

## PRESSURE SENSING QUARTZ CRYSTAL RESONATOR **RKMA-100.0**

### APPLICATIONS

RKMA-100.0 is a quartz crystal resonator, which is packaged into a rectangular enclosure. The resonance frequency varies with the pressure-induced stress. The crystal is designed for precision electronic downhole pressure transducers with a frequency output which converts the absolute pressure to frequency.

### FEATURES

- High resolution and accuracy
- Long term quartz crystal stability
- Wide temperature range (-40...+200 °C)
- Low power consumption
- Suitable for precision downhole pressure equipment



### ELECTRICAL CHARACTERISTICS (at normal climatic conditions) / OPERATING CONDITIONS

PARAMETERS	SPECIFICATIONS AND REMARKS	UNITS
<b>Electrical characteristics</b>		
Frequency range, $f_0$	39.000...44.000	kHz
Resonance resistance typ./max., $R_r$	250 / 300	k $\Omega$
Drive Level max., $D_L$	1.0	$\mu$ W
Insulation Resistance min.	400	M $\Omega$
<b>Motional characteristics</b>		
$f(P) = f_0 + A_1 * P + A_2 * P^2 + A_3 * P^3$ ,		
<i>There: <math>f(P)</math> – crystal's frequency at pressure <math>P</math> (Hz),  <math>f_0</math> – crystal frequency at zero pressure <math>P</math> (Hz),  <math>P</math> – pressure (MPa),  <math>A_1</math> – Linear coefficient = Sensitivity  <math>A_2, A_3</math> – the second and the third order coefficients. They are determinate a nonlinearity which value less than 0.4% FS.*</i>		
<b>Operation conditions</b>		
Overall dimensions	20 x 9 x 8.5	mm
Pressure range, $P$	0 ...100	MPa
Sensitivity (linear coefficient $A_1$ )	42 $\pm$ 2	Hz/MPa
Operating temperature, $T_{OPR}$ (typ/max)	-40...+200 / -269...+250**	$^{\circ}$ C
Storage temperature, $T_{STR}$	-55...+85	$^{\circ}$ C
Maximum deviation over temperature	0.5	%
Relative deviation of the linear coefficient $A_1$ from its average value	$\pm$ 5... $\pm$ 20	%
Aging first year/next years max.	$\pm$ 5 / $\pm$ 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, $\Delta f/f_0$	5g / 10-2000 Hz, 8 hours / $\pm$ 7 ppm max.	ppm

\* $A_2$  and  $A_3$  coefficients are specified on request.

\*\*Temperature range can be increased from -269 to +250  $^{\circ}$ C on request.

Temperature sensing quartz crystal RKT206 is used for compensation of a temperature deviation of RKMA-100.0.

### PACKAGE DIMENSIONS

UNITS: millimeters

