



Tunable White COB LED

- Adjustable Natural Daylight
- CCT From 3000K - 6000K
- Dual-Controllable LED Strings
- Low-Cost Solution



Create an 'adjustable' natural daylight environment.

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Product Overview

Tunable White is a Hailux Lighting LED technology that provides the ability to control the 'daylight' (3000K to 6000K) color temperature of a LED luminaire.

Hailux Lighting's TW-209 is a dual-section chip-on-board (COB) LED comprised of two separate LED strings. The TW-209's light output is a blend of string one and string two resulting in a combined COB. Color temperature ranging from approximately 3,000K (warm white) to approximately 6,000K (cool white).

Using a Tunable White COB LED, a single luminaire can adjust its light output to match the natural changes in daylight color throughout the course of a day. This is a desired quality in office, healthcare, retail and education environments which can improve productivity, attentiveness, and the ambiance.

The color temperature is adjusted by varying the power ratio between the two LED strings. This operation requires a variable CCT Controller (part# TCC-100), external 100K potentiometers and a dimmable constant current power supply. [See block diagram on page 6]

Product Features

- Color temperature range 3000K to 6000K
- Dual, controllable, LED strings
- Adjustable simulated daylight.
- Efficacy, typically 100 Lumens/Watt at full brightness
- Full beam angle 120° (compatible with 3rd party reflectors)
- 20 to 22 Watts for optimum performance
- Alignment board to aid assembly



Ordering Information

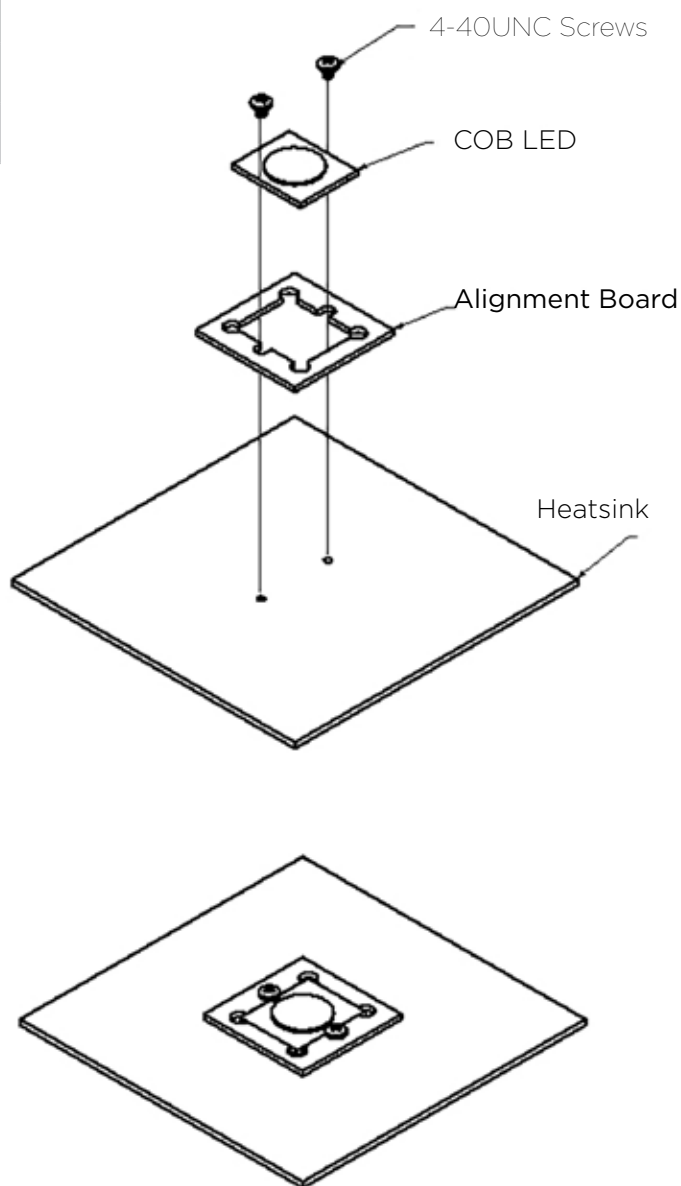
Description	Order Number
Tunable White COB LED	TW209
Variable CCT Controller	TCC-100

What's Included?

- Tunable White COB LED
- Alignment Board to aid assembly. For more information on product assembly see page 5, Assembly Instructions.

What's Not Included?

- CCT Controller
- Potentiometers
- Screws and Washers
- Thermal Interface Material
- Heatsink

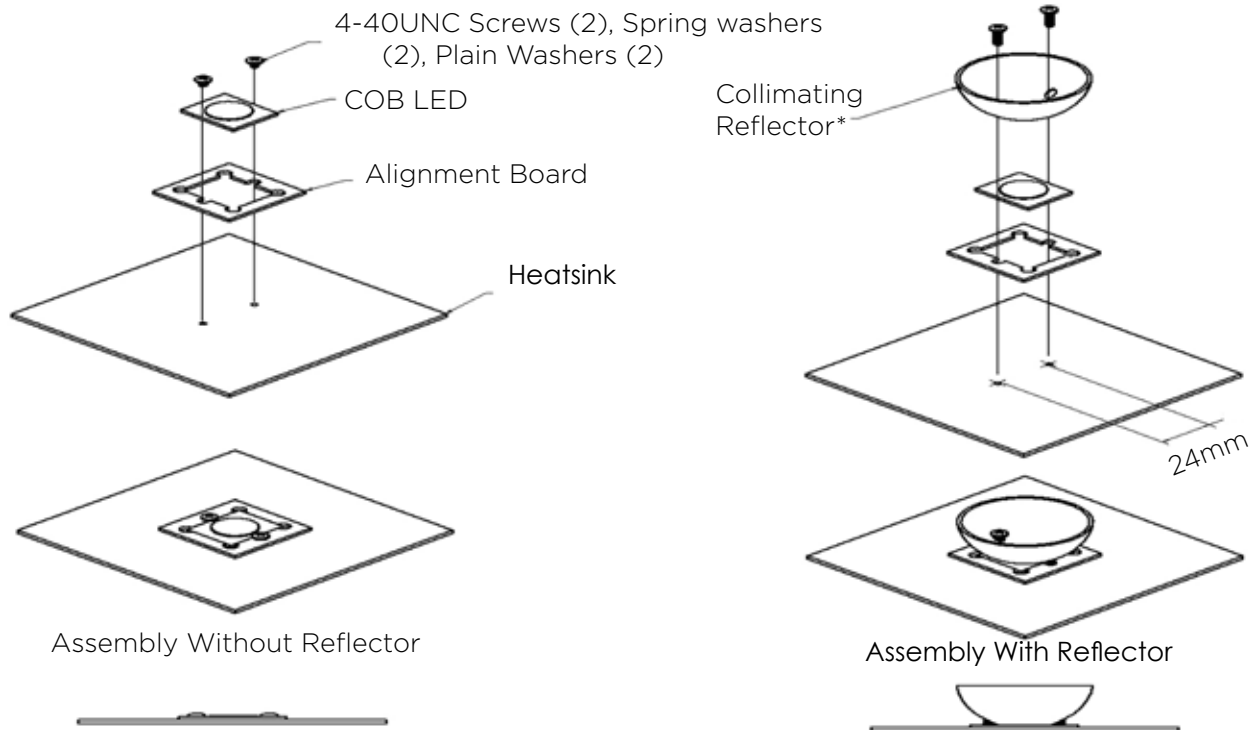


ASSEMBLY WITHOUT REFLECTOR



See page 5 for detailed assembly instructions.

Assembly Instructions



* Hailux Lighting recommends the use of Ledil Brooke Series reflectors [Models #12352 (18°), #12083 (34°) and #12084 (47°)] for mechanical compatibility with the 2 x 4-40UN screw installation.

Assembly Instructions Without A Reflector

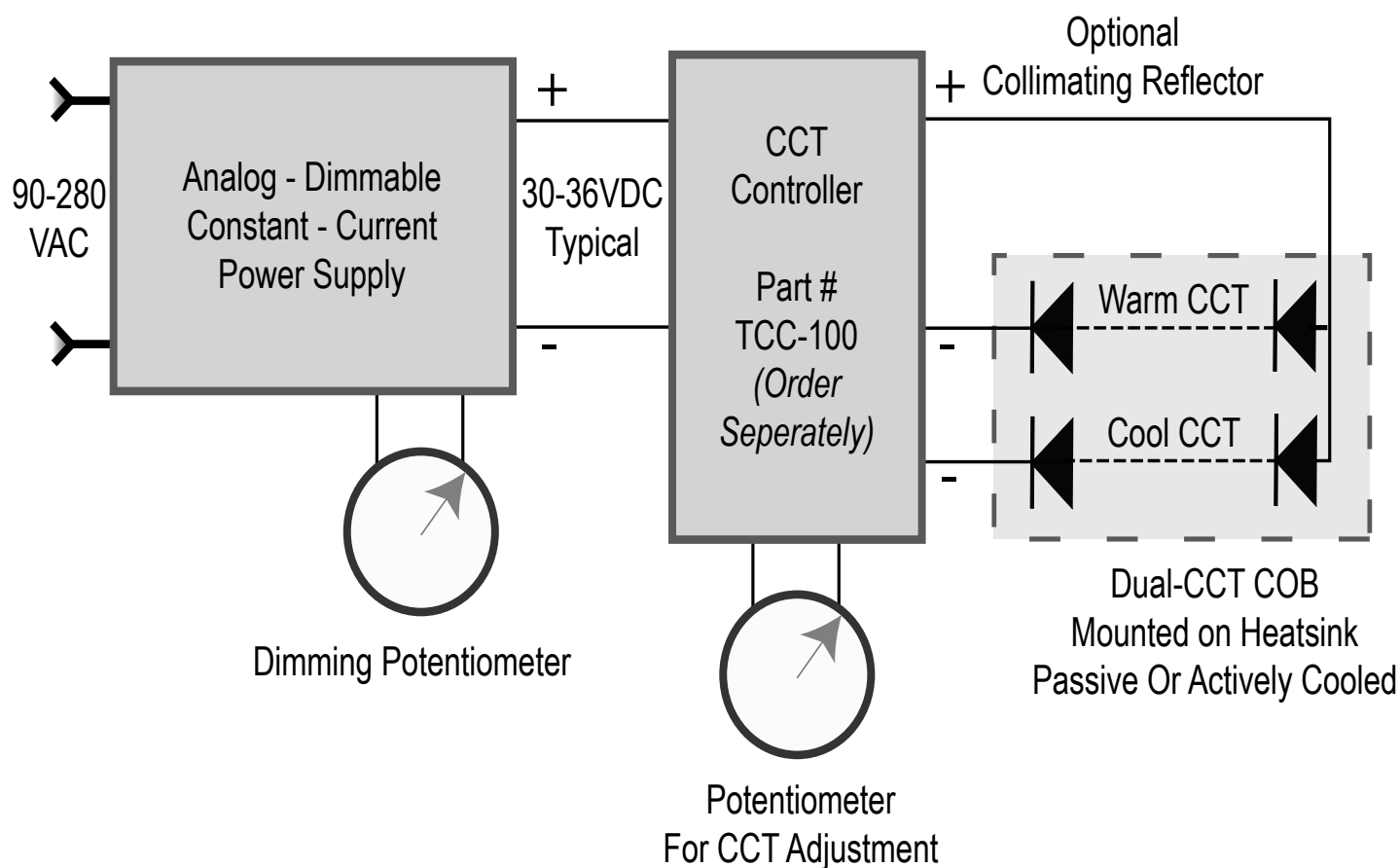
- Step 1: Prepare the heatsink with two threaded M3 holes, 24mm apart
- Step 2: Temporarily locate the alignment board with the two M3 screws. (Do not tighten)
- Step 3: Apply Thermal Interface Material
- Step 4: Place the COB inside the alignment board and tighten the screws clamping both the COB and alignment board.

Assembly Instructions With A Reflector

Complete Steps 1 through 4, then remove the screws and washers, assemble the reflector reusing the 4-40UNC screws and washers.

This is Hailux Lighting's recommended assembly method.

Block Diagram



Absolute Maximum Ratings

Description	Symbol	Rating	Unit
Power Dissipation (Note 1)	P	25	Watts
Forward Current	I-f	750	mA
Reverse Voltage	V-r	60	V
Operating Temperature (Note 2)	T-oper	75	Deg C
Storage Temperature	T-stg	100	Deg C
Case Temperature	T-C	75	Deg C

Note 1: Absolute maximum power dissipation and forward current are for the sum of warm white and cool white –not for individual value of each unit For best performance, power should be limited to 20-22 watts.

Note 2: Operating temperature as measured at point on the COB marked "TC".

Performance Specifications, COB

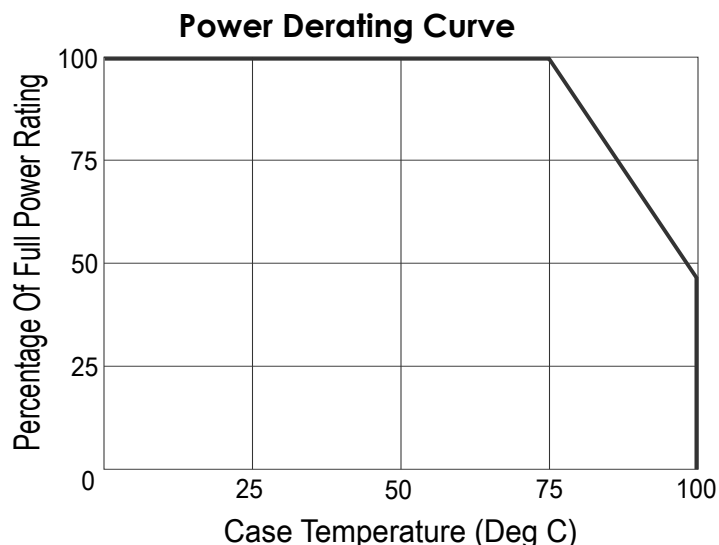
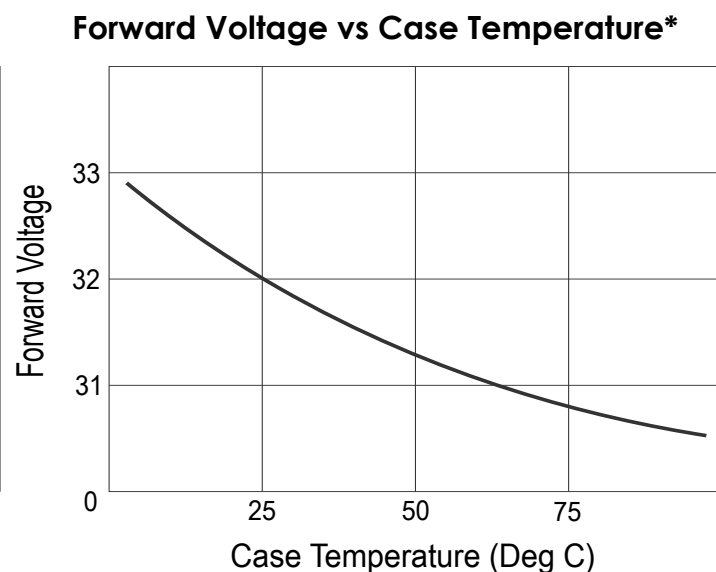
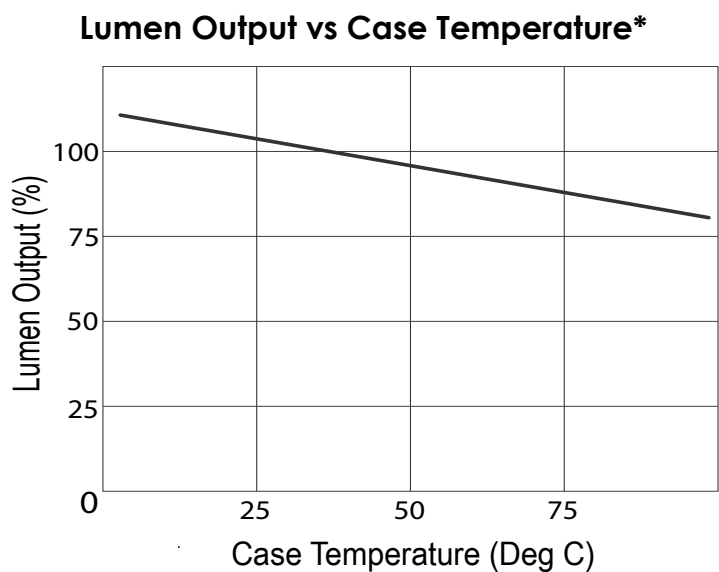
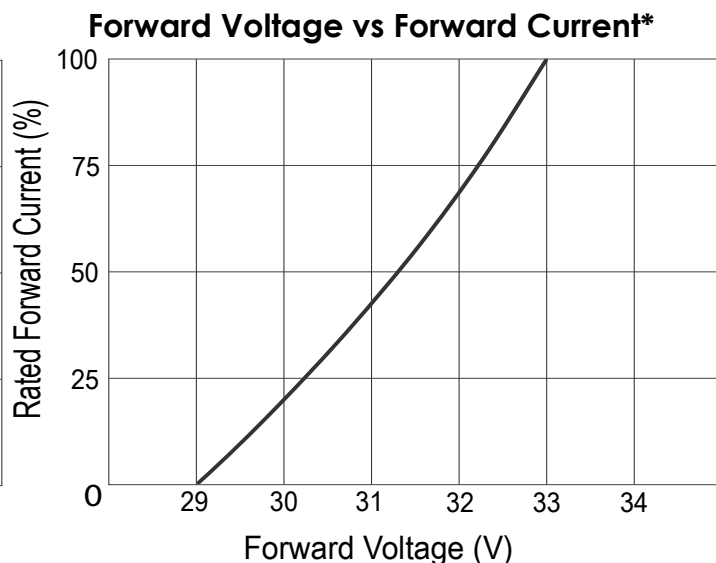
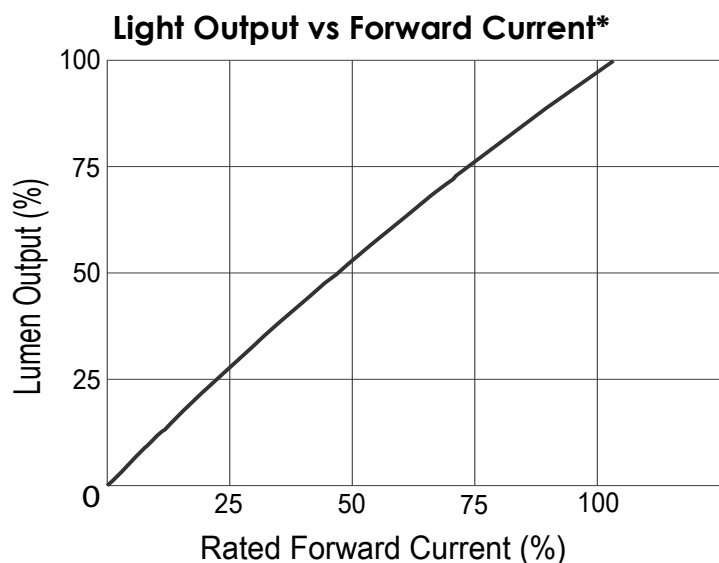
Conditions	Parameter	Limits		
		Min	Typ	Max
(T _J =25)				
Forward Current, 750mA	Forward Voltage	32	36	40
Warm-White LED String	CCT		3000K	
Cool-White LED String	CCT		6000K	

Performance Specifications, Dual CCT Controller (Purchased Separately)

Conditions	Limits		
	Min	Typ	Max
(T _J =25)			
Operating Current Per String			2.0A
Controller Operating PMW Frequency			1.0kHz
Duty Cycle Per LED String As CCT Adjusted	5%		95%
Max. Constant Current Dead-Time In A Full PWM Cycle			1.0%



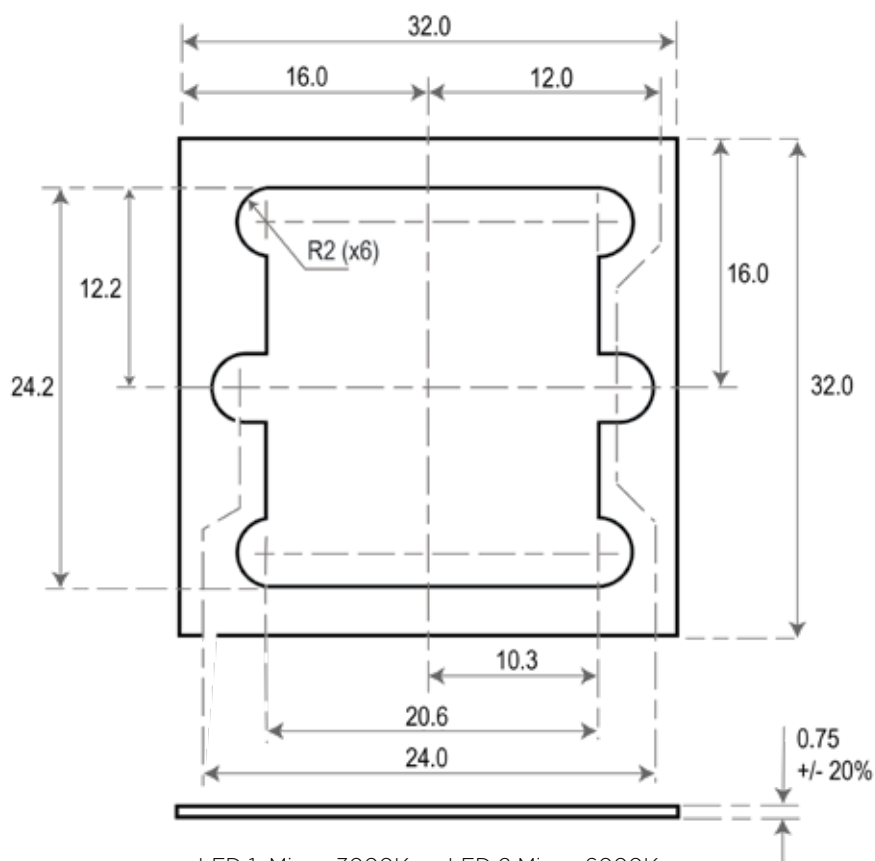
Performance Charts



* Per Individual LED String

Mechanical Outlines

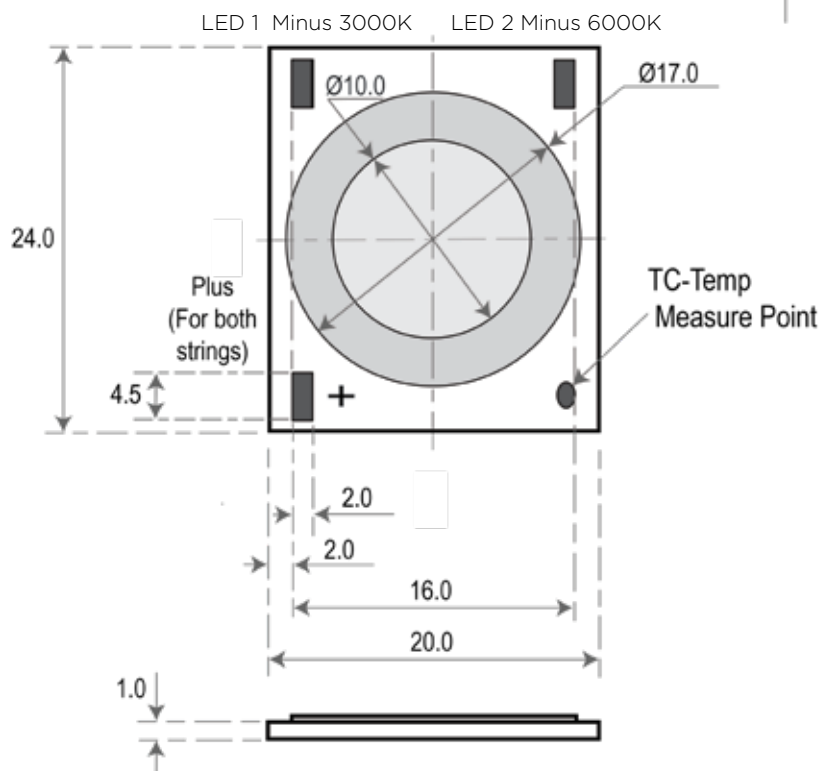
Alignment Board



COB



Actual Size



Application Examples

20W

20W COB installed on a 2.45°C/W Heatsink at full beam angle (120°)

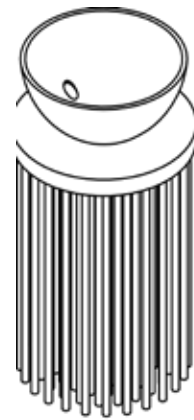
Heatsink: Pin Fin Style



20W With Collimating Reflector

20W COB installed on a 2.45°C/W Heatsink with a Ledil Brooke Series reflectors to narrow the beam angle less than 60°.

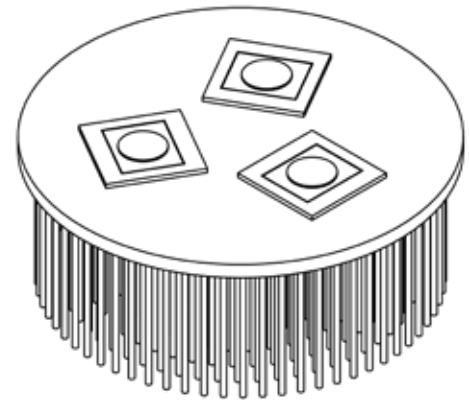
Heatsink: Pin Fin Style



60W

60W (3 x 20W COBs) installed on a 0.9°C/W Heatsink at full beam angle (120°)

Heatsink: Pin Fin Style



60W With Collimating

60W (3 x 20W COBs) installed on a 0.9°C/W Heatsink with Ledil Brooke Series Reflectors to narrow the beam angle of each COB to less than 60°.

Heatsink: Pin Fin Style

