



MAAMSS0014 V3

#### **Features**

- Low Cost Plastic SOT-89 Package
- Broadband Operation
- 18 dBm Pout at –50 dBc ACPR
- 24 dBm P1dB

### **Description**

M/A-COM's MAAMSS0014 RF driver amplifier is a GaAs MMIC which exhibits excellent ACPR performance as well as high gain and low power consumption in a low-cost SOT-89 surface mount plastic package.

The MAAMSS0014 employs a monolithic single stage design featuring a convenient 50-ohm input/output impedance. This device runs off a single +5 volt supply and draws 110 mA typically. The design provides excellent performance from 500 to 2400 MHz.

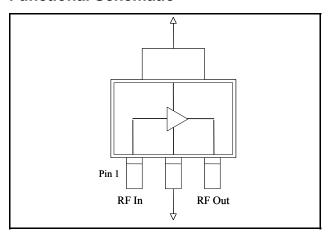
The MAAMSS0014 is fabricated using M/A-COM's iHBT process to realize low current and high power functionality. The process features full passivation for increased performance and reliability.

# **Ordering Information**

Part Number	Package
MAAMSS00014SMB-01	900 MHz Standard Sample Kit
MAAMSS00014SMB-02	1900 MHz Standard Sample Kit
MAAMSS0014TR	1000 Piece Tape and Reel*
MAAMSS0014TR-3000	3000 Piece Tape and Reel*

<sup>\*</sup> Reference Application Note M513 for reel size information.

#### **Functional Schematic**



### **Pin Configuration**

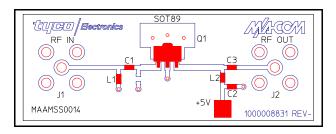
Pin No.	Function	Pin No. Function	
1	RF In	3	RF Out/Bias
2	GND		

# **Absolute Maximum Ratings**<sup>1,2</sup>

Parameter	Absolute Maximum		
RF Input Power <sup>2</sup>			
500 MHz	0 dBm		
900 MHz	2 dBm		
1900 MHz	4 dBm		
Voltage	6.0 volts		
Operating Temperature	-40 °C to +85 °C		
Storage Temperature	-65 °C to +150 °C		

- 1. Exceeding any one or combination of these limits may cause permanent damage to this device.
- The MAAMSS0014 is designed to operate optimally at 10 dB backed off from its output P1dB of 24 dBm. Driving the device at higher power levels could degrade performance.

### Sample Board Layout



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MAAMSS0014

# Cellular Band Electrical Specifications: $T_A$ = 25°C, $Z_0$ = 50 $\Omega$ , $V_{cc}$ = 5 V, $P_{IN} \le$ -5 dBm

Parameter	Test Conditions	Frequency	Units	Min	Тур	Max
Gain	_	900 MHz	dB	17	19	21
Input Return Loss	_	800 - 1000 MHz	dB	_	8	_
Output Return Loss	_	800 - 1000 MHz	dB	_	11	_
Output IP3	Two tones, 0.3 MHz spacing, -11 dBm / tone	900 MHz	dBm	35	38	_
P <sub>OUT</sub>	ACPR=-50 dBc, 9 Channels Forward	880 MHz	dBm	_	18	_
P1dB	_	800 - 1000 MHz	dBm	_	24	_
Noise Figure	_	800 - 1000 MHz	dB	_	5	_
Current	_	<del>-</del>	mA	_	110	130

# PCS Band Electrical Specifications: $T_A$ = 25°C, $Z_0$ = 50 $\Omega$ , $V_{cc}$ = 5 V, $P_{IN} \le 0$ dBm

Parameter	Test Conditions	Frequency	Units	Min	Тур	Max
Gain	_	1800 - 2200 MHz	dB	_	14.5	_
Input Return Loss	_	1800 - 2200 MHz	dB	_	8	_
Output Return Loss	_	1800 - 2200 MHz	dB	_	20	_
Output IP3	Two tones, 0.3 MHz spacing, -6.5 dBm/tone	1800 - 2200 MHz	dBm	_	38	_
P <sub>OUT</sub>	ACPR=-50 dBc, 9 Channels Forward	1960 MHz	dBm	_	19	_
P1dB	_	1800 - 2200 MHz	dBm	_	24	_
Noise Figure	_	1800 - 2200 MHz	dB	_	5	_
Current	_	_	mA	_	110	130

# **Component List**

Cellular Configuration	Value	Style	Manufacturer
C1	5 pF	0603	Murata
C2	3300 pF	0603	Murata
C3	8 pF	0603	Murata
L1	7.5 nH	0603	Coilcraft
L2	120 nH	0603	Coilcraft

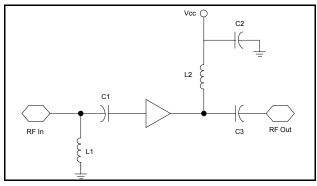
PCS Configuration	Value	Style	Manufacturer
C1	1.5 pF	0603	Murata
C2	2200 pF	0603	Murata
C3	4 pF	0603	Murata
L1	5.1 nH	0603	Coilcraft
L2	47 nH	0805	Coilcraft

# **Operating the MAAMSS0014**

The MAAMSS0014 can be damaged by electrostatic discharge (ESD). Use proper ESD control techniques when handling this device. To operate the MAAMSS0014, follow these steps.

- 1. Apply V<sub>CC</sub> (5.0 V).
- 2. Set P<sub>IN</sub>.
- 3. Turn off in reverse order.

# **Application Schematic**



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information.

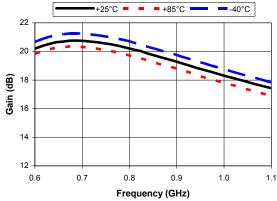


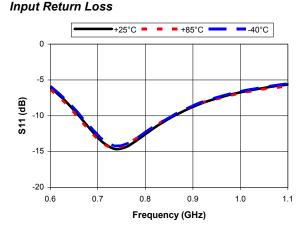


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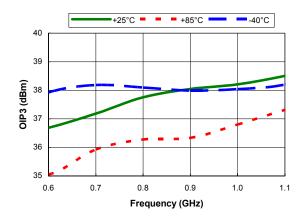
# **Typical Performance Curves - Cellular Band**

#### Gain

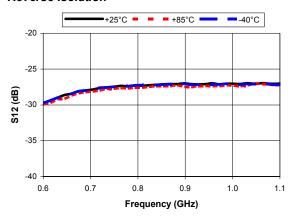




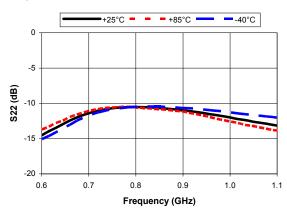
#### $OIP3 (P_{IN} = -11 dBm / tone)$



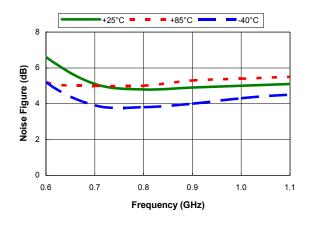
#### Reverse Isolation



#### **Output Return Loss**



#### Noise Figure



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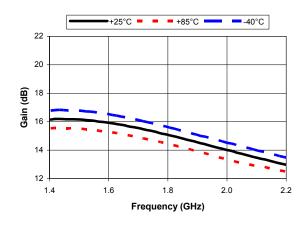




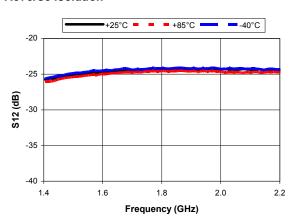
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### **Typical Performance Curves - PCS Band**

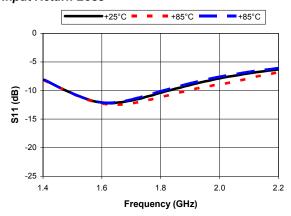
#### Gain



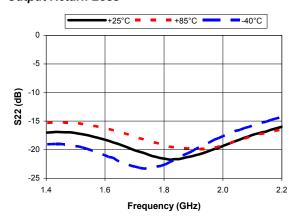
#### Reverse Isolation



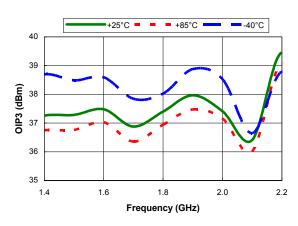
#### Input Return Loss



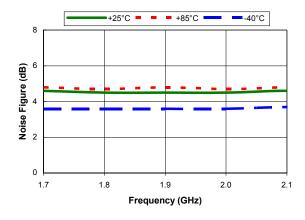
**Output Return Loss** 



#### $OIP3 (P_{IN} = -6.5 dBm / tone)$



#### Noise Figure



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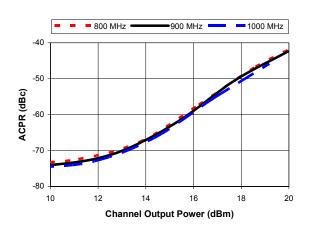




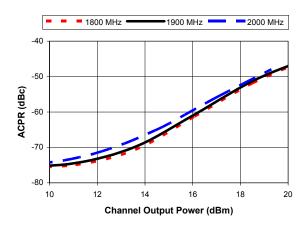
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### **Typical Performance Curves**

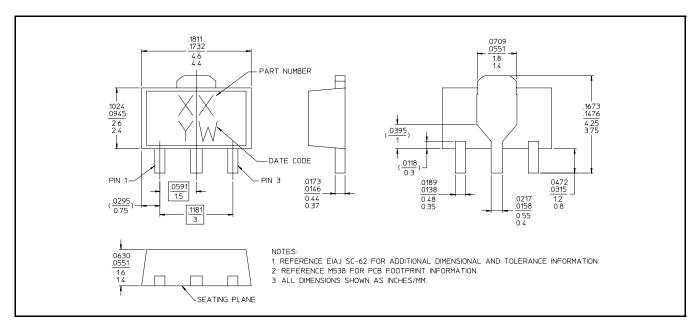
#### ACPR - Cell Band (9 channels Forward)



#### ACPR - PCS Band (9 channels Forward)



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