

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.

Compatible with Eu Directive
2002/EC - RoHS



Specification

Parameter	Symbol	Specification	Condition
Frequency Range	fo	12.000MHz~ 54.000MHz	Please specify
Frequency Tolerance (@25°C)	$\Delta f/f_0$	$\pm 10, \pm 15, \pm 20, \pm 30$ & ± 50 ppm(Std)	Please specify
Stability over temp range	Tc	± 5 ppm ~ 50ppm (See table 1&2)	Please specify
Temp Operating Range	Topr	0~+50°C ~ -40~+85°C (See table 1& 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	10 μ W Typ, 100 μ W max	(Custom to 150 μ W available - Enquire)
Drive Level Dependency	DLD	DLD2 <10 Ω (min-max ratio) FDLD <10ppm	0.01, ~100 μ W 6 steps minimum
Insulation Resistance	IR	500M Ω min	@100V DC
Aging	Fa	± 3 ppm per year **	(First year max @ 25°C)

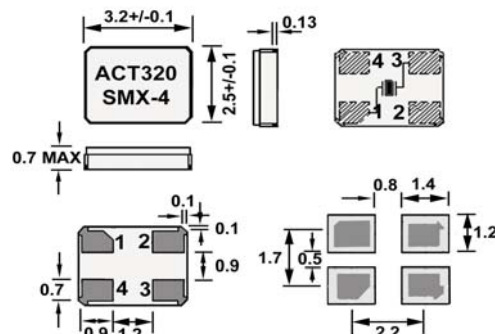
** aging ± 1.00 ppm /year device available, to order, as a "semi-custom" part - Please enquire.

Table 1*

ESR and available stabilities for temperature range -40 to+85°C

Frequency range	Max ESR	Min Tolerance Available	Tightest Stability v Temperature Available
12MHz $\leq$ fo <15MHz	80 Ω	± 10 ppm	-40~+85°C // ± 30 ppm -20~+70°C // ± 10 ppm
15MHz $\leq$ fo <19MHz	70 Ω	± 10 ppm	-40~+85°C // ± 20 ppm -20~+70°C // ± 10 ppm
19MHz $\leq$ fo <22MHz	50 Ω	± 10 ppm	-40~+85°C // ± 20 ppm -20~+70°C // ± 10 ppm
22MHz $\leq$ fo <25MHz	40 Ω	± 10 ppm	-40~+85°C // ± 20 ppm -20~+70°C // ± 10 ppm
25MHz $\leq$ fo <32MHz	30 Ω	± 10 ppm	-40~+85°C // ± 15 ppm -20~+70°C // ± 10 ppm
32MHz $\leq$ fo <54MHz	25 Ω	± 10 ppm	-40~+85°C // ± 15 ppm -20~+70°C // ± 10 ppm

Dimensions (mm)



Pad Surface Material: Gold (Au)

Connections

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

* Tighter ESR may be available please enquire.

Table 2 Available stabilities

Stability Temp	+/- 5ppm	+/- 10ppm	+/- 15ppm	+/- 20ppm	$\geq$ +/- 30ppm	
0~+50°C	✓	✓	✓	✓	✓	✓ Available stabilities
-10+60°C	✓	✓	✓	✓	✓	
-20~+70°C		✓	✓	✓	✓	✓ Only available for frequencies ≥ 30 MHz
-20~+85°C			✓	✓	✓	
-30~+80°C			✓	✓	✓	✓ See Table 1
-40~+85°C			✓	✓	✓	

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

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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>

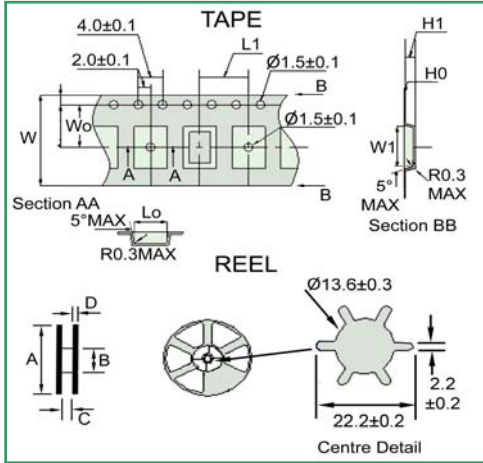
Issue: 12 C1F

Date: 03-12-2010

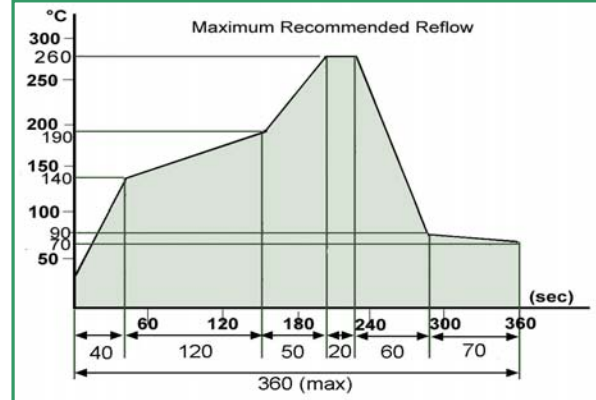
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Tape & Reel Dimensions (mm)

Tolerance Dimension	TAPE							REEL			
	W	Wo	W1	Lo	L1		H1	A	B	C	D
	±0.2	±0.05	±0.1	±0.1	±0.1		±0.1	+0/-	+1/-0	±1.5	±0.5
	8.0	3.5	3.5	2.8	4.0		1.0	##	60	9.5	2.0

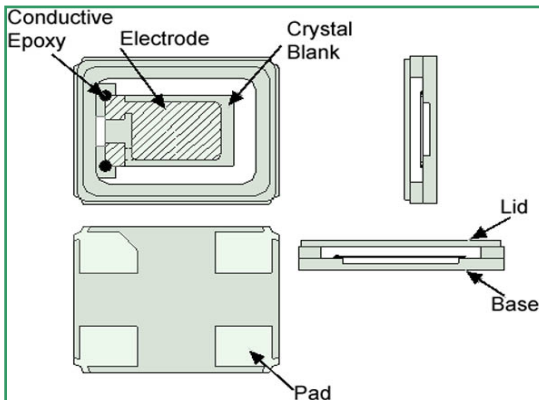


Reflow



Material Content / RoHS

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Material content

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	%
Conductive epoxy Bonding	Tungsten	7440-33-7	0.18	%
	Nickel	7440-02-0	0.3	%
	Silver	7440-22-4	80	%
	Dodecane	112-40-3	10	%
	Aromatic hydrocarbons	63231-51-6	10	%
Iron Alloy Lid	Cobalt	7440-48-4	17.5	%
	Nickel	7440-02-0	30	%
	Iron	7439-89-6	52.5	%
Silver Electrode	Silver	7440-22-4	100	%
Synthetic Quartz Blank	Silicon dioxide, synthetic	112926-00-8	100	%

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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SERIES : ACT320SMX-4 Part numbering code is BN

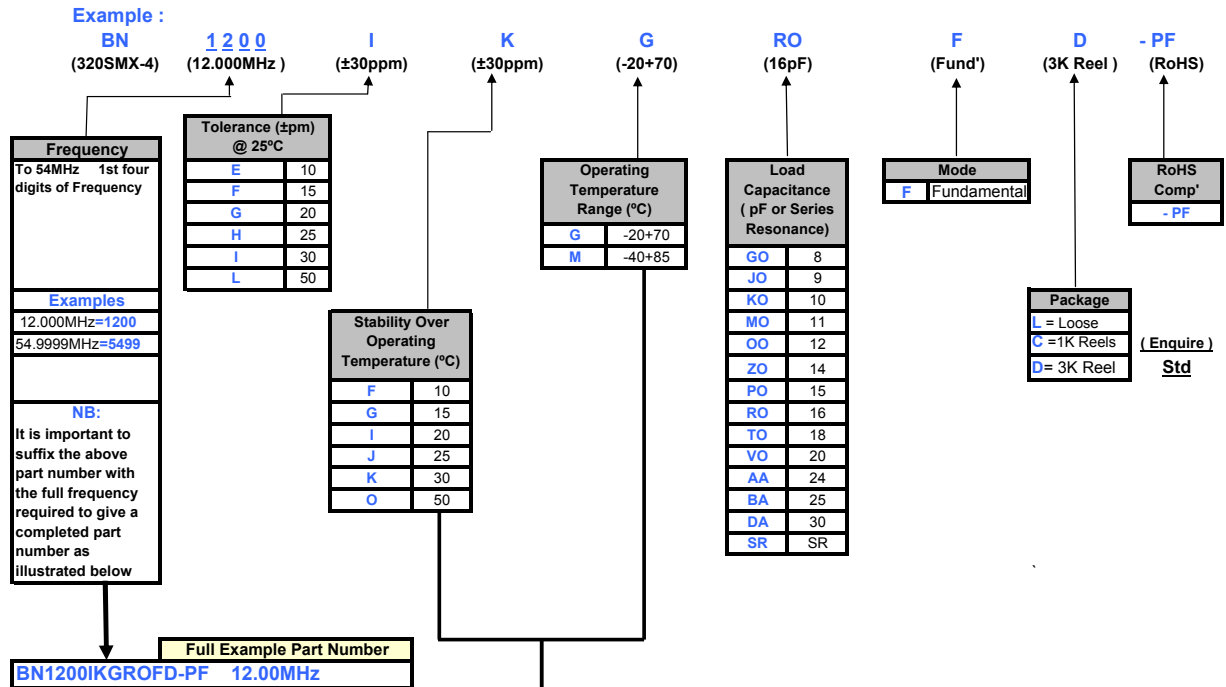


Table 1: Available stabilities:

Stability Temp	± 5 ppm	± 10 ppm	± 15 ppm	± 20 ppm	± 30 ppm
0~+50°C	✓	✓	✓	✓	✓
-10+60°C	✓	✓	✓	✓	✓
-20~+70°C		✓	✓	✓	✓
-20~+85°C			✓	✓	✓
-30~+80°C			✓	✓	✓
-40~+85°C			✓	✓	✓

✓ Available stabilities

✓ Only available for frequencies ≥ 30 MHz

✓ See Table 2

Table 2: Available stabilities for temperature range -40+85°C

Frequency range	Max ESR	Min Tolerance Available	Tightest Stability v Temperature Available
12MHz $\leq f_o < 15$ MHz	80 Ω	± 10 ppm	-40~+85°C // ± 30 ppm -20~+70°C // ± 10 ppm
15MHz $\leq f_o < 19$ MHz	70 Ω	± 10 ppm	-40~+85°C // ± 20 ppm -20~+70°C // ± 10 ppm
19MHz $\leq f_o < 22$ MHz	50 Ω	± 10 ppm	-40~+85°C // ± 20 ppm -20~+70°C // ± 10 ppm
22MHz $\leq f_o < 25$ MHz	40 Ω	± 10 ppm	-40~+85°C // ± 20 ppm -20~+70°C // ± 10 ppm
25MHz $\leq f_o < 32$ MHz	30 Ω	± 10 ppm	-40~+85°C // ± 15 ppm -20~+70°C // ± 10 ppm
32MHz $\leq f_o < 54$ MHz	25 Ω	± 10 ppm	-40~+85°C // ± 15 ppm -20~+70°C // ± 10 ppm

NOTES :

- 1) Tighter Tolerances and Stabilities and other Operating Temperature Ranges may be available.
- 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.
- 3) A guide to availability of tighter stabilities appears on page one of this data sheet in Table 2
- 4) Frequencies below 10.000MHz are prefixed with a "0" (eg: 0900 = 9MHz. Whereas 10.000MHz is 1000)

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