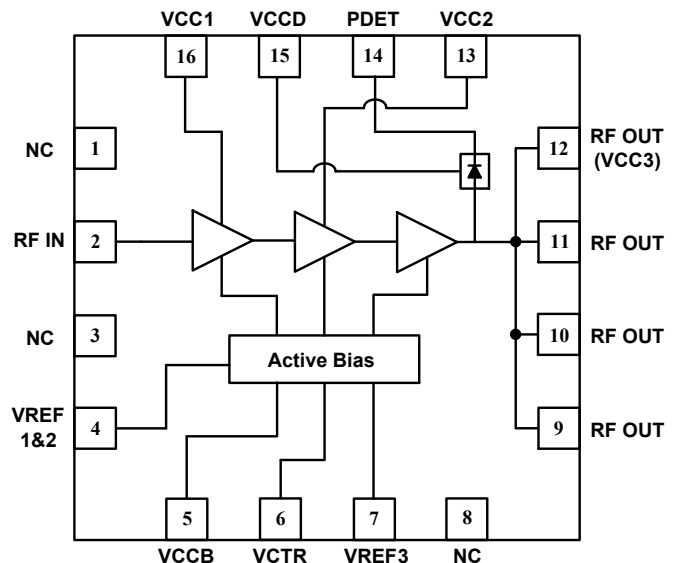


Features

- 0.9~1.7GHz Frequency Range
- 31dB Gain (Typ.)
- 37dBm Saturation Output Power (P_{sat})
- ≥ 15 dB Input Return Loss
- 3.3~6.0V Supply Voltage
- 50mA Quiescent Current
- Integrated Output Power Detector
- Integrated ESD Protection Unit
- Advanced InGaP/GaAs HBT Technology



Functional Block Diagram

Applications

- Compass Satellite Communication
- Compass Satellite Navigation

Product Description

The YP163137 is a high-power, high-efficiency Power Amplifier optimized for the applications in bands from 900MHz to 1700MHz (it needs different matching circuit for different frequency range), such as Compass Satellite Communication and Navigation. The Power Amplifier provides a typical gain of 31 dB and P_{sat} of 37dBm with CW input, typical quiescent bias condition is 6.0V at 50mA. The device is manufactured on an advanced InGaP/GaAs Heterojunction Bipolar Transistor (HBT) process. The YP163137 is assembled in a 16-pin, 4mm×4mm, QFN package, it is internally integrated with ESD protection unit.

Ordering Information

- YP163137 1.6GHz Power Amplifier Module
- YP163137-EVB 1.6~1.7GHz YP163137 Evaluation Board

Pin Description

Pin No.	Symbol	Description
2	RF IN	RF input
4, 7	VREF1&2, VREF3	Bias current control voltage
5	VCCB	Supply voltage for bias
6	VCTR	Power on/off control voltage. Apply >2.5VDC to power down the three power amplifier stages. Apply 0VDC to power up. If function is not desired, pin6 may be connected to GND.
9, 10, 11, 12	RF OUT (VCC3)	RF output and Supply voltage for stage 3
13	VCC2	Supply voltage for stage 2
14	PDET	Power detect
15	VCCD	Supply voltage for power detector
16	VCC1	Supply voltage for Stage 1
1, 3, 8	NC/GND	No connection or ground
PKG Base	GND	Ground connection

Absolute Maximum Ratings


Caution! ESD Sensitive Device.

Parameter	Symbol	Rating	Unit
Input RF Power	RF IN	+10	dBm
Supply Voltage	VCC1,VCC2, VCC3,VCCB	-0.5 to +6.0	V
Reference Voltage	VREF1&2, VREF3	-0.5 to +3.0	V
Operating Ambient Temperature	T _{OP}	-55 to +105	°C
Storage Temperature	T _{ST}	-55 to +150	°C

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

ESD Rating: Class IV
Value: Passes ≥ 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

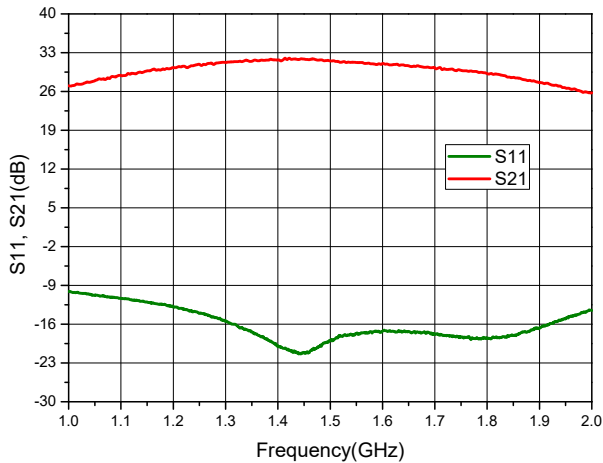
Electrical Specifications

Parameter	Specification			Unit	Condition
	Min.	Typ.	Max.		
Compliance and Nominal Conditions					VREF1&2=VREF3=2.5V, T _{OP} =+25°C
Frequency range	1.5	1.6	1.7	GHz	
Output power		36.5		dBm	VCC1=VCC2=VCC3=VCCB=5.0V, Pulse Signal
		37.2		dBm	VCC1=VCC2=VCC3=VCCB=6.0V, Pulse Signal
Small signal gain		31		dB	
Input return loss		17		dB	
Reference current, IREF		3		mA	Total Current of VREF1&2+VREF3
Quiescent current, ICQ		50		mA	Total Current of VCC1+VCC2+VCC3
Operating current, ICC		1980		mA	Pout=37dBm, CW

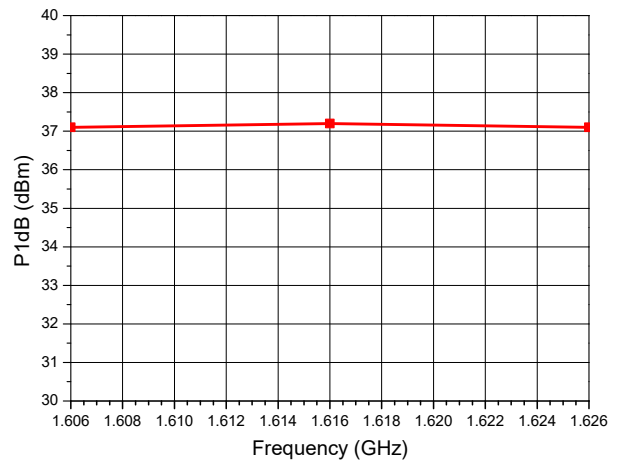
Typical Performance

(Test Condition: $V_{CC1}=V_{CC2}=V_{CC3}=V_{CCB}=6V$, $I_{CQ}=50mA$, $T_{OP}=+25^{\circ}C$)

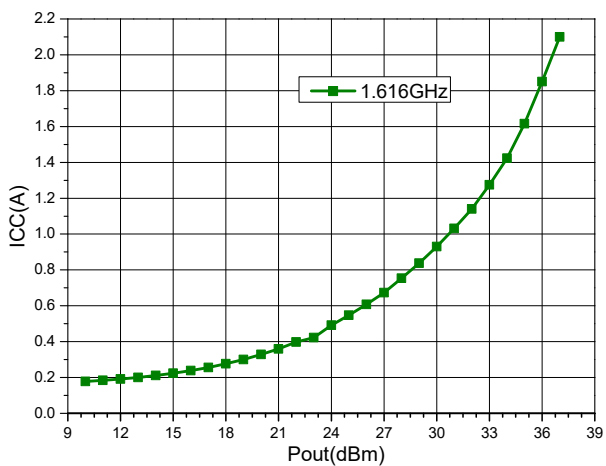
Broadband Gain & Return Loss



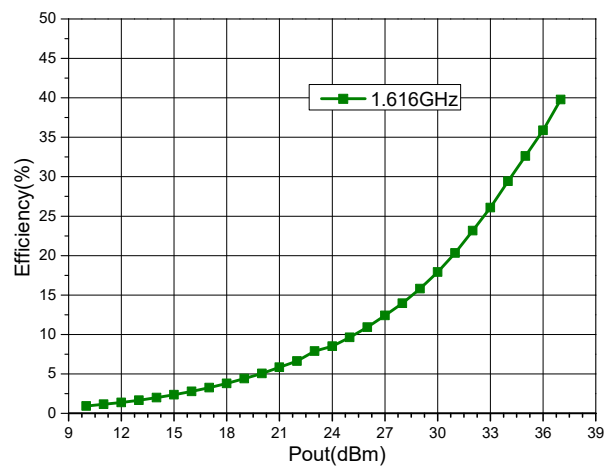
P1dB vs. Frequency



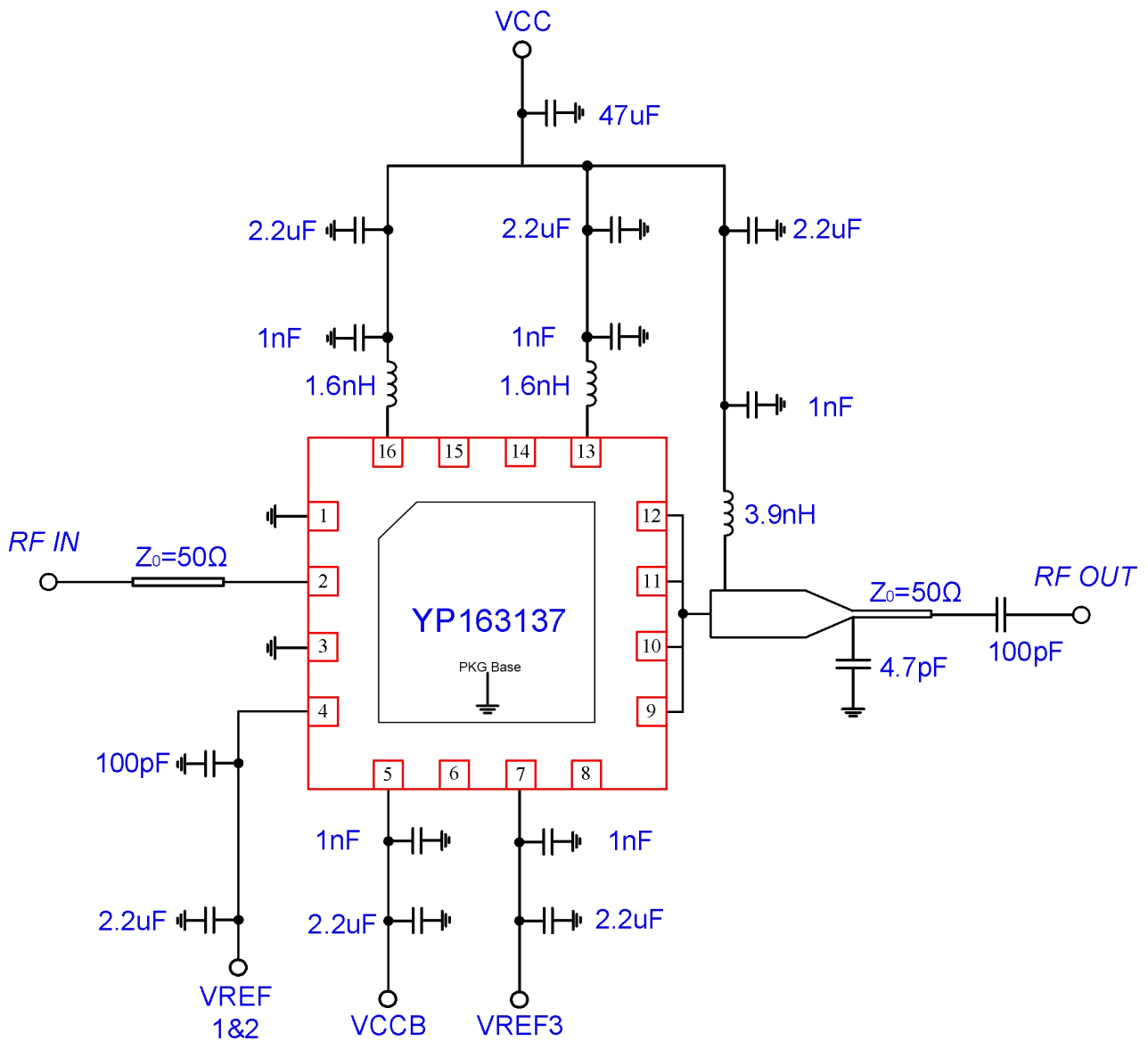
ICC vs. Output Power



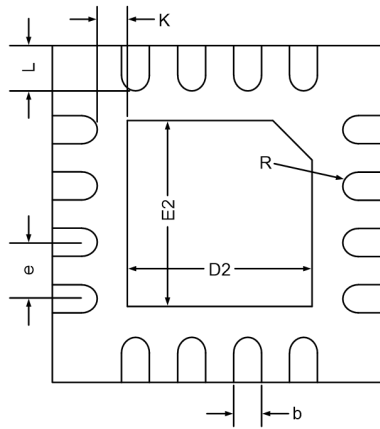
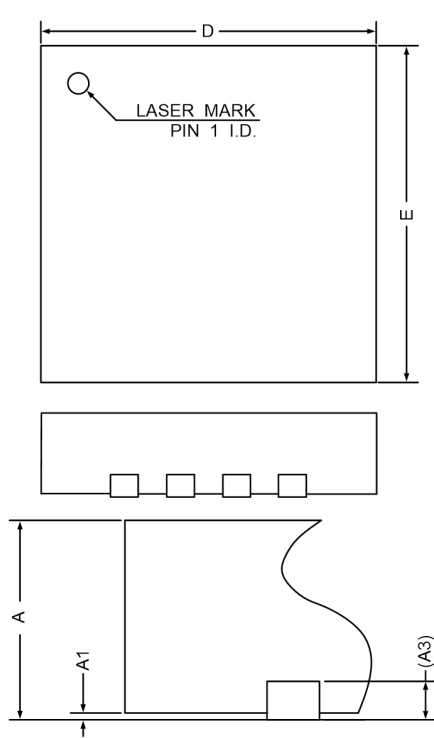
Efficiency vs. Output Power



Evaluation Board Schematic



Packaging Diagram



COMMON DIMENSIONS
(UNITS OF MEASURE = MILLIMETER)

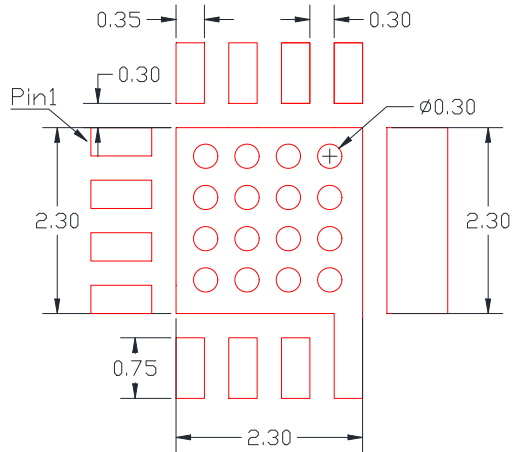
SYMBOL	MIN	NOM	MAX
A	0.70	0.75	0.80
A1	0	0.02	0.05
A3	0.203 REF		
b	0.25	0.30	0.35
D	3.95	4.00	4.05
E	3.95	4.00	4.05
D2	2.00	2.15	2.25
E2	2.00	2.15	2.25
e	0.60	0.65	0.70
K	0.375	—	—
L	0.35	0.40	0.45
R	0.09	—	—

NOTE:

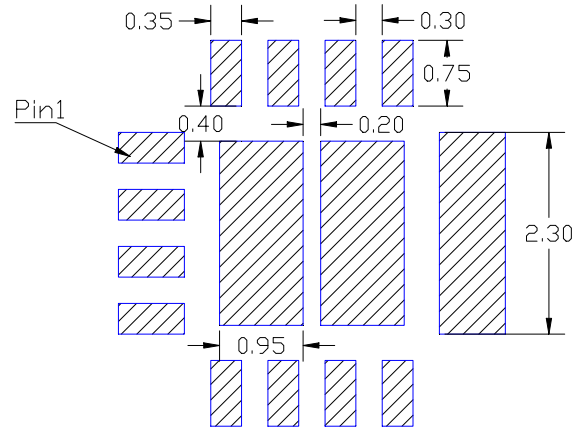
ALL DIMENSIONS REFER TO JEDEC STANDARD MO-220 WEED-4.

PCB Land Pattern and Stencil Outline

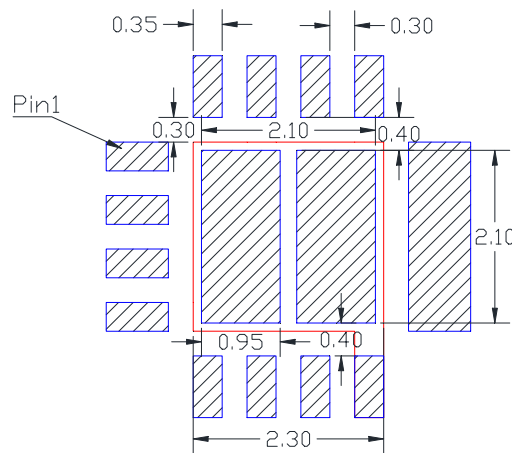
(Units: millimeters)



PCB Land Pattern (Top View)

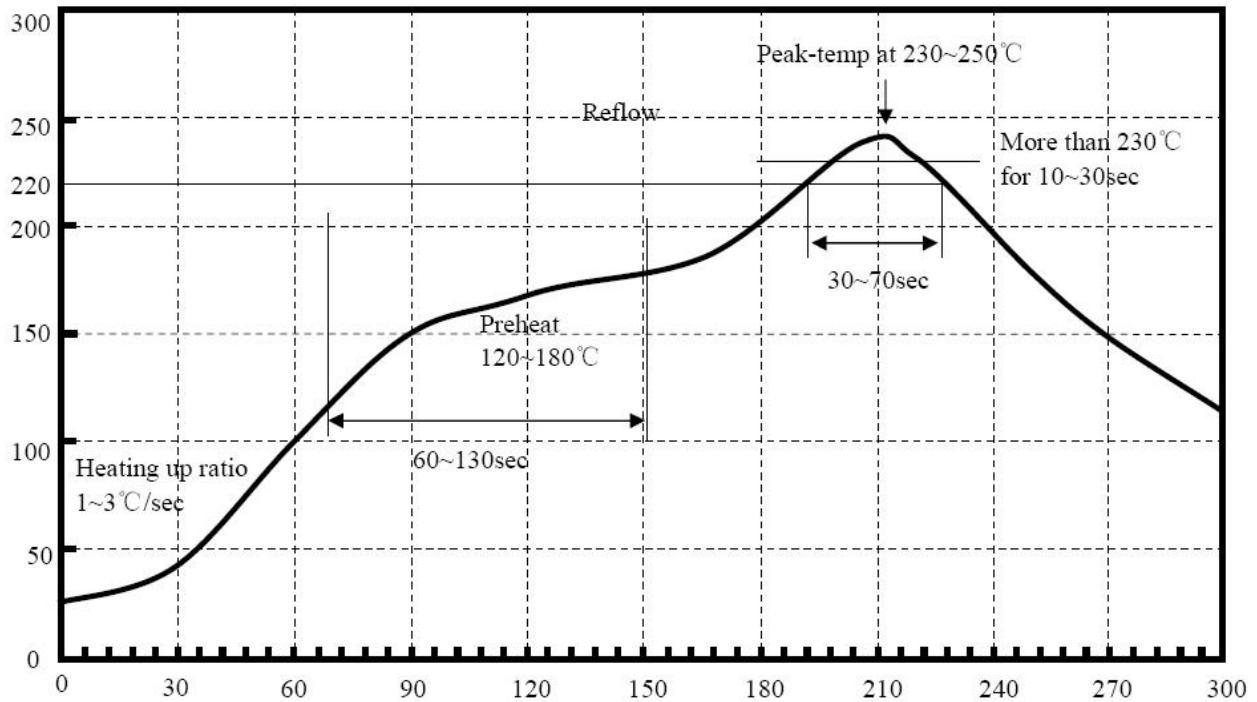


Stencil Outline



Combined PCB Land Pattern and Stencil Outline

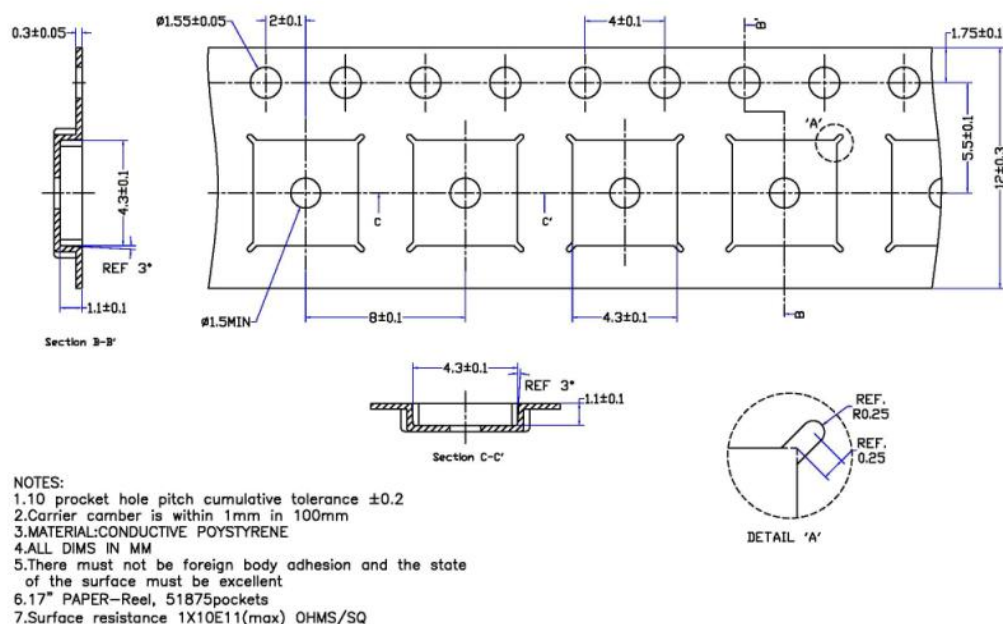
Recommended Solder Temperature



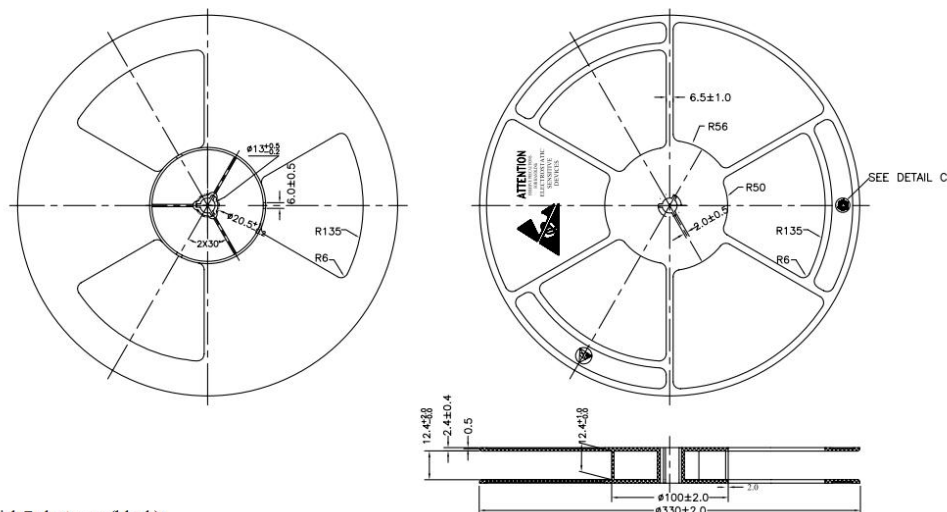
Recommended Temperature

Sn95.5Ag4.0Cu0.5

Tape dimensions and Orientation



Reel dimensions and Orientation



Notes:

1. Material: Polystyrene(black);
2. Surface flatness: Maximum permissible error is 3mm;
3. Dimensions in millimeters;
4. Surface resistance: 105TO 1010/OHMS/SQ;
5. General tolerances: ± 0.25