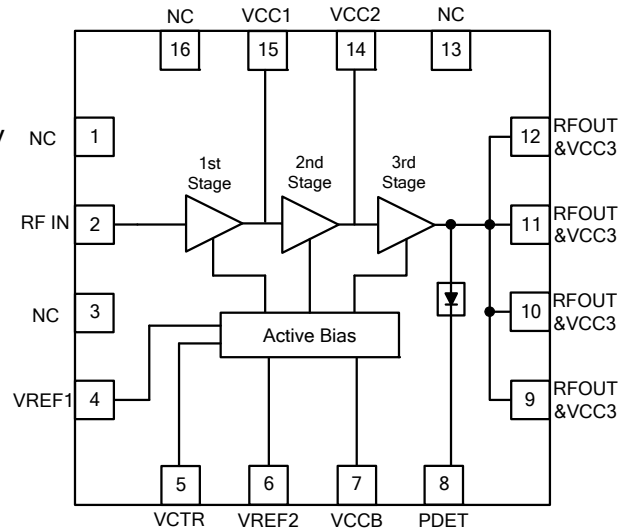


### Features

- 35dB Gain (Typ.)
- 33dBm P<sub>-1dB</sub> @ Supply Voltage=5V
- 2.5% EVM WLAN @P<sub>out</sub>=27dBm, Supply Voltage=5V
- 320mA Quiescent Current@ Supply Voltage=5V
- 3~5V Supply Voltage
- Integrated Output Power Detector
- ESD protection all ports above 1000V HBM, forward and reverse voltage

*RoHS & Pb-Free Product*



**Functional Block Diagram**

### Applications

- IEEE 802.11b/g/n WLAN
- 3G/4G
- 5G Band41

### Product Description

The YP243433 is a three-stage, high-linearity, high-gain power amplifier. The device is manufactured on an advanced InGaP/GaAs HBT process. This amplifier provides a typical gain of 35dB and P<sub>1dB</sub> power of 33dBm, typical bias condition is 5V at 320mA. The input is internally matched to 50Ω and requires a minimum of external matching components to cover the entire 1.8GHz to 2.8GHz (it needs different matching circuit for different frequency range). The YP243433 is assembled in a 16-Pin, 4×4mm<sup>2</sup>, QFN package. It is internally integrated with ESD protection circuitry on all ports.

### Pin Description

Pin No.	Symbol	Description
1, 3, 13, 16	NC	No connection or connect to ground
2	RF IN	RF input
4, 6	VREF1/VREF2	Bias current control voltage
5	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, pin5 may be connected to GND
7	VCCB	Supply voltage for bias circuit
8	PDET	Output power detector
9, 10, 11, 12	RFOUT&VCC3	RF output and Stage3 supply voltage
14, 15	VCC2, VCC1	Stage2, Stage1 supply voltage
PKG Base	GND	Ground connection

### Absolute Maximum Ratings

Parameter	Symbol	Rating	Unit
Input RF Power with 50Ω Output Load	RF IN	+3	dBm
Supply Voltage	VCC1,VCC2, VCC3,VCCB	-0.5 to +8.0	V
Reference Voltage	VREF1, VREF2	-0.5 to +2.9	V
Operating Ambient Temperature	T <sub>OP</sub>	-40 to +85	°C
Storage Temperature	T <sub>ST</sub>	-40 to +150	°C



**Caution!** ESD Sensitive Device.

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

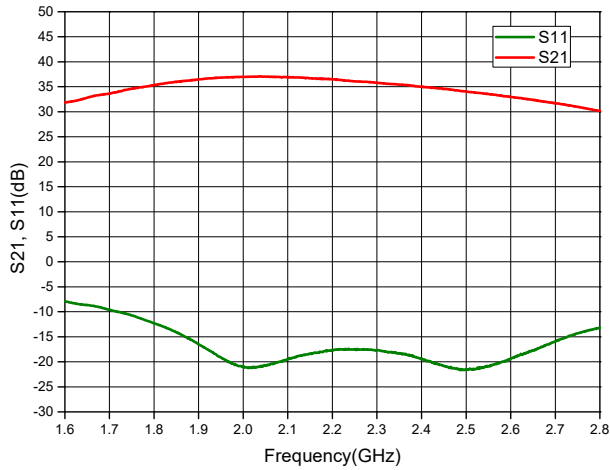
### Electrical Characteristics

Parameter	Specification			Unit	Conditions
	Min.	Typ.	Max.		
<b>WLAN IEEE802.11g</b>					VCC1=VCC2=VCC3=VCCB=5V, T <sub>OP</sub> =+25°C, Freq=2.4GHz to 2.5GHz
Frequency Range	2.4		2.5	GHz	
P <sub>-1dB</sub>		33		dBm	@ICQ=320mA, 2.442GHz
		33		dBm	@ICQ=210mA, 2.442GHz
EVM @ Pout=27dBm		2.0		%	@ICQ=320mA, 2.442GHz, 802.11g, 54Mbps, 64QAM
		3.0		%	@ ICQ=210mA,2.442GHz, 802.11g, 54Mbps, 64QAM
Operating Current, ICC @ Pout=27dBm		650		mA	@ICQ=320mA, 2.442GHz, 802.11g, 54Mbps, 64QAM
		510		mA	@ICQ=210mA,2.442GHz, 802.11g, 54Mbps, 64QAM
Small Signal Gain		34		dB	@ICQ=320mA, 2.442GHz
		35		dB	@ICQ=210mA,2.442GHz
Quiescent Current (no RF), ICQ		320		mA	VREF1=VREF2=2.83V
		210		mA	VREF1=VREF2=2.66V
Reference Current (Total), IREF		3		mA	VREF1=VREF2=2.83V
		2		mA	VREF1=VREF2=2.66V

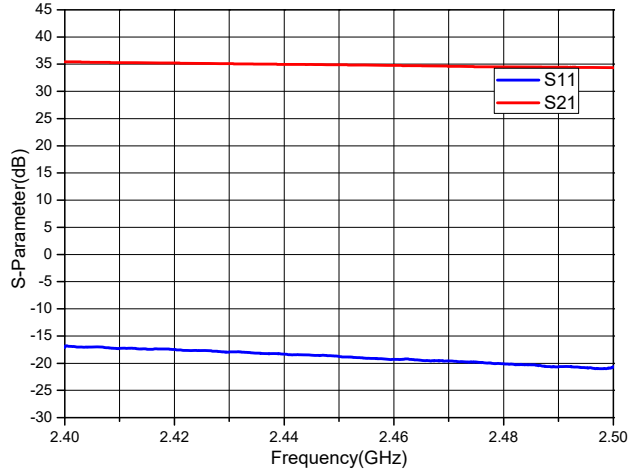
**WLAN 802.11g Performance Plots**

VCC1=VCC2=VCC3=VCCB=5V, ICQ=320mA(no RF), T<sub>OP</sub>=+25°C

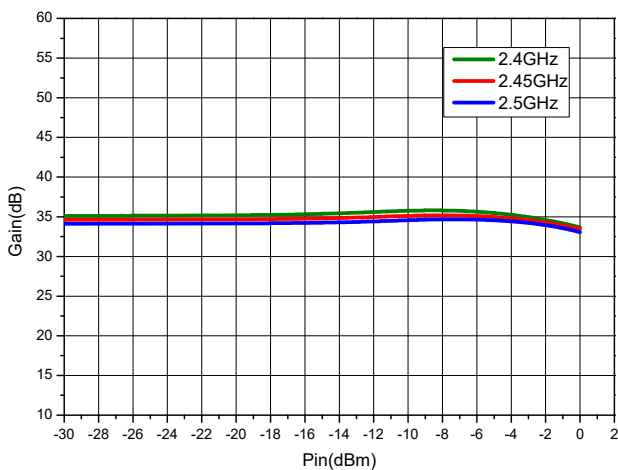
**Gain & Return Loss**



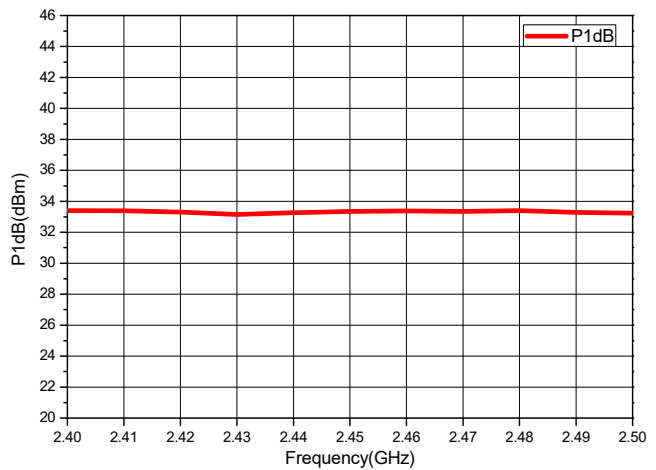
**Gain & Return Loss**



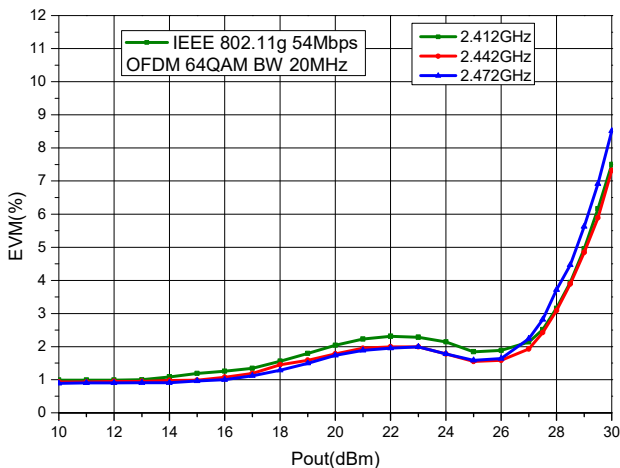
**Power Gain vs. Input Power**



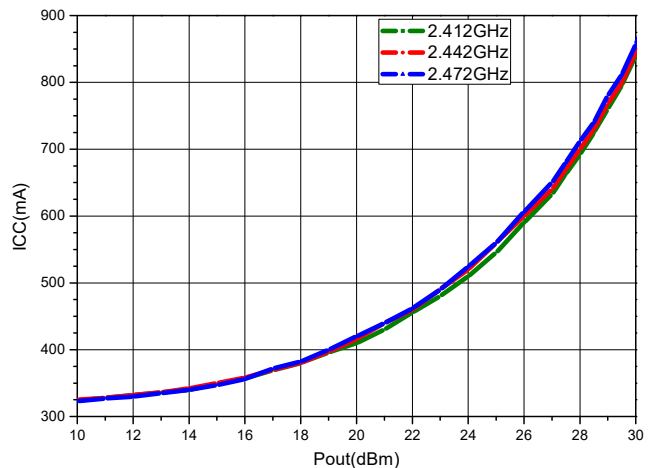
**P1dB vs. Frequency**



**EVM vs. Output Power**

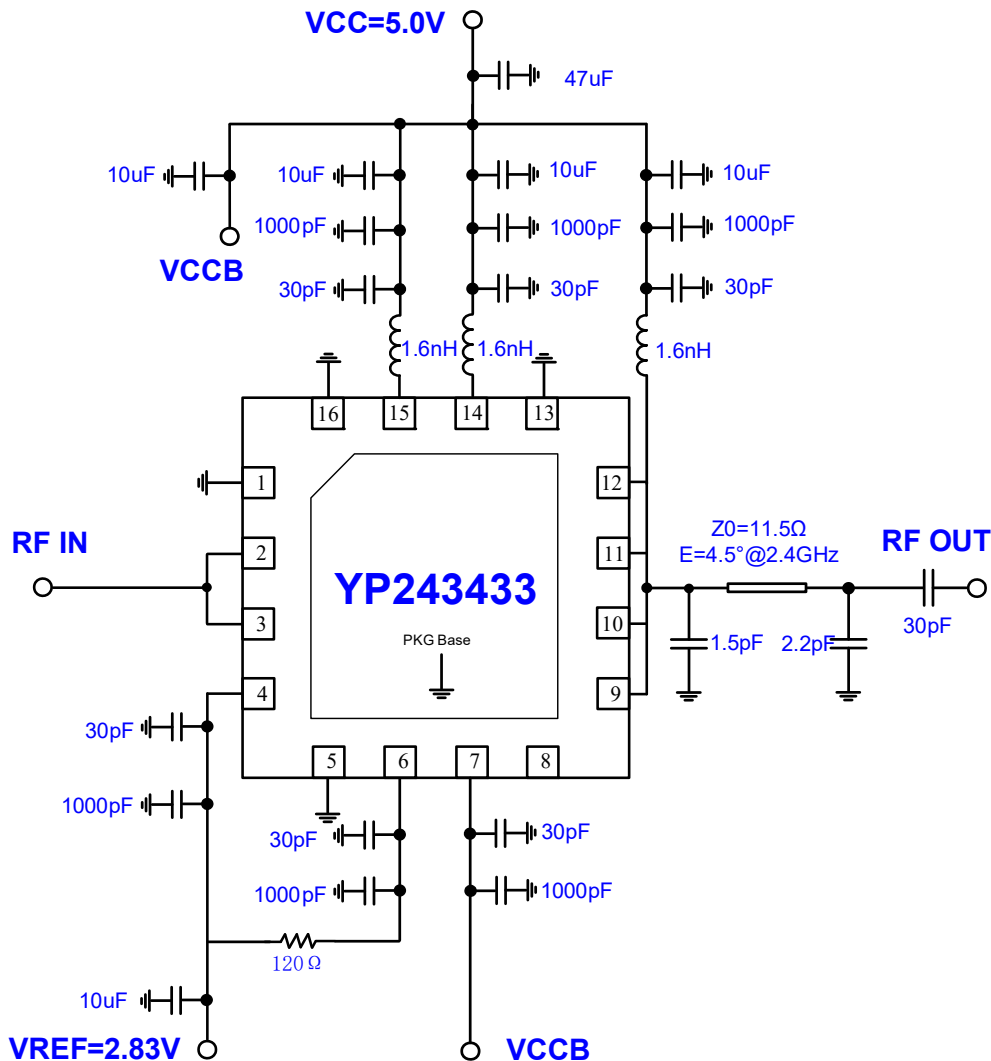


**ICC vs. Output Power**



### Evaluation Board Schematic for WLAN Application

VCC1=VCC2=VCC3=VCCB=5V, ICQ=320mA(no RF), T<sub>OP</sub>=+25°C



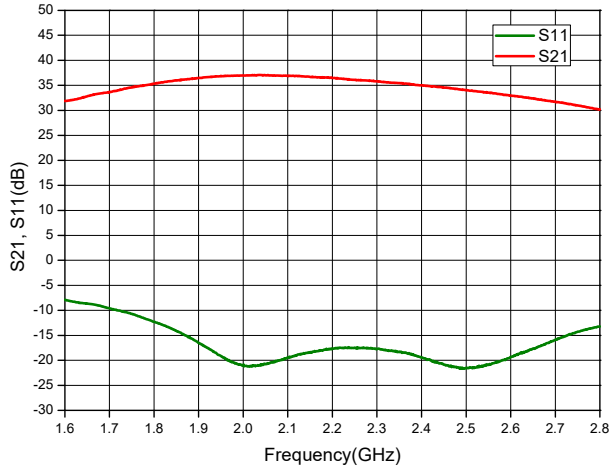
#### Notes:

1. Pin5 is power down pin. Apply >1.5 V<sub>DC</sub> to power off the PA. Apply 0 V<sub>DC</sub> to power on. If the function is not desired, this pin may be connected to GND.
2. Pin8 is active power detection port, if the function is not desired, this pin need to left unterminated (open).

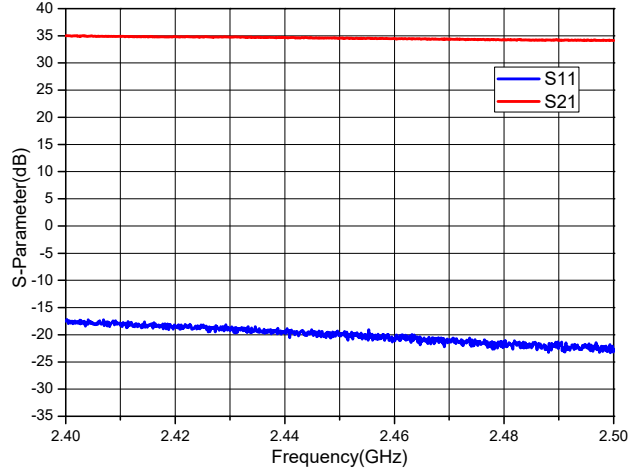
**WLAN 802.11g Performance Plots**

VCC1=VCC2=VCC3=VCCB=5V, ICQ=210mA(no RF), T<sub>OP</sub>=+25°C

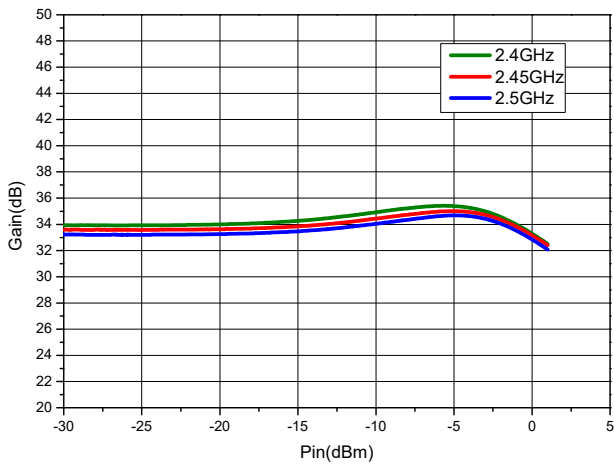
**Gain & Return Loss**



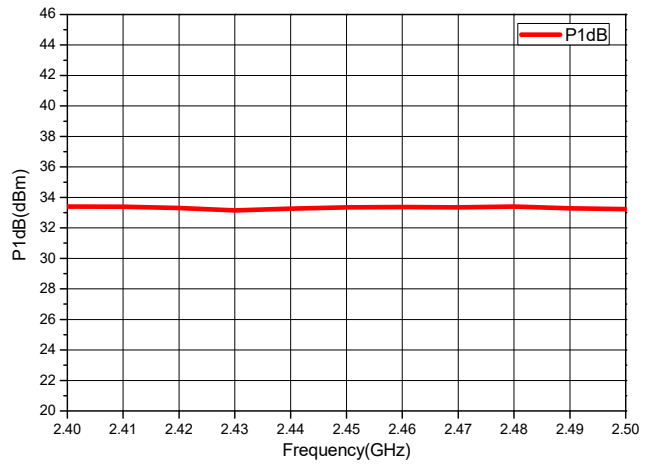
**Gain & Return Loss**



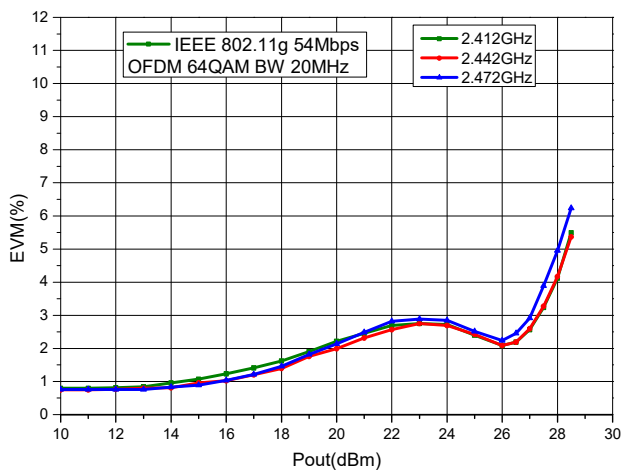
**Power Gain vs. Input Power**



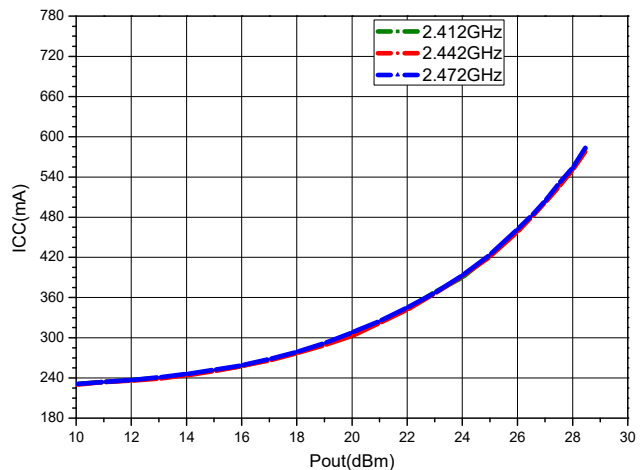
**P1dB vs. Frequency**



**EVM vs. Output Power**

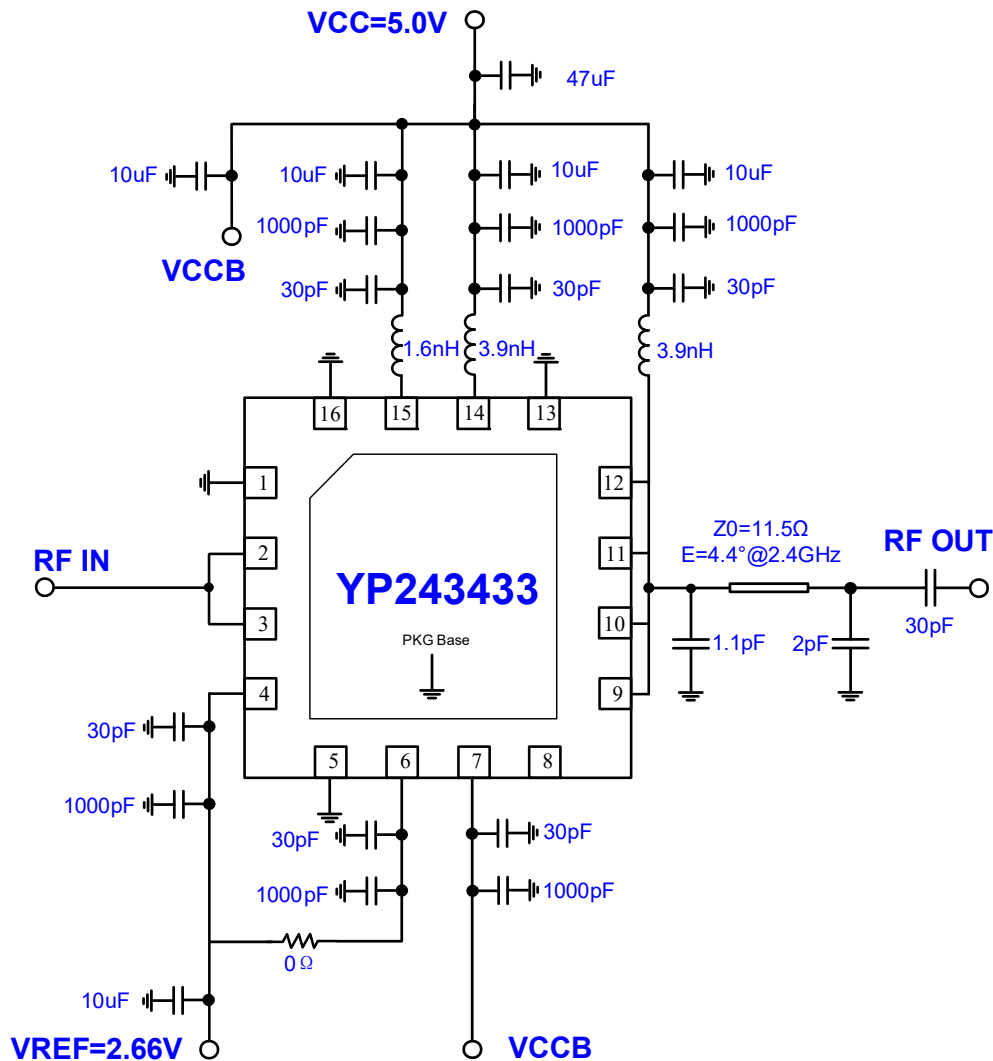


**ICC vs. Output Power**



**Evaluation Board Schematic for WLAN Application**

VCC1=VCC2=VCC3=VCCB=5V, ICQ=210mA(no RF), T<sub>OP</sub>=+25°C



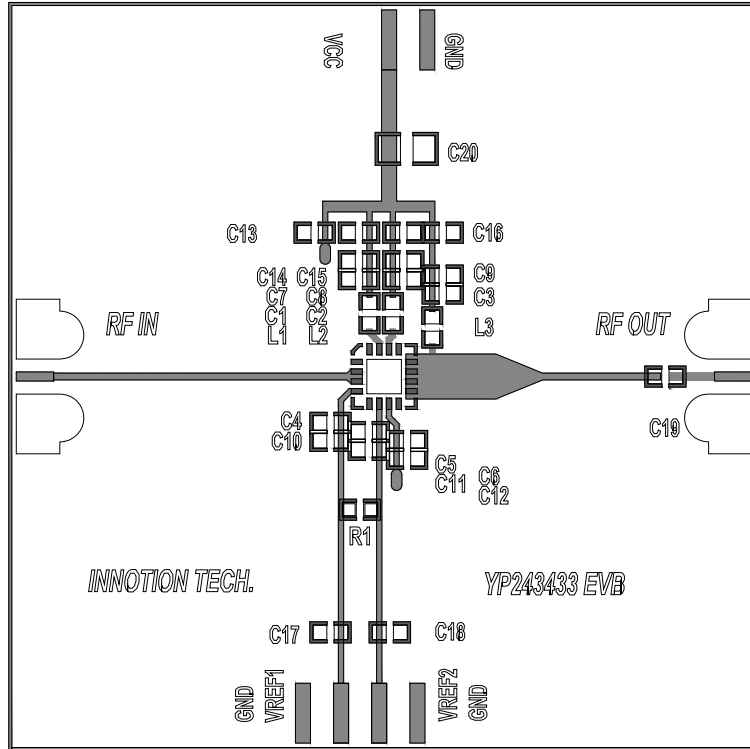
Notes:

3. Pin5 is power down pin. Apply >1.5 V<sub>DC</sub> to power off the PA. Apply 0 V<sub>DC</sub> to power on. If the function is not desired, this pin may be connected to GND.
4. Pin8 is active power detection port, if the function is not desired, this pin need to left unterminated (open).

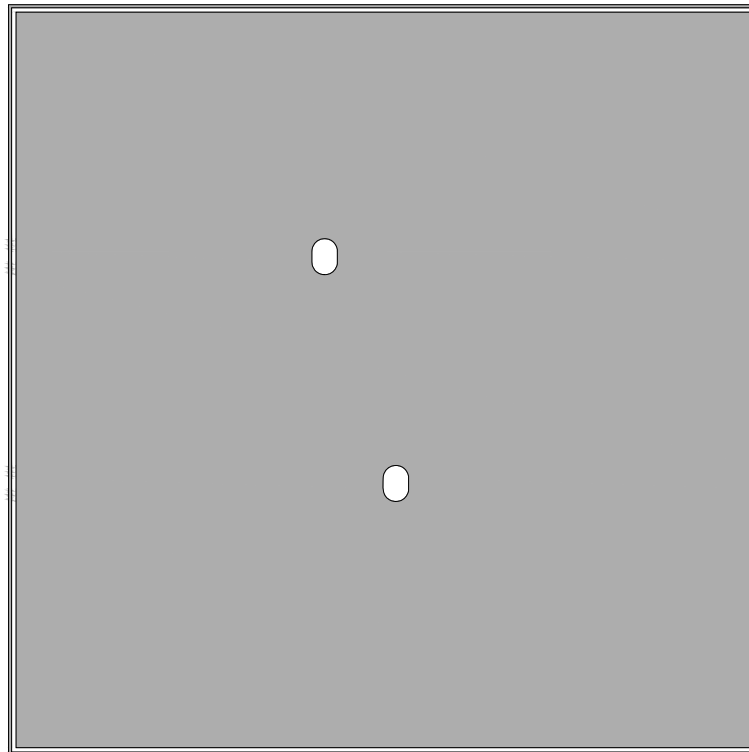
**Evaluation Board Layout**

Board Size 50mm × 50mm

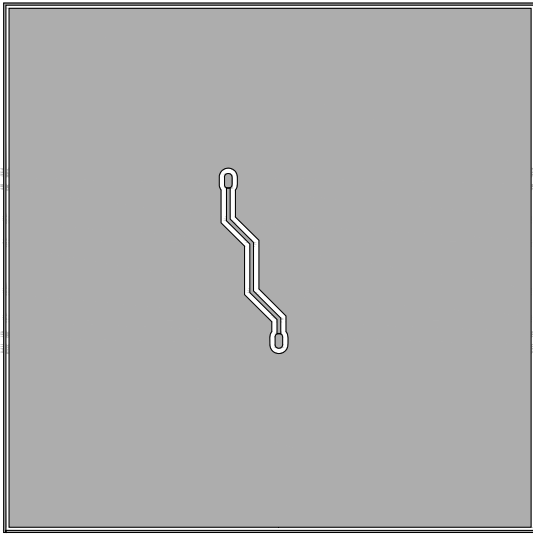
Board Thickness 0.8mm, Board Material FR4, Multi-Layer



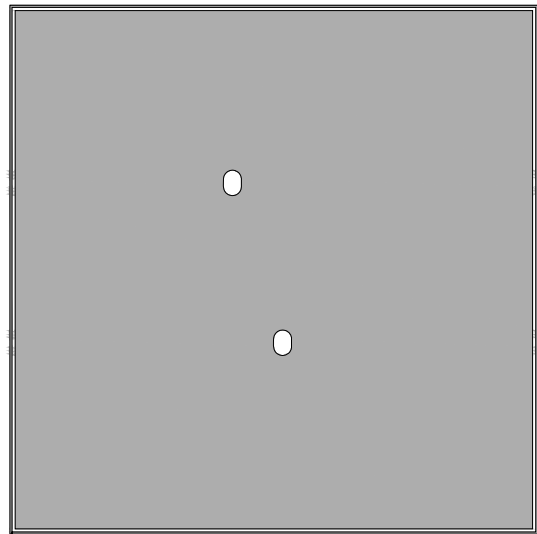
Top-Layer



Middle-Layer1



Middle-Layer2



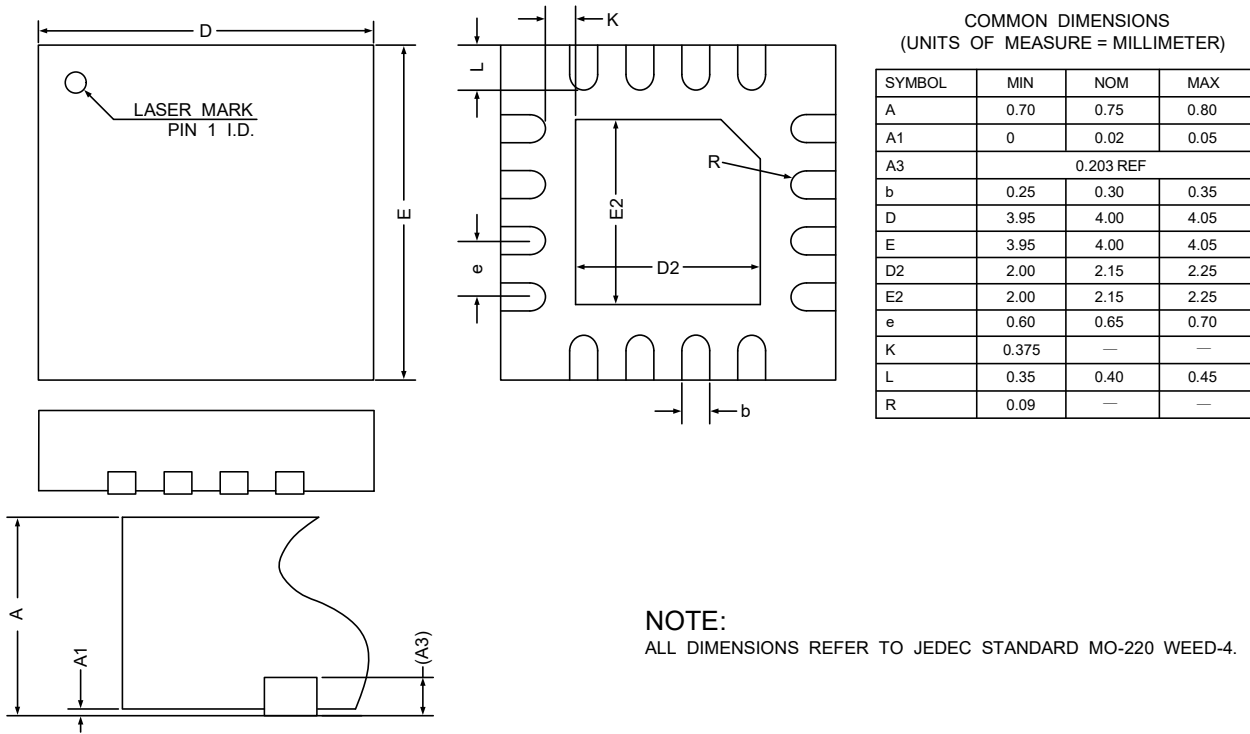
Bottom-Layer

**Layer Details of DEMO Board**

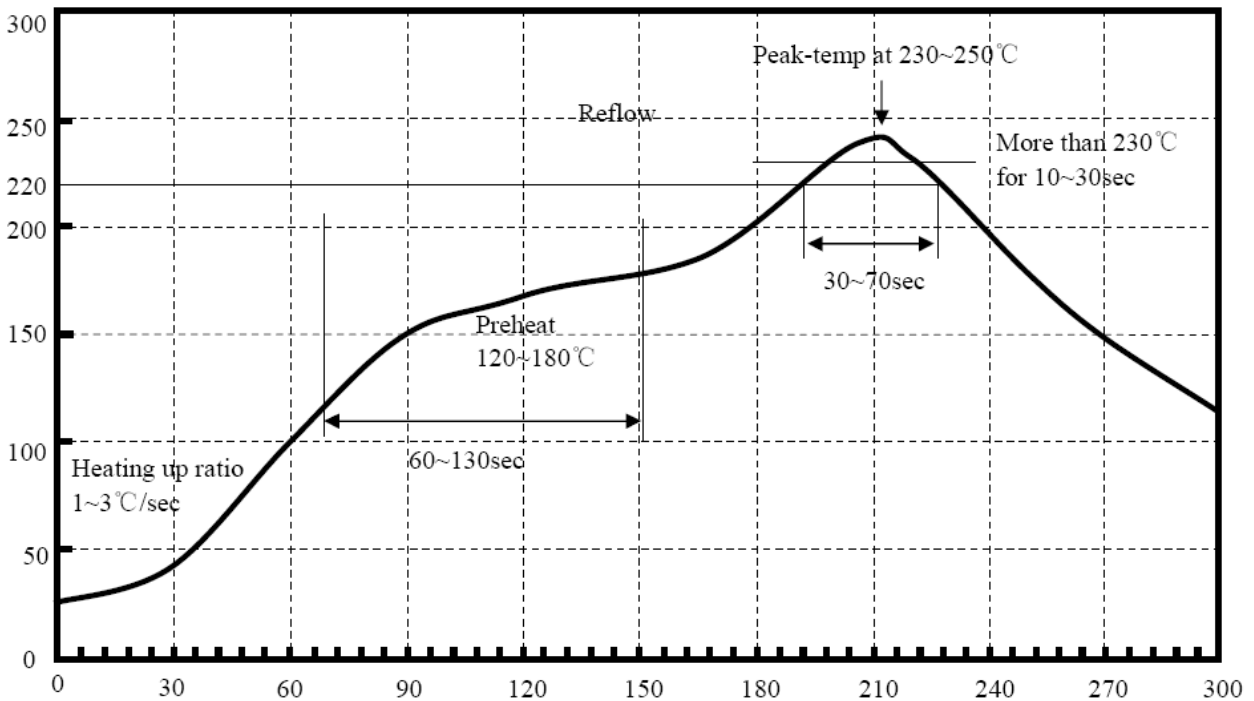
Cross Section	Name	Thickness	Material	$\epsilon_r$	
	Via14				
	Top-Layer	1 oz	Cu	--	
	Core 1	240um	FR-4	4.2	
	Mid-Layer1	1 oz	Cu	--	
				FR-4	4.2
	Mid-Layer2	1 oz	Cu	--	
				FR-4	4.2
Bottom-Layer	1oz	Cu			



**Packaging Diagram**



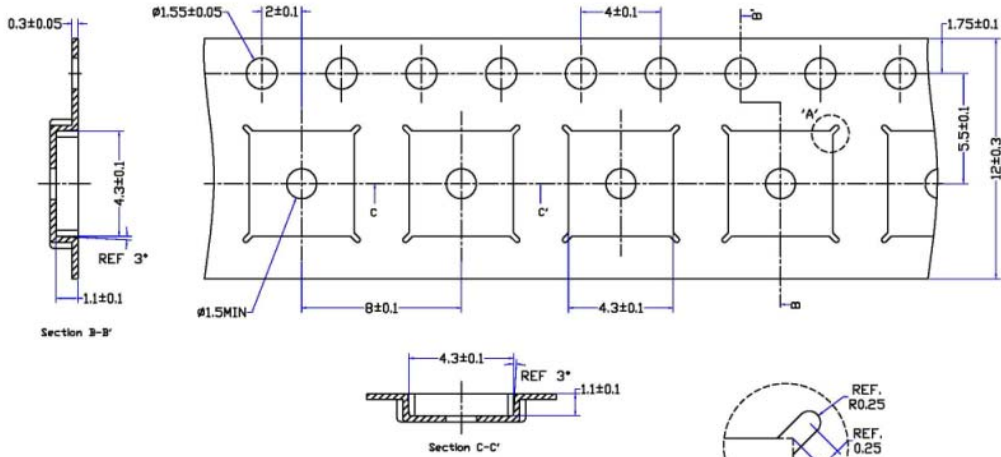
**Recommended Solder Temperature**



**Recommended Temperature**

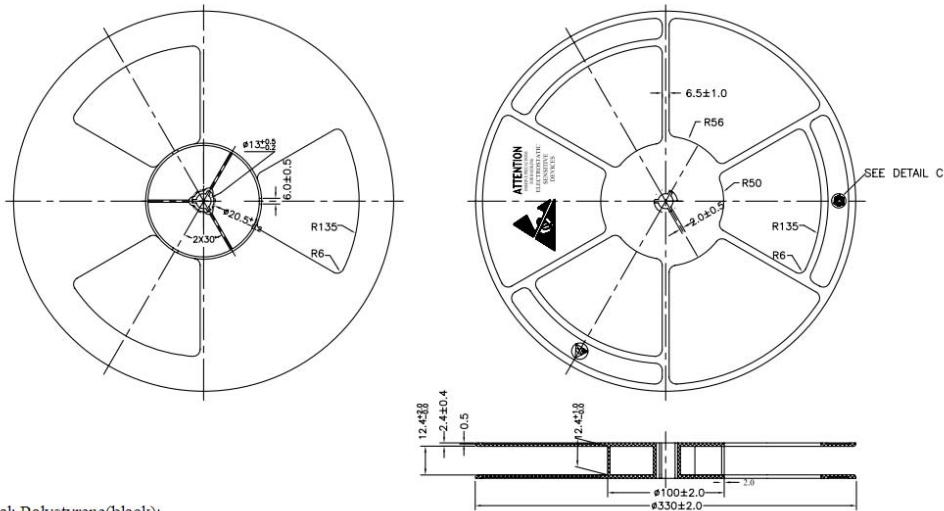
**Sn95.5Ag4.0Cu0.5**

### Tape dimensions and Orientation



- NOTES:**
- 1.10 pocket hole pitch cumulative tolerance  $\pm 0.2$
  - 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, 51875pockets
  - 7.Surface resistance 1X10E11(max) 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: 105 TO 1010/OHMS/SQ;
  5. General tolerances:  $\pm 0.25$