

2X Series 2.5 x 2.0 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: 2.5 x 2.0 x 0.55mm
- 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.	12.000		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

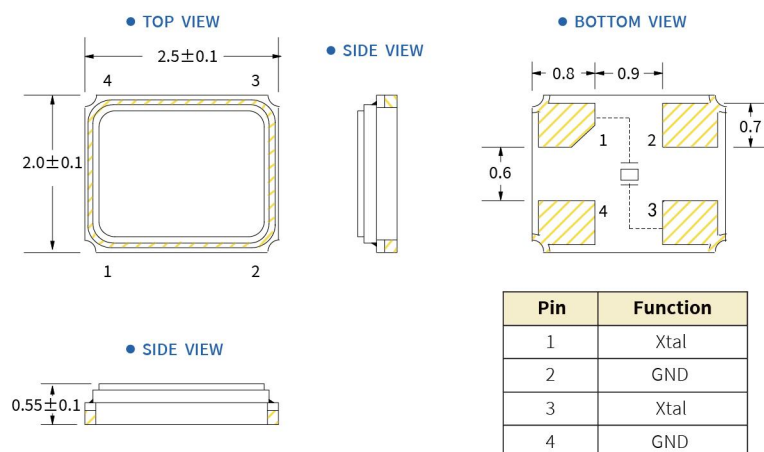
Temp.	FT			
	$\pm 10\text{ppm}$	$\pm 15\text{ppm}$	$\pm 20\text{ppm}$	$\pm 30\text{ppm}$
-20°C to +70°C	Δ	★	★	★
-40°C to +85°C		Δ	★	★

★: Available Δ : Conditional

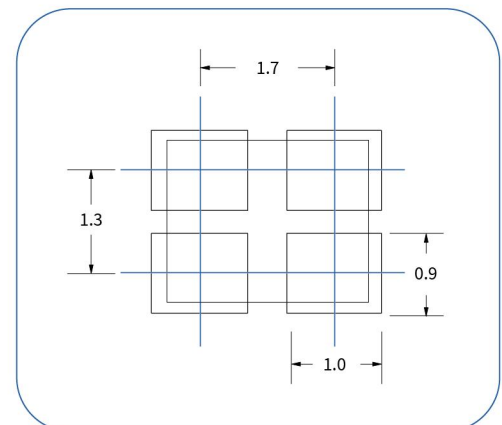
Equivalent Series Resistance

Frequency Range	ESR(Max.)
12MHz \leq Freq. < 16MHz	200 Ω
16MHz \leq Freq. < 20MHz	80 Ω
20MHz \leq Freq. < 30MHz	60 Ω
30MHz \leq Freq. < 35MHz	50 Ω
35MHz \leq Freq. \leq 54MHz	40 Ω

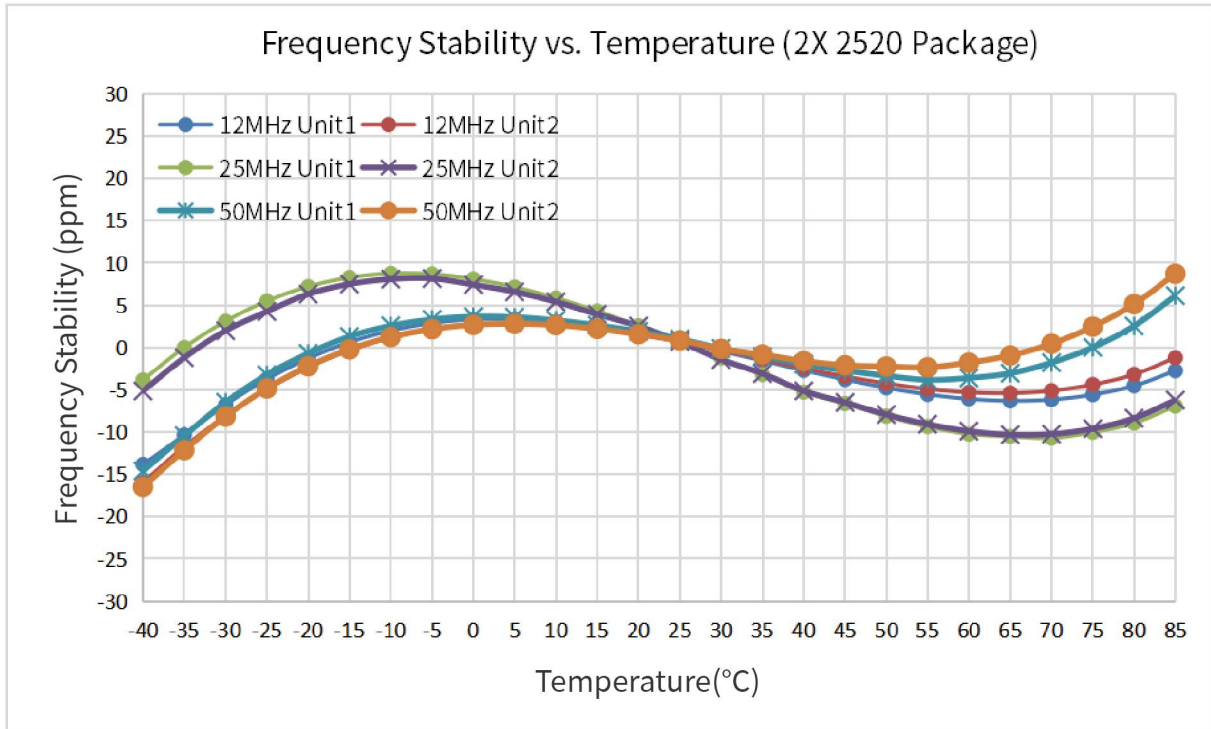
Dimensions (UNIT:mm)



Solder pad layout (UNIT:mm)

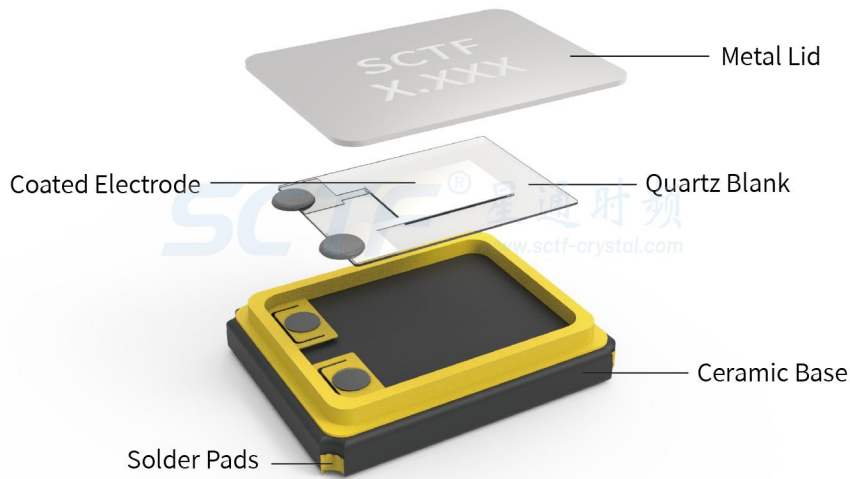


Frequency Temperature Characteristics

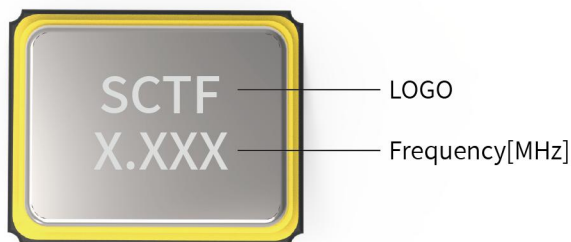


Product Structure & Marking Information

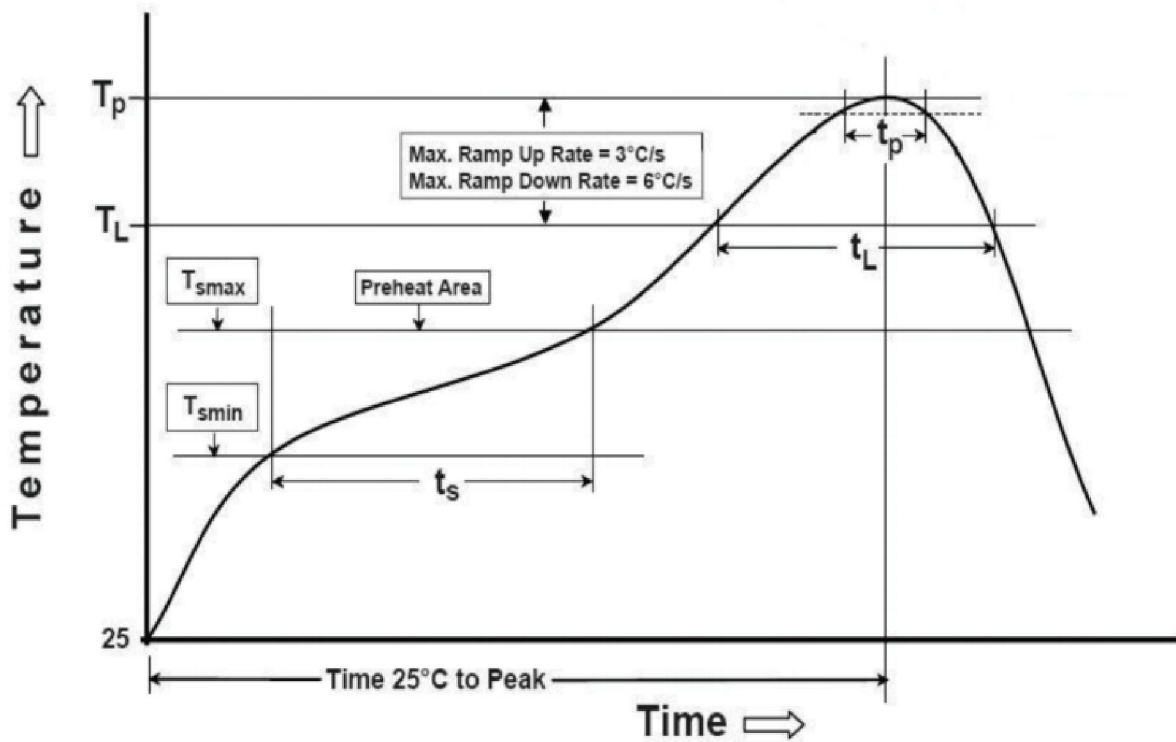
Product Structure



Marking Information



Suggested Reflow Profile

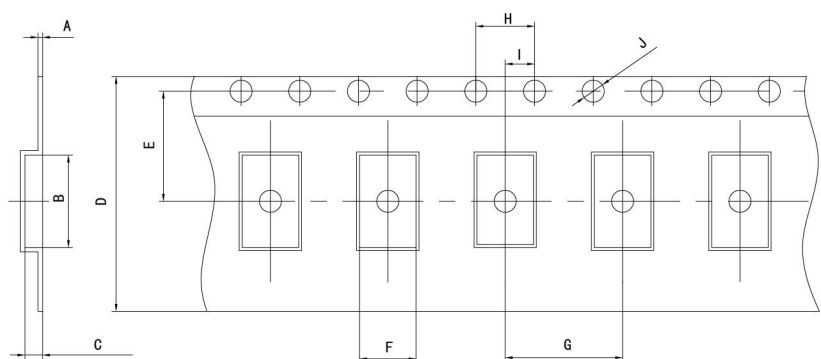
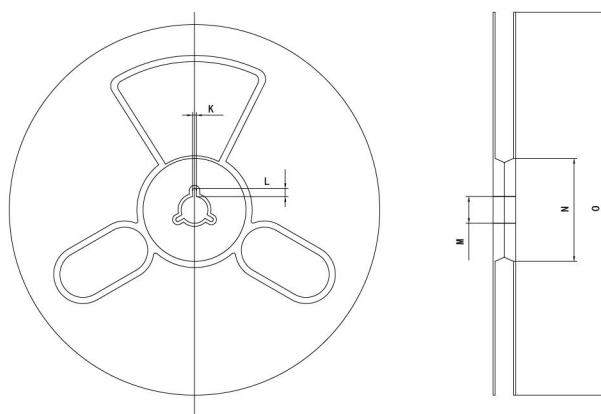


Profile Feature	Sn - Pb Eutectic Assembly	Preheat / Soak
Preheat / Soak <ul style="list-style-type: none"> ● Temperature Min (Ts min) ● Temperature Max (Ts max) ● Time (Ts min to Ts max) 	100°C 150°C 60-120 seconds	150°C 200°C 60-120 seconds
Ramp - up rate (TL to Tp)	3°C/ second max.	3°C/ second max.
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
2X	0.25±0.05	2.25±0.1	0.8±0.1	8.0±0.1	3.5±0.1	2.25±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

2X Series				
12.000	12.288	14.31818	16.000	16.384
18.432	19.200	20.000	22.1184	22.5792
24.000	24.305	24.576	25.000	26.000
27.000	27.120	28.63636	30.000	32.000
37.400	38.400	40.000	48.000	50.000
52.000	54.000			