

TFLN Intensity Modulator

(No light source)

Features

- ※ High RF Bandwidth up-to 40 GHz
- ※ Low half-wave voltage down-to 2 V
- ※ Low insertion loss down-to 4.5 dB
- ※ Small device size



Description of TFLN Intensity Modulator

The thin-film lithium niobate (TFLN) intensity modulator is an exceptional opto-electric converter device, which was developed in-house and showcased unparalleled performance. This device features thermal-optic bias control interface and is manufactured using advanced coupling and micro-electronic processes, and realizes high opto-electric conversion efficiency on TFLN. Compared to other commercial bulk lithium niobate-based modulators, our products provide superior characteristics on half-wave voltage, stability, and device size, significantly enhancing critical performance in digital optical communications and telecommunication networks.

Absolute Maximum Ratings

Working over maximum ratings could significantly reduce device reliability and cause irreversible damage.

Parameters	Symbol	Min.	Max.	Unit
RF Input Power	Sin	-	23	dBm
RF Swing Voltage	Vpp	-4.465	+4.465	V
RF RMS Voltage	Vrms	-	3.16	V
Optical Input Power	Pin. max	-	20	dBm
Heater Bias Voltage	Vh	0	5	V
Storage Temperature	Ts	-40	85	°C
Relative Humidity (no condensation)	RH	5	90	%

Specifications

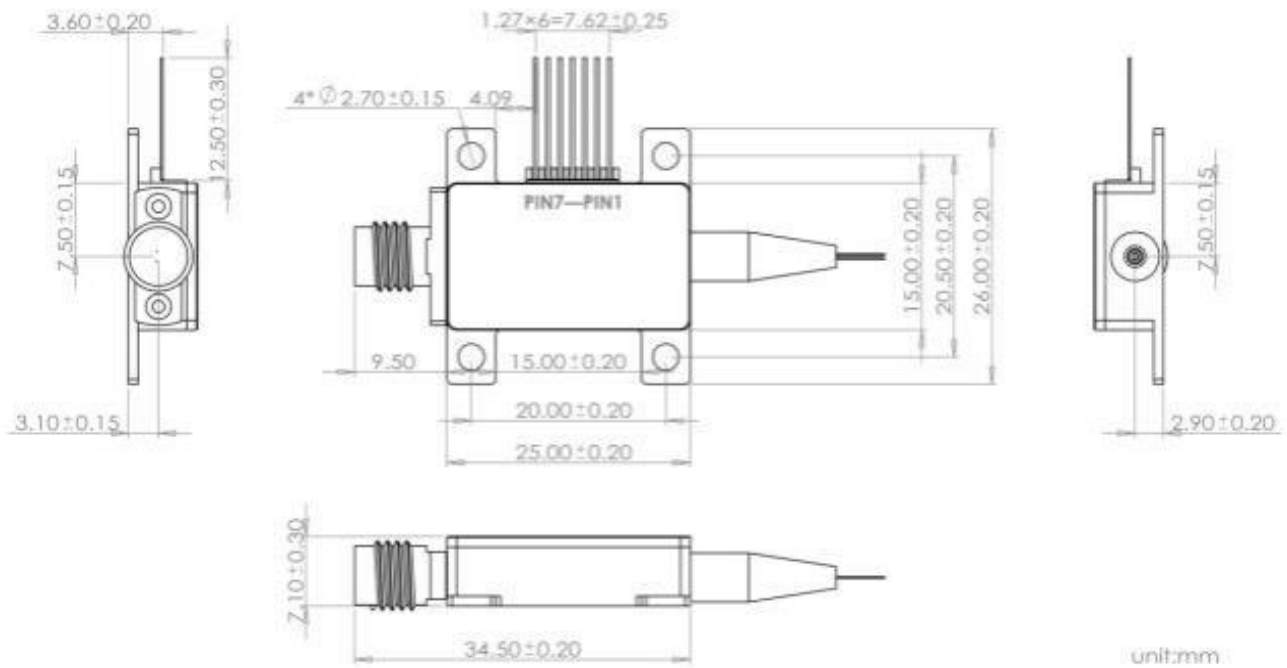
Category	Parameters	Symbol	Unit	Performance	
Optical Features	Operating Wavelength	λ	nm	X2: C	
				~1550	
	Optical Extinction Ratio (@ DC)	ER	dB	≥ 20	
	Optical Return Loss	ORL	dB	≤ -27	
Electrical Features	Optical Insertion Loss	IL	dB	Max: 5.5 Typ: 4.5	
	3dB Bandwidth (from 2 GHz)	S ₂₁	GHz	X1 : 2	X1 : 4
				Min: 18 Typ: 20	Min: 36 Typ: 40
	RF Load	R _m	Ohm	50±10	
	RF V _π (@ 50 KHz)	V _π	V	X3: 5	X3: 6
				Max: 3.0 Typ: 2.5	Max: 3.5 Typ: 3.0
	Heater Resistance	R _h	Ohm	220±10	
Work Condition	Heater P _π (@ DC)	P _π	mw	≤ 50	
	RF Return Loss (10 MHz to 40 GHz)	S ₁₁	dB	≤ -10	
	Operating Temperature*	T _o	°C	-20~70	

*Customization is available.

Category	Parameters	Symbol	Unit	Performance	
Optical Features	Operating Wavelength	λ	nm	X ₂ : O	
				~1310	
	Optical Extinction Ratio (@ DC)	ER	dB	≥ 20	
	Optical Return Loss	ORL	dB	≤ -27	
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	3 dB Bandwidth (from 2 GHz)	S ₂₁	GHz	X ₁ : 2	X ₁ : 4
				Min: 18 Typ: 20	Min: 36 Typ: 40
	RF Load	R _m	Ohm	50±10	
	RF V _π (@ 50 KHz)	V _π	V	X ₃ : 4	
				Max: 2.5 Typ: 2.0	
	Heater Resistance	R _h	Ohm	220±10	
Work Condition	Heater P _π (@ DC)	P _π	mw	≤ 50	
	RF Return Loss (10 MHz to 40 GHz)	S ₁₁	dB	≤ -10	
	Operating Temperature*	T _o	°C	-20~70	

*Customization is available.

Package and Pins (Unit: mm)



PIN	Symbol	Description
1	MPD0+	MPD0 anode (GND)
2	MPD0-	MZ modulator input optical power monitor MPD0 cathode
3	Heater+	Heater bias positive electrode
4	Heater-	Heater bias negative electrode
5	MPD1 +	MPD1 anode (GND)
6	MPD1-	MZ modulator output optical power monitor MPD1 cathode
7	-	N/A
RF	RF connector*	2.92mm connector
In	Input fiber	FC/APC, PMF
Out	Output fiber	FC/APC, PMF

* Customizable 1.85mm connector.

S21 & S11 Measurement (Typical)

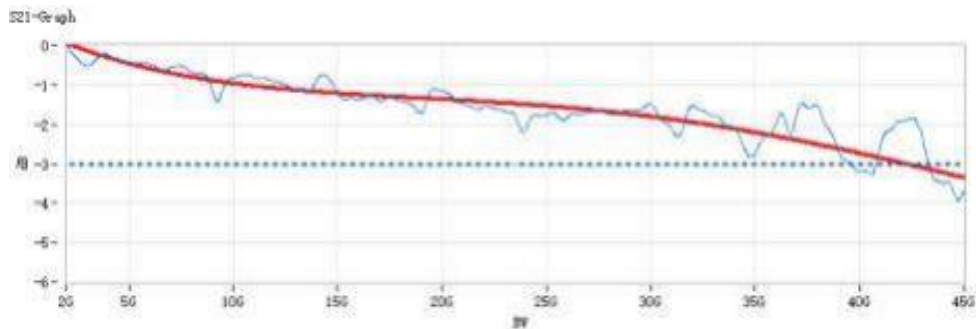


Figure 1: S21

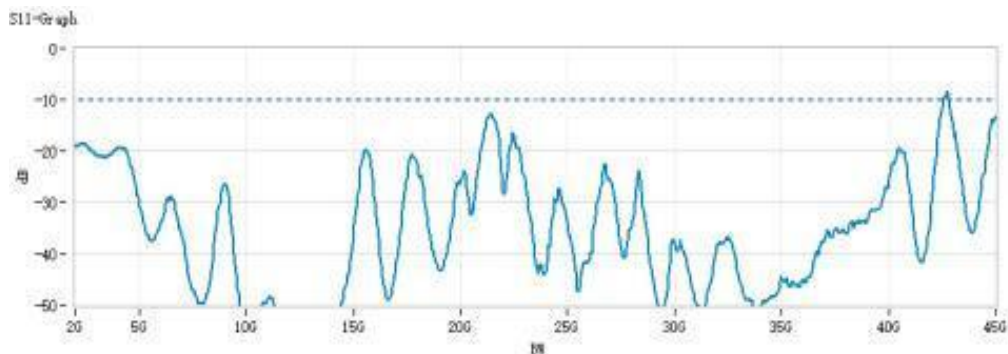


Figure 2: S11

Ordering Information

P/N: NY - X_1X_2 6PPBM X_3 1

Optional Model	Description	Optional Code	
X ₁	RF 3dB Bandwidth	2 or 4	
X ₂	Working Wavelength	O or C	
X ₃	RF V _π	5 or 6 for C-band	4 for O-band

Product Description: LiNbO₃ TFLN intensity modulator device, polarization maintaining fiber as optical input and output.

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