70 GHz Thin-Film Lithium Niobate Ultra-High Bandwidth Intensity Modulator



Overview

The Thin-Film Lithium Niobate Ultra-High Bandwidth Intensity Modulator is a high-performance electro-optic conversion device independently developed by our company, with full proprietary intellectual property rights. The product is packaged using high-precision optical coupling and assembly techniques, achieving an electro-optic 3 dB bandwidth of up to 70 GHz. Compared with traditional bulk lithium niobate crystal modulators, this product features low half-wave voltage (Vπ), high stability, compact size, and thermal-optic bias control. It can be widely applied in digital optical communications, microwave photonics, backbone communication networks, and research projects in related communication fields.

Features

- RF bandwidth up to 70 GHz
- Low half-wave voltage
- Low insertion loss down to 5 dB
- Small device size

Specifications

Product parameters: C band

Category	Parameters	Symbol	Unit	Index
Optical performance (@25°C)	Operating Wavelength (*)	λ	nm	~1550
	Optical Extinction Ratio (@ DC) (**)	ER	dB	≥20
	Optical Return Loss	ORL	dB	≤-27
	Optical Insertion Loss	IL	dB	Maximum value: 6 Typical value: 5
Electrical	3 dB Electro-Optical Bandwidth	S21	GHz	Minimum value: 63

Performance (@25°C)	(from 2 GHz)			Typical value: 65
	RF Half-Wave Voltage (@ 50 kHz)	Vπ	V	≤4
	Thermal Bias Half-Wave Power	Pπ	mW	≤50
	RF Return Loss	S11	dB	≤-10
Operating Conditions	Operating Temperature (*)	TO	°C	-20~70

* Customizable.

** High extinction ratio (> 25 dB) available on request.

Damage threshold

If the device operates beyond the maximum damage threshold, it will cause irreversible damage to the device.

Parameters	Symbol	Min.	Max.	Unit
RF input power	Sin	-	18	dBm
RF input swing voltage	Vpp	-2.5	+2.5	V
RF input RMS voltage	Vrms	-	1.78	V
Optical input power	Pin	-	20	dBm
Thermal bias voltage	Uheater	-	4.5	V
Thermal bias current	Iheater	-	50	mA
Storage temperature	TS	-40	85	℃
Relative humidity (non-condensing)	RH	5	90	%

S21 test sample image (90 GHz typical)

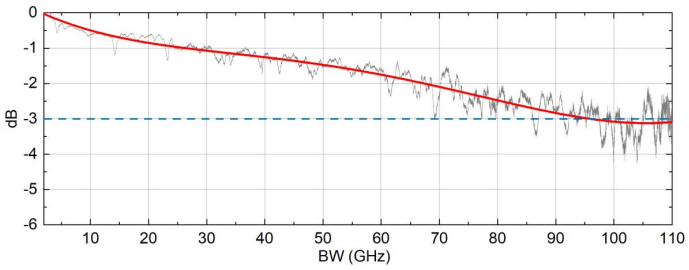


Figure 1: S21

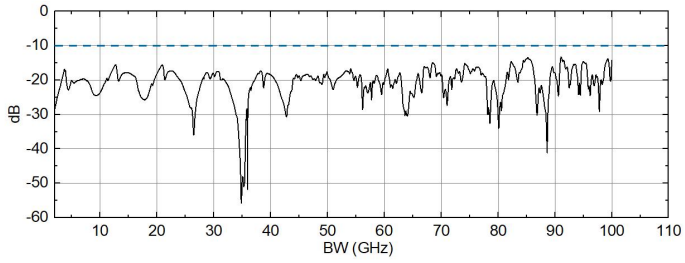


Figure 1: S11

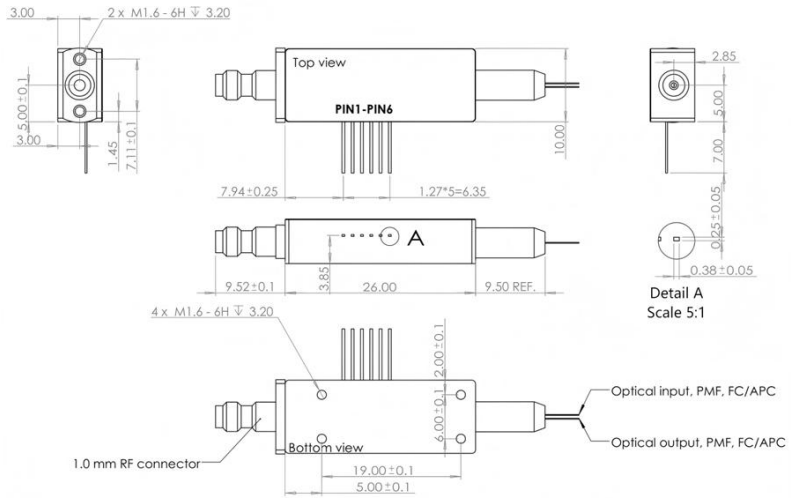
Electrostatic Discharge (ESD) Protection

This product contains ESD-sensitive components (MPDs). Necessary ESD protection measures must be taken when using it.



Dimensions and Pin definitions

Package dimensions and pin definition (unit: mm)



*Note：

1.Unless other wise specified tolerance:±0.15 mm;

2.The REF.dimension will not be measured in batch.

Pin	Symbol	Description
1	-	N.C. (Not Connected)
2	-	N.C. (Not Connected)
3	Heater	Thermo-Optic Bias Electrode
4	Heater	Thermo-Optic Bias Electrode
5	MPDO+	Monitor PD Anode (Modulator Output)
6	MPDO-	Monitor PD Cathode (Modulator Output)
RF	RF Connector	1.0 mm K connector
In	Input fiber	FC/APC, PMF
Out	Output fiber	FC/APC, PMF