

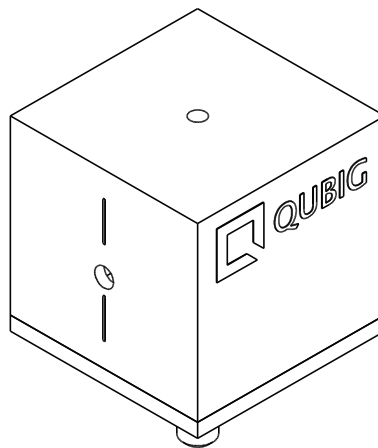


## Test Data Sheet

**EO-1000M3-NIR**

S/N:

### Resonant electro-optic phase modulator with - thermal crystal mount



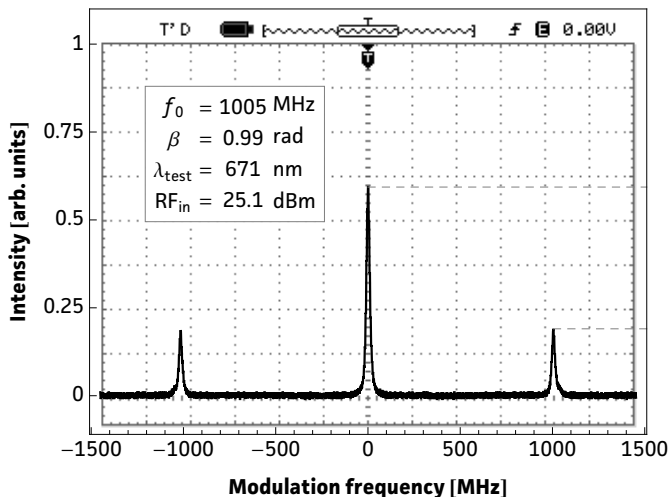
RF properties	Value	Unit
Resonance frequency: $f_0$ <sup>1)</sup>	1.0	GHz
Preset frequency: $f_{set}$ <sup>1)</sup>	1.0	GHz
Bandwidth: $\Delta\nu$	3.6	MHz
Quality factor: Q	278	
Required RF power for 1rad @ 532   880nm <sup>2)</sup>	22.7   27.9	dBm
max. RF power: $RF_{max}$ <sup>3)</sup>	3	W

Optical properties		
EO crystal	MgO:LN	
Aperture	3x3	mm <sup>2</sup>
Wavefront distortion (633nm)	$\lambda/4$	nm
recommended optical intensity (880nm)	<10	W/mm <sup>2</sup>
AR coating (R<0.5%)	500 - 1100	nm

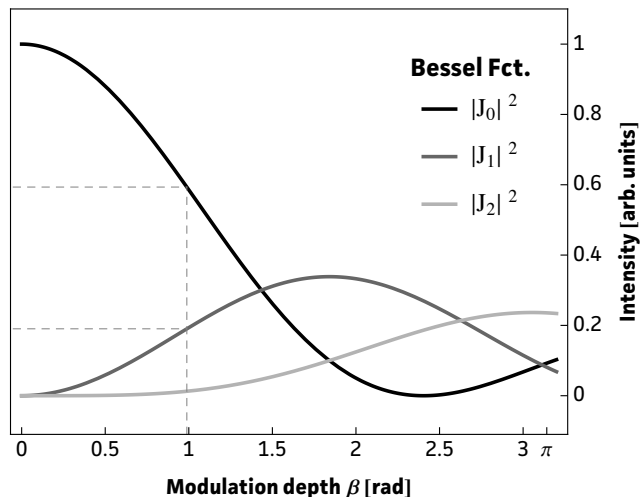
<sup>1)</sup> at 24.3°C <sup>2)</sup> with 50Ω termination <sup>3)</sup> no damage with  $RF_{in} < 10W$

# Measured modulation

**Fig. 1: Oscilloscope trace**

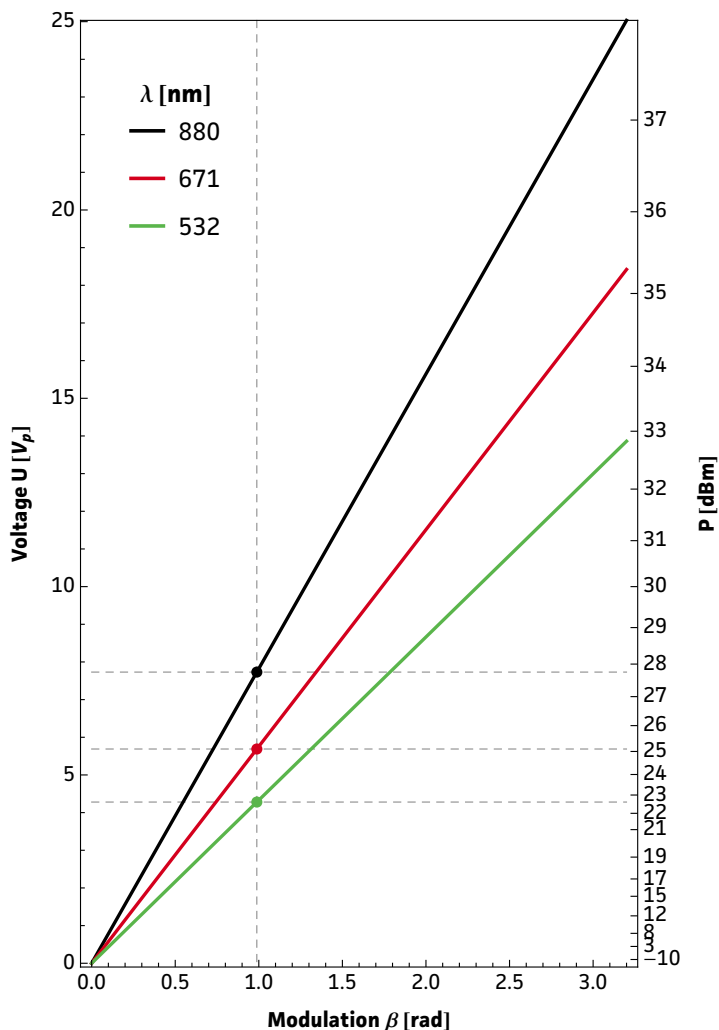


**Fig. 2: Carrier/sideband ratio**



**Table 1: Expected modulation**

$\beta = 1 \text{ rad}$	unit	$\lambda_1$	$\lambda_2$	$\lambda_3$
$\lambda$	nm	532	671	880
P	dBm	22.7	25.2	27.9
P	mW	187	332	612
U	$V_p$	4.3	5.8	7.8
$U_\pi$	$V_p$	13.6	18.1	24.6
$\beta / U$	rad/V	0.23	0.17	0.13



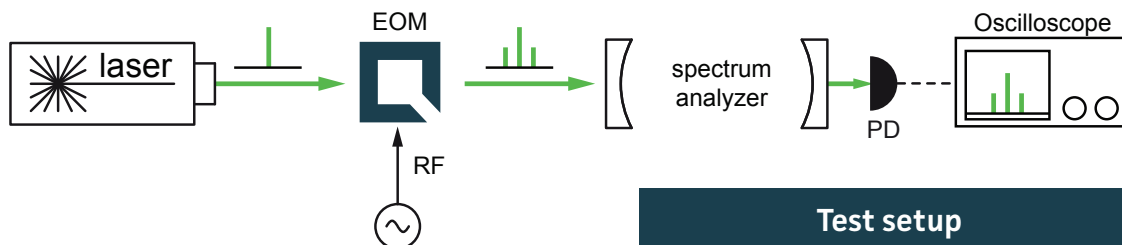
**Fig.1:** Recorded oscilloscope trace retrieved from a test setup as illustrated below.

**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  $i^{\text{th}}$  sideband  $|J_i|^2$  at a specific  $\beta$ .

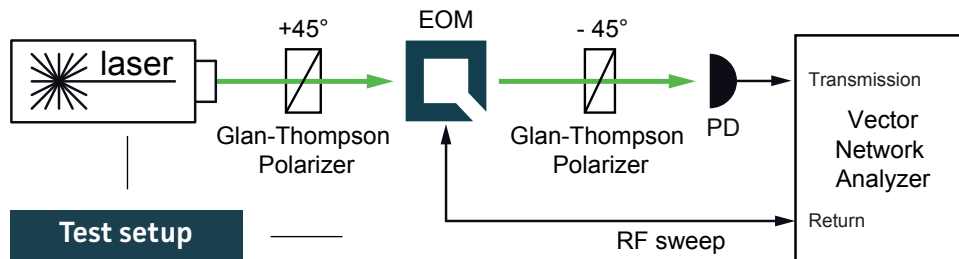
**Fig.3:** Dependency between RF amplitude and modulation depth for different wavelengths. Points on the curve allow to retrieve either the required RF amplitude for a specific/desired  $\beta$  or the max. achievable modulation depth for a given/available RF power.

**Table 1:** Expected RF-amplitude/-power values and conversion factors for the required wavelength at the reference modulation depth of 1 rad.

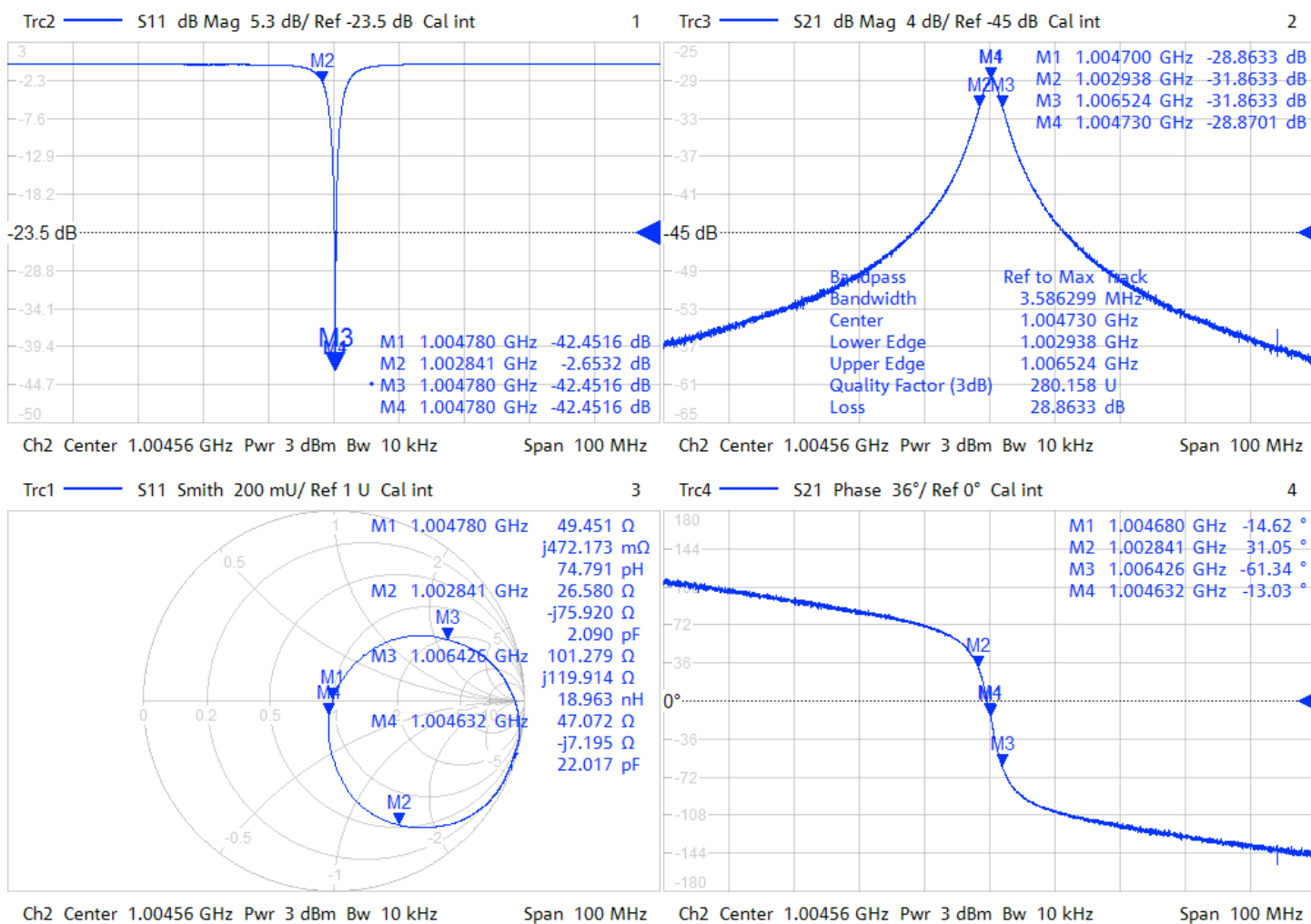
**Fig. 3: RF-signal amplitude vs. modulation depth**



## Resonance characteristics



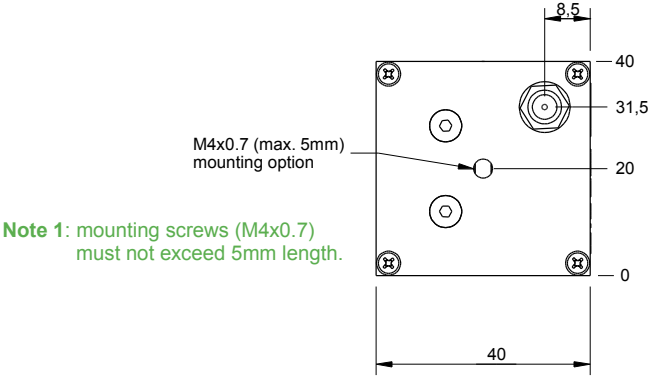
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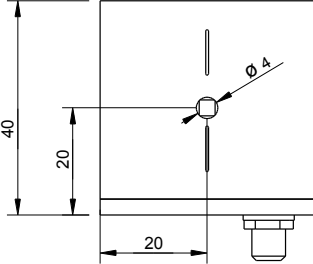
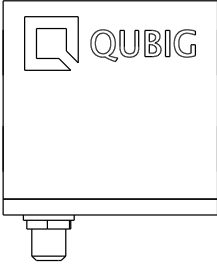
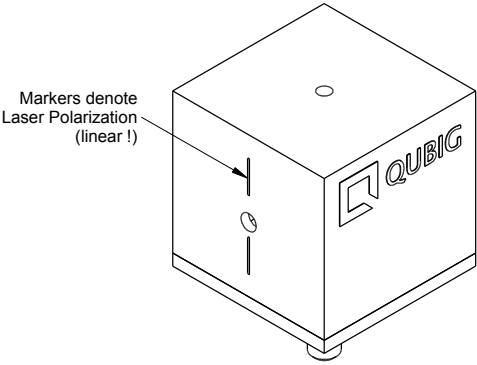
## Handling instructions

- 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)
- For lowest RAM ideally use temperature-control (dT < 0.01C)

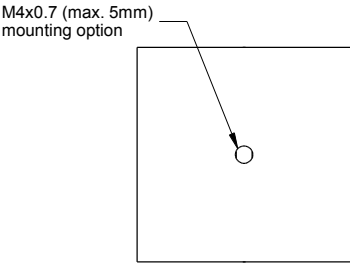
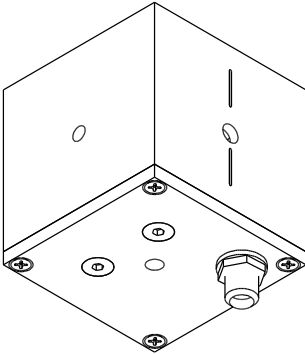
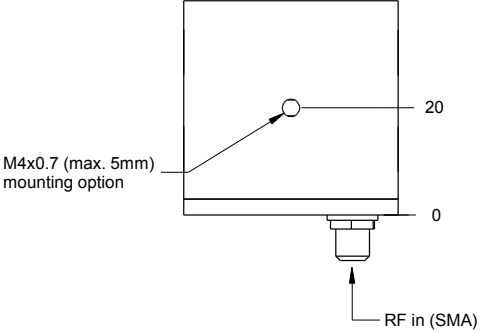
# Package drawing



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



**Note 2:** crystal aperture is 3x3mm.



Tested by:

Tel: +49 8642 2449064  
 Fax: +49 8642 2447063  
 eMail: [mail@qubig.de](mailto:mail@qubig.de)  
 web: [www.qubig.com](http://www.qubig.com)

**Qubig GmbH**  
 Greimelstr. 26  
 83236 Übersee  
 Germany