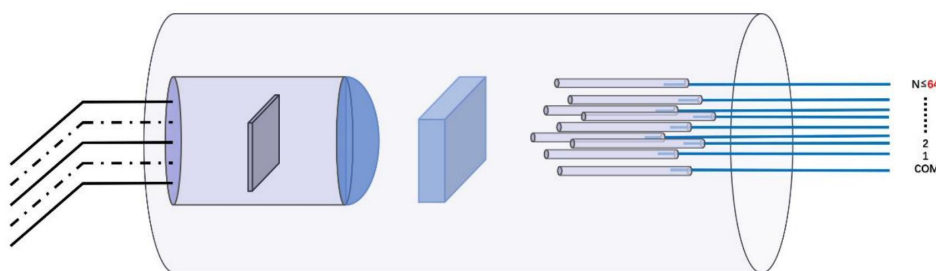


PM (Polarization-maintaining) 1X12 MEMS Fiber Optical Switch 1550nm 0.9MM 0.5M PM Fiber FC/APC 158x150x29mm Module FW-MSX-1X12-15-PM-09-05-FC/APC-M3



MEMS 1xN optical switch is based on micro-electro-mechanical system technology. It allows channel selection between an input fiber and up to N output fibers by rotating the MEMS mirror. 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.



Features

- ◆ Proven MEMS durability and reliability
- ◆ Compact Form Factor
- ◆ Fast switching time
- ◆ Qualified to Telcordia GR-1073-CORE and RoHS
- ◆ UART/TTL or UART/RS232 control interface

Applications

- ◆ Optical network routing
- ◆ Resource sharing in test & measurement applications
- ◆ Optical network protection and restoration

Specifications

Table 1 Optical Specifications¹

PARAMETER		VALUE	UNIT	NOTE
Wavelength		15:1525~ 1568	nm	Single-band: 13 or 15 or 16 Dual-band: 13&15 or 15&16 Full-band: 13&15&16 or 1290~ 1650
Test Wavelength		1550	nm	
MxN		1x12		
Insertion Loss	1x12	≤1.8	dB	1. IL is measured at CWL, 23°C 2. IL is for Single-band. Dual-band adds 0.2dB 3. If with connectors, IL increases by 0.2~0.3dB 4. If at -5~65°C, IL increases by 0.4dB
Return Loss		≥45	dB	Or customer specify
Repeatability		≤0.1	dB	Repeatability is defined after 100 cycles
Crosstalk		≥50	dB	Or customer specify
Polarization Dependent Loss		≤0.35	dB	
Wavelength Dependent Loss		≤0.6	dB	WDL is measured at CWL±20nm, 23°C
Temperature Dependent Loss		≤0.6	dB	
Extinction Ratio		≥18	dB	Welding connectors of good quality
Switch Time		≤5	ms	1. One set of connection configurations 2. Excluding protocol transmission time 3. When using optimized voltage ramp
Durability		≥1x10 ⁹	cycle	
Maximum Optical Power		≤500	mW	

1. All specifications are without connectors.

Table 2 Electrical and Mechanical Specifications¹

PARAMETER	VALUE	UNIT	NOTE
Latching Type	Non-latching		
Control Type	UART		
Supply Voltage	5~ 12	V	
Power Consumption	≤2, typical 1.7	W	
Connect Type			
Dimension	158x150x29	mm	

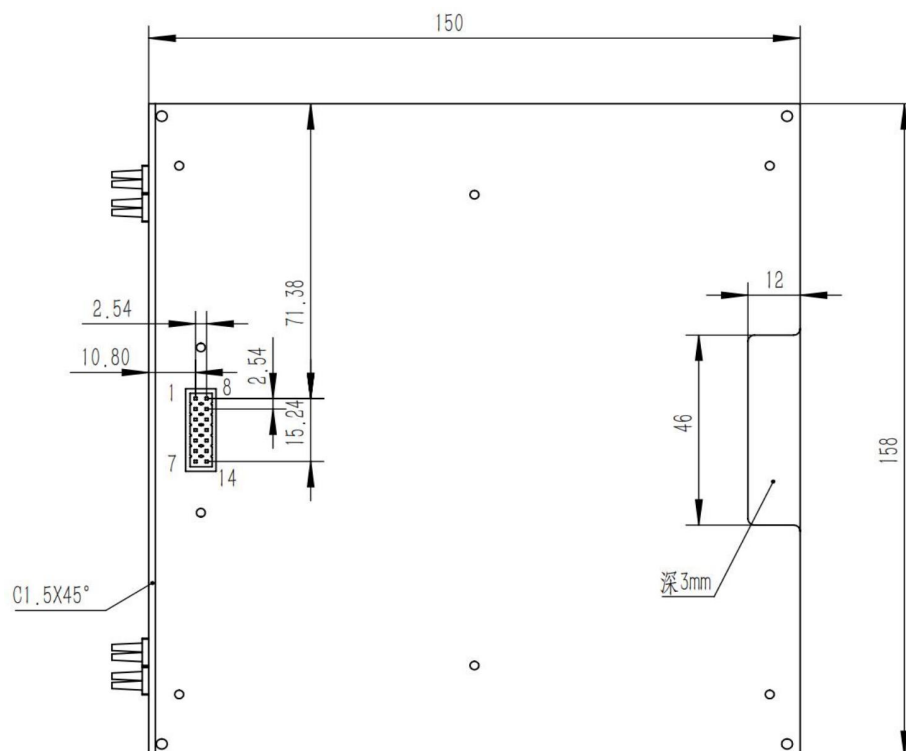
1. All specifications belong to MSX M3.

Table 3 Environmental Conditions

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

Table 4 Pigtail and Connector Type/Length

PARAMETER	VALUE	UNIT	NOTE
Fiber Type			
Fiber Pigtail (All Ports)	250um fiber or 900um loose tube		
Fiber Length (All Ports)	0.5±0.05	m	Or customer specify
Optical Connector (All port)	FC/APC		Or customer specify



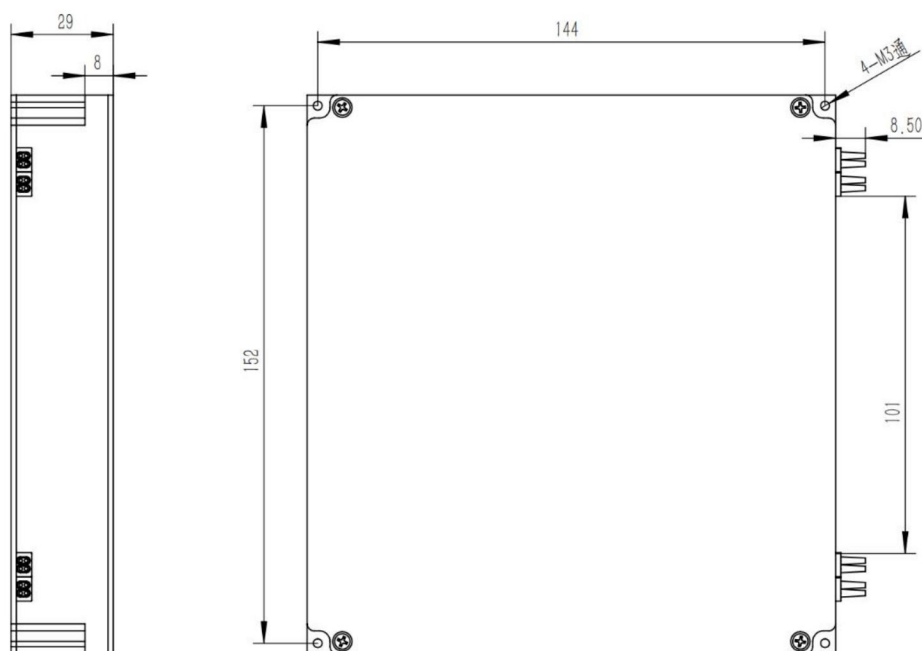


Table 5 Electronic PIN Definition

Pin Number	Name	Input/Output	Level	Function
1	NC	No connect		
2	VCC	Power supply		+(5.0±5%) V Power Supply Max 150mA
3	I/O		LVTTL	Reserved
4	GND			Power supply ground
5	I/O		LVTTL	Reserved
6	TXD	Output	LVTTL	UART serial data output
7	RXD	Input	LVTTL	UART serial 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

UART Control Setting

Baud Rate: 115200

Start Bits: 1

Data Bits: 8

Parity: None

Stop Bits: 1

Flow Control: None.

Communication Protocol

Protocol 1 (Default)

Command

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

FLAG: 0xEF EF or 0xA A A A

LEN: Total number of 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: 0xED FA

LEN: Total number of bytes from RES to SUM

RES: 0xFF

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

Command List

Set Channel							
Command	FLAG1	LEN	RES	CMD	Switch	DATA	SUM
	0xEFEF	0x06	0xFF	0x0D	00/01	CHANNEL (1byte)	SUM
	Eg: EF EF 06 FF 0D 00 00 01 F1 (set channel 1)						
	EF EF 06 FF 0D 00 00 02 F2 (set channel 2)						
	EF EF 06 FF 0D 00 00 03 F3 (set channel 3)						
Response	FLAG2	LEN	RES	RESP		DATA	SUM
	0xEDFA	0x04	RES	0x04		Success: 0xEE Fail: 0xEF	SUM
	eg: ED FA 04 FF 04 EE DC						

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

Oder Information

Part No.	Specification
FW-MSX-1X12-15-PM-09-05-F C/APC-M3	PM (Polarization-maintaining) 1X12 MEMS Fiber Optical Switch 1550nm 0.9MM 0.5M PM Fiber FC/APC 158x150x29mm Module