



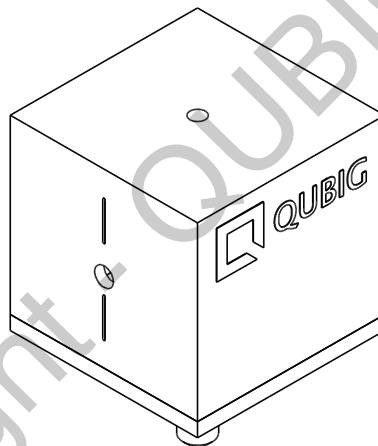
Test Data Sheet

PM-Rb85_2.9M3

(old: EO-Rb85K3-VIS)

S/N:

Resonant electro-optic phase modulator
with
- tunable resonance frequency
- thermal crystal mount



RF properties	Value	Unit
Resonance frequency: f_0 ¹⁾	2.62 - 3.00	GHz
Preset frequency: f_{set} ¹⁾	2915	MHz
Bandwidth: $\Delta\nu$	8.2	MHz
Quality factor: Q	355	
Required RF power for 1rad @ 780nm ²⁾	33.9	dBm
max. RF power: RF_{max} ³⁾	2	W

Optical properties		
EO crystal	MLN	
Aperture	3x3	mm ²
Wavefront distortion (633nm)	$\lambda/4$	nm
recommended max. optical intensity (780nm)	< 10	W/mm ²
AR coating ($R_{avg} < 0.5\%$)	630 - 1100	nm

¹⁾ at 23°C ²⁾ with 50Ω termination ³⁾ no damage with $RF_{in} < 5W$

Measured modulation

Fig. 1: Oscilloscope trace

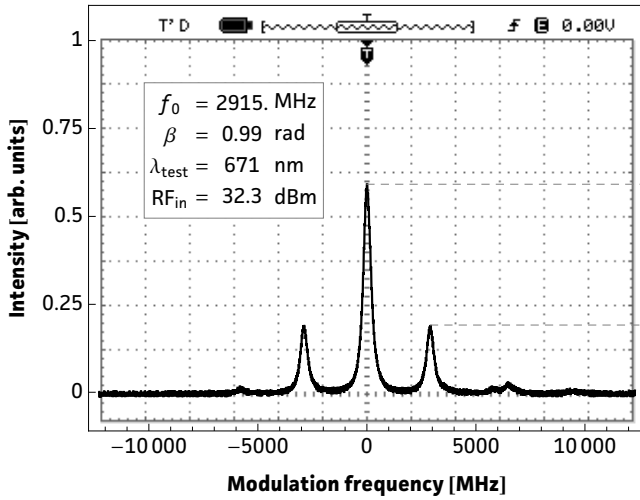


Fig. 2: Carrier/sideband ratio

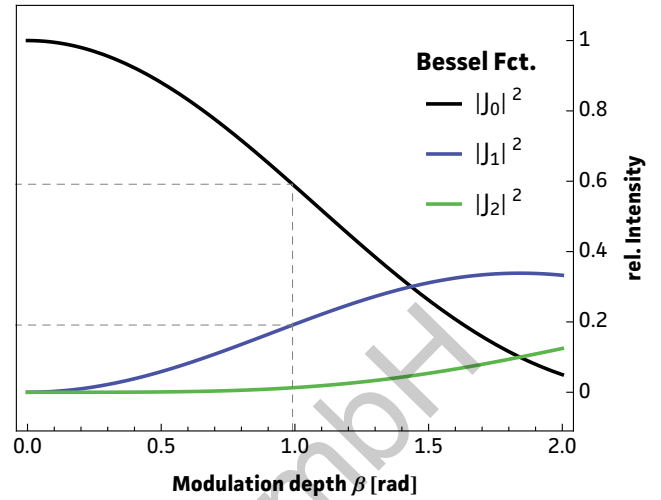


Table 1: Expected modulation

$\beta = 1 \text{ rad}$	unit	λ_1	λ_2
λ	nm	671	780
P	dBm	32.4	33.9
P	W	1.73	2.43
U	V_p	13.2	15.6
U_π	V_p	41.3	49.
β / U	rad / V	0.08	0.06

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.

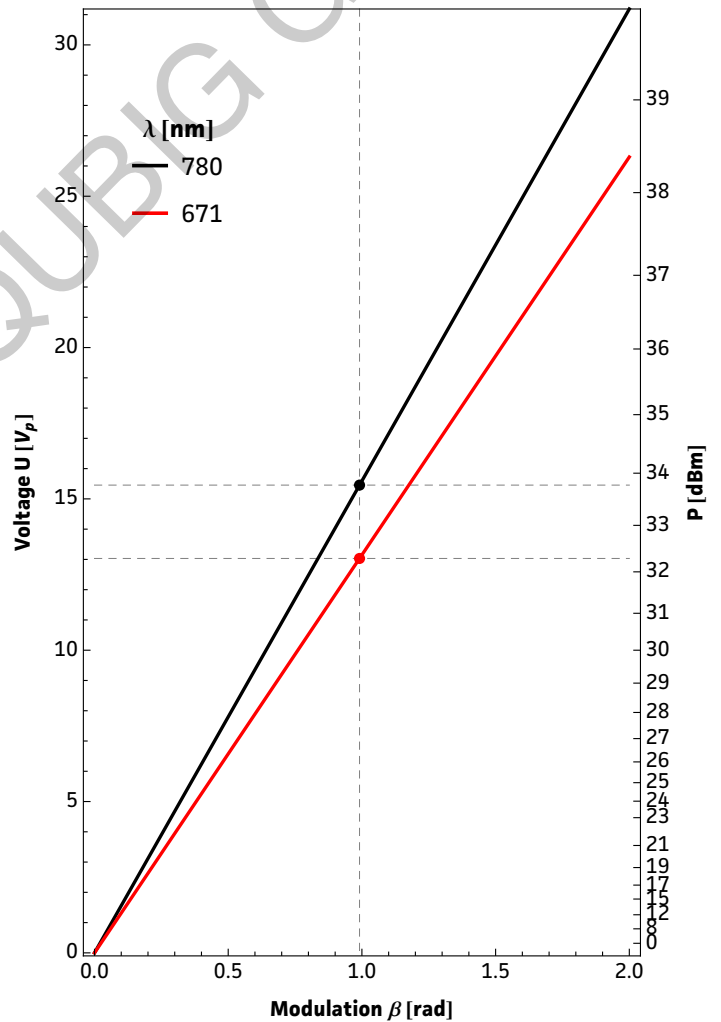
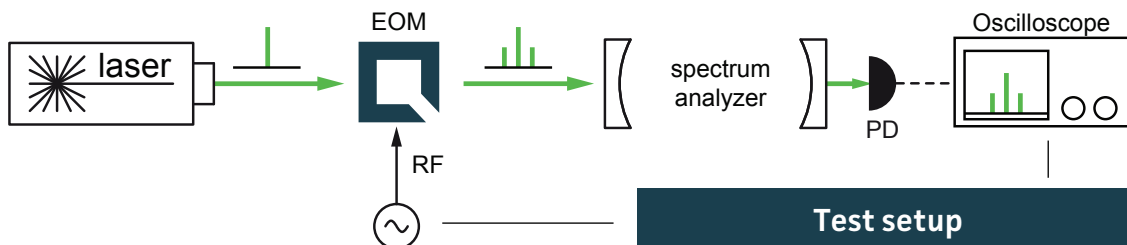
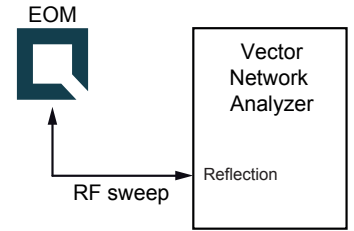


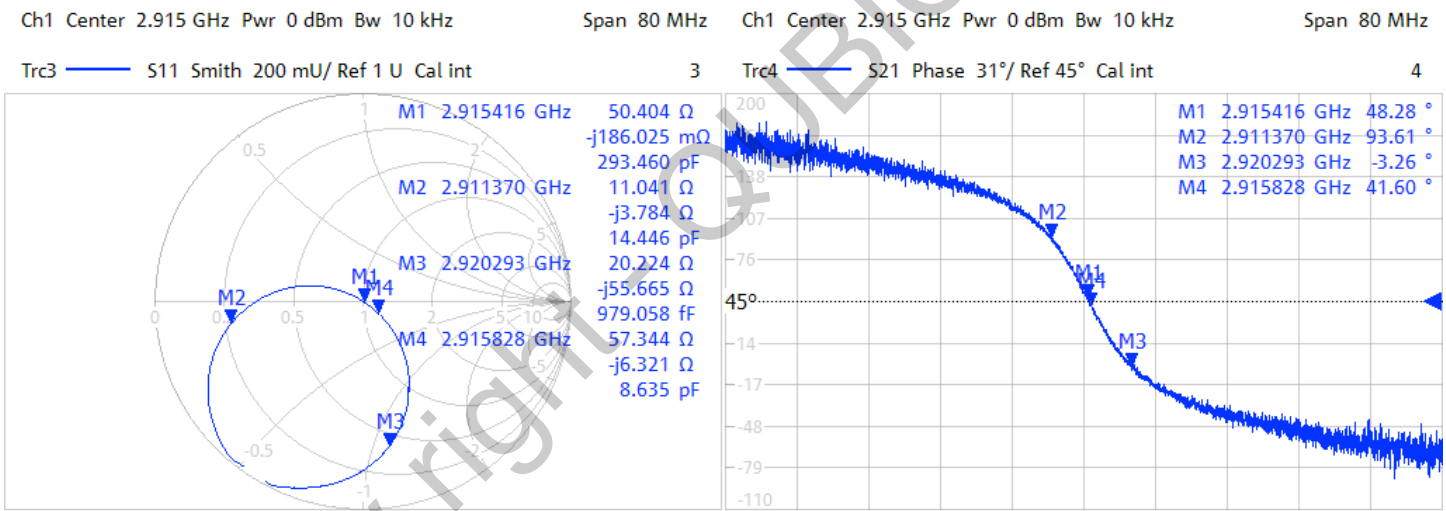
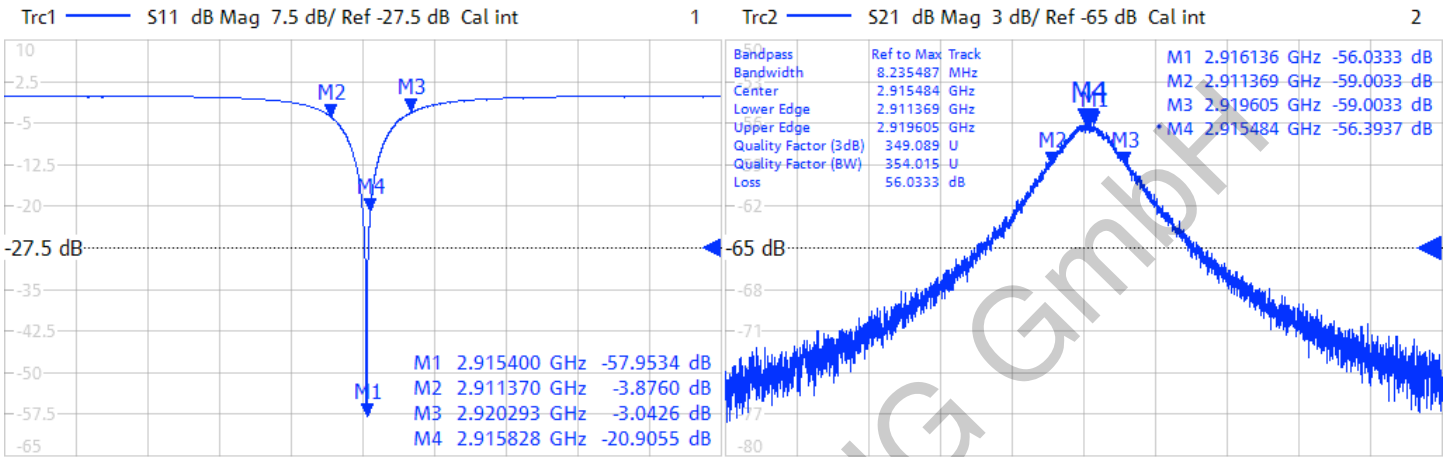
Fig. 3: RF-signal amplitude vs. modulation depth



Resonance characteristics



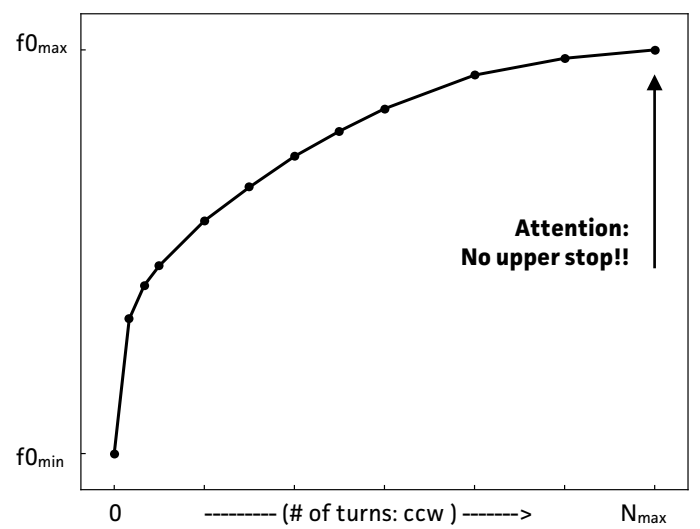
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Tuning performance

MAX resonance frequency	$f_0 \text{ max}$	3000	MHz
MIN resonance frequency	$f_0 \text{ min}$	2614	MHz
number of turns	N_{max}	6	
counter clock-wise turns ↻	higher f_0 ↑		
clock-wise turns ↻	lower f_0 ↓		

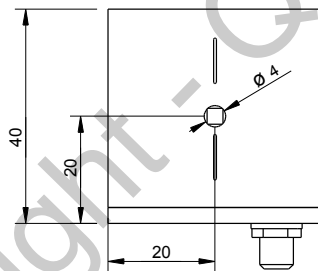
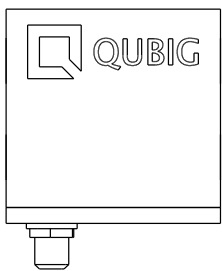
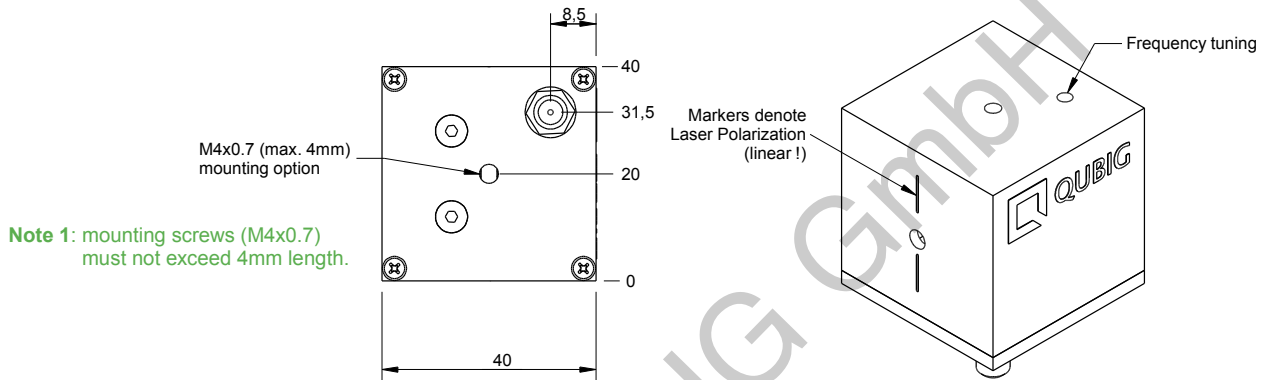
- actuate tuner carefully with supplied tuning tool
- tuner might not be perfectly perpendicular
- there might be no hard upper or lower stops (!)



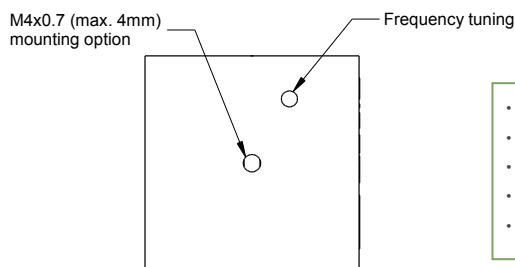
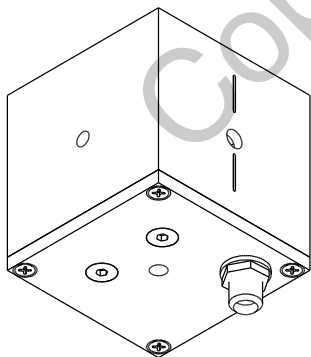
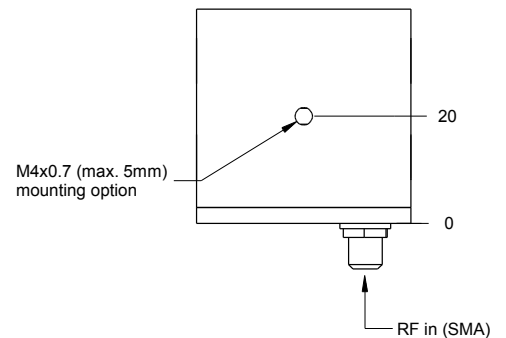
Handling instructions

- 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 2: crystal aperture is 3x3mm.



Attention!!

- 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

Tested by:

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