

Test Data Sheet

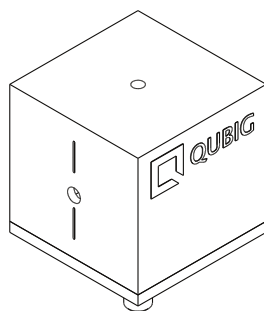
PM-Li_0.8

SN22.1235

Resonant electro-optic phase modulator

with

- Temperature control option
- Frequency tuning option



RF properties	Value	Unit
Resonance frequency: f_0 ¹⁾	5.11	MHz
Bandwidth: $\Delta\nu$	48.8	kHz
Quality Factor: Q	105	
Required RF power for 1rad @ 671nm ²⁾	5.8	dBm
max. RF power: RF_{max} ³⁾	0.5	W
Optical properties	Value	Unit
Aperture	3x3	mm ²
Wavefront distortion (633nm)	$\lambda/6$	nm
Recommended optical intensity (671nm)	< 1	W/mm ²
AR coating ($R_{avg} < 1\%$)	630 - 1100	nm

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

Measured modulation

Fig. 1: Oscilloscope trace

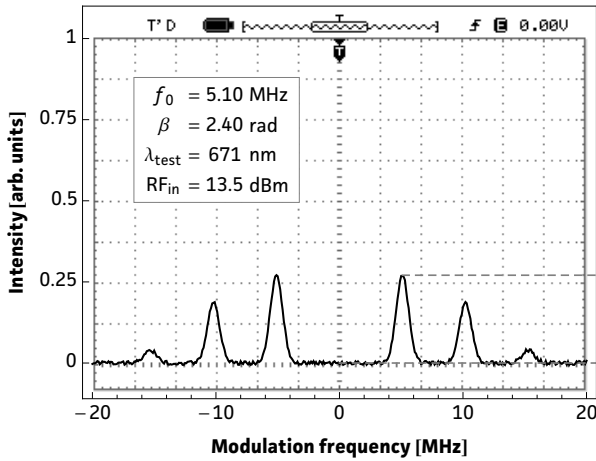


Fig. 2: Carrier/sideband ratio

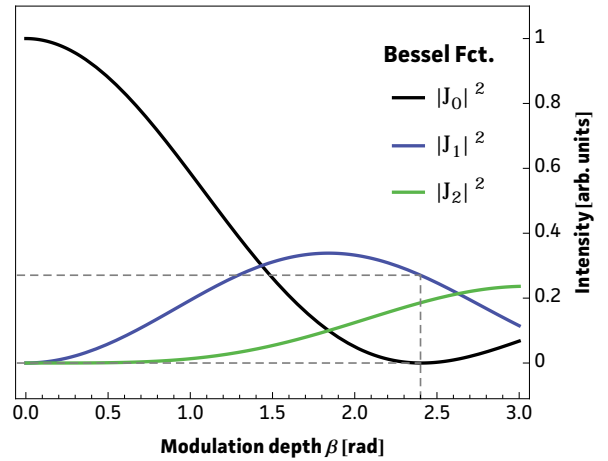


Table 1: Expected modulation

$\beta = 1 \text{ rad}$	unit	λ_1	λ_2
λ	nm	671	780
P	dBm	5.8	7.4
P	mW	4	5
U	V _p	0.6	0.7
U_π	V _p	2.	2.3
β / U	rad / V	1.61	1.35

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.

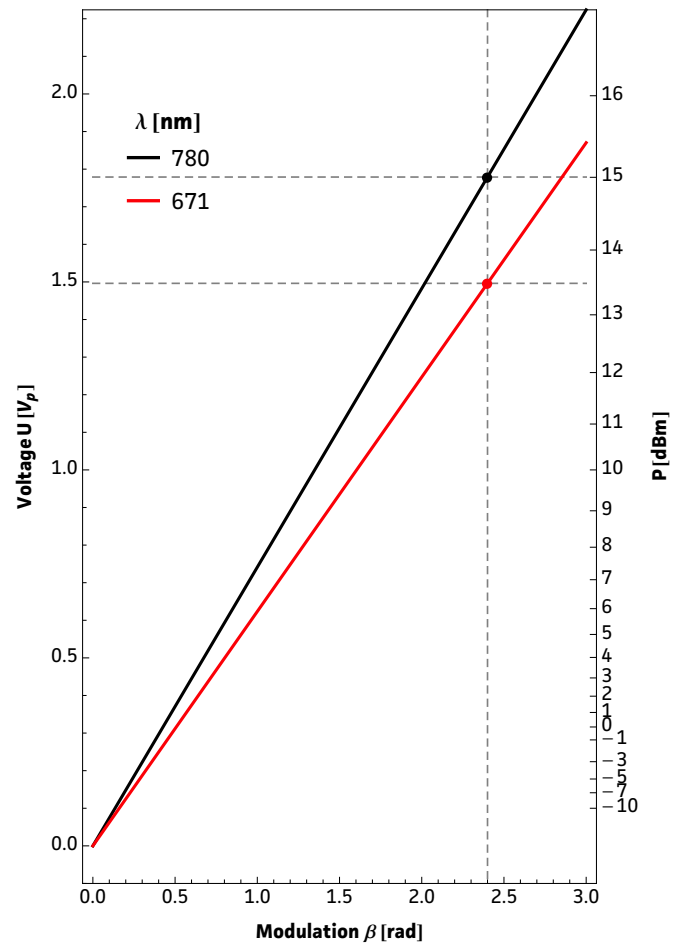
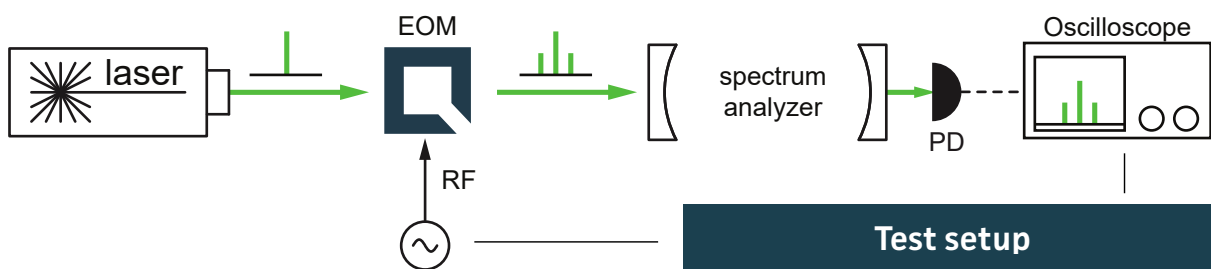
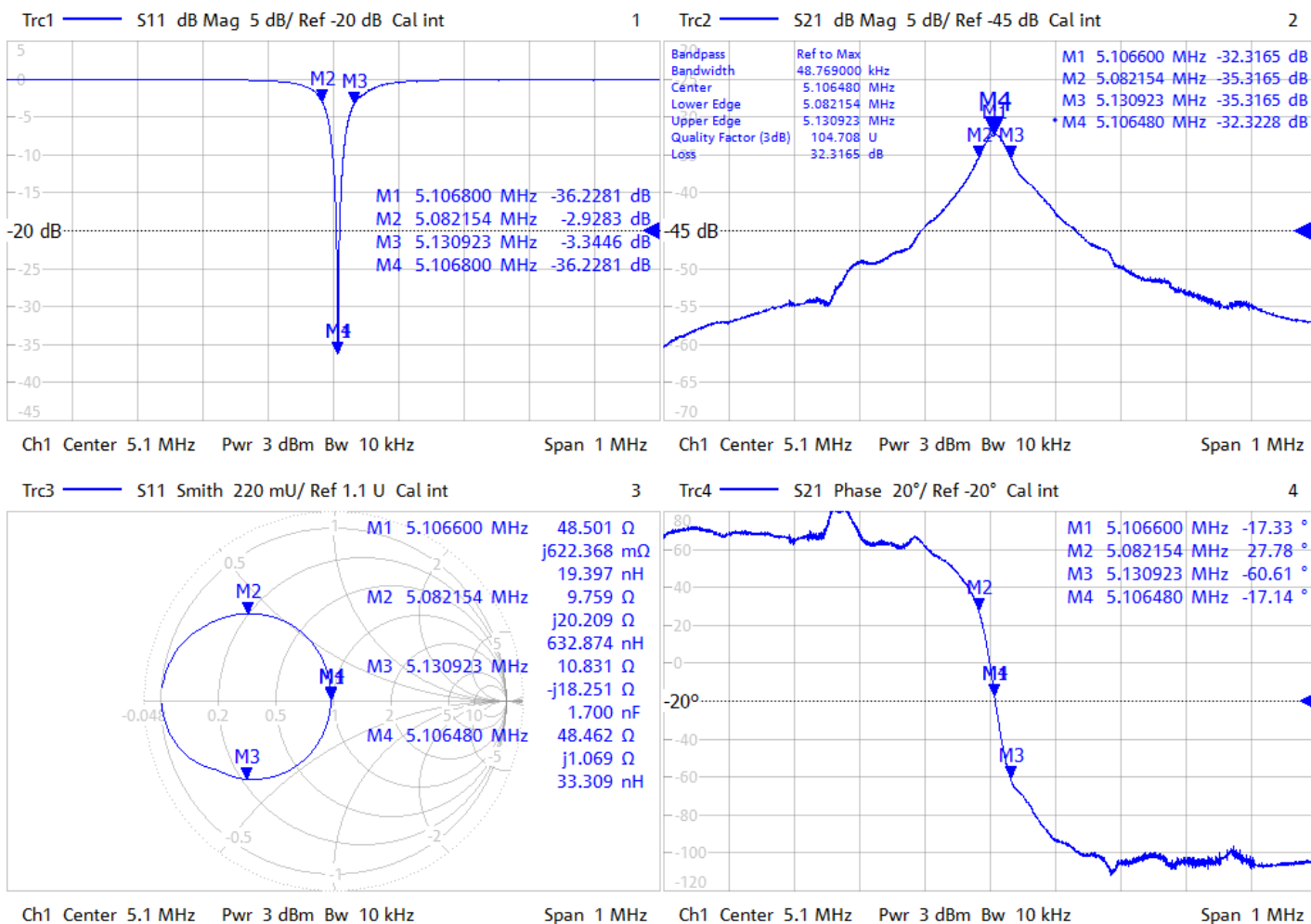
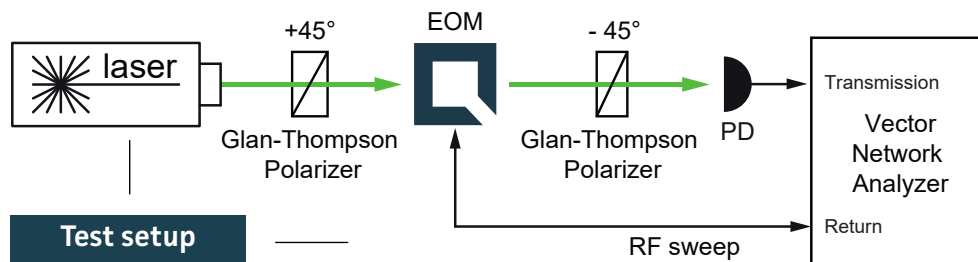


Fig. 3: RF-signal amplitude vs. modulation depth



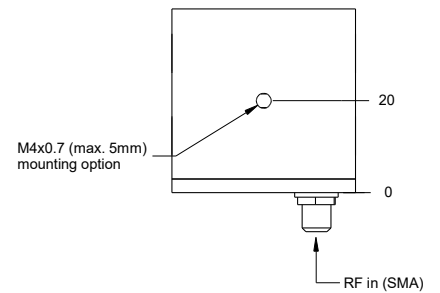
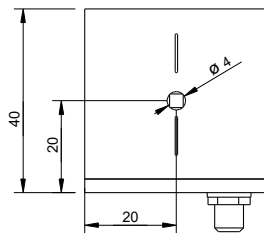
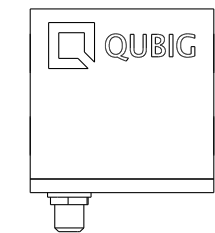
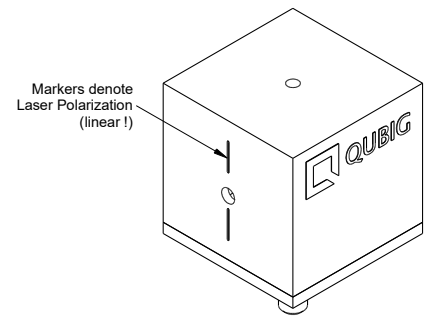
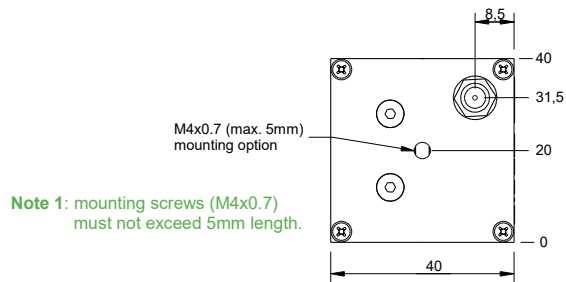
Resonance Characteristics



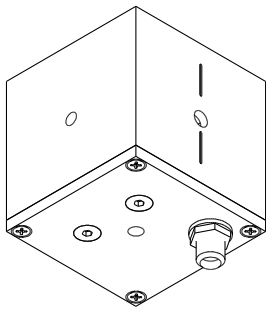
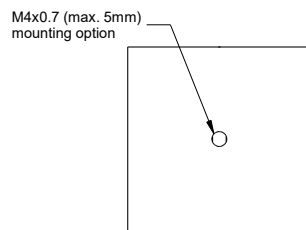
Handling instructions

- 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.



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