1, D2, D1H, D2H, D1L, D2L	QB220
	RA	2,420	D1, D2, D1H, D2H, D1L, D2L	RA220
WTH Tungsten white, High CRI (typ. 92)	PB	1,965	T1, T2, T3, T1H, T2H, T3H, T1L, T2L, T3L	PB720
			T1, T2, T1H, T2H, T1L, T2L	PB721
	QA	2,100	T1, T2, T3, T1H, T2H, T3H, T1L, T2L, T3L	QA720
			T1, T2, T1H, T2H, T1L, T2L	QA721
	QB	2,260	T1, T2, T3, T1H, T2H, T3H, T1L, T2L, T3L	QB720
			T1, T2, T1H, T2H, T1L, T2L	QB721

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