桂林恒创光电科技有限公司
HC Optical Science and Tech Co., Ltd.
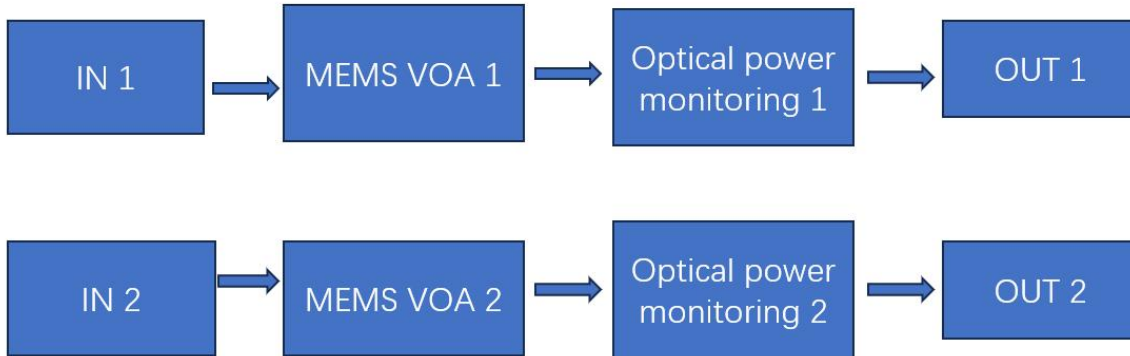
Optical Attenuation Module Specification

Model: HC-MVOA-2-SM

Catalog

1. Module internal diagram

| IN 1 | → | MEMS VOA 1 | → | Optical power monitoring 1 | → | OUT 1 |

| IN 2 | → | MEMS VOA 2 | → | Optical power monitoring 2 | → | OUT 2 |

2. Technical Parameter

| Model	HC-MVOA-2-SM
Fiber type	SM（9/125）
Calibration wavelength	1310/1550nm
Attenuation range	0 ~ 30 dB (excluding insertion loss)
VOA mode	MEMS Dark or Bright (optional)
Insertion Loss [1]	≤1.2dB
Attenuation accuracy	≤±0. 3dB
Optical power monitoring range	–50~ +23 dBm
Optical power accuracy	≤±0. 25dB
Resolution	0.01 dB
Wavelength dependent loss	≤0.25 dB
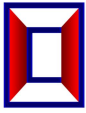
Polarization dependent loss	≤0.2 dB
Return loss	≥50 dB
Response time	≤10ms
Input optical power	≤500 mW
Optical interface	FC/APC (optional)
Fiber length	1m (0.9 casing)
Operating voltage/current	DC5V±10%，I≤300mA
Operating temperature	–5 ~ 70 ℃
Storage temperature	–40 ~ 85 ℃
Module size	90(L) x 55(W) x 12(H) ±0.2mm

Note: 1. All parameters are tested at room temperature.

2.All parameters do not include the insertion loss of the connector, and a pair of connectors adds 0.3dB loss.

3. Module size diagram

M3
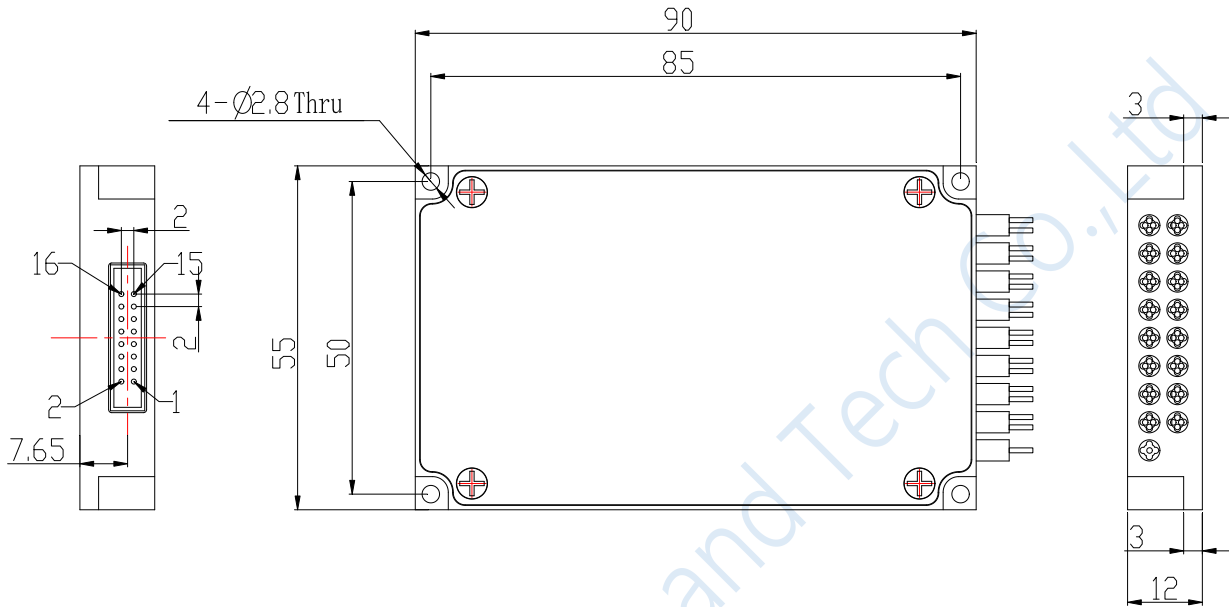
4. pin definition

Pin number	Pin definition	Direction and type of signal	Functional description
3	VCC	Power	Operating power supply, DC 5V, 1.0 A
6	GND	Power	GND
9	TXD	Output	Serial port data sending end (LVTTL level serial port)
10	RXD	Input	Serial port data receiver (LVTTL level serial port)

Note: The M3 module electrical interface uses MOLEX's 87833-1620. It is recommended that the customer connector use MOLEX's 87568-1694.

5.Description of UART program control command

The module can receive control signals through LVTTL UART interface to realize automatic measurement or real-time monitoring.

(1) This module can only execute one instruction at a time. The next instruction is usually entered after the program returns the corresponding value.

(2) Please use capital letters.

(3) In actual operation, input the angle bracket "<" as the start character and the angle bracket ">" as the end character.

(4) Instruction error returns < ER >.

Programmed instruction set

Command	Description	Examples
<RESET>	Restart the module	Success return: < RESET _ OK >
<RESTORE>	Restore factory settings	Success return: < RESET _ OK >
<INFO_?>	Query module information	Successfully returned: <MEMS-VOA-SM_VER1.00_ SN01234567890_C08.04.00051> Indicates MEMS-VOA-SM module, version 1.00, SN number 01234567890, product number C08.04. 00051;
<BAUD_x>	Set or query the serial port baud rate 1. X is from 1 to 9, representing baud rates 2400, 4800, and 9600, 14400, 19200, 38400, 56000, 57600, and 115200, respectively. Success return: < BAUD _ X _ OK > 2. Send < BAUD _? > Query the baud rate	Send: < BAUD _ 5 > Success return: < BAUD _ 5 _ OK > Set the device serial port baud rate to the 19200. Restart to take effect after the configuration is saved!
<VOA_x_ATT_yy.yy>	Sets the amount of attenuation X: 1 ~ 2 channels YY. YY: range: 00.00 ~ 30.00dB;	Send: < VOA _ 1 _ ATT _ 30.00 > Indicates that the attenuation of the first channel is set to 30 dB; Success return: < VOA _ 1 _ ATT _ OK >
<VOA_x_W_yyyy>	Set the operating wavelength X: 1 ~ 2 channels; yyyy: 1310/1550nm	Send: < VOA _ 2 _ W _ 1310 > Indicates that the operating wavelength of the second channel is set to 1310 nm; Success return: < VOA _ 2 _ W _ OK >

<VOA_x_A_?>	Query the current operating wavelength, attenuation and output power of the channel X: 1 ~ 2 channels	Send: < VOA _ 1 _ A _? > It indicates to query the current working wavelength, attenuation and output power of the first channel; Success return: < VOA _ Channel _ Wavelength _ Attenuation _ Output Power > If return: < VOA _ 1 _ 1310 _ 23.00 _ –25.34 > Indicates that the current operating wavelength of the first channel is 1310nm, the attenuation is 23.00 dB, and the output power is –25.34 dBm;
<VOA_x_LOK_ ± zz.zz>	Set Lock Output Optical Power and Query X: 1 ~ 2 channels; ± ZZ. ZZ: fixed output value,? Represents a query; Range: –50.00 ~ + 20.00 dBm;	Send: < VOA _ 1 _ LOK _ –25.00 > It indicates that the locked output optical power of the first channel is set to –25.00 dBm, and the locked output function is enabled; Success return: < VOA _ 1 _ LOK _ OK > Note: The setting of the locking output optical power is related to the power of the input light source. If the set locking output optical power is greater than the input power, the locking fails;
<VOA_x_ULOK_y>	Output locking feature off and query X: 1 ~ 2 channels; Y: 0 for off, 1 for on,? Represents a query;	Send: < VOA _ 1 _ ULOK _ 0 > indicates that the output lock function of channel 1 is closed; Success return: < VOA _ 1 _ ULOK _ OK > Note: This command cannot be used to open the lock output function; Send: < VOA _ 1 _ ULOK _ 1 > Failure will be returned: < ER >
<VOA_x_PC_yyyy_ ±zz.zz>	Calibrate the output optical power of the channel X: 1 ~ 2 channels Yyyy: 1310/1550nm wavelength ± ZZ. ZZ: calibration value, –10.00 ~ + 10.00 dB;	Send: < VOA _ 2 _ PC _ 1310 _ + 01.55 > Indicating that the output power value of the wavelength of 1310 nm of the fourth channel is compensated by + 1.55 dB; Success return: < VOA _ 2 _ PC _ 1310 _ + 01.55 _ OK >
<VOA_x_AC_yyyy>	Attenuation is automatically calibrated X: 1 ~ 2 channels Yyyy: 1310/1550nm wavelength	Send: < VOA _ 1 _ AC _ 1310 > Indicates the automatic calibration of attenuation amount for the wavelength of 1310nm of channel 1; Success return: < VOA _ 1 _ AC _ 1310 _ OK > Note: 1. The calibration time for one channel and one wavelength is about 2 minutes; 2. During automatic calibration of attenuation, the input light source power must be greater than –3.00 dBm, otherwise the calibration fails; 3. When the optical power is locked for output, automatic calibration cannot be performed, and the output locking function needs to be turned off first. 4. Query the calibration progress through < VOA _ X _ AC _? >. The returned content is: < VOA _ X _ AC _ 1310 _ START > indicates that the calibration is started; < VOA _ X _ AC _ 1310 _ ING > indicates that the calibration is in progress; < VOA _ X _ AC _ 1310 _ OK >

		indicates that the calibration is successful; < ER > indicates a calibration failure;
<SAVE_ALL>	Save the configuration Success return: < SAVE _ ALL _ OK >	Save the configuration, such as the attenuation amount.

6. Fiber length definition
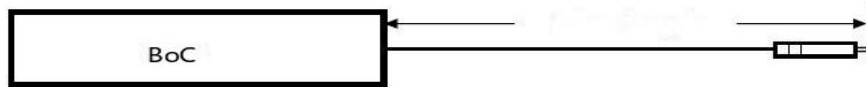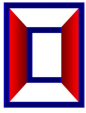

Including Boot and connector length

7. Factory default configuration

Project	Factory default configuration	Remark
Serial port baud rate	115200	8 data bits, 1stop bit, no parity.
Attenuation	0dB	
Operating wavelength	1550nm	
Output locking function	Close	

Note: After the module is powered off and powered on again, it will keep the state when the

configuration is saved.

8. Ordering Information HC-MVOA-A-B-C-D-E-F-G-H

A	B	C	D	E	F	G	H
Channel	VOA Mode	Mode	Dimension Type	Fiber type	Fiber diameter	Fiber Length	Connector
01~16	1. Bright 2. Dark	S: SM	M3: 90 x 55 x 12 （2 CH) M5: 141 x 110 x 12 X: Other	9: 9/125 X: Other	25:250um 90:900um X: Other	05:0.5m 10:1.0m X:Other	OO:None FP: FC/PC FA: FC/APC SP: SC/PC SA: SC/APC LP: LC/PC LA: LC/APC X: Other