

High-Reliability Products for Space

Made in India with proven heritage

Rakon is one of the world's largest providers of frequency control products for the space and high reliability markets and a preferred supplier to the European Space Agency (ESA) and the Indian Space Centers (ISRO) for frequency control solutions. Rakon continuously develops leading products that are at the cutting edge of technology, supporting the "Make in India" initiative directed by the Indian government.

Rakon India's high-reliability solutions for space

Our products can be found in many India and international programmes

 Chandrayaan TCXOs VCXOs	 GSAT-19 OCXOs TCXOs	 MARS-Mission VCXOs
 NVS Crystal Filters OCXOs	 GSAT-17 OCXOs TCXOs	 ASTROSAT XOs
 Aditya-L1 TCXOs VCXOs	 GSAT-15 TCXOs	 IRNSS-1D XOs

Coming soon

OCXOs – ROX4240S

Application: GEOSAT, LEOSAT.



- Size: 42 x 40 x 39 mm
- Frequency: 70 – 130 MHz
- FvT: $\leq \pm 10$ ppb, -10 to 60°C
- Phase noise: -140 dBc/Hz @ 1 kHz offset.

PLDROs – RDO5757S

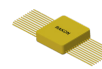
Application: NewSpace.



- Size: 57 x 57 x 15.7 mm
- Frequency: C, X, Ku bands
- Excellent phase noise
- Spurious level < -70 dBc
- In-built internal reference
- Phase lock alarm output

TCXOs – RTX3225S

Application: GEOSAT.



- Size: 32 x 20 x 10 mm
- Frequency: 14 – 375 MHz
- FvT: $\leq \pm 1$ ppm, -20 to 70°C
- Phase noise: -130 dBc/Hz (1 kHz offset, @137.5 MHz)

New platforms



Products	VCOs – RVC1111S	Isolators/Circulators – RIC1919S	LC Band Pass Filters – RLF1212S
Applications	Digitally tuned oscillators, frequency synthesizers.	GSAT, duplexers, radio link and navigation, radar systems, reference frequency distribution.	Transmitters and receiver systems, signal conditional and RF signal Filtering, Radar and communication systems.
Key features	<ul style="list-style-type: none"> • Size: 11 x 11 x 4.3 mm • Frequency: 2 – 4 GHz (S band) • Broadband frequency coverage • Tuning voltage: 0 to 15 V • Output power level: > 10 dBm • Frequency pushing: 20 MHz/V • Spurious: < -60 dBc 	<ul style="list-style-type: none"> • Size: 19 x 19 x 6.5 mm • Frequency: L, S, C bands • Drop-in and Coaxial types • Insertion loss: < 0.5 dB • Power handling: Drop-in 1W (CW), Coaxial: 100W (CW) 	<ul style="list-style-type: none"> • Size: 2.7 x 12.7 x 10.66 mm • Frequency: 8 – 200 MHz • Low insertion loss of < 7 dBm • Small form factor



Rakon India space product ranges and heritage

- ✦ Rakon India is the expert in the design and manufacture high reliability space-grade oscillators, filters, isolators/circulators and frequency distribution amplifiers for the Indian market. We have contributed to building India's domestic heritage in space missions. Recently, we proudly launched new VCO, Isolator/Circulator and LC Band Pass Filter platforms to support Space applications.
- ✦ Our space-grade products are qualified and certified by the Indian Space Research Organisation (ISRO). They are manufactured following the guidelines of MIL-PRF-55310 Level S and the ISRO-approved Process Identification Document (PID).
- ✦ Rakon products are used in many government and commercial programs worldwide, providing high performance in the most demanding conditions. Our oscillators are present in spacecraft and launch vehicles, playing a key role in Indian space missions such as Chandrayaan, NVS, Aditya-L1, GSAT-19, GSAT-17, GSAT-15, MARS Mission, ASTROSAT, IRNSS-1D, PSLV-25 (MARS Mission), PSLV-27 (IRNSS 1D), GSLV D6 (GSAT-6), GSLV Mk3 (GSAT-19), GSLV F09 (GSAT-9), and PSLV-38 (Cartosat).

Space products

OCXOs – MIL-PRF-55310 Class 1, Level S

ROX5050S



Application: Atomic clocks.

- Size: 50 x 50 x 31 mm
- Frequency: 10, 10.23 MHz
- FvT: $\leq \pm 10$ ppb over -10 to 60°C
- Short term stability: $< 8 \times 10^{-13}$ (1s)
- Phase noise: -140 dBc/Hz (10 Hz)
- Spurious: < -100 dBc

ROX5555S



Application: GSAT-07, GSAT-17 and GSAT-19.

- Size: 50 x 50 x 34 mm
- Frequency: 70 – 130 MHz
- FvT: $\leq \pm 24$ ppb over -10 to 60°C
- Phase noise: -140 dBc/Hz (1 kHz)
- Spurious: < -100 dBc
- Supply voltage: 15 V

Distribution Amplifiers – MIL-PRF-55310 Class 1, Level S

RDA5040S

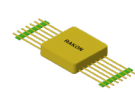


Application: Atomic clock, frequency synthesis chains, reference frequency distribution.

- Size: 50.8 x 40 x 25.4 mm
- Frequency: 10 – 40 MHz
- Unity gain
- Power Level: 7 dBm min.
- Isolation between outputs: > 50 dB
- Short term stability: $< 8 \times 10^{-13}$ (1s)
- Spurious: < -60 dBc
- 1 direct output, 2 auxiliary outputs

VCOs – MIL-STD-883/MIL-PRF-38534

RVC1616S



Application: High speed data communication and network surveillance radars.

- Size: 16 x 16 x 4.3 mm
- Frequency: 950 – 1450 MHz
- Control voltage range: 1 to 11 V
- Tuning sensitivity: 45 – 75 MHz/V
- Frequency pushing: 2 MHz
- Output type: Sine
- Frequency pushing: 2 MHz

TCXOs – MIL-PRF-55310 Class 2, Level S

RTX3520S



Application: GSAT (07, 15, 17, 19) and exploration missions (Chandrayaan).

- Size: 35 x 20 x 10/15 mm and 38 x 25 x 7 mm
- Frequency: 5.5 – 375 MHz
- FvT: $\leq \pm 1$ ppm over -15 to 60°C
- Phase noise: -140 dBc/Hz (1 kHz, @75 MHz)
- Supply voltage: 3.3, 5 and 15 V
- Output: Sine, Square

RTX3825S



VCOs – MIL-PRF-55310 Class 2, Level S

RVX2213S



Application: SPADEX, GSAT, MARS-Mission and Chandrayaan.

- Size: 22 x 13 x 4.8 mm, 35 x 20 x 10 mm
- Frequency: 0.032 – 95.19 MHz
- FvT: ≤ 20 ppm pk-pk over -30 to 60°C

RVX3520S



- Frequency pulling:
 - $\geq \pm 375$ ppm (RVX2213S)
 - $\geq \pm 150$ ppm (< 40 MHz, RVX3520S)
 - $\geq \pm 100$ ppm (> 40 MHz, RVX3520S)
- Linearity: $< 10\%$ (RVX2213S), $< 7\%$ (RVX3520S)
- Supply voltage: 5, 12 V
- Output: Sine or Square

XOs – MIL-PRF-55310

RXO2213S

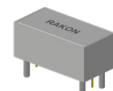


Application: Navigation satellites (IRNSS) and space observatory satellites (Astrosat).

- Size: 22 x 13 x 4.8 mm
- Frequency: 500 Hz – 52.5 MHz
- FvT: $\leq \pm 50$ ppm over -55 to 125°C
- Output: Square
- Ageing: $\leq \pm 3$ ppm/year

Crystal Filters – MIL-PRF-55310 Class 1, Level S

RCF4020S



Application: High speed data communication, network surveillance radar, satellite receiver.

- Size: 40 x 20 x 18 mm
- Frequency: 40 – 138 MHz
- Relative bandwidth: 0.001 to 0.5%
- Poles: 2 to 8
- Input power handling: up to 5 dBm
- Spurious: < -70 dBc

