

O-band 40 GBaud InP

DFB Laser Mach-Zehnder-Modulator

General Description

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

Applications

40GBaud OOK, 4PAM, 2PSK

Features

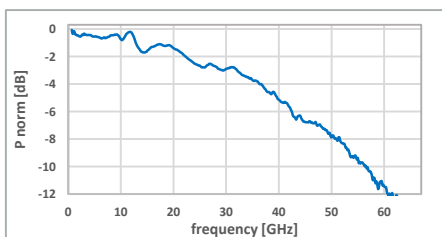
- O-band operation
- Integrated DFB laser
- Traveling-wave-electrode design with zero chirp
- Adjustable $V\pi$
- Small foot print (8.0 x 0.5 x 0.2mm)
- AR-coated output facet with spot size converter for efficient optical coupling

Operating Conditions / Absolute Maximum Ratings

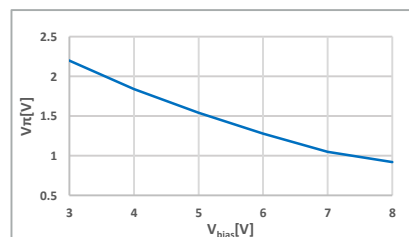
Parameter	Unit	Min	Typ	Max
Temperature	°C		20	40
Bias current I	mA		100	120
Bias voltage V_{bias}	V	3	6	10
Phase-voltage	V	-10		0

Performance

Parameter	Symbol	Unit	Typ	Comments
Output Power	P_{out}	dBm	4	@ max. transmission
Wavelength	λ	nm	1293	@ 100 mA, 20°C
Side mode suppression ratio	SMSR	dB	40	
Extinction ratio (DC)	ER	dB	> 20	@ $V_{bias} = +5$ V
3dB EO cut-off frequency	f_{3dB}	GHz	33	
Phase voltage	P1 P2	V	3	quadrature point
$V\pi$		V	1.6	@ $V_{bias} = +5$ V



Small signal response (S21 eo)



$V\pi = f(V_{bias})$ @ 1293 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. The laser should not be connected to GND.

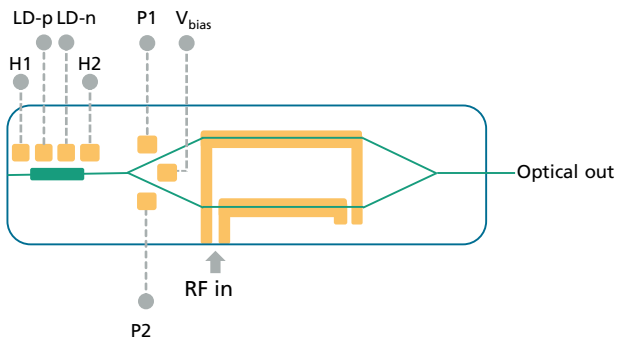
Limits: V_{bias} : 3 mA, Phase: 1 mA, Laser: 2.5 V.

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

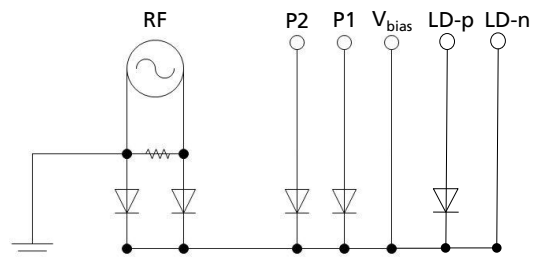
Connections / Specifications

- Optical coupling: SSMF with tapered fiber / lense recommended
- Contact-pad material: Au
- DC-pad dimensions: 85 x 85 μm
- RF-pitch: 150 μm , external 50 Ω needed for RF-operation
- Integrated heater for wavelength fine-tuning (H1, H2)

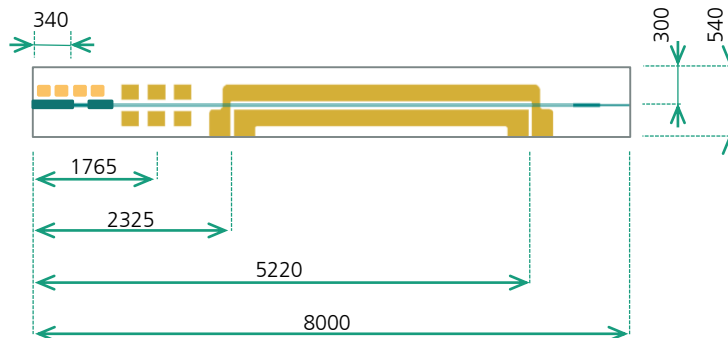
Device diagram



Electric circuit diagram



Chip dimensions [μm]



Part Number

- Chip: MZM_D_O_33_19

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