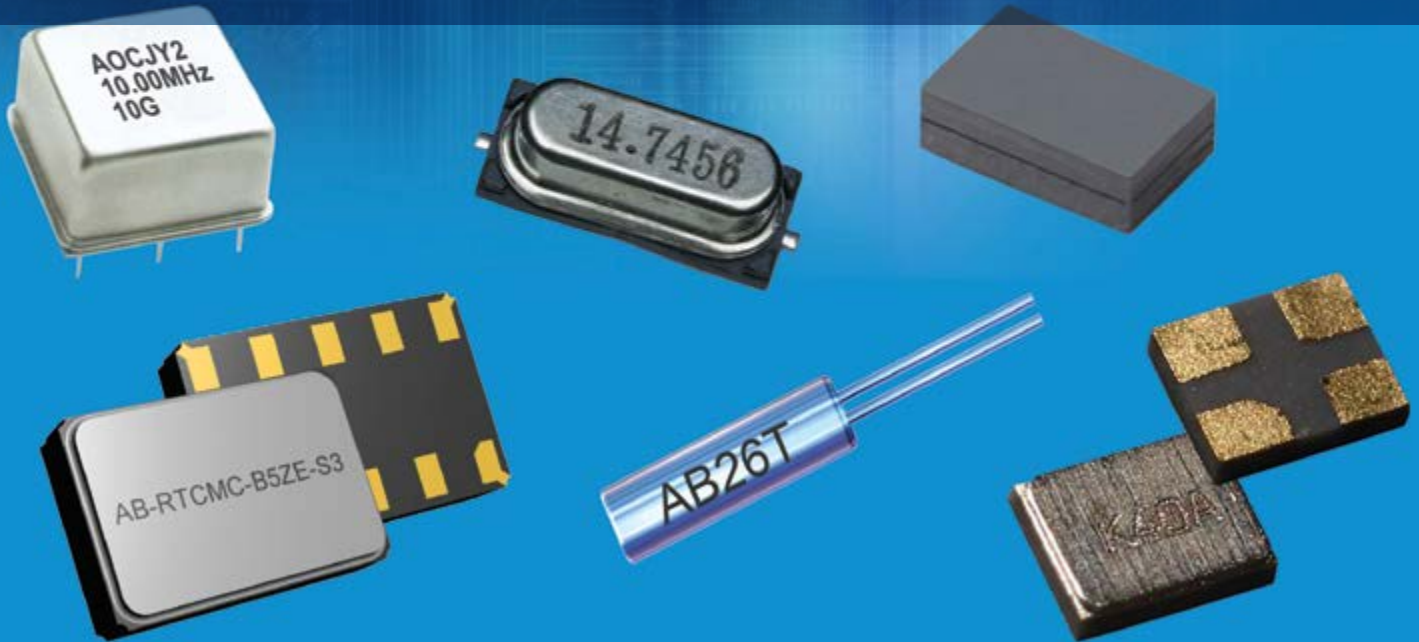




Timing Devices/Frequency Control

Line Card



TTI Stocks the Solutions to Synchronize Your Next Design

Tomorrow's technologies require a variety of timing devices and frequency control components. TTI stocks a wide range of crystal oscillators, resonators, and MEMS devices to sync operations across the board and the system. Whether it is a cutting edge application for a compact wearable, a cost-efficient solution to be deployed in an Industrial Internet of Things (IIoT) application, or a space level component for a satellite constellation, TTI has the inventory to meet your requirements for durability, pricing, and footprint on the board.



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SELECTION	Ceramic Resonators	Real Time Clock 32.768KHz (RTC)	Quartz Crystals (Xtal)	Crystal Oscillator (XO)	Temp-Controlled XO (TCXO)	Voltage-Controlled XO (VCXO)	Oven-Controlled XO (OCXO)	MEMS Oscillator
SUPPLIERS								
Abrakon	◆	◆	◆	◆	◆	◆	◆	◆
Kyocera		◆	◆	◆	◆	◆		
Murata	◆		◆		◆	◆		◆
Vishay/Dale			◆	◆				

Abrakon

Selection	Series	Package (mm)		Features	Frequency Range (MHz)	Stability		Output Logic Type	Temp Range
Ceramic Resonators	AWSCR	3.7 x 3.1		Low resonant impedance Built-in load cap	8-60 MHz	±0.4ppm		N/A	-25 to 85°C
Real Time Clock (RTC) 32.768kHz	AB08x5; 22nA RTC	3 x 3		Alarm, Leap Year, Watchdog Timer	32.768kHz	±16ppm		LVC MOS	-40 to 85°C
	ASAK (XO) ASDK (XO) ASHxx (XO)	2 x 1.6 3.2 x 1.5	2.5 x 2 3.2 x 2.5	Low Power	32.768kHz	±20ppm ±30ppm ±50ppm	±25ppm ±50ppm ±100ppm	LVC MOS	-40 to 85°C
	ABSOx	1.6 x 1 3.2 x 1.5	2 x 1.2 4.1 x 1.5	Timing Fork Crystals	32.768kHz	±10ppm	±20ppm	N/A	-40 to 85°C -40 to 125°C
	AB-RTCMx (Xtal)	3.2 x 1.5 3.7 x 2.5	3.2 x 2.5	Alarm, Leap Year, Watchdog Timer	32.768kHz	±5ppm	±8ppm	LVC MOS	-40 to 85°C -40 to 125°C
	ASTMx (MEMS)	1.54 x 0.84	2 x 1.2	Smallest RTC	32.768kHz	±5ppm	±100ppm	LVC MOS	-40 to 85°C
Quartz Crystal (Xtal)	AB ABL ABS ABM	1.2 x 1 1.6 x 1.2 2.0 x 1.6 2.5 x 2 5.0 x 3.2	6.0 x 3 6.0 x 3.5 6.6 x 4 7.0 x 4.1 11.4 x 4.7	Thru-hole and SMD packages with excellent stability	3.5-200	±3ppm ±5ppm ±10ppm ±15ppm	±20ppm ±30ppm ±50ppm ±100ppm	N/A	-10 to 60°C -20 to 70°C -40 to 85°C -40 to 105°C -40 to 125°C
Crystal Oscillator (XO)	ABFM ABLIO ABLNO ABNM ACHx	2.5 x 2 5 x 3.2 12.7 x 12.7 13.2 x 13.2	3.2 x 2.5 7 x 5 14.3 x 8.7 20.2 x 12.6	Fixed or any frequency programmable XOs offer up to 1.5GHz	1-860	±5ppm ±10ppm ±15ppm	±18ppm ±20ppm	LVPECL LVDS HCSL LVC MOS TTL HCMOS	0 to 50°C 0 to 70°C -10 to 60°C -20 to 70°C -30 to 70°C -40 to 85°C
TCXO	ASTX ASVTX ASTRX AST3TQ	2 x 1.6 3.2 x 2.5 7 x 5	2.5 x 2 5 x 3.2 9 x 7	Temperature stability from ±0.1ppm to ±2ppm with frequencies up to 1.5GHz	10-1500	±0.1ppm ±1.5ppm ±2.5ppm ±50ppm	±1ppm ±2ppm ±3ppm ±100ppm	LVC MOS HCMOS LVPECL LVDS Clipped Sine	0 to 50°C 0 to 70°C -10 to 60°C -20 to 70°C -40 to 85°C
VCXO	ACVX122x ALVD ASEV ASFLV ASx-x ASGTX	2.5 x 2 5 x 3.2 14.3 x 8.7 20.8 x 13.2	3.2 x 2.5 7 x 5 20.2 x 12.6 60.4 x 42.7	Programmable and fixed frequencies up to 1.5GHz	1.5-1500	±10ppm ±20ppm ±30ppm ±50ppm	±18ppm ±25ppm ±35ppm	LVPECL LVDS HCSL LVC MOS TTL HCMOS Sinewave	0 to 50°C 0 to 70°C -10 to 60°C -20 to 70°C -30 to 70°C -40 to 85°C
	ABDF-xxxx (Sratum-III)	5 x 3.2 9 x 14	7 x 5	Telecom Accuracy with 6mA no-load current	5-40	±50ppm ±280ppm	±100ppm ±500ppm	LCMOS Clipped Sine Wave	-20 to 70°C -40 to 85°C -50 to 90°C -55 to 95°C
OCXO	AOCJYx AOCTQx	9.7 x 7.5 21 x 21.1 25.5 x 25.5	20.8 x 13.2 25.4 x 22.1 36.1 x 27.1	Thru-hole and SMD packages with excellent stability	10-100	±5ppm ±30ppm	±10ppm ±50ppm	LVC MOS Sinewave CMOS	0 to 50°C -20 to 70°C -40 to 75°C
MEMS Oscillator	ABMJB ABJDx AMJMx AMPxx	1.54 x 0.84 2 x 1.2 3.2 x 2 5 x 3.2	1.6 x 1.2 2 x 1.6 3.2 x 2.5	MEMS timing is ideal when size, temp stability, resistance to shock are essential	0.001kHz- 32.768kHz 1-460MHz	±10ppm ±50ppm ±100ppm	±25ppm ±75ppm	CMOS LVC MOS LVDS LVPECL HCSL	-20 to 70°C -40 to 85°C -40 to 105°C -55 to 125°C

Kyocera

Selection	Series	Package (mm)		Features	Frequency Range (MHz)	Stability		Output Logic Type	Temp Range
Real Time Clock (RTC) Crystals	KC25xx KC32xx KT32xx	2 x 1.2 3.2 x 1.5	2.5 x 2 3.2 x 2.5	Tuning Fork, Automotive and TCXO versions	32.768kHz	±3ppm		CMOS LVCMOS	-10 to 60°C -20 to 70°C -40 to 85°C -40 to 125°C
Quartz Crystal (Xtal)	CX Family CT Family	1 x 0.8 1.6 x 1.2 2.5 x 2 4.9 x 3.1 8 x 4.5	1.2 x 1 2 x 1.6 3.2 x 2.5 5 x 3.2	Automotive and Crystal with Thermistor Options	4.0-80.0	±10ppm ±20ppm ±100ppm	±15ppm ±50ppm	N/A	-10 to 70°C -40 to 85°C -40 to 125°C -40 to 150°C
Crystal Oscillator (XO)	KC Family MC Family	2 x 1.6 3.2 x 2.5 5 x 3.2	2.5 x 2 4.9 x 3.1 7 x 5	Various Voltage Technologies and Automotive Versions	1.5-175	±25ppm ±50ppm	±30ppm ±100ppm	CMOS LV-PECL LVDS HCSL	-10 to 70°C -40 to 85°C -40 to 105°C -40 to 125°C
TCXO	KT Family	1.65 x 1.25 2.5 x 2 5 x 3.2	2 x 1.6 3.2 x 2.5 7 x 5	Stratum III and Automotive Versions	10-60	±0.1ppm ±0.5ppm ±1.5ppm	±0.28ppm ±1ppm ±2ppm	CMOS Clipped Sine	-10 to 70°C -40 to 85°C -40 to 105°C -40 to 125°C
VCXO	KV Family	3.2 x 2.5 7 x 5	5 x 3.2	Dual Selectable Frequency Versions	1.5-900	±50ppm		CMOS LV-PECL	-10 to 70°C -40 to 85°C

Murata

Selection	Series	Package (mm)		Features	Frequency Range (MHz)	Stability		Output Logic Type	Temp Range
Ceramic Resonators	CSTCR Family CSTCC Family	2.5 x 2 3.2 x 1.3 4.5 x 2	6 x 5 8.5 x 7.5	Automotive and Consumer, Surface Mount and Thru-hole	4-40 1.5-800kHz	±0.1% ±0.3% ±0.5%		N/A	-20 to 80°C -40 to 85°C -40 to 125°C
Quartz Crystal (Xtal)	XRC Family	1.2 x 1 1.6 x 1.2 2 x 1.6	2.5 x 2 5 x 3.2	Automotive and Consumer Versions	10-52	±10ppm ±20ppm ±30ppm	±50ppm ±100ppm	N/A	-20 to 70°C -30 to 85°C -40 to 105°C -40 to 125°C
TCXO	XNC Family	2.5 x 2 3.2 x 2.5 5 x 3.2		Temperature Compensated	10-52	±0.2ppm ±0.28ppm ±0.5ppm		CMOS Clipped Sine	-40 to 85°C
VCXO	XTC Family	2.5 x 2 3.2 x 2.5 5 x 3.2		Voltage Controlled Temperature Compensated	10-52	±0.2ppm ±0.28ppm ±0.5ppm		CMOS Clipped Sine	-40 to 85°C
MEMS Oscillators	WMRA Family	0.9 x 0.6		Under Development	32.768kHz	±10ppm		N/A	-30 to 85°C

Vishay/Dale

Selection	Series	Package (mm)		Features	Frequency Range (MHz)	Stability		Output Logic Type	Temp Range
Quartz Crystal (Xtal)	XT Family	8 x 4.5 12.3 x 4.7		Surface Mount and Thru-hole Options	32.768kHz 3.5-30	±20ppm ±30ppm ±50ppm		N/A	-20 to 70°C -40 to 85°C
Crystal Oscillator (XO)	XO Family	5 x 3.2 7 x 5		Commercial and Industrial Temp Range	1.5-100	±50ppm ±100ppm		HCMOS	-20 to 70°C -40 to 85°C



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