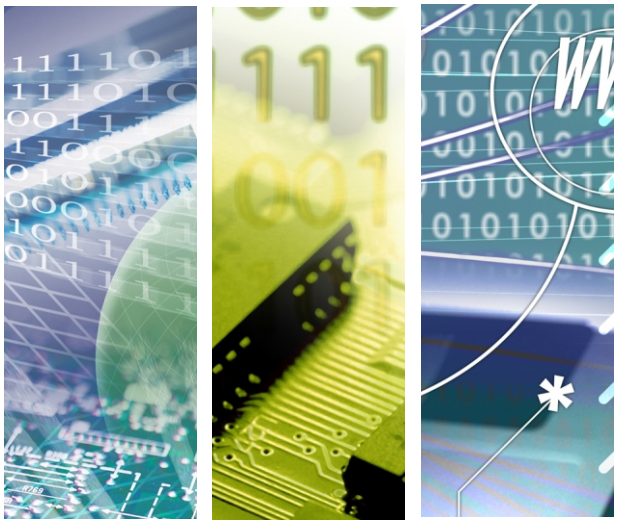
DGF109R

802.11AC/abgn Wi-Fi with BT4.2/5.0 NGFF Card



DGF109R

802.11abgn/AC+BT4.2/5.0, 2T2R, M.2(2230), Realtek RTL8822BE/CE

Introduction of Products

Bointec DGF109R/DGF109R-3* IEEE 802.11 a/b/g/n/ac PCIE WIFI with Bluetooth 4.2/5.0* combo M.2 module is a highly integrated single-chip MIMO (Multiple In, Multiple Out) wireless local area network (WLAN) solution to let users enjoy the digital content through the latest wireless technology without using the extra cables and cords. It combines a WLAN MAC, a 2T2R capable WLAN baseband, and RF in s single chip. It enables a high performance, cost effective, low power, compact solution that easily fits onto the PCI Express and USB M.2 module.

Bointec DGF109R/DGF109R-3* baseband implements Multi-user Multiple Input, Multiple Output (MU-MIMO) Orthogonal Frequency Division Multiplexing (OFDM) with two transmit and two receive paths (2T2R). Features include two spatial stream transmissions, short Guard Interval (GI) of 400ns, spatial spreading, and support for variant channel bandwidth.

Moreover, Bointec DGF109R/DGF109R-3 provides one spatial stream space- time block code (STBC), Transmit Beam forming (TXBF) and Low Density Parity Check (LDPC) to extend the range of transmission. At the receiver, extended range and good minimum sensitivity is achieved by having receiver diversity up to 2 antennas. As the recipient, DGF109R also supports explicit sounding packet feedback that helps senders with beam forming capability.

*DGF109R-3 support Bluetooth 5.0, while DGF109A support Bluetooth4.2

Product Highlight

Wi-Fi Feature:

- Support 802.11ac 2x2,Wave-2 compliant with MU-MIMO
- Complete 802.11n MIMO solution for 2.4GHz and 5Ghz band
- Maximum PHY data rate up to 173.3 Mbps using 20MHz bandwidth, 400Mbps using 40MHz bandwidth, and 866.7Mbps using 80MHz bandwidth.
- Multiple BSSID feature allows the RTL8822BE-CG to assume multiple MAC identities when used as a wireless bridge
- Wi-Fi Direct supports wireless peer to peer applications.
- Supports Wake-On-WLAN via Magic Packet and Wake-up frame
- Transmit Beam forming
- Support Network List Offload
- CCA on secondary through RTS/CTS handshake.
- Maximum data rate 54Mbps in 802.11g, 300Mbps in 802.11n and 866.7bps in 802.11ac.

BT Feature:

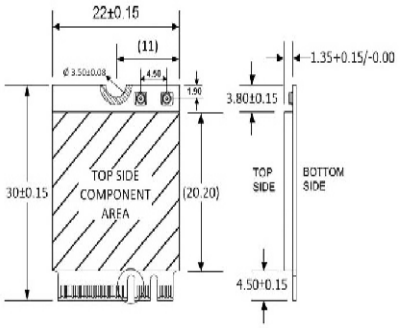
- Compatible with Bluetooth v2.1 and v3.0+EDR
- Support Bluetooth 4.1 system(DGF109R)
  Support Bluetooth 5.0(DGF109R-3)
- Support Bluetooth 4.2 LE Secure Connection by upper layer software upgrade
- Integrated MCU to execute Bluetooth protocol stack
- Supports all packet types in basic rate and enhanced data rate
- Supports Pico nets in a scatter net
- Supports Secure Simple Pairing
- Supports Low Power Mode (Sniff/Sniff Sub-rating)
- 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
- Fast AGC control to improve receiving dynamic range
- Supports AFH to dynamically detect channel quality to improve transmission quality
- negated internal Class 1, Class 2, and Class 3 PA
- Supports Bluetooth Low Energy

Specification

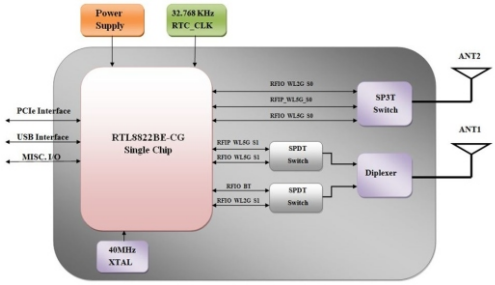
	Wi-Fi
Standard	IEEE802.11ac,IEEE802.11a , IEEE802.11b , IEEE 802.11g , IEEE 802.11n
Bus Interface	PCI Express
Data Rate	802.11b: 1, 2, 5.5, 11Mbps
	802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54Mbps
	802.11n: up to 150Mbps-single
	802.11n: up to 300Mbps-2x2 MIMO
	802.11ac:up to 192.6Mbps (20MHz channel)
	802.11ac:up to 400Mbps (40MHz channel)
	802.11ac:up to 866.7Mbps (80MHz channel)
Media Access Control	
Modulation Techniques	DSSS, OFDM, DBPSK, DQPSK, CCK, 16-QAM, 64-QAM for WLAN
Network Architecture	
Operation Channel	2.4GHz:
	USA, NORTH AMERICA, Canada and Taiwan – 1 ~ 11
	China, Australia, Most European Countries – 1 ~ 13
	Japan – 1 ~ 14(CH14 only for 802.11b)
	802.11g:
	USA, Canada and Taiwan – 1 ~ 11
	China, Australia, Most European Countries – 1 ~ 13
	5GHz:
	USA, EUROPE – 36, 40, 44, 48, 52, 56, 60, 64, 100, 104, 108,
	112, 116, 120, 124, 128, 132, 136, 140, 149, 153, 157, 161, 165
Frequency Range	2.4 GHz : 2.412 ~ 2.484 GHz
	5 GHz: 4.915 ~5.925Ghz
Security	WAPI
	WEP 64-bit and 128-bit encryption with H/W TKIP processing
	WPA/WPA2 (Wi-Fi Protected Access)
	AES-CCMP hardware implementation as part of 802.11i security standard
Bluetooth	
Standard	Bluetooth 2.1+Enhanced Data Rate (EDR) + BT4.2
Bus Interface	USB2.0
Data Rate	Bluetooth 2.1+EDR data rates of 1,2, and 3Mbps
Modulation Scheme	GFSK (1Mbps), Π/4 DQPSK (2Mbps) and 8DPSK (3Mbps)
Frequency Range	2402~2480MHz
Transmit Output Power	Class 2 : 0~6 dBm
Receiver Sensitivity	GFSK: -88 dBm (Typical)
	π/4-DQPSK: -89 dBm (Typical)
	8-DPSK: -83 dBm (Typical)
Software	Bluetooth Suite
Electronics characteristics	
Operating Voltage	3.3 V
OS Supported	Microsoft Windows
Antenna Type	I-PEX MHF4 Connector Receptacle (20449)
	Main : Wi-Fi → TX/RX
	Aux: Wi-Fi/Bluetooth → TX/RX
Environmental	
Operating Temperature	● Commercial: 0°C ~ +70°C
Storage Temperature	● Commercial: -40°C ~ +85°C
Operating Humidity	● Operating humidity: <85%

Product quick glance

ME Drawing/placement



Block Diagram



Ordering Information

PART NUMBER	DESCRIPTION
T.DGF109R	DGF109R, Single packed
T.DGF109R3	DGF109R-3(Bluetooth5.0), Single packed
T.DGF109R-DK	Bointec packed, DGF109R development kit packed
TFGA-DGF109R0-12	Finished non packaing,Bointec,DGF109R
TFGA-DGF109R0-13	Finished non packaing,Bointec,DGF109R(BT5.0)

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