ACT HC49/US-SMX   (Custom Packages)

The **ACT HC49/US-SMX** is one of the most cost effective and popular surface mount crystals available. With it's wide range of frequencies, stabilities and operating temperatures it is still small enough to fit most applications including many hand held units and is the economical solution for automatic assembly. With it's available tight tolerances / stabilities and available operating temperature ranges, the HC49/US-SMX is a favoured choice in many applications, including Communications, Industrial Controls, Microprocessor Systems, Vending, Security and Access Control.

Compatible with Eu Directive
2002/EC - RoHS

Specification

Parameter	Symbol	Specification	Condition
Frequency Range	fo	3.00 ~ 100.00MHz	Fundamental & 3rd O/T
Frequency Tol.	$\Delta f/fo$	±10 ~ ±100ppm	@25°C (see note 1 for <±10)
Stability over Temp Range	Tc	±5 ~ ±100ppm	Dependent on temperature
Temp Operating Range	Topr	-10 ~ +60°C Typ	Others available, please enquire.
Temp Storage Range	Tstg	-40 ~ +85°C	
Equivalent Series Resistance	ESR	See table below	
Shunt Capacitance	CO	7pFmax	
Load Capacitance	CL	10 ~ 55pF & SR	Please specify
Drive Level	DL max	50μ W typ	Others available, please enquire.
Drive Level Dependency	DLD	Rmax/Rmin ≤1.3 FDLDmax-FDLDmin	0.01, 0.1, 1, 10, 50, 100 μW steps
Insulation Resistance	IR	500MΩ	min at 100Vdc
Aging	Fa	±5ppm per year @25°C	Others available, please enquire.

Note 1   For packages BM (H=3.8mm) and PO (H=4.2mm) Frequency Tolerance starts at ±5ppm .

Table 1

Frequency (MHz)	ESR (Ω) max	Mode	Frequency (MHz)	ESR (Ω) max	
3.000 ~ 4.199	180	AT Fund	12.000 ~ 13.999	60	AT Fund
4.200 ~ 4.499	130	AT Fund	14.000 ~ 16.999	50	AT Fund
4.500 ~ 5.999	100	AT Fund	17.000 ~ 35.999	35	AT Fund
6.000 ~7.999	90	AT Fund	36.000 ~ 40.000	25	AT Fund
8.000 ~ 9.999	70	AT Fund	20.000 ~ 40.00	40	BT Fund
10.00 ~ 11.999	60	AT Fund	24.000 ~ 100.00	100	3rd Overtone

### Recommended maximum re-flow profile
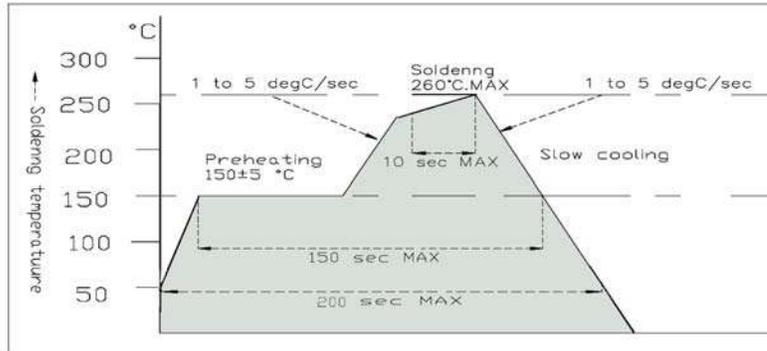
Standard Frequencies

3.579545	7.680	14.7456	22.1184
3.6864	8.192	15.000	22.5792
4.000	9.000	16.660	23.040
4.096	9.8304	16.670	24.000
4.9152	10.000	16.9344	25.000
5.000	10.240	17.734475	27.000
6.000	11.000	18.000	28.625
6.144	11.0592	18.432	28.636363
6.5539	12.000	19.6608	33.330
6.605	12.288	20.000	40.000
6.750	13.560	20.00014	48.000
7.3728	14.31818	22.080	50.000

HC49US SMX OUTLINE DIMENSIONS
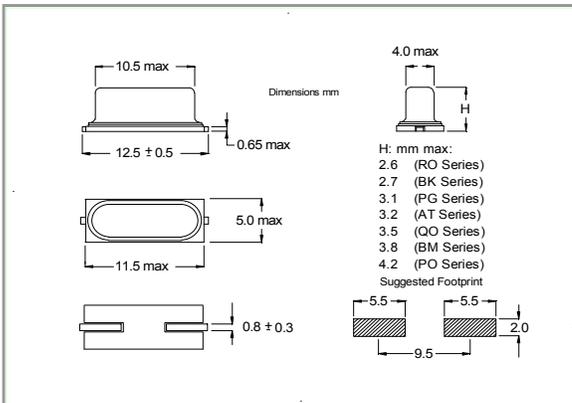
HC49US SMX TAPE DIMENSIONS (mm)
STANDARD REEL QUANTITY 1000PCS

A	B	C	D	E	F
1.35	4.00	8.00	11.50	24.00	4.25**
±0.05				±0.3	±0.25
					** Varies with Height Option
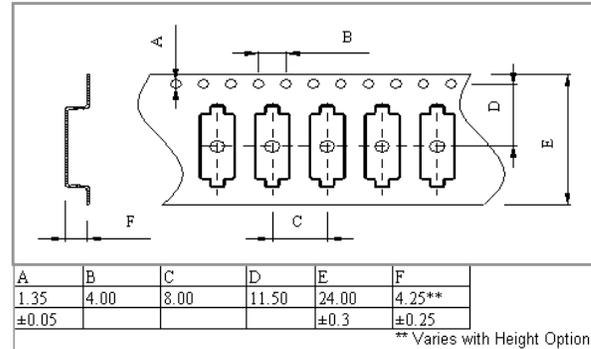
Please note that all parameters can not necessarily be specified in the same device
Customer to specify : Frequency Tolerance, Operating Temperature, Temperature Stability, Load Capacitance & Mode/cut
In line with our ongoing policy of product evolvement and improvement, the above specification may be subject to change without notice
ISO9001:2000 Registered
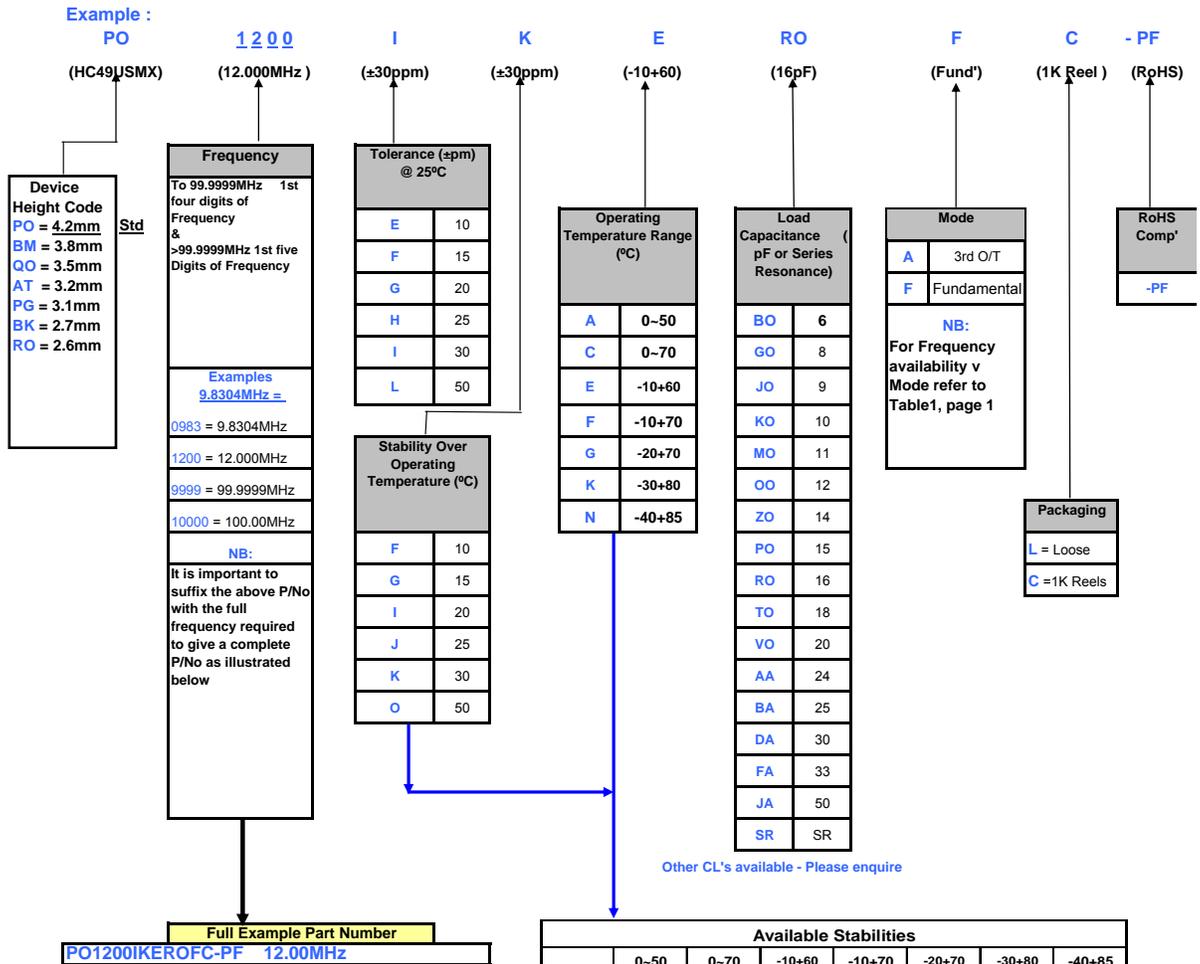For quotations or further information please contact us at:
3 The Business Centre, Molly Millars Lane, Wokingham, Berkshire, RG41 2EY, UK
http://www.actcrystals.com

Issue : 10C1A/F/H3
Date : 14/12/10

SERIES : ACT   HC49/USMX (Custom) Part numbering codes PO / BM / QO / AT / PG / BK / RO

Example :

PO	1 2 0 0	I	K	E	RO	F	C	- PF
(HC49USMX)	(12.000MHz)	(±30ppm)	(±30ppm)	(-10+60)	(16pF)	(Fund')	(1K Reel)	(RoHS)

Device Height Code

PO = 4.2mm **Std**
BM = 3.8mm
QO = 3.5mm
AT = 3.2mm
PG = 3.1mm
BK = 2.7mm
RO = 2.6mm

Frequency

To 99.9999MHz   1st four digits of Frequency &
>99.9999MHz 1st five Digits of Frequency

Examples 9.8304MHz =

0983 = 9.8304MHz
1200 = 12.000MHz
9999 = 99.9999MHz
10000 = 100.00MHz

NB:
It is important to suffix the above P/No with the full frequency required to give a complete P/No as illustrated below

Tolerance (±pm) @ 25°C

E	10
F	15
G	20
H	25
I	30
L	50

Stability Over Operating Temperature (°C)

F	10
G	15
I	20
J	25
K	30
O	50

Operating Temperature Range (°C)

A	0~50
C	0~70
E	-10+60
F	-10+70
G	-20+70
K	-30+80
N	-40+85

Load Capacitance (pF or Series Resonance)

BO	6
GO	8
JO	9
KO	10
MO	11
OO	12
ZO	14
PO	15
RO	16
TO	18
VO	20
AA	24
BA	25
DA	30
FA	33
JA	50
SR	SR

Other CL's available - Please enquire

Mode

A	3rd O/T
F	Fundamental

NB:
For Frequency availability v Mode refer to Table1, page 1

Packaging

L = Loose
C =1K Reels

RoHS Comp'

-PF

Full Example Part Number

PO1200IKEROFC-PF   12.00MHz

Available Stabilities

	0~50	0~70	-10+60	-10+70	-20+70	-30+80	-40+85
±10	✔	✔	✔	✔	✔	Enquire	X
±15	✔	✔	✔	✔	✔	✔	Enquire
±20	✔	✔	✔	✔	✔	✔	✔
±25	✔	✔	✔	✔	✔	✔	✔
±30	✔	✔	✔	✔	✔	✔	✔
±50	✔	✔	✔	✔	✔	✔	✔

NOTES :

1)   Tighter Stabilities, other Operating Temperature Ranges and CL's may be available as semi custom devices.
As each of these specification parameters impact on others, it is not always possible to combine all options in one device. Therefore, if a specification not catered for above is required, please contact us directly for the relevant part number code(s).

2)   ACT are always happy to consider truly custom specification parts which may require non-standard specification parameters, specific testing, customer requested AQL requirements, non standard packaging or taping and reeling and custom marking. Such devices would normally be allocated a custom specification part number which is wholly customer specific.
(EG : A 12.00MHz custom ACT49/USMX device may have a part number such as PO1200C- C1246-PF)

3)   Frequencies below 10.000MHz are prefixed with a "0" (eg: 0800MHz = 8MHz.Whereas 10.000MHz is 1000 and a frequency of 100MHz is 10000.).