深圳市锦辉鸿电子科技有限公司

LC-RTL8821CE

DATASHEET

Design	Check	Approve	Version	Date
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1. Overview

The LC-RTL8821CE is a Mini PCIE module .that support 1-stream 802.11ac solutions with Multi-user MIMO (Multiple-Input , Multiple-Output) STA mode with Wireless LAN (WLAN) PCI Express network interface controller with integrated Bluetooth Smart Ready USB interface controller. The LC-RTL8821CE provides a complete solution for a high-performance integrated wireless and Bluetooth device.

2. Features

WLAN

- IEEE 802.11a/b/g/n/ac compliant WLAN
- 5MHz / 10MHz / 20MHz / 40MHz / 80MHz bandwidth transmission
- Complies with PCI Express Base Specification Revision 2.1
- Support low-power PCIe 2.1 (withL1-substate) interface for WLAN
- Maximum data rate 54Mbps in 802.11g,150Mbps in 802.11n and 433.3Mbps in 802.11ac.
- DSSS with DBPSK and DQPSK, CCKmodulation with long and short Preamble.
- OFDM with BPSK, QPSK, 16QAM,64QAM and 256QAM modulation.Convolutional Coding Rate: 1/2, 2/3, 3/4,and 5/6

Bluetooth

- Support Bluetooth 4.2 system
- Compatible with Bluetooth V2.1+EDR
- Integrated MCU to execute Bluetooth protocol stack
- Enhanced BT/WIFI Coexistence Control to improve transmission quality in different Profiles
- Dual Mode support: Simultaneous LE and BR/EDR

- Supports multiple Low Energy states
- Supports Enhanced Power Control
- Supports all packet types in basic rate and enhanced data rate
- Supports Secure Simple Pairing

3. General Specification

Model	LC-RTL8821CE
Product Name	WiFi 11a/b/g/n/ac 1T1R and BT4.2 Module
Major Chipset	Realtek RTL8821CE-CG
Standard	IEEE802.11a/b/g/n/ac, 802.3, 802.3u, BT2.1/ 3.0/ 4.2
Data Transfer Rate	1,2,5.5,6,11,12,18,22,24,30,36,48,54,60, 90,120 and maximum of 433.3Mbps
Modulation Method	DSSS/DBPSK/DQPSK/16-QAM/ 64-QAM/256QAM
Frequency Band	2.4~2.4835GHz , 5.0~5.8 GHz
Spread Spectrum	IEEE 802.11b: DSSS (Direct Sequence Spread Spectrum) IEEE802.11a/g/n/ac (OFDM (Orthogonal rthogonal Frequency Division Multiplexing)
Operation Mode	Ad hoc, Infrastructure
Interface	Wi-Fi : PCI-E , Bluetooth : USB2.0
Operating Temperature	-0~ +70° C ambient temperature
Storage Temperature	-40 ~+85°C ambient temperature
Humidity	5 to 90 % maximum (non-condensing)
Dimension	26.8mm x29.8mm x 3mm (LxWxH)±0.15mm

4. DC Characteristics

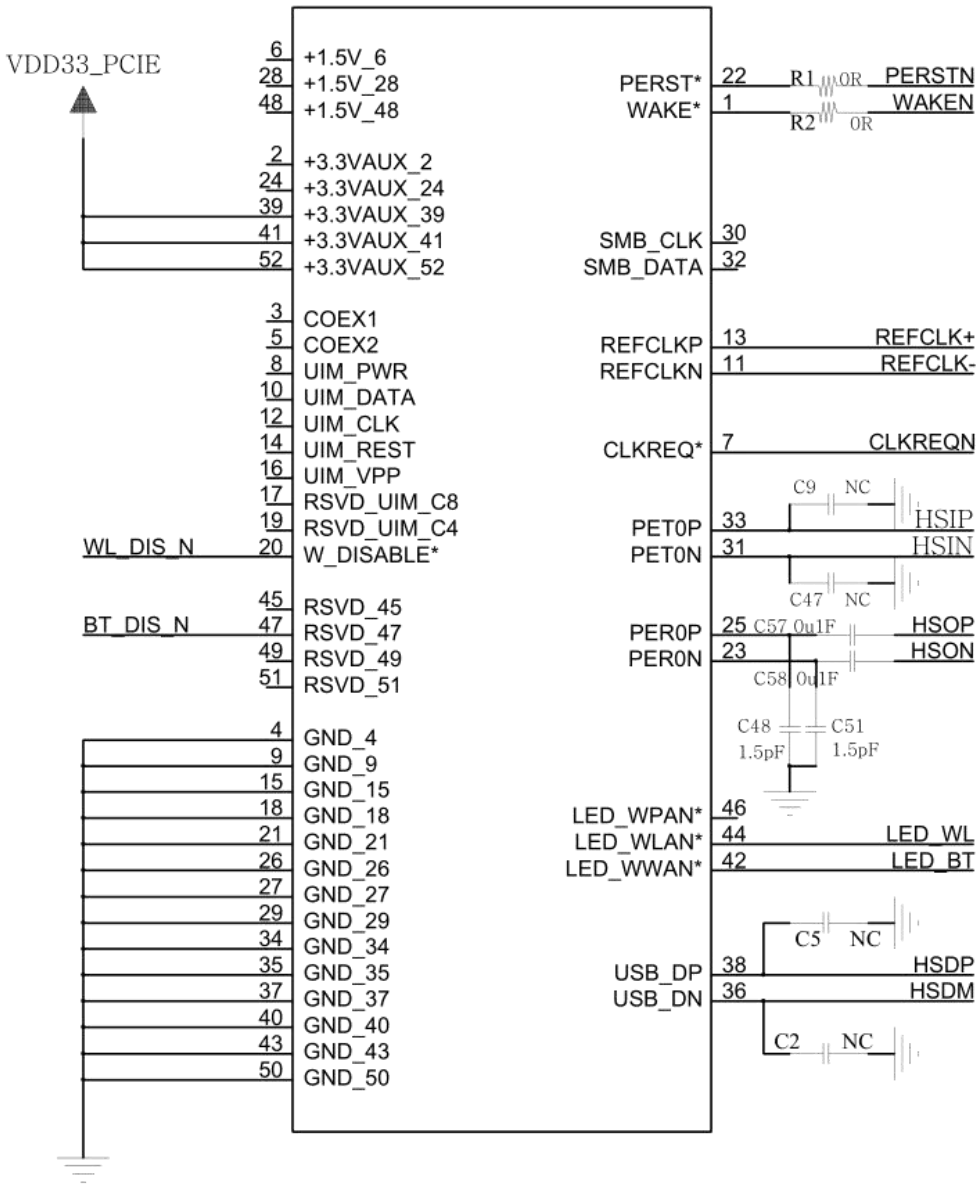
Symbol	Parameter	Min.	Typ.	Max	Units
VD33	3.3V I/O supply Voltage	3.0	3.3	3.6	V
VD10	1.05V Core Supply Voltage	0.945	1.05	1.155	V
V_{IH}	Input high Voltage	2.0	3.3	3.6	V
V_{IL}	Input low Voltage	--	0	0.9	V
V_{OH}	output high Voltage	2.97	--	3.3	V
V_{OL}	output low Voltage	0	--	0.33	V

5. Dimension & Pin Assignments

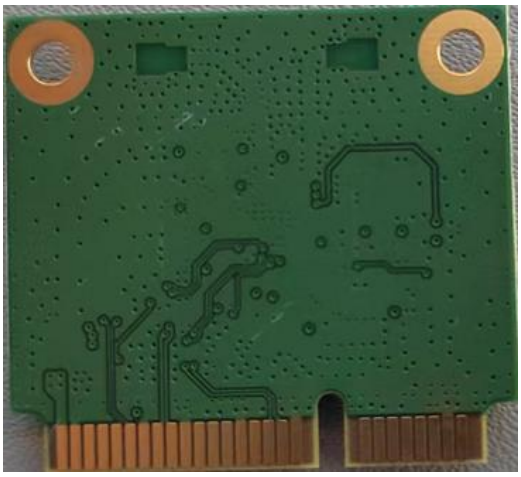
NO	Name	Description
1	WAKE	pen Drain active Low signal. This signal is used to request that the system return from a sleep/susp
2	NC	Floating Pin, No connect to anything.
3	NC	Floating Pin, No connect to anything.
4	GND	Ground connections
5	NC	Floating Pin, No connect to anything.
6	NC	Floating Pin, No connect to anything.
7	CLKREQN	Reference clock request
8	NC	Floating Pin, No connect to anything.
9	GND	Ground connections
10	NC	Floating Pin, No connect to anything.
11	REFCLKN	Differential reference clock.
12	NC	Floating Pin, No connect to anything.
13	REFCLKP	Differential reference clock.
14	NC	Floating Pin, No connect to anything.
15	GND	Ground connections
16	NC	Floating Pin, No connect to anything.
17	NC	Floating Pin, No connect to anything.
18	GND	Ground connections
19	NC	Floating Pin, No connect to anything.
20	WL_DIS_N	WLAN disable control.
21	GND	Ground connections
22	PERSTN	PCI express fundamental reset
23	PER0N	Differential transmit
24	NC	Floating Pin, No connect to anything.

25	PER0P	Differential transmit
26	GND	Ground connections
27	GND	Ground connections
28	NC	Floating Pin, No connect to anything.
29	GND	Ground connections
30	NFC_CLK	RSVD
31	PET0N	Differential receive
32	NFC_DATA	RSVD
33	PET0P	Differential receive
34	GND	Ground connections
35	GND	Ground connections
36	USB_DN	USB Differential signal USB_D-
37	GND	Ground connections
38	USB_DP	USB Differential signal USB D+
39	3.3V	3.3V power supply
40	GND	Ground connections
41	3.3V	3.3V power supply
42	LED_BT	Active low signal.The signal is used to provide
43	GND	Ground connections
44	NC	Floating Pin, No connect to anything.
45	NC	Floating Pin, No connect to anything.
46	NC	Floating Pin, No connect to anything.
47	BT_DIS_N	BT disable control.
48	NC	Floating Pin, No connect to anything.
49	NC	Floating Pin, No connect to anything.
50	GND	Ground connections
51	NC	Floating Pin, No connect to anything.
52	3.3V	3.3V power supply

6. Schematics



7. Modular photo

	
TOP View	Botttom View
Dimension：26.8mm x29.8mm x 3mm (LxWxH)±0.15mm	

8. Supplier

Name of material	Specifications	Suppliers
Crystal	40Mhz	JWT ， FK ， SFJ
Diplexer	2.4G/5G	Sunlord, TDK, Glead
PCBA	21821CE	A ， O ， S

9. Electrical Characteristics

WiFi Section:

9.1 2.4GHz RF Specification

Feature	Description
WLAN Standard	IEEE 802.11a/b/g/n/ac WiFi compliant
Frequency Range	2.400 GHz ~ 2.497 GHz (2.4 GHz ISM Band)
Number of Channels	2.4GHz：Ch1 ~ Ch14
Modulation	802.11b : DQPSK, DBPSK, CCK 802.11 g/n : OFDM /64-QAM,16-QAM, QPSK, BPSK
Output Power	802.11b /11Mbps : 17dBm ± 2 dB @ EVM ≤ -15dB
	802.11g /54Mbps : 14 dBm ± 2 dB @ EVM ≤ -28dB
	802.11n /MCS7 HT20: 14 dBm ± 2 dB @ EVM ≤ -28dB
	802.11n /MCS7 HT40: 13 dBm ± 2 dB @ EVM ≤ -28dB

Receive Sensitivity (11b,20MHz) @8% PER	- 1Mbps	PER @ -93 dBm, typical
	- 2Mbps	PER @ -91 dBm, typical
	- 5.5Mbps	PER @ -88 dBm, typical
	- 11Mbps	PER @ -86 dBm, typical
Receive Sensitivity (11g,20MHz) @10% PER	- 6Mbps	PER @ -90 dBm, typical
	- 9Mbps	PER @ -89 dBm, typical
	- 12Mbps	PER @ -88 dBm, typical
	- 18Mbps	PER @ -85 dBm, typical
	- 24Mbps	PER @ -82 dBm, typical
	- 36Mbps	PER @ -79 dBm, typical
	- 48Mbps	PER @ -74 dBm, typical
	- 54Mbps	PER @ -72 dBm, typical
Receive Sensitivity (11n,20MHz) @10% PER	- MCS=0	PER @ -90 dBm, typical
	- MCS=1	PER @ -87 dBm, typical
	- MCS=2	PER @ -85 dBm, typical
	- MCS=3	PER @ -81 dBm, typical
	- MCS=4	PER @ -78 dBm, typical
	- MCS=5	PER @ -73 dBm, typical
	- MCS=6	PER @ -72 dBm, typical
	- MCS=7	PER @ -68 dBm, typical
Receive Sensitivity (11n,40MHz) @10% PER	- MCS=0	PER @ -85 dBm, typical
	- MCS=1	PER @ -84 dBm, typical
	- MCS=2	PER @ -82 dBm, typical
	- MCS=3	PER @ -75 dBm, typical
	- MCS=4	PER @ -73 dBm, typical
	- MCS=5	PER @ -70 dBm, typical
	- MCS=6	PER @ -68 dBm, typical
	- MCS=7	PER @ -66dBm, typical
Maximum Input Level	802.11b : -10 dBm	
	802.11g/n : -20 dBm	
Antenna Reference	Small antennas with 0~2 dBi peak gain	

9.2 5GHz RF Specification

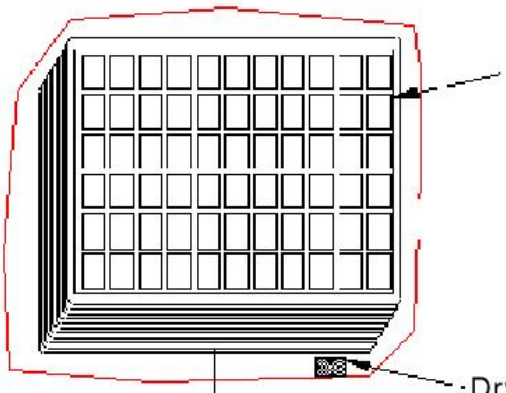
Feature	Description
WLAN Standard	IEEE 802.11a/n/ac 1x1, WiFi compliant
Frequency Range	4.900 GHz ~ 5.845 GHz (5.0 GHz ISM Band)
Number of Channels	5.0GHz：Please see the table
Modulation	802.11a : OFDM /64-QAM,16-QAM, QPSK, BPSK 802.11n : OFDM /64-QAM,16-QAM, QPSK, BPSK 802.11ac : OFDM /256-QAM
Output Power	802.11a /54Mbps : 13 dBm ± 2 dB @ EVM ≤ -25dB
	802.11n HT20 /MCS7 : 12 dBm ± 2 dB @ EVM ≤ -28dB
	802.11n HT40 /MCS7 : 12 dBm ± 2 dB @ EVM ≤ -28dB
	802.11ac VHT20 /MCS8 : 11 dBm ± 2 dB @ EVM ≤ -30dB
	802.11ac VHT40 /MCS9 : 11 dBm ± 2 dB @ EVM ≤ -32dB
	802.11ac VHT80 /MCS9 : 10 dBm ± 2 dB @ EVM ≤ -32dB
Receive Sensitivity (11a,20MHz) @10% PER	- 6Mbps PER @ -89 dBm, typical
	- 9Mbps PER @ -88 dBm, typical
	- 12Mbps PER @ -87 dBm, typical
	- 18Mbps PER @ -84 dBm, typical
	- 24Mbps PER @ -81 dBm, typical
	- 36Mbps PER @ -78 dBm, typical
	- 48Mbps PER @ -73 dBm, typical
	- 54Mbps PER @ -72 dBm, typical
Receive Sensitivity (11n,20MHz) @10% PER	- MCS=0 PER @ -89 dBm, typical
	- MCS=1 PER @ -86 dBm, typical
	- MCS=2 PER @ -84 dBm, typical
	- MCS=3 PER @ -81 dBm, typical
	- MCS=4 PER @ -77 dBm, typical
	- MCS=5 PER @ -72 dBm, typical
	- MCS=6 PER @ -71 dBm, typical
	- MCS=7 PER @ -68 dBm, typical
Receive Sensitivity (11n,40MHz) @10% PER	- MCS=0 PER @ -86 dBm, typical
	- MCS=1 PER @ -83 dBm, typical
	- MCS=2 PER @ -81 dBm, typical
	- MCS=3 PER @ -78 dBm, typical
	- MCS=4 PER @ -74 dBm, typical
	- MCS=5 PER @ -70 dBm, typical
	- MCS=6 PER @ -68 dBm, typical
	- MCS=7 PER @ -66 dBm, typical
	- MCS=0, NSS1 PER @ -87 dBm, typical

	- MCS=1, NSS1 PER @ -85 dBm, typical
	- MCS=2, NSS1 PER @ -83 dBm, typical
	- MCS=3, NSS1 PER @ -80 dBm, typical
	- MCS=4, NSS1 PER @ -76 dBm, typical
	- MCS=5, NSS1 PER @ -71 dBm, typical
	- MCS=6, NSS1 PER @ -70 dBm, typical
	- MCS=7, NSS1 PER @ -69 dBm, typical
	- MCS=8, NSS1 PER @ -65 dBm, typical
Receive Sensitivity (11ac,40MHz) @10% PER	- MCS=0, NSS1 PER @ -85 dBm, typical
	- MCS=1, NSS1 PER @ -82 dBm, typical
	- MCS=2, NSS1 PER @ -80 dBm, typical
	- MCS=3, NSS1 PER @ -77 dBm, typical
	- MCS=4, NSS1 PER @ -74 dBm, typical
	- MCS=5, NSS1 PER @ -69 dBm, typical
	- MCS=6, NSS1 PER @ -68 dBm, typical
	- MCS=7, NSS1 PER @ -67 dBm, typical
	- MCS=8, NSS1 PER @ -62 dBm, typical
	- MCS=9, NSS1 PER @ -58 dBm, typical
Receive Sensitivity (11ac,80MHz) @10% PER	- MCS=0, NSS1 PER @ -82 dBm, typical
	- MCS=1, NSS1 PER @ -79 dBm, typical
	- MCS=2, NSS1 PER @ -77 dBm, typical
	- MCS=3, NSS1 PER @ -73 dBm, typical
	- MCS=4, NSS1 PER @ -70 dBm, typical
	- MCS=5, NSS1 PER @ -67 dBm, typical
	- MCS=6, NSS1 PER @ -65 dBm, typical
	- MCS=7, NSS1 PER @ -63 dBm, typical
	- MCS=8, NSS1 PER @ -59 dBm, typical
	- MCS=9, NSS1 PER @ -55 dBm, typical
Maximum Input Level	802.11a/n/ac : -20 dBm
Antenna Reference	Small antennas with 0~2 dBi peak gain

9.3 Bluetooth Section

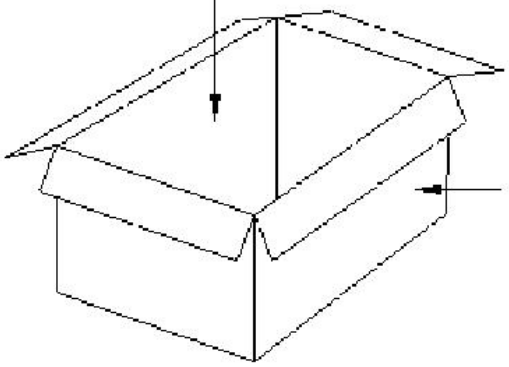
Feature	Description		
General Specification			
Bluetooth Standard	Bluetooth V2.1+EDR + V5.0		
Host Interface	USB2.0		
Antenna Reference	Small antennas with 0~2 dBi peak gain		
Frequency Band	2402 MHz ~ 2480 MHz		
Number of Channels	79 channels		
Modulation	FHSS, GFSK, DPSK, DQPSK		
RF Specification			
	Min	**Typical**	**Max**
Output Power		6 dBm	
Sensitivity @ BER=0.1% for GFSK (1Mbps)		-86 dBm	
Sensitivity @ BER=0.01% for π/4-DQPSK (2Mbps)		-86 dBm	
Sensitivity @ BER=0.01% for 8DPSK (3Mbps)		-80 dBm	
Maximum Input Level	GFSK (1Mbps):-20dBm		
	π/4-DQPSK (2Mbps) :-20dBm		
	8DPSK (3Mbps) :-20dBm		

10.Packing information



Material Trays：350*255mm
One for 60 pcs

Drying agent



Carton size：370*290*130mm
QTY:

纸箱：370*265*145mm

一箱共装 1000PCS

ESD CAUTION

The LC-RTL8821CE is ESD (electrostatic discharge) sensitive device and may be damaged with ESD or spike voltage. Although LCL-RTL8821CE is with built-in ESD protection circuitry, please handle with care to avoid the permanent malfunction or the performance degradation.