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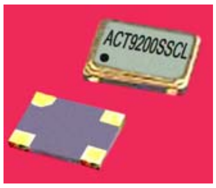
Compatible with Eu Directive 2002/EC - RoHS

ACT9200SSCL



The ACT9200SSCL 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. This 7x5mm device is available with CMOS output with a supply voltage of 3.3V This version offers a lower jitter than the standard 9200SSC version. Taped and reeled packaging (1K reels) and loose quantities are available for purchase, to suit high and low volume production. Other Spread Spectrum devices available in DIL14 and 9.6x11.4x2.5 on request.

SPECIFICATION

Parameter	Symbol	Specification			Condition
Supply Voltage	VDD	3.3VDC ± 5%			
Frequency Range	fo	13.000 ~220.0 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 Dependent
Operating Current	Iop	25mA typical			
Spread Percentage		Total %	Down Spread %	Centre Spread %	
Down spread or		0.50	-0.5	±0.25	
		0.75	-0.75	±0.375	
		1.30	-1.25	±0.625	** For initial trial samples the centre spread ±1.5% is recommended
Centre spread need to be specified when ordering. Tolerance ±30% of Total%		2.00	-2	±1.0	
		2.50	-2.5	±1.25	
		3.00	-3	±1.5**	
		3.50	-3.5	±1.75	
		3.80	-3.75	±1.875	
EMI Reduction		Equals 10Log(Total%x Frequency (MHz))xHarmonic / 0.12			See examples
Modulation Carrier Frequency		25.3 KHz min, 58.6KHz max			Frequency dependant
Duty Cycle	Tw/t	45/55%			
Output Level '0'	VOL	0.4V max (at 20% VDD)			
Output Level '1'	VOH	2.4V min (at 80% VDD)			
Output Impedance		40 ohms typical			
Rise & Fall Time (max)	TrTf	1.2nS max (20%VDD to 80%VDD)			
Output Load	N/CL	15pF CMOS			
Start-up Time	Tosc	5mS max, 2mS Typ			
Tri-state		Not Available			Pin 1 must be O/C
Static discharge Voltage		>2000V			MIL STD 883 Method 3015
Ageing	Fa	±5ppm			first year max @25°C
Cycle to Cycle Jitter	Tj	±150pS max, ±100pS Typical			for 13 MHz Oscillator **

** Refer to Page 3

APPLICATIONS

- Networking
- Embedded Systems
- GPS
- LCD Displays
- ADSL, PCMCIA
- Digital Imaging
- Instrumentation

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

In line with our ongoing policy of product evolvement and improvement, the above specification is subject to change without notice.

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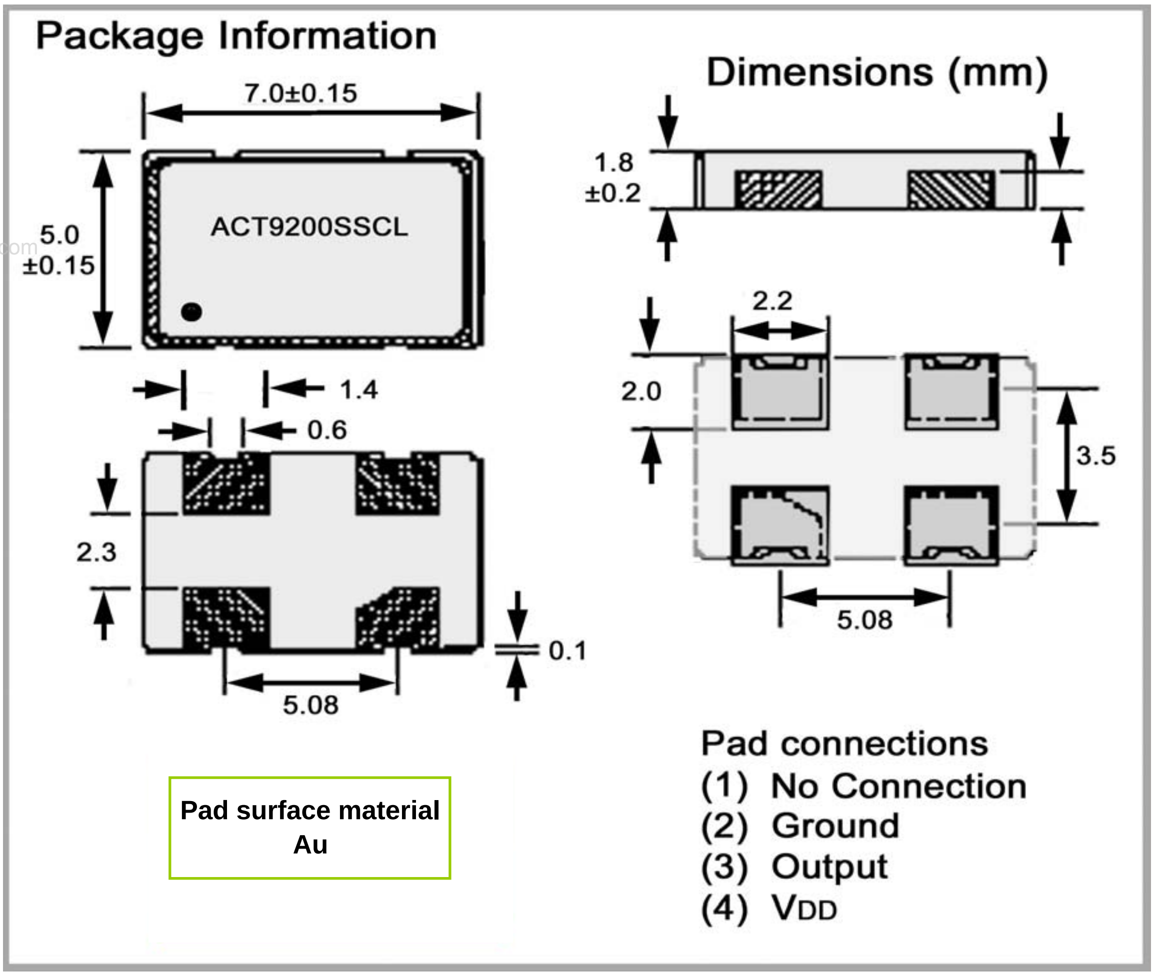
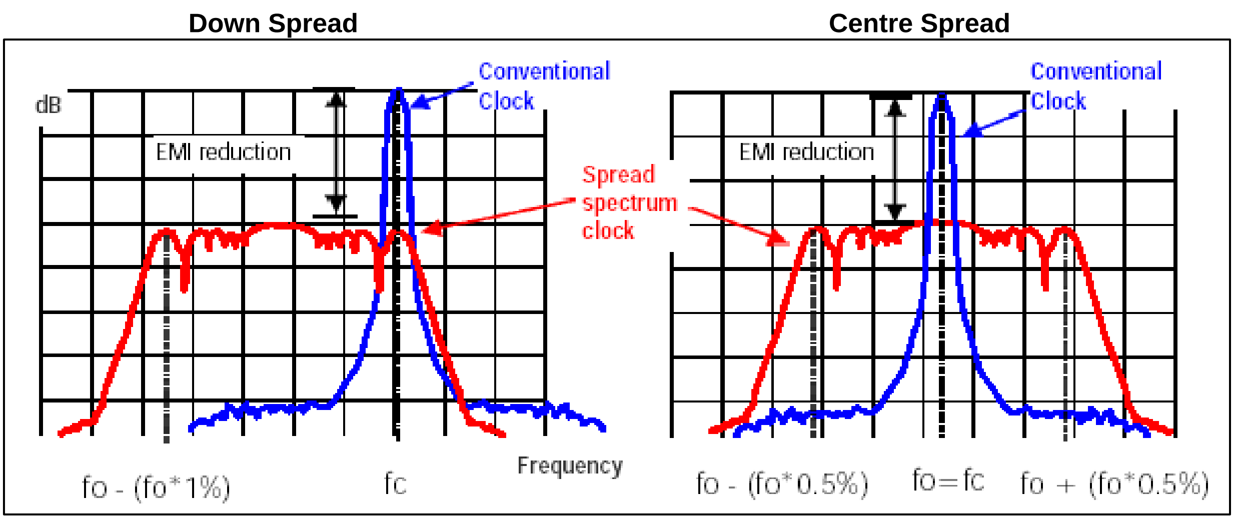


Principle of Spread Spectrum



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ACT9200SSCL

Principle of Spread Spectrum (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	-0.5%	0%	-0.25%	+0.25%
	-5000ppm	0ppm	-2500ppm	+2500ppm
	99.500000	**100.000000**	**99.750000**	**100.250000**
0.75	-0.75%	0%	-0.375	+0.375
	-7500	0ppm	-3750	-3750
	99.250000	**100.000000**	**99.625000**	**100.375000**
1.25	-1.25%	0%	-0.625%	+0.625
	-12500	0ppm	-6250	+12650
	98.750000	**100.000000**	**99.375000**	**100.625000**
2.0	-2.0%	0%	-1.0%	+1.0%
	-20000	0ppm	-10000	+10000
	98.000000	**100.000000**	**-99.000000**	**101.000000**
2.5	-2.5%	0%	-1.25%	+1.25%
	-25000	0ppm	-12500	+12500
	99.000000	**100.000000**	**99.500000**	**100.500000**
3.0**	-3.0%	0%	-1.5%	+1.5%
	-30000ppm	0ppm	-15000ppm	+15000ppm
	97.500000	**100.000000**	**98.750000**	**101.250000**
3.5	-3.5%	0%	-1.75%	+1.75%
	-35000ppm	0ppm	-17500	+17500
	96.500000	**100.000000**	**98.250000**	**101.750000**
3.75	-3.75%	0%	-1.875%	+1.875%
	-30000ppm	0ppm	-15000ppm	+15000ppm
	96.250000	**100.000000**	**98.125000**	**101.875000**

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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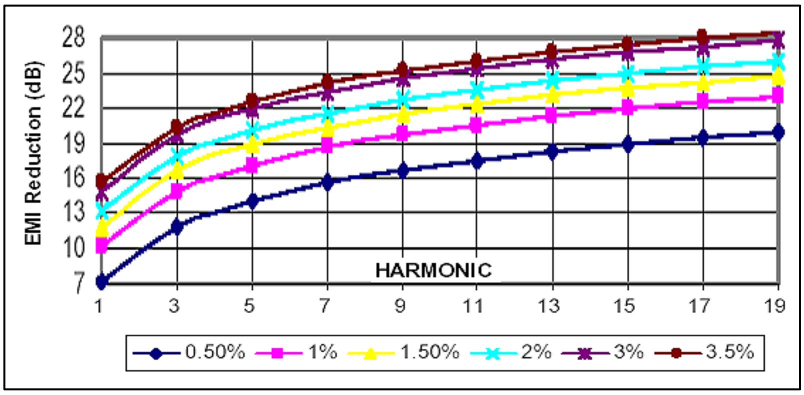
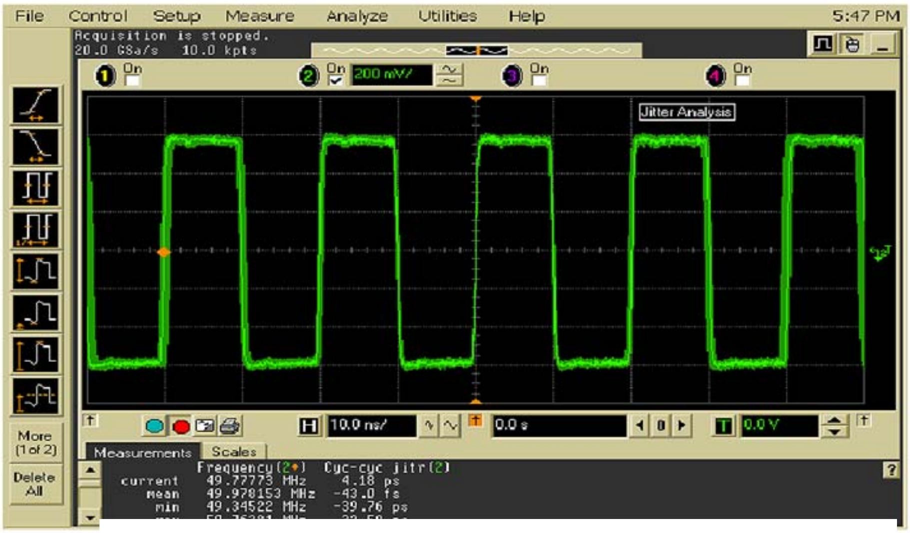
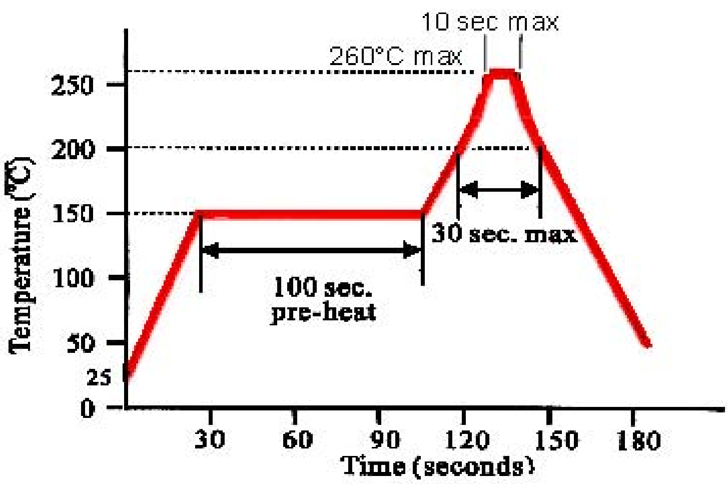


Example Jitter Measurement for 125MHz 9200SSCL

Cycle to Cycle Jitter 32ps min 39.76ps max for 10000 samples



Reflow Data



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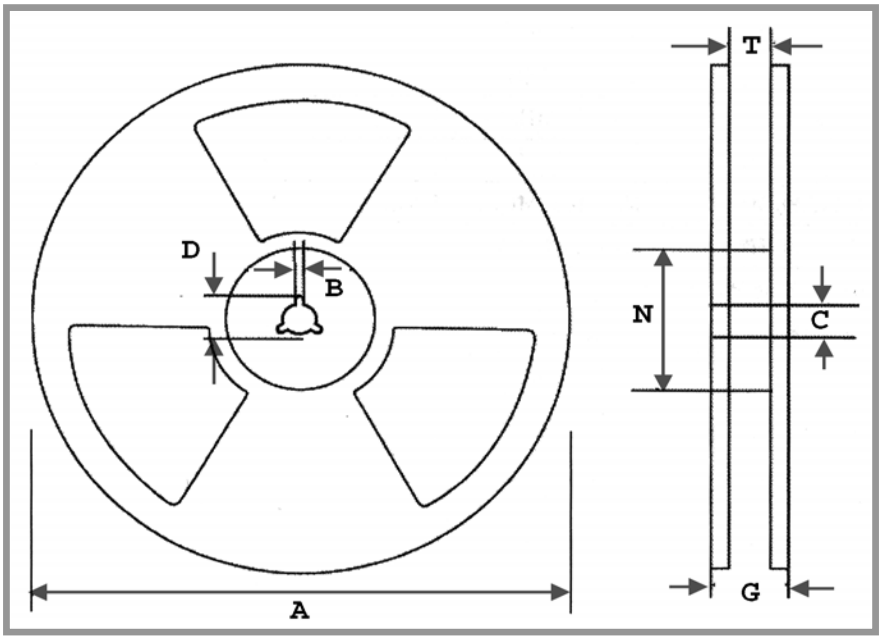
ACT9200SSCL TAPE & REEL SPECIFICATIONS

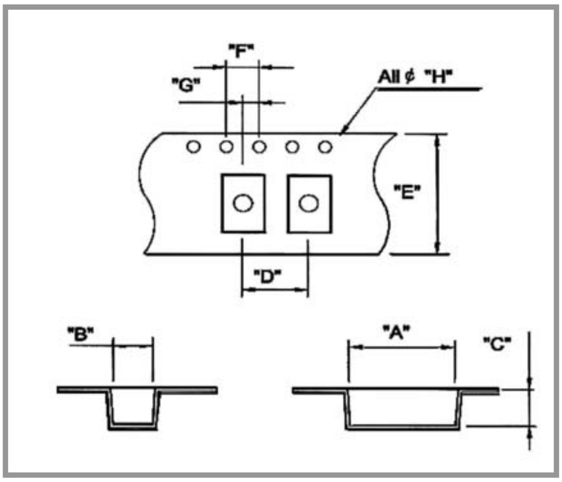
REEL



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	

ACT9200SSCL REFLOW SPECIFICATION

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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