

3X Series 3.2 x 2.5 mm SMD Crystal

Feature

- AT-cut Crystal Construction
- Ultra miniature ceramic surface mount with Metal Lid
- High temperature, high precision and reliability Characteristics
- Package Size: 3.2 x 2.5 x 0.7mm
- Pb-free and RoHS/Green compliant

Applications

- Industrial applications
- Portable devices
- Short-range Wireless module
- Computers, Modems, Microprocessors



Electrical Specifications

Item	Symb.	Min.	Typ.	Max.	Unit	Notes
Frequency Range	Freq.	8.000		54.000	MHz	
Oscillation Mode		Fundamental (AT-cut)				
Frequency Tolerance	$\Delta f/f$			± 10	ppm	at 25°C $\pm 2^\circ\text{C}$
Operating Temperature	T_use	-20		70	°C	
		-40		85	°C	
Storage Temperature Range	T_sta	-55		125	°C	
Shunt Capacitance	C0			3	pF	
Drive Level	DL		10	100	μW	
Load Capacitance	CL	6		20	pF	
Insulation Resistance	IR			500	M Ω	at DC 100V
Aging	f_age			3	ppm	1st. Year at 25°C

Frequency Stability & Operating Temperature Range

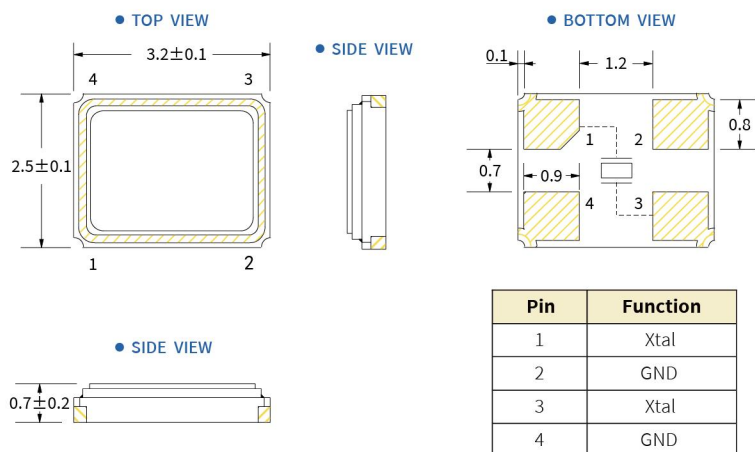
Temp.	FT	$\pm 10\text{ppm}$	$\pm 15\text{ppm}$	$\pm 20\text{ppm}$	$\pm 30\text{ppm}$
	-20°C to +70°C	Δ	\star	\star	\star
-40°C to +85°C		Δ	\star	\star	\star

\star : Available Δ : Conditional

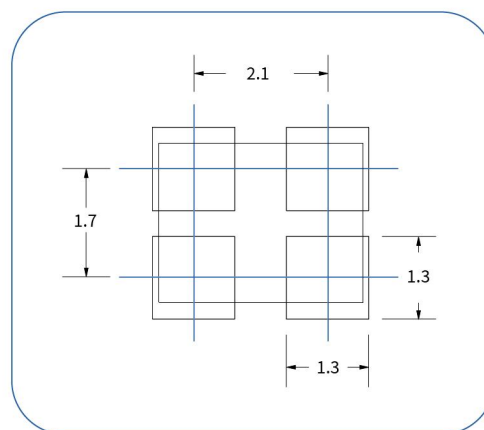
Equivalent Series Resistance

Frequency Range	ESR(Max.)
8MHz \leq Freq. < 10MHz	300 Ω
10MHz \leq Freq. < 16MHz	100 Ω
16MHz \leq Freq. < 20MHz	60 Ω
20MHz \leq Freq. \leq 54MHz	30 Ω

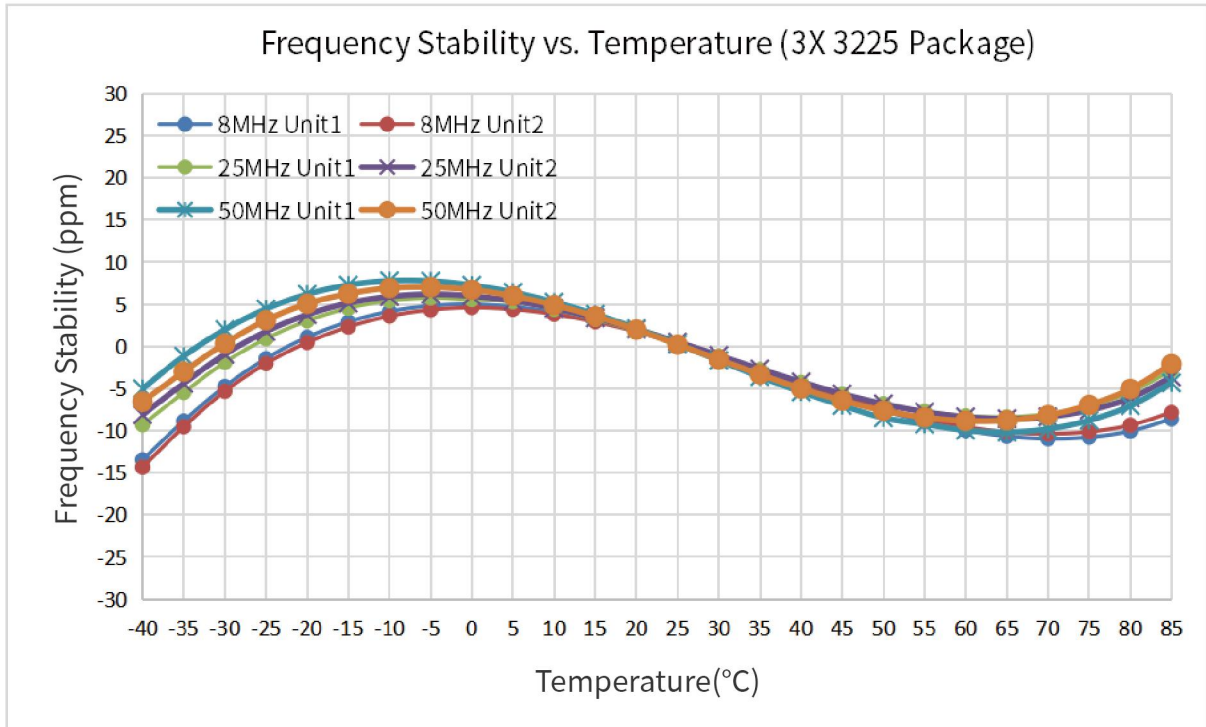
Dimensions (UNIT:mm)



Solder pad layout (UNIT:mm)

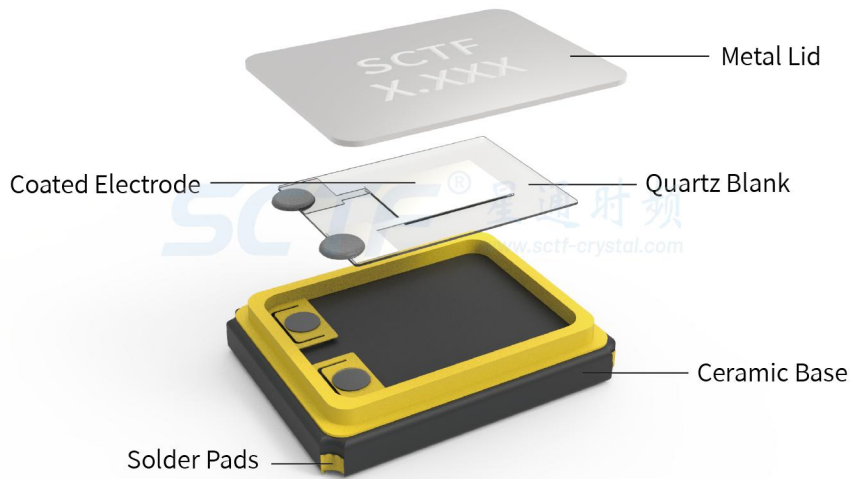


Frequency Temperature Characteristics

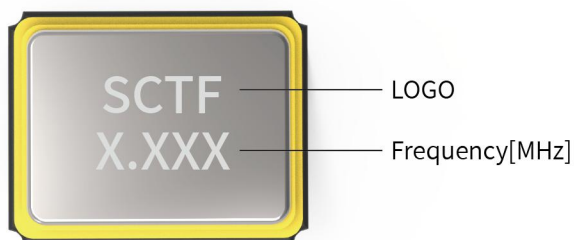


Product Structure & Marking Information

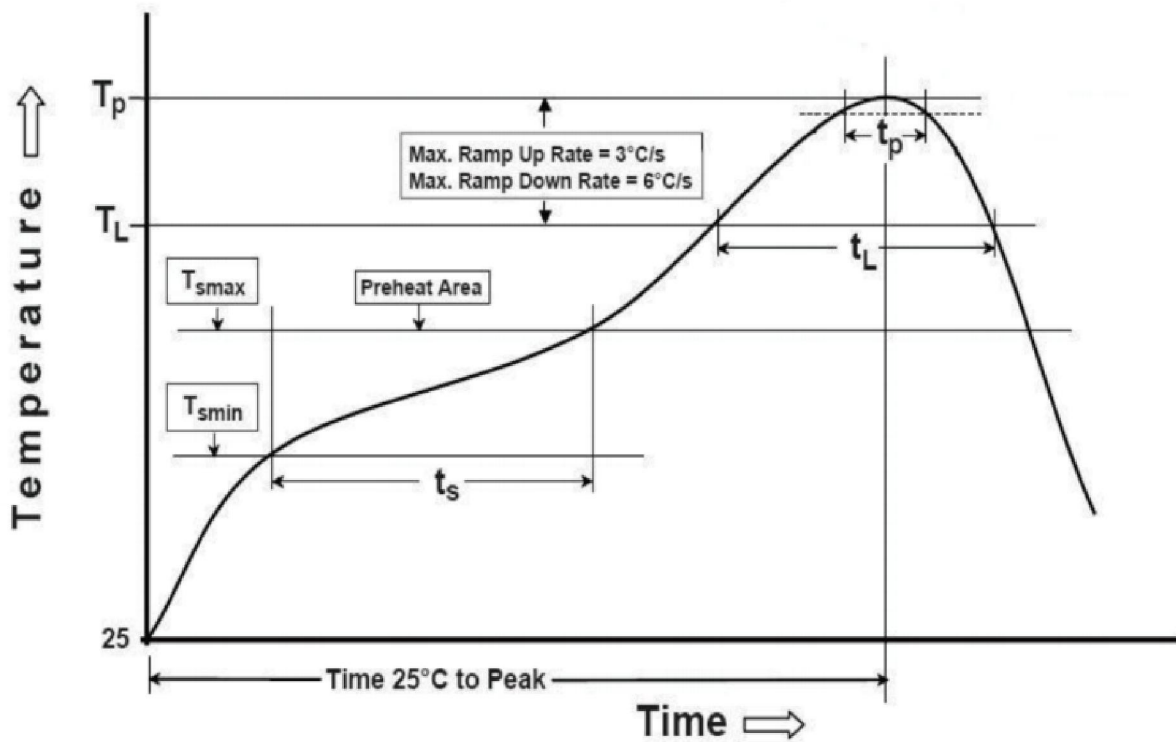
Product Structure



Marking Information



Suggested Reflow Profile

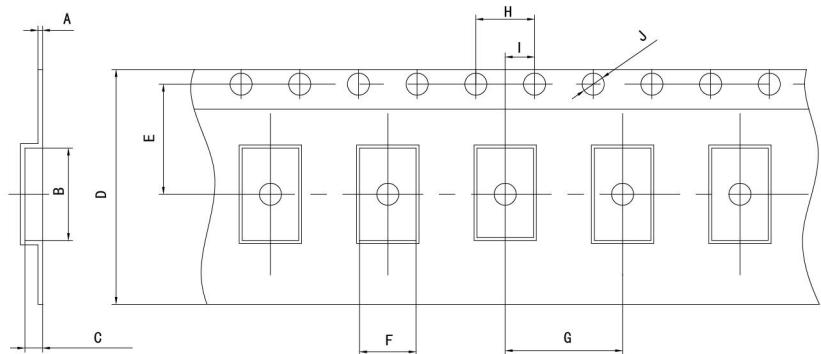
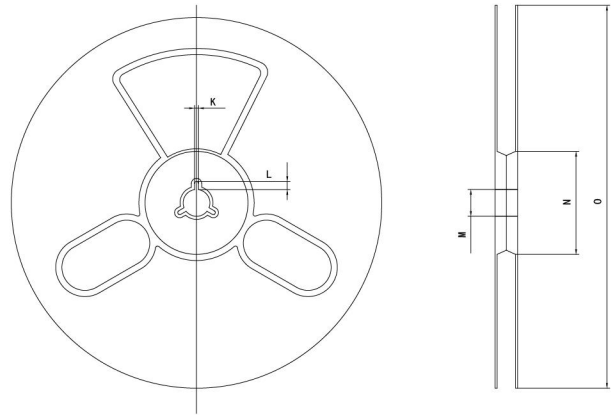


Profile Feature	Sn - Pb Eutectic Assembly	Preheat / Soak
Preheat / Soak <ul style="list-style-type: none"> ● Temperature Min (Ts min) ● Temperature Max (Ts max) ● Time (Ts min to Ts max) 	100°C 150°C 60-120 seconds	150°C 200°C 60-120 seconds
Ramp - up rate (TL to Tp)	3°C/ second max.	3°C/ second max.
Time maintained above <ul style="list-style-type: none"> ● Liquidous temperature (TL) ● Time (tL) maintained above TL 	183°C 60-150 seconds	217°C 60-150 seconds
Peak package body temperature (Tp)	235°C	260°C
Time within 5° C of the specified classification temperature (Tp)	20 seconds	30 seconds
Ramp - down rate (Tp to TL)	6°C/ second max.	6°C/ second max.
Time 25° C to peak temperature	6 minutes max.	8 minutes max.
Suggest reflow times	2 Times max.	

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Packaging Information

T=Tape and reel (3,000pcs/reel)



Pocket Tape Dimensions(mm)

Series	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
3X	0.25±0.05	3.5±0.1	1.0±0.1	8.0±0.1	3.5±0.1	2.75±0.1	4.0±0.1	4.0±0.1	2.0±0.1	φ1.5±0.1	2.0±0.2	4.0±1.0	φ13±0.5	φ60±1	φ180±1

Common Frequencies – MHz

3X Series				
8.000	10.000	11.0592	12.000	12.288
12.800	13.000	13.52127	13.52313	13.560
13.598	13.824	14.31818	14.7456	16.000
16.384	16.9344	18.432	19.200	19.6608
20.000	22.1184	22.5792	24.000	24.305
24.576	25.000	26.000	27.000	27.120
27.1383	28.224	28.63636	29.4912	30.000
32.000	32.768	33.000	36.000	36.864
37.400	38.400	40.000	48.000	50.000
52.000	52.083333	54.000		