MAAPSS0066

WDCT Power Amplifier
2400 - 2500 MHz

Rev. V3

Features

- Ideal for WDCT Applications
- Saturated Output Power: +25 dBm Typical
- Power Gain: 25 dB Typical
- Low Current: 400 mA at P_{SAT}
- Micro-Amp Shutdown
- Operates from 1.5 V to 4.0 V
- V_{EN} configurable for either 1.7 V or 2.5 V
- Lead-Free 3 mm 12-Lead PQFN Package
- 100% Matte Tin Plating over Copper
- Halogen-Free "Green" Mold Compound
- RoHS* Compliant and 260°C Reflow Compatible

Description

The MAAPSS0066 is a three stage power amplifier designed for Cordless Telephone applications. This power amplifier is packaged in a standard outline, lead-free 3 mm 12-lead PQFN plastic package. The MAAPSS0066 features an integrated bias controller that allows for micro amp shut down current.

Ordering Information[1]

Part Number	Package
MAAPSS0066	Bulk Packaging
MAAPSS0066TR-3000	3000 piece reel
MAAPSS0066SMB	Sample Test Board (Includes 5 Samples)

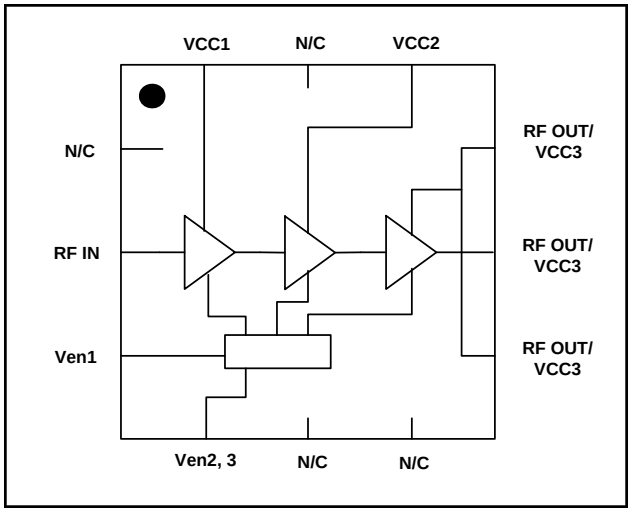
1. Reference Application Note M513 for reel size information.

Absolute Maximum Ratings [2,3]

Parameter	Absolute Maximum
Input Power	+ 5 dBm
Operating Supply Voltage	+4.0 Volts
Operating Control Voltage	+3.0 Volts
Operating Temperature	-20°C to +85°C
Channel Temperature	+150°C
Storage Temperature	-40°C to +150°C

2. Exceeding any one or combination of these limits may cause permanent damage to this device.
3. M/A-COM does not recommend sustained operation near these survivability limits.

Functional Schematic



Pin Configuration

Pin No.	Pin Name	Description
1	N/C	No Connection
2	RF_{IN}	RF Input
3	V_{EN1}	Power Enable
4	$V_{EN2,3}$	Power Enable
5	N/C	No Connection
6	N/C	No Connection
7	RF_{OUT} / V_{CC3}	RF Output, 3rd Stage Supply
8	RF_{OUT} / V_{CC3}	RF Output, 3rd Stage Supply
9	RF_{OUT} / V_{CC3}	RF Output, 3rd Stage Supply
10	V_{CC2}	2nd Stage Supply
11	N/C	No Connection
12	V_{CC1}	1st Stage Supply
Pad[4]	GND	RF & DC Ground

4. The exposed pad centered on the package bottom must be connected to RF and DC ground.

* Restrictions on Hazardous Substances, European Union Directive 2002/95/EC.

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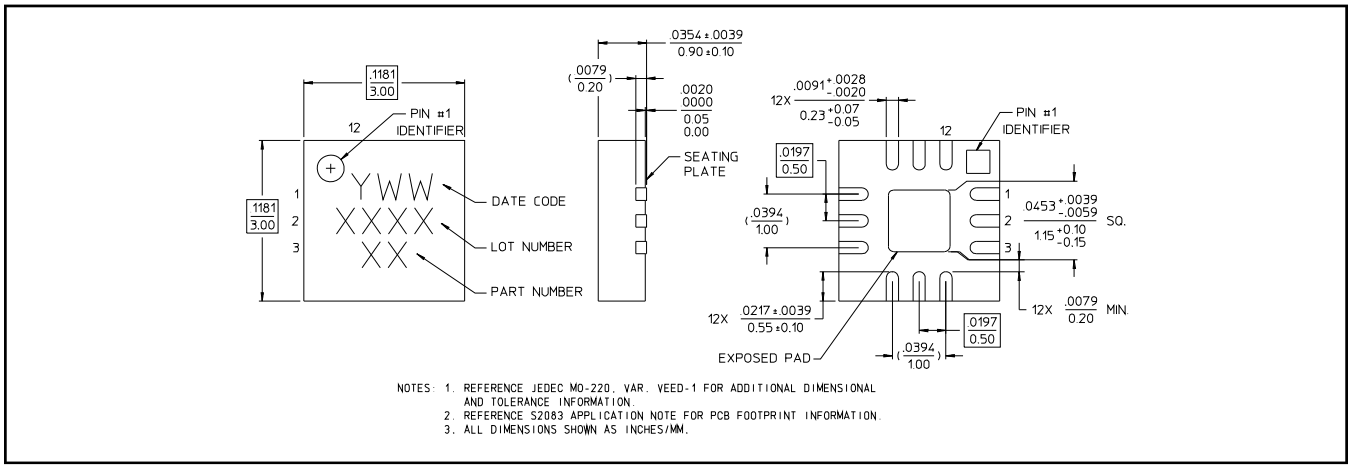
Electrical Specifications:

Frequency = 2450 MHz, P_{IN} = -1 to 3 dBm, V_{CC} = 2.4 V, V_{EN} = 2.5 V, T_A = 25 °C, Z_0 = 50Ω

Parameter	Test Conditions	Units	Min.	Typ.	Max
Small Signal Gain	Pin = -20 dBm	dB	—	27	—
Input Return Loss	—	dB	—	15	—
Output Power	—	dBm	23	25	—
Power Flatness	2.0 V < V_{CC} < 3.0 V	dB	—	3	—
PAE	—	%	—	33	—
Current	—	mA	—	400	500
Current, Off	V_{EN} = 0 V	µA		3	10
Pdiss	P_{OUT} = 25.0 dBm	W	—	0.6	—
Control Pins	$V_{EN,}$ Low $V_{EN,}$ High Current	V V mA	0 2.0 —	— — 3	0.5 2.5 4.0
Harmonics	2f 3f	dBc dBc	— —	-54 -42	— —
Forward Isolation	V_{EN} = 0 V	dB	—	39	—
Duty Cycle	—	%	—	—	100
Stability	+1.5 V < V_{CC} < +3.5 V, P_{IN} = -1 to 3 dBm, VSWR < 6:1 -20°C < T_C < +70ºC, RBW = 3 MHz max hold		All spurs < -60 dBc		

Lead-Free 3 mm 12-Lead PQFN†



† Reference Application Note M538 for lead-free solder reflow recommendations.
Meets JEDEC moisture sensitivity level 1 requirements.

Operating the MAAPSS0066

The MAAPSS0066 can be damaged by electrostatic discharge (ESD). Use proper ESD control techniques when handling this device. To operate the MAAPSS0066, turn on V_{CC} before V_{EN} for power on and turn off V_{CC} after V_{EN} for shutdown.

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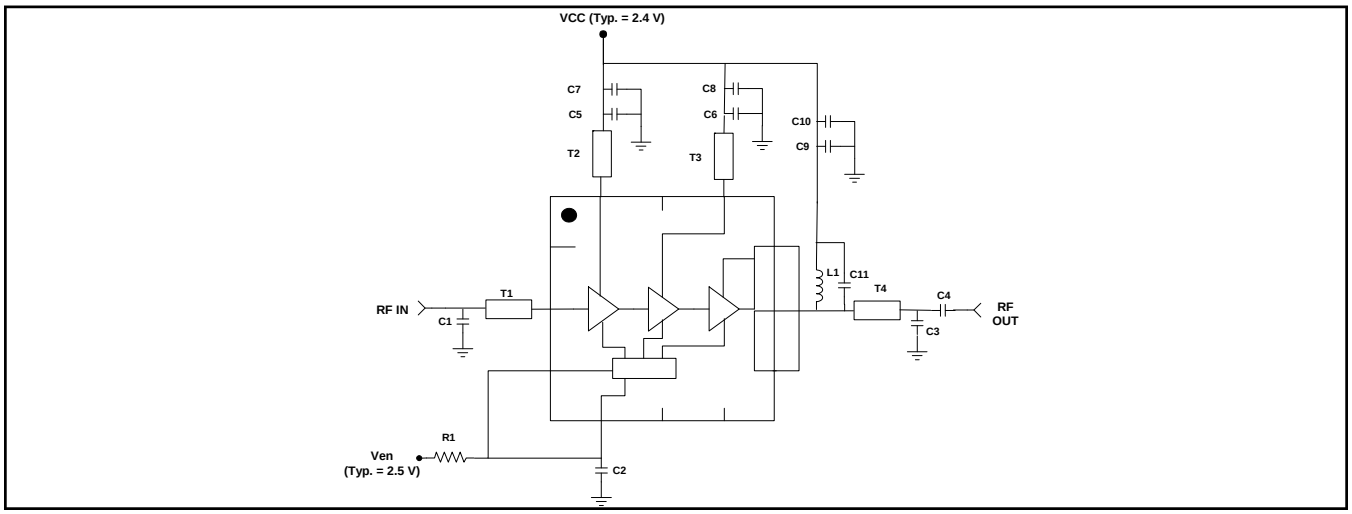
Evaluation Board Schematic

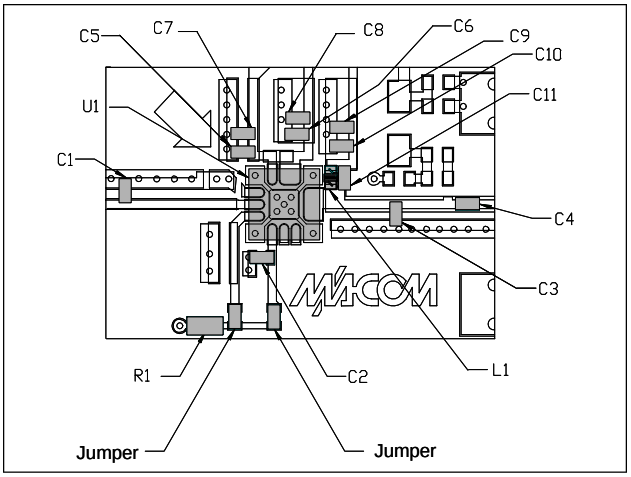


MAAPSS0066 External Parts List

Designator	Value	Footprint	Manufacturer	Part ID
C1, C3	2 pF	0402	Murata	GRM1555C1H2R0CZ01
C2	1 nF	0402	Murata	GRM1555R71H102KA01
C4, C5, C6	47 pF	0402	Murata	GRM1555C1H470JZ01
C7, C8, C9	1 µF	0402	Murata	GRM1555R60J105KE19
C10	4700 pF	0402	Murata	GRM155R71H472KA01D
C11	1 pF	0402	Murata	GRM36C0G010C50
L1	10 nH	0402	Coilcraft	0402CS-10NXJB
R1 (V_{EN} = 2.5 V)	240 Ohm	0402	KOA	RK73B1ET241J
R1 (V_{EN} = 1.7 V)	100 Ohm	0402	KOA	RK73B1ET101J

Transmission Line Dimensions, 0.20 mm thick FR4

Designator	Length (mm) *	Width (mm)
T1	5.20	0.37
T2	1.00	0.37
T3	1.27	0.37
T4	3.20	0.37
* From package edge to center of component		



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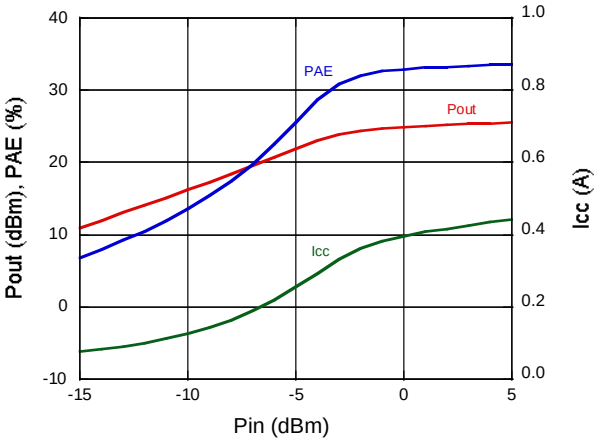
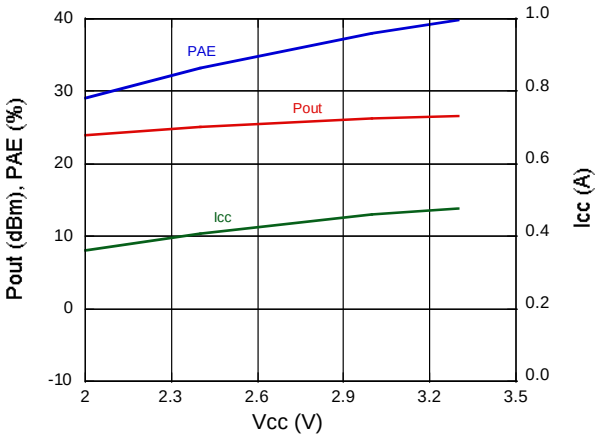
Typical Characteristics (All data uses the supplied sample board BOM)

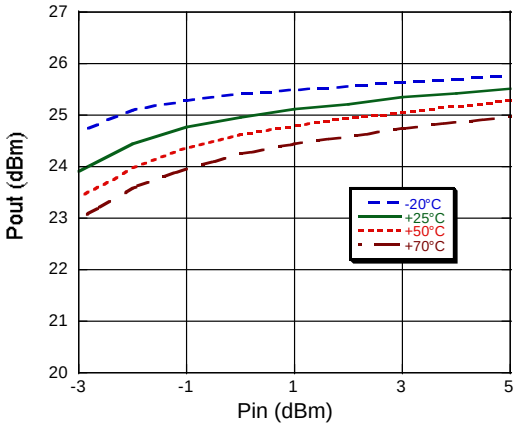
P_{OUT}, PAE, I_{CC} vs. P_{IN} @ 2.4 V, 2450 MHz



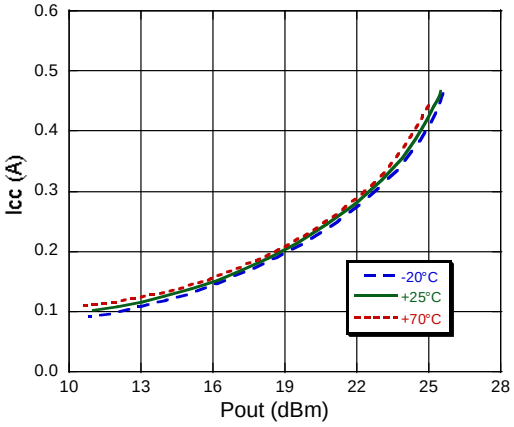
P_{OUT}, PAE, I_{CC} vs. V_{CC} @ 2450 MHz, P_{IN} = 1 dBm



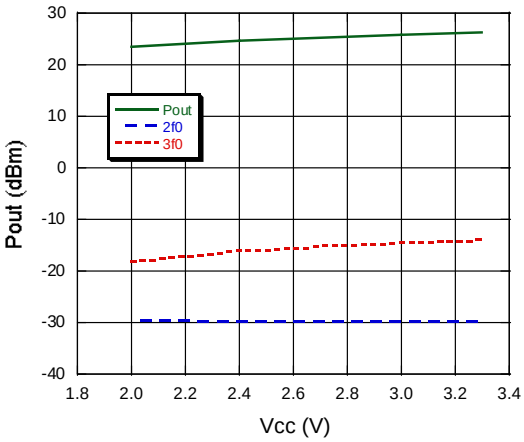
P_{OUT} vs. P_{IN} and Temp @ 2.4 V, 2450 MHz



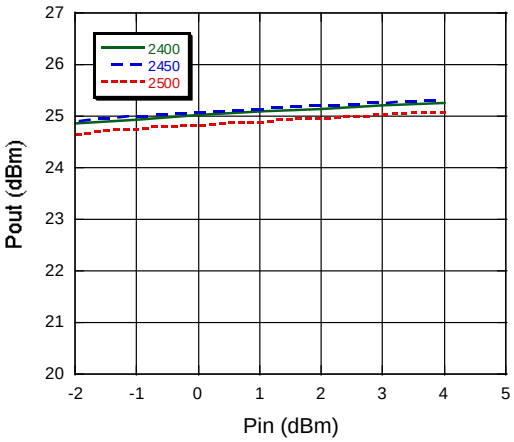
I_{CC} vs. P_{OUT} and Temp @ 2.4 V, 2450 MHz



P_{OUT} vs. V_{CC} @ 2450 MHz, Pin = 1 dBm



P_{OUT} vs. P_{IN}, V_{CC} = 2.4 V @ 2450 MHz



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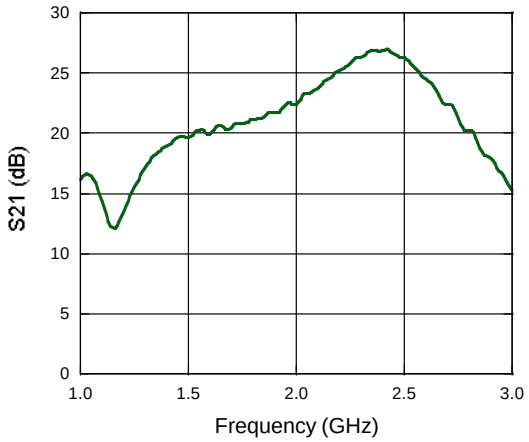
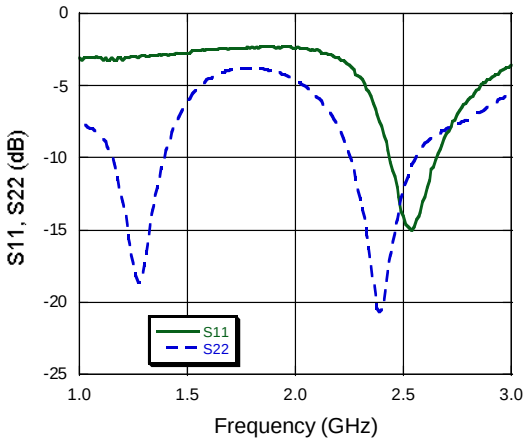
S21 vs. Frequency @ V_{CC} = 2.4 V, V_{EN} = 2.5 V

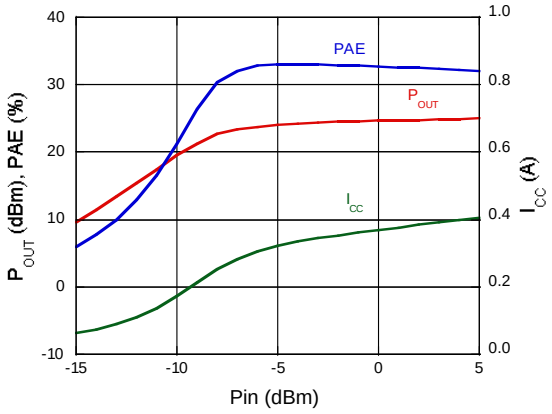


S22, S11 vs. Frequency @ V_{CC} = 2.4 V, V_{EN} = 2.5 V

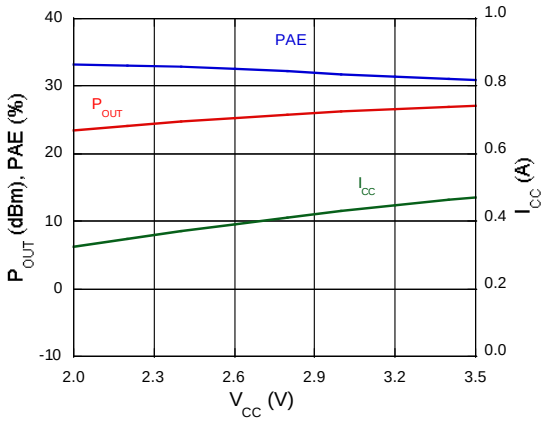


Typical Characteristics, V_{EN} = 1.7 V (All data uses the supplied sample board BOM)

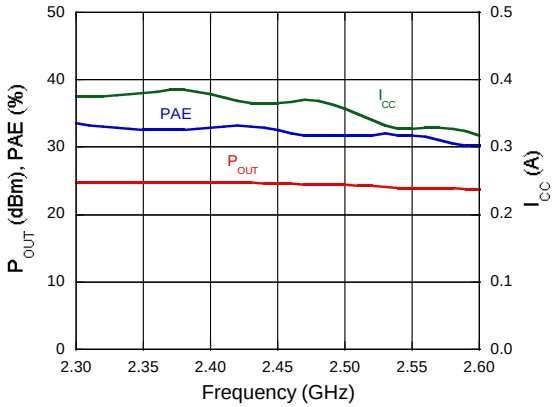
P_{OUT}, PAE, I_{CC} vs. P_{IN} @ 2.4 V, 2450 MHz



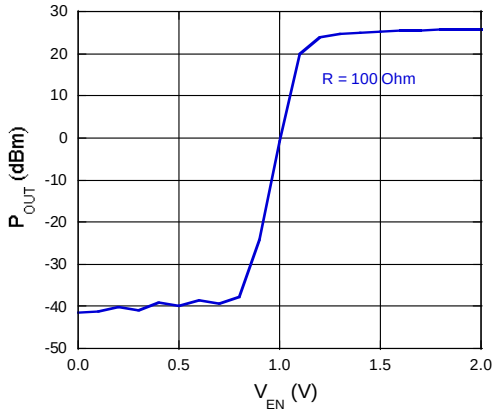
P_{OUT}, PAE, I_{CC} vs. V_{CC} @ 2450 MHz, P_{IN} = 0 dBm



P_{OUT}, PAE, I_{CC} vs. Freq. @ 2450 MHz, P_{IN} = 0 dBm



P_{OUT} vs. V_{EN} @ 2.4 V, 2450 MHz, P_{IN} = 0 dBm



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