

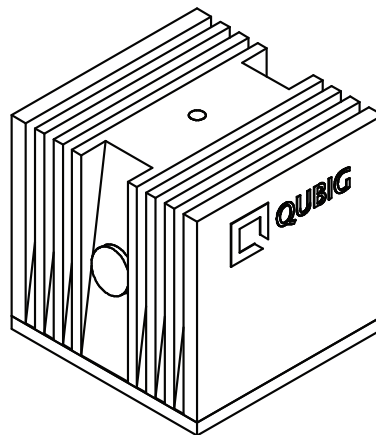


Test Data Sheet

EO-T4P3-UV

S/N:

Resonant electro-optic phase modulator
 with
 - thermal crystal mount
 - hermetically sealed housing
 - tunable resonance frequency



RF properties	Value	Unit
Resonance frequency: f_0 ¹⁾	3.3 - 4.7	MHz
Preset frequency: f_{set} ¹⁾	4.0	MHz
Bandwidth: $\Delta\nu$	~135	kHz
Quality factor: Q	~52	
Required RF power for 1rad @ 275 320nm ²⁾	16.2 17.8	dBm
max. RF power: RF_{max} ³⁾	3	W

Optical properties		
EO crystal	DKDP	
Aperture	3x3	mm ²
Wavefront distortion (633nm)	$\lambda/8$	nm
recommended max. optical intensity (275nm)	<1	W/mm ²
AR coating (R<0.5%)	240-420	nm

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

Measured modulation

Fig. 1: Oscilloscope trace

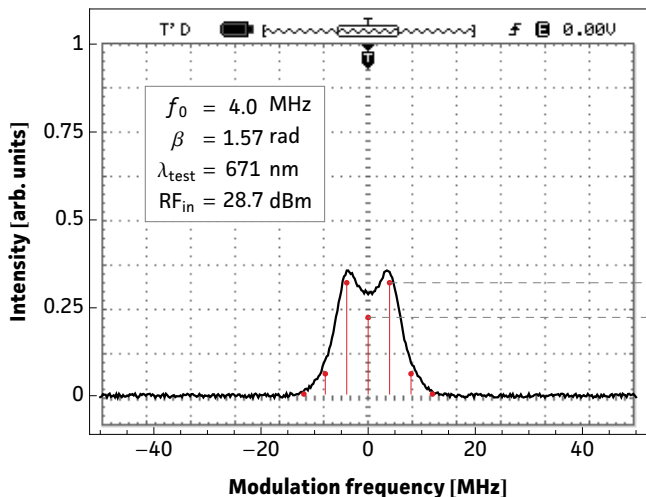


Fig. 2: Carrier/sideband ratio

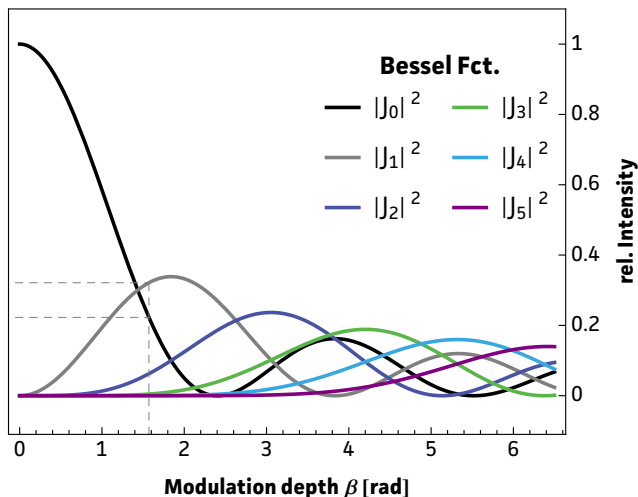


Table 1: Expected modulation

$\beta = 1 \text{ rad}$	unit	λ_1	λ_2	λ_3
λ	nm	275	320	671
P	dBm	16.2	17.8	24.8
P	mW	42	61	300
U	V_p	2.	2.5	5.5
U_π	V_p	6.4	7.7	17.2
β / U	rad / V	0.49	0.41	0.18

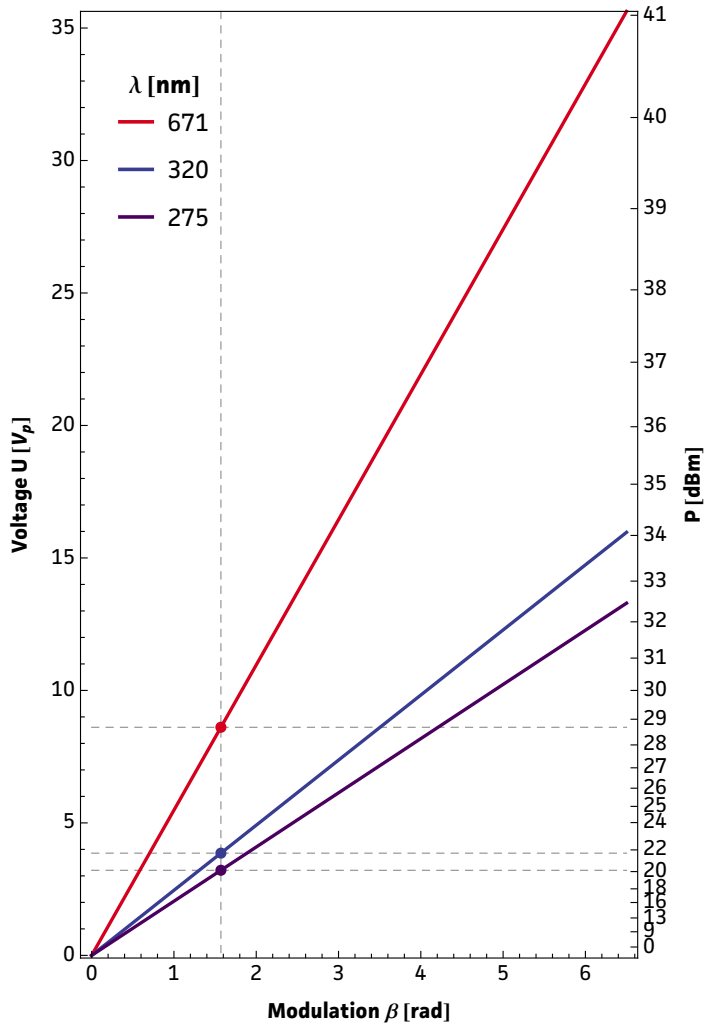


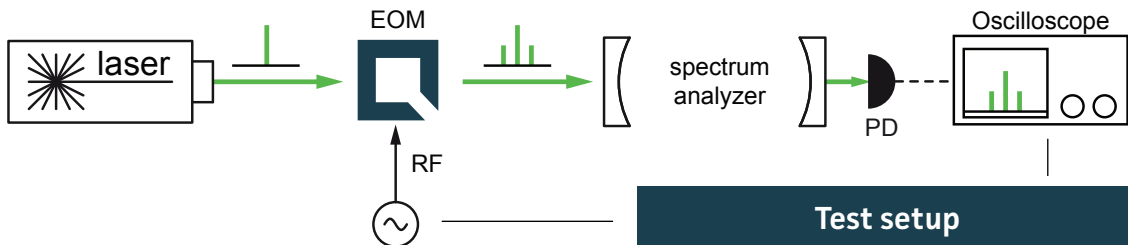
Fig.1: Recorded oscilloscope trace retrieved from a test setup as illustrated below.

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 .

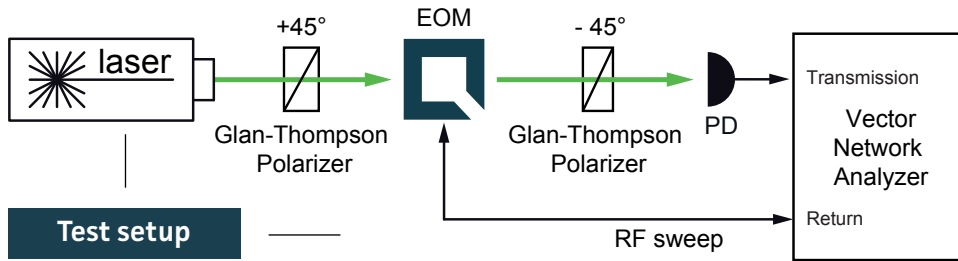
Fig.3: Dependency between RF amplitude and modulation depth for different wavelengths. Points on the curve allow to retrieve either the required RF amplitude for a specific/desired β or the max. achievable modulation depth for a given/available RF power.

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.

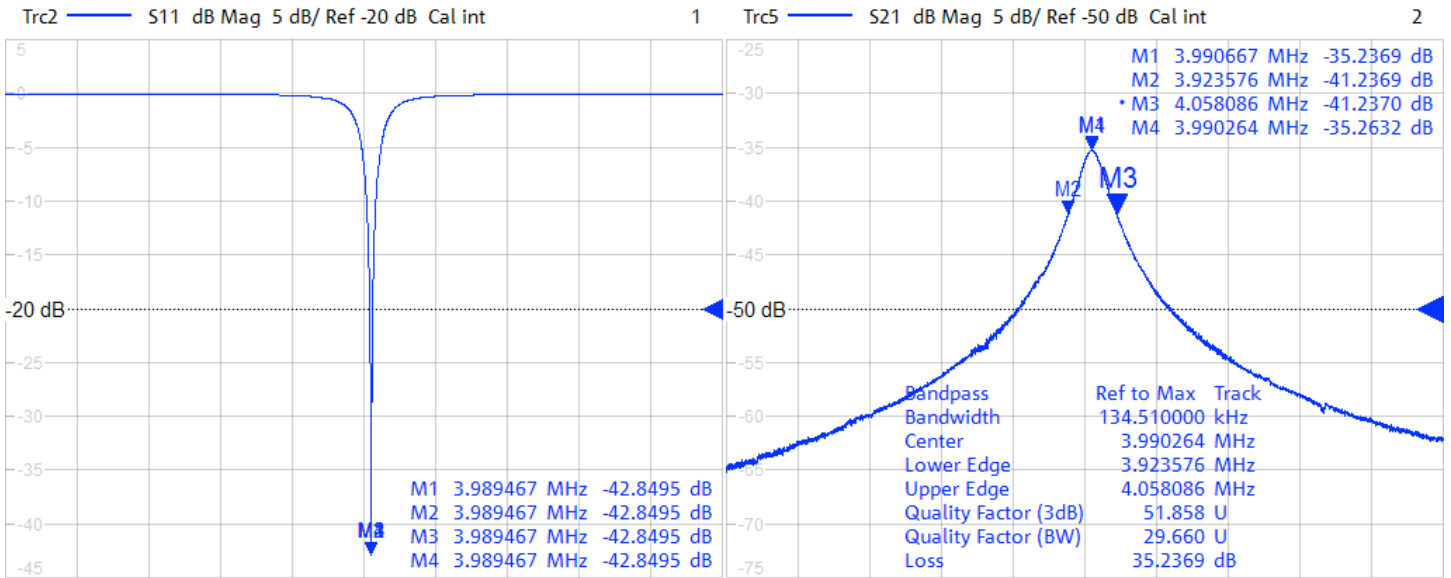
Fig. 3: RF-signal amplitude vs. modulation depth



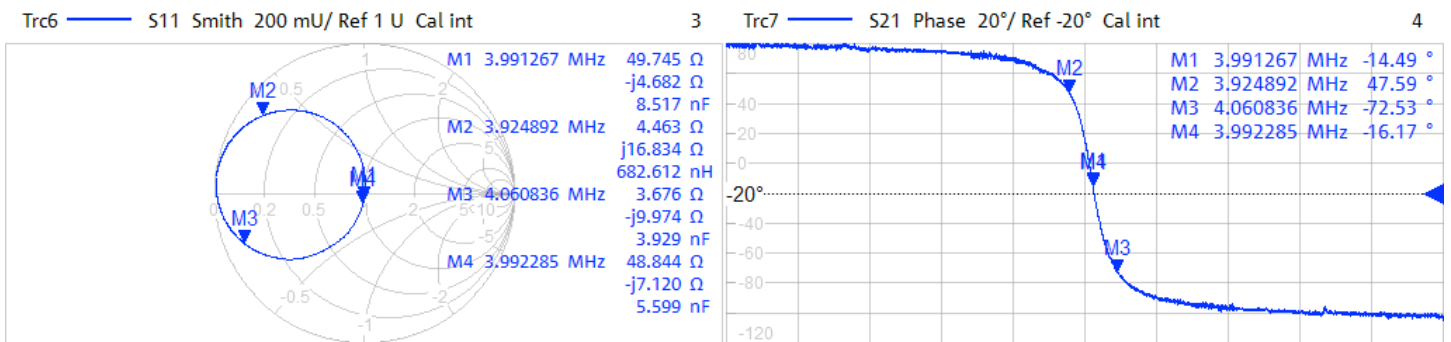
Resonance characteristics



11/26/2015 10:43:04 AM
1328.5170K92-100178-XI



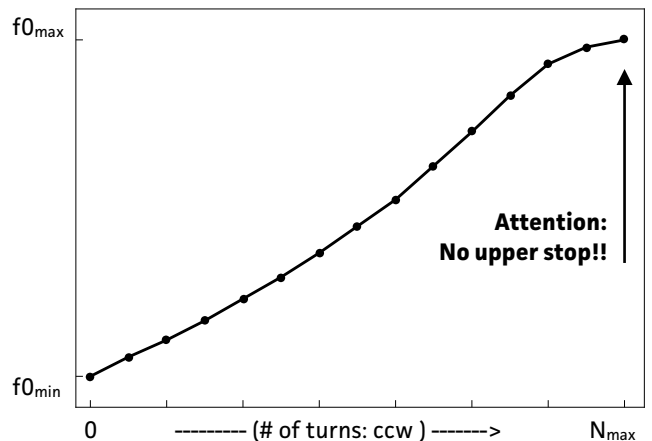
Ch2 Center 3.969467 MHz Pwr 3 dBm Bw 10 kHz Span 2 MHz Ch2 Center 3.969467 MHz Pwr 3 dBm Bw 10 kHz Span 2 MHz



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Tuning performance

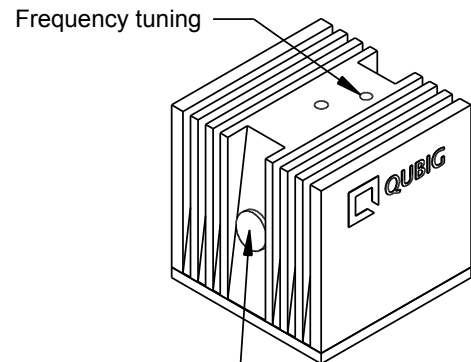
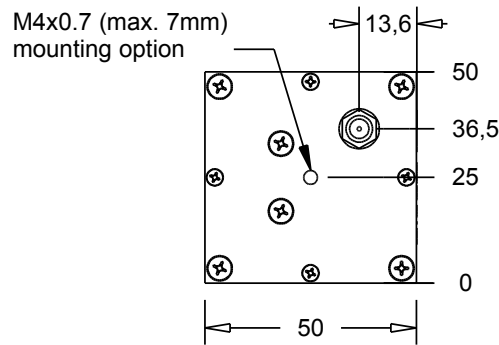
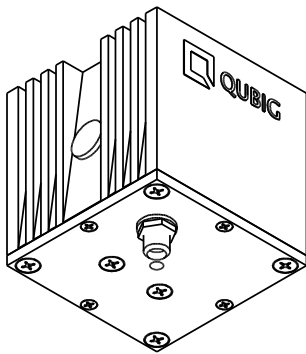
MAX resonance frequency	$f_0 \text{ max}$	4.7	MHz
MIN resonance frequency	$f_0 \text{ min}$	3.3	MHz
number of turns	N_{max}	14	
incr. frequency shift	Δf	~ 0.1	MHz / turn
counter clock-wise turns ↻	higher f_0 ↑		
clock-wise turns ↻	lower f_0 ↓		



Handling instructions

- Housing is hermetically sealed. There are no user serviceable parts inside. None of the screws must not be loosened at any time! Crystal will be damaged otherwise.
- Input laser polarisation must be orthogonal 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).

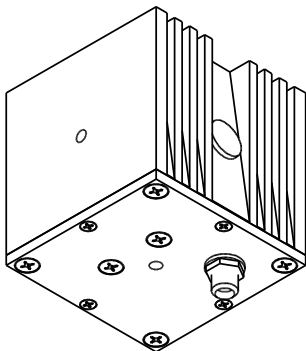
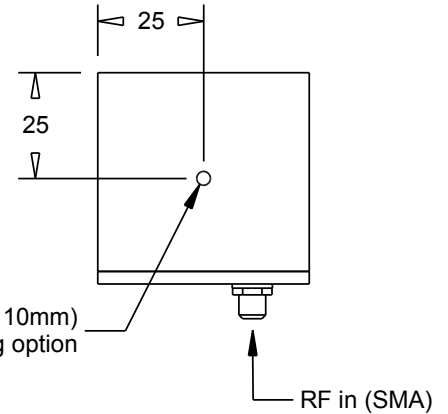
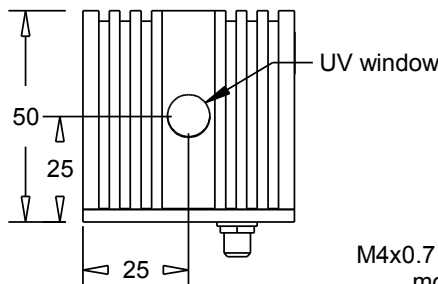
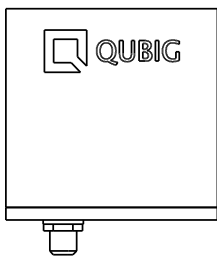
Package drawing



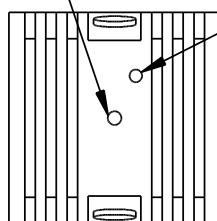
Attention!

 Laser polarisation (linear!) is orthogonal with respect to the cooling fins.

Note:

 crystal aperture is 3x3mm


M4x0.7 (max. 9mm) mounting option



Frequency tuning

Attention!!!

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

Tested by:

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