

Test Data Sheet

PM-Li7_0.8M3

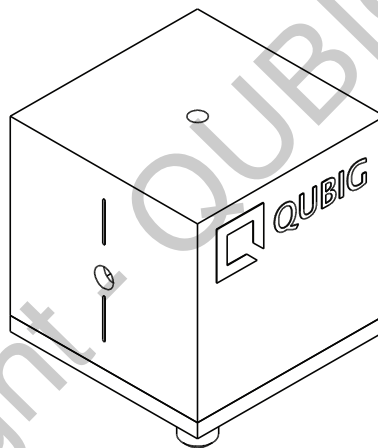
(old: EO-Li7-M3)

S/N:

Resonant electro-optic phase modulator

with

- tunable resonance frequency
- thermal crystal mount



RF properties	Value	Unit
Resonance frequency: f_0 ¹⁾	675 - 858	MHz
Preset frequency: f_{set} ¹⁾	813	MHz
Bandwidth: $\Delta\nu$	2.1	MHz
Quality factor: Q	387	
Required RF power for 1rad @ 671nm ²⁾	24.2	dBm
max. RF power: RF_{max} ³⁾	1	W

Optical properties		
EO crystal	MLN	
Aperture	3x3	mm ²
Wavefront distortion (633nm)	$\lambda/4$	nm
recommended optical intensity (671nm)	<5	W/mm ²
AR coating (R<0.5%)	350 - 670	nm

¹⁾ at 22.3°C ²⁾ with 50Ω termination ³⁾ no damage with $RF_{in} < 3W$

Measured modulation

Fig. 1: Oscilloscope trace

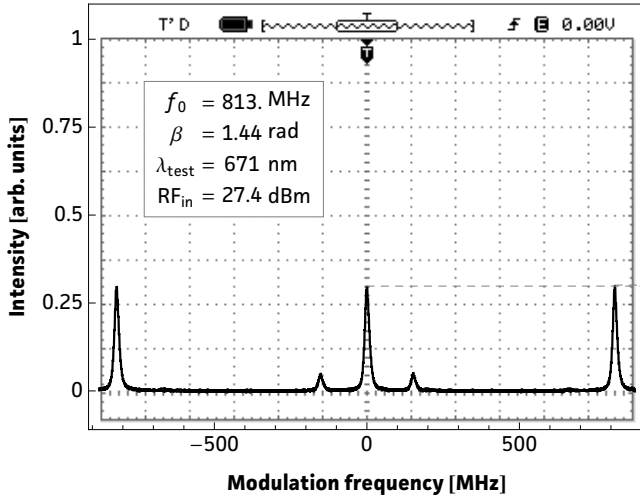


Fig. 2: Carrier/sideband ratio

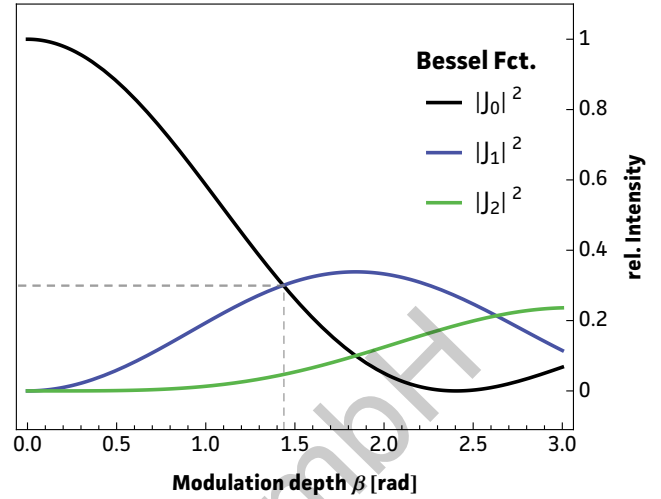


Table 1: Expected modulation

$\beta = 1 \text{ rad}$	unit	λ_1
λ	nm	671
P	dBm	24.2
P	mW	265
U	V_p	5.2
U_π	V_p	16.2
β / U	rad / V	0.19

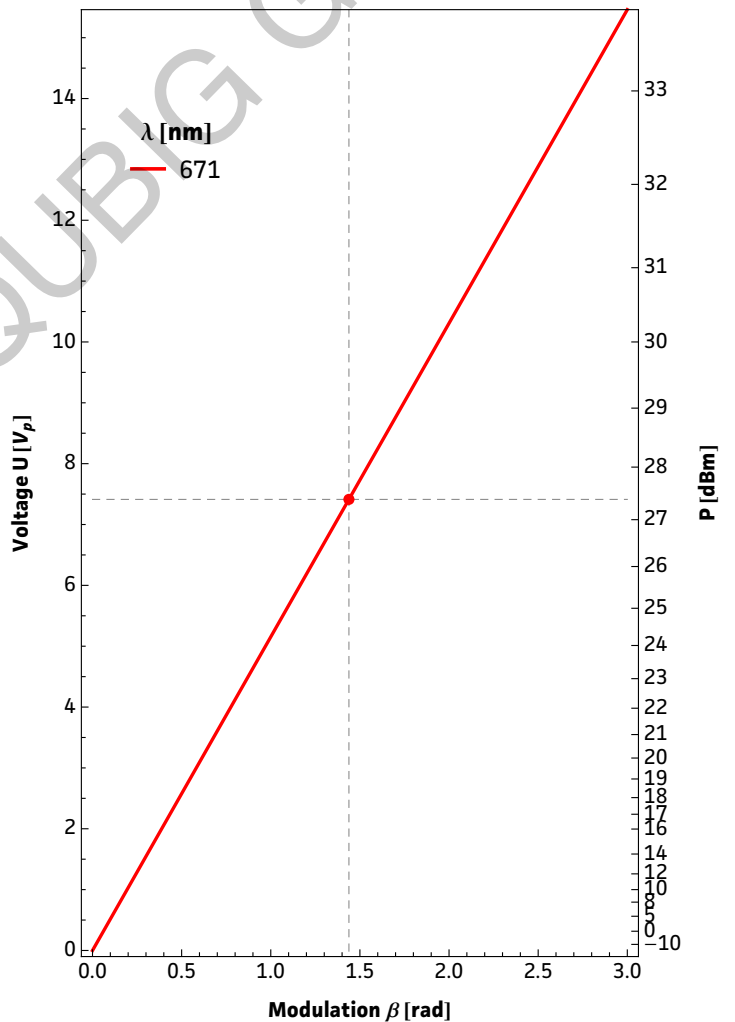


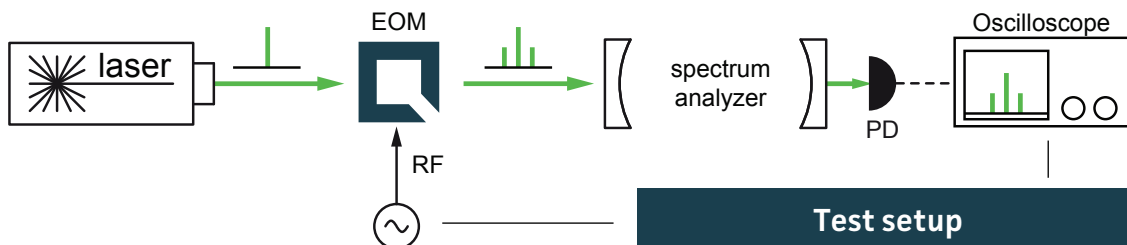
Fig.1: Recorded oscilloscope trace retrieved from a test setup as illustrated below.

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 .

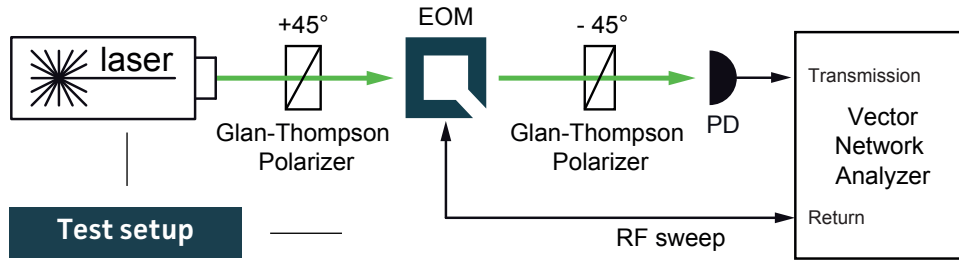
Fig.3: Dependency between RF amplitude and modulation depth for different wavelengths. Points on the curve allow to retrieve either the required RF amplitude for a specific/desired β or the max. achievable modulation depth for a given/available RF power.

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.

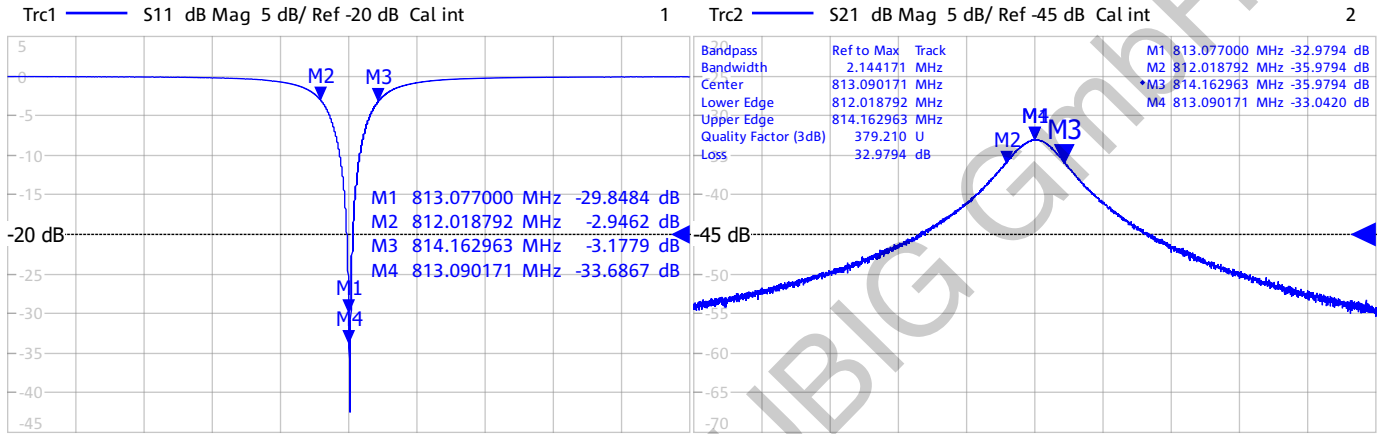
Fig. 3: RF-signal amplitude vs. modulation depth



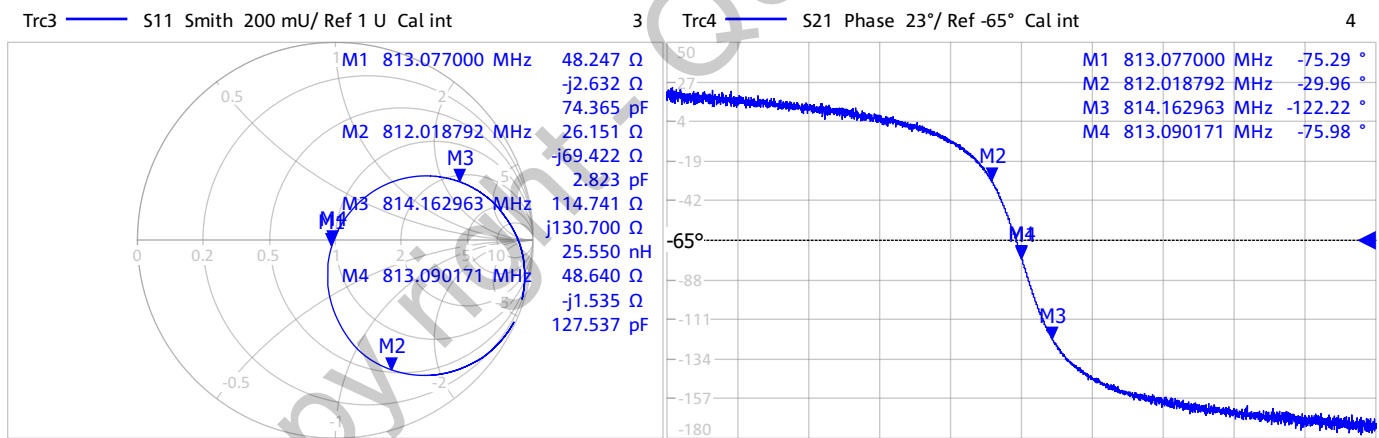
Resonance characteristics



7/10/2017 6:19:51 PM
1328.5170K92-100178-Xi



Ch1 Center 813.072 MHz Pwr 0 dBm Bw 10 kHz Span 25 MHz Ch1 Center 813.072 MHz Pwr 0 dBm Bw 10 kHz Span 25 MHz

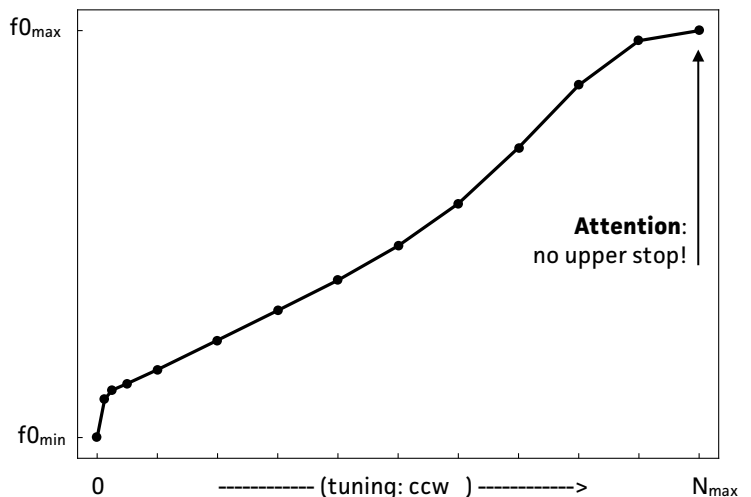


Ch1 Center 813.072 MHz Pwr 0 dBm Bw 10 kHz Span 25 MHz Ch1 Center 813.072 MHz Pwr 0 dBm Bw 10 kHz Span 25 MHz

Tuning performance

MAX resonance frequency	$f_0 \text{ max}$	858	MHz
MIN resonance frequency	$f_0 \text{ min}$	675	MHz
number of turns	N_{max}	5	
counter clock-wise turns ↻	higher f_0 ↑		
clock-wise turns ↻	lower f_0 ↓		

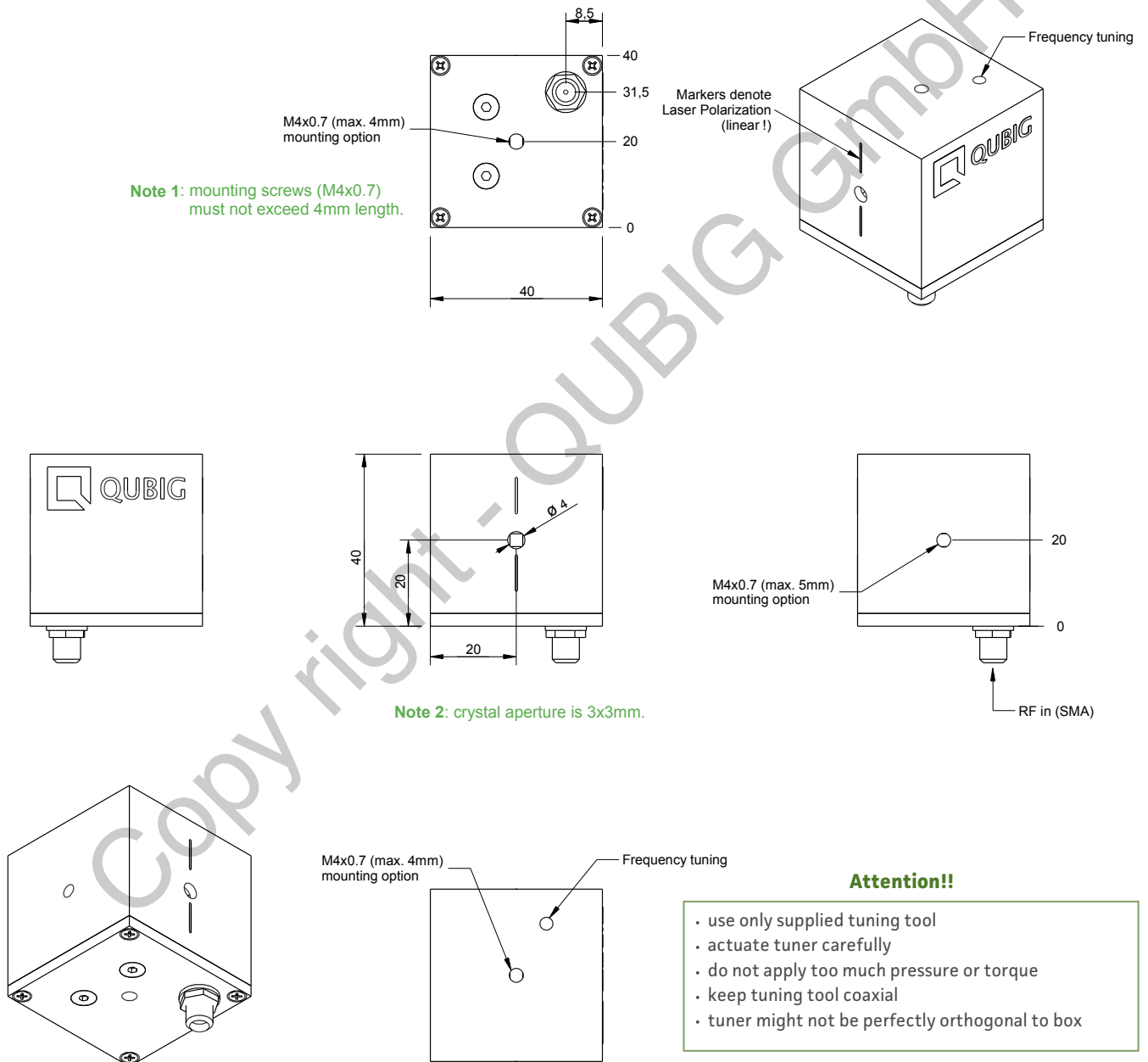
- use only supplied tuning tool
- actuate tuner carefully
- do not apply too much pressure or torque
- keep tuning tool coaxial
- tuner might not be perfectly orthogonal to box



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).
- Slight angle adjustment can reduce unwanted residual amplitude modulation (RAM)

Package drawing



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