



Standard Frequency
**SELECTION
GUIDE**



VCXOs










TCXOs

Quartz Crystals

Clock Oscillators

QUARTZ CRYSTALS





Cost Efficient
Tight Stability

QUARTZ CRYSTALS*	PACKAGE SIZE (mm)	FREQUENCY RANGE (MHz)	CALIBRATION TOLERANCE (ppm)	TEMPERATURE STABILITY (ppm)	
 Cost Efficient Glass Seal	Model 443	3.2 x 2.5	12 - 48	± 20	± 30
	Model 445	5.0 x 3.2	10 - 50	± 20	± 30
	Model 402  2.0 x 1.6	16 - 60	± 20	± 30	
 Cost Efficient SMT	Model 425	2.5 x 2.0	16 - 54	± 30	± 50
	Model 403	3.2 x 2.5	12 - 50	± 30	± 50
	Model 405	5.0 x 3.2	12 - 50	± 30	± 50
 SMT	Model 406	6.0 x 3.5	10 - 50	± 30	± 50
	Model 407	7.0 x 5.0	6.0 - 156.25	± 30	± 50
 HC-49/US-SM	ATS-SM Series	12.3 x 4.83 x 4.3	3.2 - 64	± 30	± 50
	ATS-SMTS Series TIGHT STABILITY	12.3 x 4.83 x 4.3	3.2 - 64	± 20	± 30
	ATSSMLP Series LOW PROFILE	12.3 x 4.83 x 3.2	3.2 - 64	± 30	± 30
	ATSSMGL Series GROUND LEAD	12.3 x 5.0 x 4.3	3.2 - 64	± 30	± 30
	ATSSM4P Series 4-PAD FOOTPRINT	13.0 x 4.85 x 5.2	3.2 - 64	± 30	± 30
 HC-49/US	ATS Series	10.85 x 4.5 x 3.68	3.2 - 64	± 30	± 50
 HC-49/U	MP Series	10.85 x 4.5 x 13.46	1.8 - 64	± 30	± 50
	UM1 Series	7.1 x 2.4 x 8.0	3.5 - 65	± 30	± 50
	UM5 Series	7.1 x 2.4 x 6.0	10 - 100	± 30	± 50

* Available in Commercial and Industrial temperature ranges.

CLOCK OSCILLATORS

High Frequency
Low Jitter




CLOCK OSCILLATORS*		PACKAGE SIZE (mm)	FREQUENCY RANGE (MHz)	TEMPERATURE STABILITY (ppm)	OUTPUT LOGIC	SUPPLY VOLTAGE (V _{DC})
 Real Time Clock	Model TC25	2.5 x 2.0	0.032768	± 20, ± 25, ± 50	HCMOS	1.5, 1.8 2.5, 3.3
	Model TC32	3.2 x 2.5	0.032768	± 20, ± 25, ± 50	HCMOS	1.5, 1.8 2.5, 3.3
	Model TC50	5.0 x 3.2	0.032768	± 20, ± 25, ± 50	HCMOS	1.5, 1.8 2.5, 3.3
	Model TC70	7.0 x 5.0	0.032768	± 20, ± 25, ± 50	HCMOS	1.5, 1.8 2.5, 3.3
 General Purpose	Model 625	2.5 x 2.0	1.0 - 50	± 25, ± 50	HCMOS/TTL	1.8, 2.5 2.8, 3.3
	Model 632	3.2 x 2.5	1.0 - 75	± 25, ± 50	HCMOS/TTL	1.8, 2.5 2.8, 3.3
	Model 636	5.0 x 3.2	1.0 - 125	± 20, ± 25, ± 50, ± 100	HCMOS/TTL	1.8, 2.5 3.3, 5.0
	CB3 CB3LV	7.0 x 5.0	1.5 - 160	± 20, ± 25, ± 50, ± 100	HCMOS/TTL	3.3, 5.0
	CB1V8	7.0 x 5.0	1.0 - 70	± 20, ± 25, ± 50, ± 100	HCMOS/TTL	1.8
	CB2V5	7.0 x 5.0	1.0 - 125	± 20, ± 25, ± 50, ± 100	HCMOS/TTL	2.5
 Thru-hole	MXO45HS MXO45HST	13.2 x 13.2 x 5.5	1 - 105	± 20, ± 25, ± 50, ± 100	HCMOS/TTL	5.0
	MXO45HSLV MXO45HSTLV	13.2 x 13.2 x 5.5	1.0 - 50	± 20, ± 25, ± 50, ± 100	HCMOS/TTL	3.3
 Thru-hole	MXO45 MXO45T	13.2 x 20.8 x 5.1	1 - 105	± 20, ± 25, ± 50, ± 100	HCMOS/TTL	5.0
	MXO45LV MXO45TLV	13.2 x 20.8 x 5.1	1.0 - 50	± 20, ± 25, ± 50, ± 100	HCMOS/TTL	3.3
	Model 635 High Frequency Fundamental	7.0 x 5.0	19.44 - 250	± 20, ± 25, ± 50, ± 100	LVPECL LVDS	2.5, 3.3
	Model 656 Analog Multiplier	7.0 x 5.0	62.5 - 670	± 25, ± 50	LVPECL LVDS HCMOS	2.5, 3.3
	Model 658 Digital Multiplier	7.0 x 5.0	38 - 750	± 20, ± 25, ± 100	LVPECL LVDS HCMOS	2.5, 3.3


* Available in Commercial and Industrial temperature ranges.

TCXOs & VCXOs

Voltage Control Option
Excellent Phase Noise










TCXOs*	PACKAGE SIZE (mm)	FREQUENCY RANGE (MHz)	TEMPERATURE STABILITY (ppm)	OUTPUT LOGIC	SUPPLY VOLTAGE (V _{DC})	
	Model 520	2.5 x 2.0	10 - 52	± 0.5, ± 2.5	CLIPPED SINE WAVE	1.8, 2.5, 2.8, 3.0, 3.3
	Model 525	3.2 x 2.5	10 - 40	± 0.5, ± 2.5	CLIPPED SINE WAVE	1.8, 2.5, 2.7, 2.8, 3.0, 3.3
	Model 532	5.0 x 3.2	10 - 40	± 0.5, ± 2.5	CLIPPED SINE WAVE	2.8, 3.0, 3.3, 5.0
	Model 533	5.0 x 3.2	10 - 40, 50	± 0.5, ± 2.5	HCMOS	2.8, 3.0, 3.3
	Model 575	7.0 x 5.0	10 - 40	± 0.5, ± 2.5	CLIPPED SINE WAVE	2.8, 3.0, 3.3, 5.0
	Model 576	7.0 x 5.0	10 - 40	± 0.5, ± 2.5	HCMOS	2.8, 3.0, 3.3, 5.0

VCXOs *	PACKAGE SIZE (mm)	FREQUENCY RANGE (MHz)	APR PULL RANGE (ppm)	OUTPUT LOGIC	SUPPLY VOLTAGE (V _{DC})	
	Model 357 Low Phase Noise	7.0 x 5.0	1.5 - 77.76	±50 [std]	HCMOS/TTL	3.3, 5.0
	Model 335 High Frequency Fundamental	7.0 x 5.0	19.44 - 212.5	±50 [std]	LVPECL LVDS	2.5, 3.3
	Model 356 Analog Multiplier	7.0 x 5.0	100 - 670	±50 [std]	LVPECL LVDS HCMOS	2.5, 3.3

* Available in Commercial and Industrial temperature ranges.

TUNING FORKS & AUTOMOTIVE CRYSTALS



TUNING FORK CRYSTALS*		PACKAGE SIZE (mm)	FREQUENCY RANGE (kHz)	CALIBRATION TOLERANCE (ppm)	TEMPERATURE STABILITY (ppm)
 Cost Efficient Tuning Fork	TF32 Series	3.2 x 1.5	32.768	± 20	-0.030/°C ² Temp Coefficient
	TF20 Series	2.0 x 1.2 x 0.6	32.768	± 20	-0.030/°C ² Temp Coefficient
	TF16 Series	1.6 x 1.0	32.768	± 20	-0.030/°C ² Temp Coefficient
	TF20L Series	2.0 x 1.2 x 0.38	32.768	± 20	-0.030/°C ² Temp Coefficient
 Citizen CM519 Epson FC-255	TF519 Series	4.9 x 1.8	32.768	± 20	-0.034/°C ² Temp Coefficient
 Citizen CM200 Epson MC-306	TFPM Series	8.0 x 3.8	32.768	± 20	-0.034/°C ² Temp Coefficient
 Citizen CM310 Epson MC-146	TFPMN Series	6.9 x 1.4	32.768	± 20	-0.034/°C ² Temp Coefficient
 Citizen CFS Epson C-Type	TFNC Series	5.1 x 1.5 6.2 x 2.1 8.3 x 3.1	32.768	± 20	-0.035/°C ² Temp Coefficient

AUTOMOTIVE CRYSTALS**		PACKAGE SIZE (mm)	FREQUENCY RANGE (MHz)	CALIBRATION TOLERANCE (ppm)	TEMPERATURE STABILITY (ppm)
Cost Efficient Tuning Fork	TFA32	3.2 x 1.5	0.032768	± 20	-0.030/°C ² Temperature Coefficient
	TFA20	2.0 x 1.2	0.032768	± 20	-0.030/°C ² Temperature Coefficient
Glass Seal	GA324	3.2 x 2.5	15 - 40	± 30	± 50
	GA532	5.0 x 3.2	8 - 40	± 30	± 50
	GA534	5.0 x 3.2	8 - 40	± 30	± 50
Seam Weld	SA324	3.2 x 2.5	10 - 40	± 10	± 50
	SA534	5.0 x 3.2	8 - 40	± 10	± 50

* Available in Commercial and Industrial temperature ranges.

** Compliant with AEC-Q200 Standards

CTS[®]

ELECTRONIC COMPONENTS

A World Of Solutions

Frequency Control

Frequency Translator/Jitter Attenuators
Clock Generators
Ovenized Crystal Oscillators (OCXOs)
Temperature Controlled Crystal Oscillators (TCXOs)
Voltage Controlled Crystal Oscillators (VCXOs)
Clock Oscillators
Quartz Crystals
High Reliability/COTS
High Temperature
Shock & Vibration Resistant

EMC Products

EMI / RFI Filters
Capacitors
Coaxial Resonators

Electrocomponents

Potentiometers / Variable Resistors
Precision Potentiometers
Position Sensors
Optical and Mechanical Encoders
Trimmers
Dip Switches
Rotary & Other Power Switches
Mini-Joysticks
Acceleration Modules
Small Engine Rotary Position Sensor

Ceramic Components

Monoblock Filters
Monoblock Duplexers and Diplexers
ClearPlex[®] Waveguide Ceramic Filters
Recess Top Pattern Ceramic Filters (RTP)
Piezoelectric Materials

Resistors

ClearOne Terminators (BGA)
Resistor Networks
Resistor Arrays
Current Sensing Resistors
Ultra High Resistance
Chip Resistor

Thermal Management Solutions

Extruded
Precision Forged
Military
Stamped
ZIF Prime Circuit Card Retainer

