

# CFSS-2 SPREAD SPECTRUM CLOCK OSCILLATORS

ISSUE 5; 27 NOVEMBER 2009 - RoHS 2002/95/EC

## Description

- Spread spectrum surface mount oscillators in a ceramic package with a hermetically sealed metal lid

## Package Outline

- 7 x 5mm

## Frequency Range

- 8 to 170MHz

## Output Compatibility & Load

- Tri-state CMOS
- Drive Capability 15pF max

## Frequency Stabilities (averaged frequency)

- $\pm 100\text{ppm}$  (inclusive of supply voltage and output load variations over the operating temperature range)

## Operating Temperature Ranges

- 10 to 70°C (CFSS-2)
- 40 to 85°C (CFSS-2I)

## Storage Temperature Range

- 40 to 85°C

## Tri-state Operation

- Logic '1' to pad 1 (>70% Vs) enables oscillator output.
- Logic '0' to pad 1 (<30% Vs) disables oscillator output, the oscillator output goes to a high impedance state.
- No connection to pad 1 enables oscillator outputs.

## Modulation Ratios

- Centre Spread  $\pm 0.25$ ,  $\pm 0.5\%$ ,  $\pm 0.75\%$ ,  $\pm 1\%$ ,  $\pm 1.5\%$ ,  $\pm 2\%$
- Down Spread -0.5%, -1%, -1.5%, -2%, -3%, -4%

## Internal Spread Spectrum Modulation Frequency

- 30kHz to 33kHz

## Spread Spectrum Enable Connection ( pad 2 )

- Logic '1' to pad 2 (>70% Vs), spread spectrum is off.
- Logic '0' to pad 2 (<30% Vs), spread spectrum is on.
- No connection to pad 1, spread spectrum is on.

## Cycle to Cycle Jitter ( SS on )

- 8MHz to <133MHz 400ps max pk-pk
- 133MHz to 170MHz 250ps max pk-pk

## Start Up Time

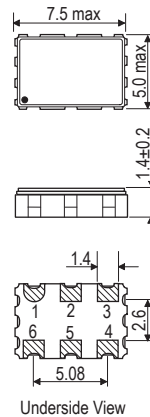
- 10ms max

**Note:** Power-up time for all Vs to reach minimum specified voltage 0.05ms ~ 500ms (power ramp must be monotonic)

## Environmental Specification

- Shock: MIL-STD-202F, Method 213B (1000g, 0.5ms)
- Vibration: MIL-STD-202F, Method 204D, Cond.D 20g, 10-2000Hz, 4 hrs duration in each of 3 mutually perpendicular axis

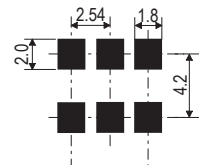
## Outline (mm)



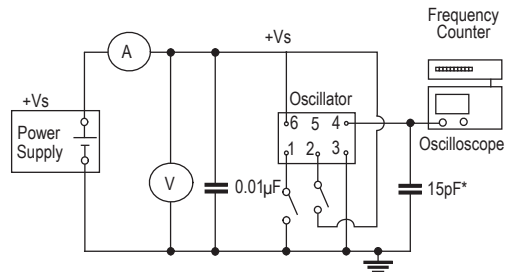
## Pad Connections

1. Enable/Disable
2. SSON
3. GND
4. Output
5. N/C
6. +Vs

## Solder pad layout



## Test Circuit



\*Inclusive of jigging and equipment capacitance

## Marking Includes

- Model Number + Frequency

## Packaging

- Loose in bulk pack or tape and reel
- Tape & Reel in accordance with EIA-481-D

## Minimum Order Information Required

- Frequency + Model Number + Operating Temperature Code (if applicable) + Modulation Ratio

## Electrical Specifications - maximum limiting values

Frequency Range	Frequency Stability	Supply Voltage	Supply Current	Rise Time (tr) (20-80%)	Fall Time (tf) (80-20%)	Duty Cycle	Model Number
8.0 to 170.0MHz	±100ppm	3.3V ±5%	50mA	3ns	3ns	45/55%	CFSS-2, CFSS-2I

Ordering Example 10.0MHz CFSS-2 I M ±1% C

Frequency \_\_\_\_\_

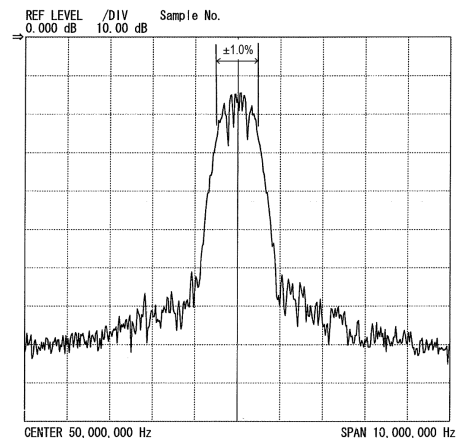
Model No. \_\_\_\_\_

Operating Temperature Code: I = -40 to 85°C; not applicable for -10 to 70°C \_\_\_\_\_

Modulation Ratio: M plus ratio required \_\_\_\_\_

Frequency Stability: C = ±100ppm \_\_\_\_\_

### Example Output Spectrum (SSon)



### Example Output Spectrum (SSoff)

