

## M690SDM Voltage Controlled SAW Oscillator

### DESCRIPTION

The M690SDM Voltage Controlled SAW Oscillator (VCISO) is a low noise oscillator that incorporates an analog X2 frequency multiplier to provide an output frequency that is twice that of the fundamental VCISO frequency.

The fundamental frequency VCISO is implemented using an IDT SiGe VCISO IC and an IDT low loss Surface Acoustic Wave (SAW) quartz delay line. The fundamental VCISO is housed in a 5x7mm ceramic package that is mounted to the M690SDM PCB.

The use of a SAW quartz delay line as the frequency controlling element in the oscillator provides low phase noise, temperature stability, and a repeatable linear tuning characteristic.

The M690SDM VCISO is manufactured on a 13x20 mm FR4 PCB.

### FEATURES

- Low jitter
  - 60 fs rms from 20 kHz to f<sub>out</sub>
- 13x20 mm Surface Mount FR4 PCB
- +5V Power Supply
- RoHS Compliant

### APPLICATIONS

- Frequency Translation
- De-jitter Phase Lock Loop Applications
- Clock and Data Retiming
- Low Noise Clocks

### ABSOLUTE MAX RATINGS

Operating Temperature: 10°C to 85°C  
Storage Temperature: -55°C to 125°C  
Power Supply Voltage: 6.0V  
Tuning Voltage: -0.5V to +5.5 V

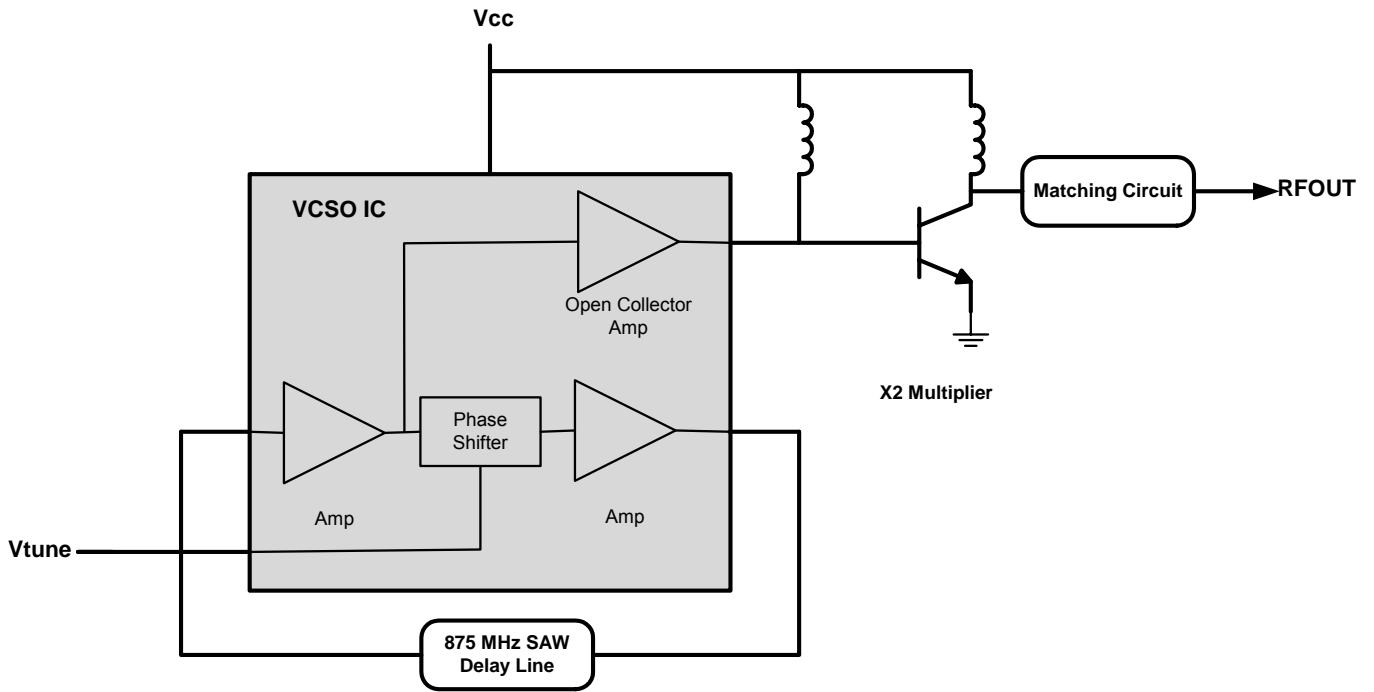


## SPECIFICATIONS

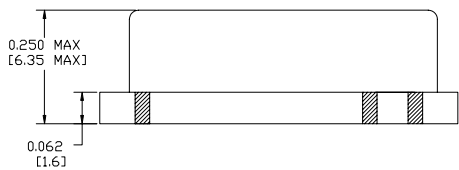
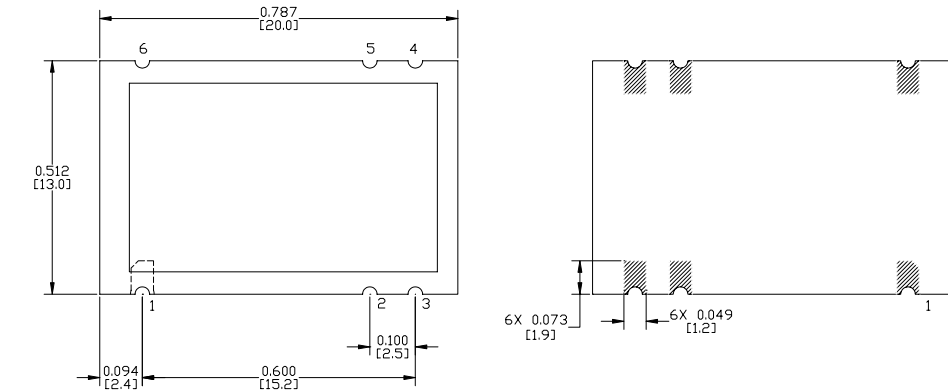
Specifications apply at  $V_{cc} = 5.0V$  and  $T_{case} = 25^{\circ}C$  unless otherwise specified

Parameter	Minimum	Typical	Maximum	Units	Notes
Center Frequency Range		1747.6230		MHz	Other frequencies available
Tuning Range		700		ppm	$V_{tune} = 0.0V$ to $3.3V$
APR	$\pm 50$			ppm	
Temperature Stability			250	ppm p-p	$10^{\circ}C$ to $85^{\circ}C$
Power supply Pushing	-32		32	ppm/V	$V_{cc} = 5.0V \pm 2.5\%$
Kvco		220		ppm/V	
Tuning Linearity	-8		8	%	Deviation from best linear fit
Output Power	7.5	10	12	dBm	$10^{\circ}C$ to $85^{\circ}C$ , $V_{cc} = 5.0V \pm 2.5\%$
Harmonic Spurious			-30	dBc	
Sub-harmonic Spurious			-30	dBc	
Non-harmonic Spurious			-60	dBc	
Load VSWR, all phases			3.5:1	na	
SSB Phase Noise					
$\Delta f = 10$ kHz		-98		dBc/Hz	
$\Delta f = 100$ kHz		-120		dBc/Hz	
$\Delta f = 1$ MHz		-137		dBc/Hz	
$\Delta f = 10$ MHz		-140		dBc/Hz	
$\Delta f > 20$ MHz		-143		dBc/Hz	
$V_{cc}$	4.875	5	5.125	Volts	
$I_{cc}$		120	150	mA	
Operating Temperature	10		85	$^{\circ}C$	Case temperature

BLOCK DIAGRAM



OUTLINE DRAWING



PIN CONNECTIONS

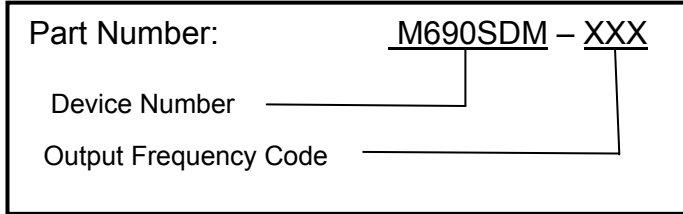
PIN 1	V <sub>in</sub> (TUNING VOLTAGE)
PIN 2	GROUND
PIN 3	GROUND
PIN 4	RF OUTPUT
PIN 5	GROUND
PIN 6	VCC

Pad Finish: Gold over Nickel  
 Moisture Sensitivity: Level 1



Ordering Information

Part Numbering Scheme



Output Frequencies & Order Codes

Output Frequency Code	Output Frequency MHz
R01	1747.623000
R02	1747.030837
R03	1748.366885
R04	1748.793733

Consult IDT for availability of other frequencies