

QUARTZ RATE SENSOR

BEIJING AUTOMATION CONTROL EQUIPMENT INSTITUTE



• DQRS-21



• SQRS-03

Overview of product

As one of the earliest manufacturers who develops quartz rate sensor in China, the institute is an important MEMS system development manufacturer with the support of inertial technology. With nearly 15 years of development, the institute has already established complete quartz processing line, mastered the core technologies such as instrument design, micro-fabrication and final setting, and realized full-closed loop of development flow. The comprehensive performance of the product is in leading position in the industry.

Technical characteristics

The quartz rate sensor is Coriolis vibration gyro based on piezoelectric effect. The product is manufactured by taking quartz tuning fork as sensing element and using micro-fabrication technology. The gyroscope has advantages such as small volume, low power consumption, high reliability, and adverse-environment resistance with precision range from 5 deg/h to 300 deg/h.

Field of application

It is mainly applied to combined navigation or short-time inertial navigation of tactic weapons such as medium/short-range missile, UAV, guidance air bomb, and rocket artillery. It is also used for serve loop control of seeker, stabilization control of aerodynamic missile body, and stabilization control of imaging platform.

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TYPE	SQRS-02	SQRS-03	SQRS-04	SQRS-05	DQRS-21
Performance					
Start-Up time(s)	≤5	≤5	≤10	≤5	≤5
Bandwidth (Hz)	50 to 100	50 to 100	50 to 100	50 to 100	120
Bias stability(deg/h, 1σ)	(30, 20, 10)	(30, 20, 10)	(100, 50, 30)	(10, 5)	10
Bias repeatability(deg/h, 1σ)	(30, 20, 10)	(30, 20, 10)	(100, 50, 30)	(10, 5)	10
Bias variation over temperature (deg/s) (without compensation)	≤0.2	≤0.4	≤3	≤0.02	≤0.05
Scale factor non-linearity (ppm)	≤200	≤200	≤300	≤100	≤100
Scale factor over temperature (%)	≤2	≤2.5	≤3	≤0.05	≤0.05
Operating range					
Standard range (deg/s)	-200 to +200(-50 to +50, -100 to +100, -500 to +500 selectable)				
Operating temperature (°C)	-40 to +80	-40 to +80	-40 to +80	-40 to +80	-40 to +80
Storage temperature (°C)	-50 to +100	-50 to +100	-50 to +100	-50 to +100	-50 to +100
Vibration operating(g,RMS)	10 (20Hz to 2kHz Random)	10 (20Hz to 2kHz Random)	10 (20Hz to 2kHz Random)	10 (20Hz to 2kHz Random)	10 (20Hz to 2kHz Random)
Shock (g)	200(3ms)	200(3ms)	200(3ms)	200(3ms)	200(3ms)
Electrical					
Interface	analog signal	analog signal	analog signal	RS-422	RS-422
Input supply(VDC)	±(9 to15)	5.5 to 6.5	5	±5	±5
Input current (mA)	≤15(±)	≤10	≤10	<50(+), <15(-)	<60(+), <20(-)
Physical					
Dimensions (mm)	66x25.65x25.65	Φ25x18	29.4x29.4x10.7	35x40x19.4	Φ39.8x20
Weight (grams)	≤50	≤30	≤10	≤40	≤45

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