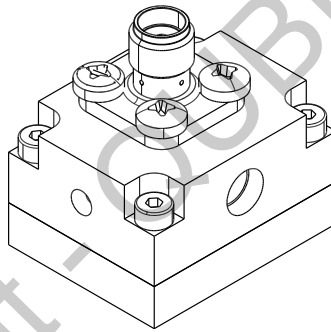


Test Data Sheet

PM-Yb171+_12.6M1

S/N:

Resonant electro-optic phase modulator
with
- tunable resonance frequency



RF properties	Value	Unit
Resonance frequency: f_0 ¹⁾	12560 - 12779	MHz
Preset frequency: f_{set} ¹⁾	12643	MHz
Bandwidth: $\Delta\nu$	54	MHz
Quality factor Q	234	
Required RF power for 1 rad @ 370 nm	30.45	dBm
max. RF power: RF_{max} ²⁾	3	W

Optical properties		
EO crystal	MLN	
Aperture	Ø 1.2	mm
Wavefront distortion (@ 633 nm)	$\lambda/4$	
recommended max. optical intensity (@ 370 nm)	< 100	mW/mm ²
AR coating ($R_{avg} < 1\%$)	360 - 650	nm

¹⁾ at 21.0 °C ²⁾ no damage with $RF_{in} < 5W$, but use of a proper heatsink is strongly recommended at high powers

Measured phase modulation

Fig. 1: Oscilloscope trace

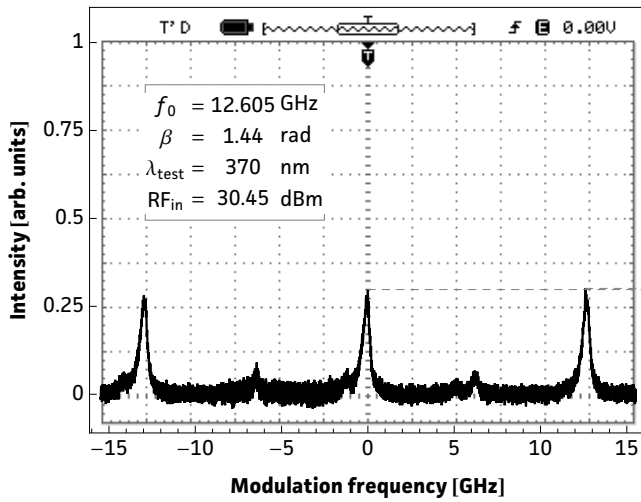


Fig. 2: Carrier/sideband ratio

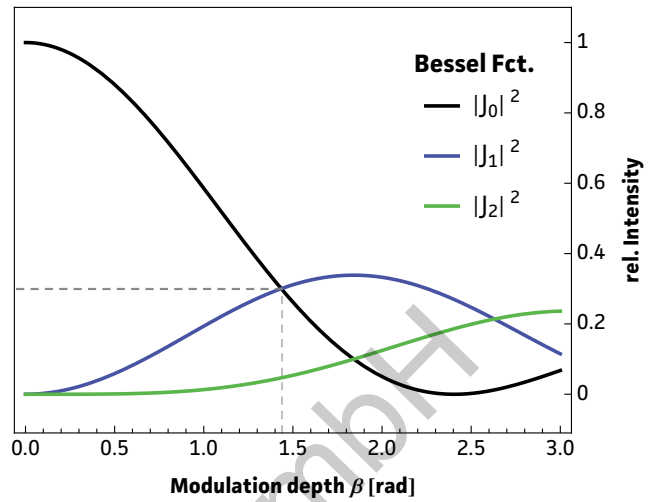


Table 1: Expected modulation

$\beta = 1 \text{ rad}$	unit	λ_1
λ	nm	370
P	dBm	27.3
P	mW	536
U	V_p	7.3
U_π	V_p	23.
β / U	rad / V	0.14

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.

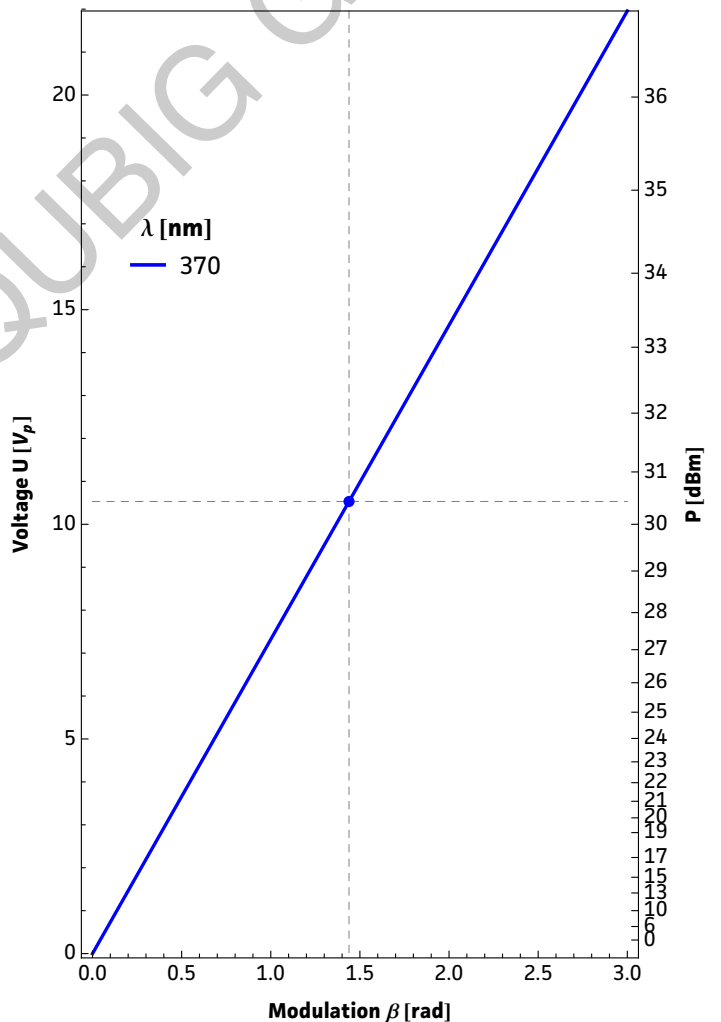
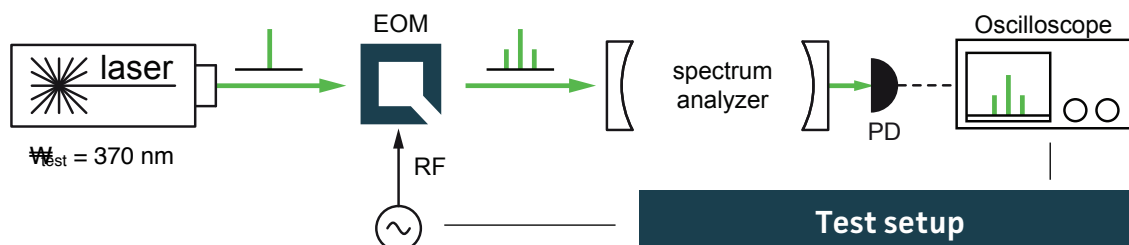
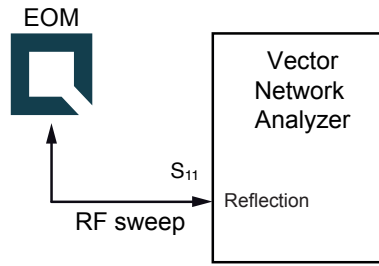


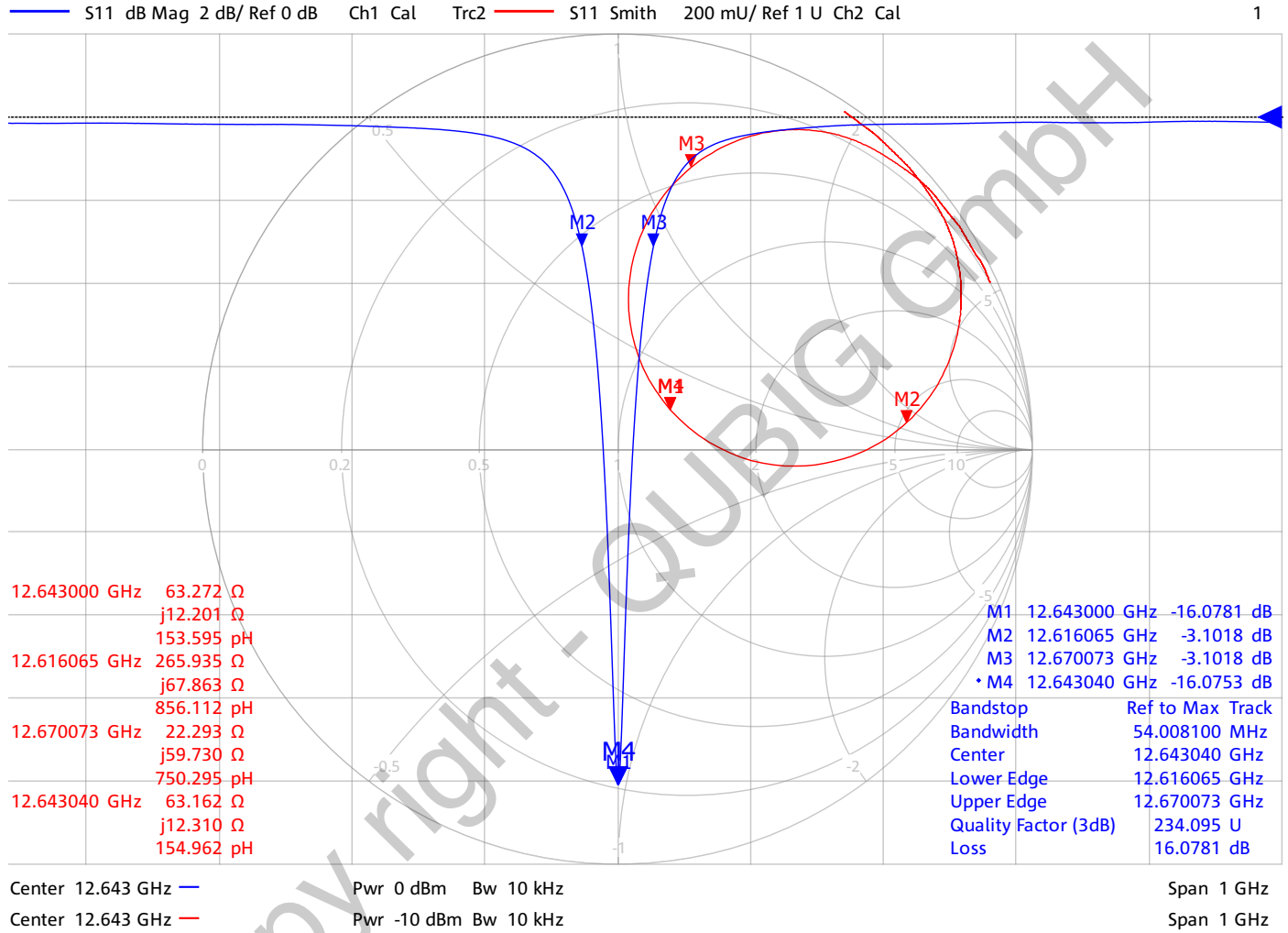
Fig. 3: RF-signal amplitude vs. modulation depth



Resonance characteristics



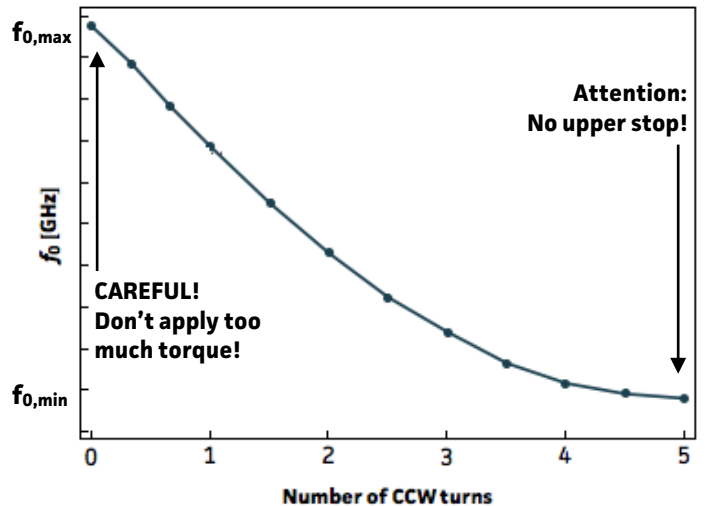
$T_{EOM} = 21.0\text{ }^{\circ}\text{C}$



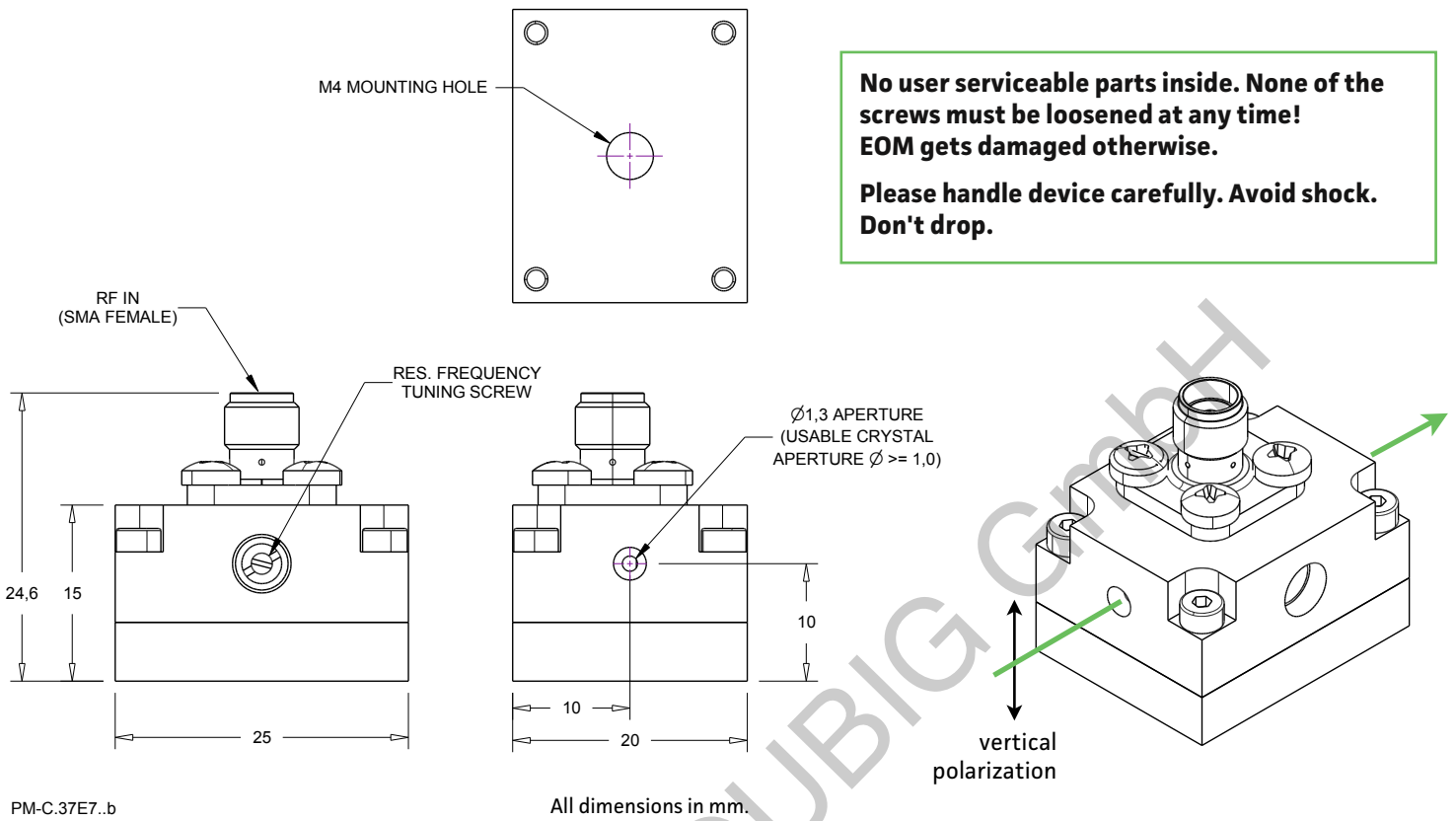
Frequency tuning performance @ $T=21.0^{\circ}\text{C}$

MAX resonance frequency	$f_{0,max}$	12779	MHz
MIN resonance frequency	$f_{0,min}$	12560	MHz
number of turns	N_{max}	5	
tuning range		119	MHz
temperature dependence	df_0/dT	-4.3	MHz/ $^{\circ}\text{C}$

- only use supplied tuning tool
- actuate tuner carefully / do not apply too much torque especially around $f_{0,max}$
- there might be no hard upper or lower stops (!)



Package drawing



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