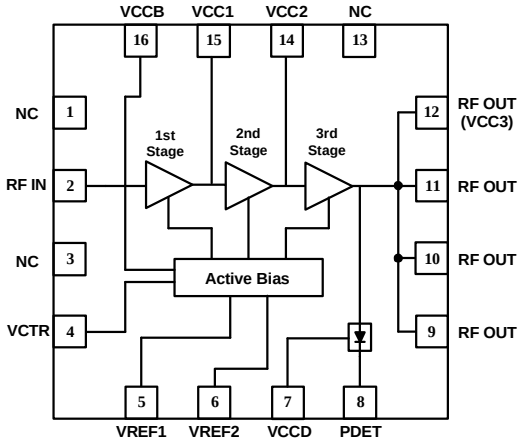
RoHS & Pb-Free Product

Features

- 1.8~2.8GHz Frequency Range
- 3.3V~5.0V Operation
- 30dB Gain (Typ)
- 35dBm P1dB @VCC=5V
- 3.0% EVM WLAN @Pout=29 dBm, Vcc=5V
- 2.0% EVM WLAN @Pout=28 dBm, Vcc=5V
- 450mA Quiescent Current
- >20dB Input Return Loss
- Integrated Output Power Detector
- ESD protection all ports above 1000V HBM, forward and reverse voltage



Functional Block Diagram

Product Description

The AC3035W is a three stage linearized power amplifier optimized for 802.11b/g/n WLAN applications in the 2.4GHz band. The device is manufactured on an advanced InGaP Heterojunction Bipolar Transistor (HBT) process, The amplifier provides a typical gain of 30 dB and P1dB power of 35dBm, typical bias condition is 5V at 450 mA. The AC3035W is assembled in a 16-pin, 4×4mm^2, QFN package. It is internally integrated with ESD protection circuitry on all ports.

Applications

- IEEE 802.11b/g/n WLAN
- 2.4GHz ISM
- LTE
- Small Cell
- MDAS 1.8 GHz to 2.7 GHz Applications

Ordering Information

■ AC3035W	High Linearity Power Amplifier
■AC3035WE-1	2.3 to 2.4GHz Evaluation Board and 5PCS Samples
■AC3035WE-2	2.4 to 2.5GHz Evaluation Board and 5PCS Samples
■AC3035WE-3	2.5 to 2.7GHz Evaluation Board and 5PCS Samples

Pin Description

Pin No.	Symbol	Description
2	RF IN	RF input
4	VCTR	Power on/off control voltage
5, 6	VREF1, VREF2	Bias current control voltage
7	VCCD	Supply voltage for power detector
8	PDET	Output power detect
9, 10, 11, 12	RFout /VCC3	RF output /stage 3 collector voltage
14, 15	VCC2, VCC1	Stage 2, Stage 1 collector voltage
16	VCCB	Supply voltage for bias
1, 3, 13	NC/GND	No connection or ground

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

Absolute Maximum Ratings

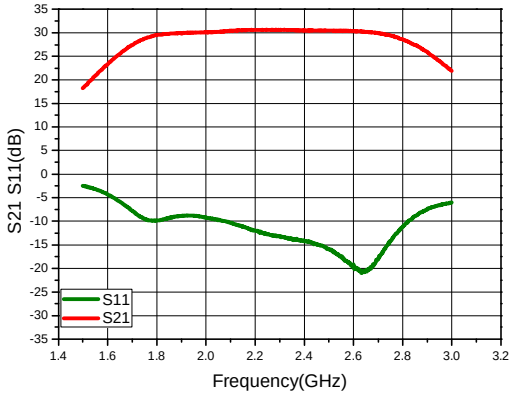
Parameter	Rating	Unit
Input RF Power	+20	dBm
Supply Voltage (VCC)	-0.5 to +8.0	V
Bias Voltage (VREF)	-0.5 to +3.0	V
DC Supply Current	2000	mA
Operating Ambient Temperature	-40 to +85	°C
Storage Temperature	-40 to +150	°C

Electrical Specifications

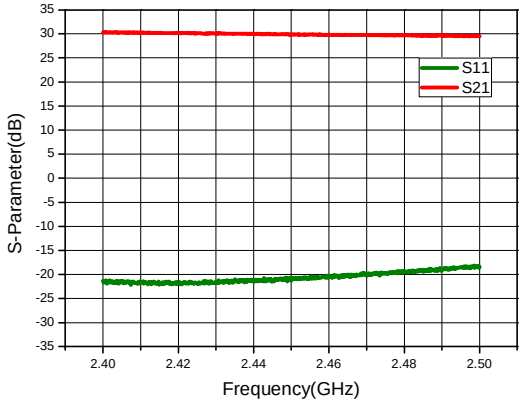
Parameter	Specification			Unit	Condition
	Min	Typ.	Max.		
WLAN IEEE802.11b/g/n					VCC=VCCB=5.0V, ICC=450mA, Temp=+25°C, Freq=2.4GHz to 2.5GHz
Frequency Range	2.4	2.45	2.5	GHz	
Output Power@1dB Compression	34.5	35	36	dBm	VCC=5.0V@2.40GHz
Gain	29	30	31	dB	VCC=5.0V@2.40GHz
EVM		3.0		%	Pout=+29dBm, VCC=5.0V@2.442GHz 802.11g, 54Mbps, 64QAM
		2.0		%	Pout=+28dBm, VCC=5.0V@2.442GHz 802.11g, 54Mbps, 64QAM
Power Supply					
Operating Voltage		5.0		V	
VREF1		2.85		V	
VREF2		2.73		V	
Quiescent Current (Total)		450		mA	
Reference Current (Total)		5		mA	VCC=5.0V,Vref1=2.85V, Vref2=2.73V
ICC1		30		mA	VCC=5.0V,Vref1=2.85V, Vref2=2.73V
ICC2		140		mA	VCC=5.0V,Vref1=2.85V, Vref2=2.73V
ICC3		280		mA	VCC=5.0V,Vref1=2.85V, Vref2=2.73V

Typical Performance (Test Condition: VCC=VCCB=5V, ICC=450mA, T=25°C)

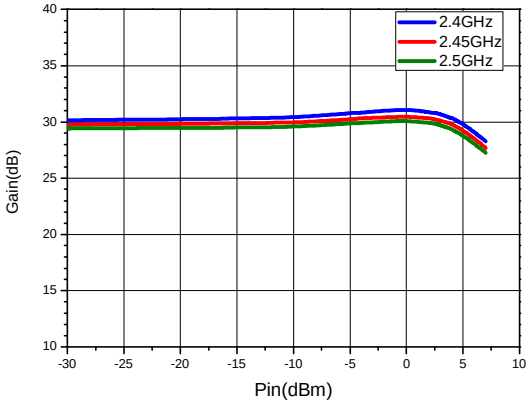
Broadband Gain & Return Loss



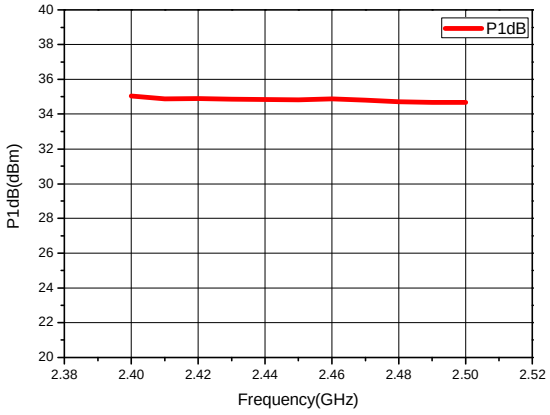
Narrowband Gain & Return Loss



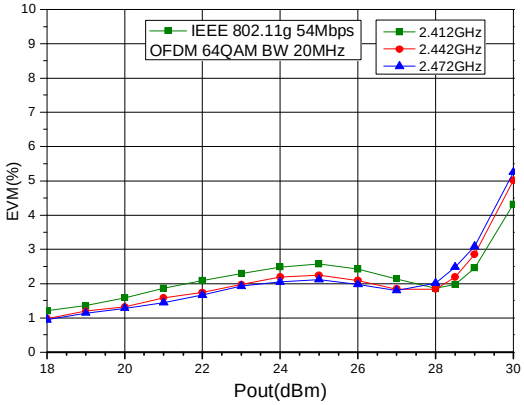
Power Gain vs. Input Power



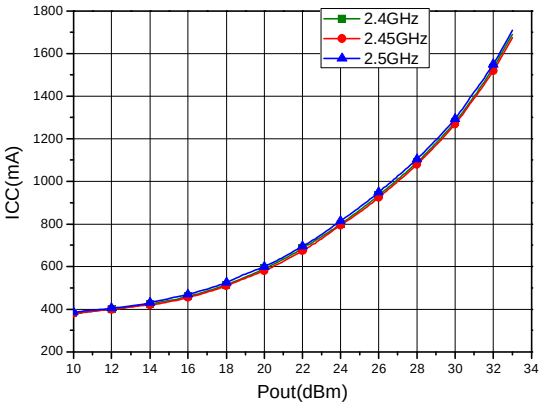
P1dB vs. Frequency



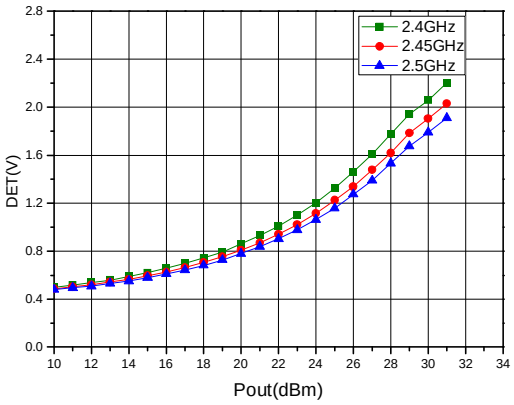
EVM vs. Output Power vs. Frequency



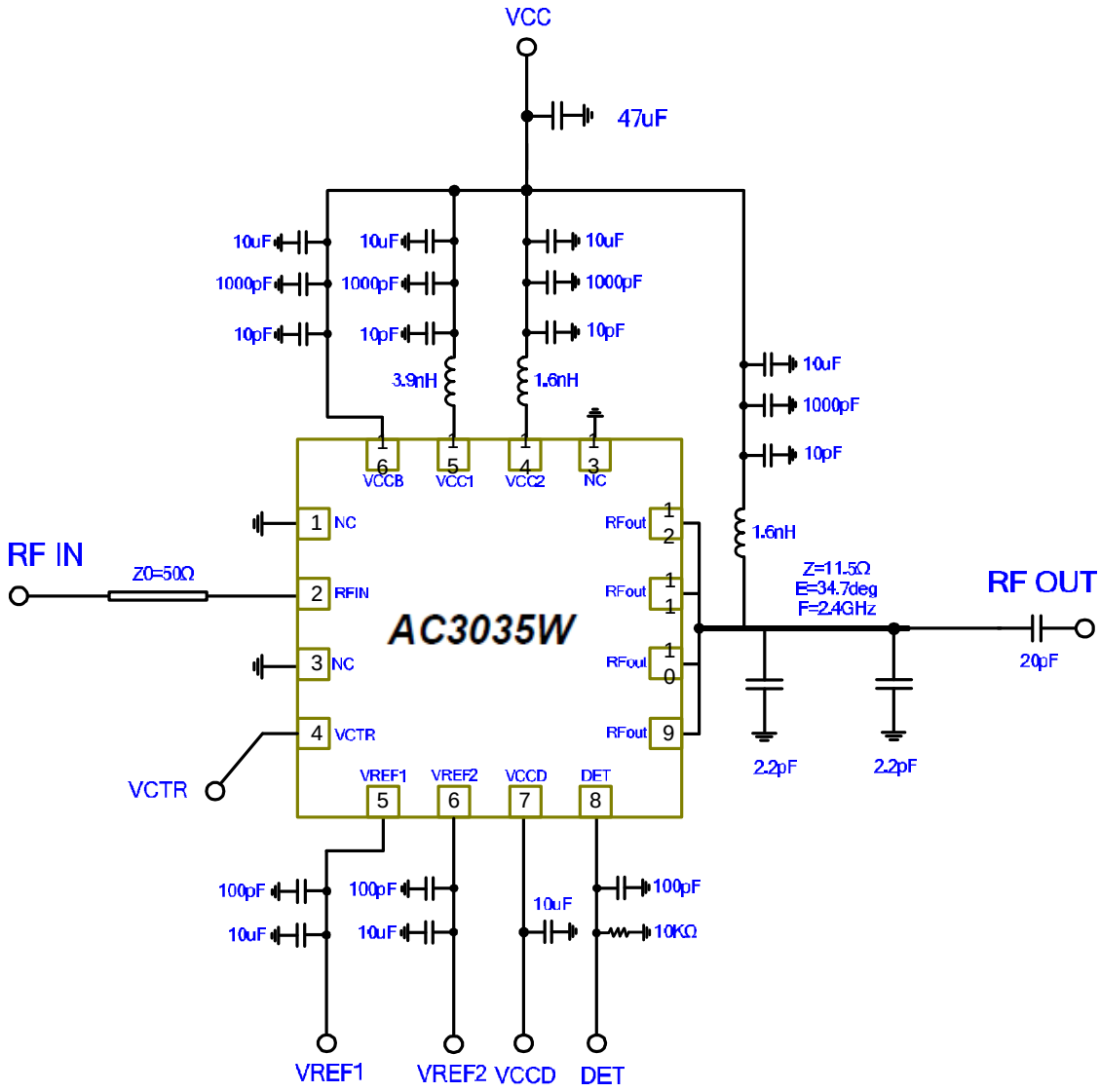
ICC vs. Output Power vs. Frequency



Power Detector (DET) vs. Pout



Evaluation Board Schematic for WLAN@VCC=5V



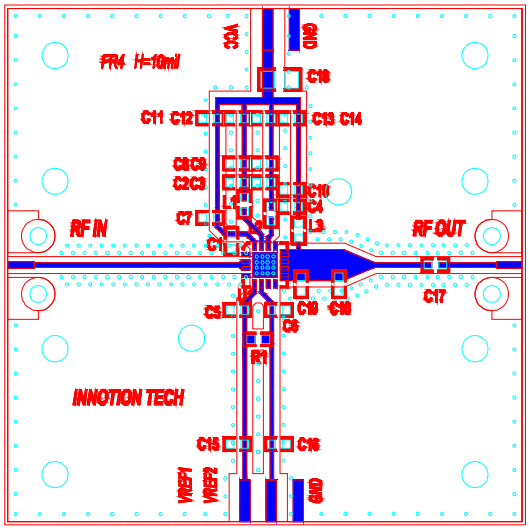
Notes:

1. Pin4 is power down pin. Apply >1.5 V_{DC} to power down the three power amplifier stages. Apply 0V_{DC} to power up. If function is not desired, pin4 may be connected to GND.
2. Pin7, 8 are active power detection circuit ports, if function is not desired, pin7, 8 may be left unterminated（open）.

Evaluation Board Layout

Board Size 50mm×50mm, Board Thickness 1mm, Board Material FR-4 (ε_r=4.5)

Evaluation Board Top View



Layer Detail Physical Characteristics

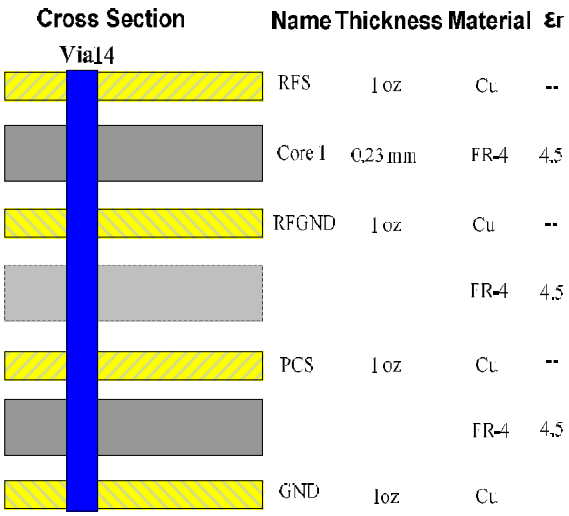
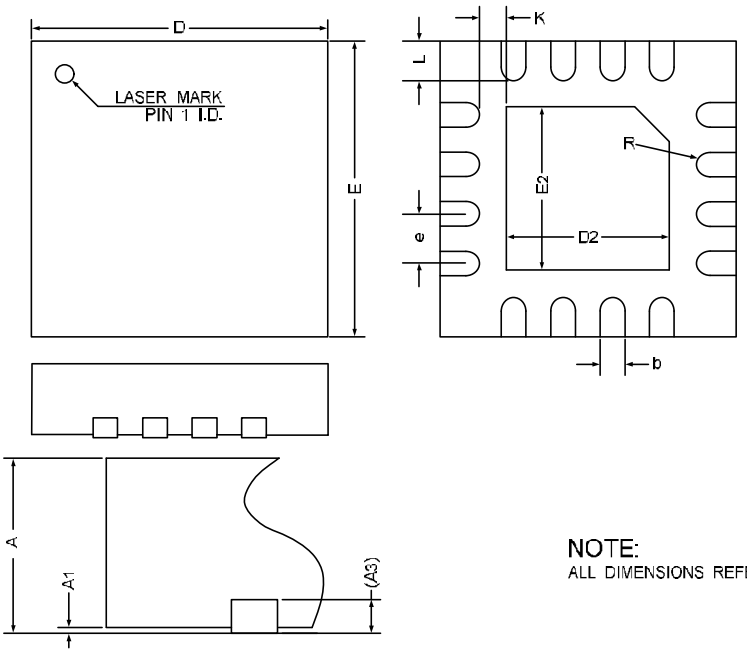


Table1. Circuit Component Designations and Values

Component	Description	Manufacturer
L1	3.9nH Inductor	ATC
L2,L3	1.6nH Inductor	ATC
C1,C2,C3,C4,C5,C6	10pF Chip Capacitor	TDK
C7,C8, C9,C10	1000pF Chip	TDK
C11,C12,C13,C14,C15,C16	10uF Chip Capacitor	TDK
C17	20pF Chip Capacitor	TDK
C18	47uF Chip Capacitor	AVX
C19,C20	2.2pF Chip Capacitor	DLC

Packaging Diagram



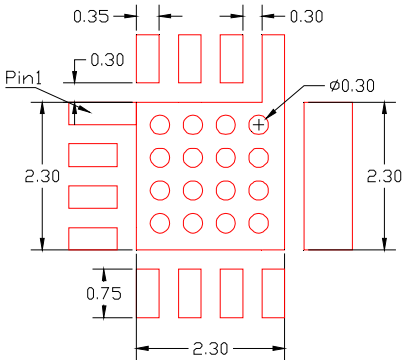
COMMON DIMENSIONS
(UNITS OF MEASURE = MILLIMETER)

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		

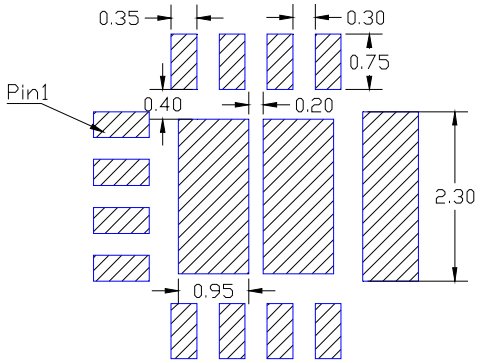
NOTE:
ALL DIMENSIONS REFER TO JEDEC STANDARD MO-220 WEED-4.

PCB Land Pattern and Stencil Outline

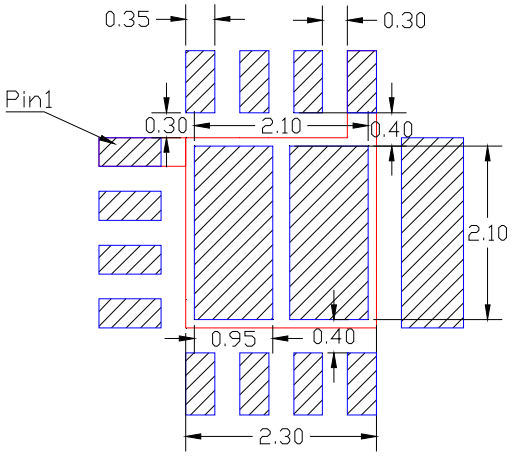
(Units: millimeters)



PCB Land Pattern (Top View)

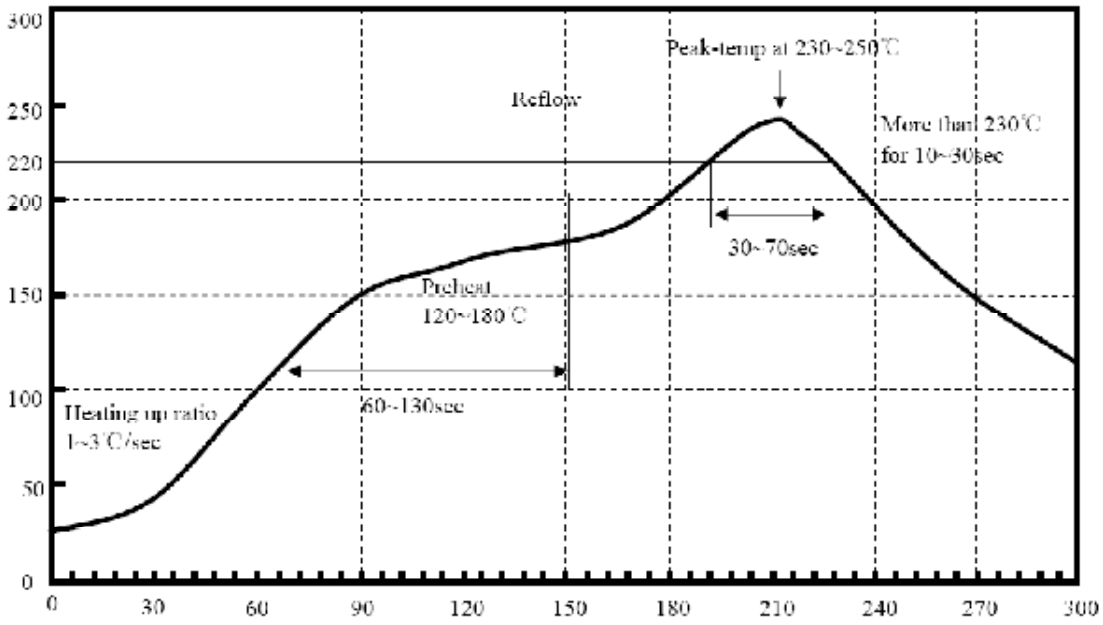


Stencil Outline



Combined PCB Land Pattern and Stencil Outline

Recommended Solder Temperature



Recommended Temperature

Sn95.5Ag4.0Cu0.5