

# Synthesizer , SMT 1046 — 1085 MHz, 200 kHz

**MASYVS0061-1066**

Rev: E

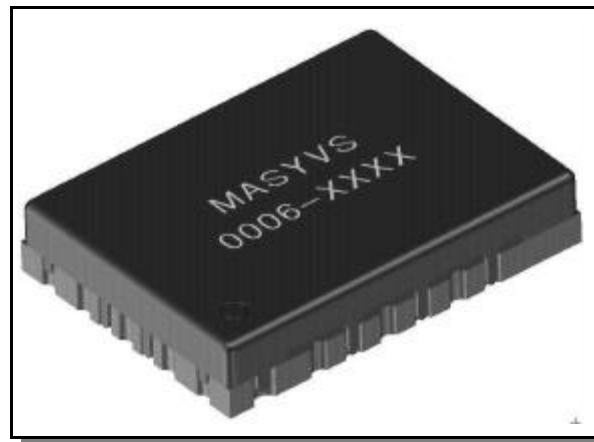
## Features

- ♦ 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, F<sub>ref</sub> = 10MHz, 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	1046		1085
RF Output Power	Over T <sub>op</sub> <sup>2</sup>	dBm	+2.5		+7.5
Phase Noise	SSB at 600 kHz offset from carrier SSB at 800 kHz offset from carrier SSB at 1800 kHz offset from carrier SSB at 6000 kHz offset from carrier	dBc/Hz dBc/Hz dBc/Hz dBc/Hz		-145 -151 -153 -160	-144 -148 -151 -157
Harmonic Suppression		dBc		-33	-20
Spurious Suppression (Non-Harmonic)	Phase comparison frequency ( ± 200 kHz) ± 400 kHz ± 600 kHz ± 800 kHz Reference breakthrough ( ± 10 MHz)	dBc dBc dBc dBc dBc		-85 -87 -93 -97 -100	-79 -84 -90 -95 -97
Frequency Lock Time	Over F <sub>out</sub> , Measured to within ± 4 degrees	µs			450
Phase Error (rms)	Measured over 577µs time slot	Degree		0.6	1.0
Phase Error (peak)	Measured over 577µs time slot	Degree		1.7	4
VCO Supply Current (I <sub>CC1</sub> )	Recommended operating condition	mA		47	55
PLL Supply Current (I <sub>CC2</sub> )	Recommended operating condition	mA		13	15
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	+3.1	+3.3	+3.5

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.

# Synthesizer , SMT 1046 — 1085 MHz, 200 kHz

**MASYVS0061-1066**

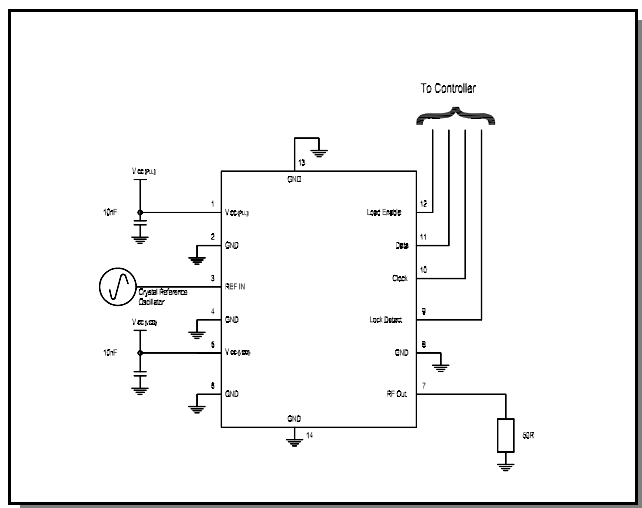
## Electrical Specifications<sup>1</sup>: (cont'd)

Parameter	Test Conditions	Units	Min	Typ	Max
Step Size ( $\Delta F$ )	Recommended operating limit	kHz		200	
Reference Frequency ( $F_R$ )	1.0 V pp $\pm$ 0.2V square wave with input filter	MHz	10		100
PLL Programming	3-wire serial CMOS IAW ADF4113, Charge Pump 5 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	$V_{CC1}$	8	GND
2	GND	9	Lock Detect
3	REF I/P	10	Clock
4	GND	11	Data
5	$V_{CC2}$	12	Load Enable
6	GND	13	GND
7	RF O/P	14	GND

## 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.

## Absolute Maximum Ratings $T_A = +25^\circ\text{C}$

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

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

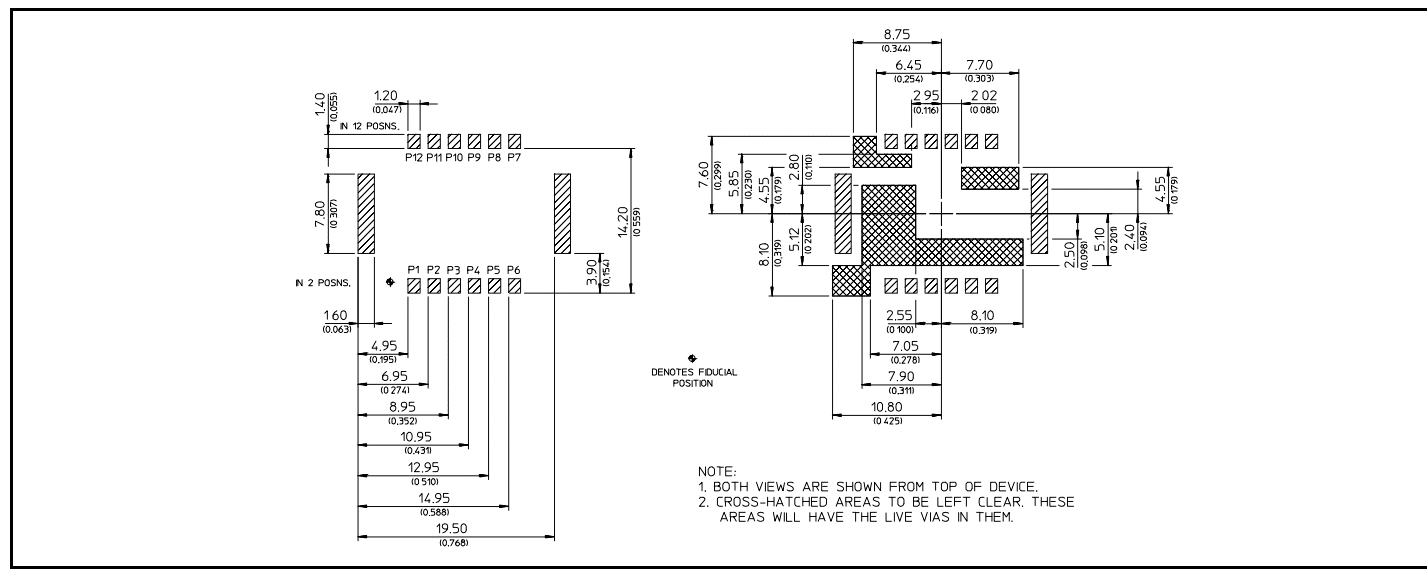
Part Number	Package
MASYVS0061-1066 B	Bulk Packaging
MASYVS0061-1066 T	Tape and Reel (300/Reel) <sup>1</sup>
MASYVS0061-1066 R	Reverse Tape and Reel (300/Reel) <sup>1</sup>

1. See application note M513.

**Synthesizer , SMT**  
**1046 — 1085 MHz, 200 kHz**

**MASYVS0061-1066**

**Recommended PCB Layout**



**Outline Drawing**

