

Introduction

Bolb 1x12 S3535-H Array (M1x12-S35-H-250/350) (Version 1.1B, July 2024)

The M1x12-S35-H-250/350 array (formerly 12" M-DR1A-W265-P1200-V24) is a high-efficiency UVC LED module that delivers high optical power in a linear configuration. The M1x12-S35-H-250/350 module includes twelve S3535-H LEDs mounted onto a metal core printed circuit board. In addition, the Bolb 1x12 S3535-H Array is available with several connector, driver, thermal management, and beam shaping options that simplify the integration of the array into a solution or fixture.



Highest Wall Plug Efficiency (WPE) in the industry (6-7%), resulting in shortest irradiation times

The default array delivers up to $100\mu\text{W}/\text{cm}^2$ intensity on-axis from 1m away at 350mA/LED

One 1x12 S3535 Array can disinfect 150 Cubic feet per minute air in situ, killing 99.9% of aerosolized staph bacteria and SARS2-COVID19

Practical 1-inch x 12 inboard configuration

Reduced engineering and simplified manufacturing without the need to solder

Each parallel LED string has a separate driver

Constant current drivers on the PCB produce a stabilized input current to the LEDs

Fixed current setting range from 1 and 1.4

Amps

High-demand air treatment, including upper air room disinfection, air troffers, floor standing air purifiers, etc.

Industrial curing

Photobiological Warning

RISK GROUP 3

WARNING UV EMITTED FROM THIS PRODUCT
AVOID EYE AND SKIN EXPOSURE TO UNSHEIELDED 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



CAUTION - RISK OF PERSONAL INJURY. THIS LED PACKAGE IS NOT INTENDED FOR GENERAL ILLUMINATION AND MAY REQUIRE THE USE OF SPECIAL SAFEGUARDS. INSTALL AND USE ONLY IN STRICT ACCORDANCE WITH THE PRODUCT AND PACKAGING MARKINGS

INTEGRATION OF THIS LED PACKAGE INTO LED LIGHT SOURCES (ARRAYS, LAMPS OR LUMINAIRES) OR ADDITION OF REFLECTIVE OR MAGNIFYING OPTICS MAY CHANGE THE EXPECTED PHOTOBIOLOGICAL SAFETY CHARACTERISTICS OF SUCH DEVICES. THE ASSIGNED RISK GROUP CLASSIFICATION OF THIS LED PACKAGE MAY NOT NECESSARILY INDICATE THE RISK GROUP CLASSIFICATION OF THE LED LIGHT SOURCE

Product Nomenclature M1x12-S35-H-250/350

The Bolb 1x12 S3535 Array is available with several connector, driver, thermal management, and beam shaping options that simplify the integration of the array into a solution or fixture. When placing an order that includes an option, use these option codes, the "-" symbol followed by specific letter and number combinations after the part number:

Optical		Electrical		Thermal (Lamp Option)		Connectivity	
Option Description	Option Code	Option Description	Option Code	Option Description	Option Code	Option Description	Option Code
S35-H	-	1 Amp Constant Current Driver or 250mA/LED	-250	Heat Sink with Integrated Fan	-HAF		
S35-H	-	1.4 Amp Constant Current Driver or 350mA/LED	-350	Heat Sink with Integrated Fan	-HAF	Molex Pico-Blade 1.25mm 4-pin Connector	-CM4

Example:

M1x12-S35-H-250-HAF-CM4

Interpretation:

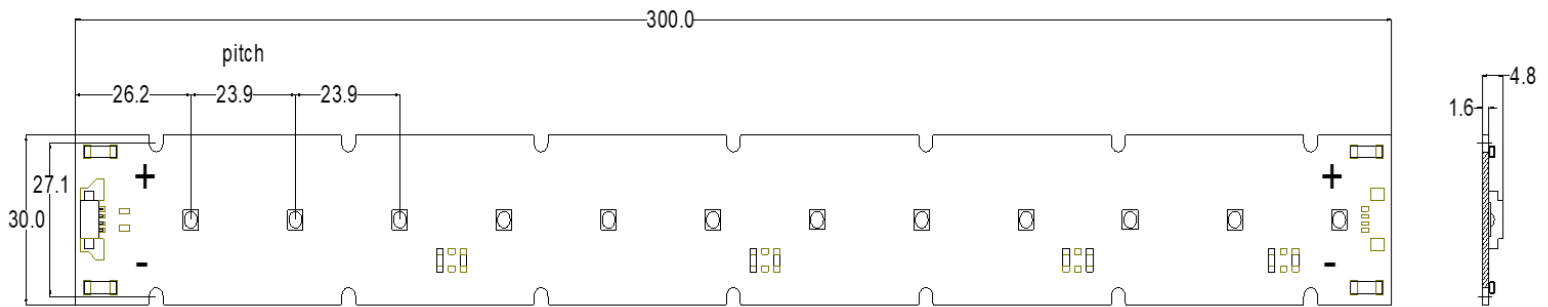
Module 1x12, with SMD size 3.5x3.5mm, hard lens
 250mA/LED drive current (total 1A since 4p3s configuration)
 Integrated Heatsink and Fan
 Molex Pico-blade 4 pin type connector

Note:

The product's default wavelength is 265nm
 Other wavelengths may be specified with the W designation, such as "W295"

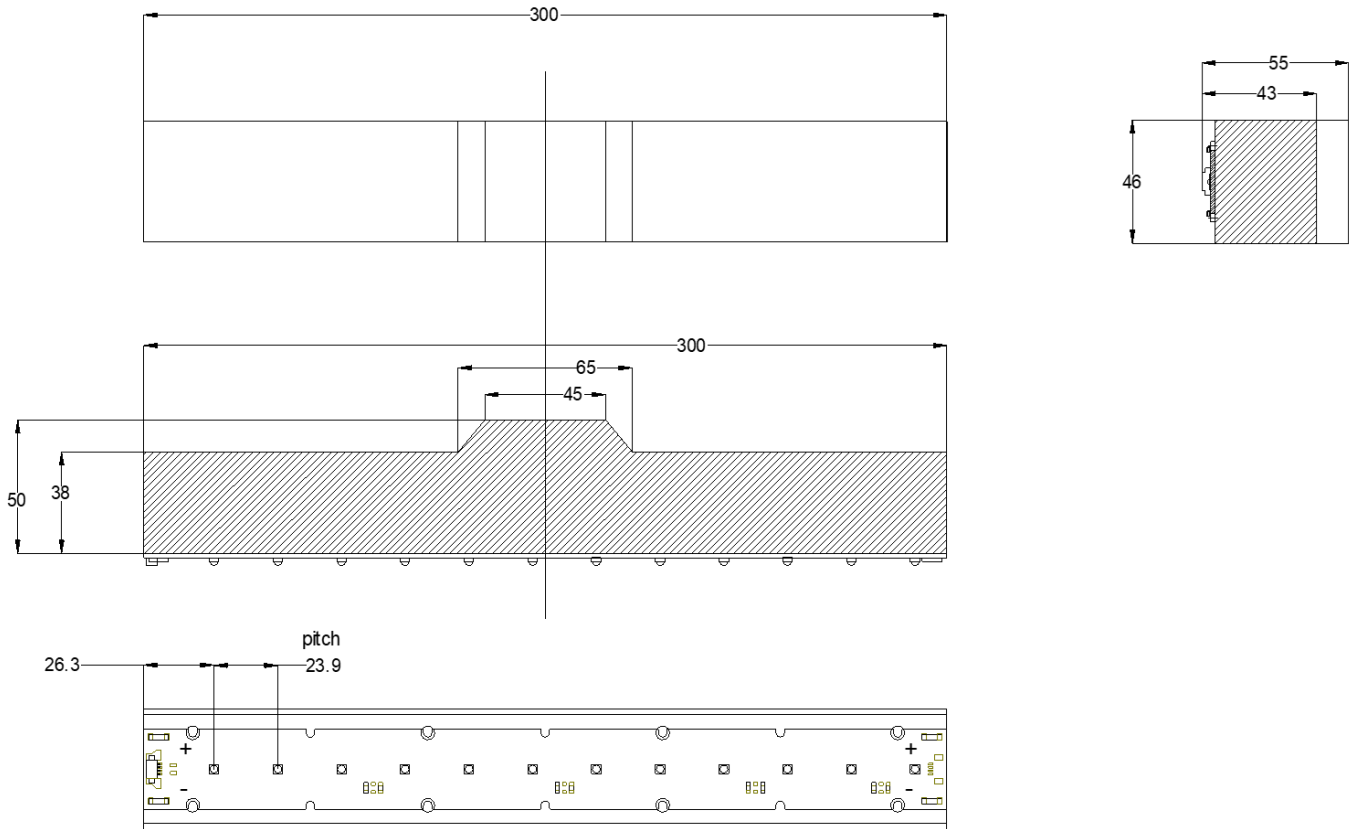
Mechanical Dimensions

M1x12-S35-H-250/350 module with Molex Pico-Blade 1.25 mm 4 pins connector



Mechanical Dimensions

Mechanical Dimensions of M1x12-S35-H-250/350 array -HAS
units in mm



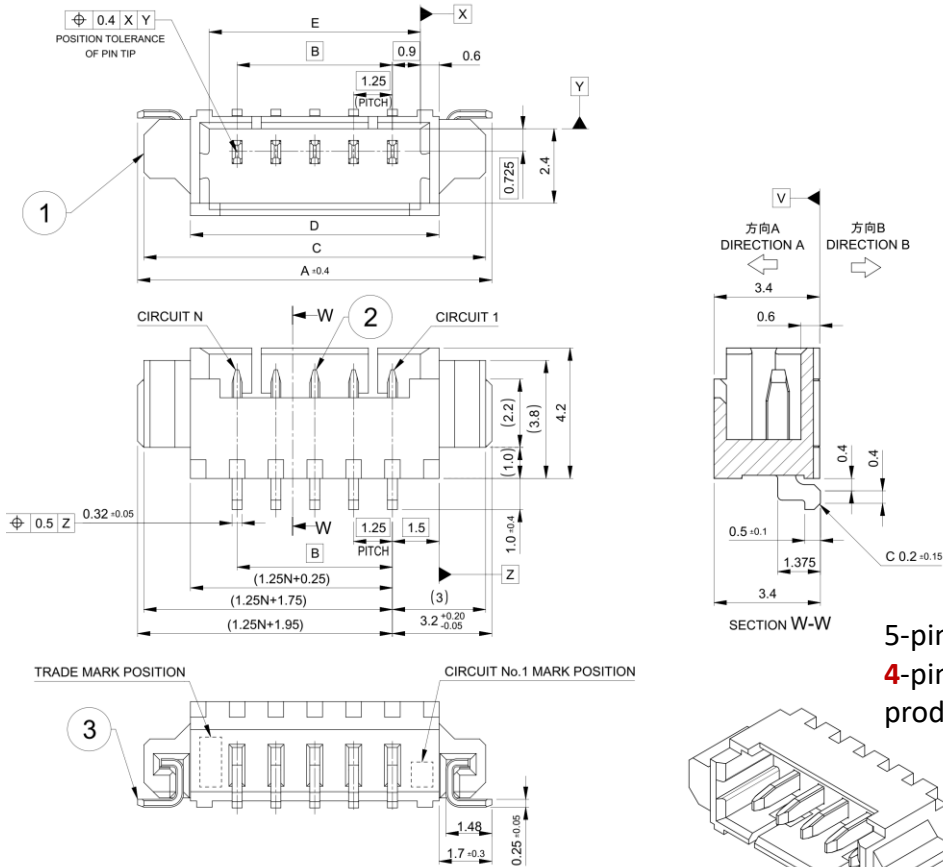
Notes:

1. Drawing is not to scale, and unless otherwise specified, tolerances are +/-2mm.
2. The air intake is through the sides, and the air exit is through the module's center. Therefore, DO NOT BLOCK AIRFLOW through the sides and center-fan area of the module.
3. Bolb 1x12 S3535 module dimensions not shown. Refer to previous page for details. The module sits centered on the heat sink.
4. 24VCD 0.1A sources power the 3010-cooling fan.
5. The complete module, including fans, requires a 24VDC >1.5A power supply.

Mechanical Dimensions

MOLEX Pico-Blade 1.25mm Connector 4-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(ページュ) COLOUR: NATURAL (BEIGE)	極数 CIRCUIT SIZE
E D C B A					\triangle 発注番号 ORDER NO		
					梱包形態：エンボス梱包 PACKAGING : EMBOSSED TAPE AND REEL		



Performance

Table 1: Typical performance at 25°C and active cooling

Parameter	Symbol	Unit	Min	Typ	Max
Peak Wavelength ¹	λ_p	nm	260	265	270
Radiant Flux ¹	ϕ_e	W_{opt} (250mA/LED)	1	1.2	1.3
		W_{opt} (350mA/LED)	1.3	1.6	1.8
Forward Voltage ^{1,2}	V_f	V	22	24	26
Forward Current ⁴	I_f	A (250mA/LED)	-	1	-
		A (350mA/LED)	-	1.4	-
Spectrum Half Width ¹	$\Delta\lambda$	nm	-	12	-
Viewing Angle, FWHM	$2\theta_{1/2}$	°	-	80	-
On-Axis Irradiance at 1m ⁵	I	250mA/LED $\mu\text{W}/\text{cm}^2$	-	70	-
		350mA/LED $\mu\text{W}/\text{cm}^2$	-	100	-
Thermal Resistance ³	R_{j-b}	°C/W	-	15	-

Notes for Table 1:

1. Bolb tests SMD3535-H LEDs at a solder point temperature (T_{sp}) of $38\pm 2^\circ\text{C}$ and $T_a=25^\circ\text{C}$. In addition, Bolb tests the M1x12-S35-H-250/350 module at a solder point temperature of 38°C .
2. The noted forward voltage includes LED and constant current driver electronics.
3. Thermal resistance is calculated using total electrical input power and includes the thermal resistance of the MCPCB board and thermal interface material.
4. Bolb sets the current at one amp on standard 1x12 Linear products, which produces 250mA per LED. Bolb can set the current to other values. Refer to the product option code table for details.
5. The spread of irradiance values reflects the performance of typical 265nm wavelength product.
6. JEDEC J-STD-020 Moisture resistance rating MSL 5

Absolute Maximum Ratings

Table 2: M1x12-S35-H-250/350 Maximum Ratings

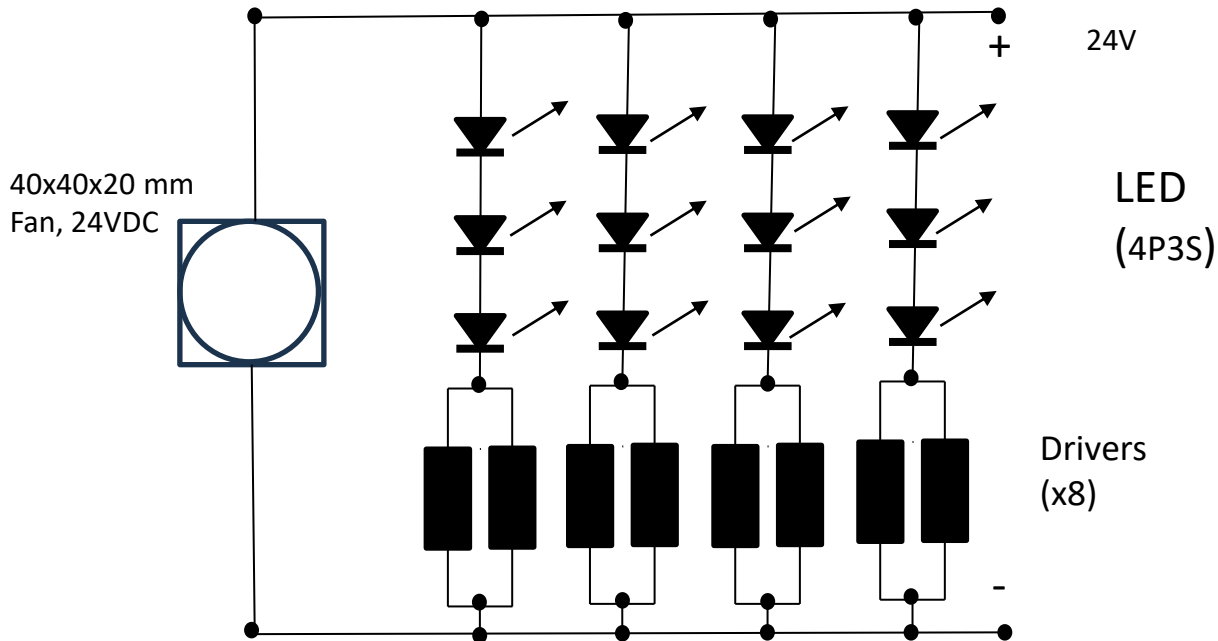
Parameter	Symbol	Unit	Max ²
Maximum DC Drive Current	IFM	A	1.4
Maximum Junction Temperature	T _{jmax}	°C	85
Maximum Solder Point Temperature	T _{jmax}	°C	70
Operating Temperature Limits ¹	T _{opr}	°C	-20 to 60
			-20 to 60
Storage Temperature ¹	T _{stg}	°C	-30 to 40

Notes for Table 2:

1. Maintain relative humidity at 40% or less.
2. Maximum rating provided for reference only. Do not drive the LED in reverse voltage.

Electrical diagram 12" S3535 – HAS

Power supply requirement
24VDC, >2A

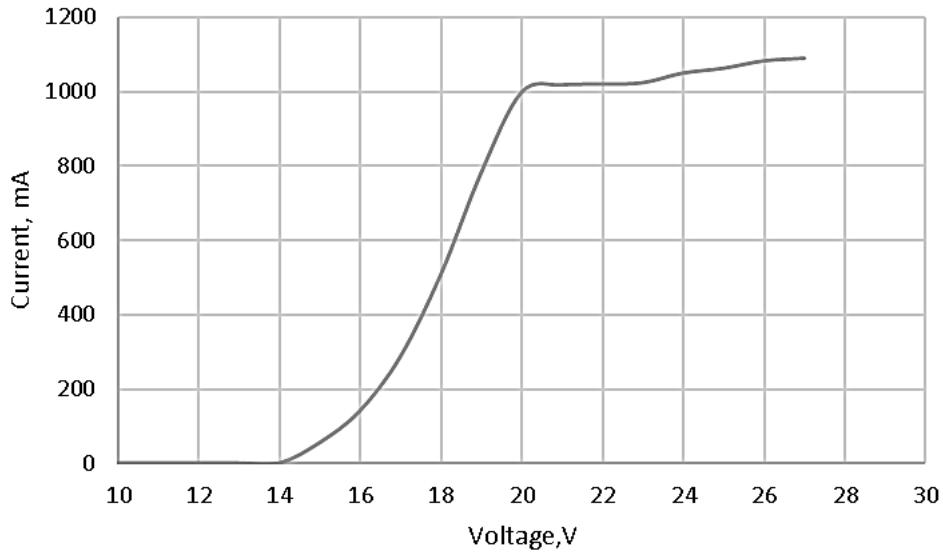


Electrical connection 4P3S (4 parallel branches of 3 serial SMDs) with serially connected current stabilization driver for each branch. Bolb's M1x12-S35-H-250/350 includes Molex Pico-blade or Micro-fit surface mount right-angle connectors (optional) for ease of connectivity to an external voltage source.

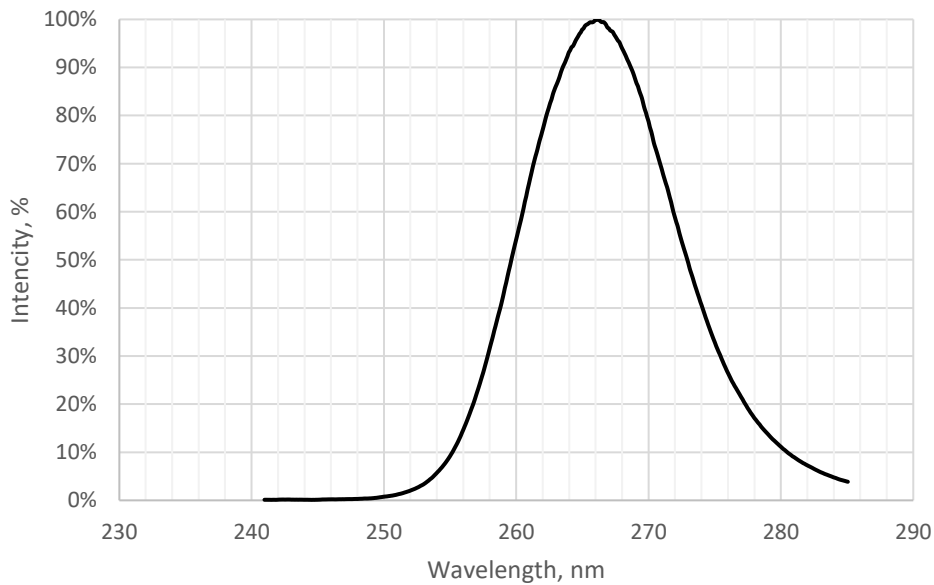
All connectors are ROHS compliant. The recommended std cable for Molex Pico-blade 1.25mm 4 pins cable or Micro-fit 3mm 2 pins.
Please email Bolb at bolb@info.co for additional information.

Performance Data

Forward Current vs. Forward Voltage for default 250mA/LED

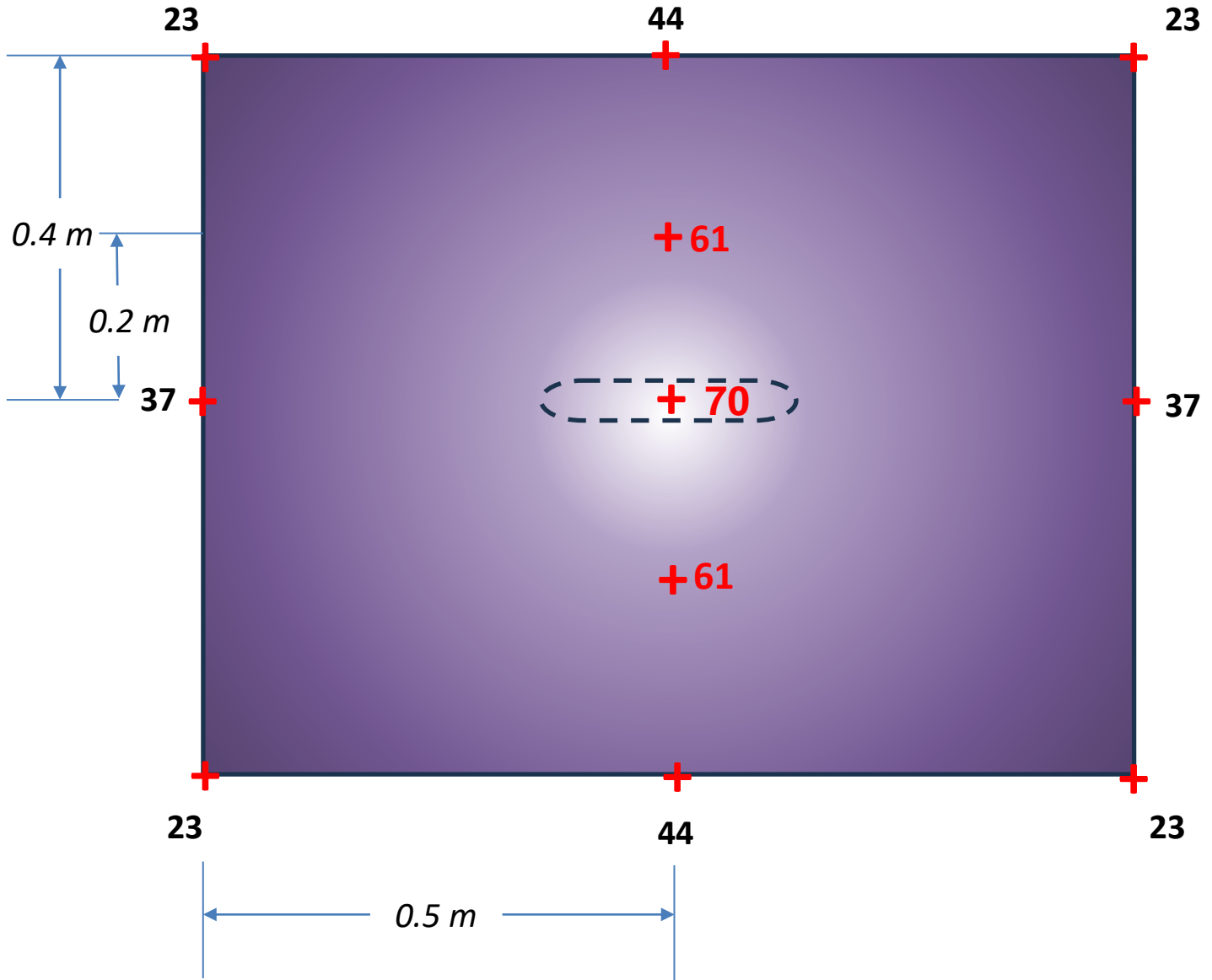


Typical Spectrum [Ta=25°C, I_F=250/350mA]



Performance Data

(Irradiance at 250mA/LED in $\mu\text{W}/\text{cm}^2$ at 1 meter from the array)

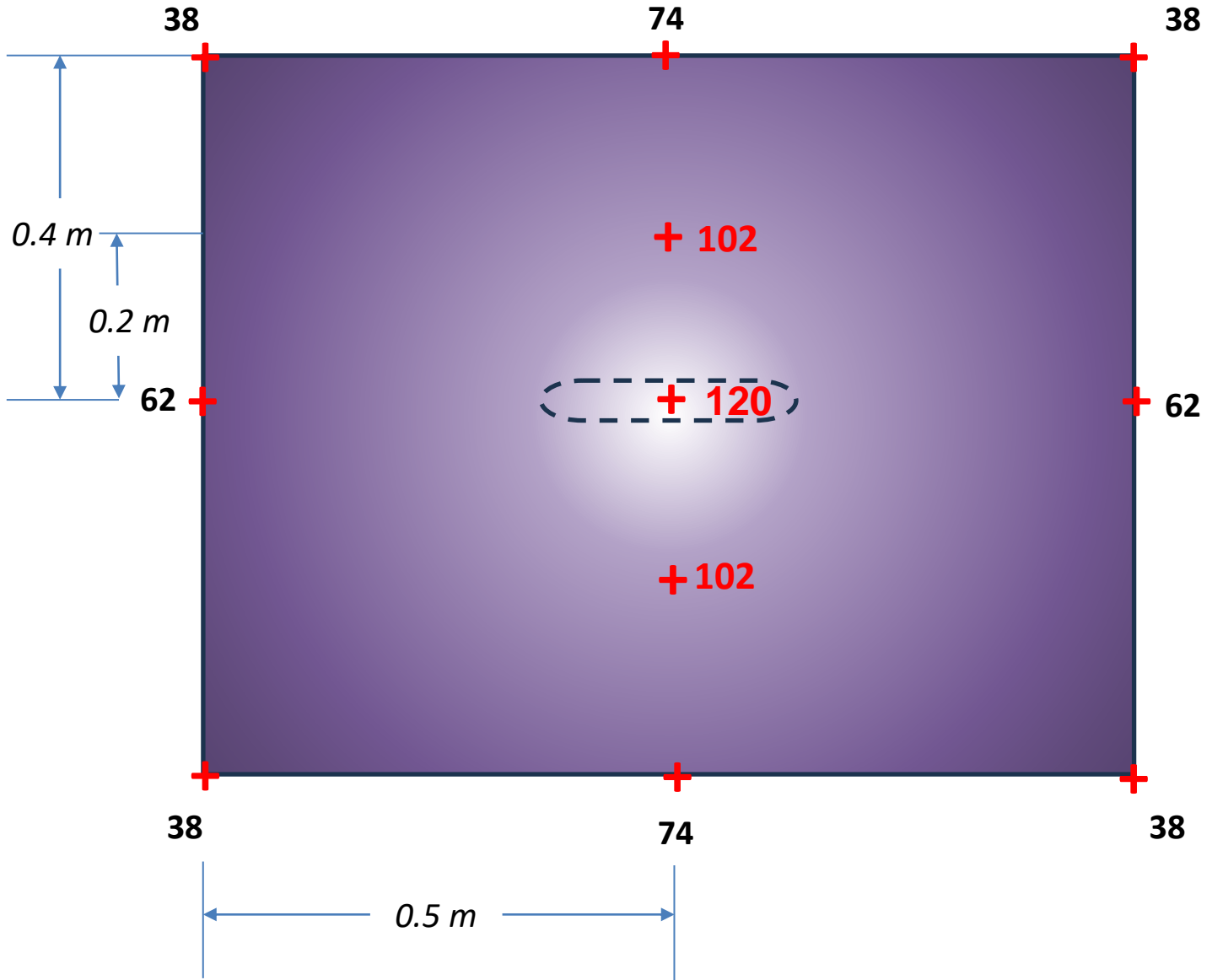


Note

1. Irradiance values are $\pm 5\%$

Performance Data

(Irradiance at 420mA/LED in $\mu\text{W}/\text{cm}^2$ at 1 meter from the array)



Note

1. Irradiance values are $\pm 5\%$
2. Special on-PCB board drivers need to be put in place to allow 420mA/LED drive current.

Electrical Connection Recommendations

Bolb's M1x12-S35-H-250/350 includes Molex Pico-blade or Micro-fit surface mount right-angle connectors (optional) for ease of connectivity to an external voltage source.

All connectors are ROHS compliant. The recommended std cable for Molex Pico-blade 1.25mm 4 pins cable or Micro-fit 3mm 2 pins.

Please email Bolb at bolb@info.co for additional information.

General Precautions and UVC Safety

Eye and Skin Safety Precautions

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

ESD Protection

Electrostatic discharge may damage UVC LEDs. Follow JDEC standard recommendations to prevent damage to the LEDs.

Disclaimers

By purchasing UVC LEDs or arrays from Bolb Inc., the customer agrees to indemnify the manufacturer of any bodily harm because of failure to follow common-sense precautions or warnings and guidelines contained within this datasheet. It is the buyer's responsibility to design products that ensure the safety of end-users.

Additional Resources

For additional design resources, including application and technical notes, visit our website at www.bolb.co.

