

# Quartz Crystal HC-49S-SMD

# S Series

Resistance Weld Low Profile SMD Crystal

(HC-49SD & HC49SSD)



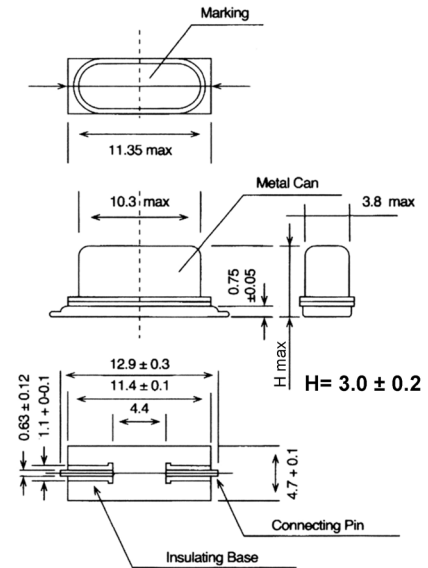
### Features:

- Wide frequency range
- Industry standard
- AT-cut
- Excellent clock signal generator for chips
- Height  $3.0 \pm 0.2\text{mm}$  (low profile) or Code H =  $4.0 \pm 0.2\text{mm}$
- Tape & reel (1000 pcs / reel)
- **RoHs Compliant (Pb Free)**

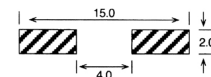


### Electrical Specifications:

Frequency Range	<b>3.00MHz - 100MHz</b>
Frequency Tolerance	$\pm 30\text{ppm}$ @ $25^\circ\text{C} \pm 2^\circ\text{C}$ (Typical), or specify ( $\pm 5\text{ppm}$ - $\pm 50\text{ppm}$ available)
Frequency Stability Over Temperature	$\pm 50\text{ppm}$ @ $-20^\circ\text{C}$ - $+70^\circ\text{C}$ (Typical), or specify ( $\pm 10\text{ppm}$ - $\pm 100\text{ppm}$ available)
Operating Temperature Range	- $20^\circ\text{C}$ to $+70^\circ\text{C}$ Standard - $40^\circ\text{C}$ to $+85^\circ\text{C}$ Extended or specify
Storage Temperature Range	$-40^\circ\text{C}$ to $+85^\circ\text{C}$
Load Capacitance (CL)	Parallel: 10pF to 50pF or Series $\infty$
Aging	$\pm 5\text{ppm}$ per year maximum
Insulation Resistance	500 Meg Ohms min. at 100 VDC
Shunt Capacitance	7pF maximum
Drive Level	0.1mW typical (1mW maximum)
Equivalent Series Resistance	see chart



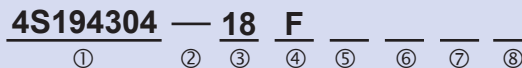
Recommended Solder Pad Layout



### Part Numbering System:

#### Example:

Frequency = 4.194304MHz, Holder = HC-49S-SMD,  
CL = 18pF, Mode = Fundamental,  
Oper. Temp. =  $-20^\circ\text{C}$  to  $+70^\circ\text{C}$ ,  
Packaging = Tape & reel (1000pcs/reel)  
Height =  $3.0 \pm 0.2\text{mm}$  (Code: —)



①	② Crystal Height	③ Load Capacitance CL	④ Mode of Vibration	⑤ Operating Temperature	⑥ Package																																
- First five digits of the frequency or all significant digit if frequency contains more than 5 digits. - Holder code represented by letter "S" for HC-49S-SMD holder type & indicating decimal point.	<table border="1"> <thead> <tr> <th>Code</th> <th>Height</th> </tr> </thead> <tbody> <tr> <td>—</td> <td><math>3.0 \pm 0.2\text{mm}</math></td> </tr> <tr> <td>H</td> <td><math>4.0 \pm 0.2\text{mm}</math></td> </tr> </tbody> </table>	Code	Height	—	$3.0 \pm 0.2\text{mm}$	H	$4.0 \pm 0.2\text{mm}$	<table border="1"> <thead> <tr> <th>Code</th> <th>Load Capacitance</th> </tr> </thead> <tbody> <tr> <td>S</td> <td>Series</td> </tr> <tr> <td>18</td> <td>18pF</td> </tr> <tr> <td>20</td> <td>20pF</td> </tr> </tbody> </table>	Code	Load Capacitance	S	Series	18	18pF	20	20pF	<table border="1"> <thead> <tr> <th>Code</th> <th>Cut-Mode</th> </tr> </thead> <tbody> <tr> <td>F</td> <td>AT Fund</td> </tr> <tr> <td>3</td> <td>AT 3rd OT</td> </tr> </tbody> </table>	Code	Cut-Mode	F	AT Fund	3	AT 3rd OT	<table border="1"> <thead> <tr> <th>Code</th> <th>Ranges</th> </tr> </thead> <tbody> <tr> <td>Nil</td> <td><math>-20^\circ\text{C}</math> ~ <math>+70^\circ\text{C}</math></td> </tr> <tr> <td>X</td> <td><math>-40^\circ\text{C}</math> ~ <math>+85^\circ\text{C}</math></td> </tr> </tbody> </table>	Code	Ranges	Nil	$-20^\circ\text{C}$ ~ $+70^\circ\text{C}$	X	$-40^\circ\text{C}$ ~ $+85^\circ\text{C}$	<table border="1"> <thead> <tr> <th>Code</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>Nil</td> <td>Bulk</td> </tr> <tr> <td>T</td> <td>Tape &amp; reel</td> </tr> </tbody> </table>	Code	Description	Nil	Bulk	T	Tape & reel
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Optional

⑦ Frequency Tolerance	⑧ Frequency Stability																																
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\* If any option is not applicable (ex. Code=Nil) simply continue building the part number omitting spaces. Examples: 11S0592-20F 12S288-SF

**Remark:** Specifications are subject to change without prior notice. Please confirm with our sales engineer.

**Mechanical Characteristics:**

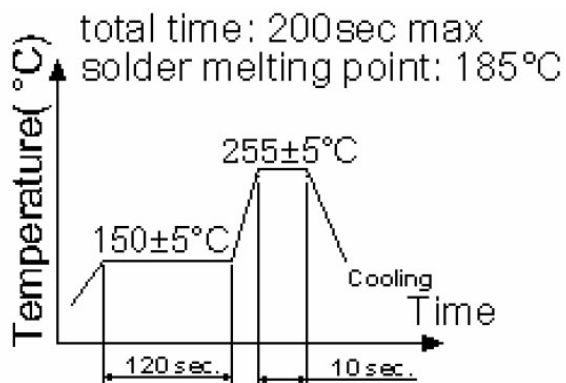
<b>Resistance to shock</b>	± 3 ppm max. ±3Ohms max., naturally drop it 3 times on a hard wood plate from 100cm height.
<b>Resistance to vibration</b>	± 3 ppm max. ±3Ohms max.

**Typical Frequencies, ESR & Operating Modes:**

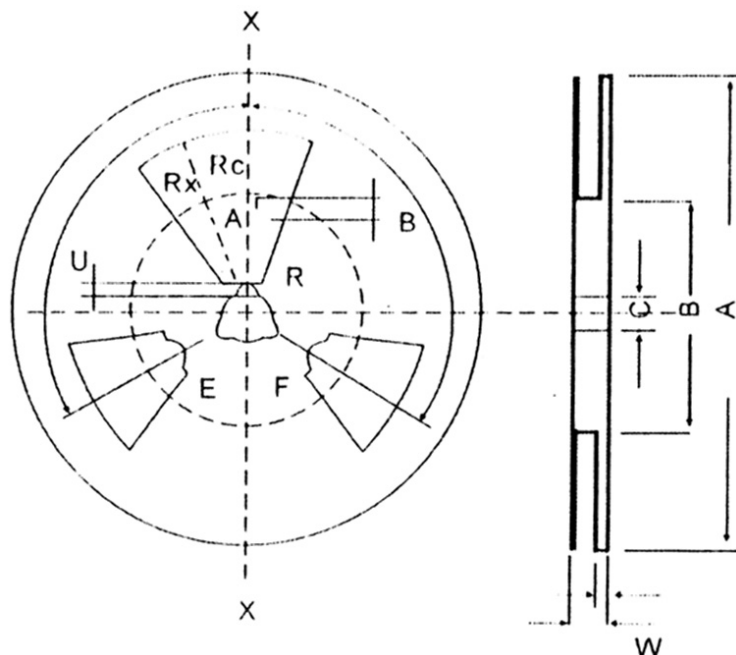
Frequency	E.S.R. (ohm)	Mode
3.000MHz ~ 5.999MHz	150 Max.	Fundamental / AT
6.000MHz ~ 7.999MHz	60 Max.	Fundamental / AT
8.000MHz ~ 15.999MHz	50 Max.	Fundamental / AT
16.000MHz ~ 30.000MHz	30 Max.	Fundamental / AT
24.000MHz ~ 40.320MHz	30 Max.	Fundamental / AT
24.000MHz ~ 29.999MHz	100 Max.	3rd OT / AT
30.000MHz ~ 49.999MHz	80 Max.	3rd OT / AT
50.000MHz ~ 100.000MHz	60 Max.	3rd OT / AT

*In addition to the Standard MEC Crystals HC-49S SMD, various custom-designed units are available to meet your requirements.*

**Recommended Reflow Conditions:**

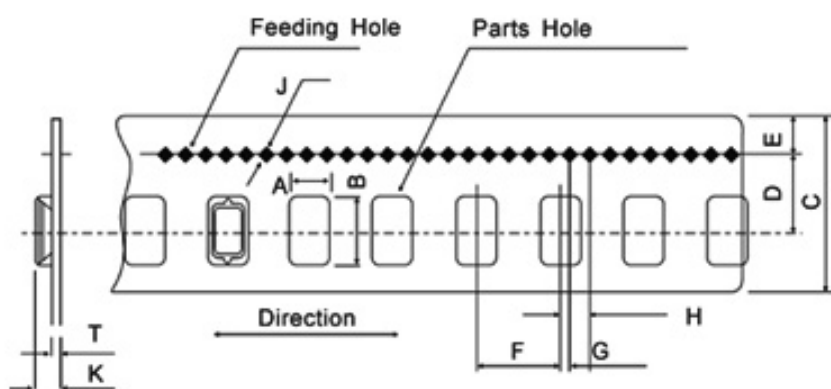


**HC-49S-SMD Reel Dimension (mm):**



Code	Dimension
A	Ø330 ± 2.0
t	2.4 ± 0.2
W	24.4 ± 2.0
B	100 ± 2.0
F	2.3 ± 1.0
V	6.0 ± 1.0
Q	120° ± 3°
C	Ø13.0 ± 0.5
E	2.5
U	5.0 ± 0.5
Ro	R90 ± 1.0
Ri	R40 ± 1.0
Rc	R5 ± 2.0
R	40° ± 2°

**HC-49S-SMD Embossed Carrier Dimension (mm):**



Code	Dimension
A	5.0 ± 0.1
B	15.0 ± 0.2
C	24.0 ± 0.3
D	11.5 ± 0.1
E	1.75 ± 0.1
F	12.0 ± 0.1
G	2.5 ± 0.1
H	6.0 ± 0.1
J	Ø1.5 ± 0.1
K	4.0 ± 0.1
T	0.5 ± 0.1