
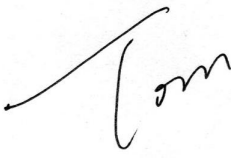
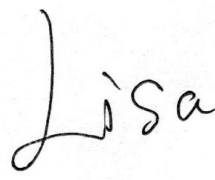


Customer	
Production Name	SMD TSX 2.0*1.6
Customer P/N	N/A
TROQ P/N	RX38400005
Revision	A
Print Date	2023/5/11

Drawn	Checked	Approved
		



RoHS Compliant



R
v2

TROQ P/N:

RX38400005

REV: A

● ELECTRICAL PARAMETERS

谐振器产品技术指标		Min	Max	Units	Remark	
1.Holder Type		TSX 2.0*1.6				
2.Mode of Oscillation		Fundamental				
3.Frequency		38.400000		MHz		
4.Load Capacitance (CL)		8		pF		
5.Shunt Capacitance (Co)		0	2	pF		
6.Equivalent Resistance			50	Ω		
7.Frequency Tolerance at 25°C		-10	10	ppm	at 25±3°C	
8.Stability over operation temperance		-12	10	ppm	-30 to +85°C	
9.Insulation Resistance (at D.C. 100V)		500		MΩ		
10.Drive Level		200		uw		
11.Operating Temperature Range		-30	105	°C		
12.Storage Temperature Range		-40	105	°C		
13.Aging		-1	1	ppm	First Year	
		-1.5	1.5		Second Year	
		-2.5	2.5		after 5years	
		-5	5		after 10years	
14.Frequency Perturbation		-0.5	0.5	ppm		
15.Tuning Sensitivity		7	16	ppm/pF	@CL=7pF	
16.Spurious Mode Series Resistance		1100		Ω	± 1MHz	
17.Driver Level Dependency	DLD2	2.5		Ω	0.01~100 ~0.01uW	
	DLDH2	1.5		Ω		
	FDDL	2		ppm		
	FDLDH	0.7		ppm		
18.Full Cycle Temperature Hysteresis		0.5		ppm	*Note 1	
19.Small Cycle Temperature Hysteresis		0.05		ppm	*Note 2	
20	1 st order coefficient	C1	-0.4	-0.1	ppm/°C	- 40 to +85°C
	2 nd order coefficient	C2	-4.5	4.5	ppm/°C ²	
	3 rd order coefficient	C3	8.5	11.5	ppm/°C ³	
21.Freq. Slope error	-10~60°C	-0.05	0.05	ppm/°C	*Note3	
	-30~85°C	-0.1	-0.1	ppm/°C		
22.Other(其他)	N/A					

Note 1 Temp.range:-30°C to 85°C for each 1°C(Temp.rate:~1.0°C/min)

Test flow:25°C(1)->-30°C->85°C->25°C(2)(25°C(1)freq.drift Subtrace 25°C(2)freq.drift)

Note 2 Temp.range:-30°C to 85°C for each 0.5°C(Temp.rate:~1.0°C/min)

Test flow:any 5°C cycle(ex.25°C(1)->-30°C->25°C(2),25°C(1) freq.drift subtract 25°C(2) freq.drift)

Note 3 Ta=-30°C to 85°C for each 1°C(Temp.rate:~1.0°C/min)

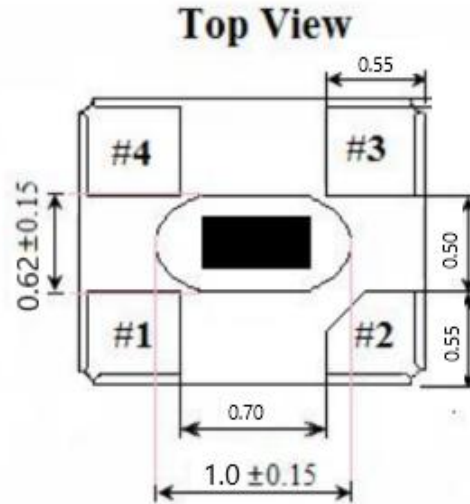
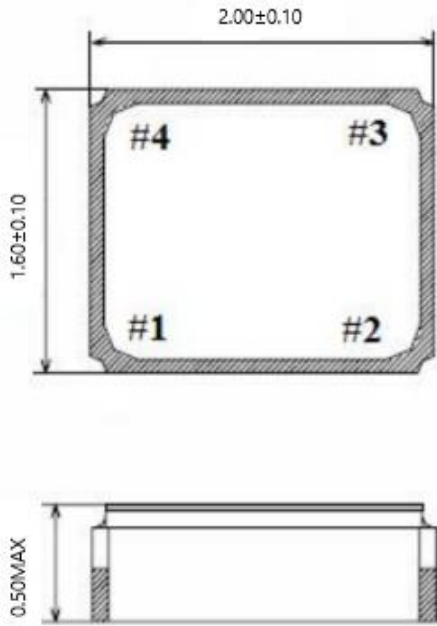
(difference from fifth-order curve fit)

●THERMISTOR ELECTRICAL SPECIFICATIONS

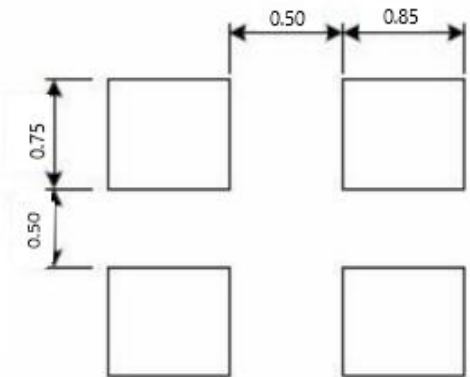
	Parameters	Symbol	Condition	Electrical Spec.				Note
				Min.	Typ.	Max.	Units	
1	Thermistor Size			0201				
2	Resistance (25°C)			100K±1%		Ω		
3	B-Constant (25-50°C)			4250±1%		K	*Note 4	

*Note 4: The B constant is calculated using the zero-power resistance values measured at 25°C and 50°C

● OUTLINE DIMENSIONS(UNIT:mm)

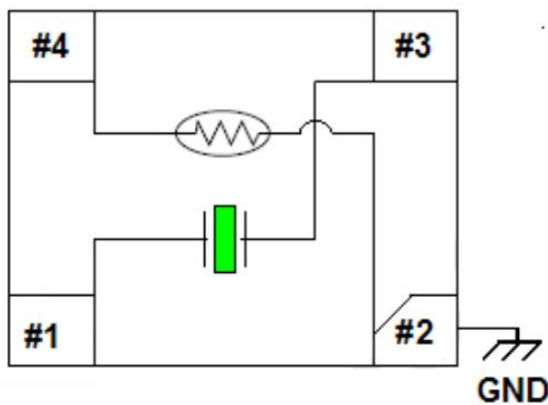


Recommended Solder Pattern

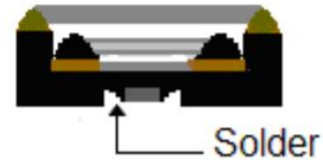
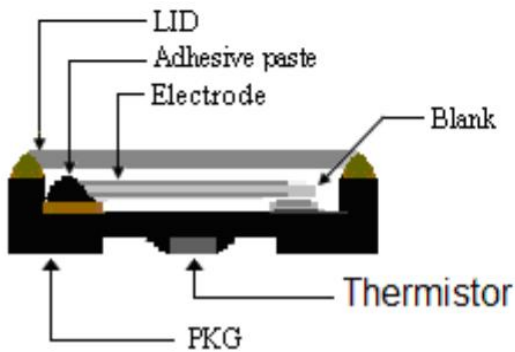
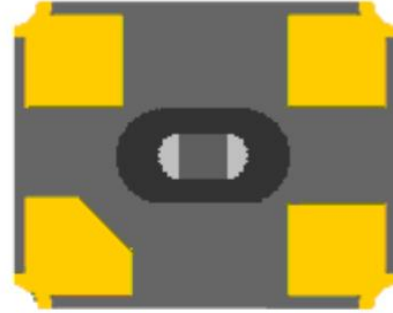
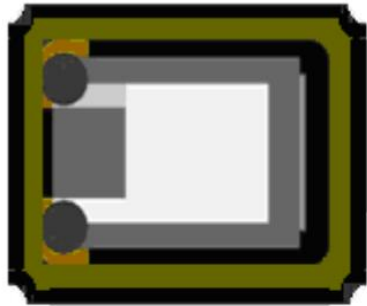


PIN	Connection
#1,#3	X'TAL
#2	Thermistor ,GND ,the metal LID
#4	Thermistor

● BLOCK DIAGRAM

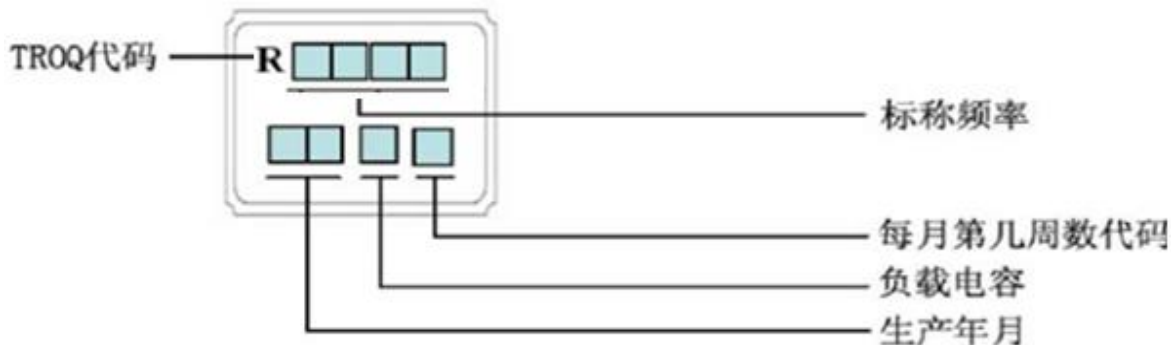


●Product Layout



NO.	PART	MATERIAL	REMARK
1	LID	KOVAR(Fe+Co+Ni alloy)	
2	PKG	Al ₂ O ₃	Base
3	Blank	SiO ₂	Quartz
4	Adhesive paste	Ag/Silicon	Support
5	Electrode	Noble metal	
6	Thermistor	Al ₂ O ₃ , Ag, Ni	
7	Solder	Sn/Ag/Cu 96.5/3/0.5	

● Marking (标记)



● 负载电容

负载电容 (CL)	5.7	10	12	12.5	15	16	18
代码	A	B	C	D	E	F	G
负载电容 (CL)	20	22	27	30	32	∞	8
代码	H	J	K	M	N	S	R
负载电容 (CL)	7	9	13	7.5			其他
代码	T	V	W	X	Y	Z	P

● 生产年月 (年份为12年一循环)

月份	1	2	3	4	5	6	7	8	9	10	11	12
代码	A	B	C	D	E	F	G	H	K	M	N	P

年份	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
代码	a	b	c	d	e	f	g	h	k	m	n	p

	周数	第一周	第二周	第三周	第四周	第五周
同订单 不同批 次代码	第一批	1	2	3	4	5
	第二批	A	B	C	D	E
	第三批	F	G	H	J	K
	第四批	L	M	N	P	Q
	第五批	R	S	W	X	Y



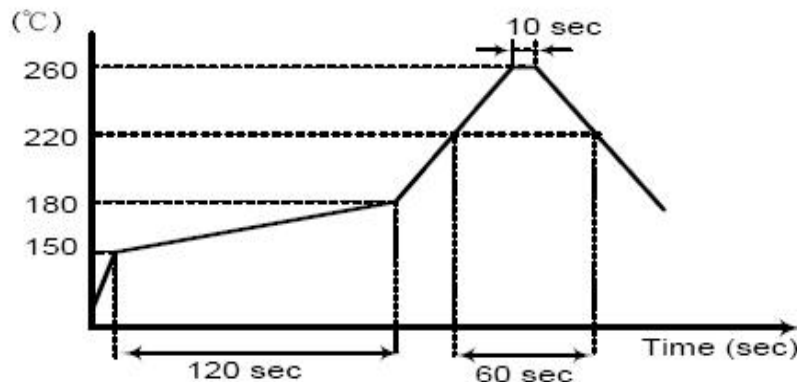
说明: 标称频率 25.000MHZ
负载电容20PF
2020年1月份第一周 TROQ制造

● **SUGGESTED REFLOW PROFILE** (回流焊曲线图)

Total time:200sec.Max. (总时间: 200秒 最大)

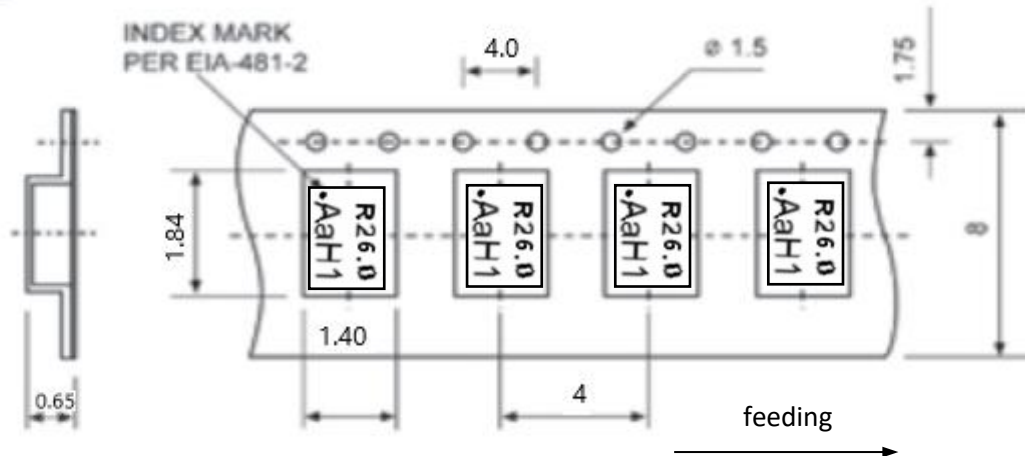
Solder melting point:220℃ (熔点220℃)

Profiles Feature (特性)		Pb-Free Assembly
Average Ramp-up Rate(Ts max to Tp)	平均升温速度	3℃/second Max
Preheat	预热	
■ Temperature Min (Ts min)	最低温度	125℃
■ Temperature Max (Ts max)	最高温度	200℃
■ Time (ts min to ts max)	从最低到最高时间	(60~180) seconds
Time maintained above	维持上述时间	
■ Temperature(T1)	温度	217℃
■ Time(tp)	时间	(60~150) seconds
Peak/Classification Temperature(Tp)	最高点温度	260℃
Time within 5℃ of actual Peak Temperature(tp)	高温维持时间	(20~40) seconds
Ramp-down rate	降温速度	6℃/second max
Time 25℃ to Peak Temperature	从25℃到最高温度的时间	8 minutes max
	建议 reflow次数	3 Times max



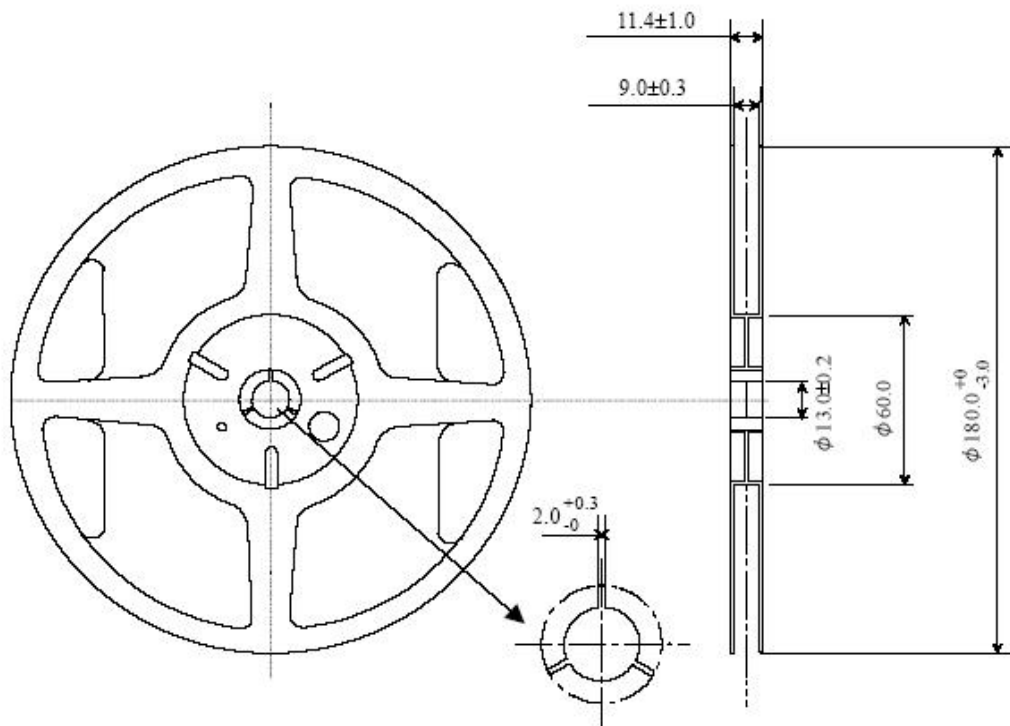
- PACKING (包装) 3Kpcs/REEL

編帶尺寸圖
Taping Dimensions



8.3. Reel dimension & Outline drawing

Material of the Reel : PS



● RELIABILITY SPECIFICATIONS (信赖度试验)

No	Test Item (测试项目)	Test Conditions (测试条件)	Reference (参考)
1	High Temperature High Humidity Storage (高温、高湿、储存)	Temperature: 85°C ± 3°C 温度: 85°C ± 3°C Relative Humidity: 85%RH 相对湿度: 85%RH Time: 250 Hours 时间: 250小时	JIS C5023
2	High Temperature Storage (高温储存)	Temperature: 125°C ± 3°C 温度: 125°C ± 3°C Time: 1000 Hours 时间: 1000 小时	MIL-STD-883E Method 1005.8
3	Low Temperature Storage (低温储存)	Temperature: -40°C ± 3°C 温度: -40°C ± 3°C Time: 1000Hours 时间: 1000小时	MIL-STD-883E Method 1013
4	Thermal Shock (温度冲击)	Temperature1: -55°C ± 5°C 温度1: -55°C ± 5°C Temperature2: 125°C ± 5°C 温度2: 125°C ± 5°C Temperature change between T1 and T2 5 min T1和T2温度在5分钟内改变 100cycles maintain T1 and T2 for 30 minutes each mone cycle 每次循环30分钟共100次	MIL-STD-202F Method 107 Condition A
5	RESISTANCE TO SOLDER HEAT (耐焊接热)	Solder Temperature: 260°C ± 5°C 焊槽温度: 260°C ± 5°C Time: 30 ± 1 Seconds 时间: 30 ± 1秒	MIL-STD-202F Method 210E
6	Solderability(可焊性)	The solder pot temperature is 245 ± 5°C , dwell time 5 ± 0.5sec 245 ± 5°C 焊锡槽浸润 5 ± 0.5秒	J-STD-002B
7	Drop Test (落下试验)	3 Times Free Fall from 150cm height table to 3cm thickness hard wood board 从150cm高度3次跌落到3cm厚硬质木板上	JIS C6701
8	MECHANICAL SHOCK (机械冲击)	Half sine wave, 1000 G 半正弦波, 加速度 1000G 3 Times for all 3 directions X、Y、Z 三个相互垂直方向各三次	MIL-STD-202F Method 213B
9	Vibration (机械振动)	Frequency Range: 10Hz ~ 2000Hz 频率范围: 10Hz ~ 2000Hz Amplitude: 1.5mm 振幅: 1.5mm 4 Hours in each direction, total 12 Hours X、Y、Z 三个相互垂直方向各振动4小时	MIL-STD-883E Method 2007.3
10	Leakage Test (气密性)	Take measurements with a helium Leakage detector 氦质检漏 Leakage Rate ≤ 1 × 10 ⁻³ Pa cm ³ /s 漏率 ≤ 1 × 10 ⁻³ Pa cm ³ /s	MIL-STD-883E

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