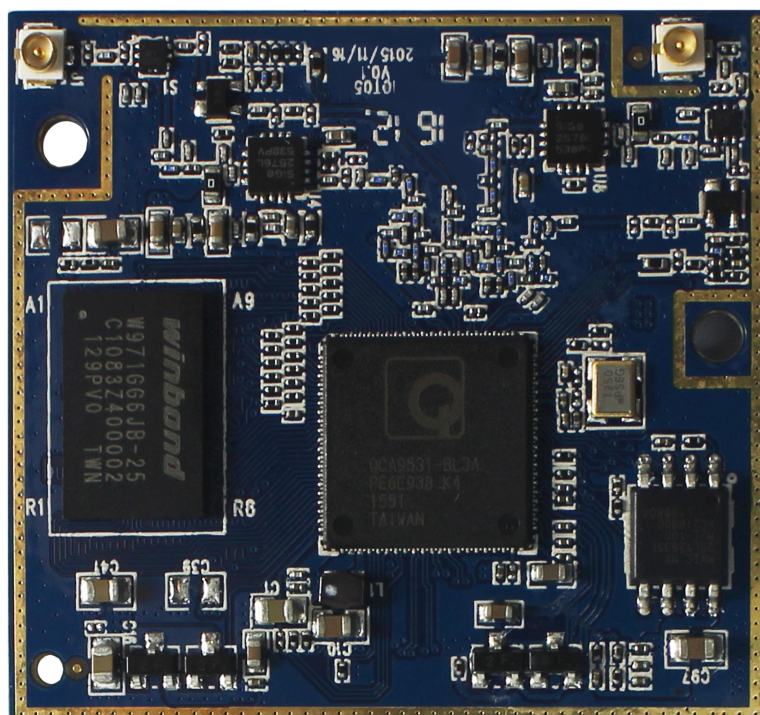


ComIoT 05

802.11b/g/n 大功率无线路由核心模组 产品规格书



- 高通方案
- 支持 Mesh
- 可开放开发资料
- 支持 OpenWRT 方案
- 传输距离可达 800 米
- 300M 大功率传输速率

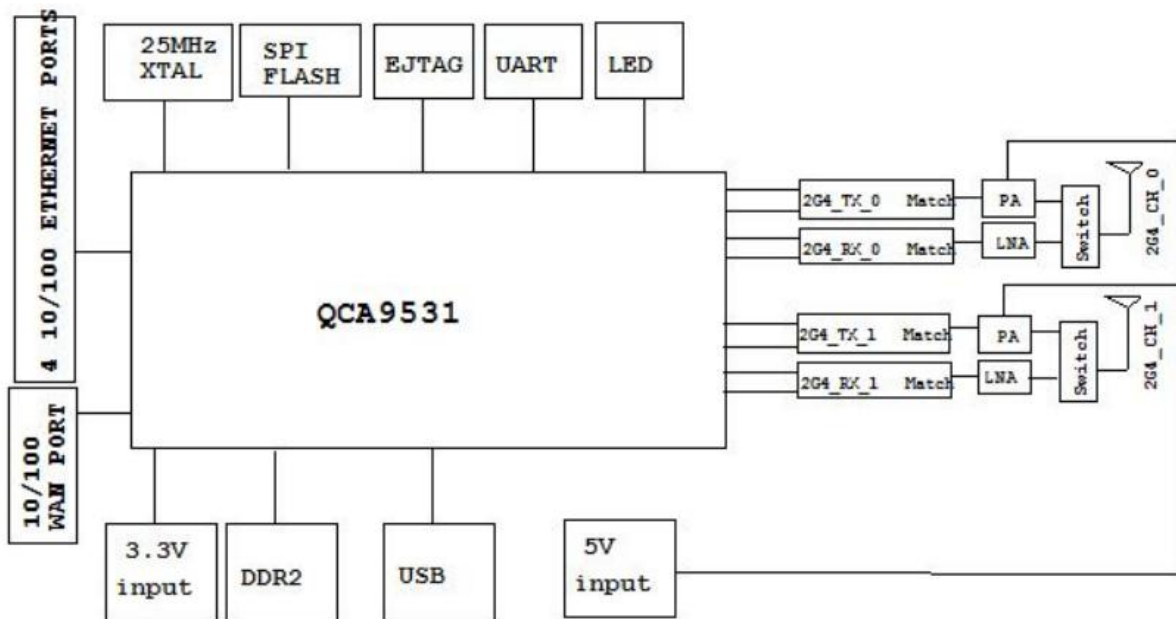
1. 产品介绍

ComIoT 05 模块是一个完整的小型 802.11 b/g/n Wi-Fi 解决方案，针对低成本、高度集成的高功率消费电子设备进行了优化，该模块是一个高集成的小型 802.11 b/g/n Wi-Fi 网关模组。ComIoT 05模组将Wi-Fi功能，网口，串口，USB及路由系统集成在一个封装中，只需要进行简单的几个外部电路就可以把模块完美应用起来。

该模块基于单芯片 QCA9531，集成了 802.11n 2x2 MAC/BB/radio 以及外部 PA 和 LNA，它的无线部分射频最高可达到150mW。它支持 802.11n 操作，20 MHz 和 40 MHz 信道分别高达 144 Mbps 和 300 Mbps，以及 IEEE 802.11b/g 数据速率。

模块同时支持AP模式和客户端模式，包含海量业务应用软件，减少客户的研究和设计工作。

硬件架构如下图所示：



硬件框图设计

1.1 协议规范

模块支持以下协议规范:

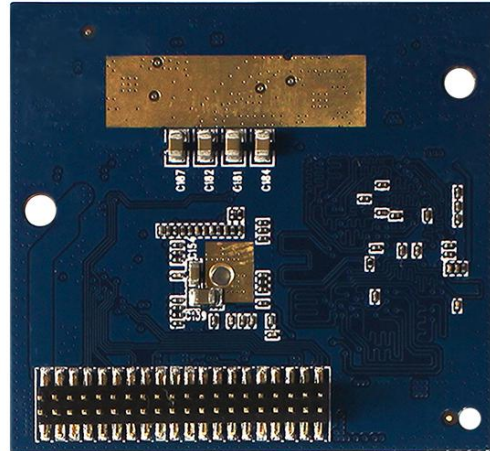
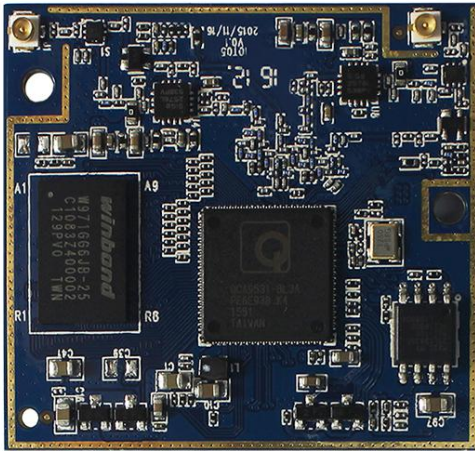
- IEEE Std. 802.11b
- IEEE Std. 802.11g
- IEEE Std. 802.11n

1.2 模块信息

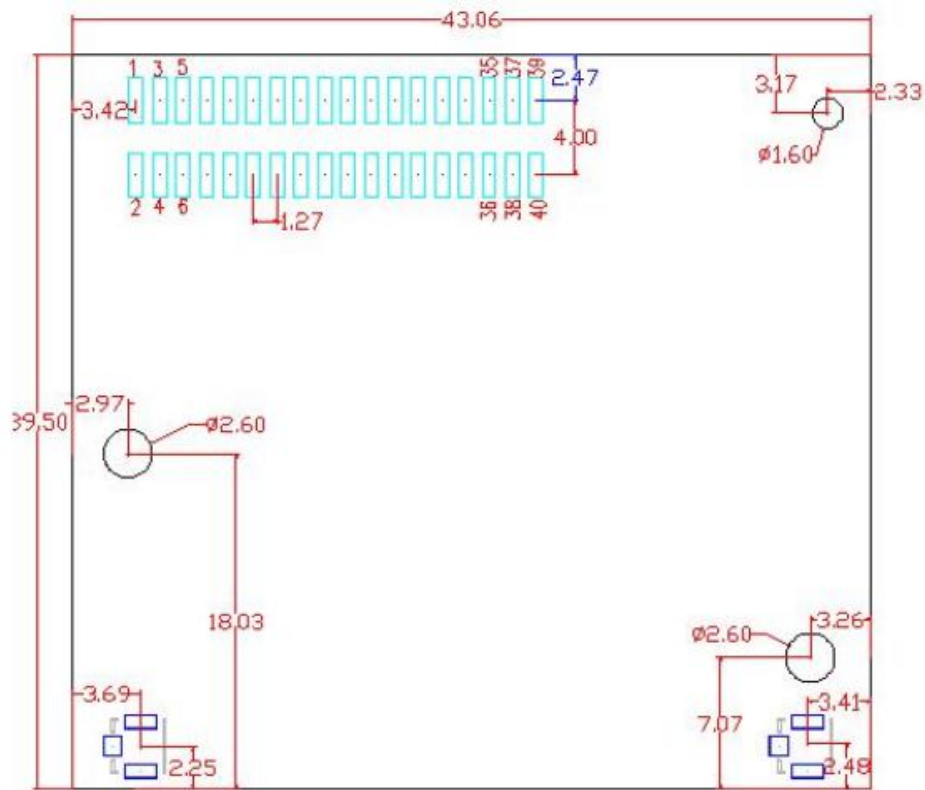
| | |
|-----------|--|
| 主芯片 | QCA9531 |
| 射频频率 | 2.40~2.4835GHz |
| WiFi 协议 | 802.11b/g/n(2X2) |
| 调制解调 | 11b: DBPSK, DQPSK and CCK and DSSS 11g: BPSK, QPSK, 16QAM, 64QAM and OFDM 11n: MCS0~15 OFDM |
| 理论带宽 | 11b:1, 2, 5.5 and 11Mbps 11g:6, 9, 12, 18, 24, 36, 48 and 54 Mbps 11n: MCS0~5, up to 300Mbps |
| 排针 | 60pin CONN, 1.27mm pitch, |
| 主要接口 | Ethernet*2, UART*1, USB*1 |
| PCB | 4层 |
| 尺寸 | 43mm(W) x 39.5mm(L) x 1.0mm(T) |
| 天线 | 标准 ipex |
| 工作温度 | -10°C to +70°C |
| 存储温度 | -40°C to +150°C |
| 工作电压 | 3.3V +/-10% |
| 平均功耗 | 1.5W |
| GPIO 输出电压 | 2.5 V +/-10% |

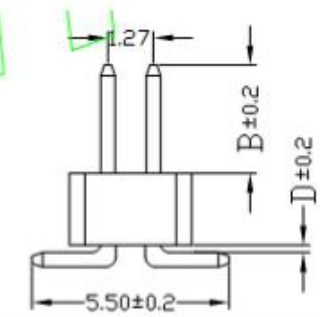
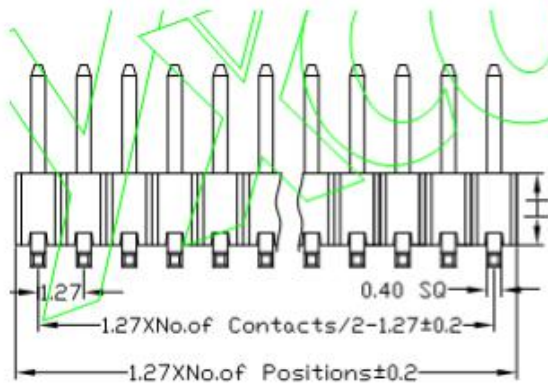
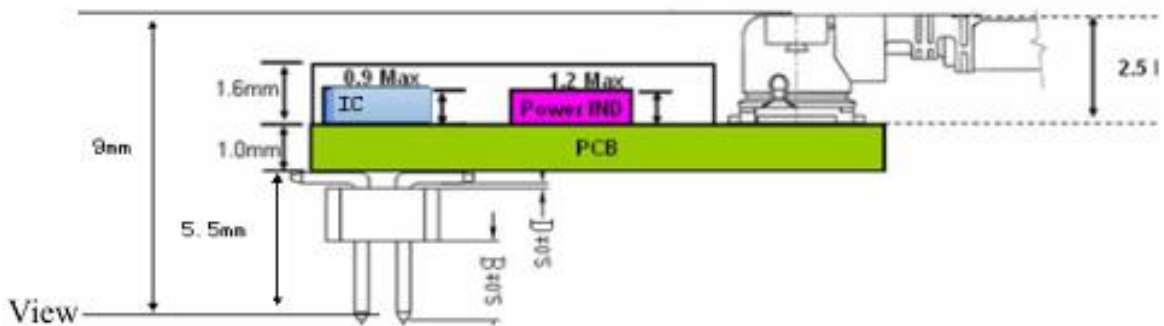
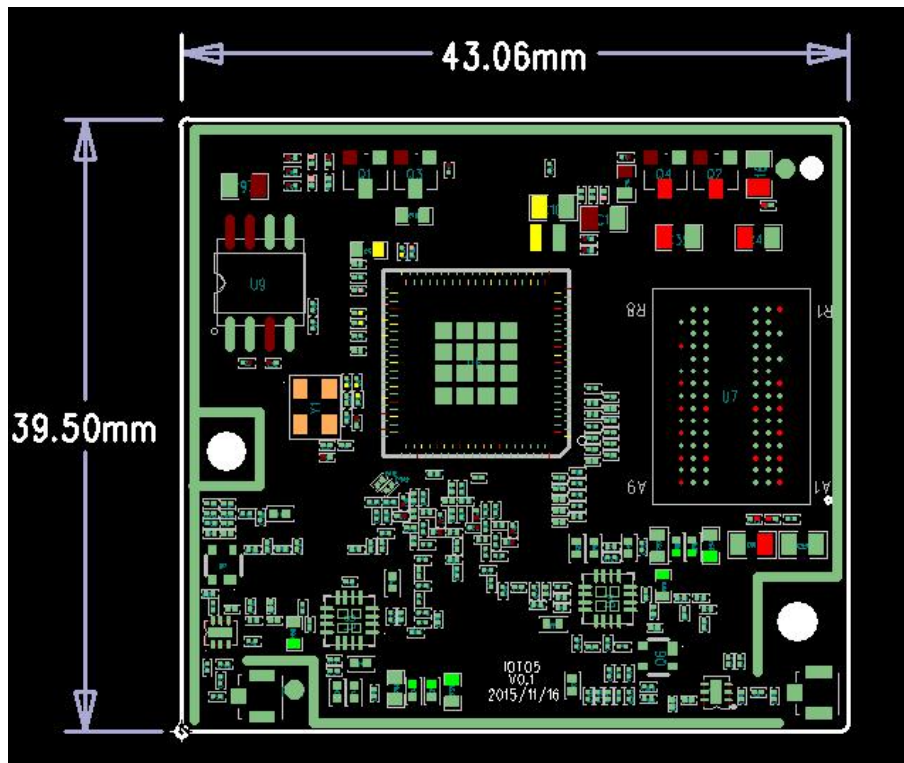
2. 结构尺寸

2.1 外观



2.2 尺寸





Dimension antitheses list

| ITEM | D | B | H |
|----------|-------|-------------|--------------|
| Standard | 0 1.2 | 1.8 3.0 4.0 | 1.6 2.0 2.54 |

2.3 引脚定义

| PIN 脚 | 名称 | 描述 |
|-------|----------------------|--|
| 1 | PA_5V | 5V input 1000mA PA 供电 |
| 2 | PA_5V | 5V input 1000mA PA 供电 |
| 3 | GND | GROUND |
| 4 | GND | GROUND |
| 5 | VDD_3.3V | 3.3V input 1000mA, recommended voltage 3.3V+/-10%, |
| 6 | VDD_3.3V | 3.3V input 1000mA, recommended voltage 3.3V+/-10%, |
| 7 | JUMPSTART (GPIO_17) | WPS 功能, 内部有 10K 上拉电阻, 外部拉低有效 |
| 8 | LED_LINK_1 (GPIO_16) | LAN_PORT0_LED |
| 9 | WLAN_LED (GPIO_12) | Wireless LED |
| 10 | WAN_LED (GPIO_4) | WLAN LED |
| 11 | SYSTEM_LED(GPIO_13) | SYSTEM LED |
| 12 | RESET | 外部上电复位, 内部有 10K 上拉电阻, 外部拉低有效 |
| 13 | USB + | USB signal, |
| 14 | UART_TX | Serial data out |
| 15 | USB - | USB signal |
| 16 | UART_RX | Serial data in |
| 17 | GND | GROUND |
| 18 | GND | GROUND |
| 19 | VDD_2.0V OUTPUT | 外部网络变压器电源输出 |
| 20 | VDD_2.5V OUTPUT | 外部 IO 输出 |
| 21 | GND | GROUND |
| 22 | GND | GROUND |
| 23 | WAN_PORT_TX- | Ethernet port |
| 24 | LAN_PORT0_RX- | Ethernet port |

| | | |
|----|---------------|----------------------|
| 25 | WAN_PORT_TX+ | Ethernet port |
| 26 | LAN_PORT0_RX+ | Ethernet port |
| 27 | WAN_PORT_RX- | Ethernet port |
| 28 | LAN_PORT0_TX- | Ethernet port |
| 29 | WAN_PORT_RX+ | Ethernet port |
| 30 | LAN_PORT0_TX+ | Ethernet port |
| 31 | GND | GROUND |
| 32 | GND | GROUND |
| 33 | GPIO_1 | GPIO |
| 34 | GPIO_2 | GPIO |
| 35 | GPIO_0 | GPIO |
| 36 | GPIO_3 | GPIO |
| 37 | SPI_CLK | SPI serial interface |
| 38 | GPIO_11 | GPIO |
| 39 | SPI_MISO | SPI serial interface |
| 40 | SPI_MOSI | SPI serial interface |

3. 射频规格

3.1 802.11b 模式

| 项目 | 规格 | | | | |
|-----------------------------|-------------------|------|------|------|--|
| 协议 | IEEE802.11b | | | | |
| 模式 | DSSS / CCK | | | | |
| 频段 | CH1 to CH13 | | | | |
| 速率 | 1, 2, 5.5, 11Mbps | | | | |
| TX Characteristics | Min. | Typ. | Max. | Unit | |
| 2. Power Levels(Calibrated) | | | | | |
| 1) 27dBm Target | 25 | 27 | 29 | dBm | |

| | | | | | |
|--|-------------|-------------|-------------|-------------|--|
| 3. Spectrum Mask @ target power | | | | | |
| 1) fc +/-11MHz to +/-22MHz | - | - | -30 | dBr | |
| 2) fc > +/-22MHz | - | - | -50 | dBr | |
| 4. Frequency Error | -25 | 0 | +25 | ppm | |
| RX Characteristics | Min. | Typ. | Max. | Unit | |
| 5. Minimum Input Level Sensitivity | | | | | |
| 1) 1Mbps (FER \leq 8%) | - | - | -83 | dBm | |
| 2) 2Mbps (FER \leq 8%) | - | - | -80 | dBm | |
| 3) 5.5Mbps (FER \leq 8%) | - | - | -79 | dBm | |
| 4) 11Mbps (FER \leq 8%) | - | -94 | -76 | dBm | |
| 6. Maximum Input Level (FER \leq 8%) | -20 | -10 | - | dBm | |

3.2 802.11g 模式

| 项目 | 规格 | | | | |
|---|----------------------------------|-------------|-------------|-------------|--|
| 协议 | IEEE802.11g | | | | |
| 模式 | OFDM | | | | |
| 频段 | CH1 to CH13 | | | | |
| 速率 | 6, 9, 12, 18, 24, 36, 48, 54Mbps | | | | |
| TX Characteristics | Min. | Typ. | Max. | Unit | |
| 2. Power Levels | | | | | |
| 1) 25dBm Target @6Mbps | 23 | 25 | 27 | dBm | |
| 2) 23dBm Target @54Mbps | 21 | 23 | 25 | dBm | |
| 3. Spectrum Mask @ target power | | | | | |
| 1) at fc +/- 11MHz | - | - | -20 | dBr | |
| 2) at fc +/- 20MHz | - | - | -28 | dBr | |
| 3) at fc > +/-30MHz | - | - | -40 | dBr | |
| 4. Constellation Error(EVM)@ target power | | | | | |

| | | | | | |
|---|-------------|-------------|-------------|-------------|--|
| 1) 6Mbps | - | - | -5 | dB | |
| 2) 9Mbps | - | - | -8 | dB | |
| 3) 12Mbps | - | - | -10 | dB | |
| 4) 18Mbps | - | - | -13 | dB | |
| 5) 24Mbps | - | - | -16 | dB | |
| 6) 36Mbps | - | - | -19 | dB | |
| 7) 48Mbps | - | - | -22 | dB | |
| 8) 54Mbps | - | -31 | -25 | dB | |
| 5. Frequency Error | -25 | 0 | +25 | ppm | |
| RX Characteristics | Min. | Typ. | Max. | Unit | |
| 6. Minimum Input Level Sensitivity | | | | | |
| 1) 6Mbps (PER \leq 10%) | - | - | -85 | dBm | |
| 2) 9Mbps (PER \leq 10%) | - | - | -84 | dBm | |
| 3) 12Mbps (PER \leq 10%) | - | - | -82 | dBm | |
| 4) 18Mbps (PER \leq 10%) | - | - | -80 | dBm | |
| 5) 24Mbps (PER \leq 10%) | - | - | -77 | dBm | |
| 6) 36Mbps (PER \leq 10%) | - | - | -73 | dBm | |
| 7) 48Mbps (PER \leq 10%) | - | - | -69 | dBm | |
| 8) 54Mbps (PER \leq 10%) | - | -77 | -68 | dBm | |
| 7. Maximum Input Level (PER \leq 10%) | -20 | -10 | - | dBm | |

3.3 802.11n HT20 模式

| 项目 | 规格 | | | | |
|---------------------------|---------------------------|-------------|-------------|-------------|--|
| 协议 | IEEE802.11n HT20 @ 2.4GHz | | | | |
| 模式 | OFDM | | | | |
| 频段 | CH1 to CH13 | | | | |
| 速率 (MCS index) | MCS0~15 | | | | |
| TX Characteristics | Min. | Typ. | Max. | Unit | |

| | | | | | |
|---|-------------|-------------|-------------|-------------|--|
| 2. Power Levels | | | | | |
| 1) 24dBm Target@MCS0 | 22 | 24 | 26 | dBm | |
| 2) 22dBm Target@MCS7 | 20 | 22 | 24 | dBm | |
| 3. Spectrum Mask @target power | | | | | |
| 1) at fc +/- 11MHz | - | - | -20 | dBr | |
| 2) at fc +/- 20MHz | - | - | -28 | dBr | |
| 3) at fc > +/-30MHz | - | - | -45 | dBr | |
| 4. Constellation Error(EVM)@ target power | | | | | |
| 1) MCS0 | - | - | -5 | dB | |
| 2) MCS1 | - | - | -10 | dB | |
| 3) MCS2 | - | - | -13 | dB | |
| 4) MCS3 | - | - | -16 | dB | |
| 5) MCS4 | - | - | -19 | dB | |
| 6) MCS5 | - | - | -22 | dB | |
| 7) MCS6 | - | - | -25 | dB | |
| 8) MCS7 | - | -31 | -28 | dB | |
| 5. Frequency Error | -25 | 0 | +25 | ppm | |
| RX Characteristics | Min. | Typ. | Max. | Unit | |
| 6. Minimum Input Level Sensitivity | | | | | |
| 1) MCS0 (PER \leq 10%) | - | - | -85 | dBm | |
| 2) MCS1 (PER \leq 10%) | - | - | -82 | dBm | |
| 3) MCS2 (PER \leq 10%) | - | - | -80 | dBm | |
| 4) MCS3 (PER \leq 10%) | - | - | -77 | dBm | |
| 5) MCS4 (PER \leq 10%) | - | - | -73 | dBm | |
| 6) MCS5 (PER \leq 10%) | - | - | -69 | dBm | |
| 7) MCS6 (PER \leq 10%) | - | - | -68 | dBm | |
| 8) MCS7 (PER \leq 10%) | - | -74 | -67 | dBm | |
| 7. Maximum Input Level (PER \leq 10%) | -20 | -10 | - | dBm | |

3.4 802.11n HT40 模式

| 项目 | 规格 | | | | |
|--|---------------------------|------|------|------|--|
| 协议 | IEEE802.11n HT40 @ 2.4GHz | | | | |
| 模式 | OFDM | | | | |
| 频段 | CH3 to CH11 | | | | |
| 速率 (MCS index) | MCS0~15 | | | | |
| TX Characteristics | Min. | Typ. | Max. | Unit | |
| 2. Power Levels (Calibrated) | | | | | |
| 1) 24dBm Target @MCS0 | 22 | 24 | 26 | dBm | |
| 2) 22dBm Target@MCS7 | 20 | 22 | 24 | dBm | |
| 3. Spectrum Mask @14dBm | | | | | |
| 1) at fc +/- 22MHz | - | - | -20 | dBr | |
| 2) at fc +/- 40MHz | - | - | -28 | dBr | |
| 3) at fc > +/-60MHz | - | - | -45 | dBr | |
| 4. Constellation Error(EVM)@target power | | | | | |
| 1) MCS0 | - | - | -5 | dB | |
| 2) MCS1 | - | - | -10 | dB | |
| 3) MCS2 | - | - | -13 | dB | |
| 4) MCS3 | - | - | -16 | dB | |
| 5) MCS4 | - | - | -19 | dB | |
| 6) MCS5 | - | - | -22 | dB | |
| 7) MCS6 | - | - | -25 | dB | |
| 8) MCS7 | - | -30 | -28 | dB | |
| 5. Frequency Error | -25 | 0 | +25 | ppm | |
| RX Characteristics | Min. | Typ. | Max. | Unit | |
| 6. Minimum Input Level Sensitivity | | | | | |
| 1) MCS0 (PER \leq 10%) | - | - | -82 | dBm | |
| 2) MCS1 (PER \leq 10%) | - | - | -79 | dBm | |

| | | | | | |
|---|-----|-----|-----|-----|--|
| 3) MCS2 (PER \leq 10%) | - | - | -77 | dBm | |
| 4) MCS3 (PER \leq 10%) | - | - | -74 | dBm | |
| 5) MCS4 (PER \leq 10%) | - | - | -70 | dBm | |
| 6) MCS5 (PER \leq 10%) | - | - | -66 | dBm | |
| 7) MCS6 (PER \leq 10%) | - | - | -65 | dBm | |
| 8) MCS7 (PER \leq 10%) | - | -70 | -62 | dBm | |
| 7. Maximum Input Level (PER \leq 10%) | -20 | -10 | - | dBm | |

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