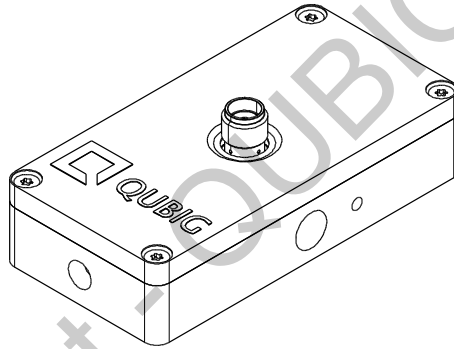


## Test Data Sheet

### PM11-NIR

S/N:

### Resonant electro-optic phase modulator



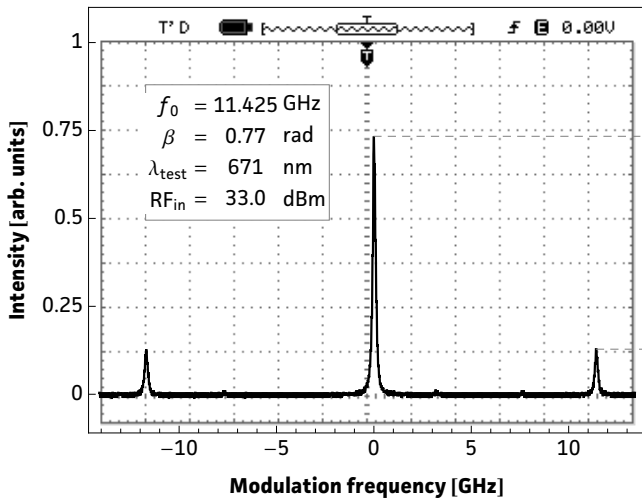
RF properties	Value	Unit
Resonance frequency: $f_0$ <sup>1)</sup>	11400 - 11510	MHz
Preset frequency: $f_{\text{set}}$ <sup>1)</sup>	11424	MHz
Bandwidth: $\Delta\nu$	65	MHz
Quality factor Q	176	
Required RF power for 1 rad @ 1030nm	39.4	dBm
max. RF power: $RF_{\text{max}}$ <sup>2)</sup>	5	W

Optical properties		
EO crystal	KTP	
Aperture	∅ 2	mm
Wavefront distortion (@ 633 nm)	$\lambda/8$	
recommended max. optical intensity (@ 1030nm)	10	W/mm <sup>2</sup>
AR coating ( $R_{\text{avg}} < 1\%$ )	630 - 1100	nm

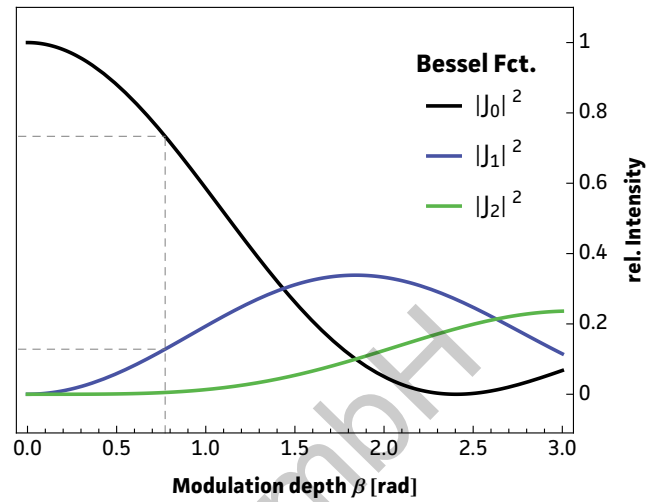
<sup>1)</sup> at 24.7 °C <sup>2)</sup> no damage with  $RF_{\text{in}} < 10\text{W}$ , but use of a proper heatsink is strongly recommended at high powers

# Measured phase modulation

**Fig. 1: Oscilloscope trace**



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



**Table 1: Expected modulation**

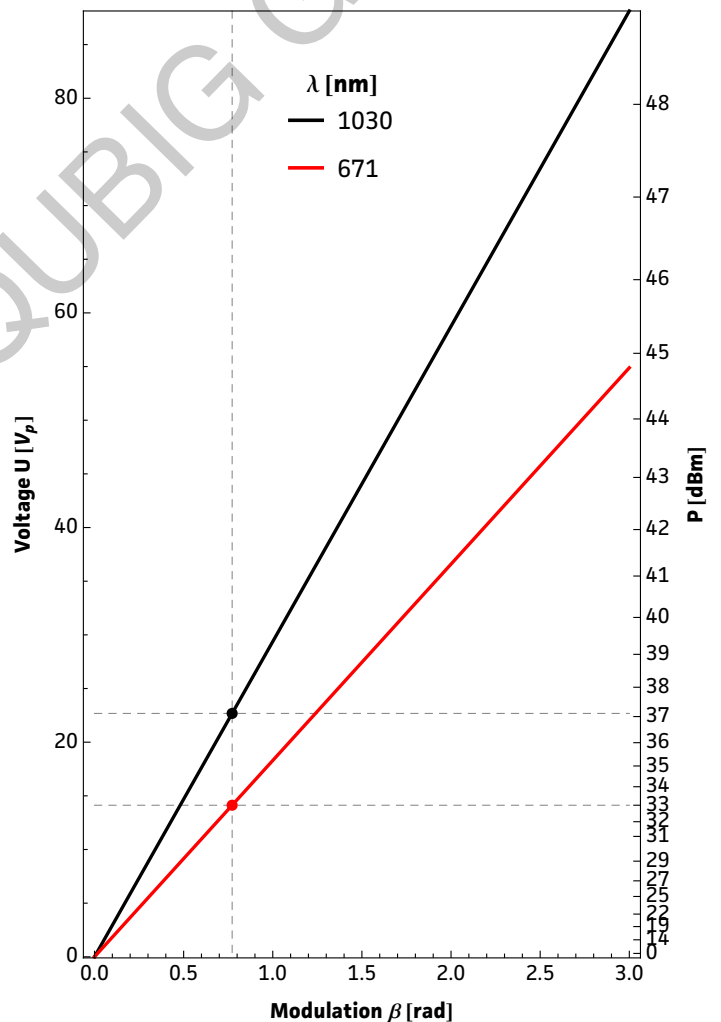
$\beta = 1 \text{ rad}$	unit	$\lambda_1$	$\lambda_2$
$\lambda$	nm	<b>671</b>	<b>1030</b>
P	dBm	35.2	39.4
P	W	3.35	8.63
U	V <sub>p</sub>	18.3	29.4
U <sub><math>\pi</math></sub>	V <sub>p</sub>	57.5	92.3
$\beta / U$	rad / V	0.05	0.03

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

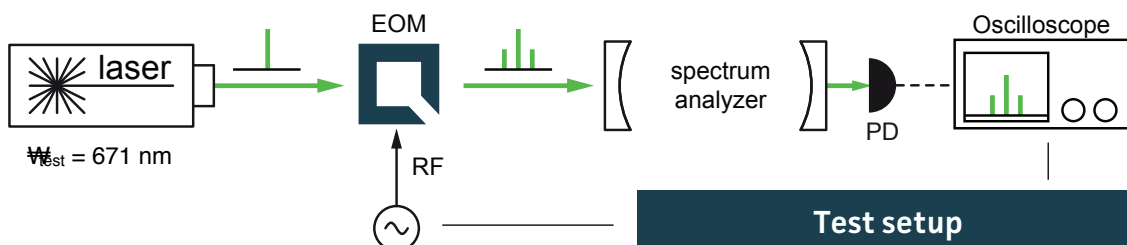
**Fig. 2:** Squared absolute values of first-kind Bessel functions vs. modulation depth. Vertical lines reveal the ratio between the carrier  $|J_0|^2$  and the  $i^{\text{th}}$  sideband  $|J_i|^2$  at a specific  $\beta$ .

**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.

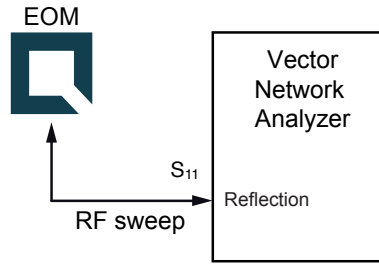
**Table 1:** Expected RF-amplitude/-power values and conversion factors for the required wavelength at the reference modulation depth of 1 rad. **Note:** Experimentally recorded modulation depth displayed in Fig. 1 might vary from the respective values ( $\beta=1\text{rad}$ ) provided in the table.



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

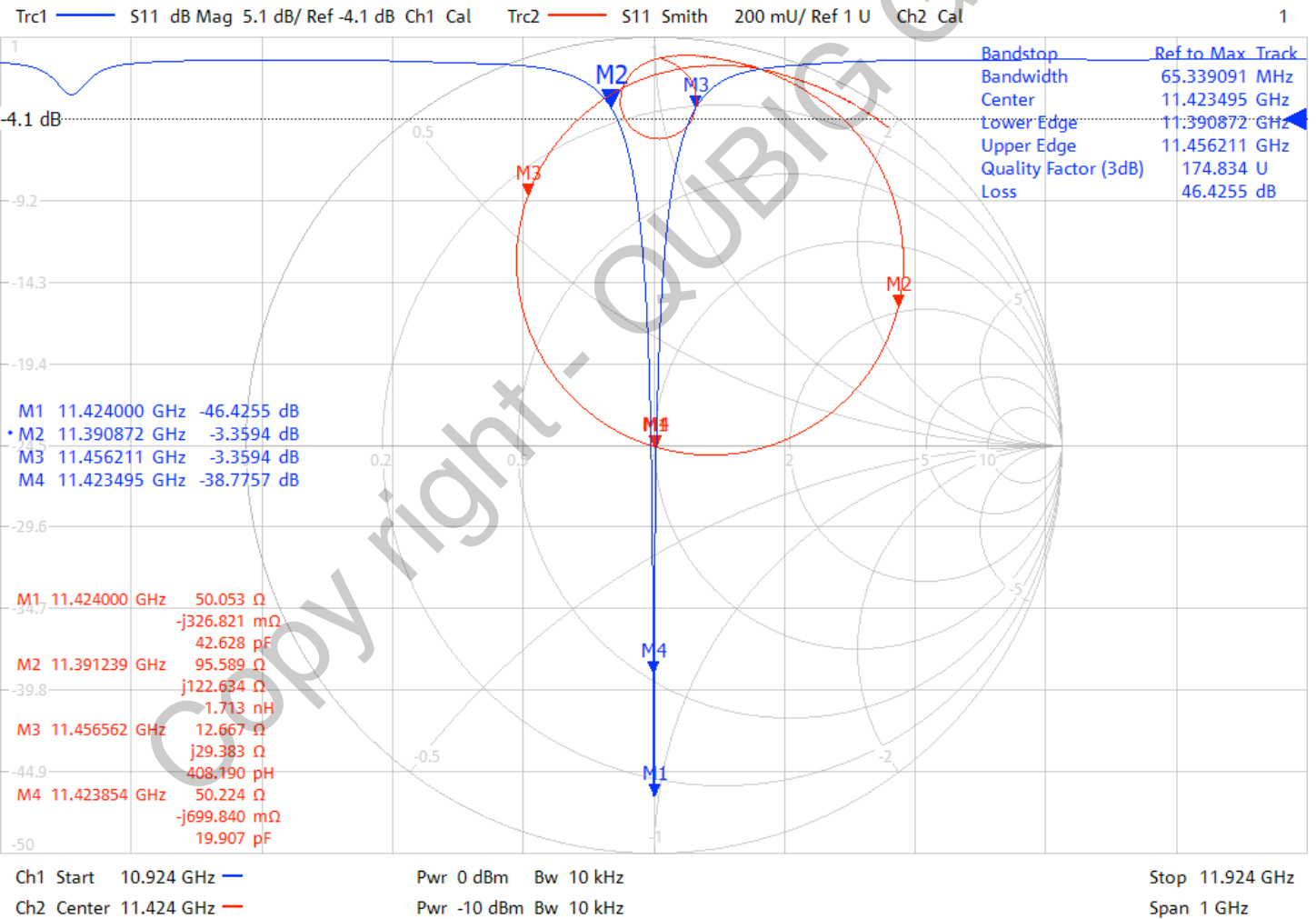


# Resonance characteristics

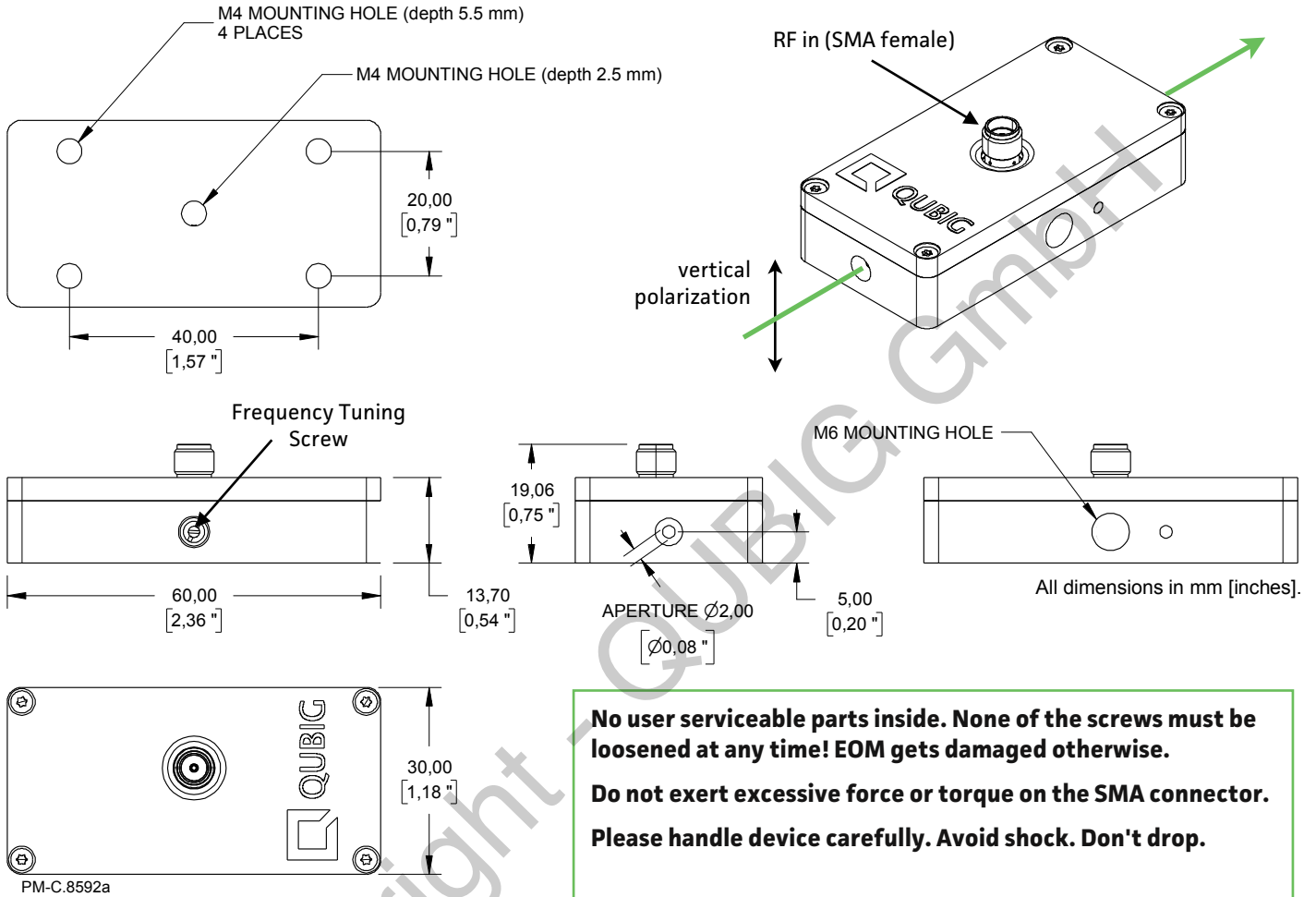


T<sub>EOM</sub> = 24.13 °C

10/2/2018 5:36:45 PM  
1311.6010K62-101870-Bu



# Package drawing



**No user serviceable parts inside. None of the screws must be loosened at any time! EOM gets damaged otherwise.**

**Do not exert excessive force or torque on the SMA connector.**

**Please handle device carefully. Avoid shock. Don't drop.**