QUBIG

Empowering Laser Technologies

Test Data Sheet

PM7 - UV

(old: EO-20D3-UV)

S/N:

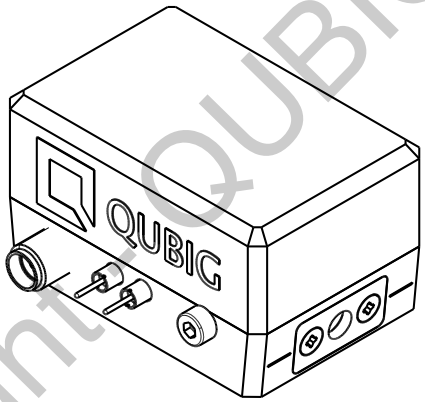
Resonant electro-optic phase modulator

with

- hermetically dry-sealed housing

- temperature sensor (NTC)

- thermal crystal mount



RF properties	Value	Unit
Preset frequency: f_{set} [1]	20.0	MHz
Bandwidth: Δν	279	kHz
Quality factor: Q	72	
Required RF power for 1rad @ 242nm	18.6	dBm
max. RF power: RF_{max} [3]	0.5	W

Optical properties		
EO crystal	DKDP	
Aperture	3x3	mm^2
Wavefront distortion (633nm)	λ/8	nm
recommended optical intensity (355nm)	≦ 5	W/mm^2
AR coating (R<1%)	200 - 400	nm

[1] at 30°C [2] with 50Ω termination [3] no damage with RF_{in} < 1W

Measured modulation

Fig. 1: Oscilloscope trace

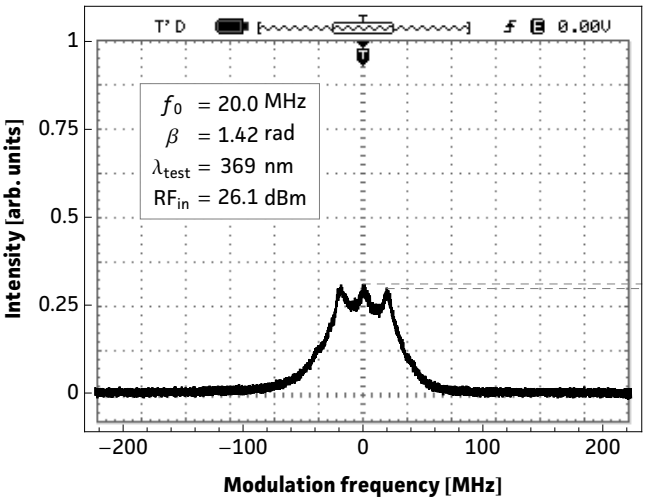


Fig. 2: Carrier/sideband ratio

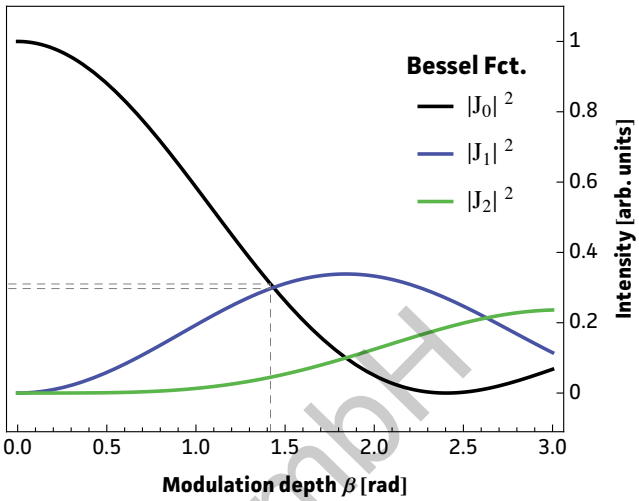


Table 1: Expected modulation

$\beta = 1$ rad	unit	λ_1	λ_2	λ_3
λ	nm	**242**	**369**	**400**
P	dBm	18.6	23.1	23.8
P	mW	72	202	242
U	V_p	2.7	4.5	4.9
U_π	V_p	8.5	14.1	15.5
β / U	rad / V	0.37	0.22	0.2

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 ß.

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 ß 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 (ß=1rad) provided in the table.

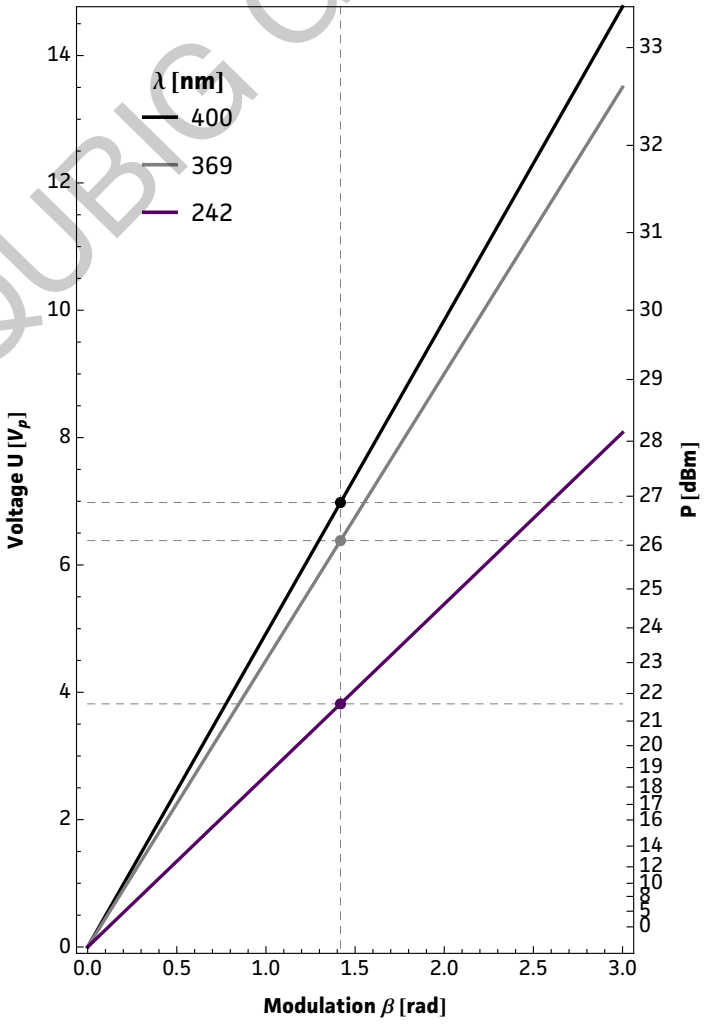
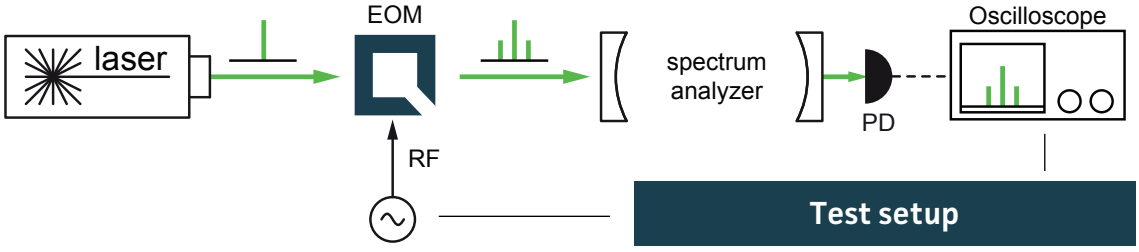
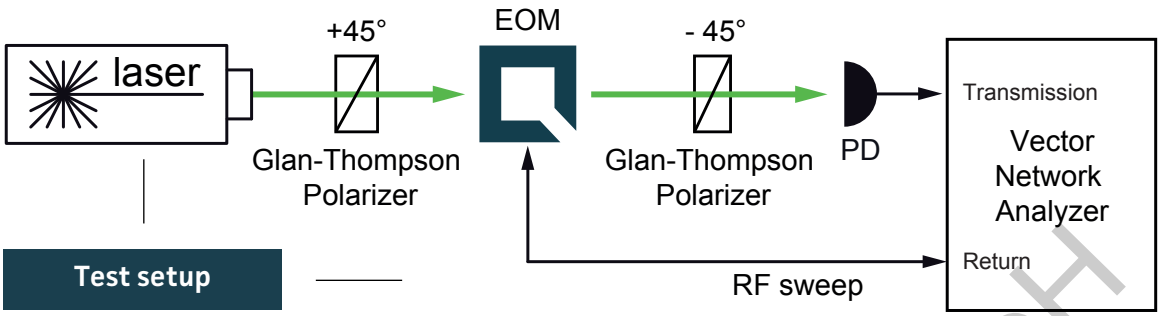


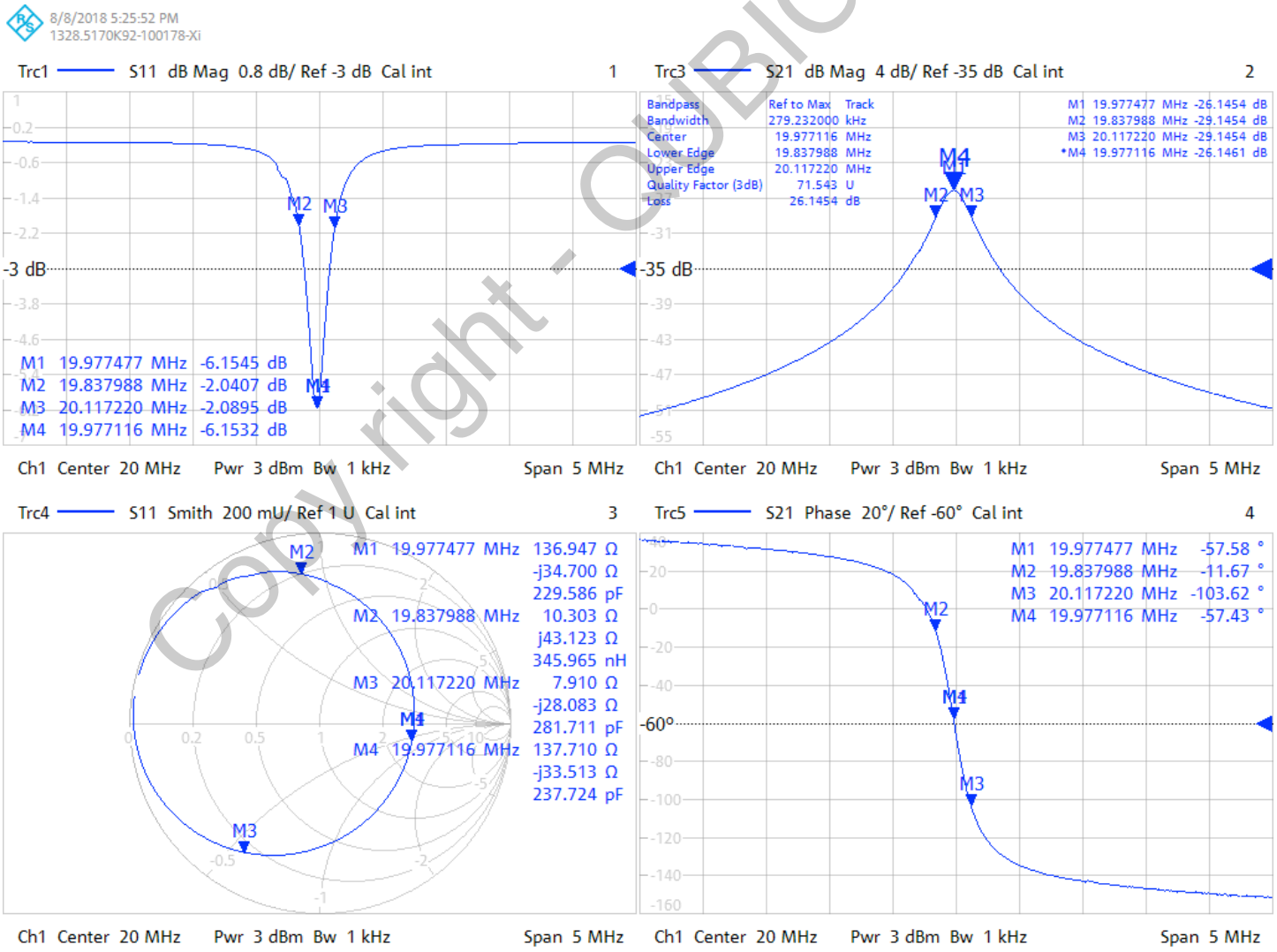
Fig. 3: RF–signal amplitude vs. modulation depth



Resonance characteristics



Test setup

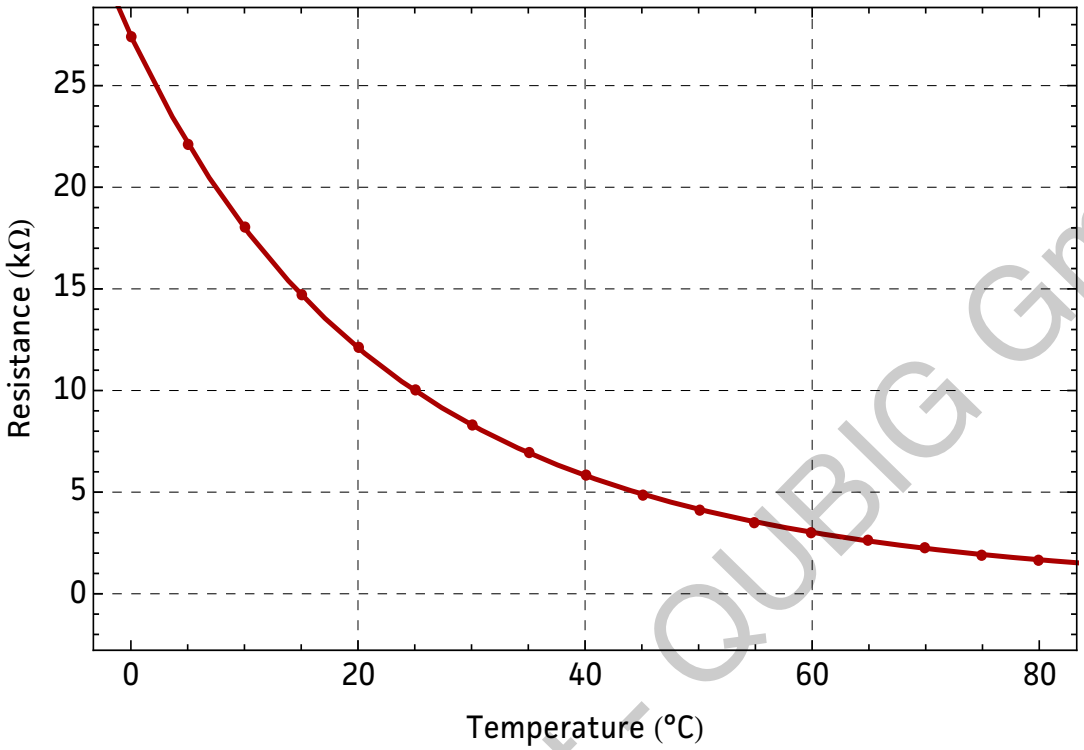


TXC-option information

NTC characteristics

NTC part number	Resistance (25°C) (ohm)	B-Constant (25-50°C) (K)	Operating Current for Sensor (25°C) (mA)	Rated Electric Power (25°C) (mW)	Typical Dissipation Constant (25°C) (mW/°C)	Thermal Time Constant (25°C) (s)
NXFT15XH103FA2B050	10k +/- 1%	3380 +/- 1%	0.12	7.5	1.5	4

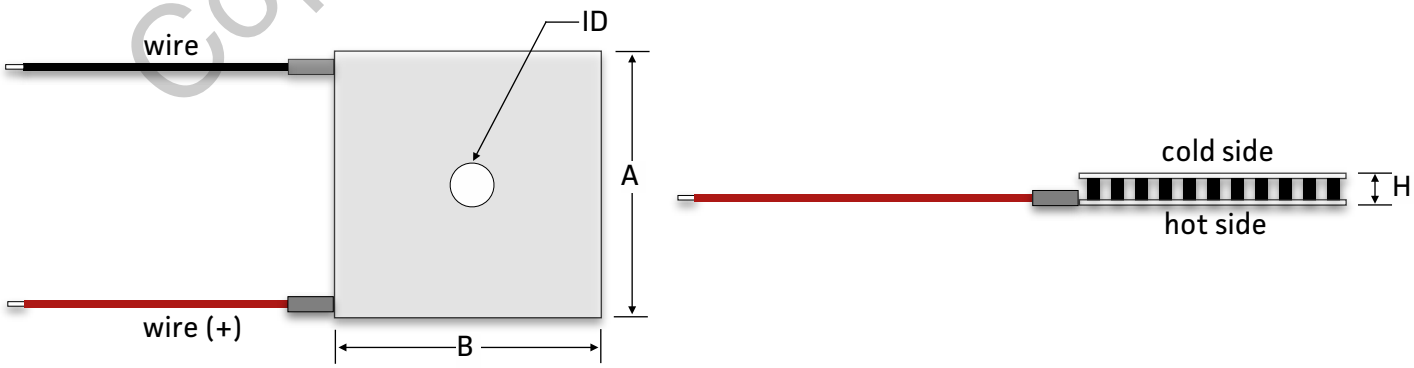
- Operating Current for Sensor rises Thermistor's temperature by 0.1°C
- Rated Electric Power shows the required electric power that causes Thermistors's temperature to rise to 30°C by self heating, at ambient temperature of 25°C.



Part Number	NXFT15XH103
Resistance	10kΩ
B-Constant	3380K
Temp. (°C)	Resistance (kΩ)
-40	197.388
-35	149.395
-30	114.345
-25	88.381
-20	68.915
-15	54.166
-10	42.889
-5	34.196
0	27.445
5	22.165
10	18.010
15	14.720
20	12.099
25	10.000
30	8.309
35	6.939
40	5.824
45	4.911
50	4.160
55	3.539
60	3.024
65	2.593
70	2.233
75	1.929
80	1.673
85	1.455
90	1.270
95	1.112
100	0.976
105	0.860
110	0.759
115	0.673
120	0.598
125	0.532

TEC characteristics:

TEC part number	Imax (A)	Umax (V)	Qcmax (W)	ΔTmax (K)	Tmax (°C)	A (mm)	B (mm)	H (mm)	ID (mm)	Sealing
UEPT-130-127 -040M125	4.0	15.2	37.7	66	125	30.0	30.0	3.1	w/o	Silicon

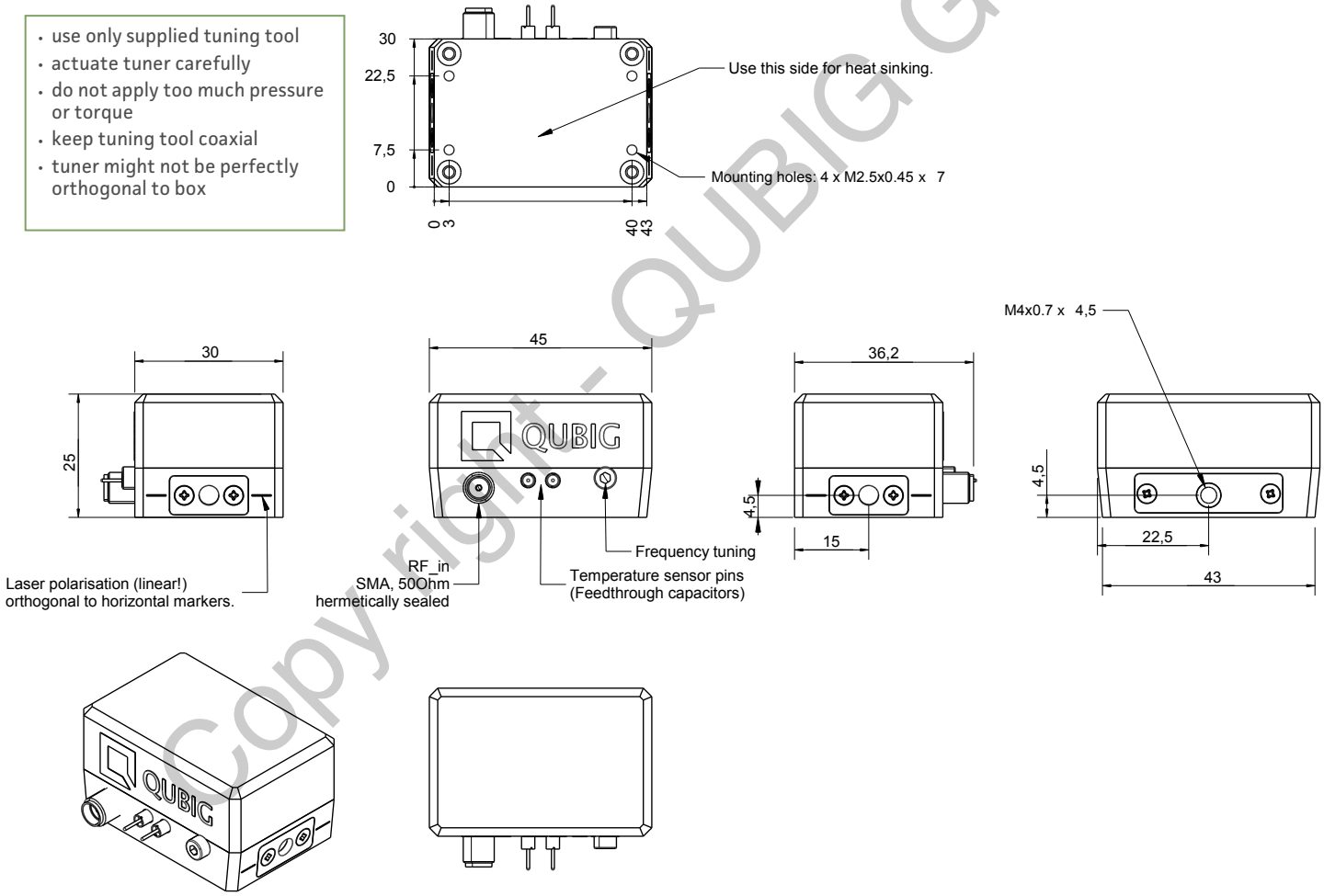


Handling instructions

- The EOM housing is hermetically sealed. There are no user serviceable parts inside. None of the screws, accept the one for frequency tuning, must be loosened at any time! Crystal will be damaged otherwise.
- Input laser polarization must be aligned orthogonal to the white markers on the housing
- Please handle device carefully. Avoid shock. Don't drop.
- Slight angle adjustment can reduce unwanted residual amplitude modulation (RAM)
- 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

- use only supplied tuning tool
- actuate tuner carefully
- do not apply too much pressure or torque
- keep tuning tool coaxial
- tuner might not be perfectly orthogonal to box



Tested by:

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