

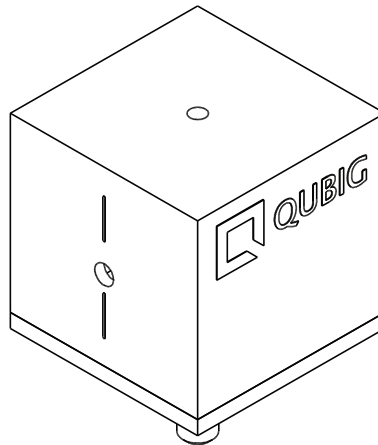


Test Data Sheet

EO-T50T3-IR4

S/N:

Resonant electro-optic phase modulator with - tunable resonance frequency



RF properties	Value	Unit
Resonance frequency: f_0 ¹⁾	42.5 - 55.2	MHz
Preset frequency: f_{set} ¹⁾	50.0	MHz
Bandwidth: $\Delta\nu$	330	kHz
Quality factor: Q	150	
Required RF power for 1rad @ 4.6 μ m ²⁾	34.7	dBm
max. RF power: RF_{max} ³⁾	2	W

Optical properties		
EO crystal	LT	
Aperture	3x3	mm ²
Wavefront distortion (633nm)	$\lambda/6$	nm
recommended max. optical intensity (4.6 μ m)	<10	W/mm ²
AR coating (R<0.5%)	3.0 - 5.0	μ m

¹⁾ at 24.3°C ²⁾ with 50 Ω termination ³⁾ no damage with $RF_{in} < 5W$

Measured modulation

Fig. 1: Oscilloscope trace

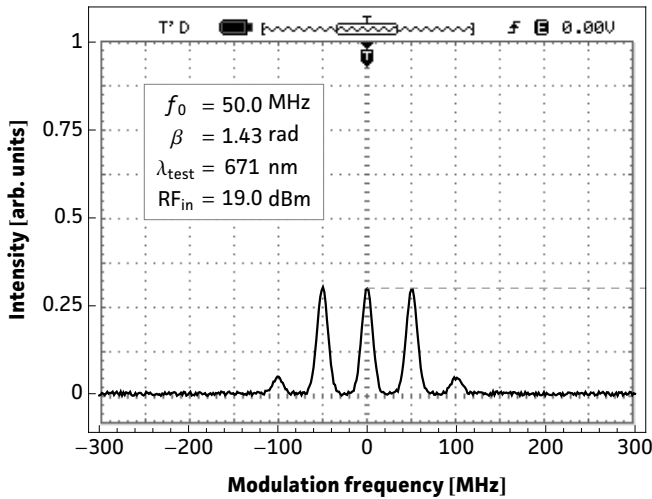


Fig. 2: Carrier/sideband ratio

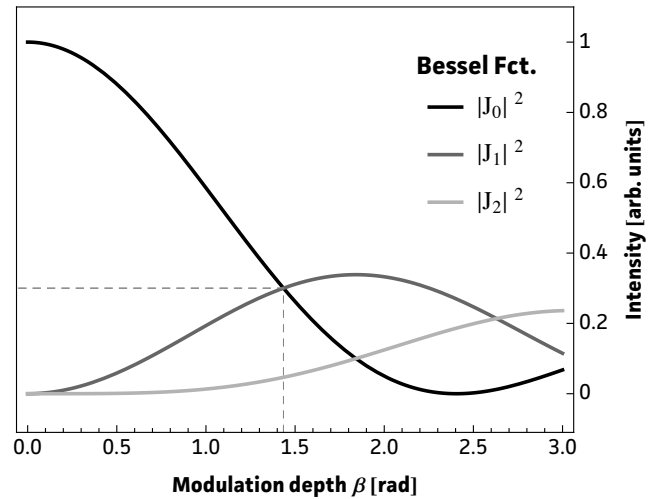


Table 1: Expected modulation

$\beta = 1 \text{ rad}$	unit	λ_1	λ_2
λ	nm	671	4600
P	dBm	15.8	34.7
P	W	0.04	2.92
U	V _p	2.	17.1
U _{π}	V _p	6.2	53.7
β/U	rad/V	0.51	0.06

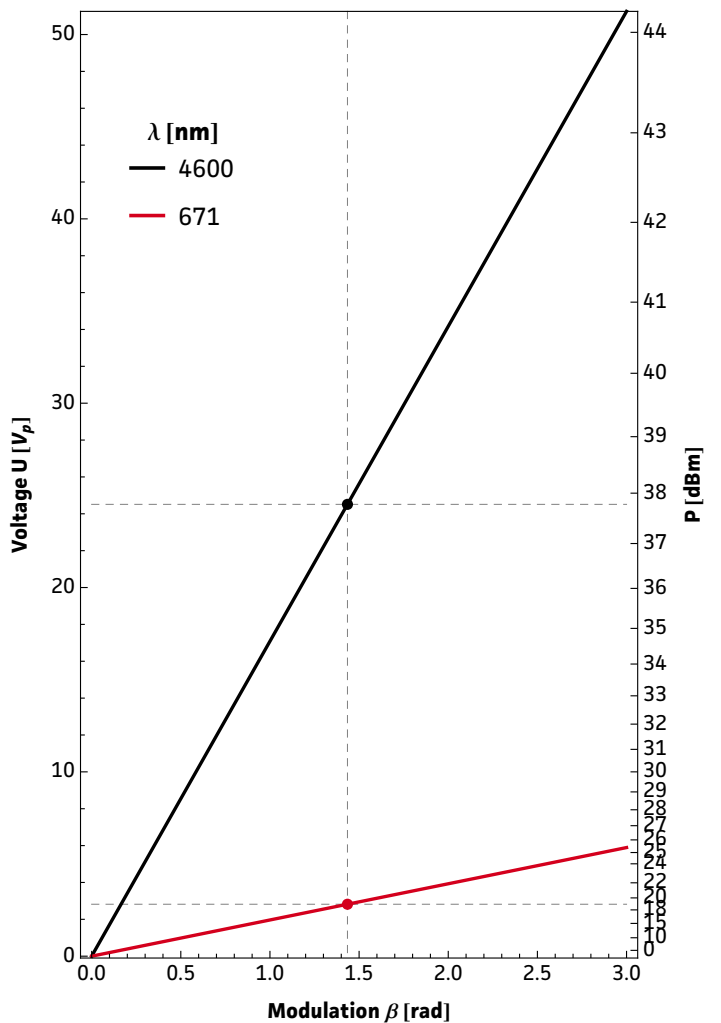


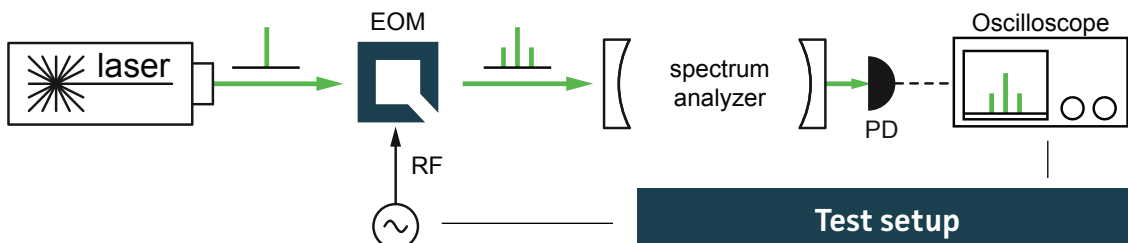
Fig.1: Recorded oscilloscope trace retrieved from a test setup as illustrated below.

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 .

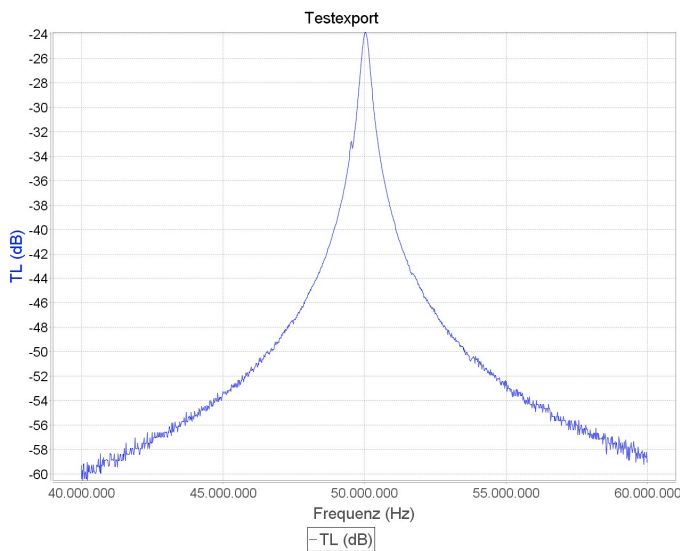
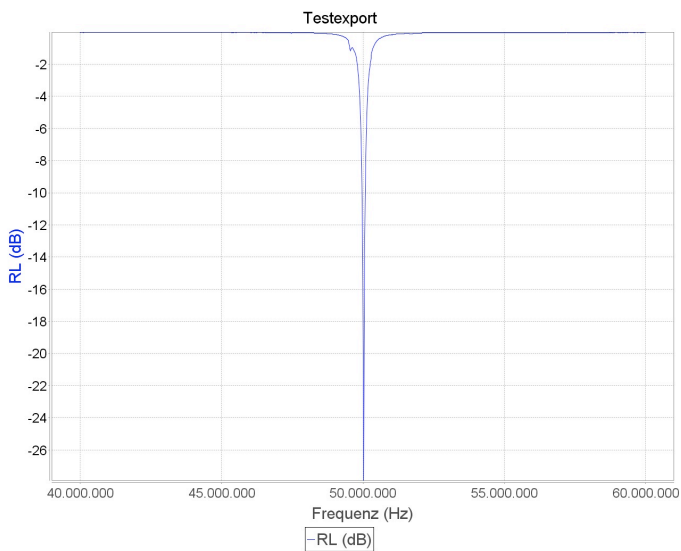
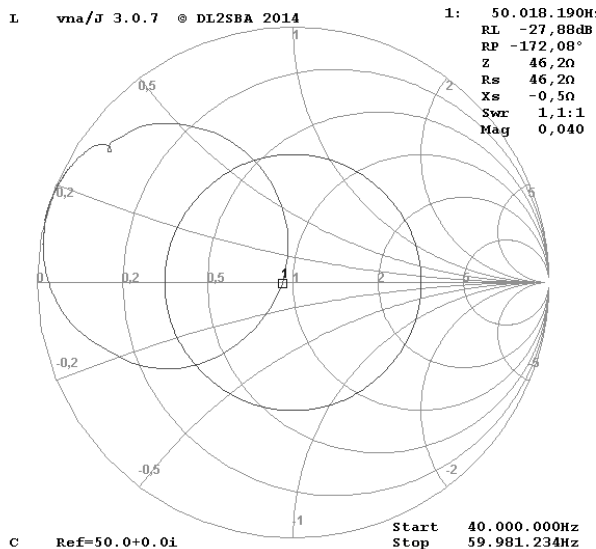
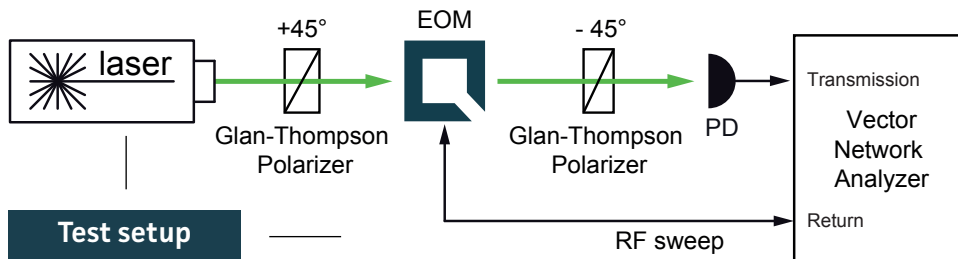
Fig.3: Dependency between RF amplitude and modulation depth for different wavelengths. Points on the curve allow to retrieve either the required RF amplitude for a specific/desired β or the max. achievable modulation depth for a given/available RF power.

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

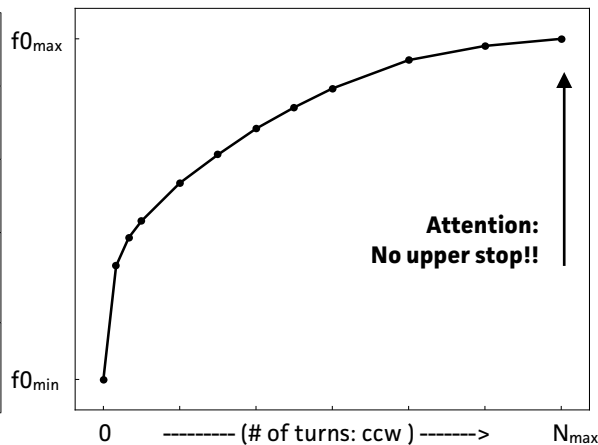


Resonance characteristics



Tuning performance

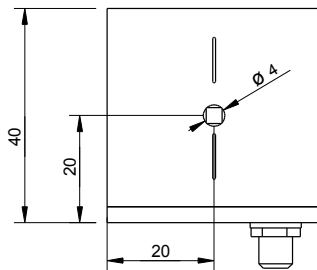
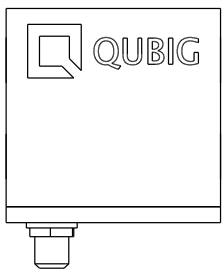
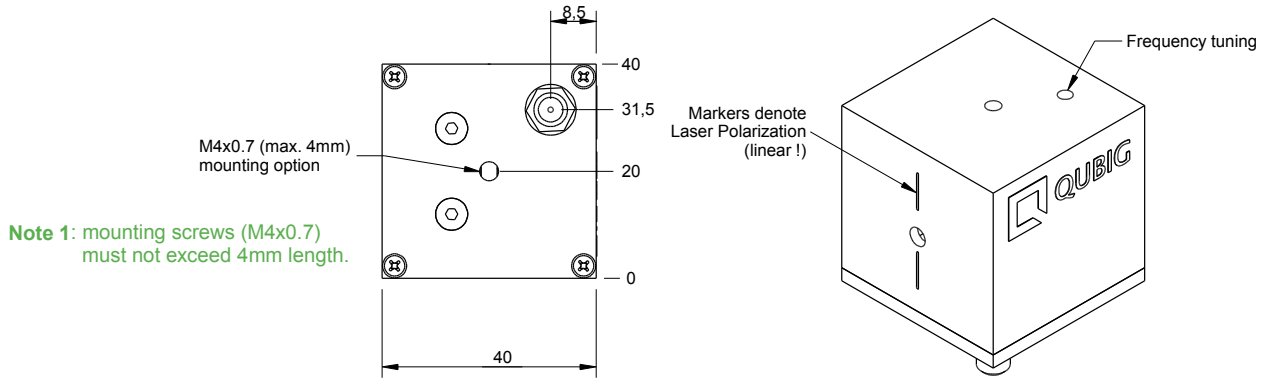
MAX resonance frequency	f_0 max	55.2	MHz
MIN resonance frequency	f_0 min	42.4	MHz
number of turns	N_{max}	19	
counter clock-wise turns ↻	higher f_0 ↑		
clock-wise turns ↻	lower f_0 ↓		



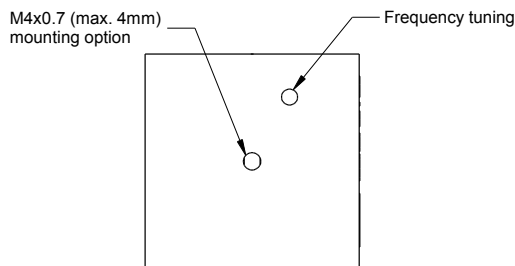
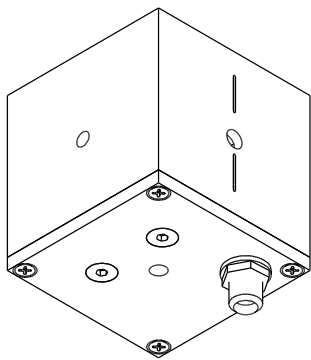
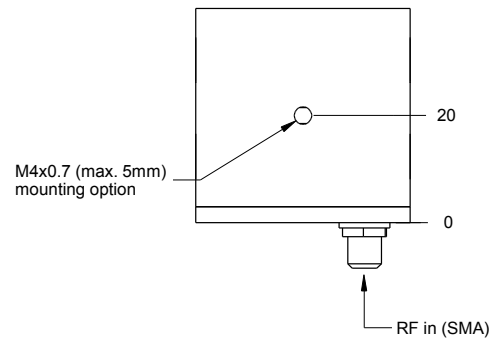
Handling instructions

- Input laser polarisation must be orthogonally aligned with respect to the cooling fins
- 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!!!

Housing is hermetically sealed.
No use serviceable parts inside.
Screws must not be loosened!
Crystal will be damaged otherwise.

Tested by:

Tel: +49 8642 2449064
Fax: +49 8642 2447063
eMail: mail@qubig.de
web: www.qubig.com

Qubig GmbH
Greimelstr. 26
83236 Übersee
Germany