

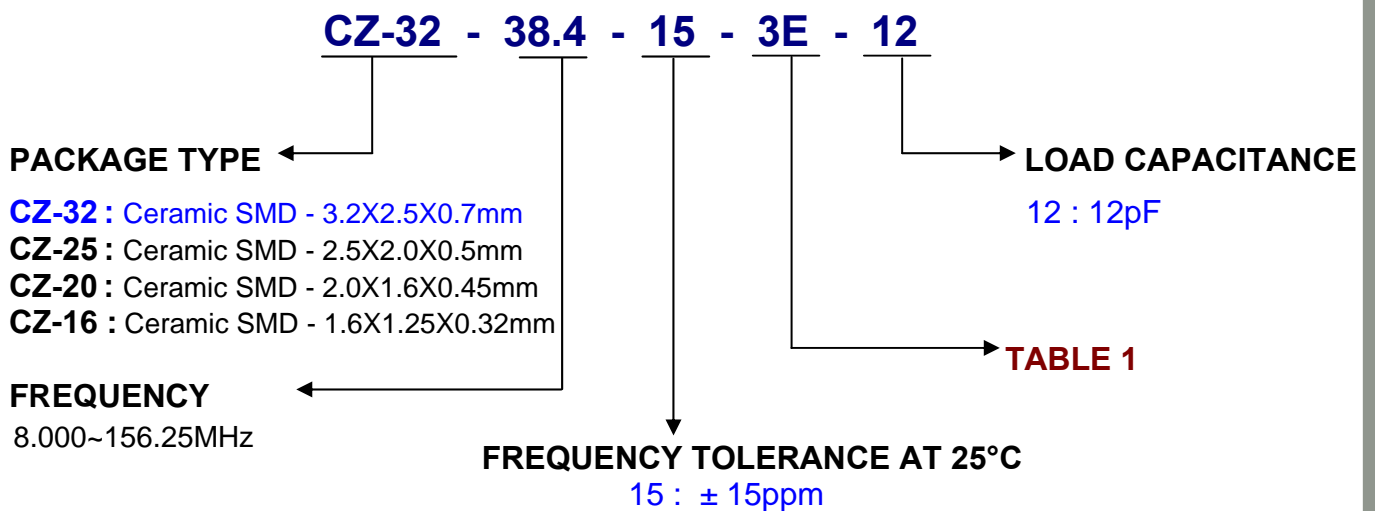


## CZ Series Ceramic SMD Crystal

- Ultra miniature and lightweight SMD crystal units.
- Tight tolerance / stability.
- Bluetooth, WIFI, GPS, LoRa, ISM Bands, GSM...



### PART NUMBER GUIDE



### ELECTRICAL SPECIFICATIONS

MODEL	CZ-32
Frequency Range (Fundamental)	38.400MHz (AT-Cut, Fundamental)
Operating Temperature Range	-20°C to +70°C
Storage Temperature Range	-55°C to 125°C
Frequency Tolerance (at 25°C)	±15ppm
Frequency Stability <i>over Operating Temperature Range</i>	±20ppm
Load Capacitance (CL)	12pF
ESR (Serie Resistance)	40Ohms Max.
Drive Level	100µW Max.
Shunt Capacitance (Co)	5.0pF Max
Insulation Resistance	500MΩ at DC 100V
Aging (at 25°C)	±3ppm/year Max.

\* : Available

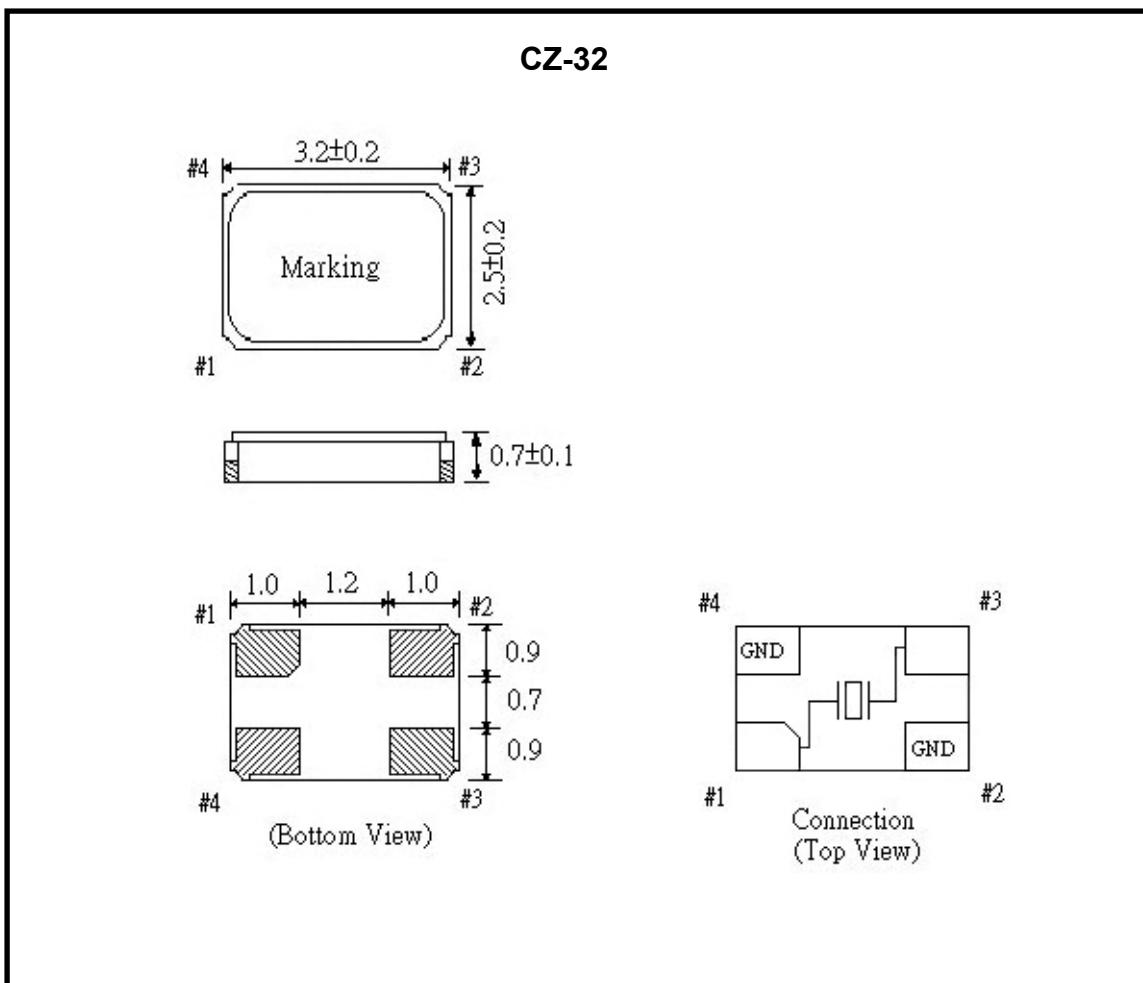
**TABLE 1**

FREQUENCY STABILITY VS. TEMPERATURE RANGE							
Temp	Stability	±10	±15	±20	±30	±50	±100
		1	2	3	4	5	6
-10~+60°C	A			*	*	*	*
-20~+60°C	B	*	*	*	*	*	*
0~+70°C	C	*	*	*	*	*	*
-10~+70°C	D	*	*	*	*	*	*
-20~+70°C	E	*	*	*	*	*	*
-30~+85°C	F	*	*	*	*	*	*
-40~+85°C	G			*	*	*	*
-40~+125°C	H					*	*

**MARKING**

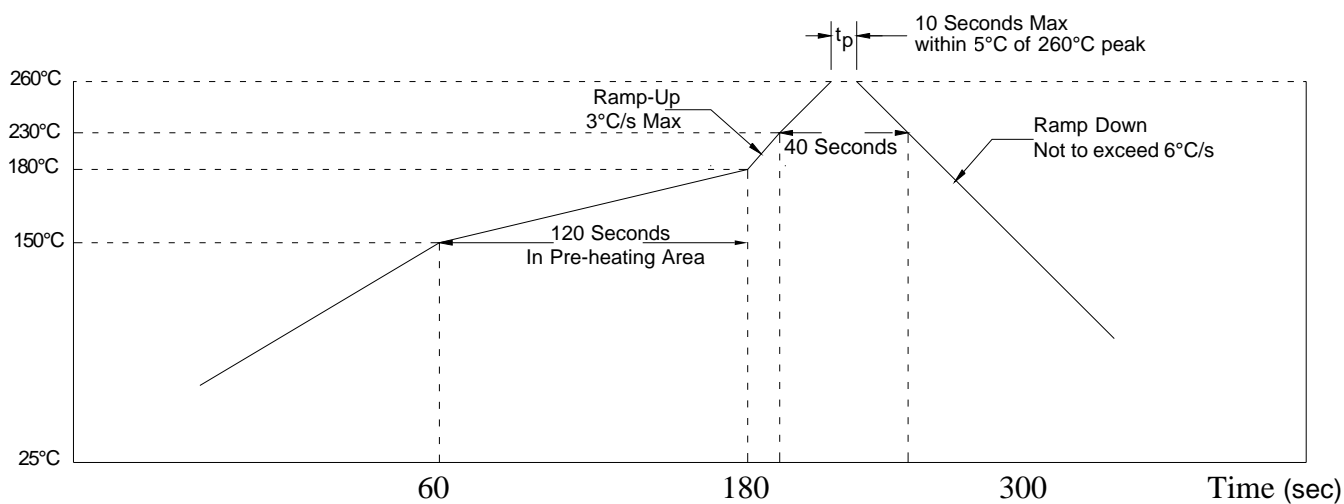
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**MECHANICAL DIMENSION**



**SOLDERING REFLOW**

Recommended reflow soldering standard conditions



## CRYSTAL 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 " $\Delta F \leq \pm 5\text{ PPM}$ ,  $\Delta \text{C.I.} \leq \pm 5\text{ ohms}$ "

## RoHS and REACH Regulation



### **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 below
- External packaging and terminations are Pb-free
- Internal PCB, components, solders, and terminations are Pb-free

### **Ro HS Compliance**

We certify that our crystal series comply with the European ROHS 3 Directive (EU) 2015/865, Restriction of use of certain Hazardous Substances, which has an effective date of July 22, 2019.

Hazardous Substances as defined by the RoHS 3 directive:

Restricted Substances	Maximum Threshold Limit (ppm)
1. Lead (Pb)	1000 (0.1 weight %)
2. Mercury (Hg)	1000 (0.1 weight %)
3. Cadmium (Cd)	100 (0.01 weight %)
4. Hexavalent Chromium (CrVI)	1000 (0.1 weight %)
5. Polybrominated Biphenyls (PBB)	1000 (0.1 weight %)
6. Polybrominated Diphenyl Ethers (PBDE)	1000 (0.1 weight %)
7. Bis(2-Ethylhexyl) phthalate (DEHP)	1000 (0.1 weight %)
8. Benzyl butyl phthalate (BBP)	1000 (0.1 weight %)
9. Dibutyl phthalate (DBP)	1000 (0.1 weight %)
10. Diisobutyl phthalate (DIBP)	1000 (0.1 weight %)

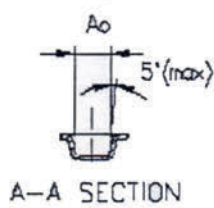
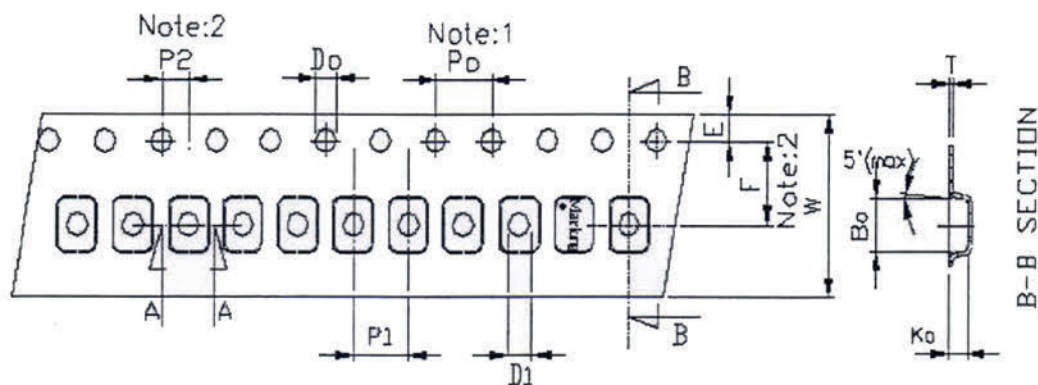
### **Reach Compliance**

#### **EACH Regulation (EC) 1907/2006**

Above concerned part is compliant with all requirements in the REACH regulations EC No. 1907/2006.

**TAPE & REEL SPECIFICATIONS**

**Taping**



$A_0 = \underline{2.70 \pm 0.10}$  mm

$B_0 = \underline{3.40 \pm 0.10}$  mm

$K_0 = \underline{1.40 \pm 0.10}$  mm

Unit: mm

Symbol	Spec.
K1	-
P <sub>0</sub>	4.0 ± 0.10
P1	4.0 ± 0.10
P2	2.0 ± 0.10
D <sub>0</sub>	1.55 ± 0.05
D1	1.50 (MIN)
E	1.75 ± 0.10
F	5.50 ± 0.10
10P <sub>0</sub>	40.0 ± 0.10
W	12.0 ± 0.20
T	0.25 ± 0.05

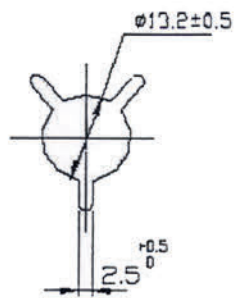
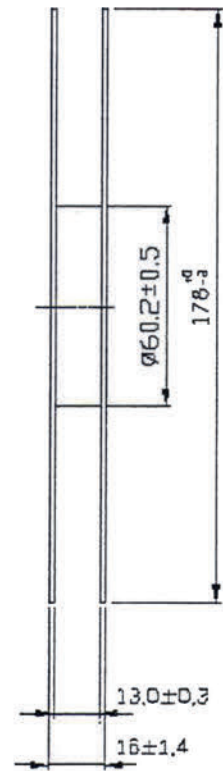
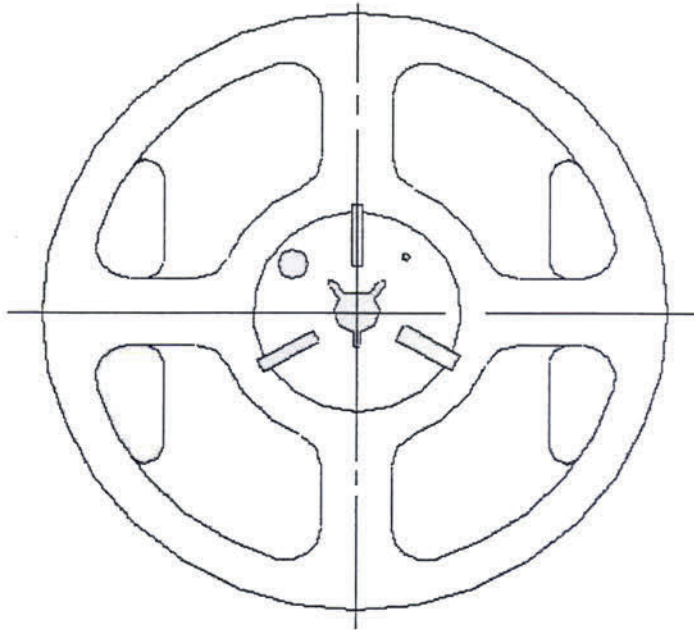
**Notice:**

1. 10 Sprocket hole pitch cumulative tolerance is ± 0.1mm
2. Pocket position relative to sprocket hole measured as true position of pocket not pocket hole.
3. A<sub>0</sub> & B<sub>0</sub> measured on a plane 0.3mm above the bottom of the pocket to top surface of the carrier.
4. K<sub>0</sub> 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



Unit:mm

Q'ty:3000pcs/reel