DESCRIPTION

The RTC6691H power amplifier (PA) is designed to operate in 2.4GHz ISM band, compatible with 802.11b/g wireless LAN system. The amplifier consists of 3 power stages with input matching, inter-stage matching, and a power detector for close loop power control operation. For 21.5 dBm OFDM output power (64QAM, 54Mbps), the PA provides a low EVM (Error-Vector Magnitude) of 3%, and consumes 240mA total DC current. Power gain of 35 dB is obtained with a quiescent current of 160mA.
The device is packaged in a industry-standard 16-lead surface mount package 3mm x 3mm (QFN-16L) .

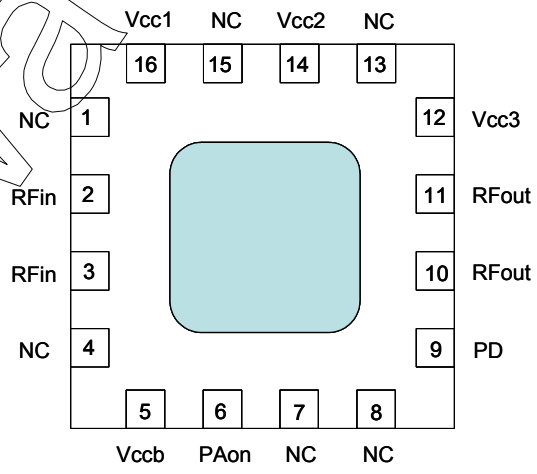
FEATURE

- 2.4 – 2.5GHz Operation
- Single 3.3V Supply
- Pin Compatible to RTC6691
- Typically 3% EVM at 21.5dBm Output Power for 802.11g 54Mbps/64 QAM
- Small Signal Gain 35 dB
- Quiescent Current 160mA
- Digital PA On/Off Control
- On-chip Input Matching
- Packaged in QFN-16L 3mmX3mm
- Lead(Pb)-free, RoHS compliant packaging

APPLICATION

- IEEE 802.11b/g Wireless LAN System
- 2.4GHz ISM Band Application
- 2.4GHz Cordless Phones

PINOUT (top view)



PIN FUNCTION DESCRIPTION

Pin	Function	Description
1	NC	Not connected
2	RFin	RF input. Input matching network is built on chip.
3	RFin	Same as pin 2
4	NC	Not connected
5	Vccb	Power supply for bias circuit, typically 3.3V
6	PAon	PA on/off control.
7	NC	Not connected
8	NC	Not connected
9	PD	Detector output voltage for output power index
10	RFout	RF output.
11	RFout	Same as pin 10
12	Vcc3	Power supply for power stage-3, typically 3.3V
13	NC	Not connected
14	Vcc2	Power supply for power stage-2, typically 3.3V
15	NC	Not connected
16	Vcc1	Power supply for power stage-1, typically 3.3V

ABSOLUTE MAXIMUM RATINGS

PARAMETER	RATING	UNITS
Supply Voltage	-0.5 to +5.0	V
PAon Voltage	0.0 to +4.0	V
Input RF Level	+15	dBm
Operating Ambient Temperature	-40 to +85	℃
Storage Temperature	-40 to +150	℃

DC ELECTRICAL CHRACTERISTICS

T=25℃, Vcc=3.3V, Freq=2.45GHz

PARAMETER	CONDITION	MIN	TYP	MAX	UNITS
Supply Voltages					
Vcc1		3.0	3.3	3.6	Volts
Vcc2		3.0	3.3	3.6	Volts
RFOUT/Vcc3		3.0	3.3	3.6	Volts
VCCB		3.0	3.3	3.6	Volts
PAon_H	Logic High Voltage	1.9		3.3	Volts
PAon_L	Logic Low Voltage	0		0.5	Volts
Supply Currents					
Icc1 + Icc2 + Icc3 (for 802.11g usage)	Quiescent (no RF) Pout= 21.5 dBm		160 240		mA
Ioff	Standby current			50	μA
I_PAon	Quiescent (no RF)			50	μA

POWER DETECTOR

T=25℃, Vcc=3.3V, Freq=2.45GHz,

PARAMETER	CONDITION	MIN	TYP	MAX	UNITS
Vpd	Power detector voltage @ Pout=12 dBm		0.37		Volts
Vpd	Power detector voltage @ Pout=15 dBm		0.49		Volts
Vpd	Power detector voltage @ Pout=18 dBm		0.64		Volts

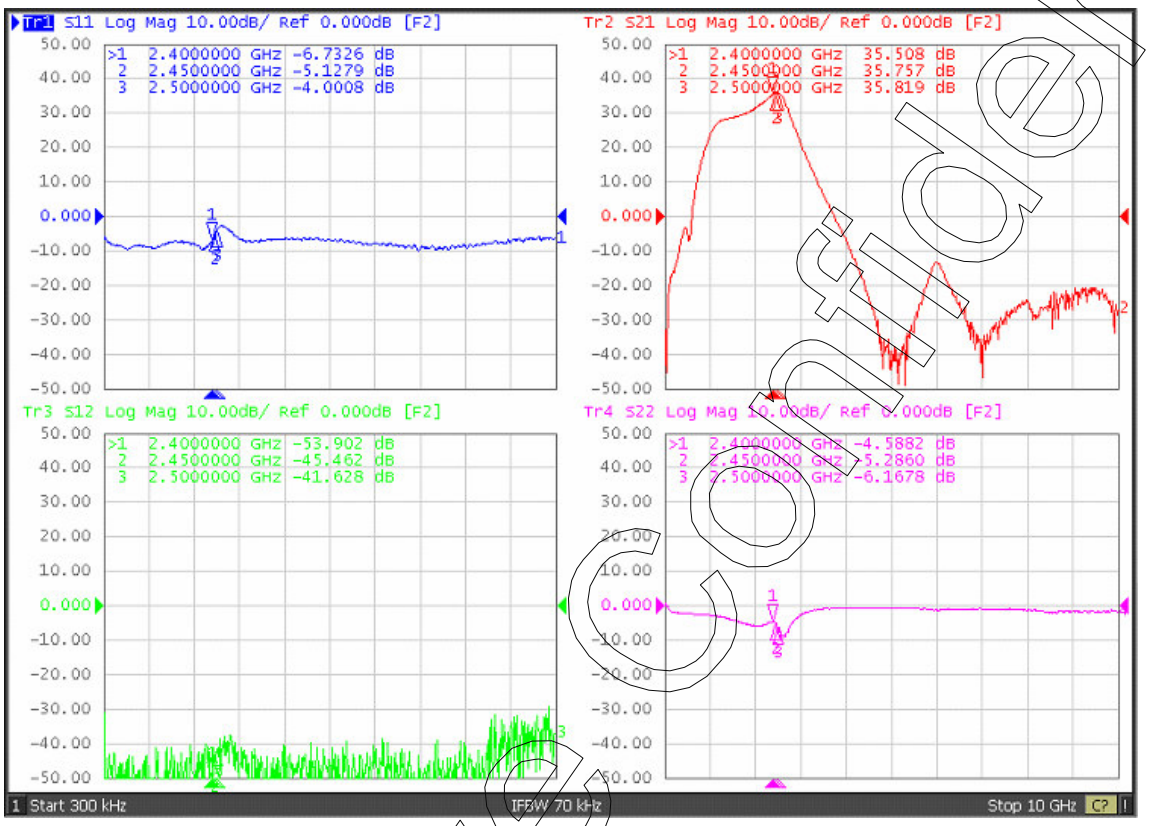
AC ELECTRICAL CHRACTERISTICS

T=25℃, Vcc=3.3V, Freq=2.45GHz,

PARAMETER	CONDITION	MIN	TYP	MAX	UNITS
Frequency Range		2.4	2.45	2.5	GHz
Small Signal Gain	Pin=-30dBm		35		dB
P1dB	1dB Gain compression		27.5		dBm
Linear Pout for 11g usage	802.11g OFDM 64 QAM EVM = 3%		21.5		dBm
Linear Pout for 11g usage	Pass 802.11g spectrum mask (OFDM 6Mbps)		22.5		dBm
Linear Pout for 11b usage	Pass 802.11b spectrum mask (CCK 1Mbps)		25		dBm
Gain Flatness	within band(2.4~2.5GHz)		+/-0.3		dB
Input return loss			-8		dB
Output return loss			-8		dB
Adjacent Channel Power Ratio (ACPR) +/- 11MHz offsets from carrier +/- 22MHz offsets from carrier	Pout=25dBm,1Mbps CCK signal		 -38 -58		dBc
2f, 3f harmonics	802.11b 1Mbps, Pout = 21 dBm		-57		dBc

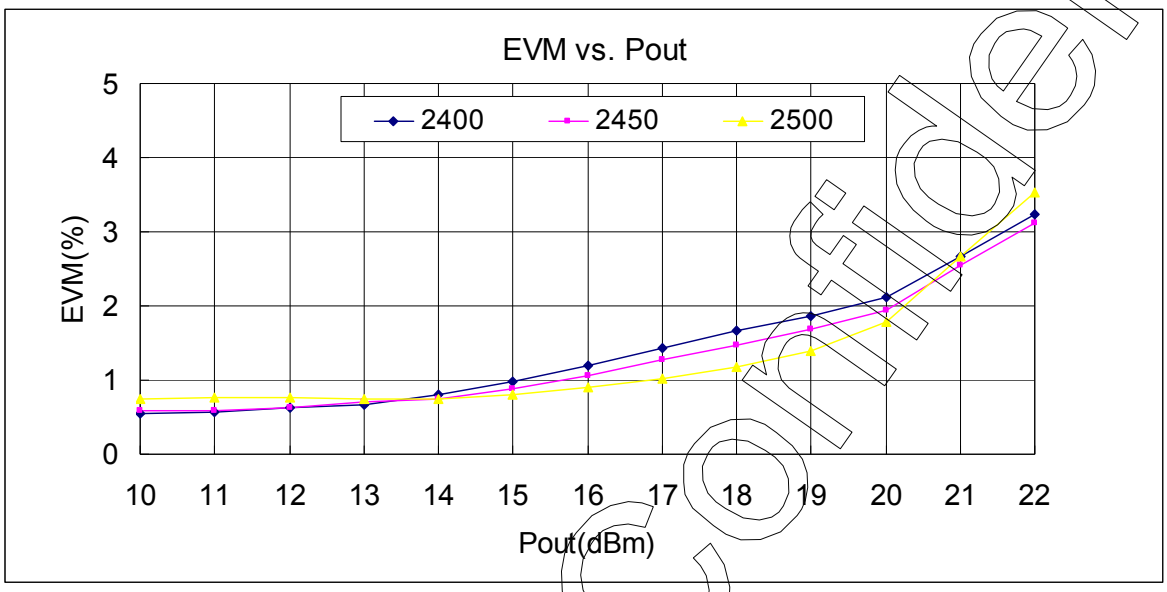
S-PARAMETERS

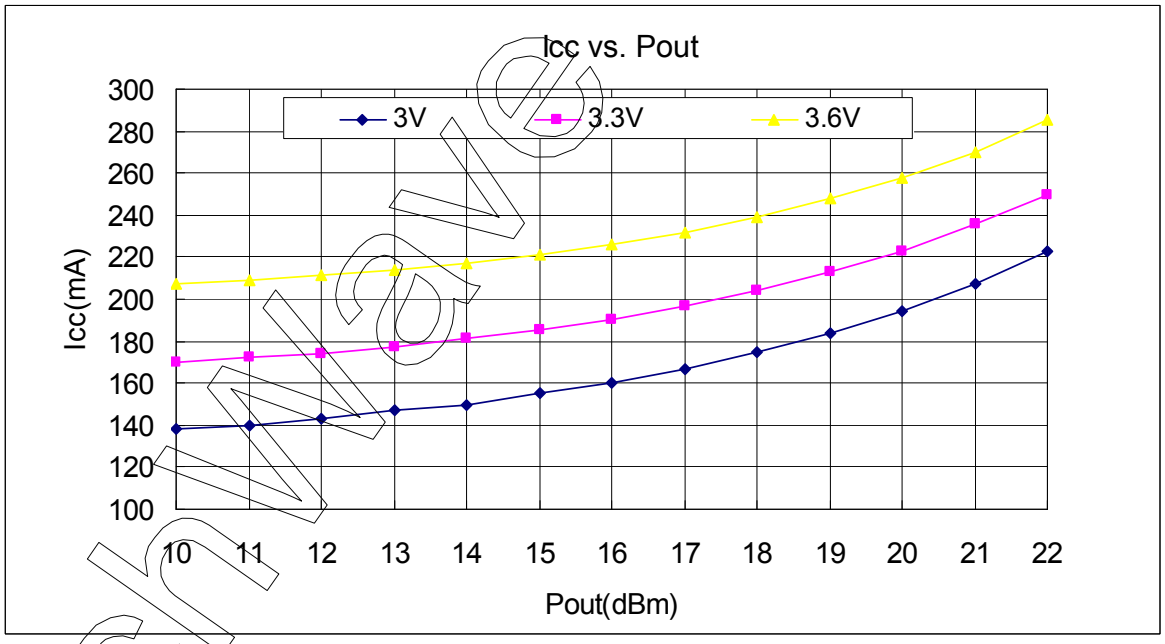
T=25℃, Vcc=3.3V,



EVM and CURRENT CONSUMPTION

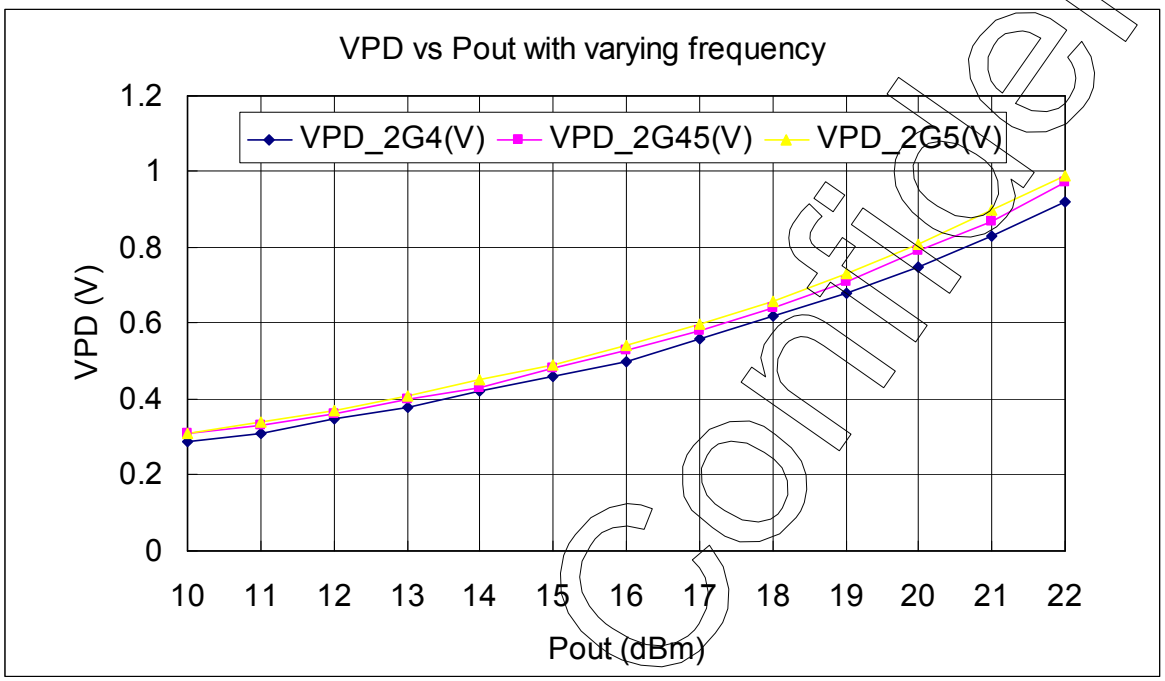
T=25℃, Vcc=3.3V, 802.11g 64QAM 54Mbps, Duty Cycle=70%

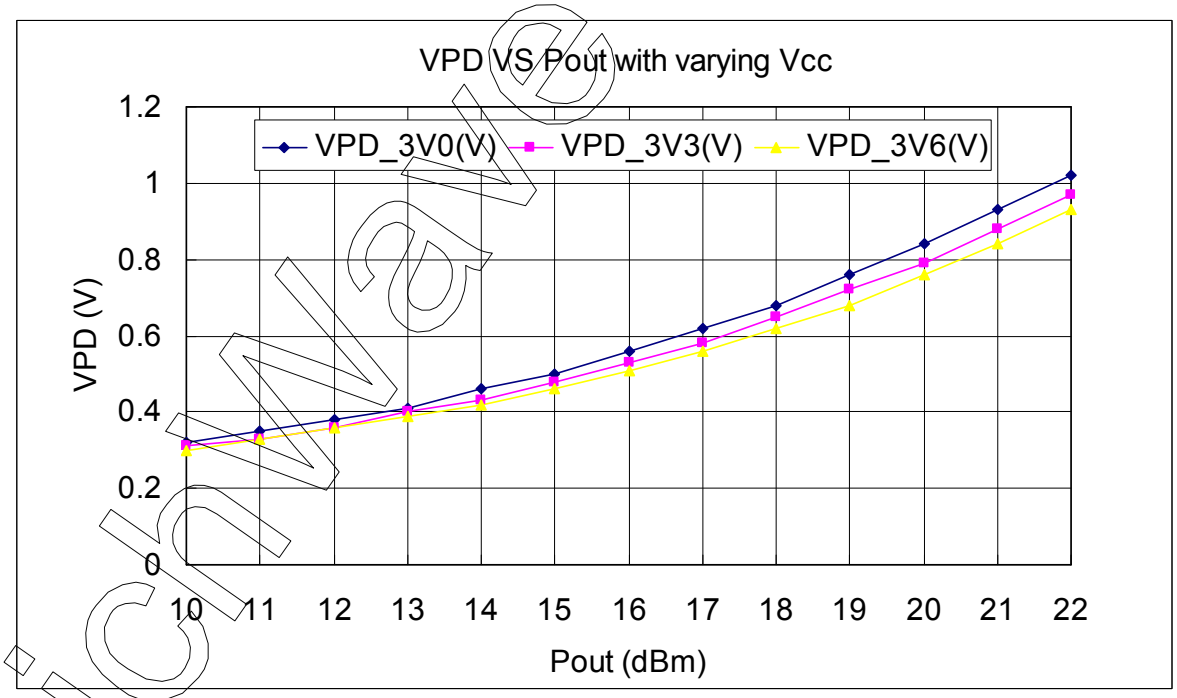




POWER DETECTOR

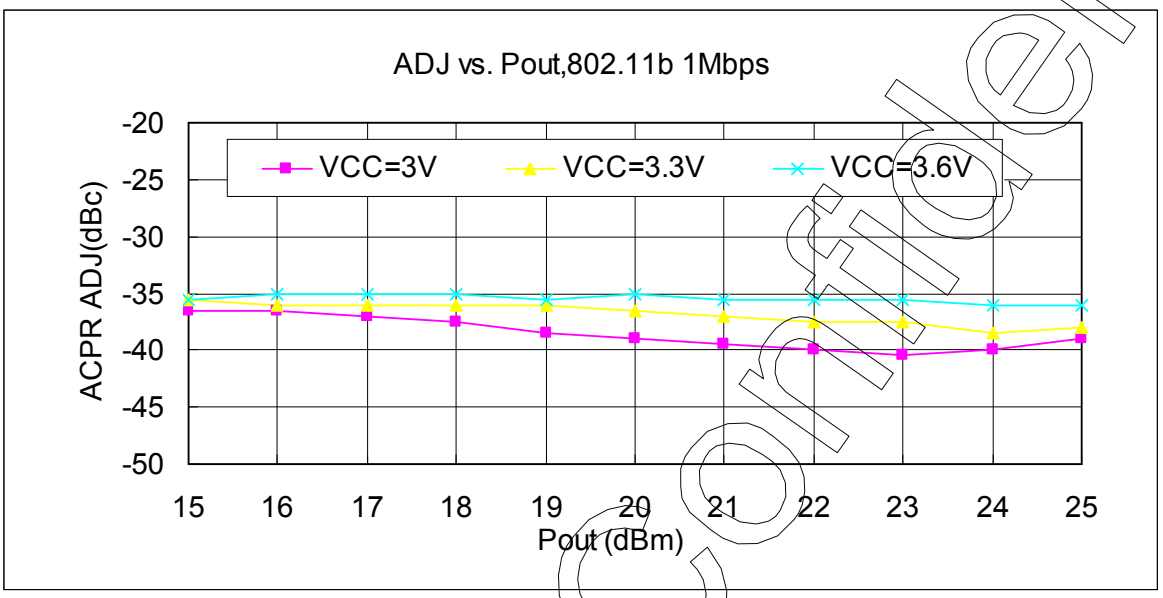
T=25℃, 802.11g 64QAM 54Mbps, Duty Cycle=70%

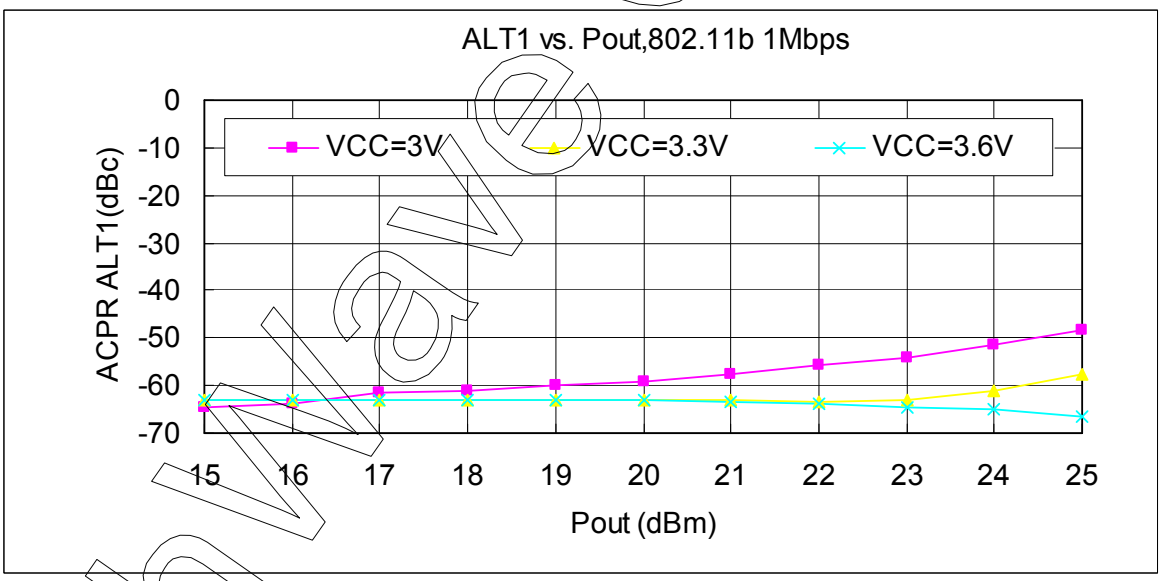




ACPR

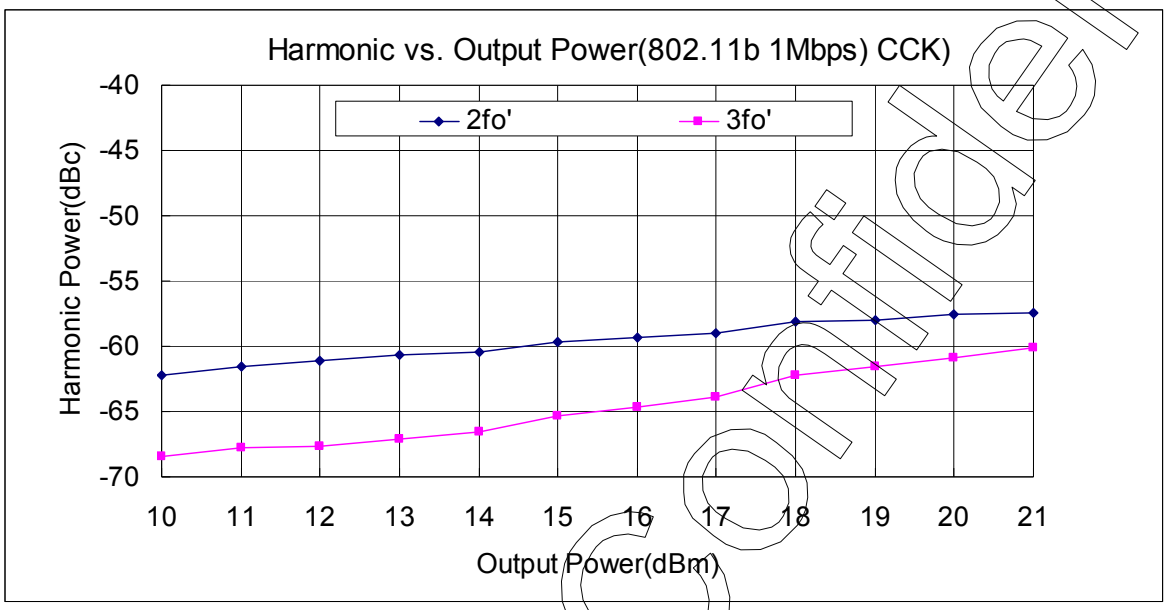
T=25℃, Freq=2.45GHz, 802.11b CCK 1Mbps



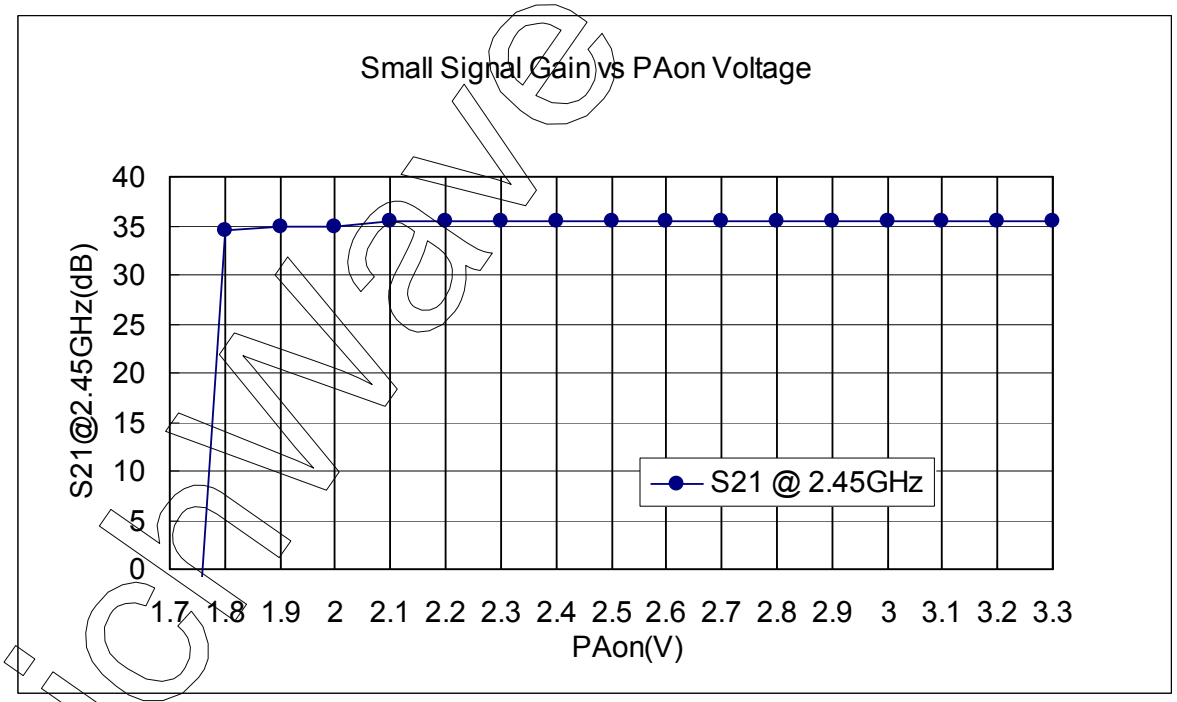


HARMONICS (802.11b 1Mbps CCK)

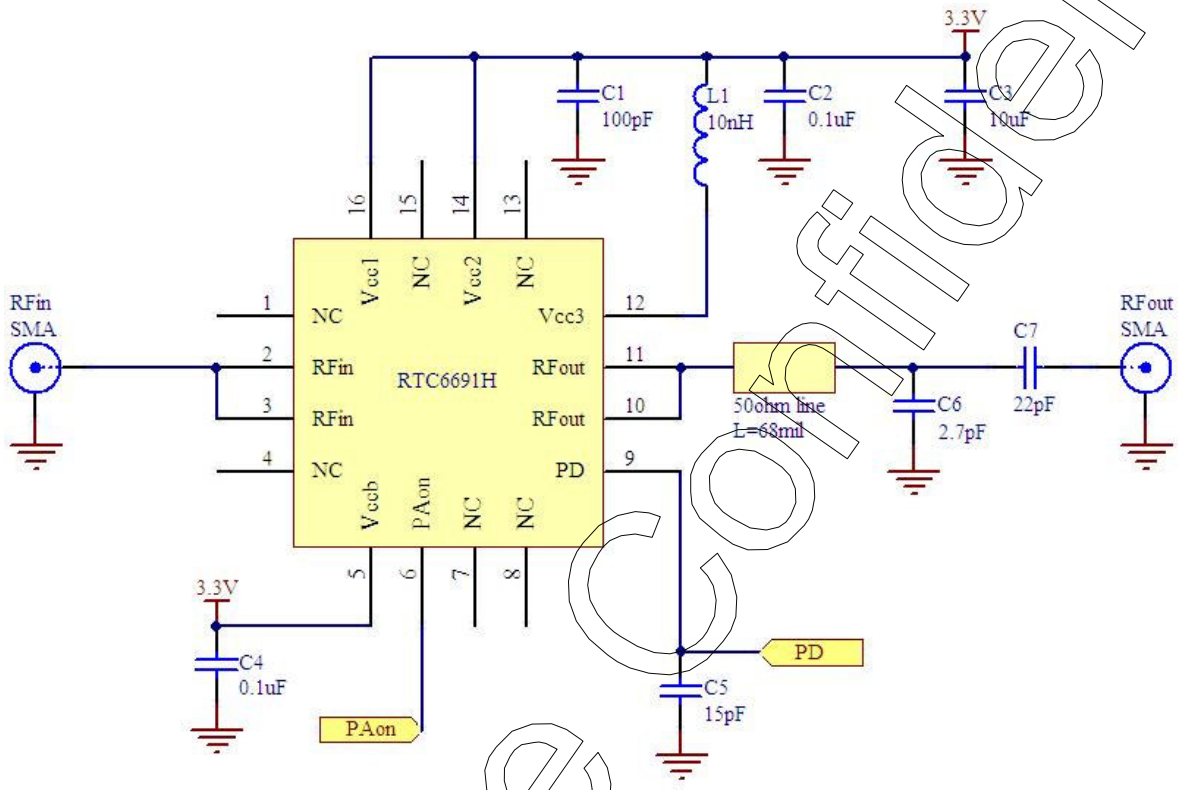
T=25℃, Freq=2.45GHz



DIGITAL PAon CONTROL

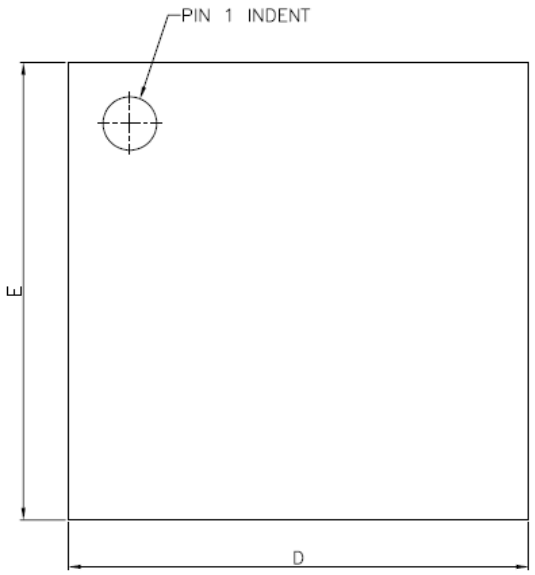


APPLICATION CIRCUIT



PACKAGE DRAWING

QFN 16 pin 3mm x 3mm x 0.9mm(NOM.)



SYMBOLS	DIMENSIONS IN MILLIMETERS		
	MIN	NOM	MAX
A	0.80	0.90	1.00
A1	0.00	0.02	0.05
b	0.18	0.25	0.30
C	——	0.20 REF.	——
D	2.90	3.00	3.10
D2	1.65	1.70	1.75
E	2.90	3.00	3.10
E2	1.65	1.70	1.75
e	——	0.50	——
L	0.35	0.40	0.45
y	0.00	——	0.075