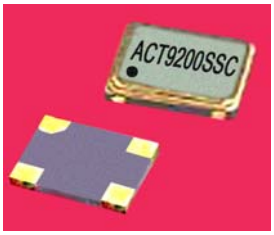
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ACT9200SSC

Compatible with Eu Directive 2002/EC - RoHS

The ACT9200SSC is housed in a miniature, low profile SMD package, with a ceramic base utilising a seam welded metal lid for high reliability and better long-term stability. Spread Spectrum Technology is employed to assist with EMI emission reductions. A Low Jitter version is available as the 9200SSCL . Taped and reeled packaging (1K reels) and loose quantities are available, to suit high and low volume production. Other Spread Spectrum devices are available in 5x3.2 (ACT9300SSC), DIL14 and 9.6x11.4x2.5. A 0.5% total percentage device is available to special order (MOQ 2K).



SPECIFICATION

Parameter	Symbol	Specification			Condition
Supply Voltage	V_{DD}	3.3V_{DC} ± 5%			
Frequency Range	fo	3.500 ~160.0 MHz			Please specify
Frequency Stability	Δf/fo	±25ppm, ±50ppm or ±100ppm			Please specify
Temp Operating Range	Topr	0 ~ +70°C or -40 ~ +85°C			Please specify
Temp Storage Range	Tstg	-65 to +150°C			Freq Dependant
Operating Current	Iop	7mA (10MHz) 8mA (32.768MHz) 17mA (75MHz) 18mA (125MHz)			
Spread Percentage Down spread		Total %	Down Spread %	Centre Spread % ©	Please specify
or Centre spread need to be		0.5#	-0.5#	±0.25#	# Tri State not available.
Specified when ordering.**		1.0	1	±0.5	
Tolerance ±2% of Total%		3.0	-3%	±1.5	
EMI Reduction		-7dBc 100MHz at C=0.25# -9dBc min 100MHz at C=0.5 -15dBc min 100MHz at C=1.5			dBc: with respect to EMI level with no modulation. See examples
Modulation Carrier Frequency		6.9KHz min, 55.5KHz max			Dependant on frequency
Duty Cycle	Tw/t	45/55%			C_L=15pF: @50%V_{DD}
Output Level '0'	VOL	0.8V max 0.2 V typical (at 10% V_{DD})			
Output Level '1'	VOH	2.0V min 3.2V typical (at 90% V_{DD})			
Output Impedance		40 ohms typical			
Rise & Fall Time (max)	TrTf	4.0nS max (10%V_{DD} to 90%V_{DD})			
Output Load	N/CL	15pF CMOS			
Start-up Time	Tosc	5mS max, 2mS Typical			
Tri-state#		Tri state: output when low. Disable time 100nS max			100K int'l pull up resistor
Static discharge Voltage		>2000V			MIL STD 883 Method 3015
Ageing	Fa	±5ppm			first year max @25°C
Cycle to Cycle Jitter	Tj	±250pS typical, ±300pS max			for 13 MHz Oscillator

Notes:

**For initial design samples centre spread 1.5% is recommended.

Tri state not available on 0.5% total spread versions.

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

Customer to Specify : Frequency, Frequency Stability, Operating Temperature Range, Centre or down Spread, Spread Percentage

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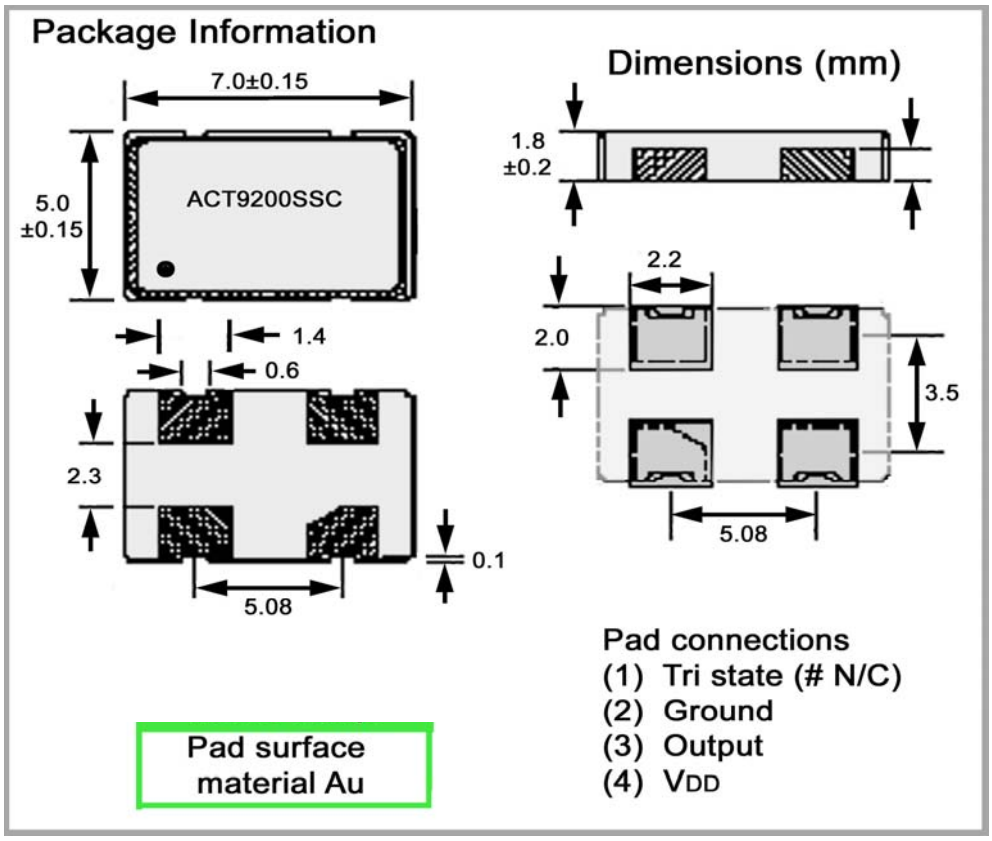
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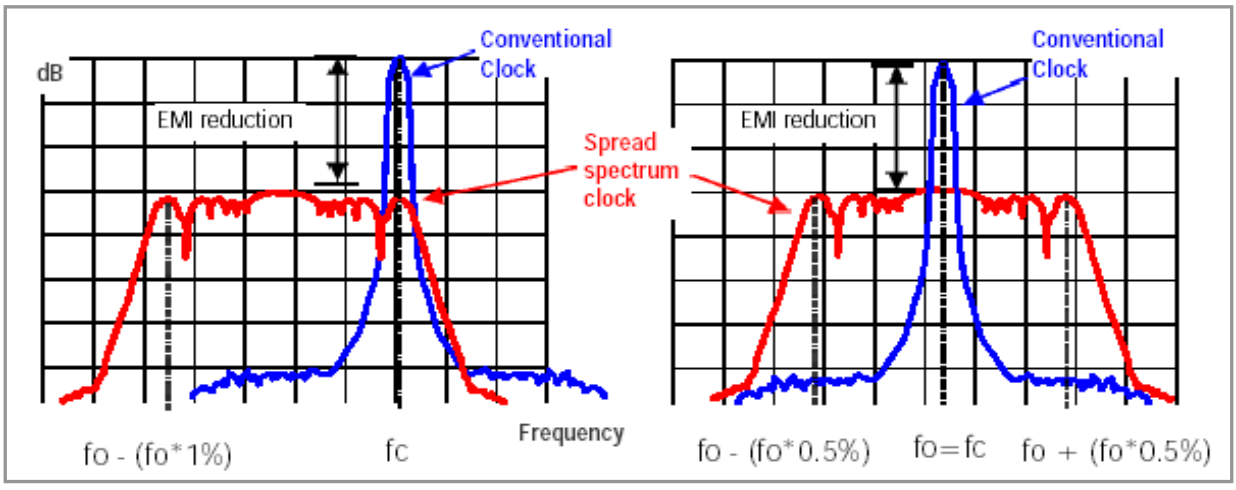
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ACT9200SSC



Spread Spectrum principle:

Down Spread **Centre Spread**



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ACT9200SSC

Spread Spectrum principle (continued from page 2)

Spread Spectrum Clock (SSC), the mode energy of a spread spectrum clock is spread over a wider bandwidth, resulting from the frequency modulation technique. The modulation carrier frequency is in the KHz range which makes the modulation process transparent to the oscillator frequency. The controlled modulation process can be on all of one side of the nominal frequency (**DOWN SPREAD**) or equally spread either side of the nominal frequency (**CENTRE SPREAD**) . If **OVER-CLOCKING** is a problem to the system then the down spread is preferred.

Instantaneous Frequencies (100MHz Nominal Frequency)

Total Spread %	Down Spread		Centre Spread	
	Min	Max	Min	Max
	Down Range	Up Range	Down Range	Up Range
0.5%	-1.0%	0%	-0.25%	+0.25%
	-5000ppm	0ppm	-2500ppm	+2500ppm
	99.500000	**100.000000**	**99.750000**	**100.250000**
	Note. Tri State not available with **0.5%** versions.			
1%	-1.0%	0%	-0.5%	+0.5%
	-10000ppm	0ppm	-5000ppm	+5000ppm
	99.000000	**100.000000**	**99.500000**	**100.500000**
3%	-3.0%	0%	-1.5%	+1.5%
	-30000ppm	0ppm	-15000ppm	+15.000ppm
	97.000000	**100.000000**	**98.500000**	**101.500000**

EMI Reduction Data

Main mode: EMI reduction:

$$10\text{Log}\left(\frac{\text{Total spread \% x frequency (fo)}}{0.12}\right) \text{ dB}$$

3rd Harmonic: EMI reduction:

$$10\text{Log}\left(\frac{\text{Total spread \% x frequency(fo)x3}}{0.12}\right) \text{ dB}$$

5th Harmonic: EMI reduction:

$$10\text{Log}\left(\frac{\text{Total spread \% x frequency(fo)x5}}{0.12}\right) \text{ dB}$$

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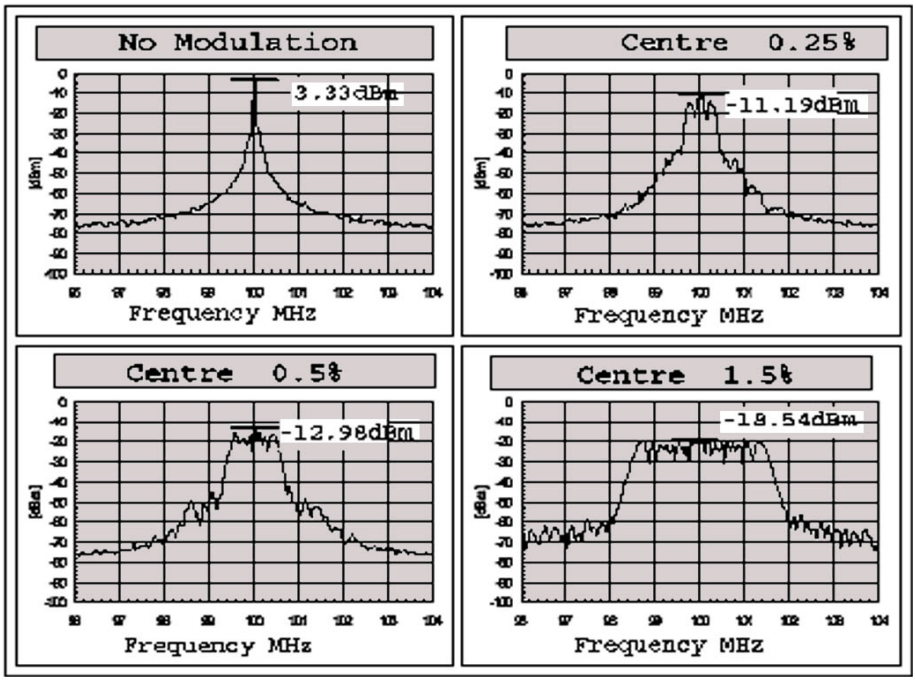
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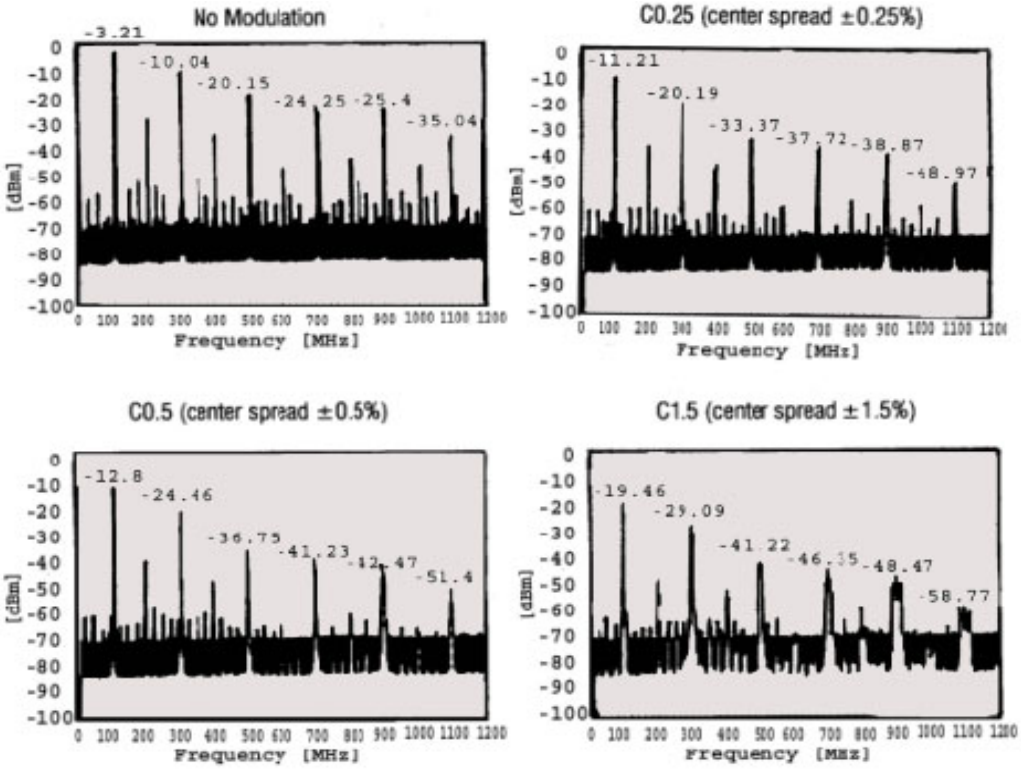
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ACT9200SSC

EMI Example Test Data Nominal Frequency 100MHz Modulation Carrier 34.678KHz



Example Whole Spectrum EMI Data 100MHz



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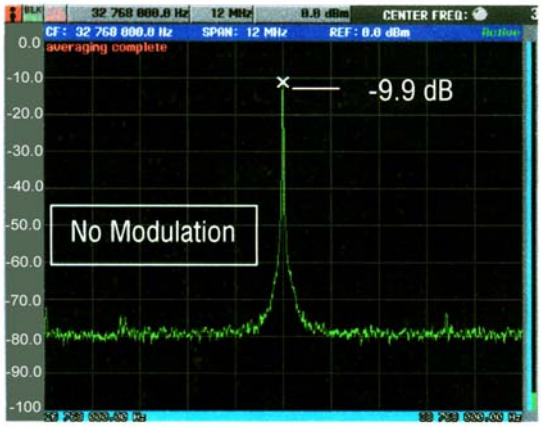
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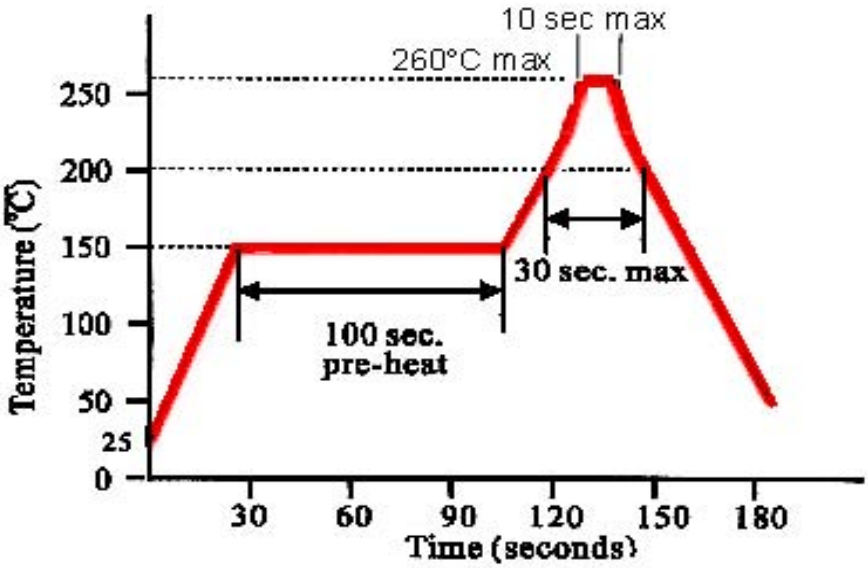
ACT9200SSC

13.1dBc EMI reduction





ACT9200SSC REFLOW SPECIFICATION



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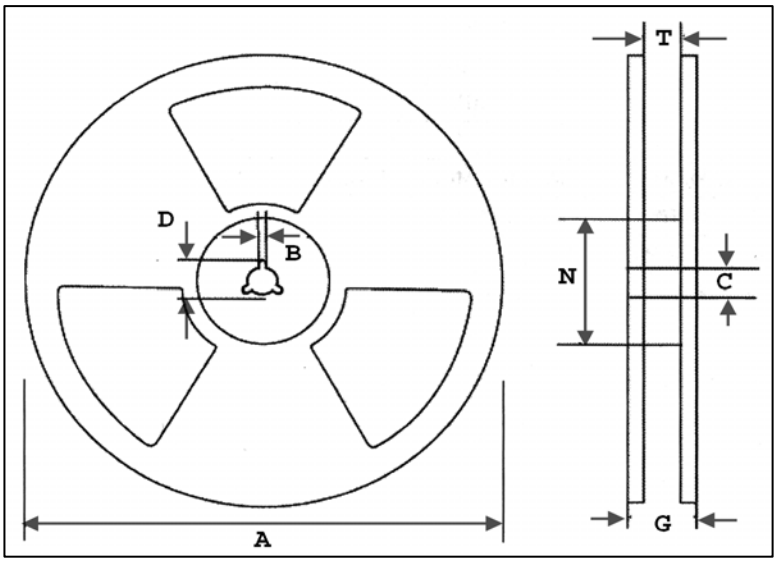
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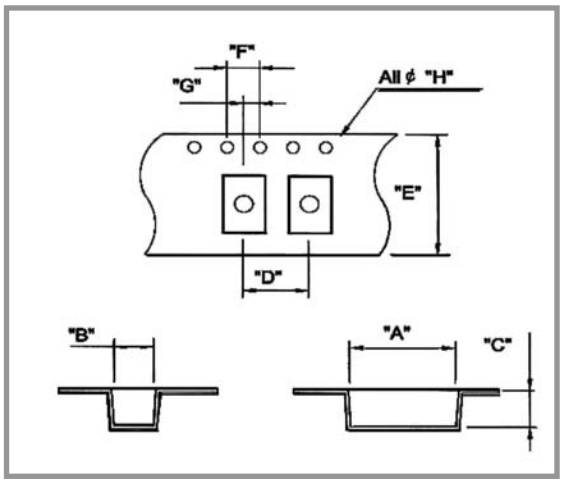
ACT9200SSC TAPE & REEL SPECIFICATIONS

REEL



A	B±0.5	D±1.0	C±0.2	N±1.0		T±0.1	G±2.0	mm
180	2.2	20.2	13	62		16.5	20.5	

TAPE



A±0.1	B±0.1	C±0.1	D±1.0	E±0.1	F±0.1	G±0.05	H+0.1-0	mm
7.7	5.3	1.8	8.0	16.0	4.0	2.0	1.5	

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