



Features

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

Applications

- Instrumentation
- Telecommunications
- GPS

Absolute Maximum Ratings

Parameters	Symbol	Condition	Min	Typ	Max	Unit	Notes
Input Break Down Voltage	V _{cc}	5V supply	-0.5		5.5	V	V _{cc} = 5V
Storage temper.	T _s		-50		90	°C	
Control Voltage	V _c		-1		6	V	Slope option "P"

Electrical

Parameters	Symbol	Condition	Min	Typ	Max	Unit	Notes
Frequency	F		8.000	10.000	50.000	MHz	*10
Frequency stability	ΔF/F	vs. Temp.		±10		ppb	See chart below
		vs. Supply		1	2	ppb/5%V _{cc}	
Aging		per day per year, first year second year		5E-10 1E-7	3.5E-7		after 30 days 5E-8 available 1*
Allan Deviation		0.1s to 1s		5E-12			
SSB Phase Noise (achieved after 10 minutes warm-up)	S _φ	1Hz		-100	-98	dBc/Hz	2*
		10Hz		-135	-130		
		100Hz		-153	-150		
		1KHz		-162	-160		
		10KHz		-165	-164		
100KHz		-168	-165				
Retrace 9*		After 30 minutes			±10	ppb	24 Hours off
Input Voltage	V _{cc}		4.75 3.165	5.0 3.3	5.25 3.465	V	See chart below to specify
Power consumption, Still air 3*, 10MHz	P	steady state, 25°C, operating temp range to 70°C start-up @ -30°C		0.6 2.0	0.7 2.5	W	
Spectral Purity		Subharmonics Spurious Harmonics		none -35	-80 -30	dBc	
Load		10KOhm//15pF (HCMOS/TTL) AC-coupled 50 Ohm (Sine-wave)					Output Code T Output Code S
Warm-up time	τ	to 0.1ppm accuracy to 0.25ppm			90 60	seconds	
Output Power			+5	+7		dBm	10MHz, Output Code S
Logic 1 (CMOS)	V _{oh}		0.7 V _{ref}			V	Output Code T
Logic 0 (CMOS)	V _{ol}				0.1 V _{ref}	V	Output Code T

All parameters for 10 MHz

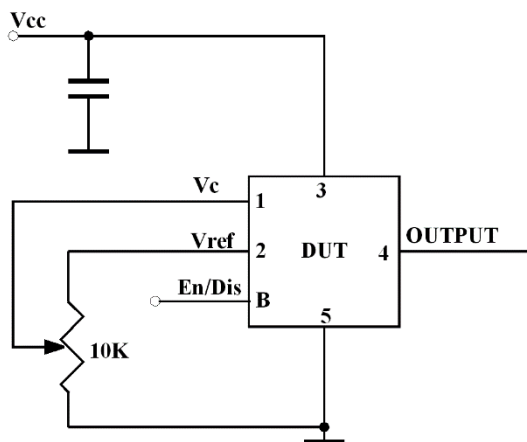
Electrical (cont.)

Parameters	Symbol	Condition	Min	Typ	Max	Unit	Notes
Control voltage	Vc		0		Vref	V	4*
Output Enable		CMOS Logic "1" (4.5V>V>2.5) or floating Logic "0" (V<0.5V)	Enabled Disabled	V	Pout< -30 dBm		
Input impedance	Zin	At Vc pin	10			KOhm	
Modulation BW	Fm		DC		1,000	Hz	7*
Reference Voltage	Vref			4.5 3.0		V	5V supply 3.3V supply
Pull range		from nominal F, 10 MHz	±0.5 ±0.4	±0.7 ±0.5		ppm	5V supply 3.3V supply
Deviation slope		Monotonic, positive 10 MHz		0.3 0.33		ppm/V	5V supply 3.3V supply
Initial Calibration		Vc = Vref/2 @25°C			±100	ppb	10 MHz
Setability	Vc0	@25°C, Fnom.		Vref/2, ±0.25		V	10 MHz 5*

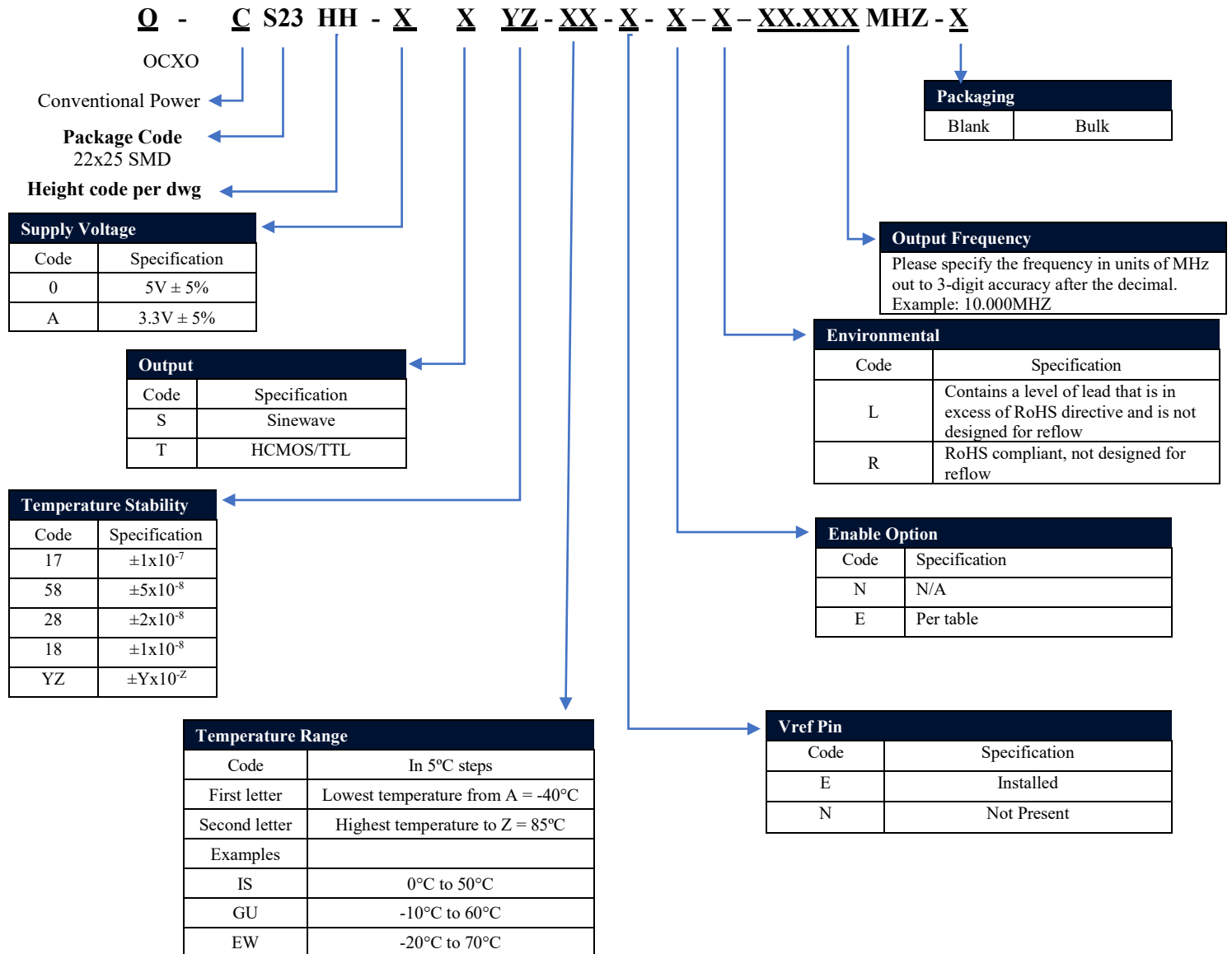
Environmental and Mechanical

Parameter	Description
Operating temp. range	0°C to 70°C Standard, other options – see chart below
Mechanical Shock	Per MIL-STD-202, 30G, 11ms
Vibration	Per MIL-STD-202, 5G to 2000 Hz
Soldering Conditions	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

Test Circuit



Creating a Part Number



Not all combinations are available. Consult Factory.

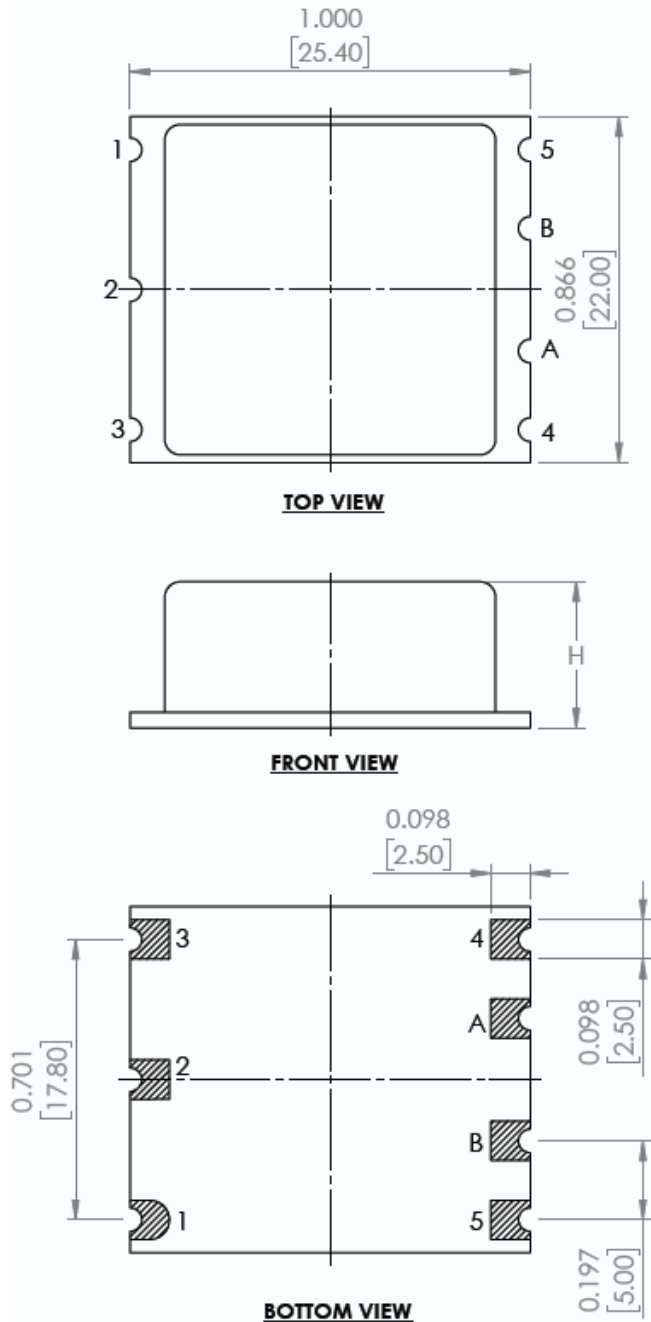
Temperature Code Table

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		

Notes:

- 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 stability parameters. It may require a few days on power for re-stabilization.
- 10* All specifications for frequencies above 20MHz are very preliminary.

Mechanical Dimensions



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

Pin #	Function
1	Vc
2	Vref
3	Vcc
4	Output
5	GND
A	N/C
B	Output Enable

Dimensions: inches [mm]

Reflow Profile [JEDEC J-STD-020]

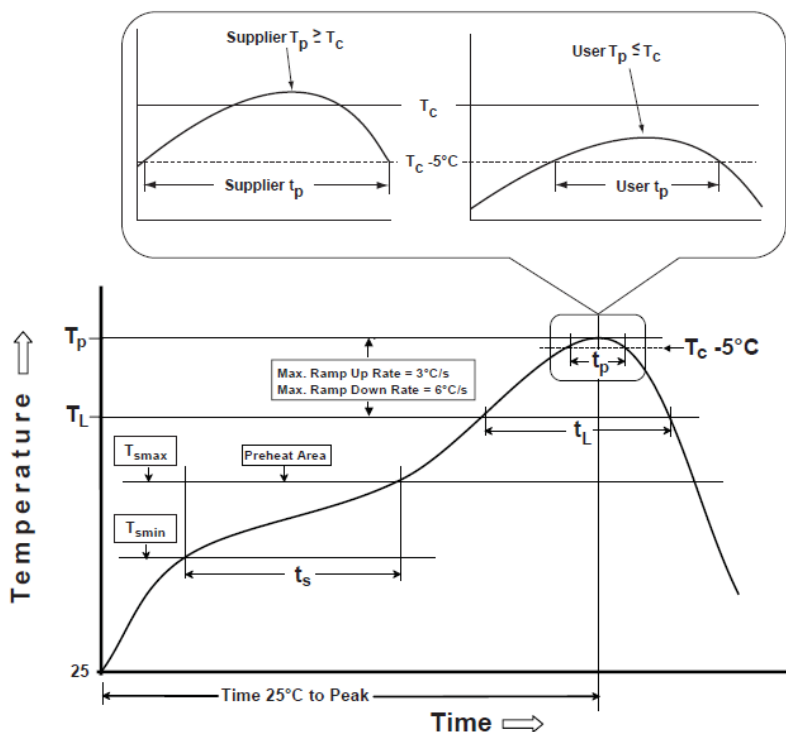


Table 1

SnPb Eutectic Process Classification Temperatures (T_c)		
Package Thickness	Volume mm^3 <350	Volume mm^3 \geq 350
<2.5 mm	235°C	220°C
\geq 2.5 mm	220°C	220°C

Table 2

Pb-Free Process Classification Temperatures (T_c)			
Package Thickness	Volume mm^3 <350	Volume mm^3 350-2000	Volume mm^3 >2000
<1.6 mm	260°C	260°C	260°C
1.6 mm - 2.5 mm	260°C	250°C	245°C
>2.5 mm	250°C	245°C	245°C

Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Preheat / soak		
Temperature minimum (T_{smin})	100°C	150°C
Temperature maximum (T_{smax})	150°C	200°C
Time (T_{smin} to T_{smax}) (t_s)	60 - 120 sec.	60 - 120 sec.
Average ramp-up rate (T_{smax} to T_p)	3°C/sec. max	3°C/sec. max
Liquidous temperature (T_L)	183°C	217°C
Time at liquidous (t_L)	60 - 150 sec.	60 - 150 sec.
Peak package body temperature (T_p)*	see Table 1	see Table 2
Time (t_p)** within 5°C of the specified classification temperature (T_c)	20 sec.	30 sec.
Ramp-down rate (T_p to T_{smax})	6°C/sec. max	6°C/sec. max
Time 25°C to peak temperature	6 min. max	8 min. max
Reflow cycles	1 max	1 max

*Tolerance for peak profile temperature (T_p) is defined as a supplier minimum and a user maximum.

**Tolerance for time at peak profile temperature (t_p) is defined as supplier minimum and a user maximum.