

**Synthesizer , SMT
400 MHz**

MAVC-060103-130400

Rev: C

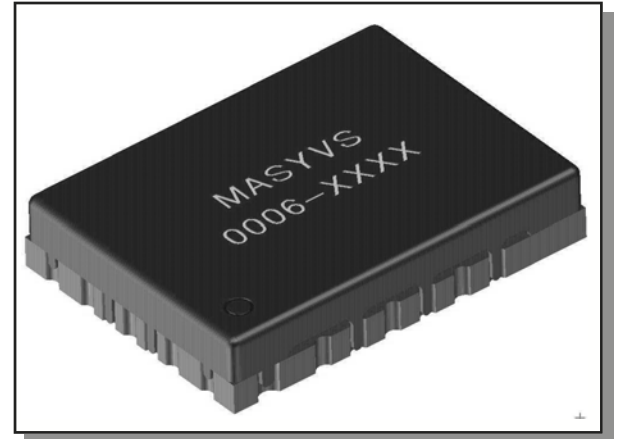
Features

- ◆ RoHS Compliant
- ◆ 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 Specifications¹:

T_A = +25°C, Z₀ = 50 Ohms, V_{cc1} = 5V, V_{cc2} = 3.3V.

Parameter	Test Conditions	Units	Min	Typ	Max
Frequency Range	Over T _{op} ²	MHz		400	
RF Output Power	Over T _{op} ²	dBm	-3.0		+3.0
Phase Noise	SSB at 100 Hz offset from carrier	dBc/Hz		-83	-80
	SSB at 1 kHz offset from carrier	dBc/Hz		-83	-80
	SSB at 10 kHz offset from carrier	dBc/Hz		-110	-105
	SSB at 100 kHz offset from carrier	dBc/Hz		-130	-127
	SSB at 1000 kHz offset from carrier	dBc/Hz		-148	-145
Harmonic Suppression		dBc		-25	-20
Spurious Suppression (Non-Harmonic)	Phase comparison frequency	dBc		-73	-70
	Other spurious	dBc		-85	-80
Reference breakthrough		dBc			-80
Frequency Lock Time	Over F _{out} , +/- 500Hz	mS		20	30
VCO Supply Current (I _{cc1})	Recommended operating condition	mA		27	30
PLL Supply Current (I _{cc2})	Recommended operating condition	mA		9	10
VCO Power Supply (V _{cc1})	Recommended operating condition	V	4.75	5.0	5.25
PLL Power Supply (V _{cc2})	Recommended operating condition	V	3.1	3.3	3.5

1. All specification limits are indicated values @ +25 °C and apply over F_{out} unless otherwise stated.
2. See "Absolute Maximum Ratings" for T_{op}.

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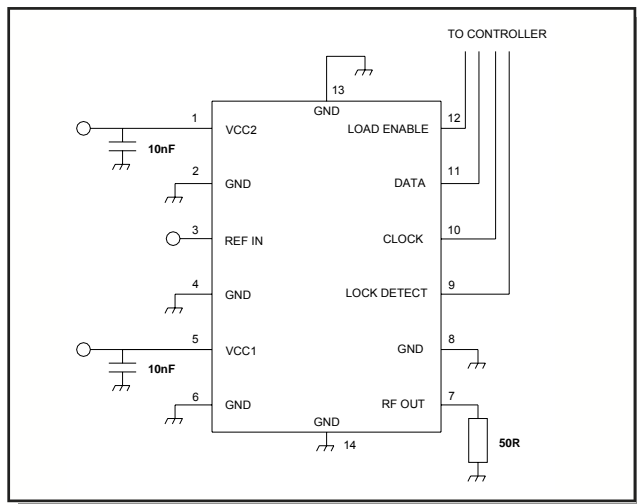
Electrical Specifications¹: (cont'd)

Parameter	Test Conditions	Units	Min	Typ	Max
Step Size (ΔF)	Recommended operating limit	kHz		1000	
Reference Frequency (F_R)	1.0 V pp \pm 0.2V square wave with input filter	MHz	6	10	100
PLL Programming	3-wire serial CMOS IAW ADF4113, Charge Pump max current 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

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.

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
Weight	3.0 grams
Moisture Sensitivity Level ²	2
ESD Rating	Class 1

1. Operation of this device above any one of these parameters may cause permanent damage.
2. As per JEDEC-STD-020.

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

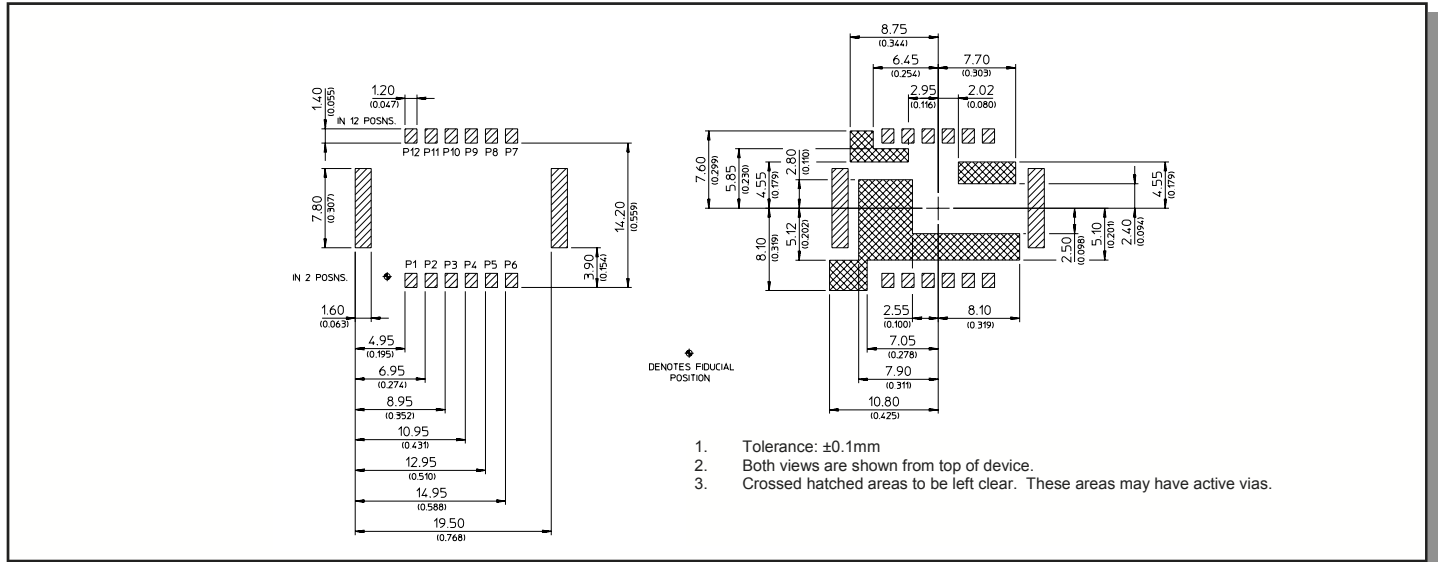
Part Number	Package
MAVC-060103-130400	Tape and Reel (300/Reel) ¹

1. See application note M513.

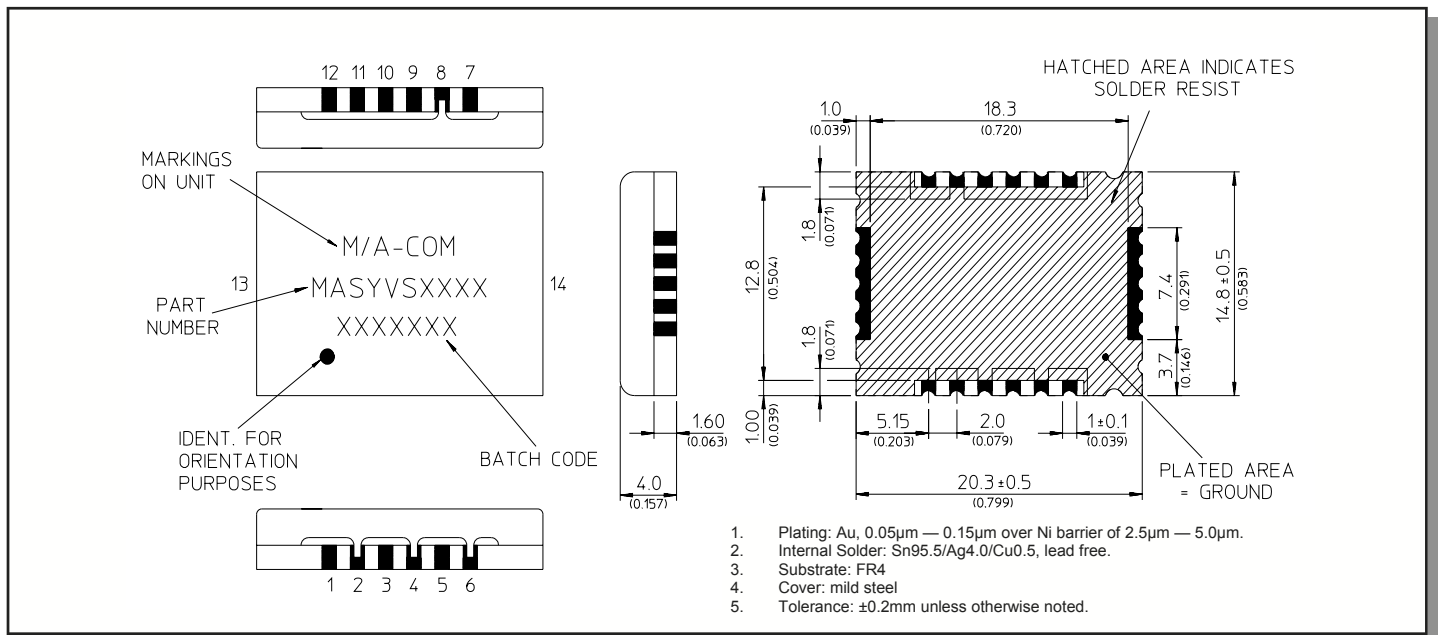
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Recommended PCB Layout



Outline Drawing



ECO History

Rev	Date	Description	By
A	Dec 8th 2005	Create datasheet	JS
B	Dec 15th 2005	Change of the reference frequency specification from Min=10, Typ=, to Min=6, Typ=10,	JS
C	Feb 20th 2005	Change of 1000kHz SSB Phase noise from Typically -150 to -148dBc/Hz, Change of 1000kHz SSB Phase noise from Max -147 to -145dBc/Hz.	JS

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