



TROQ Electronic Co.,Ltd.
CRYSTAL UNIT SPECIFICATIONS

Customer	
Production Name	Tuning Fork 2.0*1.2
TROQ P/N	RN32768B40
Revision	A
Print Date	2023/5/10

Drawn	Checked	Approved

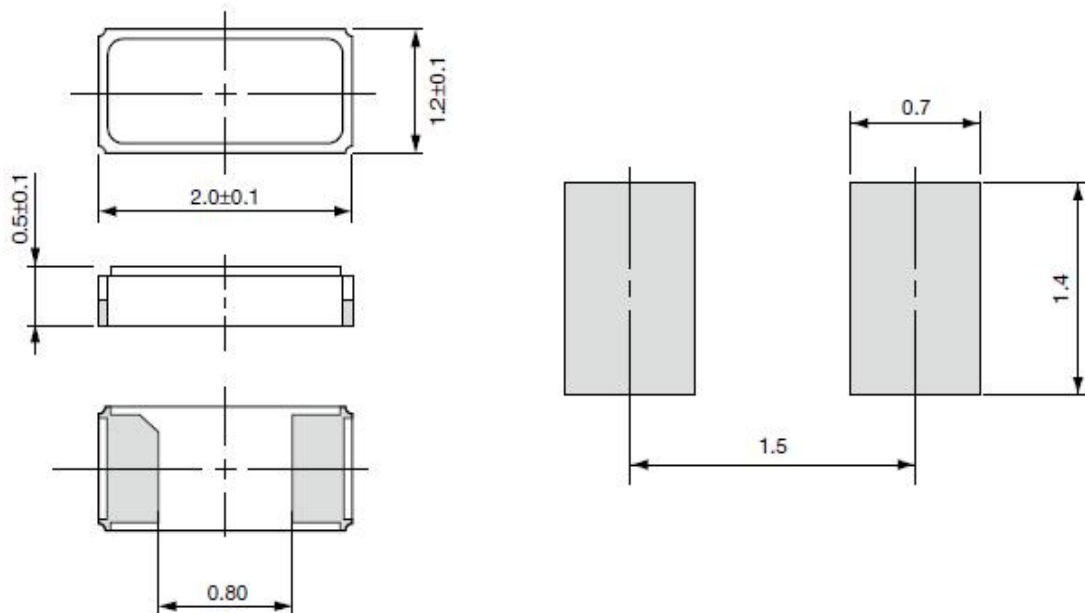


RoHS Compliant

● ELECTRICAL PARAMETERS

谐振器产品技术指标	Min	Max	Units
1. Holder Type(型号规格)	Tuning Fork 2.0*1.2		
2. Mode of Oscillation (振动模式)	Fundamental		
3. Frequency (标称频率)	32.768000		KHz
4. Load Capacitance (CL) (负载电容)	12.5		pF
5. Shunt Capacitance (Co) (静态电容)	0	TYP. 1.3	pF
6. Equivalent Resistance (谐振电阻)		70	kΩ
7. Frequency Tolerance at 25°C (调整频差)	-20	20	ppm
8. Temperature Coefficient (K) (温度系数)	-0.04		ppm/(Δ°C) ²
9. Insulation Resistance (at DC 100V) (绝缘电阻)	500		MΩ
10. Drive Level (激励功率)	1		uw
11. Operating Temperature Range (工作温度范围)	-40	85	°C
12. Storage Temperature Range (储存温度范围)	-55	125	°C
13. Aging (老化率)	± 3		ppm/year
14. Other(其他)	*Note 1: $F(T) = K * (T-t_0) * (T-t_0)$; $t_0=25^{\circ}\text{C}$		

OUTLINE DIMENSIONS(UNIT:mm) 外形尺寸 (单位: mm)

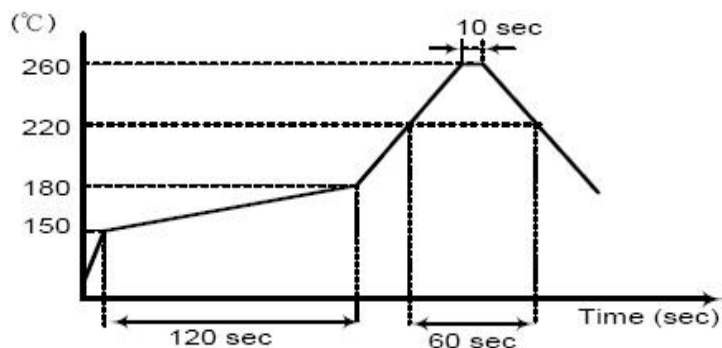


● **SUGGESTED REFLOW PROFILE** (回流焊曲线图)

Total time:200sec.Max. (总时间: 200秒 最大)

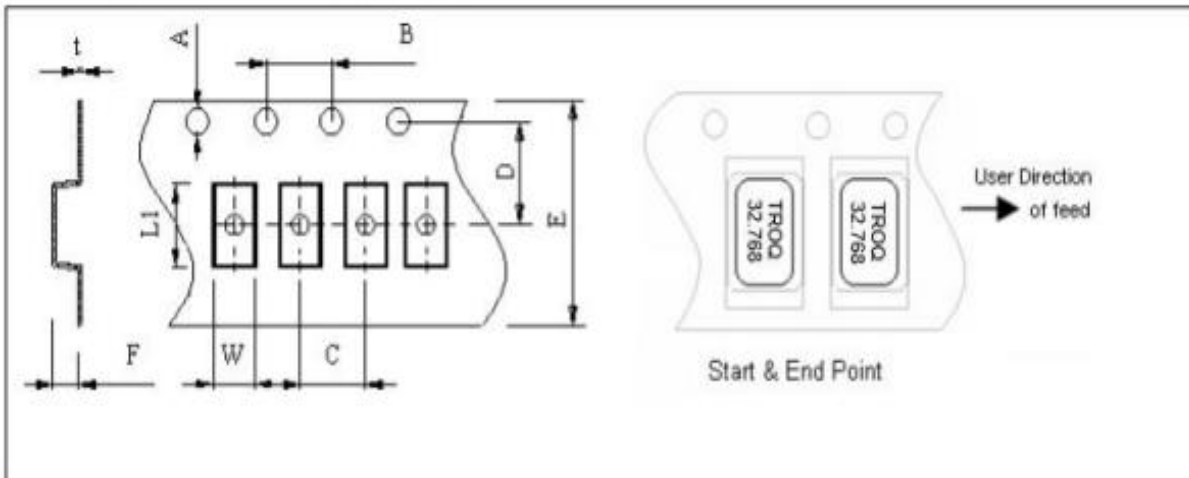
Solder melting point:220℃ (熔点220℃)

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
Suggest reflow times	建议 reflow次数	3 Times max



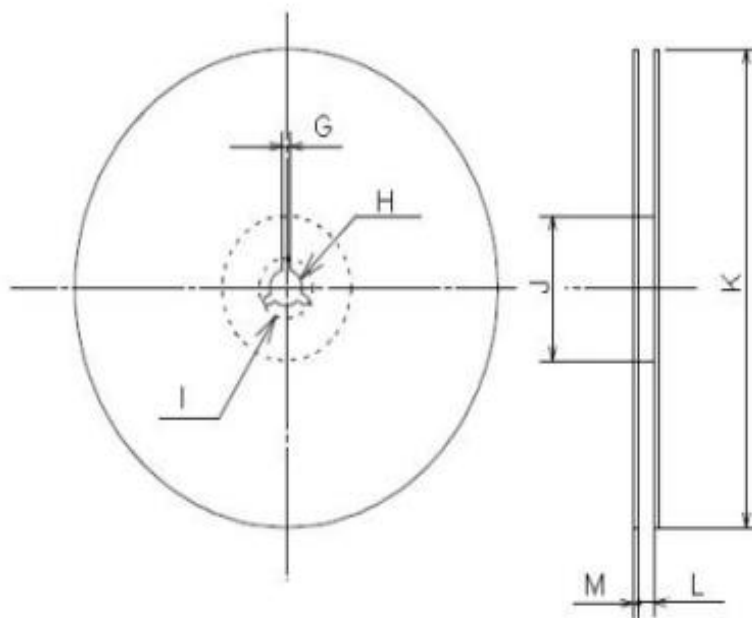
- PACKING (包装) 3Kpcs/REEL

Tape Dimensions(unit : mm)



A	B	C	D	E	F	L1	W	t
1.50	4.0	4.0	5.5	12.0	1.0	3.6	1.9	0.3

Reel Dimensions(unit: mm)



G	H	I	J	K	L	M
2.0	13.0	21.0	60.0	180	13.0	1.2

● 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: 96 Hours 时间: 96小时	JIS C5023
2	High Temperature Storage (高温储存)	Temperature: 125°C±3°C 温度: 125°C±3°C Time: 96 Hours 时间: 96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: 96Hours 时间: 96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: 85°C±5°C 温度2: 85°C±5°C Temperature change between T1 and T2 5 min T1和T2温度在5分钟内改变 10cycles maintain T1 and T2 for 30 minutes each mone 每次循环30分钟共10次	MIL-STD-202F Method 107 Condition A
5	RESISTANCE TO SOLDER HEAT (耐焊接热)	Solder Temperature: 265°C±5°C 焊槽温度: 265°C±5°C Time: 10±1 Seconds 时间: 10±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 50cm height table to 3cm thickness hard wood board 从50cm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~55Hz 频率范围: 10Hz~55Hz Amplitude: 0.75mm 振幅: 0.75mm 2 Hours in each direction, total 6 Hours X、Y、Z 三个相互垂直方向各振动2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