

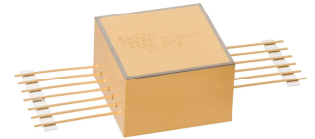
For this product, a full detailed specification can also be delivered on request.
Specific request can be addressed to RAKON info@rakon.fr

Product Description

This High performance ITAR-Free Flat Pack TCXO provides a combination of overall stability down to ± 1.5 ppm with low power consumption of 0,15W all over the temperature range of -40°C up to +85°C and an excellent phase noise.

Major applications of this TCXO are transponders, GPS receivers, digital cards, down and up converters.

Space Flat Pack TCXOs (20x20x13mm) are manufactured in accordance with MIL-PRF-55310 (Class 1, type 3, level S).



Features

- ITAR-Free
- Frequency Range : 10MHz to 100 MHz
- Supply Voltage : +5V or +12V
- Low Consumption : 30 mA max
- Frequency Stability vs. Operating Temperature : from ± 0.5 ppm to ± 5 ppm
- Ageing : ± 5 ppm over 15 years
- Output Wave Form : sine 50 Ohms
- Output Level : from 0 to 8 dBm
- Hermetic case
- Component selected as per ECSS-Q-ST-60C
- Materials selected as per ECSS-Q-70
- Manufacturing in accordance with:
 - MIL-PRF-55310 (Class 1, type 3, level S,B)
 - ECSS-Q-ST-70-08C and ECSS-Q-ST-70-38C

Applications

- GPS receivers
- Converters
- Board calculators
- Synthesizers
- FGU

Specifications

1.0 Environmental conditions

| Parameter | Conditions/remarks | Min | Nom | Max | Unit |
|---------------------------|---|-----|-----|-----|------|
| Operating Temperature | Option A | 0 | 25 | 50 | °C |
| | Option B | -20 | 25 | 70 | °C |
| | Option C | -40 | 25 | 85 | °C |
| Switch-on Temperature | TSo | -40 | | 85 | °C |
| Non-Operating Temperature | TNOp | -55 | | 125 | °C |
| Random Vibration | Level as per MIL-STD-202, Method 214, Condition I-K (46,3 Grms) | | | | |
| Sine Vibration | Level as per MIL-STD-202, Method 204, Condition D (20G) | | | | |
| Shocks | Mechanical shock as per MIL-STD-202, Method 213, Condition E (half sine with a peak acceleration of 1000g for duration of 0.5 msec) | | | | |
| Radiation | TID : 100 kRad, low dose rate No SEL up to LET = 60 MeV/mg/cm ² | | | | |

2.0 Electrical interface

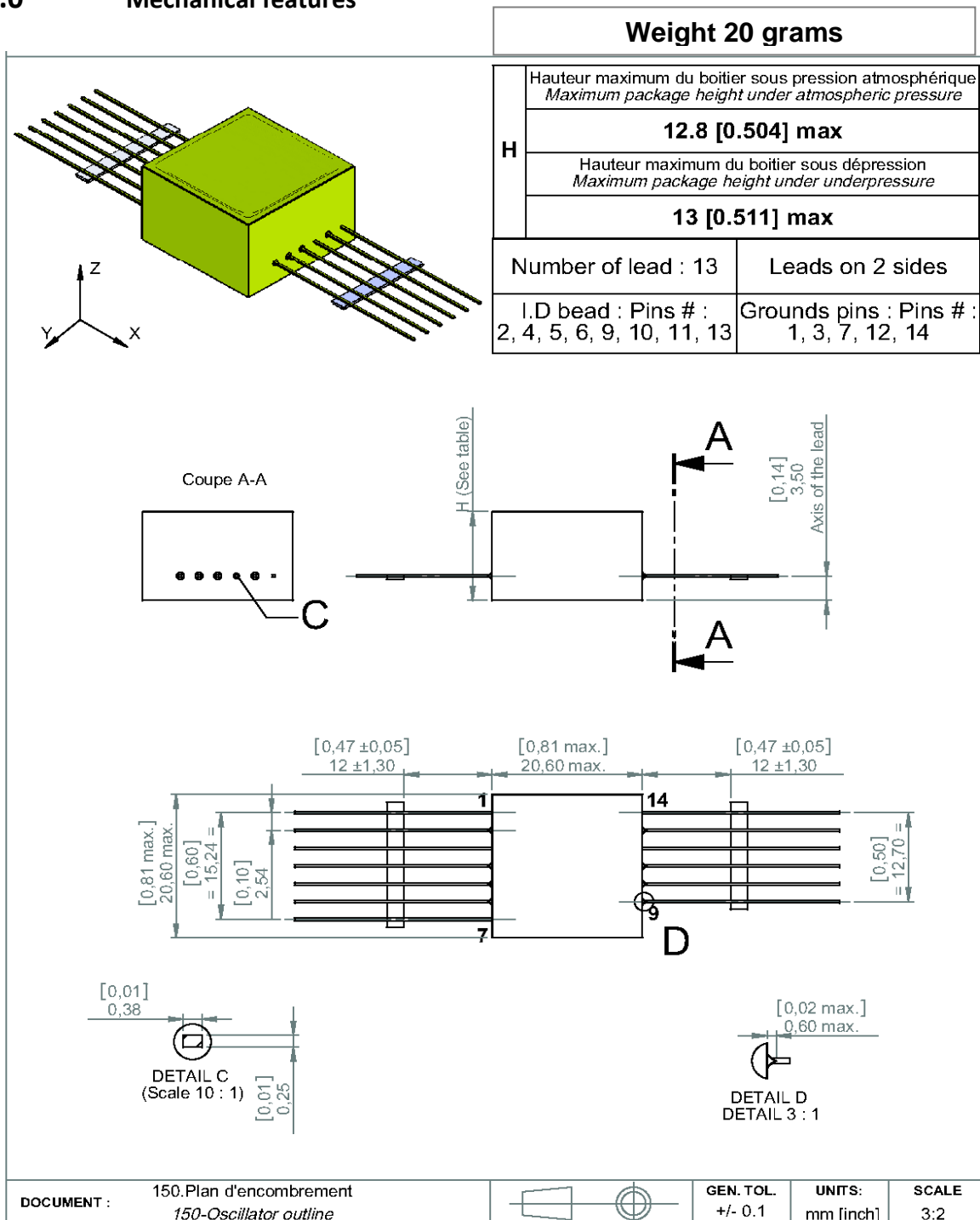
| Parameters | Conditions/remarks | Min | Nom | Max | Unit |
|---------------------|-----------------------------|------|----------|------|-----------|
| Power supply | Option 1 | 4.75 | 5 | 5.25 | V |
| | Option 2 | 11.4 | 12 | 12.6 | V |
| Load Impedance | | 45 | 50 | 55 | Ω |
| Adjustment resistor | Radj / Calibration option 1 | 0 | RadjNom* | 10 | $k\Omega$ |

Note: RadjNom will be indicated on final test report

3.0 Performances

| Parameters | Conditions/Remarks | Min | Typ | Max | Unit |
|--|---------------------------------------|------|-----|-----------|--------|
| Nominal Frequency | | 10 | | 100 | MHz |
| Steady state power supply | | | | 0.2 | W |
| Initial frequency accuracy | | | | ± 1 | ppm |
| Frequency adjustment | Calibration option 1 / negative slope | 5 | | -5 | ppm |
| Frequency-temperature stability | Temperature option A | | | ± 0.5 | ppm |
| | Temperature option B | | | ± 1 | ppm |
| | Temperature option C | | | ± 5 | ppm |
| Frequency variation vs. supply voltage | Over Operating Temperature | | | ± 0.1 | ppm |
| Frequency variation vs. load | Over Operating Temperature | | | ± 0.2 | ppm |
| Start up time | | | | 10 | ms |
| Frequency ageing | Over 1 year | | | ± 1 | ppm |
| | Over 15 years | | | ± 5 | ppm |
| Output waveform | | Sine | | | |
| Output level | Supply voltage option 1 | 0 | | | dBm |
| | Supply voltage option 2 | 7 | | | dBm |
| Harmonics level | | | | -30 | dBc |
| Spurious level | 100 Hz to 100kHz | | | -80 | dBc |
| Static Phase noise | @ 10 Hz offset | | | -75 | dBc/Hz |
| | @ 100 Hz offset | | | -105 | dBc/Hz |
| | @ 1 kHz offset | | | -130 | dBc/Hz |
| | (noise floor) @ 10 kHz offset | | | -145 | dBc/Hz |
| Allan Variance | 1s | | | 1 | ppb |

4.0 Mechanical features



5.0 Pin description

| Pin number | Name | Description |
|---------------|------|--------------------------------|
| 1,3,7,12,14 | GND | Electrical & Mechanical ground |
| 2 | Vcc | Supply voltage |
| 4,5,8,9,10,11 | NC | Do not Connect |
| 6 | Radj | Frequency adjustment option 1 |
| 13 | Fout | Frequency output |

6.0 Model philosophy

| Representativeness | Engineering Model | Engineering Qualification Model | Qualification Model | Flight Model | Flight Model + Lot Acceptance test |
|-----------------------------|--|--|---|--|---|
| Options | A | B, C | D | E, F, G, H | I |
| Components | Passive commercial parts, Active parts from the same manufacturer of HiRel parts | Mil Grade parts procured from the same manufacturer of HiRel parts | HiRel Parts | HiRel Parts | HiRel Parts |
| Crystal material | Swept quartz stabilized | Swept quartz stabilized | ESCC3501 Swept quartz stabilized | ESCC3501 Swept quartz stabilized | ESCC3501 Swept quartz stabilized |
| Mechanical interface | Flight representative in form-fit-function | Flight representative in form-fit-function | Flight design | Flight design | Flight design |
| Electrical interface | Flight design | Flight design | Flight design | Flight design | Flight design |
| Tests | Acceptance testing | Qualification testing | Qualification testing (including screening) | Acceptance testing (including screening) | Acceptance testing (including screening)+ LAT |
| Workmanship | IPC610 | ECSS-Q-ST-70-08 & 70-38 | ECSS-Q-ST-70-08 & 70-38 | ECSS-Q-ST-70-08 & 70-38 | ECSS-Q-ST-70-08 & 70-38 |

7.0 Flight Model Screening according to MIL-PRF-55310

- Full Level S (option E)
- Level S with combined burn in aging of 480 hours (option F)
- Full Level B (option G)
- Level B with combined burn in aging of 480 hours (option H)

Lot Acceptance test could be performed on all screening options

8.0 Options for Engineering Qualification Model

- Production manufacturing, qualification flow including qualification mechanical tests (option B)
- Production manufacturing, electrical tests only (option C)

9.0 Deliverable documentation

- Test data
- Full specification
- Certificate of Conformity (CoC)

10.0 Ordering part number definition

The part number breakdown is defined as follows:

