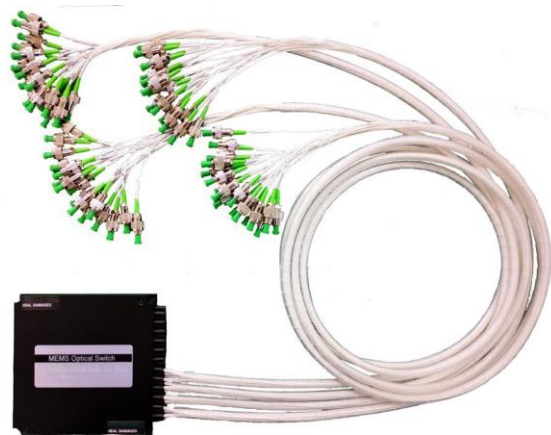


## Product features

Mini Size  
Fast Switch Speed  
Low Insertion Loss & PDL  
Wide Operating Wavelength Range  
High Reliability & Stability

## Application

Network Monitor System  
Remote Fiber Testing System  
Module & System Integration  
Instrumentation



## Technical Parameter

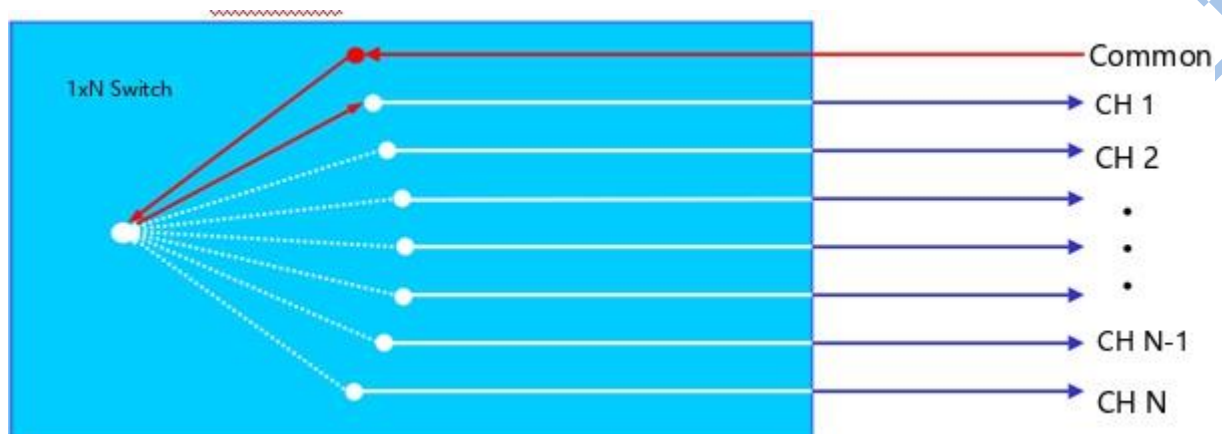
Model	MEMS-1X64	
Fiber type	SM	MM
Operating wavelength	1260~1650nm	850±20nm or 1310±20nm or 1400~1700nm
Test wavelength	1310/1550nm	850/1310/1550nm
Insertion loss 1	$\leq 1.0\text{dB}$ (Typical: 0.8) ( $N \leq 16$ ) $\leq 1.8\text{dB}$ (Typical: 1.6) ( $16 < N \leq 64$ ) $\leq 2.0\text{dB}$ (Typical: 1.8) ( $64 < N \leq 144$ ) $\leq 2.2\text{dB}$ (Typical: 2.0) ( $144 < N \leq 256$ )	$\leq 1.0\text{dB}$ (Typical: 0.8) ( $N \leq 8$ ) $\leq 1.8\text{dB}$ (Typical: 1.6) ( $8 < N \leq 64$ ) $\leq 3.2\text{dB}$ (Typical: 3.0) ( $64 < N \leq 128$ )
Wavelength dependent loss	$\leq 0.3\text{ dB}$ ( $N \leq 16$ ) $\leq 0.4\text{ dB}$ ( $16 < N \leq 144$ ) $\leq 0.5\text{ dB}$ ( $144 < N \leq 256$ )	$\leq 0.3\text{ dB}$ ( $N \leq 8$ ) $\leq 0.4\text{ dB}$ ( $8 < N \leq 64$ ) $\leq 0.6\text{ dB}$ ( $64 < N \leq 128$ )
Polarization dependent loss	$\leq 0.15\text{dB}$	$\leq 0.2\text{dB}$
Return loss	$\geq 45\text{ dB}$	$\geq 30\text{ dB}$
Crosstalk	$\geq 50\text{ dB}$	$\geq 30\text{ dB}$
Repeatability	$\leq \pm 0.05\text{dB}$	$\leq \pm 0.05\text{dB}$
Switching time	$\leq 15\text{ms}$	
Number of switches	$\geq 109\text{ times}$	
Input optical power	$\leq 500\text{ mW}$	

Operating voltage/current	$DC5V \pm 10\%$ $\leq 50mA$ ( $N \leq 16$ ) $\leq 250mA$ ( $16 < N \leq 64$ ) $\leq 350mA$ ( $64 < N \leq 144$ ) $\leq 500mA$ ( $144 < N \leq 256$ )	$DC5V \pm 10\%$ $\leq 50mA$ ( $N \leq 8$ ) $\leq 250mA$ ( $8 < N \leq 32$ ) $\leq 450mA$ ( $32 < N \leq 96$ ) $\leq 550mA$ ( $96 < N \leq 128$ )
Operating temperature	$-5 \sim 70\text{ }^{\circ}\text{C}$	
Storage temperature	$-40 \sim 85\text{ }^{\circ}\text{C}$	
Module size	M1: $34(L) \times 24(W) \times 11(H) \pm 0.2mm$ ( $N \leq 16$ , Bare Fiber) M2: $60(L) \times 24(W) \times 11(H) \pm 0.2mm$ ( $N \leq 16$ , Loose Tube) M3: $90(L) \times 55(W) \times 12(H) \pm 0.2mm$ ( $16 < N \leq 64$ , Loose Tube) M4: $100(L) \times 100(W) \times 12(H) \pm 0.2nm$ ( $64 < N \leq 144$ , Loose Tube) M5: $110(L) \times 141(W) \times 12(H) \pm 0.2nm$ ( $144 < N \leq 256$ , Loose Tube)	M1: $34(L) \times 24(W) \times 11(H) \pm 0.2mm$ ( $N \leq 8$ , Bare Fiber) M2: $60(L) \times 24(W) \times 11(H) \pm 0.2mm$ ( $N \leq 8$ , Loose Tube) M3: $90(L) \times 55(W) \times 12(H) \pm 0.2mm$ ( $8 < N \leq 32$ , Loose Tube) M4: $100(L) \times 100(W) \times 12(H) \pm 0.2nm$ ( $32 < N \leq 96$ , Loose Tube) M5: $110(L) \times 141(W) \times 12(H) \pm 0.2nm$ ( $96 < N \leq 128$ , Loose Tube)

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

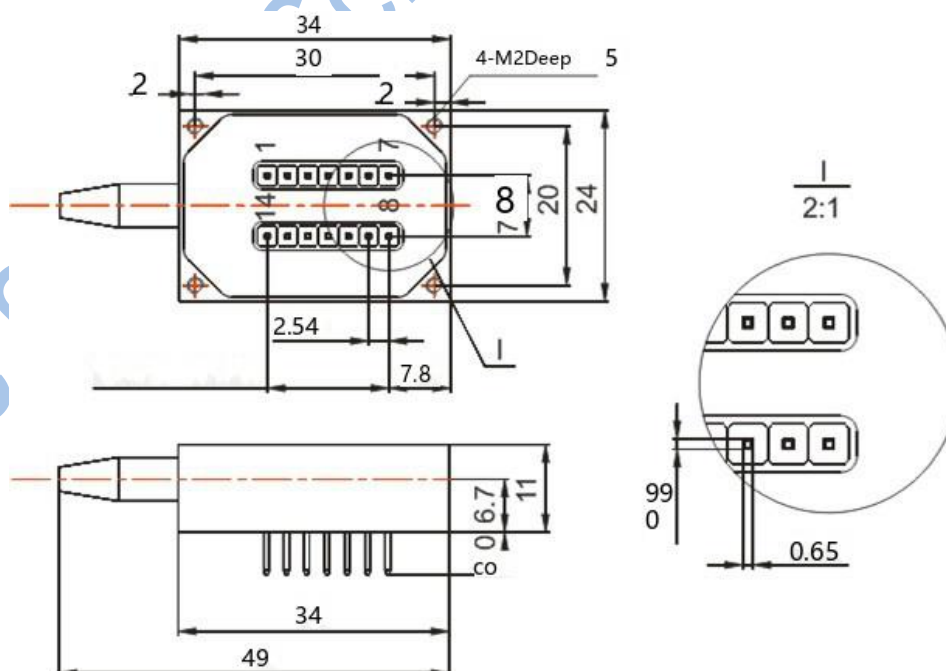
2.All parameters do not include the insertion loss of the connector, and a pair of connectors adds 0.3dB loss.

## Optical Path Diagram

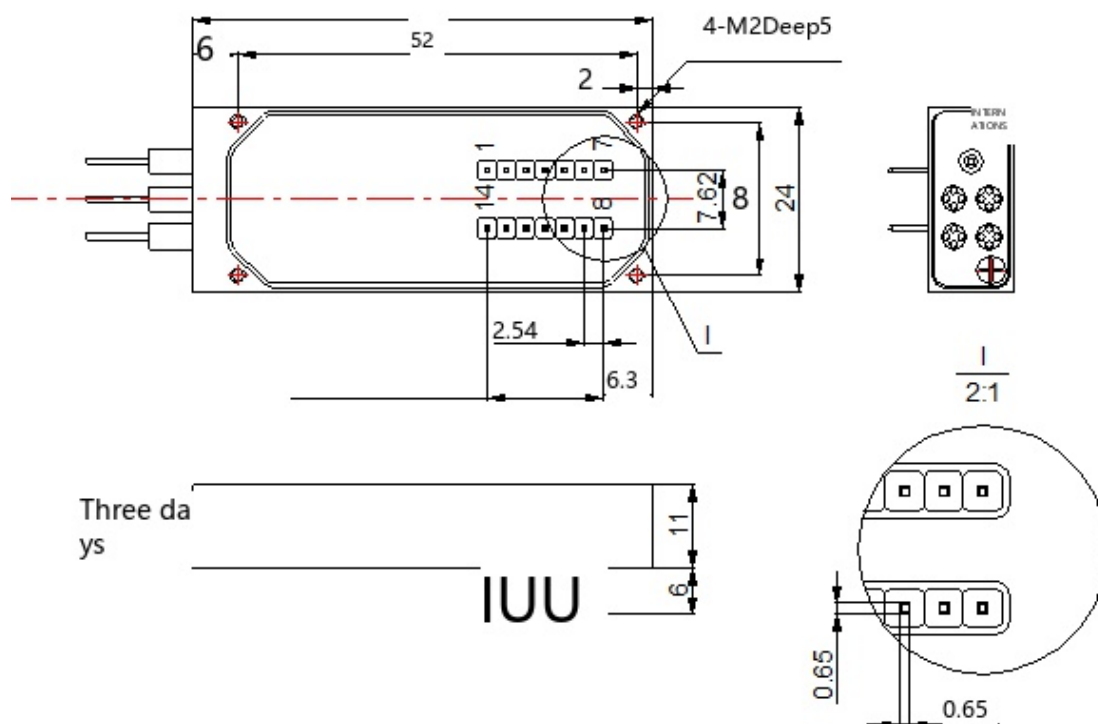


### Diagram of module dimensions(mm)

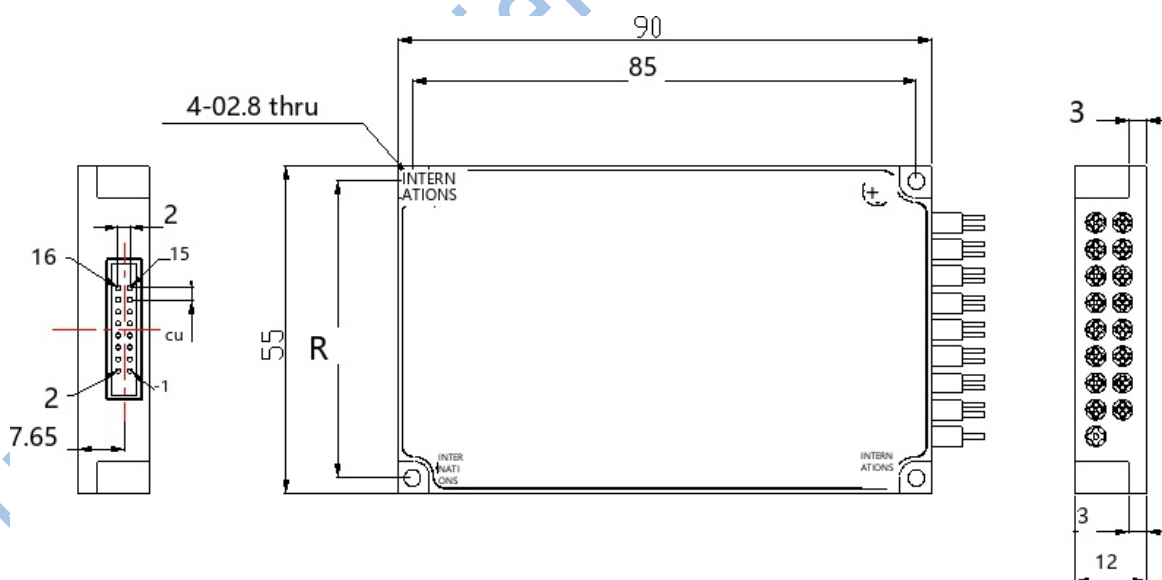
M1:



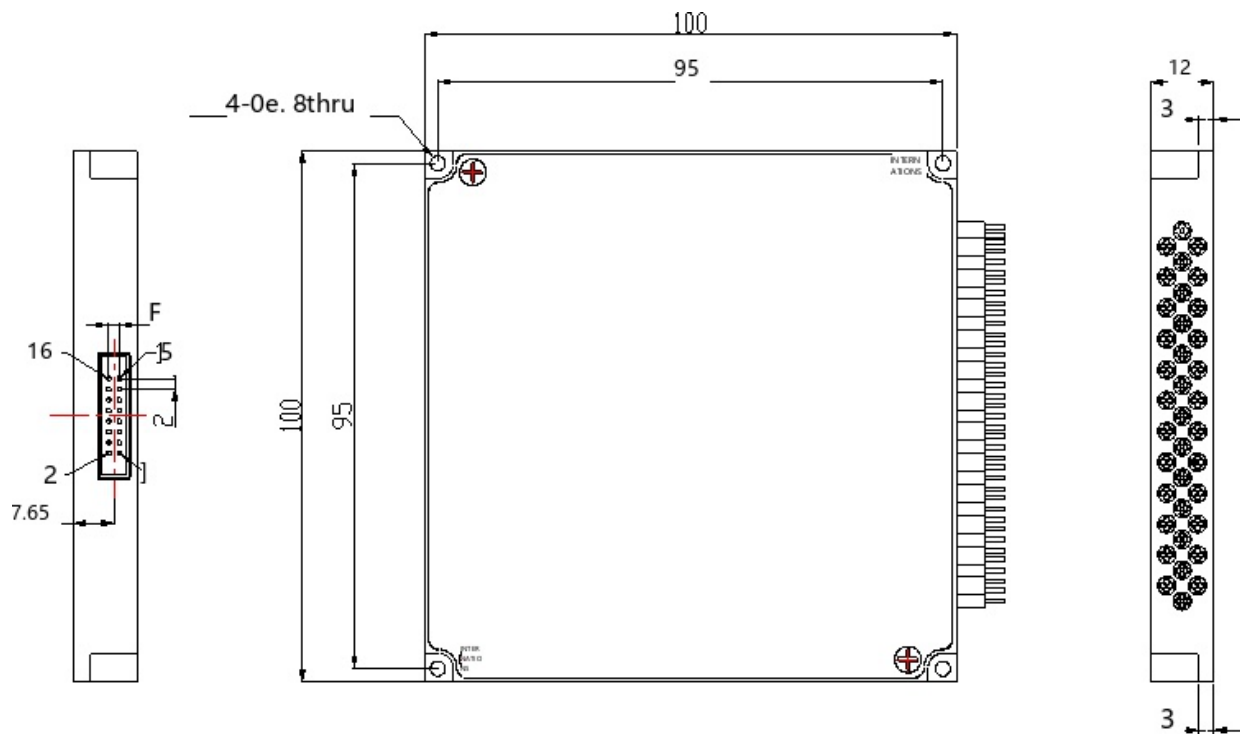
M2:



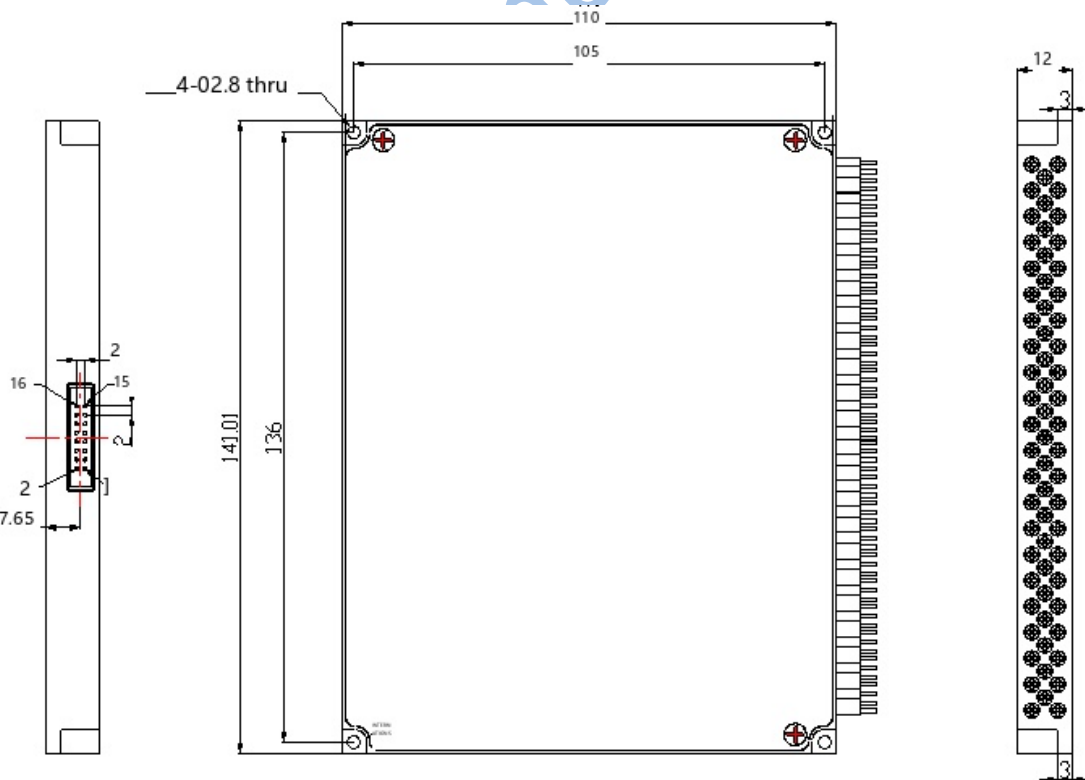
M3:



M4:



M5:



## Pin definition

Pin number		Pin definition	Direction and type of signal	Functional description
M1/M2	M3/M4/M5			
5	1	D0	Input	Data Bit D0 (Low)
	2	D5	Input	Data bit D5
2	3	VCC	Power	Operating power supply, DC 5V, 1.0 A
	4	D7	Input	Data Bit D7 (High)
	5	D6	Input	Data Bit D6
4	6	GND	Power	GND
	7	D4	Input	Data bit D4
6	8	D1	Input	Data bit D1
9	9	TXD	Output	Serial port data sending end (TTL level serial port)
10	10	RXD	Input	Serial port data receiver (TTL level serial port)
7	11	D2	Input	Data bit D2
8	12	D3	Input	Data bit D3
12	13	/BUSY	Output	The low level is ready to reset or receive data.
	14	/ALARM	Output	A high level indicates that the optical module is operating incorrectly.
3	15	/STROBE	Input	The falling edge executes the data bit.
14	16	/RESET	Input	Low reset to Channel 0.
11		GND	Power	GND
13		MODE		Low data bit controls switching, high UART Control switching
1		NC		Hanging in the air

Note: The M3, M4, and M5 module electrical interfaces use MOLEX's 87833-1620. It is recommended that the customer connector use MOLEX's 87568-1694.



## Data bit switching logic table

/RESET	D7	D6	D5	D4	D3	D2	D1	D0	Channel
0	X	X	X	X	X	X	X	X	0
1	0	0	0	0	0	0	0	0	1
	0	0	0	0	0	0	0	1	2
	0	0	0	0	0	0	1	0	3
	0	0	0	0	0	0	1	1	4
	...	...	...	...	...	...	...	...	...
	1	1	1	1	1	1	1	1	256

## Description of UART programmed command

The module can receive control signals through TTL 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, enter 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-SM-1X256_VER1.00_ SN01234567890_C08.04.00051> Indicates MEMS-SM-1X256 module, version 1.00, SN number 01234567890, product number C08.04.00051;
<OSW_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: < OSW _ BAUD _X _OK > 2. Send < OSW _BAUD _? > Query the baud rate	Send: < OSW _BAUD _5 > Success return: < OSW _BAUD _5 _OK > Set the device serial port baud rate to the 19200.  Restart to take effect after the configuration is saved!
<OSW_M_x>	Working mode selection X: Values 0, 1,?, 0 indicates data bit control switching, 1 indicates UART control switching,? Indicates the query mode of operation; Success return: < OSW _M _X _OK >	Send: < OSW _M _1 > Success return: < OSW _M _1 _ OK > It indicates that the module is set to UART control switching;  Send: < OSW _M _? > Success return: < OSW _M _1 > Indicates that the module is switched by UART control;
<OSW_01_SW_x x x>	Sets the current channel XXX: Value 000 ~ 256,000 means 0 channel, 256 means 256 channels; Success return: < OSW _01 _SW _YY _ OK >  Note: In the data bit control switching mode, send: < OSW _01 _SW _XXX > return: < OSW _ M _ER >	Send: < OSW _01 _SW _01 > Successful return: < OSW _01 _SW _02 _OK > indicates switching to channel 2;
<OSW_A_?>	Query the channel status Success return: < OSW _A _optical switch channel >	Return: < OSW _A _01 > Indicates that the optical switch is 1 channel;
<SAVE_ALL>	Save the configuration Success return: < SAVE _ALL _OK >	Save the configuration, such as channel status save.

Note: The M1 and M2 modules do not apply to this instruction set.



## Fiber length definition



Including Boot and connector length

## Factory Default Configuration

Project	Factory default configuration	Remark
Serial port baud rate	115200	8 data bits, 1stop bit, no parity.
Working mode	Data bits control switching	
Working Channel	When the data bit control is switched, the working channel is determined by the data bit; When UART control is switched, the working channel is the channel 1;	When the UART control is switched, the optical path state when the configuration is saved is maintained after the module is powered off and then powered on.

## Ordering Information MEMS-1X64-A-B-C-D-E-F-G

A	B	C	D	E	F	G
Mode	Wavelength	Dimension Type	Fiber type	Fiber diameter	Fiber Length	Connector
S:SM	85: 850nm	M1:	5:50/125	25:250um	05:0.5m	OO:None
M:MM	13: 1310nm	34 x 24 x 11	6:62.5/125	90:900um	10:1.0m	FP: FC/PC
	14: 1490nm	M2:	9: 9/125	X: Other	X:Other	FA: FC/APC
	15: 1550nm	60 x 24 x 11	X: Other			SP: SC/PC
	162: 1625nm	M3:				SA: SC/APC
	165: 1650nm	90 x 55 x 12				LP: LC/PC
	13/15:1310/1550nm	M4:				LA: LC/APC
	X:Other	100 x 100 x 12				MP: MPO
		M5:				X: Other
		110 x 141 x 12				
		X: Other				



HC Optical Science and Tech Co., Ltd