

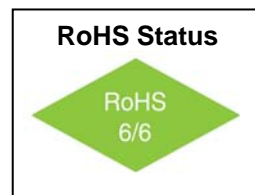
Model 148

OCXO - Ultra Miniature, Ultra Low Power Shock Resistant



Features

- 8MHz to 100MHz frequency range
- Industry's smallest OCXO
- Fast warm-up (to 45s)
- Eco-friendly < 250mW power consumption
- HCMOS output
- Shock and vibration resistant construction



Applications

- Airborne and Ground Mobile
- PLL Reference for Telecommunication Systems
- Portable (Battery Operated) Devices
- Guidance Systems
- Instrumentation / Test and Measurement

Description

The **Model 148** uses an SC-cut crystal technology with arrangement of the whole oven system together with the crystal oscillator inside the TO-8 vacuum holder to radically reduce the OCXO size, power consumption, and its warm-up time. As a result, the **Model 148** provides excellent temperature stability, low phase-noise and aging. Special internal heating resonator (IHR) design enables extra-high shock resistance and durability - a distinctive feature of this model.

Electrical Specifications

Parameter	Symbol	Condition	Min	Typ	Max	Unit	Note
Frequency Range	F		8		100	MHz	
Initial Calibration	$\Delta F/F$				± 0.1 ± 0.2	ppm	For 10MHz oscillator For 100MHz oscillator
Frequency Stability	$\Delta F/F$	Vs. Operating temp. C: -10°C to 60°C			± 5	ppb	See "How to Order"
		Vs. Supply voltage		± 2		ppb	$V_{CC} \pm 5\%$
		Vs. Aging / Day Vs. Aging / Year			0.5 ± 0.05	ppb ppm	After 30 days. See "How to Order"
Operating Temperature Range	T		-40°		+85°	°C	See "How to Order"
G-sensitivity		Worst direction			± 1	ppb/G	
SSB Phase Noise		1Hz 10Hz 100Hz 1kHz 10kHz		-97 -127 -152 -162 -166		dBc/Hz	For 10MHz oscillator
Supply Voltage	V_{CC}		4.75 3.14	5.0 3.3	5.25 3.46	V	



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Electrical Specifications

Parameter	Symbol	Condition	Min	Typ	Max	Unit	Note
Power Consumption	P	warm-up state steady state, at +25°C		1.0 0.23	1.1 0.25	W	
Warm-up Time	τ	to $\Delta F/F = 1 E^{-7}$, @+25°C, $V_{CC}=5.0V$	45	60		sec	Ref. to frequency after 15mins.
HCMOS Output Levels			10kOhms // 15pF				10MHz output frequency
	V_H	$V_{CC} = 5V$ $V_{CC} = 3.3V$	3.8 2.4			V	
	V_L				0.4	V	
Rise / Fall time	T_R/T_F	At 10MHz output frequency			10	ns	
Duty Cycle			45		55	%	
Control Voltage	V_C	$V_{CC} = 5V$ $V_{CC} = 3.3V$	0 0		4.2 2.8	V	Tuning slope - positive
Frequency Tuning Range			± 0.5	± 1.0		ppm	Monotonic
Reference Output	V_{REF}	$V_{CC} = 5V$ $V_{CC} = 3.3V$	4.1 2.7	4.2 2.8	4.3 2.9	V	

Environmental and Mechanical Conditions

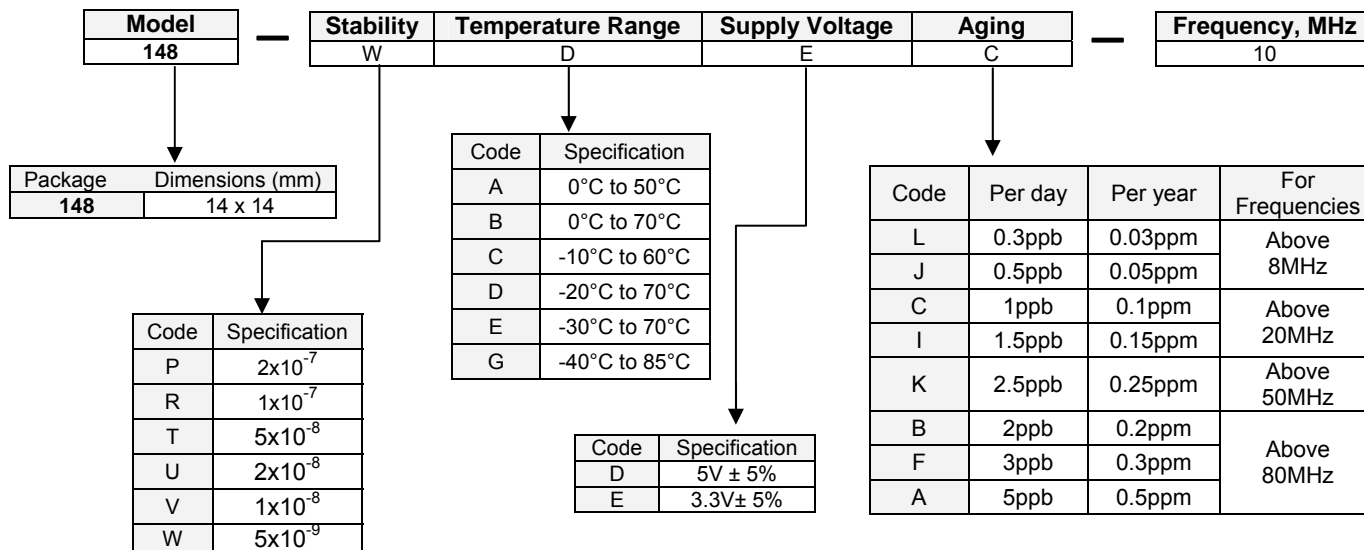
Parameter	Condition
Storage Temperature	-60°C to +90°C
Humidity	Non-condensing 95%
Mechanical Shock	Per MIL-STD-202G, method 213B, 500G, 1ms, half sine pulse
Vibration	Per MIL-STD-202G, method 204D, 1.5mm DA 10 to 100Hz, 30G peak swept sine 100 to 2000Hz
Soldering Conditions	Hand solder only
Markings	Epoxy ink or laser engraved

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How to Order



Frequency stability vs. temperature range for 10 MHz OCXOs

Temperature vs. Stability	3×10^{-8}	2×10^{-8}	1×10^{-8}	5×10^{-9}
0°C to 50°C	+	+	+	+
0°C to 70°C	+	+	+	-
-10°C to 60°C	+	+	+	+
-20°C to 70°C	+	+	+	-
-30°C to 70°C	+	+	+	-
-40°C to 85°C	+	-	-	-

Frequency stability vs. temperature range for 100 MHz OCXOs

Temperature vs. Stability	1×10^{-7}	5×10^{-8}	3×10^{-8}	2×10^{-8}
0°C to 50°C	+	+	+	+
0°C to 70°C	+	+	-	-
-10°C to 60°C	+	+	+	-
-20°C to 70°C	+	+	-	-
-30°C to 70°C	+	+	-	-
-40°C to 85°C	+	-	-	-



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Package

