IQD Frequency Products
Incorporating IQD FOQ GmbH

## Crystal Specification

Model: HC49

## ISSUE 15; September 2012 - RoHS 2011/65/EU

## Description

- Industry standard leaded package

Resistance welded, hermetically sealed in an inert atmosphere, glass to metal seals on leads
Variants available include but are not limited to:-
$3 \mathrm{~L}=$ an additional centre mounted leg grounds the can
TW = an additional top mounted leg grounds the can
$\mathrm{T}=\mathrm{a}$ truncated height of 11.1 mm
Please see our HC49 Gull-Wing for a SMD alternative
Please contact our sales offices for more options

## Frequency Range

- Frequency
- Frequency Stability
- Frequency Tolerance


## General Specification

- Load Capacitance (CL)
- Drive Level
- Ageing
- Shunt Capacitance (C0)
1.8432 to 270.0000 MHz
$\pm 5.00 \mathrm{ppm}$
$\pm 5 \mathrm{ppm}$ to $\pm 100 \mathrm{ppm}$
10.0 pF to 75.0 pF or Series

1mW max
$\pm 3 \mathrm{ppm}$ typical per year
7pF max

## Operating Temperature Ranges

- 0 to $50^{\circ} \mathrm{C}$
- -10 to $60^{\circ} \mathrm{C}$
- -20 to $70^{\circ} \mathrm{C}$
- -30 to $80^{\circ} \mathrm{C}$
- -40 to $85^{\circ} \mathrm{C}$
- -55 to $105^{\circ} \mathrm{C}$
- -55 to $125^{\circ} \mathrm{C}$


## Environmental Parameters

- Shock: $981 \mathrm{~m} / \mathrm{s}^{2}, 6 \mathrm{~ms}, 3$ times in each of 3 mutually perpendicular planes
- Vibration: $10 \mathrm{~Hz}-60 \mathrm{~Hz}, 0.75 \mathrm{~mm}$ amplitude, $60 \mathrm{~Hz}-500 \mathrm{~Hz}, 98.1 \mathrm{~m} / \mathrm{s}^{2}$, 30mins in 3 mutually perpendicular planes
- Storage Temperature Range: -55 to $125^{\circ} \mathrm{C}$


## Ordering Information

- Frequency*

Model*
Frequency Tolerance (@25 $\left.{ }^{\circ} \mathrm{C}\right)^{*}$
Frequency Stability (over operating temperature range)*
Operating Temperature Range*
Load Capacitance*
Overtone*

- Example:
10.0MHz HC49

50/50/-40 to 85C/10 FUND

## Packing Details

- Pack Style: Bulk Pack Size
- Pack Style: Reel Pack Size
Alternative packing options ava
- Alternative packing options available


Outline (mm)

$-3 L=3$ Lead


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Electrical Specification - maximum limiting values

| Frequency Range | Frequency Tolerance | Stability |  | Temperature Range | ESR Max | Vibration Mode |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Min | Max |  |  |  |
| 1.8432 to <2.0MHz | $\pm 5 \mathrm{ppm}$ to $\pm 100 \mathrm{ppm}$ | $\begin{aligned} & \pm 15 \mathrm{ppm} \\ & \pm 20 \mathrm{ppm} \\ & \pm 20 \mathrm{ppm} \\ & \pm 25 \mathrm{ppm} \\ & \pm 30 \mathrm{ppm} \\ & \pm 50 \mathrm{ppm} \\ & \pm 100 \mathrm{ppm} \end{aligned}$ | $\pm 200 \mathrm{ppm}$ | $\begin{gathered} 0 \text { to } 50^{\circ} \mathrm{C} \\ -10 \text { to } 60^{\circ} \mathrm{C} \\ -20 \text { to } 70^{\circ} \mathrm{C} \\ -30 \text { to } 80^{\circ} \mathrm{C} \\ -40 \text { to } 85^{\circ} \mathrm{C} \\ -55 \text { to } 105^{\circ} \mathrm{C} \\ -55 \text { to } 125^{\circ} \mathrm{C} \end{gathered}$ | $800 \Omega$ | Fundamental |
| 2.0000 to $<3.0 \mathrm{MHz}$ | $\pm 5 \mathrm{ppm}$ to $\pm 100 \mathrm{ppm}$ | $\begin{aligned} & \pm 15 \mathrm{ppm} \\ & \pm 20 \mathrm{ppm} \\ & \pm 20 \mathrm{ppm} \\ & \pm 25 \mathrm{ppm} \\ & \pm 30 \mathrm{ppm} \\ & \pm 50 \mathrm{ppm} \\ & \pm 100 \mathrm{ppm} \end{aligned}$ | $\pm 200 \mathrm{ppm}$ | $\begin{aligned} & \hline 0 \text { to } 50^{\circ} \mathrm{C} \\ & -10 \text { to } 60^{\circ} \mathrm{C} \\ & -20 \text { to } 70^{\circ} \mathrm{C} \\ & -30 \text { to } 80^{\circ} \mathrm{C} \\ & -40 \text { to } 85^{\circ} \mathrm{C} \\ & -55 \text { to } 105^{\circ} \mathrm{C} \\ & -55 \text { to } 125^{\circ} \mathrm{C} \end{aligned}$ | $600 \Omega$ | Fundamental |
| 3.0000 to <4.0MHz | $\pm 5 \mathrm{ppm}$ to $\pm 100 \mathrm{ppm}$ | $\begin{aligned} & \pm 15 \mathrm{ppm} \\ & \pm 20 \mathrm{ppm} \\ & \pm 20 \mathrm{ppm} \\ & \pm 25 \mathrm{ppm} \\ & \pm 30 \mathrm{ppm} \\ & \pm 50 \mathrm{ppm} \\ & \pm 100 \mathrm{ppm} \end{aligned}$ | $\pm 200 \mathrm{ppm}$ | 0 to $50^{\circ} \mathrm{C}$ -10 to $60^{\circ} \mathrm{C}$ -20 to $70^{\circ} \mathrm{C}$ -30 to $80^{\circ} \mathrm{C}$ -40 to $85^{\circ} \mathrm{C}$ -55 to $105^{\circ} \mathrm{C}$ -55 to $125^{\circ} \mathrm{C}$ | $150 \Omega$ | Fundamental |
| 4.0000 to <7.0MHz | $\pm 5 \mathrm{ppm}$ to $\pm 100 \mathrm{ppm}$ | $\begin{aligned} & \pm 15 \mathrm{ppm} \\ & \pm 20 \mathrm{ppm} \\ & \pm 20 \mathrm{ppm} \\ & \pm 25 \mathrm{ppm} \\ & \pm 30 \mathrm{ppm} \\ & \pm 50 \mathrm{ppm} \\ & \pm 100 \mathrm{ppm} \end{aligned}$ | $\pm 200 \mathrm{ppm}$ | 0 to $50^{\circ} \mathrm{C}$ -10 to $60^{\circ} \mathrm{C}$ -20 to $70^{\circ} \mathrm{C}$ -30 to $80^{\circ} \mathrm{C}$ -40 to $85^{\circ} \mathrm{C}$ -55 to $105^{\circ} \mathrm{C}$ -55 to $125^{\circ} \mathrm{C}$ | $100 \Omega$ | Fundamental |
| 7.0000 to $<10.0 \mathrm{MHz}$ | $\pm 5 \mathrm{ppm}$ to $\pm 100 \mathrm{ppm}$ | $\begin{aligned} & \pm 15 \mathrm{ppm} \\ & \pm 20 \mathrm{ppm} \\ & \pm 20 \mathrm{ppm} \\ & \pm 25 \mathrm{ppm} \\ & \pm 30 \mathrm{ppm} \\ & \pm 50 \mathrm{ppm} \\ & \pm 100 \mathrm{ppm} \end{aligned}$ | $\pm 200 \mathrm{ppm}$ | 0 to $50^{\circ} \mathrm{C}$ -10 to $60^{\circ} \mathrm{C}$ -20 to $70^{\circ} \mathrm{C}$ -30 to $80^{\circ} \mathrm{C}$ -40 to $85^{\circ} \mathrm{C}$ -55 to $105^{\circ} \mathrm{C}$ -55 to $125^{\circ} \mathrm{C}$ | $50 \Omega$ | Fundamental |
| 10.0000 to <36.0MHz | $\pm 5 \mathrm{ppm}$ to $\pm 100 \mathrm{ppm}$ | $\begin{aligned} & \pm 15 \mathrm{ppm} \\ & \pm 20 \mathrm{ppm} \\ & \pm 20 \mathrm{ppm} \\ & \pm 25 \mathrm{ppm} \\ & \pm 30 \mathrm{ppm} \\ & \pm 50 \mathrm{ppm} \\ & \pm 100 \mathrm{ppm} \end{aligned}$ | $\pm 200 \mathrm{ppm}$ | 0 to $50^{\circ} \mathrm{C}$ -10 to $60^{\circ} \mathrm{C}$ -20 to $70^{\circ} \mathrm{C}$ -30 to $80^{\circ} \mathrm{C}$ -40 to $85^{\circ} \mathrm{C}$ -55 to $105^{\circ} \mathrm{C}$ -55 to $125^{\circ} \mathrm{C}$ | $35 \Omega$ | Fundamental |
| 21.0000 to <90.0MHz | $\pm 5 \mathrm{ppm}$ to $\pm 100 \mathrm{ppm}$ | $\begin{aligned} & \pm 15 \mathrm{ppm} \\ & \pm 20 \mathrm{ppm} \\ & \pm 20 \mathrm{ppm} \\ & \pm 25 \mathrm{ppm} \\ & \pm 30 \mathrm{ppm} \end{aligned}$ | $\pm 200 \mathrm{ppm}$ | $\begin{gathered} 0 \text { o to } 50^{\circ} \mathrm{C} \\ -10 \text { to } 60^{\circ} \mathrm{C} \\ -20 \text { to } 70^{\circ} \mathrm{C} \\ -30 \text { to } 80^{\circ} \mathrm{C} \\ -40 \text { to } 85^{\circ} \mathrm{C} \end{gathered}$ | $40 \Omega$ | 3RD Overtone |

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Electrical Specification - maximum limiting values

| Frequency Range | Frequency Tolerance | Stability |  | Temperature Range | ESR Max | Vibration Mode |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Min | Max |  |  |  |
|  |  | $\begin{gathered} \pm 50 \mathrm{ppm} \\ \pm 100 \mathrm{ppm} \end{gathered}$ |  | -55 to $105^{\circ} \mathrm{C}$ -55 to $125^{\circ} \mathrm{C}$ |  |  |
| 60.0000 to $<150.0 \mathrm{MHz}$ | $\pm 5 \mathrm{ppm}$ to $\pm 100 \mathrm{ppm}$ | $\begin{aligned} & \pm 10 \mathrm{ppm} \\ & \pm 15 \mathrm{ppm} \\ & \pm 15 \mathrm{ppm} \\ & \pm 20 \mathrm{ppm} \\ & \pm 25 \mathrm{ppm} \\ & \pm 50 \mathrm{ppm} \\ & \pm 50 \mathrm{ppm} \end{aligned}$ | $\pm 200 \mathrm{ppm}$ | 0 to $50^{\circ} \mathrm{C}$ -10 to $60^{\circ} \mathrm{C}$ -20 to $70^{\circ} \mathrm{C}$ -30 to $80^{\circ} \mathrm{C}$ -40 to $85^{\circ} \mathrm{C}$ -55 to $105^{\circ} \mathrm{C}$ -55 to $125^{\circ} \mathrm{C}$ | $70 \Omega$ | 5TH Overtone |
| 85.0000 to <210.0MHz | $\pm 5 \mathrm{ppm}$ to $\pm 100 \mathrm{ppm}$ | $\pm 5 \mathrm{ppm}$ <br> $\pm 5 \mathrm{ppm}$ <br> $\pm 10 \mathrm{ppm}$ <br> $\pm 20 \mathrm{ppm}$ <br> $\pm 25 \mathrm{ppm}$ <br> $\pm 50 \mathrm{ppm}$ <br> $\pm 50 \mathrm{ppm}$ | $\pm 200 \mathrm{ppm}$ | 0 to $50^{\circ} \mathrm{C}$ -10 to $60^{\circ} \mathrm{C}$ -20 to $70^{\circ} \mathrm{C}$ -30 to $80^{\circ} \mathrm{C}$ -40 to $85^{\circ} \mathrm{C}$ -55 to $105^{\circ} \mathrm{C}$ -55 to $125^{\circ} \mathrm{C}$ | $100 \Omega$ | 7TH Overtone |
| 110.0000 to $<270.0 \mathrm{MHz}$ | $\pm 5 \mathrm{ppm}$ to $\pm 100 \mathrm{ppm}$ | $\pm 5 \mathrm{ppm}$ <br> $\pm 5 \mathrm{ppm}$ <br> $\pm 10 \mathrm{ppm}$ <br> $\pm 20 \mathrm{ppm}$ <br> $\pm 25 \mathrm{ppm}$ <br> $\pm 50 \mathrm{ppm}$ <br> $\pm 50 \mathrm{ppm}$ | $\pm 200 \mathrm{ppm}$ | 0 to $50^{\circ} \mathrm{C}$ -10 to $60^{\circ} \mathrm{C}$ -20 to $70^{\circ} \mathrm{C}$ -30 to $80^{\circ} \mathrm{C}$ -40 to $85^{\circ} \mathrm{C}$ -55 to $105^{\circ} \mathrm{C}$ -55 to $125^{\circ} \mathrm{C}$ | $150 \Omega$ | 9TH Overtone |

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