

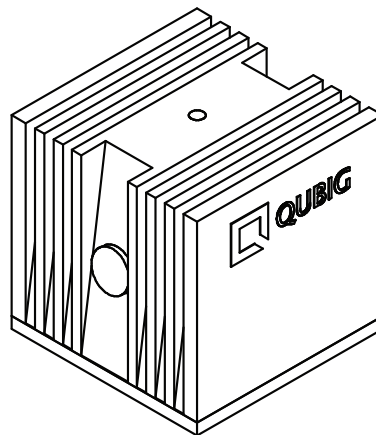


Test Data Sheet

EO-F47B3-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⁾	47.2	MHz
Preset frequency: f_{set} ¹⁾	47.2	MHz
Bandwidth: $\Delta\nu$	380	kHz
Quality factor: Q	125	
Required RF power for 1rad @ 242nm ²⁾	26.2	dBm
max. RF power: RF_{max} ³⁾	1	W

Optical properties		
EO crystal	BBO	
Aperture	3x3	mm ²
Wavefront distortion (633nm)	$\lambda/8$	nm
recommended max. optical intensity (242nm)	<10	W/mm ²
AR coating (R<0.5%)	200 - 350	nm

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

Measured modulation

Fig. 1: Oscilloscope trace

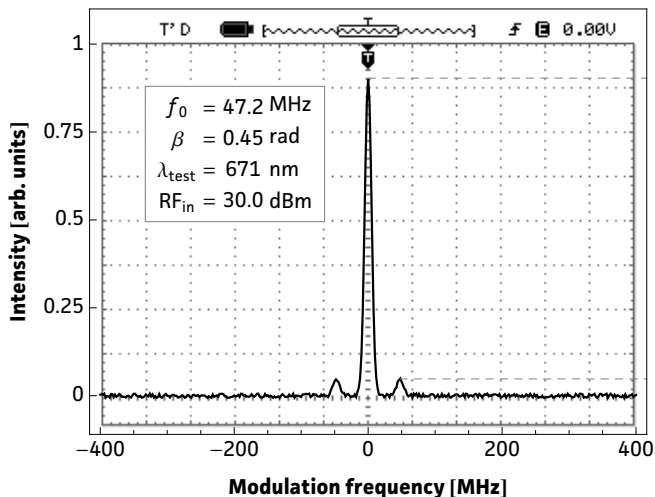


Fig. 2: Carrier/sideband ratio

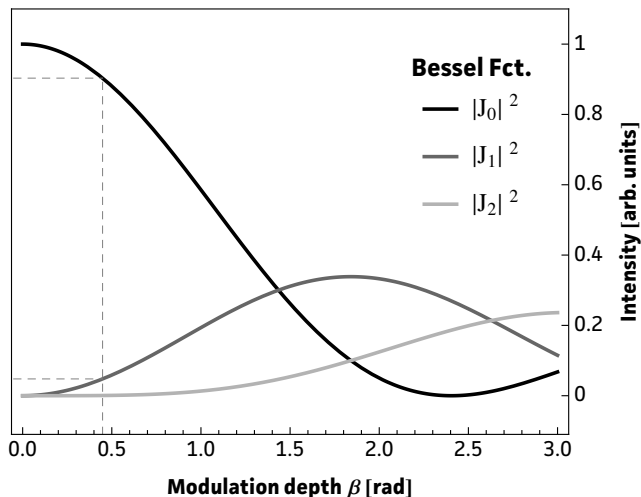


Table 1: Expected modulation

$\beta = 1 \text{ rad}$	unit	λ_1	λ_2
λ	nm	242	671
P	dBm	26.2	37.
P	W	0.42	4.98
U	V_p	6.5	22.3
U_π	V_p	20.4	70.1
β / U	rad / V	0.15	0.04

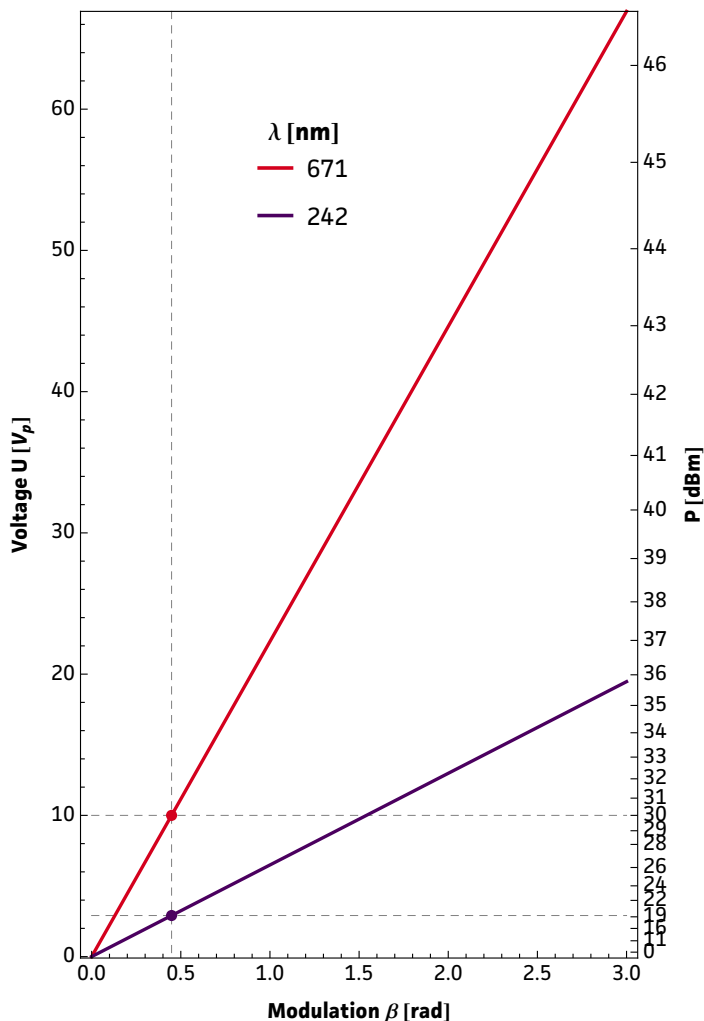


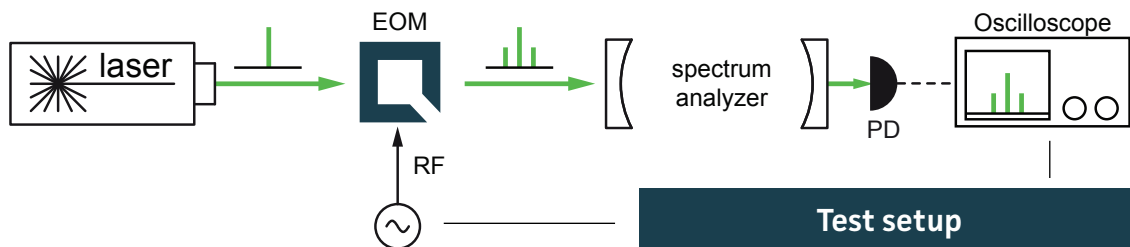
Fig.1: Recorded oscilloscope trace retrieved from a test setup as illustrated below.

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

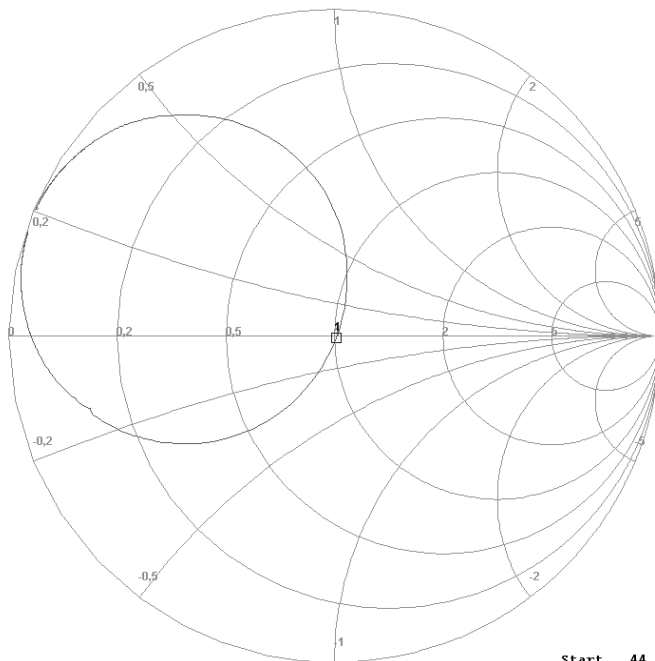


Resonance characteristics

L vna/j 2.8.6c © DL2SBA 2013

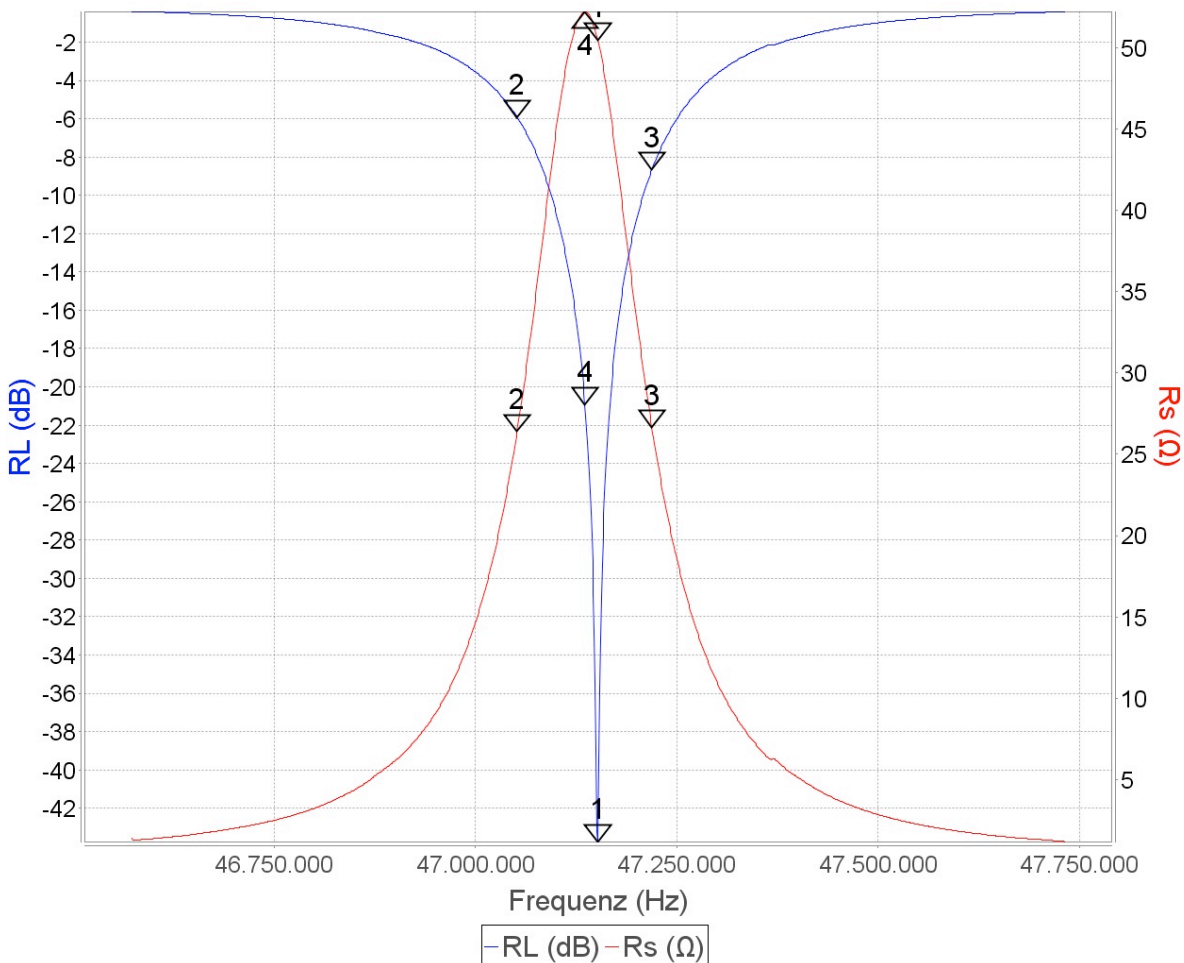
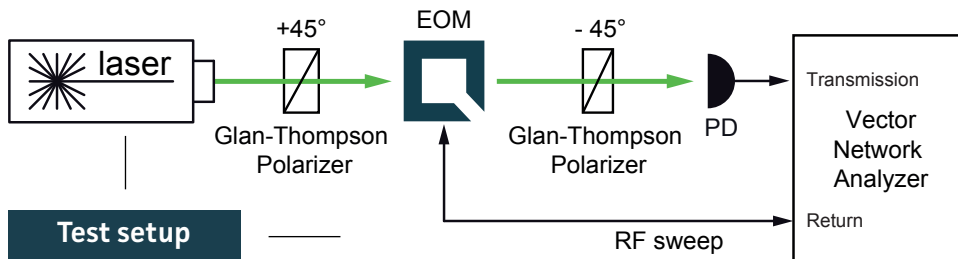
```

1: 47.152.839Hz
RL -39,85dB
RP -38,80°
Z 50,80
Rs 50,80
Xs -0,60
SWR 1,0:1
Mag 0,010
    
```



C Ref=50.0+0.0i

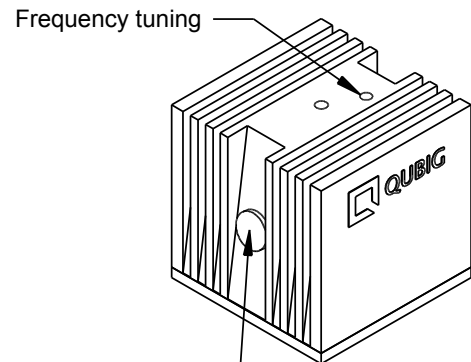
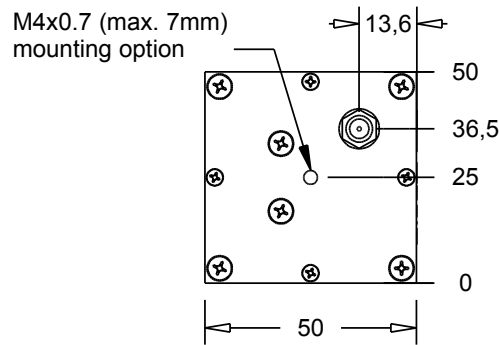
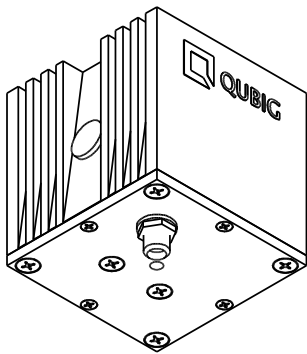
Start 44.253.319Hz
Stop 50.047.029Hz



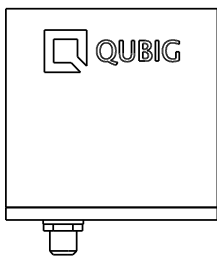
Handling instructions

- 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 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).

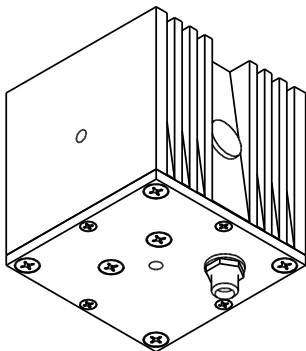
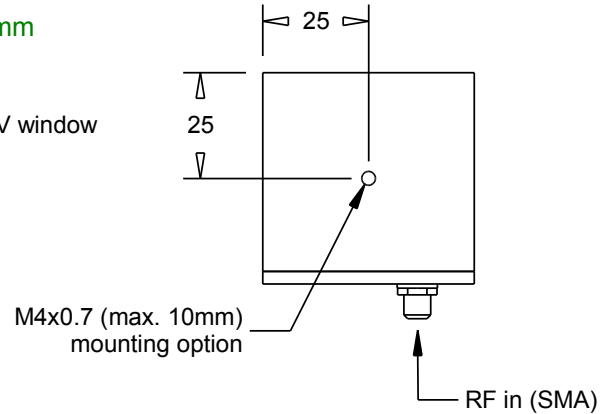
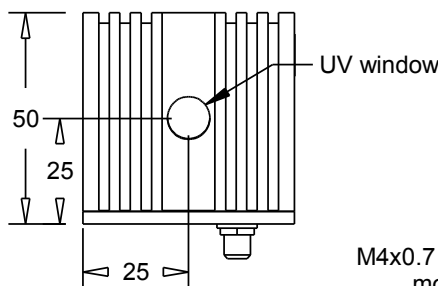
Package drawing



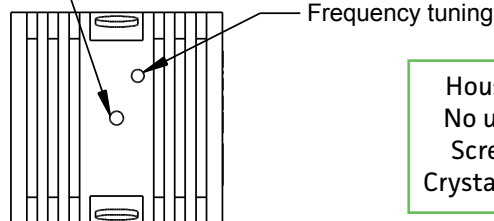
Attention! Laser polarisation (linear!) is orthogonal with respect to the cooling fins.



Note: crystal aperture is 3x3mm



M4x0.7 (max. 9mm) mounting option



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