DESCRIPTION

The RTC6670E power amplifier (PA) is designed to operate in 5GHz ISM band, compatible with 802.11a wireless LAN system with high power, high gain. The amplifier consists of 3 gain stages with inter-stage matching, build-in input matching network, and a power detector for close loop power control operation. In 802.11a mode (OFDM 64QAM, 54Mbps), it provides a low EVM (Error Vector Magnitude) of 3% at +19dBm linear output power. The part is pin compatible to previous RTC6670 with performance enhancement. The device is packaged in a tiny industry-standard 16-lead surface mount package QFN16 3x3.

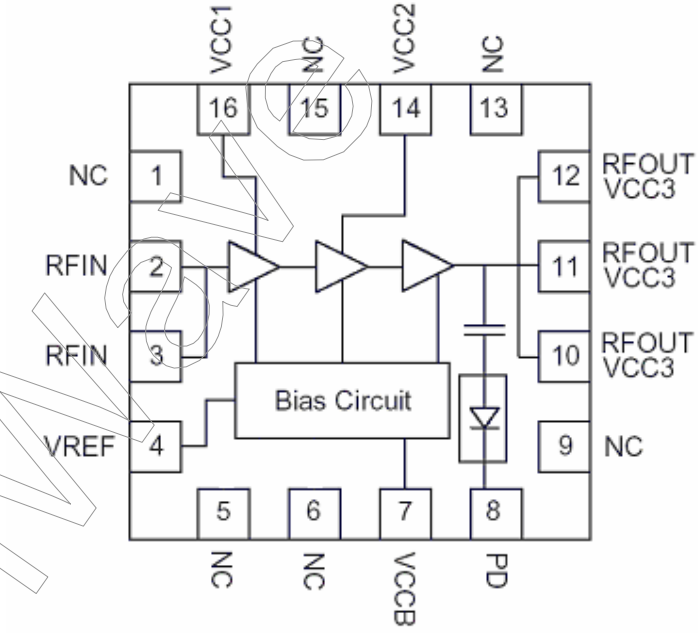
FEATURE

- 3.3V Power Supply
- Maximum Linear Output Power for 11a usage : +19 dBm (54Mbps OFDM 64 QAM)
- Small signal gain : 28dB
- On-chip input matching
- Lead(Pb)-free, RoHS compliant packaging

APPLICATION

- IEEE 802.11a Wireless LAN System
- 5GHz ISM Band Application
- 5GHz Cordless Phones
- High Power WLAN applications

PINOUT (top view)



PIN FUNCTION DESCRIPTION

PIN	FUNCTION	DESCRIPTION
1,5,6,9,13,15	NC	Not connected
2	RFIN	RF input. Input matching network is built on chip.
3	RFIN	Same as pin 2
4	VREF	Bias Control voltage of power stage-1,2 & 3. This pin can be used to control PA on/off.
7	VCCB	Power supply for bias circuit, typically 3.3V
8	PD	Detector output voltage for output power index
10,11,12	RFOUT/VCC3	RF output & Power supply for power stage-3
14	VCC2	Power supply for power stage-2, typically 3.3V
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
Reference Voltage(Vref)	0.0 to +4.0	V
Input RF Level	+5	dBm
Operating Ambient Temperature	-40 to +85	℃
Storage Temperature	-40 to +150	℃

Notes : (1) ESD sensitive device, handle with care. (2) All voltage are with respective to ground.

Exceeding these ranges might cause damage to the device

DC ELECTRICAL CHRACTERISTICS

T=25℃, Vcc=3.3V, Vref=2.9V

PARAMETER	CONDITION	MIN	TYP	MAX	UNITS
Supply Voltages					
VCC1		3.0	3.3	4.0	Volts
VCC2		3.0	3.3	4.0	Volts
VCC3		3.0	3.3	4.0	Volts
VREF		2.8	2.9	3.0	Volts
Supply Currents					
Icc1 + Icc2 + Icc3 (for 802.11a usage)	Quiescent (no RF) Pout= 19 dBm		120 180		mA
Ioff	Standby current		0.05		uA
Iref	Quiescent (no RF)		5		mA

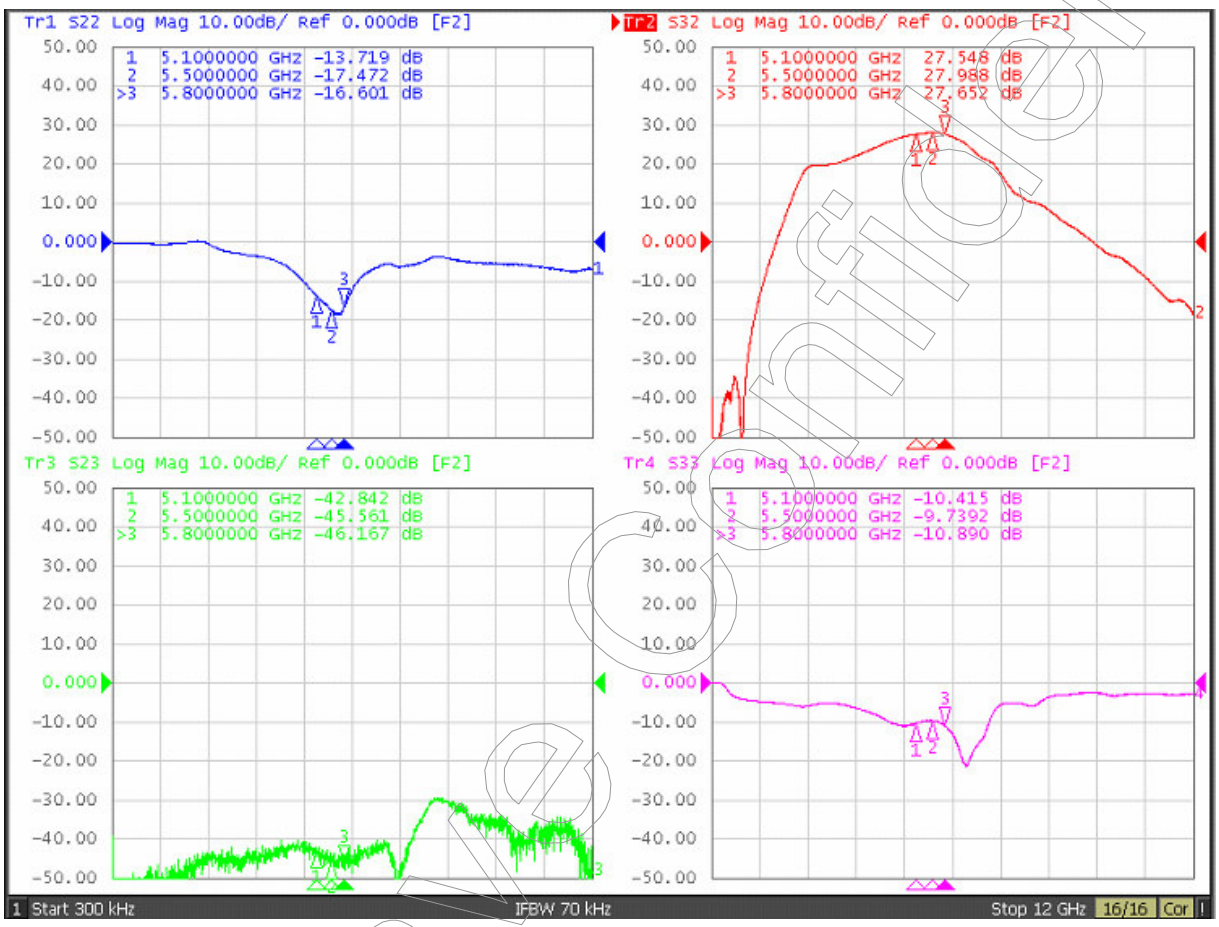
AC ELECTRICAL CHRACTERISTICS

T=25℃, Vcc=3.3V, Vref=2.9V

PARAMETER	CONDITION	MIN	TYP	MAX	UNITS
Frequency Range		4.9	5.4	5.9	GHz
Small Signal Gain	Pin= -20dBm		28		dB
P1dB	1dB Gain compression		25		dBm
Linear Pout for 11a usage	802.11a OFDM 64 QAM EVM = 3%		19		dBm
Pout for 11a Spectral mask	802.11a OFDM 64 QAM, 6Mbps		21.5		dBm
Gain Flatness	within band(4.9~5.9GHz)	-0.5		0.5	dB
Input return loss				-10	dB
Output return loss				-10	dB
2f, 3f, 4f harmonics	CW signal, Pout = 19 dBm			-32	dBc
t_{on} (ramp-on time)	Rise time for 10% to 90% Pout			100	ns

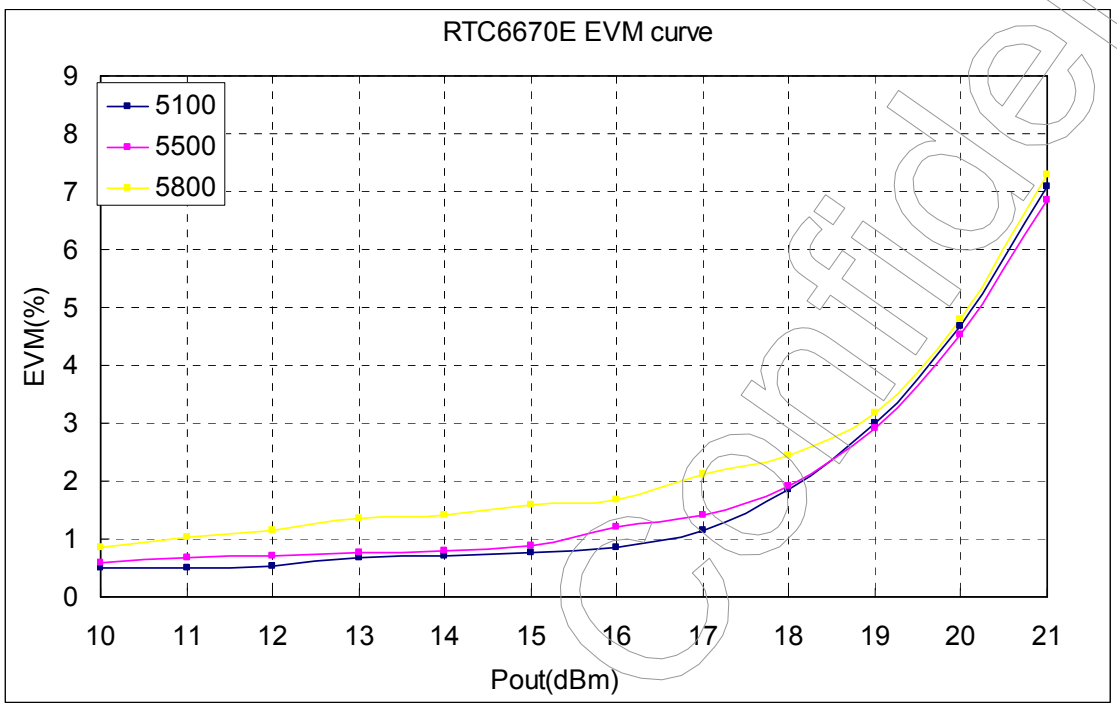
S-PARAMETER

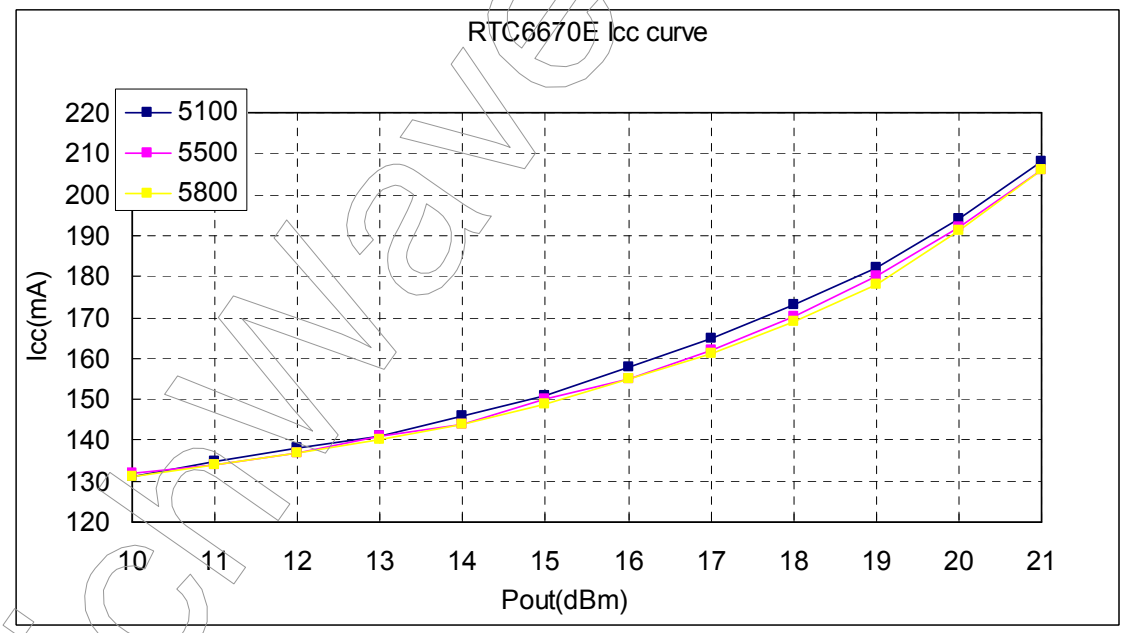
T=25℃, Vcc=3.3V, Vref=2.9V



EVM and ICC(@100% duty cycle) vs. Pout(OFDM/54Mbps)

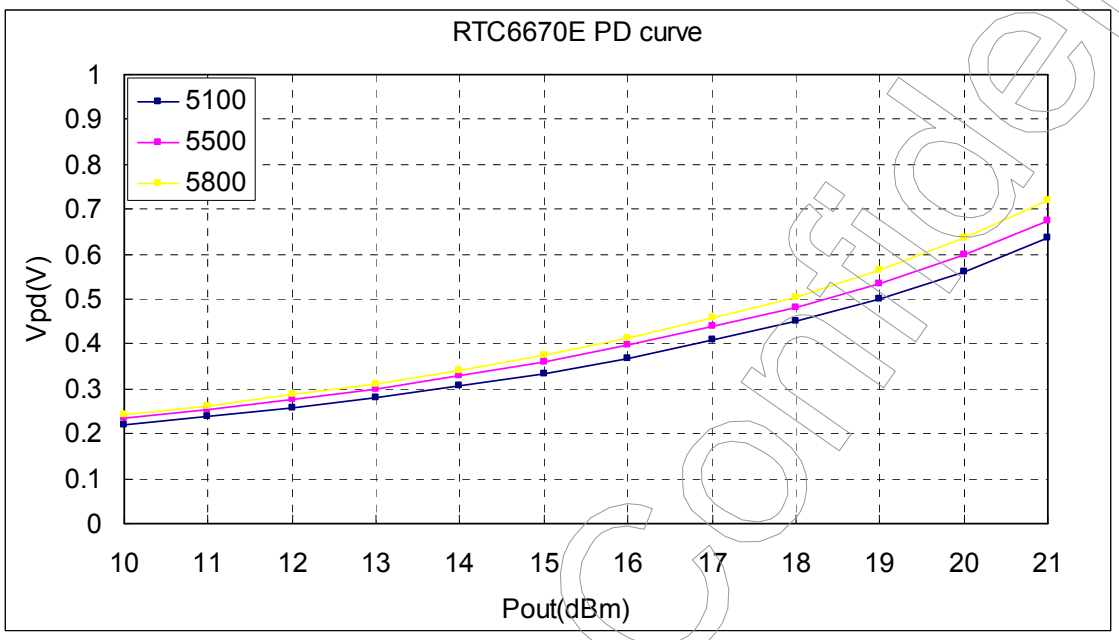
T=25℃, Vcc=3.3V, Vref=2.9V



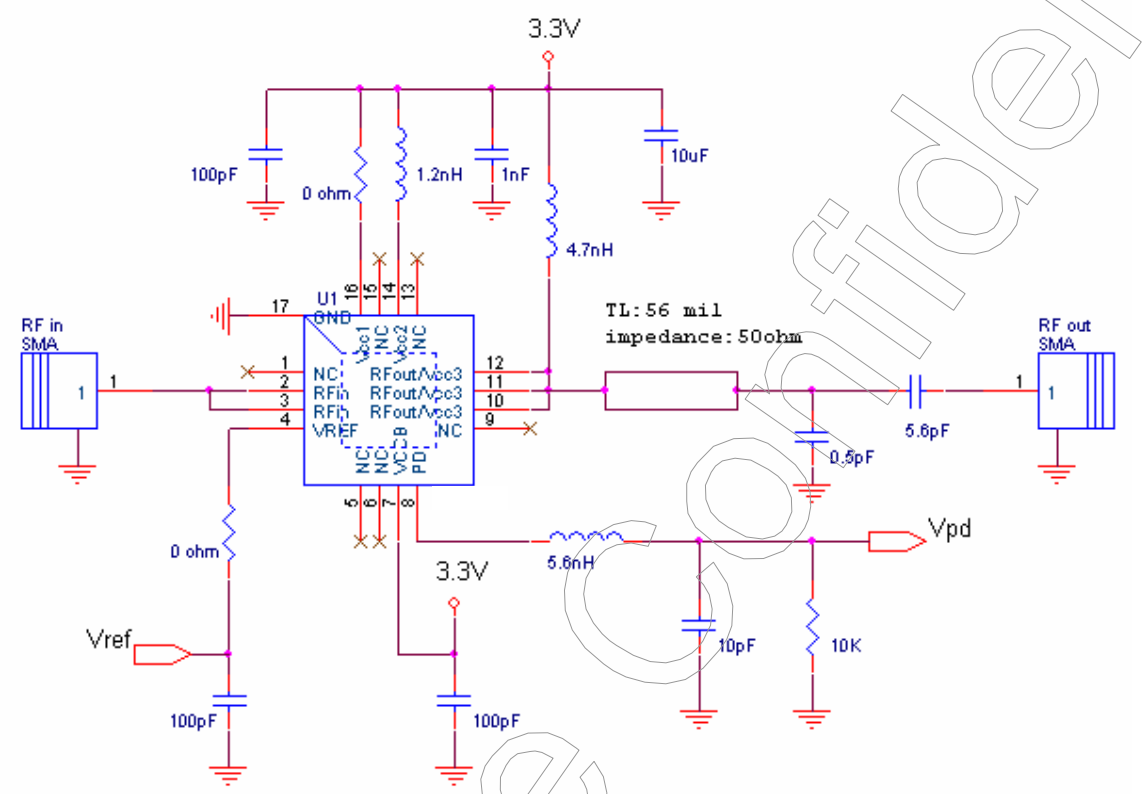


POWER DETECTOR

T=25℃, Vcc=3.3V, Vref=2.9V

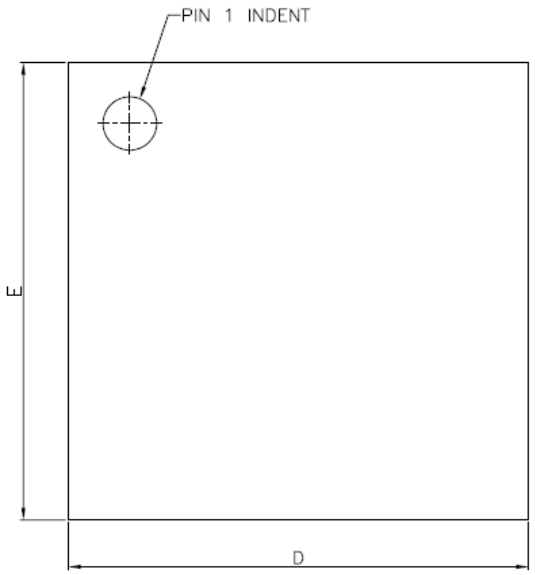


APPLICATION CIRCUIT :



PACKAGE

Quad Flat No-Lead Plastic Package (QFN16 3x3)



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