Low Current MHz Crystal Oscillator

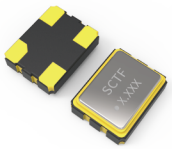
2L / 3L / 5L / 7L

Feature

- 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

- Internet of Things(IoT) devices
- Wireless Devices
- Medical Devices



Electrical Specifications

Item	Symb.		Min.	Typ.	Max.	Unit	Notes
Frequency Range	Freq.		1	—	54	MHz	
Standard Available Frequencies	Freq.		2.048，4.000，8.000，12.000，24.000			MHz	Contact SCTF for availability of frequencies not listed
Operating Temperature	T_use		-40	—	+85	℃	
Storage Temperature Range	T_stg		-55	—	+155	℃	
Supply Voltage	Vdd		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	Icc	Vdd=1.8V	—	—	46	μA	No load, Freq.=2.048MHz
			—	—	84		No load, Freq.=4.000MHz
			—	—	144		No load, Freq.=8.000MHz
			—	—	180		No load, Freq.=12.000MHz
			—	—	312		No load, Freq.=24.000MHz
		Vdd=3.3V	—	—	74	μA	No load, Freq.=2.048MHz
			—	—	136		No load, Freq.=4.000MHz
			—	—	244		No load, Freq.=8.000MHz
			—	—	301		No load, Freq.=12.000MHz
			—	—	606		No load, Freq.=24.000MHz
Duty Cycle	SYM		45	—	55	%	50% Vdd level
Output Voltage	V_{OH}		0.9Vdd	—	—	V	
	V_{OL}		—	—	0.1Vdd		
Enable Voltage High	V_{IH}		0.7Vdd	—	—	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}		—	—	0.3Vdd		
Rise / Fall Time	T_R / T_F		—	—	5	nS	10% Vdd to 90% Vdd level
Start-up time	T_str		—	—	5	mS	To 90% of Final Amplitude
RMS Phase Jitter	PJ		—	—	1	pS	Offset：12kHz to 5MHz
			—	—	1	pS	Offset：12kHz to 20MHz
Aging	f_age		-3	—	+3	ppm	at 25°C±3°C.First Year

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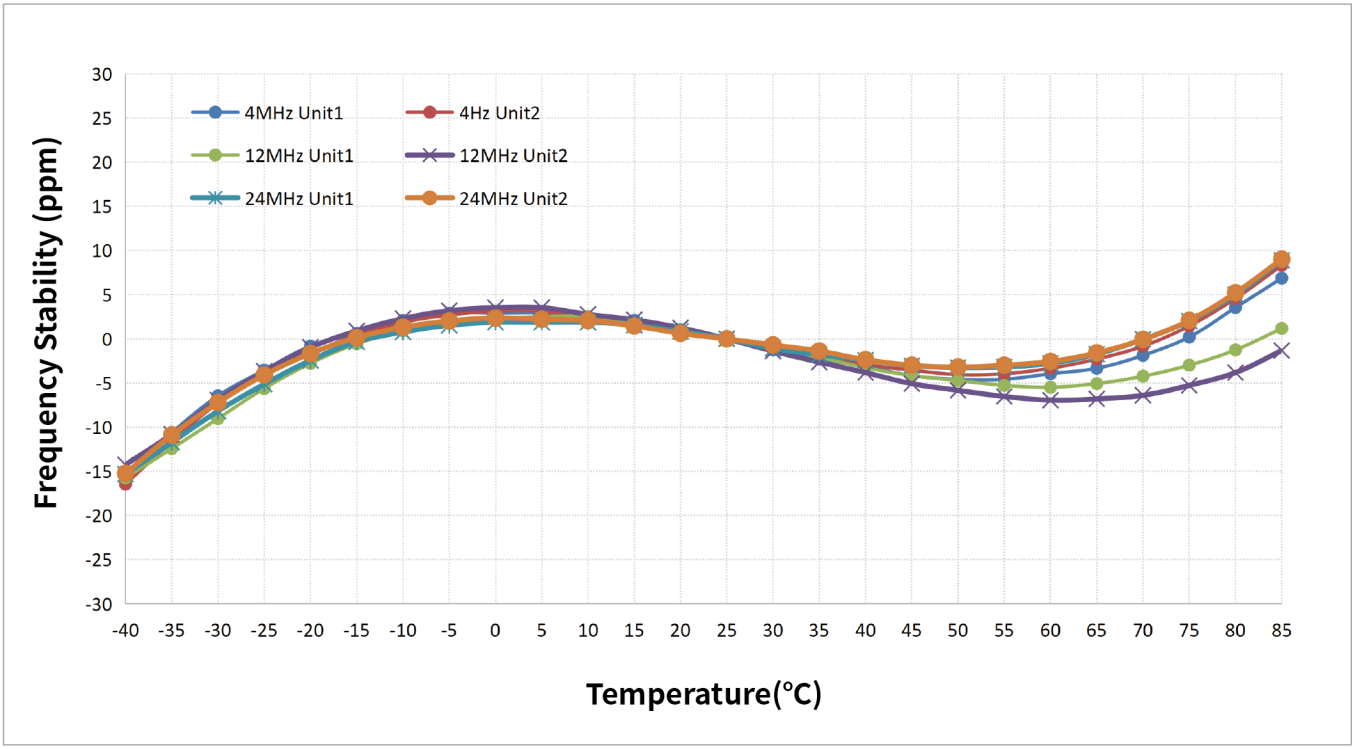
Revision: 05/12/2026

Electrical Specifications Cont.

- Table 1: Frequency Stability VS. Temperature



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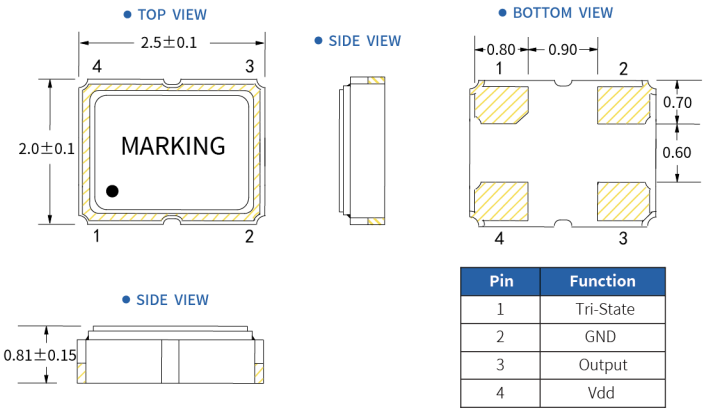
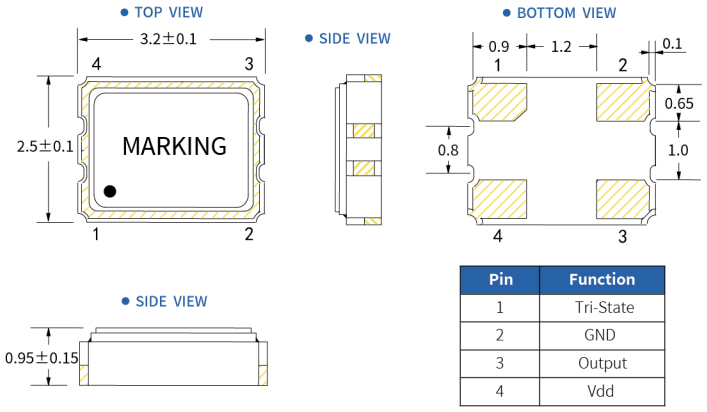
Dimensions (UNIT:mm)

2L Series (2.5 x 2.0 mm SMD Crystal Oscillator)



Pin	Function
1	Tri-State
2	GND
3	Output
4	Vdd

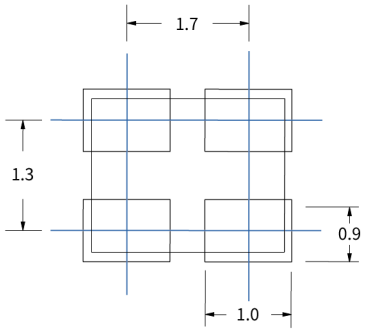
3L Series (3.2 x 2.5 mm SMD Crystal Oscillator)



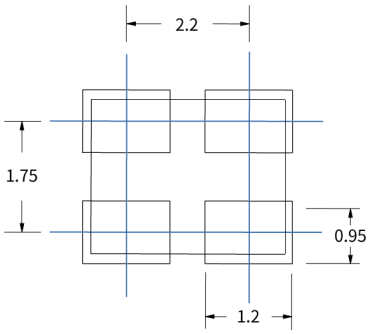
Pin	Function
1	Tri-State
2	GND
3	Output
4	Vdd

Solder pad layout (UNIT:mm)

2L Series (2.5 x 2.0 mm SMD Crystal Oscillator)



3L Series (3.2 x 2.5 mm SMD Crystal Oscillator)



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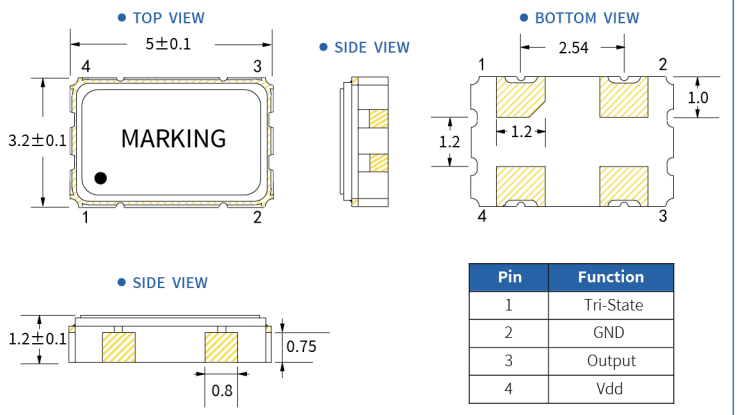
Dimensions (UNIT:mm)

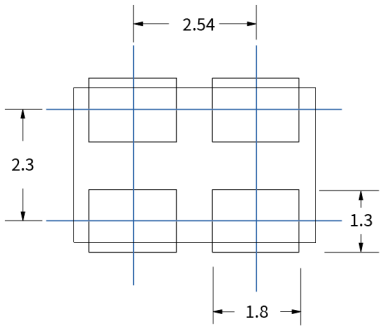
5L Series (5.0 x 3.2 mm SMD Crystal Oscillator)



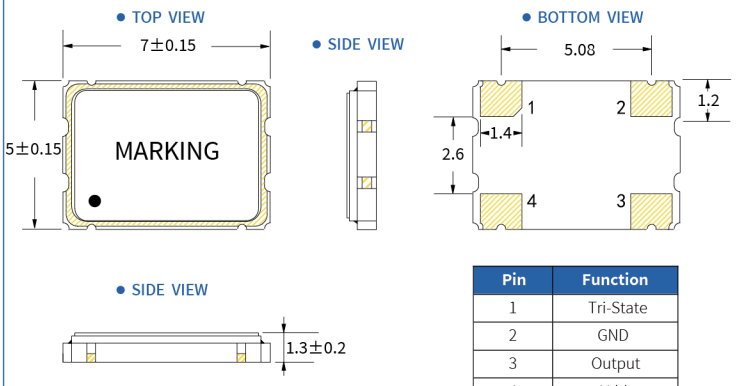
Pin	Function
1	Tri-State
2	GND
3	Output
4	Vdd

Solder pad layout (UNIT:mm)

5L Series (5.0 x 3.2 mm SMD Crystal Oscillator)

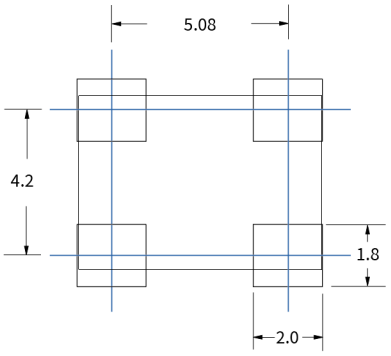


7L Series (7.0 x 5.0 mm SMD Crystal Oscillator)



Pin	Function
1	Tri-State
2	GND
3	Output
4	Vdd

7L Series (7.0 x 5.0 mm SMD Crystal Oscillator)



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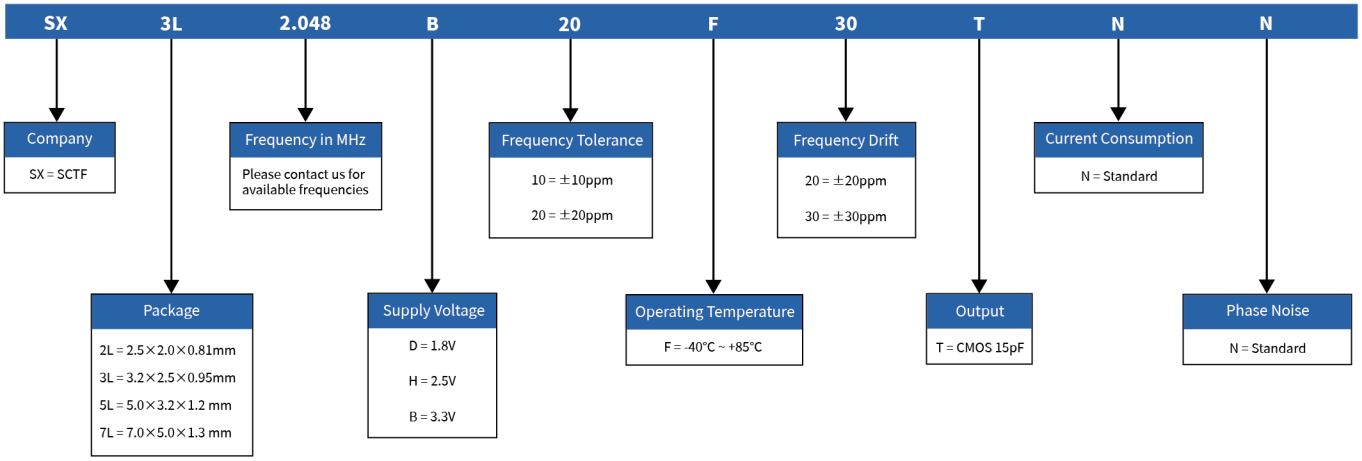
Options and Part Identification



List of available part numbers

Part NO#			
SX2L2.048D20F30TNN	SX2L2.048B20F30TNN	SX3L2.048D20F30TNN	SX3L2.048B20F30TNN
SX2L4.000D20F30TNN	SX2L4.000B20F30TNN	SX3L4.000D20F30TNN	SX3L4.000B20F30TNN
SX2L8.000D20F30TNN	SX2L8.000B20F30TNN	SX3L8.000D20F30TNN	SX3L8.000B20F30TNN
SX2L12.000D20F30TNN	SX2L12.000B20F30TNN	SX3L12.000D20F30TNN	SX3L12.000B20F30TNN
SX2L24.000D20F30TNN	SX2L24.000B20F30TNN	SX3L24.000D20F30TNN	SX3L24.000B20F30TNN

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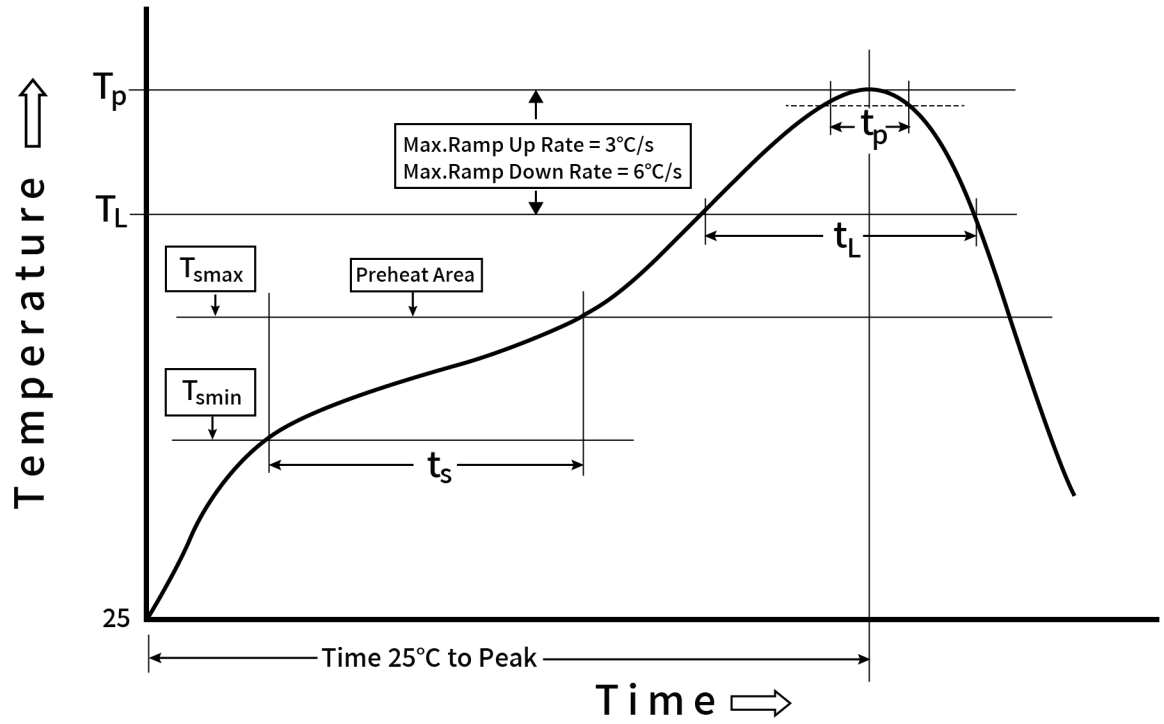
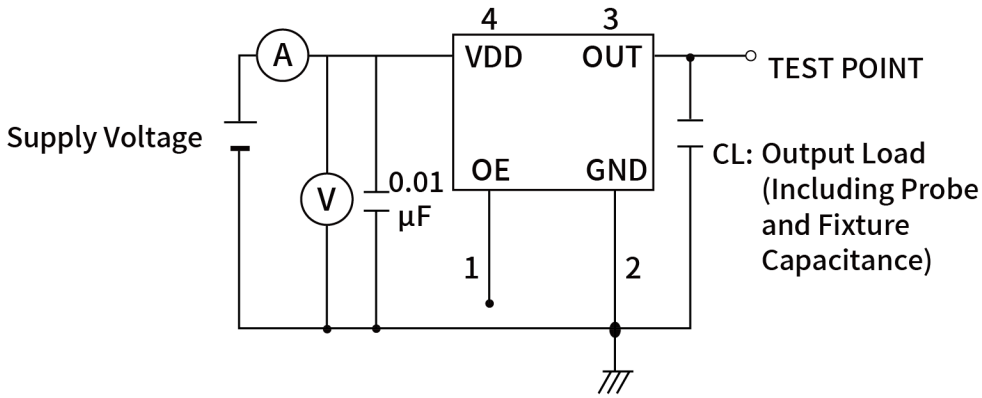
Reflow Profile



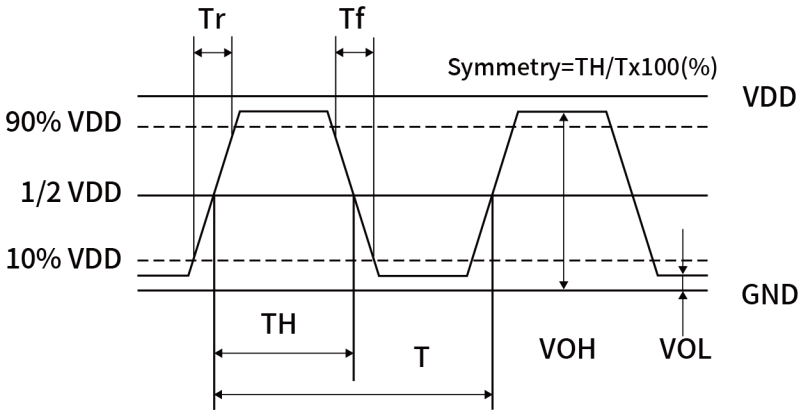
Profile Feature	Sn - Pb Eutectic Assembly	Preheat / Soak
Preheat / Soak ● Temperature Min (Ts min) ● Temperature Max (Ts max) ● Time (Ts min to Ts max)	100°C 150°C 60-120 seconds	150°C 200°C 60-120 seconds
Ramp - up rate (TL to Tp)	3°C/ second max.	3°C/ second max.
Time maintained above ● Liquidous temperature (TL) ● Time (tL) maintained above TL	183°C 60-150 seconds	217°C 60-150 seconds
Peak package body temperature (Tp)	235°C	260°C
Time within 5° C of the specified classification temperature (Tp)	20 seconds	30 seconds
Ramp - down rate (Tp to TL)	6°C/ second max.	6°C/ second max.
Time 25° C to peak temperature	6 minutes max.	8 minutes max.
Suggust reflow times	**2 Times max.**	

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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Reliability Specification

NO.	Item	Conditions	Basis of Verdict
1	Drop	High:100cm;Thickness:3cm;3 times.	△FL≤±5ppm
2	Vibration	Frequency:10~500HZ speed:11min/cycle Amplitude:1.5mm(10~55Hz) acceleration rate:200m/s2(55~500Hz) Direction:X,Y,Z	△FL≤±5ppm
3	Low Temperature Storage	Temp:-40°C±2°C;Times:96h	△FL≤±5ppm
4	High Temperature Storage	Temp:125°C±2°C;Times:96h	△FL≤±5ppm
5	High Temp.&Humidity	Temp:80°C±2°C; Humidity:85%±5%;Times:1000h	△FL≤±5ppm
6	Thermal Shock	-40°C±2°C（30min）←→85°C±2°C（30min）; For 100 cycles	△FL≤±5ppm
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	△FL≤±5ppm
8	Aging	Temp:85°C;Times:30days	△FL≤±5ppm
9	Soldering Test	Dipping in solder bath at 245deg.C ±5deg.C for 3±0.5 sec.	Soldering tin rate greater than 95%

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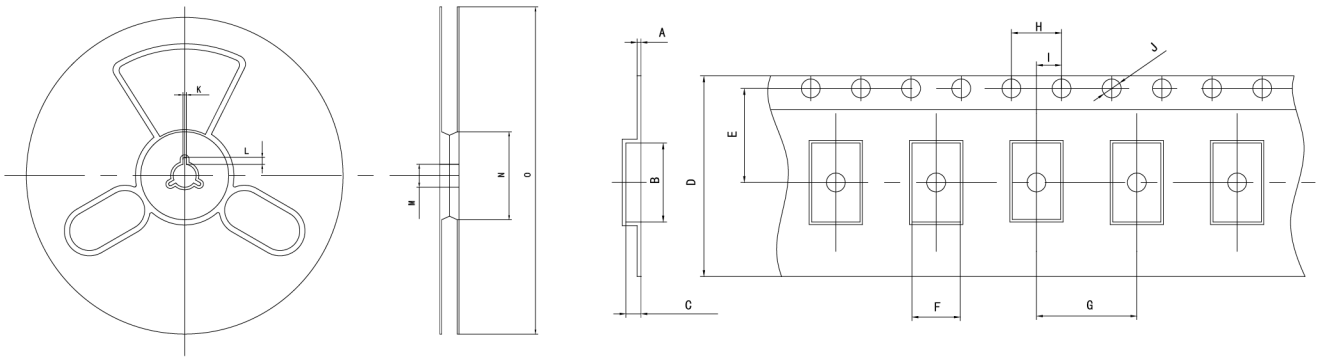
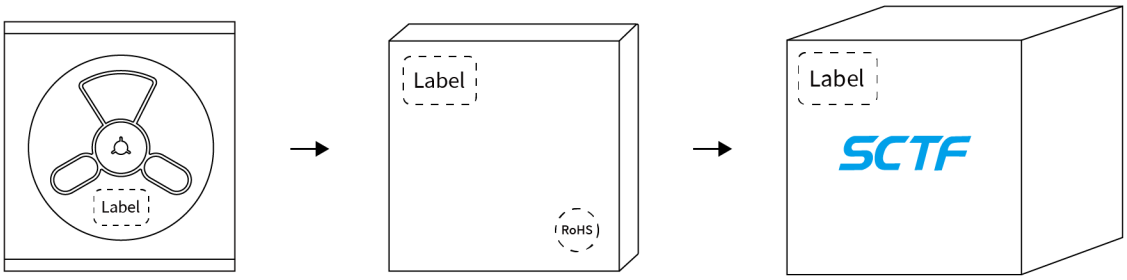
Taping Specifications



Pocket Tape Dimensions(mm)

Series	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
2L	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
3L	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
5L	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
7L	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
2L	3,000 pcs/reel
3L	3,000 pcs/reel
5L	1,000 pcs/reel
7L	1,000 pcs/reel

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