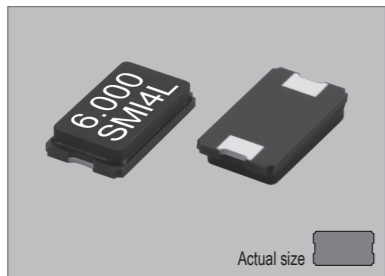


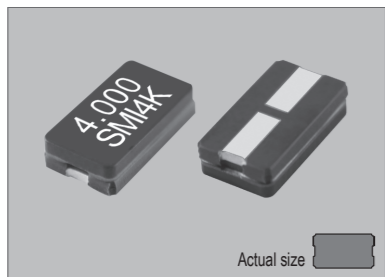
XTAL

93SMX(A)



Actual size
0.1667 gm (wt.)

93SMX(B)



Actual size
0.208 gm (wt.)

CLK OSC

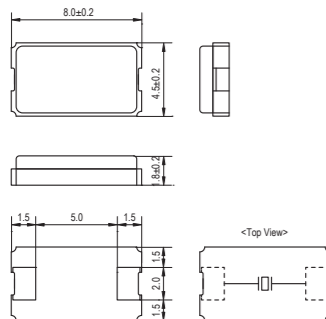
VCXO

TCXO

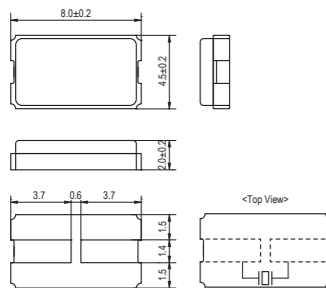
OCXO

MCF

93SMX(A)

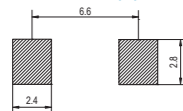


93SMX(B)

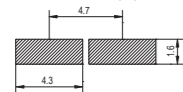


SOLDERING PATTERN

93SMX(A)



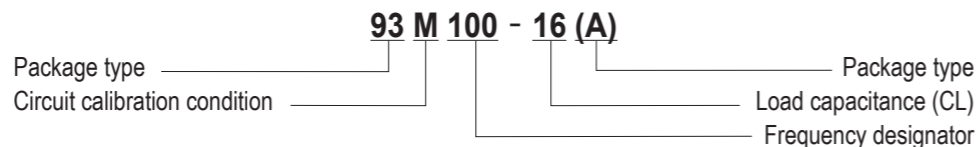
93SMX(B)



STANDARD SPECIFICATIONS

Item	Specifications	
	93SMX(A)	93SMX(B)
Package type	93SMX(A)	93SMX(B)
Frequency range	4.000 MHz to 50.000 MHz	4.000 MHz to 8.000 MHz
Frequency tolerance	±50 ppm at +25°C ±3°C	
Temperature stability (referred to +25°C)	±50 ppm over -20°C to +70°C	
Load capacitance (CL)	16 pF, Typical	
Shunt capacitance (C0)	5 pF max.	
Drive level (P)	300 µW max. (10 µW for testing)	
Aging	±5 ppm max. at +25°C ±3°C per year	
Cut / Oscillation mode	AT-Cut / Fundamental	
Reflow condition	10 seconds max. at +250°C ±10°C	

PART NUMBERING GUIDE



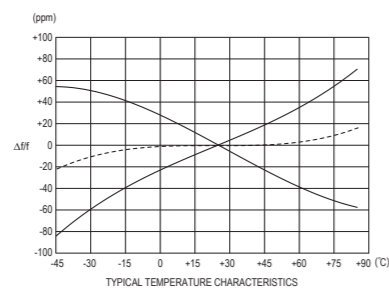
Example

SMI Part No.	Package	Circuit Calibration Condition	Frequency
93M100-16(A)	93 = 93SMX	M = Parallel resonance CL = 16 pF	100 = 10.000 MHz
93S360(A)	93 = 93SMX	S = Series resonance	360 = 36.000 MHz
93M040-8(B)	93(B) = 93SMX(B)	M = Parallel resonance CL = 8 pF	040 = 4.000 MHz

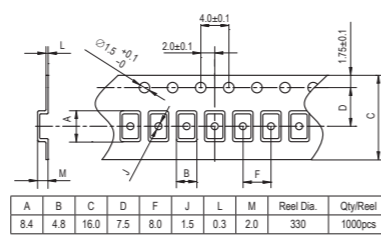
PACKAGE DATA

Item	93SMX(A)	93SMX(B)
Lid	Ceramic	Ceramic
Base	Ceramic	Ceramic
Sealing	Glass	Glass
Terminal	Tungsten (metalized)	Tungsten (metalized)
Terminal plating	Gold / Nickel (surface) / (under)	Gold / Nickel (surface) / (under)
RoHS	Compliant	Compliant

AT-CUT



TAPE SPECIFICATIONS



93SMX STANDARD FREQUENCIES

Frequency MHz	Frequency Designator	Max. Equivalent Series Resistance Ohms (Q) ESR	Frequency MHz	Frequency Designator	Max. Equivalent Series Resistance Ohms (Q) ESR	Frequency MHz	Frequency Designator	Max. Equivalent Series Resistance Ohms (Q) ESR	Frequency MHz	Frequency Designator	Max. Equivalent Series Resistance Ohms (Q) ESR	Frequency MHz	Frequency Designator	Max. Equivalent Series Resistance Ohms (Q) ESR
4.000000	040	300	13.500000	135	50	17.258400	1725	50	24.557200	2455	50	35.468800	354688	50
5.000000	050	250	13.560000	1356	50	17.262700	172	50	24.576000	245	50	35.637500	356	50
5.175000	0517	250	13.564980	13564	50	17.664000	176	50	24.858900	248	50	35.795500	357	50
5.845000	0584	250	13.567178	135671	50	17.734475	1773	50	25.000000	250	50	36.000000	360	50
6.000000	060	250	13.567200	135672	50	18.000000	180	50	25.140000	2514	50	36.200000	362	50
6.750000	0675	250	13.568750	135687	50	18.080000	1808	50	25.670000	2567	50	36.818178	36818178	50
7.200000	072	250	13.568800	135688	50	18.105600	181	50	25.804800	258	50	36.818200	368182	50
7.372800	073	250	13.570300	1357	50	18.300000	183	50	26.000000	260	50	36.864000	3686	50
7.500000	075	250	13.570313	135703	50	18.355000	1835	50	26.800000	268	50	37.500000	375	50
8.000000	080	200	13.574000	13574	50	18.425200	1842	50	26.973050	26973	50	38.000000	380	50
8.192000	08192	200	13.575600	13575	50	18.432000	184	50	26.973100	2697	50	38.035000	3803	50
8.664000	086	200	13.575630	135756	50	18.437500	18437	50	26.980000	2698	50	38.352000	3835	50
9.000000	090	200	13.577000	13577	50	18.544000	18544	50	27.000000	270	50	38.400000	384	50
9.185183	091	200	13.577400	135774	50	18.937500	1893	50	27.120000	271	50	40.000000	400	50
9.216000	092	200	13.577500	135775	50	19.000000	190	50	27.500000	275	50	40.190000	401	50
9.509375	095	120	13.580000	1358	50	19.069920	1906992	50	27.700000	277	50	40.320000	403	50
9.510000	0951	120	13.580600	135806	50	19.069929	19069929	50	27.823900	27823	50	40.500000	405	50
9.830400	098	120	13.580625	1358062	50	19.138600	1913	50	27.870000	2787	50	40.737600	407	50
9.843750	0984	120	13.585500	13585	50	19.170000	1917	50	28.000000	280	50	41.600000	416	50
9.845310	09845	120	13.750000	1375	50	19.176000	19176	50	28.125000	281	50	42.954540	4295	50
9.859380	0985	120	13.824000	138	50	19.200000	192	50	28.224000	282	50			
9.861818	098618	120	13.912800	139	50	19.247000	1924	50	28.244000	2824	50			
9.861820	09861	120	14.000000	140	50	19.260000	1926	50	28.322000	2832	50			
9.864375	0986437	120	14.129688	1412	50	19.390000	193	50	28.350000	2835	50			
9.864380	09864	120	14.187500	1418	50	19.500000	195	50	28.375000	283	50			
9.874380	0987	120	14.237500	1423	50	19.660800	196	50	28.496100	284	50			
10.000000	100	100	14.250000	142	50	19.670000	1967	50	28.500000	285	50			
10.000500	100005	100	14.264000	1426	50	19.687500	19687	50	28.604900	28604	50			
10.178000	1017	100	14.284800	1428	50	19.800000	198	50	28.625000	2862	50			
10.178125	101781	100	14.318180	143	50	19.968000	199	50	28.636363	2863	50			
10.250000	1025	100	14.464063	1446	50	19.990000	1999	50	28.724000	287	50			
10.260000	1026	100	14.721000	1472	50	19.993700	19993	50	28.900000	289	50			
11.000000	110	100	14.745600	147	50	20.000000	200	50	29.000000	290	50			
11.059200	1105	100	14.750000	1475	50	20.250000	2025	50	29.491200	294	50			
11.150000	1115	100	15.000000	150	50	20.480000	2048	50	29.498900	294989	50			
11.250000	1125	100	15.360000	153	50	20.499800	2049	50	29.498928	2949892	50			
11.289600	1128	100	15.954500	1595	50	20.500000	205	50	29.700000	297	50			
11.298000	11298	100	15.968000	1596	50	20.736000	2073	50	30.000000	300	50			
11.894400	11894	100	15.974400	1597	50	20.945000	20945	50	30.275000	3027	50			
11.895100	11895	100	15.992000	1599	50	21.000000	210	50	30.720000	307	50			
11.895104	118951	100	16.000000	160	50	21.047200	2104	50	31.000000	310	50			
11.968000	1196	100	16.069900	1606	50	21.047236	21047	50	31.104000	31104	50			
11.980800	1198	100	16.110000	1611	50	21.120000	211	50	31.400000	314	50			
11.995200	1199	100	16.128000	1612	50	21.213000	2121	50	31.948800	31948	50			
12.000000	120	80	16.200000	162	50	21.250000	2125	50	31.987500	3198	50			
12.288000	122	80	16.384000	163	50	21.477270	2147	50	32.000000	320	50			
12.331800	1233	80	16.500000	165	50	21.544400	215	50	32.223200	3222	50			
12.500000	125	80	16.647300	1664	50	21.544415	2154	50	32.720000	327	50			
12.580000	1258	80	16.656000	1665	50	21.667000	216	50	32.768000	32768	50			
13.000000	130	50	16.666000	1666	50	22.118400	221	50	33.000000	330	50			
13.083600	130836	50	16.667000	166	50	22.450000	224	50	33.145300	331	50			
13.083840	1308384	50	16.670000	1667	50	22.579200	2257	50	33.231000	332	50			
13.125000	1312	50	16.777000	1677	50	22.909088	229	50	33.333000	33333	50			
13.225000	13225	50	16.777200	167	50	23.000000	230	50	33.333333	33333333	50			
13.225600	132256	50	16.900000	169	50	23.040000	2304	50	33.528000	3352	50			
13.333300	133333	50	16.915000	1691	50	24.000000	240	50	33.868800	338	50			
13.333333	1333333	50	16.920000	1692	50	24.000100	240001	50	34.560000	345	50			
13.333333	13333333	50	16.934400	1693	50	24.545400	245454	50	35.328000	3532	50			
13.400000	134	50	17.177600	171	50	24.545454	24545454	50	35.468750	354687	50			

XTAL

CLK OSC

VCXO

TCXO

OCXO

MCF