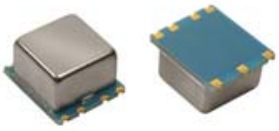

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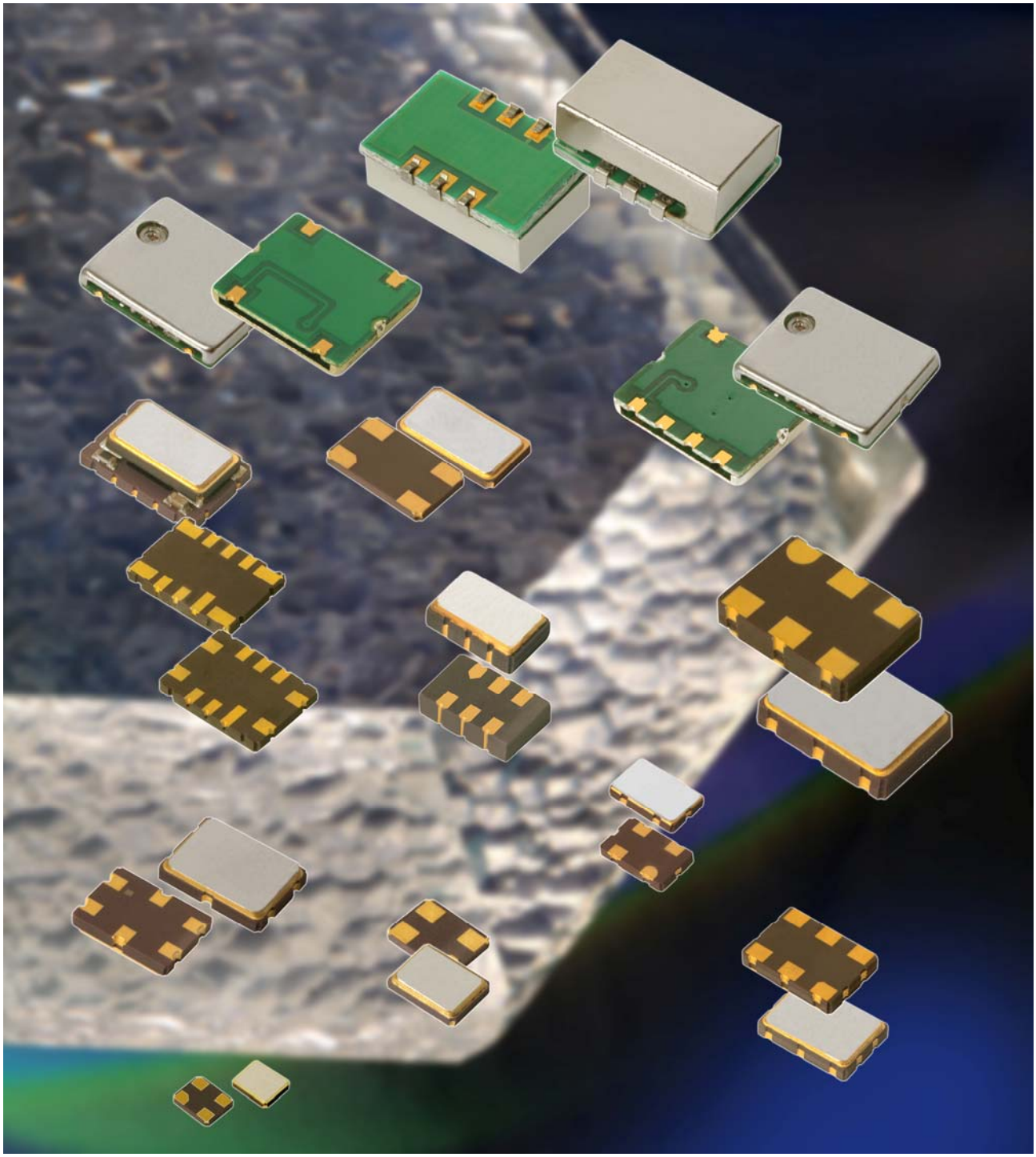
OCXO

MORE THAN FREQUENCY

Oven Controlled Crystal Oscillators



OCXO

Oven Controlled Crystal Oscillator

Type	Frequency Range	Stability vs. temperature	Aging per year	Supply Voltage	Output Signal	Package Size	Features
	[MHz]			[V]		[mm]	
OCO-M14	5 MHz to 60 MHz	± 5 x 10^{-8}	± 1 x 10^{-7}	3.3 V 5.0 V 12.0 V	HCMOS sine wave	DIL 14/4 pin	miniature packaged OCXO wide frequency range high reliability
OCO-SM14 SMD	5 MHz to 60 MHz	± 5 x 10^{-8}	± 1 x 10^{-7}	3.3 V 5.0 V 12.0 V	HCMOS sine wave	DIL 14 Gullwing SMD	miniature packaged SMD OCXO wide frequency range high reliability
OCO-M20A	8.192 MHz to 20 MHz	± 1 x 10^{-9}	± 3 x 10^{-8}	5.0 V 12.0 V	HCMOS sine wave	20x20x12.7	ultra miniature accurate OCXO high stability vs. temperature long term stability
OCO-M20B	10 MHz to 25MHz	± 1 x 10^{-8}	± 3 x 10^{-8}	3.3 V 5.0 V	HCMOS	20x20x10	ultra miniature OCXO high stability vs. temperature power supply 3.3 V or 5.0 V
OCO-M25A	10 MHz to 30 MHz	± 5 x 10^{-9}	± 3 x 10^{-8}	3.3 V 5.0 V 12.0 V	HCMOS sine wave	25x25x12.7	high stability vs. temperature long term stability low phase noise
OCO-M25B	48 MHz to 500 MHz	± 5 x 10^{-8}	± 2 x 10^{-7}	12.0 V	sine wave	25x25x10	wide frequency range low phase noise, floor -167 dBc/Hz available with SMA connectors
OCO-SMH SMD	10 MHz to 40 MHz	± 5 x 10^{-9}	± 3 x 10^{-8}	3.3 V 5.0 V	HCMOS	25.4x22x14 SMD	SMD packaged OCXO high stability vs. temperature wide frequency range
OCO-SMS SMD	10 MHz to 20 MHz	± 5 x 10^{-9}	± 3 x 10^{-8}	5.0 V	sine wave	25.4x22x12.5 25.4x22x14.0 SMD	SMD packaged OCXO oven alarm & oscillator on/off high stability vs. temperature
OCO-M36AD	5 MHz to 10 MHz	± 2 x 10^{-10}	± 2 x 10^{-8}	12.0 V	sine wave	36x27x19	high stability double oven for STRATUM 2 & 3E base station & GPS/GALILEO
OCO-M36A	10 MHz to 20 MHz	± 5 x 10^{-10}	± 2 x 10^{-8}	5.0 V 12.0 V	HCMOS sine wave	36x27x10.0 36x27x12.7 36x27x16.0	high stability low case height fast warming up for -40 to +85 °C ask factory
OCO-M36B	48 MHz to 120 MHz	± 5 x 10^{-8}	± 3 x 10^{-7}	5.0 V 12.0 V	sine wave	36x27x16	high frequency, low phase noise small case size for PLL, VSAT & synthesizer
OCO-M36C	5 MHz to 10 MHz	± 5 x 10^{-9}	± 2 x 10^{-8}	3.3 V 5.0 V	HCMOS	36x27x15	high stability low case height power supply 3.3 V or 5.0 V available for -40 to +85 °C
OCO-M36CE	10 MHz to 40 MHz	± 7.5 x 10^{-9}	± 3 x 10^{-8}	5.0 V 12.0 V	HCMOS sine wave	36x27x16	high stability vs. temperature low aging available for -40 to +85 °C

Specification example for OCO-M36A 10.000 MHz

frequency stability from -40 to +70 °C	±5 x 10^{-10}	supply voltage	+5.0 V
long term stability, aging per year	±3 x 10^{-8}	current consumption @ +25 °C	< 400 mA
short term stability, aging per day	±1 x 10^{-10}	warming up time for < ±2 x 10^{-8}	< 3 min
short term stability, Allan deviation	5 x 10^{-12}		
frequency deviation vs. load change	±5 x 10^{-10}	**ultra low phase noise @ 10 MHz carrier**	
frequency deviation vs. supply change	±5 x 10^{-10}	< -103 dBc/Hz @ 1 Hz	
frequency pulling (adjustment)	±4 x 10^{-7}	< -133 dBc/Hz @ 10 Hz	
output sine wave	> 300 mV	< -155 dBc/Hz @ 100 Hz	
output load	50 Ω	< -160 dBc/Hz @ 1'000 Hz	
harmonic suppression	> 30 dBc	< -161 dBc/Hz @ 10'000 Hz	

OCXO

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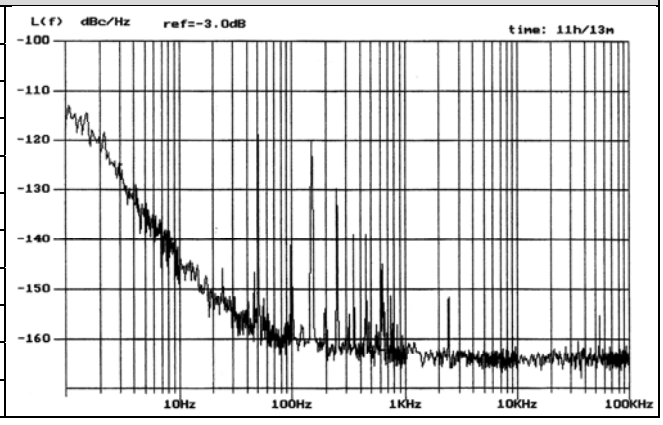
Type	Frequency Range	Stability vs. temperature	Aging per year	Supply Voltage	Output Signal	Package Size	Features
	[MHz]			[V]		[mm]	
OCO-M40A	5 MHz to 10 MHz	$\pm 5 \times 10^{-10}$	$\pm 2 \times 10^{-8}$	12.0 V	HCMOS sine wave	51x41x19 51x41x25	very high precision ($\pm 5 \times 10^{-10}$) low aging , low phase noise for GPS, CDMA and 3G
OCO-M40C	9.5 MHz to 10.5 MHz	$\pm 1 \times 10^{-8}$	$\pm 1 \times 10^{-7}$	5.0 V 12.0 V	HCMOS sine wave	51x41x25	high stability, low phase noise fast warming up < 45 s low power consumption
OCO-M40B	4.6 MHz to 20 MHz	$\pm 7.5 \times 10^{-9}$	$\pm 3 \times 10^{-8}$	12.0	sine wave	51x41x25	high frequency stability low power consumption low phase noise
OCO-M50DL	5 MHz to 16 MHz	$\pm 1 \times 10^{-10}$	$\pm 1 \times 10^{-8}$	5.0 V 12.0 V	sine wave	51x51x17 51x51x19	double oven, low profile ultra high frequency stability low aging
OCO-M50AA	4.096 MHz to 20 MHz	$\pm 5 \times 10^{-10}$	$\pm 1 \times 10^{-8}$	5.0 V 12.0 V	HCMOS sine wave	51x51x19 51x51x25	high stability vs. temperature low aging low phase noise
OCO-M50AB	5 MHz to 40 MHz	$\pm 2 \times 10^{-10}$	$\pm 2 \times 10^{-8}$	5.0 V 12.0 V	HCMOS sine wave	51x51x10 51x51x19	low profile, high accuracy high stability, low aging very low phase noise
OCO-M50B	5 MHz to 10 MHz	$\pm 5 \times 10^{-9}$	$\pm 3 \times 10^{-8}$	12.0 V	sine wave	51x51x25	excellent short term stability of $< 5 \times 10^{-13}$ per 1 s low power consumption extremely low phase noise
OCO-M50A	90 MHz to 100 MHz	$\pm 1 \times 10^{-9}$	$\pm 3 \times 10^{-8}$	12.0 V	sine wave	51x51x16 51x51x19	high frequency, high stability low phase noise < -165 dBc/Hz designed for VSAT
OCO-M50C	48 MHz to 700 MHz	$\pm 5 \times 10^{-8}$	$\pm 3 \times 10^{-7}$	12.0 V	sine wave	51x51x12.7	high frequency, high stability low phase noise < -165 dBc/Hz designed for VSAT available with SMA connectors
OCO-M50AD Double oven	5 MHz & 10 MHz	$\pm 5 \times 10^{-11}$	$\pm 5 \times 10^{-9}$	12 V	sine wave	51x51x38	ultra high stability double oven 10 years over all stability of $< \pm 3 \times 10^{-8}$ for 3G telecom system rubidium replacement

Specification example for OCO-M50AB 10.00 MHz

frequency stability from -10 to +70 °C	$\pm 5 \times 10^{-10}$
long term stability, aging per year	$\pm 2 \times 10^{-8}$
short term stability, Allan deviation	5×10^{-12}
frequency deviation vs. load change	$\pm 5 \times 10^{-10}$
frequency deviation vs. supply change	$\pm 5 \times 10^{-10}$
current consumption @ +25 °C	< 200 mA
frequency pulling (adjustment)	$\pm 4 \times 10^{-7}$
output sine wave	> 300 mV
output load	50 Ω
harmonic suppression	> 30 dBc
supply voltage	+12 V



Environmental test

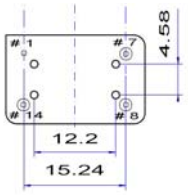
vibration	vibration: 10 g; 10 Hz up to 500 Hz and down to 10 Hz; all 3 axes, 4.5 h/axis
shock	single shock of 100 g during 3 ms ±1 ms (3 shocks each, 6 directions) multiple shock of 40 g during 5 ms ±1 ms (400 shocks each, 6 directions)
humidity	@ +35 °C, 98 %

OCXO

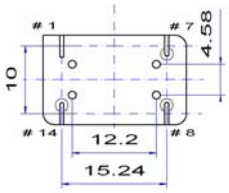
Oven Controlled Crystal Oscillator

Package Size (bottom view)

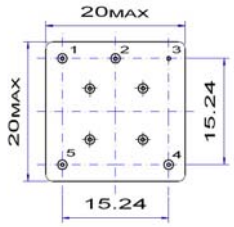
OCO-M14



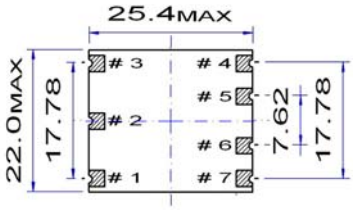
OCO-SM14



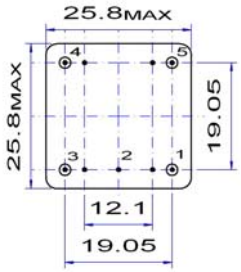
OCO-M20



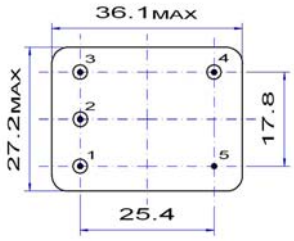
OCO-SM



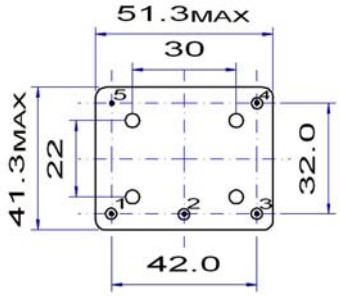
OCO-M25



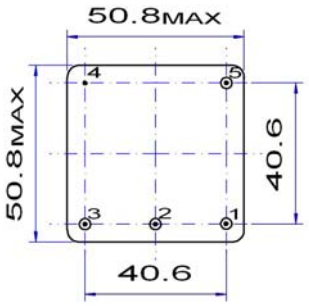
OCO-M36



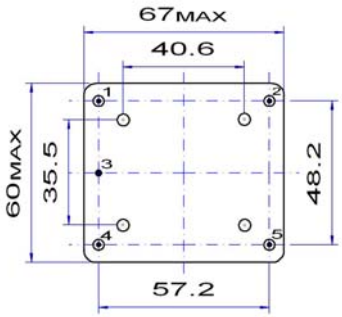
OCO-M40



OCO-M50



OCO-M60



Required specification for quotation request	Units	Example
Type		OCO-SMH
nominal frequency	MHz	16.3840 MHz
frequency stability vs. temperature range	ppm	±5 x 10-9
operating temperature range	°C	-20 ~ +70 °C
aging per year or per day	V	±3 x 10-8 per year
output signal sine wave, HCMOS / TTL		HCMOS
output load sine wave 50 Ω	Ω	
HCMOS / TTL 15pF	pF	15 pF
special output load on request		
supply voltage	V	5.0 V
phase noise	dBc/Hz	< -130 dBc/Hz @ 10 Hz < -145 dBc/Hz @ 100 Hz < -150 dBc/Hz @ 1'000 Hz < -155 dBc/Hz @ 10'000 Hz

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