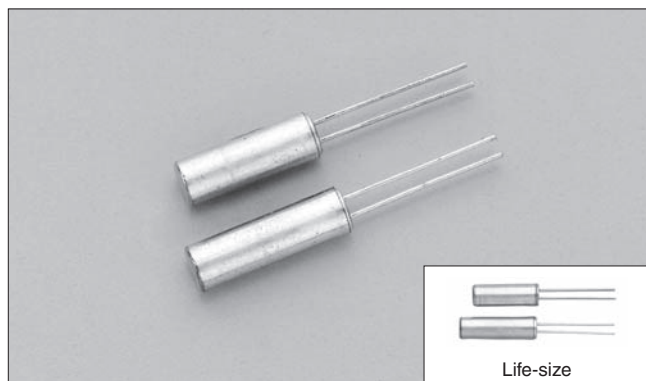


# AT-CUT CRYSTAL UNITS (Cylinder Type)

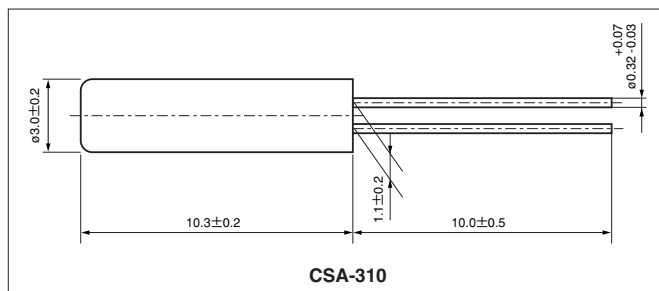
## CSA-310 · CSA-309



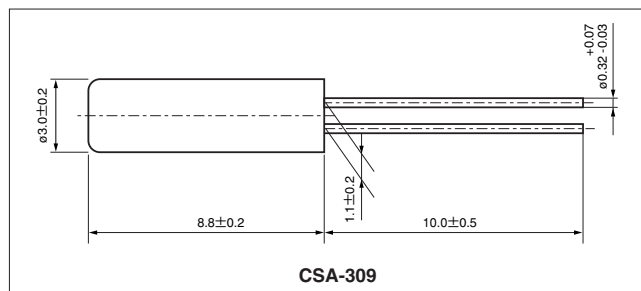
### FEATURES

- High performance miniature crystal units with Citizen's ultra-precise processing technology.
- High-stability assured with tight vacuum sealing.
- Suitable for various applications.

### DIMENSION [mm]



### SOLDER PAD LAYOUT [mm]



### STANDARD SPECIFICATIONS

| Item                                                 | Model            | CSA-310                                                              | CSA-309                                                          | Conditions                                     |
|------------------------------------------------------|------------------|----------------------------------------------------------------------|------------------------------------------------------------------|------------------------------------------------|
| Nominal Frequency                                    | $f_0$            | 3.5MHz~4.0MHz                                                        | 4.001MHz~34.0MHz (Fundamental)<br>27.0MHz~70.0MHz (3rd Overtone) | Need to contact us for the available frequency |
| Frequency Tolerance                                  | $\Delta f/f_0$   | $\pm 30\text{ppm}$                                                   |                                                                  | at 25°C                                        |
| Frequency Tolerance over Operating Temperature Range | $\Delta f/f_0$   | below 6.0MHz: $\pm 50\text{ppm}$<br>above 6.0MHz: $\pm 30\text{ppm}$ |                                                                  | -10°C ~ +60°C<br>See figure 3 in P4            |
| Operating Temperature Range                          | $T_{\text{OPR}}$ | -20°C ~ +70°C                                                        |                                                                  |                                                |
| Storage Temperature Range                            | $T_{\text{STR}}$ | -40°C ~ +85°C                                                        |                                                                  |                                                |
| Motional (series) resistance                         | $R_1$            | Refer to the following table                                         |                                                                  | at 25°C                                        |
| Load capacitance                                     | $C_L$            | 16.0pF, 18.0pF                                                       |                                                                  | Need to specify your requirement               |
| Shunt capacitance                                    | $C_0$            | 5.0pF Max.                                                           |                                                                  |                                                |
| Level of drive                                       | $D_L$            | 100 $\mu\text{W}$                                                    |                                                                  |                                                |
| Insulation Resistance                                | $I_R$            | 500M $\Omega$ Min.                                                   |                                                                  | DC100V $\pm 15\text{V}$                        |
| Aging (first year)                                   | $\Delta f/f_0$   | $\pm 5\text{ppm}$ Max.                                               |                                                                  | 25°C $\pm 3^\circ\text{C}$                     |

### MOTIONAL (SERIES) RESISTANCE ( $R_1$ )

| Frequency Range | $3.5\text{MHz} \leq f_0 < 4.0\text{MHz}$ | $4.0\text{MHz} \leq f_0 < 6.0\text{MHz}$ | $6.0\text{MHz} \leq f_0 < 10\text{MHz}$ | $10\text{MHz} \leq f_0 < 27\text{MHz}$ | $27\text{MHz} \leq f_0 < 36\text{MHz}$ | $36\text{MHz} \leq f_0 \leq 70\text{MHz}$ |
|-----------------|------------------------------------------|------------------------------------------|-----------------------------------------|----------------------------------------|----------------------------------------|-------------------------------------------|
| Mode            | Fundamental                              | Fundamental                              | Fundamental                             | Fundamental                            | Fundamental 3rd Overtone               | 3rd Overtone                              |
| $R_1$           | 200 $\Omega$ Max.                        | 150 $\Omega$ Max.                        | 100 $\Omega$ Max.                       | 50 $\Omega$ Max.                       | 50 $\Omega$ Max. 100 $\Omega$ Max.     | 80 $\Omega$ Max.                          |