

Compatible with Eu Directive  
2002/EC - RoHS

## ACT320SMX-4

The ACT320SMX-4 is a low cost, 4 pad, high quality, low aging 3X2.5mm SMD Crystal in a ceramic base / metal lid package, seam welded for good long term reliability. The device has the lid grounded via the package to reduce EMI issues. The wide frequency range and specification options ensure suitability for many applications.

**APPLICATIONS:** Bluetooth, WLAN, PDA, Pagers, Card readers, Cellular, PC Accessories, Notebook, Audio-visual, PCMCIA, MP3, Consumer & Communications.



### Specification

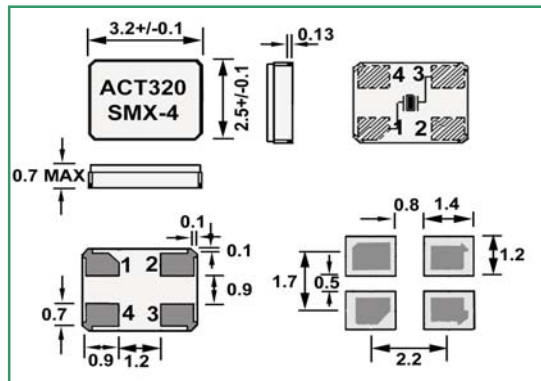
Parameter	Symbol	Specification	Condition
Frequency Range	fo	14.7456MHz & 16.000 ~ 50.000MHz	Please specify
Frequency Tolerance (@25°C)	$\Delta f/f_0$	$\pm 5, \pm 10, \pm 15, \pm 20, \pm 30$ & $\pm 50$ ppm(Std)	Please specify
Stability over temp range	Tc	$\pm 5$ ppm ~ 50ppm (See table 2)	Please specify
Temp Operating Range	Topr	0~+50°C ~ -40~+85°C ( See table 2)	Please specify
Temp Storage Range	Tstg	-40 ~+85°C	
Equivalent Series Resistance	ESR	See table 1	
Load Capacitance	CL	8pF ~ 50pF & Series	(16,20 & 30pF Std. Please specify)
Shunt Capacitance	C0	5pF max	
Drive Level	DL	100 $\mu$ W typical (500 $\mu$ W max)	(Custom available - Please enquire)
Drive Level Dependency	DLD	DLD6 <1.3 (min-max ratio) FL min to max <10ppm	0.01, 0.1, 1, 10, 100, 500 $\mu$ W steps
Insulation Resistance	IR	500M $\Omega$ min	@100V DC
Aging	Fa	$\pm 3$ ppm per year **	(First year max @ 25°C)

### Dimensions (mm)

\*\* aging  $\pm 1.00$ ppm /year device available, to order, as a "semi-custom" part - Please enquire.

Table 1

Freq. Range (MHz)	ESR ( $\Omega$ ) max	Mode / Cut
14.000 ~ 14.999	100*	Fundamental / AT
15.000 ~ 19.999	60*	Fundamental / AT
20.000 ~ 50.000	50	Fundamental / AT



\* Tighter ESR may be available please enquire

Table 2

Stability Temp	+/- 5ppm	+/- 10ppm	+/- 20ppm	+/- 30ppm	+/- 50ppm	
0~+50°C	+	+	+	+	+	Available stabilities
-10~+60°C	+	+	+	+	+	Available stabilities
-20~+70°C		+	+	+	+	Only available for frequencies $\geq 30$ MHz
-20~+85°C		+	+	+	+	Standard stabilities
-30~+80°C		+	+	+	+	Standard stabilities
-40~+85°C		+	+	+	+	Standard stabilities

### Connections

- #1. Crystal
- #2. Grounded to lid
- #3. Crystal
- #4. Grounded to lid

Pad Surface Material: Gold (Au)

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

Customer to specify : Frequency, Frequency Tolerance, Temperature Stability, Operating Temperature & Load Capacitance  
 In line with our ongoing policy of product evolution and improvement, the above specification may 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>

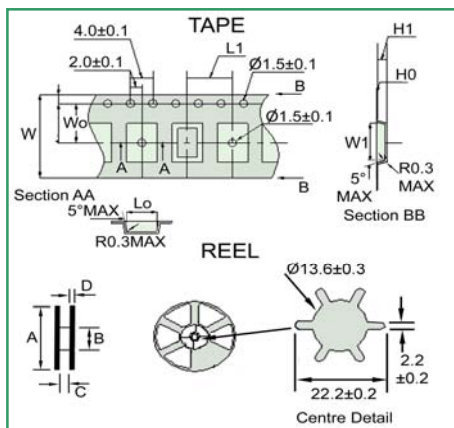
Issue: 5 C1F

### ACT320SMX-4

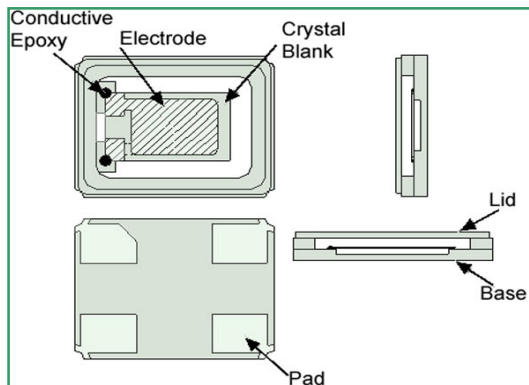
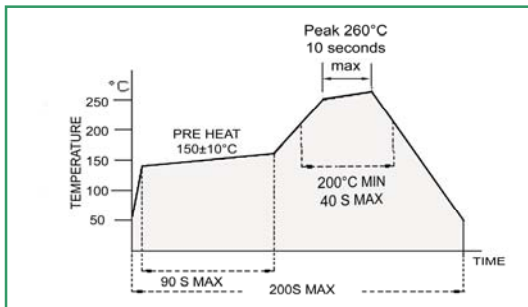
Tape & Reel Dimensions (mm)

1K pieces per reel

Tolerance Dimension	TAPE							REEL			
	W	Wo	W1	Lo	L1	Ho	H1	A	B	C	D
	±0.3	±0.1	±0.1	±0.1	±0.1	±0.1	±0.05	±0.1	±1	±0.5	±0.2
	12.0	5.5	3.6	2.9	8.0	0.3	1.2	178	62	12.5	2.0



#### Standard Reflow Profile



#### Material content

Material	Component	Material	Code	Percentage	Unit
Ceramic	package	Aluminum oxide	1344-28-1	86.2	%
		Silicon oxide	14808-60-7	4	%
		Calcium carbonate	471-34-1	4	%
		Magnesium carbonate	23389-33-5	5	%
		Gold	7440-57-5	0.32	%
		Tungsten	7440-33-7	0.18	%
Conductive epoxy	Bonding	Nickel	7440-02-0	0.3	%
		Silver	7440-22-4	80	%
		Dodecane	112-40-3	10	%
Iron Alloy	Lid	Aromatic hydrocarbons	63231-51-6	10	%
		Cobalt	7440-48-4	17.5	%
		Nickel	7440-02-0	30	%
Silver	Electrode	Iron	7439-89-6	52.5	%
		Silver	7440-22-4	100	%
Synthetic Quartz	Blank	Silicon dioxide, synthetic	112926-00-8	100	%

#### Material content

Banned substances content: none detected (detection limits below)					
Banned substances	Product Maximum concentration (ppm)	Packaging Maximum concentration (ppm)	Banned substances	Product Maximum concentration (ppm)	Packaging Maximum concentration (ppm)
Cadmium & compounds	2	100	Chlorinated Paraffin	5	5
Lead & compounds	2		Other chlorinated organic compounds	5	5
Mercury & compounds	2		Other brominated organic compounds	5	5
Hexavalent Chromium	2		Organic tin compounds	5	5
PBB	5		Asbestos	5	5
PBDE	5		Azo compounds	5	5
PCB	5	5	Formaldehyde	5	5
PCN	5	5	PVC	5	5

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