MCCPA1020-P40

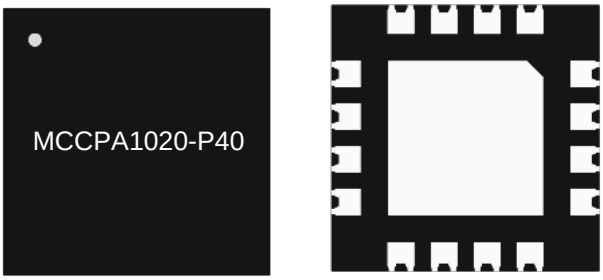
10W, 1000-2000MHz,High Power Amplifier

Product Overview

The MCCPA1020-P40 is a two stage HBT high power amplifier for indoor/outdoor wireless application such as RFID,Lora,global position system application.It works for L band from 1000MHz to 2000MHz and can deliver 40dBm CW output peak power with 33dBm power gain,and high efficiency. The input port is internally matched 50Ω and integrated temperature compensation circuits within a tiny 5×5 lead frame package.

ROHS compliant

Evaluation boards are available upon request.



16Pin 5×5 mm QFN Package

Figure1.

Functional Block Diagram

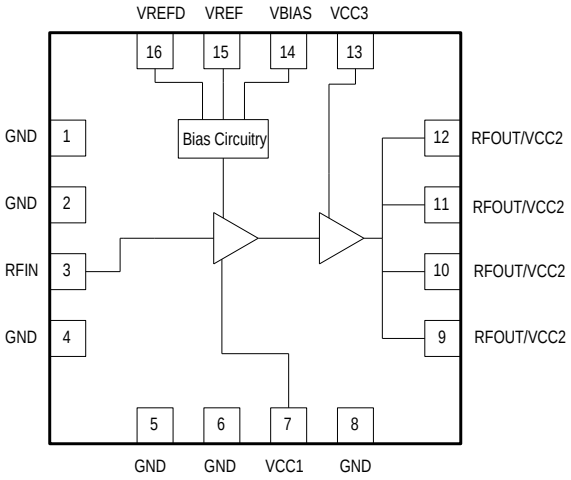


Figure2.

Key Features

- Frequency Range: 1000-2000MHz
- 33dB Gain
- 65% PAE at 39.5dBm output power@V_{CC2}=9V
- Above 40dBm output peak power
- Integrated temperature compensation circuits
- Compact and low-cost 5mm×5mm QFN package (MSL3,260℃ per JEDEC J-STD-020)

Applications

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

Ordering info

Part No.	Description
MCCPA1020-P40	13' Reel with 5000pcs

Pin Description

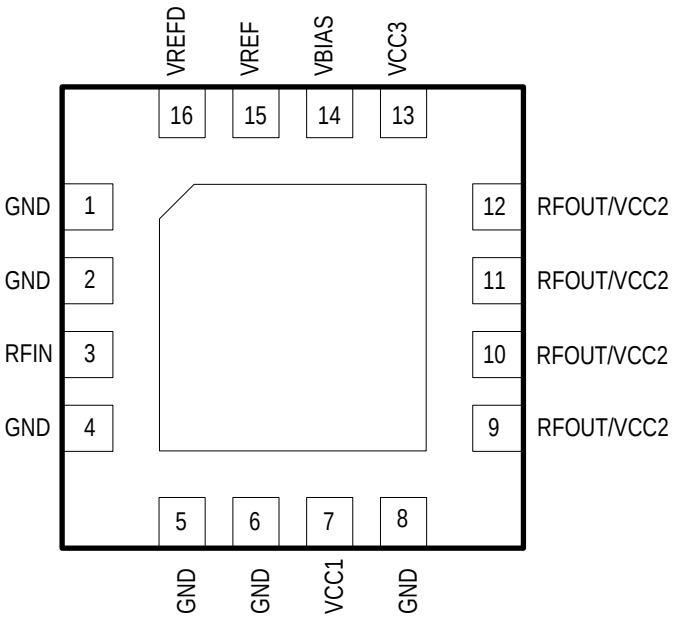


Figure 3.Pinout (Top View)

Pin	Name	Description	Pin	Name	Description
1	GND	Ground	9	RFOUT/VCC2	RF output port with Vcc2
2	GND	Ground	10	RFOUT/VCC2	RF output port with Vcc2
3	RFIN	RF input port	11	RFOUT/VCC2	RF output port with Vcc2
4	GND	Ground	12	RFOUT/VCC2	RF output port with Vcc2
5	GND	Ground	13	VCC3	Bias Circuit voltage supply
6	GND	Ground	14	VBIAS	Bias voltage supply
7	VCC1	Collector1 voltage supply	15	VREF	Last stage reference voltage
8	GND	Ground	16	VREFD	Driver stage reference voltage

Absolute Maximum Ratings[1]

Parameter	Rating	Unit
Operating Temp,T_C	-40 to +85	°C
Operating Junction Temp,T_J	175	°C
Storage Temp,T_{STG}	-55 to+125	°C
Thermal Resistance,$R_{\theta jc}$		°C/W
Operating Voltage,V_{CC1},V_{CC3},V_{BIAS}	3.3	V
Operating Voltage ,VCC2	12	V
Inuput Power,P_{IN}	15	dBm

Notes[1]: Exceeding any one or a combination of the Absolute Maxium Rating conditions may cause permanent damage to the device. Extended application of the Absolute Maximum Rating conditions to the device mayreduce device reliability.

Recommended Operating Conditions

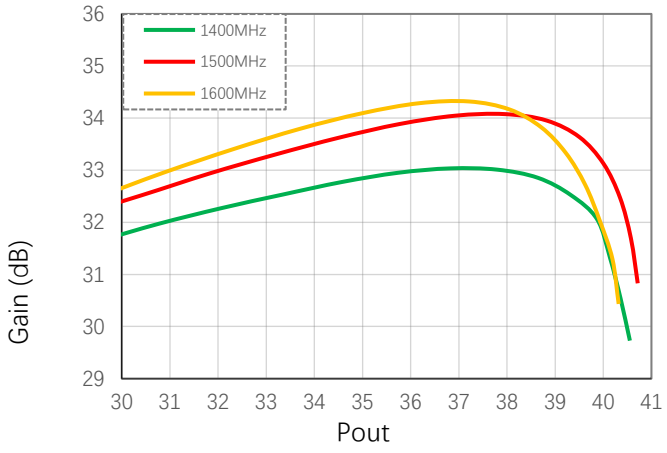
Parameter	Min	Typ	Max	Unit
Operating Frequency,F	1000		2000	MHz
Operating Temp,TC	-40	25	85	℃
Operating Voltage,VCC1,VCC3,VBIAS		3.3		V
Operating Voltage,VCC2	6		12	V
VREFD Voltage,VREFD	2.4	2.7		V
VREF Voltage,VREF		3		V
VREFD,VREF Current,IREFD,IREF		10	15	mA

Electrical Specifications[1]

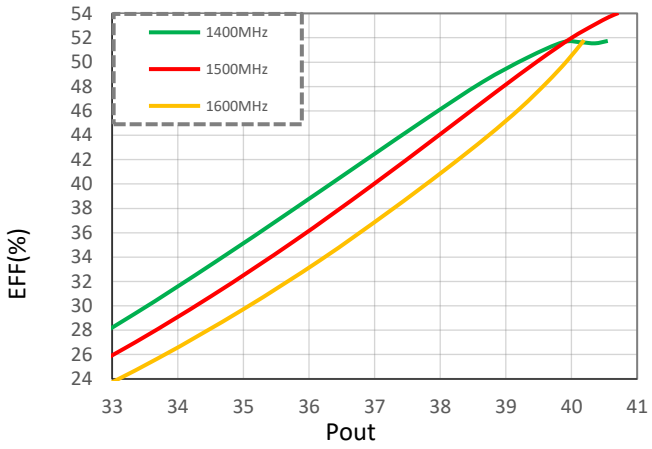
Parameter	Conditions	Min	Typ	Max	Unit
Frequency		1000	1500	2000	MHz
Output P3dB	Pulse&CW		40		dBm
Gain@37dBm			33		dB
Power added efficiency	@40dBm,CW		52		%
Quiescent currnt	Driver,3.3V		50		mA
	Last Stage,12V		90		mA
Input return loss			-10		dB

Notes[1]:VCC1=VCC3 =VBAIS=3.3V,VCC2=12V,VREFD=2.7V,VREF=3V,F=1500MHz,TC=25℃,Input/Output Load=50Ω

Performance Data



Gain vs Pout over Frequency



Efficiency vs Pout over Frequency

Figure4 1.4-1.6GHz EVB Performance

Evaluation Board Schemic

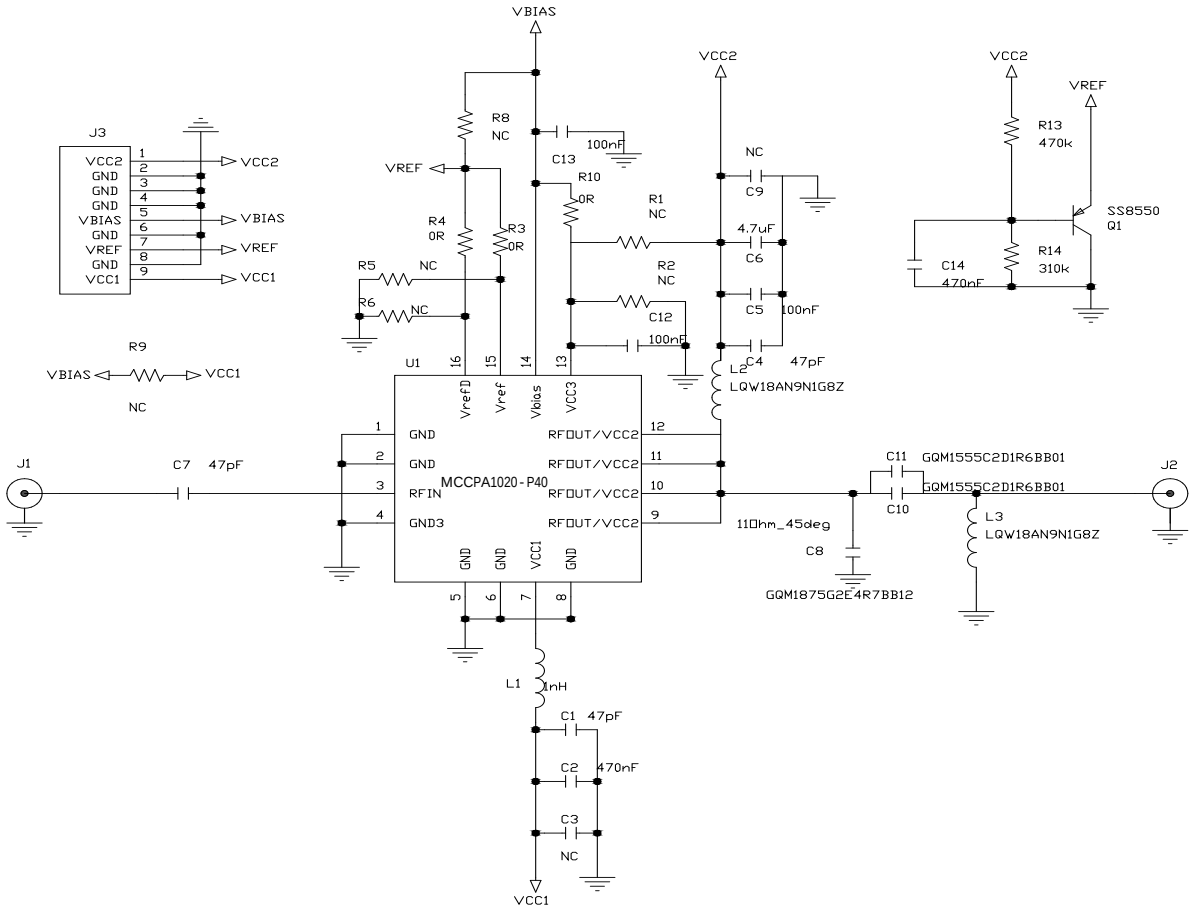


Figure 5 . Evaluation Board Schemic

Evaluation Board Information

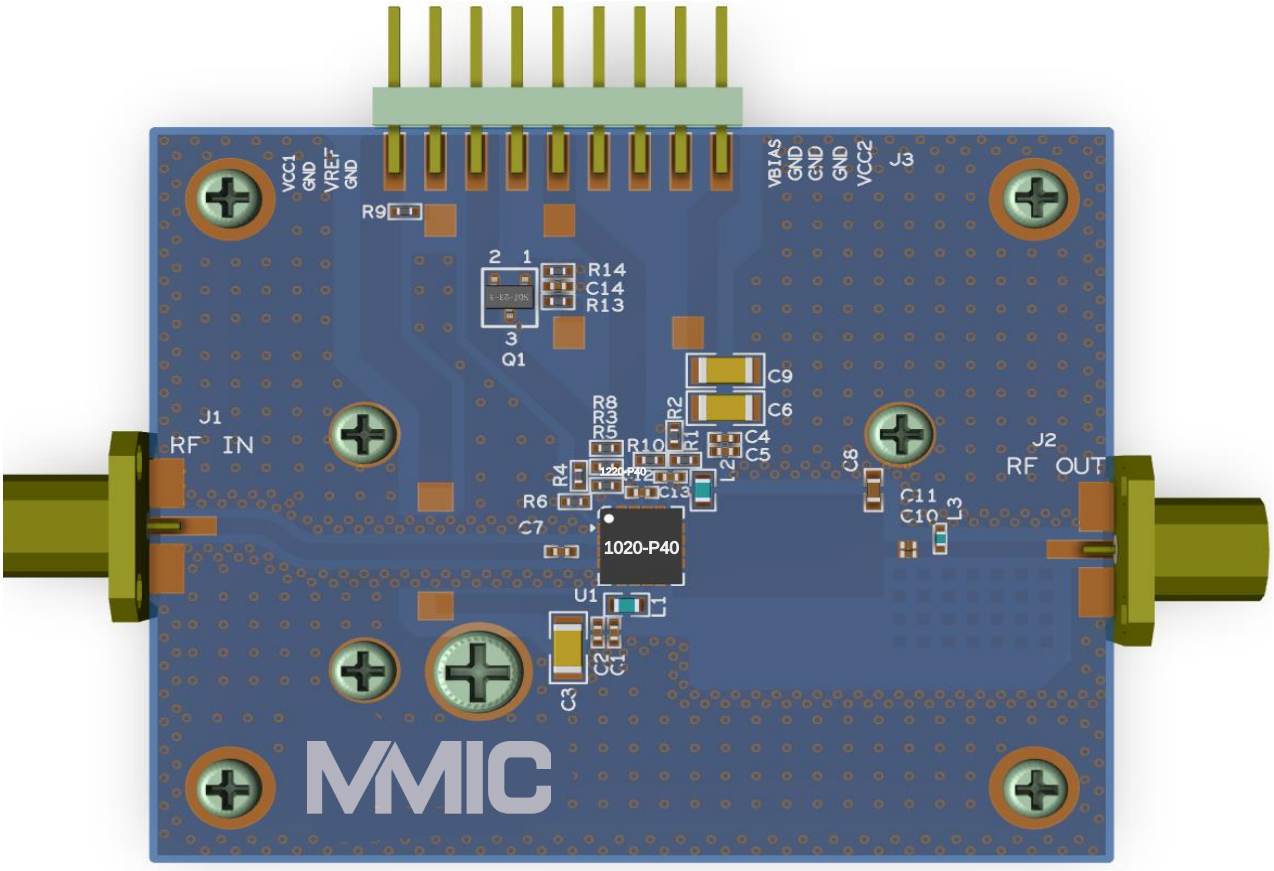


Figure 6

Evaluation Board Test Procedure

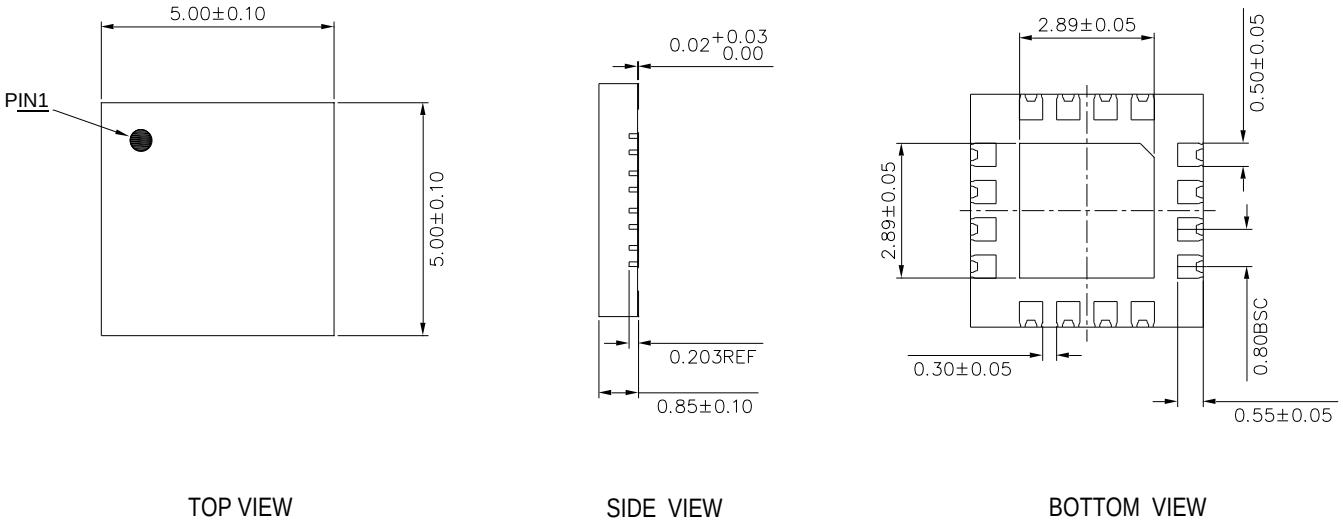
Turn-on sequence

1.Connect test equipment to the input and output port of Evaluation board and then connect DC ground.
2.Turn on V_{CC2} to 12V,then turn on V_{CC1} ,V_{CC3} ,V_{BIAS} to 3.3V,then turn on V_{REF} to 2.7V in order.
3.Apply RF signal

Turn-on sequence

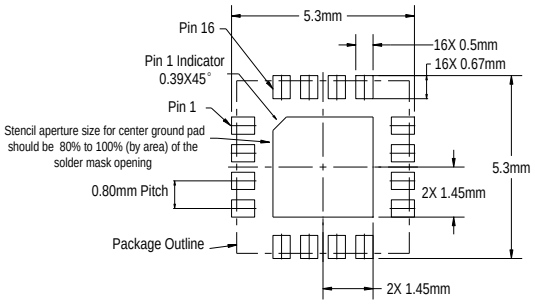
1.Turn off RF signal
2.Turn off V_{REF},V_{CC1},V_{CC3} and V_{BIAS} then V_{CC2} in order

Package Dimensions

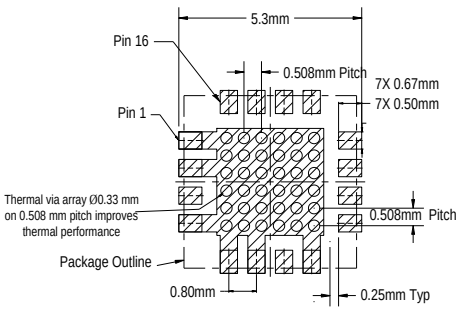


TOP VIEW SIDE VIEW BOTTOM VIEW

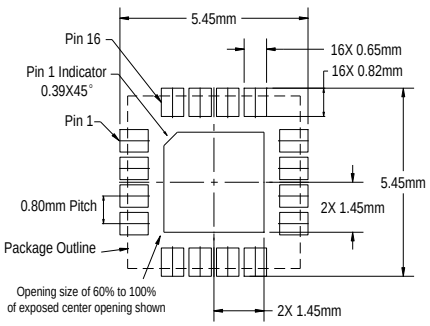
Figure 7 .



Stencil Aperture Top View



Metallization Top View



Solder Mask Opening Top View

Figure 8. PCB Layout Footprint

Tape and Reel Information

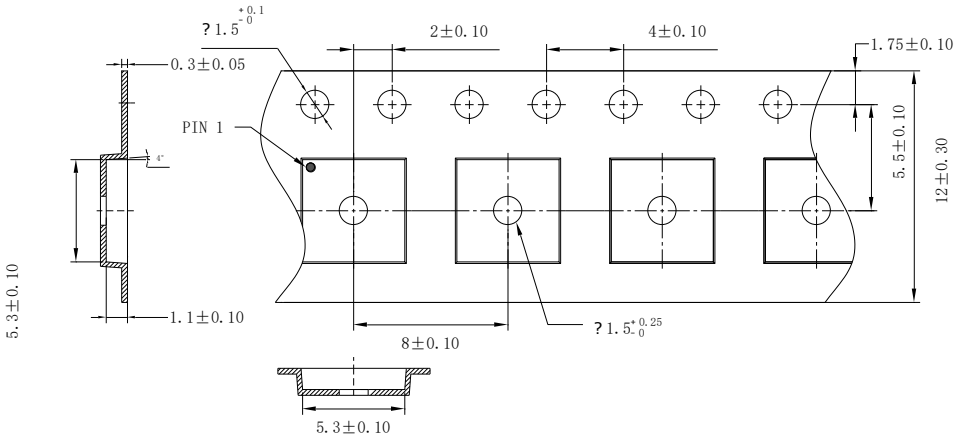


Figure 9 .

Technical requirements:
1.The accumulative error of the distance between any 10 transmitting holes is ± 0.1 mm;
2.The lateral bending of the belt along the length direction is ≤1mm/100mm;
3.Roughness：Ra＜0.8um;
4.Carrier tape color:Black;