

O-band-DFB + Mach-Zehnder-Modulator

General Description

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

Applications

100GBaud OOK, 4PAM, 2PSK

Features

- O-band operation
- Integrated DFB-laser
- High bandwidth
- Traveling-wave-electrode design with zero chirp
- Evaluation-board available (for easy DC- connection)

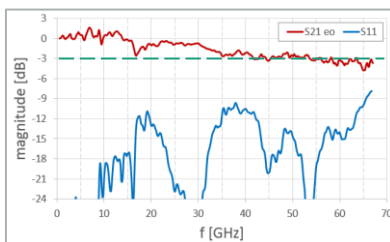


Operating Conditions / Absolute Maximum Ratings

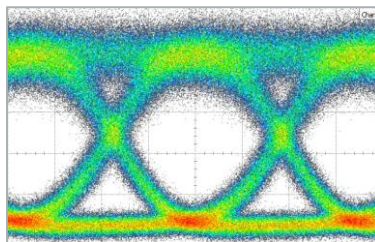
Parameter	Unit	Min	Typ	Max
Chip temperature	°C		18	30
LD current I_{DFB}	mA	+65	+100	+120
Bias-Voltage	V	+3	+7	+10
Phase-Voltage	V	0		-10

Performance

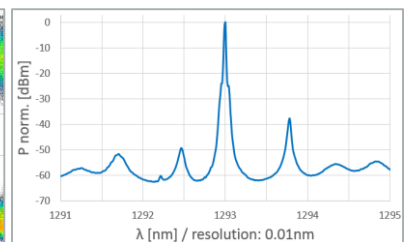
Parameter	Symbol	Unit	Typ	Comments
Output Power	P_{out}	dBm	+6	@ max. transmission
Wavelength	λ	nm	1293	@ 100 mA, 18°C
Side mode suppression ratio	SMSR	dB	35	
Extinction ratio (dynamic)	ER	dB	>10	@ $V_{bias} = +7$ V, 56Gbit/s
3dB EO cut-off frequency	f_{3dB}	GHz	40	
Phase voltage	$P1 P2$	V	-2.0	quadrature point
$V\pi$		V	3.6	@ $V_{bias} = +7$ V



Small signal response



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



DFB spectrum @ 18°C, 100mA

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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} and has to be always positive, referenced against GND. Phase voltages has to be always negative, referenced against V_{bias} . I_{LD} reference is V_{bias} . Use sources with integrated current limiter and voltage limiter, respectively.

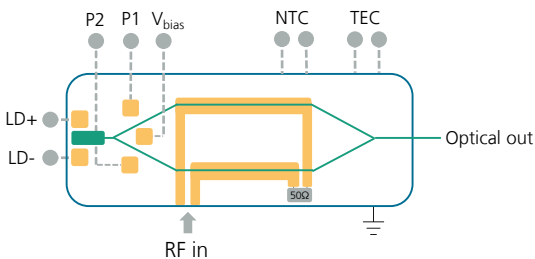
Limits: V_{bias} : 5mA, Phase: 1mA, LD: 2.5V

An external temperature controller is mandatory.

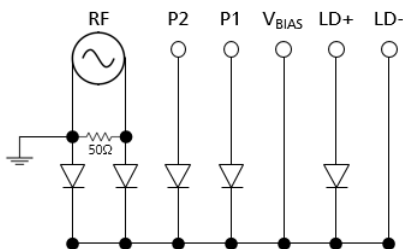
Connections / Specifications

- Optical connection: SSMF with FC/APC connectors
- RF: single ended, 1.85mm female, 50 Ω
- DC: 14 PIN breakout, evaluation board with preconfigured cable assembly available
- NTC: BetaTHERM NTC 10K3CG3
(R @25°C = 10k Ω ; α @25°C = -4.39%; β 0/50°C = 3892)
- TEC: peltier-element (1A max current)

Device diagram



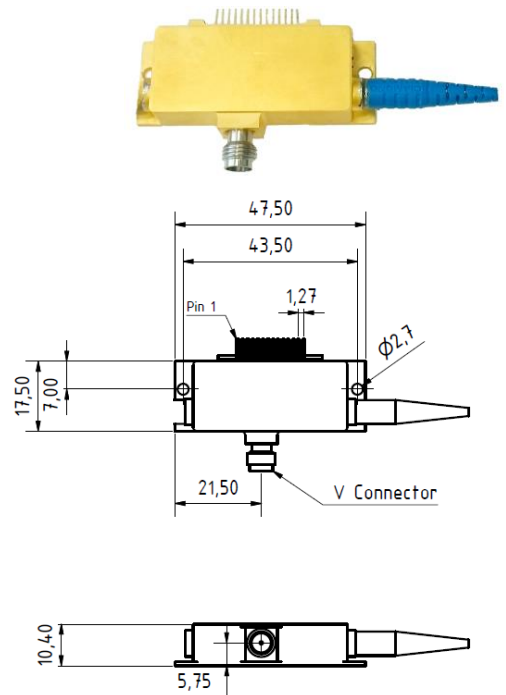
Electric circuit diagram



Part Number

- Module: LMZM_M_O_40_19

Drawings / Pictures



PIN layout

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