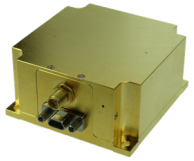
AXTAL ADVANCED XTAL PRODUCTS

CRYSTAL PRODUCTS FOR SPACE

Model	 AXE55310-26	 AXIOM75SL/H	 AXIS45S	 AXIOM6060	 AXIOM6060A	COMING SOON!  AXIOM75RH	 MQF4021S
Oscillator type	SPXO (Clock)	OCXO	VCXO	OCXO			Crystal Filter
Features	Space-COTS for LEO and New Space Applications		Wide pulling range & high linearity options	ESA EPPL		Smallest OCXO with AXIOM6060 Performance	High filter slope and out-of-band attenuation
Radiation hardness	20 krad (TID)	20 krad (TID)	100 krad (TID) – SEE > 90 MeV·cm²/mg – SEL immune				
Frequency range	4 ~ 65 MHz	10 & 100 MHz	10 ~ 100 MHz	100 MHz	120 MHz	10 & 100 MHz	10 ~ 100 MHz
Output waveform	HCMOS	HCMOS / Sine	Sine wave	Sine wave			50 Ohm
Stability	±40 ppm	±25 to ±50 ppb	±10 ppm	±50 ppb			±20 ppm
Temperature range	-55°C to +125°C	-30°C to +70°C	-30°C to +70°C	-30°C to +70°C			-40°C to +85°C
Supply voltage	5 V	12 V	5 V	12 V			-
Manufacturing	MIL-PRF-55310 Level “S”		MIL-PRF-55310 Level “S” / ECSS-Q-ST-70-08C/38C				
Size	20 x 13 mm DIL14 14-pin	25 x 25 mm (CO 43)	21 x 13 mm (CO 02)	60 x 60 x 30 mm SMA Micro-D	60 x 60 x 30 mm SMA Feedthrough	25 x 25 mm THD & SMD Options	40 x 21 mm SMD Package

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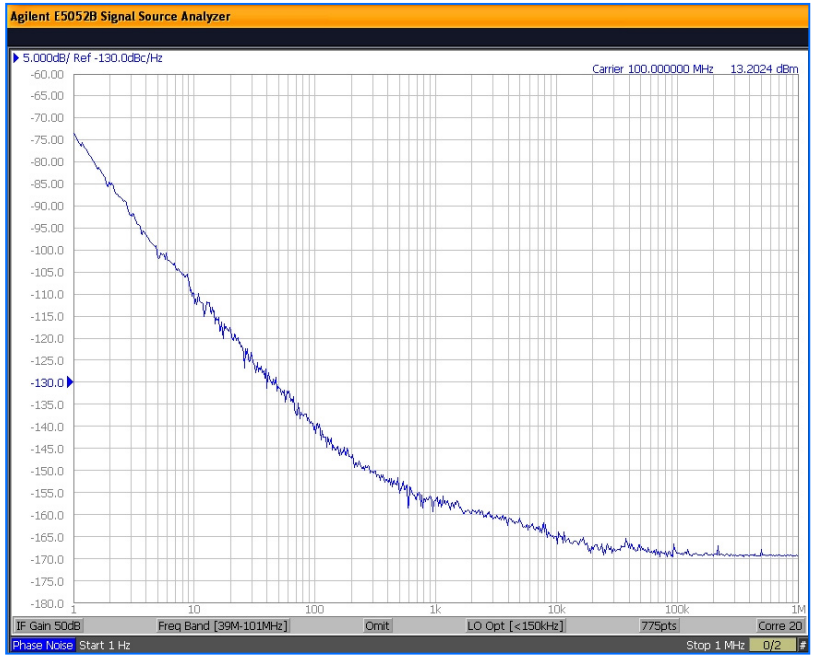
Designed and Manufactured in Germany

Performance and Manufacturing

Performance AXIOM6060



- Ultra-Low Phase Noise:
  < -70 dBc/Hz @ 1 Hz
  <-105 dBc/Hz @ 10 Hz
  <-135 dBc/Hz @ 100 Hz
  -170 dBc/Hz floor
- Aging: ±30 ppb for 1st year
- Stability: ±15 ppb / -30°C to +70°C
- Short-term stability: 5·10-12 for τ = 1 sec

Design, Manufacturing and Quality

- Use of radiation resistant ECSS-Q-ST-60C class 1 components (QPL or other approved sources)
- Material selection based on ECSS-Q-ST-70C and ECSS-Q-70-71
- Usage of quartz crystal resonators manufactured from swept quartz material for high radiation resistance IAW with ESCC 3501
- Oscillator manufacturing in Clean-Room environment (ISO Class 3) in accordance with ECSS-Q-ST-70-08C and ECSS-Q-ST-70-38C
- Pre-cap inspection of quartz crystal prior to sealing
- Soldering and assembly by ESA certified personnel
- Pre-cap inspection of oscillator assembly prior to sealing
- Screening and Group A, B & C inspection to MIL-PRF-55310 Level “S”
- Testing and qualification to ESA, MIL and customer specifications
- Complete traceability of all materials and manufacturing steps
- Engineering Models, Qualification Models, Flight Models, LAT Models
- Destructive Physical Analysis (DPA)

Heritage

- **Geostationary (weather) satellites:** FengYun China, DSO Singapore
- **LEO Satellite:** DSO Singapore and others
- **International Space Station ISS**: ACES (Atomic Clock Ensemble in Space)
- **NCLE (NL-China Low Frequency Explorer) – Earth-Moon L2 Orbit**
- **LARA/ExoMars Mission (ESA)**: Communication Link Earth-Mars
- **And others**

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