QUBIG

Empowering Laser Technologies

Test Data Sheet

PM-Yb171+_2.1M3

(old: EO-T2100M3-VIS)

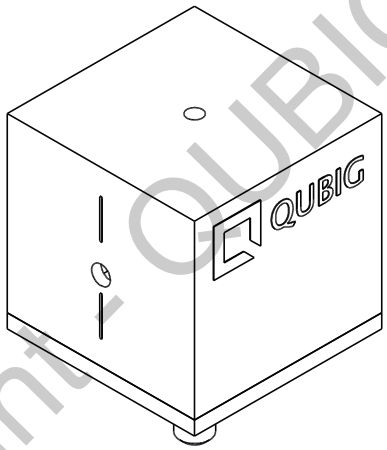
S/N:

Resonant electro-optic phase modulator

with

- tunable resonance frequency

- thermal crystal mount



RF properties	Value	Unit
Resonance frequency: f_0 [1)]	1909 - 2194	MHz
Preset frequency: f_{set} [1)]	2105	MHz
Bandwidth: Δν	5.3	MHz
Quality factor: Q	397	
Required RF power for 1rad @ 370nm [2)]	22.3	dBm
max. RF power: RF_{max} [3)]	3	W

Optical properties		
EO crystal	MLN	
Aperture	3x3	mm^2
Wavefront distortion (633nm)	λ/4	nm
recommended optical intensity (370nm)	<0.1	W/mm^2
AR coating (R<1%)	360 - 650	nm

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

Measured modulation

Fig. 1: Oscilloscope trace

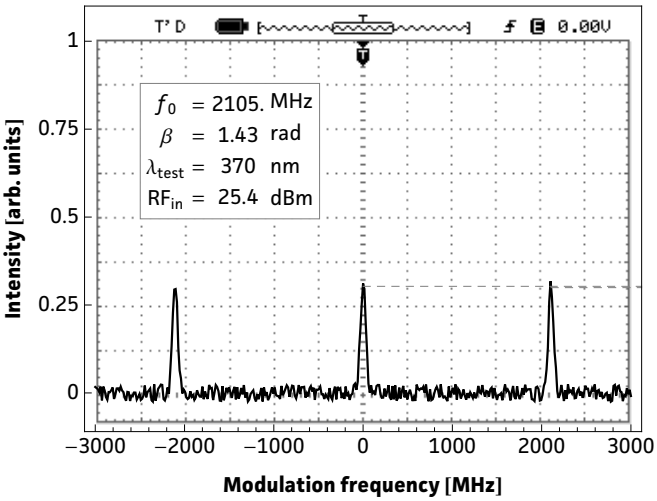


Fig. 2: Carrier/sideband ratio

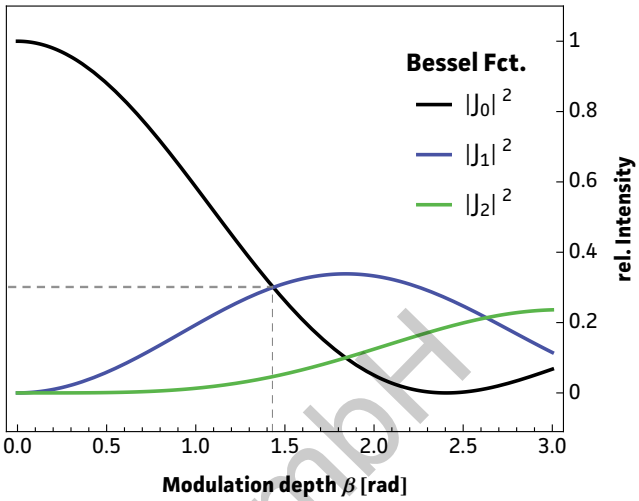


Table 1: Expected modulation

$\beta = 1$ rad	unit	λ_1
λ	nm	**370**
P	dBm	22.3
P	mW	170
U	V_p	4.1
U_π	V_p	12.9
β / U	rad / V	0.24

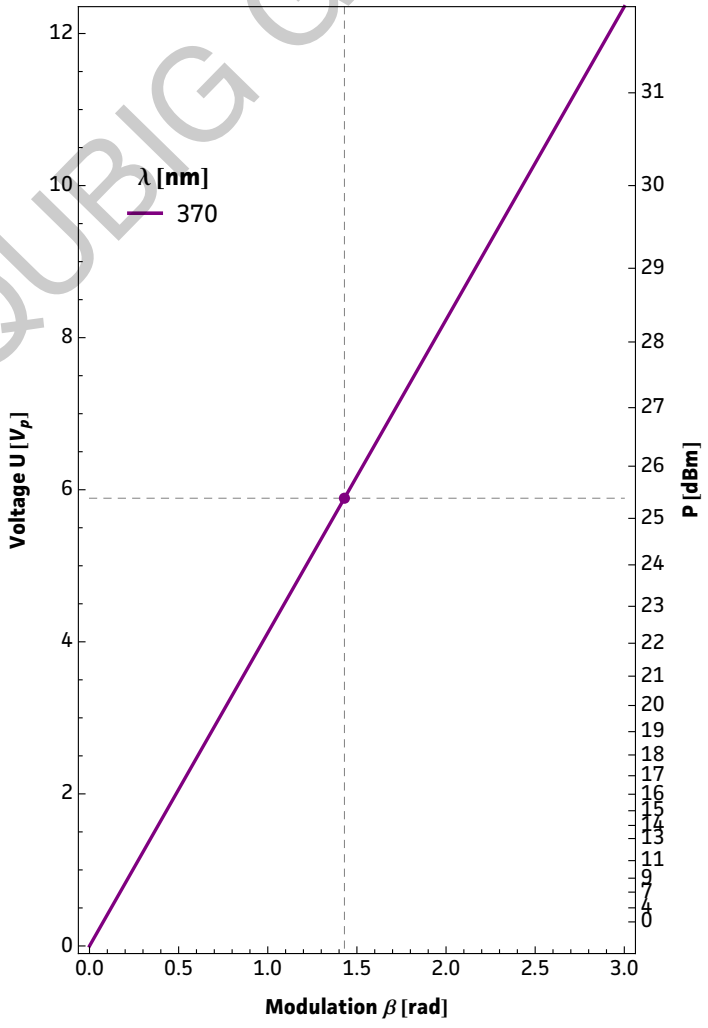


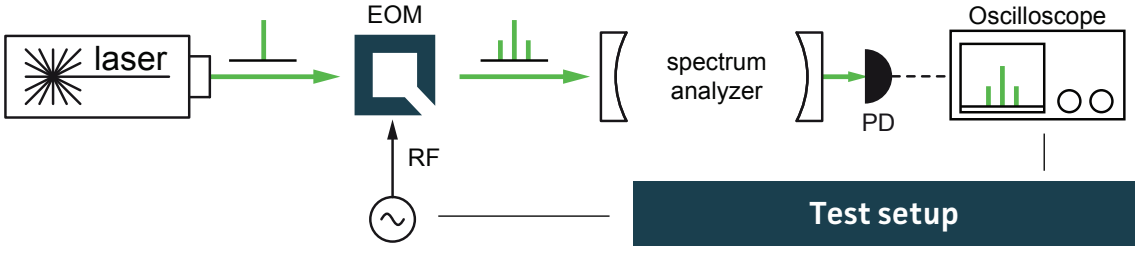
Fig. 3: RF–signal amplitude vs. modulation depth

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

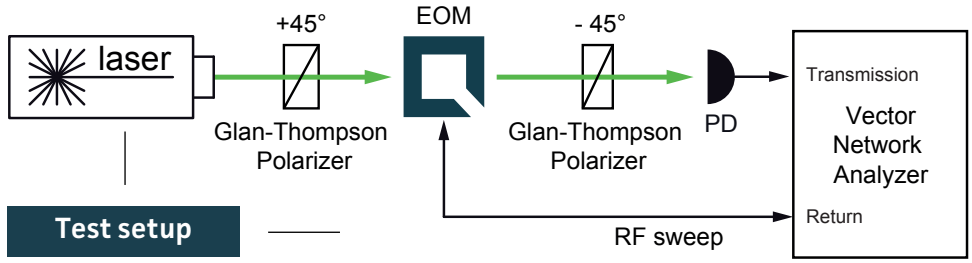
Fig.2: Squared absolute values of first-kind Bessel functions vs. modulation depth. Vertical lines reveal the ratio between the carrier $|J_0|^2$ and the i^{th} sideband $|J_i|^2$ at a specific ß.

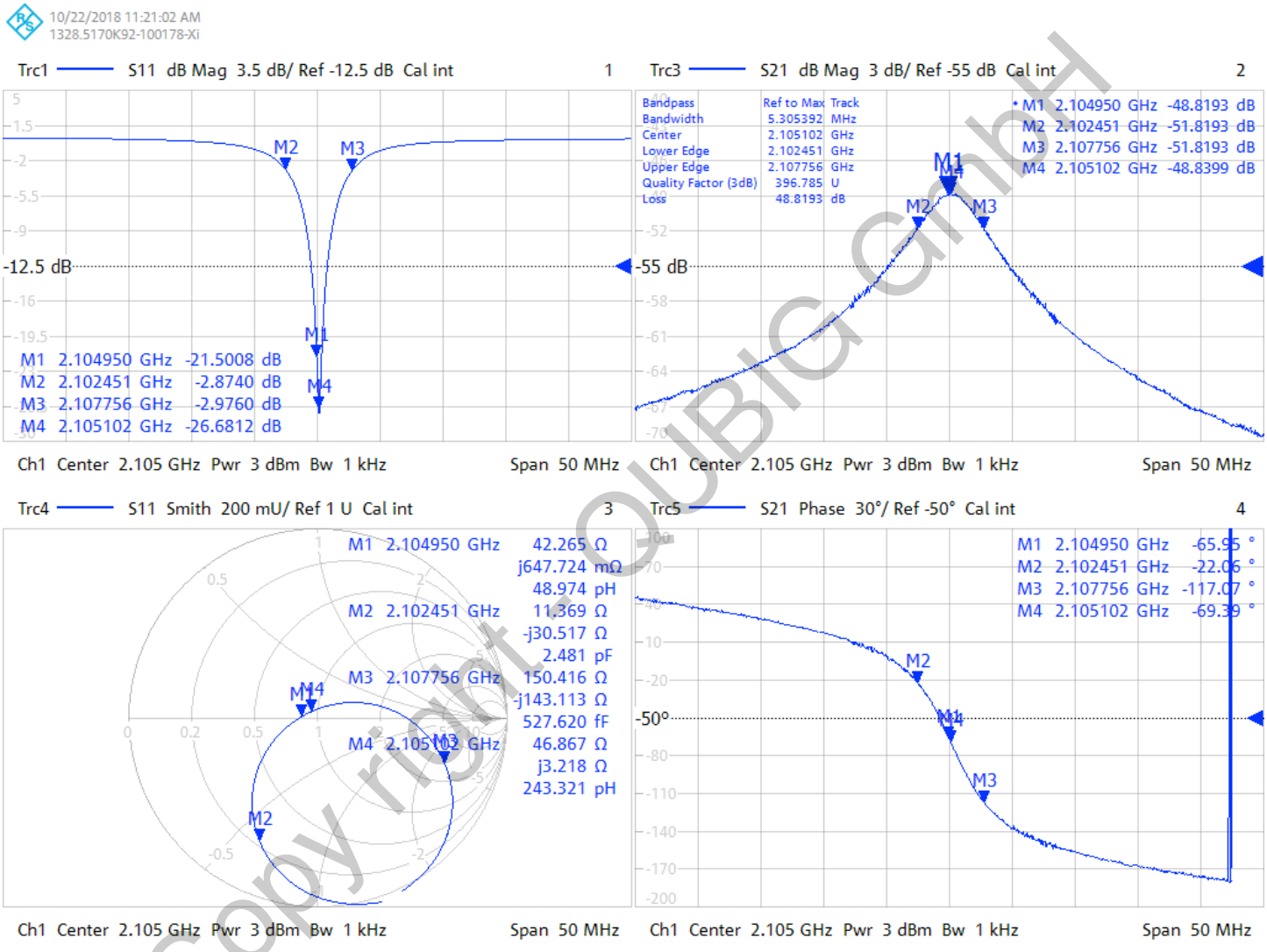
Fig.3: Dependency between RF amplitude and modulation depth for different wavelengths. Points on the curve allow to retrieve either the required RF amplitude for a specific/desired ß or the max. achievable modulation depth for a given/available RF power.

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

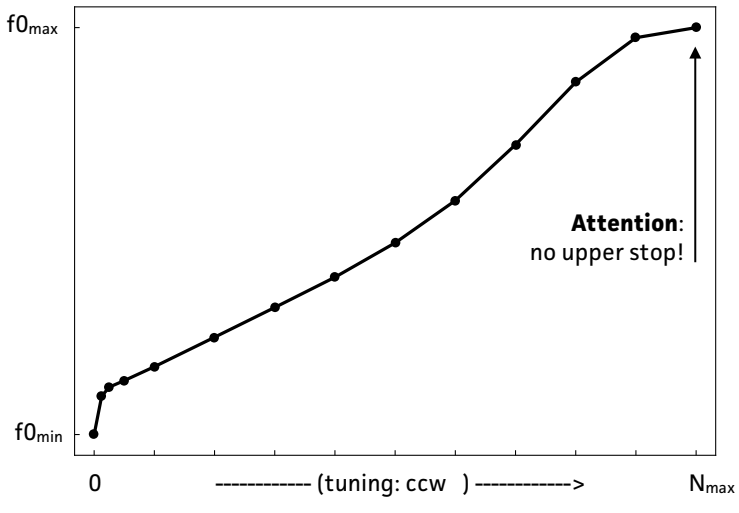




Tuning performance

MAX resonance frequency	f_0 max	2194	MHz
MIN resonance frequency	f_0 min	1909	MHz
number of turns	N_{max}	5	
counter clock-wise turns ↺	higher f_0 ↑		
clock-wise turns ↻	lower f_0 ↓		

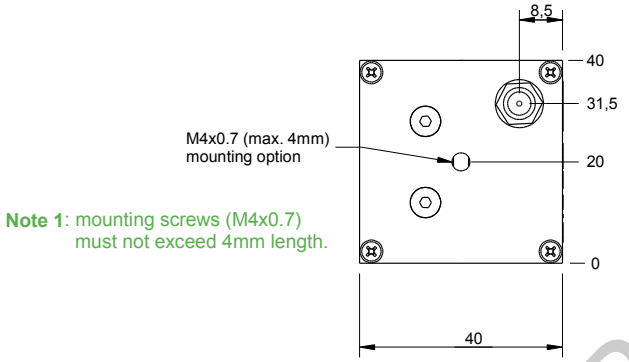
- **use only supplied tuning tool**
- **actuate tuner carefully**
- **do not apply too much pressure or torque**
- **keep tuning tool coaxial**
- **tuner might not be perfectly orthogonal to box**



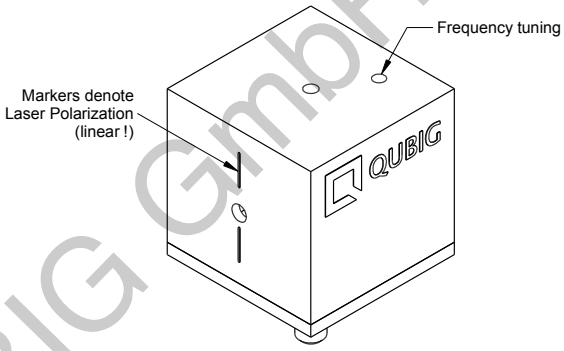
Handling instructions

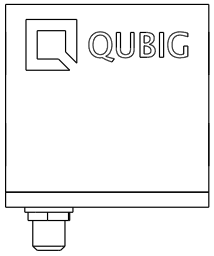
- Input laser polarization must be aligned with respect to the white markers on the housing
- Please handle device carefully. Avoid shock. Don't drop.
- After turn on the resonance frequency might drift slightly with applied RF power. Please compensate by tuning the RF drive frequency until steady-state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

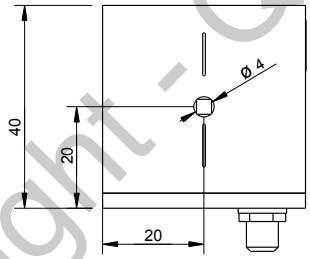
Package drawing

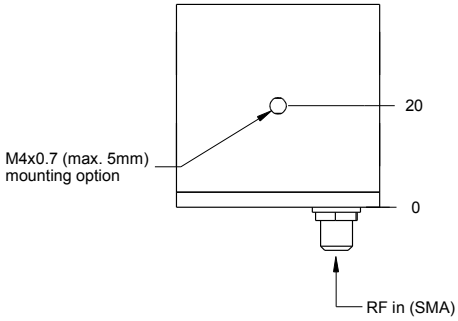


Note 1: mounting screws (M4x0.7) must not exceed 4mm length.

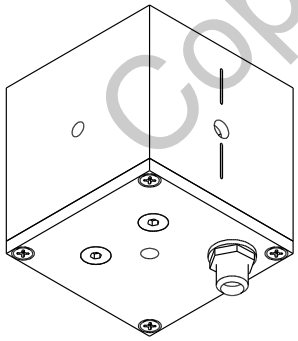


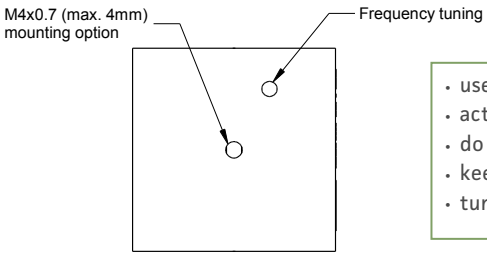






Note 2: crystal aperture is 3x3mm.





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Tested by:

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