

SPECIFICATION

Classification:

Product Code: MU4-450-01 Rev: Prelim.

Part Description: High Power Module MU4-450-01

Product Line: High Power MM Un-Cooled Laser Module

Responsible Engineer: V.Solodovnikov

Spec Number:

SWSPEC - 072

Revision: 1

Department: Engineering, Marketing and Sales

Type of Specification: Product Specification, Basic Overview

1.0 Product Specification:

1.1 Scope

Specification for an un-cooled 450 nm Multi-Mode Pump Module with more than 4 W fiber light output power. The package design is based on a compact, dust-sealed OEM package. It has isolated electric contacts.

Non-qualified product. Refer to SvetWheel Terms and Conditions.

1.2 Specification Parameters

1.2.1 Max Ratings

Parameter	Symbol	Min	Max	Unit	Condition / Comment
ESD			500	V	HBM, C=100pF, R=1.5 kOhm
Storage temperature		0	75	°C	Non-condensing
Lead Soldering Temp.			250	°C	
Lead Soldering Time			10	sec	
Operating case temperature		15	45	°C	Reliability impacted if operating point deviates from reference condition
Relative Humidity		5	95	%	Transport, non-condensing
		5	75	%	Operating, non-condensing ¹⁾
Maximum current			1.6	A	< 1min
Fiber bend radius			100	mm	

¹⁾ A relative humidity of <55% is recommended for long term stability due to the epoxy sealing of the package. Operation outside of the recommended range may cause irreversible or latent chip and/or module damage.

1.2.2 Laser Module E/O

Parameters at 25 °C Heat sink temperature and the use of a thermal interface material rated for a thermal contact resistance of less than 1.0 cm K/W (0.155 in K/W).

Parameter	Symbol	Min	Typ	Max	Unit	Condition
Output optical power	P	4.0	4.2	4.5		Serially connected 3 laser diodes
Operating current*	I_{op}	-	1.5	1.6	A	
Forward voltage*	V	-	-	12.0	V	
Threshold current	I_{th}	-	0.2	0.6	A	
Center wavelength	λ_c	440	450	460	nm	
Spectral width	$\Delta\lambda$	4	5	6	nm	FWHM of power
Spectral width	$\Delta\lambda$		6.0		nm	90% of power

*Remark: Min/Max values reflect recognized uncertainties not only from performance variations, but also uncertainties from measurement setup. Data need to be aligned with customer data based on prototype sample testing.

Module spectrum data measurement:

Emission Wavelength

$$\lambda = f(T_{Case})$$

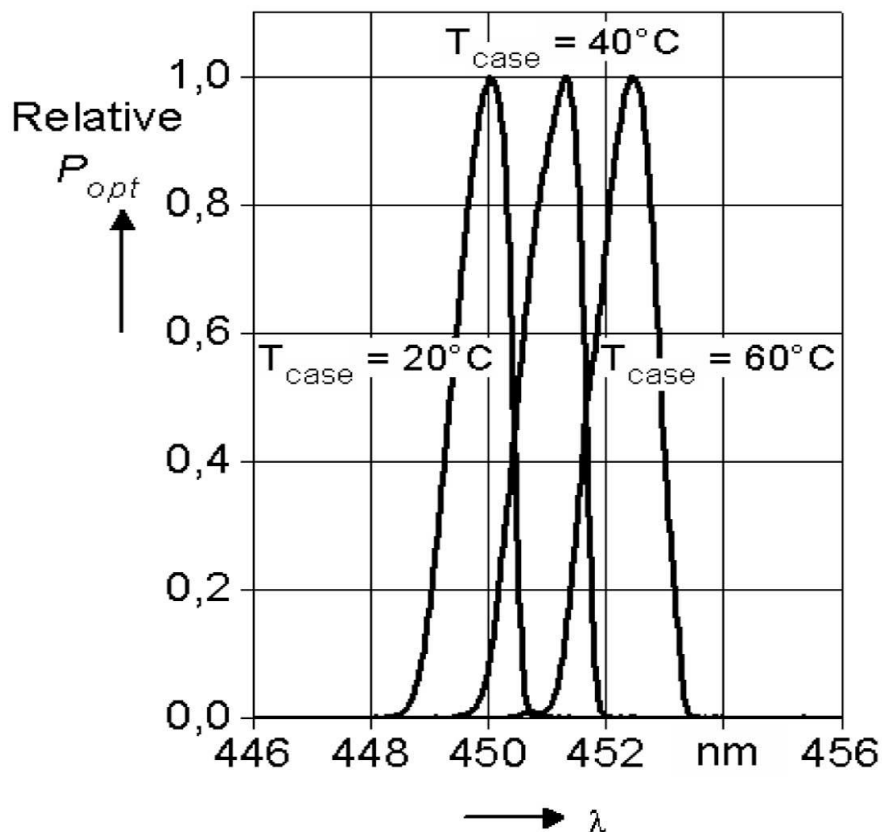


Fig. 1. Typical spectrum data

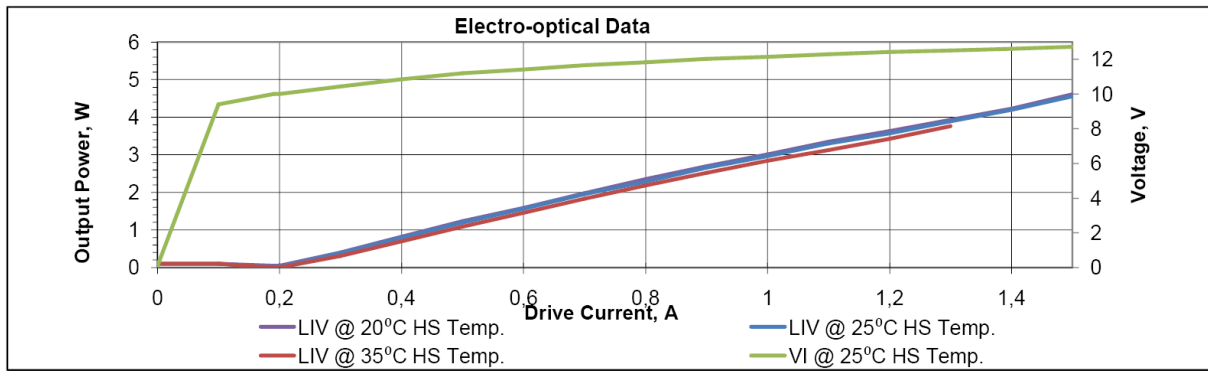


Fig. 2. Typical LIV characteristics

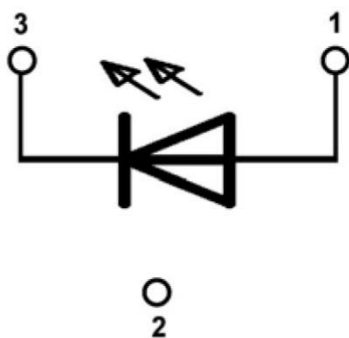
1.2.3 Hermeticity

Parameter	Symbol	Min	Max	Unit	Condition
Package hermeticity					Dust sealed OEM package

1.2.4 Fiber

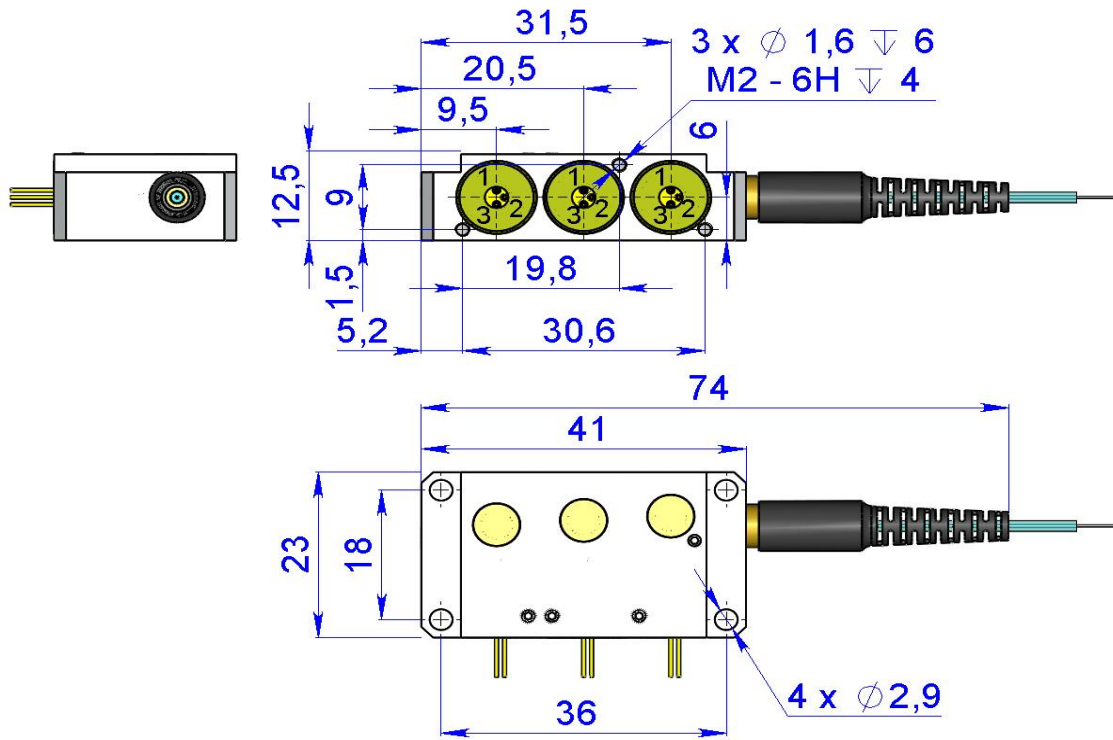
Parameter	Min	Typ	Max	Unit	Remark
Fiber type					Multi-Mode Step Index
Buffer diameter	230	250	270	um	Acrylate material
Cladding diameter	123	125	128	um	
Core diameter	49	50	51	um	
Numerical aperture	0.20	0.21	0.22		
Pigtail length	0.5	0.7	1.0	m	
Connector					FC-UPC

1.2.5 Pinout

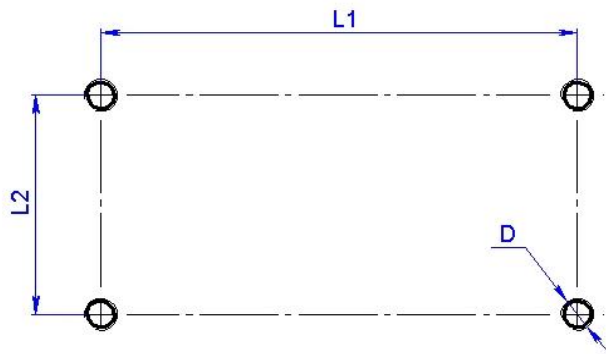


Pin 1 LD Anode
 Pin 2 Case
 Pin 3 LD Cathode

1.2.6 Design layout and Mechanical Dimension



2.0 Mechanical Interface with Heat Sink



Heat-sink mounting layout.

See details in paragraph 3. Mechanical Interface with Heat Sink

	METRIC, mm	ENGLISH, in
L1	36	1.417
L2	17	0.669
THREAD(D)	M2.5-6H 8mm DP	#3-48UNC .315 DP
SCREW	SOC HD HEX M2.5 x 16mm	SOC HD HEX #3-48UNCx5/8
SCREW SUPPLIER	McMaster-Carr PN 92290A065	McMaster-Carr PN 92196A095

A thermal interface gasket is required to be installed between a module and heat sink. Panasonic's thermally conductive Pyrolytic Graphite Sheet (PGS) is been found to be an effective material. The product can be purchased at Digikey catalog:

<http://www.digikey.com/PTM/PTMPartList.page?site=us&lang=en&ptm=13077>

3.0 Product Reliability Estimates:

- 3.1. Expected module survival time is not calculated for this product
- 3.2. Power degradation over life of the product at constant electrical current and heat sink temperature is estimated not to exceed 10%

List Associated Quality System Documents

SPEC-1779-7060817701

SPEC-1607-70608160702



4.0 Revision History:

Revision Number: 1

Latest Revision Date: 12/10/2013

Latest Approval Date: 12/11/2013

Reason for Change: Test results update

Revision	Sec/ Para Changed	Change Made:	Date
Prelim.	N/A	Initial Issue of Document Based on SWSpec - 071	12/11/2013
1	1.2.2	Power value and LIV parameters was updated	12/12/2014

Specification Author: Vladimir Solodovnikov	Specification Manager: Vladimir Solodovnikov
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5.0 Electronic Notification List: ULE

6.0 Approvals:

First Approver's Signature

Name: Andrey Sokortov Title: Engineering manager

Second Approver's Signature

Name: Sergey Busurin Title: Quality manager

Third Approver's Signature

Name: Vladimir Solodovnikov Title: VP