

## EWOS16HP-UW

High performance OCXO for underwater systems

### PRODUCT OVERVIEW

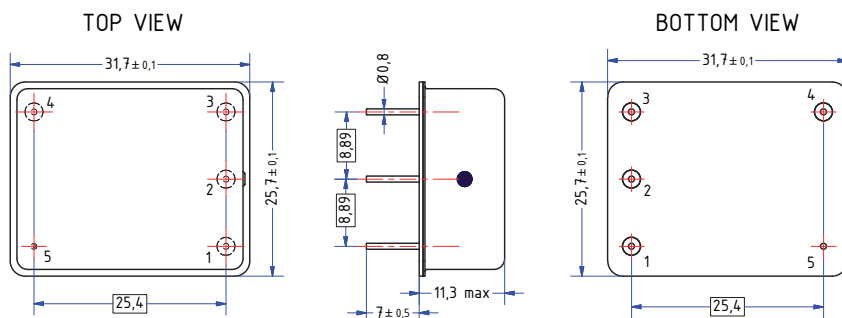
EWOS16HP-UW is a very low aging and ultra low power consumption OCXO dedicated to underwater systems. Built around a SC-cut resonator, it combines a low aging drift and an extremely low power consumption at a record 109 mW measured at 25°C. It is used in many underwater systems and provides an excellent 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  $\pm 15$ ppb (typ.)



### KEY FEATURES

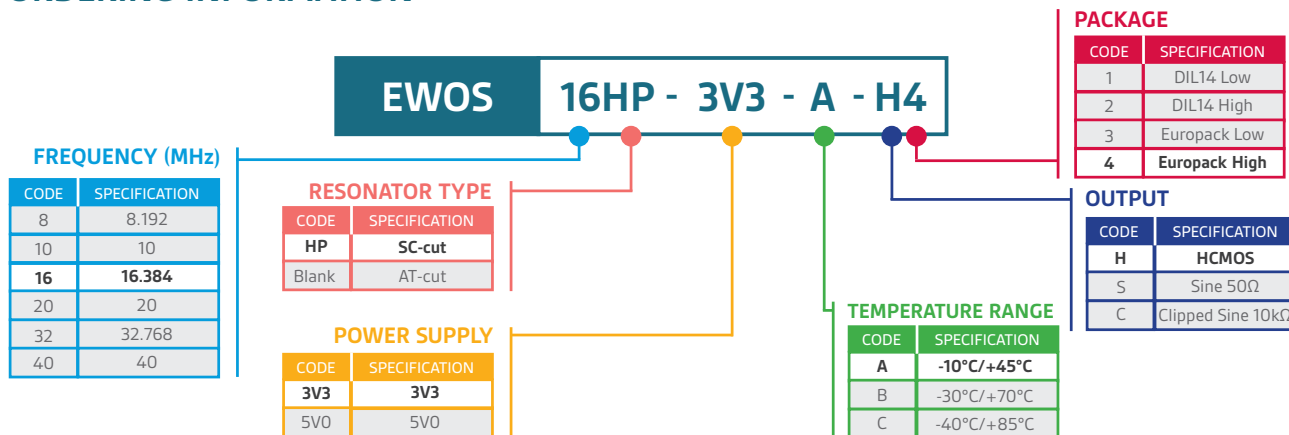
- 16.384 MHz HCMOS output
- $\pm 15$  ppb (typ.) thermal sensitivity
- 109 mW (typ.) @ 25°C
- $\pm 0,2$  ppb/day after 30 days (typ.)

### DIMENSIONS & PIN-OUT



PIN NUMBER	FUNCTION
1	Frequency control
2	Reference Voltage
3	Power Supply
4	RF Out
5	Ground

### ORDERING INFORMATION



**ELECTRICAL CHARACTERISTICS**

PARAMETERS	Unit	Min	Typ.	Max	Note	Comments
<b>Output Frequency</b>	MHz		16.384		1	
<b>Temperature Range</b>						
• Operating	°C	-10		+45		Stay functional at +50°C but stability may not be met
• Storage	°C	-30		+95		
<b>Supply Voltage</b>	V		3.3			±5%
<b>Supply Current</b>						
• Warm-up	mA			220	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	
<b>Frequency Stability</b>						
• Initial frequency accuracy	ppm		±0.1	±0.2	1	+25°C referred to nominal frequency. Control Voltage 1V peak to peak drift
• Vs operating temperature range	ppb		±15	±30	1	
• Vs supply voltage variation	ppb			±2	3	3.3V ± 5%
• Vs load	ppb			±2	3	(10 kΩ/15 pF) Load ± 10%
• Short-term	(τ=0.1s)	10 <sup>-11</sup>	0.5	1	3	Allan deviation @ 16.384 MHz
	(τ=1s)	10 <sup>-11</sup>	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 @ 25°C
	min			3	3	To ±100 ppb of final frequency obtained after 1 hour @ 25°C
• Retrace	ppb			±10	3	24h work after 24 off
<b>Phase Noise @16.384 MHz</b>						
• 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	
<b>HCMOS output parameters</b>						
• 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	
<b>Frequency Tuning</b>						
• 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	
<b>Weight</b>	grams		15			

**Notes**

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

**ENVIRONMENTAL CONDITIONS**

<b>Shocks</b>	1500G peak / 0.5 ms / 3 axis ; MIL-STD-883 method 2002, Test Condition B
<b>Vibrations</b>	16.91 Grms / 10 to 2000 Hz Random / 3 min per axis, MIL STD 202-214 cond E
<b>Soldering instructions</b>	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
<b>Mounting instructions</b>	Metallic Case glued onto the PCB, without glue overflow into the metallized holes No spacer material between OCXO and PCB
<b>PCB cleaning/washing</b>	Washable with a temperature below 85°C

**OCXO HERMETICITY**

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