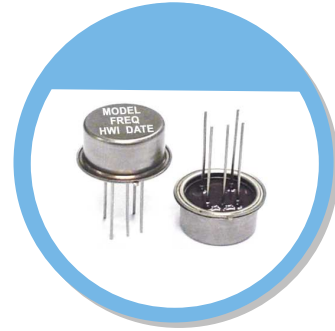


X7(TO-8) Type

FEATURE

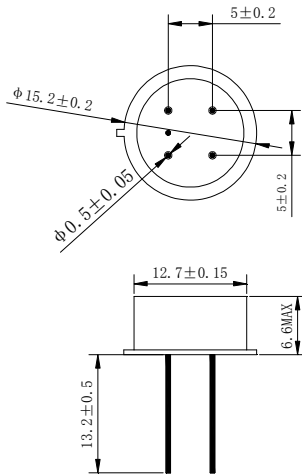
- \varnothing 15 x 6.5mm TO-8 Cold Weld
- Gold electrode, vacuum
- Fast warm up
- High stability, low temperature frequency coefficient
- Good aging and reliability



TYPICAL APPLICATION

- Precision OCXO, VCXO and TCXO oscillators

DIMENSION (mm)



EQUIVALENT SERIES RESISTANCE (E.S.R)

Frequency Range	MODE(Cut)	E.S.R.
4 MHz \leq Fo \leq 8 MHz	AT Fundamental	\leq 20 Ω
8 MHz < Fo \leq 10 MHz	AT 3 rd OT	\leq 40 Ω
10 MHz < Fo \leq 20 MHz	AT 3 rd OT	\leq 30 Ω
20 MHz < Fo \leq 50 MHz	AT 3 rd OT	\leq 20 Ω
50 MHz < Fo \leq 100 MHz	AT 5 th OT	\leq 50 Ω
5 MHz < Fo \leq 20 MHz	SC 3 rd OT	\leq 100 Ω
20 MHz < Fo \leq 40 MHz	SC 3 rd OT	\leq 60 Ω

ELECTRICAL SPECIFICATION

Parameter	Min.	Typical	Max.	Unit
Operating Temp. Range	-55		+105	$^{\circ}$ C
Standard Frequency	5, 10, 12.8, 16.384			MHz
Turn Point	+75 $^{\circ}$ C to +105 $^{\circ}$ C (mode, cut, frequency dependent, other turn points)			$^{\circ}$ C
Frequency Tolerance @ Turn	\pm 1.5	\pm 3	\pm 5	ppm
Level of Drive		100	500	μ W
Shunt Capacitance (C0)			7.0	pF
Insulation Resistance	500M Ω @ DC100V			
Aging	\pm 0.5 to \pm 1.0			ppm/year

Standard frequencies are frequencies which the crystal has been designed and does not imply a stock position.

STANDARD OPTIONS

Nominal Frequency	MODE(Cut)	R(Ω)	C0(pF)	C1(fF)	Q(Typical)	Aging(ppm/year)
10 MHz	AT 3 rd OT	< 45	< 2.6	0.44 \pm 20%	645k	0.3
12.8 MHz	AT 3 rd OT	< 45	< 2.6	0.85 \pm 20%	460k	0.5
16.384 MHz	AT 3 rd OT	< 30	< 3.8	1.60 \pm 20%	420k	0.5
5 MHz	SC 3 rd OT	< 110	< 3.0	0.18 \pm 20%	2,200k	0.01
10 MHz	SC 3 rd OT	< 70	< 3.2	0.19 \pm 20%	1,200k	0.03
12.8 MHz	SC 3 rd OT	< 70	< 4.2	0.26 \pm 20%	930k	0.05
16.384 MHz	SC 3 rd OT	< 75	< 4.5	0.20 \pm 20%	780k	0.06

Note: not all combination of options are available. Other specifications may be available upon request.

Specifications subject to change without notice

Model Numbering Guide – Crystal Units

Available options

Type	package (mm)	Load Capacitance (pF)	Freq. Tol. @25°C (ppm)	Freq. Stability (ppm)	Temp. Range(°C)	Special Requirement	Oscillator Mode	Appearance	Lead Free	Dash	Freq. (MHz)
X: X'tal (MHz series)	3: 1.6x1.2 Z: 2.0x1.6 Y: 2.5x2.0 X: 3.2x2.5 V: 5.0x3.2 (4Pads) R: 6.0x3.5 2: 3.2x2.5 S: 5.0x3.2 (2Pads) Q: 8.0x4.5 I: 11.1x4.68 (U4) J: 13.0x4.85 (U4B)	L: 6 O: 7 A: 8 B: 9 C: 10 D: 12 E: 15 F: 16 G: 18 H: 20 P: 22 Q: 25 I: 30 J: 32 K: 50 N: No Standard S: Series	A: ±5 B: ±10 P: ±15 C: ±20 D: ±25 E: ±30 F: ±40 G: ±50 H: ±100 I: ±150	A: ±5 B: ±10 P: ±15 C: ±20 D: ±25 E: ±30 F: ±40 G: ±50 H: ±100 I: ±150 Z: ±150 above	A: +10~+40 B: +0~-55 E: +0~+85 I: -10~+60 C: -20~+70 D: -30~+85 L: -40~+85 M: -40~+95 J: -40~+105 H: -40~+125 G: -40~+150 F: -55~+125	A: For Automotive B: Spurious D: DLD N: No Special P: Pullability S: Several	A: AT Fundamental T: AT 3 rd Overtone	N: Normal	F: RoHS Compliant	-	XX.XXXXX
X: X'tal (32.768 kHz series)	A: 3.0x8.0 (Dip) B: 1.0x4.0 (Dip) /2.0x6.0 (Dip) D: 2.0x1.2 (2Pads) 3.2x1.5 (2Pads) /4.1x1.5 (2Pads) N: 6.9x1.4 (4Pads) /8.0x3.8 (4Pads)	L: 6 O: 7 B: 9 M: 12.5	C: ±20	H: ±100 I: ±150 Z: ±150 above	C: -20~+70 L: -40~+85	N: No Special	D: Tuning Fork	N: Normal (XA 3.0x8.0 size XB 2.0x6.0 size) J: XB 1.0x4.0 size C: XD 4.1x1.5 size D: XD 3.2x1.5 size M: XD 2.0x1.2 size E: XN 8.0x3.8 size H: XN 6.9x1.4 size	D: RoHS Compliant B: Non-RoHS Compliant	-	0.032768

X Y C D D L N A N F – 40.000000

*Not all combinations of options are available.

Example: XYCDDLNANF-40.000000

Type	X'tal
Package	2.5 x 2.0 mm
Load Capacitance	10 pF
Freq. Tol.	±25ppm
Freq. Stability	±25ppm
Temp Range	-40~+85 °C
Special Requirement	No Special
Oscillator Mode	AT Fundamental
Appearance	Normal Appearance
Lead Free	RoHS Compliant
Frequency	40.000000 MHz