

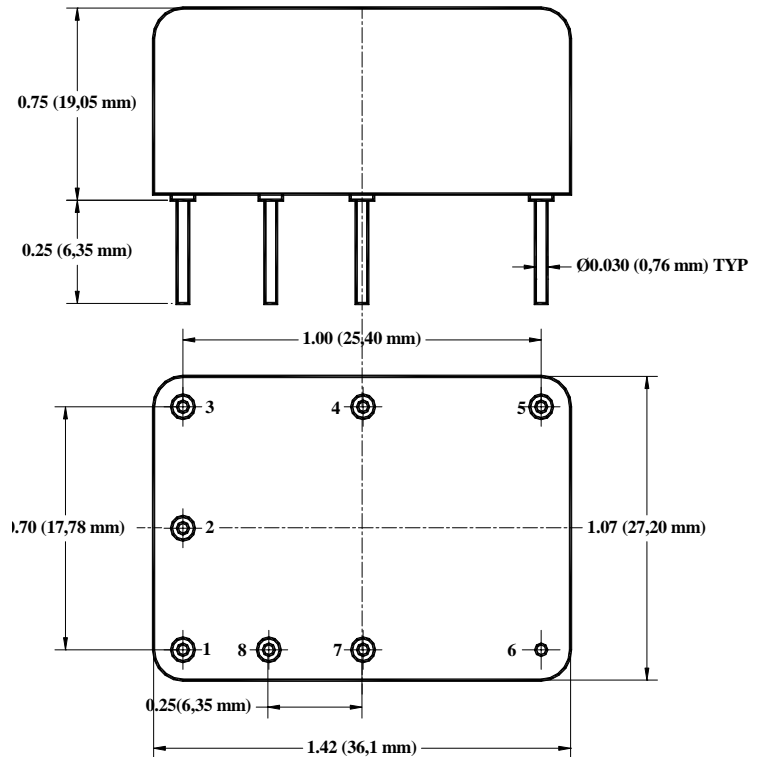
Rev F

**O-CE8-XYZXX-X-V-XX-X****Precision Very Low Phase Noise OCXO in 36x27 mm “Europack”  
with OSC Disable and Oven Alarm features for Instrumentation****Product Data Sheet****Features**

- SC-cut crystal
- High Stability
- Low Aging
- Very Low Phase Noise:  
-135 dBc/Hz at 10Hz offset  
-170 dBc/Hz on the noise floor

**Applications**

- Instrumentation
- Telecommunication Systems
- Data Communications
- GPS
- COTS/Dual use



**FREQUENCY  
CONTROLS, INC.**

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Parameter	Symb	Condition	Min	Typ	Max	Unit	Note
<b>Absolute Maximum Ratings</b>							
<b>Input Break Down Voltage</b>	V <sub>cc</sub>	12 V supply 5 V supply	-0.5 -0.5		13.0 5.5	V	
<b>Storage temper.</b>	T <sub>s</sub>		-40		85	°C	
<b>Control Voltage</b>	V <sub>c</sub>		-1 -5		5.5 5	V	Slope option "P" Slope option "N"

**Electrical (4)**

<b>Frequency</b>	F		8	10.000	13	MHz	
<b>Frequency stability</b>	$\Delta F/F$	vs. Temp.		$\pm 10$		ppb	See chart below
		vs. Supply		0.2	0.3	ppb/10% V <sub>cc</sub>	
<b>Aging</b>		per day		5E-10			after 30 days 5E-8 available
		per year, first year		1E-7			
		second year		3E-8			
		10 years		2.5E-7			
		15 years		2.7E-7			
<b>Allan Deviation</b>		.1s to 10s		1E-12			
<b>SSB Phase Noise (achieved after 10 minutes warm-up)</b>		1Hz		-105	-102	dBc/Hz	
		10 Hz		-135	-133		
		100 Hz		-155	-154		
		1 KHz		-162	-161		
		10 KHz		-168	-167		
		100 KHz		-170	-169		
<b>Retrace</b>		After 30 minutes			$\pm 10$	ppb	24 Hours off 3*
<b>G-sensitivity</b>		worst direction			$\pm 1.0$	ppb/G	
<b>Input Voltage</b>	V <sub>cc</sub>		4.75 11.4	5.0 12.0	5.25 12.6	V	See chart below to specify
<b>Power consumption</b>	P	steady state, 25°C steady state, -30°C start-up @ -30°C		0.8 1.5 2.5	1.0 3.2	W	Still air
<b>Spectral Purity</b>		Spurious Harmonics		-35	-80 -30	dBc	Non-harmonic
<b>Load</b>	Internally AC-coupled 50 Ohm						
<b>Warm-up time</b>	$\tau$	to 0.1ppm accuracy to 10ppb accuracy		3	5 10	minutes	Off time <24 hrs Aging rate was reached
<b>Output Waveform</b>	HCMOS/TTL compatible or Sinewave						
<b>Output Power</b>			+8	+10		dBm	Output Code S
<b>Logic 1 (CMOS)</b>	V <sub>oh</sub>		0.7 V <sub>ref</sub>			V	Output Code T
<b>Logic 0 (CMOS)</b>	V <sub>ol</sub>				0.1 V <sub>ref</sub>	V	Output Code T
<b>Control voltage</b>	V <sub>c</sub>		0 -4.5		V <sub>ref</sub> 4.5	V	Slope option "P" Slope option "N"
<b>Reference Voltage</b>	V <sub>ref</sub>	V <sub>cc</sub> = 12V V <sub>cc</sub> = 5V		5 or 4.5 4.5		V	
<b>Output Impedance</b>		At V <sub>ref</sub> pin		100		Ohm	
<b>Modulation Bandwidth</b>	F <sub>m</sub>		DC		1	KHz	Note 5
<b>Pull range</b>		from nominal F	$\pm 0.4$ $\pm 0.5$	$\pm 0.6$ $\pm 0.7$		ppm	Slope option "P" Slope option "N"
<b>Deviation slope</b>		Monotonic, positive Monotonic, negative		1.2/V <sub>ref</sub> -0.15		ppm/V	Slope option "P" Slope option "N"
<b>Setability</b>	V <sub>c0</sub>	@25°C, F <sub>nom</sub> .	V <sub>ref</sub> /2 $\pm$ 0.5 0 $\pm$ 0.5			V	Slope option "P" 3* Slope option "N"
<b>Oven Ready</b>		V pin #7	3.3		0.5	V	Ready Not Ready

All parameters for 10 MHz

<b>Output Enable</b>	CMOS Logic "1" (4.5V>V>2.5) or floating	Enabled	V	Pout< -30 dBm
	Logic "0" (V<0.5V)	Disabled		

**Notes:**

- 1\*. For operating temperatures higher than 70°C the power consumption will be higher (about 20% for 85°C). Values listed are for test in still air environment, the values will go up while testing in the temperature chamber.
- 2\* For recommended phase noise test, contact factory. It's assumed that phase noise test is performed under static conditions (no vibration), in still air, and care is taken for minimizing EMI.
- 3\*. Longer storage time, especially at low temperatures, may affect both retrace and setability parameters. It may require few days on power for re-stabilization.
4. All parameters, unless otherwise specified, are at nominal conditions, ie: T=25°C, Nominal Vcc & Nominal Load.
5. Older and stock units may have MBW of 150 Hz Max.

**Environmental and Mechanical**

<b>Operating temp. range</b>	-30°C to 70°C Standard, Other options – see chart below
<b>Mechanical Shock</b>	Per MIL-STD-202, 30G, 11ms
<b>Vibration</b>	Per MIL-STD-202, 5G to 2000 Hz
<b>Soldering Conditions</b>	260°C for 10s Max leads only

**Electrical Connections**

<b>Pin Out</b>	Pin #1-Vc ; Pin#2, Pin #8 – For internal use – do not connect; Pin #3 – Vcc; Pin #4 – Output Enable; Pin #5 – RF Output; Pin #6 – GND; Pin #7 – Oven Ready indicator
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## Creating a Part Number

**O** - **C** **E8** **X** **X** **YZ** **XX** - **X** - **V** - **XX** - **X** **FREQ**

**OCXO**  
Conventional Power

**Package Code**  
Europack 36x27mm, 8 pin

**Supply Voltage**

Code	Specification
0	5V ± 5%
F	12V ± 5%

**Output**

Code	Specification
T	CMOS/TTL
S	Sinewave

**Temperature Stability**

Code	Specification
17	1x10 <sup>-7</sup>
58	5x10 <sup>-8</sup>
28	2x10 <sup>-8</sup>
18	1x10 <sup>-8</sup>
59	5x10 <sup>-9</sup>
YZ	Yx10 <sup>-Z</sup>

**Temperature Range**

Code	In 5°C steps **
First letter	Lowest temperature from A = -40°C
Second letter	Highest temperature to Z = 85°C
Examples	
AZ	-40°C to 85°C
GU	-10°C to 60°C
EW	-20°C to 70°C

**\*\*Temperature Code Table**

Letter	Temp °C	Letter	Temp °C	Letter	Temp °C	Letter	Temp °C	Letter	Temp °C	Letter	Temp °C
A	-40	F	-15	K	10	P	35	U	60	Z	85
B	-35	G	-10	L	15	Q	40	V	65		
C	-30	H	-5	M	20	R	45	W	70		
D	-25	I	0	N	25	S	50	X	75		
E	-20	J	5	O	30	T	55	Y	80		

Not all combinations are available. Consult Factory.

**Environmental**

Code	Specification
L	Contains a level of lead that is in excess of RoHS directive and is not designed for reflow
R	RoHS compliant, not designed for reflow

**Aging**

Insert Value per day times 1E-10	
Examples	
05	5E-10 = 0.5 ppb/day
10	1E-9 = 1 ppb/day

**Phase Noise Code**

Code	Specification
V	Standard

**Deviation slope**

Code	Specification
P	Positive
N	Negative



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