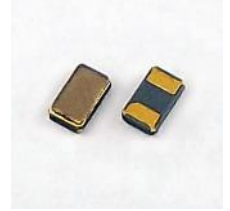
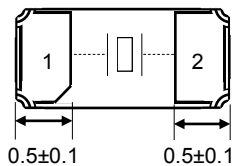
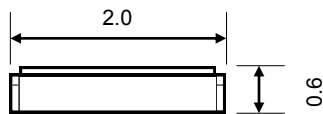


**MINIATURE CERAMIC SMD TUNING FORK CRYSTAL (2 x 1.2 x 0.6mm)**
**FEATURES:**

- SMALLEST CERAMIC SMD PACKAGE 32.768KHz
- EXCELLENT HEAT RESISTANCE
- -40°C TO 85°C OPERATING TEMPERATURE

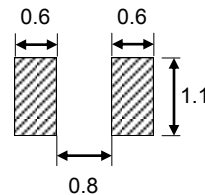


MODEL	CS2012
FREQUENCY	32.768KHz
FREQUENCY TOLERANCE @ 25°C ± 2°C	± 20ppm max.
OPERATING TEMPERATURE	-40°C to 85°C
TURN OVER TEMPERATURE	25°C ± 5°C
TEMPERATURE COEFFICIENT	-0.045 x 10 <sup>-6</sup> / °C <sup>2</sup> Max
STORAGE TEMPERATURE	-40°C to 85°C
LOAD CAPACITANCE	12.5pF
SHUNT CAPACITANCE	2.0pF typical
ESR	90KΩ max.
DRIVE LEVEL	0.5uW max
AGING (First Year)	± 3.0ppm max. @ 25°C ± 3°C

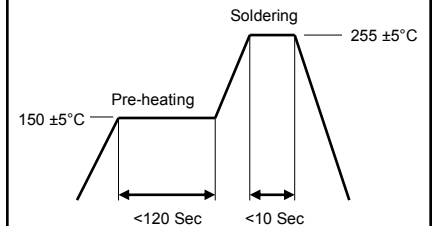
**PACKAGE DIMENSIONS**


Unit : mm

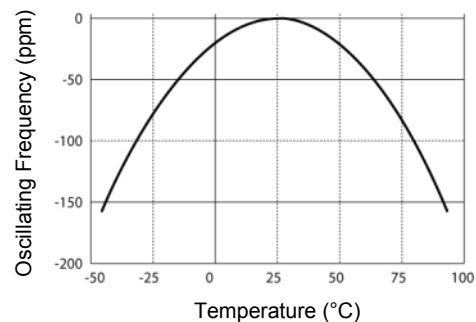
Pin Configuration	
1	Xtal
2	Xtal

**SOLDER PATTERN**


Unit :mm

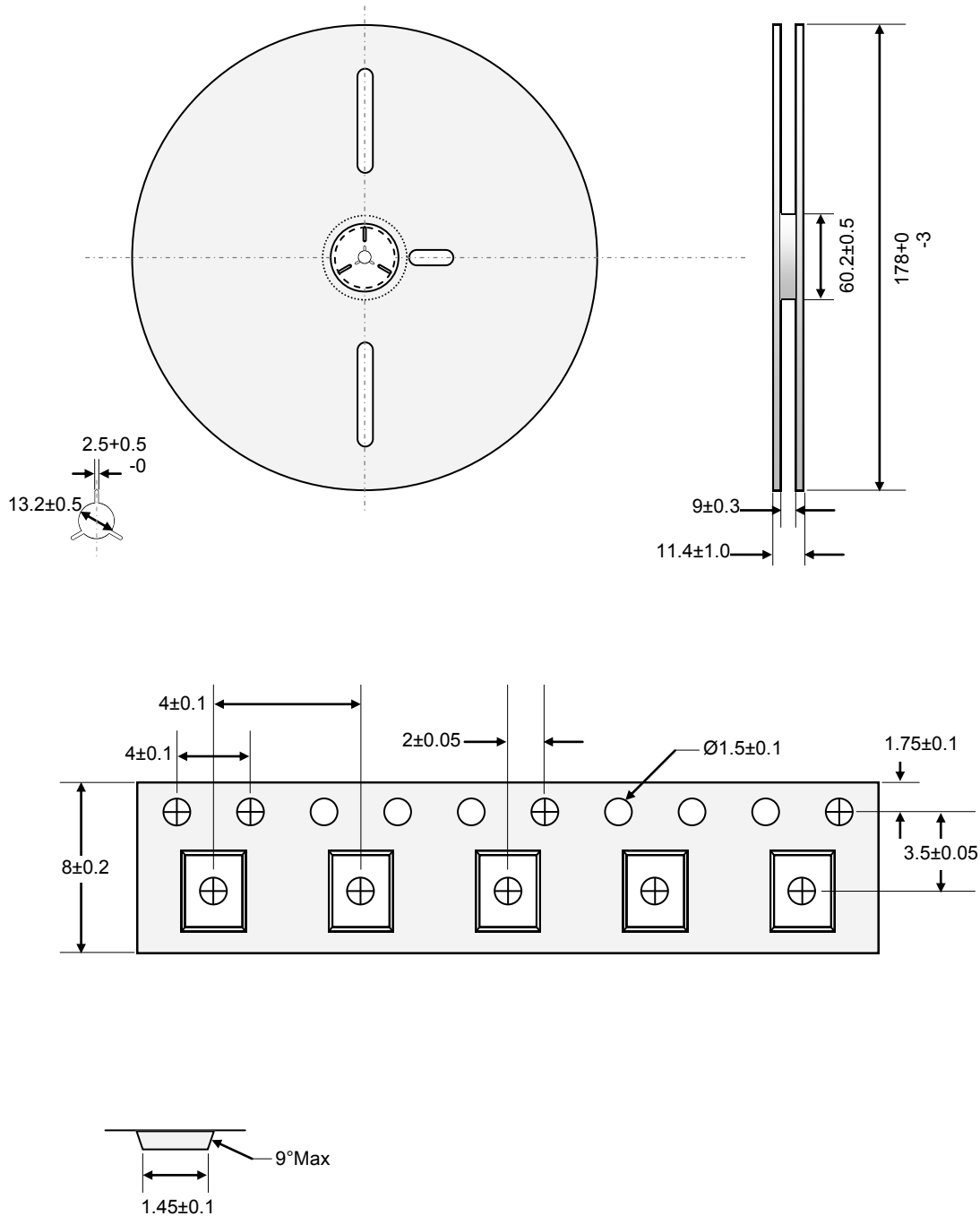
**REFLOW PROFILE**


Note: Consult factory for detail

**FREQUENCY VS. TEMPERATURE**


**RELIABILITY TEST**

Test Items	Test condition	Specification	
		Dip	SMD
1. Gross Leak Test	FC-0 125°C / 30sec	No continuous bubble	
2. Fine Leak Test	Bombing of He 4kg/cm <sup>2</sup> for 2 hours	Less than 5*10 <sup>-8</sup> atm. c.c./sec, Helium	
3. Drop Test	A. ~19.999MHz(Fund.) -> 100cm height B. 20~29.000MHz(Fund.) -> 50cm height C. 30~ MHz(Fund.) -> 20cm height On hard wooden surface / 3times (thickness more that 30mm)	$\Delta F \leq \pm 10\text{ppm}$ , C.I within spec.	$\Delta F \leq \pm 10\text{ppm}$ , C.I within spec.
4. Vibration Test	Freq. range: 10~55Hz Peak to peak amplitude: 1.5mm 3direction(X,Y,Z) each 60min.	$\Delta F \leq \pm 10\text{ppm}$ , C.I within spec.	$\Delta F \leq \pm 10\text{ppm}$ , C.I within spec.
5. Resistance to Soldering Test	A. IR Reflow furnace with the condition 2 times. Peak temp. 260±3°C, 10±1 sec.	NA	$\Delta F \leq \pm 10\text{ppm}$ , C.I within spec. For SMD type only.
	B. Dip terminals in a 245±5°C solder station(pool) Dipping depth 0.5mm(Min) Dipping time 5±0.5sec.	At least 90% by 30X magnification of each dipped area shall be covered by fresh solder. For DIP type only.	NA
6. Bending Test	Bending cycle: 1 cycle 0°-> 45°-> 0° -> 45° -> 0°	$\Delta F \leq \pm 15\text{ppm}$ , C.I within spec. For DIP type only.	NA
7. Shearing Test	Weight: 5N, Test duration: 10±1 sec	NA	$\Delta F \leq \pm 10\text{ppm}$ , C.I within spec. For SMD type only.
8. Low Temp. Exposure Test	-40±3°C, 240 ± 12hrs	$\Delta F \leq \pm 10\text{ppm}$ , C.I within spec.	$\Delta F \leq \pm 10\text{ppm}$ , C.I within spec.
9. Aging Test	85±3°C, 240 ± 12hrs	$\Delta F \leq \pm 10\text{ppm}$ , C.I within spec.	$\Delta F \leq \pm 10\text{ppm}$ , C.I within spec.
10. High Temp. & Humidity Test	85±5°C & 85%±5% R.H., 240 ± 12 hrs	$\Delta F \leq \pm 10\text{ppm}$ , C.I within spec.	$\Delta F \leq \pm 10\text{ppm}$ , C.I within spec.
11. Temperature Cycling Test	-25±3°C/15±3min ~ 85±3°C/15±3min 15cycles	$\Delta F \leq \pm 10\text{ppm}$ , C.I within spec.	$\Delta F \leq \pm 10\text{ppm}$ , C.I within spec.

**TAPE & REEL DIMENSION**


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