PLETRONICS
www.pletronics.com 425-776-1880



MP49 Series
HC-49/U Crystal

January 2009

- The Pletronics' MP49 Series is a thru-hole crystal
- Bulk packaging
- 3 MHz to 70 MHZ
- AT Cut Crystal

Pletronics Inc. certifies this device is in accordance with the RoHS 5/6 (2002/95/EC) and WEEE (2002/96/EC) directives.

Pletronics Inc. guarantees the device does not contain the following:
Cadmium, Hexavalent Chromium, Lead (<1000 ppm), Mercury, PBB's, PBDE's
Weight of the Device: 1.00 grams
Moisture Sensitivity Level: 1 As defined in J-STD-020C
Second Level Interconnect code: e1 or e3

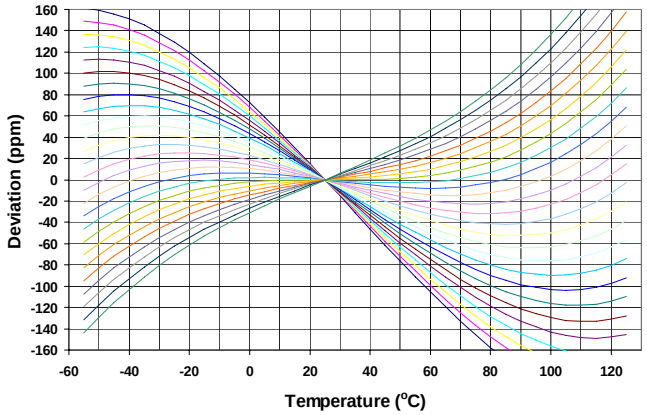
Electrical Specification:

Item	Min	Max	Unit	Condition	
Frequency Range	1.8432	210	MHZ	AT cut	
Calibration Frequency Tolerance	-	-	ppm	at +25°C ± 3°C	see table on page 3 for available options
Frequency Stability over OTR	-	-	ppm		
Equivalent Series Resistance (ESR)	-	700	Ohms	1.8432 MHZ to 3 MHZ	
	-	150	Ohms	3 MHZ to 4 MHZ	Fundamental
	-	100	Ohms	4 MHZ to 7 MHZ	
	-	50	Ohms	7 MHZ to 10 MHZ	
	-	25	Ohms	10 MHZ to 37 MHZ	
	-	40	Ohms	21 MHZ to90 MHZ	3rd Overtone
	-	70	Ohms	60 MHZ to 150 MHZ	5th Overtone
	-	100	Ohms	85 MHZ to 210 MHZ	7th Overtone
Drive Level	-	1	mW	use 10 µW for testing	
Shunt Capacitance (C0)	-	7	pF	Pad to Pad capacitance	
Aging	-5	+5	ppm /Yr	at +25°C ± 3°C	
Specified Temperature Range	-40	+85	°C	see table on page 3 for available options	
Storage Temperature Range	-55	+125	°C		

Product information is current as of publication date. The product conforms to specifications per the terms of the Pletronics limited warranty. Production processsing does not necessarily include testing of all parameters.

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AT Cut Crystal Frequency versus Temperature Typical Performance:



Part Marking:

PLE	**or**	**PLE**
MP49x		**SRMP49**
FFFFFM		***FFFFFM***
ymdz		***ymdz***

Legend:

x = Capacitance load code from below
FFFFFM = Frequency in MHz
PLE = Pletronics
ymd = Date of Manufacture (year, month and day)
All other marking is internal factory codes

Specifications such as frequency tolerance and operating temperature range, etc. are not identified from the marking. External packaging labels and packing list will correctly identify the ordered Pletronics part number.

Code	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	T	U	V	W	X	Y
pF	10	12	13	8	15	18	20	22	24	26	28	30	32	34	36	27	33	50	19	16	17	14

Codes for Date Code YMD

Code	6	7	8	9	0	1	2
Year	2006	2007	2008	2009	2010	2011	2012

Code	A	B	C	D	E	F	G	H	J	K	L	M
Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC

Code	1	2	3	4	5	6	7	8	9	A	B	C
Day	1	2	3	4	5	6	7	8	9	10	11	12
Code	D	E	F	G	H	J	K	L	M	N	P	R
Day	13	14	15	16	17	18	19	20	21	22	23	24
Code	T	U	V	W	X	Y	Z					
Day	25	26	27	28	29	30	31					

MP49 Series
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Part Number:

MP49	-18	-14.31818M	-50	H	1	G	G	-XX

See chart below for available options

Internal code or blank
Highest Specified Operating Temperature **A** = 40°C **G** = 70°C **B** = 45°C **H** = 75°C **C** = 50°C **J** = 80°C **D** = 55°C **K** = 85°C **E** = 60°C **F** = 65°C
Lowest Specified Operating Temperature **A** = +10°C **F** = -15°C **L** = -40°C **B** = +5°C **G** = -20°C **C** = 0°C **H** = -25°C **D** = -5°C **J** = -30°C **E** = -10°C **K** = -35°C
Mode: 1 = Fundamental **3** =3rd Overtone
Frequency Stability See chart below
Calibration Frequency Tolerance (Typ. Values shown) **15** = ± 15 ppm at 25°C ± 3°C **20** = ± 20 ppm at 25°C ± 3°C **30** = ± 30 ppm at 25°C ± 3°C (Standard)
Frequency in MHZ
Cload in pF Parallel Resonance from **09** to **44** pF or **SR** = Series Resonance
Series Model

Operating Temperature Range		Available Frequency Stability versus Temperature in ppm					
		D	**E**	**F**	**G**	**H**	**J**
	CODE	± 10	± 15	± 20	± 30	± 50	± 100
0 to +45°C	**CB**	●	●	●	●	●	●
0 to +50°C	**CC**	●	●	●	●	●	●
0 to +60°C	**CE**	●	●	●	●	●	●
0 to +70°C	**CG**	●	●	●	●	**STD**	●
-10 to +50°C	**EC**	●	●	●	●	●	●
-10 to +60°C	**EE**	●	●	●	●	●	●
-10 to +75°C	**EH**	●	●	●	●	●	●
-20 to +70°C	**GG**	●	●	●	●	●	●
-20 to +75°C	**GH**	●	●	●	●	●	●
-30 to +75°C	**JH**	●	●	●	●	●	●
-30 to +80°C	**JJ**	●	●	●	●	●	●
-30 to +85°C	**JK**	●	●	●	●	●	●
-35 to +80°C	**KJ**		●	●	●	●	●
-40 to +85°C	**LK**		●	●	●	●	●

Legacy Part Number (not for new designs):

MP49	B	E	-18	-11.0592M	-XX	
						Internal code or blank
						Frequency in MHz
						Cload in pF Parallel Resonance in pF or **SR** = Series Resonance
						Operating Temperature Range Blank = 0 to + 70°C (STD) **E** = -40 to +85°C
						Calibration Tolerance / Frequency Stability Blank = 30/50 (STD) **B** = 30/30 **C** = 15/30 **D** = 10/20 (not all frequencies)
						Series Model

Reliability: Environmental Compliance

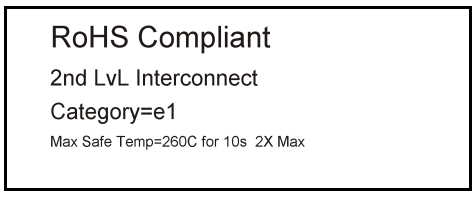
Parameter	Condition
Mechanical Shock	MIL-STD-883 Method 2002, Condition B
Vibration	MIL-STD-883 Method 2007, Condition A
Solderability	MIL-STD-883 Method 2003
Thermal Shock	MIL-STD-883 Method 1011, Condition A

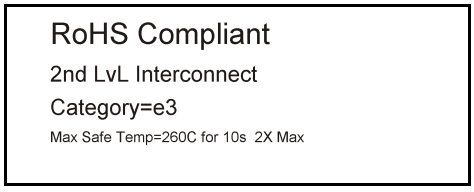
Package Labeling

Label is 1" x 2.6" (25.4mm x 66.7mm)
Font is Courier New
Bar code is 39-Full ASCII

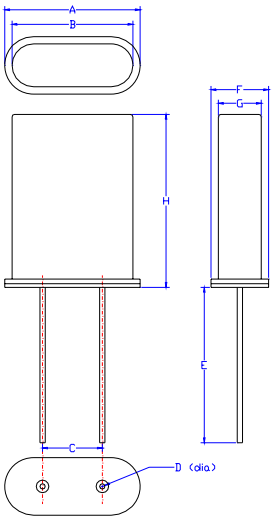


Label is 1" x 2.6" (25.4mm x 66.7mm)
Font is Arial





Mechanical:



	Inches	mm
A	0.425 max	10.80 max
B	0.404	10.26
C	0.192	4.88
D	0.017 dia	0.43 dia
E	0.500 min	12.7 min
F	0.176 max	4.47 max
G	0.145	3.68
H	0.52 max	13.21 max

Contacts (3 types of lead plating used):

Matte Tin (Sn)

Tin over Copper (SnCu)

SAC (SnAgCu)

Not to Scale

[1] Typical dimensions

Layout and application information

- Trace lengths to the crystal should be kept as short as possible.
- The crystal connections are sensitive to noise.
- The package should be grounded for optimum performance.

IMPORTANT NOTICE

Pletronics Incorporated (PLE) reserves the right to make corrections, improvements, modifications and other changes to this product at anytime. PLE reserves the right to discontinue any product or service without notice. Customers are responsible for obtaining the latest relevant information before placing orders and should verify that such information is current and complete. All products are sold subject to PLE's terms and conditions of sale supplied at the time of order acknowledgment.

PLE warrants performance of this product to the specifications applicable at the time of sale in accordance with PLE's limited warranty. Testing and other quality control techniques are used to the extent PLE deems necessary to support this warranty. Except where mandated by specific contractual documents, testing of all parameters of each product is not necessarily performed.

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