

# Linear IC Power Amplifier

## 2.4 GHz

MAAPSS0063

### Features

- Ideal for WLAN and CDT Applications
- +25 dBm Saturated Output Power
- +24 dBm Output P1dB
- 31 dB Gain Typical
- 802.11b Compliant to 21 dBm Pout
- Low Current: 145 mA at 21 dBm Pout
- Analog Power Control
- Micro-Amp Shutdown
- 3 mm FQFP-N 16 Lead Package

### Description

The MAAPSS0063 is a two stage power amplifier designed for 2.4 GHz WLAN applications. It meets the 802.11b spectral mask requirements at an output power of +21 dBm consuming only 145 mA current. This power amplifier is mounted in a standard outline 3 mm FQFP-N 16 lead plastic package. The MAAPSS0063 also features analog power control.

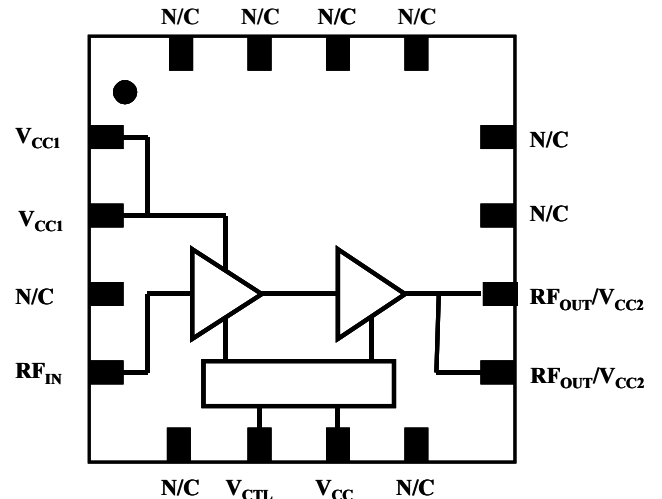
The MAAPSS0063 is fabricated using M/A-COM's iHBT process for high power efficiency and low leakage shutdown.

### Ordering Information <sup>1</sup>

Part Number	Package
MAAPSS0063	3 mm FQFP-N 16 Lead Package
MAAPSS0063TR	7 inch, 1000 piece reel
MAAPSS0063TR-3000	13 inch, 3000 piece reel
MAAPSS0063SMB	Sample Test Board (Includes 5 Samples)

1. Reference Application Note M513 for reel size information.

### Functional Schematic



### Pin Configuration

PIN No.	PIN Name	Description
1	V <sub>CC1</sub>	First Stage Supply Voltage
2	V <sub>CC1</sub>	First Stage Supply Voltage
3	N/C	No Connect
4	RF <sub>IN</sub>	RF Input
5	N/C	No Connect
6	V <sub>CTL</sub>	Control Voltage
7	V <sub>CC</sub>	Bias Circuit Supply Voltage
8	N/C	No Connect
9	RF <sub>OUT</sub> /V <sub>CC2</sub>	RF Output, 2nd Stage Supply
10	RF <sub>OUT</sub> /V <sub>CC2</sub>	RF Output, 2nd Stage Supply
11	N/C	No Connect
12	N/C	No Connect
13	N/C	No Connect
14	N/C	No Connect
15	N/C	No Connect
16	N/C	No Connect
Pad	GND	RF & DC Ground

**Electrical Specifications:**  $T_A = 25\text{ }^\circ\text{C}$ ,  $Z_0 = 50\text{ Ohms}$ ,  $V_{CC} = 3.3\text{ V}$ ,  $V_{CTL} = 2.8\text{ V}$

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Frequency		GHz	2.4		2.5
Output Power, Saturated		dBm		+25	
Output Power, P1dB		dBm		+24	
Output Power, Linear	Modulation = DSSS	dBm		21	
Small Signal Gain		dB		31	
Current, Operating	$P_{OUT} = +21\text{ dBm CW or DSSS}$ $P_{OUT} = 18\text{ dBm}$	mA		145	
Current, Off	$V_{CTL} = 0\text{ V}$	$\mu\text{A}$		1	
Control Current		mA		4	
Input VSWR				1.4:1	
Isolation, Reverse		dB		30	
Isolation, Forward	$V_{CTL} = 0\text{ V}$	dB		30	
Harmonics		dBc		-40	
Duty Cycle		%			100
Stability	$+3.0\text{ V} < V_{CC} < +3.6\text{ V}$ , $P_{OUT} < +23\text{ dBm}$ , $VSWR < 6:1$ , $-20\text{ }^\circ\text{C} < T_C < 85\text{ }^\circ\text{C}$ , $RBW = 3\text{ MHz max. hold}$		All spurs $< -60\text{ dBc}$		
Ruggedness	$0\text{ V} < V_{CC} < +5.0\text{ V}$ , $P_{OUT} < +23\text{ dBm}$ $VSWR < 8:1$		No Permanent Damage		

**Operating the MAAPSS0063**

The MAAPSS0063 is static sensitive. Please handle with care. To operate the device, follow these steps.

1. Apply  $V_{CC}$  (3.3 V) to pins 1,2,7,9, and 10.
2. Apply  $V_{CTL}$  (2.8 V) to pin 6.
3. Ramp input power.
4. Turn off in reverse order with  $V_{CC}$  last.

**Handling Procedures**

Please observe the following precautions to avoid damage to the MAAPSS0063:

**Static Sensitivity**

Gallium arsenide integrated circuits are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. Use proper ESD control precautions when handling these devices.

**Absolute Maximum Ratings<sup>1</sup>**

Parameter	Absolute Maximum
Max Input Power	+ 5 dBm
Operating Voltages	+5.0 volts
Operating Temperature	-20 °C to +85 °C
Channel Temperature	+150 °C
Storage Temperature	-40 °C to +150 °C

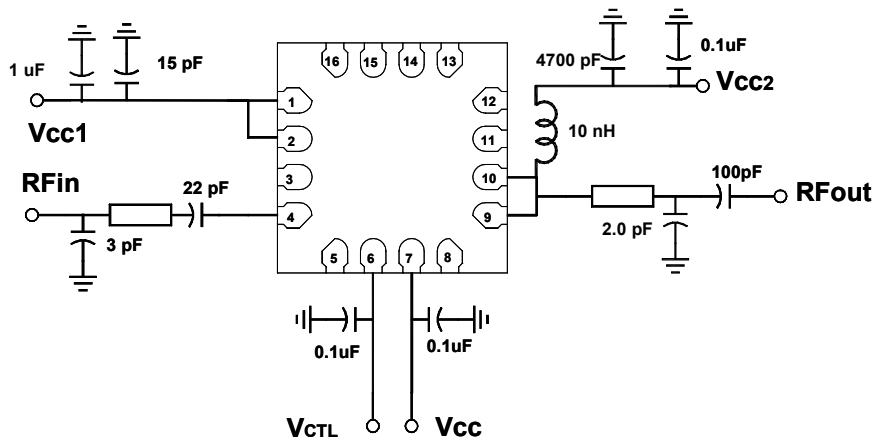
1. Exceeding any one or combination of these limits may cause permanent damage.

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Application Schematic



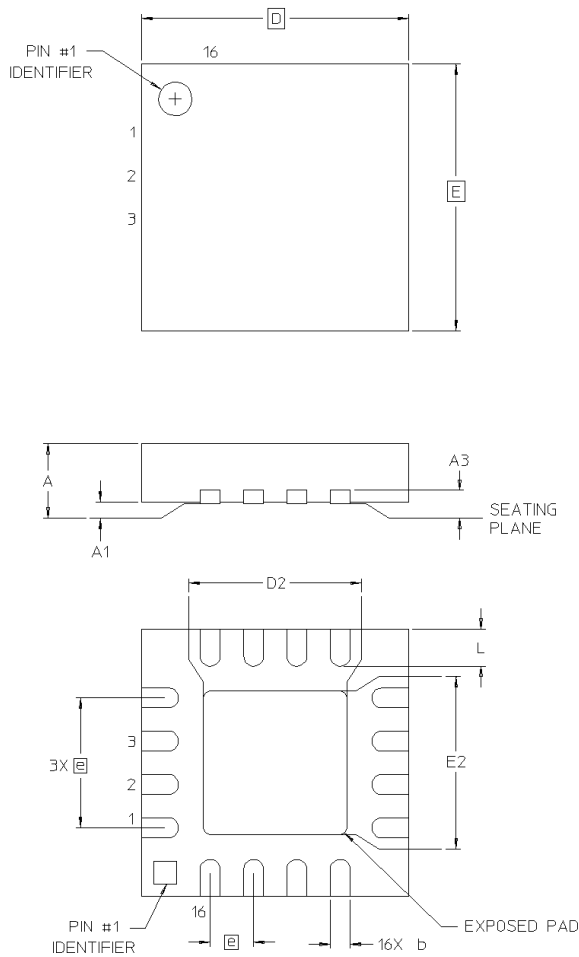
- 1. Vcc1, +3.3V
- 2. Vcc1, +3.3V
- 3. N/C
- 4. RFin
- 5. N/C
- 6. VCTL, +2.8V/0V
- 7. Vcc, +3.3V
- 8. N/C
- 9. RFout
- 10. RFout
- 11. N/C
- 12. N/C
- 13. N/C
- 14. N/C
- 15. N/C
- 16. N/C

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3 mm FQFP-N 16 Lead Saw Singulated



DIMENSION SYMBOL	MEASUREMENT (mm)		
	MIN	NOM	MAX
A	0.80	0.90	1.00
A1	0	0.02	0.05
A3	0.25 REF		
b	0.18	0.23	0.30
D	3.00 BSC		
D2	1.30	1.45	1.55
e	0.50 BSC		
E	3.00 BSC		
E2	1.30	1.45	1.55
L	0.30	0.40	0.50

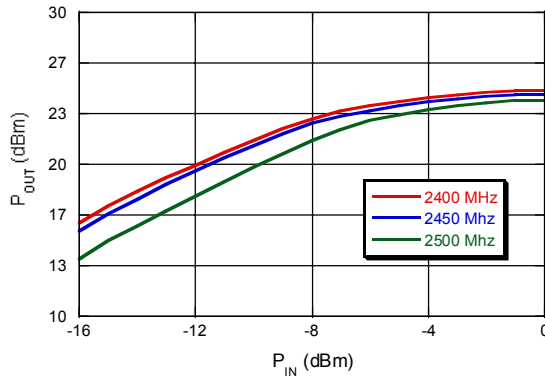
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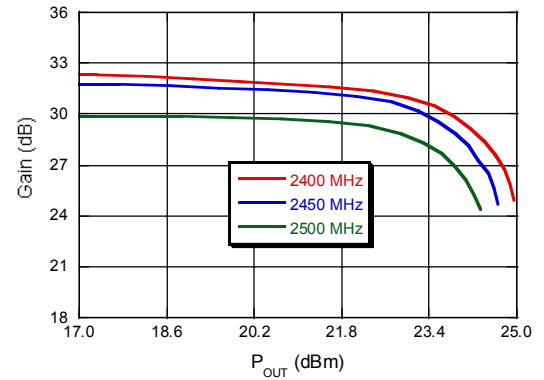
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Typical Performance Curves,  $T_A = 25^\circ\text{C}$

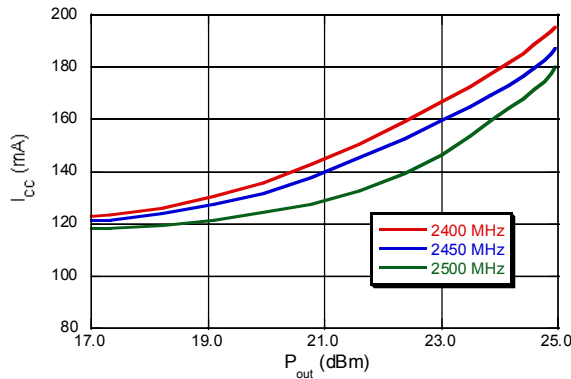
$P_{OUT}$  vs.  $P_{IN}$  over Frequency,  
 $V_{CC} = 3.3\text{ V}$ ,  $V_{CTL} = 2.8\text{ V}$



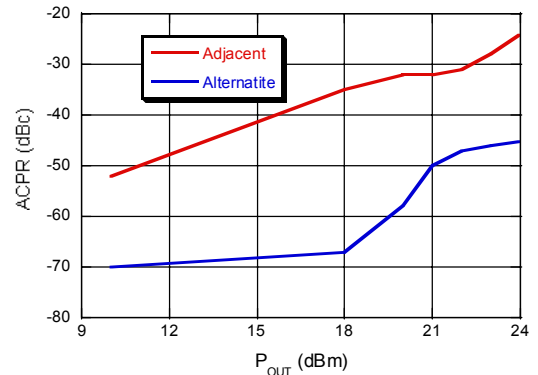
Gain vs.  $P_{OUT}$  over Frequency,  
 $V_{CC} = 3.3\text{ V}$ ,  $V_{CTL} = 2.8\text{ V}$



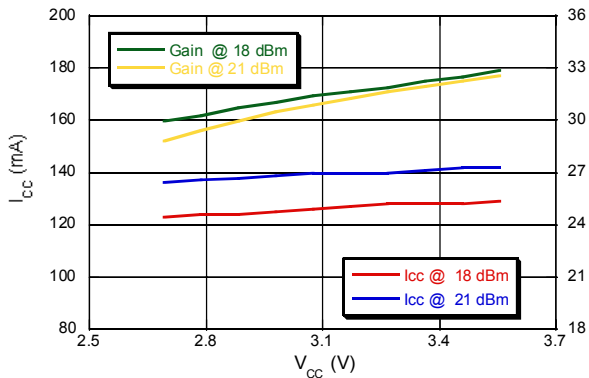
$I_{CC}$  vs.  $P_{OUT}$  over Frequency,  
 $V_{CC} = 3.3\text{ V}$ ,  $V_{CTL} = 2.8\text{ V}$



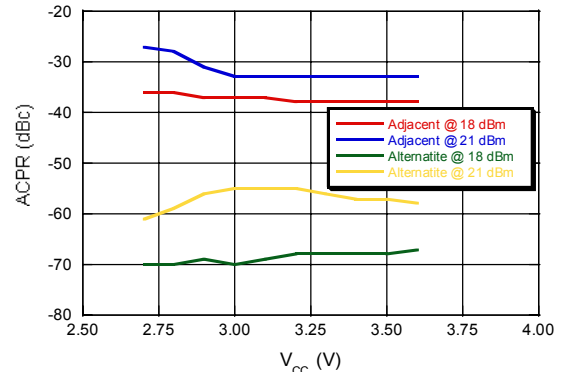
ACPR vs.  $P_{OUT}$  @ 2450 MHz,  $V_{CTL} = 2.8\text{ V}$



$I_{CC}$ , Gain vs.  $V_{CC}$  @ 2450 MHz,  $V_{CTL} = 2.8\text{ V}$



ACPR vs.  $V_{CC}$  @ 2450 MHz,  $V_{CTL} = 2.8\text{ V}$



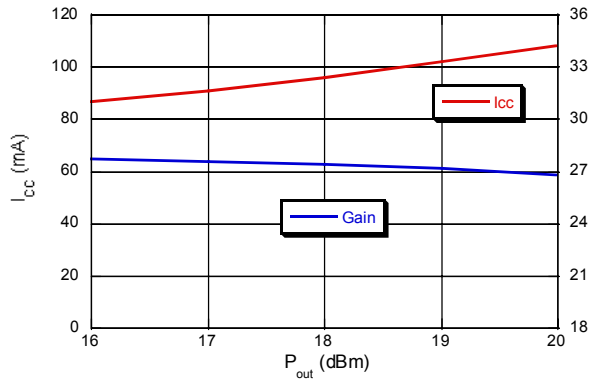
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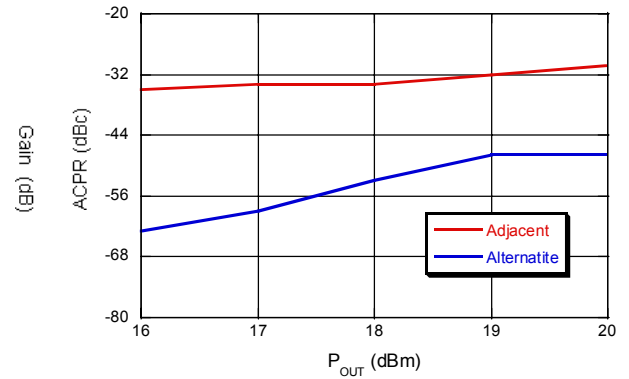
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Typical Performance Curves,  $T_A = 25^\circ\text{C}$

$I_{CC}$ , Gain vs.  $P_{OUT}$  @ 2450 MHz,  $V_{CTL} = 2.7\text{ V}$



ACPR vs.  $P_{OUT}$  @ 2450 MHz,  $V_{CTL} = 2.7\text{ V}$



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