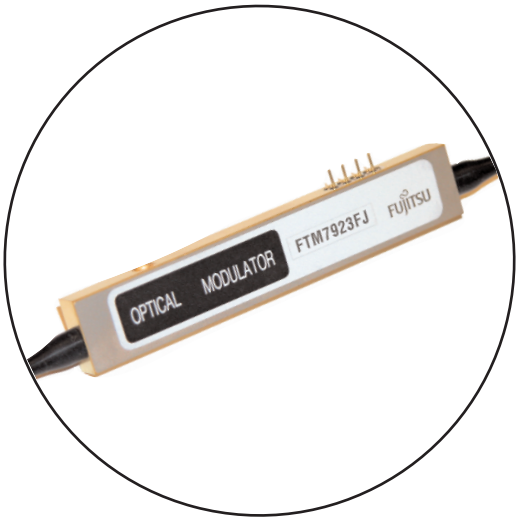
Single Drive 12.5Gb/s LN Modulator with Monitor PD — *FTM7923FJ*

FEATURES

- Operation up to 12.5Gb/s
- Zero Chirp Single Drive Modulator
- X-Cut LN
- Integrated Monitor Photodiode
- GPO RF Input Connector



DESCRIPTION

The FTM7923FJ is a Ti:$LiNbO_3$ Single Drive Mach-Zehnder modulator with a modulation speed of up to 12.5 Gb/s. This optical modulator integrates a monitor PD chip and coupler function for automatic bias control (ABC) for the compensation system of DC-drift and other phenomena.

ABSOLUTE MAXIMUM RATINGS (Tc=25°C, Unless otherwise specified)

Parameter	Symbol	Condition	Limits			Unit
			Min.	Typ.	Max.	
Storage Temperature	T_{stg}	Ambient	-40	-	85	°C
Operating Case Temperature	T_{op}	Case	-5	-	75	°C
Storage Relative Humidity	RH_{stg}		30	-	85	%
Operating Relative Humidity	RH_{op}		30	-	85	%
DC Input Voltage	$V_{in(DC)}$		-20	-	20	V
Optical Input Power	$P_{in(opt)}$	At 1550nm	-	-	50	mW
Monitor PD Reverse Voltage	V_{RM}		-	-	20	V
Monitor PD Reverse Current	I_{RM}		-	-	1	mA
Monitor PD Forward Current	I_{FM}		-	-	3	mA

ELECTRICAL CHARACTERISTICS (Tc =-5 to 75°C, 20 years Unless otherwise specified)

Parameter	Symbol	Condition	Limit			Unit
			Min.	Typ.	Max.	
Drive Voltage	$V\pi$	At 12.5Gb/s	-	4.5	5.0	V
Drive Voltage	V_{π}	At low frequency	-	3.4	4.0	V
DC Bias Voltage	V_{Bias}	Tavg=65°C, 20 years	-12	-	12	V
Electrical Return Loss	S_{11}	130MHz ≤ f ≤ 10GHz	10	-	-	dB

Note 1. See Table 1 for test reference.

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OPTICAL SPECIFICATIONS (Tc=-5 to 75°C, 20 years)

Parameter	Symbol	Condition	Limit			Unit
			Min.	Typ.	Max.	
Optical Bandwidth	BW	3dB Down Relative to 130MHz, Small-signal	10	11	-	GHz
Operating Wavelength	λ_{op}	C Band	1530	-	1570	nm
		L Band	1570	-	1610	
On/Off Extinction Ratio	R_{ext}	At Low Frequency	20	22	-	dB
		At 12.5Gb/s	12	13	-	
Optical Return Loss	ORL	Input Port	35	-	-	dB
Optical Insertion Loss	IL	C Band, No Connector	-	4.0	6.0	dB
		L Band, No Connector	-	4.5	6.5	
Operating Bit Rate		-	12.5	-	-	Gb/s
Alpha Parameter	α	-	-0.1	0	+0.1	-

Note 1. See Table 1 for test reference.

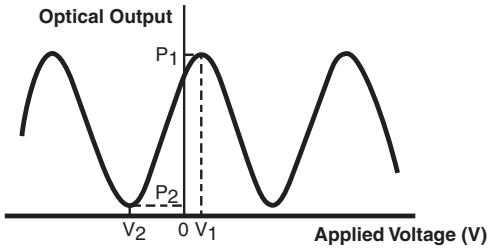
ELECTRO-OPTICAL SPECIFICATIONS OF MONITOR PD (Tc=-5 to 75°C, 20 years)

Parameter	Symbol	Condition	Limit			Unit
			Min.	Typ.	Max.	
Responsivity	$RmAC_{out}$	-	0.001	0.012	-	A/W
Bias Shift	-	-	-5.0	0	+5.0	%
Monitor PD Vπ Difference	-	Difference at Low Frequency Vπ	-0.3	0	+0.3	V
PD Extinction Ratio	-	-	-	8	-	dB
PD Capacitance	C_t	PD bias=2V, 1MHz@25°C	-	-	1.1	pF
PD Dark Current	I_d	PD bias=5V	-	-	100	nA

Note 1. See Table 1 for test reference.

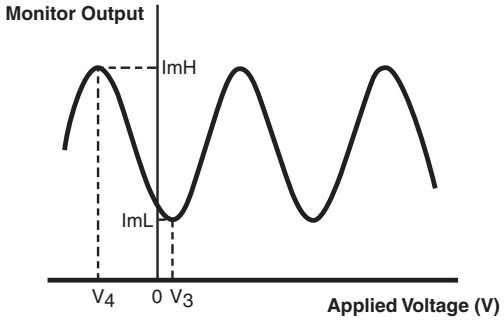
Table 1

1. Optical Output Characteristics



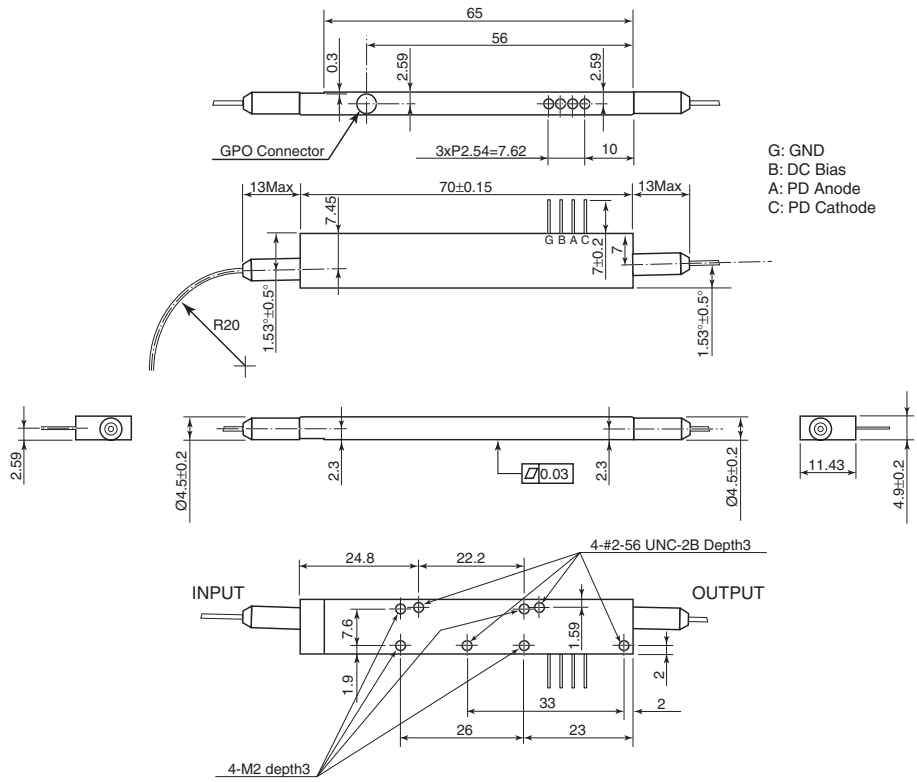
	Parameter	Definition	Remarks
1	Drive Voltage (Vπ)	$\lvert V_1 - V_2 \rvert$	V_1: Minimum absolute applied voltage corresponding to maximum optical output V_2: Minimum absolute applied voltage corresponding to minimum optical output
2	On/Off Extinction Ratio	$-10 \times \mathrm{Log}(P_2/P_1)$	P_1: Optical output at V_1 P_2: Optical output at V_2 P_0: Optical input to modulator
3	Optical Insertion Loss	$-10 \times \mathrm{Log}(P_1/P_0)$	

2. Monitor Current Characteristics



	Parameter	Definition	Remarks
1	Responsivity (RmACout)	$(\mathrm{ImH} - \mathrm{ImL})/P_1$	V_1: Minimum absolute applied voltage corresponding to maximum optical output V_3: Minimum absolute applied voltage corresponding to minimum monitor current V_4: Minimum absolute applied voltage corresponding to maximum monitor current $V\pi m$: $\lvert V_3 - V_4 \rvert$ ImH: Monitor current at V_3 ImL: Monitor current at V_4 P_1: Optical output at V_1
2	Bias Shift	$((V_1 - V_3)/V\pi) \times 100$	
3	Monitor PD Vπ Difference	$V\pi m - V\pi$	
4	PD Extinction ratio	$10 \times \mathrm{Log}_{10}(\mathrm{ImH}/\mathrm{ImL})$	

"FJ" Package **UNIT: mm**



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