

### FEATURES

- Plastic mold package incorporated tubular type quartz crystal.
- Suitable for automatic and high density surface mounting.
- Excellent shock and heat resistance.

### APPLICATIONS

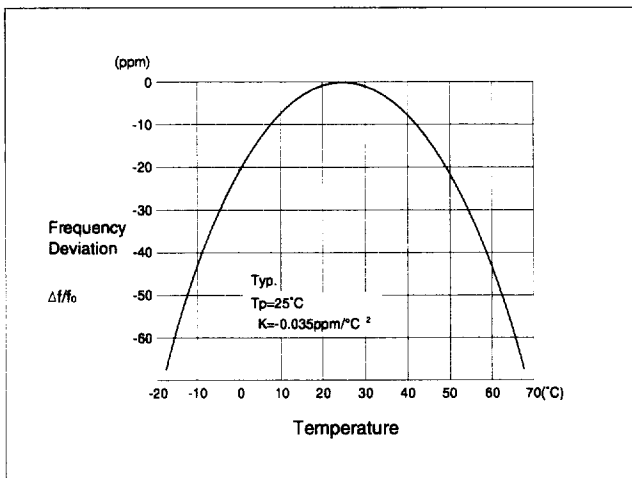
- Radio Communication Equipment, Pagers, Cellular Phones, Camcorders, Portable Applications, Clock Source for Micro-Computers

### STANDARD SPECIFICATION

Conditions without notice (Temperature: +25°C±2°C)

Item	Symbol	SP-T1A/B, SP-T2A/B			Conditions / Note
		32.768kHz	24kHz to 350kHz	351kHz to 615kHz	
Nominal Frequency	$f_0$	32.768kHz	24kHz to 350kHz	351kHz to 615kHz	
Frequency Tolerance	$\Delta f/f_0$	±20ppm, ±50ppm, ±100ppm			
Turnover Temperature	$T_p$	+25°C±5°C	+25°C±8°C	+25°C±15°C	
Temperature Coefficient	K	(-3.5±0.8)×10 <sup>-8</sup> /°C <sup>2</sup>			
Load Capacitance	$C_L$	6.0 to 12.5pF			
Equivalent Series Resistance	$R_1$	50kΩ max.	50kΩ max.	20kΩ max.	
Excitation Level	DL	1μW max.			
Shunt Level	$C_0$	1.0pF typ.	0.95pF typ.	0.9pF typ.	
Aging	$\Delta f/f_0$	±5ppm max.			+25°C±3°C, First Year
Operating Temperature Range	$T_{ope}$	-40°C ~ +85°C			
Storage Temperature Range	$T_{sto}$	-55°C ~ +125°C			
Reflow Profile	$T_{sol}$	230°C max., 20sec. max. x 2times			IR Reflow

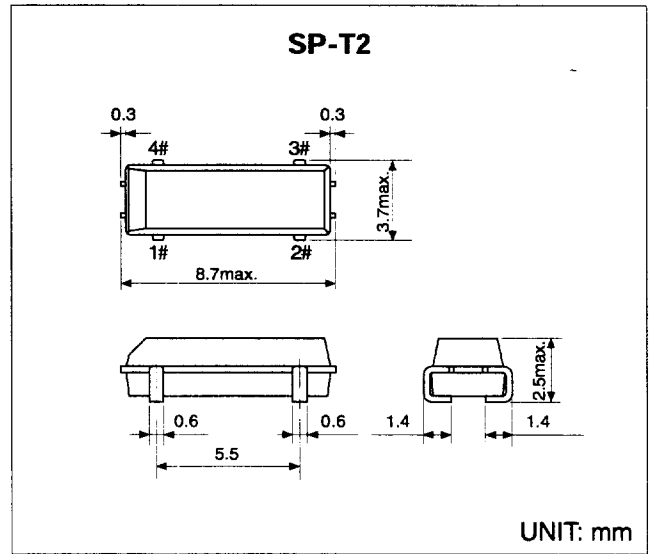
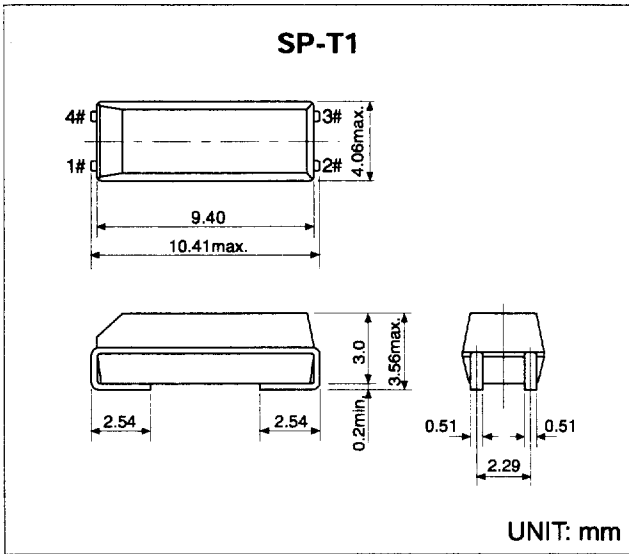
### FREQUENCY-TEMPERATURE CURVE



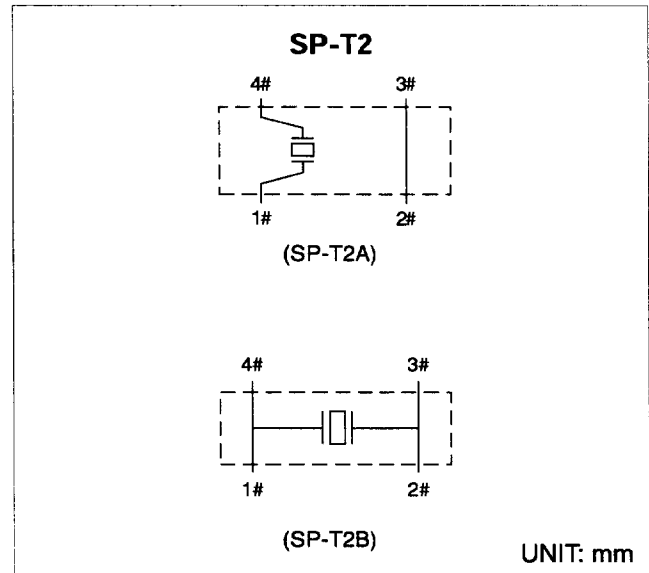
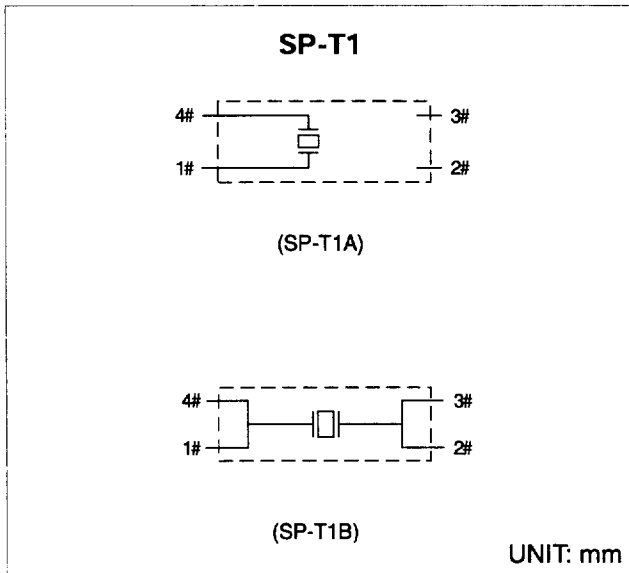
### STANDARD FREQUENCIES (kHz)

SP-T1/SP-T2			
24.000	40.000	77.500	150.000
26.667	65.536	96.000	153.600
31.200	75.000	99.660	200.000
32.000	76.800	100.000	307.200
32.768	77.025	106.000	614.400
38.000	770.40	130.000	
38.400	77.056	131.072	

**DIMENSIONS** (For details, please refer to individual specification)

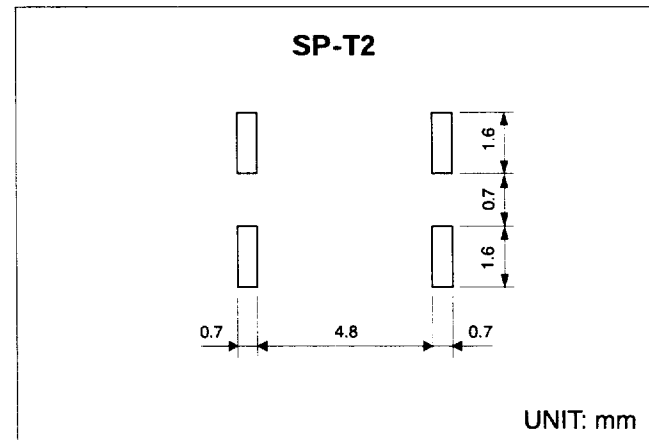
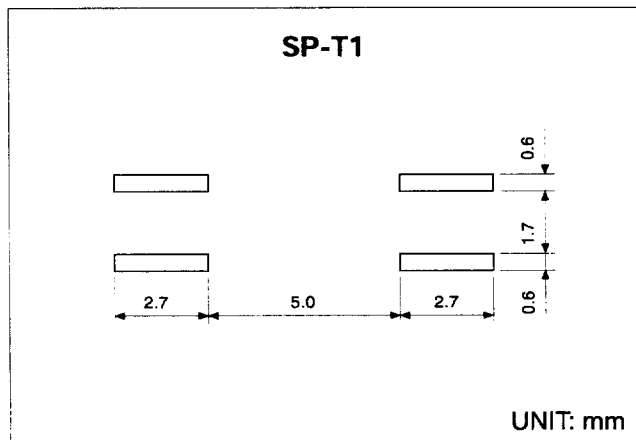


**LEAD CONNECTION**



Note: Do not connect terminals #2, #3 of T1A and T2A to the outside electrode. These are dummy terminals.

**TERMINAL LAND AREA** (Projection to the PCB surface of the electrode lead)



Note: The drawings are not a PCB layout.