

# C-band InP IQ-Mach-Zehnder-Modulator

## General Description

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

## Applications

APSK (QAM)

## Features

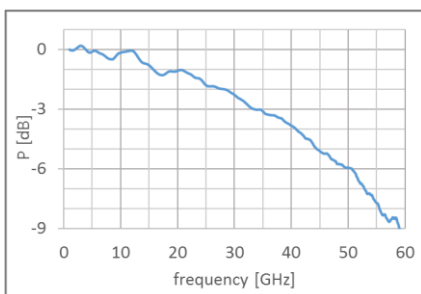
- C-band operations (1527-1568nm)
- Traveling-wave-electrode design with zero chirp
- Low drive voltage ( $V\pi$ ), adjustable
- Small foot print (12 x 0.8 x 0.2mm)
- AR-coated facets with spot size converter for efficient optical coupling
- On-chip monitor PD

## Operating Conditions / Absolute Maximum Ratings

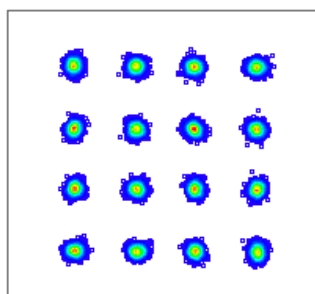
Parameter	Unit	Min	Typ	Max
Optical wavelength	nm	1527	1550	1568
Optical input power	dBm		10	16
Temperature	°C		40	50
Bias voltage $V_{\text{bias}}$	V	3		10
Phase-voltage	V	-10		0

## Performance

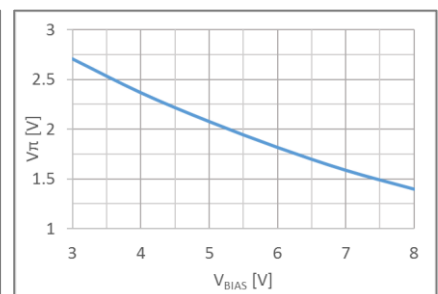
Parameter	Symbol	Unit	Typ	Comments
Insertion loss	IL	dB	8	@ max. transmission
Extinction ratio (DC) child, parent	ER	dB	>22	
3dB EO cut-off frequency	$f_{3\text{dB}}$	GHz	32	
Bias voltage	$V_{\text{bias}}$	V	5	
$V\pi$		V	2.0	@ $V_{\text{bias}} = +5\text{V}$



Small signal response (S21 eo)



QAM16 @ 32GBaud



$V\pi = f(V_{\text{bias}})$  @ 1550nm

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

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# C-band InP IQ-Mach-Zehnder-Modulator

## General Instructions / Precautions

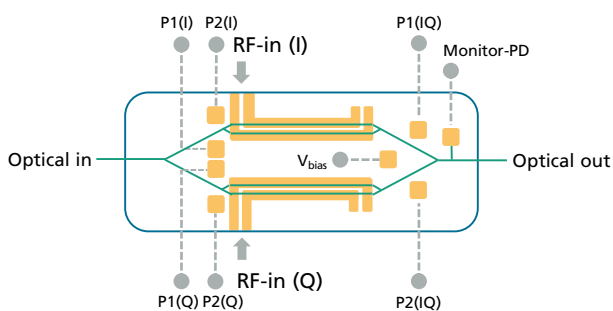
An InP-IQ-Mach-Zehnder-Modulator contains several semiconductor-p-i-n junctions, a faulty DC-operation will result in an irreversible damage of the device. Please use the electric circuit diagram for correct DC-wiring. Don't exceed maximum values for Phase- and Bias-voltages.  $V_{bias}$  has to be always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

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

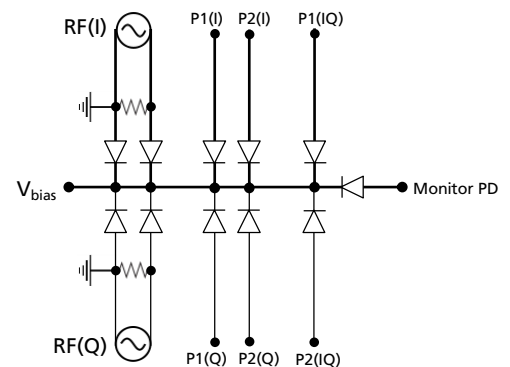
## Connections / Specifications

- Optical coupling: SSMF with tapered fiber / lense recommended
- Contact-pad material: Au
- DC-pad dimensions: 85 x 85 $\mu$ m
- RF-pitch: 100 $\mu$ m, external 50 $\Omega$  needed for RF-operation

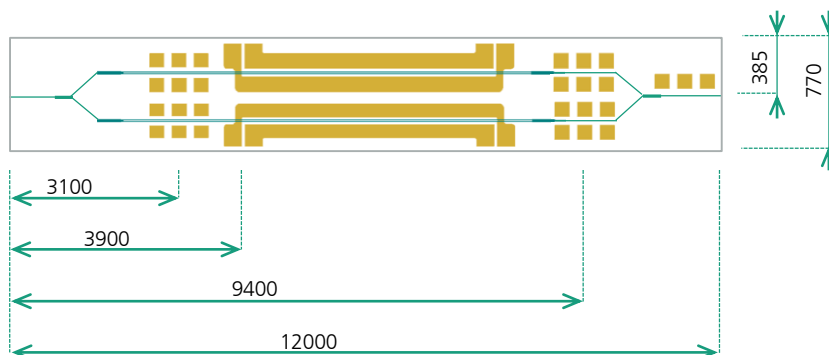
## Device diagram



## Electric circuit diagram



## Chip dimensions [ $\mu$ m]



## Part Number

- Chip: IQM\_D\_C\_32\_19

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