



# R-PM Series Phase Modulator



## Description

The LiNbO<sub>3</sub> phase modulator is widely used in high-speed optical communication system, laser sensing and ROF systems because of well electro-optic effect. The R-PM series based on Ti-diffused and APE technology, has stable physical and chemical characteristics, which can meet requirement of the most applications in laboratory experiments and industrial systems.

### Features

- Low insertion loss
- Polarization-maintaining
- Low half-wave voltage
- Dual-polarization option

### Applications

- Optical communication
- Quantum key distribution
- Laser sensing systems
- Frequency shifting

### Wavelength

- 850nm
- 1064nm
- 1310nm
- 1550nm

### Bandwidth

- 300MHz
- 2.5GHz
- 10GHz

Operating wavelength	850nm	1064nm	1310nm	1550nm	
3dB Bandwidth	~10GHz	~10GHz	~10GHz	~300MHz	~12GHz
Insertion Loss	<3.5dB	< 3.5dB	< 3.5dB	< 3.5dB	< 3.5dB
Polarization extinction ratio	> 20dB	> 20dB	> 20dB	> 20dB	
V <sub>π</sub> @RF (50KHz)	< 3V	<4.0V	< 3V	< 4V	<3.5V

### Ordering Information

R	AM	15	10G	XX	XX
	Type: PM---Phase Modulator	Wavelength: 08---850nm 10---1060nm 13---1310nm 15---1550nm	工作带宽: 2.5G---10GHz 10G---10GHz 20G---10GHz	In-Out Fiber type: PP---PM/PM PS---PM/SMF	Optical connector: FA---FC/APC FP---FC/PC SP---Customization



**R-PM-08-10G**

**Wavelength 850nm 10GHz Phase modulator**

Parameter		Symbol	Min	Typ	Max	Unit
<b>Optical parameters</b>						
Operating wavelength		$\lambda$	780	850	870	nm
Insertion loss		IL		3	3.5	dB
Optical return loss		ORL			-45	dB
Polarization extinction ratio		PER	20			dB
Optical fiber	Input port		850nm PM fiber(125/250 $\mu$ m)			
	output port		850nm PM fiber(125/250 $\mu$ m)			
Optical fiber interface			FC/PC、FC/APC Or Customization			
<b>Electrical parameters</b>						
Operating bandwidth (-3dB)		S <sub>21</sub>	10	12		GHz
Half-wave voltage @50KHz		V <sub>π</sub>		2.5	3	V
Electrical return loss		S <sub>11</sub>		-12	-10	dB
Input impedance		Z <sub>RF</sub>	50			$\Omega$
Electrical interface			SMA(f)			

**Limit Conditions**

Parameter	Symbol	Unit	Min	Typ	Max
Input optical power@850nm	P <sub>in,Max</sub>	dBm			10
Input RF power		dBm			28
Operating temperature	Top	°C	-10		60
Storage temperature	Tst	°C	-40		85
Humidity	RH	%	5		90



**R-PM-10-10G**

**Wavelength 1064nm 10GHz Phase modulator**

Parameter		Symbol	Min	Typ	Max	Unit
<b>Optical parameters</b>						
Operating wavelength		$\lambda$	980	1060	1150	nm
Insertion loss		IL		3	3.5	dB
Optical return loss		ORL			-45	dB
Polarization extinction ratio		PER	20			dB
Optical fiber	Input port		980nm PM fiber(125/250 $\mu$ m)			
	output port		980nm PM fiber(125/250 $\mu$ m)			
Optical fiber interface			FC/PC、FC/APC Or Customization			
<b>Electrical parameters</b>						
Operating bandwidth (-3dB)		S <sub>21</sub>	10	12		GHz
Half-wave voltage @50KHz		V <sub>II</sub>		3.5	4.0	V
Electrical return loss		S <sub>11</sub>		-12	-10	dB
Input impedance		Z <sub>RF</sub>	50			$\Omega$
Electrical interface			SMA(f)			

**Limit Conditions**

Parameter	Symbol	Unit	Min	Typ	Max
Input optical power	P <sub>in,Max</sub>	dBm			20
Input RF power		dBm			28
Operating temperature	Top	°C	-10		60
Storage temperature	Tst	°C	-40		85
Humidity	RH	%	5		90



**R-PM-13-10G**

**Wavelength 1310nm 10GHz Phase modulator**

Parameter		Symbol	Min	Typ	Max	Unit
<b>Optical parameters</b>						
Operating wavelength		$\lambda$	1290	1310	1310	nm
Insertion loss		IL		3.5	4	dB
Optical return loss		ORL			-45	dB
Polarization extinction ratio		PER	20			dB
Optical fiber	Input port		PM fiber(125/250 $\mu$ m)			
	output port		PM fiber(125/250 $\mu$ m)			
Optical fiber interface			FC/PC、FC/APC Or Customization			
<b>Electrical parameters</b>						
Operating bandwidth (-3dB)		S <sub>21</sub>	10	12		GHz
Half-wave voltage @50KHz		V <sub>π</sub>		2.7	3	V
Electrical return loss		S <sub>11</sub>		-12	-10	dB
Input impedance		Z <sub>RF</sub>	50			$\Omega$
Electrical interface			SMA(f)			

**Limit Conditions**

Parameter	Symbol	Unit	Min	Typ	Max
Input optical power	P <sub>in,Max</sub>	dBm			20
Input RF power		dBm			28
Operating temperature	T <sub>op</sub>	°C	-10		60
Storage temperature	T <sub>st</sub>	°C	-40		85
Humidity	RH	%	5		90



**R-PM-15-300M**

**Wavelength 1550nm 300MHz Phase modulator**

Parameter		Symbol	Min	Typ	Max	Unit
<b>Optical parameters</b>						
Operating wavelength		$\lambda$	1530	1550	1565	nm
Insertion loss		IL		3	3.5	dB
Optical return loss		ORL			-45	dB
Polarization extinction ratio		PER	20			dB
Optical fiber	Input port		PM fiber(125/250 $\mu$ m)			
	output port		PM fiber(125/250 $\mu$ m)			
Optical fiber interface			FC/PC、FC/APC Or Customization			
<b>Electrical parameters</b>						
Operating bandwidth (-3dB)		S <sub>21</sub>		300		MHz
Half-wave voltage @50KHz		V <sub>II</sub>		3.5	4	V
Electrical return loss		S <sub>11</sub>		-12	-10	dB
Input impedance		Z <sub>RF</sub>	50			$\Omega$
Electrical interface			SMA(f)			

**Limit Conditions**

Parameter	Symbol	Unit	Min	Typ	Max
Input optical power	P <sub>in,Max</sub>	dBm			20
Input RF power		dBm			28
Operating temperature	Top	°C	-10		60
Storage temperature	Tst	°C	-40		85
Humidity	RH	%	5		90



**R-PM-15-10G**

**Wavelength 1550nm 10GHz Phase modulator**

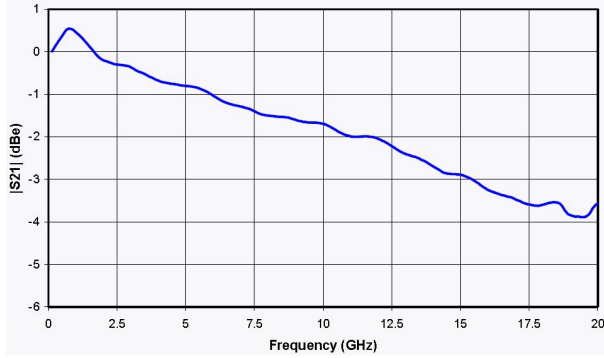
Parameter		Symbol	Min	Typ	Max	Unit
<b>Optical parameters</b>						
Operating wavelength		$\lambda$	1530	1550	1565	nm
Insertion loss		IL		3	3.5	dB
Optical return loss		ORL			-45	dB
Polarization extinction ratio		PER	20			dB
Optical fiber	Input port		850nm PM fiber(125/250 $\mu$ m)			
	output port		850nm PM fiber(125/250 $\mu$ m)			
Optical fiber interface			FC/PC、FC/APC Or Customization			
<b>Electrical parameters</b>						
Operating bandwidth (-3dB)		S <sub>21</sub>	10	12		GHz
Half-wave voltage @50KHz		V <sub>II</sub>		3	3.5	V
Electrical return loss		S <sub>11</sub>		-12	-10	dB
Input impedance		Z <sub>RF</sub>	50			$\Omega$
Electrical interface			SMA(f)			

**Limit Conditions**

Parameter	Symbol	Unit	Min	Typ	Max
Input optical power	P <sub>in,Max</sub>	dBm			20
Input RF power		dBm			28
Operating temperature	Top	°C	-10		60
Storage temperature	Tst	°C	-40		85
Humidity	RH	%	5		90

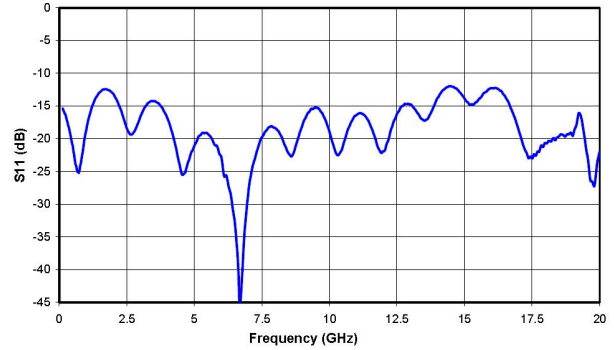


S21 Curve



S21 Curve

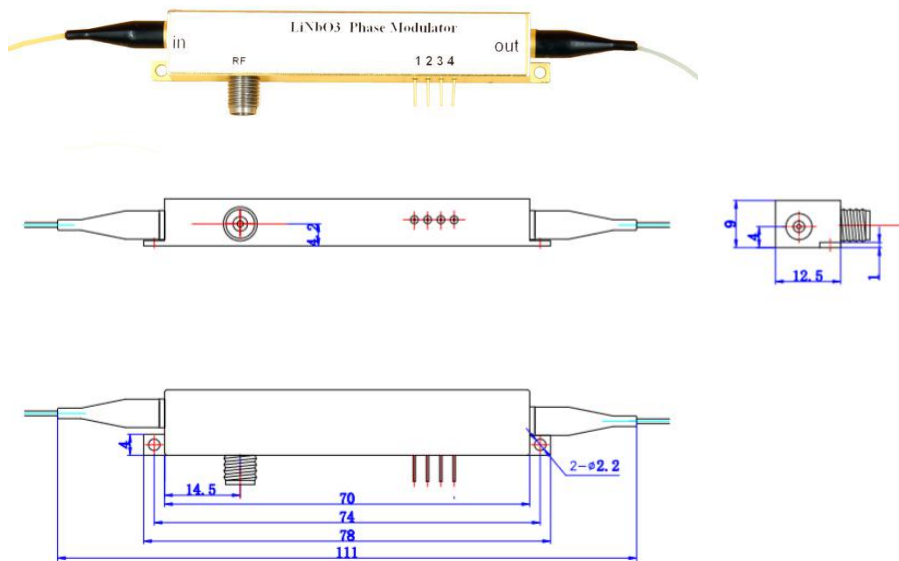
&S11 Curve



S11 Curve

S21&s11 curves of R-PM-15-10G

Mechanical Diagram



PORT	Symbol	Note
In	Optical input port	PM Fiber (125μm/250μm)
Out	Optical output port	PM and SMF option
RF	RF input port	SMA(f)
Bias	Bias control port	1,2,3,4-N/C

RF Driver and Bias control circuit board information are provided on website ([www.rof-oc.com](http://www.rof-oc.com)), you can also contact us for more information by email ([sales@rof-oc.com](mailto:sales@rof-oc.com)).