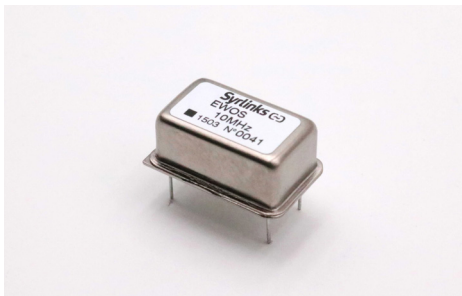


EWOS0535

High mechanical resistance OCXO for Space applications, Flight Proven

PRODUCT OVERVIEW

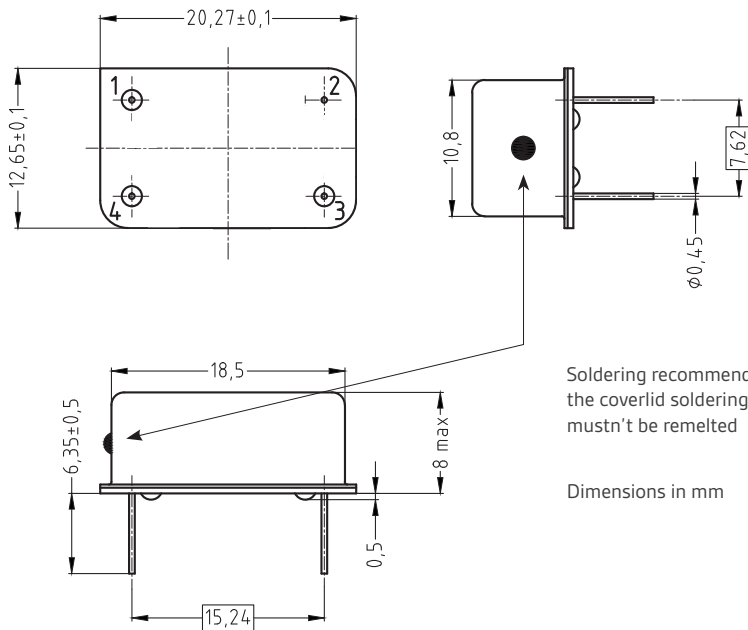
EWOS0535 is a 10 MHz OCXO using a quartz resonator with very high mechanical resistance and low accelerometric sensitivity. It has a very high frequency stability over short and medium term and is perfectly suited for LEO space missions subject to significant environmental constraints (vibrations & shocks). This OCXO is based on COTS components and is an ideal compromise in terms of cost and performance for cubesat applications, nanosat, micro-minisat, space gnss receivers, ranging functions and radio links.



KEY FEATURES

- 10 MHz
- ± 0.1 ppm (typ.) thermal sensitivity
- 300 mW @ -40°C (typ.)
- ± 2 ppb/day after 30 days (typ.)

DIMENSIONS & PIN-OUT



Soldering recommendation:
the coverlid soldering point
mustn't be remelted

Dimensions in mm

PIN	FUNCTION
1	Frequency control
2	Ground
3	RF Out
4	Power Supply

ORDERING INFORMATION

EWOS 0535

ELECTRICAL CHARACTERISTICS

PARAMETERS	Unit	Min	Typ.	Max	Note	Comments
Output Frequency	MHz		10		1	Nominal frequency
Frequency Tolerance	ppm		±0.5	±1	1	+25°C, Vctrl= 1.5V or Rcd = 20 KOhms
Temperature Range						
• Operating	°C	-40		+65	1	
• Storage	°C	-55		+125		
Supply Voltage	V		5 ± 5%			
Supply Current						
• Warm-up	mA		200	250	3	During 10 seconds
• Steady state / -40°C	mA		60	70	3	
• Steady state / +25°C	mA		30	35	3	
• Steady state / +65°C	mA		5	10	3	
Warm-up time						
	s			60	3	1E-7 accuracy referred to frequency measured at 25°C. To achieve 1E-10 short term stability - quiet environment
	mn			15	2	
Frequency Stability						
• Vs temperature variation	ppm		±0.1	±0.25	1	-40°C to 65°C
• Vs supply voltage variation	ppm		±0.05	±0.1	3	5V ±1%
• Vs load variation	ppm		±0.1	±0.2	2	(10 KΩ//10 pF) ± 10%
• Short-term			4E-11	1E-10	2	Allan deviation / 1s
• Aging						
	Per day	ppb	±2	±5	2	After 30 days
	First year	ppm		±1	2	
	After 20 years	ppm		±5	2	Over full temperature range
Phase noise						
• 10 Hz	dBc/Hz		-110		1	
• 100 Hz	dBc/Hz		-135		1	
• 1 kHz	dBc/Hz		-150		1	
• 10 kHz	dBc/Hz		-152		1	
Control Voltage (Vctrl)	V	0	1.5	4	1	Frequency control
Frequency Shift	ppm	±5	±6		1	Referred to nominal frequency measured at 25°C. Control voltage 0V to 4V - Positive slope or 0 Ohm to 1 MOhm resistance Rcd to ground
Tuning Input Impedance						
	kΩ		100		3	
	pF		100		3	
Output level						
	Vpp	1.6	1.8		4	Clipped sinewave - Dc cut Load 10 kΩ // 10pF
Output Impedance						
	kΩ		1		3	
	pF		5		3	
Frequency sensitivity to acceleration						
			5E-10/g		3	All three axes

Notes

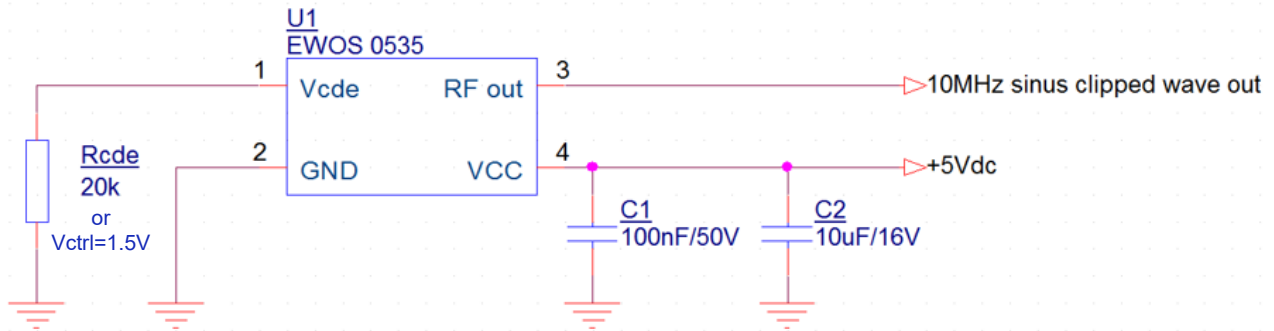
1. Parameter inspected at 100%
2. Parameter inspected by sampling
3. Parameter guaranteed by design and characterization
4. Parameter guaranteed by periodical qualification

ABSOLUTE MAXIMUM RATINGS

- Supply Voltage Vcc: 0V / 6V
- Control Voltage Vctrl: 0V / 6V

Operation of the device beyond these limits may affect device reliability or may cause permanent damage.

TYPICAL APPLICATION



Rated performance requires using good high frequency board layout techniques. It is recommended to connect decoupling capacitors (100 nF ceramic and 10 µF tantalum capacitors) to the supply pin.

Oscillator case has to be mechanically maintained or glued on the equipment board in order not to be damaged by environment vibrations and shocks.

The resistance R_{cde} permits to adjust very precisely the frequency accuracy. This resistance must have very low temperature sensitivity.

ENVIRONMENTAL CONDITIONS	
Shocks	1500G peak / 0.5 ms / 3 axis ; MIL-STD-883 method 2002, Test Condition B
Random Vibrations	23.91 Grms / 10 to 2000 Hz / 3 min per axis, MIL STD 202-214 cond G
Sine Vibrations	20G / 10 to 2000 Hz / 3 min per axis, MIL-STD-883 method 2007, Test Condition A
Radiations: Total Ionizing Dose (TID)	100 krad at low dose rate (36 to 360 rad/h)
Radiations: Single Event Effects	No SEE up to LET = 80.7 MeV/mg/cm ²
Soldering instructions	Hand soldering with recommended pins temperature: 235°C ±5°C, t=10s ±0.5s (260°C max for 5s max) Selective wave soldering with limitation of pre-heating to reach the max temperature of 85°C (body of component) and 3s max at max temperature Use of no-clean solder paste When connecting a pad to a copper plane, thermal pads are recommended
Mounting instructions	Metallic Case glued onto the PCB, without glue overflow into the metallized holes No spacer material between OCXO and PCB
PCB cleaning/washing	Washable with a temperature below 85°C

OCXO HERMETICITY	
	Metallic housing hermetically sealed
	Fine Leaks and Gross Leaks tests performed 100%