

## SPECIFICATION

**Classification:**

**Product Code:** MU20-795-01 Rev: 3

**Part Description:** Very High Power Module MU20-795-01,

**Product Line:** High Power MM Un-Cooled Laser Module

**Responsible Engineer:** Sergey Busurin

Spec Number:

**SWSPEC 035**

Revision: 3

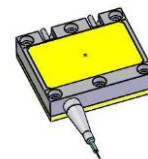
**Department:** Engineering, Marketing and Sales

Type of Specification: Product Specification Basic Overview

### 1.0 Product Specification:

#### 1.1 Scope

Specification for an un-cooled 793nm Multi-Mode Pump Module with more than 20W light output power. The package design is based on a compact, dust-sealed OEM package. It has isolated contacts and a single output fiber.



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 <sup>1)</sup>
Maximum current			5	A	< 1min
Fibre bend radius		50		mm	

<sup>1)</sup> A relative humidity of <55% is recommended for long term stability due to the epoxy sealing of the package. Operation outside 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	Typical/Recommend	Max	Unit	Condition
Operating current	$I_{op}$	4.1	5.0	A	20W ex-fiber minimum
Forward voltage	V	11.0	12.0	V	20W ex-fiber
Threshold current	$I_{th}$	0.7	1.0	A	
Center wavelength	$\lambda_c$	793		nm	20W ex-fiber at 25°C
Spectral width	$\Delta\lambda$	2.5	4.5	nm	90% of power, 18W ex-fiber

Remark: Min/Max values reflect recognized uncertainties not only from performance variations but also uncertainties from the setup.

Module spectrum data measurement:

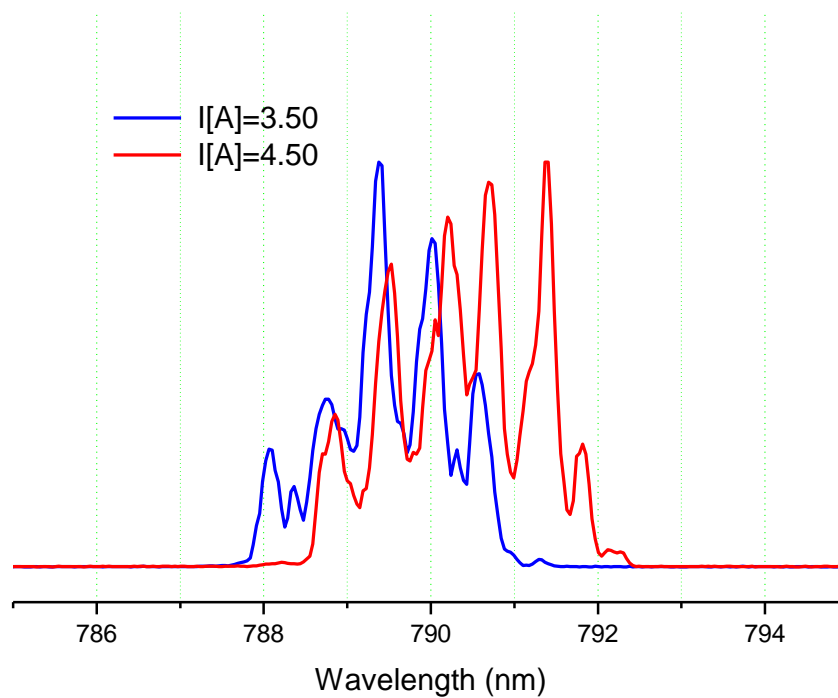


Fig 1. Typical spectrum data for 3.5 Amp and 4.5 Amp at 25 °C heat sink

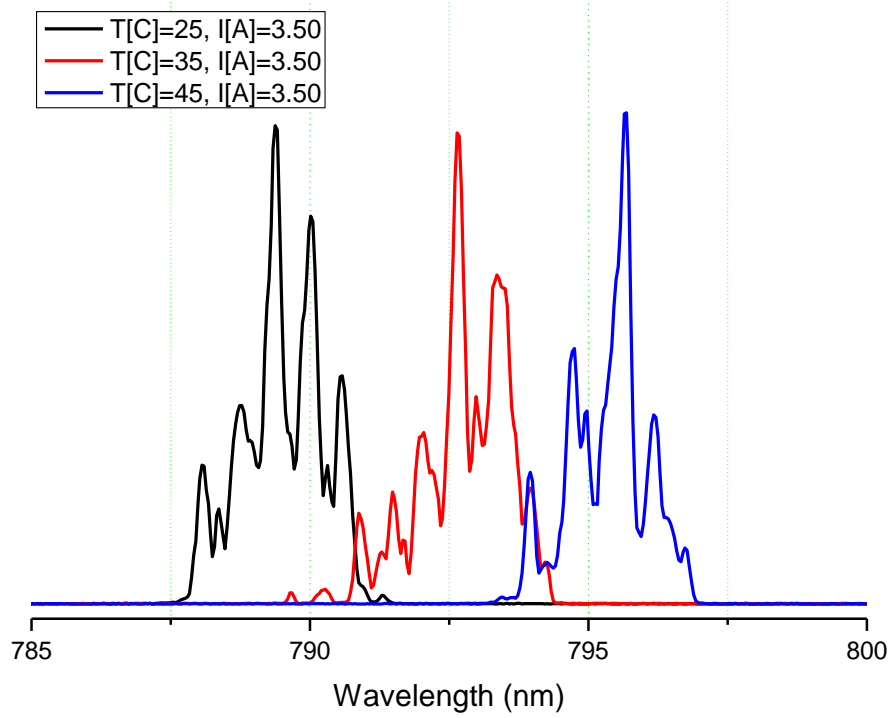


Fig 2. Typical spectrum data for 3.5 Amp and cold plate temperature: 25, 35 and 45 °C

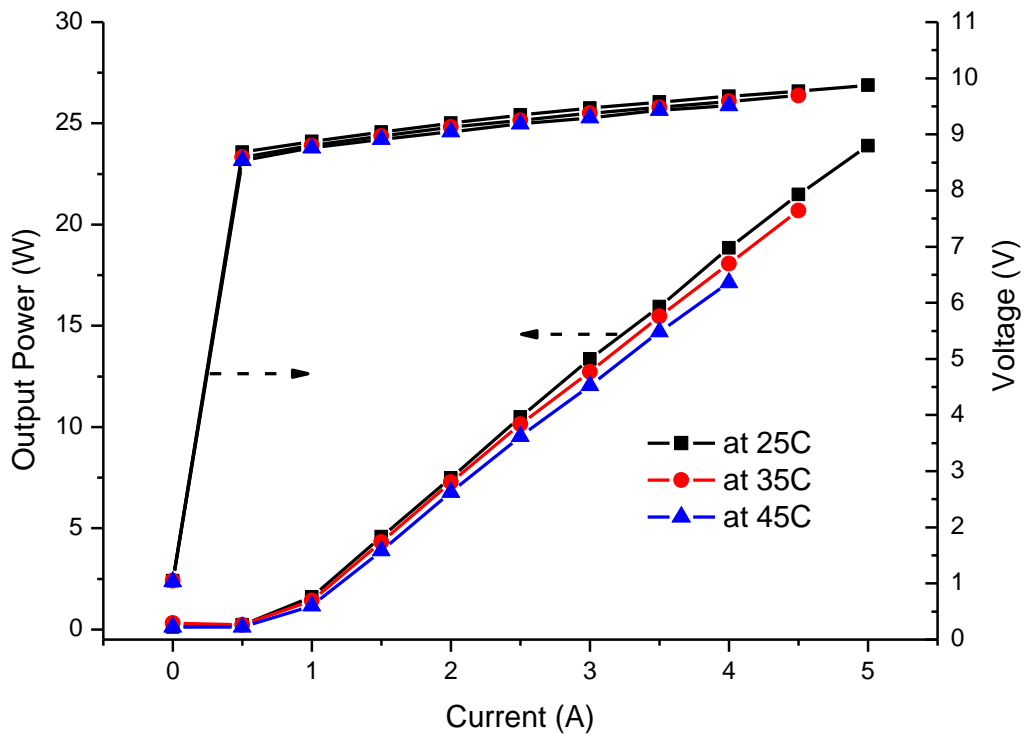


Fig 3. Typical LIV characteristics

### 1.2.3 Sealing

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

### 1.2.4 Fiber

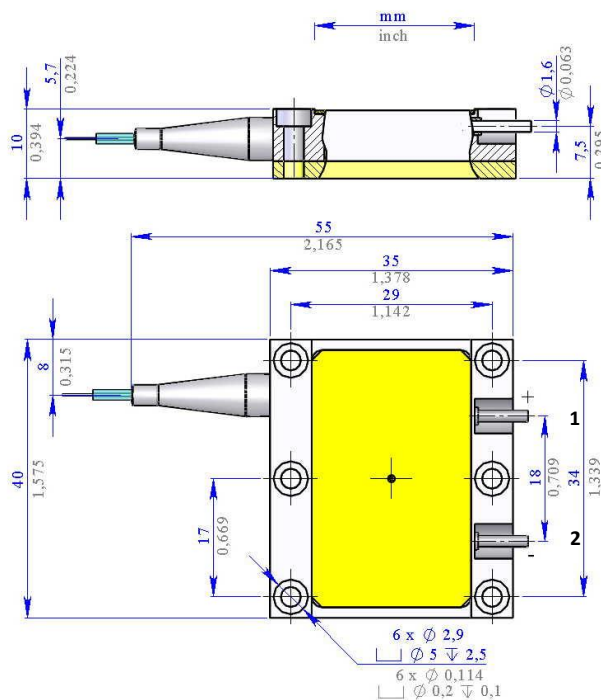
Parameter	Min	Typ	Max	Unit	Remark
Fiber type	Fully compatible <sup>2)</sup> with fiber 105um core dia 0.15 NA				Multi-Mode Step Index
Buffer diameter	230	250	270	um	Acrylate material
Cladding diameter	123	125	128	um	
Core diameter	103	105	110	um	
Full cone diversion, (1/e <sup>2</sup> )	12.5	14	15	deg	
Pigtail length	1.0	1.5	1.8	m	
Connector					Splice to customer fiber

<sup>2)</sup> Compatibility is defined as a splicing loss to 105um core/ 125um dia 0.15 NA fiber to be no greater than 0.01 dB (0.2%)

### 1.2.5 Pinout

Pin	Function
1	Laser anode (+)
2	Laser cathode (-)

### 1.2.6 Design layout and Mechanical Dimensions



Heat-sink mounting layout.

See details in paragraph 3. Mechanical Interface with Heat Sink

Fig. 3 Design layout and Mechanical Dimensions

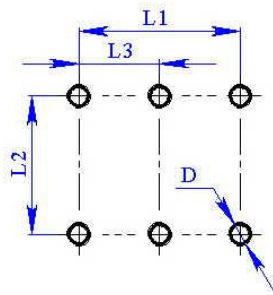
## 2.0 Product Reliability Estimates:

2.1 Expected module survival time is calculated for 90% survival rate over time in hours:

Fiber Output Power, W	Heatsink Temp., ° C	0 chip failure		1 chip failure	
		lop, Amp	90% survival, Hrs	lop, Amp	90% survival, Hrs
25	30	5.1	2500		
25	20	4.9	4400		
20	20	4	15500	4.7	48000
20	30	4.2	8500	4.9	26000

2.2 Power degradation over life of the product at constant electrical current and heat sink temperature will not exceed 10%

## 3.0 Mechanical Interface with Heat Sink

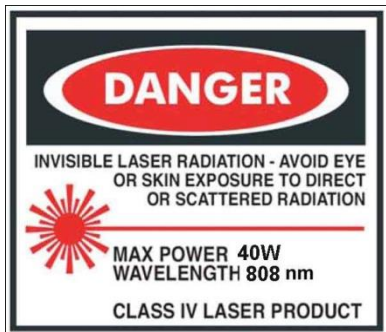


	METRIC, mm	ENGLISH, in
L1	34	1.339
L2	29	1.142
L3	17	0.669
THREAD(D)	M2.5-6H 6mm DP	#3-48UNC .25 DP
SCREW	SOC HD HEX M2.5 x 12mm	SOC HD HEX #3-48UNCx1/2
SCREW SUPPLIER	McMaster-Carr PN 92290A062	McMaster-Carr PN 92196A102

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>

#### 4.0 Product Compliance



This product complies with  
21CFR 1040.10

List Associated Quality System Documents

SPEC-1779-7060817701

SPEC-1607-70608160702

#### 4.0 Revision History:

**Revision Number:** 3 **Latest Revision Date:** 06.16.2013 **Latest Approval Date:** 06.16.2013

**Reason for Change:** Optical design improvement, LD, Design snout

Revision	Sec/ Para Changed	Change Made:	Date
1	N/A	Initial Issue of Document Based on SWSpec - 035	9-Sept-2011
2	1.2.6 / Fig 3.	Update Drawing Boot Snout	13-Jun-2013
3	2.1 / Table data	90% survival rate data	16-Jun-2013

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#### 5.0 Electronic Notification List: ULE

#### 6.0 Approvals:

First Approver's Signature

Name: Andrey Kolchin

Title: Quality Manager

Second Approver's Signature

Name: Victor Faybishenko

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