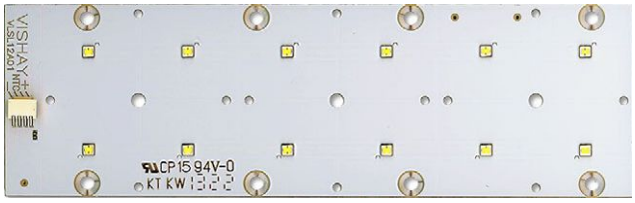
High Brightness LED Power Module



FEATURES

- High power LED module with aluminum metal core PCB
- Dimensions in mm: 161 x 50 x 2
- Single side / single layer PCB with shiny white surface
- PCB layout compatible with LEDIL quadruple lens series like Strada and High Bay
- PCB already equipped with 4-pin connector (87438-0443) and NTC (NTCS0603E3473JHT)
- 12 LEDs in series connection, max. current per LED 1.5 A
- CRI: min. 70, typ. 72
- Color temperature: 4700 K to 5500 K
- Power consumption only 36 W at T_{sp} = 85 °C
- ESD withstand voltage: up to 2 kV according to JESD22-A114-B
- LM80 certified LEDs
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb-free

RoHS COMPLIANT

HALOGEN FREE

GREEN (5-2008)

DESCRIPTION

The VLSL12A03… power LED module series combines high lumen output and excellent heat dissipation on an easy to use aluminum metal core PCB. Due to the physical layout of the twelve, serially connected high brightness LEDs, ready-available matrix-lenses with a choice of various emission characteristics could be used just off the shelf. Every module is already equipped with a small thermal sensor and a fourfold plug in connector, so that no additional soldering process is required at customer site.

PRODUCT GROUP AND PACKAGE DATA

- Product group: LED
- Package: LED module
- Product series: power
- Angle of half intensity: ± 60°

APPLICATIONS

- Street lighting
- Indoor and outdoor lighting
- Tunnel lights
- Industrial lighting
- General lighting application

PARTS TABLE

PART	COLOR	LUMINOUS FLUX (lm)			at I_F (mA)	COLOR TEMPERATURE (K)			at I_F (mA)	FORWARD VOLTAGE (V)			at I_F (mA)	TECHNOLOGY
		MIN.	TYP.	MAX.		MIN.	TYP.	MAX.		MIN.	TYP.	MAX.		
VLSL12A03-3Q3T-50A	Cool white	3830	4000	-	1000	4700	5100	5500	1000	33.6	38	40.8	1000	InGaN

ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25 °C, unless otherwise specified)
VLSL12A03-3Q3T-50A

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Forward current		I_F	1500	mA
Power dissipation	Total	P_{tot}	55	W
Junction temperature		T_j	135	°C
Operating temperature range		T_{amb}	-40 to +110	°C
Storage temperature range		T_{stg}	-40 to +110	°C
Thermal resistance junction PCB backside		R_{thJB}	0.5	K/W

OPTICAL AND ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)
VLSL12A03-3Q3T-50A, COOL WHITE

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous flux total	I_F = 700 mA	Φ_V	-	3000	-	lm
	I_F = 1000 mA		3830	4000	-	
Color temperature	I_F = 700 mA	CCT	-	5000	-	K
	I_F = 1000 mA		4700	5100	5400	K
Color rendering index	I_F = 700 mA	CRI	-	72	-	
Forward voltage	I_F = 700 mA	V_F	-	36.6	-	V
	I_F = 1000 mA		33.6	38	40.8	
Power consumption	I_F = 700 mA	P_{IN}	-	26	-	W
	I_F = 1000 mA		33	38	41	
Luminous efficacy	I_F = 700 mA	η_{opt}	-	117	-	lm/W
	I_F = 1000 mA		-	105	-	
Full angle of half intensity	I_F = 700 mA	2 $\varphi_{½}$	-	120	-	°
NTC resistance value	T_{amb} = 25 °C	R_{NTC}	-	47	-	kΩ

LUMINOUS FLUX CLASSIFICATION

GROUP STANDARD	LUMINOUS FLUX (lm)	
	MIN.	MAX.
3Q	3830	4220
3R	4220	4640
3S	4640	5110
3T	5110	5620

Note

- Luminous flux is tested at a current pulse duration of 25 ms and an accuracy of ± 11 %.
  The above classification represents the brightness range which includes only a few brightness groups. Only one group will be shipped on each bag (there will be no mixing of two groups on each bag).
  In order to ensure availability, single brightness groups will not be orderable.
  In a similar manner for colors where chromaticity groups are measured and binned, single chromaticity groups will be shipped on any one bag.
  In order to ensure availability, single chromaticity groups will not be orderable.

COLOR TEMPERATURE CLASSIFICATION

GROUP STANDARD	CCT (K)	
	MIN.	MAX.
6	4700	5000
7	5000	5400

Note

- Color temperature is tested at a current pulse duration of 25 ms
  In order to ensure availability, single CCT groups will not be orderable.

FORWARD VOLTAGE CLASSIFICATION

GROUP STANDARD	FORWARD VOLTAGE (V)	
	MIN.	MAX.
E5	33.6	34.8
F5	34.8	36.0
G5	36.0	37.2
H5	37.2	38.4
J5	38.4	39.6
K5	39.6	40.8

Note

- Forward voltage is tested at a current pulse duration of 1 ms and an accuracy of ± 0.1 V.
  In order to ensure availability, single forward voltage groups will not be orderable.

COLOR RANGE

VLSL12A03-3Q3T-50A, cool white

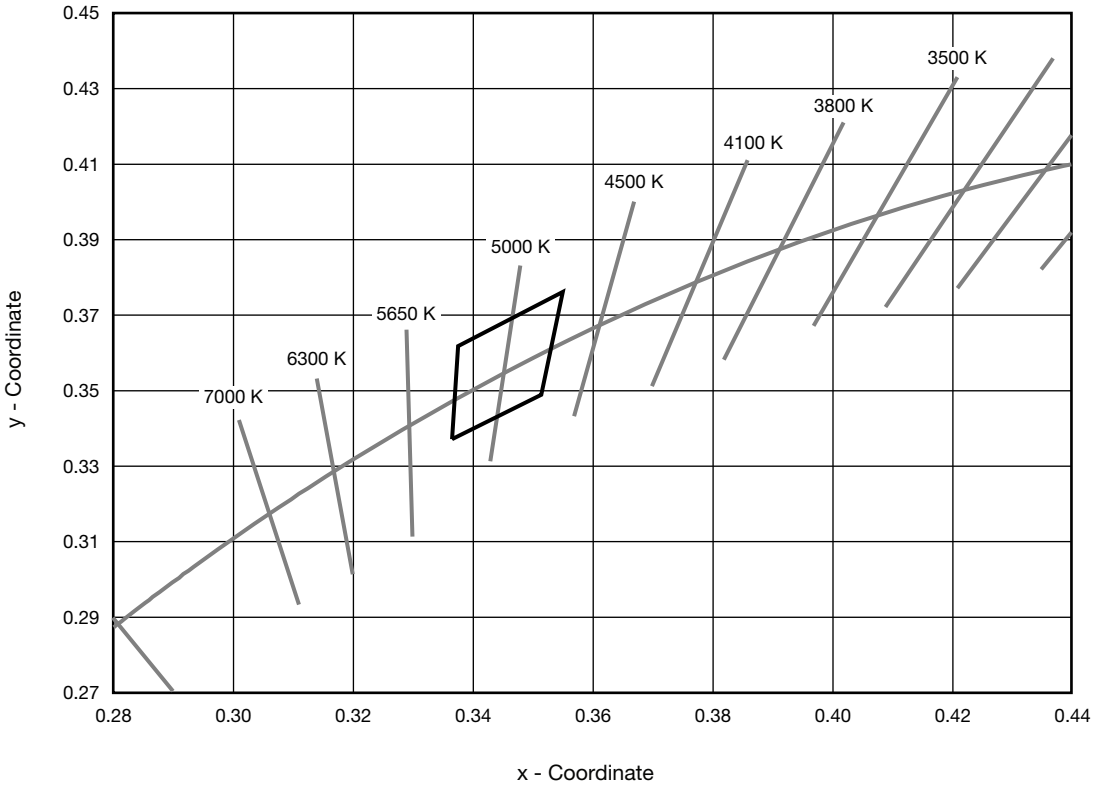


Fig. 1 - Chromaticity Coordinates of Colorgroups

TYPICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)

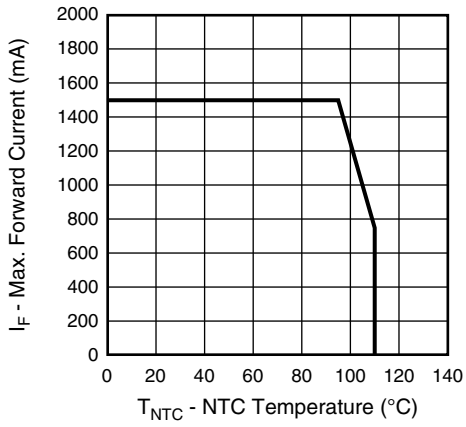


Fig. 2 - Maximum Forward Current vs. NTC Temperature

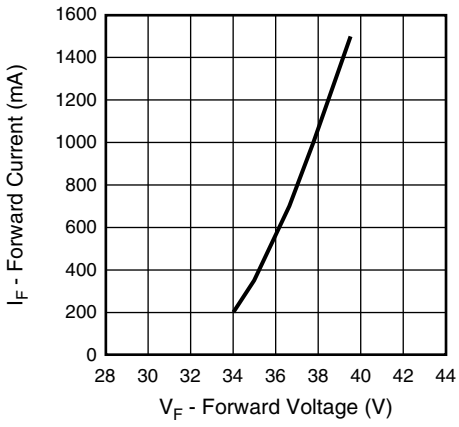


Fig. 3 - Forward Current vs. Forward Voltage

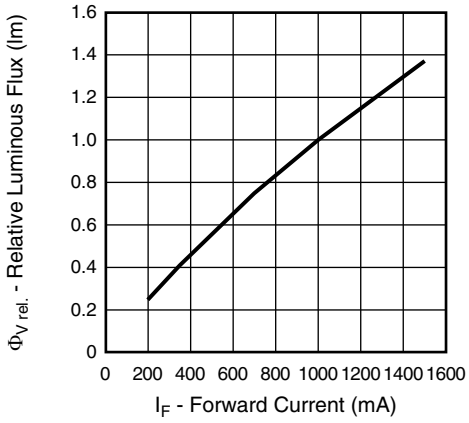


Fig. 4 - Relative Luminous Flux vs. Forward Current

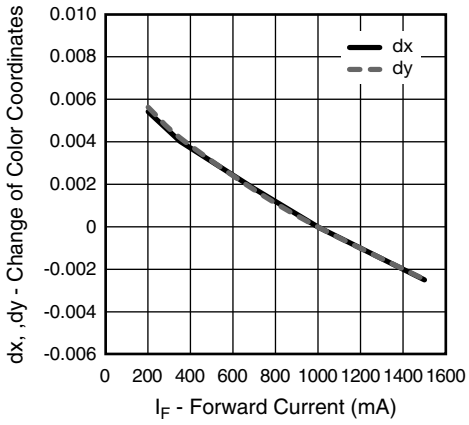


Fig. 5 - Change of Color Coordinates vs. Forward Current

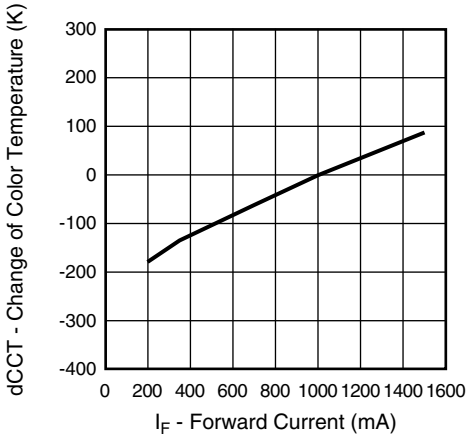


Fig. 6 - Change of Color Temperature vs. Forward Current

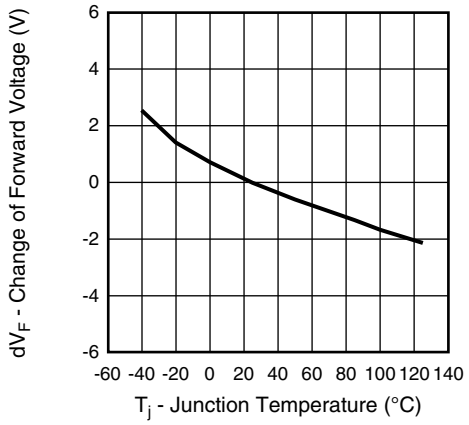


Fig. 7 - Change of Forward Voltage vs. Junction Temperature

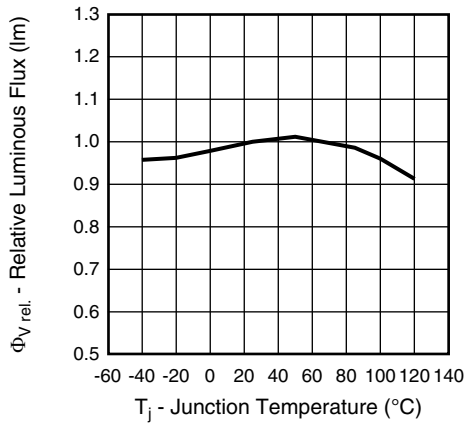


Fig. 8 - Relative Luminous Flux vs. Junction Temperature

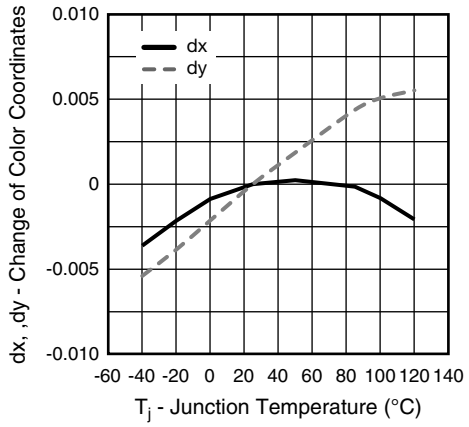


Fig. 9 - Change of Color Coordinates vs. Junction Temperature

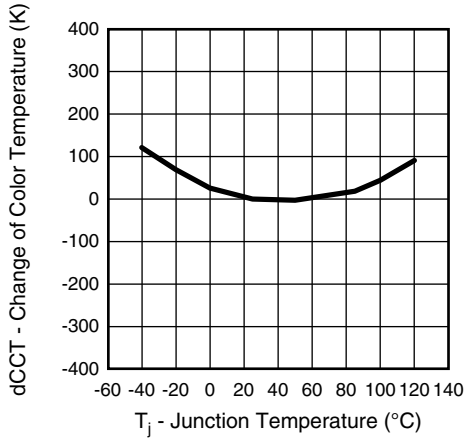


Fig. 10 - Change of Color Temperature vs. Junction Temperature

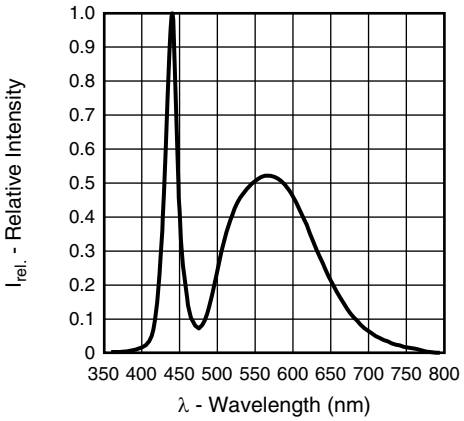


Fig. 11 - Relative Intensity vs. Wavelength

LIGHT DISTRIBUTION OPTIONS

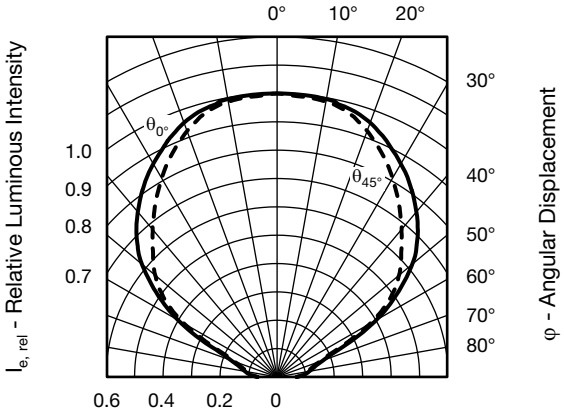


Fig. 12 - Relative Luminous Intensity vs. Angular Displacement

Fig. 12 shows the light distribution characteristic of the VLSL12A03… without secondary optics. Using LEDIL 2 x 2 STRADA or High Bay quadruple lenses a variety of emission patterns can be realized. The VLSL12A03… is compatible with the following lenses:

STRADA SERIES	HIGH BAY SERIES
C12360_STRADA-2X2-DNW	C13749_HB-2X2-O
C12362_STRADA-2X2-DWC	C13233_HB-2X2-M
C12419_STRADA-2X2-A-T	C13239_HB-2X2-M-BLIND
C13299_STRADA-2X2-ME	C13605_HB-2X2-RW
C13300_STRADA-2X2-T2	C12361_HB-2X2-W
C13301_STRADA-2X2-T3	C13232_HB-2X2-WW
C13858_STRADA-2X2-XW	C13237_HB-2X2-WW-BLIND
C14116_STRADA-2X2-PX	
C13499_STRADA-2X2-CY	

Fig. 13 shows four exemplary emission patterns using different lenses.

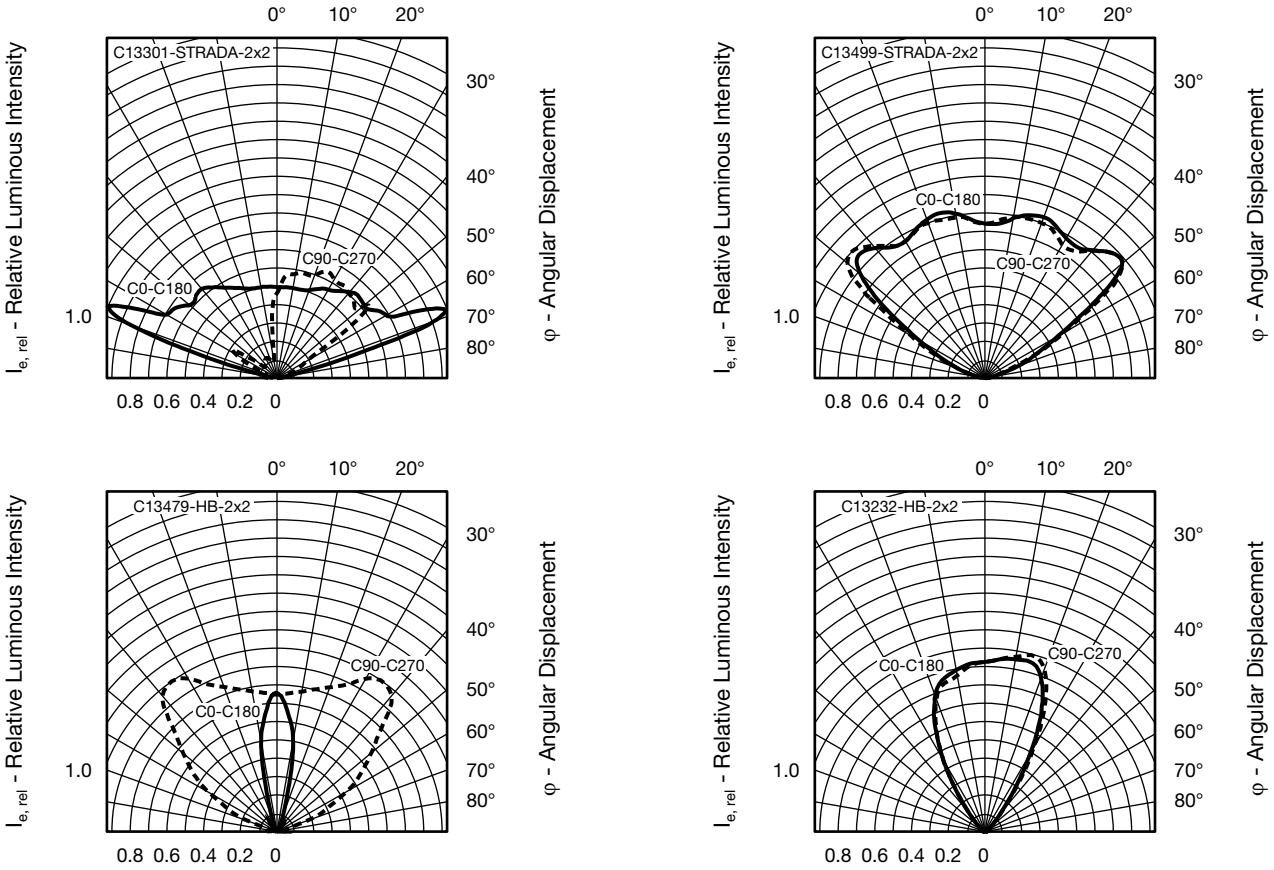


Fig. 13 - Four Examples for Different Light Distribution Options Using LEDIL 2 x 2 Lenses

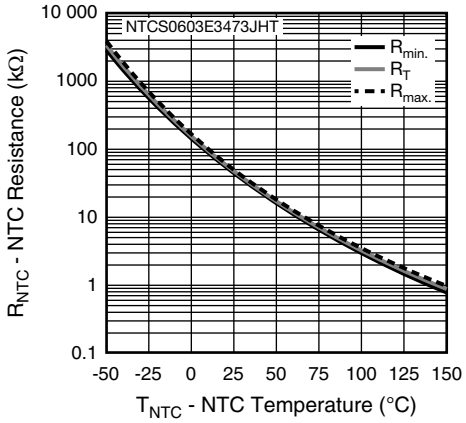
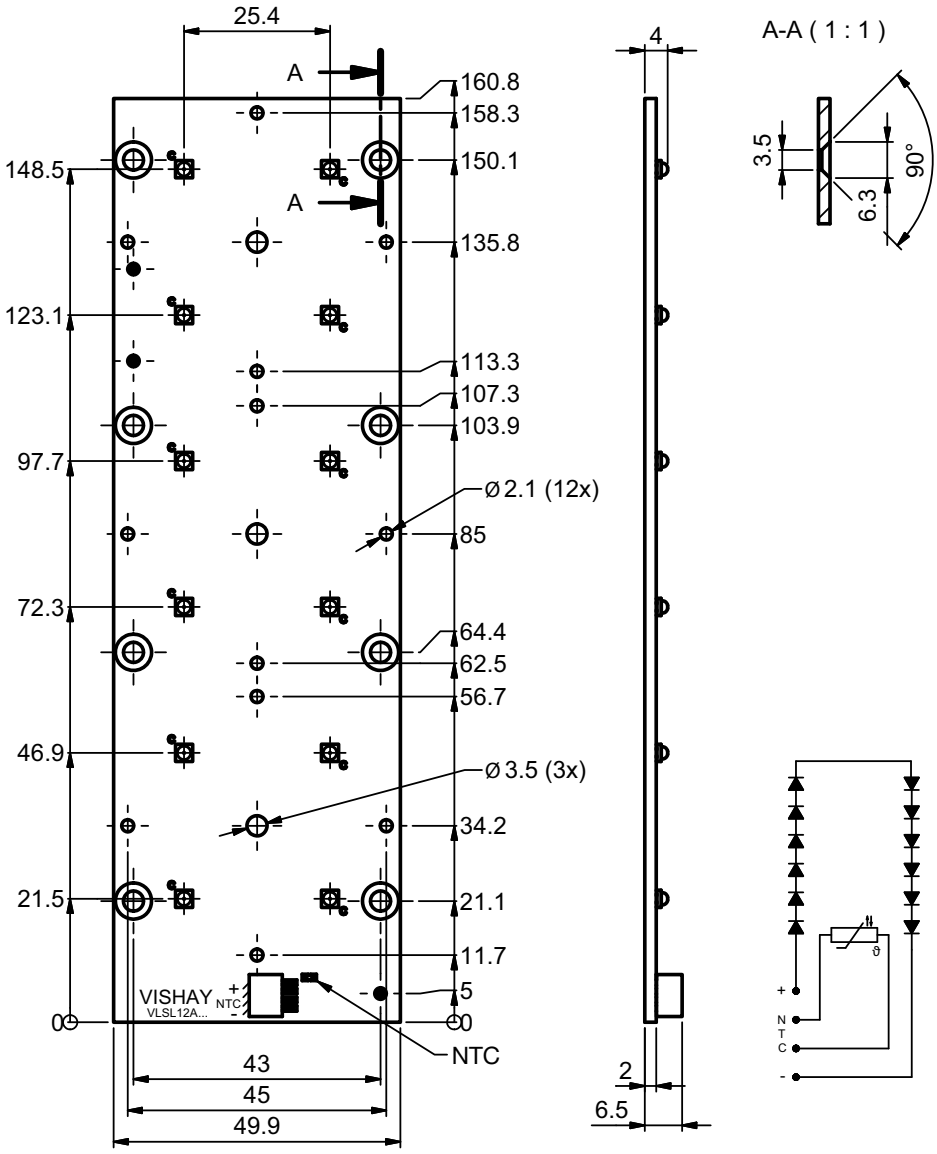
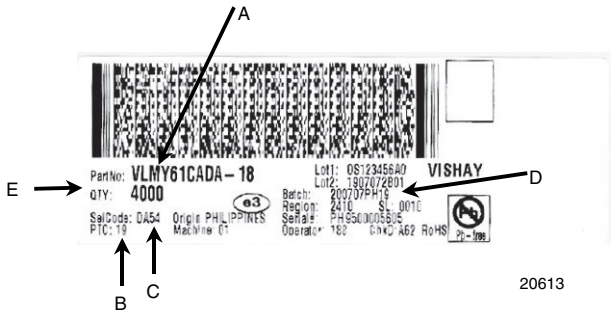


Fig. 14 - NTC Resistance vs. NTC Temperature

PCB BASIC DESIGN DIMENSIONS in millimeters



BAR CODE PRODUCT LABEL (example only)



A. Type of component

B. Manufacturing plant

C. SEL - selection code (bin):
X = color group

D. Batch:
200707 = year 2007, week 07
PH19 = plant code

E. Total quantity

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