DESCRIPTION

The RTC6649E is a power amplifier (PA) designed for 2.4~2.5GHz frequency range, compatible with 802.11b/g/n wireless LAN system. The device is manufactured based on advanced InGaP/GaAs HBT (Hetero-junction Bipolar Transistor) process. 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 802.11g mode (OFDM 64QAM, 54Mbps), it is capable to provide a low EVM (Error-Vector magnitude) of 3% at +26dBm and 23.5dBm linear output power by single supply voltage 5V and 3.3V, respectively. The device is provided in a tiny industrial standard 16-lead surface mount package QFN 3mmX3mm.

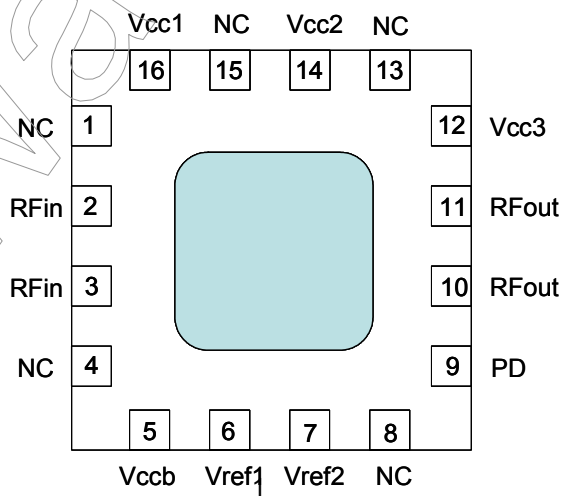
FEATURE

- 2.4 ~2.5GHz Frequency Range
- 3 ~ 5V Single Supply Voltage
- Linear Output Power for 802.11g usage : +26dBm under single 5V supply
- Linear Output Power for 802.11g usage : +23.5dBm under single 3.3V supply
- Small Signal Gain : 34 dB
- On-chip Input Matching
- QFN 3mmX3mm 16 Lead Package
- Lead-Free RoHS compliant
- RTC6649 Pin Compatible

APPLICATION

- High Power WLAN applications
- IEEE 802.11b/g/n Wireless LAN System
- 2.4GHz ISM Band Application
- 2.4GHz Cordless Phones

PIN OUT (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 control circuit
6	Vref1	Bias control voltage for 1st & 2nd stage
7	Vref2	Bias control voltage for 3rd stage
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, connected to pin10 & 11 internally
13	NC	Not connected
14	Vcc2	Power supply for power stage-2
15	NC	Not connected
16	Vcc1	Power supply for power stage-1

ABSOLUTE MAXIMUM RATINGS

Parameters	Rating	Units
Supply Voltage(Vcc)	0 to +6	V
Reference Voltage(Vref)	0 to +3.5	V
Input RF Level	+15 @10:1 output load	dBm
Operating Ambient Temperature	-40 to +85	℃
Storage Temperature	-40 to +150	℃

***** ESD sensitive device, handle with care***

DC ELECTRICAL CHRACTERISTICS

T=25℃, Vcc=Vccb=5V, Freq=2.45GHz

PARAMETER	CONDITION	MIN	TYP	MAX	UNITS
Supply Voltages					
Vcc1		4.75	5	5.25	Volts
Vcc2		4.75	5	5.25	Volts
Vcc3		4.75	5	5.25	Volts
Vccb		4.75	5	5.25	Volts
Vref		2.7	2.85	3	Volts
Supply Currents					
Icc1 + Icc2 + Icc3 (for 802.11g usage)	Quiescent (No RF) Pout= 26 dBm		270 430		mA
Iref	Quiescent (no RF)		4		mA

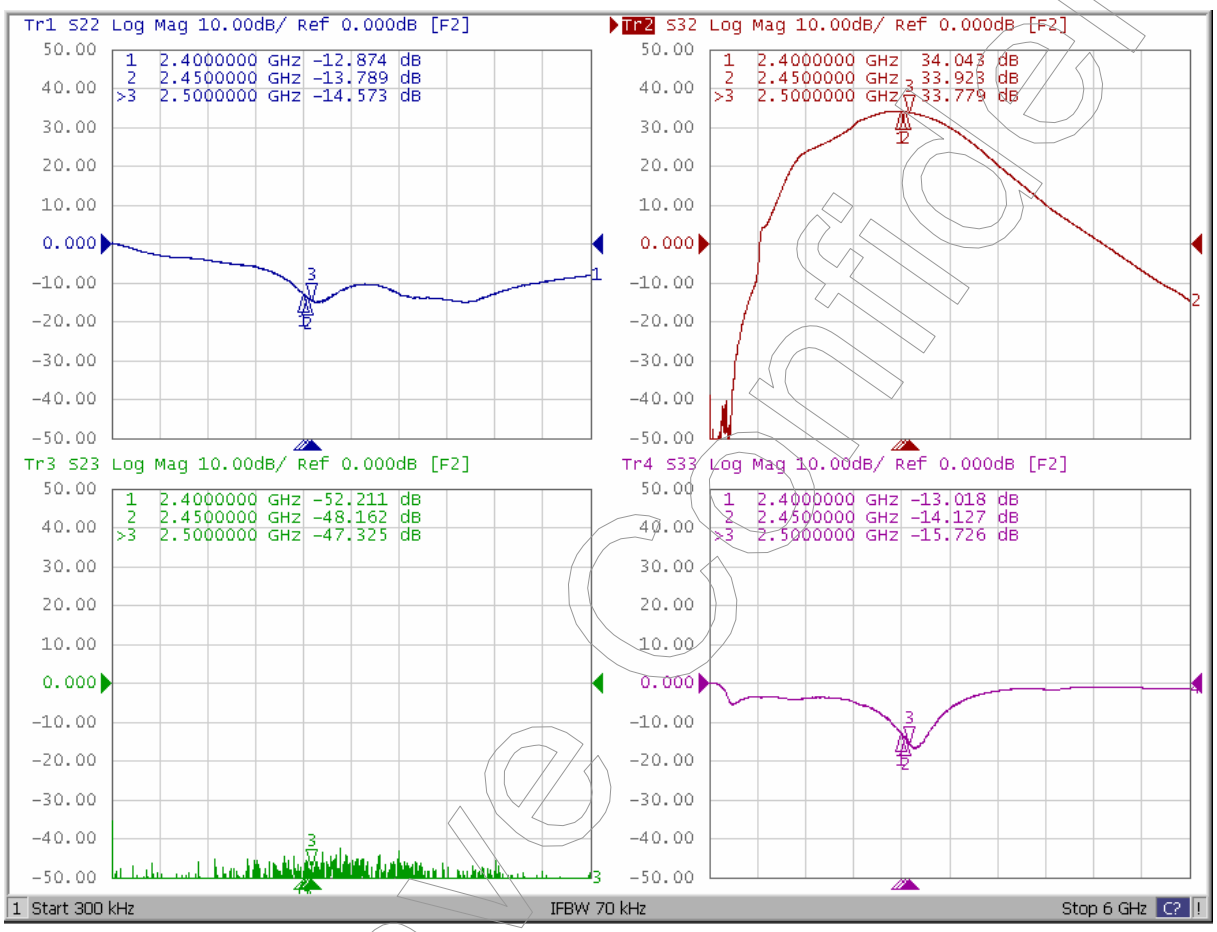
AC ELECTRICAL CHRACTERISTICS

T=25℃, Vcc=Vccb=5V, Freq=2.45GHz, Vref=2.85V

PARAMETER	CONDITION	MIN	TYP	MAX	UNITS
Frequency Range		2.4	2.45	2.5	GHz
Small Signal Gain	P_{in}=-30 dBm		34		dB
P1dB	1dB Gain compression		32		dBm
Linear Pout for 11g usage	64 QAM/54Mbps EVM = 3%		26		dBm
11g mask compliant power	OFDM 6Mbps		29		dBm
11b mask compliant power	DSSS 1Mbps		29.3		dBm
Gain Flatness	within band(2.4~2.5GHz)		+/-0.2		dB
Input return loss			-12		dB
Output return loss			-14		dB
2f, 3f, harmonics	Pout=27dBm, 802.11b 1Mbps		-43/-48		dBm/MHz

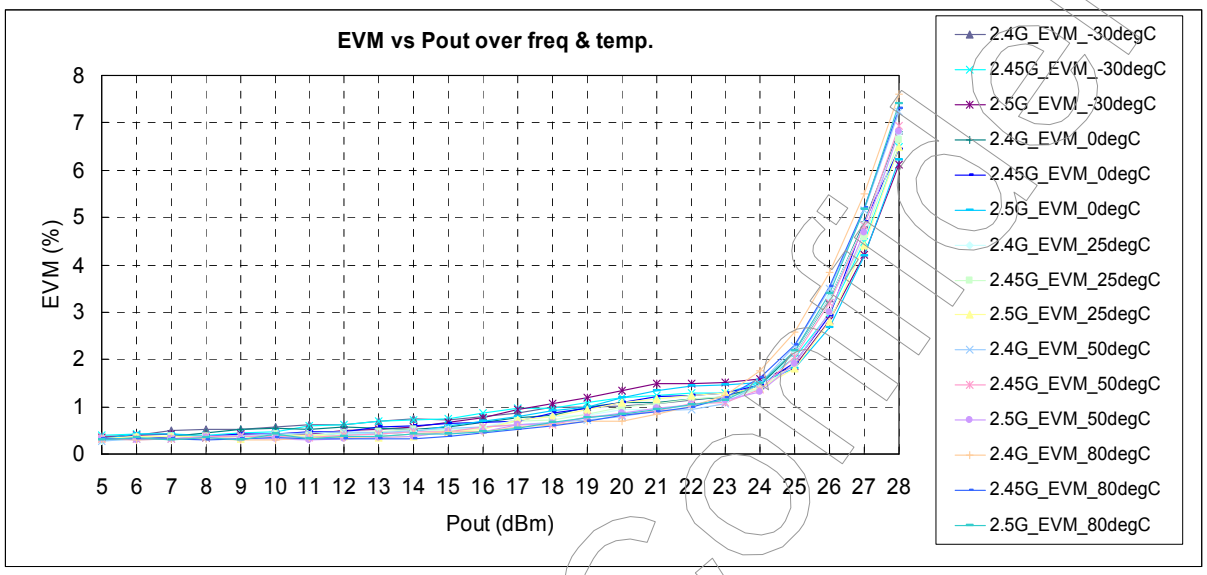
S-PARAMETER

T=25℃, Vcc=Vccb=5V, Vref=2.85V



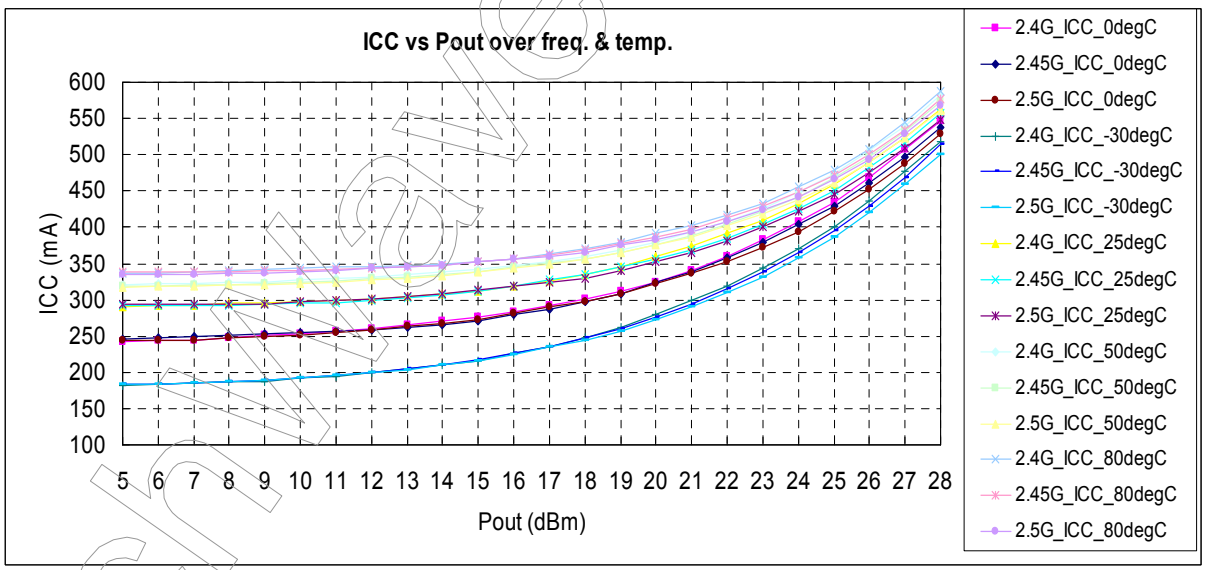
EVM

T=25℃, Vcc=Vccb=5V, Vref=2.85V, 64QAM/54Mbps



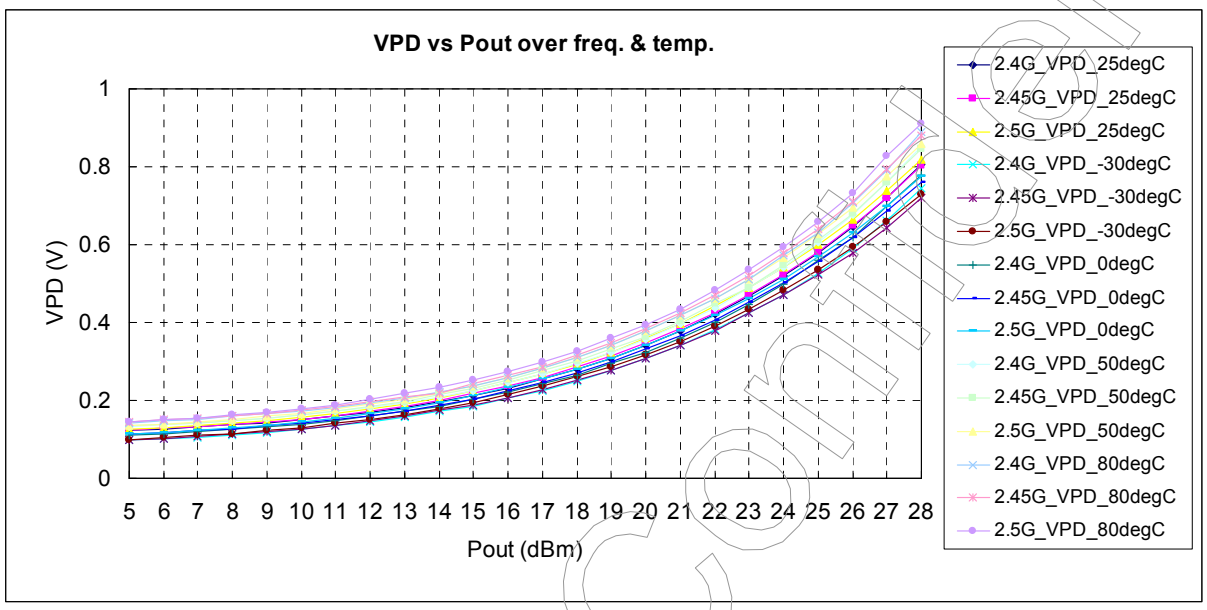
Icc

T=25℃, Vcc=Vccb=5V, Vref=2.85V, 64QAM/54Mbps(100% duty cycle)

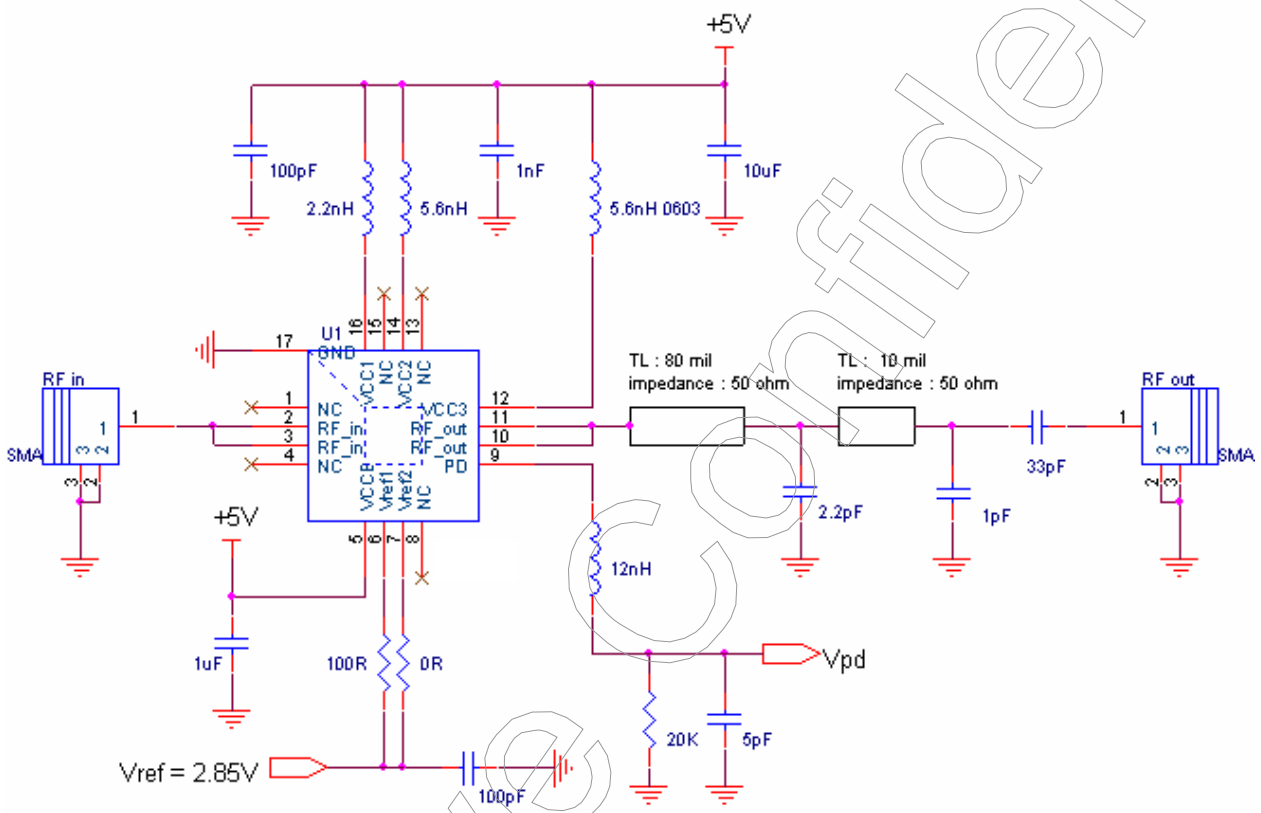


POWER DETECTOR

T=25℃, Vcc=Vccb=5V, Vref=2.85V, 64QAM/54Mbps(100% duty cycle)

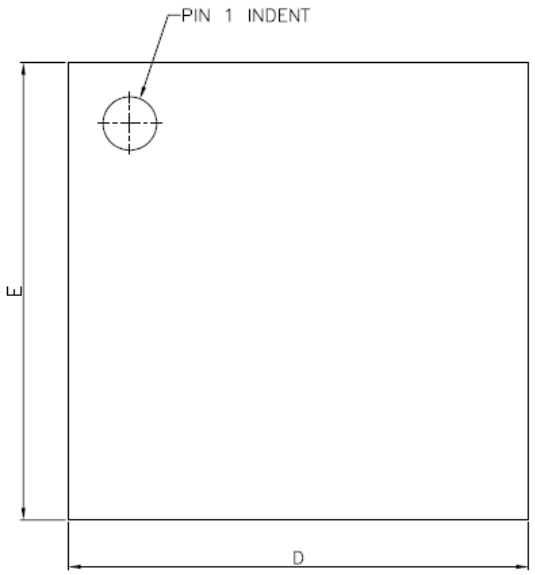


RECOMMENDED APPLICATION CIRCUIT



PACKAGE :

16L QFN-3mmX3mm



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