QUBIG

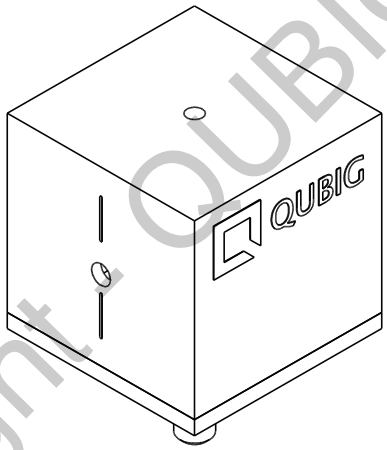
Empowering Laser Technologies

Test Data Sheet

PM-Dy162_0.1M3

(old: EO-0.1M3-VIS)
S/N:

Resonant electro-optic phase modulator



RF properties	Value	Unit
Resonance frequency: f_0 [1]	108.7	kHz
Bandwidth: Δν	6.2	kHz
Quality factor: Q	18	
Required RF power for 1rad @ 626nm [2]	-0.8	dBm
max. RF power: RF_{max} [3]	1	W

Optical properties		
EO crystal	MLN	
Aperture	3x3	mm^2
Wavefront distortion (633nm)	λ/4	nm
recommended optical intensity (@ 626nm)	5	W/mm^2
AR coating (R<0.5%)	360 - 720nm	nm

[1] at 24.3°C [2] with 50Ω termination [3] no damage with RF_{in} < 1W

Measured modulation

Fig. 1: Oscilloscope trace

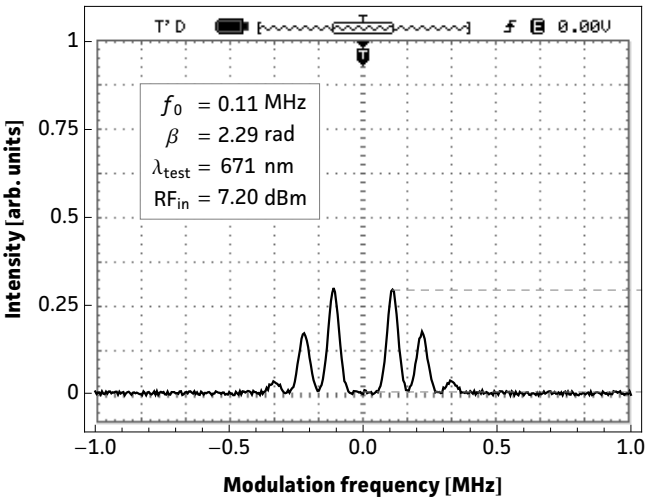


Fig. 2: Carrier/sideband ratio

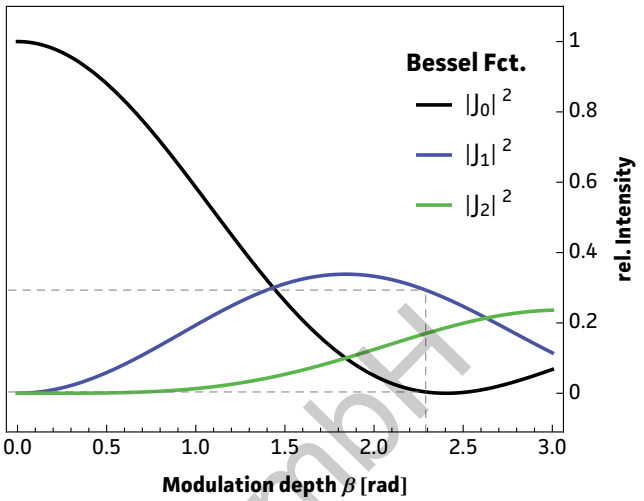


Table 1: Expected modulation

$\beta = 1$ rad	unit	λ_1	λ_2
λ	nm	**626**	**671**
P	dBm	−0.8	0.1
P	mW	1	1
U	V_p	0.3	0.3
U_π	V_p	0.9	1.
β / U	rad / V	3.45	3.12

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.

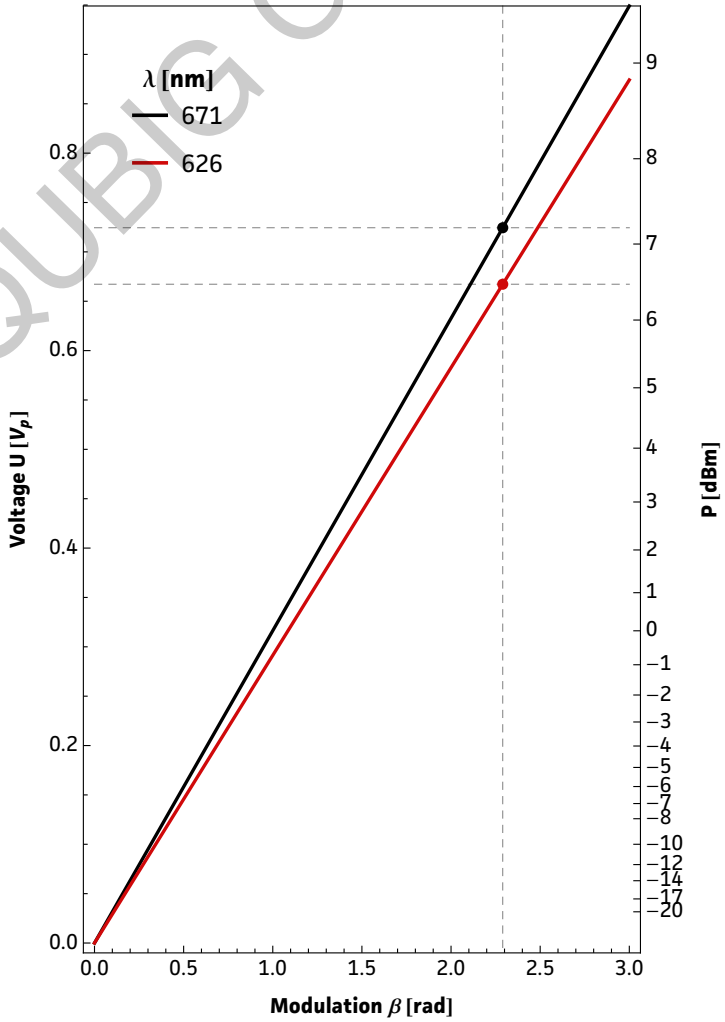
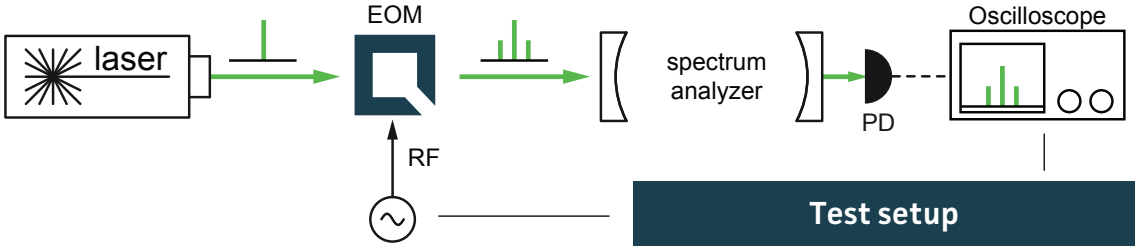
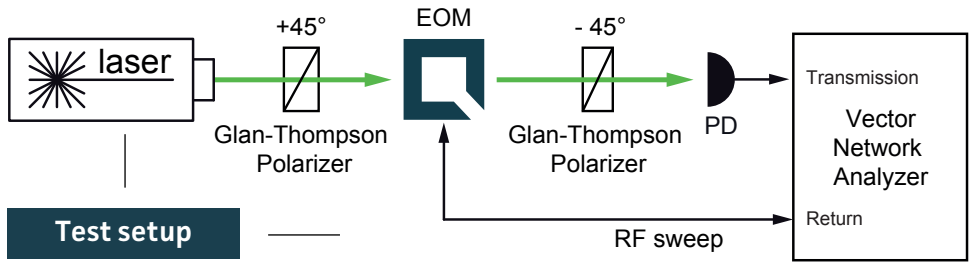
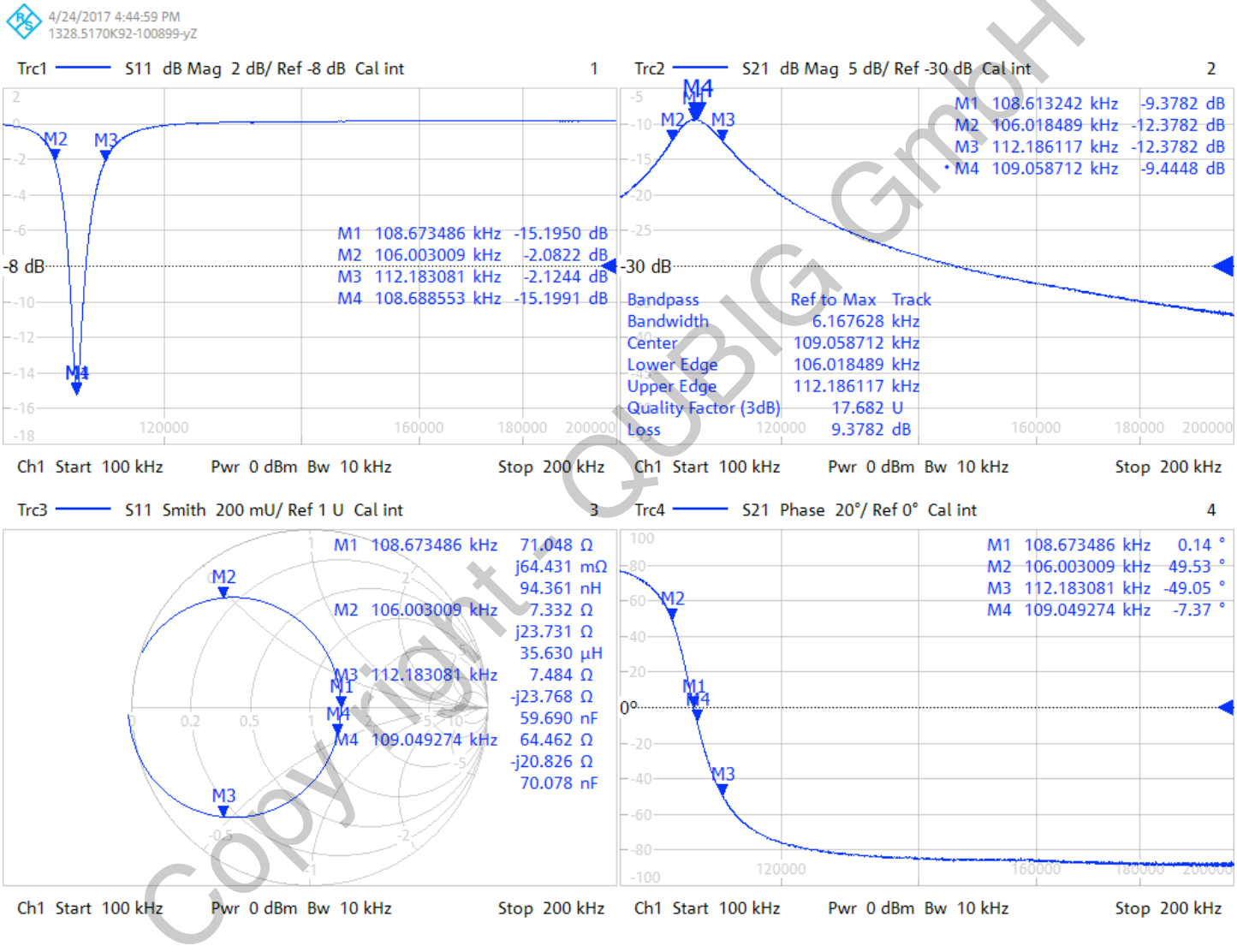


Fig. 3: RF–signal amplitude vs. modulation depth



Resonance characteristics

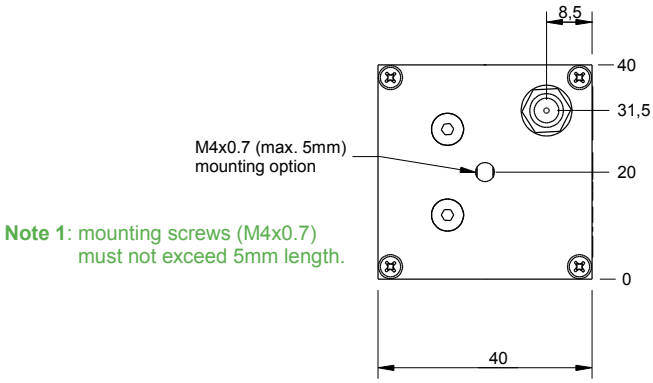




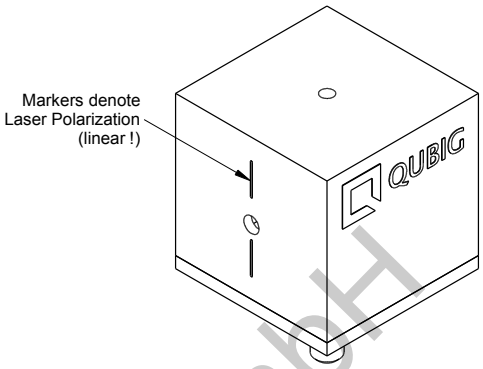
Handling instructions

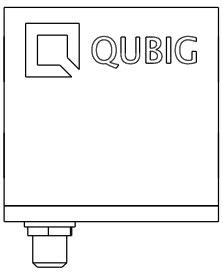
- Input laser polarization must be aligned with respect to the white markers on the housing
- Please handle device carefully. Avoid shock. Don't drop.
- After turn on the resonance frequency might drift slightly with applied RF power. Please compensate by tuning the RF drive frequency until steady-state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

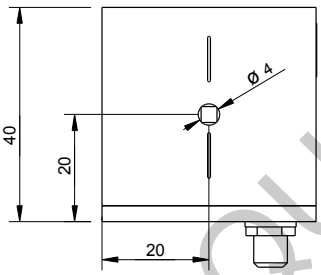
Package drawing

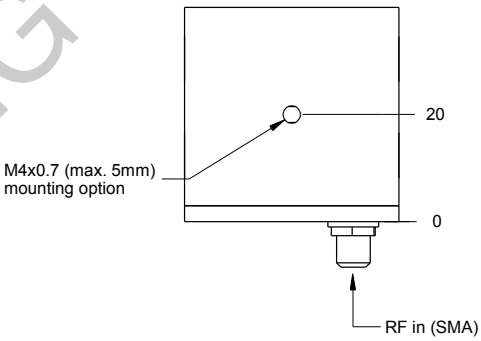


Note 1: mounting screws (M4x0.7) must not exceed 5mm length.

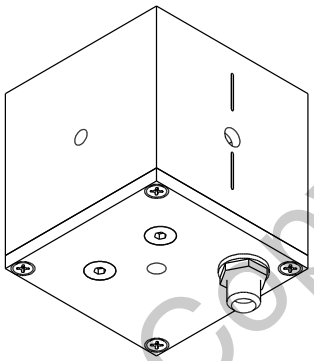


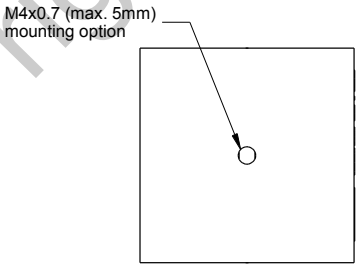






Note 2: crystal aperture is 3x3mm.





Tested by:

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