

## Miniature, 5.0V, Surface Mount, Tristate HCMOS Oscillators

# SM990 • SM991

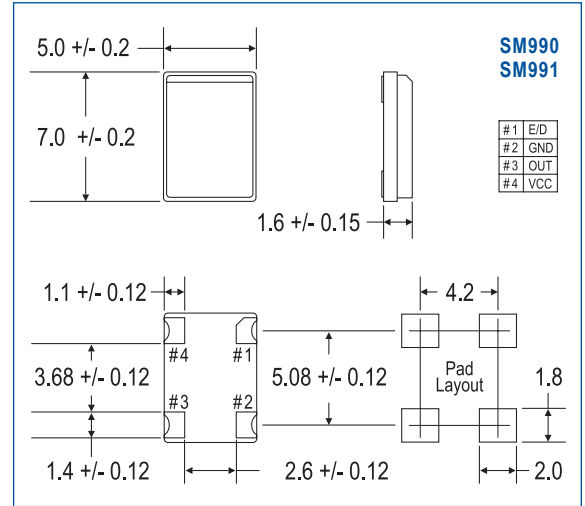
Monitor Products' SM990 and SM991 surface mount oscillators are presented in highly reliable packages that can be reflow soldered at 260°C for 10 seconds, and are available in convenient tape and reel packaging.

### APPLICATIONS

- PDAs
- ATM
- PCMCIA
- Laptops
- Controller Boards
- Wireless RF
- Networking
- Disk & Tape Drives
- Cameras

### FEATURES

- Low profile (1.6mm)
- TTL/CMOS compatible
- Hermetically-sealed, ceramic package
- Tristate enable/disable
- Reflow solderable at 260°C for 10 secs
- 16mm tape & reel (500 pcs/reel)



### ELECTRICAL SPECIFICATIONS

	SM990	SM991
<b>Frequency Range</b>	1.8432 ~ 66.667 MHz*	1.8432 ~ 80.0 MHz*
<b>Supply Voltage</b>	5.0 VDC ± 0.5 V	5.0 VDC ± 0.5 V
<b>Load Capacitance</b>	50 pF	15 pF
<b>Input Current</b> (MHz = mA max)	1.8432 ~ 20.0 = 20 20.1 ~ 50.0 = 35 50.1 & up = 60	1.8432 ~ 30.0 = 10 30.1 ~ 35.0 = 15 35.1 ~ 66.0 = 30 66.1 & up = 50
<b>Symmetry</b>	50/50 ± 10% std (50/50 ± 5% optional**)	
<b>Frequency Stability</b>	± 100 ppm std (± 50 ppm avail)	
<b>Oper Temp Range</b>	0°C ~ 70°C std (other options avail)	
<b>Rise and Fall Time</b>	10 nS max	
<b>Start Up Time</b>	5 mS max	
<b>Logic 0 Level</b>	Vcc X 0.1V max	
<b>Logic 1 Level</b>	Vcc X 0.9V min	
<b>E/D Phase Delay</b>	100 nS max	
<b>Phase Jitter RMS</b>	8 pS typical	

\* Denotes frequency range potential. Contact factory for your specific requirement

\*\* 5% symmetry available for selected frequencies - call factory for details

### DEVELOPED FREQUENCIES

1.843200	12.352000	20.000000	29.498900	39.398400	53.000000
2.048000	12.441600	20.160000	29.498920	39.460000	53.125000
2.457600	12.500000	20.250000	29.500000	39.927800	53.203425
3.000000	13.000000 <sup>0</sup>	20.284000	30.000000	39.936000	53.693175
3.579545	13.248000	20.736000	30.159000	40.000000	54.000000
3.686400	13.330000	22.000000	30.720000	40.500000	54.217400
4.000000	13.500000	22.118400	31.500000	40.550400	55.000000
4.096000	13.600000	22.220000	32.000000	40.608000	56.250000
4.354500	14.318180	22.222200	32.256000	41.472000	56.448000
4.433619	14.400000 <sup>0</sup>	22.500000	32.768000	42.000000	57.600000
4.915200	14.745600	23.040000	33.000000	43.180000	60.000000
5.000000	15.000000	23.587000	33.330000	43.243200	62.196000
5.068800	15.360000	23.941100	33.333000	44.236800	62.500000
6.000000	16.000000	24.000000	33.333300	44.736000 <sup>0</sup>	63.566400 <sup>0</sup>
6.144000	16.384000	24.192000	33.868800	44.900000	64.000000
6.250000	16.500000	24.545450 <sup>0</sup>	34.200000	45.000000	65.000000
6.758400	16.666000	24.576000	34.560000	46.000000	65.536000
7.108000	16.666700	25.000000	34.574400	46.647000	66.000000
7.200000	16.670000	25.175000	34.576000	48.000000	66.660000
7.372800	17.631200	25.426500	35.251200	48.384000	66.666000
7.680000	17.664000 <sup>0</sup>	25.750000	35.328000	48.933000	66.666700
8.000000	17.734476	26.660000	35.468950 <sup>0</sup>	49.152000	66.667000
8.064000	18.432000	27.000000	36.000000	49.730000 <sup>0</sup>	67.500000 <sup>1</sup>
8.192000	18.937500	27.500000	36.864000	49.800000	67.737600 <sup>1</sup>
9.830400	19.069928	28.224000	37.000000	50.000000	71.500000 <sup>1</sup>
10.000000	19.200000	28.322000	37.056000 <sup>0</sup>	50.113630	75.000000 <sup>1</sup>
11.059200	19.312500	28.375000	37.632000	50.000000	80.000000 <sup>1</sup>
12.000000	19.440000	28.636360	38.912000	52.000000	
12.288000	19.660800	29.491200	39.321600	52.900000	

<sup>0</sup> SM990 only

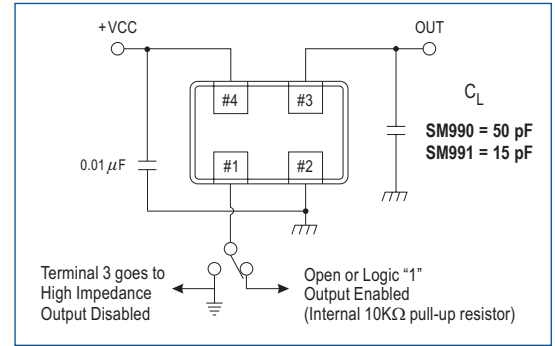
<sup>1</sup> SM991 only

# SM990 • SM991

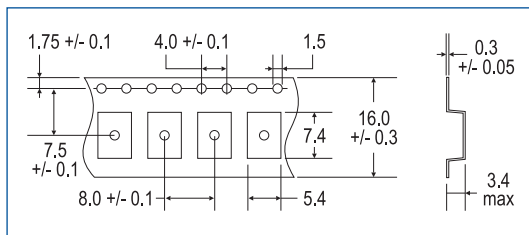
## ENVIRONMENTAL PERFORMANCE SPECIFICATIONS

<b>Operating Temp Range</b>	0°C ~ 70°C standard *
<b>Storage Temp Range</b>	-55°C ~ 125°C
<b>Humidity</b>	85% RH, 85°C, 48 Hours
<b>Hermetic Seal</b>	Leak Rate $2 \times 10^{-8}$ ATM-cm <sup>3</sup> /sec max
<b>Solderability</b>	MIL-STD-202F Method 208E
<b>Reflow Solderability</b>	260°C for 10 seconds
<b>Vibration</b>	MIL-STD-202F Method 204, 35G, 50 to 2000 Hz
<b>Shock</b>	MIL-STD-202F Method 213B Test Cond E, 1000G, 1/2 Sine Wave
<b>MIL-0-55310</b>	Exceeds environmental and electrical specifications of equivalent MIL-0-55310
<b>Packaging</b>	16mm Tape & Reel (500pcs/reel) or Bulk (<500pcs)

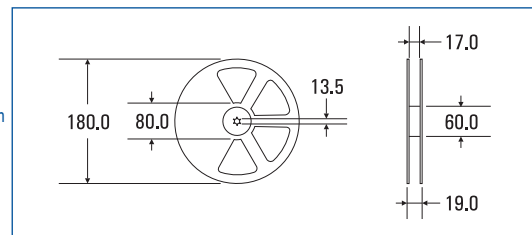
\*See Part Numbering Key for other temperature options



**TEST CIRCUIT**



**TAPE DIMENSIONS**



**REEL DIMENSIONS (500pcs/reel std)**

## PART NUMBERING KEY

Sample Part Numbers

SM99021B2E  
@ 14.31818 MHz

SM99121B5E  
@ 66.666 MHz

SERIES	SYMMETRY	FREQUENCY STABILITY	TEMPERATURE RANGE	PACKAGING	FREQUENCY
SM990 = 5.0V, 50pF SM991 = 5.0V, 15pF	21 = 55/45 % 22 = 60/40 %	B = 100 ppm* C = 50 ppm	2 = 0°C ~ 70°C* 3 = -20°C ~ 70°C 5 = -40°C ~ 85°C 7 = -10°C ~ 70°C	A = Bulk (< 500pcs) E = Tape & Reel* (500pcs/reel)	
<b>SM990</b>	<b>21</b>	<b>B</b>	<b>2</b>	<b>E</b>	<b>14.31818</b>
<b>SM991</b>	<b>21</b>	<b>B</b>	<b>5</b>	<b>E</b>	<b>66.666</b>

\* Standard

Call factory for additional options. Use full descriptive part number when ordering. Parts will be marked with series and frequency only.

Monitor Products has a proven track record as a pioneer manufacturer in the frequency control market. If our extensive selection of standard and engineered crystals and oscillators does not meet your spec, we will work with you towards a customized solution.

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