

# 1X Series 2.0 x 1.6 mm SMD Crystal

1 : 2.0×1.6×0.45 mm | SMD2016-4P

X : Crystal Resonator

## Feature

- AT-cut Crystal Construction
- Ultra miniature Seam sealed ceramic surface mount
- High temperature, high precision and reliability Characteristics
- Package Size: 2.0 x 1.6 x 0.45mm
- Pb-free and RoHS/Green compliant

## Applications

- Audio Devices
- Portable devices
- Short-range Wireless module
- Computers, Modems, Microprocessors



## Electrical Specifications

Item	Symb.	Min.	Typ.	Max.	Unit	Notes
Frequency Range	Freq.	16.000		54.000	MHz	
Oscillation Mode		Fundamental (AT-cut)				
Frequency Tolerance	$\Delta f/f$			$\pm 10$	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	$\mu\text{W}$	
Load Capacitance	CL	6		20	pF	
Insulation Resistance	IR			500	M $\Omega$	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	$\Delta$	★	★	★
-40°C to +85°C		$\Delta$	★	★	

★: Available     $\Delta$ : Conditional

## Equivalent Series Resistance

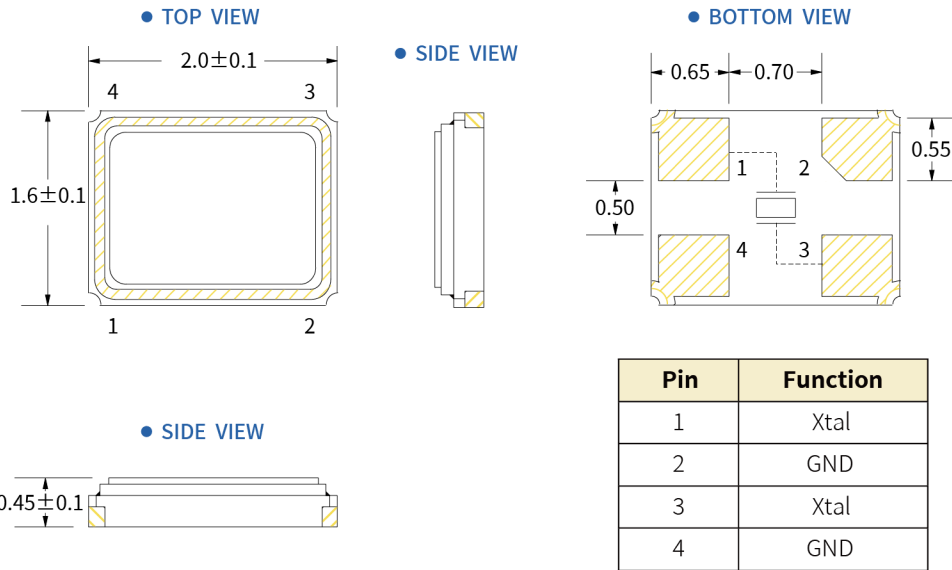
Frequency Range	ESR(Max.)
16MHz $\leq$ Freq. < 24MHz	200 $\Omega$
24MHz $\leq$ Freq. < 26MHz	80 $\Omega$
26MHz $\leq$ Freq. < 40MHz	60 $\Omega$
40MHz $\leq$ Freq. $\leq$ 54MHz	50 $\Omega$

# 1X Series 2.0 x 1.6 mm SMD Crystal

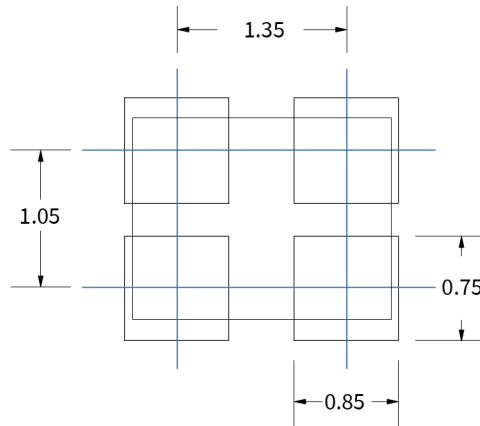
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## Dimensions (UNIT:mm)



## Solder pad layout (UNIT:mm)



## Options and Part Identification : Example SX1B16.000F1010F30

Company	Ceramic Package	Frequency Code [MHz]	Vibration Mode	Load Capacitance	Frequency Tolerance	Operating Temperature	Frequency Drift
<b>SX</b>	<b>1B</b>	<b>X.XXX</b>	<b>F</b>	<b>10</b>	<b>10</b>	<b>F</b>	<b>30</b>
Code Company		Frequency	Code Vibration Mode		Code Frequency Tolerance		Code Frequency Drift
SX SCTF		16.000	F AT - Fundamental		10 ±10ppm 20 ±20ppm		10 ±10ppm 15 ±15ppm 20 ±20ppm 30 ±30ppm
	Code Ceramic Package			Code Load Capacitance		Code Operating Temperature	
	0B 1.6 x 1.2 x 0.35mm [4PAD]			S Please specify CL in pF or S for series		E -20°C ~ +70°C	
	1B 2.0 x 1.6 x 0.45mm [4PAD]			06 6pF		F -40°C ~ +85°C	
	2B 2.5 x 2.0 x 0.55mm [4PAD]			08 8pF			
	3B 3.2 x 2.5 x 0.7mm [4PAD]			10 10pF			
	5B 5.0 x 3.2 x 0.8mm [4PAD]			12 12pF			
	5A 5.0 x 3.2 x 0.8mm [2PAD]			20 20pF			
	7B 7.0 x 5.0 x 1.0mm [4PAD]						

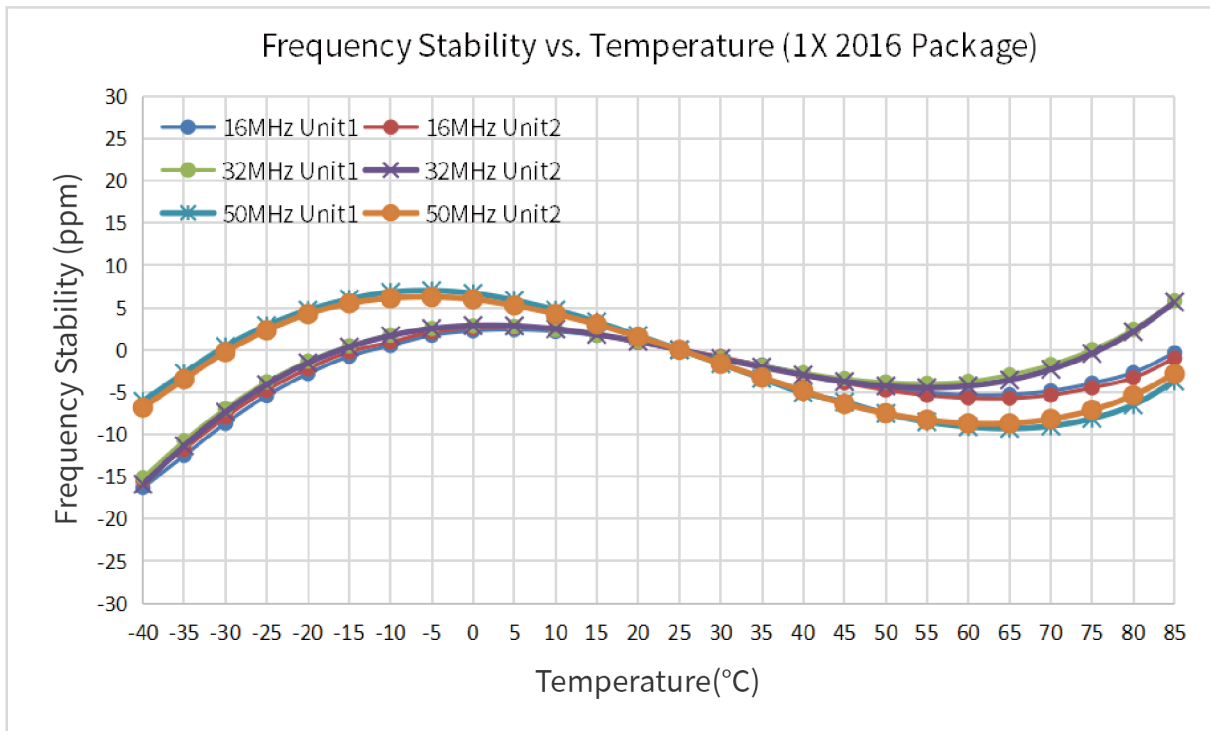
If you have other parameter requirements, you can contact **SCTF** at any time.

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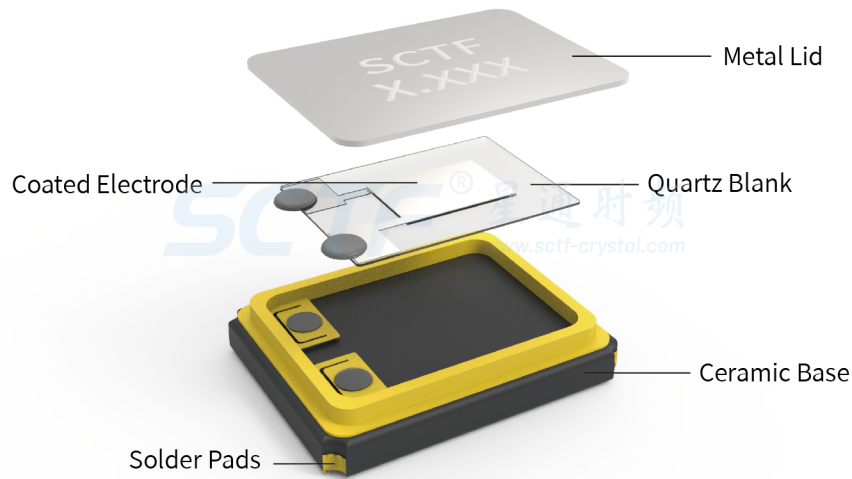
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## Frequency Temperature Characteristics

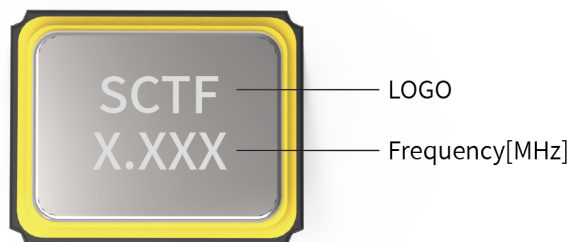


## Product Structure & Marking Information

### Product Structure



### Marking Information

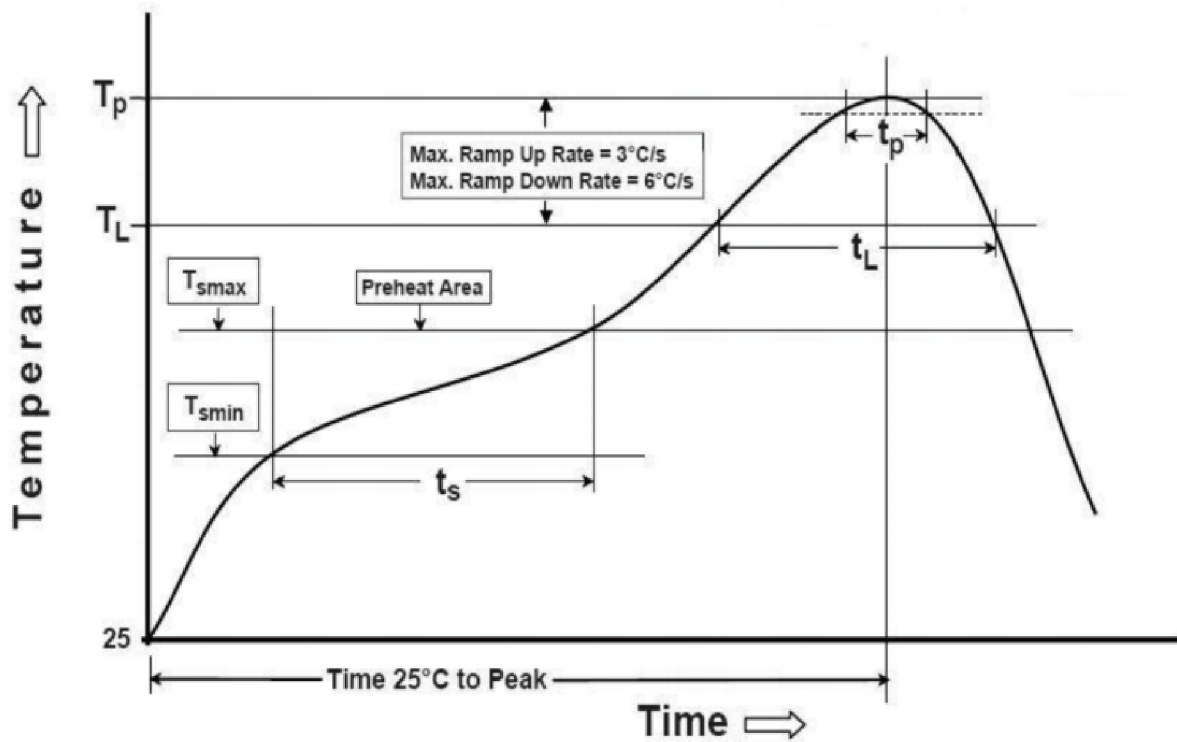


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## Suggested Reflow Profile



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

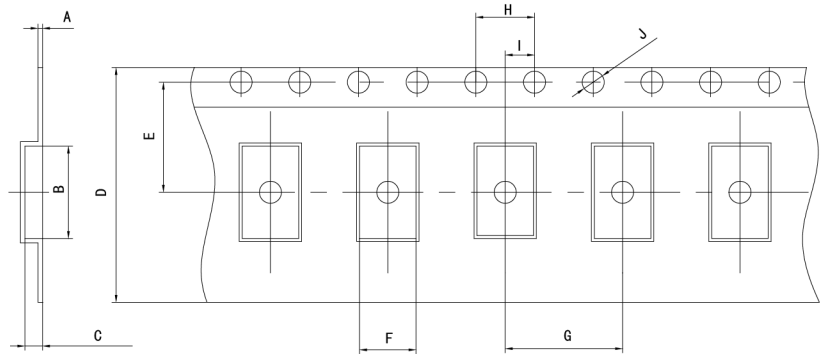
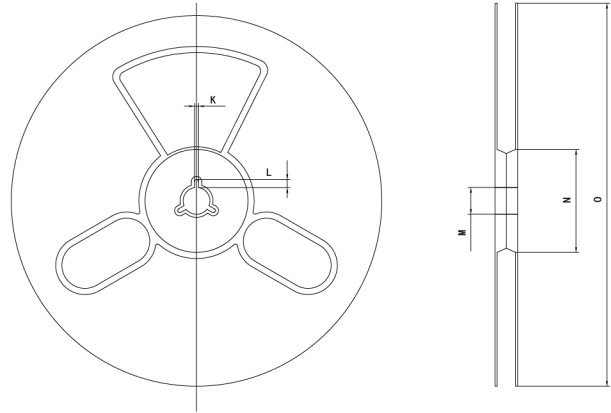
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## Packaging Information

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
1X	0.25±0.05	2.25±0.1	0.7±0.1	8.0±0.3	3.5±0.1	1.85±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

1X Series				
16.000	19.200	20.000	24.000	24.305
24.576	25.000	26.000	27.000	27.120
30.000	32.000	32.768	36.000	37.400
38.400	40.000	48.000	50.000	52.000
54.000				