

EWOS16HP-UW

HIGH PERFORMANCE OCXO FOR UNDERWATER SYSTEMS

PRODUCT OVERVIEW

EWOS16HP-UW is a very low aging and ultra low power consumption OCXO dedicated to underwater systems. Built around a SC-cut resonator, it combines a low aging drift and an extremely low power consumption at a record 109 mW measured at 25°C. It is used in many underwater systems and provides an excellent holdover precision time for battery powered devices like Underwater Autonomous Vehicles. Supplied with 3.3V, it delivers an high stability HCMOS 16.384 MHz frequency output and a very low thermal sensitivity at ± 15 ppb (typ.).



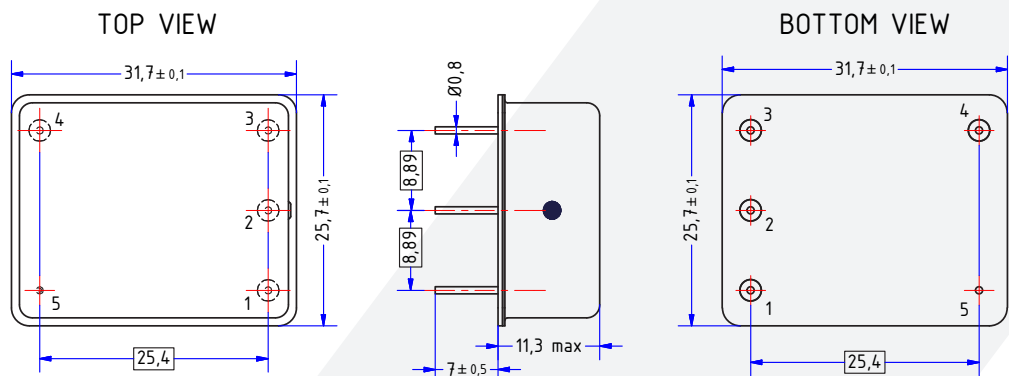
KEY FEATURES

- 16.384 MHz HCMOS output
- ± 15 ppb (typ.) thermal sensitivity
- 109 mW @ 25°C (typ.)
- ± 0.2 ppb/day after 30 days (typ.)

i ORDERING INFORMATION IS AVAILABLE ON THE LAST PAGE

DIMENSIONS & PIN-OUT

PIN	FUNCTION
1	Frequency control
2	Reference voltage
3	Power supply
4	RF Out
5	Ground



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ELECTRICAL CHARACTERISTICS

PARAMETERS	UNIT	MIN	TYP.	MAX	NOTE	COMMENTS
Output Frequency	MHz		16.384		1	
Temperature Range						
Operating	°C	-10		+45		Stay functional at 50°C but stability may not be met
Storage	°C	-30		+95		
Supply Voltage	V		3.3			± 5%
Supply Current						
Warm up	mA			200	3	During 20s max @25°C / 40s max @ 5°C
Steady state / -10°C	mA		70	76.5	1	
Steady state / +5°C	mA		56	61.5	1	
Steady state / +25°C	mA		33	36	1	
Steady state / +45°C	mA		16	22	1	
Frequency Stability						
Initial frequency accuracy	ppm		±0.1	±0.2	1	+25°C referred to nominal frequency. Control voltage 1V
Vs operating temperature range	ppb		±15	±30	1	peak to peak drift
Vs supply voltage variation	ppb			±2	3	3.3V ± 5%
Vs load	ppb			±2	3	(10 kΩ//15 pF) Load ± 10%
Short-term ($\tau=0.1s$)	10 ⁻¹¹		0.5	1	3	Allan deviation @16.384 MHz
($\tau=1s$)	10 ⁻¹¹		1	5	3	
Aging						
Per day	ppb		±0.2	±0.5	3	After 30 days
First year	ppb			±50	3	
After 10 years	ppb			±300	3	
Acceleration sensitivity	ppb/G		±1		3	Worst direction
Warm-Up Time	sec			30	3	To ±1 ppm of final frequency obtained after 1 hour at 25°C
	min			3	3	To ±100 ppb of final frequency obtained after 1 hour at 25°C
Retrace	ppb			±10	2	24h work after 24 off
Phase Noise @16.384 MHz						
1 Hz	dBc/Hz		-90		2	
10 Hz	dBc/Hz		-120		2	
100 Hz	dBc/Hz		-135		2	
1 kHz	dBc/Hz		-145		2	
10 kHz	dBc/Hz		-145		2	
HC MOS output parameters						
Load	pF		15		3	
Signal Level - Vh	V	2.4			3	
Signal Level - Vl	V			0.4	3	
Rise \ Fall Time	ns			8	3	10% - 80%
Duty Cycle	%	45		55	3	

NOTES

1. Parameter inspected at 100%
2. Parameter inspected by sampling
3. Parameter guaranteed by design & characterization

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PARAMETERS	UNIT	MIN	TYP.	MAX	NOTE	COMMENTS
Frequency Tuning						
Reference Voltage	V		3.0		3	
Tuning Voltage	V	0		3.0	3	
Tuning Range	ppm	±0.3	±0.6		2	
Tuning Slope			Positive		3	
Tuning Input Impedance	kΩ		100		3	
	pF		100		3	
Weight	grams		15			

ENVIRONMENTAL CONDITIONS

Shocks	1500G peak / 0.5 ms / 3 axis ; MIL-STD-883 method 2002, Test Condition B
Vibrations	16.91 Grms / 10 to 2000 Hz Random / 3 min per axis, MIL STD 202-214 cond E
Soldering instructions	Hand soldering with recommended pins temperature: 235°C ±5°C, t=10s ±05s (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 3 s 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%

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ORDERING INFORMATION

