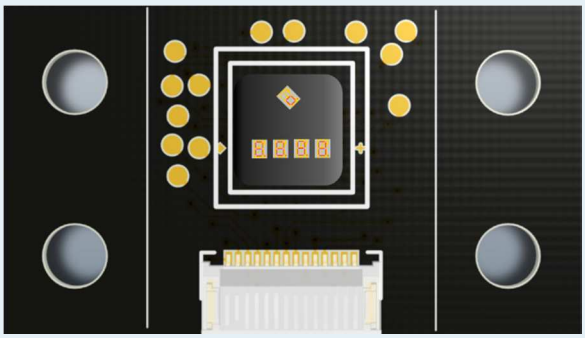


LED Display Module | 650 nm | AlInGaP
ELM-650-992-7

Prototype

Pat. US 8847241 B2

Features
- FR4 PCB
- Radiation 650 nm (red)
- 7-segment chip (5-times)
- Optimized to avoid reflections

Applications
- Rangefinder

Maximum Ratings[1]	Symbol	Value	Unit
Forward current (DC) per segment	I_F	10	mA
Operating temperature range	T_{amb}	-25 to +85	°C
Storage temperature range	T_{stg}	-40 to +85	°C
Junction temperature	T_j	+100	°C

Optical and Electrical Characteristics[1]	Test conditions	Symbol	Min	Typ	Max	Unit
Forward voltage	I_F = 5 mA	V_F		1.85		V
Reverse voltage	I_R = 10 µA	V_R	5			V
Luminous intensity/segment	I_F = 5 mA	I_V		12		mcd
I_V ratio segment to segment	I_F = 5 mA				1.75	
I_V ratio to adjacent chip	I_F = 5 mA				2.00	
Peak wavelength	I_F = 5 mA	λ_p		645		nm
Centroid wavelength	I_F = 5 mA	λ_c	635	645	655	nm
Spectral bandwidth at 50%	I_F = 5 mA	$\Delta\lambda_{0.5}$		15		nm
Temperature coefficient of V_F	I_F = 5 mA	$TC(V_F)$		-1.4		mV/K
Temperature coefficient of I_V	I_F = 5 mA	$TC(I_V)$		-0.7		%/K
Temperature coefficient of λ_c	I_F = 5 mA	$TC(\lambda_c)$		0.11		nm/K

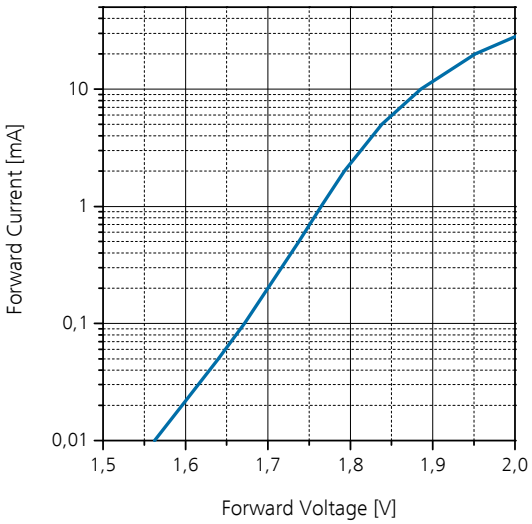
1 T_{amb} = 25°C, unless otherwise specified

2 measured on bare chip on TO-18 header with JENOPTIK Polymer Systems equipment

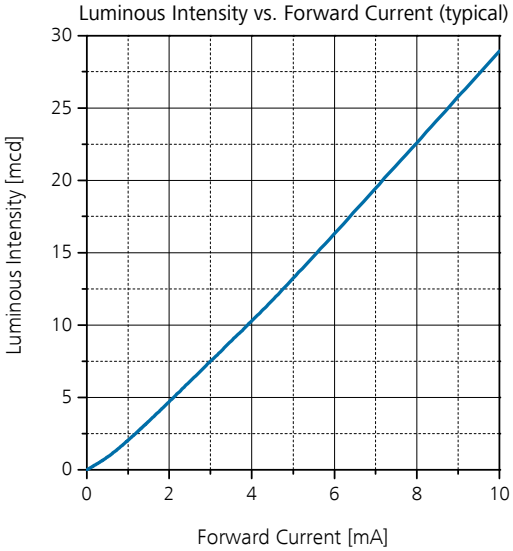
Typical Characteristics

Segment of 7-Segment Chip

Forward Voltage vs. Forward Current (typical)

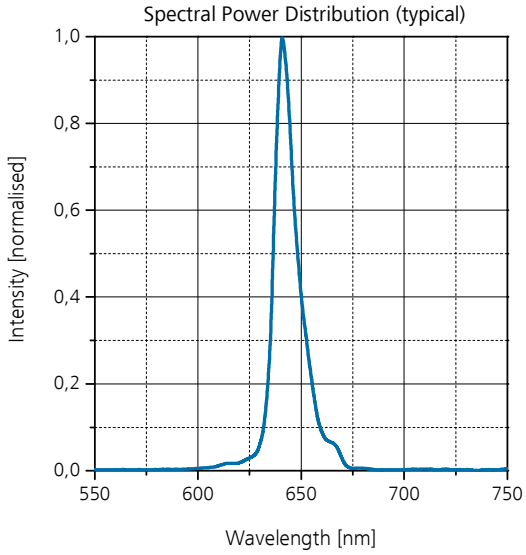


Luminous Intensity vs. Forward Current (typical)



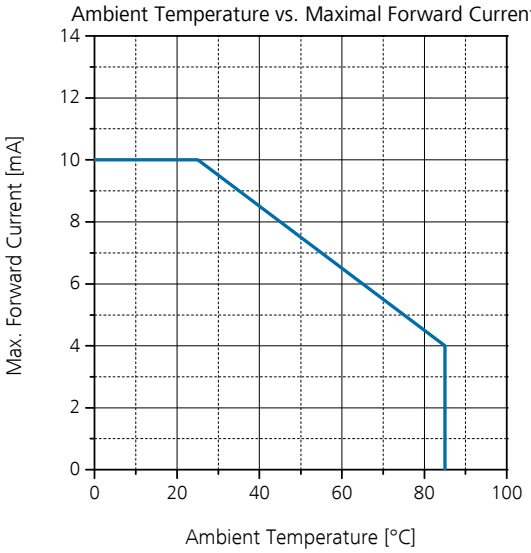
Spectral Power I_F = 5 mA

Spectral Power Distribution (typical)



Current Reduction

Ambient Temperature vs. Maximal Forward Current

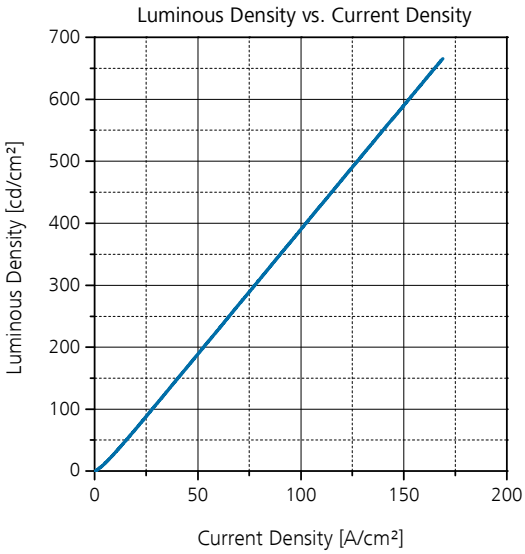


July 4, 2018 | Rev. 01

Luminous Density

Typical current for a luminous density of approx. 100 000 cd/m² *

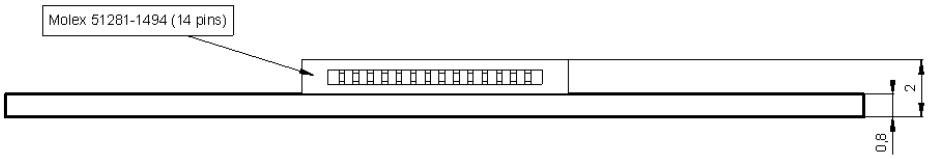
	Typ. Current
7-Segment	[mA]
Per segment	0.29

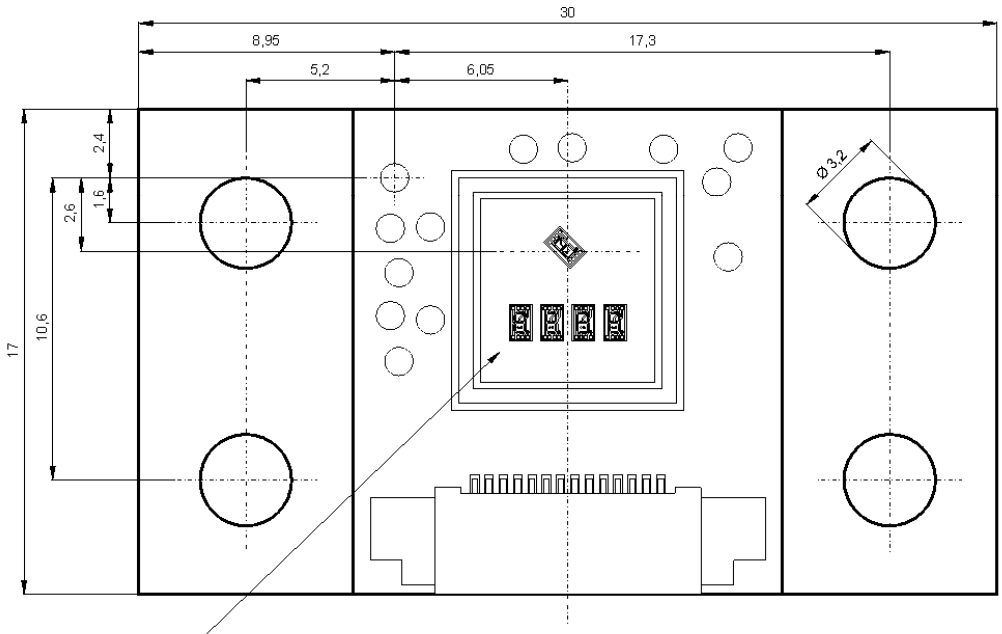


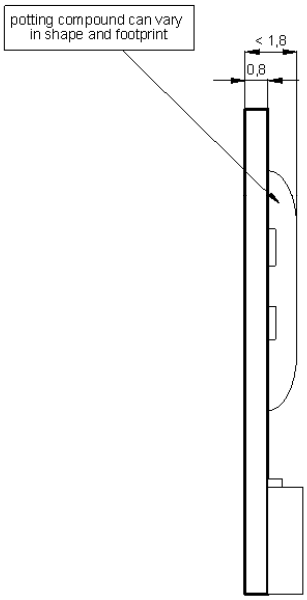
*Note: The typical current results by calculation on basis of the measurements of bare chips at 5 mA and room temperature. This value is for information only.

Mechanical Dimensions

Module

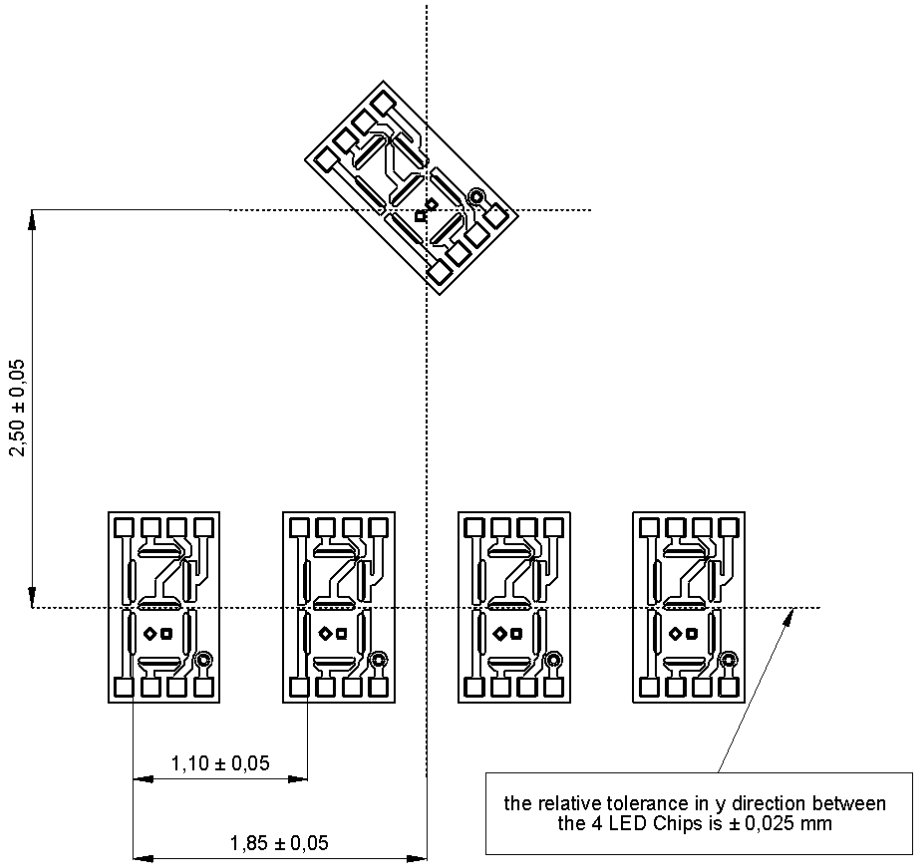






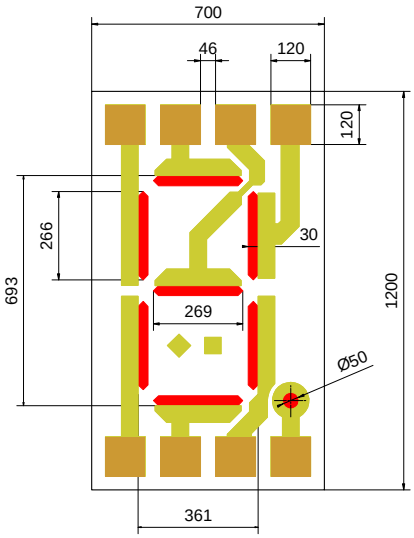
dimensions specified in mm

Mechanical Dimensions



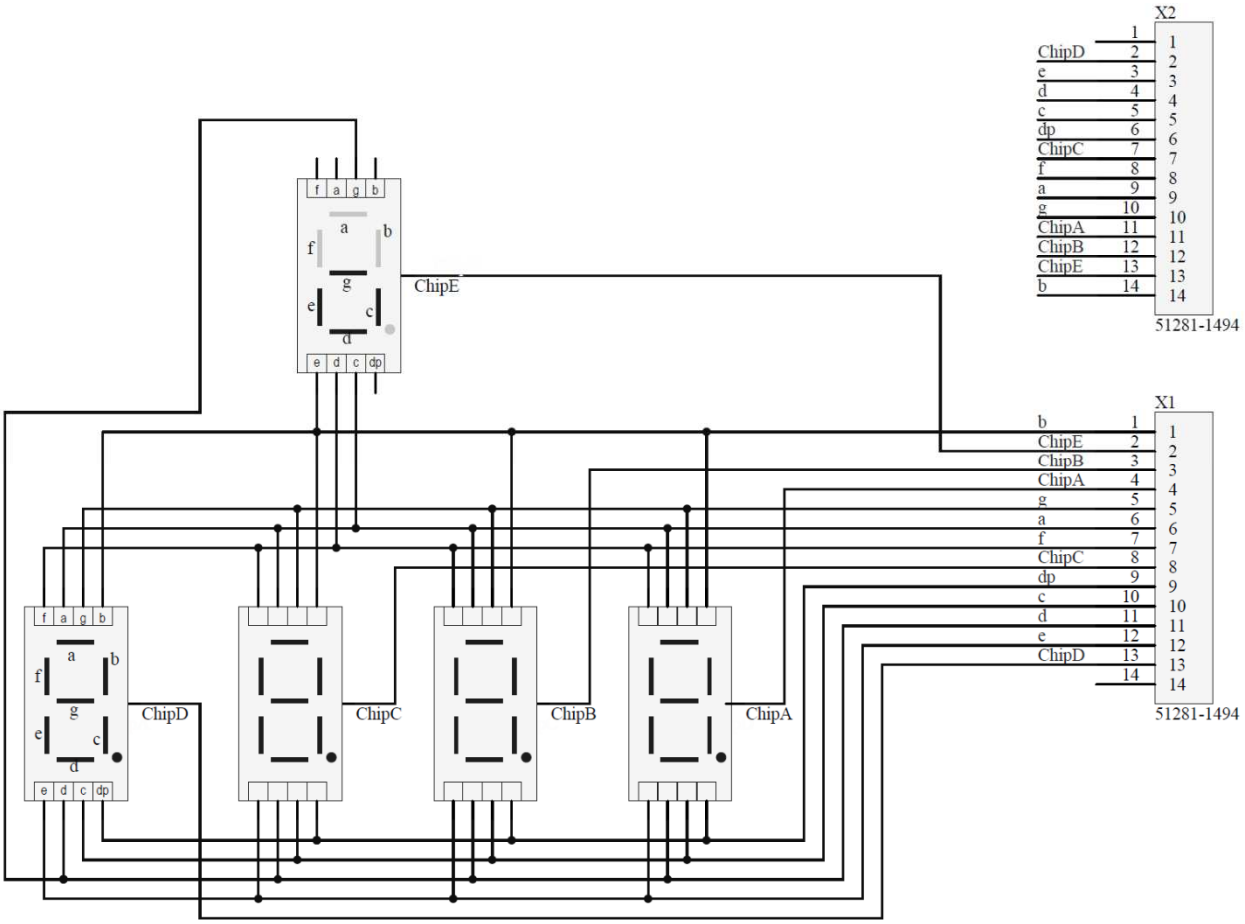
dimensions specified in mm

Chip

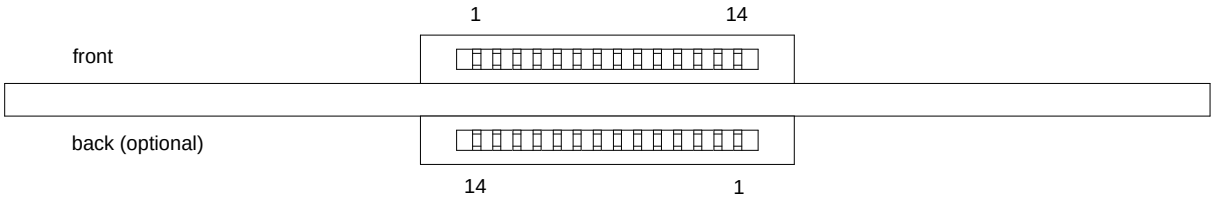


dimensions specified in µm

Circuit Diagram



Pinout



front connector
1 - "b" anode
2 - Chip E cathode
3 - Chip B cathode
4 - Chip A cathode
5 - "g" anode
6 - "a" anode
7 - "f" anode
8 - Chip C cathode
9 - "dp" anode
10 - "c" anode
11 - "d" anode
12 - "e" anode
13 - Chip D cathode
14 - not connected

back connector
1 - not connected
2 - Chip D cathode
3 - "e" anode
4 - "d" anode
5 - "c" anode
6 - "dp" anode
7 - Chip C cathode
8 - "f" anode
9 - "a" anode
10 - "g" anode
11 - Chip A cathode
12 - Chip B cathode
13 - Chip E cathode
14 - "b" anode

ELM-650-992-7 | 650 nm | Prototype
Labeling

Labeling	
Manufacturer	JENOPTIK Polymer System GmbH
Type	ELM-650-992-7
Order N°	626937
Quantity	XXX pcs
Charge	XXXXXXX
Purchase Order N°	1234567890
Patent	US 8847241 B2

Handling

Die surface and contact wires are very sensitive to mechanical stress. Lift and assemble the module carefully.
We accept no liability for errors during handling and resulting damage.

Modules have to be handled ESD sensitive.

Safety Advice*

The evaluation of eye safety occurs according to the standard CIE/IEC 62471:2006 ("Photobiological Safety of Lamps and Lamp Systems"). Within the risk grouping system of this CIE standard the LED module in this data sheet is assigned into the **Group 1 – Low Risk**.

*Note: Safety classification of an optical component mainly depends on the intended application and the way the component is being used. Furthermore, all statements made to classification are based on calculations and are only valid for this LED "as it is", and at continuous operation, assuming direct view and maximum forward current. Using pulsed current or altering the light beam with additional optics may lead to different safety classifications. Therefore these remarks should be taken as recommendation and guideline only.

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