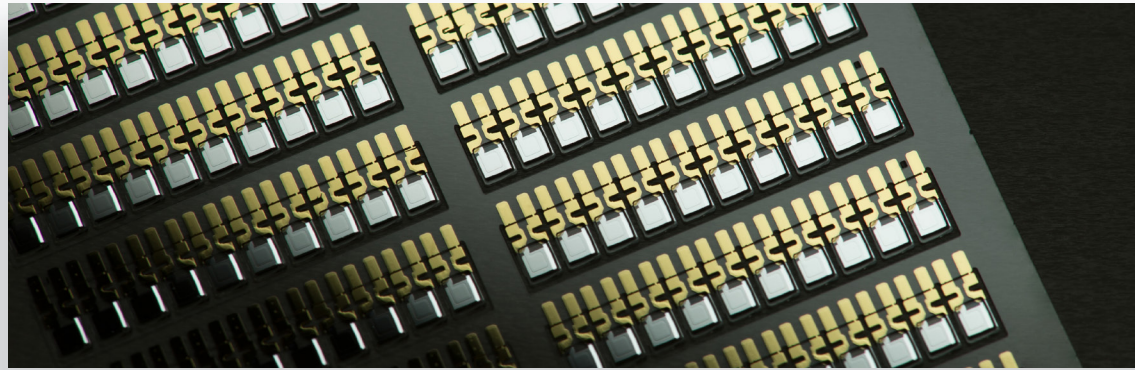


# Micro Crystal

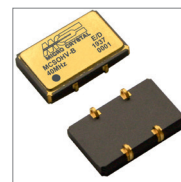
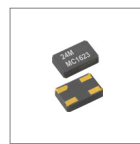


MHz AT-Cut Crystals

MHz Clock Oscillators










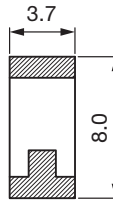
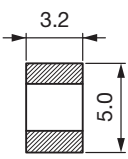
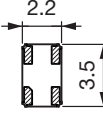
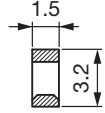
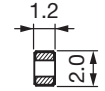
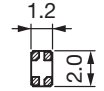
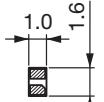
MHz VCXO Oscillators

MHz OCXO Oscillators



**Short Form Catalog Q4 2023**

# MHz AT-Cut Crystals in Ceramic Packages

Product Type	CC1A/F	CC2A	CC6A/F	CC7A	CC8A	CM8A	CC9A
Dimensions (l x w) mm	8.0 x 3.7	5.0 x 3.2	3.5 x 2.2	3.2 x 1.5	2.0 x 1.2	2.0 x 1.2	1.6 x 1.0
			 4 or 2 pads				
 PCB Symbol, Footprint & 3D Model available on product pages on website	 h = 1.75	 h = 1.20	 h = 1.0/0.80	 h = 0.75	 h = 0.60	 h = 0.60	 h = 0.50

## Standard (Fundamental Mode)

Product Type	Number of pads	Frequency MHz	Temp. Range °C	Rs typ. in Ω @ Fmin - Fmax	C <sub>1</sub> typ. in fF @ Fmin - Fmax	C <sub>0</sub> typ. in pF @ Fmin - Fmax	Key Features / Applications
<a href="#">CC1A-T1A</a>	2	8 - 30	-55 to +125	60 - 30	4 - 11	2.0 - 4.0	
<a href="#">CC1F-T1A</a>	2	30 - 250	-55 to +125	35 - 15	4 - 7	2.0 - 4.0	Inverted mesa crystal
<a href="#">CC2A-T1A</a>	2	12 - 70	-55 to +125	60 - 10	3 - 12	2.0 - 5.0	
<a href="#">CC6A-T1D</a>	4	16 - 70	-55 to +125	60 - 20	2 - 5	1.5 - 3.0	
<a href="#">CC6F-T1A</a>	2	70 - 250	-55 to +125	30 - 15	5 - 6	2.4 - 3.2	Inverted mesa crystal
<a href="#">CC6F-T1A F</a>	2	70 - 200	-55 to +125	35 - 15	3 - 3	2.4 - 3.2	Inverted mesa crystal Filter applications - low spurious
<a href="#">CC7A-T1A</a>	2	20 - 50	-55 to +125	40 - 25	2 - 2	0.7 - 0.7	
<a href="#">CC8A-T1A</a>	2	24 - 50	-55 to +125	40 - 20	1 - 1	0.7 - 0.7	Smallest package
<a href="#">CM8A-T1D</a>	4	24 - 50	-55 to +125	40 - 20	1 - 1	0.7 - 0.7	Smallest package
<a href="#">CC7A-T1A Medical</a>	2	14 - 50	0 to +55	60 - 25	2 - 2	0.7 - 0.7	Medical implantable
<a href="#">CC8A-T1A Medical</a>	2	24 - 50	0 to +55	40 - 20	1 - 1	0.7 - 0.7	Medical implantable
<a href="#">CC9A-T1A Medical</a> <sup>1)</sup>	2	32 - 50	0 to +55	40 - 20	1 - 1	0.7 - 0.7	Medical implantable

## High Temperature / High Shock and Vibration Resistant (Fundamental Mode)

<a href="#">CC1A-T1A H</a>	2	8 - 24	-55 to +200	100 - 50	4 - 9	2.0 - 3.2	Harsh Environment
<a href="#">CC2A-T1A H</a>	2	14 - 40	-55 to +200	70 - 40	5 - 10	2.5 - 4.0	Harsh Environment
<a href="#">CC6A-T1D H</a>	4	16 - 40	-55 to +200	80 - 50	2 - 4	1.5 - 2.5	Harsh Environment

1) In qualification.

## Applications

Customer-specific applications such as:

- Filters
- Industrial
- Telemetry
- Animal Tracking
- Optical Network
- Airborne Equipment
- Avionics / Aerospace
- Radio Communication
- Geothermal Equipment
- TCXO, VCTCXO, VCXO
- Downhole and Well Drilling
- Healthcare, Medical and Medical Implantable

## Ordering Information

<b>C</b> Ceramic package	<b>C</b> Ceramic lid	<b>24.000 MHz</b> Frequency F <sub>L</sub>	<b>20.0 pF</b> Load capacitance C <sub>L</sub>	<b>±50 ppm</b> Frequency tolerance	<b>TC</b> Temperature range	<b>QI</b> Qualification
<b>M</b> Metal lid	<b>C</b> = Ceramic lid <b>M</b> = Metal lid				<b>TA</b> = -40 to +85°C (Standard) <b>TB</b> = -40 to +125°C <b>TC</b> = -55 to +125°C <b>TD</b> = -55 to +175°C <b>TG</b> = -55 to +200°C <b>TM</b> = 0 to +55°C <b>TX</b> = Custom	<b>QI</b> = Industrial Grade (Standard) <b>QM</b> = Medical Grade <b>QS</b> = Custom Specification
<b>6</b> Package size	<b>A</b> = AT-Cut <b>F</b> = AT-Cut inverted mesa					<b>H</b> = Harsh environment <b>F</b> = Filter applications
<b>1</b> = 8.0 x 3.7 x 1.75 mm <b>2</b> = 5.0 x 3.2 x 1.20 mm <b>6</b> = 3.5 x 2.2 x 1.00 mm <b>7</b> = 3.2 x 1.5 x 0.75 mm <b>8</b> = 2.0 x 1.2 x 0.60 mm <b>9</b> = 1.6 x 1.0 x 0.50 mm	<b>SMD Package</b>					
<b>Quartz blank</b>	<b>Au flashed pads</b>					
<b>Number of pads</b>	<b>A</b> = 2 pads <b>D</b> = 4 pads					








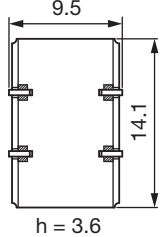
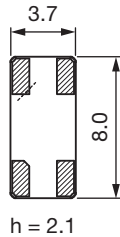
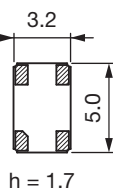
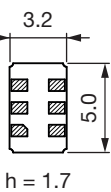
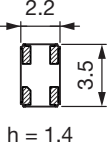


Micro Crystal: MHz Quartz Crystals



www.microcrystal.com

# MHz Clock and VCXO Oscillators in Ceramic Packages

Product Type	MCSO	MCSO1	MCSO2 / VCXO2	MCSO2L	MCSO6
Dimensions (l x w) mm	14.1 x 9.5	8.0 x 3.7	5.0 x 3.2	5.0 x 3.2	3.5 x 2.2
					
 PCB Symbol, Footprint & 3D Model available on product pages on website					

## Standard Clock Oscillators

Product Type	Number of pads	Frequency	Supply V <sub>DD</sub> V	Temp. Range °C	Output	Key Features / Applications
<b>MCSO</b>	4	10 kHz to 225 MHz	2.5 / 3.3 / 5.0	-55 to +125	HCMOS	
<b>MCSO1</b>	4	10 kHz to 225 MHz	1.8 / 2.5 / 3.3 / 5.0	-55 to +125	HCMOS	
<b>MCSO2</b>	4	10 kHz to 225 MHz	1.8 / 2.5 / 3.3 / 5.0	-55 to +125	HCMOS	
<b>MCSO2L</b>	6	40 MHz to 130 MHz	2.5 / 3.3	-55 to +125	LVDS	Low-Voltage Differential Signaling
<b>MCSO6</b>	4	10 kHz to 155 MHz	1.8 / 2.5 / 3.3 / 5.0	-55 to +125	HCMOS	Smallest Package, Low Jitter

## High Temperature / Harsh Environment Clock Oscillators

<b>MCSO1E</b>	4	15 kHz to 100 MHz	2.5 / 3.3 / 5.0	-55 to +210	HCMOS	
<b>MCSO1EU</b>	4	32,768 kHz	2.5 / 3.3	-55 to +175	HCMOS	Consumption 20 µA
<b>MCSO1ES</b>	4	15 kHz to 100 MHz	2.5 / 3.3 / 5.0	-10 to +210	HCMOS	High Stability
<b>MCSO2E</b>	4	15 kHz to 100 MHz	2.5 / 3.3 / 5.0	-55 to +210	HCMOS	
<b>MCSO2EU</b>	4	32,768 kHz	2.5 / 3.3	-55 to +175	HCMOS	Consumption 20 µA
<b>MCSO6E</b>	4	15 kHz to 60 MHz	2.5 / 3.3 / 5.0	-55 to +210	HCMOS	Smallest Package
<b>MCSO6EU</b>	4	32,768 kHz	2.5 / 3.3	-55 to +175	HCMOS	Smallest Package, Consumption 20 µA

## Standard VCXO

<b>VCXO2H</b>	4	5 MHz to 170 MHz	3.3	-55 to +125	HCMOS	Low Noise, High APR (±110 to ±130 ppm)
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## High Temperature / Harsh Environment VCXO

<b>VCXO2E</b>	4	5 MHz to 40 MHz	3.3	-10 to +210	HCMOS	Very High Shock and Vibration Resistant
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## Applications

Customer-specific applications such as:

- Security / Safety
- Avionics / Aerospace
- Radio Communication
- Geothermal Equipment
- Remote Control / Telemetry
- Down Hole and Well Drilling
- Microprocessor and FPGA Clocks
- Test and Measurement Equipment
- Wired and Wireless Communications

## Ordering Information

<b>MCSO1</b>	<b>F</b>	<b>C</b>	<b>H</b>	<b>V</b>	<b>T</b>	<b>-C</b>	<b>40.000 MHz</b>	<b>E/D</b>	<b>T3</b>	<b>XXX</b>
	<b>F</b> = Low jitter *	<b>C</b> = Ceramic lid	<b>H</b> > 20 MHz	<b>V</b> = V <sub>DD</sub> = 3.3 V	<b>T</b> = ±50 ppm	<b>-C</b> = -55 to +125°C	<b>40.000 MHz</b> = Frequency	<b>E/D</b> = Enable/Disable	<b>T3</b> = SnAgCu solder dipped pads	<b>XXX</b> = Customer specification N°
	<b>Blank</b> = Standard	<b>Blank</b> = Kovar lid	<b>Blank</b> ≤ 20 MHz **	<b>Blank</b> = V <sub>DD</sub> = 5.0 V ***	<b>Blank</b> = ±100 ppm		<b>Option 1</b>	<b>Blank</b> = No function	<b>Blank</b> = Au flashed pads	
	<b>Frequency range</b>						<b>Option 2</b>			
	<b>Supply voltage</b>									
	<b>Z</b> = V <sub>DD</sub> = 1.8 V									
	<b>W</b> = V <sub>DD</sub> = 2.5 V									
	<b>V</b> = V <sub>DD</sub> = 3.3 V									
	<b>Blank</b> = V <sub>DD</sub> = 5.0 V ***									
	<b>Frequency stability</b>									
	<b>T</b> = ±50 ppm									
	<b>Blank</b> = ±100 ppm									
	<b>Temperature range</b>									
	<b>A</b> = 0 to +70°C									
	<b>B</b> = -40 to +85°C									
	<b>C</b> = -55 to +125°C									
	<b>X</b> = Custom									

\* One-sigma jitter for low jitter version (F):  
 $t_{RMS} < 2$  ps for F ≤ 20 MHz  
 $t_{RMS} < 10$  ps for F > 20 MHz

\*\* pin 2 also 45° chamfered for F ≤ 20 MHz

\*\*\* 5.0 V version not available for low jitter version (F)




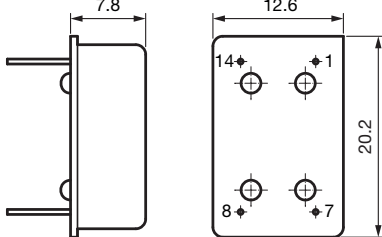


Micro Crystal: MHz Oscillators



Micro Crystal: VCXO Oscillators

# MHz OCXO Oscillators in DIL-14 Metal Package

<b>Product Type</b>	<b>OCXO</b>	
<b>Dimensions (l x w) mm</b>	20.2 x 12.6	
 		
		

Standard								
Product Type	Package Size	Frequency MHz	Supply V <sub>DD</sub> V	Temp. Range °C	Output	Frequency Stability	Current I <sub>DD</sub>	Key Features / Applications
<b>SCOCXOL</b>	DIL-14	Up to 54	3.3 / 5.0	-55 to +85	HCMOS	From ±25 ppb	From 50 mA	High Stability, Ultra Fast Warm-up, Ultra Low Power
<b>SCOCXO</b>	DIL-14	Up to 120	3.3 / 5.0	-55 to +85	HCMOS	From ±25 ppb	From 80 mA	High Stability, Low Phase Noise
<b>SCOCXOS</b>	DIL-14	Up to 120	3.3 / 5.0	-55 to +85	Sine Wave	From ±25 ppb	From 80 mA	High Stability, Low Phase Noise
<b>OCXOVT-SAR</b>	DIL-14	Up to 40	5.0	-40 to +55	Sine Wave	±3 ppb / 50 s	From 40 mA	Cospas-Sarsat
<b>OCXOS</b>	DIL-14	Up to 54	3.3 / 5.0	-55 to +85	Sine Wave	From ±75 ppb	From 80 mA	
<b>OCXO</b>	DIL-14	Up to 54	3.3 / 5.0	-55 to +85	HCMOS	From ±75 ppb	From 80 mA	

## Applications

Customer-specific applications such as:

- Cospas-Sarsat
- Instrumentation
- Digital Switching
- Radio Transceiver
- Airborne Equipment
- Telecom Transmission
- Battery Operated Systems
- Sonet / SDH / DWDM / FDM/36 / WIMAX

## Ordering Information

<b>OCXO</b>	<b>W</b>	<b>T</b>	<b>-</b>	<b>C</b>	<b>V3</b>	<b>20.000 MHz</b>	<b>D2</b>	<b>XXX</b>
<b>Supply voltage</b>	<b>W</b> = V <sub>DD</sub> = 3.3 V <b>V</b> = V <sub>DD</sub> = 5.0 V	<b>Frequency stability</b>	<b>T</b> = High stability <b>Blank</b> = Standard	<b>Temperature range</b>	<b>A</b> = 0 to +60°C <b>B</b> = -20 to +70°C <b>C</b> = -40 to +85°C <b>E</b> = -55 to +85°C * <b>X</b> = Custom	<b>Frequency</b>	<b>Option 1</b> <b>D2</b> = SMD (formed leads) <b>Blank</b> = THD (Standard)	<b>Customer specification N°</b>
<b>Frequency control</b>	<b>R1</b> = R <sub>C</sub> = 0 to 10 kΩ <b>V3</b> = V <sub>C</sub> = 0 to 3.3 V <b>V5</b> = V <sub>C</sub> = 0.5 to 5.0 V <b>YA</b> = Internal accuracy ≤ ±1.0 ppm <b>YB</b> = Internal accuracy ≤ ±0.5 ppm <b>Y</b> = Custom							

\* E version is only available at 5.0 V version (V)

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Micro Crystal: OCXO Oscillators

