AXTAL ADVANCED XTAL PRODUCTS

PRESSURE SENSING QUARTZ CRYSTAL RESONATOR **RKMA-P**

APPLICATIONS

RKMA-P is a quartz crystal resonator which is packaged in a rectangular enclosure. The resonance frequency varies with the pressure-induced stress. The crystal unit is designed as a precision electronic pressure sensor for transducer, manometers, and controllers with a frequency output for the conversion of the absolute pressure to frequency.



FEATURES

- High resolution and accuracy
- Long term quartz crystal stability
- Wide temperature range (-55…+80 °C)
- Low power consumption
- Suitable for precision pressure equipment

ELECTRICAL CHARACTERISTICS (at normal climatic conditions) / OPERATING CONDITIONS

PARAMETERS	SPECIFICATIONS AND REMARKS				UNITS
Electrical characteristics					
Model	**RKMA-P-1**	**RKMA-P-3**	**RKMA-P-4**	**RKMA-P-2**	
Frequency range, f_O	32.000…48.000				kHz
Resonance resistance typ./max., R_r	120; 150 / 200			150; 200 / 250	kΩ
Drive Level max., D_L	4.0				μW
Insulation Resistance min.	400				MΩ

Motional characteristics

$$f(P)=f_O +A_1*P +A_2*P^2+ A_3*P^3,$$

There: f(P) – crystal frequency at pressure P (Hz),
f_O – crystal's frequency at zero pressure (Hz),
P – pressure (MPa),
A_1 – Linear coefficient = Sensitivity
*A_2, A_3 –second and third order coefficients. Nonlinearity less than 0.4% FS.**

Operation conditions

Model	Pressure range, P MPa	UNIT	Sensitivity (Linear coefficient A_1)	UNIT	Overall dimensions	UNIT
RKMA-0.1-1 (3;4)	0 – 0.10	MPa	21350.00 ± 5…20%FS	Hz/MPa	25 x 23 x 3.0 (5.0)	mm
RKMA-0.1-2	**0 – 0.10**	**MPa**	**5515.45 ± 5…20%FS**	**Hz/MPa**	**11 x 12 x 0.74**	**mm**
RKMA-0.25-1 (3;4)	0 – 0.25	MPa	7853.14 ± 5…20%FS	Hz/MPa	25 x 23 x 3.2 (5.1)	mm
RKMA-0.4-1 (3;4)	0 – 0.40	MPa	5415.45 ± 5…20%FS	Hz/MPa	25 x 23 x 3.3 (5.2)	mm
RKMA-0.6-1 (3;4)	0 – 0.60	MPa	3144.25 ± 5…20%FS	Hz/MPa	25 x 23 x 3.5 (5.45)	mm
RKMA-1.0-1 (3;4)	0 – 1.00	MPa	1518.88 ± 5…20%FS	Hz/MPa	25 x 23 x 4.45 (6.4)	mm
RKMA-1.6-1 (3)	0 – 1.60	MPa	1092.84 ± 5…20%FS	Hz/MPa	25 x 23 x 3.65 (5.6)	mm
RKMA-2.5-1 (3)	0 – 2.50	MPa	678.055 ± 5…20%FS	Hz/MPa	25 x 23 x 4.55 (6.5)	mm
RKMA-4.0-1 (3)	0 – 4.00	MPa	434.55 ± 5…20%FS	Hz/MPa	25 x 23 x 4.8 (6.75)	mm
RKMA-6.0-1 (3)	0 – 6.00	MPa	294.77 ± 5…20%FS	Hz/MPa	25 x 23 x 5.5 (7.45)	mm
RKMA-10.0-1 (3)	0 – 10.0	MPa	160.06 ± 5…20%FS	Hz/MPa	25 x 23 x 5,15 (7,1)	mm
RKMA-16.0-1 (3)	0 – 16.0	MPa	127.51 ± 5…20%FS	Hz/MPa	25 x 23 x 5,6 (7,5)	mm
RKMA-25.0-1 (3)	0 – 25.0	MPa	58.76 ± 5…20%FS	Hz/MPa	25 x 23 x 6,1 (8,1)	mm
RKMA-60.0-1 (3)	0 – 25.0	MPa	33.30 ± 5…20%FS	Hz/MPa	25 x 23 x 6,1 (8,8)	mm

Operating temperature, T_{OPR} (typ/max)	-55…+80 / -40…+100; -269…+250**	°C
Storage temperature, T_{STR}	-55…+85	°C
Maximum deviation over temperature	0.75	%
Relative deviation of the linear coefficient A_1 from its average value	± 5…± 20	%
Aging first year/next years max.	± 5 / ± 25	ppm
FS Pressure Hysteresis	< 0.02	%
Reproducibility of temperature dependence of the crystal frequency $f_T=f_O +B_1*T +B_2*T^2$	0.05	%
Vibration resistance, $\Delta f/f_0$	5g / 50-2000 Hz, 8 hours / ±7 ppm max.	ppm

*A_1, A_2 and A_3 coefficients are specified on request.
**Temperature range can be increased from -269 to +250 °C on request.
Temperature sensing quartz crystal RKT206 is used for compensation of a temperature deviation of RKMA-P.

AXTAL GmbH & Co. KG
Wasemweg 5
D-74821 Mosbach
Germany

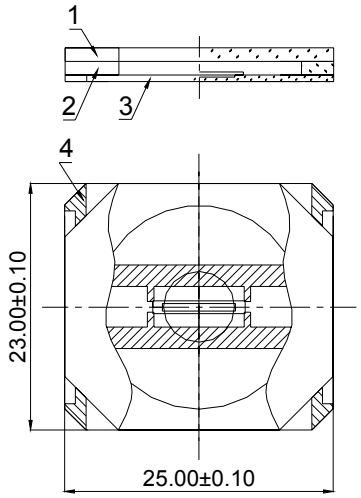
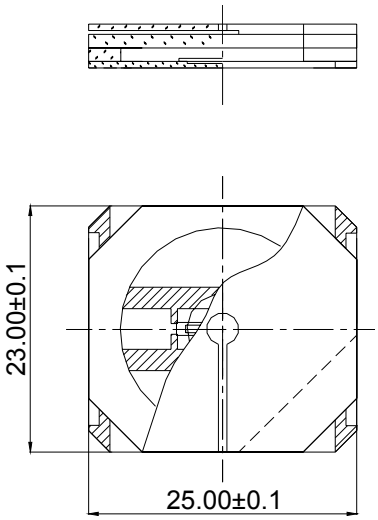
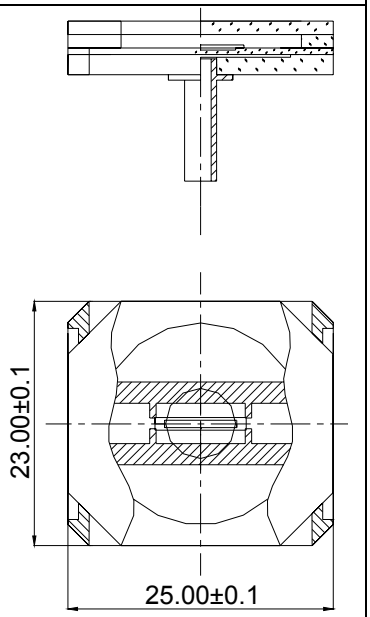
www.AXTAL.com
fon: +49 (6261) 939834
fax: +49 (6261) 939836
E-mail: info@axtal.com

PACKAGE DIMENSIONS

Four basic package variants of RKMA-P are available:

RKMA-P-1: basic model for direct fastening on the transducer case.
RKMA-P-2: Small size variant of RKMA-P-1 (see "Operation Conditions" table).
RKMA-P-3: With additional cover, glued to surface, for temperature isolation.
RKMA-P-4: With metal connecting pipe, through which the pressure is guided.

UNITS: millimeters

RKMA-P-1 (LxWxH=25x23xH) **RKMA-P-2** (LxWxH=11x13x0,74)	**RKMA-P-3**	**RKMA-P-4**
		
1- Cover; 2- Gasket; 3- Diaphragm; 4- Contact surfaces.		