

Features

- 3.2~3.8GHz Frequency Range
- 28dB Gain (Typ.)
- 33dBm P1dB (Typ.)
- ≥ 10 dB Input Return Loss
- 3.5~5.0V Power Supply
- Integrated Output Power Detector
- Integrated ESD Protection Unit
- Advanced InGaP/GaAs HBT Technology

Applications

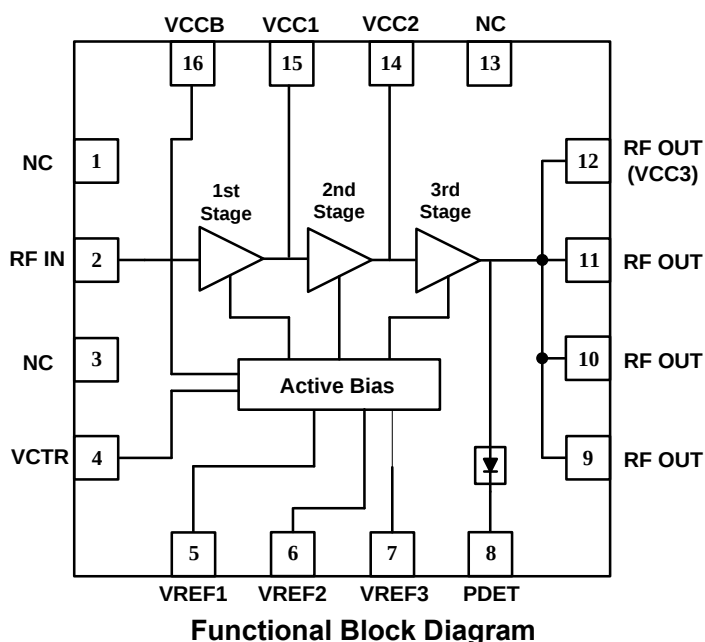
- 5G Communication
- Jammer

Product Description

The AC352833 is a high-integrated power amplifier MMIC intend for 5G wireless communication application. This power amplifier provides a typical gain of 28 dB and P1dB of 33dBm at 3.5GHz. It needs different matching circuit for different frequency range. Its typical quiescent bias condition is 5.0V at 400mA. The device is manufactured on an advanced InGaP/GaAs Heterojunction Bipolar Transistor (HBT) process. The AC352833 is assembled in a 16-pin, 4mm×4mm, QFN package, it is internally integrated with ESD protection unit.

Ordering Information

- AC352833 3.2~3.8GHz MMIC Power Amplifier
- AC352833-EVB1 3.4~3.6GHz AC352833 Evaluation Board



AC352833

3.2GHz-3.8GHz GaAs MMIC 2W Power Amplifier

Pin Description

Pin No.	Symbol	Description
2	RF IN	RF input
5, 6, 7	VREF1, VREF2, VREF3	Bias current control voltage
8	PDET	Power detect
9, 10, 11, 12	RF OUT (VCC3)	RF output and supply voltage for stage 3
14	VCC2	Supply voltage for stage 2
15	VCC1	Supply voltage for stage 1
16	VCCB	Supply voltage for bias
1, 3, 4, 13	NC/GND	No connection or ground
PKG base	GND	Ground connection



Caution! ESD sensitive device.

ESD Rating: Class1C
 Value: Passes $\geq 1000V$ min.
 Test: Human Body Model (HBM)
 Standard: JEDEC Standard JESD22-A114

ESD Rating: Class IV
 Value: Passes $\geq 1000V$ min.
 Test: Charged Device Model (CDM)
 Standard: JEDEC Standard JESD22-C101

MSL Rating: Level 3 at +260 °C convection reflow
 Standard: JEDEC Standard J-STD-020

Absolute Maximum Ratings

Parameter	Symbol	Rating	Unit
Input RF Power	RF IN	+8	dBm
Supply Voltage	VCC1, VCC2, VCC3, VCCB	-0.5 to +5.5	V
Reference Voltage	VREF1, VREF2, VREF3	-0.5 to +3.0	V
Operating Ambient Temperature	T _{OP}	-40 to +85	°C
Storage Temperature	T _{ST}	-55 to +150	°C

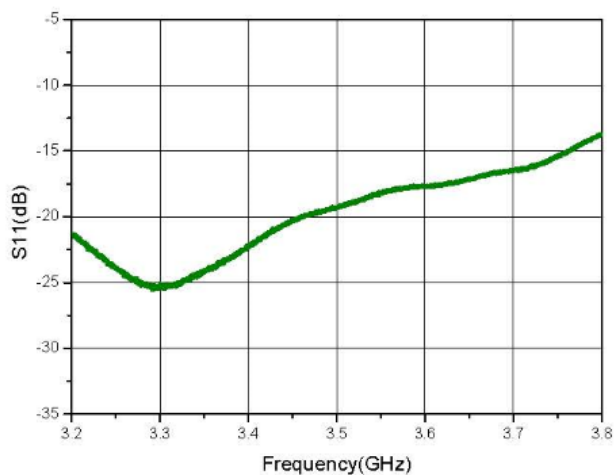
Electrical Specifications

Parameter	Specification			Unit	Conditions
	Min.	Typ.	Max.		
Compliance and Nominal Conditions					VCC1=VCC2=VCC3=VCCB=5V, ICQ=400mA, T _{OP} =+25°C,
Frequency range	3.2	3.5	3.8	GHz	
Small signal gain		28		dB	
Input Return loss		18		dB	Pin=-20dBm
Output Return loss		9		dB	Pin=-20dBm
Output power at 1dB compression		33		dBm	
ACLR		-31.5		dBc	Pout=28dBm
Supply voltage	3.5	5.0	5.25	V	
Power added efficiency		37		%	Pout=33dBm
Power Supply					
Voltage for VREF1& VREF2		2.85		V	
Voltage for VREF3		2.80		V	
Current for VREF1& VREF2		5		mA	VREF1= VREF2=2.85V, VREF3=2.80V
Current for VREF3		3		mA	VREF1= VREF2=2.85V, VREF3=2.80V
Total Quiescent current, ICQ		400		mA	VREF1= VREF2=2.85V, VREF3=2.80V
Total Operating current, ICC		1080		mA	Pout=33dBm

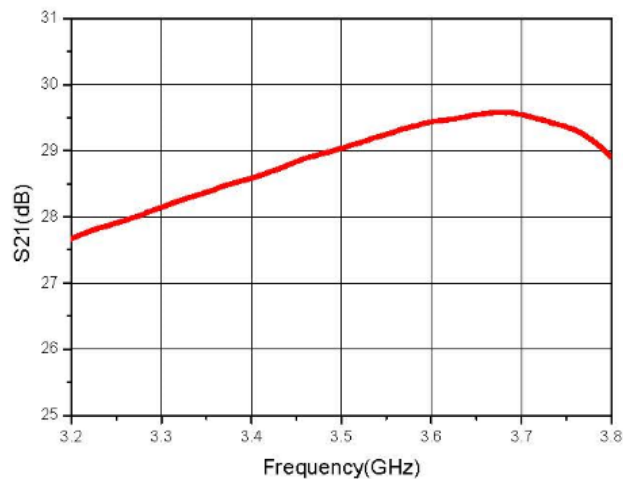
Typical Performance

(VCC1= VCC2=VCC3=VCCB=5V, ICQ=400mA, T_{Op}=+25°C as measured on the evaluation board, unless otherwise noted)

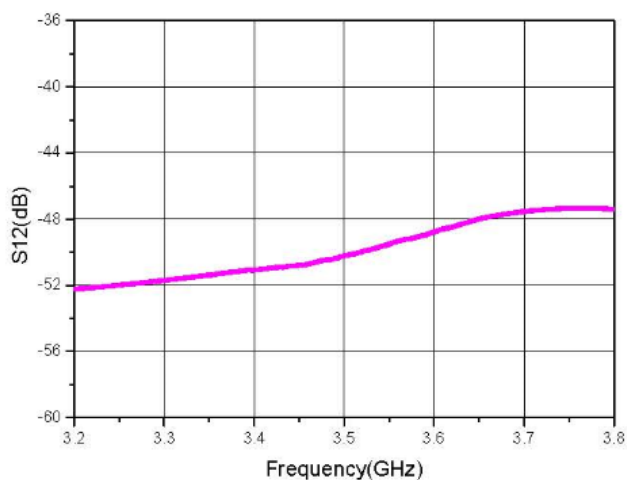
S11 vs. Frequency



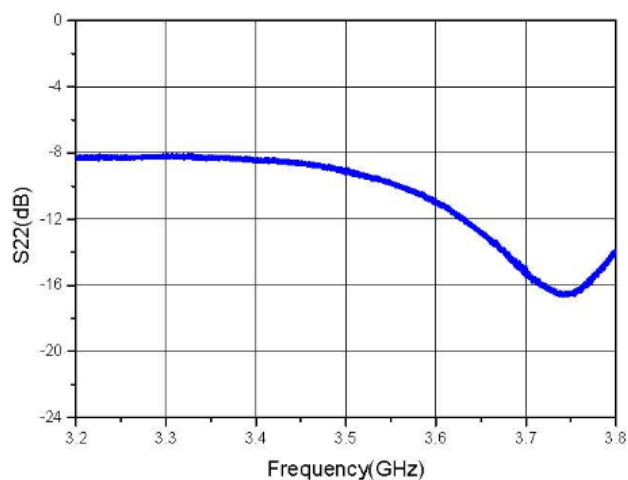
S21 vs. Frequency



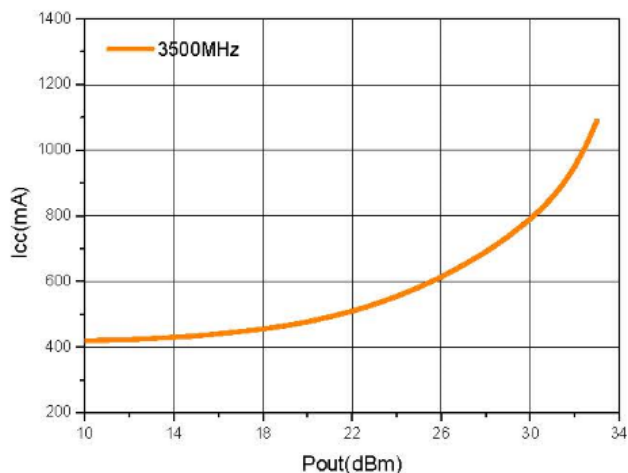
S12 vs. Frequency



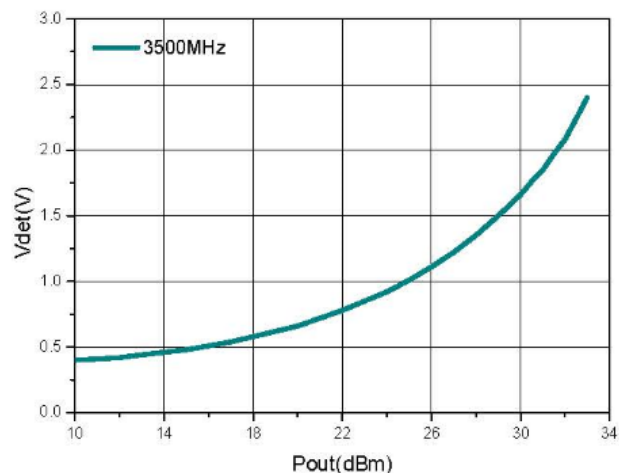
S22 vs. Frequency



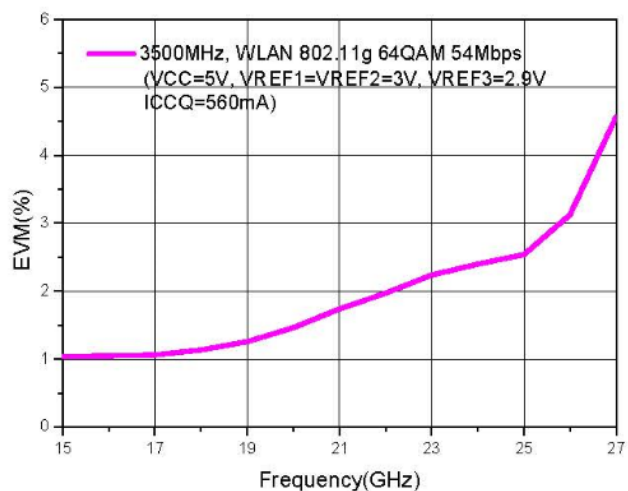
Icc vs. Pout



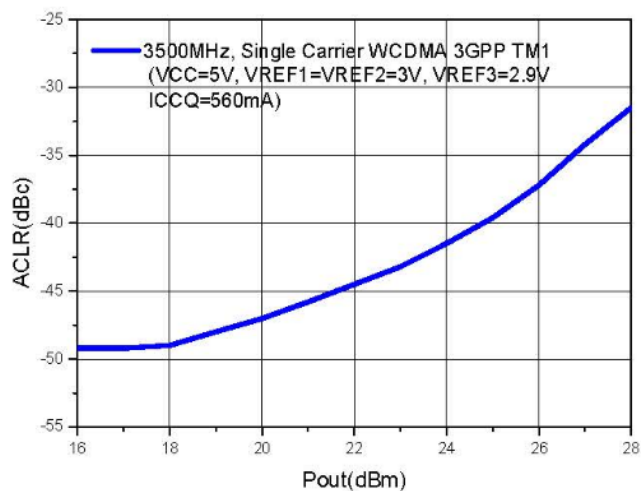
Vdet vs. Pout



EVM vs. Pout



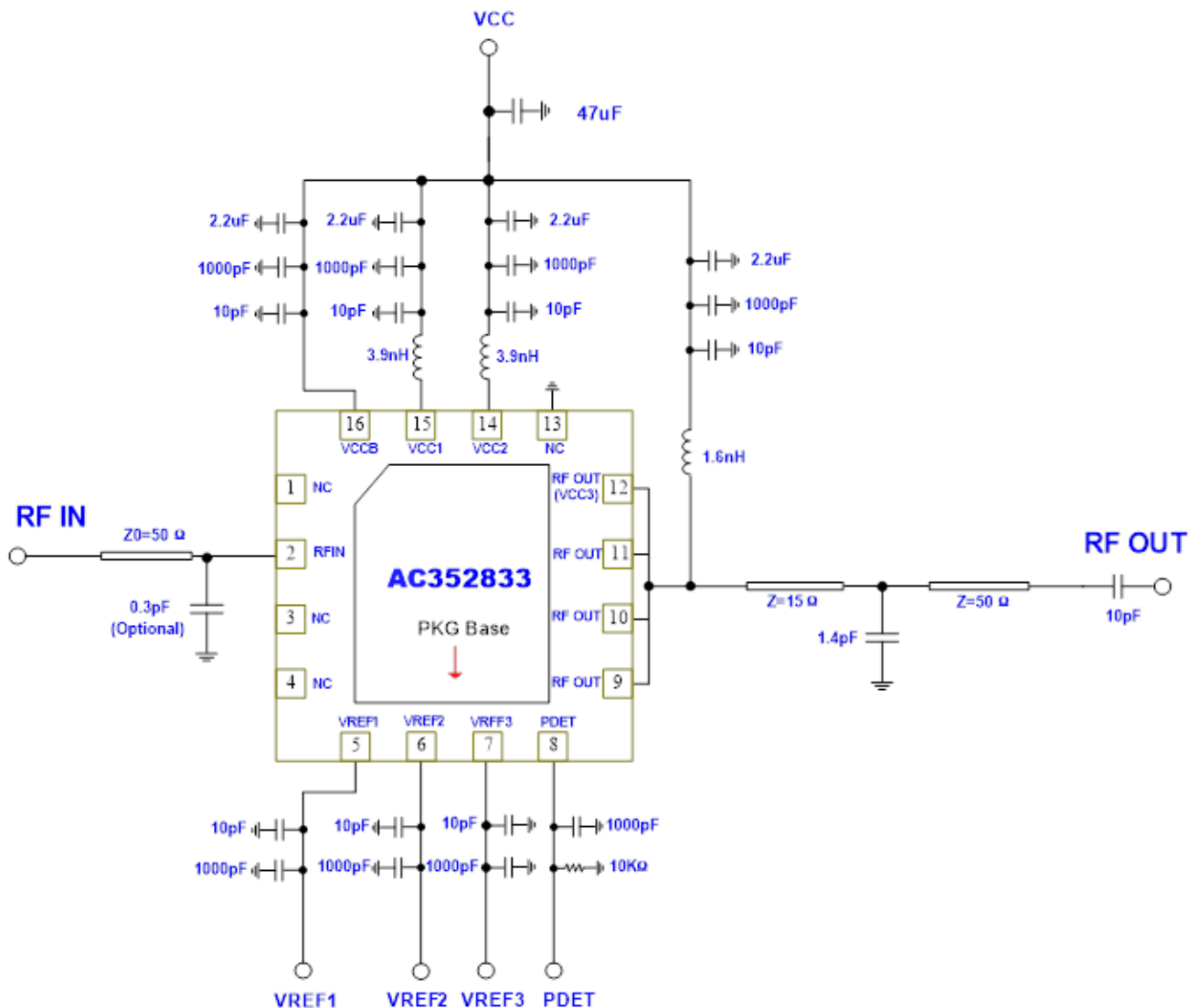
ACLR vs. Pout



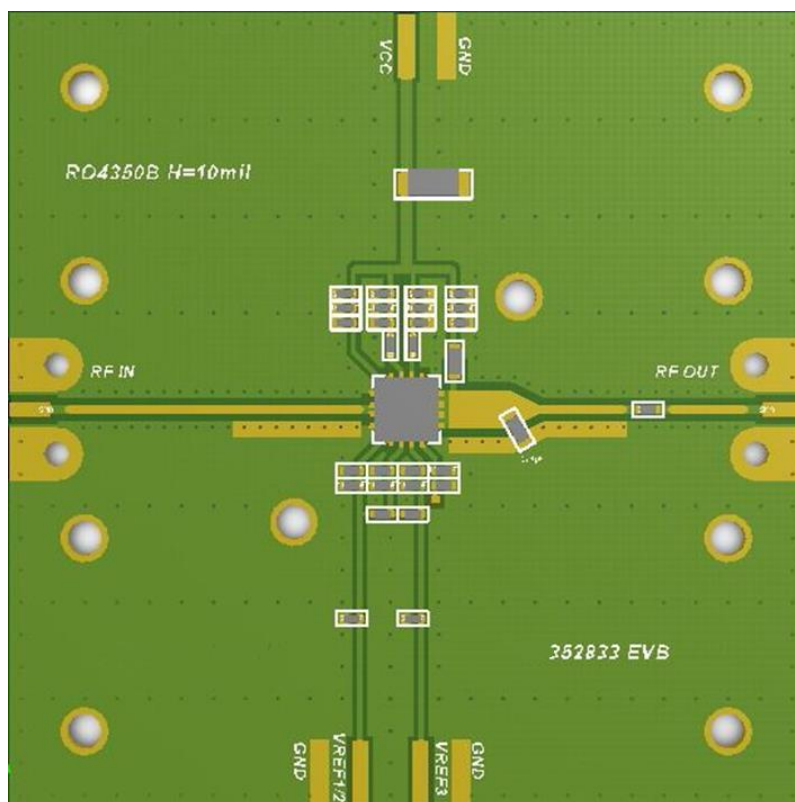
AC352833

3.2GHz-3.8GHz GaAs MMIC 2W Power Amplifier

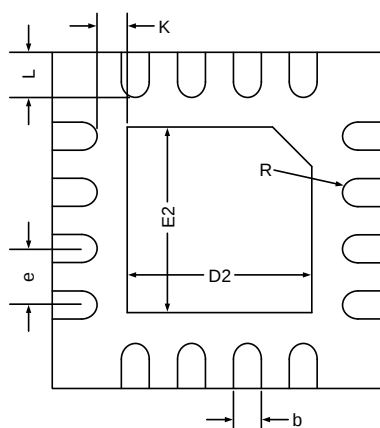
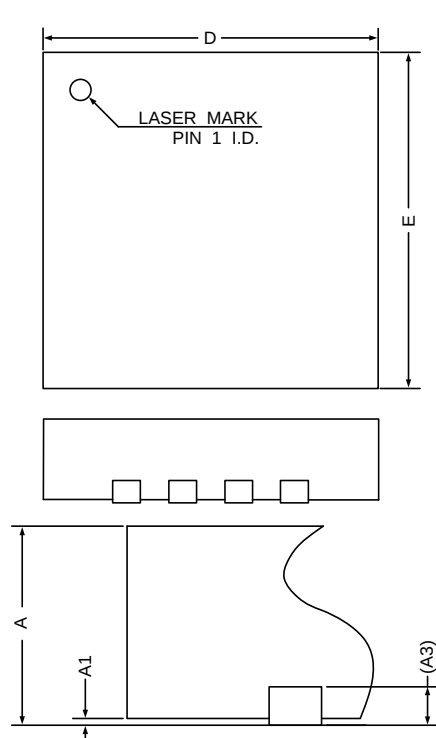
3400~3600MHz Evaluation Board Schematic



3400~3600MHz Evaluation Board Layout



Packaging Diagram



COMMON DIMENSIONS
(UNITS OF MEASURE = MILLIMETER)

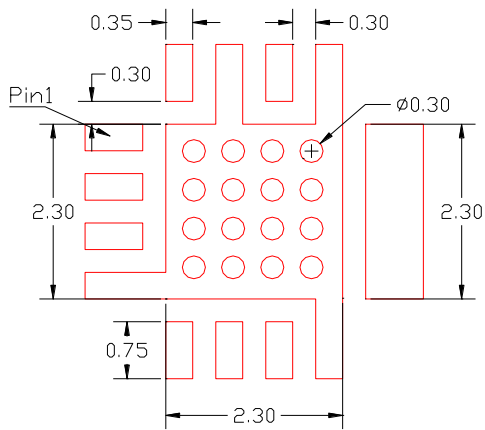
SYMBOL	MIN	NOM	MAX
A	0.70	0.75	0.80
A1	0	0.02	0.05
A3	0.203 REF		
b	0.25	0.30	0.35
D	3.95	4.00	4.05
E	3.95	4.00	4.05
D2	2.00	2.15	2.25
E2	2.00	2.15	2.25
e	0.60	0.65	0.70
K	0.375	—	—
L	0.35	0.40	0.45
R	0.09	—	—

NOTE:

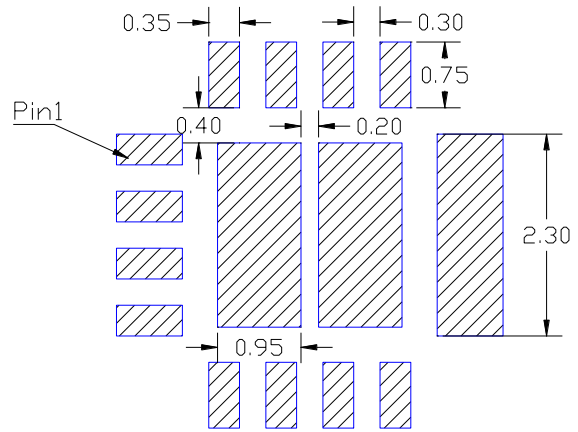
ALL DIMENSIONS REFER TO JEDEC STANDARD MO-220 WEED-4.

PCB Land Pattern and Stencil Outline

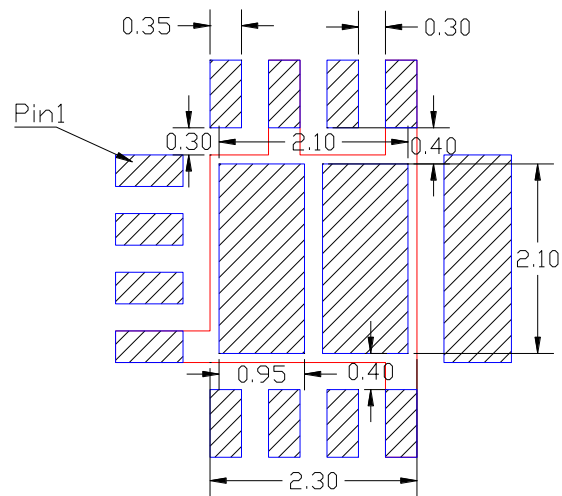
(Units: millimeters)



PCB Land Pattern (Top View)

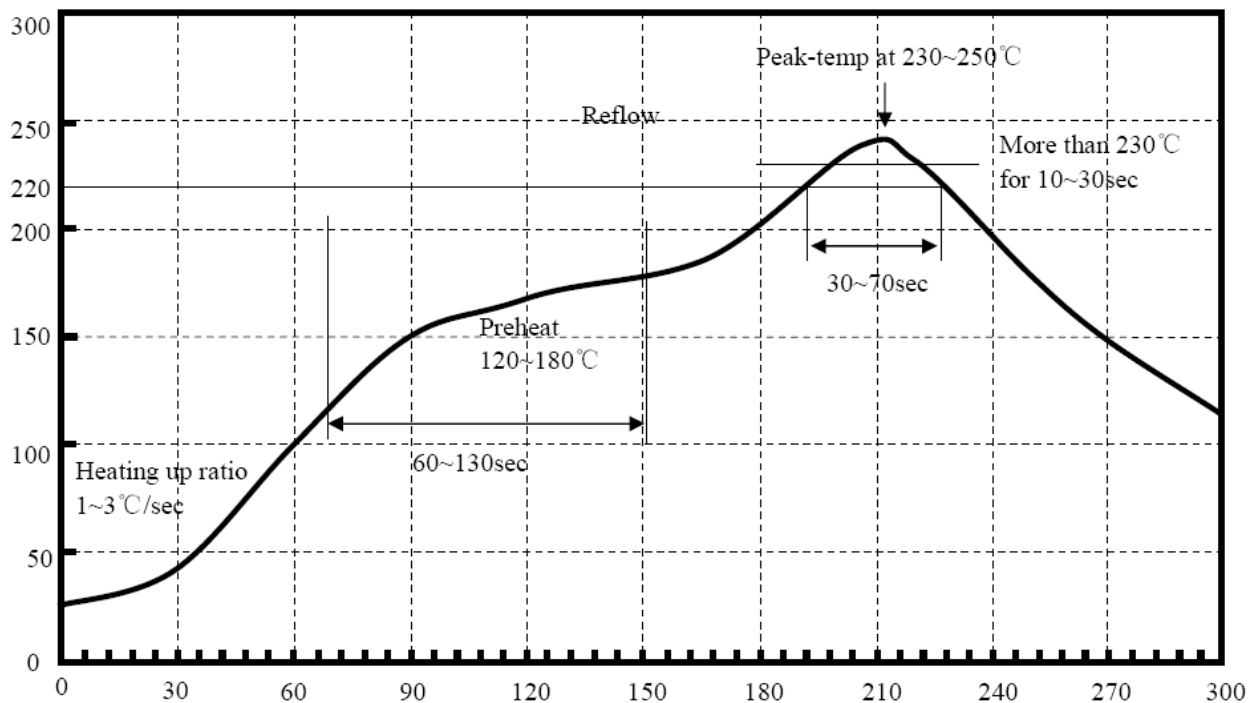


Stencil Outline



Combined PCB Land Pattern and Stencil Outline

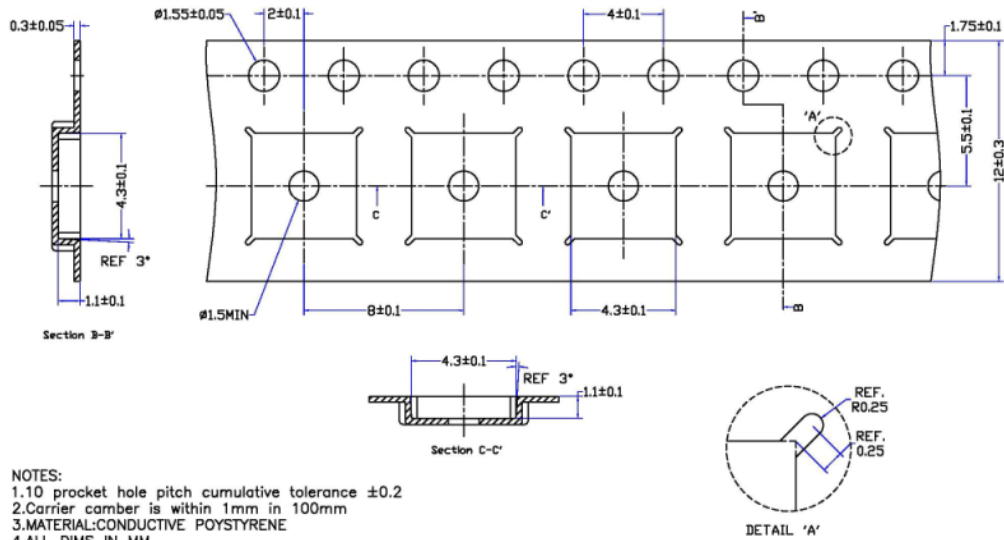
Recommended Solder Temperature



Recommended Temperature

Sn95.5Ag4.0Cu0.5

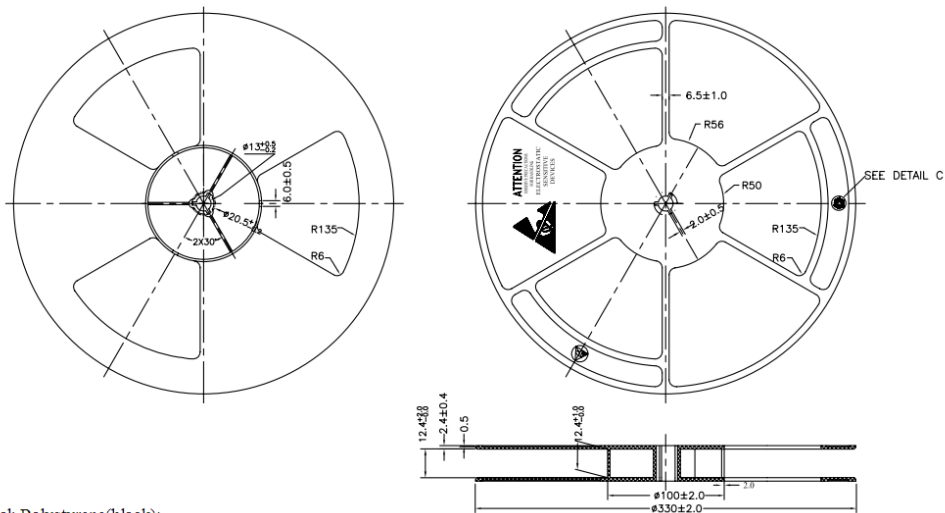
Tape dimensions and Orientation



NOTES:

- 1.10 pocket hole pitch cumulative tolerance ± 0.2
- 2.Carrier camber is within 1mm in 100mm
- 3.MATERIAL: CONDUCTIVE POLYSTYRENE
- 4.ALL DIMS IN MM
5. There must not be foreign body adhesion and the state of the surface must be excellent
- 6.17" PAPER-Reel, 51875 pockets
7. Surface resistance $1 \times 10^{11}(\text{max}) \text{ OHMS/SQ}$

Reel dimensions and Orientation



Notes:

1. Material: Polystyrene(black);
2. Surface flatness: Maximum permissible error is 3mm;
3. Dimensions in millimeters;
4. Surface resistance: $10^5 \text{ TO } 10^{10} \text{ OHMS/SQ}$;
5. General tolerances: ± 0.25