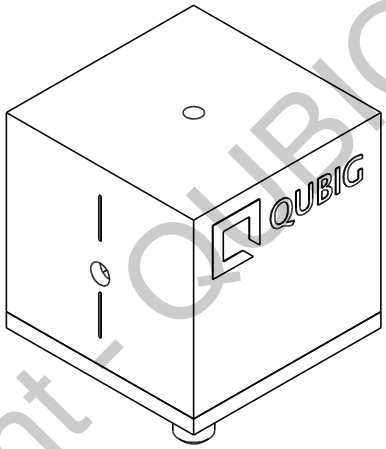
QUBIG

Empowering Laser Technologies

Test Data Sheet

PM7 - VIS
(EO-28M3-VIS)
S/N: J7729

Resonant electro-optic phase modulator
with
- thermal crystal mount



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RF properties	Value	Unit
Resonance frequency: f_0 [1]	28.9	MHz
Bandwidth: Δν	478	kHz
Quality factor: Q	60	
Required RF power for 1rad @ 369nm [2]	7.4	dBm
max. RF power: RF_{max} [3]	0.5	W

Optical properties		
EO crystal	MLN	
Aperture	3x3	mm^2
Wavefront distortion (633nm)	λ/4	nm
Recommended optical intensity (369nm)	< 0.1	W/mm^2
AR coating (R_{avg}<1%)	360 - 650	nm

[1] at 27°C [2] with 50Ω termination [3] no damage with RF_{in} < 1W

Measured modulation

Fig. 1: Oscilloscope trace

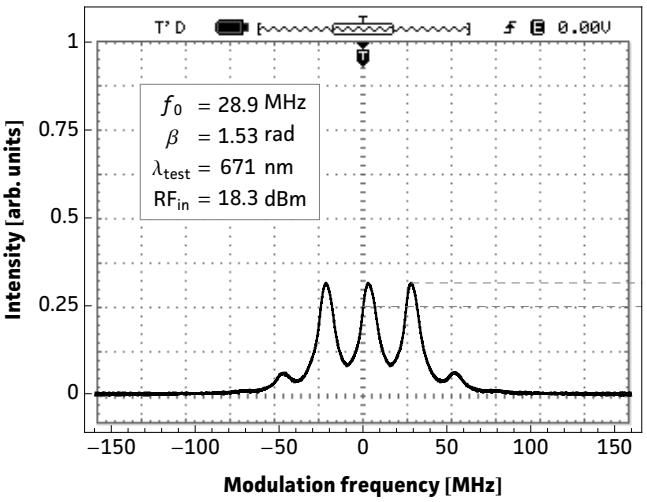


Fig. 2: Carrier/sideband ratio

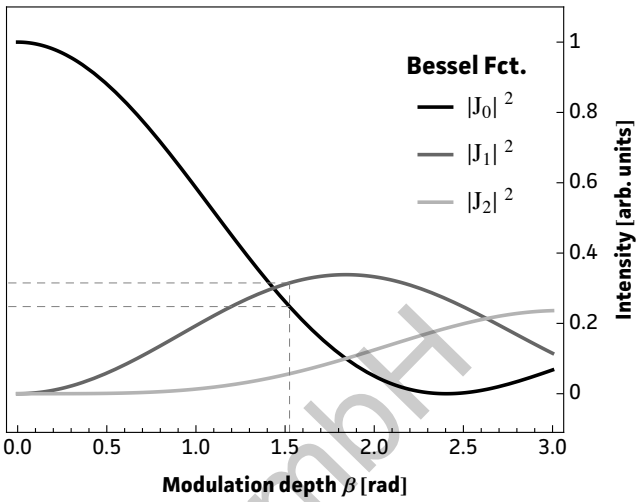


Table 1: Expected modulation

$\beta = 1$ rad	unit	λ_1	λ_2
λ	nm	**369**	**671**
P	dBm	7.4	14.7
P	mW	5	29
U	V_p	0.7	1.7
U_π	V_p	2.3	5.4
β / U	rad / V	1.35	0.58

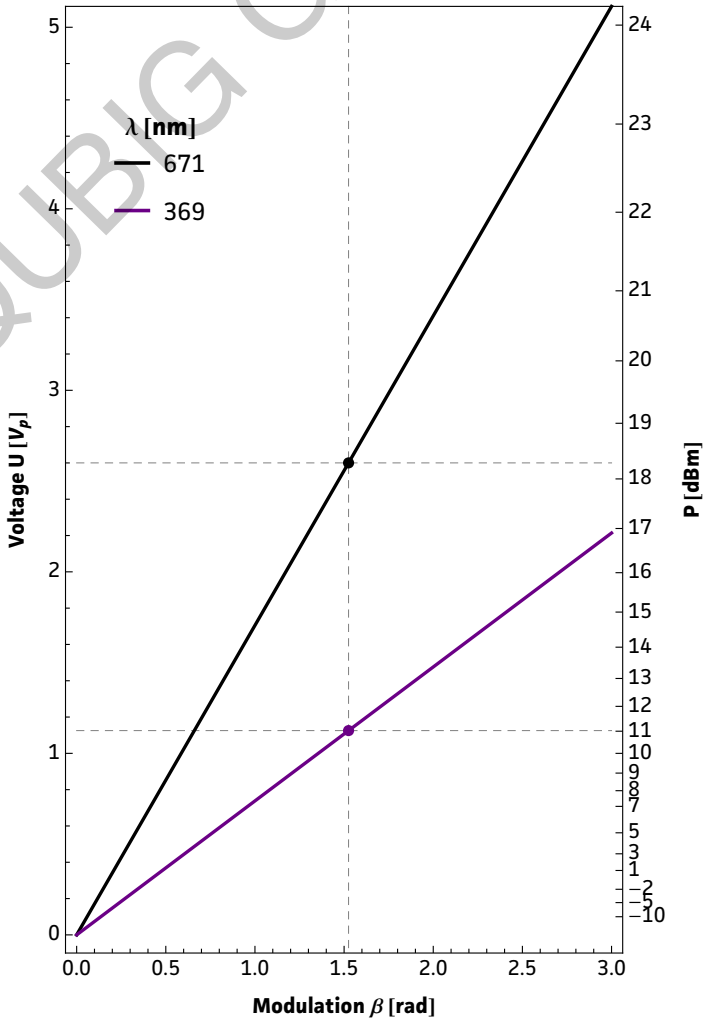


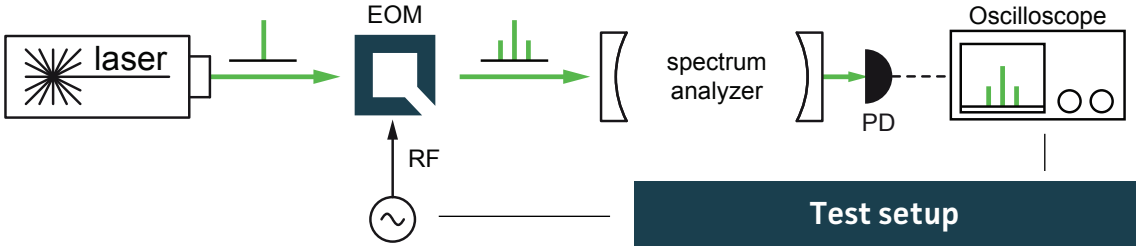
Fig. 3: RF–signal amplitude vs. modulation depth

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 ß.

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 ß 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 (ß=1rad) provided in the table.



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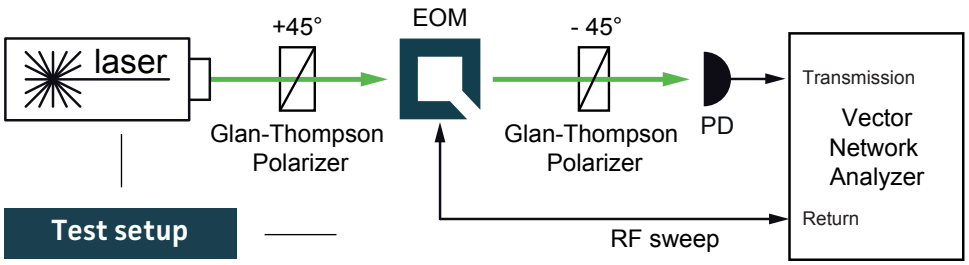
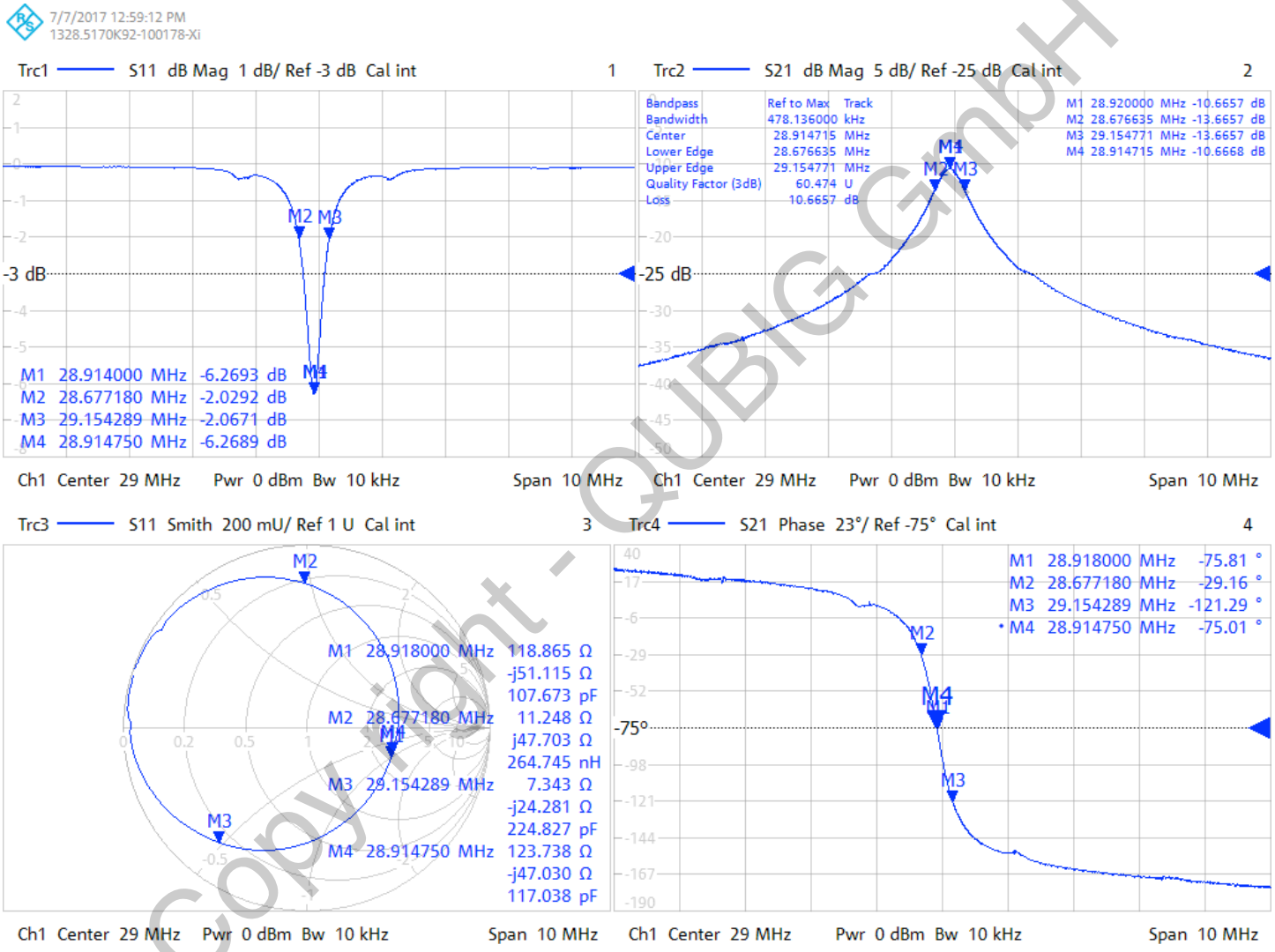
Resonance characteristics





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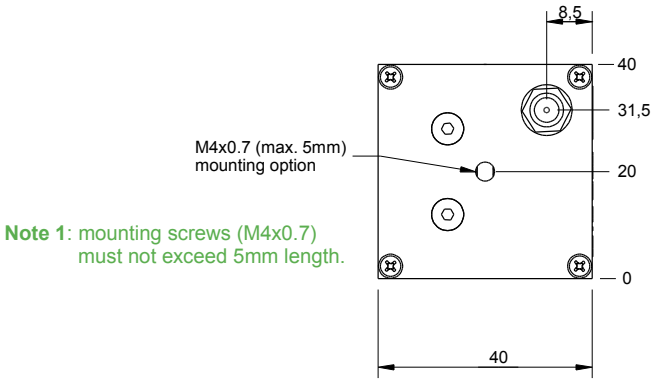
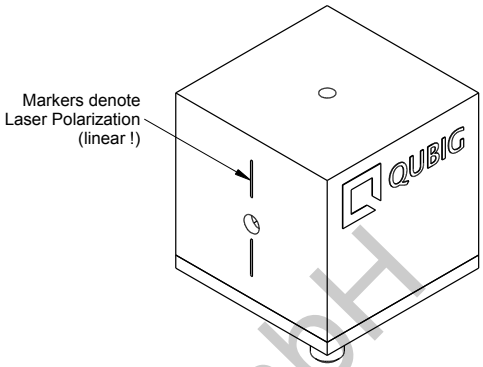
Handling instructions

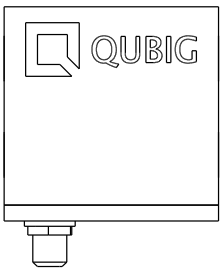
- Input laser polarization must be aligned with respect to the white markers on the housing
- Please handle device carefully. Avoid shock. Don't drop.
- After turn on the resonance frequency might drift slightly with applied RF power. Please compensate by tuning the RF drive frequency until steady-state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

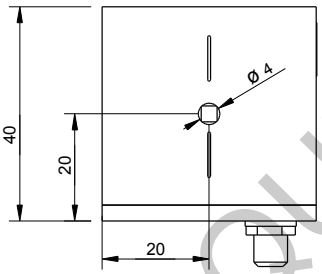
Package drawing

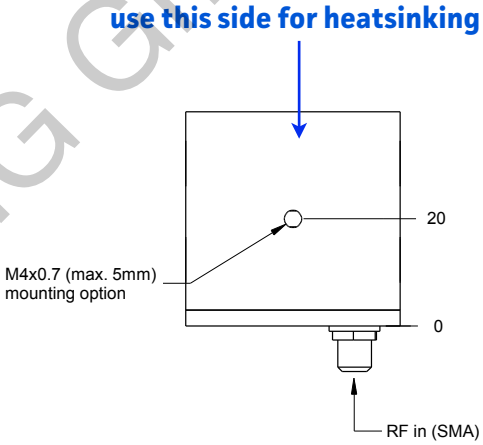


Note 1: mounting screws (M4x0.7) must not exceed 5mm length.

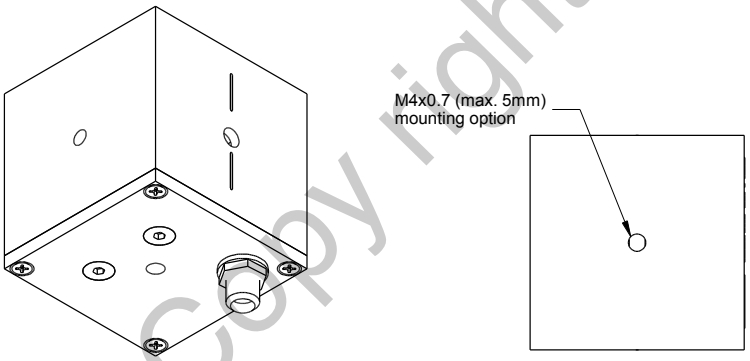








Note 2: crystal aperture is 3x3mm.



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Tested by:

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