

## ACT HC49/US-SMX ( Standard Packages )



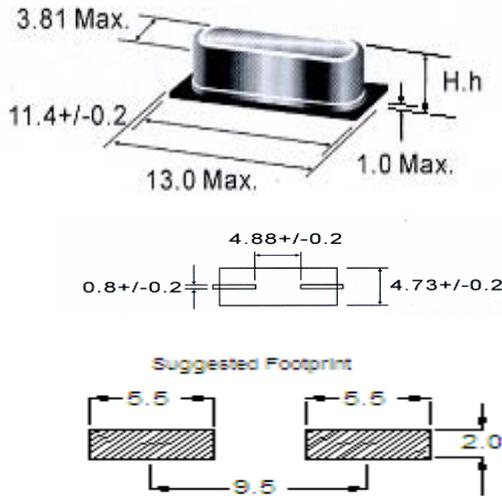
The ACT HC49/US-SMX is one of the most cost effective and popular surface mount crystals available. With its wide range of frequencies, stabilities and operating temperatures it is still small enough to fit most applications including many hand held units and is the economical solution for automatic assembly. With its wide range of specification options, the HC49/US-SMX is a favoured choice in many applications, including Communications, Industrial Controls, Microprocessor Systems, Vending, Security and Access Control. There are four height options available ranging from 2.7 to 4.2 mm max.

### Specification

Parameter	Symbol	Specification	Condition
Frequency	fo	3.00 ~ 100.00MHz	Please specify
Frequency Tol. ( @ 25°C )	Δf/fo	±5ppm ~ ±100ppm	Please specify
Mode		See table 1	Please specify
Stability over Temp Range	Tc	See table 2	Operating Temperature Dependent
Temp Operating Range	Topr	-10~+60°C, -20~+70°C & -40~+85°C	Others available - Please specify
Temp Storage Range	Tstg	-40 ~ +85°C	
Equivalent Series Resistance	ESR	See table 1	
Shunt Capacitance	CO	7pFmax	
Load Capacitance	CL	5pF ~ 55pF & Series Resonance	Please specify
Drive Level	DL max	100μW typical	Custom options - Please enquire
Drive Level Dependency	DLD	Δ Freq & ESR	0.01, 0.1, 1, 10, 50, 100 μW steps
Insulation Resistance	IR	500MΩ	min at 100Vdc
Aging	Fa	±3ppm per year @25°C	@ 25°C

Table 1

Frequency (MHz)	ESR (Ω) max max	Mode	Frequency (MHz)	ESR (Ω) max max	Mode
3.000 ~ 3.500	150	AT Fundamental	24.000 ~ 40.320	40	BT Fundamental
3.579545 ~ 5.999	150	AT Fundamental	24.000 ~ 29.999	100	3 <sup>rd</sup> Overtone
6.000 ~ 7.999	60	AT Fundamental	30.000 ~ 49.999	80	3 <sup>rd</sup> Overtone
8.000 ~ 15.999	50	AT Fundamental	50.000 ~ 100.000	60	3 <sup>rd</sup> Overtone
16.000 ~ 30.000	40	AT Fundamental			



### H. Overall Height:(mm)

- 4.2 max (PO Series)
- 3.2 max (AT Series)
- 3.0 max (BX Series)
- 2.7 max (BK Series)



Example 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

Table 2 Frequency Stabilities VS Operating Temperatures

Stability Temp	±10ppm	±15ppm	±20ppm	±25ppm	±30ppm	±50ppm
-10 ~ + 60°C	★	★	★	★	★	★
-20 ~ + 70°C	★	★	★	★	★	★
-40 ~ + 85°C		★	★	★	★	★

Please note that all parameters can not necessarily be specified in the same device

Customer to specify : Height, Frequency Tolerance, Operating Temperature, Temperature Stability, Load Capacitance & Mode/cut

In line with our ongoing policy of product evolution and improvement, the above specification may be subject to change without notice

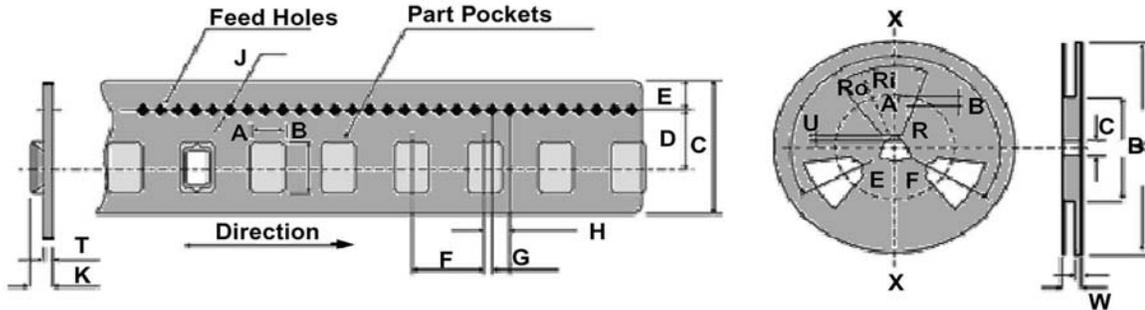
ISO9001:2000 Registered

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>

**ACT HC49US\_SMX TAPE DIMENSIONS (mm)**

STANDARD REEL QUANTITY 1000PCS

TAPE AND REEL DIMENSIONS ( mm )



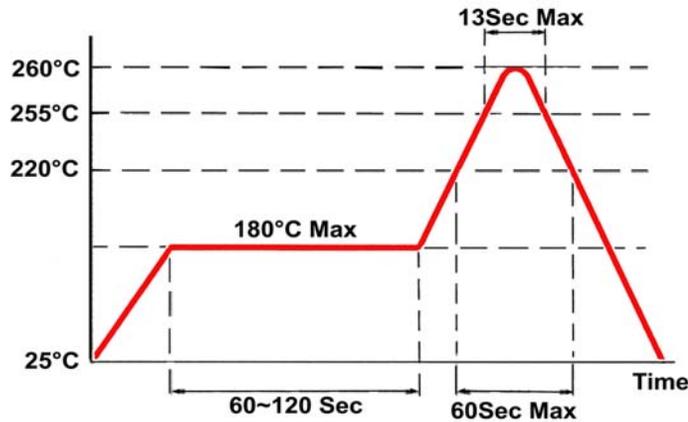
Description	Code	Dimensions
Diameter	A	φ330 $\pm$ 2.0
Thickness	t	2.4 $\pm$ 0.2
Flanges	WidthbetweenFlanges	W 24.4 $\pm$ 0
	OutlineDiameter	B φ100 $\pm$ 2.0
	Width	F 2.3 $\pm$ 1.0
	Depth	V 6.0 $\pm$ 1.0
CenterCore	Position	Q 120° $\pm$ 3.0°
SpindleDiameter	C	φ13.0 $\pm$ 0.5
Flanges	Width	E 2.5
	Depth	U 5.0 $\pm$ 0.5
	KeySeats	Position
Fenestrate	OutlineRadius	Ro R90 $\pm$ 1.0
	InlineRadius	Ri R40 $\pm$ 1.0
	RoundedComers	Rc R5 $\pm$ 0
OpenAngle	R	40° $\pm$ 1.2°

Code	Dimension	Code	Dimension	Code	Dimension
A	5.0 $\pm$ 0.1	E	1.75 $\pm$ 0.1	J	φ1.5 $\pm$ 0.1-0
B	15.0 $\pm$ 0.2	F	8.0 $\pm$ 0.1 / 12.0 $\pm$ 0.1	K	5.0 $\pm$ 0.1
C	24.0 $\pm$ 0.3	G	2.0 $\pm$ 0.1	T	0.45 $\pm$ 0.1
D	11.05 $\pm$ 0.1	H	4.0 $\pm$ 0.1		

**TAPE DIMENSIONS ( mm )**

**NB: Dimension "F"**  
12.0mm Standard  
8.0mm "Custom"

**Maximum Re-Flow Profile**



**Note: No more than 2 re-flow cycles**

Please note that all parameters can not necessarily be specified in the same device

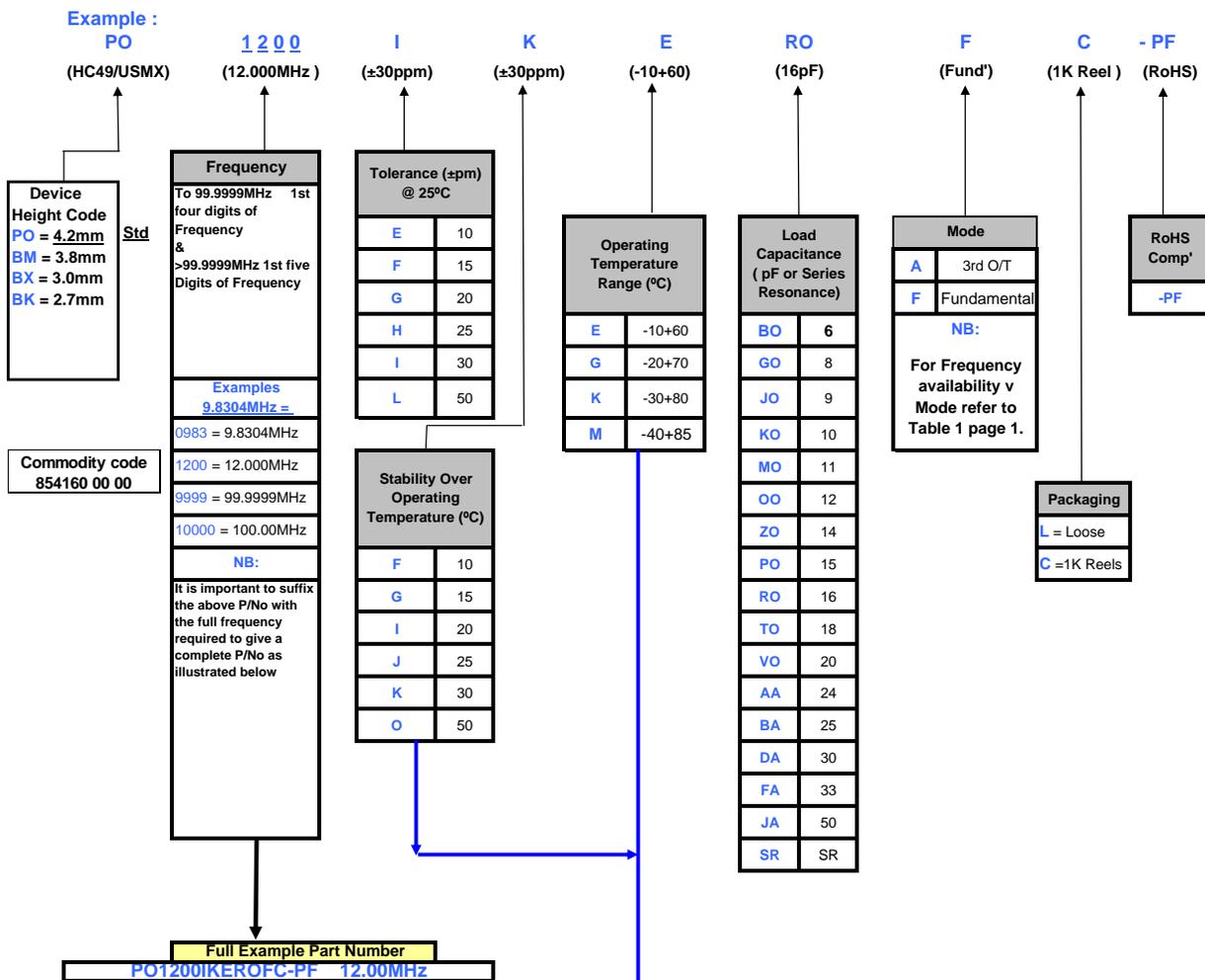
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SERIES : ACT HC49/USMX ( Standard ) Part numbering code PO / BM / BX / BK



**Table 2: Available Stabilities**

Stability	±10ppm	±15ppm	±20ppm	±25ppm	±30ppm	±50ppm
Temp						
-10 ~ + 60°C	★	★	★	★	★	★
-20 ~ + 70°C	★	★	★	★	★	★
-40 ~ + 85°C		★	★	★	★	★

**NOTES :**

- 1) Tighter Tolerances and Stabilities, other Operating Temperature Ranges and CL's may be available as semi custom devices.
- 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 mav have a part number such as PO1200C.
- 3) A guide to availability of tighter stabilities appears above in Table 2
- 4) Frequencies below 10.000MHz are prefixed with a "0" (eg: 0800MHz = 8MHz. Whereas 10.000MHz is 1000 and 100MHz is 10000)