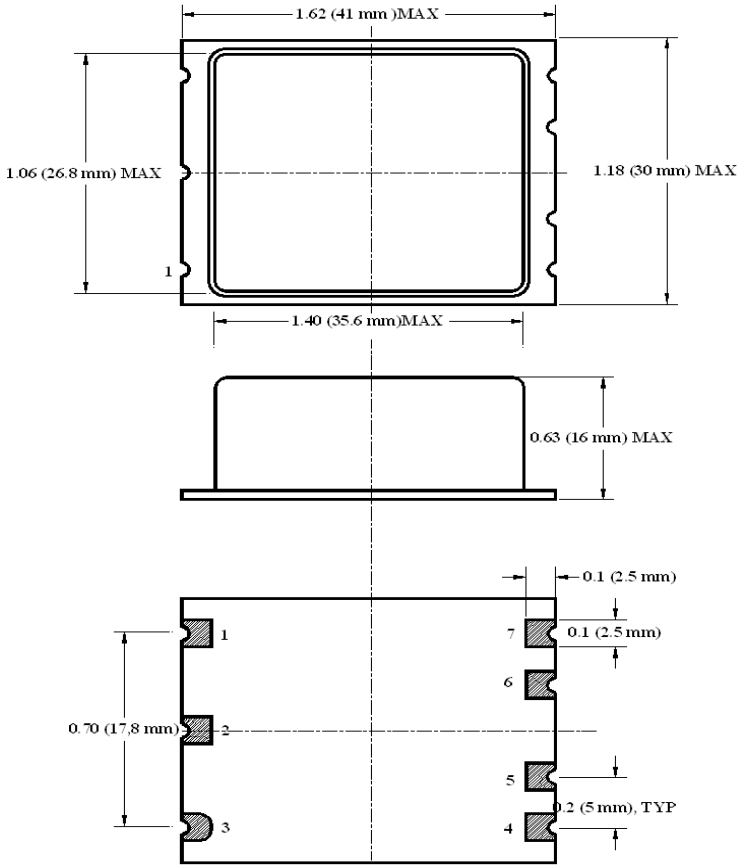
O-CS41-XXXXYZ-X-X-XX-X - FREQ

Precision Ultra Low Phase Noise OCXO in 41x30 mm SMD Package with OSC Disable and Oven Alarm features for Instrumentation

Product Data Sheet



Features

- SC-cut crystal
- High Stability
- Low Aging
- Ultra Low Phase Noise
  Ultimate (U) -146 dBc/Hz at 10Hz
  -172 dBc/Hz on the floor
  Extraordinary(E) -120 dBc/Hz at 1 Hz
  -148 dBc/Hz at 10 Hz
  -173 dBc/Hz on the floor

Applications

- Instrumentation
- Radar
- Satellite Communications
- Reference
- COTS/Dual use

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OVEN-CONTROLLED CRYSTAL OSCILLATORS

Data Sheet 1441A

Rev. B

Parameter	Symb	Condition	Min	Typ	Max	Unit	Note
Absolute Maximum Ratings							
Input Break Down Voltage	Vcc	12 V supply 5 V supply	-0.5 -0.5		13.0 5.5	V	
Storage temper.	Ts		-40		85	°C	
Control Voltage	Vc		-1 -5 -1		5.5 5 11	V	Slope option "P" Slope option "N" Slope option "L"
Electrical (4)							
Frequency	F		8	10.000	13	MHz	
Frequency stability	ΔF/F	vs. Temp.		±10		ppb	See chart below
		vs. Supply		0.2	0.3	ppb/10%Vcc	
Aging		per day per year, first year second year		5E-10 1E-7 3E-8			after 30 days 5E-8 available
Allan Deviation		0.1s 1.0 s 10 s		5E-13 2E-12 5E-12			Premium version, option P
SSB Phase Noise (achieved after 10 minutes warm-up)		1Hz 10 Hz 100 Hz 1 KHz 10 KHz 100 KHz			-110 -140 -155 -162 -170 -172	dBc/Hz	Standard version, option L
		1Hz 10 Hz 100 Hz 1 KHz 10 KHz 100 KHz			-112 -143 -155 -162 -170 -172		Premium version, option P
		1Hz 10 Hz 100 Hz 1 KHz 10 KHz 100 KHz			-115 -146 -156 -163 -170 -172		Ultimate version, Option U
		1Hz 10 Hz 100 Hz 1 KHz 10 KHz 100 KHz			-120 -148 -160 -168 -170 -173		Extraordinary version, option E, available with slope options N or L
Retrace		After 30 minutes			±10	ppb	24 Hours off 3*
G-sensitivity		worst direction			±1.0	ppb/G	
Input Voltage	Vcc		4.75 11.4	5.0 12.0	5.25 12.6	V	See chart below to specify
Power consumption	P	steady state, 25°C steady state, -30°C start-up @ -30°C		1.2 1.5 2.5	1.5 3.2	W	Still air
Spectral Purity		Spurious Harmonics/Sine		 -35	-80 -30	dBc	Non-harmonic
Load	Internally AC-coupled 50 Ohm						
Warm-up time	τ	to 0.1ppm accuracy to 10ppb accuracy		3	5 10	minutes	Off time <24 hrs Aging rate was reached
Output Waveform		HCMOS/TTL compatible or Sinewave					
Output Power			+10	+13		dBm	Output Code S
Logic 1 (CMOS)	Voh		0.7 Vref			V	Output Code T
Logic 0 (CMOS)	Vol				0.1 Vref	V	Output Code T

All parameters for 10 MHz

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Rev. B

Control voltage	Vc	No internal bias	0 -4.0 0		Vref 4.0 10	V	Slope option "P" Slope option "N" Slope option "L"
Reference Voltage	Vref	Vcc = 12V Vcc = 5V		5 or 4.5 4.5		V	N/A w/slope options "N" and "L"
Output Impedance		At Vref pin		100		Ohm	
Pull range		from nominal F	±0.4	±0.6		ppm	
Deviation slope		Monotonic, positive Monotonic, negative Monotonic, positive		1.0/Vref -0.13 0.12		ppm/V	Slope option "P" Slope option "N" Slope option "L"
Setability	Vc0	@25°C, Fnom. No internal bias for slope option "L"	Vref/2 ± 0.5 0 ± 0.5 5 ±0.5			V	Slope option "P" 3* Slope option "N" Slope option "L"
Oven Ready		V pin #7	3.3		0.5	V	Ready Not Ready
Output Enable		CMOS Logic "1" (4.5V>V>2.5) or floating Logic "0" (V<0.5V)	Enabled Disabled			V	 Pout< -30 dBm
Modulation Bandwidth	Fm		DC		1	KHz	Note 5

Notes:

*. For highest operating temperature higher than 70ºC the power consumption will be higher (about 20% for 85ºC). Values listed are for test in still air environment, the values will go up while testing in the temperature chamber.

2*. It is recommended to specify Slope option "N" for Ultimate Phase noise performance. 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.

Environmental and Mechanical

Operating temp. range	0°C to 70°C TYP. See table below to specify
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

Electrical Connections

Pin Out	Pad #1- GND; Pad#2 – Oven Ready indicator; Pad #3 – RF Output; Pad #4 – Vcc; Pad #5 – Output Enable; Pad #6 – Vc; Pad #7 – Vref

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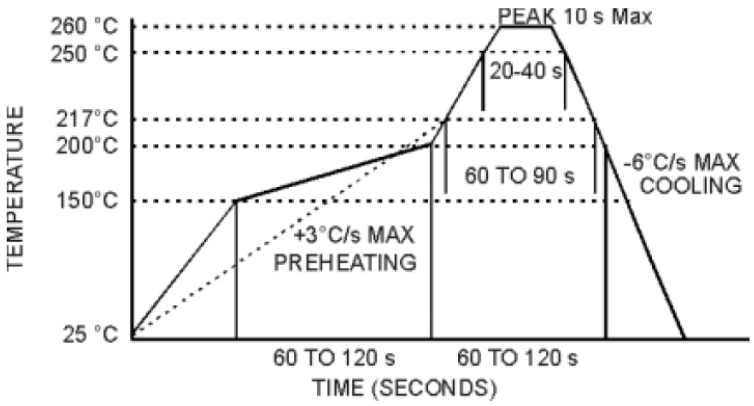
MAX Reflow Profile



Creating a Part Number

O - C S41 X X YZ XX - X - X - XX - X - FREQ

OCXO

Conventional Power

Package Code

SMD 41x30x16, 7 pads

Supply Voltage

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

Output

Code	Specification
T	CMOS/TTL
S	Sinewave

Temperature Stability

Code	Specification
17	$1x10^{-7}$
58	$5x10^{-8}$
28	$2x10^{-8}$
18	$1x10^{-8}$
59	$5x10^{-9}$
YZ	$Yx10^{-Z}$

Temperature Range

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

Deviation slope

Code	Specification
P	Positive, 0 to Vref
N	Negative, -4 to 4V
L	Positive, 0 to 10 V

Phase Noise (See Table)

Code	Specification
L	Standard
P	Premium
U	Ultimate
E	Extraordinary

Aging

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

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

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****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		

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