

MHz Crystal Oscillator

0C / 1C / 2C / 3C / 5C / 7C

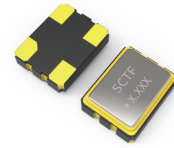


Feature

- Ultra Miniature Ceramic surface mount with Metal Lid
- CMOS compatible logic levels
- Tri-state function available
- Supply voltage : 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

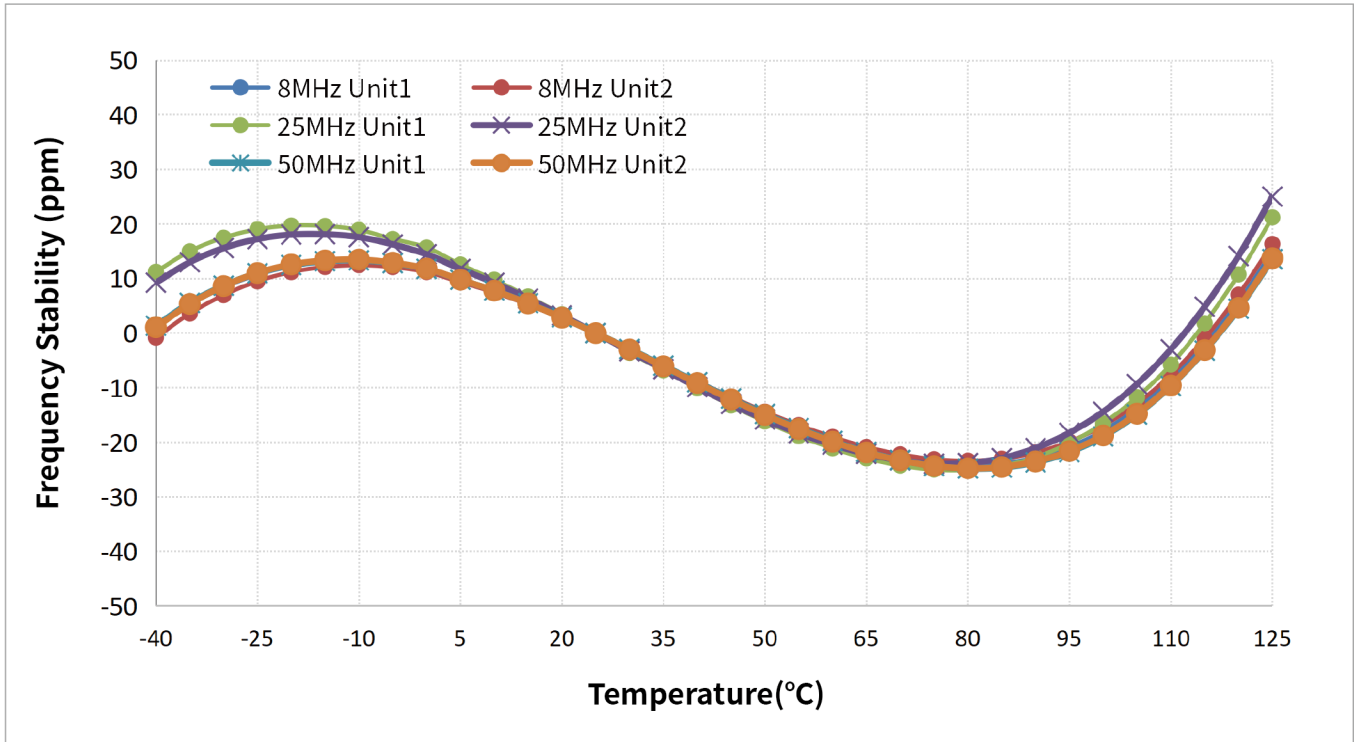


Electrical Specifications

Item	Symb.	Min.	Typ.	Max.	Unit	Notes
Frequency Range	Freq.	1	—	160	MHz	
Operating Temperature	T _{use}	-40	—	+85	°C	
		-40	—	+105	°C	
		-40	—	+125	°C	
Storage Temperature Range	T _{stg}	-55	—	+155	°C	
Supply Voltage	V _{dd}	2.97	3.3	3.63	V	
		2.25	2.5	2.75	V	
		1.62	1.8	1.98	V	
Output Load(CMOS)	L _{CMOS}	15			pF	
Current Consumption	I _{cc}	—	—	10	mA	1MHz ≤ Freq. < 40MHz, L _{CMOS} = 15pF
		—	—	20		40MHz ≤ Freq. < 80MHz, L _{CMOS} = 15pF
		—	—	40		80MHz ≤ Freq. < 160MHz, L _{CMOS} = 15pF
Duty Cycle	SYM	45	—	55	%	50% V _{dd} level, L _{CMOS} ≤ 15pF
Output Voltage	V _{OH}	0.9V _{dd}	—	—	V	
	V _{OL}	—	—	0.1V _{dd}		
Enable Voltage High	V _{IH}	0.7V _{dd}	—	—	V	Output will be disable if OE is Logic"0" Output will be enable if OE is Logic"1" or open
Disable Voltage Low	V _{IL}	—	—	0.3V _{dd}		
Rise / Fall Time	T _R / T _F	—	—	5	nS	10% V _{dd} to 90% V _{dd} level
Start-up time	T _{str}	—	—	5	mS	To 90% of Final Amplitude
Aging	f _{age}	-3	—	+3	ppm	at 25°C ± 3°C. First Year

Electrical Specifications Cont.

• Table 1: Frequency Stability VS. Temperature



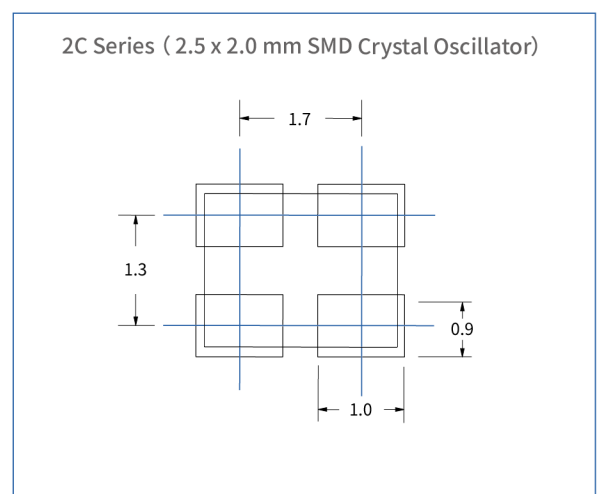
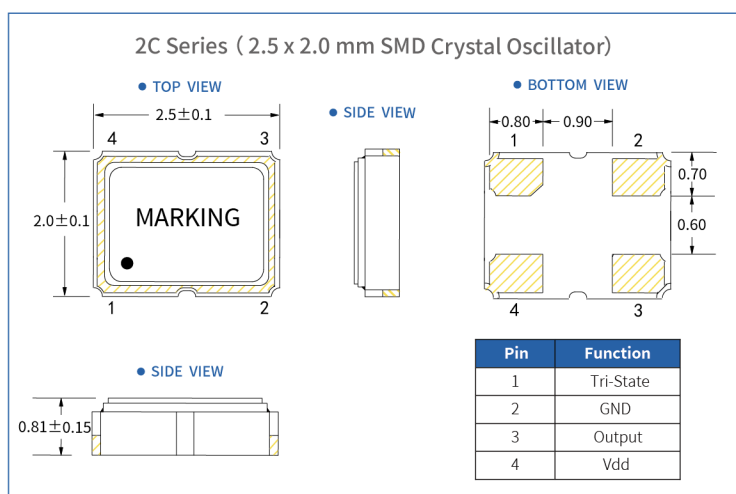
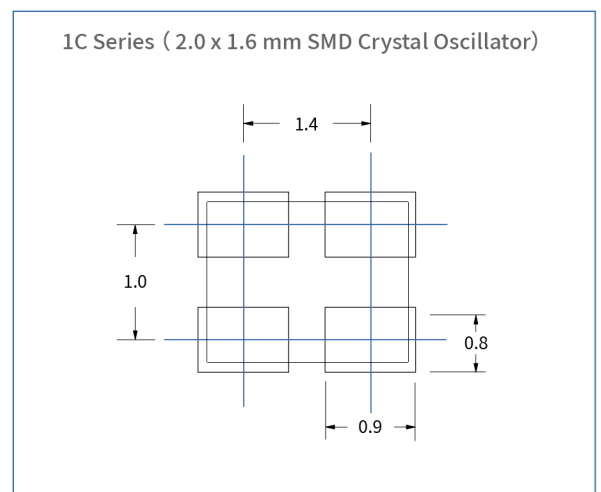
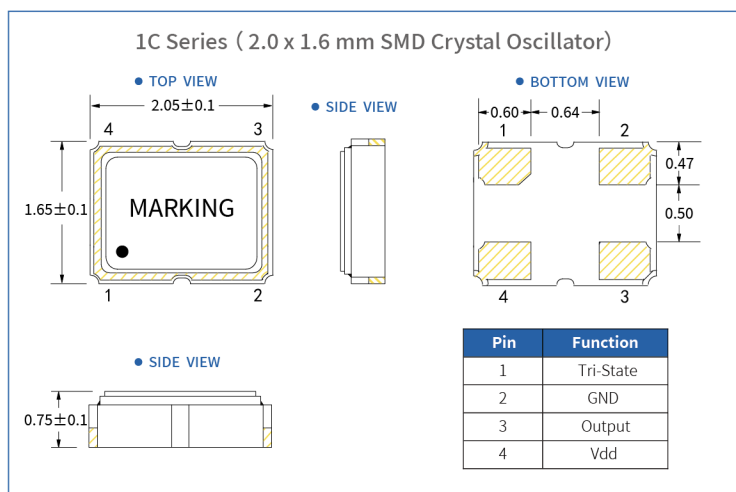
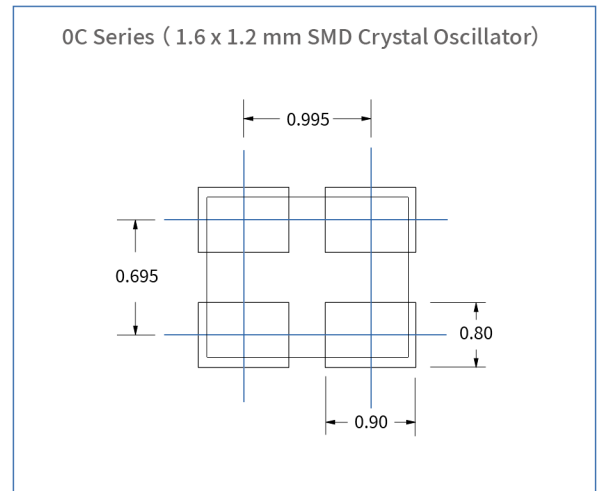
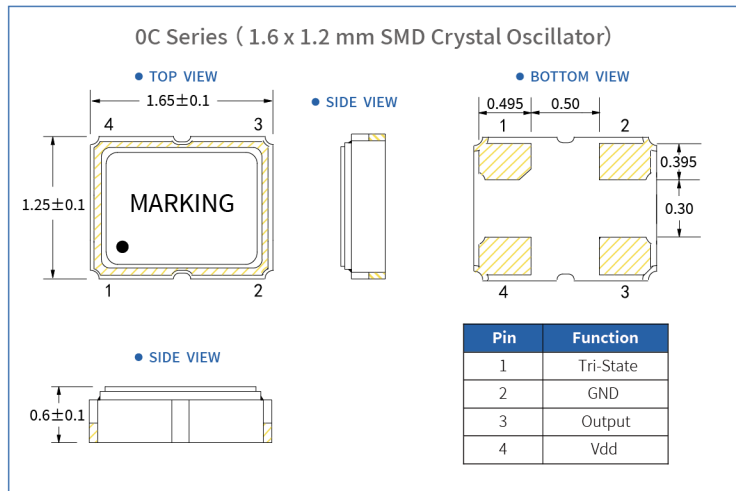
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Dimensions (UNIT:mm)

Solder pad layout (UNIT:mm)



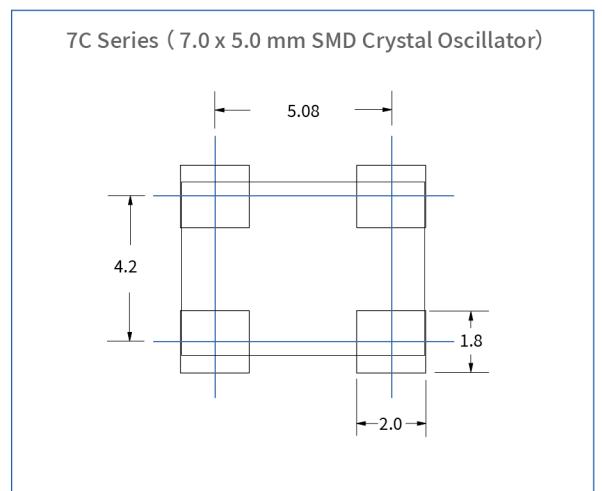
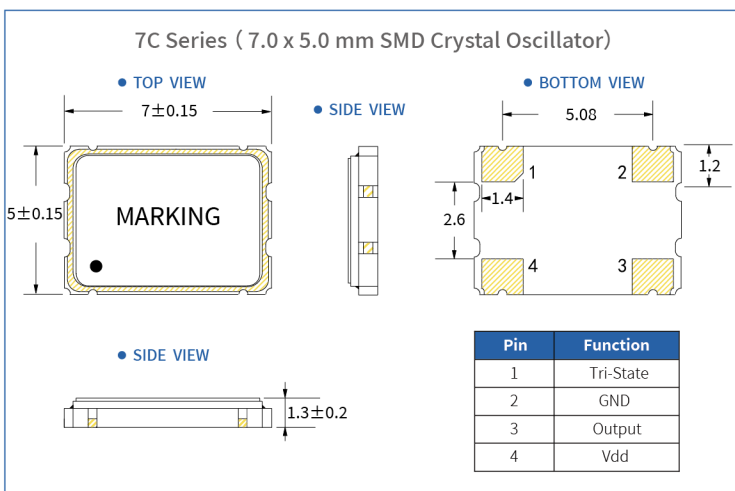
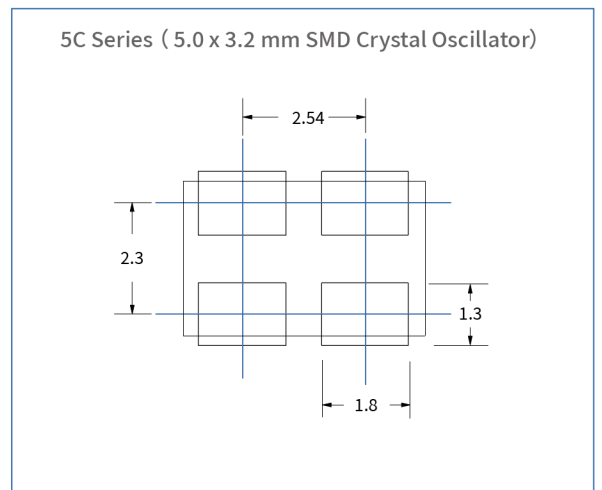
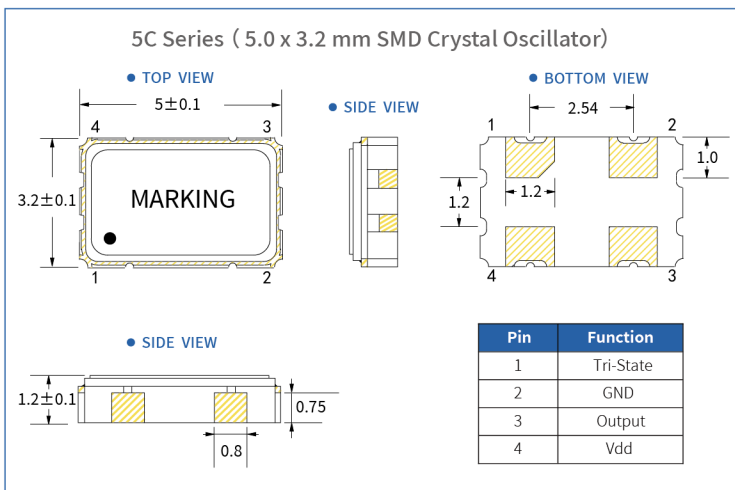
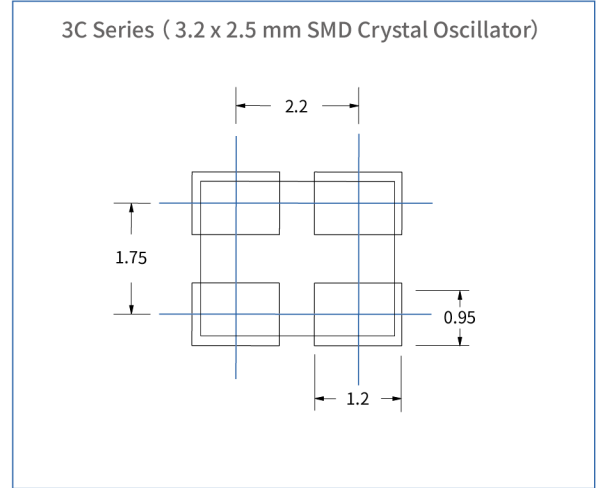
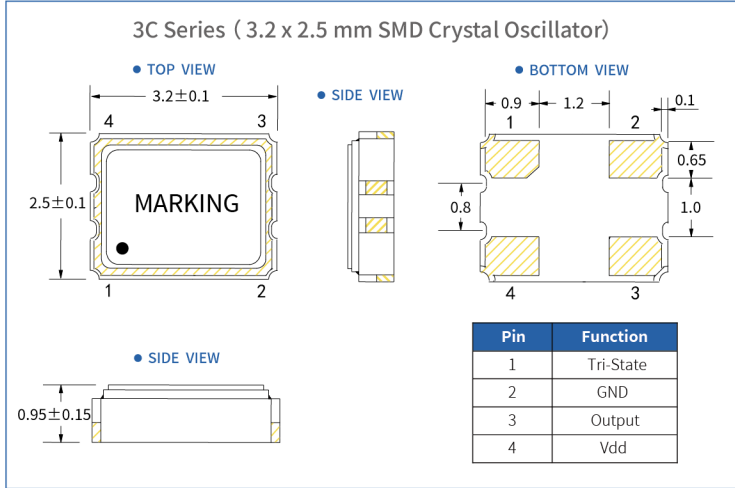
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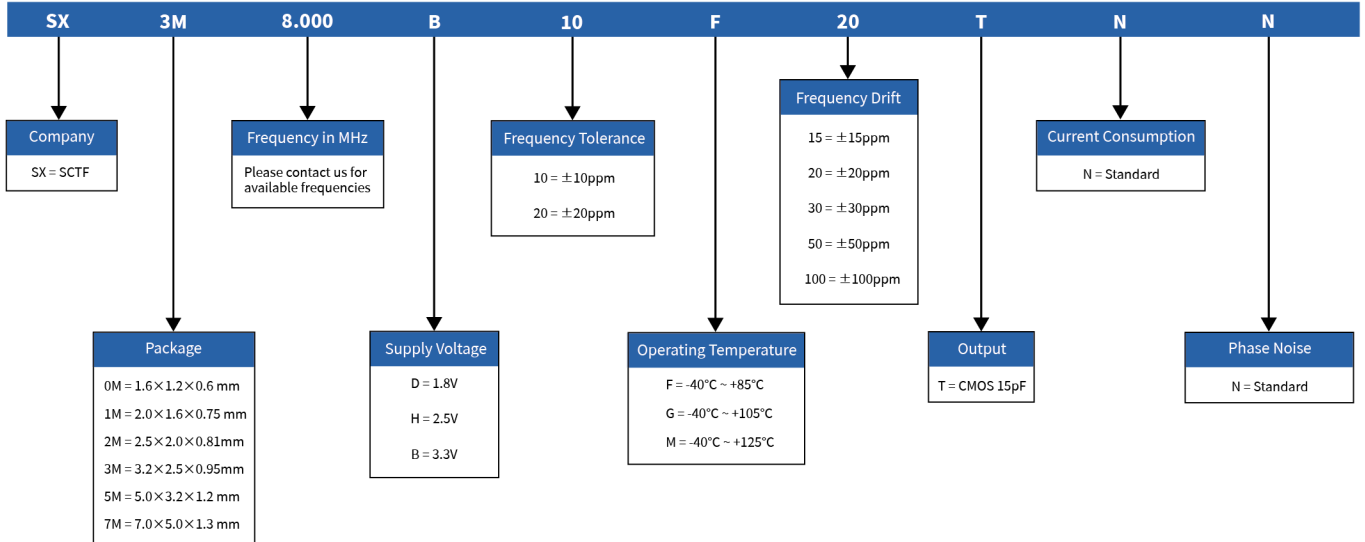
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Dimensions (UNIT:mm)

Solder pad layout (UNIT:mm)



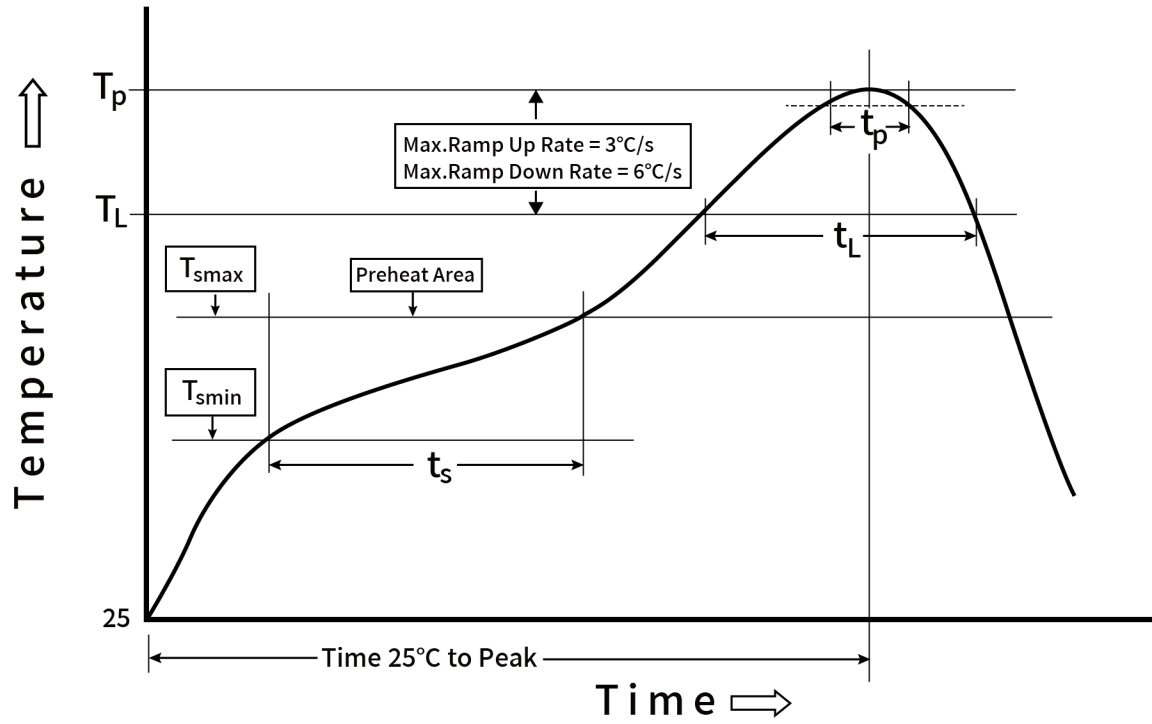
Options and Part Identification



List of available part numbers

Part NO#			
SX0M8.000B10F20TNN	SX1M8.000B10F20TNN	SX2M8.000B10F20TNN	SX3M8.000B10F20TNN
SX0M12.000B10F20TNN	SX1M12.000B10F20TNN	SX2M12.000B10F20TNN	SX3M12.000B10F20TNN
SX0M16.000B10F20TNN	SX1M16.000B10F20TNN	SX2M16.000B10F20TNN	SX3M16.000B10F20TNN
SX0M24.000B10F20TNN	SX1M24.000B10F20TNN	SX2M24.000B10F20TNN	SX3M24.000B10F20TNN
SX0M25.000B10F20TNN	SX1M25.000B10F20TNN	SX2M25.000B10F20TNN	SX3M25.000B10F20TNN
SX0M27.000B10F20TNN	SX1M27.000B10F20TNN	SX2M27.000B10F20TNN	SX3M27.000B10F20TNN
SX0M50.000B10F20TNN	SX1M50.000B10F20TNN	SX2M50.000B10F20TNN	SX3M50.000B10F20TNN
SX5M8.000B10F20TNN	SX7M8.000B10F20TNN		
SX5M12.000B10F20TNN	SX7M12.000B10F20TNN		
SX5M16.000B10F20TNN	SX7M16.000B10F20TNN		
SX5M24.000B10F20TNN	SX7M24.000B10F20TNN		
SX5M25.000B10F20TNN	SX7M25.000B10F20TNN		
SX5M27.000B10F20TNN	SX7M27.000B10F20TNN		
SX5M50.000B10F20TNN	SX7M50.000B10F20TNN		

Reflow Profile



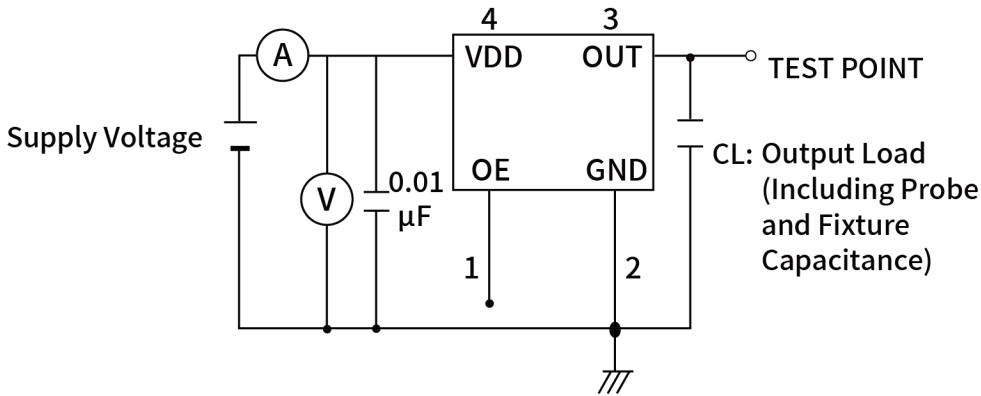
Profile Feature	Sn - Pb Eutectic Assembly	Preheat / Soak
Preheat / Soak <ul style="list-style-type: none"> ● Temperature Min (T_s min) ● Temperature Max (T_s max) ● Time (T_s min to T_s max) 	100°C 150°C 60-120 seconds	150°C 200°C 60-120 seconds
Ramp - up rate (T _L to T _p)	3°C/ second max.	3°C/ second max.
Time maintained above <ul style="list-style-type: none"> ● Liquidous temperature (T_L) ● Time (t_L) maintained above T_L 	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.
Suggest reflow times	2 Times max.	

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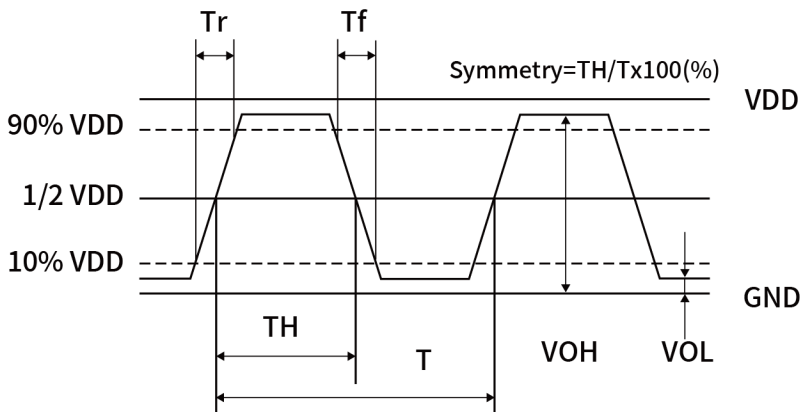
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Testing Circuit



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

Waveform Conditions

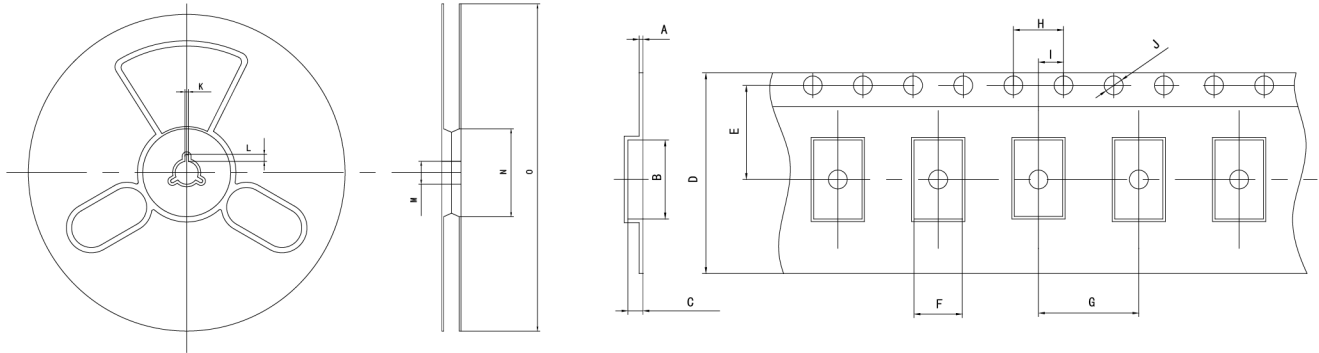


Waveform measurement system should have a min. bandwidth of 5 times the frequency being tested.

Reliability Specification

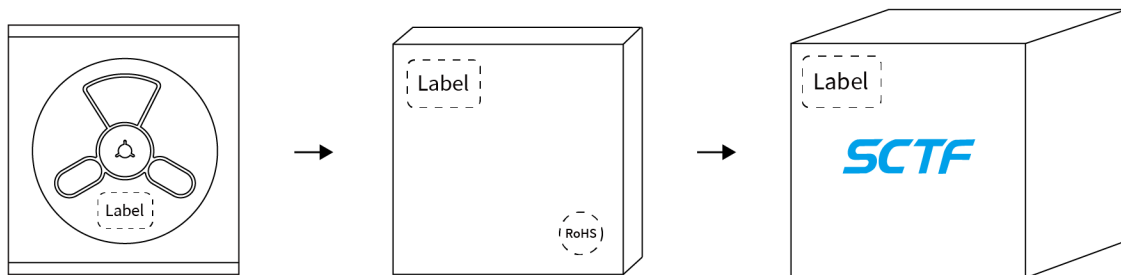
NO.	Item	Conditions	Basis of Verdict
1	Drop	High:100cm;Thickness:3cm;3 times.	$\Delta FL \leq \pm 5 \text{ppm}$
2	Vibration	Frequency:10~500HZ speed:11min/cycle Amplitude:1.5mm(10~55Hz) acceleration rate:200m/s ² (55~500Hz) Direction:X,Y,Z	$\Delta FL \leq \pm 5 \text{ppm}$
3	Low Temperature Storage	Temp:-40°C±2°C;Times:96h	$\Delta FL \leq \pm 5 \text{ppm}$
4	High Temperature Storage	Temp:125°C±2°C;Times:96h	$\Delta FL \leq \pm 5 \text{ppm}$
5	High Temp.&Humidity	Temp:80°C±2°C; Humidity:85%±5%;Times:1000h	$\Delta FL \leq \pm 5 \text{ppm}$
6	Thermal Shock	-40°C±2°C (30min) ↔ 85°C±2°C (30min) ; For 100 cycles	$\Delta FL \leq \pm 5 \text{ppm}$
7	Resistance to Soldering Heat	Keep 150 °C ± 5 °C 120s and then rose to 265 °C ± 5 °C for 10s,warming and holding time is less than the 200s, placed at room temperature 1 ~ 2h after test	$\Delta FL \leq \pm 5 \text{ppm}$
8	Aging	Temp:85°C;Times:30days	$\Delta FL \leq \pm 5 \text{ppm}$
9	Soldering Test	Dipping in solder bath at 245deg.C ± 5deg.C for 3±0.5 sec.	Soldering tin rate greater than 95%

Taping Specifications



Series	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
0C	0.25±0.05	1.8±0.1	0.7±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
1C	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
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
3C	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
5C	0.3±0.05	5.5±0.1	1.25±0.1	12±0.1	5.5±0.1	3.6±0.1	8.0±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
7C	0.3±0.05	7.6±0.1	2.0±0.1	16±0.3	7.5±0.1	5.4±0.1	8.0±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

Packaging specifications



■ 1 reel/box

■ 10 box/carton

Series	Packaging
0C	3,000 pcs/reel
1C	3,000 pcs/reel
2C	3,000 pcs/reel
3C	3,000 pcs/reel
5C	1,000 pcs/reel
7C	1,000 pcs/reel