

# 2C Series 2.5 x 2.0 mm SMD Crystal Oscillator

2 : 2.5×2.0×0.81 mm | SMD2520-4P

C : SPXO Crystal Oscillator

## Feature

- Ultra Miniature Ceramic surface mount with Metal Lid
- CMOS compatible logic levels
- Tri-state function available
- Supply voltage range : 1.62V ~ 3.63V(Compatible with 1.8V, 2.5V, 3.3V)
- RoHS Compliant / Pb Free

## Applications

- Wireless Devices
- Internet of Things (IoT) devices
- Ethernet/Gigabit Ethernet
- Audio, Video, Gaming products
- Micro base station



## Electrical Specifications

Item	Symb.	Min.	Typ.	Max.	Unit	Notes
Frequency Range	Freq.	1.000		54.000	MHz	
Operating Temperature	T_use	-20		70	°C	
		-40		85	°C	
Storage Temperature Range	T_stg	-55		125	°C	
Supply Voltage	Vdd	1.62	1.8/2.5/3.3	3.63	V	
Output Load	L_CMOS		15		pF	
Current Consumption	Icc			10	mA	1MHz ≤ Freq. < 40MHz
				20		40MHz ≤ Freq. ≤ 54MHz
Duty Cycle	SYM	45		55	%	50 % Vdd level, L_CMOS ≤ 15 pF
Rise / Fall Time	T <sub>R</sub> / T <sub>F</sub>			5	nS	10% Vdd to 90% Level
Start-up Time	T_str			5	mS	To 90% of Final Amplitude
High output voltage	V <sub>OH</sub>	0.9Vdd			V	
Low output voltage	V <sub>OL</sub>			0.1Vdd	V	
Enable Voltage High (Logic 1)	V <sub>IH</sub>	0.7Vdd			V	Output will be disable if OE is Logic 0 Output will be enable if OE is Logic 1 or open
Enable Voltage Low (Logic 0)	V <sub>IL</sub>			0.3Vdd	V	
Aging	f_age			3	ppm	1st. Year at 25°C

## Frequency Stability & Operating Temperature Range

Temp.	FT	±20ppm	±25ppm	±30ppm	±50ppm
	-20°C to +70°C		△	★	★
-40°C to +85°C			△	★	★

★: Available    △: Conditional

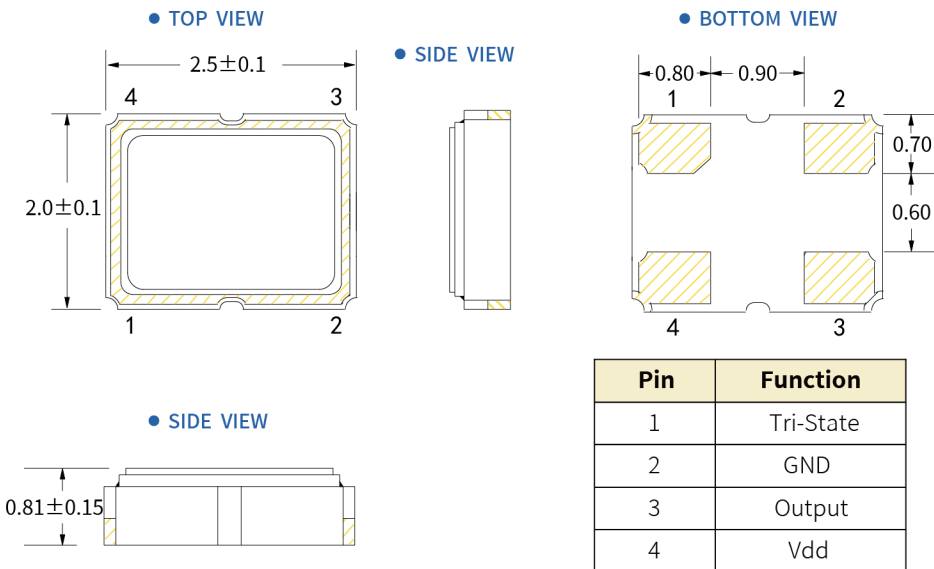
All condition: Include 25°C tolerance, operating temperature range, input voltage change, aging, load change.

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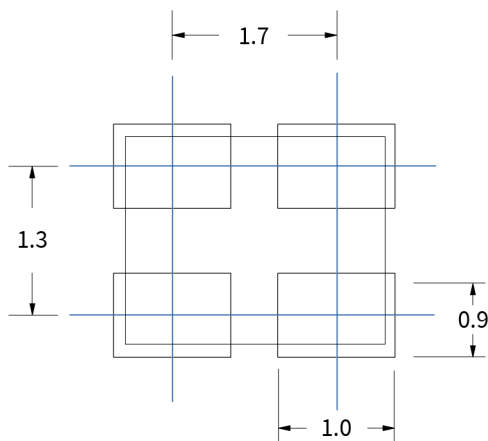
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## Dimensions (UNIT:mm)



## Solder pad layout (UNIT:mm)



## Options and Part Identification : Example SX2M1.000B20F30TNN

Company	Ceramic Package	Frequency Code [MHz]	Supply Voltage	Frequency Tolerance	Operating Temperature	Frequency Drift	Output	Current Consumption	Phase Noise
<b>SX</b>	<b>2M</b>	<b>X.XXX</b>	<b>B</b>	<b>20</b>	<b>F</b>	<b>30</b>	<b>T</b>	<b>N</b>	<b>N</b>
Code Company		Frequency		Code Frequency Tolerance		Code Frequency Drift		Code Current	
SX SCTF		1.000 13.560 19.200 37.125		10 ±10ppm 20 ±20ppm		15 ±15ppm 20 ±20ppm 30 ±30ppm		N Standard	
			Code Voltage		Code Operating Temperature		Code Output		Code Phase Noise
	Code Ceramic Package		D 1.8V H 2.5V B 3.3V A 5.0V		E -20°C ~ +70°C F -40°C ~ +85°C		T Squarewave		N Standard
	1M 2.0×1.6×0.75mm 2M 2.5×2.0×0.81mm 3M 3.2×2.5×0.95mm 5M 5.0×3.2×1.2mm 7M 7.0×5.0×1.3mm OA 12.7×12.7×5.4 mm [PXO-8] OB 20.4×12.8×4.9 mm [PXO-14]								

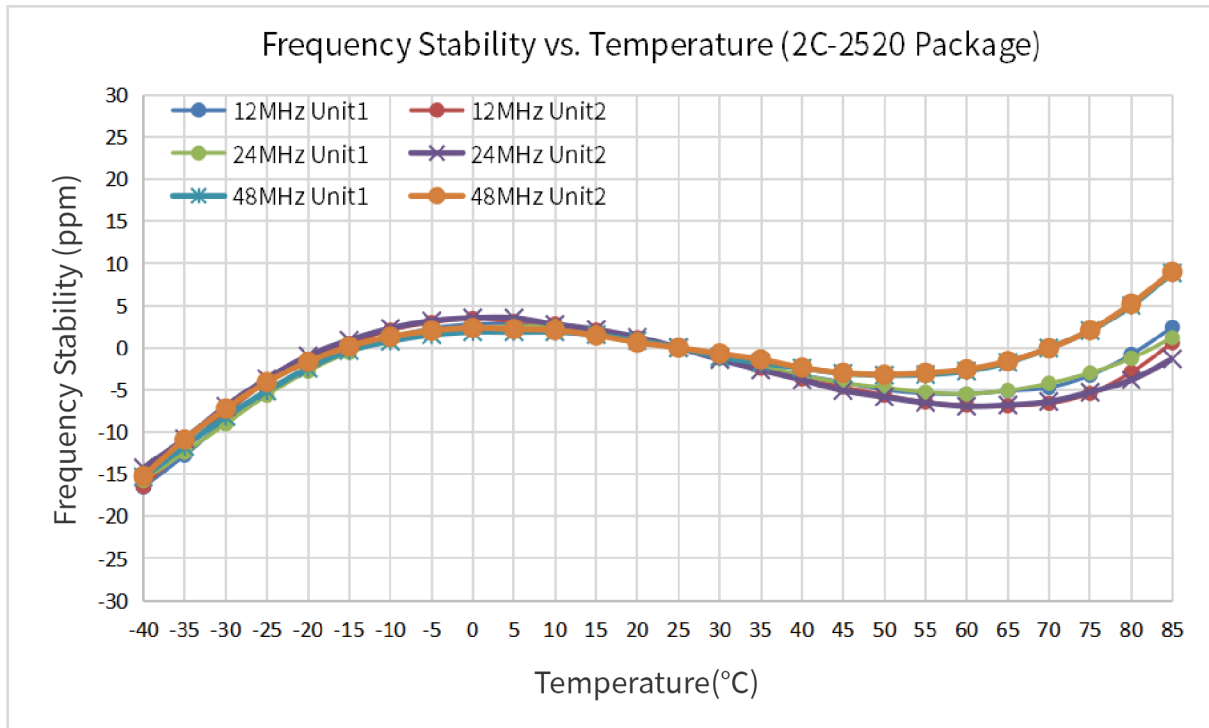
If you have other parameter requirements, you can contact **SCTF** at any time.

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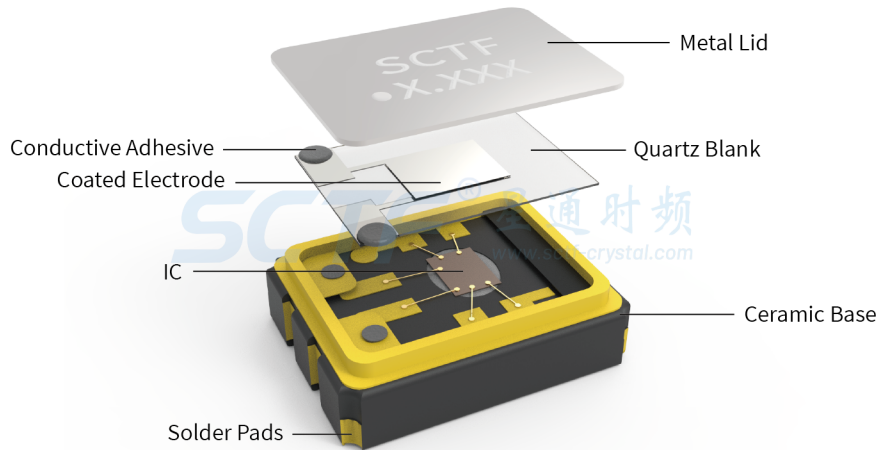
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## Frequency Temperature Characteristics

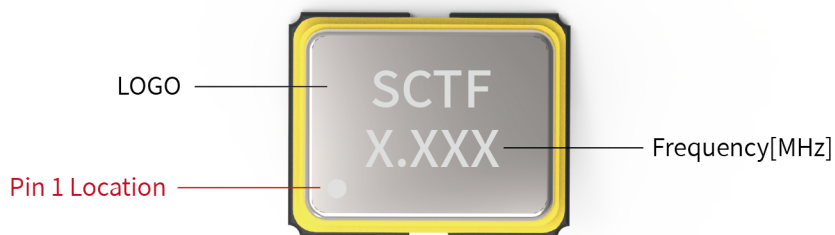


## Product Structure & Marking Information

### Product Structure



### Marking Information

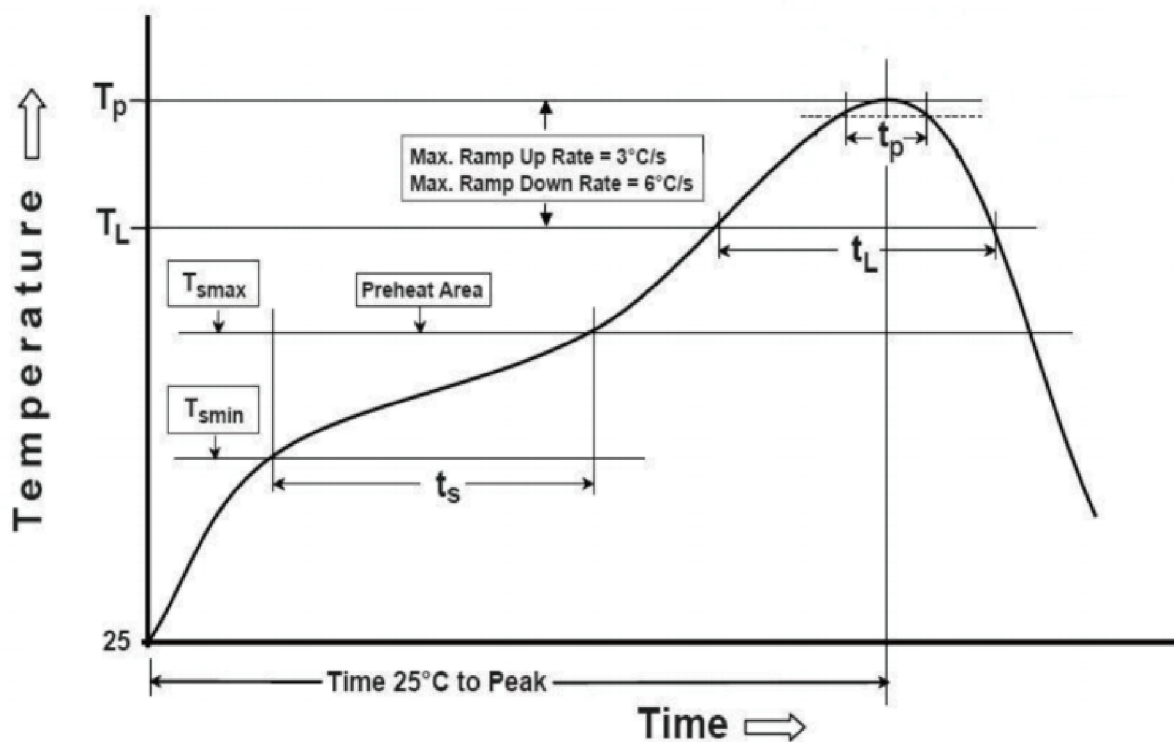


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## Suggested Reflow Profile



Profile Feature	Sn - Pb Eutectic Assembly	Preheat / Soak
Preheat / Soak <ul style="list-style-type: none"> <li>● Temperature Min ( T<sub>s</sub> min )</li> <li>● Temperature Max ( T<sub>s</sub> max )</li> <li>● Time ( T<sub>s</sub> min to T<sub>s</sub> max )</li> </ul>	100°C 150°C 60-120 seconds	150°C 200°C 60-120 seconds
Ramp - up rate ( T <sub>L</sub> to T <sub>p</sub> )	3°C/ second max.	3°C/ second max.
Time maintained above <ul style="list-style-type: none"> <li>● Liquidous temperature ( T<sub>L</sub> )</li> <li>● Time ( t<sub>L</sub> ) maintained above T<sub>L</sub></li> </ul>	183°C 60-150 seconds	217°C 60-150 seconds
Peak package body temperature ( T <sub>p</sub> )	235°C	260°C
Time within 5° C of the specified classification temperature ( T <sub>p</sub> )	20 seconds	30 seconds
Ramp - down rate ( T <sub>p</sub> to T <sub>L</sub> )	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>	

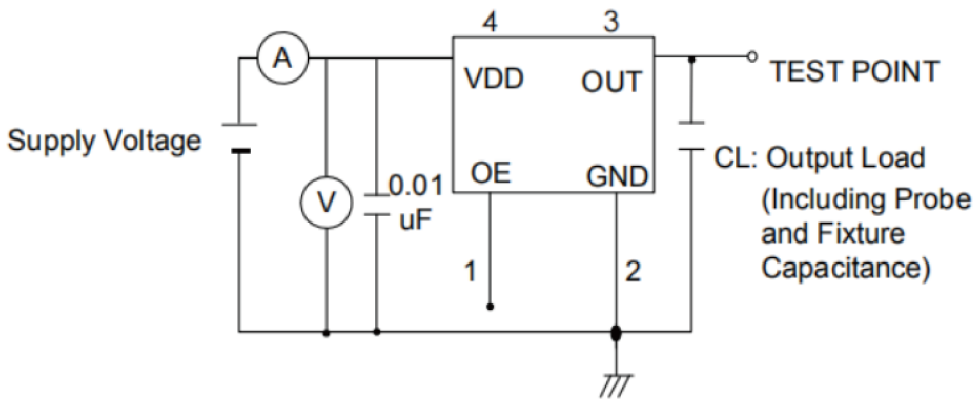
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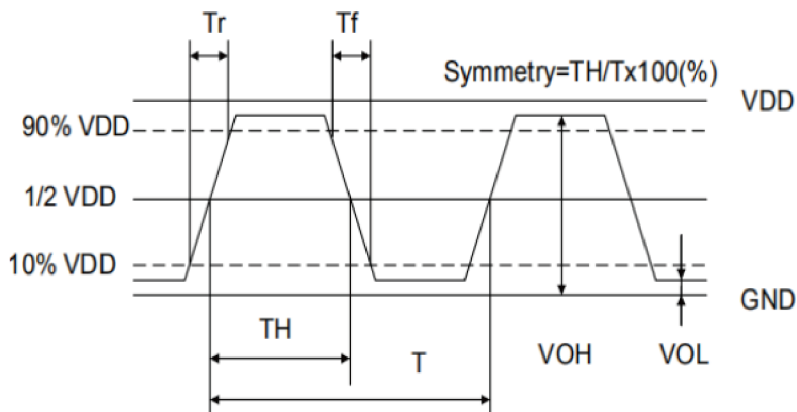
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## Testing Circuit



※ Notes: PIN 1 connected to Vdd or floating, the product is working properly; connected to GND, stops working.

## Waveform Conditions



Waveform measurement system should have a min. bandwidth of 5 times the frequency being tested.

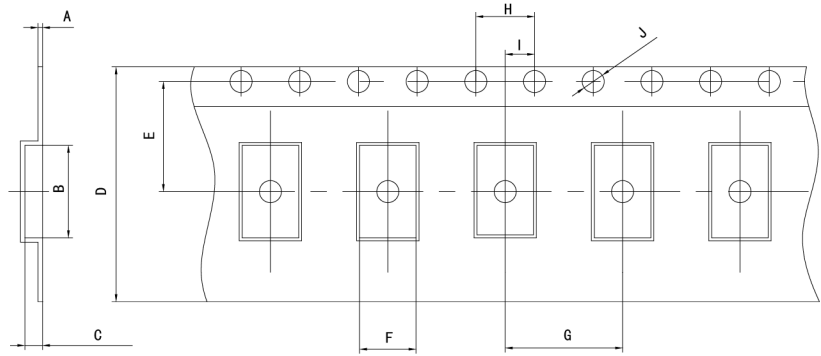
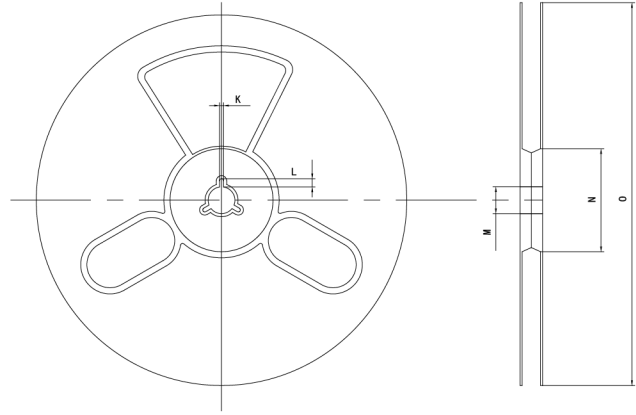
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## Packaging Information

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
2C	0.25±0.05	3.5±0.1	1.4±0.1	8.0±0.1	3.5±0.1	2.70±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

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## Common Frequencies – MHz

2C Series				
1.000	1.8432	2.000	2.048	3.579545
3.6864	4.000	4.096	4.9152	6.000
6.144	6.780	7.3728	8.000	8.192
10.000	11.0592	11.2896	12.000	12.288
13.000	13.560	14.31818	14.7456	16.000
16.384	18.432	19.200	20.000	22.1184
22.5792	24.000	24.576	25.000	26.000
27.000	28.63636	29.4912	30.000	32.000
32.768	33.000	33.330	33.333	33.3333
37.125	38.400	40.000	45.1584	48.000
49.152	50.000	54.000		