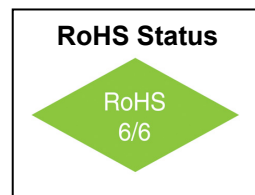
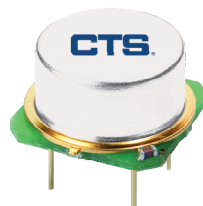


# Model 148

## 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 < 200mW 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	$\Delta F/F$				$\pm 0.1$ $\pm 0.2$	ppm	For 10MHz oscillator For 100MHz oscillator
Frequency Stability	$\Delta F/F$	Vs. Operating temp. C: -10°C to 60°C			$\pm 5$	ppb	See "How to Order"
		Vs. Supply voltage		$\pm 2$		ppb	$V_{CC} \pm 5\%$
		Vs. Aging / Day Vs. Aging / Year			0.5 $\pm 0.05$	ppb ppm	After 30 days. See "How to Order"
Operating Temperature Range	T		-40°		+85°	°C	See "How to Order"
G-sensitivity		Worst direction			$\pm 1$	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	

# Model 148

## OCXO - Ultra Miniature, Ultra Low Power

### Shock Resistant



#### 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	$\tau$	to $\Delta F/F=1 E^{-7}$ , @+25°C, $V_{CC}=5.0V$	45		60	sec	Ref. to frequency after 15mins.
HCMOS / TTL Output Levels			10kOhms // 15pF				10MHz output frequency
	$V_H$		3.8			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			$\pm 0.5$	$\pm 1.0$		ppm	Monotonic
Reference Output	$V_{REF}$	$V_{CC}=5V$ $V_{CC}=3.3V$	4.1 2.7	4.2 2.8	4.5 2.9	V	

#### Environmental and Mechanical Conditions

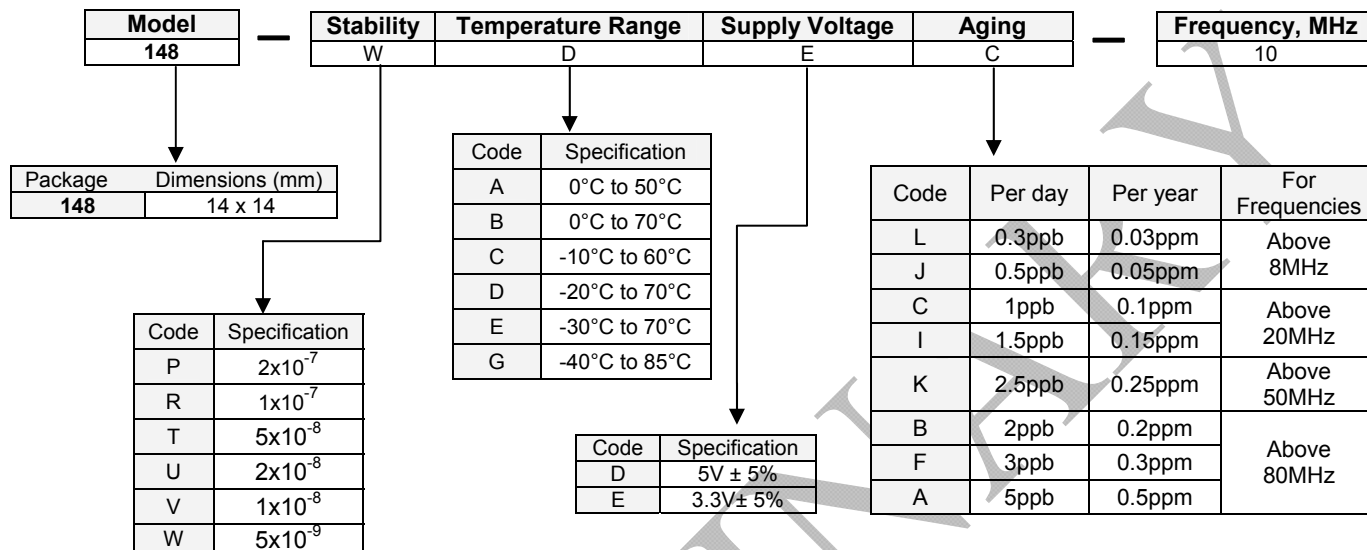
Parameter	Condition
Storage Temperature	-60°C to +90°C
Humidity	Non-condensing 95%
Mechanical Shock	Per MIL-STD-202, 500G, half sine pulse, 11ms
Vibration	Per MIL-STD-202, 30G swept sine 10 to 2000Hz
Soldering Conditions	Hand solder only
Markings	Epoxy ink or laser engraved

# Model 148

## OCXO - Ultra Miniature, Ultra Low Power Shock Resistant



### How to Order



Frequency stability vs. temperature range for 10 MHz OCXOs

Temperature vs. Stability	$3 \times 10^{-8}$	$2 \times 10^{-8}$	$1 \times 10^{-8}$	$5 \times 10^{-9}$
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	+	-	-	-

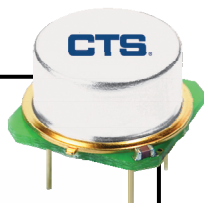
Frequency stability vs. temperature range for 100 MHz OCXOs

Temperature vs. Stability	$1 \times 10^{-7}$	$5 \times 10^{-8}$	$3 \times 10^{-8}$	$2 \times 10^{-8}$
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	+	-	-	-

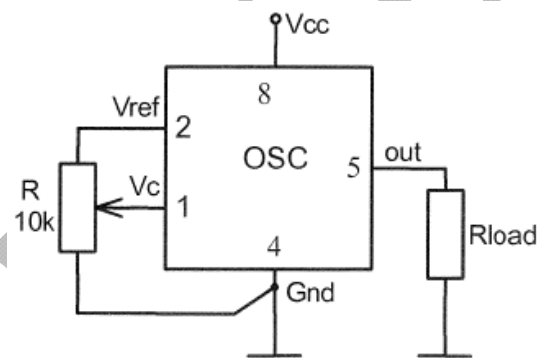
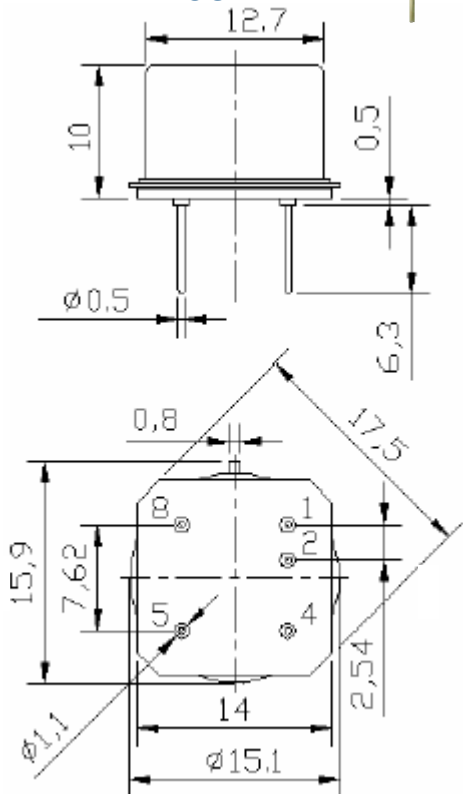
# Model 148

## OCXO - Ultra Miniature, Ultra Low Power Shock Resistant

### Package



**Model 148  
HCMOS**



Pin	Connection
1	$V_{CONTROL}$
2	$V_{REF.}$
4	GND
5	Output
8	$V_{CC}$

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