

# 1CV Series 2.0 x 1.6 mm SMD Crystal Oscillator

1 : 2.0×1.6×0.75 mm | SMD2016-4P

CV : Low Voltage Crystal Oscillator

## Feature

- Ceramic surface mount with Metal Lid
- CMOS compatible logic levels
- Tri-state function available
- Supply voltage range : 0.8V ~ 2.0V(1.2V typ.)
- RoHS Compliant / Pb Free

## Applications

- Wireless Devices
- Internet of Things (IoT) devices
- Fibre Channel
- Ethernet/Gigabit Ethernet
- Portable Electronics



## Electrical Specifications

Item	Symb.	Min.	Typ.	Max.	Unit	Notes
Frequency Range	Freq.	0.75		50.000	MHz	
Operating Temperature	T <sub>use</sub>	-20		+70	°C	
		-40		+85	°C	
Storage Temperature Range	T <sub>stg</sub>	-55		+125	°C	
Supply Voltage	V <sub>dd</sub>	0.8	1.2	2.0	V	
Output Load	L <sub>CMOS</sub>		15		pF	
Current Consumption	I <sub>cc</sub>			1.5	mA	No load condition, V <sub>dd</sub> =1.2V 0.75MHz ≤ Freq. < 12MHz
				1.7		No load condition, V <sub>dd</sub> =1.2V 12MHz ≤ Freq. < 24MHz
				2.0		No load condition, V <sub>dd</sub> =1.2V 24MHz ≤ Freq. < 50MHz
Duty Cycle	SYM	45		55	%	50 % V <sub>dd</sub> level, L <sub>CMOS</sub> ≤ 15 pF
Rise / Fall Time	T <sub>R</sub> / T <sub>F</sub>			5	nS	10% V <sub>dd</sub> to 90% Level
Start-up Time	T <sub>str</sub>			5	mS	To 90% of Final Amplitude
High output voltage	V <sub>OH</sub>	0.9V <sub>dd</sub>			V	
Low output voltage	V <sub>OL</sub>			0.1V <sub>dd</sub>	V	
Enable Voltage High(Logic 1)	V <sub>IH</sub>	0.7V <sub>dd</sub>			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>			0.3V <sub>dd</sub>	V	
Aging	f <sub>age</sub>			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

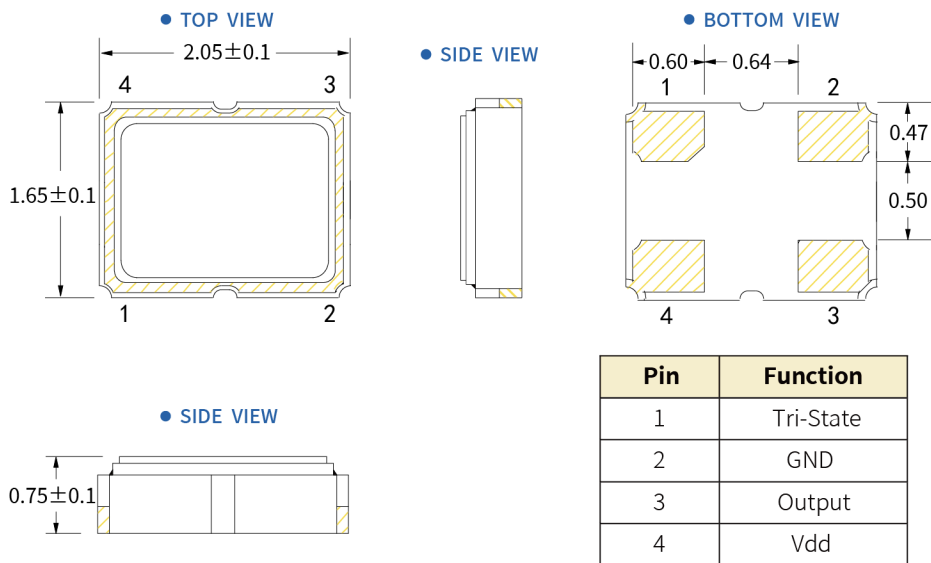
All condition: Include 25°C tolerance, operating temperature range, input voltage change, aging, load change.

# 1CV Series 2.0 x 1.6 mm SMD Crystal Oscillator

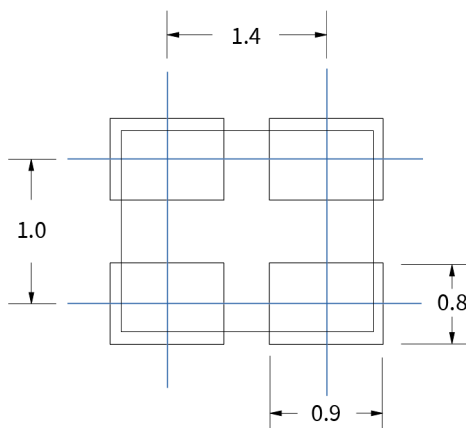
1 : 2.0×1.6×0.75 mm | SMD2016-4P

CV : Low Voltage Crystal Oscillator

## Dimensions (UNIT:mm)



## Solder pad layout (UNIT:mm)



## Options and Part Identification : Example SX1M25.000E20F30THN

Company	Ceramic Package	Frequency Code [MHz]	Supply Voltage	Frequency Tolerance	Operating Temperature	Frequency Drift	Output	Current Consumption	Phase Noise
<b>SX</b>	<b>1M</b>	<b>X.XXX</b>	<b>E</b>	<b>20</b>	<b>F</b>	<b>30</b>	<b>T</b>	<b>H</b>	<b>N</b>
Code Company		Frequency		Code Frequency Tolerance		Code Frequency Drift		Code Current	
SX SCTF		25.000 50.000		10 ±10ppm 20 ±20ppm		15 ±15ppm 20 ±20ppm 30 ±30ppm		H 3mA J 2mA K 1mA	
	Code Ceramic Package		Code Voltage		Code Operating Temperature		Code Output		Code Phase Noise
	7M 7.0×5.0×1.3mm 5M 5.0×3.2×1.2mm 3M 3.2×2.5×0.95mm 2M 2.5×2.0×0.81mm 1M 2.0×1.6×0.75mm		G 0.8V F 1.0V E 1.2V		E -20°C ~ +70°C F -40°C ~ +85°C		T Squarewave		N Standard

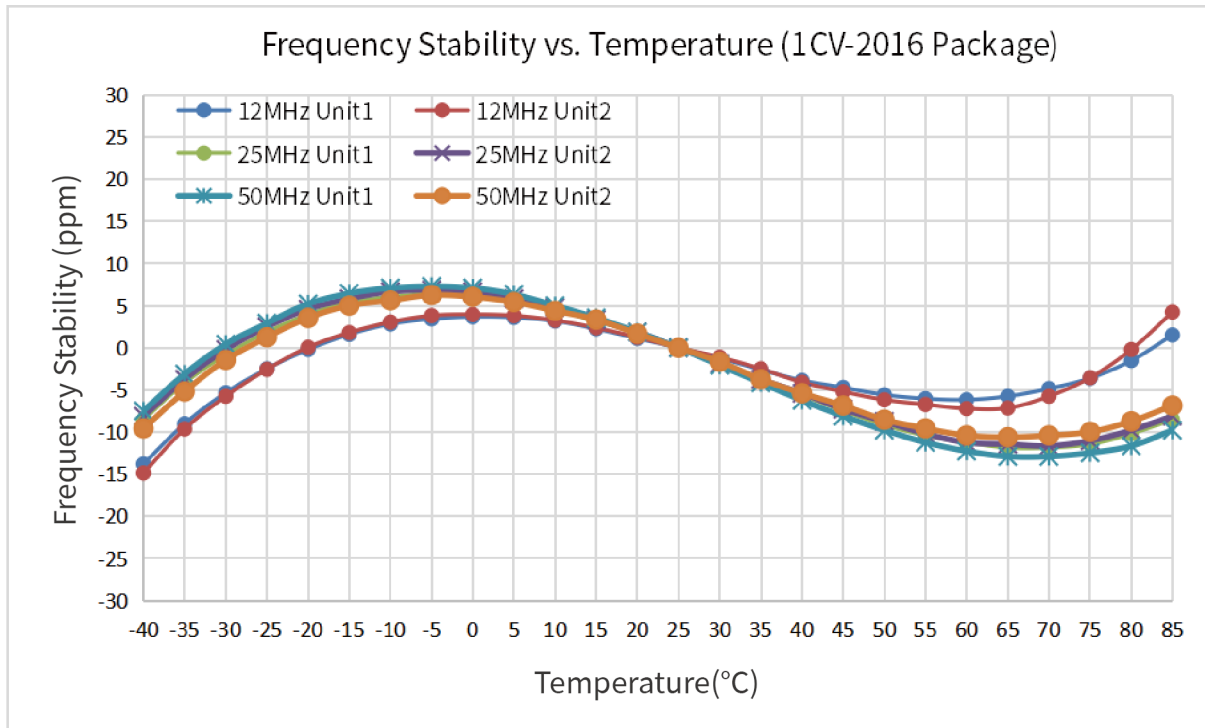
If you have other parameter requirements, you can contact **SCTF** at any time.

# 1CV Series 2.0 x 1.6 mm SMD Crystal Oscillator

1 : 2.0×1.6×0.75 mm | SMD2016-4P

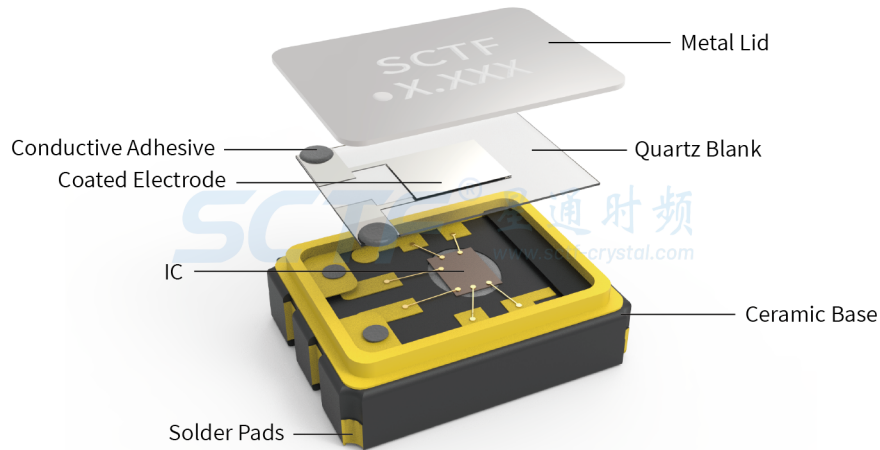
CV : Low Voltage Crystal Oscillator

## Frequency Temperature Characteristics

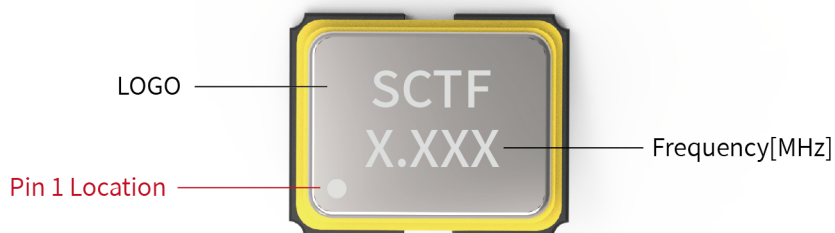


## Product Structure & Marking Information

### Product Structure



### Marking Information

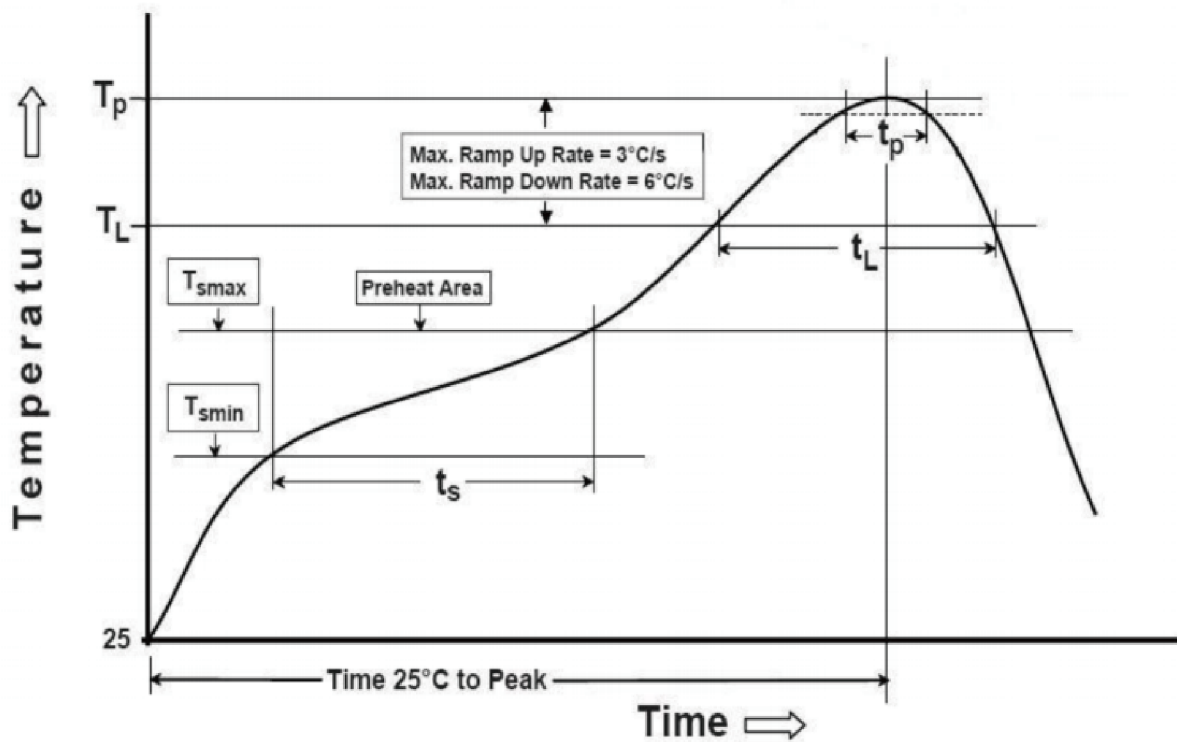


# 1CV Series 2.0 x 1.6 mm SMD Crystal Oscillator

1 : 2.0×1.6×0.75 mm | SMD2016-4P

CV : Low Voltage Crystal Oscillator

## Suggested Reflow Profile



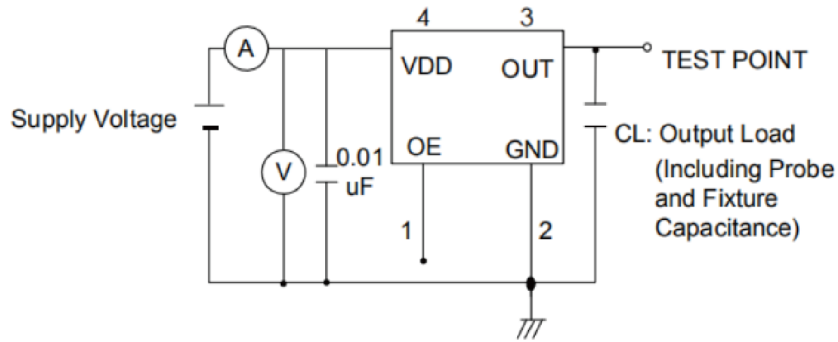
Profile Feature	Sn - Pb Eutectic Assembly	Preheat / Soak
Preheat / Soak <ul style="list-style-type: none"> <li>● Temperature Min ( <math>T_{smin}</math> )</li> <li>● Temperature Max ( <math>T_{smax}</math> )</li> <li>● Time ( <math>T_{smin}</math> to <math>T_{smax}</math> )</li> </ul>	100°C 150°C 60-120 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>	

# 1CV Series 2.0 x 1.6 mm SMD Crystal Oscillator

1 : 2.0×1.6×0.75 mm | SMD2016-4P

CV : Low Voltage Crystal Oscillator

## 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.

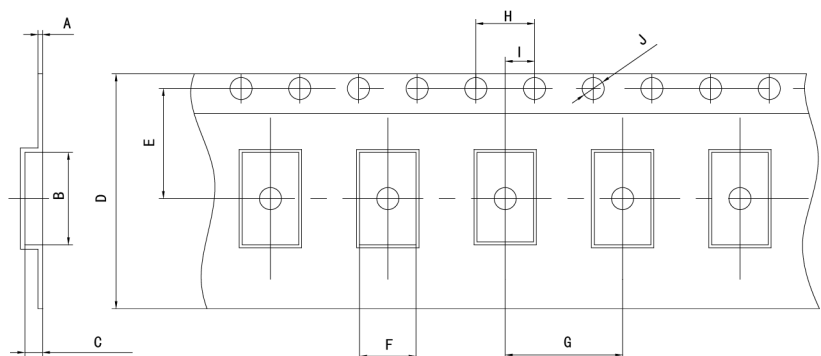
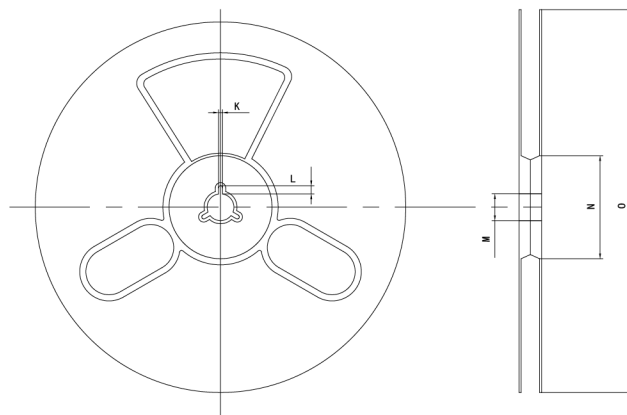
# 1CV Series 2.0 x 1.6 mm SMD Crystal Oscillator

1 : 2.0×1.6×0.75 mm | SMD2016-4P

CV : Low Voltage Crystal Oscillator

## 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
1CV	0.25±0.05	2.3±0.1	1.0±0.1	8.0±0.1	3.5±0.1	1.9±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

1CV Series				
1.000	1.024	2.000	2.048	3.579545
3.6864	4.000	4.096	4.9152	6.000
6.144	7.3728	8.000	8.192	10.000
11.0592	11.2896	12.000	12.288	14.7456
16.000	16.384	18.432	20.000	22.1184
22.5792	24.000	24.576	25.000	26.000
27.000	30.000	32.000	32.768	33.000
33.3333	36.000	40.000	45.000	45.1584
49.152	50.000			