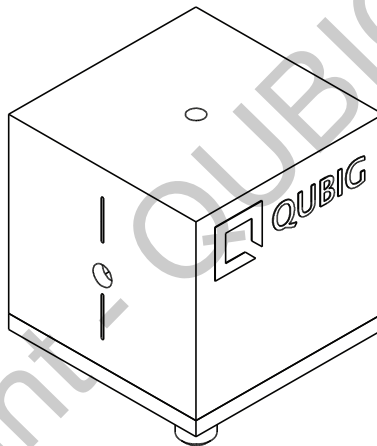




Test Data Sheet

PM7 - LWIR
(old: EO-10G3-IR4)
S/N:

Resonant electro-optic phase modulator
with
- thermal crystal mount



RF properties	Value	Unit
Resonance frequency: f_0 ¹⁾	10.0	MHz
Bandwidth: $\Delta\nu$	95	kHz
Quality factor: Q	105	
Required RF power for 1rad @ 5 μ m ²⁾	40.6	dBm
max. RF power: RF_{max} ³⁾	1	W

Optical properties		
EO crystal	GaAs	
Aperture	5x3	mm ²
Wavefront distortion (633nm)	$\lambda/4$	nm
recommended optical intensity (10 μ m)	<10	W/mm ²
AR coating (R<1%)	4.0 - 8.0	um

¹⁾ at 29°C ²⁾ with 50 Ω termination ³⁾ no damage with $RF_{in} < 1.5W$

Measured modulation

Fig. 1: Oscilloscope trace

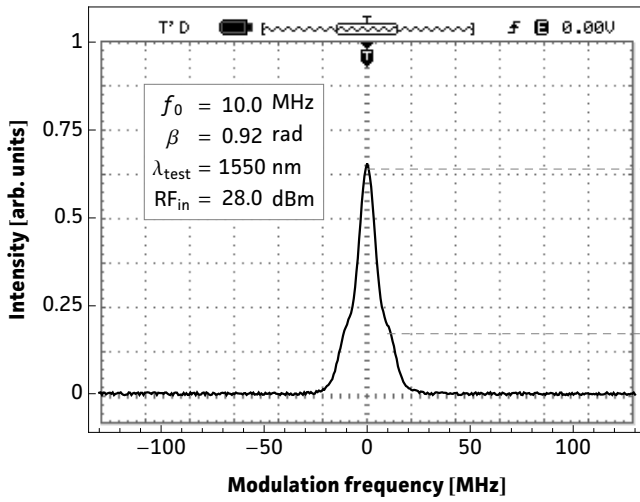


Fig. 2: Carrier/sideband ratio

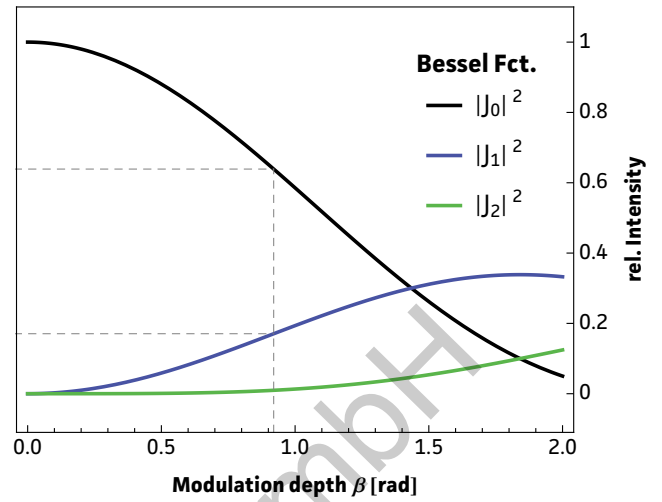


Table 1: Expected modulation

$\beta = 1 \text{ rad}$	unit	λ_1	λ_2	λ_3
λ	nm	1550	5000	8000
P	dBm	28.7	40.6	48.7
P	W	0.74	11.47	73.62
U	V_p	8.6	33.9	85.8
U_π	V_p	27.1	106.4	269.5
β / U	rad / V	0.12	0.03	0.01

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. **Note:** Experimentally recorded modulation depth displayed in Fig.1 might vary from the respective values ($\beta=1\text{rad}$) provided in the table.

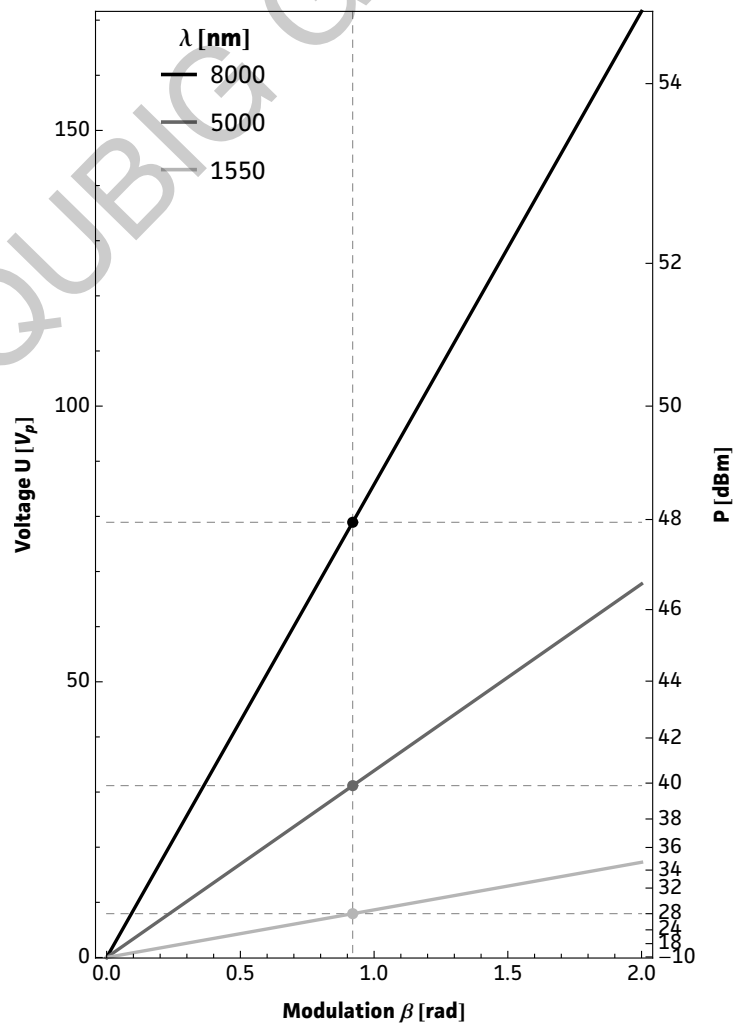
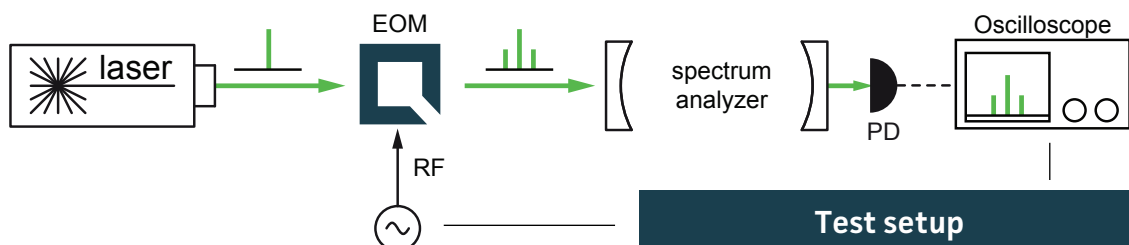
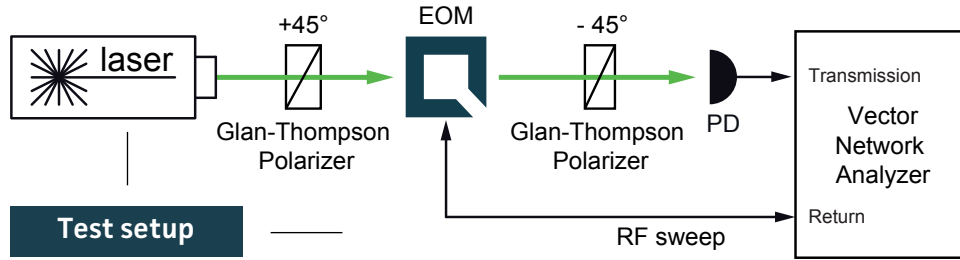


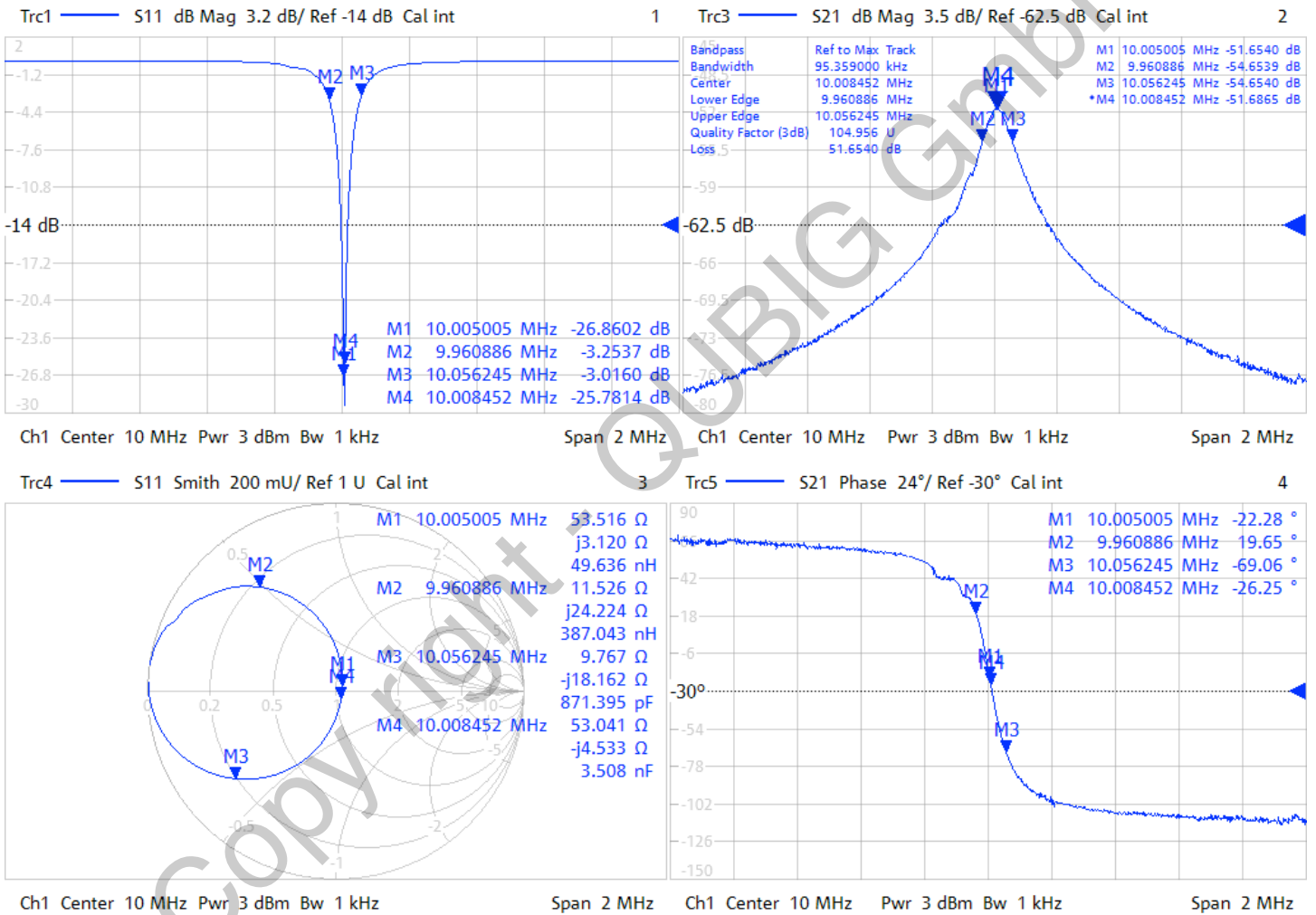
Fig. 3: RF-signal amplitude vs. modulation depth



Resonance characteristics



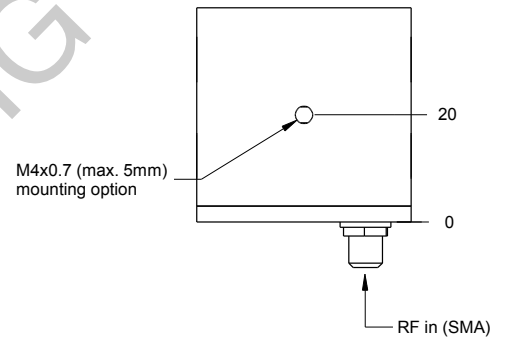
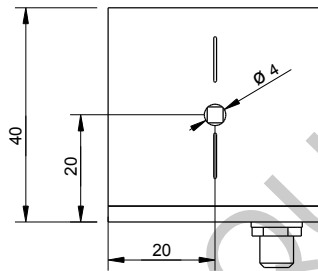
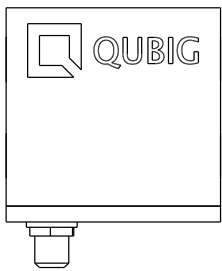
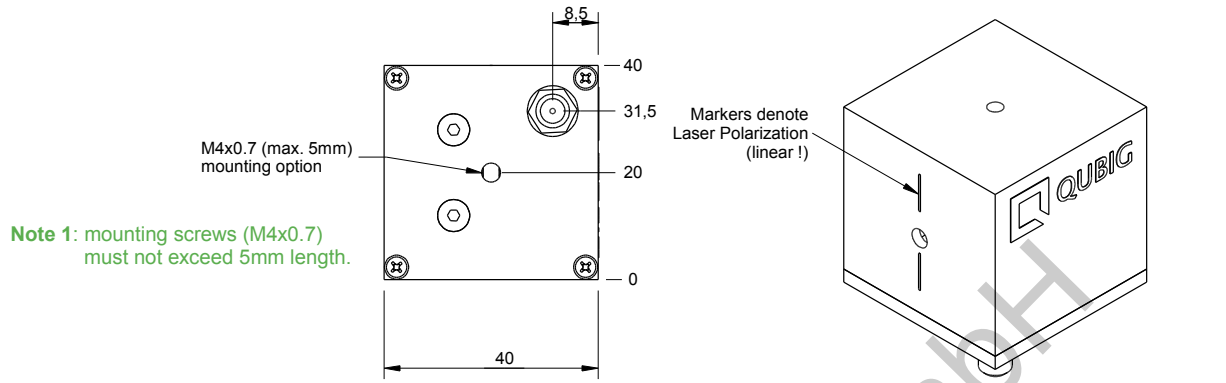
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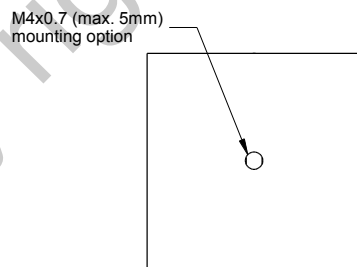
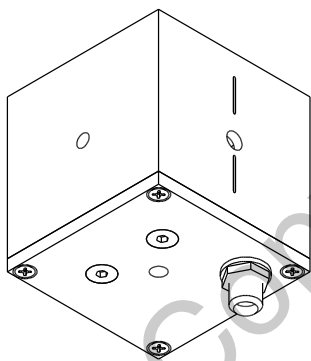
Handling instructions

- 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).
- Slight angle adjustment can reduce unwanted residual amplitude modulation (RAM)

Package drawing



Note 2: crystal aperture is 3x3mm.



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