

O-band 56GBaud InP Mach-Zehnder-Modulator

General Description

The Indium-Phosphide Mach-Zehnder-Modulator is ideally suited for optical transport applications within the O-band. It features a unique traveling-wave-electrode design, resulting in high bandwidth and zero chirp.

Applications

56GBaud OOK, 4PAM, 2PSK

Features

- O-band operations (1280-1340nm)
- High bandwidth
- Traveling-wave-electrode design with zero chirp
- Evaluation-board available (for easy DC- connection)
- Adjustable $V\pi$

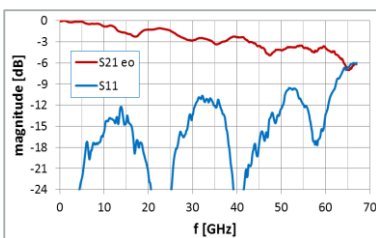


Operating Conditions / Absolute Maximum Ratings

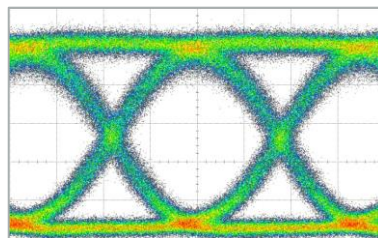
Parameter	Unit	Min	Typ	Max
Optical wavelength	nm	1280	1310	1340
Optical input power	dBm		10	16
Temperature	°C		25	50
Bias voltage V_{bias}	V	3		10
Phase-voltage	V	-10		0
TEC driving current	A			1

Performance

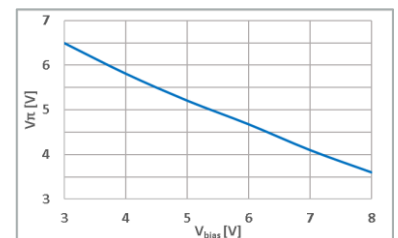
Parameter	Symbol	Unit	Typ	Comments
Insertion loss	IL	dB	8.5	@ max. transmission
Extinction ratio (dynamic)	ER	dB	>10	@ 56GBaud
Extinction ratio (DC)	ER	dB	>20	
3dB EO cut-off frequency	$f_{3\text{dB}}$	GHz	35	
Bias voltage	V_{bias}	V	8	
Phase voltage	P1 P2	V	-3	quadrature point
$V\pi$		V	3.5	@ $V_{\text{bias}} = +8\text{V}$



Small signal response



Eye diagram @ 56GBaud (RF- V_{pp} : 3.5V)



$V\pi = f(V_{\text{bias}})$ @ 1310 nm

HHI reserves the right to change specifications without any prior notice at any time

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General Instructions / Precautions

An InP-Mach-Zehnder-Modulator contains several semiconductor-p-i-n junctions, a faulty DC-operation will result in an irreversible damage of the device. Please use the electric circuit diagram for correct DC-wiring. Don't exceed maximum values for Phase- and Bias-voltages. V_{bias} has to be always positive, referenced against GND. Phase voltages has to be always negative, referenced against V_{bias} . Use voltage sources with integrated current limiter.

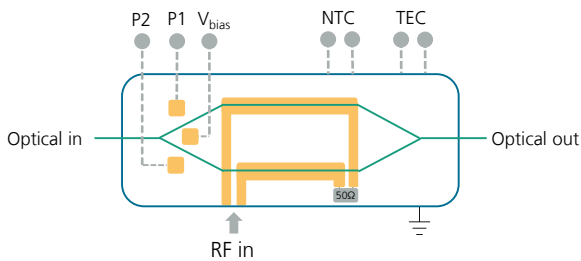
Limits: V_{bias} : 3 mA, Phase: 1 mA.

The use of an external temperature controller is highly recommended, otherwise the operating point is not stable over time.

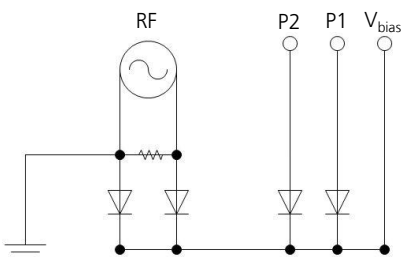
Connections / Specifications

- Optical connections: SSMF with FC/APC connectors
- RF: single ended, 1.85mm female
- DC: 14 PIN breakout, optional: evaluation board with preconfigured cable assembly available on request
- NTC: BetaTHERM NTC 10K3CG3
($R @25^{\circ}\text{C} = 10\text{k}\Omega$; $\alpha @25^{\circ}\text{C} = -4.39\%$; $\beta @50^{\circ}\text{C} = 3892$)
- TEC: peltier-element (1A max current)

Device diagram



Electric circuit diagram



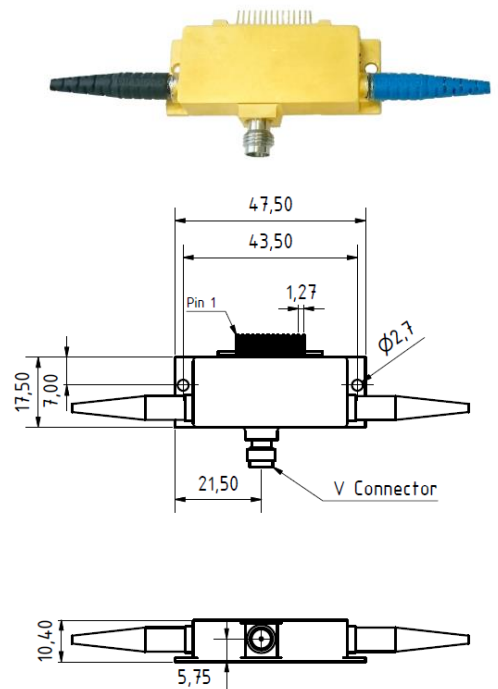
Part Number

- Module: MZM_M_O_35_22

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Drawings / Pictures



PIN layout

PIN No	Function
1	TEC+
2	TEC-
3	V_{bias}
4	not used
5	not used
6	P1
7	P2
8	NTC+
9	NTC-
10	not used
11	not used
12	not used
13	not used
14	not used