QUBIG

Empowering Laser Technologies

Test Data Sheet

PM-1500K3-VIS

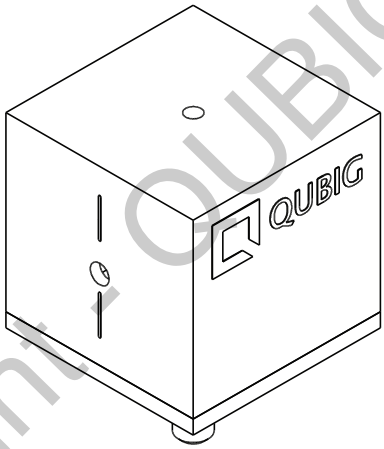
(old: EO-Tx1500K3-VIS)

S/N:

Resonant electro-optic phase modulator

with

- tunable resonance frequencies
- extended tuning range
- TXC option

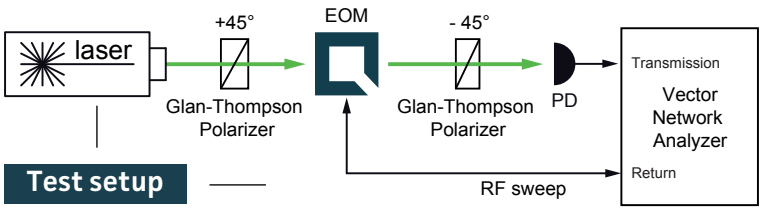


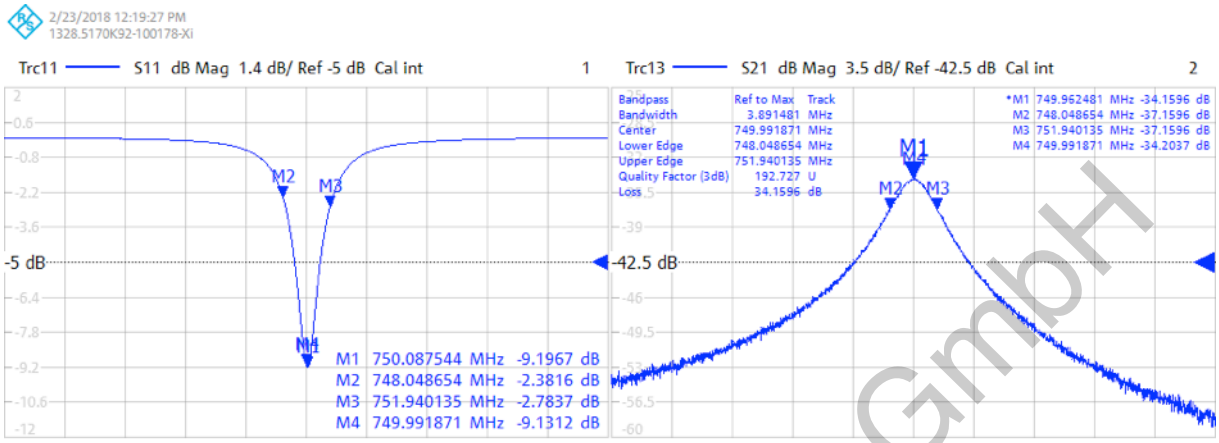
RF properties	Value		Unit
Resonance frequency: f_0 [1]	630 - 1520		MHz
Frequencies:	750	1500	MHz
Preset frequency: f_{set} [1]	1100		MHz
Bandwidth: Δν	3.9	15.6	MHz
Quality factor: Q	192	96	
Required RF power for 1rad @ 397nm	31.2	27.6	dBm
max. RF power: RF_{max} [3]	2.5		W

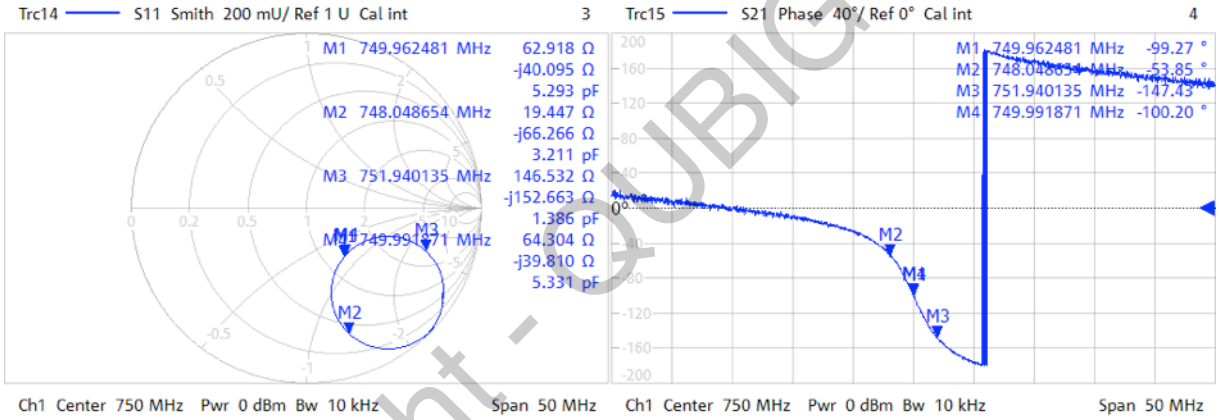
Optical properties		
EO crystal	KTP	
Aperture	3x3	mm^2
Wavefront distortion (633nm)	λ/8	nm
recommended max. optical intensity (397nm)	<0.2	W/mm^2
AR coating (R<0.5%)	390-780	nm

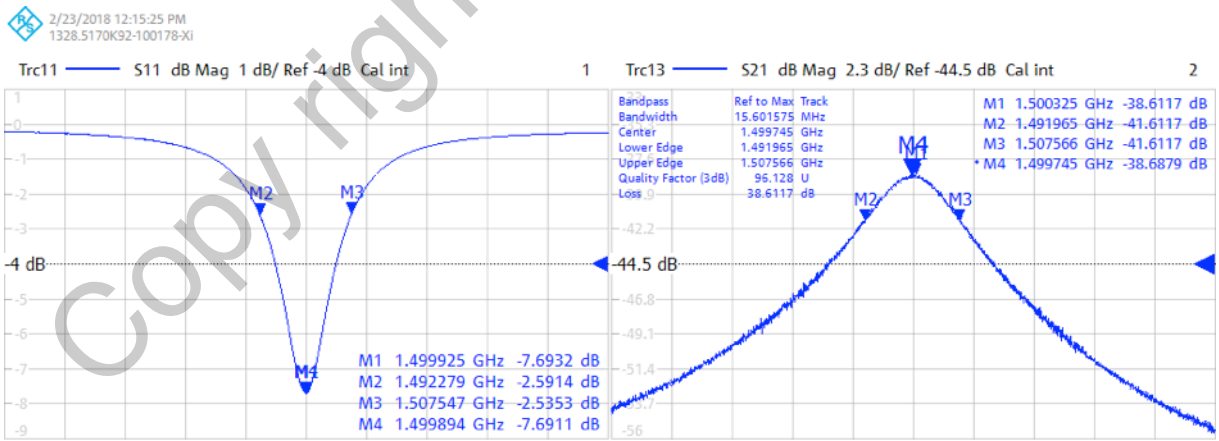
[1] at 23°C [2] with 50Ω termination [3] no damage with RF_{in} < 6W

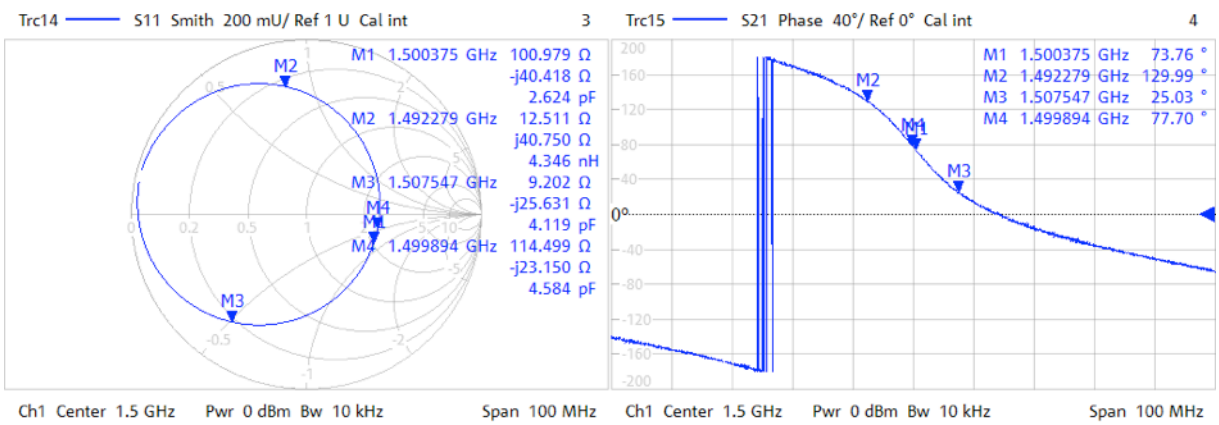
Resonance characteristics @ 750 & 1500MHz











Measured modulation for f_0^1

Fig. 1: Oscilloscope trace

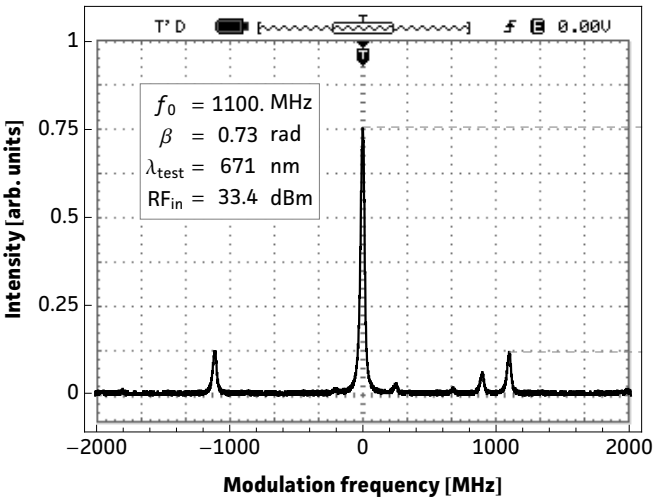


Fig. 2: Carrier/sideband ratio

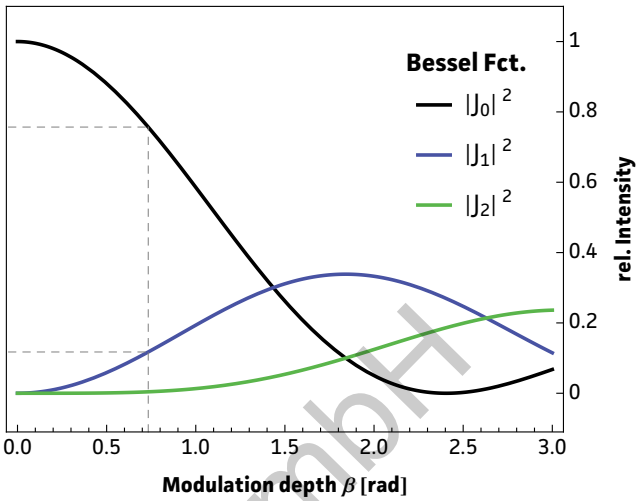


Table 1: Expected modulation

$\beta = 1$ rad	unit	λ_1	λ_2
λ	nm	**397**	**671**
P	dBm	30.1	36.1
P	W	1.01	4.07
U	V_p	10.1	20.2
U_π	V_p	31.6	63.4
β / U	rad / V	0.1	0.05

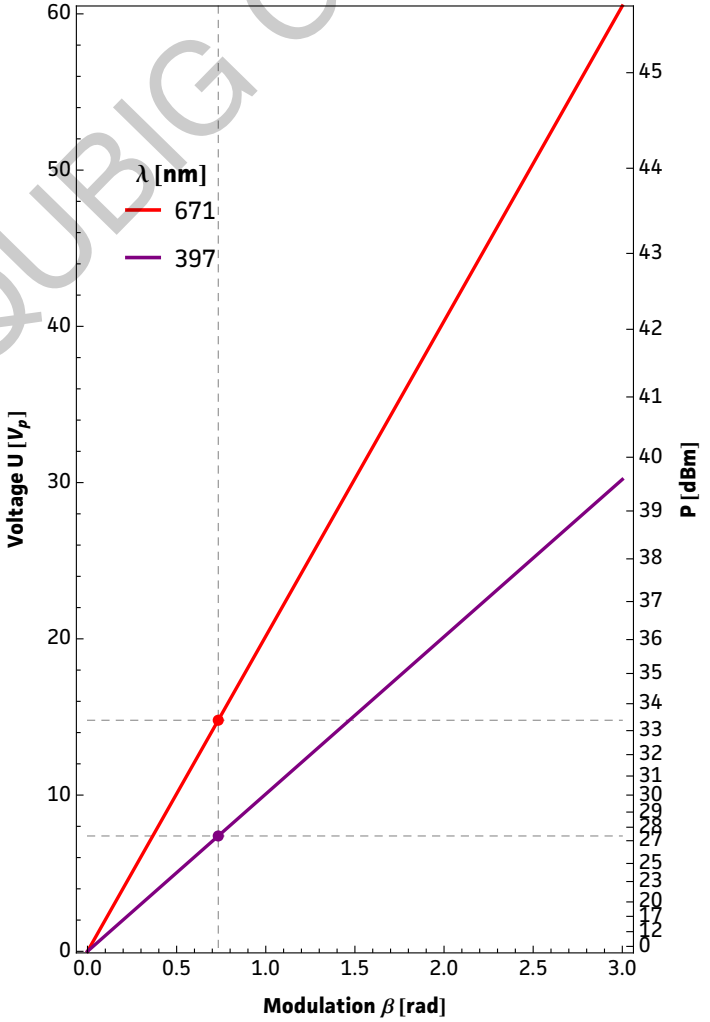


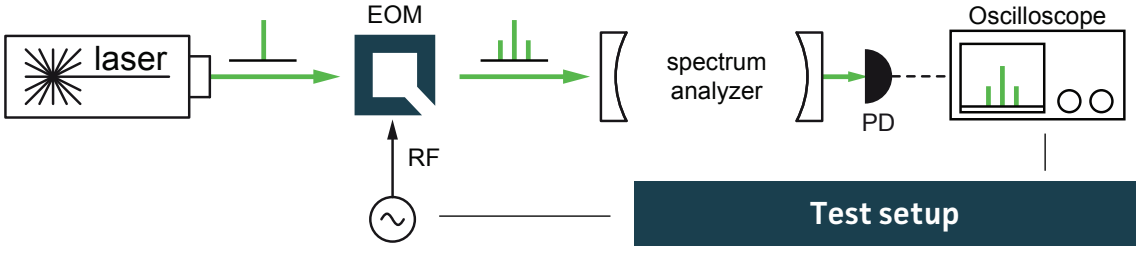
Fig. 3: RF–signal amplitude vs. modulation depth

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

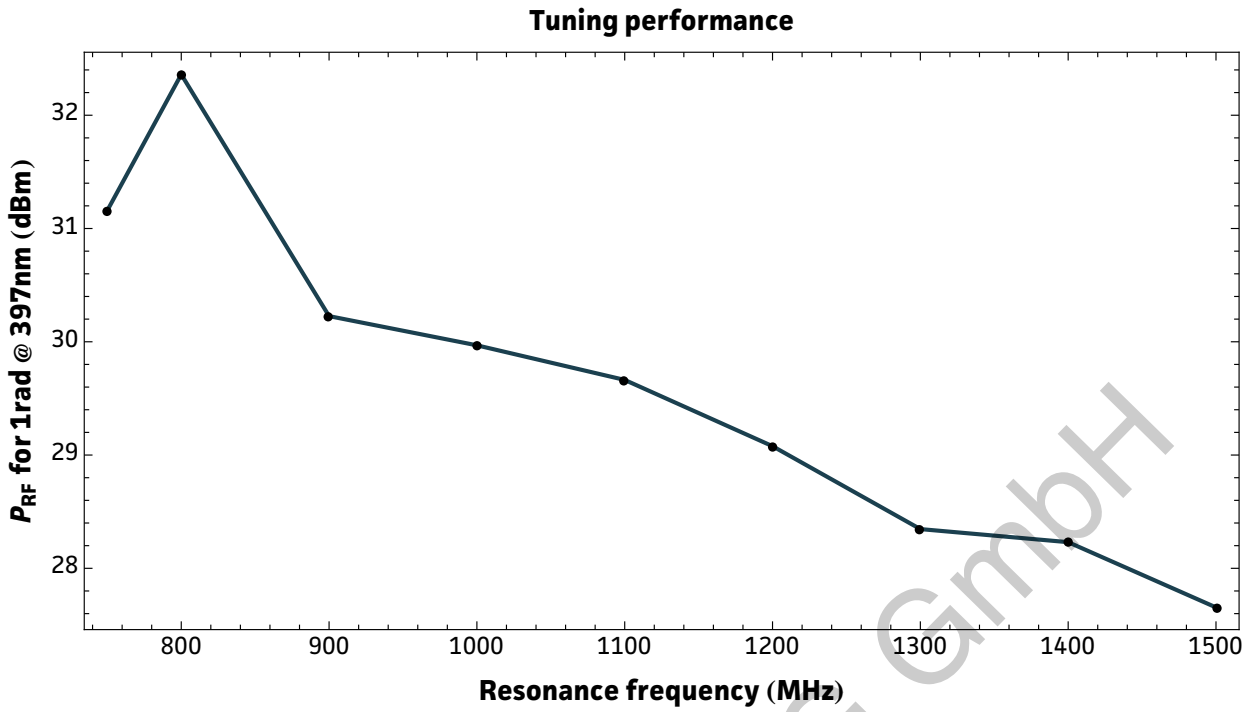
Fig.2: Squared absolute values of first-kind Bessel functions vs. modulation depth. Vertical lines reveal the ratio between the carrier $|J_0|^2$ and the i^{th} sideband $|J_i|^2$ at a specific ß.

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.

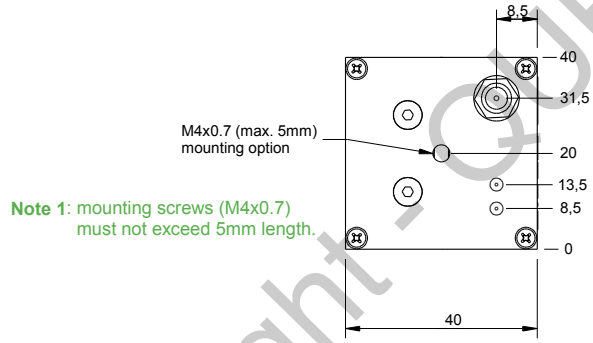
Table 1: Expected RF-amplitude/-power values and conversion factors for the required wavelength at the reference modulation depth of 1 rad. **Note:** Experimentally recorded modulation depth displayed in Fig.1 might vary from the respective values (ß=1rad) provided in the table.



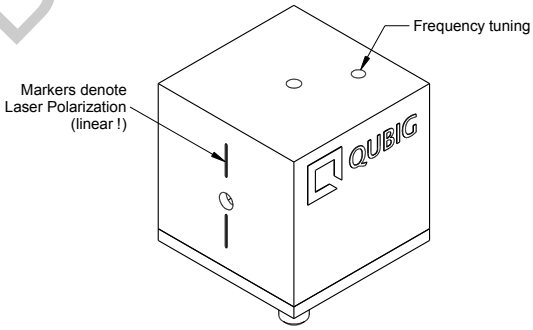
Required RF power for 1 rad @ 397nm vs. Frequency

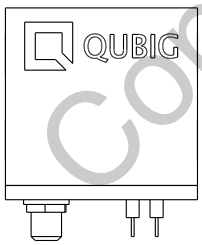


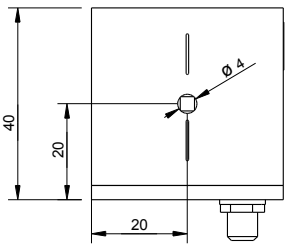
Package drawing



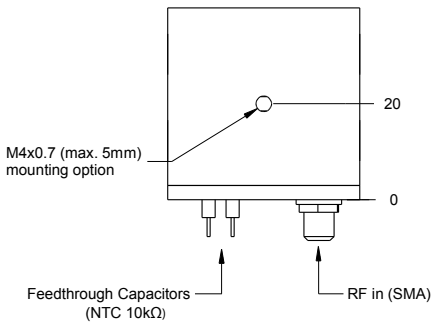
Note 1: mounting screws (M4x0.7) must not exceed 5mm length.

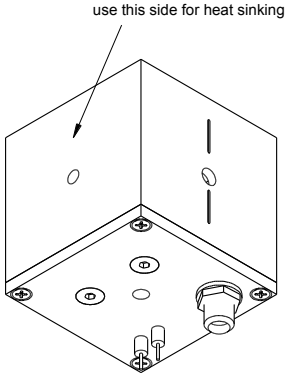


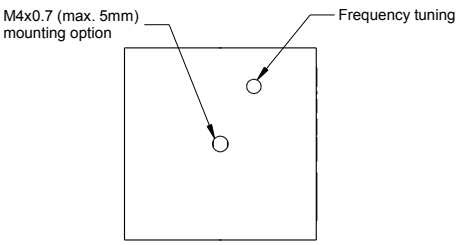




Note 2: crystal aperture is 3x3mm.







Attention!!

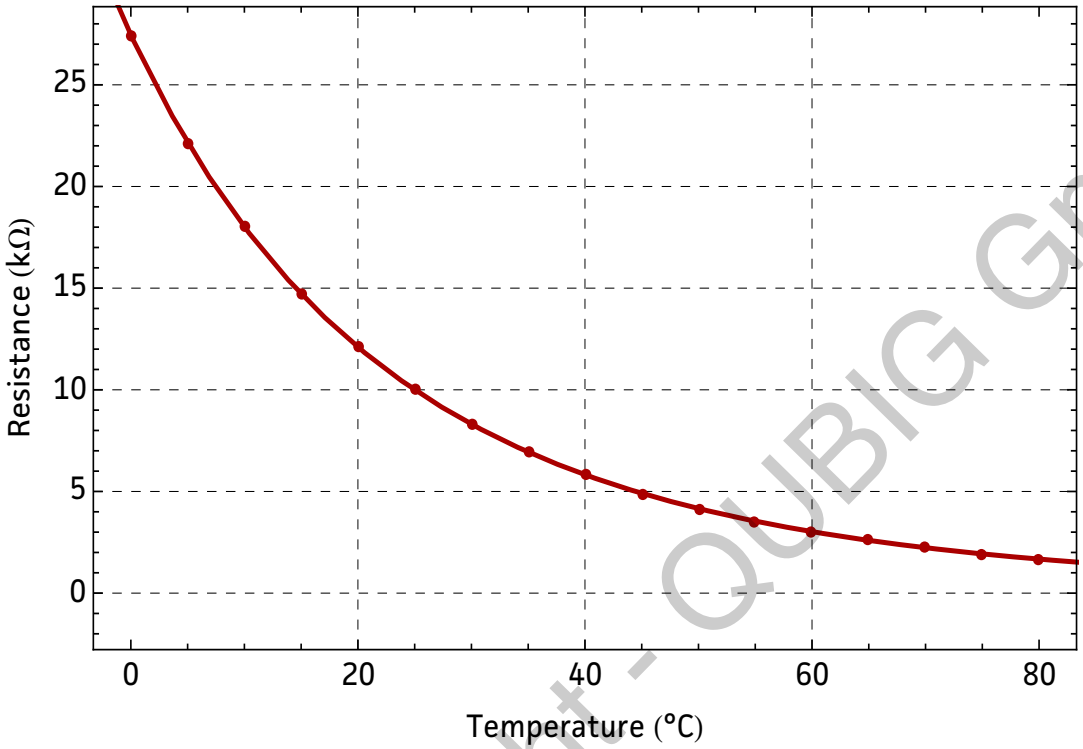
- use only supplied tuning tool
- actuate tuner carefully
- do not apply too much pressure or torque
- keep tuning tool coaxial
- tuner might not be perfectly orthogonal

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

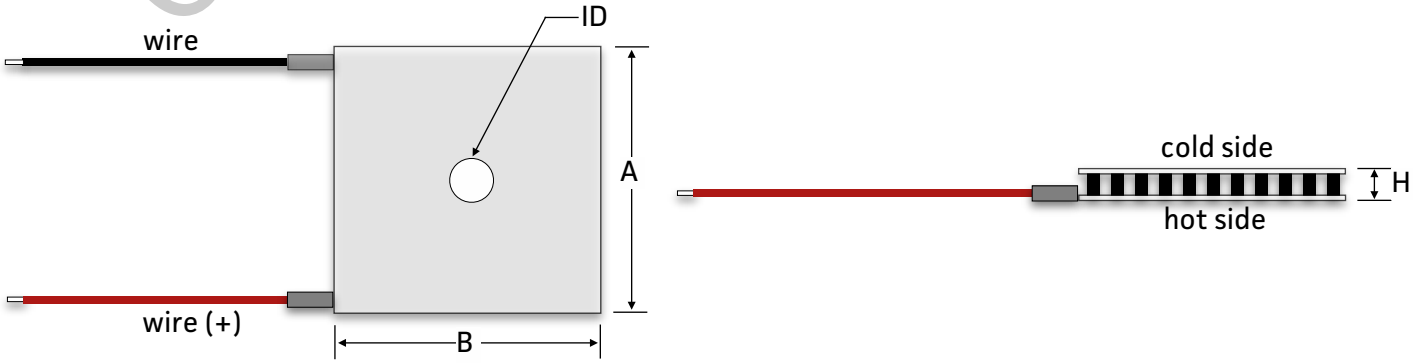
- Operating Current for Sensor rises Thermistor's temperature by 0.1°C
- Rated Electric Power shows the required electric power that causes Thermistors's temperature to rise to 30°C by self heating, at ambient temperature of 25°C.



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-440-127-040M12 5S	4.0	15.2	40	67.0	125.0	40.0	40.0	4.6	4.5	Silicon



Tested by:

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Tel: +49 89 2302 9101
Fax: +49 89 2302 9102
eMail: mail@qubig.com
web: www.qubig.com

Qubig GmbH
Balanstr. 57
81541 Munich
Germany