PRODUCT SPECIFICATION

Product Name	1xN MEMS Optical Switch Series
Product Model	
Description	Single Mode
File NO.	
Customer	

	Drafter	**Reviewer**	**Approver**	**Customer Confirm**
Signature				
Date				

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Document History

Version	DATE	DESCRIPTION OF CHANGE	Modifier
V1.0	2019.6.13	First release	GL
V1.1 - V2.1	2019.8.22 - 2020.12.22	Edit	SH
V2.2	2021.4.29	Add Cylindric package 1x2 Add Module Type 4	SH

1 DESCRIPTION

1.1 Product Function

MEMS 1xN OSW is based on micro-electro-mechanical system technology. It allows channel selection between one input fiber and N output fibers by rotating the mirror of MEMS chip.

The switch is bi-directional and can also be used as a Nx1 selector switch. The optical switch offers highly reliable, durable, long-life operation in a compact package.

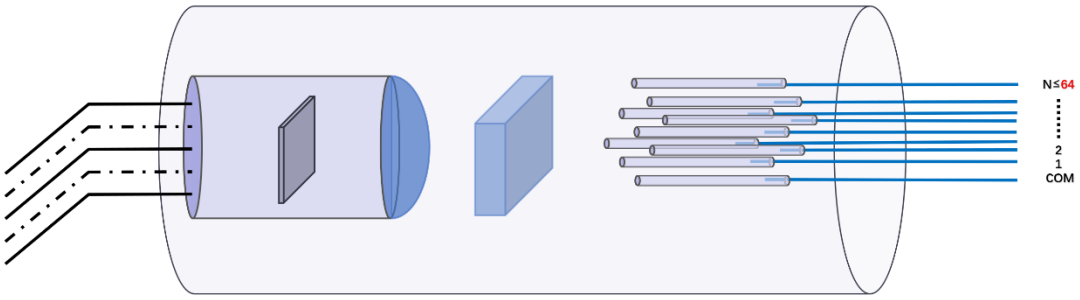
1.2 Features

- Proven MEMS durability and reliability
- Compact Form Factor
- Fast switching time
- Qualified to Telcordia GR-1073-CORE and RoHS

1.3 Applications

- Optical signal switching and routing
- Optical network protection and restoration
- Optical path monitoring (Working with OTDR or OCM)
- Instrumentation resource sharing
- As part of high-end modules such as OXC or MCS

1.4 Product Configurations



Note: “C”:common port

“1、2、3...64”:possible selected output ports=1~64;

1.5 Related Product List

Customer Code	Customer P/N	Code	P/N
			AZ-MOSW-12-C-S-025-1-00-C
			AZ-MOSW-14-C-S-025-1-00-C
			AZ-MOSW-18-C-S-025-1-00-C
			AZ-MOSW-116-C-S-025-1-00-C
			AZ-MOSW-132-C-S-025-1-00-C
			AZ-MOSW-164-C-S-025-1-00-C
			AZ-MOSW-18-C-S-09-1-LC/UPC-M1
			AZ-MOSW-116-C-S-09-1-LC/UPC-M1
			AZ-MOSW-132-C-S-09-0.5-LC/UPC-M4
			AZ-MOSW-164-C-S-09-0.5-LC/UPC-M4
			AZ-MOSW-196-C-S-09-0.5-LC/UPC-M4

2 MAIN SPECIFICATIONS

Table 1 Optical Specifications

PARAMETER		VALUE	UNIT	NOTE
Wavelength		13:1290~1330 15:1525~1568 16:1600-1650	nm	Or customer specify
Test Wavelength		1310/1550/1625 or 1650	nm	
OSW Channels		4/8/12/16/24/32/48/64		N
Insertion Loss	1x4	≤0.8, typical 0.6 @S ≤1.0, typical 0.8 @D	dB	@CWL,23°C Without Connectors @S: 13 or 15 or 16 @D: 13&15 or 15&16 (If with connectors, IL increased by 0.2~0.3dB)
	1x8			
	1x12	≤1.0, typical 0.9 @S ≤1.2, typical 1.1 @D		
	1x16			
	1x24	≤1.3, typical 1.1 @S ≤1.5, typical 1.3 @D		
	1x32			
	1x48	≤1.5, typical 1.2 @S ≤1.7, typical 1.4 @S		
	1x64			
Return Loss		≥45	dB	Or customer specify
Repeatability		≤0.1	dB	
Crosstalk		≥40	dB	Or customer specify
Polarization Dependence Loss		≤0.2	dB	
Wavelength Dependence Loss		≤0.3 @S	dB	@CWL±20nm, 23°C
Temperature Dependence Loss		≤0.3 @N≤16 ≤0.4 @24≤N≤64	dB	
Switch Time		≤20	ms	Module Or customer specify
Durability		≥1x10^9	cycle	
Maximum Optical Power		≤500	mW	

Table 2 Electrical and Mechanical Specifications

PARAMETER	VALUE	UNIT	NOTE
Switch Mode	Non-latching		
Control Voltage	<60	V	Cylindric package
	5±0.25		Module type
Dimension	Φ5.5×42	mm	Cylindric package, N≤16
	Φ6.2×47		Cylindric package, N≥24
	68x30x13		M1, single stage, N≤16
	75x30x13		M1, single stage, N=32
	75x30x16		M1, single stage, N=48
	80x60x16		M4, single stage, N=32,64
	80x60x22		M4, double stage, N=96,128

3 OPERATION/STORAGE TEMPERATURE/HUMIDITY

Table 3 Environmental conditions

PARAMETER	VALUE	UNIT	NOTE
Operation Temperature	-5~65	℃	
Storage Temperature	-40~85	℃	
Operation Humidity	5~95	%RH	
Storage Humidity	5~95	%RH	

4 PIGTAIL AND CONNECTOR

Table 4 Pigtail and connector type/length

PARAMETER	VALUE	UNIT	NOTE
Fiber Type	G657A2 or G657B3 250um bare fiber		
Fiber Pigtail (All Ports)	250um fiber or 900um loose tube		
Fiber Length (All Ports)	1.00±0.05	m	Or customer specify
Optical Connector (All port)	None		Or customer specify

5 MECHANICAL DRAWINGS

Figure 1 Cylindric package (1xN, N=2)

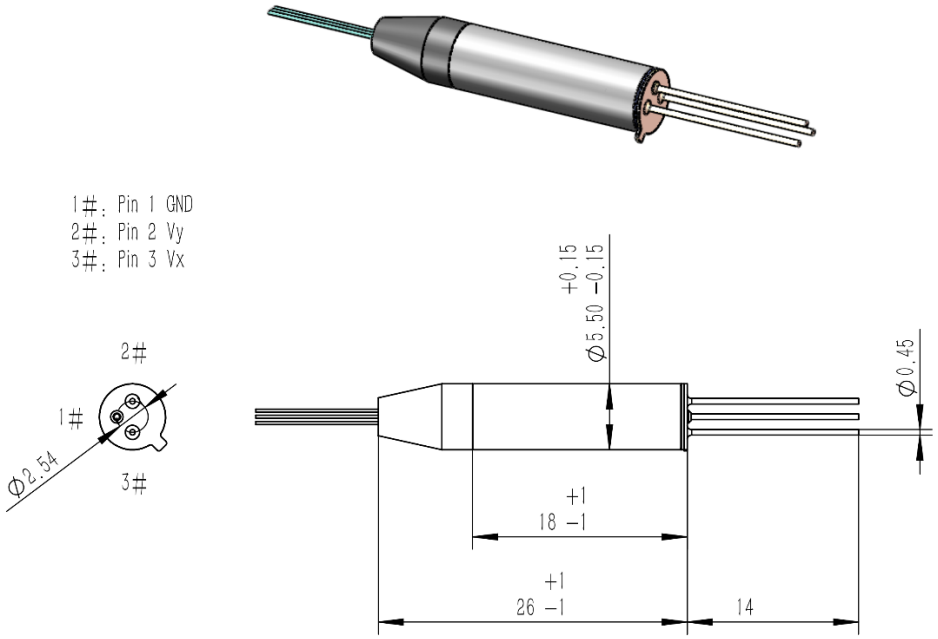


Figure 2 Cylindric package (1xN, 2<N≤16)

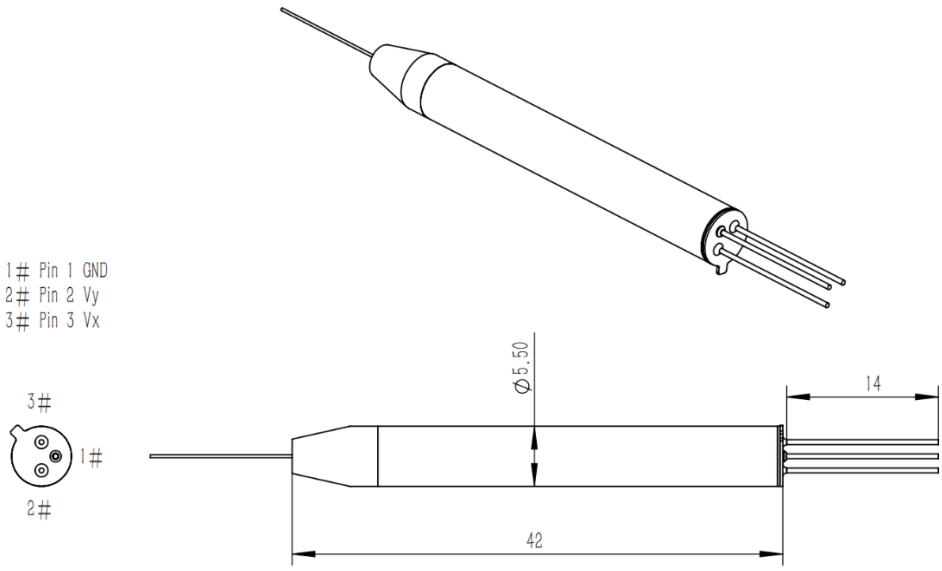


Figure 3 Cylindric package (1xN, N≥24)

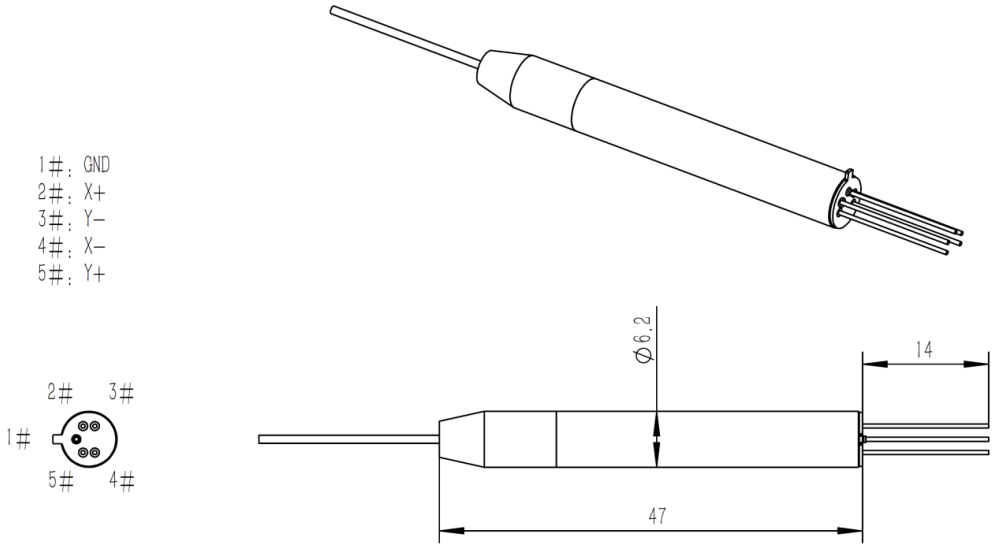


Figure 4 External PCB version (1xN, N≥24)

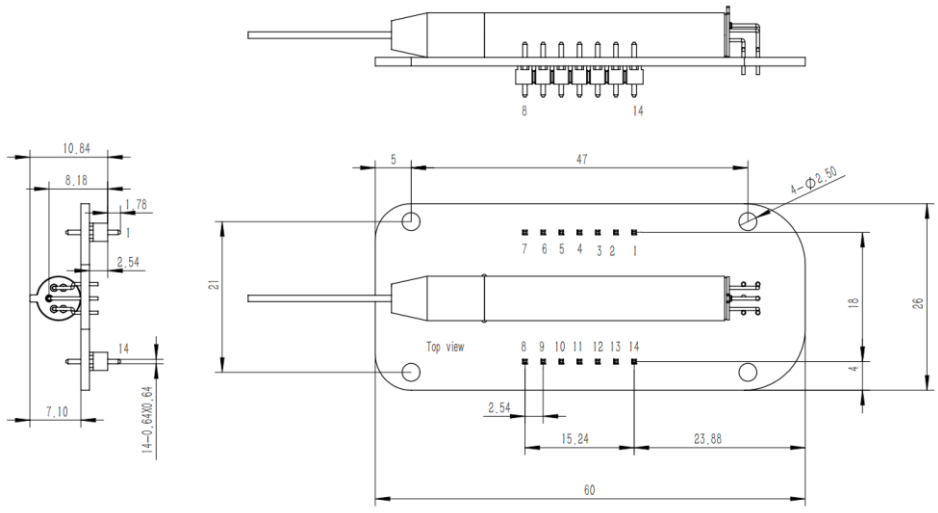


Figure 5 Module Type 1 (1xN, N≤16)

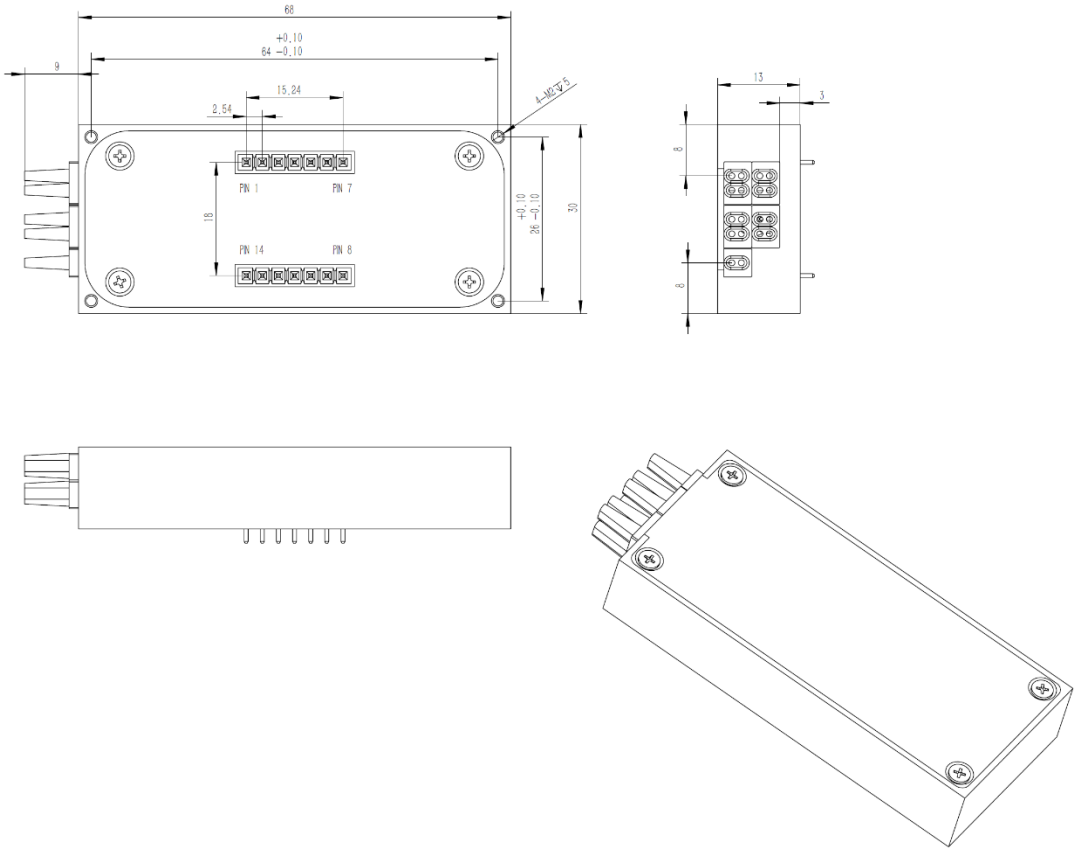


Figure 6 Module Type 1 (1xN, N≤32)

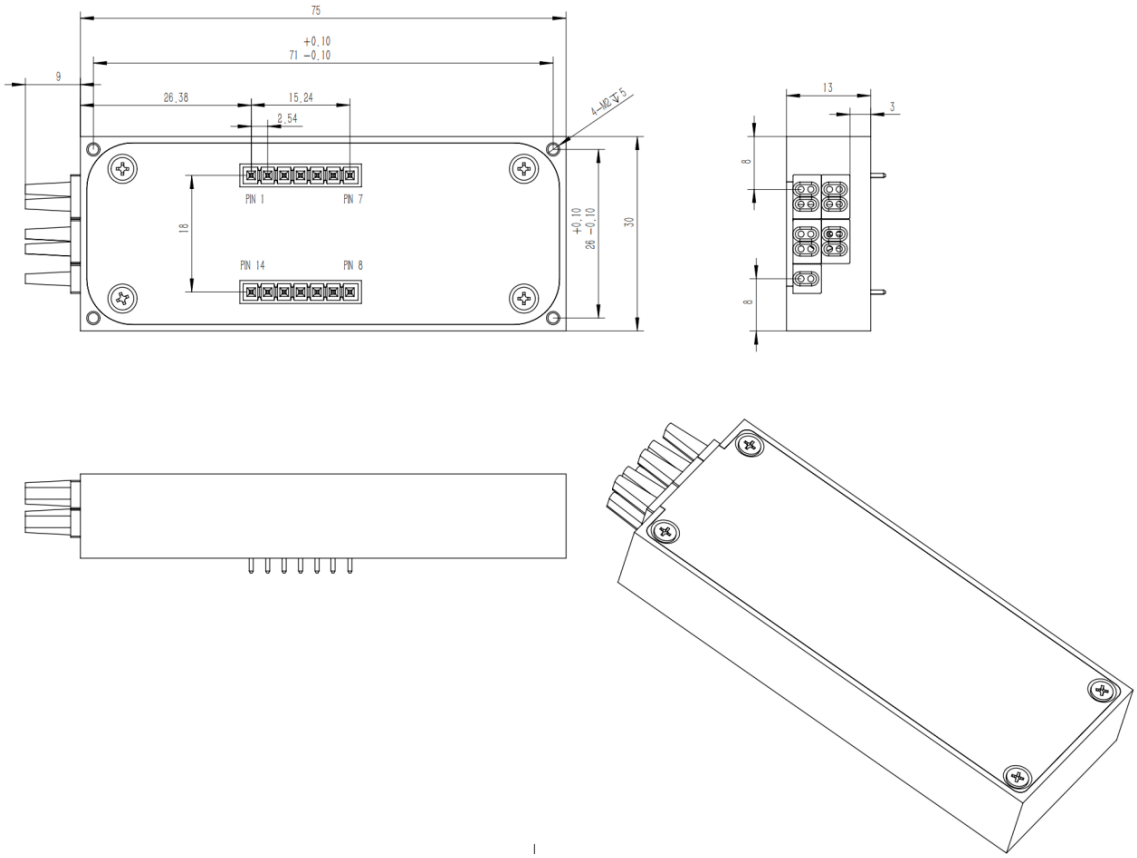


Figure 7 Module Type 4 (1xN, N≤64)

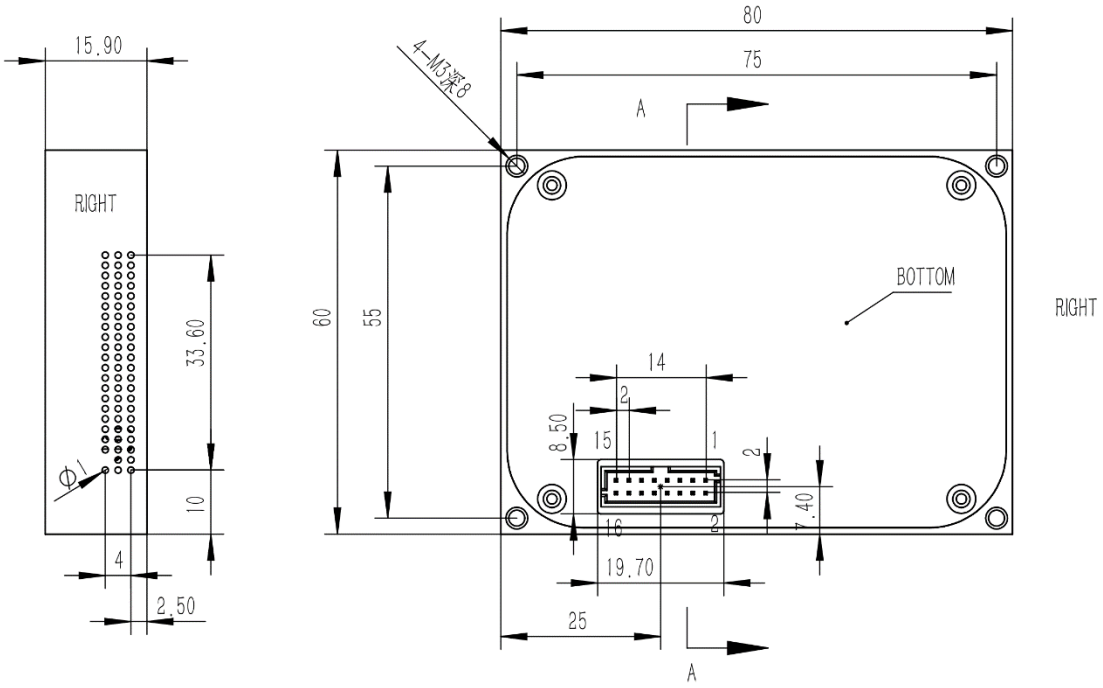
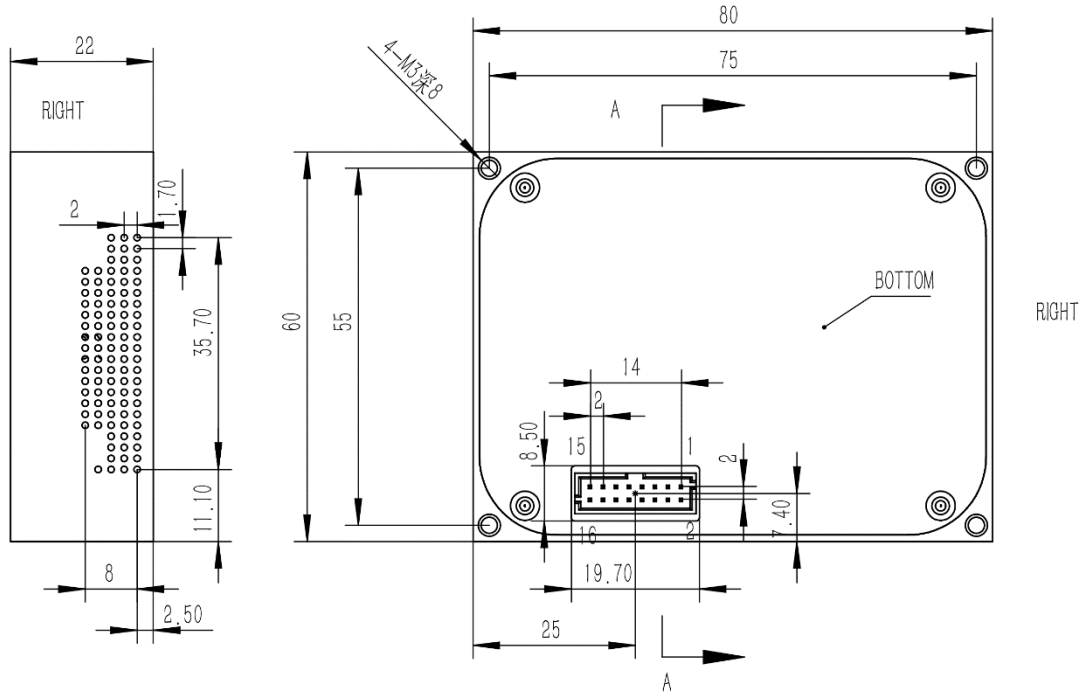
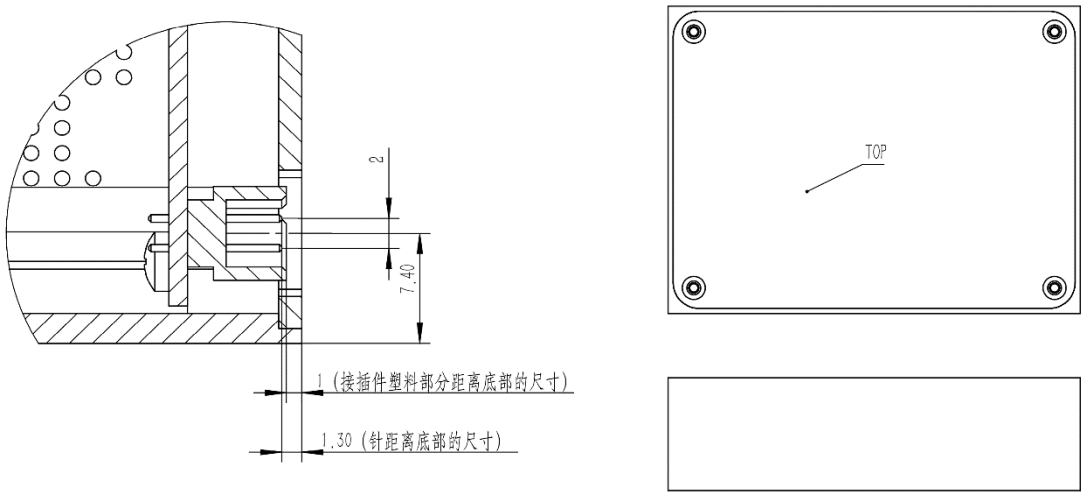


Figure 8 Module Type 4 (1xN, N≤128)





6 OPTIC PORTS AND ELECTRONIC PINS DEFINITION

6.1 Electronic Pins Definition

Table 5 Electronic PIN Definition for Module type 1

Pin Number	Name	Input/Output	Level	Function
1	NC	No connect		
2	VCC	Power supply		+(5.0±5%) V Power Supply Max 100mA
3	I/O		LVTTL	Reserved
4	GND			Power supply ground
5	I/O		LVTTL	Reserved
6	TXD	Output	LVTTL	TTL UART data output
7	RXD	Input	LVTTL	TTL UART data input
8	I/O		LVTTL	Reserved
9	I/O		LVTTL	Reserved
10	I/O		LVTTL	Reserved
11	Case GND			Case ground
12	I/O		LVTTL	Reserved
13	I/O		LVTTL	Reserved
14	Reset	Input	LVTTL	Reset, low active, the pulse width needs 4ms

Table 6 Electronic PIN Definition for Module type 4

Pin Number	Name	Input/Output	Level	Function
1	D6	IN	LVTTL	Parallel D6 Input
2	D5	IN	LVTTL	Parallel D5 Input
3	/RESET	IN	LVTTL	Low level active for hardware reset.
4	NC			Reserved
5	GND	Power		Ground
6	GND	Power		Ground
7	VCC	Power		5~12V
8	VCC	Power		5~12V
9	TXD	Power		UART Serial Data Output
10	RXD	OUT	LVTTL	UART Serial Data Input
11	D4	IN	LVTTL	Parallel D4 Input
12	D3	IN	LVTTL	Parallel D3 Input
13	D2	IN	LVTTL	Parallel D2 Input
14	D1	IN	LVTTL	Parallel D1 Input
15	D0	IN	LVTTL	Parallel D0 Input
16	/STROBE	IN	LVTTL	Falling edge active to synchronize command execution

6.2 TTL/UART Port Control Setting

Baud Rate: 115200

Start Bits: 1

Data Bits: 8

Parity: None

Stop Bits: 1

Flow Control: None

6.3 Port Control Grammar

Command

FLAG	LEN	RES	COMMA	DATA	SUM

2 Byte	1 Byte	1 Byte	1 Byte		1 Byte

FLAG: 0xEFEF or 0xAAAA

LEN: Total number of command bytes from RES to SUM

RES: 0xFF

SUM: Checksum, SUM=FLAG+LEN+RES+COMMA+DATA

Response

FLAG	LEN	RES	RESP	DATA	SUM
2 Byte	1 Byte	1 Byte	1 Byte		1 Byte

FLAG: 0xEDFA

LEN: Total number of command bytes from RES to SUM

RES: 0xFF

SUM: Checksum, SUM=FLAG+LEN+RES+COMMA+DATA

6.4 Port Controls Command

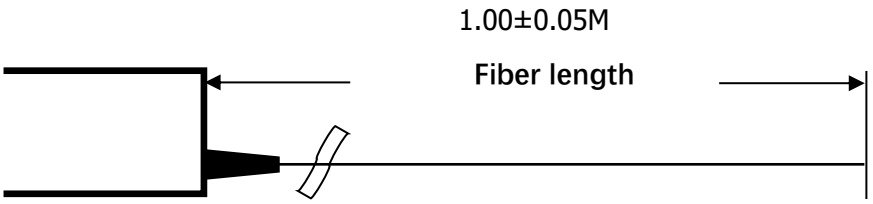
<table>
<tr><th colspan="7">Set Channel</th></tr>
<tr><td rowspan="3">Command</td><td>FLAG1</td><td>LEN</td><td>RES</td><td>COMMA</td><td>DATA</td><td>SUM</td></tr>
<tr><td>0xEFEF</td><td>0x04</td><td>0xFF</td><td>0x04</td><td>CHANNEL (1byte)</td><td>SUM</td></tr>
<tr><td colspan="6">eg: Set channel N
Set channel 1: EF EF 04 FF 04 01 E6
Set channel 2: EF EF 04 FF 04 02 E7
Set channel 3: EF EF 04 FF 04 03 E8
Set channel 4: EF EF 04 FF 04 04 E9
Set channel 7: EF EF 04 FF 04 07 EC</td></tr>
<tr><td rowspan="3">Response</td><td>FLAG2</td><td>LEN</td><td>RES</td><td>RESP</td><td>DATA</td><td>SUM</td></tr>
<tr><td>0xEDFA</td><td>0x04</td><td>RES</td><td>0x04</td><td>Success:
0
x
E
E
Fail: 0xEF</td><td>SUM</td></tr>
<tr><td colspan="6">eg: ED FA 04 FF 04 EE DC</td></tr>
</table>

Get Channel						
Command	FLAG1	LEN	RES	COMMA	DATA	SUM
	0xEFEF	0x03	RES	0x02		SUM
	eg: EF EF 03 FF 02 E2					
Response	FLAG2	LEN	RES	RESP	DATA	SUM
	0xEDFA	0x04	RES	0x02	CHANNEL (1byte)	SUM
	eg: ED FA 04 FF 02 07 F3					

Note:When channel 0 is set, the voltage is 0, that is block state

7 FIBER LENGTH

Figure 2 Fiber Length Definition



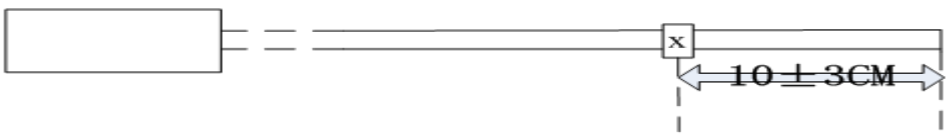
8 LABEL DEFINITION

8.1 On the module

P/N: xxxxxxxxxxx
S/N: xxxxxxxx

8.2 Label Definition

Figure 3 Label Definition



X=com,CH1,CH2,CH3……CHN

8.3 Others

ESD Packing

RoHS and GR-1073 compliance

9 ORDERING INFORMATION