

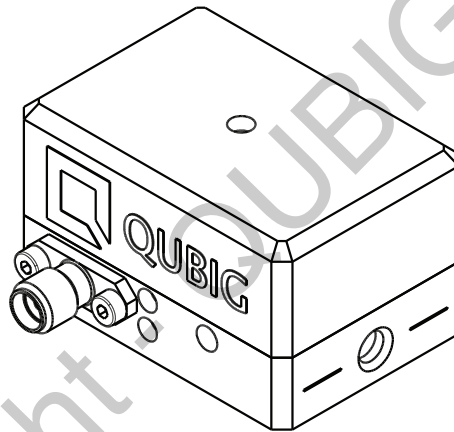


Test Data Sheet

PMx-Yb174_3.8M2

S/N:

Resonant electro-optic phase modulator



RF properties	Value	Unit
Resonance frequency: f_0 ¹⁾	3.80	GHz
Bandwidth: $\Delta\nu$	8.02	MHz
Quality factor: Q	474	
Required RF power for 1rad @ 555nm ²⁾	25.9	dBm
max. RF power: RF_{max} ³⁾	33	dBm
Temperature dependence:	0.78	MHz/K
max. operating Temperature	50	°C

Optical properties		
EO crystal	MLN	
Aperture	2x2	mm ²
Wavefront distortion (633nm)	$\lambda/4$	nm
recommended optical intensity (555nm)	<1	W/mm ²
AR coating (R<0.5%)	360 - 650	nm

¹⁾ at 25°C ²⁾ with 50Ω termination ³⁾ no damage with $RF_{in} < 3W$

Measured modulation

Fig. 1: Oscilloscope trace

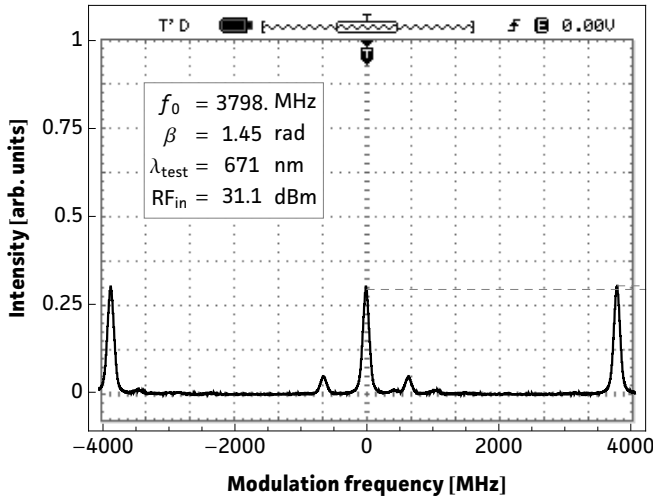


Fig. 2: Carrier/sideband ratio

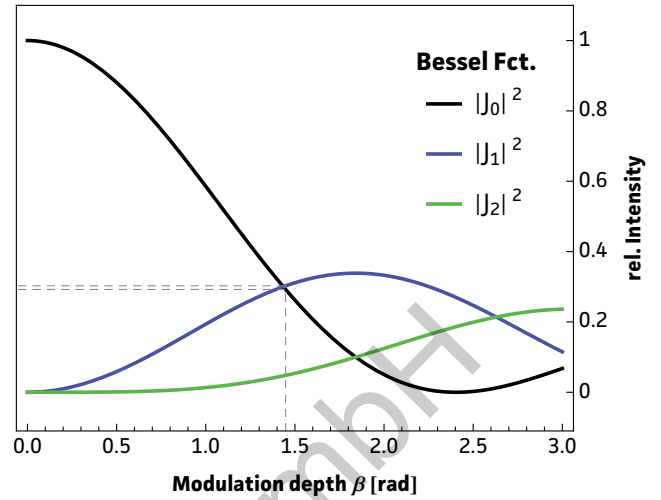


Table 1: Expected modulation

$\beta = 1 \text{ rad}$	unit	λ_1	λ_2
λ	nm	555	671
P	dBm	25.9	27.9
P	mW	388	615
U	V_p	6.2	7.8
U_π	V_p	19.6	24.6
β / U	rad / V	0.16	0.13

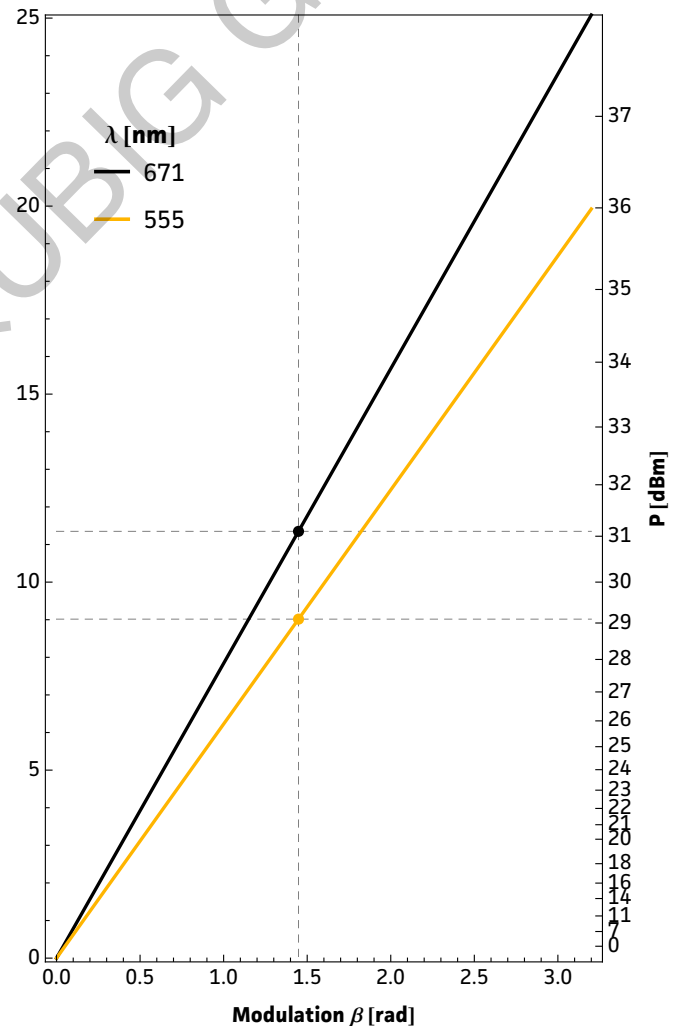


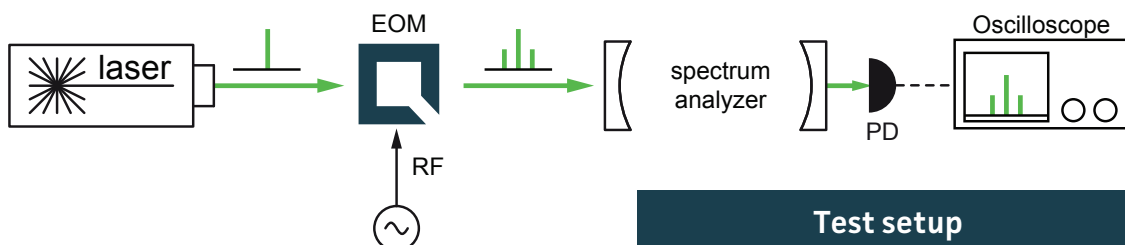
Fig.1: Recorded oscilloscope trace retrieved from a test setup as illustrated below.

Fig.2: Squared absolute values of first-kind Bessel functions vs. modulation depth. Vertical lines reveal the ratio between the carrier $|J_0|^2$ and the i^{th} sideband $|J_i|^2$ at a specific β .

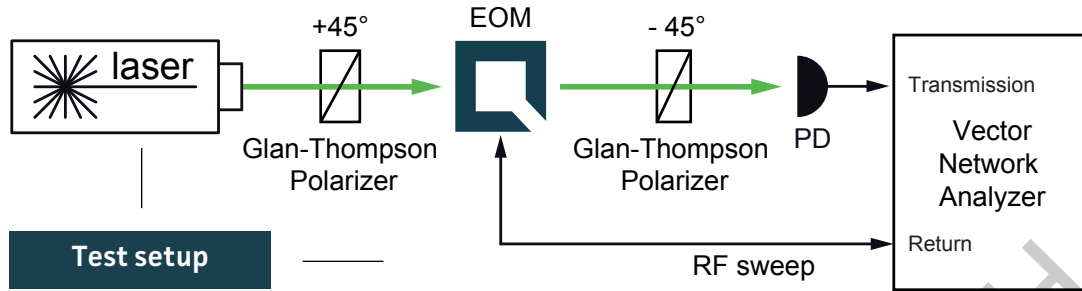
Fig.3: Dependency between RF amplitude and modulation depth for different wavelengths. Points on the curve allow to retrieve either the required RF amplitude for a specific/desired β or the max. achievable modulation depth for a given/available RF power.

Table 1: Expected RF-amplitude/-power values and conversion factors for the required wavelength at the reference modulation depth of 1 rad.

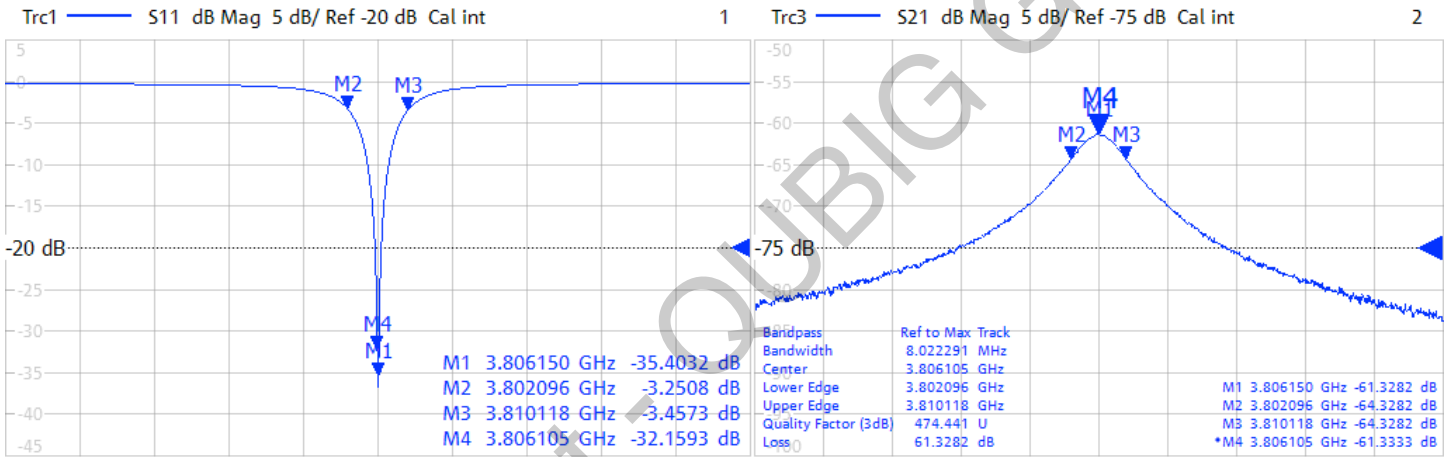
Fig. 3: RF-signal amplitude vs. modulation depth



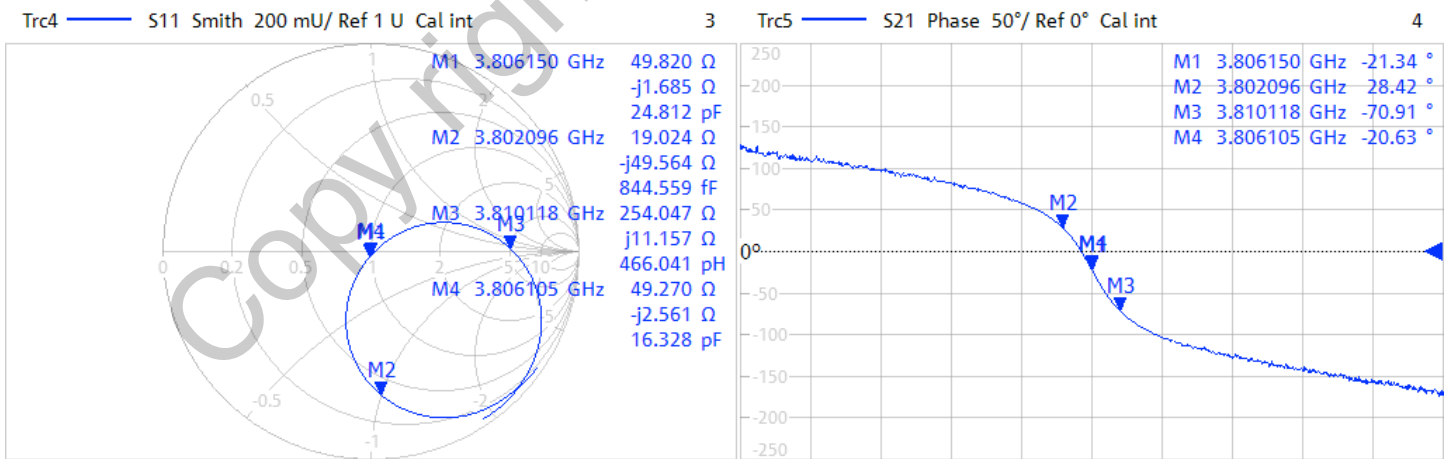
Resonance characteristics



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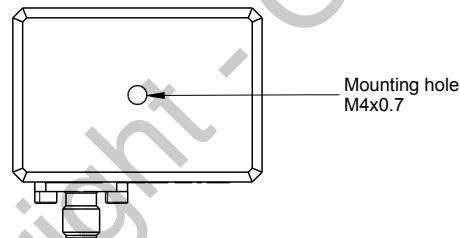
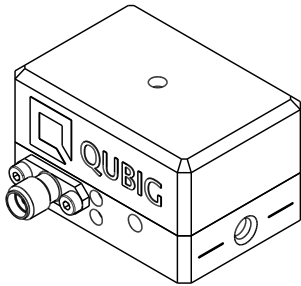
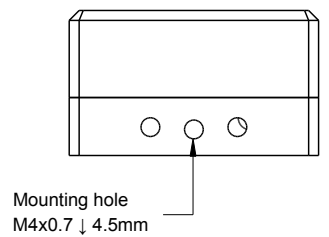
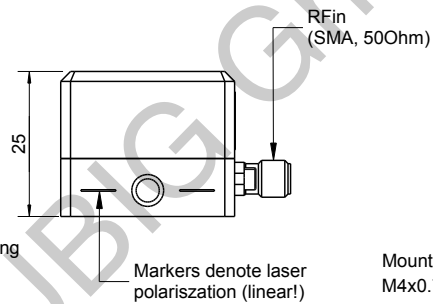
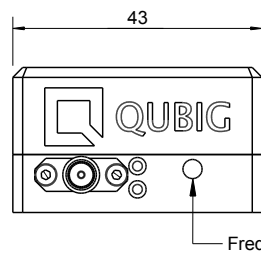
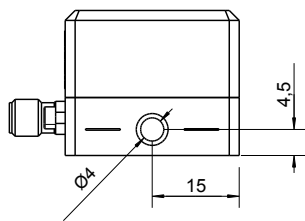
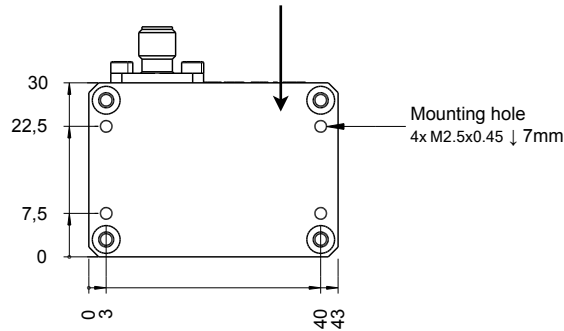
Ch1 Center 3.8062 GHz Pwr 3 dBm Bw 1 kHz Span 100 MHz Ch1 Center 3.8062 GHz Pwr 3 dBm Bw 1 kHz Span 100 MHz



Ch1 Center 3.8062 GHz Pwr 3 dBm Bw 1 kHz Span 100 MHz Ch1 Center 3.8062 GHz Pwr 3 dBm Bw 1 kHz Span 100 MHz

Package drawing

use this side for heat sinking



Handling instructions

- Input laser polarization must be aligned with respect to the white markers on the housing
- Please handle device carefully. Avoid shock. Don't drop.
- After turn on the resonance frequency might drift slightly with applied RF power. Please compensate by tuning the RF drive frequency until steady-state (~min).

Tested by:

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