



Features and Benefits

Fundamental operation at up to 150MHz
 High stability: up to ± 5 ppb from -40°C to $+85^{\circ}\text{C}$
 Very Low Power Consumption: up to 180mW at $+25^{\circ}\text{C}$
 Low Phase Noise: -172dBc/Hz floor
 Fast Warm-up: up to 30s
 Low Aging: 0.1ppb/day, 0.015ppm/year
 Fundamental operation at up to 150MHz

Typical Applications

Portable Wireless Communication
 Battery Powered Applications
 Mobile Test Equipment
 Beacons & Rescue Systems

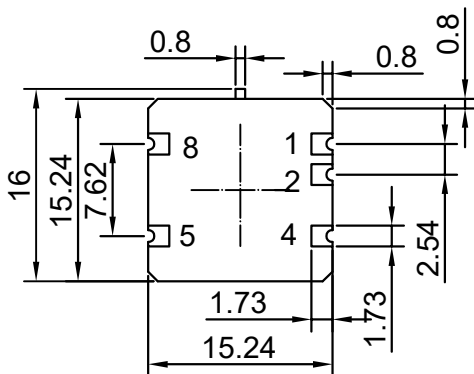
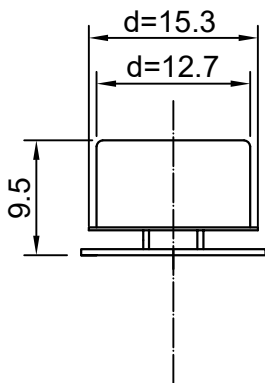
Description

OCXO1615C-SMD series utilizes a special design, which results in radical reduction of the OCXO sizes, power consumption and warm-up time. Despite its very small sizes and extremely low power consumption these oscillators exhibit excellent frequency stability and low phase-noise level comparable with that of the high-end conventional OCXO designs. The OCXO1615C-SMD is among the world smallest high stability OCXOs.

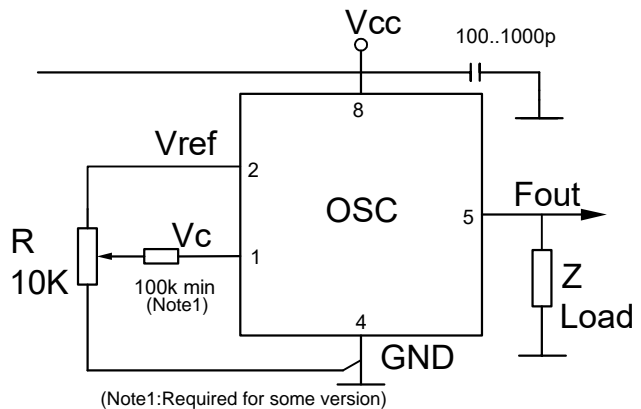
Mechanical Drawing & Pin Connections

Drawing No: MD170017-1

Physical dimensions



Schematic connections



Pin	Signal
1	Electrical tuning
2	Reference voltage
4	GND
5	RF Out
8	+V Supply

Unit in mm
 1mm = 0.0394 inches



Specifications

Oscillator Specification	Sym	Condition	Value			Unit	Note	
			Min.	Typ	Max.			
Frequency Range	F ₀		8.000		150.000	MHz		
RF Output								
HCMOS (TTL) Option	Load		10		15/5	KOhm pF	10/100 MHz	
	H-level voltage	V _H	V _{CC} = 5V V _{CC} = 3.3	3.8 2.4		V		
	L-level voltage	V _L			0.4	V		
	Duty cycle			45		55	%	
	Rise / Fall time					10/3	ns	10/100 MHz
Sine-Wave Option	Level	L	V _{CC} = 5V V _{CC} = 3.3V	+7 +4		dBm		
	Load	R _L			50	Ohm		
	Harmonics level					-25	dBc	
Sub-Harmonics level				none				
Power Supply								
Voltage	V _{cc}		4.75 3.15	5.00 3.3	5.25 3.45	V		
Power Consumption		Warm-up state Steady-state, +25°C		180	1200	mW	10 MHz -40°C to +85°C	
Warm-up time	t _{up}	@+25°C to Δf/f=10ppb @+25°C to Δf/f=100ppb	30	120 60		s	Ref. to freq. after 15 min. work	
Frequency Control								
Control Voltage Range	V _c	V _{CC} = 5V V _{CC} = 3.3V	0 0		4.2 2.8	V		
Tuning Voltage		Compliance with 10 years of aging	±300	±1000		ppb	positive slope	
Reference Voltage	V _{ref}	V _{CC} = 5V V _{CC} = 3.3V	4.1 2.7	4.2 2.8	4.3 2.9	V		
Frequency Stability								
Initial Tolerance	(f-f ₀)/f ₀	+25°C, V _C =0.5*V _{ref}		±0.1		ppm		
VS. Temperature		Ref. +25°C	±5			ppb	See ordering codes	
VS. Supply voltage		Ref V _{CC} typ		±2		ppb		
VS. Acceleration		Worst direction	±0.2		±1.0	ppb/G	0-1KHz BW	
Retrace		24h work after 24h off			±10	ppb	10 MHz	
Phase Noise								
Phase noise		1Hz	-105/----		-90/----	dBc/Hz	10/100 MHz V _{CC} = 5V	
		10 Hz	-135/-100		-120/-90			
		100 Hz	-155/-130		-145/-120			
		1 kHz	-165/-155		-155/-150			
		10 kHz	-170/-170		-165/-165			
		100 kHz	-172/-172		-165/-165			
Allan Variance		1 s	5		30	e-12	10 MHz	
Aging	Per day	After 30 days of operation	±0.1			ppb	10 MHz see ordering code	
	First year		±0.015			ppm		



Environmental Conditions	
Parameter	Reference Std.
Operating temperature range	Please refer to the ordering options information below
Storage temperature range	-60°C to +85°C
Power Voltage	-0.5V to $V_{CC} + 20\%$
Control Voltage	-0.5V to 6V
Humidity	Non-condensing 95%
Mechanical Shock	Per MIL-STD-202, 30G half sine pulse, 11ms
Vibration	Per MIL-STD-202, 10G swept sine 10 to 2000 Hz
Soldering Conditions	Hand solder only – not reflow compatible 260°C 10s (on pins)
Washing Conditions	Washing with water or alcohol based detergent allowed only with final enough drying stage

Note: Airflow velocity: 0.5m/s MAX.

Ordering Information

OCXO1615C-SMD	-	xxMHz	x	x	x	x	x
Group			1	2	3	4	5

For example, OCXO1615C-SMD-10MHz-2-10-2-1-1 denotes the OCXO has the following specifications:

Temperature Range	-10°C to +60°C
Stability Over Temperature	±10ppb
Aging per day / year	0.2ppb / 0.02ppm
Supply Voltage	5.0V ±5%
Output	HCMOS
Frequency	10MHz

1	Temperature Range
Code	Specification
1	0°C..+50°C
2	-10°C..+60°C
3	0°C..+70°C
4	-20°C..+70°C
5	-30°C..+70°C
6	-40°C..+85°C
7	-55°C..+85°C
8	-60°C..+85°C

2	Stability Over Temperature		
Code	Specification	Available temperature range code	
		10MHz	100MHz
-	-	-	-
3	±3.0 ppb	1 to 2	-
5	±5.0 ppb	1 to 6	-
10	±10 ppb	1 to 7	1 to 2
20	±20 ppb	1 to 8	1 to 5
30	±30 ppb	1 to 8	1 to 6
50	±50 ppb	1 to 8	1 to 7
100	±100 ppb	1 to 8	1 to 8

3	Aging per day/year, ppb/ppm	
Code	Specification	
1	0.1/0.015	<=10MHz
2	0.2/0.02	
3	0.3/0.03	
4	0.5/0.05	<=20MHz
5	1/0.1	<=40MHz
6	1.5/0.15	<=50MHz
7	2/0.2	<=120MHz
8	3/0.3	<=120MHz
9	5/0.5	<=150MHz

4	Supply voltage
Code	Specification
1	+5V ±5%
2	+3.3V ±5%

5	Output
Code	Specification
1	HCMOS
2	Sine wave