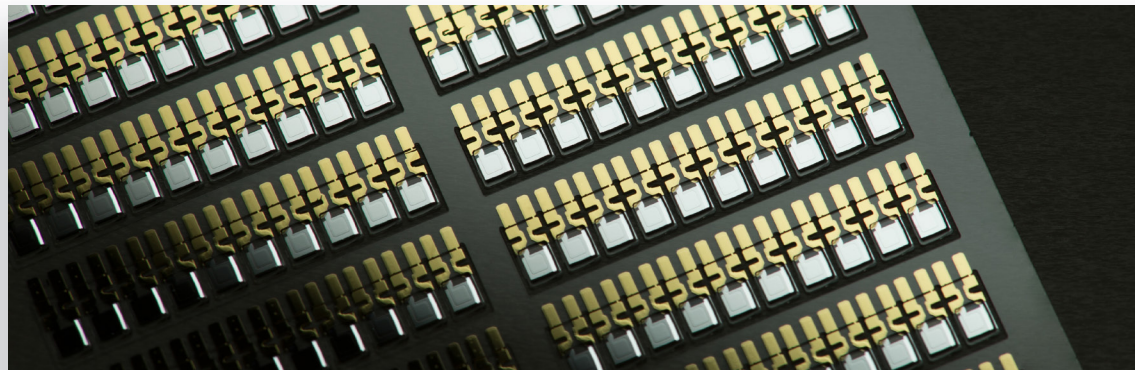


Micro Crystal

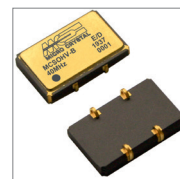
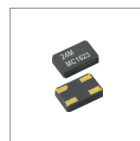


MHz AT-Cut Crystals

MHz Clock Oscillators

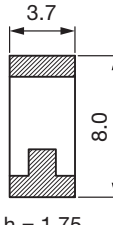
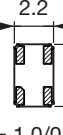
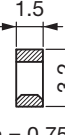
MHz VCXO Oscillators

MHz OCXO Oscillators



Short Form Catalog Q2 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 ₁ typ. in fF @ Fmin - Fmax	C ₀ typ. in pF @ Fmin - Fmax	Key Features / Applications
CC1A-T1A	2	8 - 30	-55 to +125	60 - 30	4 - 11	2.0 - 4.0	
CC1F-T1A	2	30 - 250	-55 to +125	35 - 15	4 - 7	2.0 - 4.0	Inverted mesa crystal
CC2A-T1A	2	12 - 70	-55 to +125	60 - 10	3 - 12	2.0 - 5.0	
CC6A-T1D	4	16 - 70	-55 to +125	60 - 20	2 - 5	1.5 - 3.0	
CC6F-T1A	2	70 - 250	-55 to +125	30 - 15	5 - 6	2.4 - 3.2	Inverted mesa crystal
CC6F-T1A F	2	70 - 200	-55 to +125	35 - 15	3 - 3	2.4 - 3.2	Inverted mesa crystal Filter applications - low spurious
CC7A-T1A	2	20 - 50	-55 to +125	40 - 25	2 - 2	0.7 - 0.7	
CC8A-T1A	2	24 - 50	-55 to +125	40 - 20	1 - 1	0.7 - 0.7	Smallest package
CM8A-T1D	4	24 - 50	-55 to +125	40 - 20	1 - 1	0.7 - 0.7	Smallest package
CC7A-T1A Medical	2	14 - 50	0 to +55	60 - 25	2 - 2	0.7 - 0.7	Medical implantable
CC8A-T1A Medical	2	24 - 50	0 to +55	40 - 20	1 - 1	0.7 - 0.7	Medical implantable
CC9A-T1A Medical ¹⁾	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)

CC1A-T1A H	2	8 - 24	-55 to +200	100 - 50	4 - 9	2.0 - 3.2	Harsh Environment
CC2A-T1A H	2	14 - 40	-55 to +200	70 - 40	5 - 10	2.5 - 4.0	Harsh Environment
CC6A-T1D H	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:

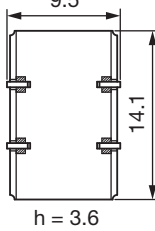
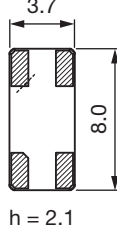
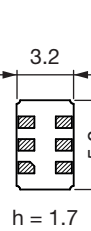
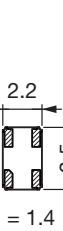
- Filters
- Industrial
- Telemetry
- Animal Tracking
- Optical Network
- Airborne Equipment
- Avionics / Aerospace
- Radio Communication
- Geothermal Equipment
- TCXO, VCTCXO, VCXO
- Downhole and Well Drilling
- Healthcare, Medical and Medical Implantable

Ordering Information

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



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 _{DD} V	Temp. Range °C	Output	Key Features / Applications
MCSO	4	10 kHz to 225 MHz	2.5 / 3.3 / 5.0	-55 to +125	HCMOS	
MCSO1	4	10 kHz to 225 MHz	1.8 / 2.5 / 3.3 / 5.0	-55 to +125	HCMOS	
MCSO2	4	10 kHz to 225 MHz	1.8 / 2.5 / 3.3 / 5.0	-55 to +125	HCMOS	
MCSO2L	6	40 MHz to 130 MHz	2.5 / 3.3	-55 to +125	LVDS	Low-Voltage Differential Signaling
MCSO6	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

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

Standard VCXO

VCXO2H	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

VCXO2E	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

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

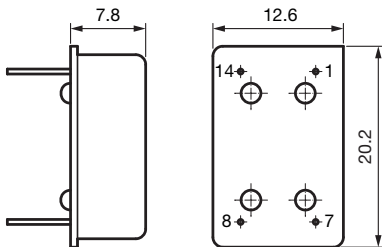
* One-sigma jitter for low jitter version (F):
t_{RMS} < 2 ps for F ≤ 20 MHz
t_{RMS} < 10 ps for F > 20 MHz

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

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



MHz OCXO Oscillators in DIL-14 Metal Package

Product Type	OCXO
Dimensions (l x w) mm	20.2 x 12.6
 	
	

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

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

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

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