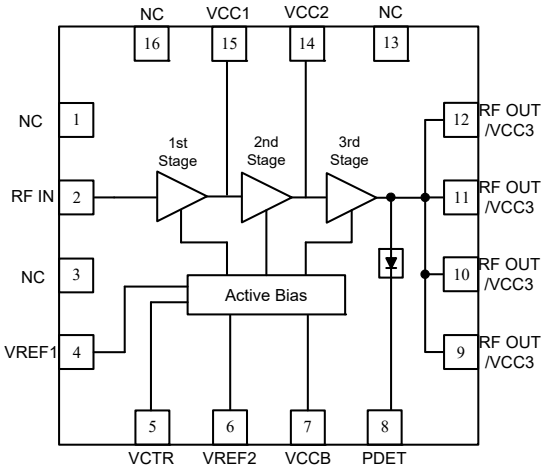
Features

RoHS & Pb-Free Product

- 1.4GHz-3.5GHz Operational Frequency
- 30dB Gain (Typ.)
- 30dBm P_{out} (Typ.)
- 250mA Quiescent Current
- 3.3V-5.0V Supply Voltage
- Integrated Output Power Detector
- DC Power Shutdown Feature
- Integrated ESD Protection Unit



Functional Block Diagram

Applications

- 2.4GHz ISM Wireless Equipment
- TDD / FDD System
- General Purpose Wireless
- 5G m-MIMO
- Mobile Infrastructure

Product Description

The YP3630W is a three-stage, high dynamic range broadband power driver amplifier using an advanced InGaP/GaAs HBT process. This amplifier can achieve high performance for 1.4–3.5 GHz applications. It needs different matching circuit for different frequency range. The YP3630W is assembled in a 16-pin, 4×4mm^2, QFN package. It is internally integrated with ESD protection circuitry on all ports and incorporates a shut-down function through the VCTR pin.

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	RF OUT/VCC3	RF output and Stage3 supply voltage
14, 15	VCC2, VCC1	Stage 2, Stage 1 supply voltage
PKG Base	GND	Ground connection

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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_{OP}	-40 to +85	°C
Storage Temperature	T_{ST}	-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.		
Compliance and Nominal Conditions					VCC1=VCC2=VCC3=VCCB=5.0V, ICQ=250mA, T_{OP}=+25°C, Freq=1.4GHz to 3.4 GHz
Frequency Range	1.4		3.5	GHz	
Output Power, Pout @P1dB		29.2		dBm	@1.5GHz
		31.2		dBm	@2GHz
		30.8		dBm	@2.6GHz
		29.35		dBm	@3GHz
Small Signal Gain		30.35		dB	@1.5GHz
		31.67		dB	@2GHz
		30.98		dB	@2.6GHz
		30.99		dB	@3GHz
Input return loss		-9.55		dB	@1.5GHz
		-11.74		dB	@2GHz
		-30.39		dB	@2.6GHz
		-14.76		dB	@3GHz
Power Supply					
Reference Voltage1, VREF1		2.7		V	
Reference Voltage2, VREF2		2.7		V	
Quiescent Current, ICQ		250		mA	
Operating Current, ICC		800		mA	Pout=30dBm@2GHz

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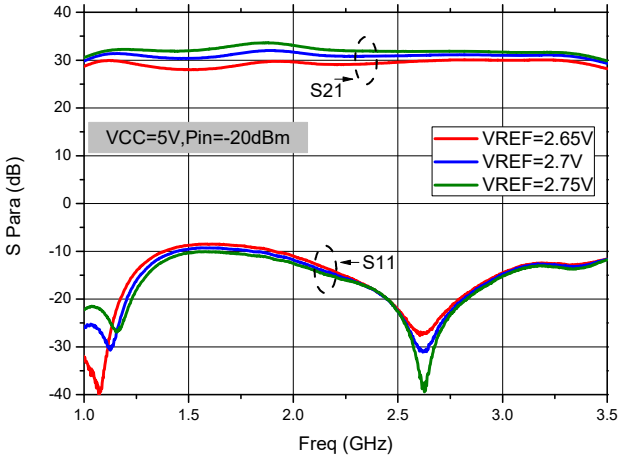
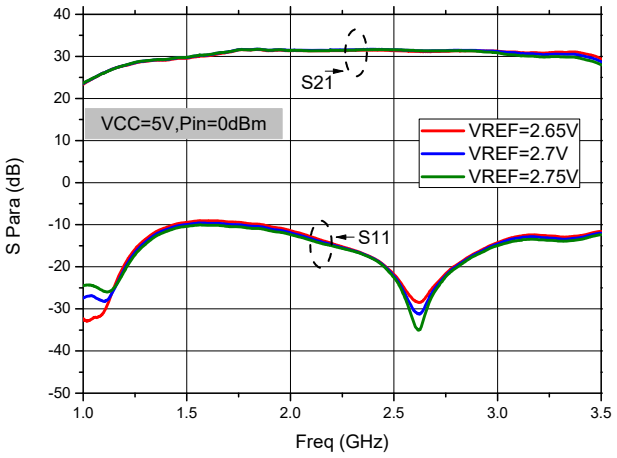
Typical Performance (T_{OP}=+25°C)

VCC1=VCC2=VCC3=VCCB=**VCC**
VREF1=VREF2=**VREF**
ICQ=250mA (no RF)

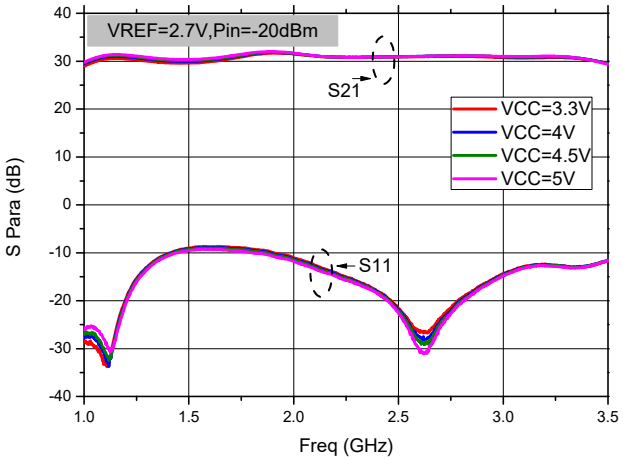
Small Signal S Para vs. VREF



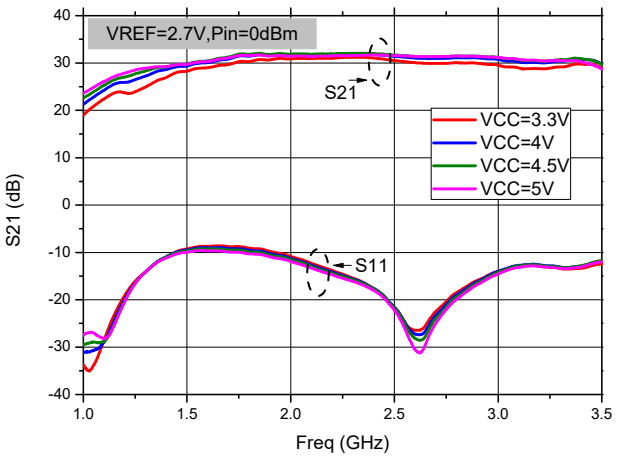
Large Signal S Para vs. VREF



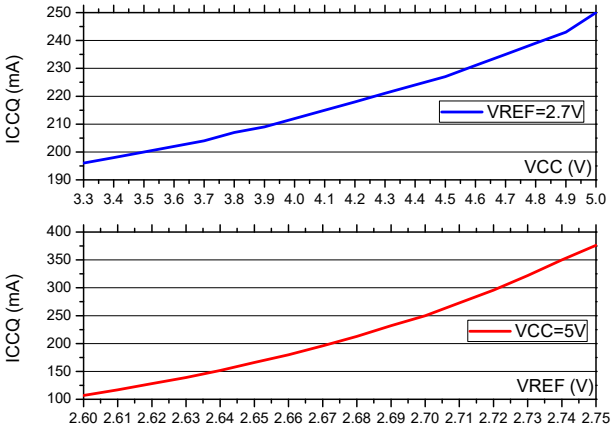
Small Signal S Para vs. VCC



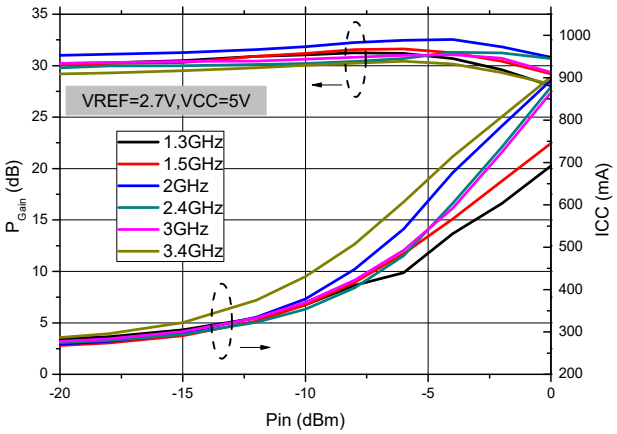
Large Signal S Para vs. VCC



ICCQ vs. VCC@VREF=2.7V & ICCQ vs. VREF@VCC=5V

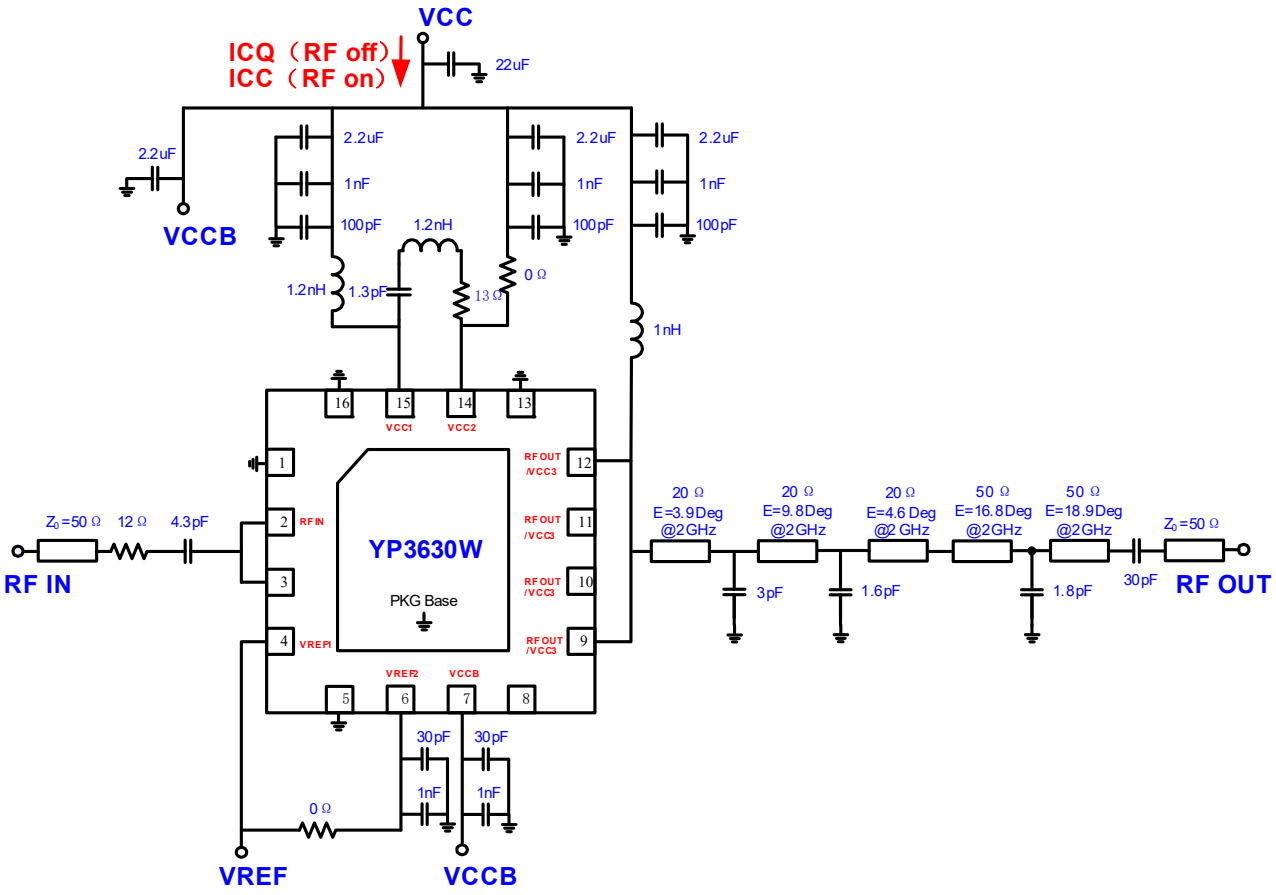


Power Gain & ICC vs. Pin vs. Freq.



Evaluation Board Schematic

VCC1=VCC2=VCC3=VCCB=**VCC**
VREF1=VREF2=**VREF**
ICQ=250mA (no RF)



Notes:

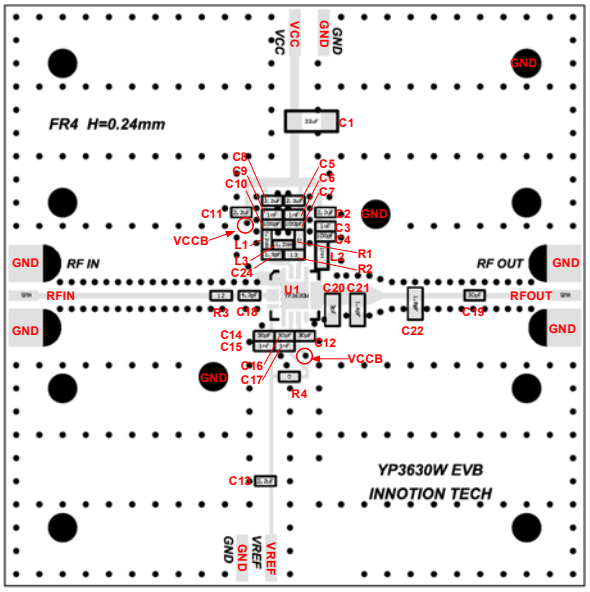
1. Pin5 is PA on/off logic control pin. Supply >1.5V DC voltage to shut down the PA. Supply 0V voltage to power on the PA. If the function is not desired, Pin5 may be connected to GND.
2. Pin8 is an active power detection port. If the function is not desired, Pin8 should left unterminated (open).

Evaluation Board Layout

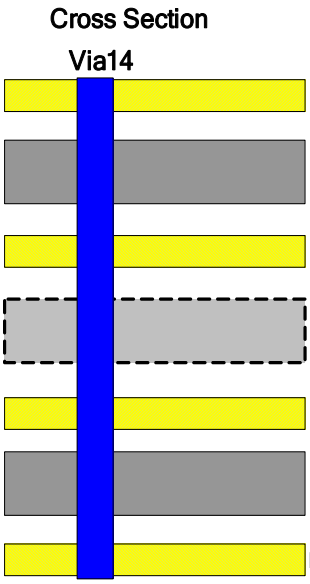
Board Size 50mm×50mm

Board Thickness 0.9mm, Board Material FR4, Multi-Layer

Evaluation Board View



Layer Details of DEMO Board



Name	Thickness	Material	εr
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	

Circuit Component Designations and Values

Reference Des.	Value	Description	Manuf.
C1	22uF	CAP, SMD, 1210	Various
C2、C5、C8、C11、C13	2.2uF	CAP, SMD, 0402	Various
C3、C6、C9、C15、C17	1nF	CAP, SMD, 0402	Various
C4、C7、C10	100pF	CAP, SMD, 0402	Various
C12、C14、C16、C19	30pF	CAP, SMD, 0402	Various
C18	4.3pF	CAP, SMD, 0402	Various
C20	3pF	CAP, SMD, 0603	DLC
C21	1.6pF	CAP, SMD, 0603	DLC
C22	1.8pF	CAP, SMD, 0603	DLC
R1、R4	0Ω	RES, SMD, 0402	Various
R2	13Ω	RES, SMD, 0402	Various
R3	12Ω	RES, SMD, 0402	Various
L1、L3	1.2nH	IND, SMD, 0402	Various
L2	1nH	IND, SMD, 0603	Various
U1	YP3630W	QFN 4*4-16L	Innotion

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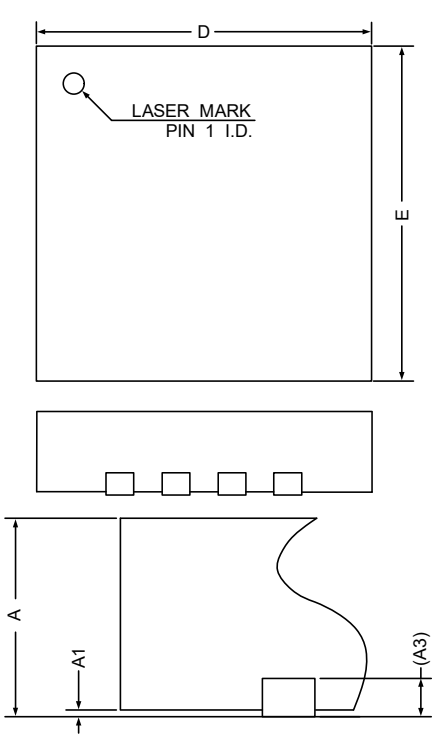
Packaging Diagram

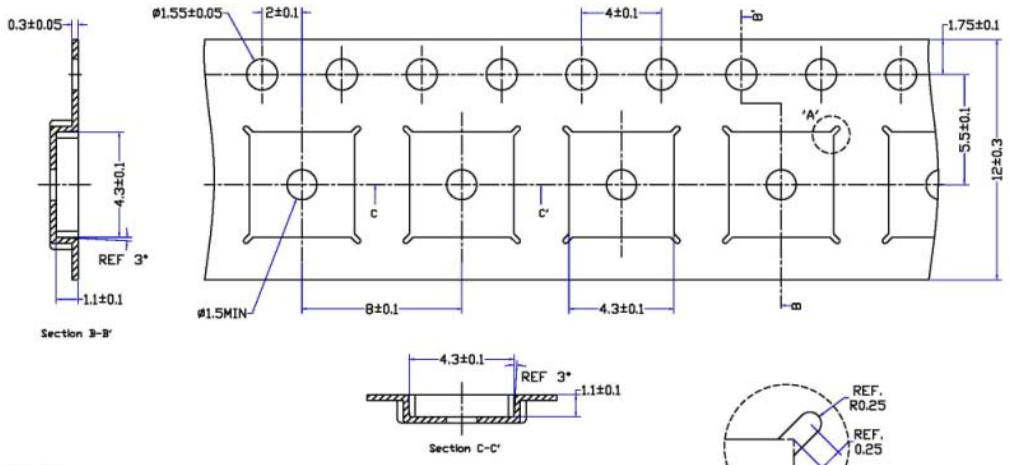


COMMON DIMENSIONS
(UNITS OF MEASURE = MILLIMETER)

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	—	—

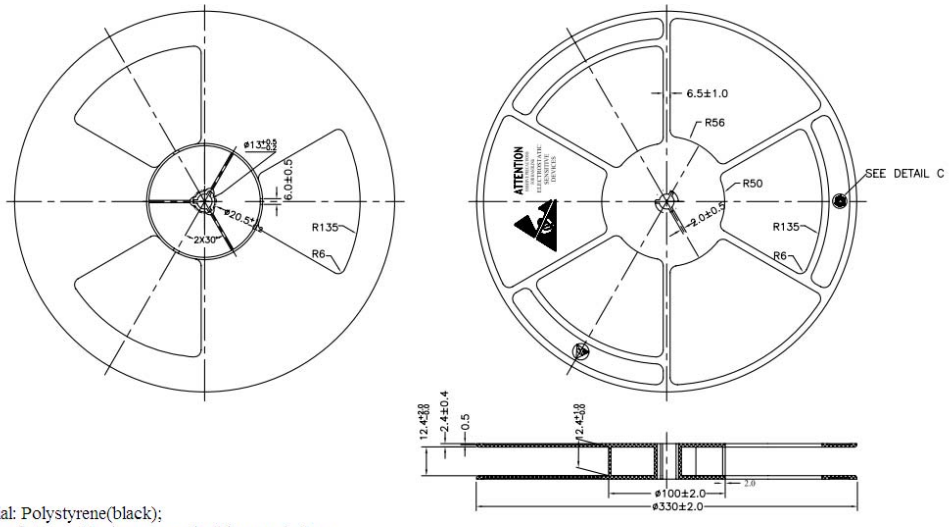
NOTE:
ALL DIMENSIONS REFER TO JEDEC STANDARD MO-220 WEED-4.

Tape dimensions and Orientation



NOTES:
1.10 procket hole pitch cumulative tolerance ±0.2
2.Carrier camber is within 1mm in 100mm
3.MATERIAL:CONDUCTIVE POYSTYRENE
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: 105TO 1010/OHMS/SQ;
5. General tolerances: ±0.25