

**Synthesizer , SMT  
1920 — 2000 MHz, 100 & 200 kHz**

**MASYVS0006-1950**

Rev: F

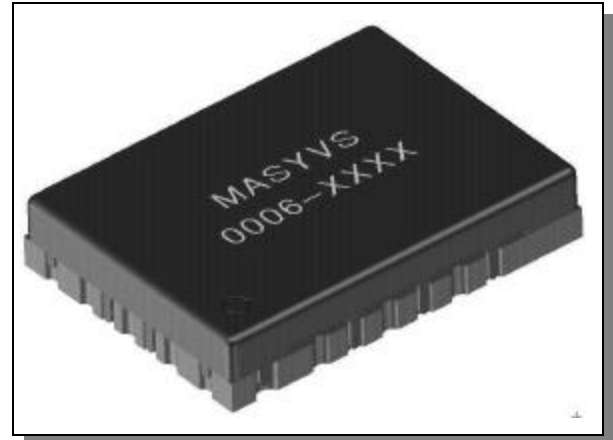
**Features**

- ◆ Fully Integrated VCO, PLL, Loop Filter
- ◆ High Performance, Low Cost
- ◆ Miniature SMT Package (LSM6)

**Description**

This synthesizer design integrates a high performance VCO, PLL, IC and discrete loop filter in a surface mount package. This SMT package provides electrical shielding, easy PCB assembly and repeatable performance. The synthesizer is designed for use in wireless base stations.

M/A-COM synthesizers are manufactured in an ISO9001 certified facility, incorporating surface mount assembly and automated electrical testing. This ensures consistent electrical performance and quality over volume production quantities.



**Electrical Specifications<sup>1</sup>:**

**T<sub>A</sub> = +25°C, Z<sub>0</sub> = 50 Ohms, V<sub>cc1</sub> = 5V, V<sub>cc2</sub> = 3.3V.**

Parameter	Test Conditions	Units	Min	Typ	Max
Frequency Range	Over T <sub>op</sub> <sup>2</sup>	MHz	1920		2000
RF Output Power	Over T <sub>op</sub> <sup>2</sup>	dBm	-3.0		+3.0
Phase Noise	SSB at 100 Hz offset from carrier SSB at 1 kHz offset from carrier SSB at 10 kHz offset from carrier SSB at 100 kHz offset from carrier SSB at 1.0 MHz offset from carrier	dBc/Hz dBc/Hz dBc/Hz dBc/Hz dBc/Hz			-65 -65 -90 -118 -138
Integrated Phase Noise	100 Hz to 1 MHz bandwidth	Degree		1.2	
Harmonic Suppression		dBc			-15
Spurious Suppression (Non-Harmonic)	Phase comparison frequency ( ± 100 kHz or ± 200 kHz)	dBc			-65
	Reference breakthrough ( ± 10 MHz)	dBc			-90
Frequency Lock Time	Over F <sub>out</sub> , Measured to within ± 50 Hz	ms			50
VCO Supply Current (I <sub>cc1</sub> )	Recommended operating condition	mA		25	30
PLL Supply Current (I <sub>cc2</sub> )	Recommended operating condition	mA		6	10
VCO Power Supply (V <sub>cc1</sub> )	Recommended operating condition	V	+4.75	+5.00	+5.25
PLL Power Supply (V <sub>cc2</sub> )	Recommended operating condition	V	+2.85	+3.30	+3.45

1. All specification limits are indicated values @ +25°C and apply over F<sub>out</sub> unless otherwise stated.  
2. T<sub>op</sub> = -40°C to +85°C operating temperature.

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**Electrical Specifications<sup>1</sup>: (cont'd)**

Parameter	Test Conditions	Units	Min	Typ	Max
Step Size ( $\Delta F$ )	Recommended operating limit	kHz		100/200	
Reference Frequency ( $F_R$ )	1.0 V pp $\pm 0.2V$ square wave with input filter	MHz	5		40
PLL Programming	3-wire serial CMOS IAW LMX2326, Charge Pump 1 mA Logic high = $V_{CC2} \times 0.8$ Min and Logic low = $V_{CC2} \times 0.2$ Max				
PLL Lock Monitor Output	Locked = $V_{CC2} - 0.4$ Min , Unlocked = 0.4V Max				

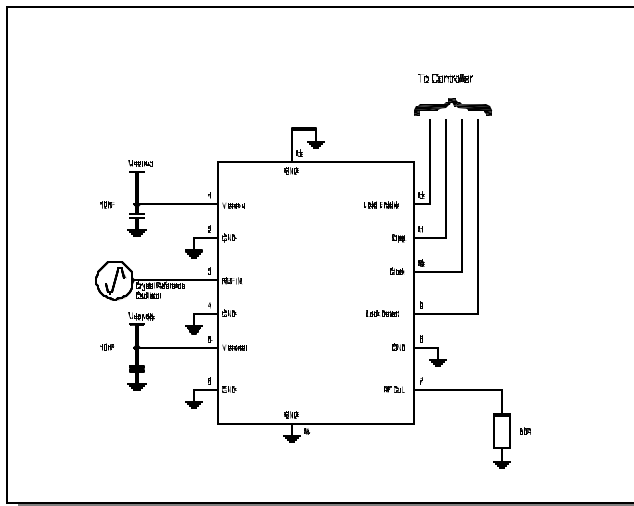
**Pin Configuration**

Pin No.	Function	Pin No.	Function
1	$V_{CC2}$	8	GND
2	GND	9	Lock Detect
3	REF I/P	10	Clock
4	GND	11	Data
5	$V_{CC1}$	12	Load Enable
6	GND	13	GND
7	RF O/P	14	GND

**Absolute Maximum Ratings  
 $T_A = +25^\circ C$**

Parameter	Absolute Maximum
VCO Supply Voltage ( $V_{CC1}$ )	-0.3V to 6.5 V
PLL Supply Voltage ( $V_{CC2}$ )	-0.3V to 6.5 V
Reference Frequency Level	-0.3V to 6.5 V
Data, Clock, Strobe Voltages	-0.3V to $V_{CC} + 0.3 V$
Operating Temperature	-40°C to +85°C
Storage Temperature	-45°C to +120°C
Solder Assembly Temperature	See App Note M2032

**Functional Block Diagram**



1. The diagram above shows a typical application.
2. The Reference input and RF output are internally AC coupled.
3. The diagram applies when digital lock detect is selected. For analog open-drain mode, a filter is required. See AN3003 for design information.

1. Operation of this device above any one of these parameters may cause permanent damage.
2. Static sensitive, observe appropriate handling precautions.

**Environmental Specifications**

Devices are designed to function after exposure to the shock, vibration, thermal shock and moisture conditions typically encountered in base station and other infrastructure environments.

**Ordering Information**

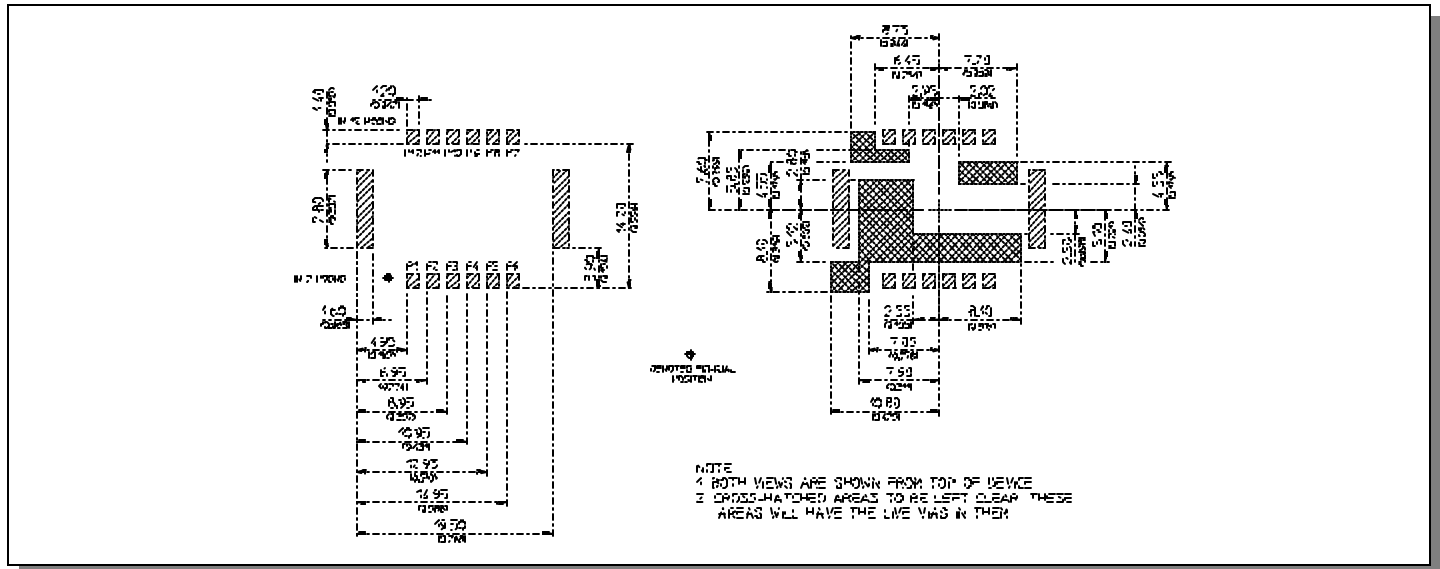
Part Number	Package
MASYVS0006-1950 B	Bulk Packaging
MASYVS0006-1950 T	Tape and Reel (300/Reel) <sup>1</sup>
MASYVS0006-1950 R	Reverse Tape and Reel (300/Reel) <sup>1</sup>

1. See application note M513.

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**Recommended PCB Layout**



**Outline Drawing**

