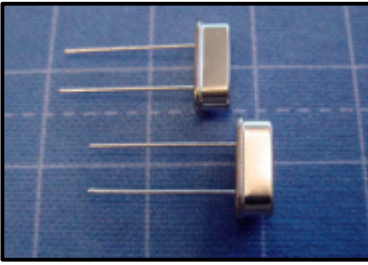


# HC-49US-DN Extended Temp Range Crystal



The HC-49US-DN is the extended temp range version of our standard HC-49US crystal. The DN version has an operating temperature of -40 to +85°C and a frequency stability of  $\pm 100$  ppm. The HC-49US-DN is a low cost option for today's industrial applications.

## FEATURES

- Cost effective
- Resistance-weld sealing
- Extended Temp range

## PART NUMBERING GUIDE "EXAMPLE"

| ECS | - | FREQUENCY (4.000 MHz) | - | LOAD CAPACITANCE* | - | PACKAGE TYPE ** | - | Suffix |
|-----|---|-----------------------|---|-------------------|---|-----------------|---|--------|
| ECS | - | 40                    | - | 20                | - | 4               | - | DN     |

\* Load Capacitance (xx=xx pF, S=series resonance) \*\* Package Type examples (-4=3.5 mm max. height, -4L = 2.5 mm max. height)  
 DN Suffix, D=  $\pm 100$  ppm frequency stability, N = -40 to +85°C temp range

## OPERATING CONDITIONS/ELECTRICAL CHARACTERISTICS

| PARAMETERS                       | CONDITIONS                          | MINIMUM  | TYPICAL  | MAXIMUM   | UNITS |
|----------------------------------|-------------------------------------|----------|----------|-----------|-------|
| FREQUENCY RANGE                  |                                     | 3.579545 |          | 70.000    | MHz   |
| CALIBRATION TOLERANCE            | @ +25°C                             |          |          | $\pm 30$  | PPM   |
| FREQUENCY STABILITY, ref @25°C   | -40 ~ +85°C                         |          |          | $\pm 100$ | PPM   |
| SHUNT CAPACITANCE                |                                     |          |          | 7         | pF    |
| LOAD CAPACITANCE                 | C <sub>L</sub> (Customer Specified) | 10       | 20.0 std | Series    | pF    |
| DRIVE LEVEL                      | DL                                  |          |          | 500       | μW    |
| OPERATING TEMPERATURE            | T <sub>OPR</sub>                    | -40      |          | +85       | °C    |
| STORAGE TEMPERATURE              | T <sub>STG</sub>                    | -40      |          | +105      | °C    |
| AGING CHARACTERISTICS (Per Year) | @ +25°C $\pm 3$ °C per year         |          |          | $\pm 5$   | PPM   |

## EQUIVALENT SERIES RESISTANCE / MODE OF OSCILLATION

| FREQUENCY RANGE (MHz) | MODE OF OSC. | MAX. ESR (W) | FREQUENCY RANGE (MHz) | MODE OF OSC. | MAX. ESR (W) |
|-----------------------|--------------|--------------|-----------------------|--------------|--------------|
| 3.579545 - 3.999      | Fundamental  | 200          | 9.000 - 12.999        | Fundamental  | 60           |
| 4.000 - 4.999         | Fundamental  | 150          | 13.000 - 19.999       | Fundamental  | 40           |
| 5.000 - 5.999         | Fundamental  | 100          | 20.000 - 30.000       | Fundamental  | 30           |
| 6.000 - 6.999         | Fundamental  | 80           | 27.000 - 70.000       | 3rd O/T      | 100          |
| 7.000 - 8.999         | Fundamental  | 80           |                       |              |              |

## PACKAGE DIMENSIONS (mm)

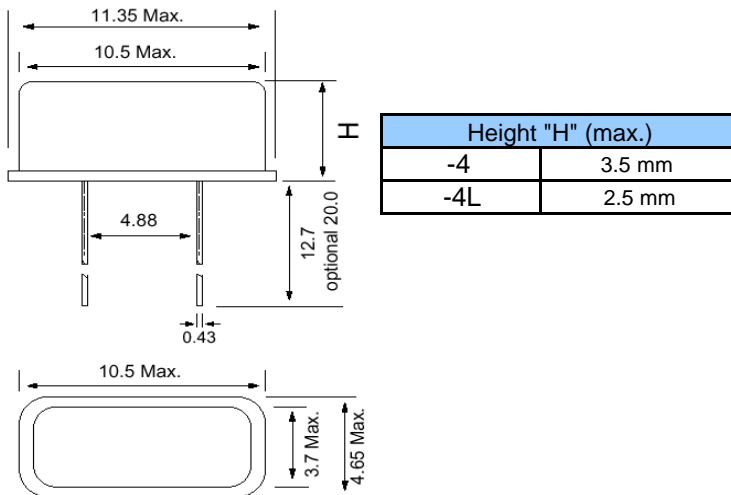


Figure 1) HC-49US-DN - Top and Side Views