QUBIG

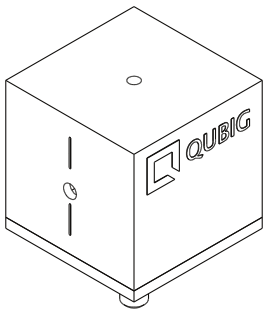
Empowering Laser Technologies

Test Data Sheet

PM7-SWIR1_20

SN22.1235

Resonant electro-optic phase modulator



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 @ 780nm [2)]	1.0	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 (780nm)	< 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

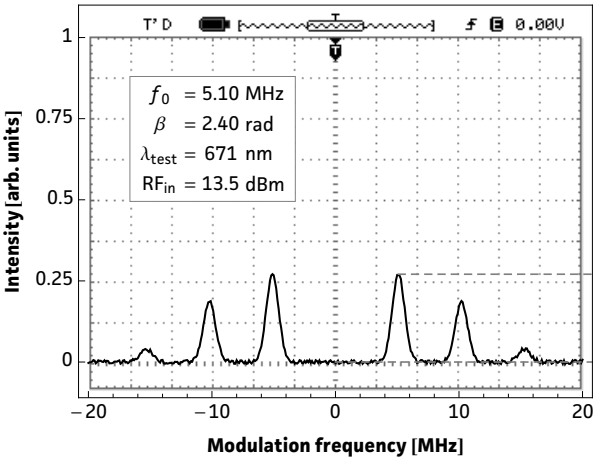


Fig. 2: Carrier/sideband ratio

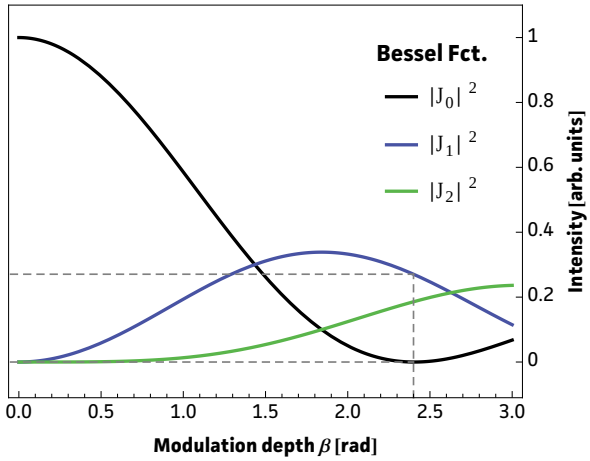


Table 1: Expected modulation

$\beta = 1$ 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 f rst-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 specif c 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 specif c/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.

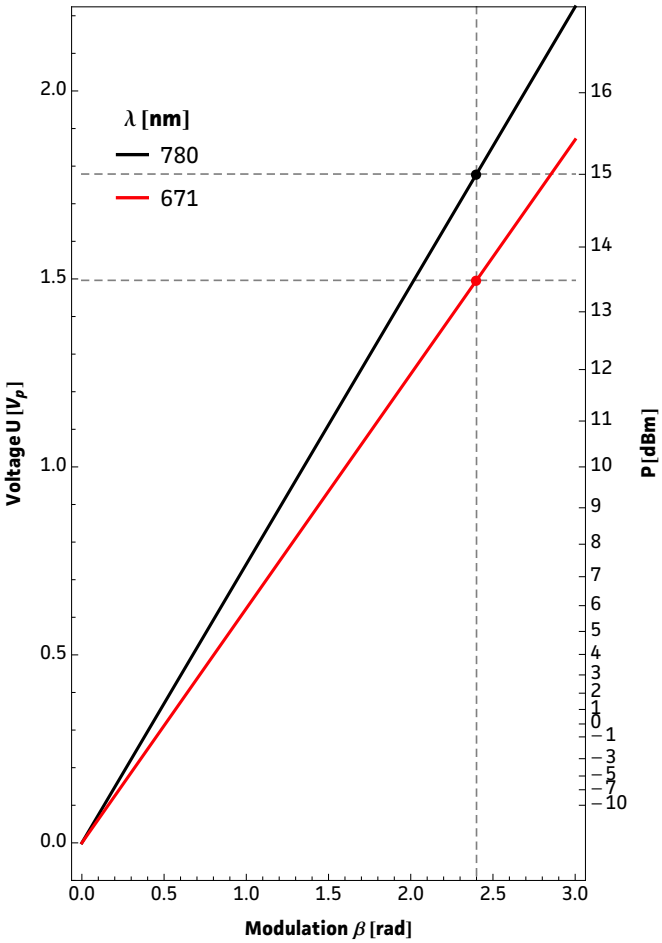
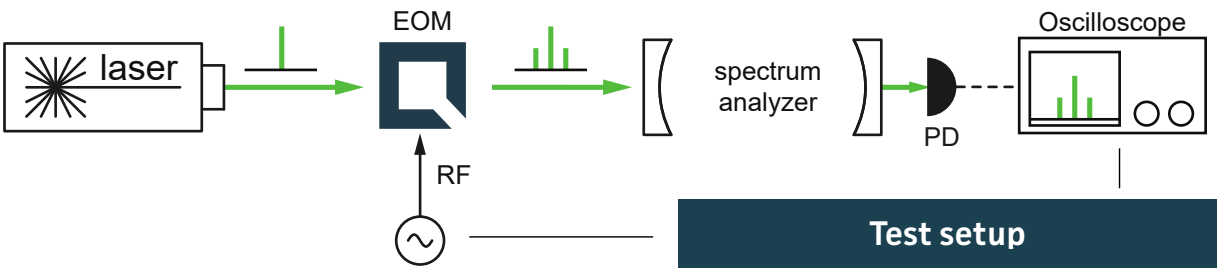
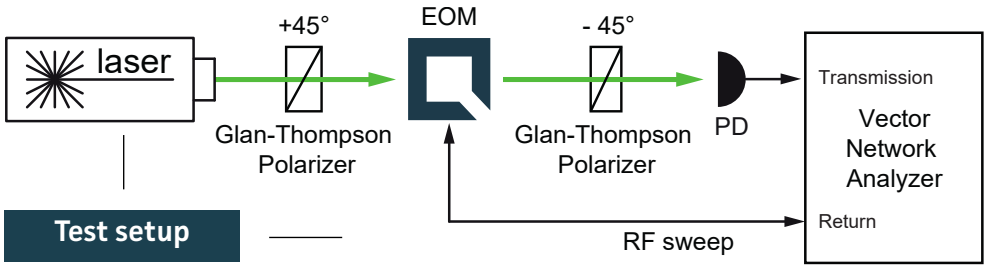
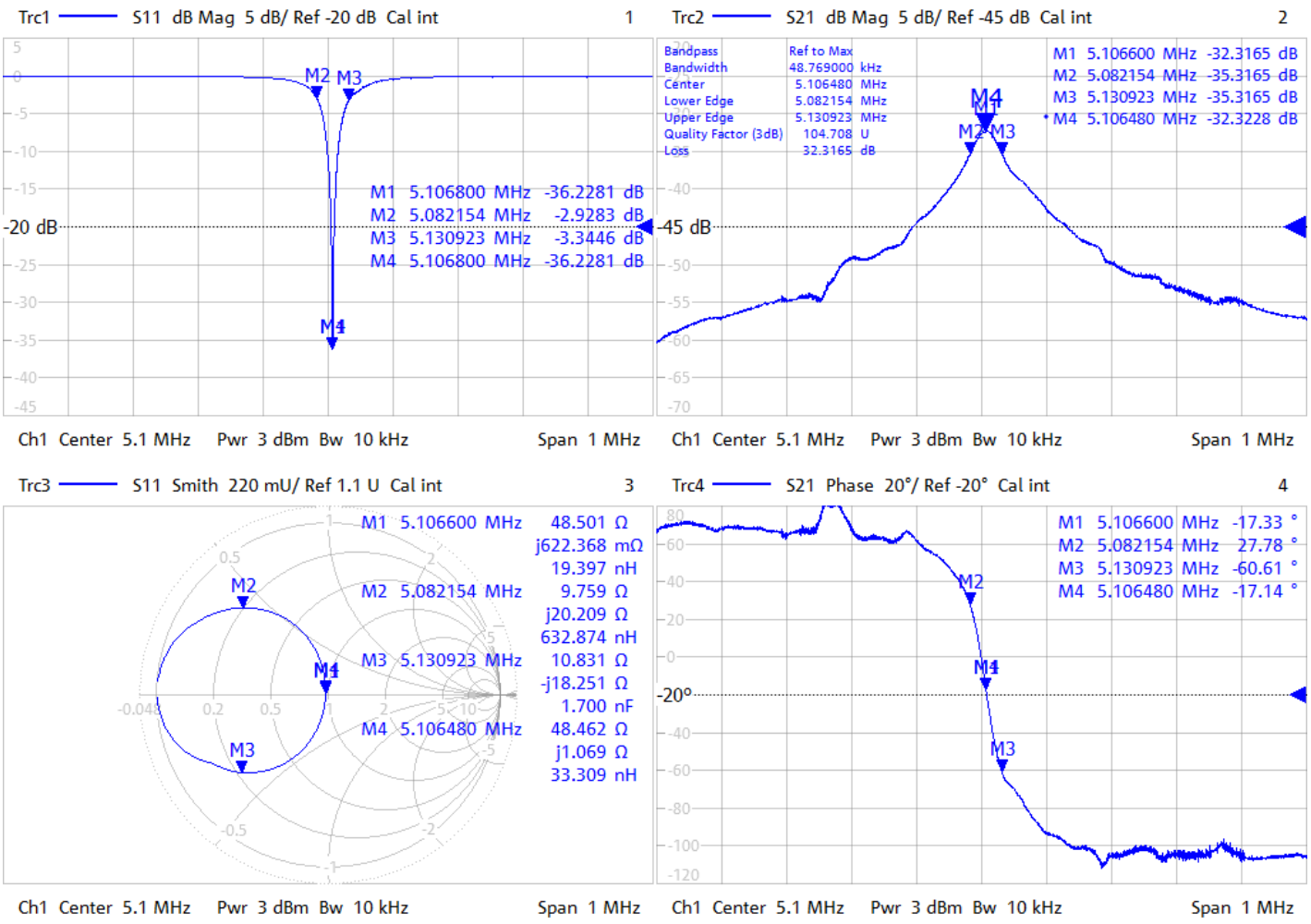


Fig. 3: RF–signal amplitude vs. modulation depth



Resonance Characteristics

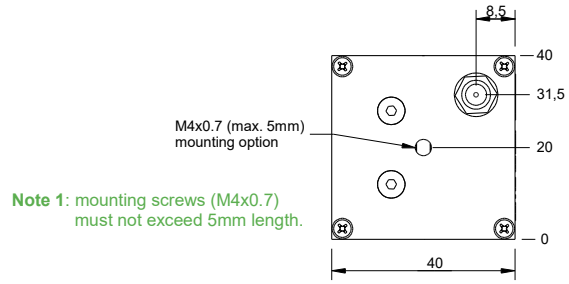




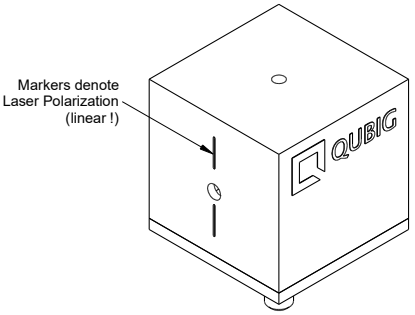
Handling instructions

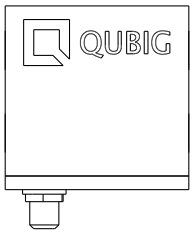
- Input laser polarization must be aligned with respect to the white markers on the housing
- Please handle device carefully. Avoid shock. Don't drop.
- After turn on the resonance frequency might drift slightly with applied RF power. Please compensate by tuning the RF drive frequency until steady-state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

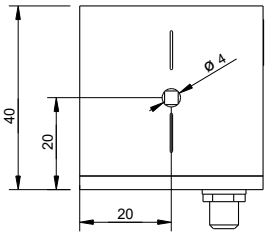
Package drawing

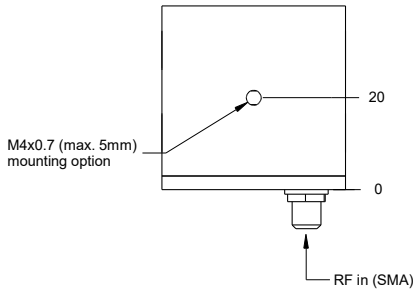


Note 1: mounting screws (M4x0.7) must not exceed 5mm length.

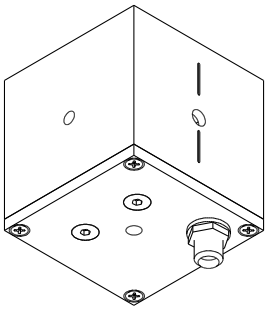


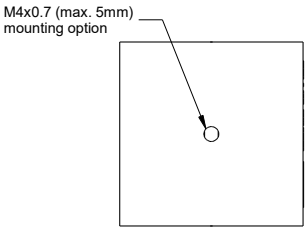






Note 2: crystal aperture is 3x3mm.





Tested by:

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