# MIMO Junior Series

## Dual Band 2x2 MIMO 802.11a/b/g/n Long Range Outdoor Access Point

560MHz CPU / 2.4GHz 300Mbps / 5GHz 300Mbps

### Model: MMJ342 Plus

**KEY FEATURES**

- Qualcomm Atheros 560MHz Processor AR9342
- IEEE 802.11a/b/g/n compliant
- 2.4GHz and 5GHz concurrent radios
- 2.4GHz 26dBm and 5GHz 26dBm aggregate power
- Data rates of up to 300Mbps in 802.11n 40 MHz channels
- Antenna Alignment Site Survey - LEDs/Buzzer
- Distance Adjustment for long range transmission
- Built-in 2x 7dBi 2.4GHz Omni Dipole array antenna
- Built-in 17dBi 5GHz Dual-polarization antenna
- Weatherproof Casing
- 2 x RP-SMA Male Connector for External Antenna (optional)

**APPLICATIONS**

- Dual band, dual concurrent AP
- 802.11a/n + 802.11b/g/n AP
- Point-to-Point / Point-to-Multipoint / Coverage
- Wireless Customer-Premises Equipment (CPE)

## Specifications

| | |
|---|---|
| Chipset | Board CPU: Qualcomm Atheros AR9342 560MHz<br>Radio Card: Qualcomm Atheros AR9283 (2.4GHz) |
| System Memory | 64MB DDR2 |
| NOR Flash | 16MB |
| Antenna | 5GHz: Integrated 17dBi Dual-polarization antenna<br>2.4GHz: 2x 7dBi Dipole array antenna |
| Interface | 2x Fast Ethernet Port (Auto MDI-X)<br>1x JTAG 14 Pin Connector[1]<br>1x Serial Port 4 Pin Connector[1] |
| Reset Button | Yes |
| LED | Indicators: Power LED, LAN Activity, 4x Signal Indicator |
| Power Over Ethernet (on LAN0) | Passive PoE 24V (LV version),<br>IEEE 802.3af/at or Passive PoE 36-56V (HV version) |
| DC Power | No DC jack connector |
| Power Consumption | 7.5W (Max) |
| Operating System | CompexWRT or OpenWRT[2] |
| Certification | FCC and CE Certified, RoHS Compliance |
| Environment | Temperature: Operating: -20°C to 70°C, Storage: -40°C to 90°C<br>Humidity (non-condensing): Operating: 5% to 95%, Storage: Max. 90% |
| Enclosure Type | Weatherproof and IP53 Compliant |
| Dimensions | 278.5 x 122.2 x 94.5 mm |
| Other Features | Surge Suppressor, Watchdog Timer |

*1. These features can only be accessed on the embedded board after removing the enclosure.*

*2. For more information on OpenWRT, please refer to the Firmware / Software Section.*

**Configurations are subject to change without notifications.*

# RF Performance Table
# On-board Radio (WPJ342)

| | Data Rate | TX Power (per chain) | TX Power (2 chains) | Tolerance |
|---|---|---|---|---|
| 5GHz 802.11a | 6Mbps | 23dBm | 26dBm | ±2dB |
| | 9Mbps | 23dBm | 26dBm | ±2dB |
| | 12Mbps | 23dBm | 26dBm | ±2dB |
| | 18Mbps | 23dBm | 26dBm | ±2dB |
| | 24Mbps | 23dBm | 26dBm | ±2dB |
| | 36Mbps | 21dBm | 24dBm | ±2dB |
| | 48Mbps | 19dBm | 22dBm | ±2dB |
| | 54Mbps | 18dBm | 21dBm | ±2dB |
| 5GHz 802.11n HT20 | MCS 0 | 22dBm | 25dBm | ±2dB |
| | MCS 1 | 21dBm | 24dBm | ±2dB |
| | MCS 2 | 21dBm | 24dBm | ±2dB |
| | MCS 3 | 21dBm | 24dBm | ±2dB |
| | MCS 4 | 20dBm | 23dBm | ±2dB |
| | MCS 5 | 19dBm | 22dBm | ±2dB |
| | MCS 6 | 18dBm | 21dBm | ±2dB |
| | MCS 7 | 16dBm | 19dBm | ±2dB |
| 5GHz 802.11n HT40 | MCS 0 | 21dBm | 24dBm | ±2dB |
| | MCS 1 | 20dBm | 23dBm | ±2dB |
| | MCS 2 | 20dBm | 23dBm | ±2dB |
| | MCS 3 | 20dBm | 23dBm | ±2dB |
| | MCS 4 | 19dBm | 22dBm | ±2dB |
| | MCS 5 | 18dBm | 21dBm | ±2dB |
| | MCS 6 | 17dBm | 20dBm | ±2dB |
| | MCS 7 | 16dBm | 19dBm | ±2dB |

| | Data Rate | RX Specifications Sensitivity | Tolerance |
|---|---|---|---|
| 5GHz 802.11a | 6Mbps | -94dBm | ±2dB |
| | 9Mbps | -94dBm | ±2dB |
| | 12Mbps | -92dBm | ±2dB |
| | 18Mbps | -91dBm | ±2dB |
| | 24Mbps | -90dBm | ±2dB |
| | 36Mbps | -85dBm | ±2dB |
| | 48Mbps | -80dBm | ±2dB |
| | 54Mbps | -75dBm | ±2dB |
| 5GHz 802.11n HT20 | MCS 0 | -94dBm | ±2dB |
| | MCS 1 | -92dBm | ±2dB |
| | MCS 2 | -89dBm | ±2dB |
| | MCS 3 | -85dBm | ±2dB |
| | MCS 4 | -80dBm | ±2dB |
| | MCS 5 | -75dBm | ±2dB |
| | MCS 6 | -74dBm | ±2dB |
| | MCS 7 | -72dBm | ±2dB |
| 5GHz 802.11n HT40 | MCS 0 | -90dBm | ±2dB |
| | MCS 1 | -88dBm | ±2dB |
| | MCS 2 | -85dBm | ±2dB |
| | MCS 3 | -82dBm | ±2dB |
| | MCS 4 | -80dBm | ±2dB |
| | MCS 5 | -75dBm | ±2dB |
| | MCS 6 | -73dBm | ±2dB |
| | MCS 7 | -70dBm | ±2dB |

# Wireless Module (WLE200N2-23)

| | Data Rate | TX Power (per chain) | TX Power (2 chains) | Tolerance |
|---|---|---|---|---|
| 2.4GHz 802.11b | 1Mbps | 23dBm | 26dBm | ±2dB |
| | 2Mbps | 23dBm | 26dBm | ±2dB |
| | 5.5Mbps | 23dBm | 26dBm | ±2dB |
| | 11Mbps | 23dBm | 26dBm | ±2dB |
| 2.4GHz 802.11g | 6-24Mbps | 23dBm | 26dBm | ±2dB |
| | 36Mbps | 22dBm | 25dBm | ±2dB |
| | 48Mbps | 20dBm | 23dBm | ±2dB |
| | 54Mbps | 19dBm | 22dBm | ±2dB |
| 2.4GHz 802.11n HT20 | MCS 0 | 23dBm | 26dBm | ±2dB |
| | MCS 1 | 23dBm | 26dBm | ±2dB |
| | MCS 2 | 23dBm | 26dBm | ±2dB |
| | MCS 3 | 22dBm | 25dBm | ±2dB |
| | MCS 4 | 21dBm | 24dBm | ±2dB |
| | MCS 5 | 20dBm | 23dBm | ±2dB |
| | MCS 6 | 19dBm | 22dBm | ±2dB |
| | MCS 7 | 18dBm | 21dBm | ±2dB |
| 2.4GHz 802.11n HT40 | MCS 0 | 23dBm | 26dBm | ±2dB |
| | MCS 1 | 23dBm | 26dBm | ±2dB |
| | MCS 2 | 23dBm | 26dBm | ±2dB |
| | MCS 3 | 22dBm | 25dBm | ±2dB |
| | MCS 4 | 21dBm | 24dBm | ±2dB |
| | MCS 5 | 20dBm | 23dBm | ±2dB |
| | MCS 6 | 19dBm | 22dBm | ±2dB |
| | MCS 7 | 18dBm | 21dBm | ±2dB |

| | Data Rate | RX Specifications Sensitivity | Tolerance |
|---|---|---|---|
| 2.4GHz 802.11g | 6Mbps | -96dBm | ±2dB |
| | 9Mbps | -96dBm | ±2dB |
| | 12Mbps | -95dBm | ±2dB |
| | 18Mbps | -93dBm | ±2dB |
| | 24Mbps | -90dBm | ±2dB |
| | 36Mbps | -87dBm | ±2dB |
| | 48Mbps | -83dBm | ±2dB |
| | 54Mbps | -81dBm | ±2dB |
| 2.4GHz 802.11n HT20 | MCS 0 | -96dBm | ±2dB |
| | MCS 1 | -94dBm | ±2dB |
| | MCS 2 | -91dBm | ±2dB |
| | MCS 3 | -87dBm | ±2dB |
| | MCS 4 | -85dBm | ±2dB |
| | MCS 5 | -82dBm | ±2dB |
| | MCS 6 | -81dBm | ±2dB |
| | MCS 7 | -79dBm | ±2dB |
| 2.4GHz 802.11n HT40 | MCS 0 | -92dBm | ±2dB |
| | MCS 1 | -90dBm | ±2dB |
| | MCS 2 | -87dBm | ±2dB |
| | MCS 3 | -86dBm | ±2dB |
| | MCS 4 | -84dBm | ±2dB |
| | MCS 5 | -82dBm | ±2dB |
| | MCS 6 | -81dBm | ±2dB |
| | MCS 7 | -77dBm | ±2dB |

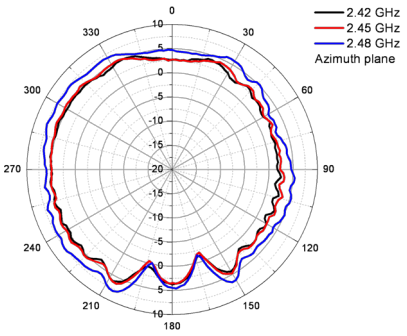




Compex Systems Pte Ltd | www.compex.com.sg | (+65) 6286 2086 | sales@compex.com.sg | Last Updated: 30/03/16 WH SY HB

# RF Performance Information

**Gain patterns for 7dBi 2.4GHz Omni Dipole array antenna**

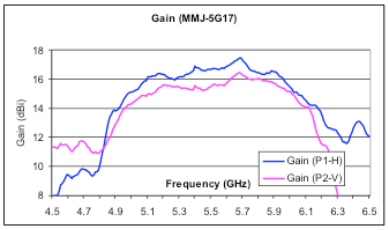
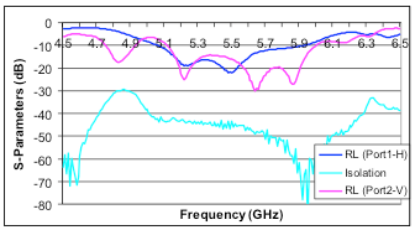



| Frequency (GHz) | Peak Gain (dBi)* |
|---|---|
| 2.42 | 6.124 |
| 2.45 | 6.284 |
| 2.48 | 7.958 |

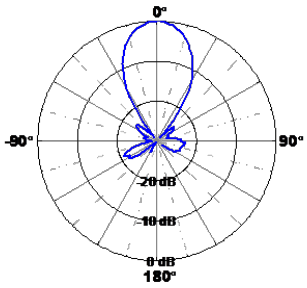
*Peak gain refers to the maximum gain value in the azimuth plane.

Please note that the nulls occurring at around 165° and 195° is most probably due to the cable effects. Excluding these nulls, typical gain variation is around 3-4dB.

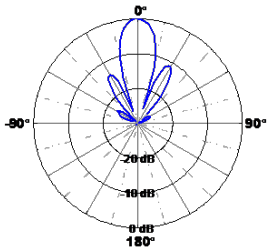
# RF Performance Information

| | |
|---|---|
| Gain | 17dBi |
| Radiation | Directional |
| Frequency Range | 5.1-5.9 GHz |
| Polarization | Dual – Polarization |
| Azimuth -3dB Beamwidth | Horizontal(Port 1): 30 degrees<br>Vertical(Port 2): 33 degrees |
| Elevation -3dB Beamwidth | Horizontal(Port 1): 17 degrees<br>Vertical(Port 2): 17degrees |
| Isolation | -40dB (Max) |
| Front-to-Back Ratio | -30dB (Max) |
| VSWR | Horizontal (Port 1) : < 1: 1.87; Vertical (Port 2): < 1: 1.55 |
| Cross Polarisation Isolation | -28dB (Max) |
| SideLobe | <-12dB |
| Gain Plot |  |
| Return Loss & Isolation Plot |  |

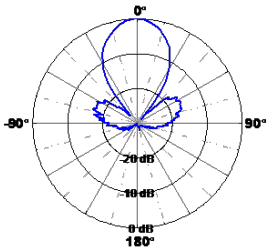
Polar Plots (At 5.6GHz)



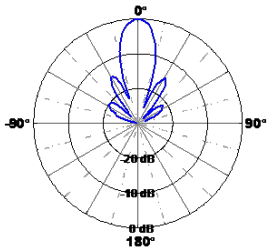

H-Pol Azimuth (Port 1 - H)




H-Pol Elevation (Port 2 – V)

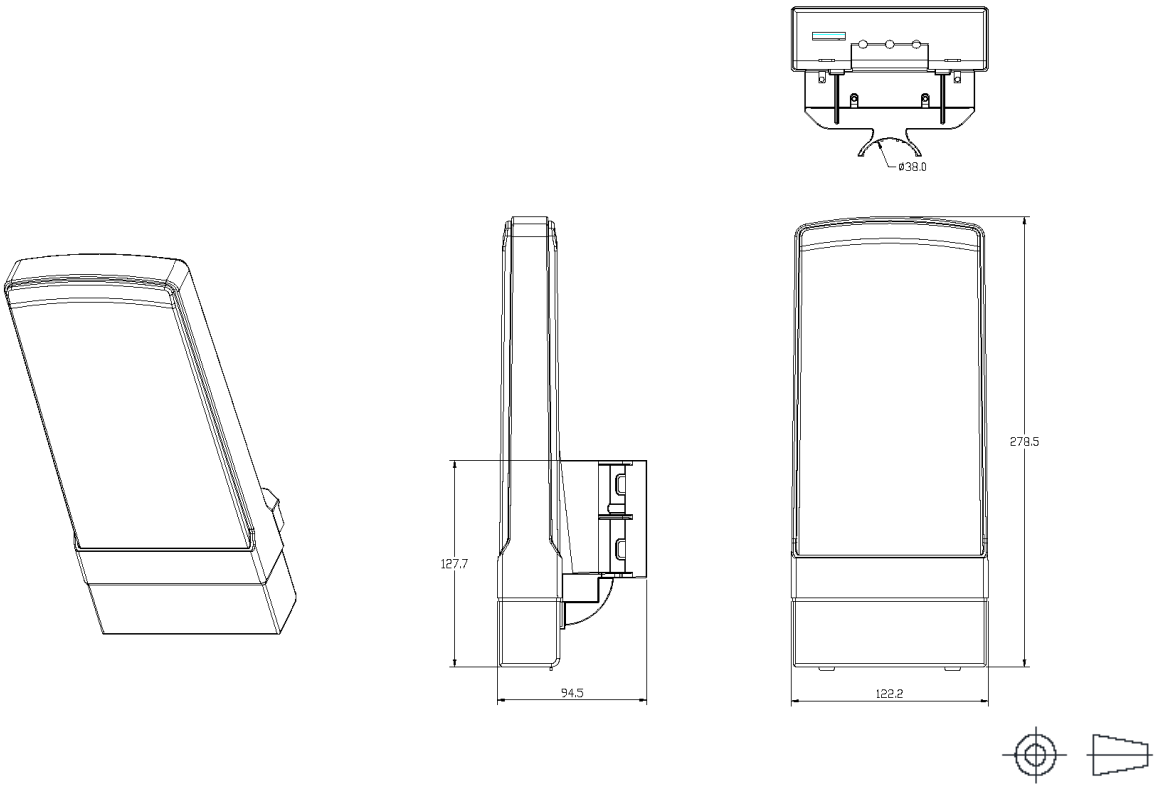



V-Pol Azimuth (Port 2 – V)



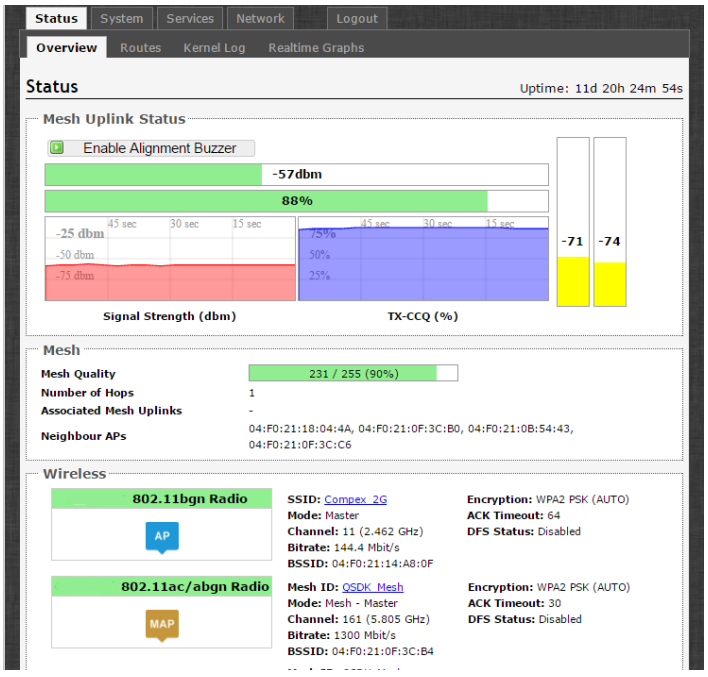

V-Pol Elevation (Port 1 – H)

## Dimensional Drawing




## CompexWRT Features

It is developed based on the OpenWRT platform and features the latest Qualcomm Atheros drivers with LuCI web interface. It combines all of the best in one system. It offers many levels of customization.




### Powerful Wireless Features

- Qualcomm Atheros Drivers
- Wireless Distribution System (WDS) AP and Client Mode
- Seamless Mesh Networking

### Enhanced Control

- User-friendly LuCI Graphical User Interface
- Hotspot and Guest Portal Support
- Powerful Network Diagnostic Utilities
- Real-time Network Load Graphs

**Find out more at http://wiki.compex.com.sg/**

# Firmware / Software

The MMJ342 Plus is shipped with CompexWRT firmware. SDKs with QCA binary drivers are available for software developers.

| | |
|---|---|
| Supported Operating System | • CompexWRT Operating System<br>• OpenWRT Operating System[1] |
| Supported Mass Management Software | • Compex AP Controller Software[2] |

*1. OpenWRT SDK is available without any technical support by Compex unless otherwise stated.*
*2. AP Controller only compatible with MMJ342 Plus running CompexWRT.*
*Configurations are subject to change without notifications.

# Ordering Options

| Item | Antenna | Power Solutions | Radio Output | Power Supply |
|---|---|---|---|---|
| MMJ342 Plus LV | 17dBi 5GHz Dual-polarization antenna | Passive PoE: 24V | 5GHz 26dBm | US |
| MMJ342 Plus LV | 17dBi 5GHz Dual-polarization antenna | Passive PoE: 24V | 5GHz 26dBm | EU |

# Packaging Content

| Item | Quantity |
|---|---|
| MMJ342 Plus Outdoor Access Point | 1 |
| Read Me First Documentation | 1 |
| GE Passive 24V PoE Adapter | 1 |
| Mounting Bracket | 1 |

# Customization Options

**The MMJ342 Plus can be customized for volume applications. Contact our sales representatives for more information.**

| | | |
|---|---|---|
| Increase System Memory up to 128 MB | Reduce NOR Flash to 8 MB | Removing of Peripherals |
| Antenna Customization | For more customization, contact us at sales@compex.com.sg | |

# Packaging Information

| Packaging Type | Dimensions | Nett Weight | Gross Weight |
|---|---|---|---|
| Carton Box (10 units) | 675 x 310 x 220 mm | 7.22 kg | 7.95 kg |





Compex Systems Pte Ltd | www.compex.com.sg | (+65) 6286 2086 | sales@compex.com.sg | Last Updated: 30/03/16 WH SY HB