Pavilion Integration Corporation
2528 Qume Drive, Suite-1, San Jose, CA 95131 USA
Tel: (408) 453-8801 - Fax: (408) 453-8802
E-mail: sales@pavilionintegration.com

Product Description Summary

This is an integrated optical engine with three lasers channels that focus at the same focal plane. Tri-laser channels include the 405nm 488nm and 638nm laser. The final focal plane is user-adjustable and the beam spot position is precisely controllable.

Product Specifications

Table 1: Optical Specifications*

Parameter		Conditions	Specifications Min.	Typ.	Max.	Units
Channel 1	Lasing Wavelength	Max. Power	485	488	491	nm
Channel 2	Lasing Wavelength	Max. Power	633	638	643	nm
Channel 3	Lasing Wavelength	Max. Power	400	405	410	nm
Max. Optical Output Power**		CW Mode	40	45	50	mW
Power Stability		8Hrs, RT, ΔT<3ºC			2%	
RMS Noise		20Hz - 2MHz			0.5%	
P-P Noise		20Hz - 2MHz			1%	
Beam Height @ $1/e^2$ (at flow channel)		At the focal plane away from the plate edge 50mm	12	15	18	μm
Beam Width @ $1/e^2$ (at flow channel)***		At the focal plane away from the plate edge 50mm	130	150	170	μm
Beam Quality (M^2)		TEM_{00}	1.0		1.3	
Polarization Orientation (reference to base plate)		Horizontal	0		±3	º
Polarization Extinction Ratio			50:1	100:1		
Warm-up Time (output power)		Cold start from ambient temp. 15-35 ºC			2	min

*Stress release to be performed before final test.
**Optical output power is tested after the focus lens.
***Beam size with Brewster Angle measured in customer's optical system.

Pavilion Integration Corporation
2528 Qume Drive, Suite-1, San Jose, CA 95131 USA
Tel: (408) 453-8801 - Fax: (408) 453-8802
E-mail: sales@pavilionintegration.com

Table 2: Alignment

Parameters	Conditions	Specifications Min.	Typ.	Max.	Units
Beam Pointing Stability*	15-30° C, at the focal plane	-12		12	um
Working Distance**	From the front edge of the base plate to the center of the flow cell	48	50	52	mm
Laser Output Height	From base plate	28.5	29	29.5	mm
Beam spacing in the V-plane, refer to the center of blue laser beam inside the flow channel	Measured at the V-focal plane in the flow channel center, red beam is down below.	105	120	135	μm
Beam overlap in the H-plane, refer to the center of blue laser beam inside the flow channel	Measured at the V-focal plane in the flow channel center	-15	0	15	μm

*Sampling test for pointing stability
** The working distance can be adjusted with a user-adjustable focus lens, the adjustment range is +/-2mm.
V, H: reference to the module base plate.

Table 3: Environment

Parameters	Conditions	Specifications Min.	Typ.	Ma x.	Units
Storage Temperature		-20		50	ºC
Base Plate Temperature	Operating	10		35	ºC
Base Plate Temperature	Non-operating	-10		50	ºC
Vibration (1Hz – 200Hz)	Non-operating		0.53		G
Humidity	Non-condensing	10%		95%	

Table 4: Electrical (488nm)

Parameters	Conditions	Specifications Min.	Typ.	Max.	Units
Input Voltage (TEC)		4.8	5	5.2	V
Input Voltage (LD)		8.5	9	9.5	V
Current Consumption (TEC)				1.5	A
Current Consumption (LD)				0.6	A
Heat Dissipation				7.0	W

Pavilion Integration Corporation
2528 Qume Drive, Suite-1, San Jose, CA 95131 USA
Tel: (408) 453-8801 - Fax: (408) 453-8802
E-mail: sales@pavilionintegration.com

Table 5: Electrical (638nm)

Parameters	Conditions	Specifications Min.	Typ.	Max.	Units
Input Voltage		4.8	5	5.2	V
Current Consumption				1.7	A
Heat Dissipation				7.0	W

Table 6: Electrical (405nm)

Parameters	Conditions	Specifications Min.	Typ.	Max.	Units
Input Voltage (TEC)		4.8	5	5.2	V
Input Voltage (LD)		8.5	9	9.5	V
Current Consumption (TEC)				1.5	A
Current Consumption (LD)				0.6	A
Heat Dissipation				7.0	W

Table 7: Mechanical Specifications

Parameters	Conditions	Specifications Typ.	Units
Optical Plate Dimension	L x W x H	176 x 130 x 68 (as fig.1)	mm

Table 8: Molex 10Pin (43020-1000) Connector Definition

PIN Number	PIN Specification	PIN Function
J1-1	Power +5V	Power Input
J1-2	Power +9V	Power Input
J1-3	Power +5V	Power Input
J1-4	RX(RS232)	RS232
J1-5	GND FOR RS232	RS232
J1-6	TX(RS232)	RS232
J1-7	Power GND	Power Ground
J1-8	Power GND	Power Ground
J1-9	Power GND	Power Ground
J1-10	Power GND	Power Ground

Table 9: Molex 2Pin (0430200200) Connector Definition

PIN Number	PIN Function
J2-1	Interlock+
J2-2	Interlock-

Firmware and Commands

Laser engine firmware provides the below functions via interface RS232.

Pavilion Integration Corporation
2528 Qume Drive, Suite-1, San Jose, CA 95131 USA
Tel: (408) 453-8801 - Fax: (408) 453-8802
E-mail: sales@pavilionintegration.com

Table 10: RS232 Communication Settings

Parameters	Settings
Port	UART
Baud Rate	115200
Data Bit	8
Start Bit	1
Stop Bit	1
Parity Bit	None
Flow Control	None

Command List and Examples

1. **Set Light State (ON/OFF) (SET CH)**

   Command:

   SET CH 3 1 // 3 means channel; 1 = ON; 0 = OFF.

   Answer:

   A CH

2. **Get Light State (ON/OFF) (GET CH)**

   Command:

   GET CH 3

   Answer:

   A CH 1orA CH 0. // 1 = ON; 0 = OFF.

3. **Set Light Power Reference (SET PWRREF)**

   Command:

   SET PWRREF 3 20 //Set CH3 Power Levelto 20mW

   Answer:

   A PWRREF

4. **Get Light Power Reference (GET PWRREF)**

   Command:

   GET CHPWRWATTS 3 //Get CH3 Power Output

   Answer:

   A PWRREF 20

5. **Get BT Temperature(GET BT)**

   Command:

   GET BT 3 //Get CH3 Baseplate temperature

   Answer:

   A BT 27.05

6. **Get DT Temperature(GET DT)**

Pavilion Integration Corporation
2528 Qume Drive, Suite-1, San Jose, CA 95131 USA
Tel: (408) 453-8801 - Fax: (408) 453-8802
E-mail: sales@pavilionintegration.com

Command:

GET DT 3 //Get CH3LD temperature

Answer:

A DT 24.85

7. **Get Status (GET STATUS)**

   Command:

   GET STATUS 3 //Get CH3 Status

   Answer:

   A STATUS 10001100

8. **Get Fault (GET FAULT)**

   Command:

   GET FAULT 3 //Get CH3 Fault

   Answer:

   A FAULT 00000000

9. **Get Light Wavelength (GET WAVELENGTH)**

   Command:

   GET WAVELENGTH 3 //Get CH3 Wavelength

   Answer:

   A WAVELENGTH 405

Status code Bit Definitions

Status Code Bit Definitions		
Mask	**Bit Label**	**Description**
00000001	Laser Fault	Laser head faults
00000010	Laser Off	Laser Off status
00000100	Laser Emission	Laser Emission status
00001000	Laser Ready	Laser Ready status
10000000	System cover Interlock	System cover interlock status

Fault Code Bit Definitions

Fault Code Bit Definitions				
Mask	**Bit Label**	**Description**	**Action**	**Range**
00000001	Base Plate Temp. Fault	Baser plate temperature out of range	Laser shutdown	>40 or <10 ℃

Pavilion Integration Corporation
2528 Qume Drive, Suite-1, San Jose, CA 95131 USA
Tel: (408) 453-8801 - Fax: (408) 453-8802
E-mail: sales@pavilionintegration.com

00000010	Diode Temp. Fault	Diode temperature out of range	Laser shutdown	>40 or <10 ℃
00000100	Over Current	High current for the diode		>0.98maxcurrent
00001000	OverPower	Fail to emit at set power lever		<0.85or>1.15times of set power value

Mechanical Diagram

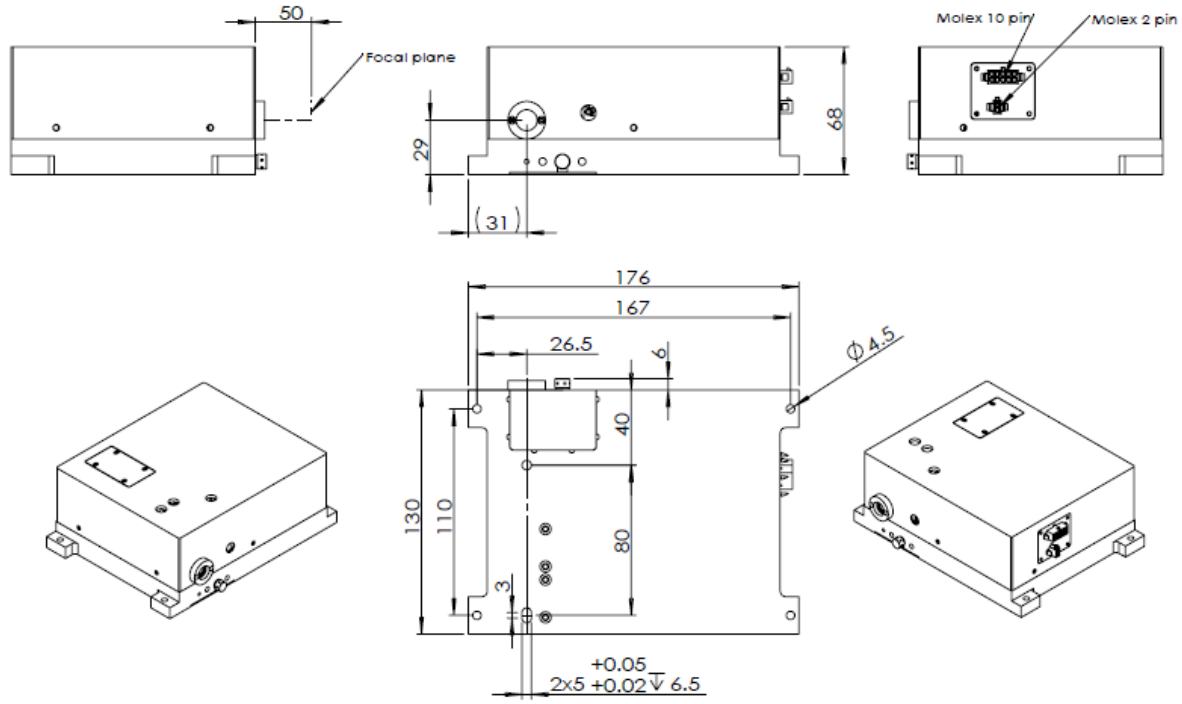

Figure1: Optical Plate Dimension

Labelling Requirements

Laser emitted aperture label; Seal broken or missing warranty void label, Series number label, adjustment holes label.

Accessory:

- Shipping Form
- Others: screw for fix, wrench and pin rod for adjustment

Regulation:

- Laser Safety Classification: Class IIIb OEM laser product. (CDRH).

Pavilion Integration Corporation
2528 Qume Drive, Suite-1, San Jose, CA 95131 USA
Tel: (408) 453-8801 - Fax: (408) 453-8802
E-mail: sales@pavilionintegration.com

□ REACH Directive

■ RoHS Directive

■ EMC Directive

- ■ EMI: Radiated Emission (RE).
- □ EMS: _____.
- □ Others: _____.

□ Other Directives: _____.

Warranty

12 months for the customer.