

Crystals in HC-49/U and HC-50/U cases

General application

Microcomputers, audio-/video-applications, wireless phones, communication devices

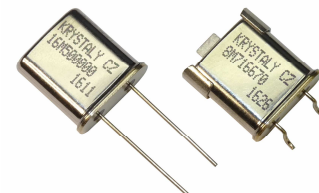
Features

Cases HC 49-50 series are highly reliable, hermetically sealed by seam welding

Assembly, taping

Cases HC 49-50 series are designed for through hole mount, but it can be designed for SMD too.

Crystals in SMD modification can be delivered in tapes wound on reels, suitable for automatic assembly.



Typical specifications

Type	HC-49/U, HC-50/U				
Overtone	1.	3.	5.	7.	9.
Frequency range [MHz]	1.6-40	16-120	30-190	90-190	120-190
Freq. adjustment tolerance at 25°C	±5, ±7, ±10, ±15, ±20, ±50 x 10 ⁻⁶				
Frequency stability	see table 1				
Equivalent series resistance	see table 2				
Aging	±1, ±2, ±3 ppm/year				
Storage temperature range	-40 ... +90 °C				
Load capacitance	series resonance, C _L = 5 ... 50 pF				
Drive level	10 - 1000 μW				

Differences from standard values and other parameters can be consulted.

Frequency stability in temperature ranges (table 1)

Temperature range [°C]	Frequency stability [ppm]											
	±2	±3	±4	±5	±7	±10	±15	±20	±25	±30	±40	±50
+15 ... +35	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
+10 ... +40	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
+5 ... +45		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
0 ... +50		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
-5 ... +55			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
-10 ... +60			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
-15 ... +65			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
-20 ... +70			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
-25 ... +75			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
-30 ... +80				✓	✓	✓	✓	✓	✓	✓	✓	✓
-40 ... +90					✓	✓	✓	✓	✓	✓	✓	✓
-55 ... +105						✓	✓	✓	✓	✓	✓	✓

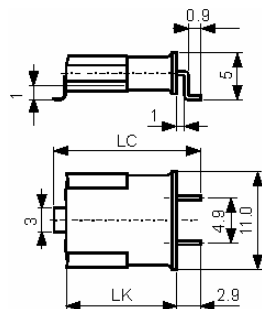
Equivalent series resistance (ESR_{max}) (table 2) for first overtone

Overtone	Frequency [MHz]							
	1.6	2.0	2.4	3.0	4.5	6	8	15
1.	500 Ω	300 Ω	250 Ω	120 Ω	80 Ω	30 Ω	20 Ω	15 Ω

for higher overtones

Overtone	Frequency [MHz]					
	16	30	90	120	160	190
3.	40 Ω		35 Ω			
5.			50 Ω		65 Ω	
7.				100 Ω		120 Ω
9.						130 Ω

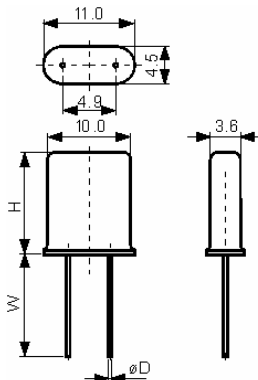
Outline dimensions [mm]



SMD modification

	LK	LC	Note
HC 49/SMD	13.4	17.9	with clip**
	11.2	16.2	with clip**
	10.5	15.6	with clip**

** clip means solderable metal cable sleeve



through hole modification

	H	W	D	Note
HC 49/U	13.4	13.7	0.48	
HC 49/11	11.2	13.7	0.48	
HC 49/10	10.5	13.7	0.48	from 4.5MHz
HC 49/x-3				3 wires*
HC 49/x-3S				3 - point mounting for higher resistivity to shock and vibrations
HC 50/U	13.4	6.2	1.06	
HC 50/11	11.2	6.2	1.06	

* central wire is connected with the case