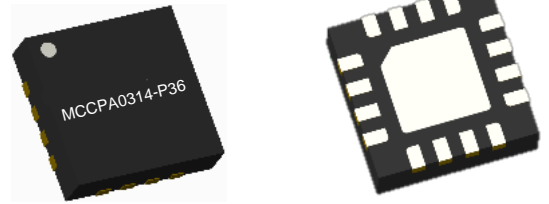


Product Overview

The MCCPA0314-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 can deliver 36dBm output peak power with 31dB power gain, and excellent linearity. The MCCPA0314-P36 input port is internally matched 50Ω and integrated temperature compensation circuits within a tiny lead frame package.

ROHS compliant

Evaluation boards are available upon request.



16Pin 3x3mm QFN Package

Figure1.

Functional Block Diagram

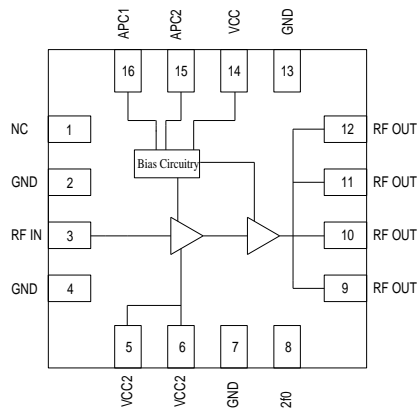


Figure2.

Key Features

- Frequency Range: 300-1400MHz
- 31dB Gain
- 50% PAE at 36dBm output power
- 36dBm output peak power
- Integrated temperature compensation circuits
- Compact and low-cost 3mmx3mm QFN package (MSL3,260 per JEDEC J-STD-020)

Applications

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

Ordering info

Part No.	Description
MCCPA0314-P36	13' Reel with 1500pcs

Pin Description

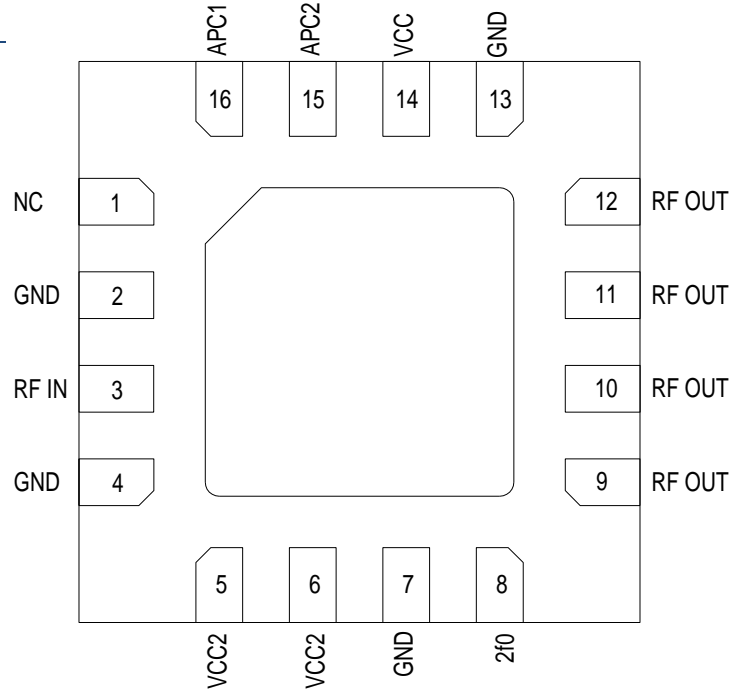


Figure 3. Pinout (Top View)

Pin	Name	Description	Pin	Name	Description
1	NC	Not Connected	9	RFOUT	RF output port
2	GND	Ground	10	RFOUT	RF output port
3	RFIN	RF input port	11	RFOUT	RF output port
4	GND	Ground	12	RFOUT	RF output port
5	VCC2	Stage 2 collector voltage	13	GND	Ground
6	VCC2	Stage 2 collector voltage	14	VCC	Collector voltage
7	GND	Ground	15	APC2	Power Enable >2.4V PA on
8	2f0	2 nd harmonic trap	16	APC1	Power Enable >2.4V PA on

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 _{jc}	27.3	/W
Operating Voltage, V _{CC1} , V _{CC2}	5.5	V
Input Power, P _{IN}	10	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	400		1200	MHz
Operating Temp,TC	-40	25	85	
Operating Voltage,VCC,VCC2	3	5	5.5	V
VAPC1,VAPC2 Voltage	2.4	3.2		V
IAPC1,IAPC2 Current,		8	15	mA

Electrical Specifications¹

Parameter	Conditions	Min	Typ	Max	Unit
Frequency		300	920	1200	MHz
Output P1dB	Pulse&CW		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		-46		dBc
Input return loss			-10		dB

Notes¹:VCC=VCC2 =5V,VACP1=VACP2=3.2V,F=920MHz,TC=25 , Input/Output Load=50

Evaluation Board Schematic

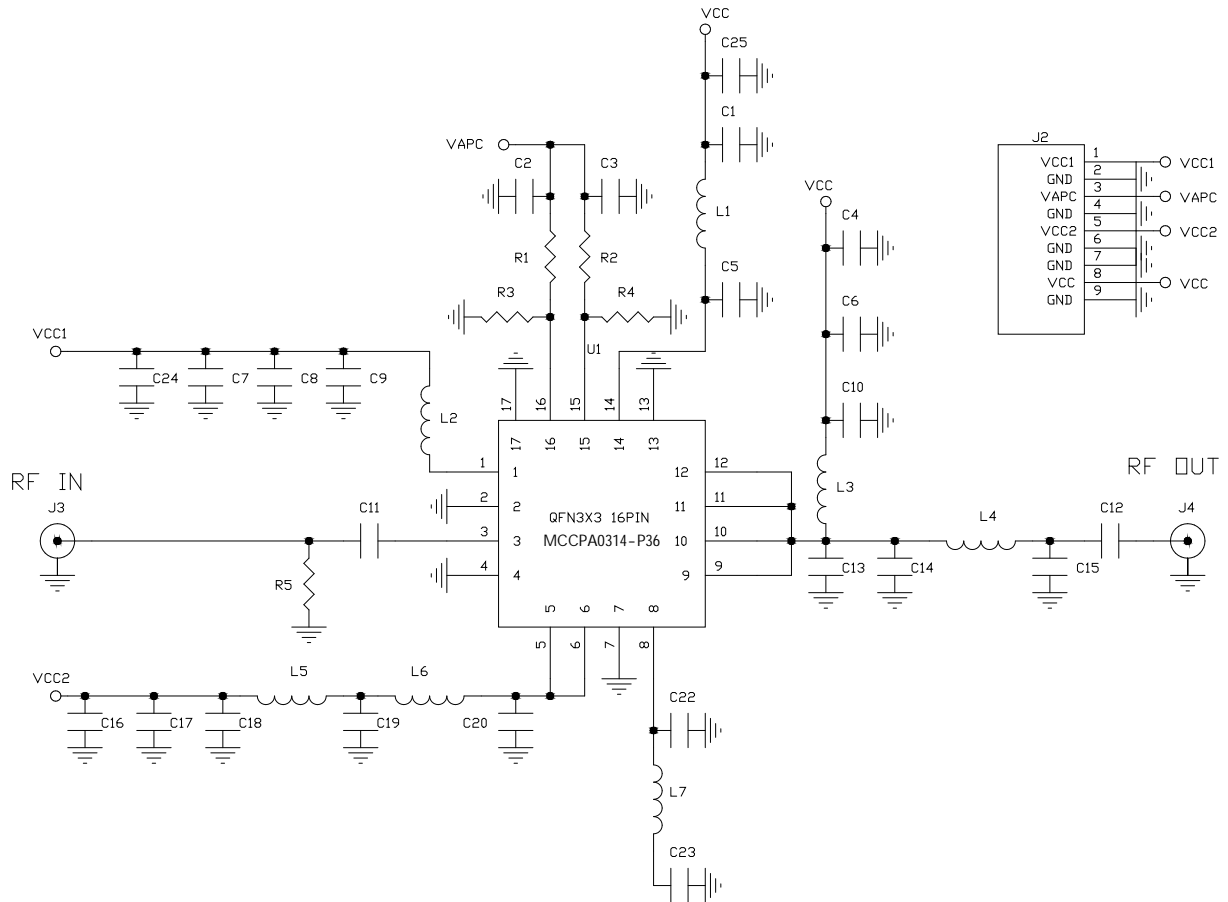


Figure 4 . Evaluation Board Schematic

Evaluation Board Information

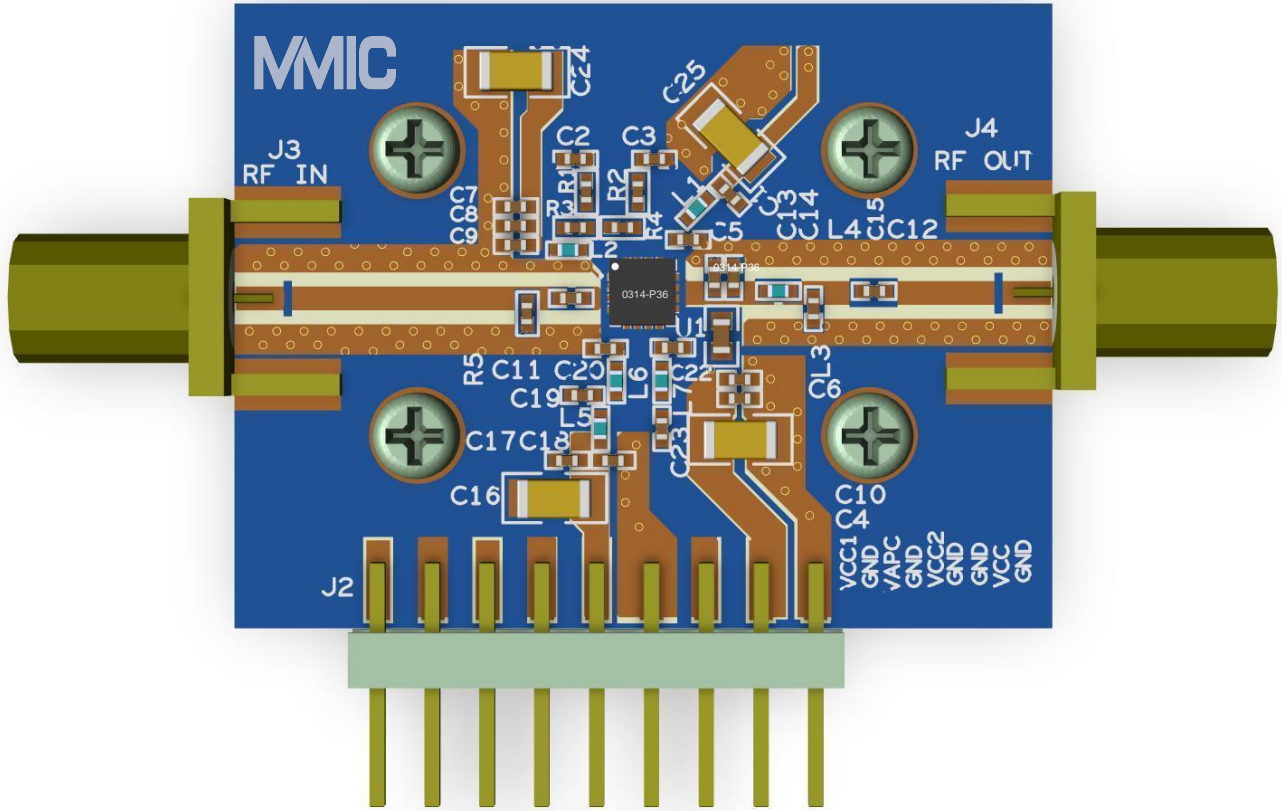


Figure 5

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 VCC, 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, VCC, VCC2 in order

Evaluation Board Bill of Materials (BOM) for 860-925MHz application

Ref,Des	Value	Size
C19, C6	100pF 25V ±10% X7R	C0402
C17, C10, C2, C3, C1	1200pF 25V ±10% X7R	C0402
C16, C4, C25	4.7uF 16V ±10% X7R	C1206
R1, R2, L1, L5	0R ±5% 1/16W	R0402
C11, C12	47pF 25V ±10% X7R	C0402
L6	3.5nH, Sunlord MWSD1005C3N5CTM81	L0402
L3	10nH, Sunlord SDWL1608CP10NNHSTF	L0603
L4	2.9nH, Sunlord MWSD1005C2N9CTM81	L0402
C13	15pF 25V ±2% X7R	C0402
C14	2pF 25V ±0.1pF X7R	C0402
C15	4p7pF 25V ±1pF X7R	C0402
C22	5.6pF 25V ±0.1pF X7R	C0402

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

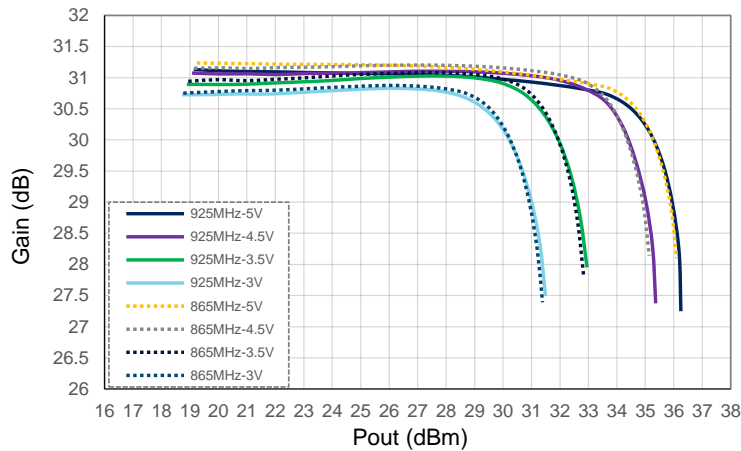


Figure 6 .Gain VS Pout over Frequency
(LTE 1x20 MHz, PAR = 9.5 dB)

Evaluation Board Bill of Materials (BOM) for 700-890MHz High Linearity 27dBm Output power application (VAPC=2.9V)

Ref,Des	Value	Size
C6	100pF 25V ±10% X7R	C0402
C17, C10, C2, C3, C1	1200pF 25V ±10% X7R	C0402
C16, C4, C25	4.7uF 16V ±10% X7R	C1206
R1, R2, L1, L5,L6	0R ±5% 1/16W	R0402
C11, C12	47pF 25V ±10% X7R	C0402
C19	12pF 25V ±10% X7R	C0402
L3	10nH, Sunlord SDWL1608CP10NNHSTF	L0603
L4	3.9nH, Sunlord MWSD1005C3N9CTM81	L0402
C13	27pF 25V ±2% X7R	C0402
C14	1pF 25V ±0.1pF X7R	C0402
C15	8pF 25V ±0.1pF X7R	C0402
C22	6.8pF 25V ±0.1pF X7R	C0402

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

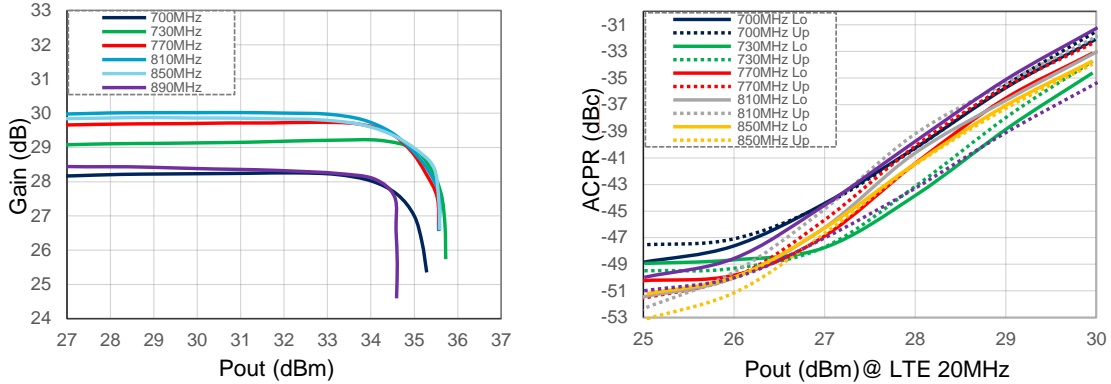


Figure 7. Gain and ACPR Performance 700-890MHz

Evaluation Board Bill of Materials (BOM) for 780-860MHz High Linearity 27dBm Output power application (VAPC=2.88V)

Ref,Des	Value	Size
C6	100pF 25V ±10% X7R	C0402
C17, C10, C2, C3, C1	1200pF 25V ±10% X7R	C0402
C16, C4, C25	4.7uF 16V ±10% X7R	C1206
R1, R2, L1, L5, L6	0R ±5% 1/16W	R0402
C11, C12	47pF 25V ±10% X7R	C0402
L3	10nH, Sunlord SDWL1608CP10NNHSTF	L0603
L4	2.9nH, Sunlord MWSD1005C2N9CTM81	L0402
C13	20pF 25V ±2% X7R	C0402
C14	2pF 25V ±0.1pF X7R	C0402
C15	6pF 25V ±0.1pF X7R	C0402
C22	5.6pF 25V ±0.1pF X7R	C0402

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

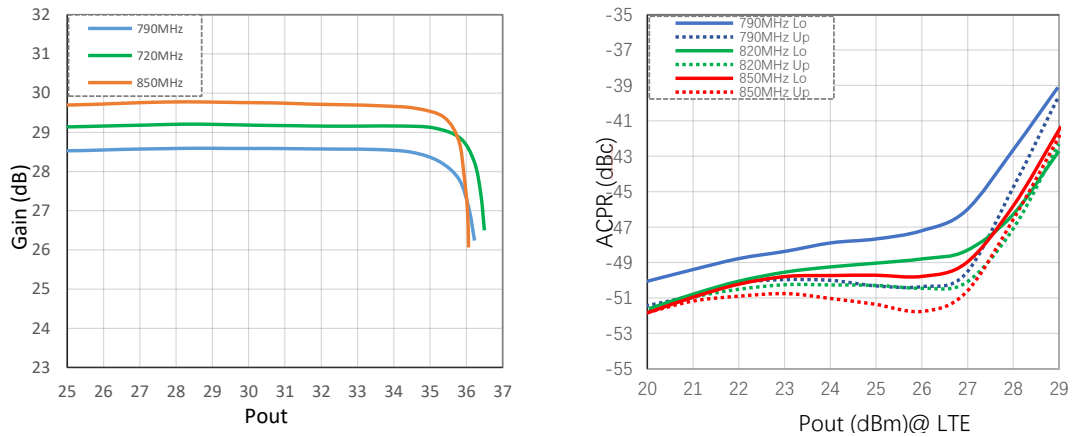


Figure 8. Gain and ACPR Performance 790-850MHz

Evaluation Board Bill of Materials (BOM) for 400-500MHz application

Ref,Des	Value	Size
C19, C6	470pF 25V ±10% X7R	C0402
C17, C10, C2, C3, C1	1000pF 25V ±10% X7R	C0402
C16, C4, C25	4.7uF 16V ±10% X7R	C1206
R1, R2, L1, L5	0R ±5% 1/16W	R0402
C11, C12	47pF 25V ±10% X7R	C0402
L6	20nH, Sunlord	L0402
L3	15nH, Sunlord	L0603
L4	6.3nH, Sunlord	L0402
C13	15pF 25V ±2% X7R	C0402
C14	27pF 25V ±0.1pF X7R (close to L4)	C0402
C15	12pF 25V ±1pF X7R	C0402
C22	5.6pF 25V ±0.1pF X7R	C0402

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

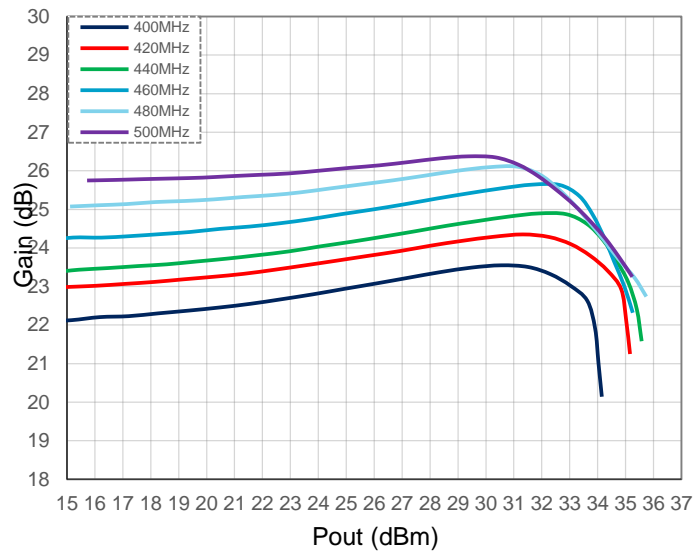


Figure 9.400-500MHz performance

Evaluation Board Bill of Materials (BOM) for 960-1225MHz application

Ref,Des	Value	Size
C6	100pF 25V ±10% X7R	C0402
C17, C10, C2, C3, C1	1200pF 25V ±10% X7R	C0402
C16, C4, C25	4.7uF 16V ±10% X7R	C1206
R1, R2, L1, L5,L6	0R ±5% 1/16W	R0402
C11, C12	47pF 25V ±10% X7R	C0402
C19	200pF 25V ±10% X7R	C0402
L3	10nH, Sunlord SDWL1608CP10NNHSTF	L0603
L4	2.9nH, Sunlord MWSD1005C2N9CTM81	L0402
C13	10pF 25V ±2% X7R	C0402
C14	2pF 25V ±0.1pF X7R	C0402
C15	4.7pF 25V ±1pF X7R	C0402
C22	5.6pF 25V ±0.1pF X7R	C0402

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

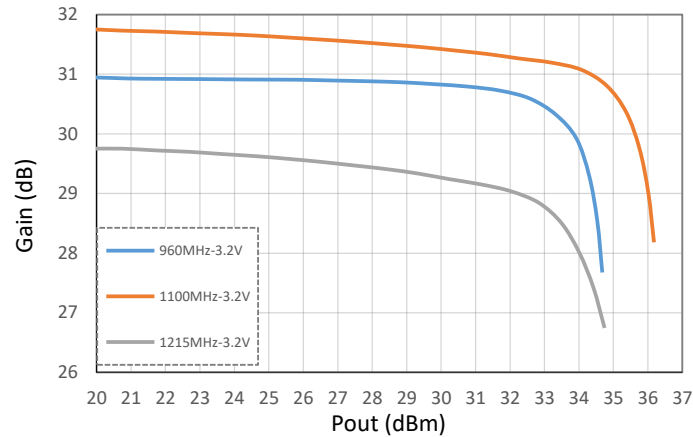


Figure 10.960-1215MHz performance

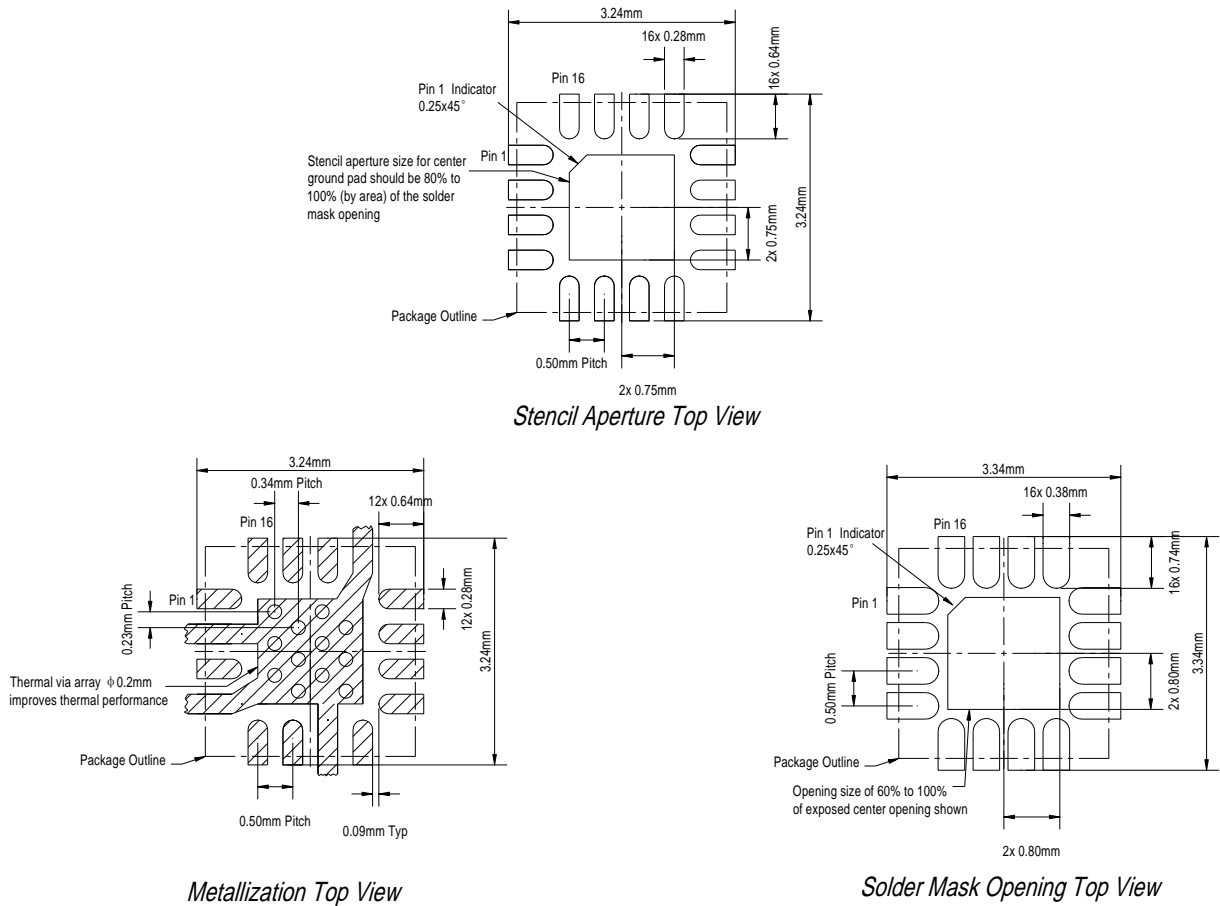


Figure 11. PCB Layout Footprint

Package Dimensions

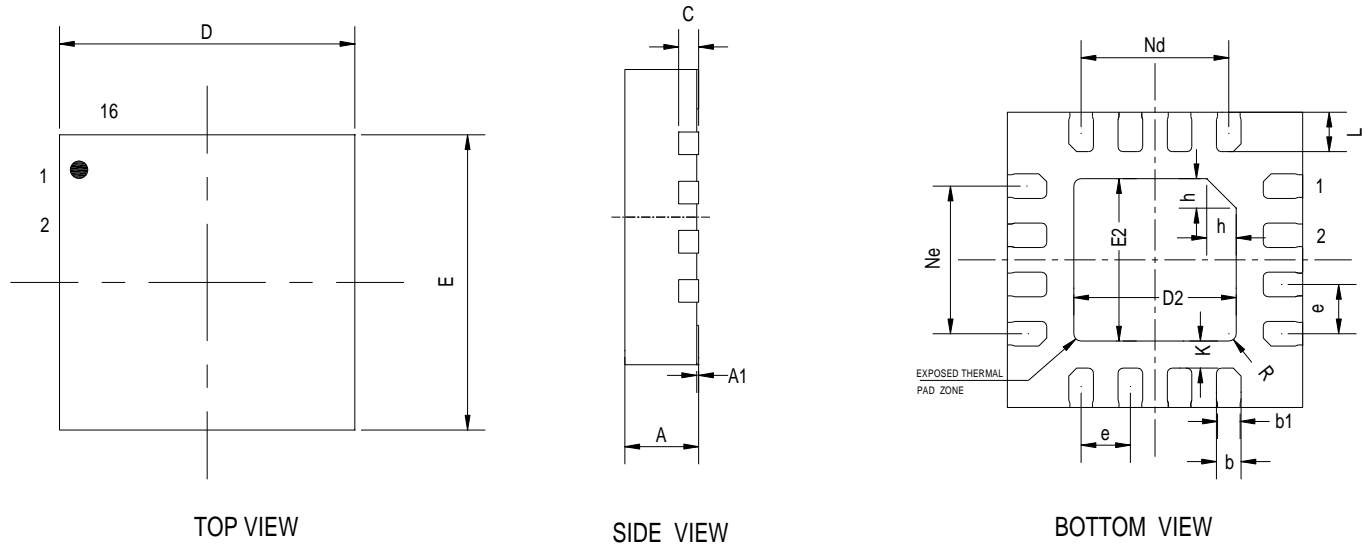


Figure 12

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

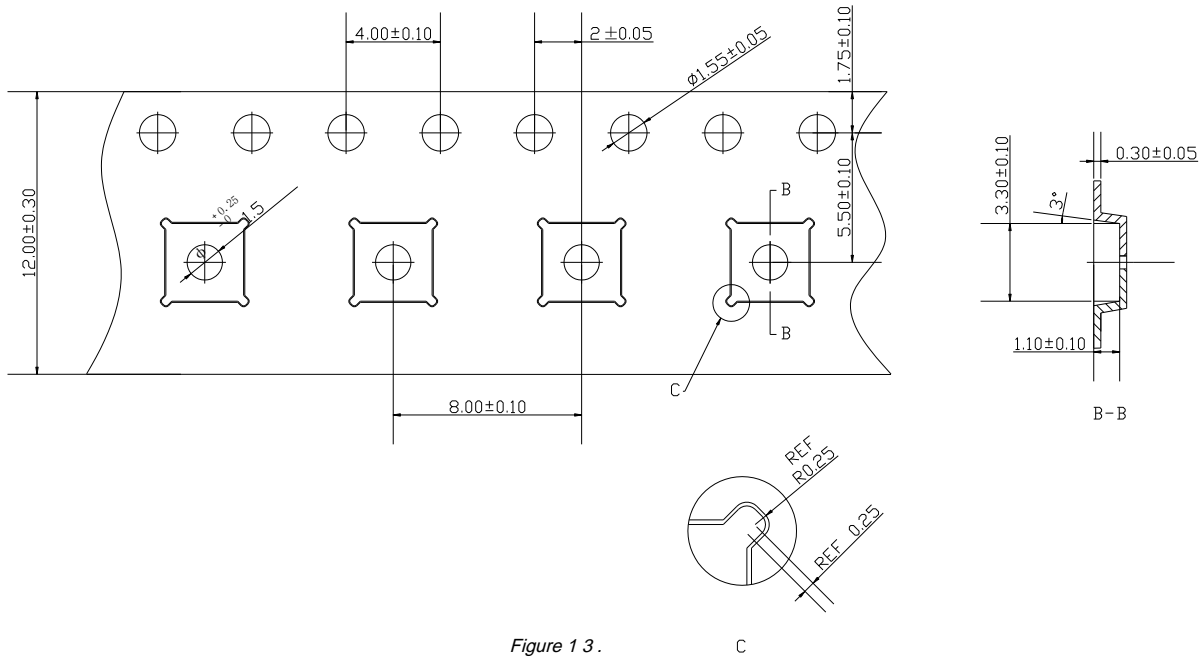


Figure 13.

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 ≤ 1 mm/100mm;
3. Roughness: $Ra < 0.8\mu\text{m}$;
4. Carrier tape color: Black;