

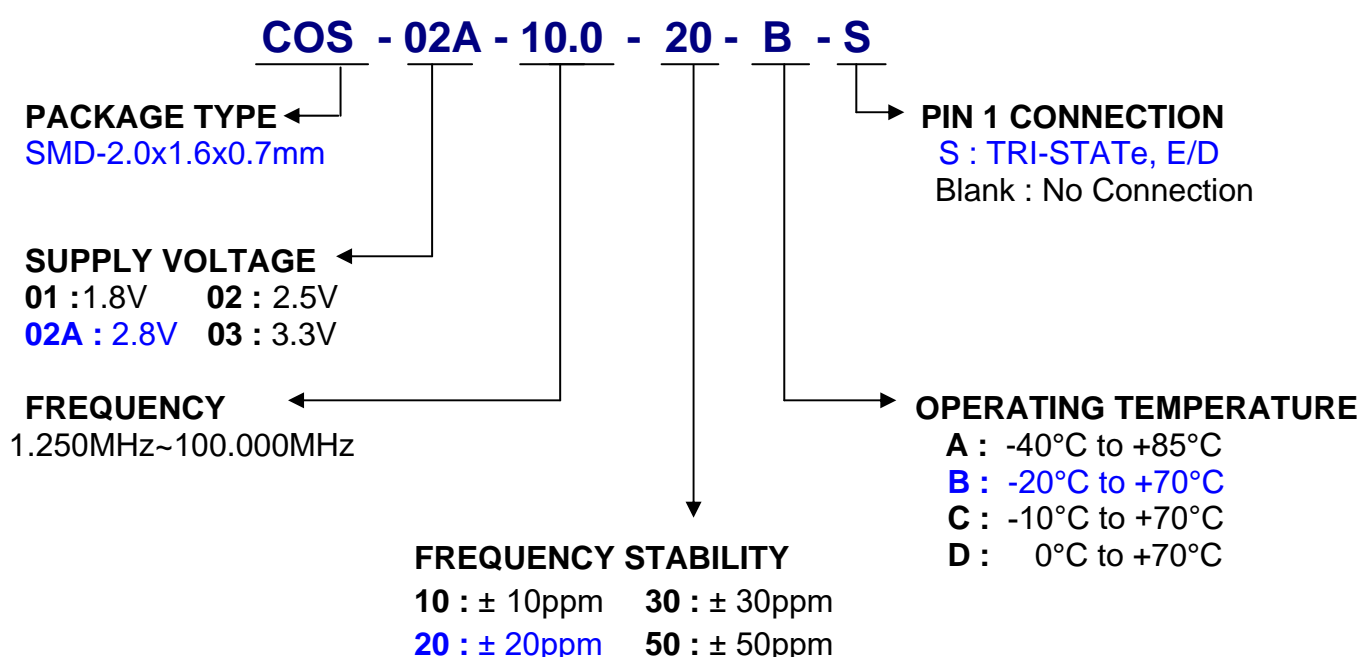


## COS Series Ceramic SMD Oscillator



- Ultra-thin, thickness (0.7mm)
- CMOS Output
- 0.8V to 3.6V supply voltage
- Stability to  $\pm 10\text{ppm}$
- Tri-state function available

### PART NUMBER GUIDE



### ELECTRICAL SPECIFICATIONS

MODEL	COS
Frequency Range	10.000MHz
Frequency Tolerance / Stability	$\pm 20\text{ppm}$
Operating Temperature Range	-20°C to +70°C
Storage Temperature Range	-55°C to +125°C
Supply Voltage (VDD)	2.8V $\pm 5\%$
Current consumption	10mA Max.
Load	15pf
Output Level	CMOS
Output Voltage Logic High (VOH)	0.9VDD Min.
Output Voltage Logic Low (VOL)	0.1VDD Max.
Start up Time	5ms Max.
Rise / Fall Time	5ns Max.
Output Symmetry	45~55 % (at 50% VDD)
Aging (at 25°C)	$\pm 2\text{ppm}$ , 1st Year.
Min. Packing	3000pcs/ Reel

**MECHANICAL DIMENSION**

**COS**

Top View Dimensions:  
 Width:  $2.0 \pm 0.1$   
 Height:  $1.6 \pm 0.1$   
 Marking: A small dot is located in the bottom-left corner of the component.

Side View Dimension:  
 Thickness:  $0.7 \pm 0.1$

Bottom View Dimensions:  
 Pin #1 width:  $0.6 \pm 0.1$   
 Pin #2 width:  $0.6 \pm 0.1$   
 Pin #3 width:  $0.5 \pm 0.1$   
 Pin #4 width:  $0.5 \pm 0.1$   
 Pin #1 to #2 distance:  $0.7 \pm 0.1$   
 Pin #2 to #3 distance:  $0.5$   
 Pin #3 to #4 distance:  $0.5 \pm 0.1$

(BOTTOM VIEW)

**Pin Assignment**

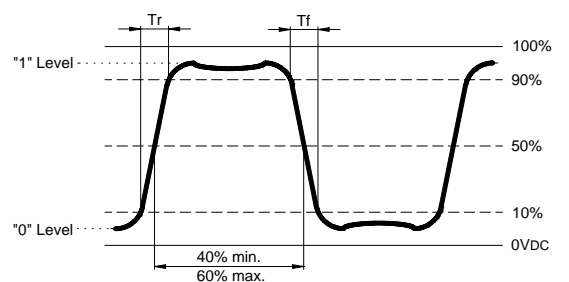
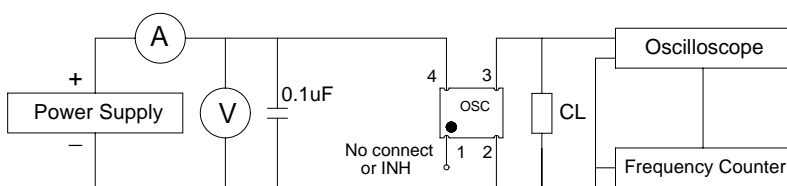
- #1 Standby Con.
- #2 Gnd
- #3 Output
- #4 Vdd

Pin 1	Output
H/Floating	Enable
L	Standby

**Recommended Soldering Pattern**

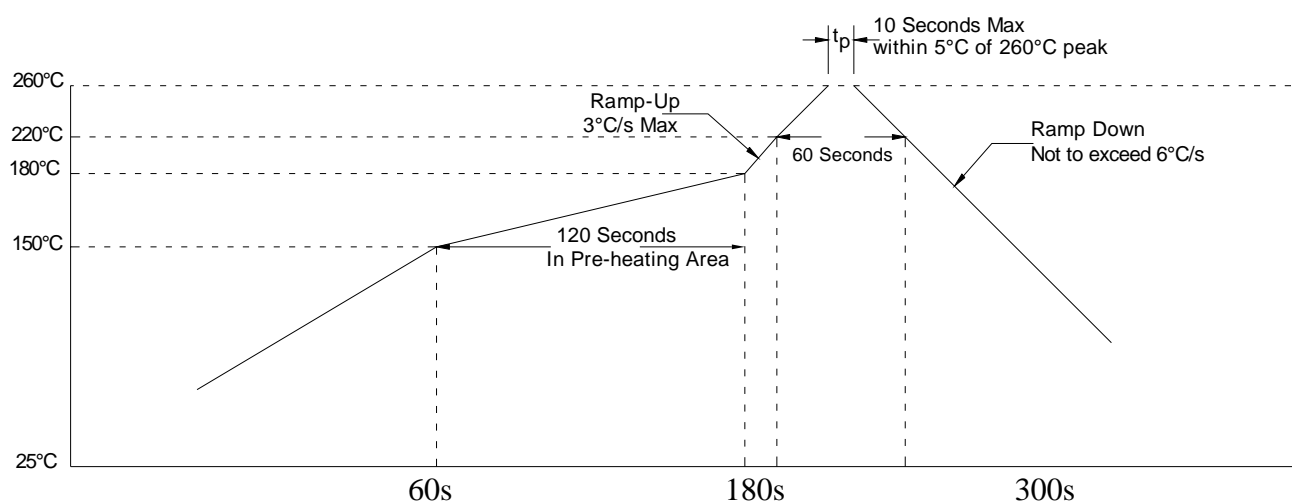
Soldering Pattern Dimensions:  
 Pin #1 width: 0.9  
 Pin #2 width: 0.5  
 Pin #3 width: 0.9  
 Pin #1 height: 0.80  
 Pin #2 height: 0.30  
 Pin #3 height: 0.80

**TEST CIRCUIT**



## CRYSTAL OSCILLATOR SPECIFICATION

### Soldering reflow



### Pb-free compliance

Component and Assembly Pb content shall be less than 0.1% by weight of the device (in accordance with IPC/EIA J-STD-006, European ROHS 3 Directive (EU) 2015/865).

### Product Information

For a product to be **RoHS** compliant, it must satisfy several conditions:

- Contain no more than the specified limits of the target hazardous substances set out in the RoHS Directive
- Able to withstand Pb-free 260°C solder reflow profile
- External packaging and terminations are Pb-free
- Internal PCB, components, solders, and terminations are Pb-free

## CRYSTAL OSCILLATOR SPECIFICATION

### Reliability Test ( applicable to OSC and SMD type X'tal )

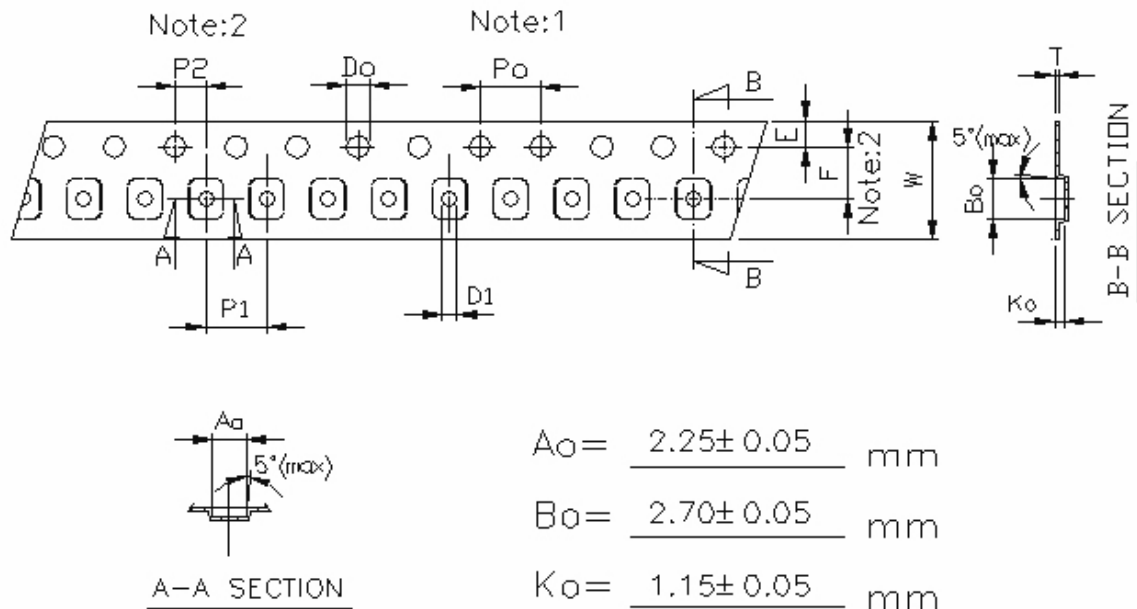
Test Items	Test Condition	Specification	
		General OSC (Note:1)	General X' tal (Note:2)
1. Gross Leak Test	FC-40 125°C/30sec	No continuous bubble	
2. Fine Leak Test	Bombing of He 5kg/cm <sup>2</sup> for 2 hours	Less than 1*10 <sup>-8</sup> atm.c.c./sec, Helium	
3. Drop Test	Free dropped a. ~19.999MHz(Fund.) →100 cm height b. 20~29.999MHz(Fund.) →50 cm height c. 30~ MHz(Fund.) →20 cm height on a hard wooden board for 3 times ( board is thickness more than 30 mm)	$\Delta F \leq \pm 10\text{PPM}$ , Duty within spec.	$\Delta F \leq \pm 10\text{PPM}$ , $\Delta \text{C.I.} \leq \pm 10\text{ohms}$
4. Vibration Test	Freq. range: 10~55Hz Peak to peak amplitude:1.5mm Peak acceleration:10 G 3 direction(X,Y,Z) , each 60min.	$\Delta F \leq \pm 10\text{PPM}$ , Duty within spec.	$\Delta F \leq \pm 10\text{PPM}$ , $\Delta \text{C.I.} \leq \pm 10\text{ohms}$
5. Resistance to Soldering Test	a. IR Reflow furnace with the condition 2 times. Peak temp. 260±3°C , 10sec( Min.)	$\Delta F \leq \pm 10\text{PPM}$ , Duty within spec. For SMD OSC only	$\Delta F \leq \pm 10\text{PPM}$ , $\Delta \text{C.I.} \leq \pm 10\text{ohms}$
	b. Dip terminals in a 260±5°C solder bath for 5±0.5 sec.	At least 90% of each dipped area shall be covered by fresh solder. For DIP OSC only.	NA
6. Bending Test	Bending cycle : 1 cycle 0° -> 45° -> 0° -> 45° -> 0°	$\Delta F \leq \pm 5\text{PPM}$ , Duty within spec. For DIP OSC only.	NA
7. Share Test	Weight : 10N, Test duration : 10±1 sec	$\Delta F \leq \pm 5\text{PPM}$ , Duty within spec. For SMD OSC only.	$\Delta F \leq \pm 10\text{PPM}$ , $\Delta \text{C.I.} \leq \pm 10\text{ohms}$
8. Low Temp. Exposure Test	-40±3°C, 240±12 hrs	$\Delta F \leq \pm 10\text{PPM}$ , Duty within spec.	$\Delta F \leq \pm 10\text{PPM}$ , $\Delta \text{C.I.} \leq \pm 10\text{ohms}$
9. Aging Test	125±3°C, 240±12hrs	$\Delta F \leq \pm 10\text{PPM}$ , Duty within spec.	$\Delta F \leq \pm 10\text{PPM}$ , $\Delta \text{C.I.} \leq \pm 10\text{ohms}$
10. High Temp. & Humidity Test	+85°C±5°C & 85%±5% R.H. , 240±12 hrs	$\Delta F \leq \pm 10\text{PPM}$ , Duty within spec.	$\Delta F \leq \pm 10\text{PPM}$ , $\Delta \text{C.I.} \leq \pm 10\text{ohms}$
11. Temperature Cycling Test	-40±3°C/15±3min ~ +85±3°C/15±3min 15cycles	$\Delta F \leq \pm 10\text{PPM}$ , Duty within spec.	$\Delta F \leq \pm 10\text{PPM}$ , $\Delta \text{C.I.} \leq \pm 10\text{ohms}$

Note:1 → For communication application the spec. demanded " $\Delta F \leq \pm 5\text{ PPM}$ , Duty within spec."

Note:2 → For communication application the spec. demanded " $\Delta F \leq \pm 5\text{ PPM}$ ,  $\Delta \text{C.I.} \leq \pm 5\text{ ohms}$ "

**TAPE & REEL SPECIFICATIONS**

**Tape Dimensions (unit : mm)**



Unit: mm

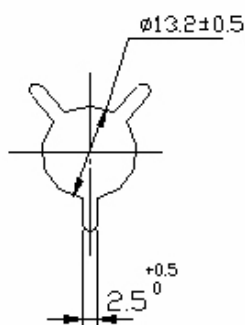
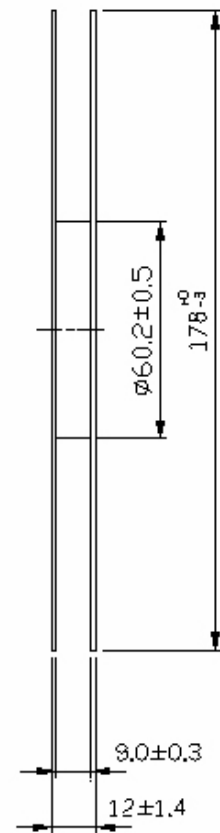
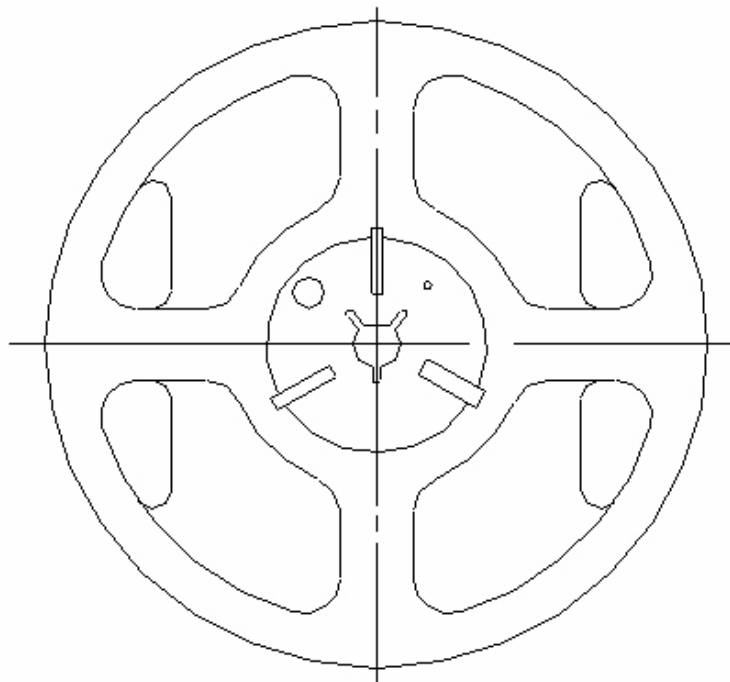
Symbol	Spec.
K1	—
Po	4.0±0.10
P1	4.0±0.10
P2	2.0±0.05
Do	1.55±0.05
D1	1.10±0.10
E	1.75±0.10
F	3.50±0.05
10Po	40.0±0.20
W	8.0±0.20
T	0.25±0.05

**Notice:**

1. Sprocket hole pitch cumulative tolerance is ±0.12mm
2. Pocket position relative to sprocket hole measured as true position of pocket not pocket hole.
3. Ao & Bo measured on a place 0.3mm above the bottom of the pocket to top surface of the carrier.
4. Ko measured from a plane on the inside bottom of the pocket to the top surface of the carrier.
5. Carrier camber shall be not than 1mm per 100mm through a length of 250mm.

TAPE & REEL SPECIFICATIONS

Reel Dimensions (unit : mm)



Q'ty: 2,500.pcs/reel

Unit:mm