

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, f₀		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						
$f(P) = f_0 + A_1 * P + A_2 * P^2 + A_3 * P^3$,						
There: <i>f(P)</i> – crystal frequency at pressure <i>P</i> (Hz),						
<i>f₀</i> – crystal's frequency at zero pressure (Hz),						
<i>P</i> – pressure (MPa),						
<i>A₁</i> – Linear coefficient = Sensitivity						
<i>A₂, A₃</i> – 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 A₁ 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 $f_T = f_0 + B_1 * T + B_2 * T^2$	0.05					%
Vibration resistance, Δf/f₀	5g / 50-2000 Hz, 8 hours / ±7 ppm max.					ppm

*A₁, A₂ and A₃ coefficients are specified on request.

**Temperature range can be increased from -269 to +250 °C on request.

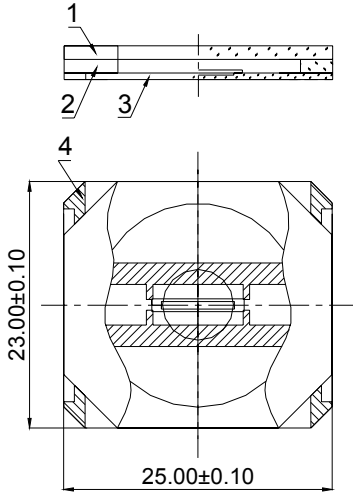
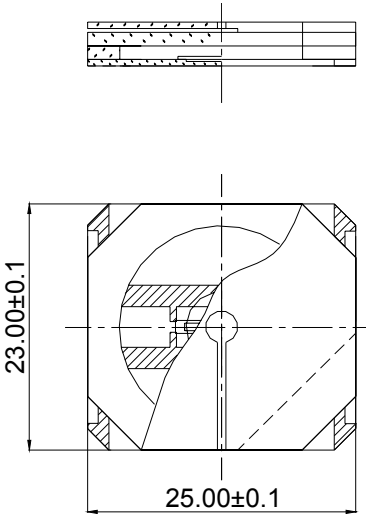
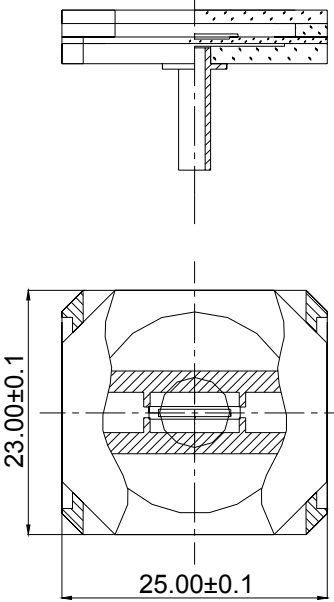
Temperature sensing quartz crystal RKT206 is used for compensation of a temperature deviation of RKMA-P.

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
		
<p>1- Cover; 2- Gasket; 3- Diaphragm; 4- Contact surfaces.</p>		