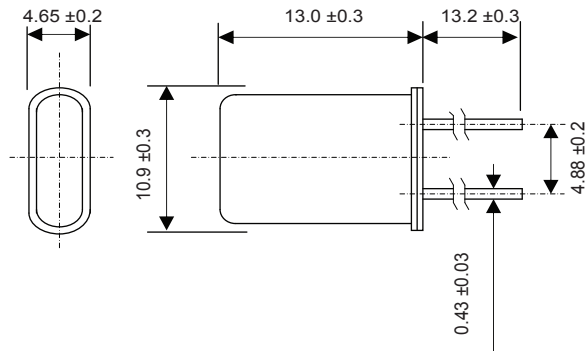


## Crystal Unit - HC-49/U

### Outline Drawing

Dimension (Unit=mm)



### Features & Applications:

- General, industrial, microcontrollers
  - RoHS Compliant
  - Cost Effective
  - Well established product
  - Wide frequency range
  - Superior resistance weld HC-49/U metal case
- Supplied loose as standard.  
Taped product available to special order.

### Specification

Nominal Frequency Range	1.8 to 32MHz	24 to 75MHz	75 to 200MHz
Vibration Mode	Fundamental (AT)	3rd Overtone (AT)	5th Overtone (AT)
Frequency Tolerance @25°C	±20 or ± 30 ppm		
Temperature Stability	±30 or ± 50 ppm		
Operating Temperature Range	-10°C to +60°C (Option: -20°C to +70°C)		
Storage Temperature Range	-20°C to +70°C (Option: -30°C to +80°C)		
Load Capacitance	8pF to 32pF or series		
Equivalent Series Resistance	see ESR table below		
Shunt Capacitance	5pF max.(≤18MHz) or 7pF max. (>18MHz)		
Drive Level	200 μW max (≤5MHz) 100 μW max (>5MHz)		
Insulation Resistance	500MΩmin @ 100VDC		
Aging	±5ppm per year		

### ESR Table

Case Frequency	Vibration Mode	HC 49U Ω Max
1.0-1.8MHz	F	3000
1.8-2.00MHz	F	500
2.01-2.399MHz	F	450
2.4-2.99MHz	F	300
3.0-3.5MHz	F	150
3.5-3.99MHz	F	90
4.0-4.99MHz	F	80
5.0-5.99MHz	F	70
6.0-6.99MHz	F	60
7.0-7.99MHz	F	50
8.0-9.99MHz	F	40
10-13.99MHz	F	35
14-23.99MHz	F	25
24-25.0MHz	F/3	25/50
25-30.0MHz	F/3	25/50
30-75.0MHz	3	50
75-125.0MHz	5	80
125-150MHz	5	100
150-200MHz	5	120

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Part Number Guide:

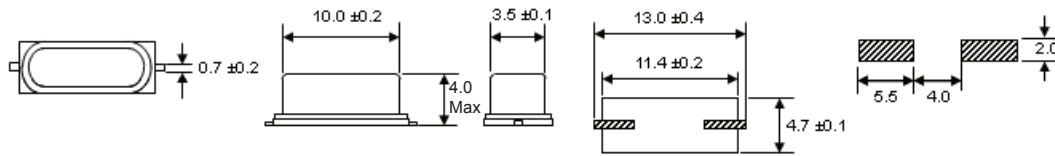
Case	Frequency (MHz)	Freq. Tol (PPM)	Temp Stab (PPM)	Temp Range 60 = -10~+60 70 = -20~+70	Load Cap pf 00 = Series	Vibration Mode AT Cut F=Fund.3 Overtone	Ant Part No.
HC49U	1.8432	20	50	60	30	ATF	XTL-1012
HC49U	2	50	100	60	20	ATF	XTL-1014
HC49U	2.4576	20	50	60	30	ATF	XTL-1017
HC49U	3.2768	20	30	60	12	ATF	XTL-1020
HC49U	3.579545	20	50	60	20	ATF	XTL-1021
HC49U	3.6864	20	50	60	30	ATF	XTL-1023
HC49U	3.6864	30	50	70	30	ATF	XTL-1024
HC49U	4	20	10	70	30	ATF	XTL-1027
HC49U	4	20	50	60	30	ATF	XTL-1028
HC49U	4	30	50	70	30	ATF	XTL-1029
HC49U	4.096	20	20	70	30	ATF	XTL-1031
HC49U	4.096	30	50	70	30	ATF	XTL-1032
HC49U	4.194304	20	30	60	12	ATF	XTL-1033
HC49U	4.608	20	50	60	30	ATF	XTL-1037
HC49U	4.9152	20	50	60	30	ATF	XTL-1040
HC49U	4.9152	30	50	70	30	ATF	XTL-1041
HC49U	5	20	50	60	30	ATF	XTL-1043
HC49U	5.0688	20	50	60	00	ATF	XTL-1044
HC49U	6	20	50	60	30	ATF	XTL-1051
HC49U	6	30	50	70	30	ATF	XTL-1053
HC49U	6.144	20	50	60	30	ATF	XTL-1055
HC49U	6.5536	20	30	60	12	ATF	XTL-1057
HC49U	7.3728	20	50	60	30	ATF	XTL-1059
HC49U	8	20	50	60	30	ATF	XTL-1062
HC49U	8	30	50	70	30	ATF	XTL-1064
HC49U	10	20	10	70	30	ATF	XTL-1069
HC49U	10	20	50	60	30	ATF	XTL-1070
HC49U	11	20	30	60	30	ATF	XTL-1073
HC49U	11.0592	20	30	60	20	ATF	XTL-1074
HC49U	12	20	30	60	30	ATF	XTL-1079
HC49U	12.288	20	50	60	30	ATF	XTL-1081
HC49U	14.31818	20	50	60	00	ATF	XTL-1083
HC49U	14.7456	20	30	60	30	ATF	XTL-1087
HC49U	16	20	30	60	30	ATF	XTL-1089
HC49U	19.6608	20	50	60	30	ATF	XTL-1096
HC49U	20	20	30	60	00	ATF	XTL-1098
HC49U	22.1184	20	50	60	30	ATF	XTL-1114
HC49U	24	20	50	60	00	ATF	XTL-1120
HC49U	32	20	30	60	00	ATF	XTL-1131

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## Crystal Unit - HC-49/SM

### Outline Drawing

Dimension (Unit=mm)



### Features & Applications:

Designed for applications where board height is critical

- General, industrial, microcontrollers
- Cost effective
- Surface mount
- Low profile (4mm height)
- Superior resistance weld HC49/4SMX metal case
- Supplied taped and reeled.

### Specification

Nominal Frequency Range	3.5 to 32MHz	24 to 70MHz
Vibration Mode	Fundamental (AT)	3rd Overtone (AT)
Frequency Tolerance @25°C	±20, ± 30 or ±50ppm (Options: ±10, ±15ppm)	
Temperature Stability	±30 or ± 50 ppm	
Operating Temperature Range	-10°C to +60°C or -20°C to +70°C	
Storage Temperature Range	-20°C to +70°C or -30°C to +80°C	
Load Capacitance	8pF to 33pF or series	
Equivalent Series Resistance	see ESR table below	
Shunt Capacitance	5pF max.(≤18MHz) or 7pF max. (>18MHz)	
Drive Level	200 μW max (≤5MHz) 100μW max (>5MHz)	
Insulation Resistance	500MΩmin @ 100V DC	
Aging	±5ppm per year	

### ESR Table

Case	Vibration	HC 49SM
Frequency	Mode	Ω Max
3.5-3.99MHz	F	150
4.0-4.99MHz	F	120
5.0-5.99MHz	F	100
6.0-6.99MHz	F	80
7.0-7.99MHz	F	80
8.0-9.99MHz	F	70
10-13.99MHz	F	50
14-23.99MHz	F	40
24-25.0MHz	F/3	40/80
25-30.0MHz	F/3	40/80
30-70.0MHz	3	80

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### Part Number Guide:

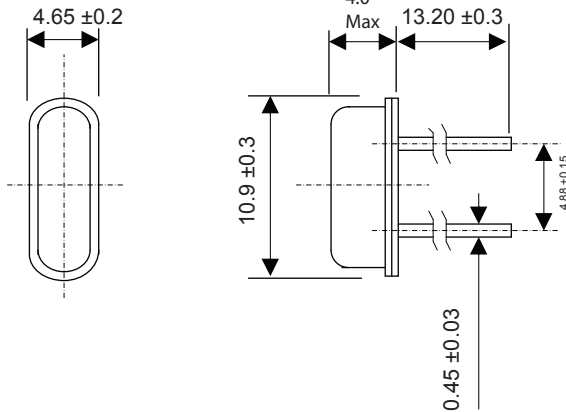
Case	Frequency (MHz)	Freq. Tol (PPM)	Temp Stab (PPM)	Temp Range 60 = -10~+60 70 = -20~+70	Load Cap pf 00 = Series	Vibration Mode AT Cut F=Fund.3 Overtone	Ant Part No.
HC49SM	3.579545	30	50	60	16	ATF	XTL-5014
HC49SM	3.6864	30	50	60	16	ATF	XTL-5014
HC49SM	4	30	50	60	16	ATF	XTL-5021
HC49SM	4.9152	30	50	60	16	ATF	XTL-5025
HC49SM	6	30	50	60	30	ATF	XTL-5032
HC49SM	8	30	50	60	16	ATF	XTL-5038
HC49SM	10	30	50	60	16	ATF	XTL-5043
HC49SM	11.0592	30	50	60	16	ATF	XTL-5048
HC49SM	12	30	50	60	16	ATF	XTL-5050
HC49SM	16	30	50	60	16	ATF	XTL-5055
HC49SM	20	30	50	60	16	ATF	XTL-5062

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## Crystal Unit - HC-49/S

### Outline Drawing

Dimension (Unit=mm)



### Features & Applications:

Designed for applications where board height and space is critical

- General, industrial, microcontrollers
- Cost effective
- Low profile (4mm height)
- Superior resistance weld HC49/4H metal case

Supplied loose as standard.  
Taped product available to special order.

### Specification

Nominal Frequency Range	3.5 to 32MHz	24 to 70MHz
Vibration Mode	Fundamental (AT)	3rd Overtone (AT)
Frequency Tolerance @25°C	±20, ±30 or ±50ppm (Options: ±10, ±15ppm)	
Temperature Stability	±30 or ±50 ppm	
Operating Temperature Range	-10°C to +60°C (Option: -20°C to +70°C)	
Storage Temperature Range	-20°C to +70°C (Option: -30°C to +80°C)	
Load Capacitance	8pF to 32pF or series	
Equivalent Series Resistance	see ESR table below	
Shunt Capacitance	5pF max.(≤18MHz) or 7pF max. (>18MHz)	
Drive Level	200 μW max (≤5MHz) 100 μW max (>5MHz)	
Insulation Resistance	500MΩmin @ 100VDC	
Aging	±5ppm per year	

### ESR Table

Case Frequency	Vibration Mode	HC 49S Ω Max
3.5-3.99MHz	F	150
4.0-4.99MHz	F	120
5.0-5.99MHz	F	100
6.0-6.99MHz	F	80
7.0-7.99MHz	F	80
8.0-9.99MHz	F	70
10-13.99MHz	F	50
14-23.99MHz	F	40
24-25.0MHz	F/3	40/80
25-30.0MHz	F/3	40/80
30-70.0MHz	3	80

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### Part Number Guide:

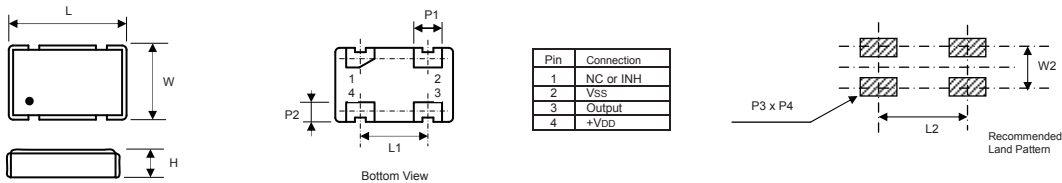
Case	Frequency (MHz)	Freq. Tol (PPM)	Temp Stab (PPM)	Temp Range 60 = -10--+60 70 = -20--+70	Load Cap pf 00 = Series	Vibration Mode AT Cut F=Fund.3 Overtone	Ant Part No.
HC49S	3.579545	30	50	70	20	ATF	XTL-3012
HC49S	3.6864	30	50	70	30	ATF	XTL-3015
HC49S	4	20	50	60	30	ATF	XTL-3018
HC49S	4.194304	30	50	60	30	ATF	XTL-3024
HC49S	4.433619	30	50	60	20	ATF	XTL-3026
HC49S	4.9152	30	50	70	30	ATF	XTL-3028
HC49S	6	30	50	60	30	ATF	XTL-3035
HC49S	7.3728	15	30	60	18	ATF	XTL-3039
HC49S	7.68	30	50	60	30	ATF	XTL-3042
HC49S	8	30	50	70	30	ATF	XTL-3044
HC49S	9.8304	30	50	60	30	ATF	XTL-3048
HC49S	10	30	50	70	30	ATF	XTL-3052
HC49S	11.0592	30	50	70	30	ATF	XTL-3060
HC49S	12	30	50	70	30	ATF	XTL-3064
HC49S	16	30	50	70	30	ATF	XTL-3069
HC49S	18.432	30	50	60	30	ATF	XTL-3074
HC49S	20	30	50	70	12	ATF	XTL-3078
HC49S	24	50	50	60	30	ATF	XTL-3085

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## SMD Clock Oscillator - DXO-57

### Outline Drawing

Dimension (Unit=mm)

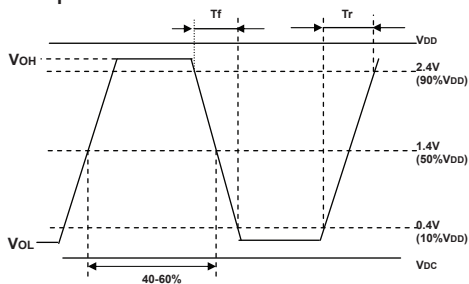


Type	L	W	H	L1	P1	P2	L2	W2	P3	P4
DXO-75	7.0 ±0.15	5.0 ±0.15	1.4 ±0.2	5.08 ±0.15	1.4 ±0.1	1.2 ±0.1	6.4 ±0.15	2.54 ±0.15	2.2 ±0.1	1.4 ±0.1

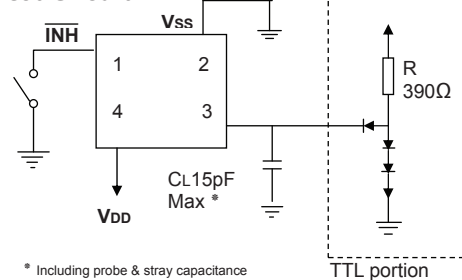
Quartz crystal oscillators house a small 5x7mm package. Choice of 3.3V and 5V supply versions.

- General, Microprocessor • Ultra Thin Ceramic Package • Cost effective • Surface mount •
- HCMOS/TTL output • Tri-state option • Supplied taped and reeled.

### Output Waveform



### Test Circuit



### Specification

Nominal Frequency Range	1.5 to 23.99MHz	24 to 49.99MHz	50 to 80MHz
Frequency Tolerance	±50ppm (Options: ±25, ±100ppm)		
Operating Temperature Range	0°C to +70°C		
Storage Temperature Range	-40°C to +85°C		
Supply Voltage (V <sub>DD</sub> )	3.3V or 5V ±10%		
Current Consumption (max.)	25mA	40mA	50mA
Output Symmetry at 1/2V <sub>DD</sub>	40% to 60% (standard), 45% to 55% tight		
Output Load	15pF HCMOS or 10TTL		
Output Level "L" (max.)	10% V <sub>DD</sub> HCMOS or +0.4VDC TTL		
Output Level "H" (min.)	90% V <sub>DD</sub> HCMOS or +2.4VDC TTL		
Rise/Fall Time (10%-90% V <sub>DD</sub> )(max.)	10ms		
Start up Time (max.)	10ms		
Stand by function	Tri State		

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### Part Number Guide:

Case	Frequency (MHz)	Freq.Tol (PPM)	Symmetry	Input Voltage	Ant Part No.
DXO57	4	50	T	3.3	DXO-2014
DXO57	8	50	T	3.3	DXO-2022
DXO57	10	50	T	3.3	DXO-2028
DXO57	12	50	T	3.3	DXO-2033
DXO57	16	50	T	3.3	DXO-2026
DXO57	20	50	T	3.3	DXO-2034
DXO57	24	50	T	3.3	DXO-2037
DXO57	32.768	50	T	3.3	DXO-2041
DXO57	40	50	T	3.3	DXO-2052
DXO57	50	50	T	3.3	DXO-2059
DXO57	60	50	T	3.3	DXO-2066
DXO57	80	50	T	3.3	DXO-2070
DXO57	100	50	T	3.3	DXO-2081

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## Crystal Unit - DX-57

### Outline Drawing

Dimension (Unit=mm)

Pin	Connection
1	Xtal
2	GND
3	Xtal
4	GND

### Features & Applications:

- Communication Equipment, PDA's, Wireless security systems
- Cost Effective
- Surface Mount
- Ultra thin ceramic package
- Size 5 x 7mm
- Height 1.4mm max.

Supplied taped and reeled.

### Specification

Nominal Frequency Range	10 to 30MHz	30 to 60MHz
Vibration Mode	Fundamental (AT)	3rd Overtone (AT)
Frequency Tolerance @25°C	±20, ± 30 or ±50ppm	
Temperature Stability	±30 or ± 50 ppm	
Operating Temperature Range	-20°C to +70°C	
Storage Temperature Range	-30°C to +80°C	
Load Capacitance	8pF to 32pF or series	
Equivalent Series Resistance	see ESR table below	
Shunt Capacitance	7pF max	
Drive Level	100 μW max	
Insulation Resistance	500MΩmin @ 100VDC	
Aging	±5ppm per year	

ESR Table

Case	Vibration Mode	DX-57 Ω Max
10-13.99 MHz	F	60
14-30.0 MHz	F	50
30-60.0MHz	3	100

### Part Number Guide:

Case	Frequency (MHz)	Freq. Tol (PPM)	Temp Stability (PPM)	Temp Range 60 = -10~+60 70 = -20~+70	Load Cap pf 00 = Series	Vibration Mode AT Cut F=Fund.3 Overtone	Ant Part No.
DX57	10	30	50	70	20	ATF	XTL-7024
DX57	11.0592	30	50	70	20	ATF	XTL-7026
DX57	12	30	50	70	20	ATF	XTL-7029
DX57	18.432	30	50	70	20	ATF	XTL-7036
DX57	19.6608	30	50	70	20	ATF	XTL-7040
DX57	24	30	50	70	20	ATF	XTL-7047
DX57	27	30	50	70	20	ATF	XTL-7052
DX57	32	30	50	70	20	AT3	XTL-7056

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