

Product Overview

MCCPA1013-P37 is a two-stage HBT small cell power amplifier for indoor cellular base stations. It works at 1060-1380MHz. This PA can deliver CW 37dBm output power with 28dB gain.

ROHS compliant

Evaluation boards are available upon request.



14 Pin 7×7mm Laminate Package

Figure1.

Functional Block Diagram

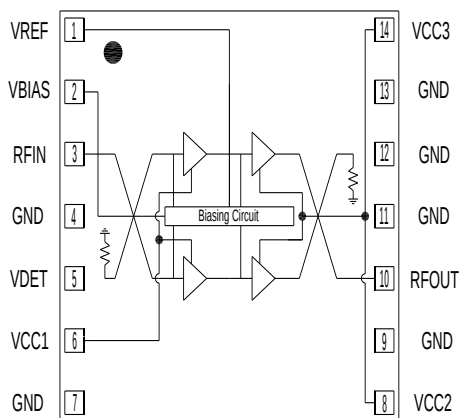


Figure2.

Key Features

- Frequency Range: 1060-1380MHz
- 28dB Gain @36dBm
- 40% PAE at 37dBm output power
- 37dBm CW peak output power
- Input/output internally matched to 50Ω
- Integrated temperature compensation circuits
- Compact and low-cost 5mm×5mm LGA package (MSL3,260 per JEDEC J-STD-020)

Applications

- FDD and TDD 2G/3G/4G LTE/5G NR systems
- Driver amplifier for micro-base and macro-base stations
- Active antenna array and massive MIMO
- Customer Premises Equipment(CPE)

Ordering info

Part No.	Description
MCCPA1013-P37	7' Reel with 1500pcs

Pin Description

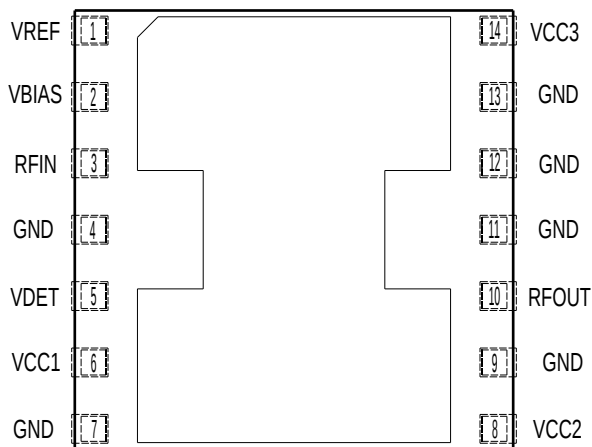


Figure 3. Pinout (Top View)

Pin	Name	Description	Pin	Name	Description
1	VREF	Reference Voltage	8	VCC2	Stage 2 collector voltage
2	VBIAS	Bias Voltage	9	GND	Ground
3	RFIN	RF input port	10	RFOUT	RF output port
4	GND	Ground	11	GND	Ground
5	VDET	Power detector DC output	12	GND	Ground
6	VCC1	Stage 1 collector voltage	13	GND	Ground
7	GND	Ground	14	VCC3	Stage 3 collector voltage

Absolute Maximum Ratings¹

Parameter	Rating	Unit
Operating Temp, T _c	-40 to +85	
Operating Junction Temp, T _j	175	
Storage Temp, T _{STG}	-55 to +125	
Thermal Resistance, R _{θjc}	10.2	/W
Operating Voltage, V _{CC1} , V _{CC2} , V _{CC3} , V _{BIAS}	5.5	V
Input Power, P _{IN}	20	dBm

Notes¹: 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	1060		1380	MHz
Operating Temp,Tc	-40	25	85	
Operating Voltage, VCC1,VCC2,VCC3,VBIAS	4.5	5	5.5	V
Reference Voltage,VREF	2.8	2.95	3.05	V
Reference Current,IREF		20	30	mA

Electrical Specifications-EVB Typical Performance¹

Parameter	Conditions	Min	Typ	Max	Unit
Frequency		1060		1380	MHz
Peak Output Power	CW		37		dBm
Gain @36dBm			28		dB
Power added efficiency	CW,37dBm			40	%
Quiescent current			600		mA
ACPR@ + 28dBm	20MHz LTE-TM3.1,9.5dB PAR		/		dBc
Instantaneous bandwidth			60		MHz
Input/Output Impedance			50		Ω

Notes¹:VCC1=VCC2=VCC3=VBIAS=5V,VREF=2.95V,F=1240MHz,Signal=CW,TC=25 , Input/Output Load=50 Ω

Detector Specifications¹

Output Power(dBm)	VDET(mV)	Output Power(dBm)	VDET(mV)
29	886	23	525
28	809	22	487
27	737	21	435
26	673	20	422
25	615		
24	568		

Notes¹:VCC1=VCC2=VCC3=VBIAS=5V,VREF=2.95V,F=1240MHz,Signal=CW,TC=25 , Input/Output Load=50 Ω .

Evaluation Board Schematic

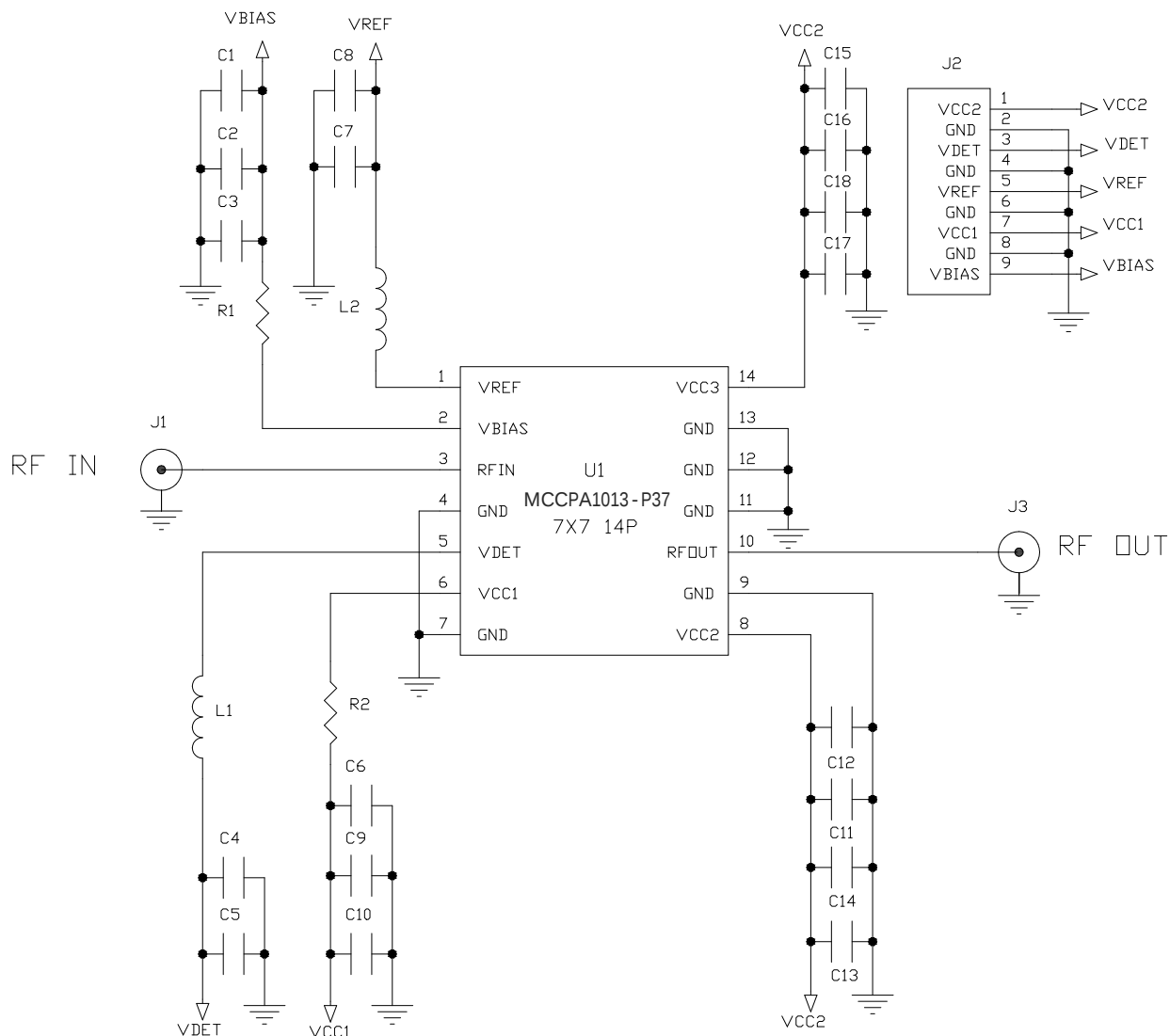


Figure 4. Evaluation Board Schematic

Evaluation Board Bill of Materials

Ref,Des	Value	Size
C1 C14 C15 C8 C10	Ceramic capacitor, 4.7uF, 16V, +/-10%, X7R	1206
L1 L2 R1 R2	Resistor, 0 Ω , 0.063W	0402
C4	Ceramic capacitor, 2.2nF, 16V, +/-10%, X7R	0402
C19	Ceramic capacitor, /pF, 16V, +/-10%, X7R	0402

Rest of the components on the schematic are not used in this part.

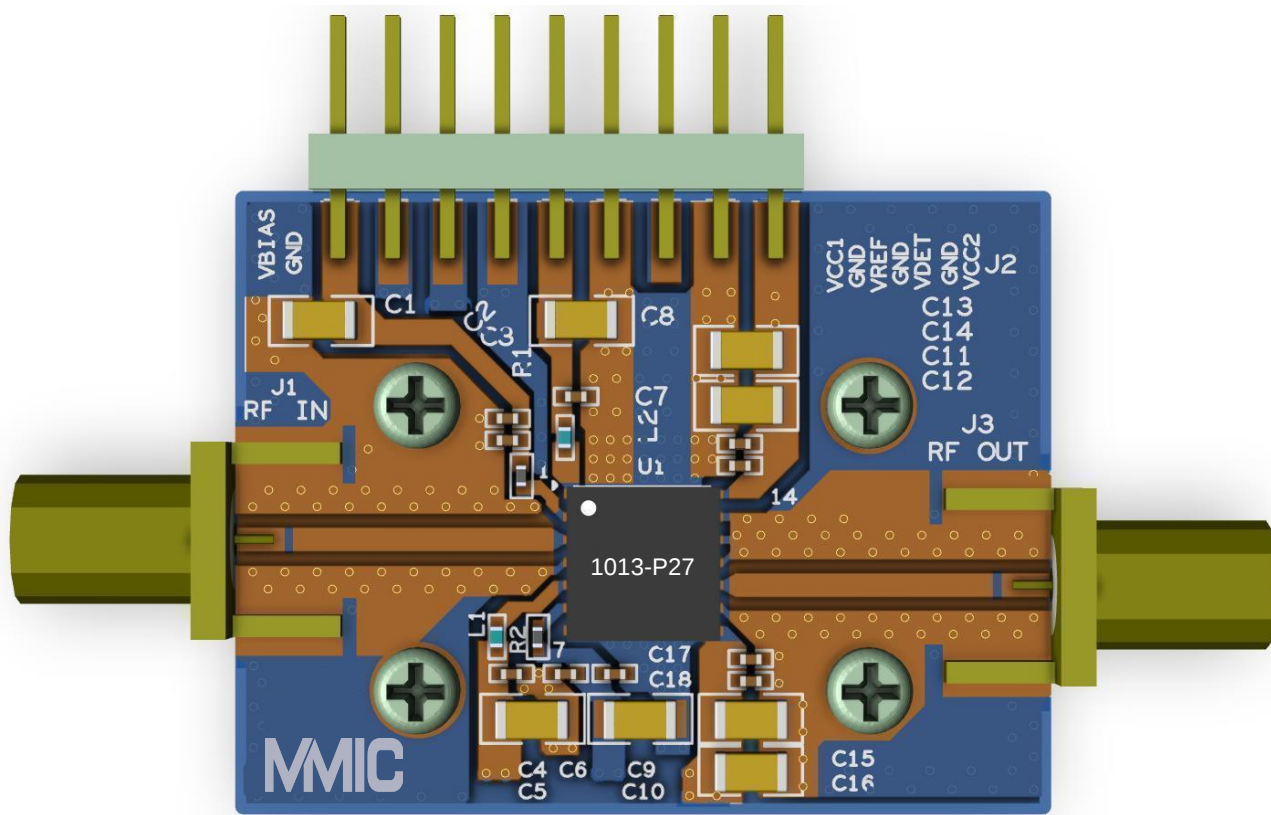


Figure 5 .Evaluation Board PCB information

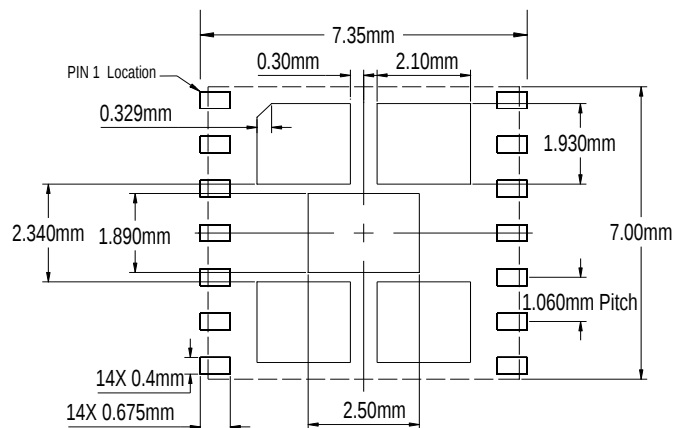
Evaluation board test procedure

Turn-on sequence

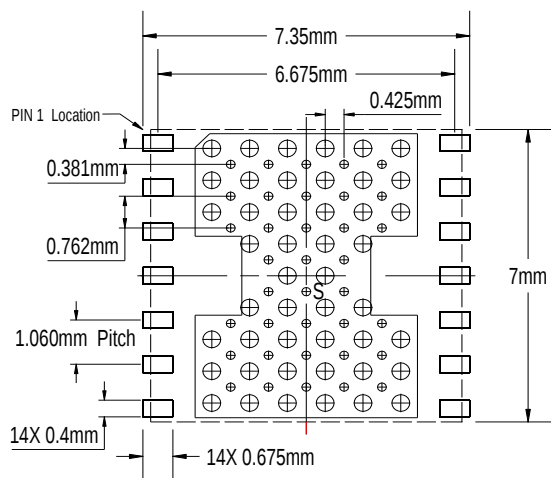
- 1.Connect test equipment to the input and output port of Evaluation board and then connect DC ground.
- 2.Turn on VCC1,VCC2,VCC3 to 5V, turn on VBIAS to 5V then turn on VREF to 2.95V in order.
- 3.Apply RF signal

Turn-on sequence

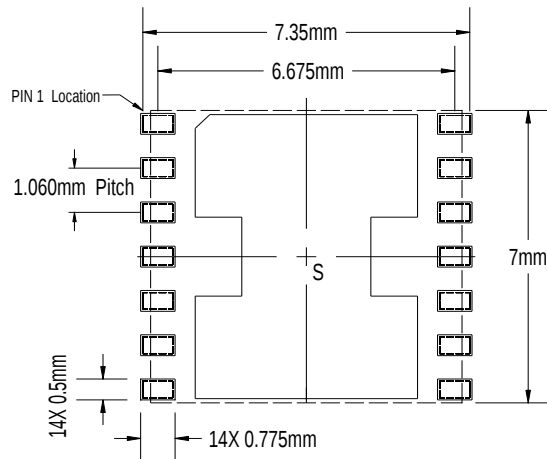
- 1.Turn off RF signal
- 2.Turn off VREF,VBIAS,VCC1,VCC2 ,VCC3 in order



Stencil Aperture Top View



Metallization Top View



Solder Mask Opening Top View

Notes:

- (1) UNLESS SPECIFIED DIMENSIONS ARE SYMMETRICAL ABOUT CENTER LINES SHOWN.
- (2) VIAS SHOWN IN PCB METAL VIEW ARE FOR REFERENCE ONLY. NUMBER & SIZE OF THERMAL VIAS REQUIRED DEPENDENT ON HEAT DISSIPATION REQUIREMENT AND THE PCB PROCESS CAPABILITY.

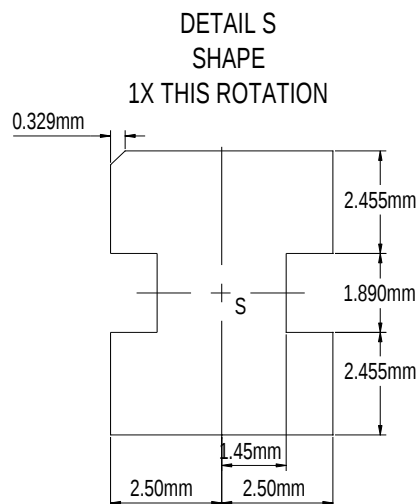
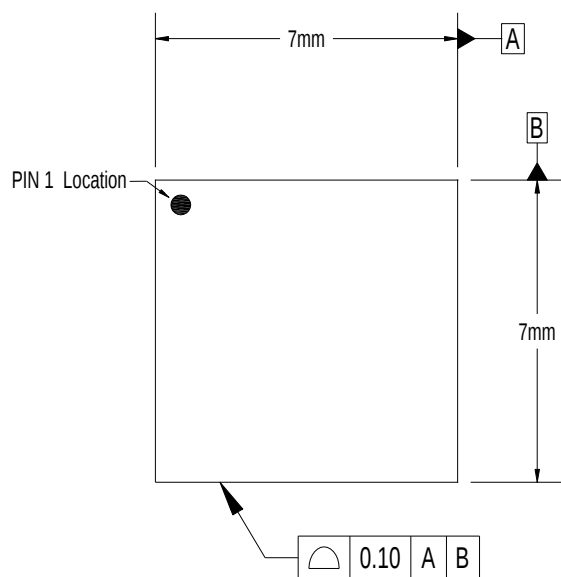
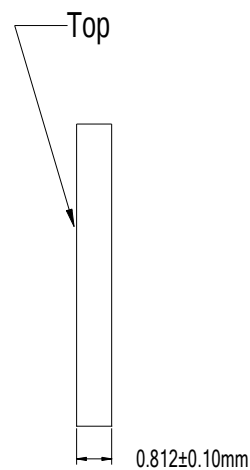


Figure 6.PCB Layout Footprint

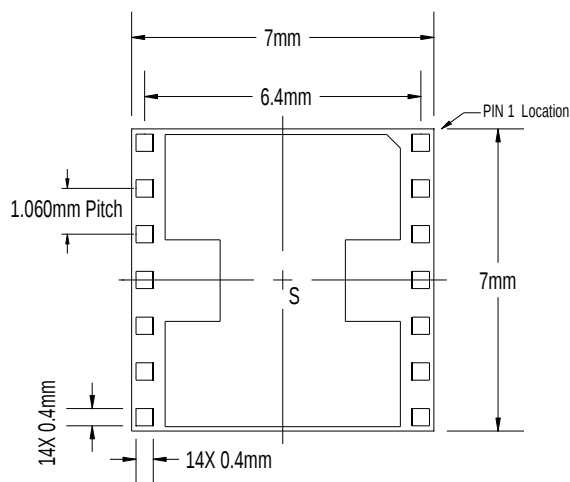
Package Dimensions



Top View



SIDE VIEW



BOTTOM VIEW

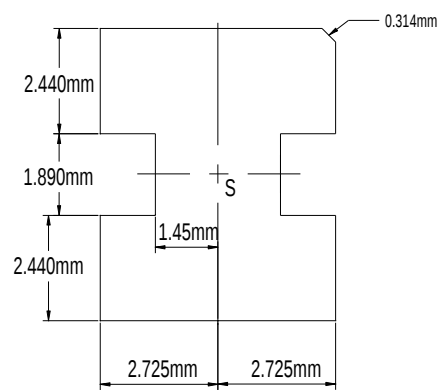


Figure 7.Package Dimensions

Notes:

1. Tolerance is $\pm 0.050\text{mm}$ unless otherwise specified.
2. Among the 14 pins on both sides, the size of the GND pin is 0.06mm larger than that of the other pins

Tape and Reel Information

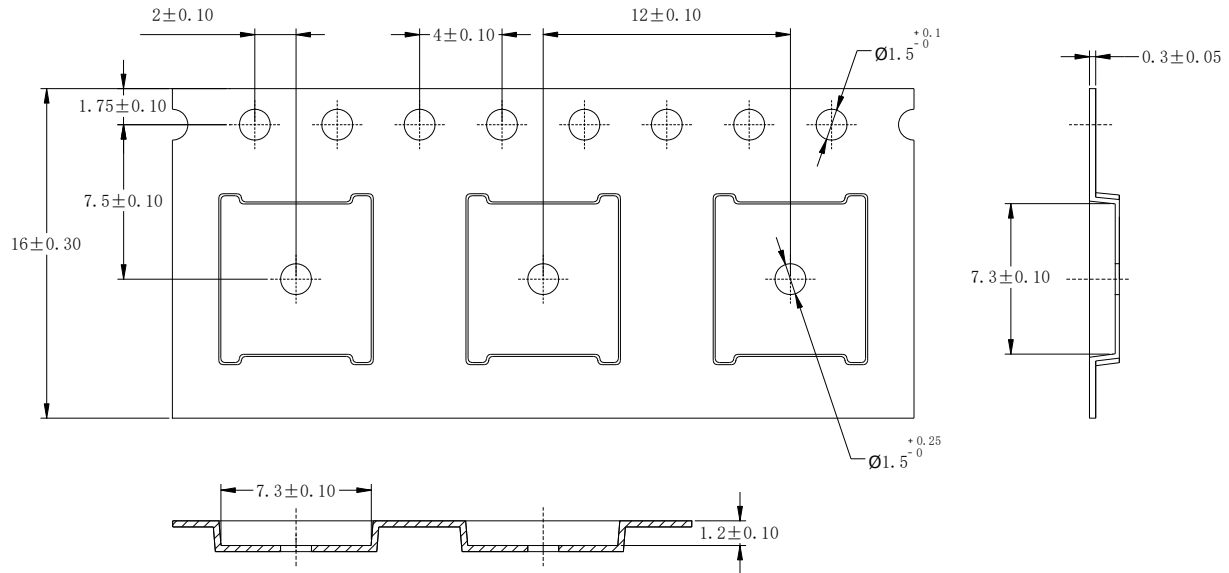


Figure 8

Technical requirements:

1. The Material :PS
2. MOLD# LGA/QFN(7×7)
3. Cover Tape Width: $13.3 \pm 0.1\text{mm}$
4. Cover Tape Color: Transparent
5. Carrier tape color: Black.