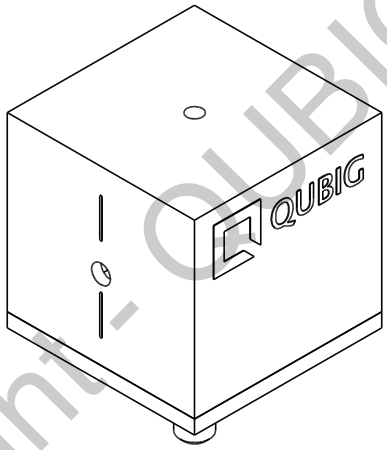
QUBIG

Empowering Laser Technologies

Test Data Sheet

PM6 - 0.1L3 - **SWIR**
(old: EO-F0.1L3-IR)
S/N:

Resonant electro-optic phase modulator



RF properties	Value	Unit
Resonance frequency: f_0 [1)]	104	kHz
Preset frequency: f_{set} [1)]	104	MHz
Bandwidth: Δν	2	kHz
Quality factor: Q	~50	
Required RF power for 1rad @ 1um [2)]	-4.4	dBm
max. RF power: RF_{max} [3)]	1	W

Optical properties		
EO crystal	LN	
Aperture	3x3	mm^2
Wavefront distortion (633nm)	< λ/6	nm
recommended optical intensity (1um)	< 5	W/mm^2
AR coating (R<0.5%)	1.0 - 1.7	um

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

Measured modulation

Fig. 1: Oscilloscope trace

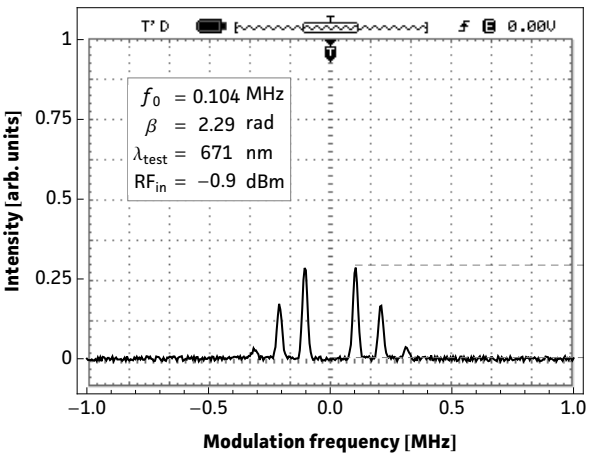


Fig. 2: Carrier/sideband ratio

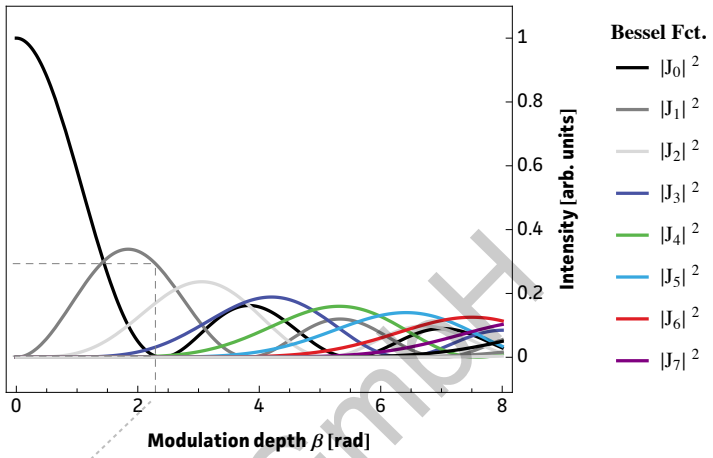


Table 1: Expected modulation

$\beta = 1$ rad	unit	λ_1	λ_2	λ_3
λ	nm	**671**	**1000**	**1700**
P	dBm	−8.4	−4.4	0.6
P	mW	0	0	1
U	V_p	0.1	0.2	0.3
U_π	V_p	0.4	0.6	1.1
β / U	rad / V	8.33	5.26	2.94

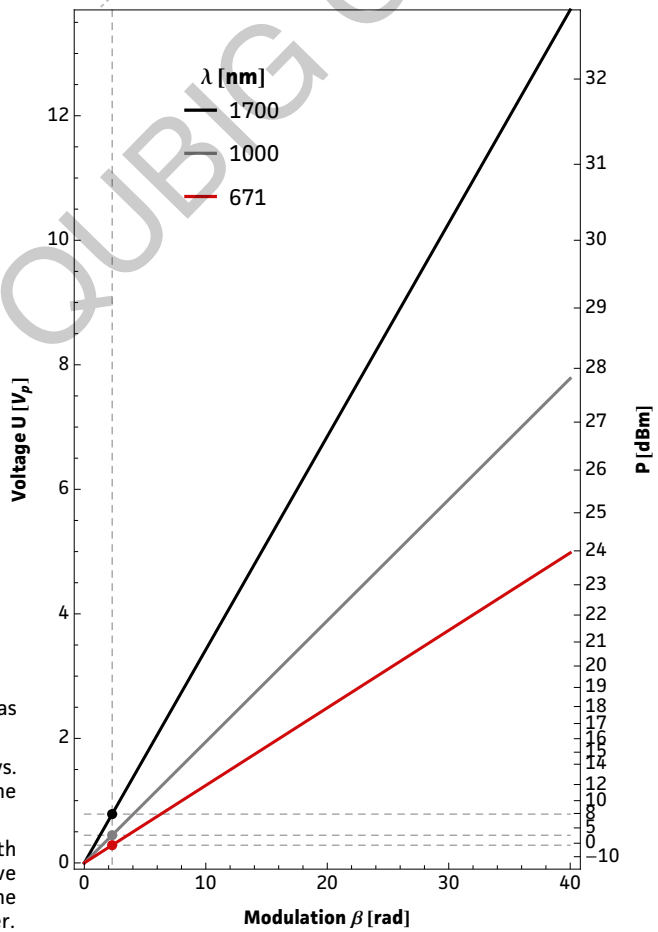


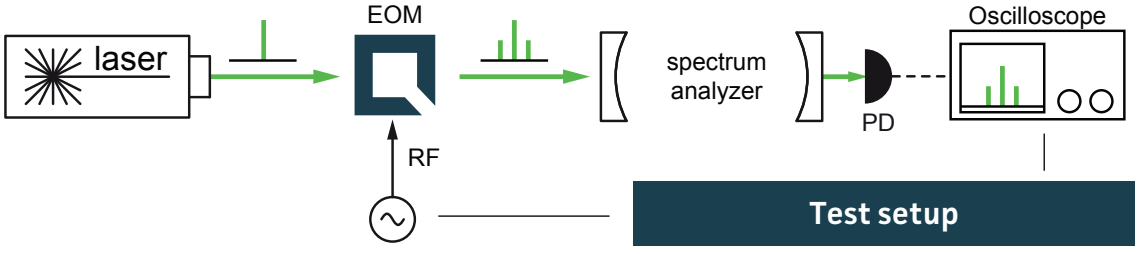
Fig. 3: RF–signal amplitude vs. modulation depth

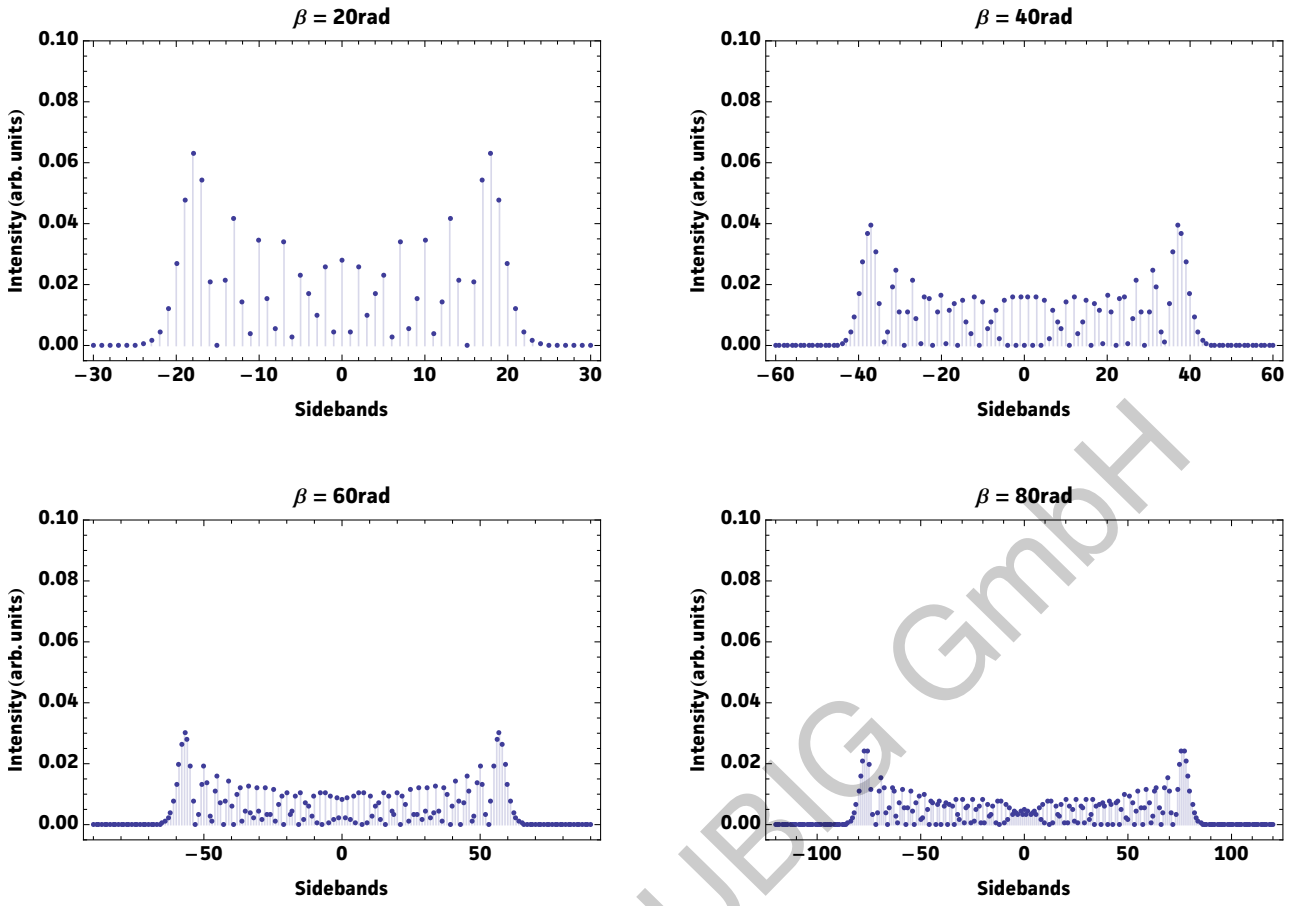
Fig.1: Recorded oscilloscope trace retrieved from a test setup as illustrated below.

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.

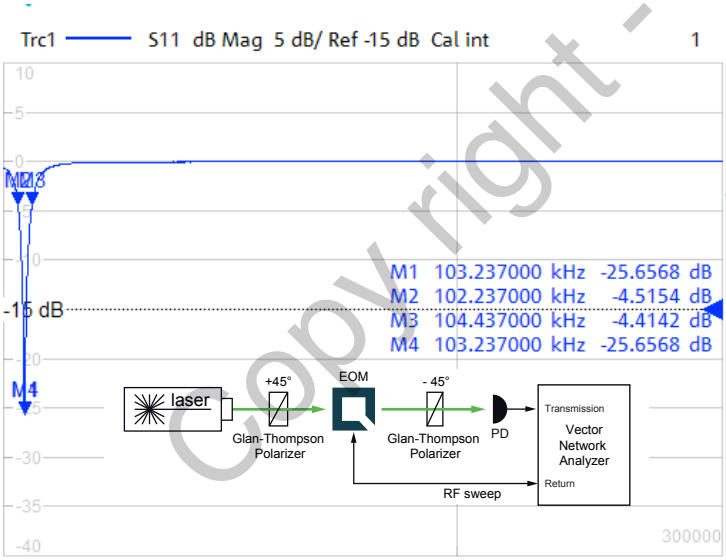
Fig.3: Dependency between RF amplitude and modulation depth for different wavelengths. Points on the curve allow to retrieve either the required RF amplitude for a specific/desired ß or the max. achievable modulation depth for a given/available RF power.

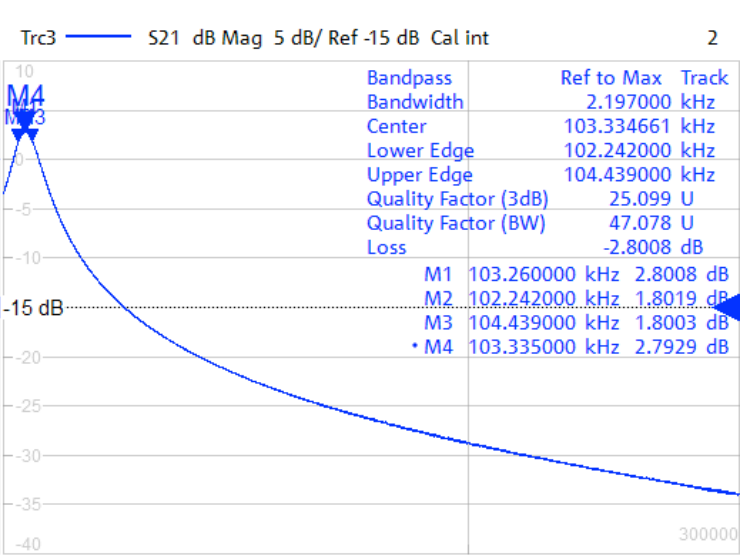
Table 1: Expected RF-amplitude/-power values and conversion factors for the required wavelength at the reference modulation depth of 1 rad. **Note:** Experimentally recorded modulation depth displayed in Fig.1 might vary from the respective values (ß=1rad) provided in the table.

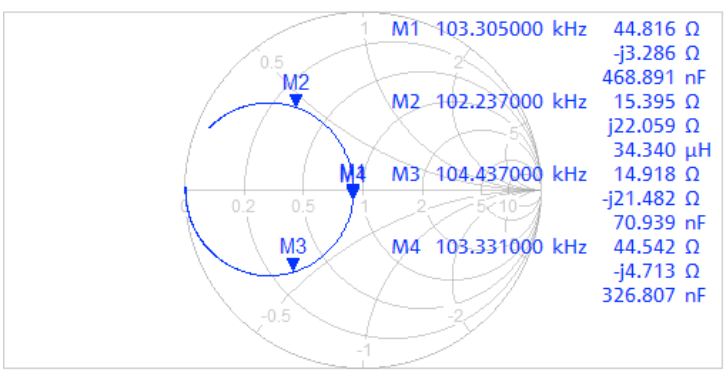


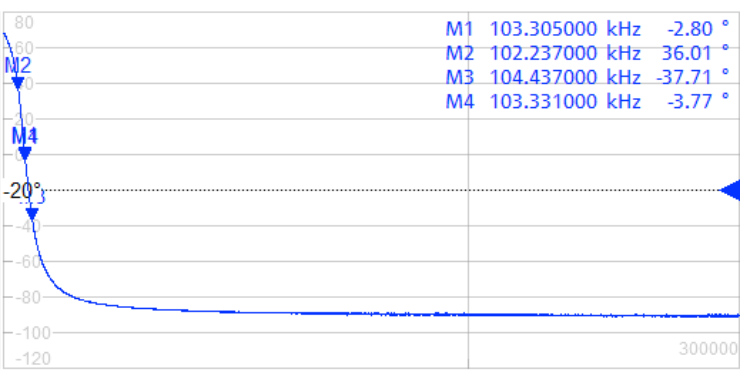


Resonance characteristics





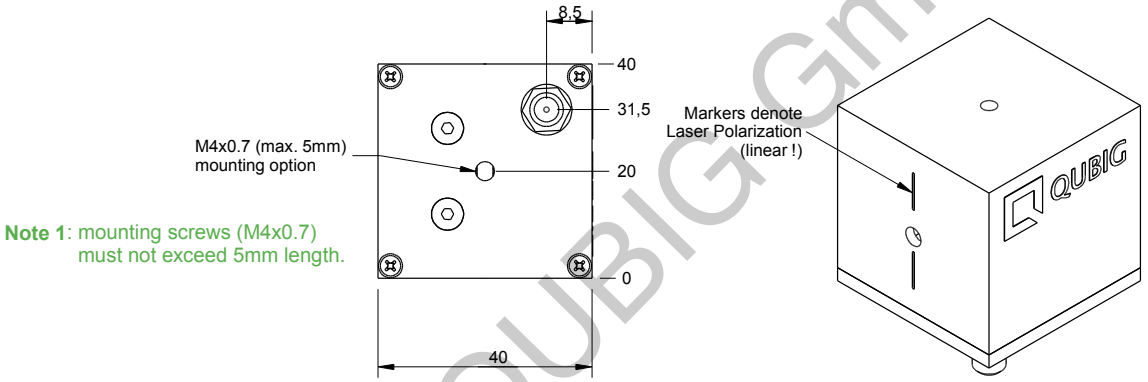




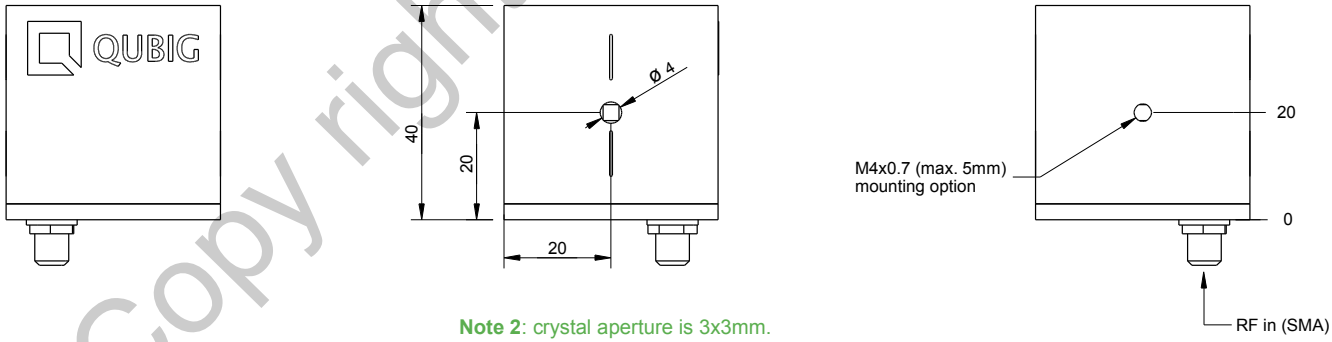
Handling instructions

- 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)

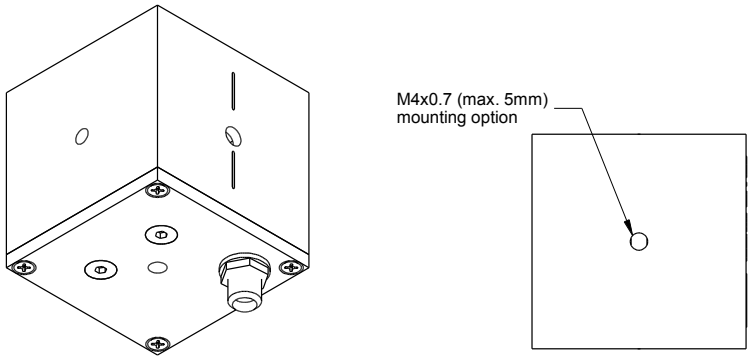
Package drawing



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



Note 2: crystal aperture is 3x3mm.



Tested by:

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Tel: +49 89 2302 9101
Fax: +49 89 2302 9102
eMail: mail@qubig.com
web: www.qubig.com

QUBIG GmbH
Balanstr. 57
81541 München
Germany