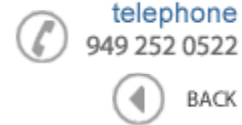


**Data Sheet**

Product Category: SMD Quartz Crystal

Series Number	Package	Description	Last Modified
250 ~ 251	HC-49SM	SMD Quartz Crystal	Sept. 01 2004

FEATURES

- Cost effective
- Low profile
- Space saving design
- Tape and Reel
- RoHs / Lead Free compliant

**OPERATING CONDITIONS / ELECTRICAL CHARACTERISTICS**

PARAMETERS	CONDITIONS	CHARACTERISTICS	UNITS
Frequency Range	f_O	3.000 ~ 85.00	MHz
Frequency Tolerance	Ref @ +25°C	±30 std. (±5 ~ ±100 avail.)	PPM
Temperature Tolerance	T_L	±50 std. (See Table 2)	PPM
Operating Temperature	T_{OPR}	-10 ~ +60 std. (See Table 2)	°C
Storage Temperature	T_{STG}	-55 ~ +125	°C
Shunt Capacitance	C_O	7.0 max.	pF
Load Capacitance	C_L	20.0 std. (8 ~ 50 and Series avail.)	pF
Drive Level	D_L	0.1 ~ 1.0	mW
Aging (First Year)	@ +25°C	±5.0	PPM/Y
Insulation Resistance	I_R	500 (DC100 ±10V) min.	Mohm

TABLE 1 - OPERATION MODE AND MOTIONAL RESISTANCE (RS)

FREQUENCY RANGE (MHz)	MODE	ohm max.	FREQUENCY RANGE (MHz)	MODE	ohm max.
3.000 ~ 3.500	Fundamental	300	8.000 ~ 10.000	Fundamental	60
3.500 ~ 3.800	Fundamental	150	10.000 ~ 12.000	Fundamental	50
3.800 ~ 4.100	Fundamental	120	12.000 ~ 28.000	Fundamental	40
4.100 ~ 5.000	Fundamental	100	28.000 ~ 33.500	Fundamental	50
5.000 ~ 6.000	Fundamental	80	26.000 ~ 40.000	3rd OT	100
6.000 ~ 8.000	Fundamental	70	40.000 ~ 75.000	3rd OT	80

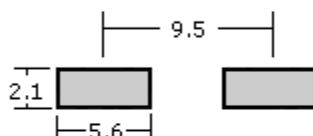
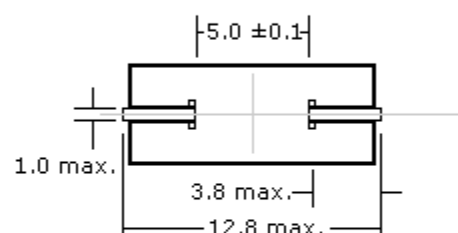
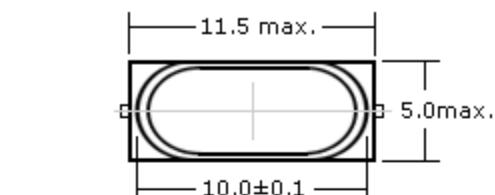
TABLE 2 - FREQUENCY - TEMPERATURE TOLERANCE

Cutting	Temperature Range	Tolerance (PPM)					
		±5.00	±10.0	±15.0	±20.0	±30.0	±50.0
AT	0 ~ +50°C	x	x	x	x	x	x
	-10 ~ +60°C		x	x	x	O	x
	-20 ~ +70°C			x	x	x	O
	-30 ~ +80°C				x	x	x

x	available
O	recommended

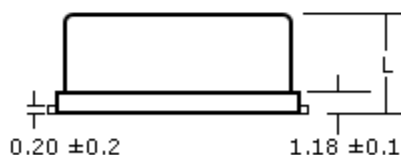
	-40 ~ +85°C					x	x
BT	Within a range of ±80 ~ ±120 PPM						
Note: Consult factory for available frequencies							

PACKAGE DIMENSIONS (mm)



Recommended Land Pattern

Dim. L	
250	4.2mm
251	3.2mm



PART NUMBER GUIDE

Series Number	Frequency	Load Capacitance	Tolerance @ +25°C	Tolerance Over Temp (°C)	Operating Temp (°C)	Packaging**
250	- 12.0M	- SR	- 05	K	P	- TR
HC-49SM 250: L=4.2 251: L=3.2	See table below for standard freq. and enter here e.g. 2.048M for 2.048 MHz OR enter any desire frequency.	Enter desired capacitance here. See table below for standard load capacitance e.g. - 20 for 20pF or Enter SR for Series.	Blank * = ± 30 PPM or Fill in E.G 05 = ± 5 PPM 25 = ± 25 PPM Avail. = $\pm 5 \sim \pm 100$	Blank* = ± 50 PPM G = ± 30 PPM H = ± 20 PPM K = ± 15 PPM L = ± 10 PPM M = ± 5 PPM N = ± 100 PPM	P = 0~+50 R = -10~+60 S = -20~+70 T = -30~+80 W = -40~+85	Blank* = Bulk TR = Tape/Reel
NOTE: Deviations on all parameters available. Please consult Oscilent for details. DEFINITIONS: Click on the characteristic names above for definitions of that particular characteristic. *STANDARDS: "Blank" part number selections indicate standard variables for that particular characteristic. **PACKAGING: Click on the packaging name above for tape/reel specifications						

STANDARD FREQUENCIES / LOAD CAPACITANCE - FOR GUIDE ONLY/ OTHER FREQ./LOADS AVAILABLE

FREQUENCY	LOAD (pF)						

(MHz)	Series	12	13	16	17	18	20	30
3.579545	Std.	-	-	-	Std.	-	-	-
3.6864	Std.	-	-	-	-	-	Std.	-
4.000	Std.	-	-	-	-	-	Std.	-
4.032	Std.	-	-	-	-	-	Std.	-
4.096	-	-	-	-	-	-	Std.	-
4.194304	-	Std.	-	Std.	-	-	-	-
4.433618	-	-	-	-	-	-	Std.	-
4.9152	Std.	-	-	-	-	-	Std.	-
5.000	Std.	-	-	-	-	-	Std.	-
5.0688	Std.	-	-	-	-	-	Std.	-
5.185	Std.	-	-	-	-	-	-	Std.
5.9904	Std.	-	-	-	-	-	Std.	-
6.000	Std.	-	-	-	-	-	-	Std.
6.144	-	-	-	-	-	-	-	Std.
6.5536	Std.	-	-	-	-	-	-	-
7.3728	Std.	-	-	-	-	-	Std.	-
8.000	Std.	-	-	-	-	Std.	-	Std.
9.216	Std.	-	-	-	-	-	Std.	-
9.8304	Std.	-	-	-	-	-	Std.	-
10.000	Std.	-	-	-	-	Std.	-	-
11.000	Std.	-	-	-	-	-	-	-
11.0592	Std.	-	-	-	-	-	Std.	Std.
12.000	Std.	-	-	-	-	-	Std.	Std.
12.000393	-	-	-	-	-	Std.	-	-
12.288	Std.	-	-	-	-	-	Std.	-
14.31818	Std.	-	-	-	-	Std.	Std.	-
14.7456	Std.	-	-	-	-	-	Std.	-
15.000	Std.	-	-	-	-	-	-	-
16.000	Std.	-	-	-	-	-	Std.	-
16.000312	-	-	-	-	-	Std.	-	-
16.257	Std.	-	-	-	-	-	Std.	-
16.9344	-	-	-	-	-	-	Std.	-
18.000	Std.	-	-	-	-	-	Std.	-
18.432	Std.	-	-	-	-	Std.	Std.	-
19.6608	Std.	-	-	-	-	-	Std.	-
20.000	Std.	-	-	Std.	-	Std.	Std.	-
22.1184	Std.	-	-	-	-	-	-	-

24.000(F)	Std.	-	-	Std.	-	Std.	Std.	-
24.00014 (F)	-	-	-	-	-	Std.	-	-
40.00 (OT)	-	-	-	-	-	Std.	-	-
40.32 (OT)	-	-	-	-	-	-	Std.	-
FREQUENCY (MHz)	Series	12	13	16	17	18	20	32
	LOAD (pF)							
F = Fundamental OT = 3RD Overtone								
NOTE: Other frequencies and load capacitance available. Please consult Oscilent for part numbers.								

Oscilent Corporation - CALL **949.252.0522**

Series No.: [250 to 251](#)

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