rakon

MILITARY SOLUTIONS

Frequency control solutions for military applications

The harsh environments that hardware is required to operate in, put extreme demands on components. At the same time those same components are required to reliably deliver cutting-edge performance.

Trade-offs between survivability, stability and low noise have meant that designers have been forced to compromise.

Rakon's patented crystal technology removes this compromise and delivers new levels of performance and reliability. Rakon's leading oscillator functionality can be combined with these crystals to create a wide range of new and innovative applications.

Shock and vibration

- Systems which are subject to or generate high G shock or vibration still demand high precision timing in order to function properly during operation.
- Existing solutions improve the shock tolerance of crystals in one dimension but such approaches severely limit the oscillator stability and noise capabilities.
- High vibration environments are unsuitable for oscillators using traditional construction techniques.

Rakon crystal solutions

Designed for rugged environments

- Extended temperature -55 to 125°C
- High G survivability up to 50,000G
- Three dimensional shock tolerance
- Vibration tolerant 10G RMS, 30 to 1500Hz

Off-the-shelf products or custom designs

- A range of commercial off-the-shelf products are available
- Contact your Rakon representative to discuss any custom requirements

Power conservation and electronic signature

- Maximising battery life and minimizing the electronic signature of military equipment are major elements in mission security and effectiveness.
- In-between active events it is desirable to put the system to sleep to be reactivated when next required, and shutdown again as required.
- In many communications and detection systems it is necessary to have a low-drift high-frequency reference oscillator for use during receive and transmit.
- From voice communications through to sophisticated battlefield data exchange systems, maintaining accurate system timing while ensuring data integrity and system reliability is critical to mission success.

Rakon oscillator solutions

- Ultra stable TCXOs ±100 ppb
- Small lightweight footprints
- Very low phase noise designs
- Designed to support software defined radio waveform requirements
- Power management and timing control functionality available
- Designed for high performance GPS applications
- Class 1 and Class 2 Beacon TCXOs available

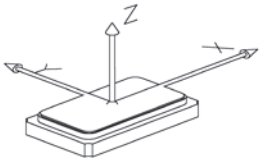
Shock & vibration tolerant crystals

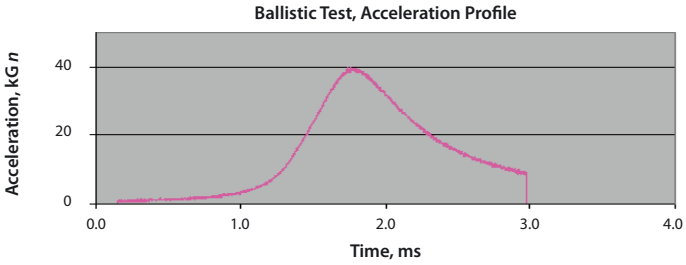
5.0 x 3.2 x 1.0 mm

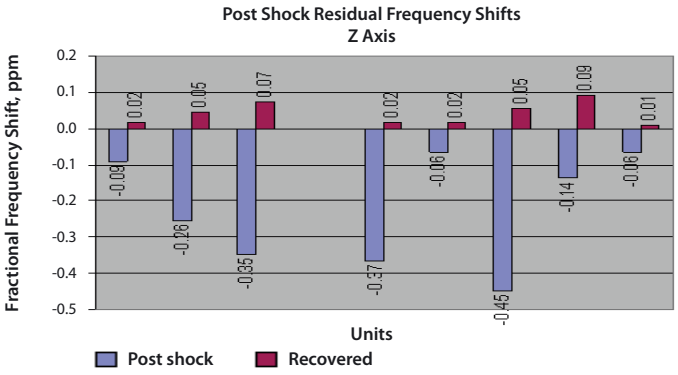
Recognising the need for acceleration tolerant crystal technology, Rakon's RGX Series of crystals can be used stand alone or combined into a TCXO. This advanced, patented technology is ideal for rugged environments where shock and vibration exceed normal conditions and survivability is key.

Using unique strip technology, Rakon's compact, seam sealed ceramic packages are up to 5 times more resistant to shock than traditional mounting techniques and are ideal for a wide range of applications.

- Up to 50,000G event survival
- G-Sensitivity down to 0.2ppb/G
- No frequency perturbations
- Excellent short term stability
- Low aging







TCXOS with power management

7.0 x 5.0 x 2.55 mm

Communications and sensors need power management to maximize battery life in portable field equipment, to enable effective use of communications bandwidth or reduce electronic signature.

TCXOs using Rakon's Pluto and Charon ASICs are designed to deliver such functionality in combination with industry leading oscillator performance. In addition, Charon includes a highly accurate onboard programmable timer and an alarm function to switch other system circuitry. This conserves energy when not in use.

Parameter	Capability
Frequency	1.25 to 40.0MHz
Stability	±0.28 ppm
Operating temperature range	-40 to 85°C
Current	≤8.0mA @36MHz
Current when disabled	≤1.7mA @36MHz

Customer controlled functions using 4 Wire SPI and 8 bit DAC	
Frequency adjust	<0.05 ppm
Timer (Set in increments of nominal frequency)	±<0.5 ppm over –40 to 85°C eg. 1ms increment accurate to 1s after 23 days
Alarm	Timer controlled alarm output to switch other functions
Low frequency divided output	Divide by 8 to divide by 262144 of TCXO frequency

Why Rakon for military applications?

- Rakon has a range of frequency control solutions for military applications. Off-the-shelf products are available or custom designs can be made to your requirements.
- Rakon has a pedigree in developing and supplying ultra-stable oscillator products.
- Rakon has an unrivalled wealth of experience in oscillator ASIC design and in the design and manufacture of crystals.
- Rakon has a unique approach to quality control and reliability testing which has been proven over many years in high volume consumer markets.

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