

# TF2012 Series 2.0 x 1.2 mm TUNING FORK Crystal

TF : TUNING FORK Crystal

2016 : 2.0×1.2×0.6 mm | SMD2012-2P

## Feature

- Miniature Ceramic surface mount with Metal Lid
- Package Size: 2.05 x 1.2 x 0.6mm max.
- Low Aging, Low Power Consumption, high reliability characteristics
- RoHS Compliant / Pb Free

## Applications

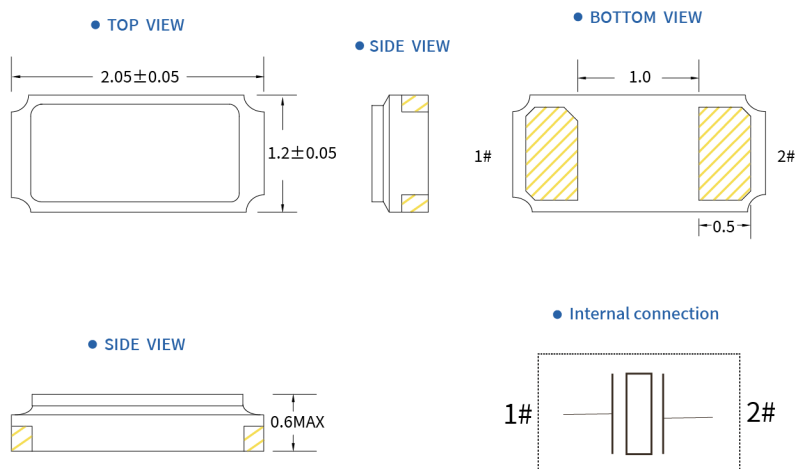
- Real Time Clock
- Portable Electronics
- Smart Meters
- Communication Electronics
- IoT Devices



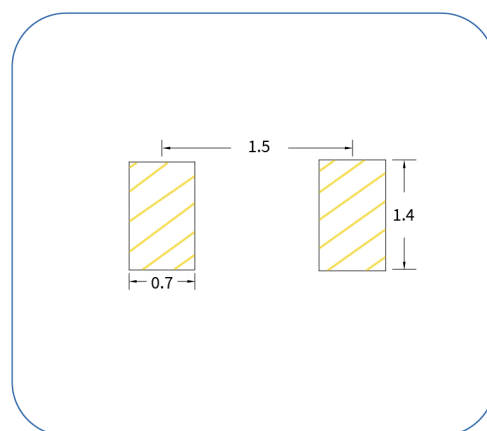
## Electrical Specifications

Item	Symb.	Electrical spec.		Notes
		TF2012	TF2012R	
Nominal Frequency	Freq.	32.768KHz		
Operating Temperature	T_use	-40°C~+85°C		
Storage Temperature Range	T_stg	-55°C~+125°C		
Oscillation Mode		Fundamental		
Frequency Tolerance	f_tol	±10ppm / ±20ppm		at 25°C ±3°C
Turnover Temperature	Ti	+25°C ±5°C		
Parabolic curvature constant	B	-0.042ppm/(Δ°C) <sup>2</sup> max.		Over Operating Temp. Range (Reference 25°C)
Drive Level	DL	0.5 μW Max.		
Load Capacitance	CL	6pF; 7pF; 9pF; 12.5pF		
Effective Resistance	RR	80kΩ max.	50kΩ max.	
Aging	f_age	±3 ppm Max.		1st. Year at 25°C

## Dimensions (UNIT:mm)



## Solder pad layout (UNIT:mm)



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## Options and Part Identification : Example SXTF2012R32768A20F

Company	Ceramic Package	Effective Resistance	Frequency Code [KHZ]	Load Capacitance	Frequency Tolerance	Operating Temperature
<b>SX</b>	<b>TF2012</b>	<b>R</b>	<b>32768</b>	<b>A</b>	<b>20</b>	<b>F</b>
↓	↓	↓	↓	↓	↓	↓
Code Company		Code Effective Resistance	Frequency		Code Frequency Tolerance	
SX SCTF		Blank Standard	32.768		10 ±10ppm	
		R 50kΩ max.			20 ±20ppm	
	Code Ceramic Package			Code Load Capacitance		
	TF1610 1.6×1.0×0.5mm			A 12.5pF		
	TF2012 2.0×1.2×0.6mm			G 9pF		
	TF3215 3.2×1.5×0.8mm			C 7pF		
	TF7015 7.0×1.5×1.4mm			D 6pF		
						Code Operating Temperature
						E -20°C ~ +70°C
						F -40°C ~ +85°C

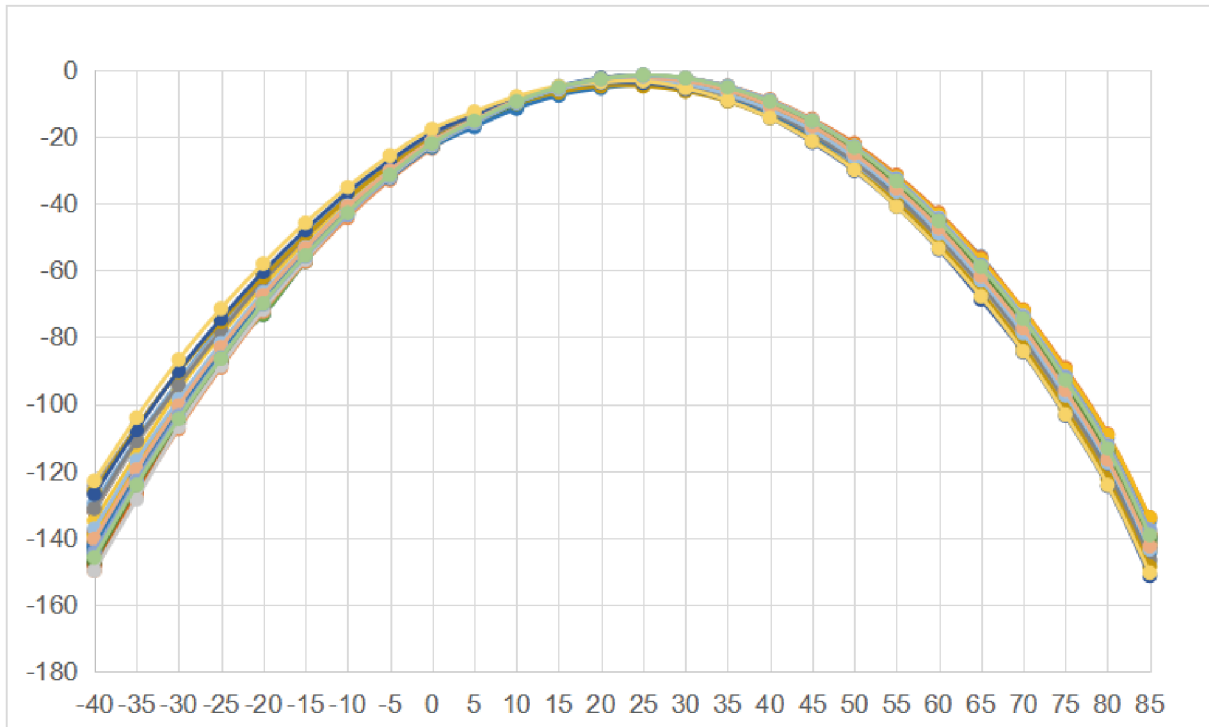
If you have other parameter requirements, you can contact **SCTF** at any time.

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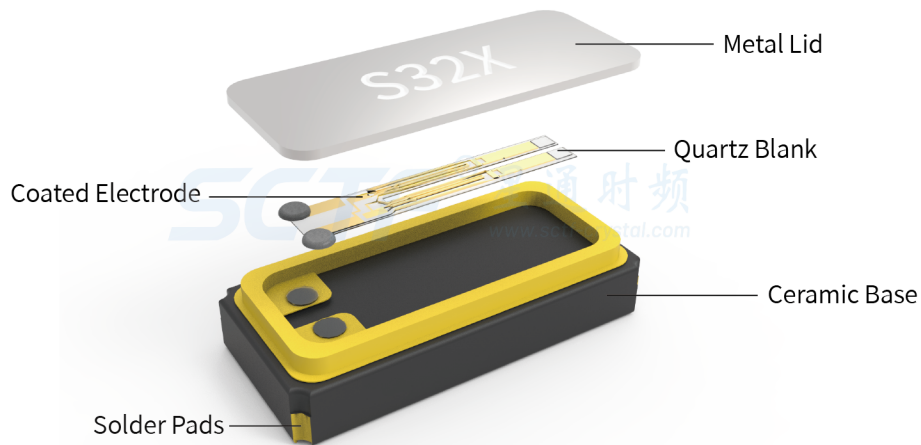
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## Frequency Temperature Characteristics

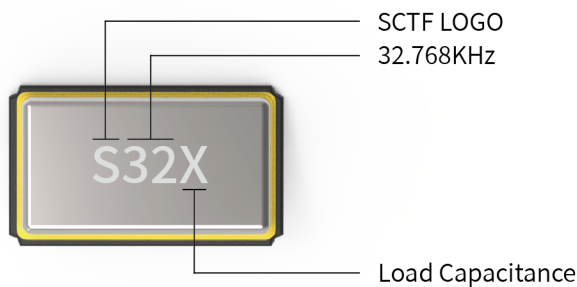


## Product Structure & Marking Information

### Product Structure

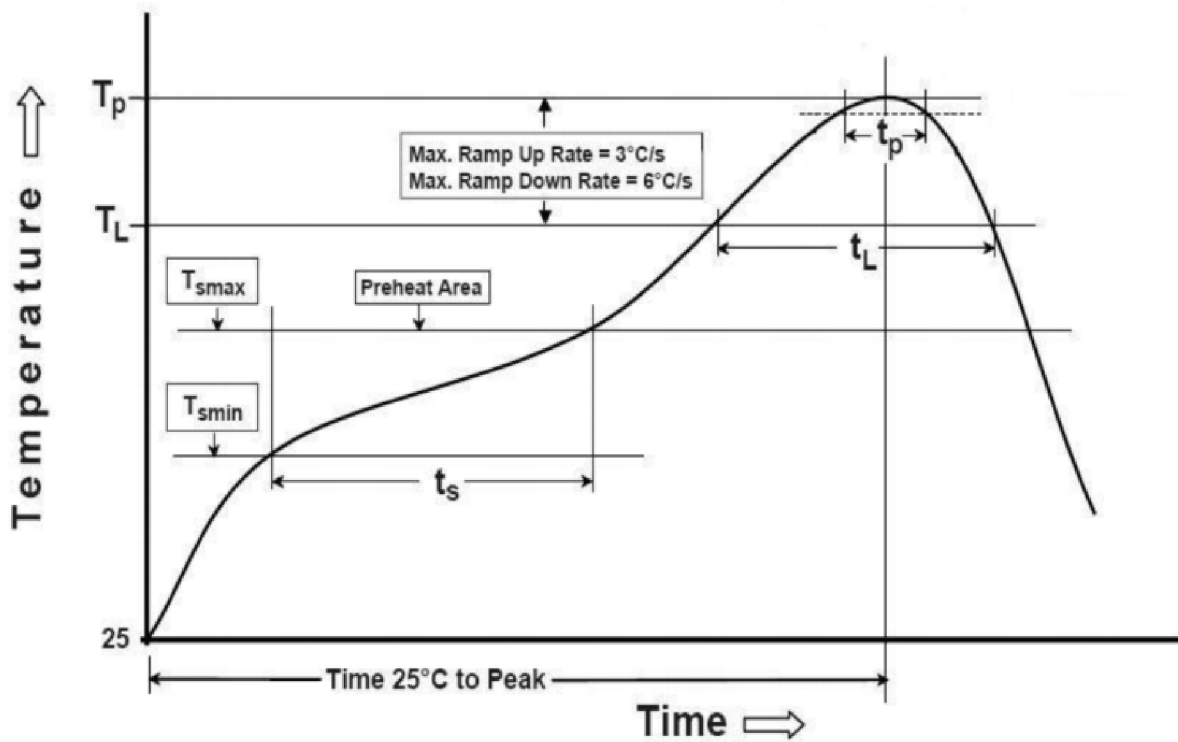


### Marking Information



*	Load Capacitance(CL)
A	12.5pF
C	7pF
D	6pF
G	9pF

## 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>	

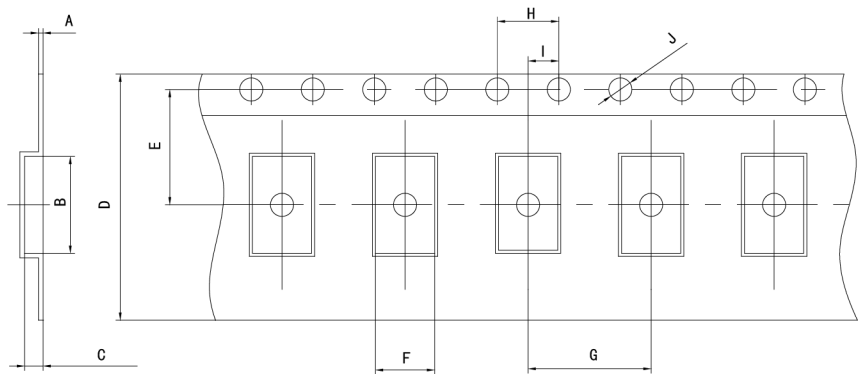
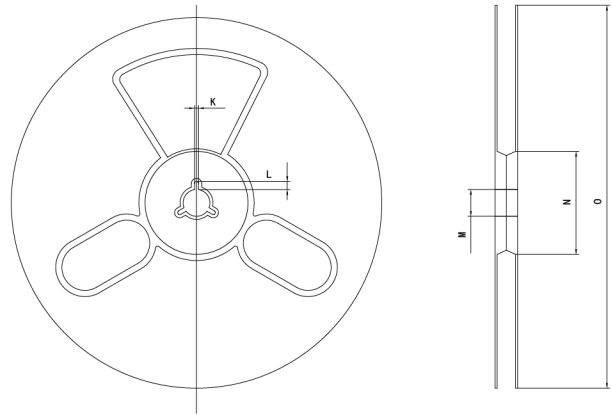
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## Packaging Information

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
TF2012 TF2012R	0.20±0.05	2.3±0.1	0.75±0.1	8.0±0.3	3.5±0.1	1.40±0.1	4±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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