

**O-CS23-HH-XXYZ-XX-X-X-X Series**  
**Precision High Stability Low Profile OCXO**  
**22x25x10mm SMD pkg**

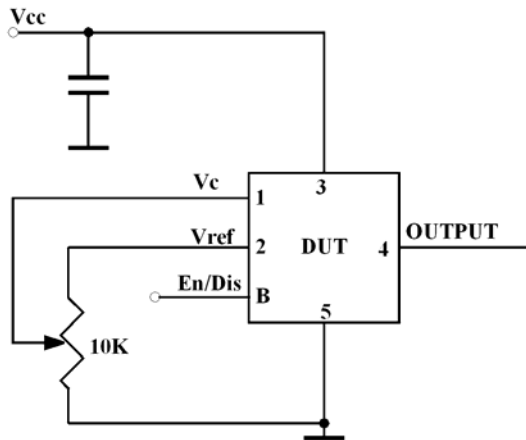
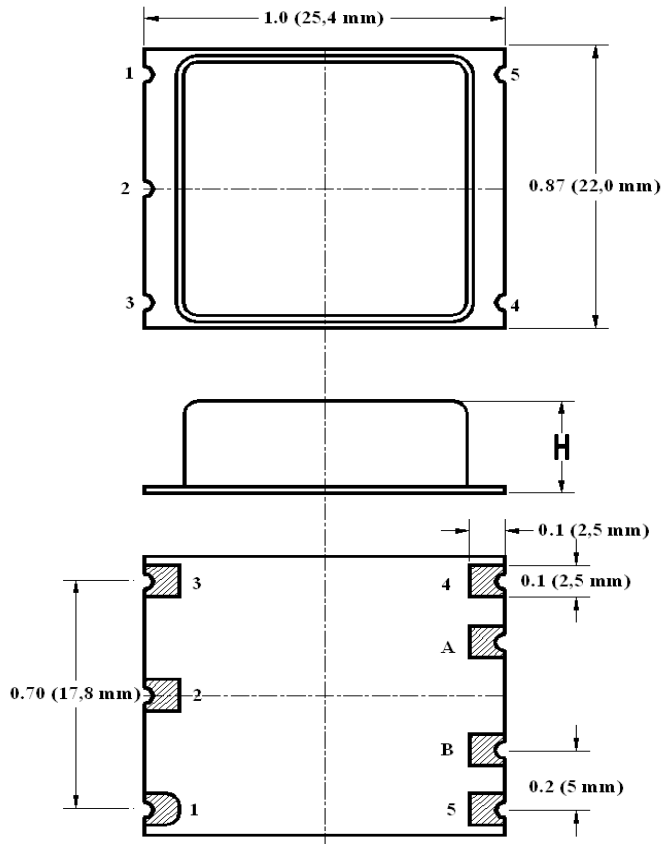
**Product Data Sheet**

**Features**

- SC-cut crystal
- High Stability
- Low Profile SMD package
- TTL output

**Applications**

- Instrumentation
- Telecommunications
- GPS



Height, H	Code
0.367" (9.3 mm)	09
0.425" (10.8 mm)	10

Parameter	Symb	Condition	Min	Typ	Max	Unit	Note
<b>Absolute Maximum Ratings</b>							
<b>Input Break Down Voltage</b>	Vcc	5V supply	-0.5		5.5	V	Vcc = 5V
<b>Storage temper.</b>	Ts		-50		90	°C	
<b>Control Voltage</b>	Vc		-1		6	V	Slope option "P"

**Electrical 6\***

Frequency	F		8.000	10.000	50.000	MHz	*
<b>Frequency stability</b>	$\Delta F/F$	vs. Temp.		$\pm 10$		ppb	See chart below
		vs. Supply		1	2	ppb/5%Vcc	
<b>Aging</b>		per day per year, first year second year		5E-10 1E-7	3.5E-7		after 30 days 5e-8 available 1*
<b>Allan Deviation</b>		0.1s to 1s		5E-12			
<b>SSB Phase Noise (achieved after 10 minutes warm-up)</b>	Sp	1Hz		-100	-98	dBc/Hz	2*
		10 Hz		-135	-130		
		100 Hz		-153	-150		
		1 KHz		-162	-160		
		10 KHz		-165	-164		
		100 KHz		-168	-165		
<b>Retrace 9*</b>		After 30 minutes			$\pm 10$	ppb	24 Hours off
<b>Input Voltage</b>	Vcc		4.75 3.165	5.0 3.3	5.25 3.465	V	See chart below to specify
<b>Power consumption, Still air 3*, 10MHz</b>	P	steady state, 25°C, operating temp range to 70°C start-up @ -30°C		0.6 2.0	0.7 2.5	W	
<b>Spectral Purity</b>		Subharmonics Spurious Harmonics		none -35	-80 -30	dBc	
<b>Load</b>	10KOhm//15pF (HCMOS/TTL) AC-coupled 50 Ohm (Sine-wave)						Output Code T Output Code S
<b>Warm-up time</b>	$\tau$	to 0.1ppm accuracy to 0.25ppm			90 60	seconds	
<b>Output Power</b>			+5	+7		dBm	10MHz, Output Code S
<b>Logic 1 (CMOS)</b>	Voh		0.7 Vref			V	Output Code T
<b>Logic 0 (CMOS)</b>	Vol				0.1 Vref	V	Output Code T
<b>Control voltage</b>	Vc		0		Vref	V	4*
<b>Output Enable</b>		CMOS Logic "1" (4.5V>V>2.5) or floating Logic "0" (V<0.5V)	Enabled Disabled	V			Pout< -30 dBm
<b>Input impedance</b>	Zin	At Vc pin	10			KOhm	
<b>Modulation BW</b>	Fm		DC		1,000	Hz	7*
<b>Reference Voltage</b>	Vref			4.5 3.0		V	5V supply 3.3V supply
<b>Pull range</b>		from nominal F, 10 MHz	$\pm 0.5$ $\pm 0.4$	$\pm 0.7$ $\pm 0.5$		ppm	5V supply 3.3V supply
<b>Deviation slope</b>		Monotonic, positive 10 MHz		0.3 0.33		ppm/V	5V supply 3.3V supply
<b>Initial Calibration</b>		Vc = Vref/2 @25°C			+/-100	ppb	10 MHz
<b>Setability</b>	Vc0	@25°C, Fnom.	Vref/2, $\pm 0.25$			V	10MHz 5*

All parameters for 10 MHz



Notes:

- \* All specifications for frequencies above 20MHz are very preliminary.
- 1\* Aging rates are proportional to the operating frequency. Pull range will be adjusted accordingly to provide for lifetime possibility to set on frequency.
- 2\* Close-to-carrier phase noise deteriorates with frequency increase.
- 3\* Power consumption listed in the table is for 10.000MHz, Sine-wave output. With increase in upper operating temperature, the power consumption will increase by about 40mW per 5°C. CMOS output option will decrease consumption by about 25mW. Shorter height option may increase power consumption by as much as 5%.
- 4\* If Vref is not used for adjusting the frequency, Vc range can be increased to 5.0V with either Vcc option.
- 5\* The Vc input may or may not be internally biased to roughly Vref/2. If internal bias is needed – it has to be specified on PO.
- 6\* All parameters, unless otherwise specified, are at nominal conditions, ie: T=25°C, Nominal Vcc & Nominal Load.
- 7\* Older and stock units may have a MBW of 150Hz Max.
- 8\* For higher frequencies, only the taller height option may be available.
- 9\* Longer storage time, especially at low temperatures, may affect both retrace and setability parameters. It may require a few days on power for re-stabilization.

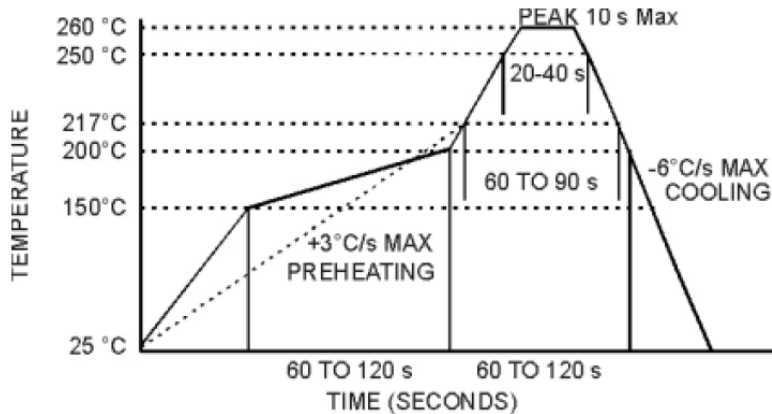
**Environmental and Mechanical**

<b>Operating temp. range</b>	0°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>	See profile below. The device may be reflowed once. Reflowing upside down is not allowed. Hand soldering is highly encouraged. NO CLEAN assembly is recommended

**Electrical Connections**

<b>Pin Out</b>	Pad #1-Vc ; Pad#2 – Vref; Pad #3 – Vcc; Pad #4- Output ; Pad #5- GND; Pad A – N/C; Pad B – Output Enable
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MAX Reflow Profile



## Creating a Part Number

**O - C S23 HH - X X YZ - XX - X - X - X - FREQ**

**OCXO**  
Conventional Power  
Package Code  
22x25 SMD

Height Code per Dwg

Supply Voltage

Code	Specification
0	5V ± 5%
A	3.3V ± 5%

Output

Code	Specification
S	Sinewave
T	HCMOS/TTL

Temperature Stability

Code	Specification
17	±1x10 <sup>-7</sup>
58	±5x10 <sup>-8</sup>
28	±2x10 <sup>-8</sup>
18	±1x10 <sup>-8</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	
IS	0°C to 50°C
GU	-10°C to 60°C
EW	-20°C to 70°C

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

Enable Option

Code	Function
N	N/A
E	Per table

Vref Pin

Code	Specification
E	Installed
N	Not Present

Not all combinations are available – consult factory

\*\*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		

