Syrlinks

Space Defense Safety Time Frequency

EWOS0535

High mechanical resistance OCXO for Space applications, Flight Proven

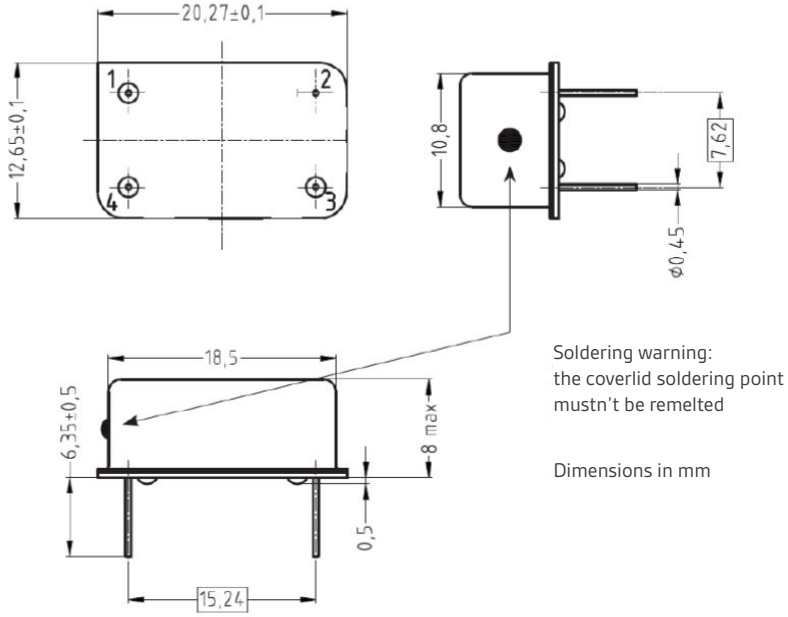
PRODUCT OVERVIEW

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 warning:
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 Rcde = 5.76 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		12	15	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	ppb		±100	±250	1	-40°C to 65°C
• Vs supply voltage variation	ppb		±50	±100	3	5V ±1%
• Vs load variation	ppb		±100	±200	2	(10 KΩ//10 pF) ± 10%
• Short-term			5E-11	1E-10	2	Allan deviation / 100ms
• Aging						
Per day	ppb		±2	±5	2	After 30 days
First year	ppm			±1	2	
After 10 years	ppm			±5	2	Over full temperature range
Phase noise						@ 25°C and Vctrl = 1.5V
• 10 Hz	dBc/Hz		-102		1	
• 100 Hz	dBc/Hz		-132		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 Rcde to ground
Tuning Input Impedance	kΩ		100		3	
	pF		100		3	
Output level	Vpp	1.6	1.8		4	Clipped sinewave - Use with DC cut coupling capacitance Load 10 kΩ // 10pF
Output Impedance	kΩ		1		3	
	pF		5		3	
Frequency sensitivity to acceleration			5E-10/g		3	All three axes

Notes

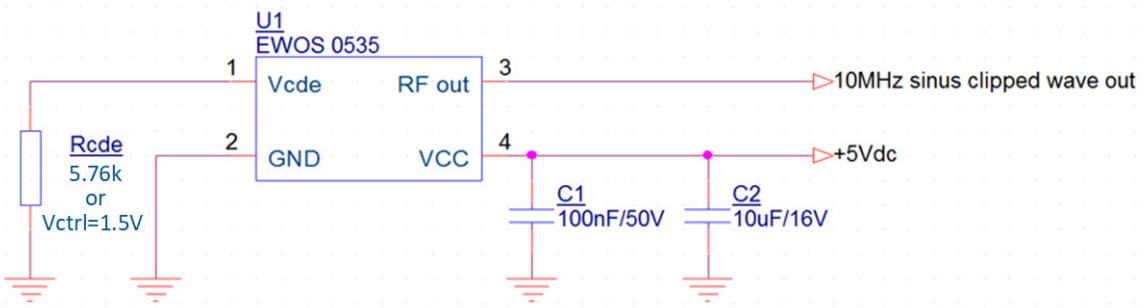
1. Parameter inspected at 100%
2. Parameter inspected by sampling
3. Parameter guaranteed by design and charaterization
4. Parameter guaranteed by periodical qualification

ABSOLUTE MAXIMUM RATINGS

- Supply Voltage Vcc: 4.5V / 5.5V
- 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.

A decoupling capacitor is recommended in parallel of Rcde for best phase noise performances. The value is to be adjusted depending on customer board configuration.

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 Rcde 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	Maximum EWOS Case (body) T°C is 110°C max during soldering operation Hand soldering Recommended temperature for pins soldering: Signals pin 320°C +/-5°C (t=3-5sec) GND pin 370°C +/-5°C (t=3-5sec) Use of preheat plate 100°C max is recommended in order to maximize the solder through hole's filling Selective wave soldering Pre-heating Temperature 110°C max (case T°C) Liquidus contact 3sec for pins soldering
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%