MCCPA3638-P36

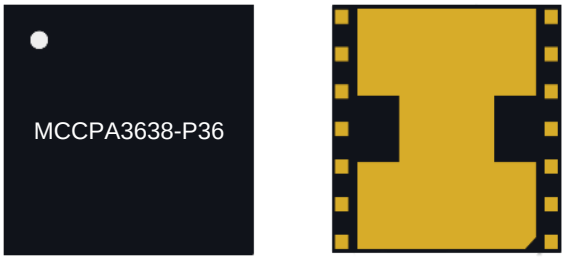
3600-3800MHz,High Linearity 27dBm Power Amplifier

Product Overview

The MCCPA3638-P36 is a three-stage HBT small cell power amplifier for indoor cellular base stations.It works at 3600-3800 MHz(B42,n78).This PA can deliver 27dBm 5G output power with ACPR below -47dBc and power gain higher than 30dB.

ROHS compliant

Evaluation boards are available upon request.



14pin 7×7mm Laminate Package

Figure1.

Functional Block Diagram

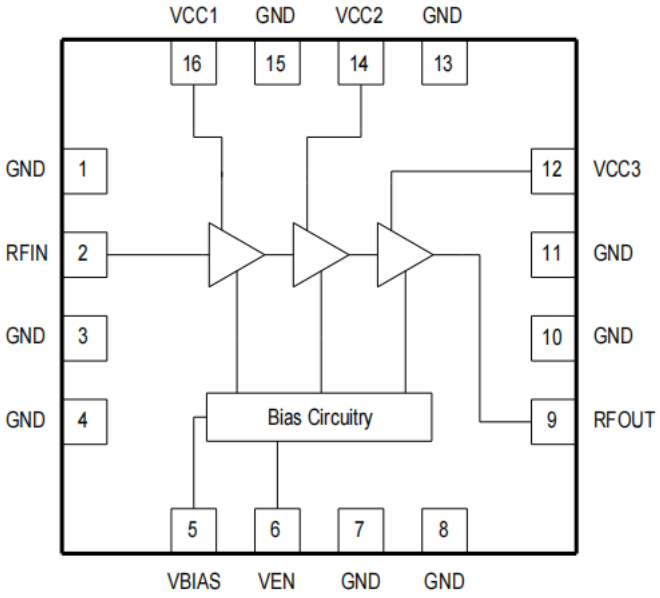


Figure2.

Key Features

- Frequency Range: 3600-3800MHz
- 31dB Gain
- 11% PAE at 27dBm output power
- Below -47dBc ACPR at 27dBm output power w/o DPD with 100M 5G NR signal
- Input/output internally matched to 50Ω
- Integrated temperature compensation circuits
- Compact and low-cost 7mm×7mm LGA package (MSL3,260℃ per JEDEC J-STD-020)

Applications

- Driver Amplifier for Micro-base and Macro-base Stations
- FDD and TDD 2G/3G/4G LTE/5G NR Systems
- Active Antenna Array and Massive MIMO
- Customer Premises Equipment(CPE)
- 3GPP band n78 for 5G base-station application

Ordering info

Part No.	Description
MCCPA3638-P36	7' Reel with 3000pcs

Pin Description

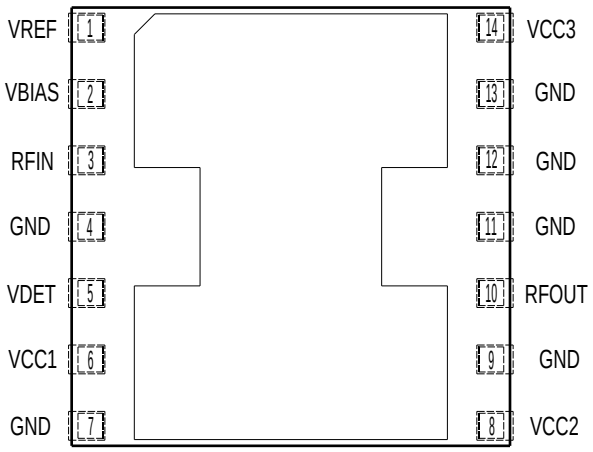


Figure 3.Pinout (Top View)

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	12	GND	Ground
6	VCC1	Stage 1 collector voltage	13	GND	Ground
7	GND	Ground	14	VCC3	Stage 3 collector 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,$R_{\theta jc}$	13.4	°C/W
Operating Voltage,V_{CC1},V_{CC2},V_{CC3},V_{BIAS}	5.5	V
Inuput Power,P_{IN}	10	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	3600		3800	MHz
Operating Temp,Tc	-40	25	85	℃
Operating Voltage V_{CC1},V_{CC2},V_{CC3},V_{BIAS}	4.5	5	5.5	V
VREF Voltage,V_{REF}	2.6	3.0	3.2	V
IREF Current,I_{REF}		20	30	mA

Electrical Specifications-EVB Typical Performance[1]

Parameter	Conditions	Min	Typ	Max	Unit
Frequency		3600		3800	MHz
Output Average Power			27		dBm
Output P3dB	Pulse 100us 10%		36.5		dBm
Gain@27dBm			31		dB
Power Added Efficiency			11		%
Quiescent Current			580		mA
ACPR@27dBm	20MHz LTE E-TM3.1,9.5dB PAR		-50		dBc
ACPR@27dBm	100M 5G NR,9.5dB PAR		-47		dBc
Input Return Loss			-15		dB
Output Return Loss			/		dB
Instantaneous Bandwidth			100		MHz
Input/Output Impedance			50		Ω

Notes[1]:VCC1=VCC2=VCC3=VBIAS=5V,VREF =3.05V,F=3500MHz,Signal=CW,Tc=25℃,Input/Output Load=50Ω

Detecter Specifications[1]

Output Power(dBm)	VDet(mV)	Output Power(dBm)	VDet(mV)
27	617	21	395
26	568	20	372
25	525	19	351
24	486	18	332
23	453	17	317
22	421	RFoff	223

Notes[1]:VCC1=VCC2=VCC3=VBIAS=5V,VREF=3.05V,F=3500MHz,Signal=CW,Tc=25℃,Input/Output Load=50Ω

Evaluation Board Schemic

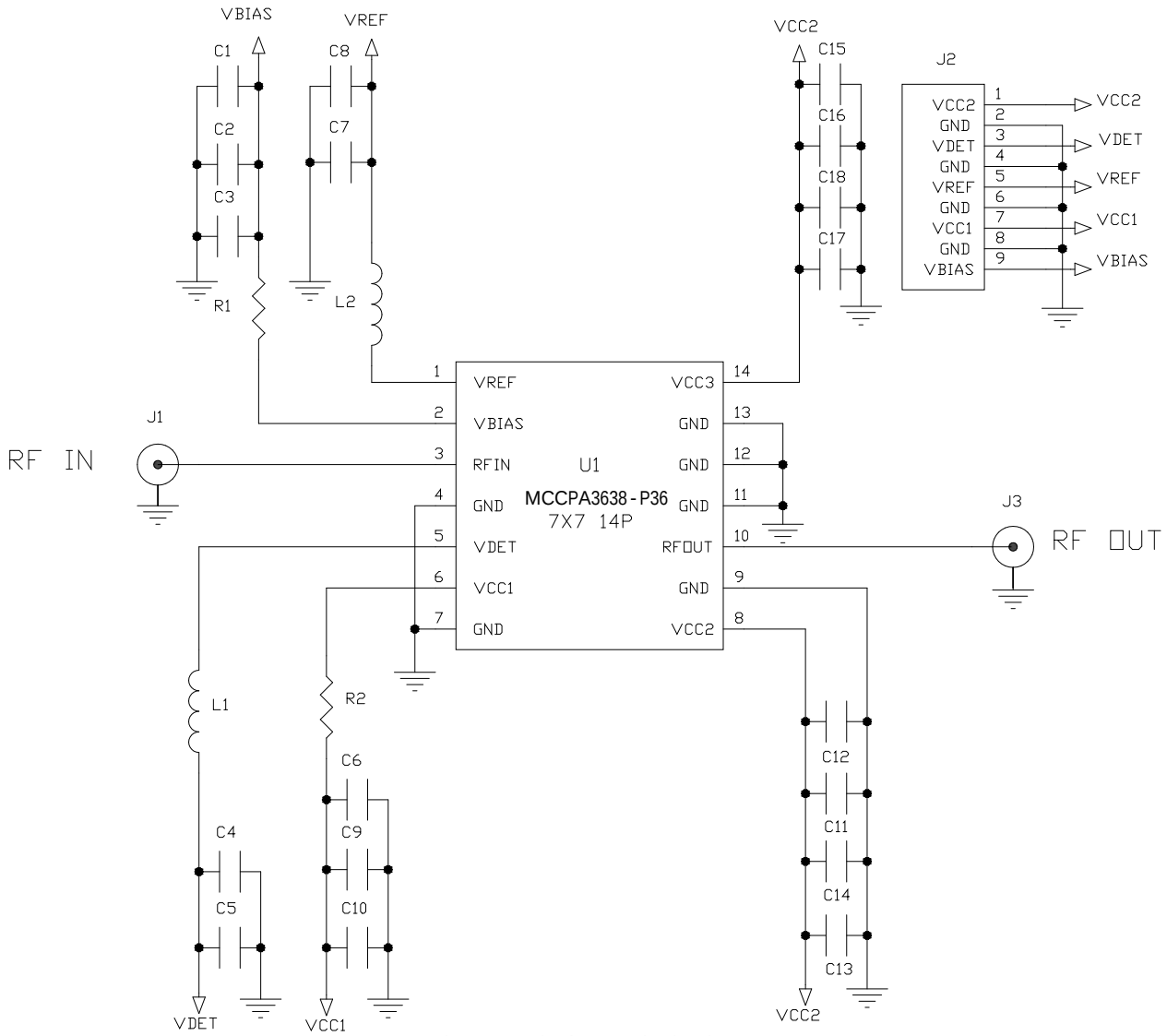


Figure 4. Evaluation Board Schemic

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

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

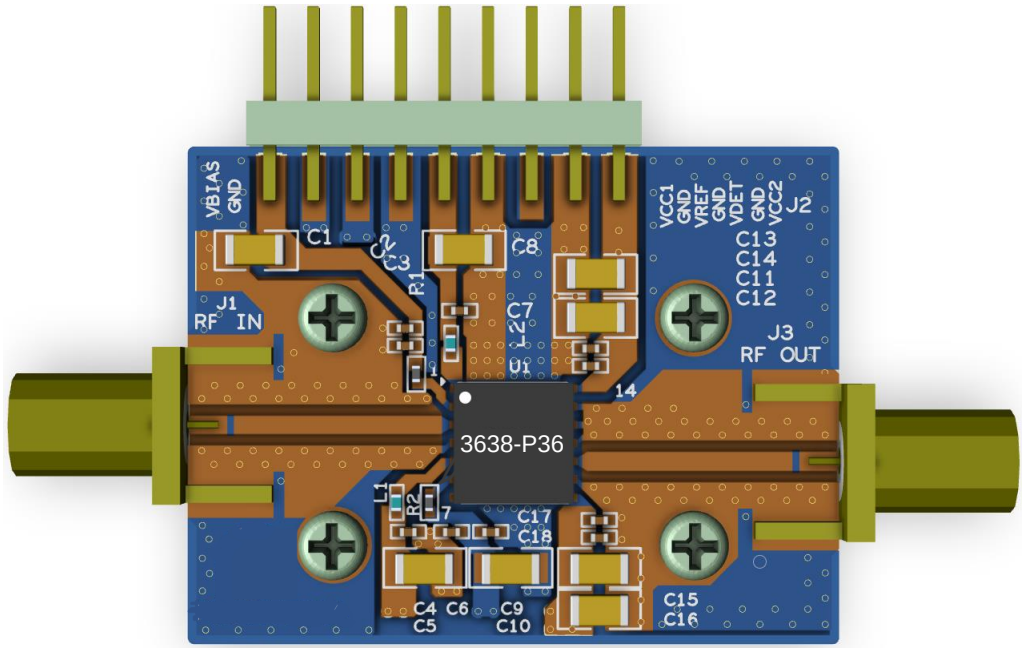


Figure 5 .Evaluation Board PCB information

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 VBAIS to 5V then turn on VREF to 1.8V in order.
3.Apply RF signal

Turn-on sequence

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

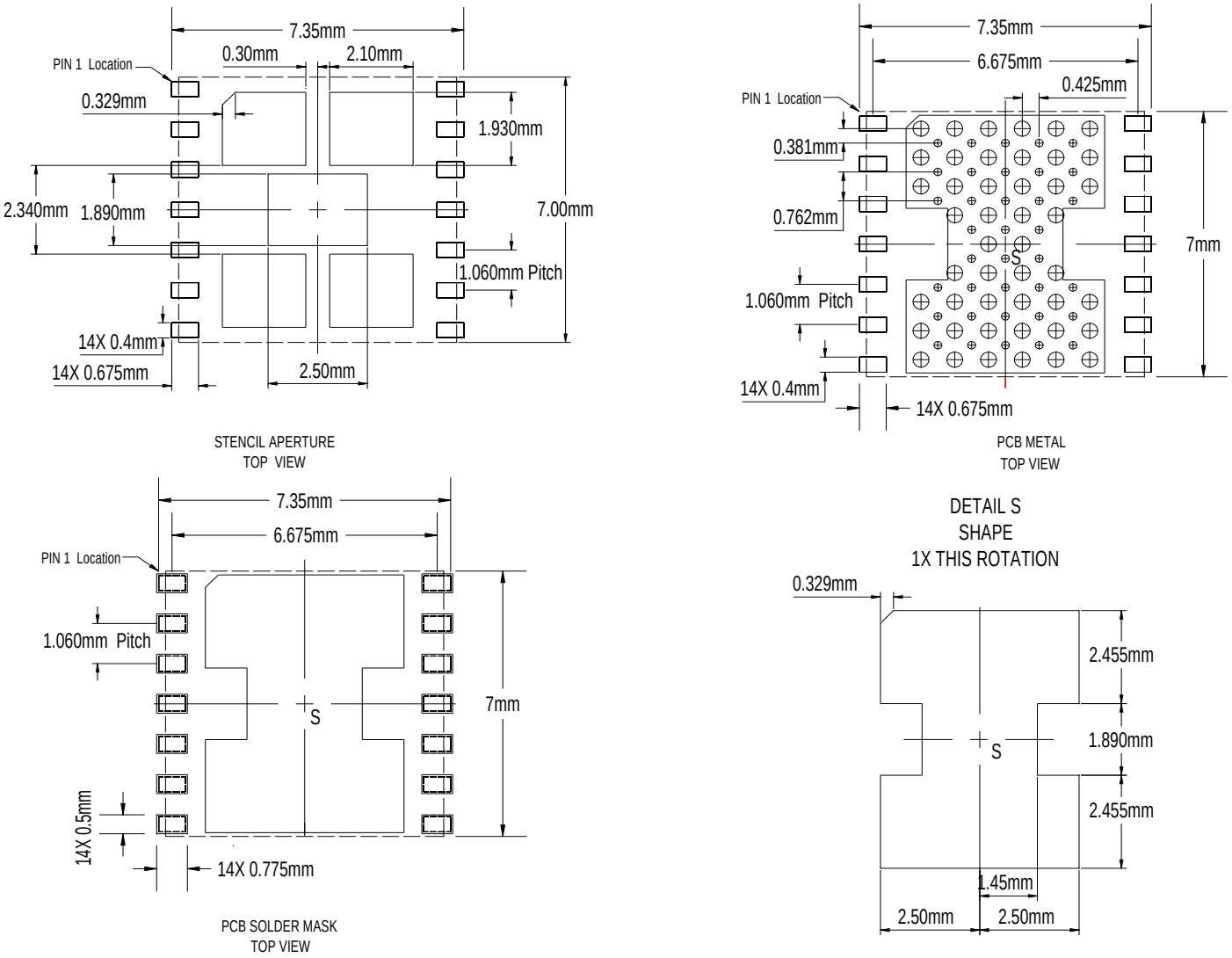


Figure 6.PCB Layout Footprint

Notes:
(1) UNLESS SPECIFIED DIMENSIONS ARE SYMMETRICAL ABOUT CENTER LINES SHOWN.
(1) VIAS SHOWN IN PCB METAL VIEW ARE FOR REEFRENCE ONLY.
NUMBER & SIZE OF THERMEL VIAS REQUIRED DEPENDENT ON HEAT DISSIPATION REQUIREMENT AND THE PCB PROCESS CAPANILITY.

Package Dimensions

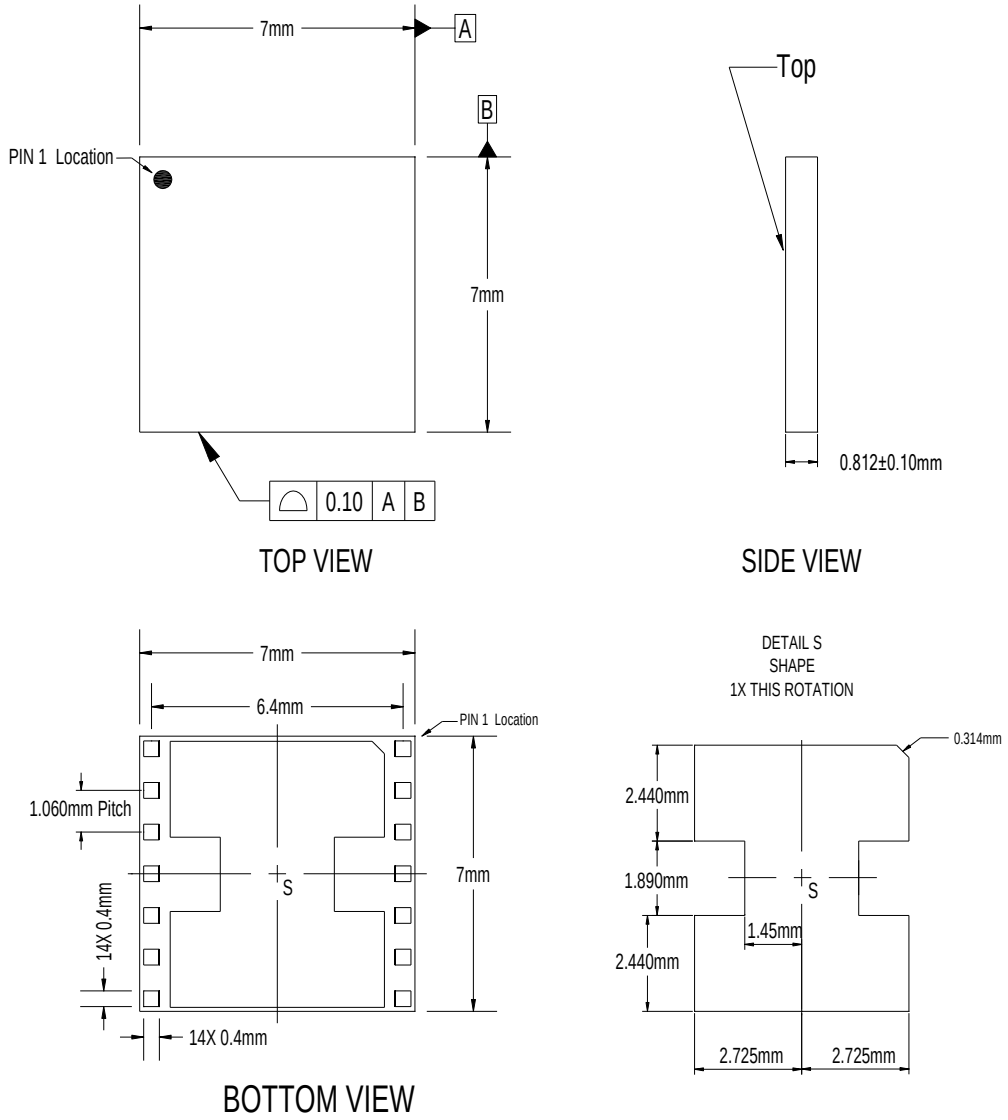


Figure 7 . Package Dimensions

Notes:
1.Tolerance is ±0.050mm unless otherwise specified.
2.Among the 14pins on both sides, the size of the GND pin is 0.06mm larger than that of the other pins

Tape and Reel Information

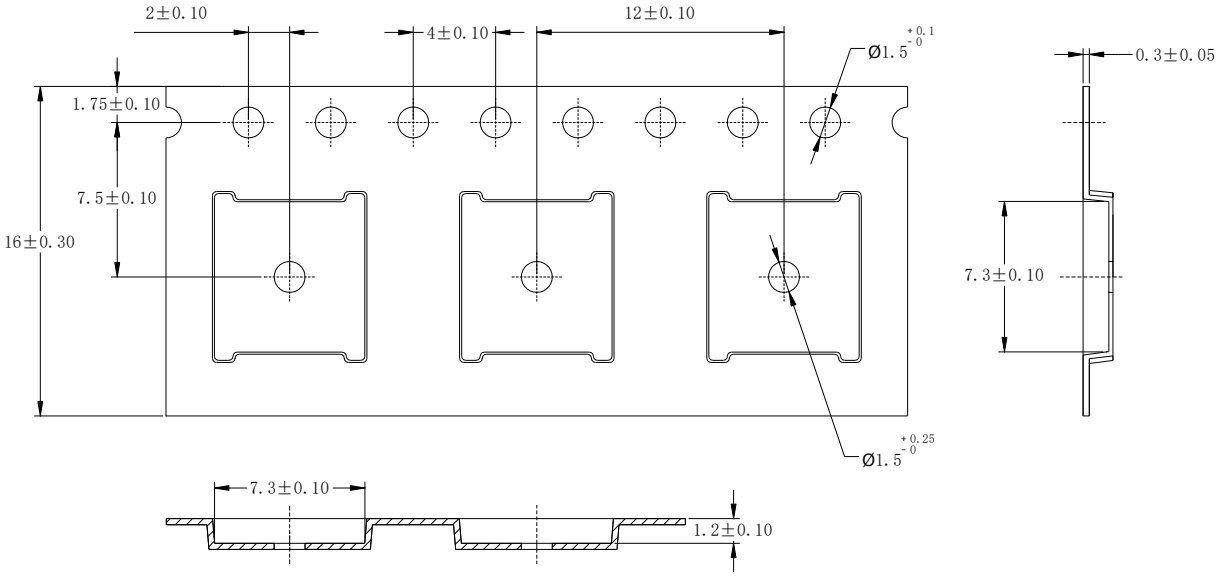


Figure 8.

Technical requirements：
1.CARRIER TAPE COLOR:BLACK
2.THE MATERIAL:PS
3.MOLD# LGA/QFN（7×7）
4.COVER TAPE WIDTH:10.3±0.1mm
5.COVER TAPE COLOR:TRANSPARENT