

**OC18T**

Square Wave

**OC18E**

True Sine Wave

Best stability

**±0.01 ppm** ( SC-cut )**±0.02 ppm** ( AT-cut )

Voltage Control

5 pins

12V

5.0V

Min.

1.25 MHz

Max.

100 MHz

## Applications

- OC18\_ ( 20.3 \* 20.3 \* 10.5 mm ) , 5 pin solder sealed metal package
- +12.0V , +5.0V Supply Voltages
- " AT - cut " crystal or " SC - cut " crystal
- Voltage control ( Electronic Frequency Tuning ) is standard .



## General Specifications ( at+25°C and specified input voltage )

Type of Crystal Cut Used		AT - cut , use " A " for crystal code ; SC - cut , use " S " for crystal code .											
Output Wave Form		Square wave. Wave form code is " T "				True Sine Wave. Wave form code is " E "							
Supply Voltage		+12V		+5 V		+12V		+5 V					
Supply Voltage range , " Voltage code "		+12V ± 0.5V , " 12 "		+5.0V ± 0.2V , " 5 "		+12V ± 0.5V , " 12 "		+5.0V ± 0.2V , " 5 "					
Frequency Range		1.25 ~ 100.0 MHz		1.25 ~ 100.0 MHz		10.0 ~ 100.0 MHz		10.0 ~ 100.0 MHz					
Initial Calibration Tolerance		± 0.5 ppm ( max. )		± 0.5 ppm ( max. )		± 0.5 ppm ( max. )		± 0.5 ppm ( max. )					
		Vcon = +2.5 V		Vcon = +2.5 V		Vcon = +2.5 V		Vcon = +2.5 V					
Frequency Stability	vs Temperature ( ppm )	AT - cut	SC - cut	AT - cut	SC - cut	AT - cut	SC - cut	AT - cut	SC - cut				
		0 ~ 60 °C	± 0.02	± 0.01	± 0.02	± 0.01	± 0.02	± 0.01	± 0.02	± 0.01			
		-20 ~ 70 °C	± 0.05	± 0.01	± 0.05	± 0.01	± 0.05	± 0.01	± 0.05	± 0.01			
	-40 ~ 85 °C	± 0.1	± 0.03	± 0.1	± 0.03	± 0.1	± 0.03	± 0.1	± 0.03				
	vs Warm -up time (+25°C)	AT - cut : 3.0 minutes ( max. ) , within ± 0.5 ppm of its reference frequency . SC - cut : 1.0 minutes ( max. ) , within ± 0.1 ppm of its reference frequency .											
	vs Aging	AT - cut : ± 5.0 ppb ( max. ) / day , ± 0.5 ppm ( max. ) / first year , ± 3.0 ppm ( max. ) over 10 years . SC - cut : ± 2.0 ppb ( max. ) / day , ± 0.1 ppm ( max. ) / first year , ± 0.5 ppm ( max. ) over 10 years .											
vs Voltage Change		≤ ±20 ppb , supply voltage ±5 % variation											
vs Load Change		≤ ±20 ppb , for a ±5 % load condition change .											
Voltage Control	Freq. Deviation Range	AT - cut : ± 5.0ppm ( min. ) , ± 20ppm ( max. ) Reference to fo at +25°C and over operating temperature range . SC - cut : ± 0.5ppm ( min. ) , ± 2.0ppm ( max. ) Reference to fo at +25°C and over operating temperature range .											
On pin 1 (EFC)	Control Voltage Range	2.5 V ± 2.0 V											
	Transfer Function	Positive : Increasing control voltage increases output frequency .											
( Electronic Freq. Tuning )	Input Impedance	100 K ohms ( min. )											
	EFC Linearity	± 10 % ( max. )											
Power	Power Dissipation ( at +25°C )	200 mA ( max. ) at steady-state ; 500 mA ( max. ) at turn-on											
Output	Output Level ( for True Sine )	---		---		+3 dBm ( typ. ) , +8 dBm ( max. ) into 50Ω load .							
	Harmonic ( for True Sine )	---		---		-30 dBc ( min. )							
	Spurious ( for True Sine )	---		---		-75 dBc ( min. )							
	Load ( Fan out )	15 pF HCMOS ( max. )											
	Output Logic High ( V <sub>OH</sub> )	+4.5 V ( min. )											
	Output Logic Low ( V <sub>OL</sub> )	+ 0.5 V ( max. )											
	Duty Cycle ( at 50% V <sub>cc</sub> )	50 % ± 10%											
	Rise and Fall Time ( 20% ~ 80% )	5 nS ( max. ) ( measured at 20% → 80% of waveform )											
	Reference Voltage	+ 4.0 VD.C. ± 0.3 VD.C. or custom											
	Phase Noise ( 10.0 MHz ) [ Unit : dBc / Hz ] ( typical )	Offset	Crystal Type		Offset	Crystal Type		Offset	Crystal Type		Offset	Crystal Type	
			AT - cut	SC - cut		AT - cut	SC - cut		AT - cut	SC - cut		AT - cut	SC - cut
1 Hz		-75	-85	1 Hz	-75	-85	1 Hz	-75	-85	1 Hz	-75	-85	
10 Hz		-100	-120	10 Hz	-100	-120	10 Hz	-100	-120	10 Hz	-100	-120	
100 Hz		-130	-140	100 Hz	-130	-140	100 Hz	-130	-140	100 Hz	-130	-140	
1 KHz		-140	-145	1 KHz	-140	-145	1 KHz	-140	-145	1 KHz	-140	-145	
10 KHz	-150	-150	10 KHz	-150	-150	10 KHz	-150	-150	10 KHz	-150	-150		
Storage Temperature	- 55°C to + 125°C												
Shock	2000 G's , 0.3 ms 1/2 sine												
Vibration	10 to 2000 Hz / 10 G's												

Mercury [www.mercury-crystal.com](http://www.mercury-crystal.com)

■ Taiwan : Tel (886)-2-2406-2779 / sales-tw@mercury-crystal.com

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■ China: Tel: (86)-512-5763-8100 / sales-cn@mecxtal.com

# " OCXO " [ Oven Controlled Crystal Oscillators ]

True Sine wave " OC \_ E "

Square wave " OC \_ T "

## Part Number Format and Example

	[ 1 ]	[ 2 ]	[ 3 ]	[ 4 ]	[ 5 ]		[ 6 ]		[ 7 ]		[ 8 ]	
	Holder Type	G	Output Wave	Supply Voltage	Cut Type	-	Center Frequency	-	Frequency Stability	/	Operating Temp. Range	
Examples	(1)	OC14	G	T	3.3	A	-	10.000	-	0.5	/	-40+85
	(2)	OC30	G	E	12	S	-	100.000	-	0.02	/	-20+70
	(2)	OC22	G	T	5	A	-	20.000	-	0.2	/	-30+75

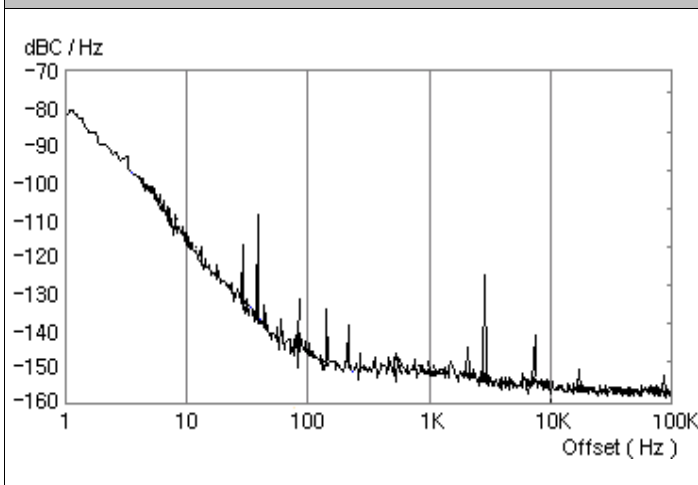
Ex (1): OC14GT33A - 10.000 - 0.5 / -40+85 [ OC14 type, RoHS, CMOS output, 3.3V, 10.000MHz, ± 0.5ppm from -40°C to 85°C ]

Ex (2): OC30GE12S - 100.000 - 0.02 / -20+70 [ OC30 type, RoHS, True Sine wave, 12V, 100.000MHz, ± 0.02ppm from -20°C to 70°C ]

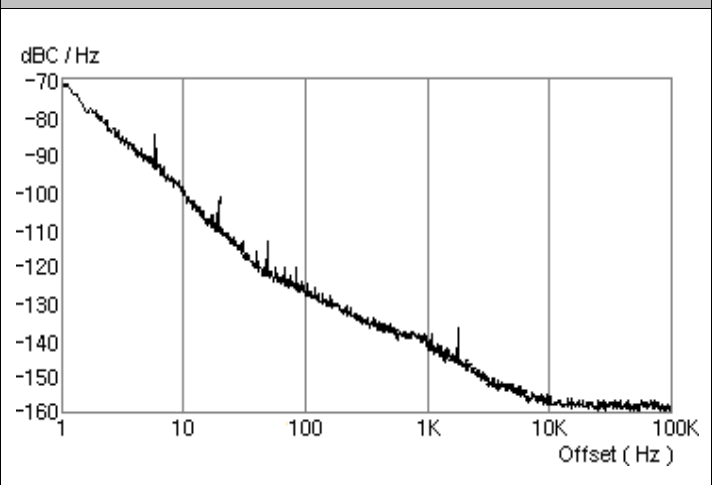
Ex (3): OC22GT5A - 20.000 - 0.2 / -30+75 [ OC22 type, RoHS, CMOS output, 5.0V, 20.000MHz, ± 0.2ppm from -30°C to 75°C ]

[ 1 ]	Holder Type " OC _ " stands for OCXO ,
[ 2 ]	Please add "G" after the " type code " for RoHS compliant
[ 3 ]	" T " stands for Square Wave , " E " stands for True Sine Wave ex 1 : OC14T, OC14 package , CMOS output ; ex 2 : OC30E , OC30 package , True Sine wave
[ 4 ]	Supply voltage , " 3 " for 3.3V D.C , " 5 " for 5.0V D.C , " 12 " for 12V D.C
[ 5 ]	Type of crystal used ; " A " stands for AT-cut crystal , " S " stands for SC-cut crystal
[ 6 ]	Center Frequency in MHz
[ 7 ]	Frequency stability in ± _ ppm ; ex 1 : ± 0.5ppm --- 0.5 , ex 2 : ± 0.02ppm --- 0.02
[ 8 ]	Operating temperature range in °C ex 1 : -10 °C to 60°C ----- -10+60 ; ex 2 : -20 °C to 70°C ----- -20+70 ; ex 3 : -40 °C to 85°C ----- -40+85

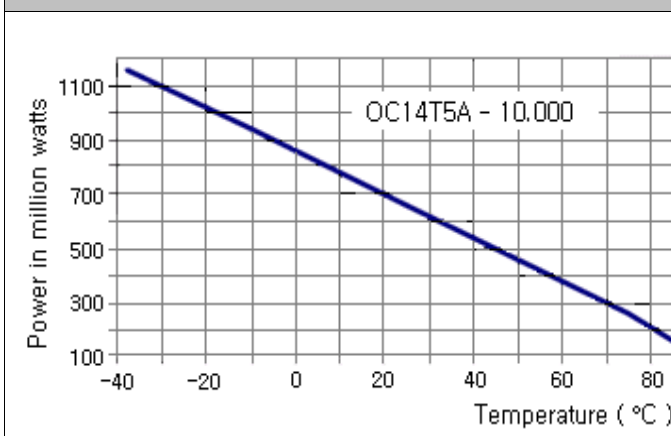
SSB Phase Noise : OC30E12S-10.000 ( SC-cut crystal )



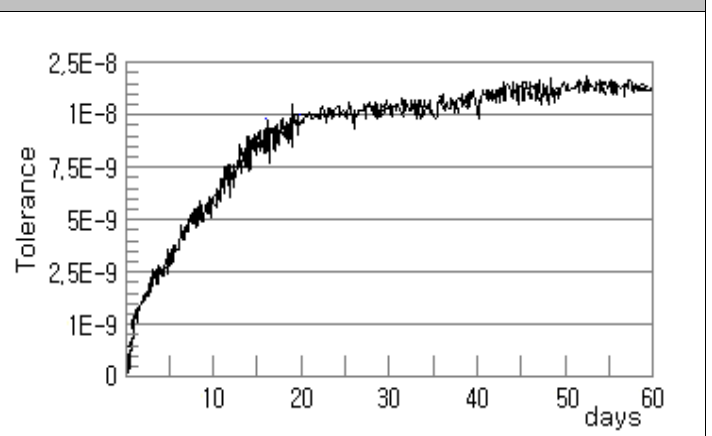
SSB Phase Noise : OC14T5A-10.000 ( AT-cut crystal )



Power Consumption vs Temperature



Aging : OC30E12S-10.000 ( SC - cut crystal )



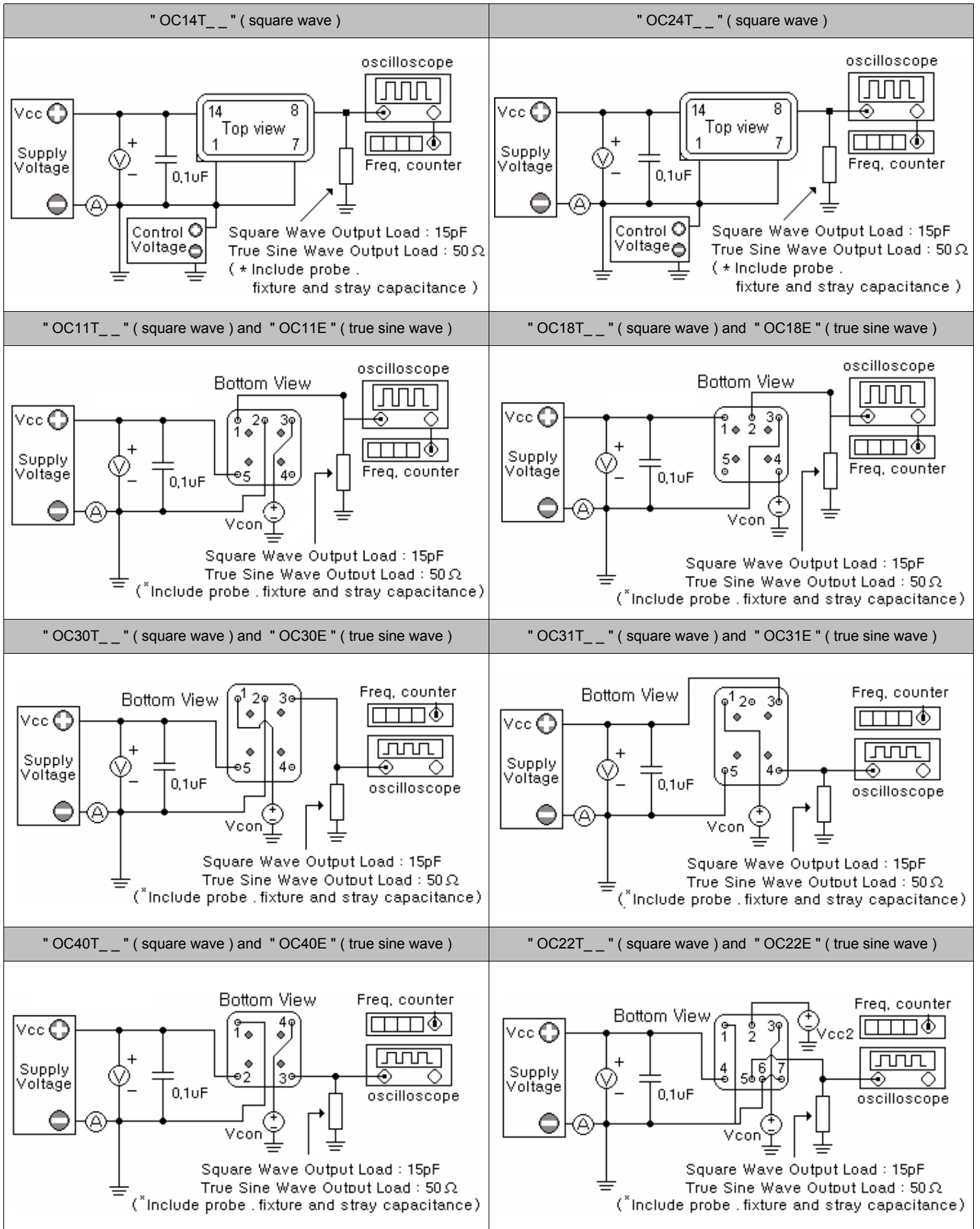
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## Test Circuits



Mercury [www.mercury-crystal.com](http://www.mercury-crystal.com)

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## Outline Dimensions ( Unit : mm )

<p>[ OC14 __ ]</p> <p>4-Ø1.8 glass stand-off</p> <p>Pin Connections :          Pin 1 : Voltage Control          Pin 7 : Ground          Pin 8 : Output          Pin 14 : Supply voltage</p>	<p>[ OC24 __ ]</p> <p>4-Ø1.8 glass stand-off</p> <p>Pin Connections :          Pin 1 : Voltage Control          Pin 7 : Ground          Pin 8 : Output          Pin 14 : Supply voltage</p>
<p>[ OC18 __ ]</p> <p>Pin Connections :          Pin 1 : Supply Voltage , Pin 2 : RF Output , Pin 3 : Ground / Case          Pin 4 : Voltage Control EFC , Pin 5 : Reference Voltage Output</p>	<p>[ OC11 __ ]</p> <p>Pin Connections :          Pin 1 : RF Output , Pin 2 : Ground / Case , Pin 3 : Voltage Control EFC          Pin 4 : Reference Voltage Output , Pin 5 : Supply Voltage</p>
<p>[ OC30 __ ]</p> <p>Pin Connections :          Pin 1 : Voltage Control EFC , Pin 2 : Ground , Case , Pin 3 : RF Output ,          Pin 4 : Reference Voltage Output , Pin 5 : Supply Voltage</p>	<p>[ OC31 __ ]</p> <p>Pin Connections :          Pin 1 : Voltage Control EFC , Pin 2 : Reference Voltage Output ,          Pin 3 : Supply Voltage , Pin 4 : RF Output , Pin 5 : Ground / Case</p>
<p>[ OC40 __ ]</p> <p>Pin Connections :          Pin 1 : Ground / Case , Pin 2 : Supply Voltage          Pin 3 : RF Output , Pin 4 : Control Voltage</p>	<p>[ OC22 __ ]</p> <p>Pin Connections :          Pin 1 : Oven Return , Pin 2 : Osc. Supply Voltage ,          Pin 3 : Electronic Tuning , Pin 4 : Oven Supply Voltage , Pin 5 : Output ,          Pin 6 : RF Ground , Pin 7 : Ground / Case</p>