

DECT Power Amplifier 1880 - 1930 MHz

Rev. V3

Features

- Ideal for DECT Applications
- Saturated Output Power: +26 dBm Typical
- Power Gain: 26 dB Typical
- Low Current: 400 mA at P_{SAT}
- Ramp Power Control
- 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 260°C Reflow Compatible

Description

The MAAPSS0071 is a three stage power amplifier designed for Cordless Telephone applications. This power amplifier is mounted in a standard outline, lead-free 3 mm 12-lead PQFN plastic package. The MAAPSS0071 features an integrated power enable control pin.

Ordering Information¹

Part Number	Package
MAAPSS0071	Bulk Packaging
MAAPSS0071TR-3000	3000 piece reel
MAAPSS0071SMB	Sample Test Board (Includes 5 Samples)

1. Reference Application Note M513 for reel size information.

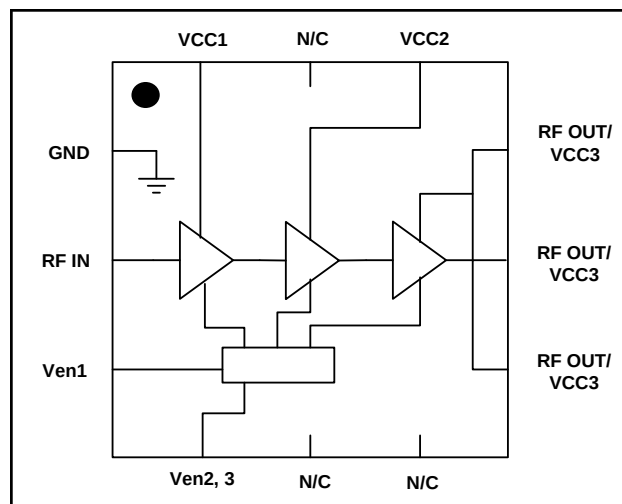
Absolute Maximum Ratings^{2,3}

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

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

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

Functional Schematic



Pin Configuration

Pin No.	Pin Name	Description
1	GND	Ground
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

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

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DECT Power Amplifier

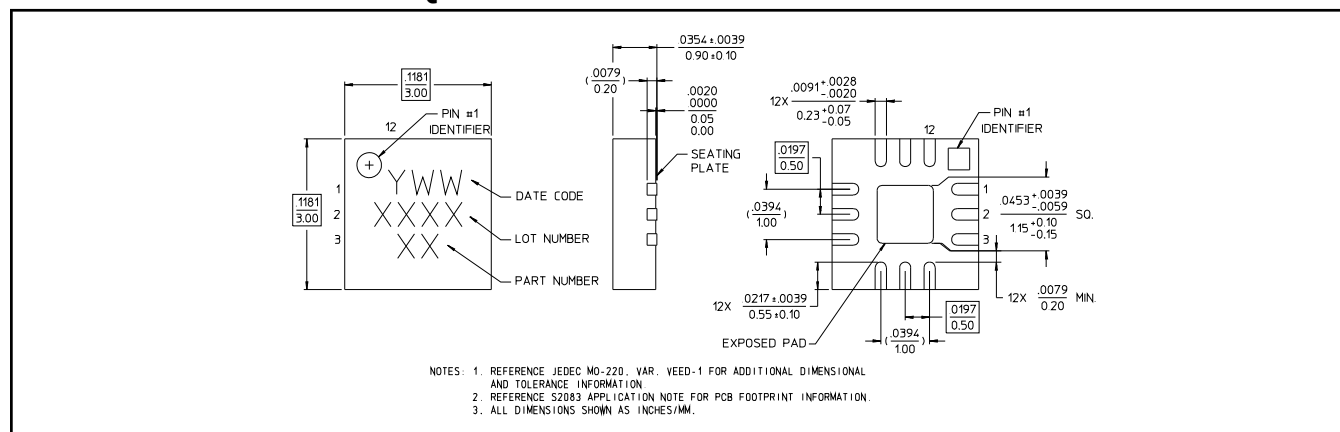
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Electrical Specifications:

Frequency = 1905 MHz, P_{IN} = -2 to 2 dBm, V_{CC} = 2.4 V, V_{EN} = 2.5 V, T_A = 25 °C, Z_0 = 50 Ω

Parameter	Test Conditions	Units	Min.	Typ.	Max
Input Return Loss	—	dB	—	15	—
Output Power	—	dBm	24	26	27
Power Flatness	$2.0 < V_{CC} < 3.0 \text{ V}$	dB	—	3	—
PAE	—	%	—	45	—
Current	—	mA	—	400	500
Current, Off	$V_{EN} = 0 \text{ V}$	μA	—	3	10
Pdiss	$P_{OUT} = 26.0 \text{ dBm}$	W	—	0.5	—
Control Pins	$V_{EN, \text{ Low}}$	V	0	—	0.5
	$V_{EN, \text{ High}}$	V	2.0	—	2.5
	Current	mA	—	2.0	4.0
Harmonics	2f	dBc	—	-35	—
	3f	dBc	—	-40	—
Forward Isolation	$V_{EN} = 0 \text{ V}$	dB	—	39	—
Duty Cycle		%	—	—	100
Turn on/off time	Ton: RF burst to NTP-1	μS	—	3	—
	Toff: NTP-1 to off	μS	—	2	—
Stability	+1.5V < V_{CC} < +3.5 V, $P_{IN} = -2$ to 2 dBm, VSWR < 6:1 -20°C < T_C < +70°C, RBW = 3 MHz max hold		All spurs < -60 dBc		

Lead-Free 3 mm 12-Lead PQFN[†]

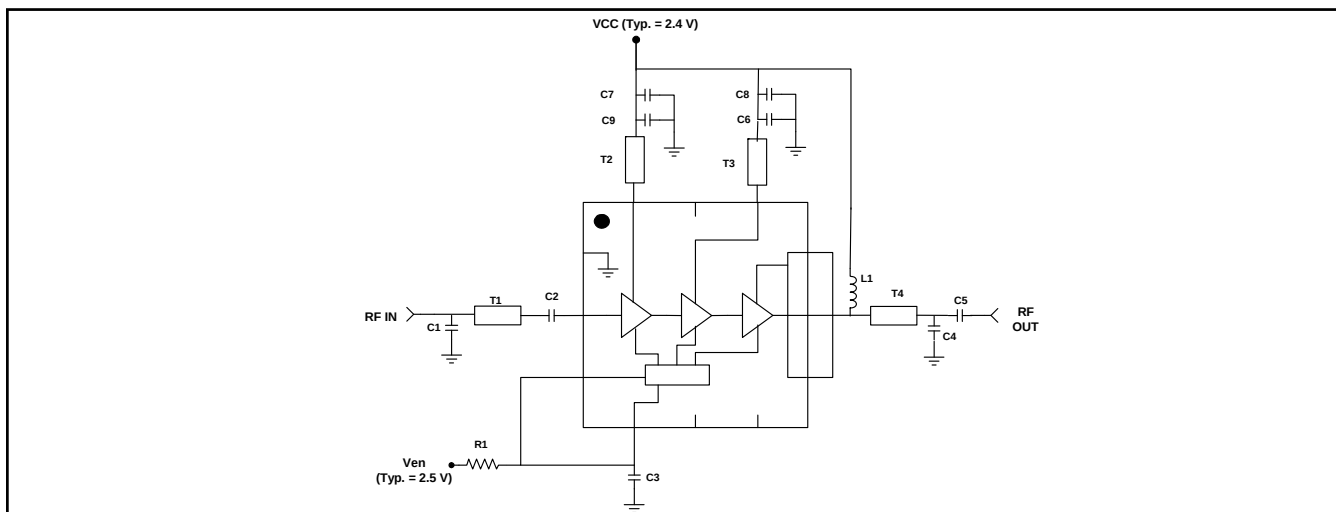


† Reference Application Note M538 for lead-free solder reflow recommendations.
Meets JEDEC moisture sensitivity level 1 requirements.

Operating the MAAPSS0071

The MAAPSS0071 can be damaged by electrostatic discharge (ESD). Use proper ESD control techniques when handling this device. To operate the MAAPSS0071, turn on the V_{CC} before V_{EN} for power on and turn off V_{CC} after V_{FN} for shutdown.

Evaluation Board Schematic



MAAPSS0071 External Parts List

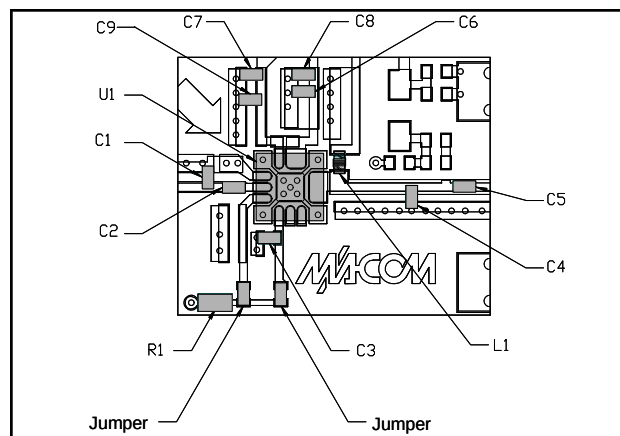
Designator	Value	Footprint	Manufacturer	Part ID
C1	1 pF	0402	Murata	GRM1555C1H1R0CZ01B
C2, C4	3 pF	0402	Murata	GRM1555C1H3R0CZ01B
C3	22 nF	0402	Murata	GRM155R71C223KA01B
C5, C6	47 pF	0402	Murata	GRM1555C1H470JZ01B
C7, C8	100 nF	0402	Murata	GRM155F51C104ZA01B
C9	4 pF	0402	Murata	GRM155C1H4R0CZ01B
R1 (V _{EN} = 2.5 V)	470 Ohm	0402	KOA	RK73B1ET470J
R1 (V _{EN} = 1.7 V)	100 Ohm	0402	KOA	RK73B1ET101J
L1	10 nH	0402	Coilcraft	0402CS-10NXJB

Transmission Line Dimensions, 0.20 mm FR4

Designator	Length (mm) ⁵	Width (mm)
T1 ⁶	2.16	0.37
T2	2.54	0.37
T3	3.05	0.37
T4	3.94	0.37

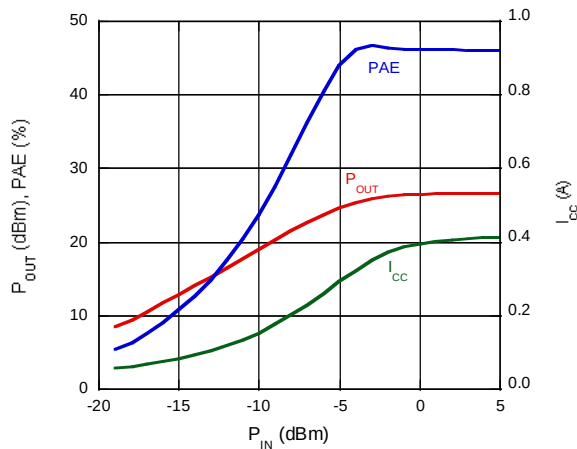
5. From package edge to center of component.

6. T1 is measured from package edge (not C2) to the center of C1.

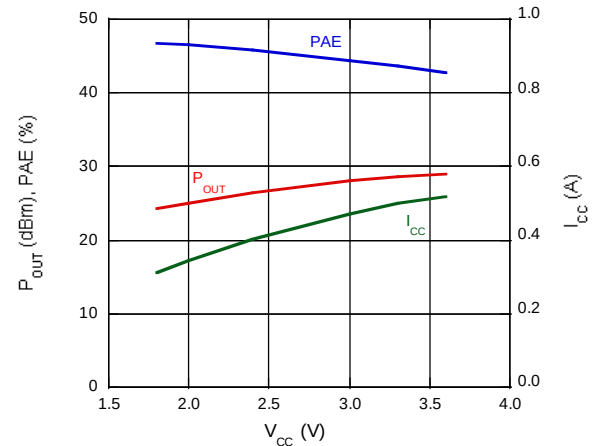


Typical Characteristics, $V_{EN} = 2.5\text{ V}$ (Using the supplied sample board BOM)

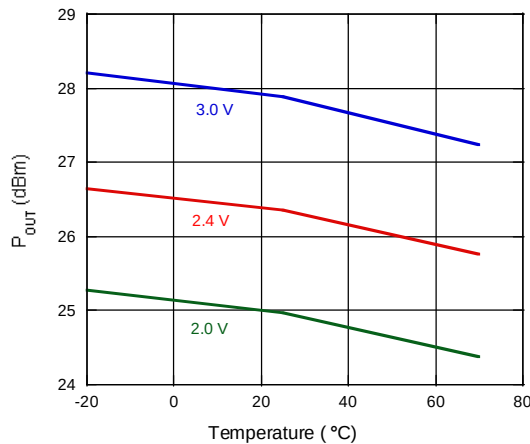
P_{OUT} , PAE, I_{CC} vs. P_{IN} @ 2.4 V, 1900 MHz



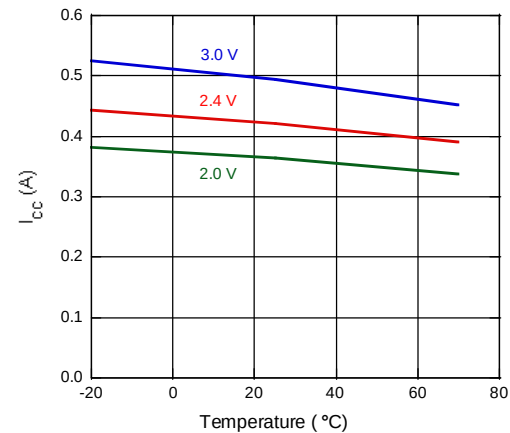
P_{OUT} , PAE, I_{CC} vs. V_{CC} @ 1900 MHz, $P_{IN} = 0\text{ dBm}$



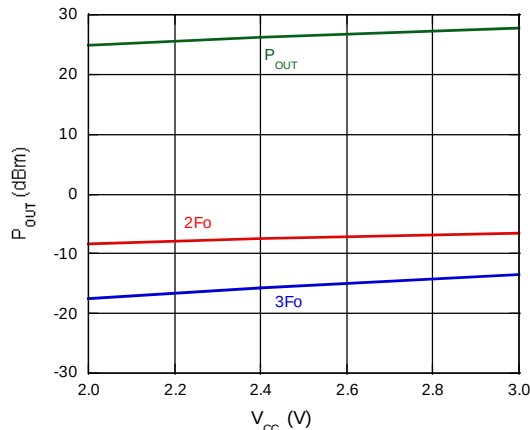
P_{OUT} vs. Temperature @ 1900 MHz, $P_{IN} = 0\text{ dBm}$



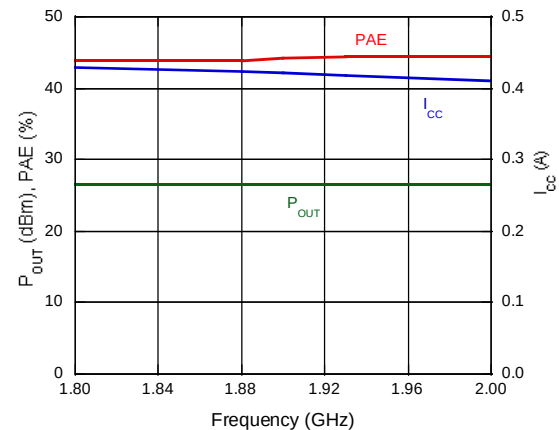
I_{CC} vs. Temperature @ 1900 MHz, $P_{IN} = 0\text{ dBm}$



P_{OUT} vs. V_{CC} @ 1900 MHz, $P_{IN} = 0\text{ dBm}$

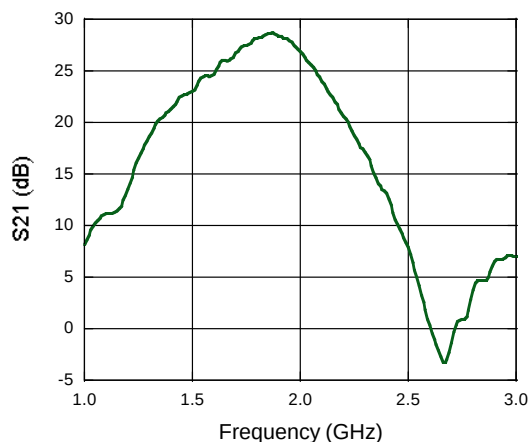


P_{OUT} , PAE, I_{CC} vs. Frequency @ $V_{CC} = 2.4\text{ V}$, $P_{IN} = 0\text{ dBm}$

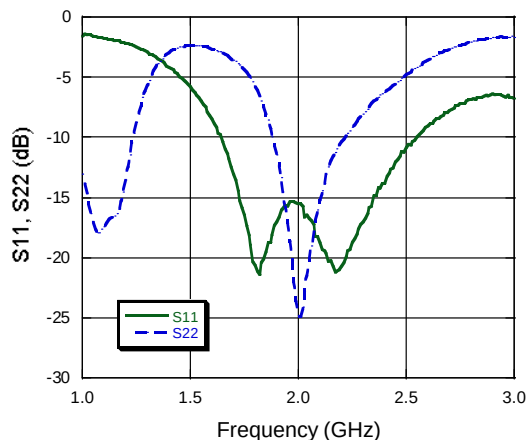


Typical Characteristics (All data uses the supplied sample board BOM)

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

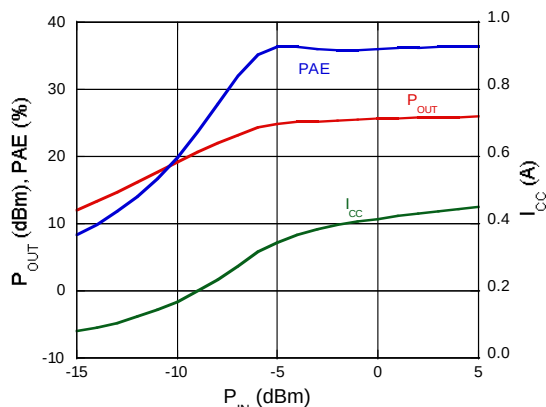


S22, S11 vs. Frequency @ $V_{CC} = 2.4$ V, $V_{EN} = 2.5$ V

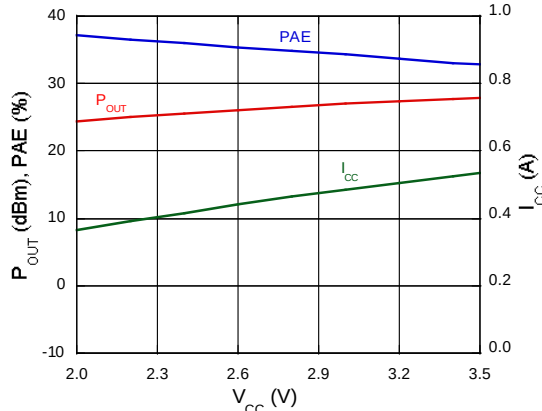


Typical Characteristics, $V_{EN} = 1.7$ V (All data uses the supplied sample board BOM)

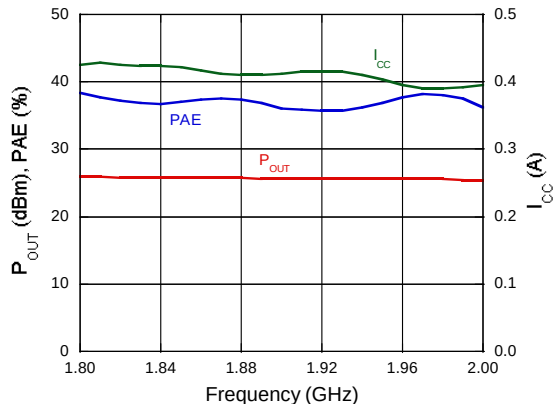
P_{OUT} , PAE, I_{CC} vs. P_{IN} @ 2.4 V, 1900 MHz



P_{OUT} , PAE, I_{CC} vs. V_{CC} @ 1900 MHz, $P_{IN} = 0$ dBm



P_{OUT} , PAE, I_{CC} vs. Freq. @ 1900 MHz, $P_{IN} = 0$ dBm



P_{OUT} vs. V_{EN} @ 2.4 V, 1900 MHz, $P_{IN} = 0$ dBm

