QUBIG

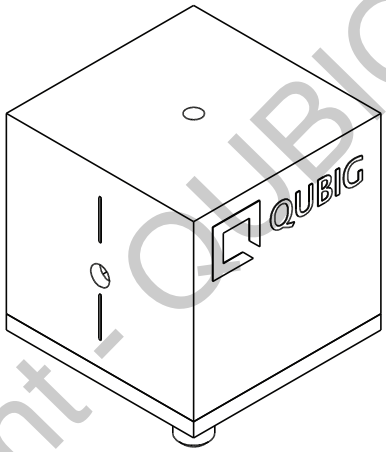
Empowering Laser Technologies

Test Data Sheet

PM-Sr_0.15M3

S/N:

Resonant electro-optic phase modulator



RF properties	Value	Unit
Resonance frequency: f_0 [1]	132	kHz
Bandwidth: Δν	4.9	kHz
Quality factor: Q	27	
Required RF power for 1rad @ 461 | 689nm [2]	-7.1 | -2.4	dBm
max. RF power: RF_{max} [3]	0.5	W

Optical properties		
Aperture	3x3	mm^2
Wavefront distortion (633nm)	λ/6	nm
Max. optical intensity (461 | 689nm)	≤ 0.1 | ≤ 2	W/mm^2
AR coating (R_{avg}<0.5%)	360 - 650 | 630 - 1100	nm

[1] at 21°C [2] with 50Ω termination [3] no damage with RF_{in} < 1W

Measured modulation

Fig. 1: Oscilloscope trace

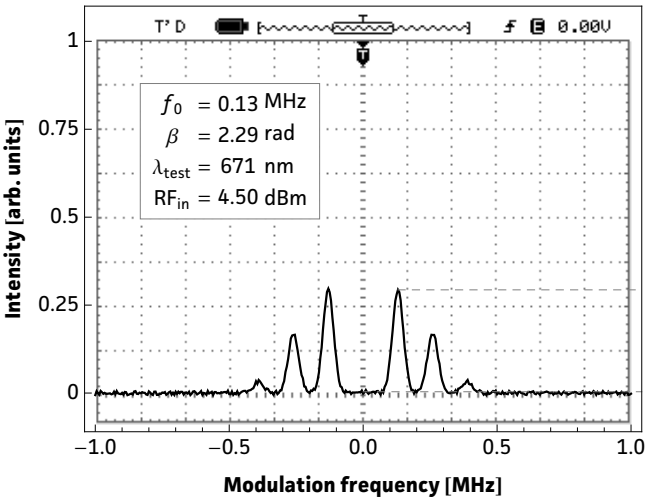


Fig. 2: Carrier/sideband ratio

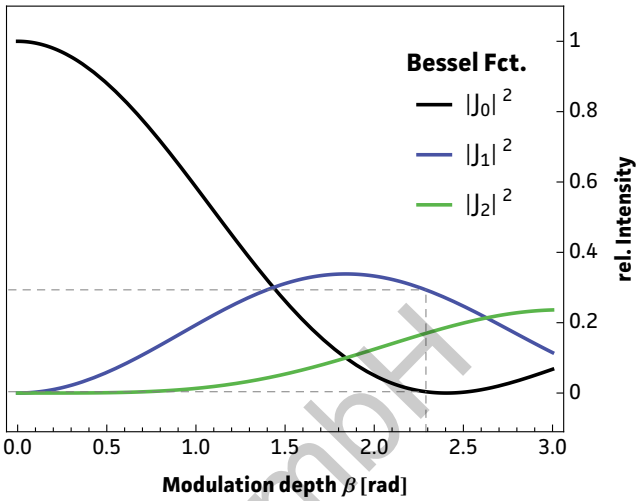


Table 1: Expected modulation

$\beta = 1$ rad	unit	λ_1	λ_2	λ_3
λ	nm	**461**	**671**	**689**
P	dBm	−7.1	−2.8	−2.4
P	mW	0	1	1
U	V_p	0.1	0.2	0.2
U_π	V_p	0.4	0.7	0.8
β / U	rad / V	7.14	4.35	4.17

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.

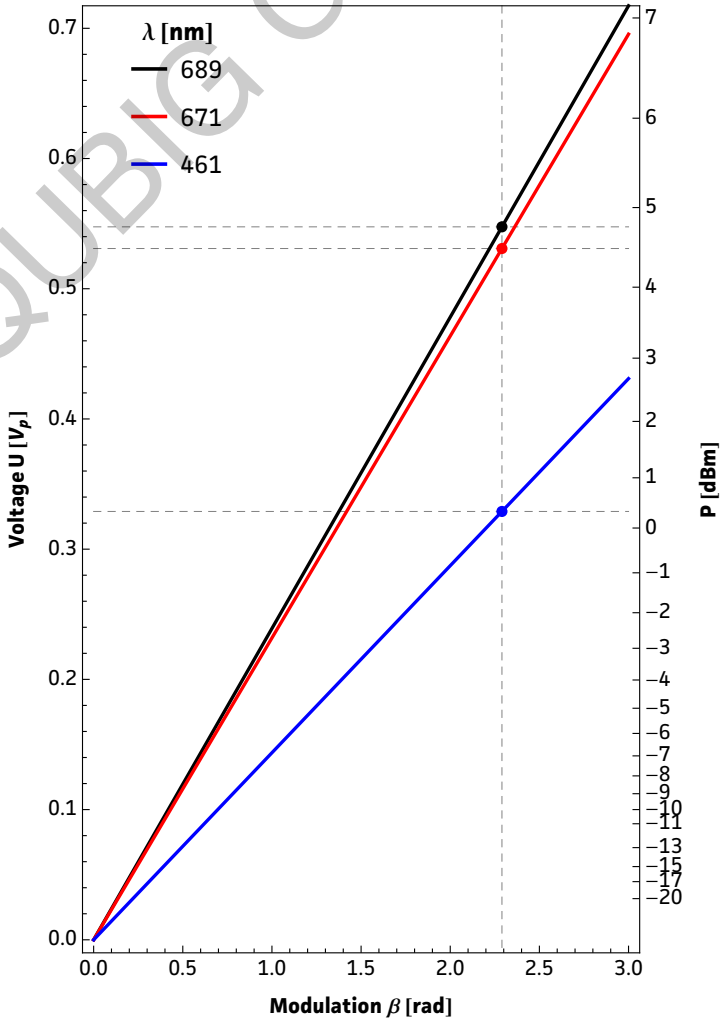
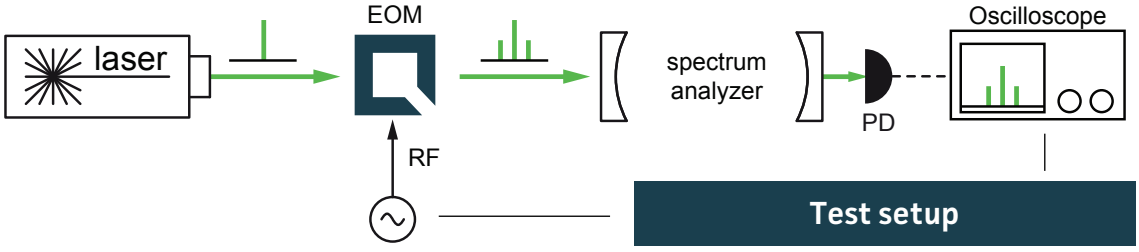
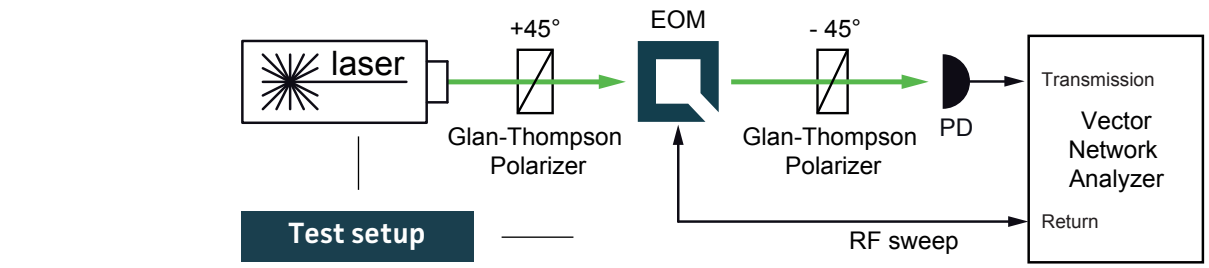
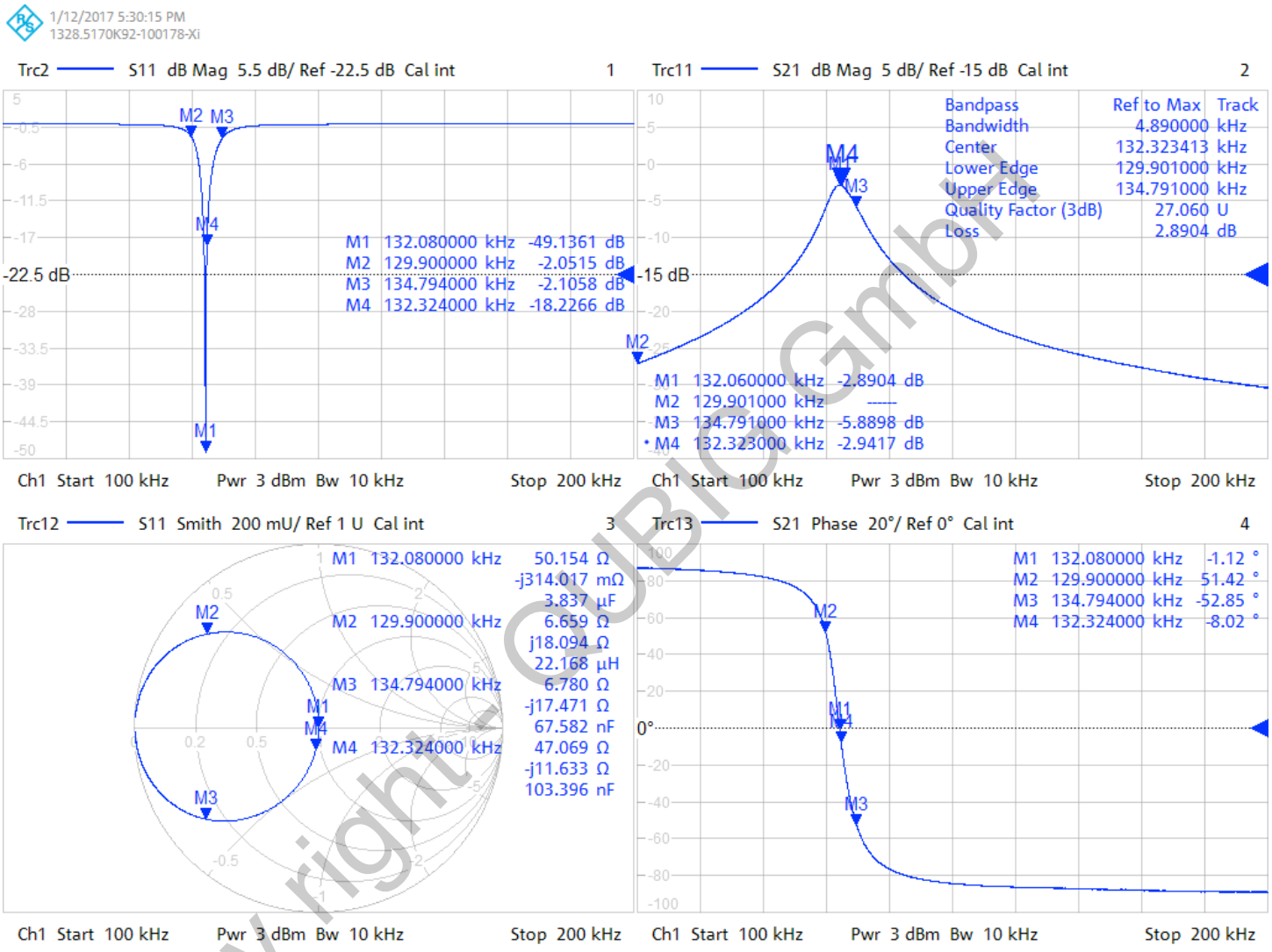


Fig. 3: RF–signal amplitude vs. modulation depth



Resonance characteristics

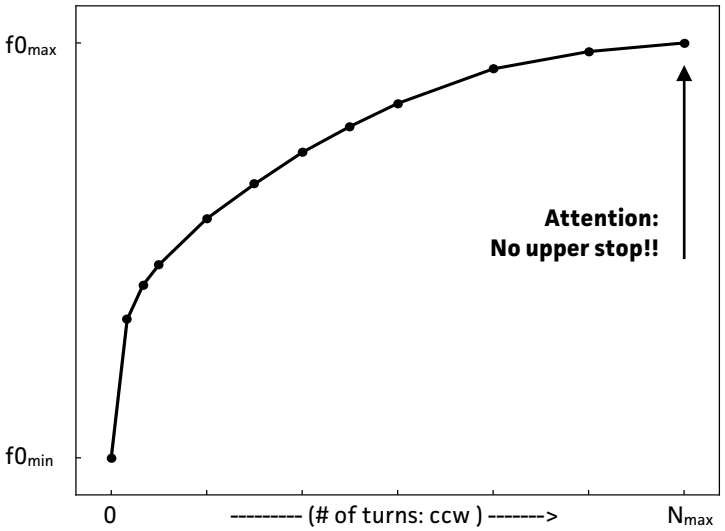




Tuning performance

MAX resonance frequency	f_0 max	1523	MHz
MIN resonance frequency	f_0 min	1292	MHz
number of turns	N_{max}	5	
counter clock-wise turns ⤴	higher f_0↑		
clock-wise turns ⤵	lower f_0↓		

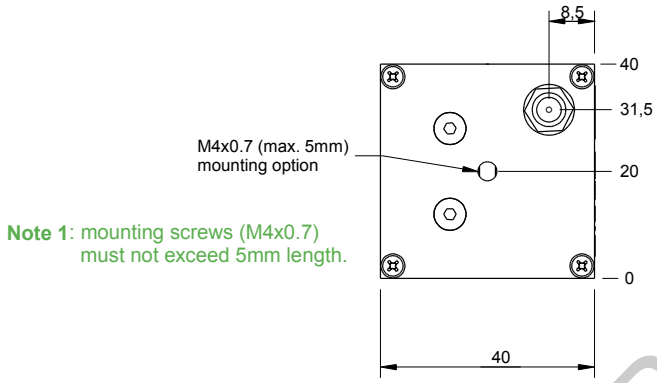
- **use only supplied tuning tool**
- **actuate tuner carefully**
- **do not apply too much pressure or torque**
- **keep tuning tool coaxial**
- **tuner might not be perfectly orthogonal to box**



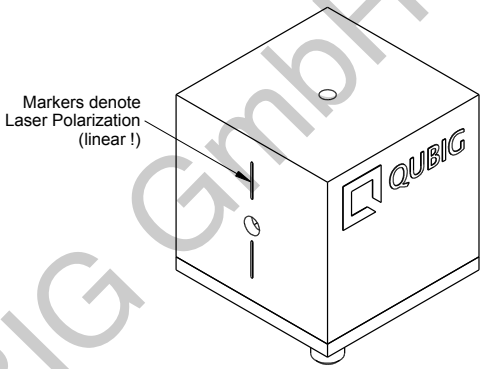
Handling instructions

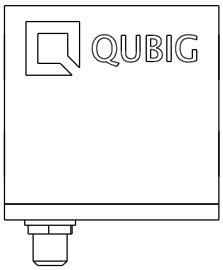
- Input laser polarization must be aligned with respect to the white markers on the housing
- Please handle device carefully. Avoid shock. Don't drop.
- After turn on the resonance frequency might drift slightly with applied RF power. Please compensate by tuning the RF drive frequency until steady-state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

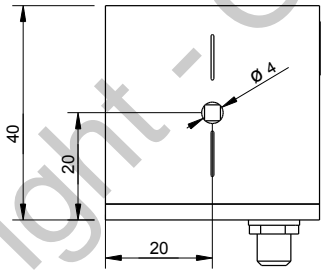
Package drawing



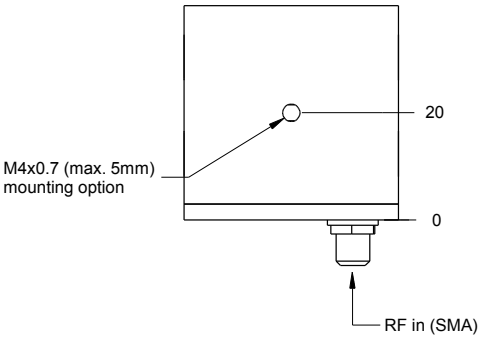
Note 1: mounting screws (M4x0.7) must not exceed 5mm length.

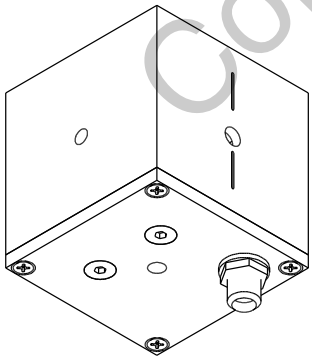


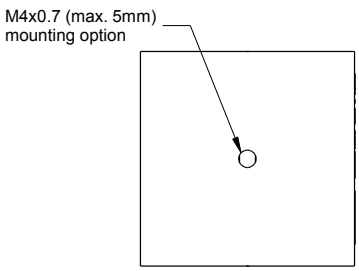




Note 2: crystal aperture is 3x3mm.







Tested by:

_____

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

Qubig GmbH
Balanstr. 57
81541 Munich
Germany