

# 5x5 Compact High Power UV-C LED Array

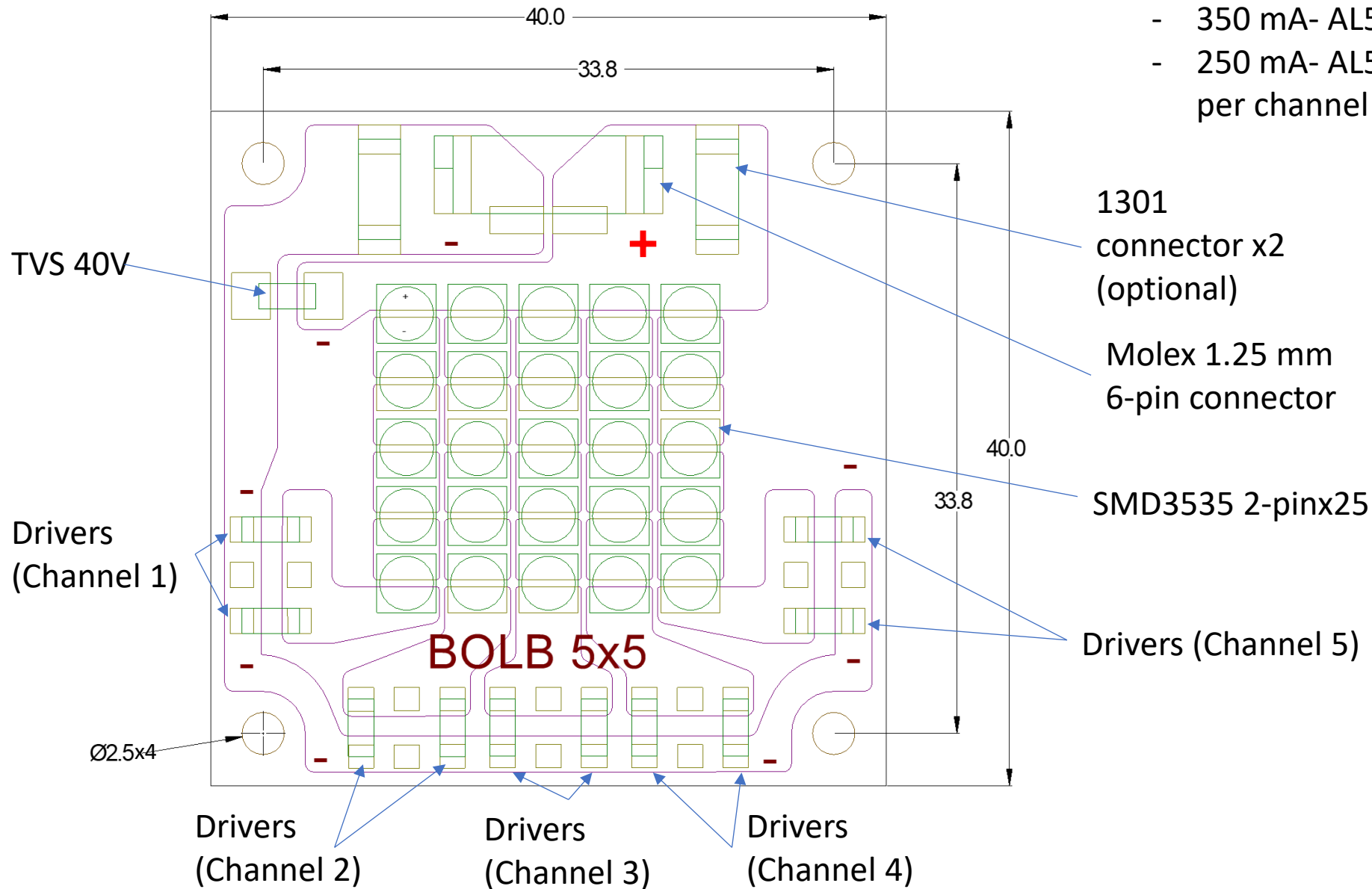
## M5x5-S35-H-350-C

Featuring S3535-H SMD LEDs

v0.96

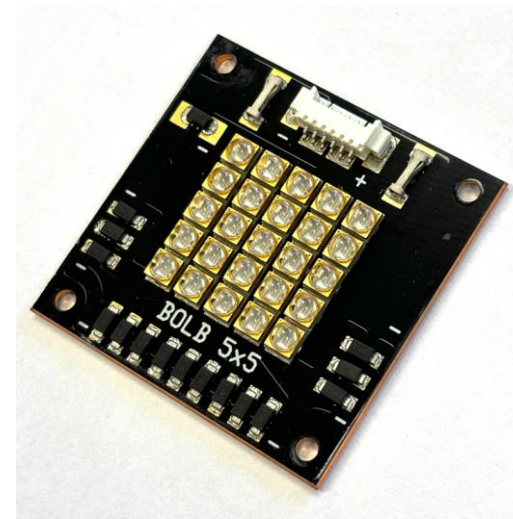
BOLB Inc.  
Livermore, California  
July 2024

5x5 module Compact SMD3535-H  
**M5x5-S35-H-350-Compact**



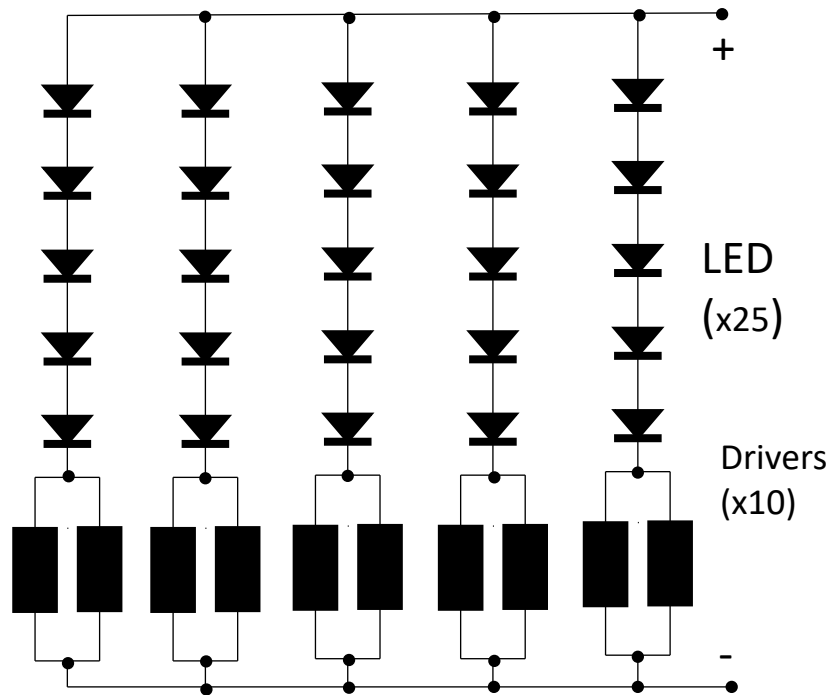
- Comments (driving current per chip):
- 350 mA- AL5809-120 mA x3 per channel
  - 250 mA- AL5809-120 mA and 150 mA per channel (illustrated)

- 1301 connector x2 (optional)
- Molex 1.25 mm 6-pin connector
- SMD3535 2-pin x25



All dimensions in mm

## Schematic of Electrical Connections



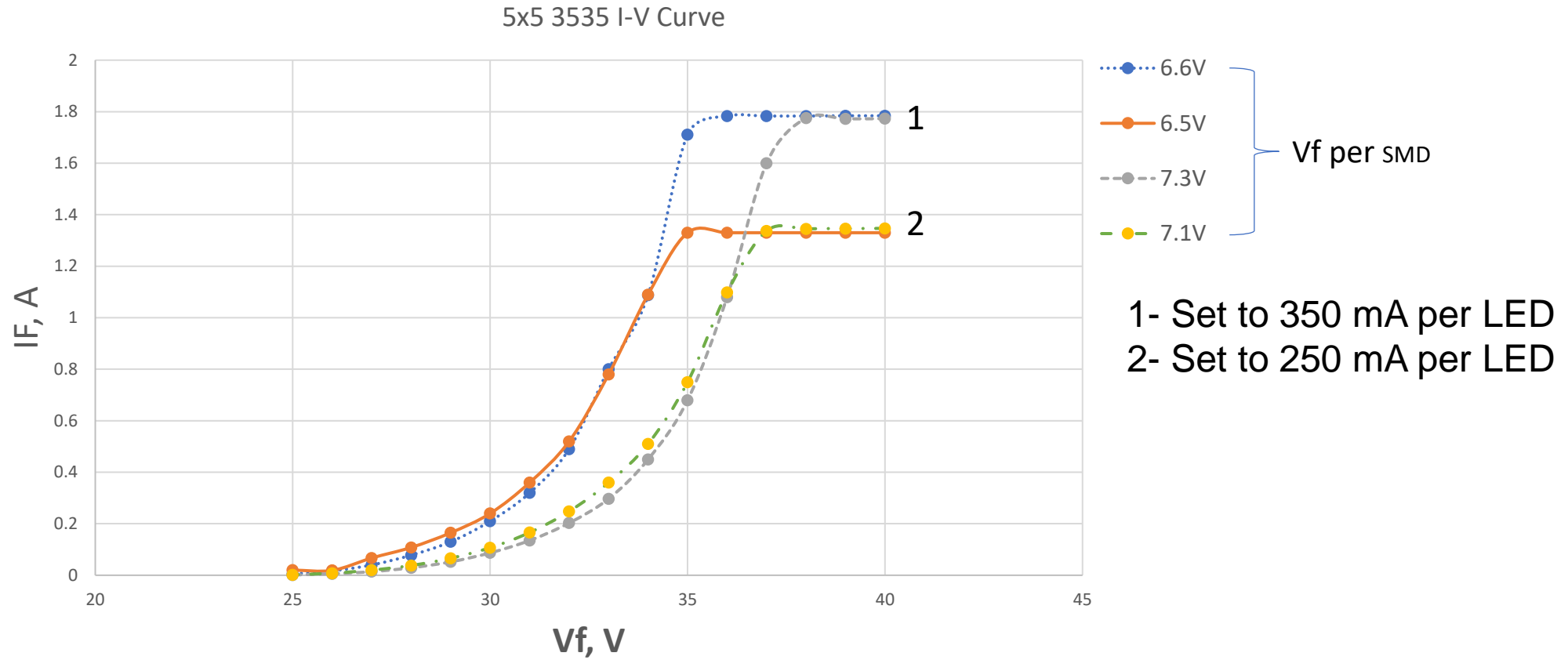
Drive current is either **250mA/LED** ( $2.5W_{opt}$ ) or **350mA/LED** ( $3.5W_{opt}$ )

On-board LED drivers are selected based on the above power selections

## Specifications

1. Output 3.5W optical at 350mA/LED
2. Output 2.5W optical at 250mA/LED
3. Active cooling required. A heat pipe rated at 100W dissipated power or above is recommended
4. A high thermal conductivity grease is highly recommended for good thermal connection to a heatsink
5. Power supply- **36-40V DC, 3A** with voltage stabilization.
6. PCB has 1 connector Molex 1.25 mm 6 pins (3 pins parallel for each polarity) for connections to the power supply
7. PCB has 2 optional Kyocera connectors (wires AWG-23 or 24) for connections to the power supply
8. No additional soldering is required

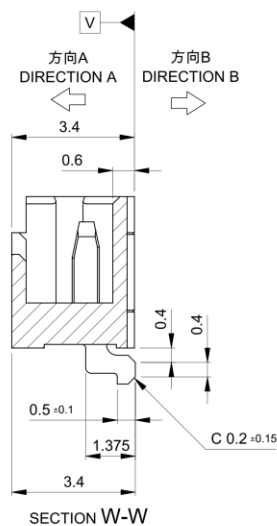
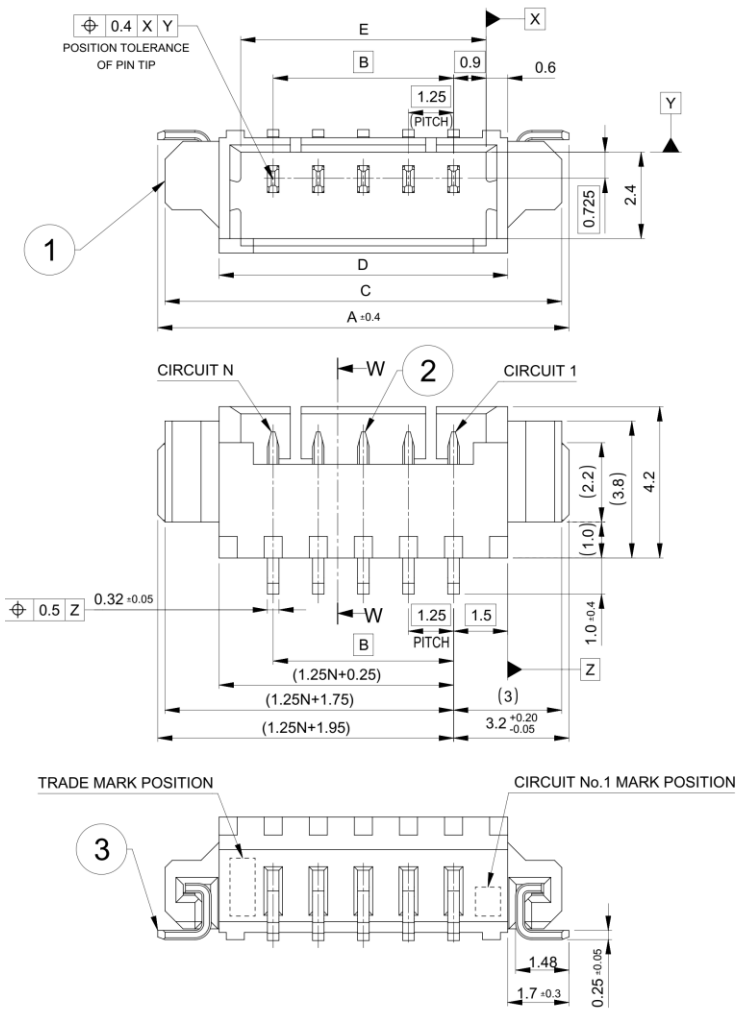
# 5x5 S3535-H Compact Module I-V data



## Irradiance of the 5x5 Compact Array as a Function of Distance When Driven at 350mA/LED

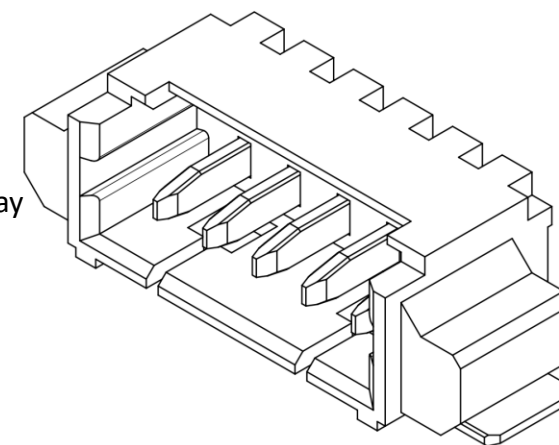
Device	On-axis Distance (cm)	Irradiance ( $\mu\text{W}/\text{cm}^2$ )		
		Irradiance on-axis	Irradiance at 20cm off-axis	Irradiance at 50cm off-axis
5x5 S3535-H Compact Module 70° FWHM lens 36VDC, 1.33 A 250mA/LED Flux Power $2.5W_{opt}$	20	2650	769	Out of beam coverage
	40	930	460	111
	60	293	256	110
	80	180	170	97
	100	135	115	82
	120	94	85	71

# MOLEX Pico-Blade 1.25mm Connector 6-Pin

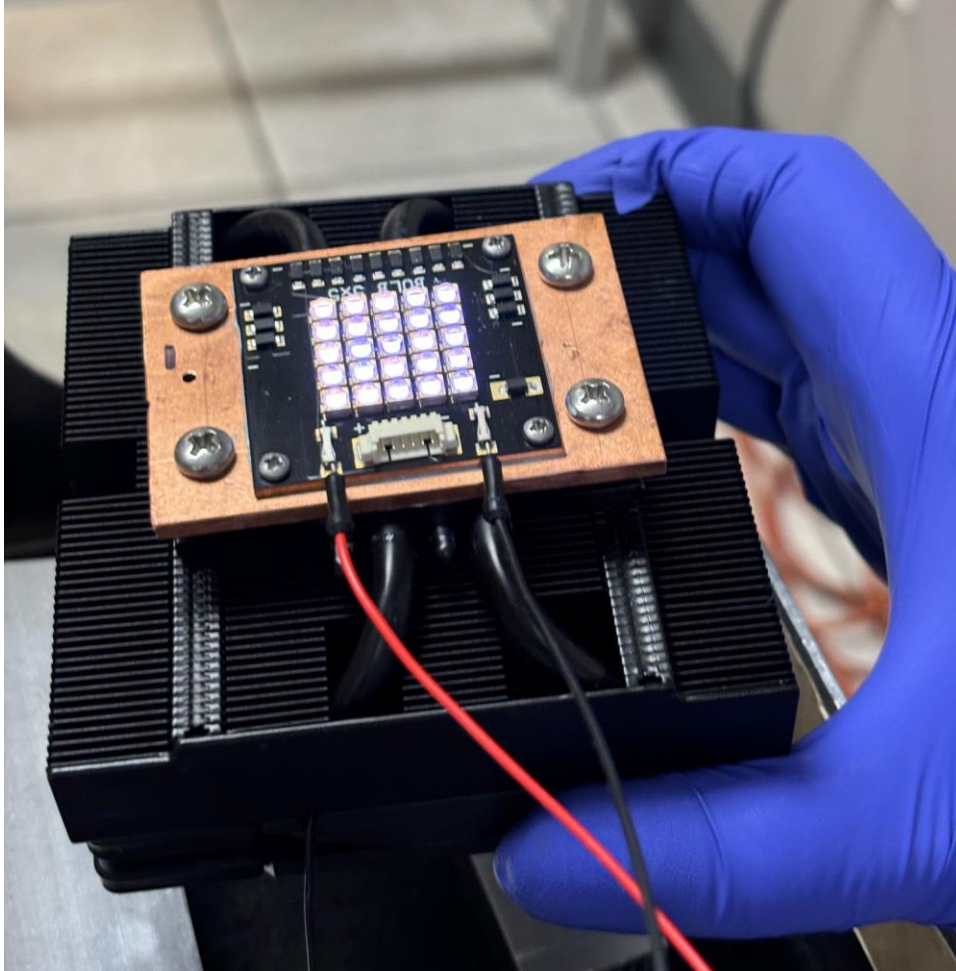


21.8	23	26	20	26.4	---	532611771	17	
19.3	20.5	23.5	17.5	23.9	---	532611571	15	
18.05	19.25	22.25	16.25	22.65	532611427	532611471	14	
16.8	18	21	15	21.4	---	532611371	13	
15.55	16.75	19.75	13.75	20.15	532611227	532611271	12	
14.3	15.5	18.5	12.5	18.9	---	532611171	11	
13.05	14.25	17.25	11.25	17.65	---	532611071	10	
11.8	13	16	10	16.4	532610927	532610971	9	
10.55	11.75	14.75	8.75	15.15	532610827	532610871	8	
9.3	10.5	13.5	7.5	13.9	532610727	532610771	7	
8.05	9.25	12.25	6.25	12.65	532610627	532610671	6	
6.8	8	11	5	11.4	532610527	532610571	5	
5.55	6.75	9.75	3.75	10.15	532610427	532610471	4	
4.3	5.5	8.5	2.5	8.9	532610327	532610371	3	
3.05	4.25	7.25	1.25	7.65	---	532610271	2	
						色 : 黒 COLOUR: BLACK	色 : ナチュラル(ベージュ) COLOUR: NATURAL (BEIGE)	極数 CIRCUIT SIZE
<b>E D C B A</b>						発注番号 ORDER NO		
						梱包形態 : エンボス梱包 PACKAGING : EMBOSSED TAPE AND REEL		

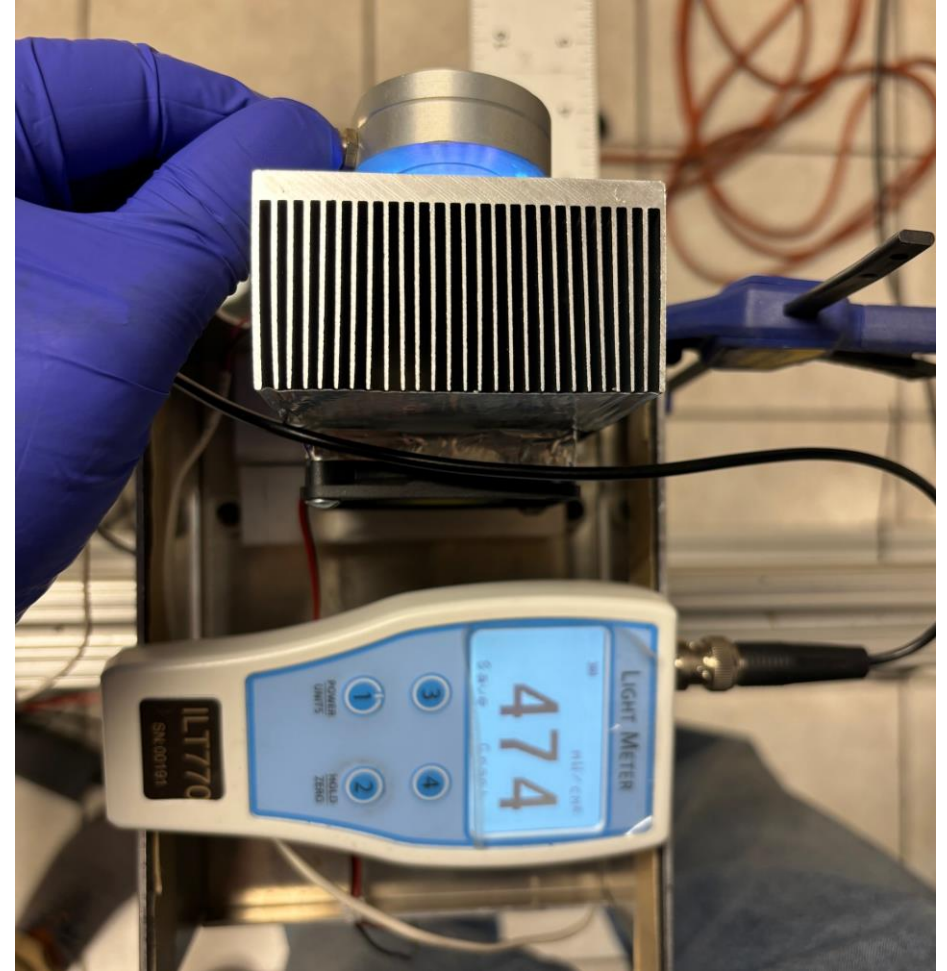
5-pin version shown on right  
**6-pin** version is used for this array product



## Irradiance of the 5x5 Compact Array Reaches $>450\text{mW}/\text{cm}^2$ at 1.0 cm When Driven at $350\text{mA}/\text{LED}$



Note: 4-pipes cooler- ID-COOLING IS-40X V3 45mm Height Low Profile CPU Cooler 4 Heat with 15mm-thick Slim Fan and copper adapter, high thermal conductivity thermal compound, Gennel G108, 4.63 W/m-K



Note: Extruded aluminum heatsink 23 fin 70x70x35 mm, with a standard 60x60x20 mm, 12V d.c. 1.5Watt fan



## Thermal Management Examples for the 5x5 Array

(Temperatures measured after 1 hour thermal stabilization)

Cooler	Cu-base PCB	Heat Sink Sizes in mm	Fan	Adapter
Extruded Aluminum Heatsink with fan <b>350mA / LED</b>	<b>53.2°C</b>	Extruded aluminum heatsink 70x70x35	12V DC, 1.5 Watt 60x60x25 220 grams	None required
Heat Pipe (4) <b>350mA / LED</b>	<b>38.3°C</b>	4 pipes Heat pipe cooler (optimal: LED face down)	Fan12VDC 92x92x15 440 grams	Cu adapter
Extruded Aluminum Heatsink with fan <b>250mA / LED</b>	<b>43.7°C</b>	Extruded aluminum heatsink 70x70x35	12V DC, 1.5 Watt 60x60x25 220 grams	None required

**Notes:**

**4-pipes cooler:** ID-COOLING IS-40X V3 45mm Height Low Profile CPU Cooler 4 Heat pipes CPU Cooler with 15mm-thick Slim Fan and copper adapter (or other heat pipes with rated dissipation >100W)

**Thermal Paste Recommendation:** Gennel G108, 4.63 W/m-K





**WARNING** UV emitted from this product. Avoid eye and skin exposure to unshielded product

**AVERTISSEMENT** UV émis par ce produit. Éviter l'exposition des yeux et de la peau à un produit non protégé

**ADVERTENCIA** Emisión de rayos ultravioleta por este producto. Evite la exposición de los ojos y la piel al producto sin protección

**警告** この製品から放出される紫外線。シールドされていない製品への目や皮膚の露出を避ける

UVC LEDs emit deep ultraviolet radiation with extremely high intensity near their surface. High irradiance allows rapid disinfection, but users must observe **strict safety precautions** during assembly, testing, and field use.

By purchasing the UVC chips (bare dice), packaged LEDs, or arrays from BOLB Inc., the customer agrees to indemnify the manufacturer of any bodily harm due to failure to follow the common-sense precautions or warnings and guidelines contained within this Specification.

It is the buyer's responsibility to design products that ensure the safety of end users.

All assembly workers, operators, and bystanders must wear eye and skin protection when the UVC LEDs are energized. Therefore, bare-eye observation (including through microscopes) and bare-hand handling of a UVC LED in operation is **PROHIBITED**.

Because most materials readily absorb UVC light, any oil or other absorbent liquid or solid substance must **NOT** be allowed to touch the sapphire side of the UVC chip, the quartz window or dome lens on a packaged LED.