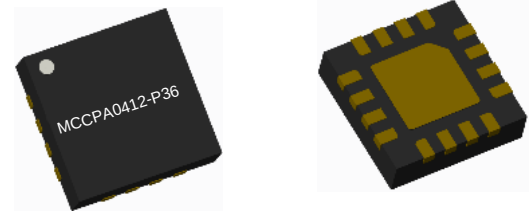


## Product Overview

The MCCPA0412-P36 is a two stage HBT high power amplifier for indoor/outdoor wireless application such as RFID or Lora system application. It works for 900MHz and deliver 36dBm output peak power with 31dB power gain, and excellent linearity. The MCCPA0412-P36 input port is internally matched 50  $\Omega$  and integrated temperature compensation circuits within a tiny lead frame package.

ROHS compliant

Evaluation boards are available upon request.



16Pin 3×3mm QFN Package

Figure1.

## Functional Block Diagram

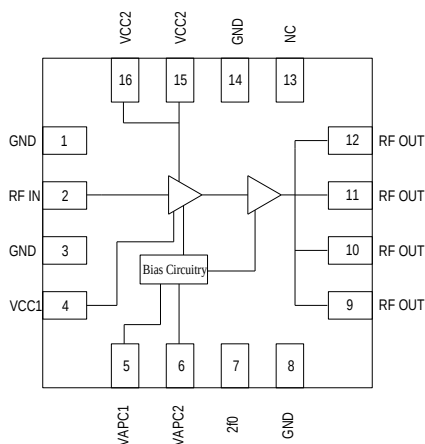


Figure2.

## Key Features

- Frequency Range: 400-1200MHz
- 31dB Gain
- 50% PAE at 36dBm output power
- 36dBm output peak power
- Integrated temperature compensation circuits
- Compact and low-cost 5mm×5mm QFN package (MSL3, 260°C per JEDEC J-STD-020)

## Applications

- Wireless Systems
- Power Amplifier Module
- Customer Permits Equipment (CPE)
- Automatic Meter Readers
- RFID Readers

## Ordering info

| Part No.      | Description           |
|---------------|-----------------------|
| MCCPA0412-P36 | 13' Reel with 4000pcs |

## Pin Description

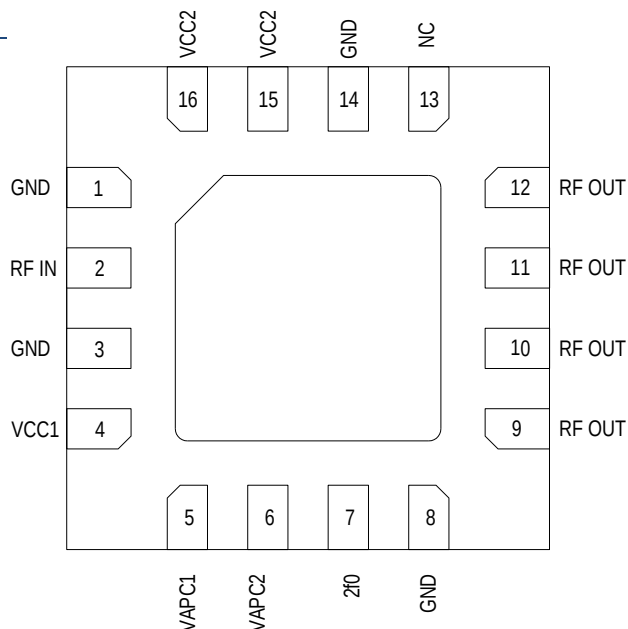


Figure 3. Pinout (Top View)

| Pin | Name  | Description                   | Pin | Name  | Description               |
|-----|-------|-------------------------------|-----|-------|---------------------------|
| 1   | GND   | Ground                        | 9   | RFOUT | RF output port            |
| 2   | RFIN  | RF input port                 | 10  | RFOUT | RF output port            |
| 3   | GND   | Ground                        | 11  | RFOUT | RF output port            |
| 4   | VCC1  | Stage 1 collector voltage     | 12  | RFOUT | RF output port            |
| 5   | VAPC1 | Voltage of bias circuit       | 13  | NC    | Not connected             |
| 6   | VAPC2 | Voltage of bias circuit       | 14  | GND   | Ground                    |
| 7   | 2f0   | 2 <sup>nd</sup> harmonic trap | 15  | VCC2  | Stage 2 collector voltage |
| 8   | GND   | Ground                        | 16  | VCC2  | Stage 2 collector voltage |

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

| Parameter                                              | Rating      | Unit |
|--------------------------------------------------------|-------------|------|
| Operating Temp, T <sub>c</sub>                         | -40 to +105 | °C   |
| Operating Junction Temp, T <sub>j</sub>                | 175         | °C   |
| Storage Temp, T <sub>STG</sub>                         | -55 to +125 | °C   |
| Thermal Resistance, R <sub>θjc</sub>                   |             | °C/W |
| Operating Voltage, V <sub>CC1</sub> , V <sub>CC2</sub> | 5.5         | V    |
| Input Power, P <sub>IN</sub>                           | 10          | dBm  |

Notes<sup>1</sup>: Exceeding any one or a combination of the Absolute Maximum Rating conditions may cause permanent damage to the device. Extended application of the Absolute Maximum Rating conditions to the device may reduce device reliability.

### Recommended Operating Conditions

| Parameter                   | Min | Typ | Max  | Unit |
|-----------------------------|-----|-----|------|------|
| Operating Frequency,F       | 400 |     | 1200 | MHz  |
| Operating Temp,TC           | -40 | 25  | 85   | °C   |
| Operating Voltage,VCC1,VCC2 | 3   | 5   | 5.5  | V    |
| VAPC1,VAPC2 Voltage         | 2.4 | 3.2 |      | V    |
| IAPC1,IAPC2 Current         |     | 8   | 15   | mA   |

### Electrical Specifications<sup>1</sup>

| Parameter              | Conditions                 | Min | Typ | Max  | Unit |
|------------------------|----------------------------|-----|-----|------|------|
| Frequency              |                            | 400 | 920 | 1200 | MHz  |
| Output P1dB            |                            |     | 34  |      | dBm  |
| Output P3dB            |                            |     | 36  |      | dBm  |
| Gain@33dBm             |                            |     | 31  |      | dB   |
| Power added efficiency | @Psat                      |     | 50  |      | %    |
| Quiescent currnt       |                            |     | 300 | 350  | mA   |
| ACPR@26dBm             | 20MHz LTE-TM 1.1 9.5dB PAR |     | -47 |      | dBc  |
| Input return loss      |                            |     | -10 |      | dB   |

Notes<sup>1</sup>:VCC1=VCC2 =5V,VACP1=VACP2=3.2V,F=920MHz,TC=25°C , Input/Output Load=50Ω



## Evaluation Board Information

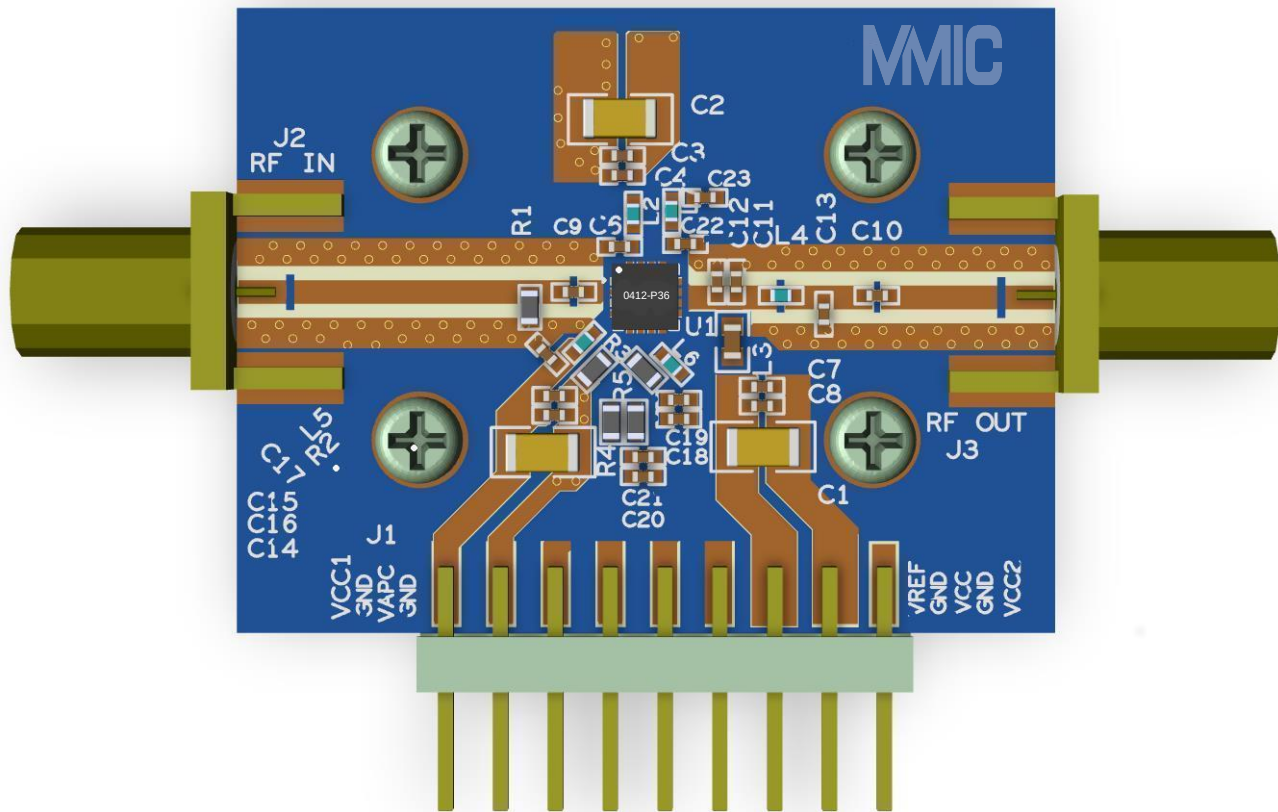


Figure 5

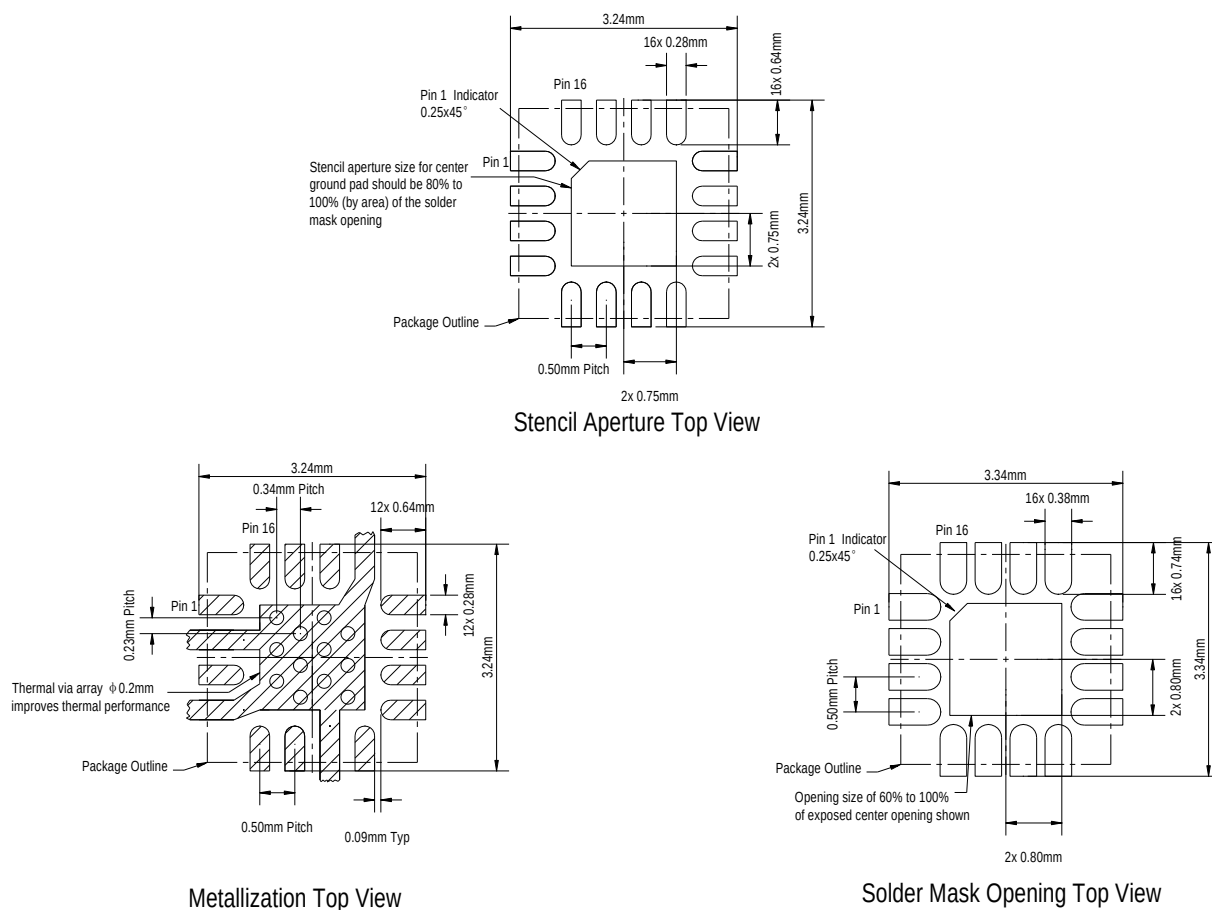
## Evaluation Board Test Procedure

### Turn-on sequence

1. Connect test equipment to the input and output port of Evaluation board and then connect DC ground.
2. Turn on VCC1, VCC2 to 5V, then turn on VAPC1=VAPC2 to 3.2V in order
3. Apply RF signal

### Turn-off sequence

1. Turn off RF signal
2. Turn off VAPC1, VAPC2, VCC1, VCC2 in order



## Package Dimensions

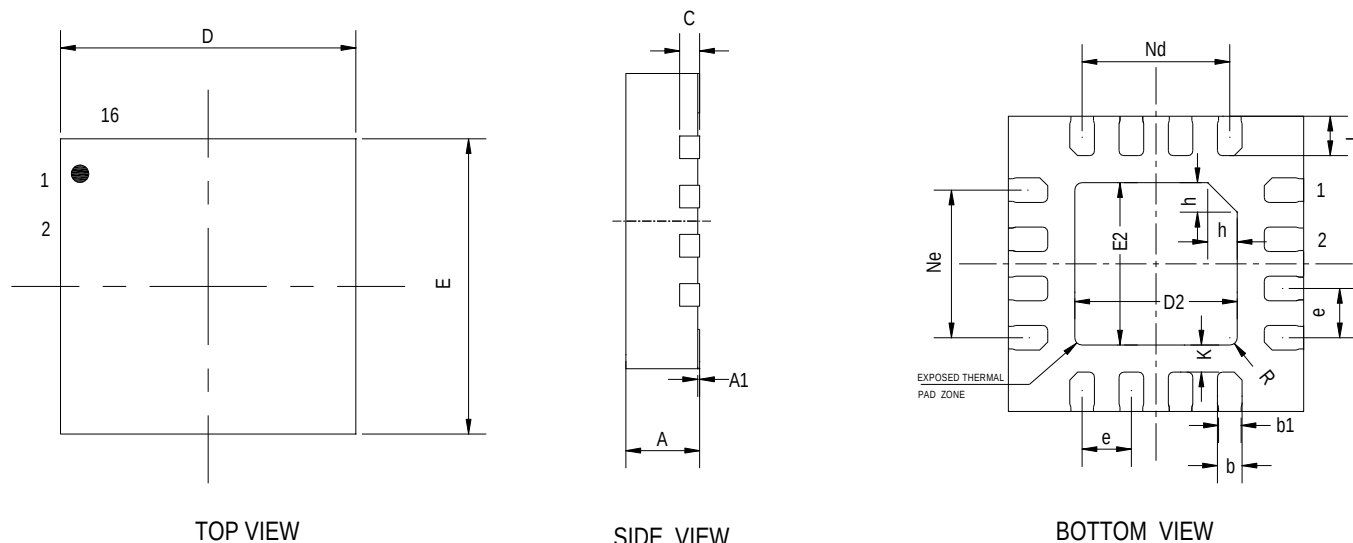
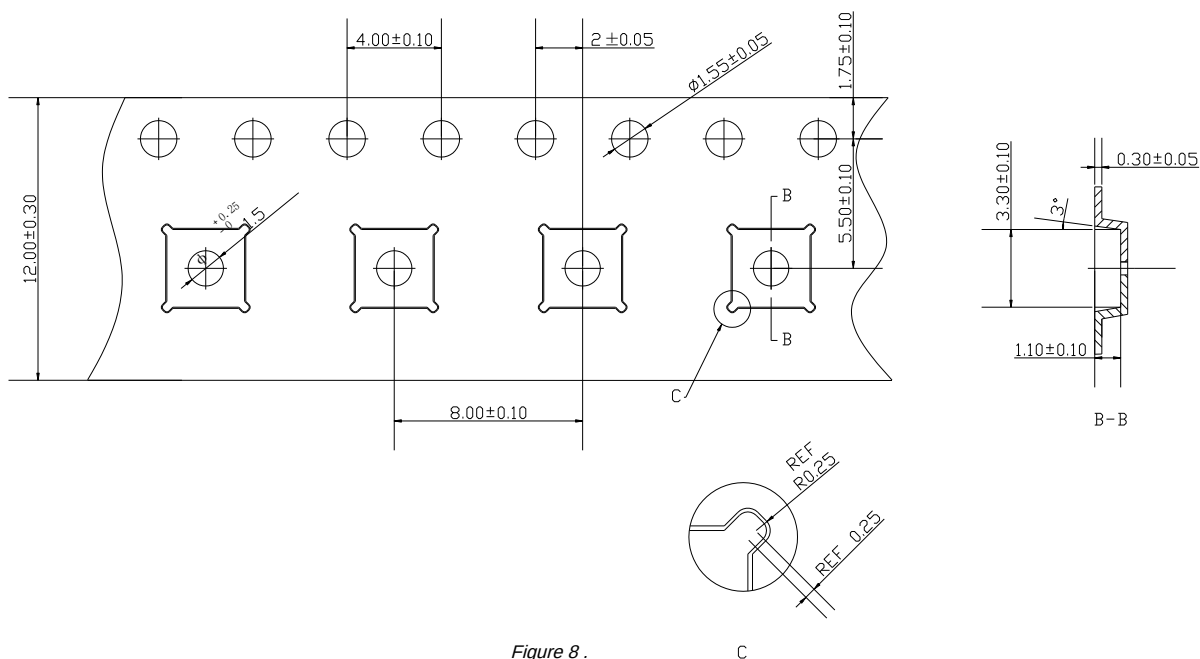


Figure 7.

| SYMBOL | MILLIMETER |       |       |
|--------|------------|-------|-------|
|        | MIN        | NOM   | MAX   |
| A      | 0.7        | 0.75  | 0.80  |
| A1     | 0          | 0.02  | 0.05  |
| b      | 0.2        | 0.25  | 0.3   |
| b1     | 0.23REF    |       |       |
| c      | 0.203REF   |       |       |
| D      | 2.90       | 3.00  | 3.10  |
| D2     | 1.6        | 1.65  | 1.70  |
| e      | 0.50BSC    |       |       |
| Ne     | 1.50BSC    |       |       |
| Nd     | 1.50BSC    |       |       |
| E      | 2.90       | 3.00  | 3.10  |
| E2     | 1.60       | 1.65  | 1.70  |
| L      | 0.35       | 0.4   | 0.45  |
| h      | 0.25       | 0.3   | 0.35  |
| K      | 0.225      | 0.275 | 0.325 |
| R      | 0.075REF   |       |       |

## Tape and Reel Information



*Technical requirements:*

1. The accumulative error of the distance between any 10 transmitting holes is  $\pm 0.1$  mm;
2. The lateral bending of the belt along the length direction is  $\leq 1$ mm/100mm;
3. Roughness:  $Ra < 0.8\mu\text{m}$ ;
4. Carrier tape color: Black;