

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.

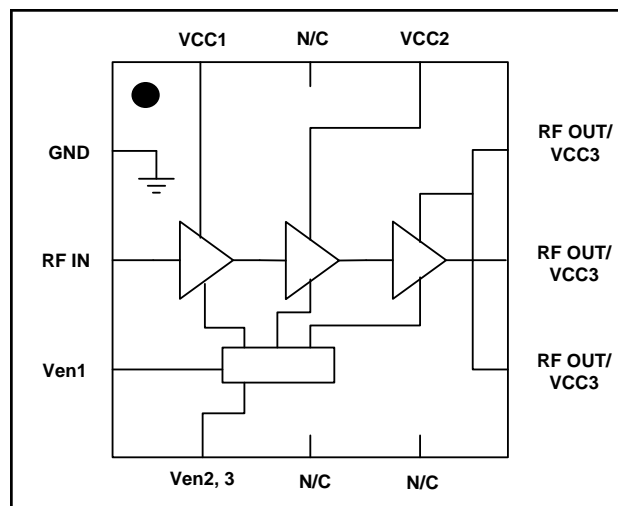
Absolute Maximum Ratings^{2,3}

| 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.

ADVANCED: Data Sheets contain information regarding a product M/A-COM Technology Solutions is considering for development. Performance is based on target specifications, simulated results, and/or prototype measurements. Commitment to develop is not guaranteed.
PRELIMINARY: Data Sheets contain information regarding a product M/A-COM Technology Solutions has under development. Performance is based on engineering tests. Specifications are typical. Mechanical outline has been fixed. Engineering samples and/or test data may be available. Commitment to produce in volume is not guaranteed.

• **North America** Tel: 800.366.2266 / Fax: 978.366.2266
 • **Europe** Tel: 44.1908.574.200 / Fax: 44.1908.574.300
 • **Asia/Pacific** Tel: 81.44.844.8296 / Fax: 81.44.844.8298
 Visit www.macomtech.com for additional data sheets and product information.

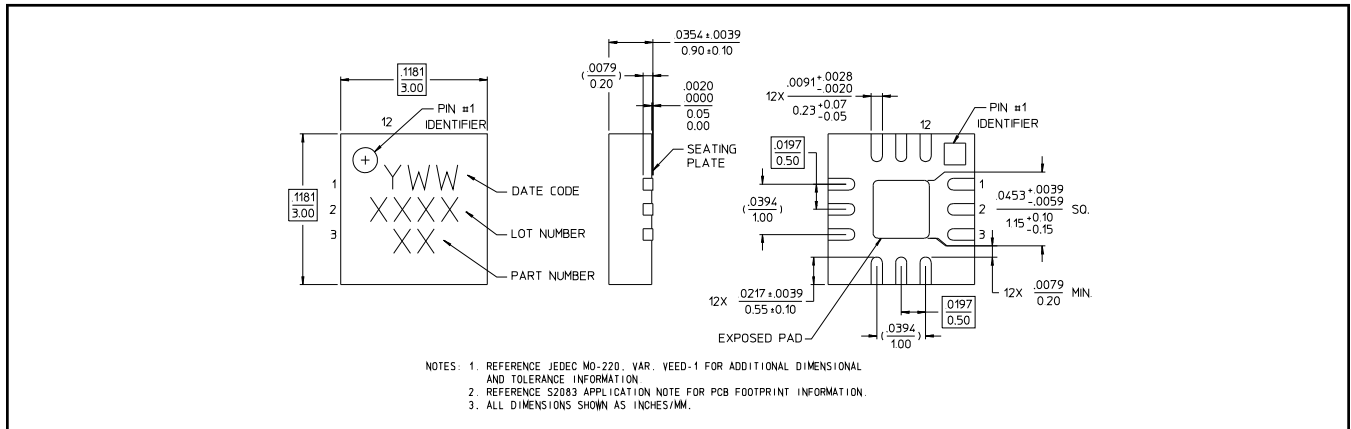
M/A-COM Technology Solutions Inc. and its affiliates reserve the right to make changes to the product(s) or information contained herein without notice.

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, $Z_0 = 50\Omega$

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

Lead-Free 3 mm 12-Lead PQFN†

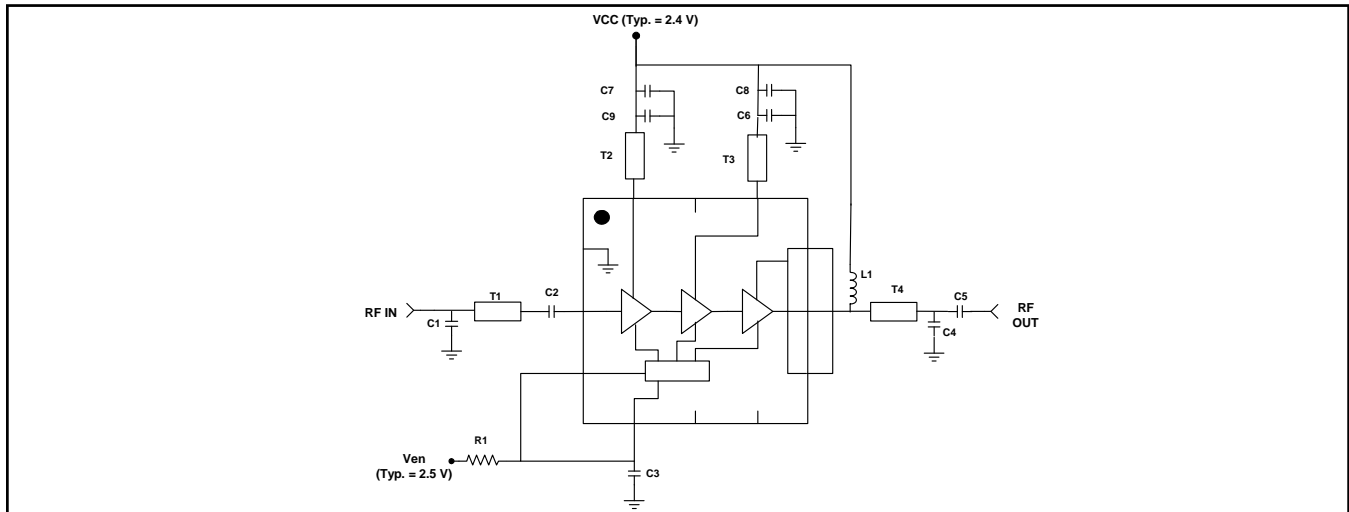


† Reference Application Note M538 for lead-free solder reflow recommendations.
Meets JEDEC moisture sensitivity level 1 requirements.

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_{EN} for shutdown.

Evaluation Board Schematic



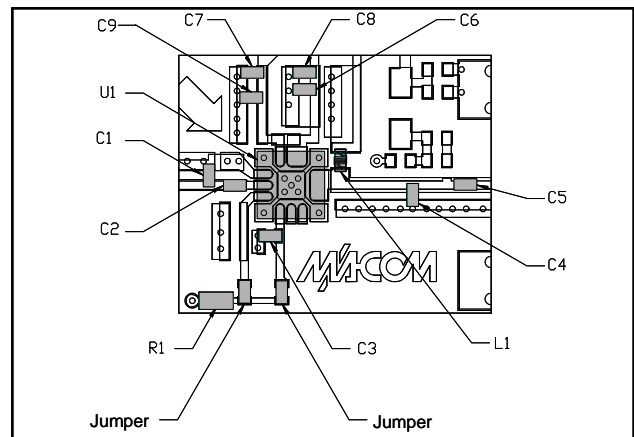
MAAPSS0071 External Parts List

| 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

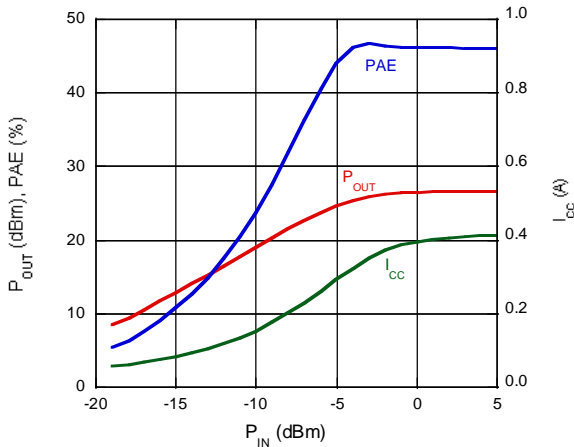
| Designator | Length (mm) ⁵ | Width (mm) |
|-----------------|--------------------------|------------|
| T1 ⁶ | 2.16 | 0.37 |
| T2 | 2.54 | 0.37 |
| T3 | 3.05 | 0.37 |
| T4 | 3.94 | 0.37 |

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

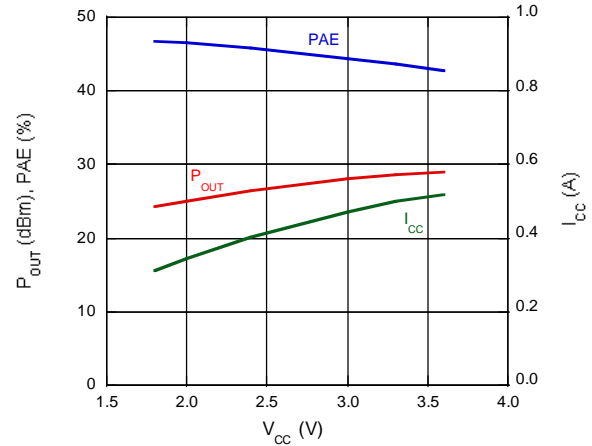


Typical Characteristics, $V_{EN} = 2.5\text{ V}$ (Using the supplied sample board BOM)

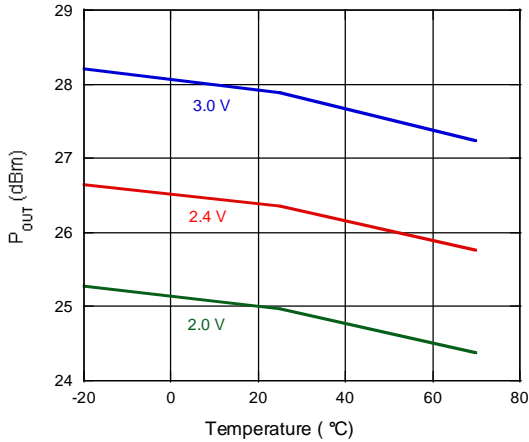
P_{OUT} , PAE, I_{CC} vs. P_{IN} @ 2.4 V, 1900 MHz



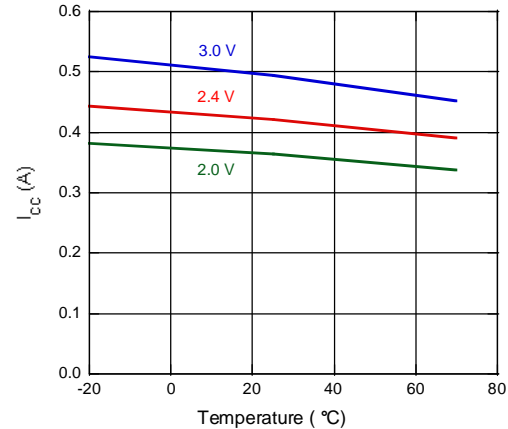
P_{OUT} , PAE, I_{CC} vs. V_{CC} @ 1900 MHz, $P_{IN} = 0\text{ dBm}$



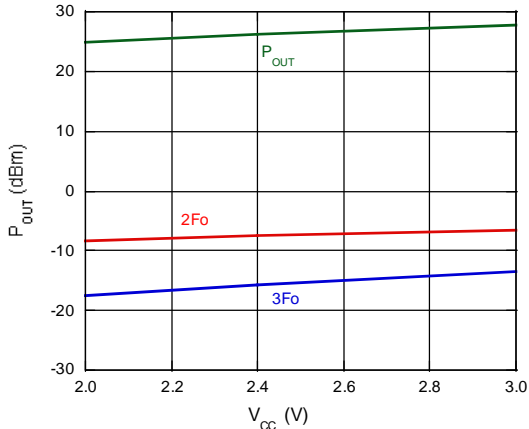
P_{OUT} vs. Temperature @ 1900 MHz, $P_{IN} = 0\text{ dBm}$



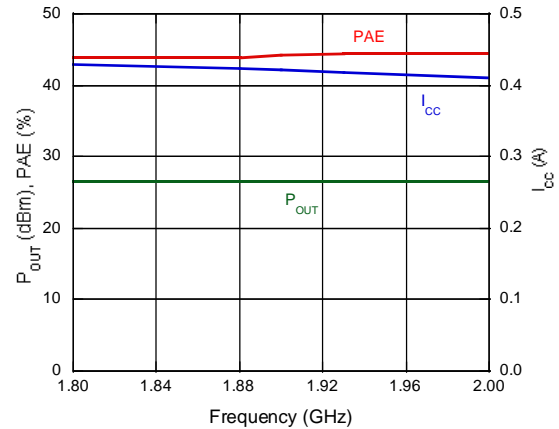
I_{CC} vs. Temperature @ 1900 MHz, $P_{IN} = 0\text{ dBm}$



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



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



ADVANCED: Data Sheets contain information regarding a product M/A-COM Technology Solutions is considering for development. Performance is based on target specifications, simulated results, and/or prototype measurements. Commitment to develop is not guaranteed.
PRELIMINARY: Data Sheets contain information regarding a product M/A-COM Technology Solutions has under development. Performance is based on engineering tests. Specifications are typical. Mechanical outline has been fixed. Engineering samples and/or test data may be available. Commitment to produce in volume is not guaranteed.

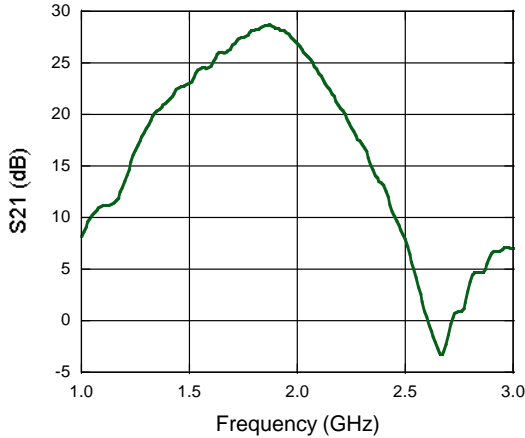
- **North America** Tel: 800.366.2266 / Fax: 978.366.2266
- **Europe** Tel: 44.1908.574.200 / Fax: 44.1908.574.300
- **Asia/Pacific** Tel: 81.44.844.8296 / Fax: 81.44.844.8298

Visit www.macomtech.com for additional data sheets and product information.

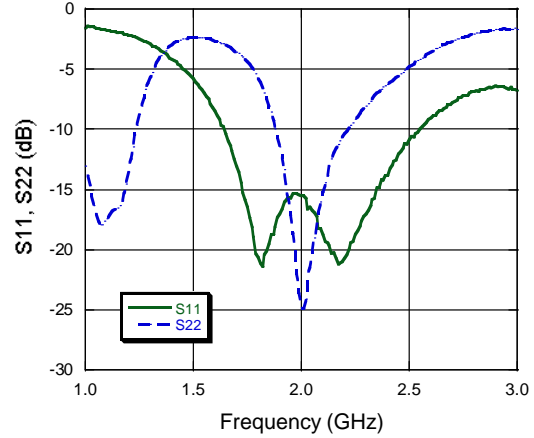
M/A-COM Technology Solutions Inc. and its affiliates reserve the right to make changes to the product(s) or information contained herein without notice.

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

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

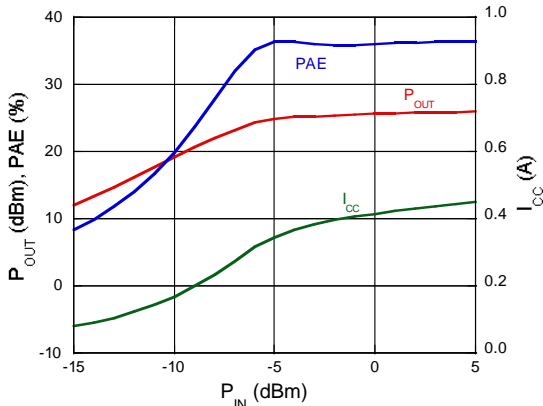


S22, S11 vs. Frequency @ $V_{CC} = 2.4\text{ V}$, $V_{EN} = 2.5\text{ V}$

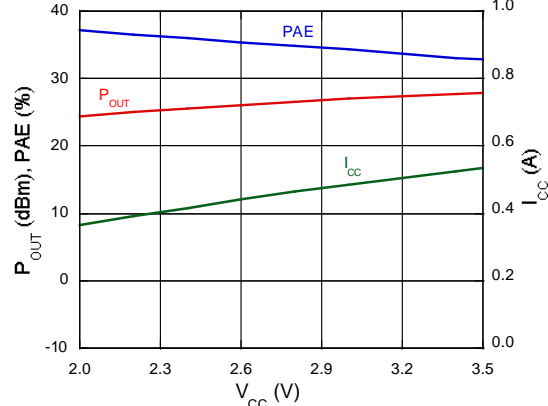


Typical Characteristics, $V_{EN} = 1.7\text{ V}$ (All data uses the supplied sample board BOM)

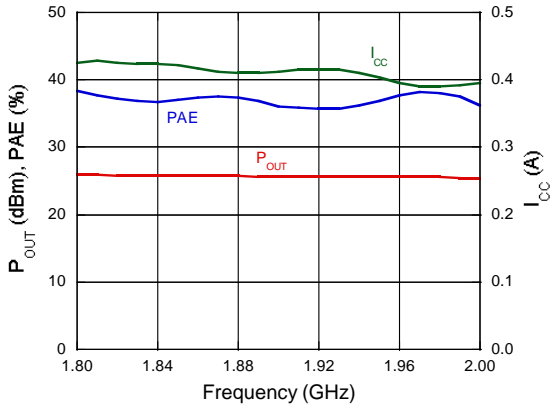
P_{OUT} , PAE, I_{CC} vs. P_{IN} @ 2.4 V, 1900 MHz



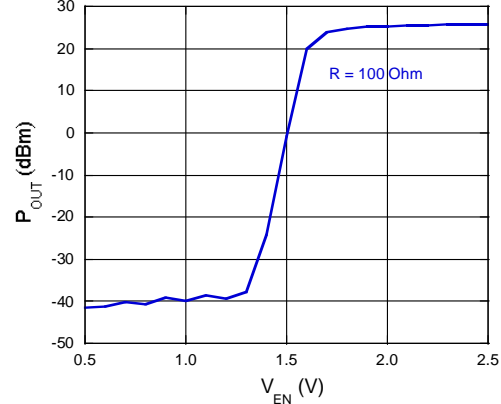
P_{OUT} , PAE, I_{CC} vs. V_{CC} @ 1900 MHz, $P_{IN} = 0\text{ dBm}$



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



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



ADVANCED: Data Sheets contain information regarding a product M/A-COM Technology Solutions is considering for development. Performance is based on target specifications, simulated results, and/or prototype measurements. Commitment to develop is not guaranteed.
PRELIMINARY: Data Sheets contain information regarding a product M/A-COM Technology Solutions has under development. Performance is based on engineering tests. Specifications are typical. Mechanical outline has been fixed. Engineering samples and/or test data may be available. Commitment to produce in volume is not guaranteed.

• **North America** Tel: 800.366.2266 / Fax: 978.366.2266
 • **Europe** Tel: 44.1908.574.200 / Fax: 44.1908.574.300
 • **Asia/Pacific** Tel: 81.44.844.8296 / Fax: 81.44.844.8298
 Visit www.macomtech.com for additional data sheets and product information.

M/A-COM Technology Solutions Inc. and its affiliates reserve the right to make changes to the product(s) or information contained herein without notice.