

LP[G]AM[F]-6-60[-VAR]

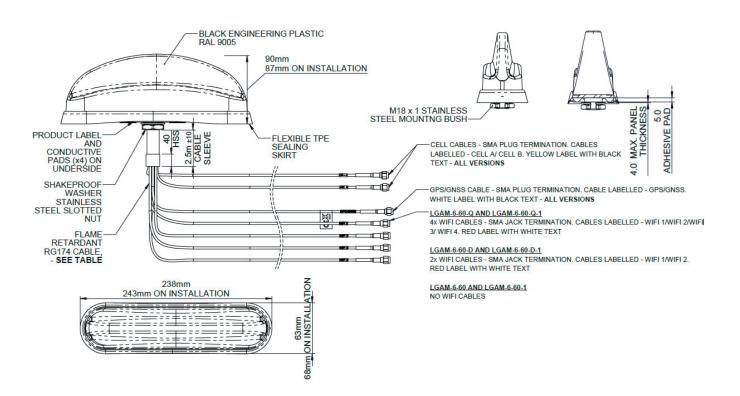
- Low Profile 2x2 MiMo Antenna for 4G/5G
- Optional GPS/GNSS
- Optional up to 4x MiMo WiFi 2.4/5.0/7.2GHz
- Meets IP69K for ingress protection

The LP[G]AM[F]-6-60 platform has a 2x2 MiMo antenna function for 4G/5G (617-960/1427-6000MHz) and the option of 2x2, 3x3 or 4x4 MiMo dual-band WiFi, which supports WiFi 6E. An optional active antenna for GPS/GLONASS/Galileo/BeiDou can be included, with 26dB gain LNA and advanced filtering for LTE Band 13/14 operation.

The LP[G]AM[F]-6-60 is designed for use on conductive metal panels but can be used on non-conductive panels with some reduction in performance in the 600MHz band.

This antenna is ideal for IoT applications including vending machines, kiosks, display screens and payment terminals where a cost-effective, efficient and robust antenna is essential. Supplied with integral flexible FR RG174 cables and requiring only a single hole mounting, the LP[G] AM[F]-6-60 range is a convenient and easy to install solution for a range of applications.

Technical Drawing LGAM-6-60-Q Shown



| ro | | | |
|----|--|--|--|
| | | | |
| | | | |

| Part No. | | | | | | | |
|-------------------------------|----------------|--|-------------------------|--------------------------|----------------|--|--|
| - arrior | | LGAM-6-60-Q | LGAM-6-60-Q-1 | LGAMF-6-60-Q | LGAMF-6-60-Q-1 | | |
| Electrical Data | | | | | | | |
| | Element 1 | 1562-1612 | | | | | |
| Frequency Range (MHz) | Elements 2 & 3 | 2x 617-960, 1427-6000 | | | | | |
| | Elements 4+ | 4 x 2.4/5.0/7.1GHz | | | | | |
| | | | 5dBi (617- | -960MHz) | | | |
| | Elements 2 & 3 | 8dBi (1427-3800MHz) | | | | | |
| Peak gain: Isotropic* | | 9dBi (4900-6000MHz) | | | | | |
| | | 5dBi (2396-2485MHz) | | | | | |
| | Elements 4+ | 11dBi (4900-7200MHz) | | | | | |
| | 4G/5G | >12dB | | | | | |
| solation** | WiFi | >12dB > 15dB | | | | | |
| Typical Efficiency* W/o Cable | | | | | | | |
| LOSS | Elements 2 & 3 | > 40% (617-698Mz) >60% (698-960/1427-6000MHz) | | | | | |
| Correlation Co-efficient | Elements 2 & 3 | | <0 | .2 | | | |
| Polarisation | | | Veri | tical | | | |
| Pattern | | | Omni-di | rectional | | | |
| mpedance | | | 50 | Ω | | | |
| Max Input Power (W) | | 10 | | | | | |
| GPS/GNSS Data | | | | | | | |
| requency Range (MHz) | _ | 1562-1612 | | | | | |
| /SWR | | <2:1 ± 4MHz | | | | | |
| Gain: LNA | | 26dB | | | | | |
| Polarisation | | Right Hand Circular | | | | | |
| Out of Band Rejection | | >40dB (+/- 100MHz f) Notch Filter @787MHz - 23dB | | | | | |
| Operating Voltage | | 3-5V DC (fed via coax) | | | | | |
| Current | | | Typical | <20mA | | | |
| Mechanical Data | | | | | | | |
| | Total Height | 90 (3.54") | | | | | |
| Dimensions (mm) - Installed | Length | 243 (9.56") | | | | | |
| | Width | 63 (2.48") | | | | | |
| Operating Temp (°C) | | | -40° / +80°C (| (-40° / 176°F) | | | |
| Material | | | LEXAN EXL9330 ,Silicone | e Rubber, Aluminium Allo | у | | |
| Colour | | | Bla | nck | | | |
| ngress Protection | | | IP6 | 9K | | | |
| Mounting Info | | | | | | | |
| Fixing | | | Panel | Mount | | | |
| Hole Size (mm) | | | 19 (3 | | | | |
| Cable Data | | | 10 (| | | | |
| Cable Type - All Feeds | | | FR RG174 (UN FCF | R 118.03 Compliant) | | | |
| | Diameter | FR RG174 (UN ECE R 118.03 Compliant) 2.8 (0.11") | | | | | |
| Dimensions (mm) | Length | 3000 (10') | 1000 (3' 3") | 3000 (10') | 1000 (3' 3") | | |
| | GPS/GNSS | SMA Plug | | FAKRA C Jack | | | |
| Formination | 4G/5G | 2 x SMA plug | | 2x FAKRA D Jack | | | |
| Termination | | · - | | | | | |
| | WiFi | 4x SMA Re | everse Polarity | 4x FAK | RA I Jack | | |
| | | | | | | | |

^{*}Swept peak gain and efficiency simulated in CST Microwave Studio with all elements fed together without cable loss on a 600x600mm (2'x2') ground plane

^{**}Typical isolation measured on a 600x600mm (2'x2') ground plane with 0.3m (1') of RG174 cable





| Part No. | | | | | | | | | |
|---------------------------------------|----------------|--|-------------------------|-----------------------|----------------|--|--|--|--|
| | | LGAM-6-60-T | LGAM-6-60-T-1 | LGAMF-6-60-T | LGAMF-6-60-T-1 | | | | |
| Electrical Data | | | | | | | | | |
| | Element 1 | | 1562 | -1612 | | | | | |
| Frequency Range (MHz) | Elements 2 & 3 | 2x 617-960, 1427-6000 | | | | | | | |
| | Elements 4+ | 3x 2.4/5.0/7.1GHz | | | | | | | |
| | Liomonto 1 | | | 7-960MHz) | | | | | |
| | Elements 2 & 3 | | | | | | | | |
| Dook gain: lootronio* | Liements 2 & 3 | 8dBi (1427-3800MHz) 9dBi (4900-6000MHz) | | | | | | | |
| Peak gain: Isotropic* | | | | | | | | | |
| | Elements 4+ | 5dBi (2396-2485MHz) | | | | | | | |
| | | 11dBi (4900-7200MHz) | | | | | | | |
| Isolation** | 4G/5G | >12dB | | | | | | | |
| | WiFi | > 15dB | | | | | | | |
| Typical Efficiency* W/o Cable Loss | Elements 2 & 3 | > | > 40% (617-698Mz) >60% | (698-960/1427-6000MHz | z) | | | | |
| Correlation Co-efficient | Elements 2 & 3 | | <(| 0.2 | | | | | |
| Polarisation | | | Ver | tical | | | | | |
| Pattern | | | Omni-di | rectional | | | | | |
| Impedance | | | 50 | Ω | | | | | |
| Max Input Power (W) | | | 1 | 0 | | | | | |
| GPS/GNSS Data | | | | | | | | | |
| Frequency Range (MHz) | | 1562-1612 | | | | | | | |
| VSWR | | <2:1 ± 4MHz | | | | | | | |
| Gain: LNA | | 26dB | | | | | | | |
| Polarisation | | Right Hand Circular | | | | | | | |
| Out of Band Rejection | | >40dB (+/- 100MHz f) Notch Filter @787MHz - 23dB | | | | | | | |
| Operating Voltage | | | 3-5V DC (fe | ed via coax) | | | | | |
| Current | | | Typical | <20mA | | | | | |
| Mechanical Data | | | | | | | | | |
| | Total Height | 90 (3.54") | | | | | | | |
| Dimensions (mm) - Installed | Length | 243 (9.56") | | | | | | | |
| | Width | 63 (2.48") | | | | | | | |
| Operating Temp (°C) | | | -40° / +80°C | (-40° / 176°F) | | | | | |
| Material | | | LEXAN EXL9330, Silicone | | / | | | | |
| Colour | | Black | | | | | | | |
| Ingress Protection | | | | 69K | | | | | |
| Mounting Info | | | 11 (| | | | | | |
| Fixing | | | Panel | Mount | | | | | |
| Hole Size (mm) | | | | 3/4") | | | | | |
| Cable Data | | | 10 (| | | | | | |
| Cable Type - All Feeds | | | FR RG174 (UN ECE | R 118.03 Compliant) | | | | | |
| | Diameter | | 2.8 (0.11") | | | | | | |
| Dimensions (mm) | Length | 3000 (10') | 1000 (3' 3") | 3000 (10') | 1000 (3' 3") | | | | |
| | GPS/GNSS | , , | SMA Plug | | FAKRA C Jack | | | | |
| Termination | 4G/5G | | 1A plug | 2x FAKRA D Jack | | | | | |
| TETTIITIAUUTI | | | · - | | | | | | |
| | WiFi | 3x SMA Reverse Polarity | | 3x FAKRA I Jack | | | | | |

^{*}Swept peak gain and efficiency simulated in CST Microwave Studio with all elements fed together without cable loss on a 600x600mm (2'x2') ground plane

^{**}Typical isolation measured on a 600x600mm (2'x2') ground plane with 0.3m (1') of RG174 cable

| | | LOAM 0.00 D | 1.0AM 0.00 D.4 | LOAME A CO D | 1.0445.0.00.5 | | | |
|------------------------------------|----------------|---|---------------------------|--|---------------|--|--|--|
| Electrical Data | | LGAM-6-60-D | LGAM-6-60-D-1 | LGAMF-6-60-D | LGAMF-6-60-D- | | | |
| Electrical Data | | | | | | | | |
| | Element 1 | 1562-1612 | | | | | | |
| Frequency Range (MHz) | Elements 2 & 3 | 2x 617-960, 1427-6000 | | | | | | |
| | Elements 4+ | 2x 2.4/5.0/7.1GHz | | | | | | |
| | | | 5dBi (617 | '-960MHz) | | | | |
| | Elements 2 & 3 | 8dBi (1427-3800MHz) | | | | | | |
| Peak gain: Isotropic* | | | 9dBi (4900-6000MHz) | | | | | |
| | Elements 4+ | | 5dBi (2396 | i-2485MHz) | | | | |
| | Elements 4+ | | | | | | | |
| Landar Carabb | 4G/5G | 11dBi (4900-7200MHz) >12dB | | | | | | |
| Isolation** | WiFi | > 15dB | | | | | | |
| Typical Efficiency* W/o Cable Loss | Elements 2 & 3 | | > 40% (617-698Mz) >60% | (698-960/1427-6000MH: | z) | | | |
| Correlation Co-efficient | Elements 2 & 3 | | <(|).2 | | | | |
| Polarisation | | | Ver | tical | | | | |
| Pattern | | | Omni-di | rectional | | | | |
| Impedance | | | 50 | Ω | | | | |
| Max Input Power (W) | | 10 | | | | | | |
| GPS/GNSS Data | | | | | | | | |
| Frequency Range (MHz) | | | 1562 | -1612 | | | | |
| VSWR | | <2:1 ± 4MHz | | | | | | |
| Gain: LNA | | 26dB | | | | | | |
| Polarisation | | Right Hand Circular | | | | | | |
| Out of Band Rejection | | ; | >40dB (+/- 100MHz f) No | | dB | | | |
| Operating Voltage | | | 3-5V DC (fed via coax) | | | | | |
| Current | | | | <20mA | | | | |
| Mechanical Data | | | yr | | | | | |
| | Total Height | | 90 (3 | 3.54") | | | | |
| Dimensions (mm) - Installed | Length | 243 (9.56") | | | | | | |
| | Width | 63 (2.48") | | | | | | |
| Operating Temp (°C) | 771001 | -40° / +80°C (-40° / 176°F) | | | | | | |
| Material | | LEXAN EXL9330, Silicone Rubber, Aluminium Alloy | | | | | | |
| Colour | | | | | | | | |
| | | Black IP69K | | | | | | |
| Ingress Protection | | | IP | DYN | | | | |
| Mounting Info | | | Daniel | Mount | | | | |
| Fixing | | Panel Mount 19 (3/4") | | | | | | |
| Hole Size (mm) | | | 19 (| 3/4) | | | | |
| Cable Data | | | ED DO474 (UN 505 | D 440 00 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | | | | |
| Cable Type - All Feeds | D'I. | | , | R 118.03 Compliant) | | | | |
| Dimensions (mm) | Diameter | 0007 (17) | | 0.11") | 40-5-15-5 | | | |
| | Length | 3000 (10') | 1000 (3' 3") | 3000 (10') | 1000 (3' 3") | | | |
| | GPS/GNSS | | SMA Plug FAKRA C | | | | | |
| Termination | 4G/5G | 2 x SMA plug 2x FAKRA I | | ≀A D Jack | | | | |
| | WiFi | 2x SMA Re | 2x SMA Reverse Polarity | | RA I Jack | | | |

^{*}Swept peak gain and efficiency simulated in CST Microwave Studio with all elements fed together without cable loss on a 600x600mm (2'x2') ground plane

^{**}Typical isolation measured on a 600x600mm (2'x2') ground plane with 0.3m (1') of RG174 cable





| Part No. | | | | | | | | |
|---------------------------------------|---------------------------------------|--|----------------------|------------------------|--------------|--|--|--|
| | | LGAM-6-60 | LGAM-6-60-1 | LGAMF-6-60 | LGAMF-6-60-1 | | | |
| Electrical Data | | | | | | | | |
| Frequency Range (MHz) | Element 1 | 1562-1612 | | | | | | |
| 3.() | Elements 2 & 3 | 2x 617-960, 1427-6000 | | | | | | |
| | | | 5dBi (617-960MHz) | | | | | |
| Peak gain: Isotropic* | Elements 2 & 3 | 8dBi (1427-3800MHz) | | | | | | |
| | | 9dBi (4900-6000MHz) | | | | | | |
| solation** | 4G/5G | | >1. | 2dB | | | | |
| Typical Efficiency* W/o Cable ∟oss | Elements 2 & 3 | > | 40% (617-698Mz) >60% | 6 (698-960/1427-6000MH | z) | | | |
| Correlation Co-efficient | Elements 2 & 3 | | < | 0.2 | | | | |
| Polarisation | | | Ver | rtical | | | | |
| Pattern | | | Omni-di | irectional | | | | |
| mpedance | | | 5 | Ω0 | | | | |
| Max Input Power (W) | | | 1 | 10 | | | | |
| GPS/GNSS Data | | | | | | | | |
| Frequency Range (MHz) | | 1562-1612 | | | | | | |
| /SWR | | <2:1 ± 4MHz | | | | | | |
| Gain: LNA | | 26dB | | | | | | |
| Polarisation | | Right Hand Circular | | | | | | |
| Out of Band Rejection | | >40dB (+/- 100MHz f) Notch Filter @787MHz - 23dB | | | | | | |
| Operating Voltage | rating Voltage 3-5V DC (fed via coax) | | | | | | | |
| Current | | Typical <20mA | | | | | | |
| Mechanical Data | | | | | | | | |
| | Total Height | | 90 (3 | 3.54") | | | | |
| Dimensions (mm) - Installed | Length | 243 (9.56") | | | | | | |
| | Width | 63 (2.48") | | | | | | |
| Operating Temp (°C) | | -40° / +80°C (-40° / 176°F) | | | | | | |
| Material | | LEXAN EXL9330, Silicone Rubber, Aluminium Alloy | | | | | | |
| Colour | | | Bl | ack | | | | |
| ngress Protection | | | IPO | 69K | | | | |
| Mounting Info | | | | | | | | |
| Fixing | | Panel Mount | | | | | | |
| Hole Size (mm) | | 19 (3/4") | | | | | | |
| Cable Data | | | | | | | | |
| Cable Type - All Feeds | | FR RG174 (UN ECE R 118.03 Compliant) | | | | | | |
|) | Diameter | | 2.8 (| 0.11") | | | | |
| Dimensions (mm) | Length | 3000 (10') | 1000 (3' 3") | 3000 (10') | 1000 (3' 3") | | | |
| | GPS/GNSS | SMA | Plug | FAKRA | A C Jack | | | |
| Termination | 4G/5G | 2 x SM | A plug | 2x FAKRA D Jack | | | | |

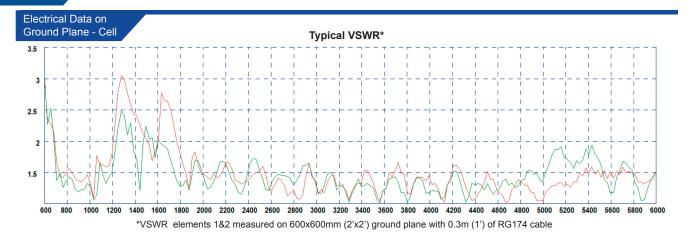
^{*}Swept peak gain and efficiency simulated in CST Microwave Studio with all elements fed together without cable loss on a 600x600mm (2'x2') ground plane

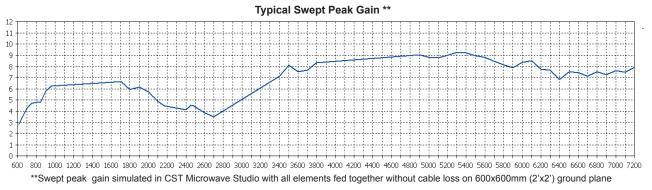
^{**}Typical isolation measured on a 600x600mm (2'x2') ground plane with 0.3m (1') of RG174 cable

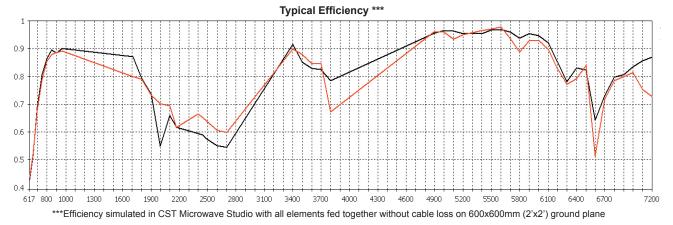
| Part No. | | | | | | | |
|------------------------------------|----------------|--------------------------------------|---|----------------------|--------------|--|--|
| | | LPAM-6-60 | LPAM-6-60-1 | LPAMF-6-60 | LPAMF-6-60-1 | | |
| Electrical Data | | | | | | | |
| Frequency Range (MHz) | Elements 1 &2 | | 2x 617-960 | , 1427-6000 | | | |
| | | 5dBi (617-960MHz) | | | | | |
| Peak gain: Isotropic* | Elements 1 & 2 | 8dBi (1427-3800MHz) | | | | | |
| | | 9dBi (4900-6000MHz) | | | | | |
| Isolation** | 4G/5G | | >1 | 2dB | | | |
| Typical Efficiency* W/o Cable Loss | Elements 1 & 2 | : | > 40% (617-698Mz) >60% | (698-960/1427-6000MH | z) | | |
| Correlation Co-efficient | Elements 1 & 2 | | < | 0.2 | | | |
| Polarisation | | | Ver | tical | | | |
| Pattern | | | Omni-directional | | | | |
| Impedance | | | 50Ω | | | | |
| Max Input Power (W) | | 10 | | | | | |
| Mechanical Data | | | | | | | |
| | Total Height | 90 (3.54") | | | | | |
| Dimensions (mm) - Installed | Length | 243 (9.56") | | | | | |
| | Width | 63 (2.48") | | | | | |
| Operating Temp (°C) | | | -40° / +80°C (-40° / 176°F) | | | | |
| Material | | | LEXAN EXL9330, Silicone Rubber, Aluminium Alloy | | | | |
| Colour | | Black | | | | | |
| Ingress Protection | | IP69K | | | | | |
| Mounting Info | | | | | | | |
| Fixing | | Panel Mount | | | | | |
| Hole Size (mm) | | 19 (3/4") | | | | | |
| Cable Data | | | | | | | |
| Cable Type - All Feeds | | FR RG174 (UN ECE R 118.03 Compliant) | | | | | |
| Dimensions (mm) | Diameter | | 2.8 (| 0.11") | | | |
| Difficitions (fillin) | Length | 3000 (10') | 1000 (3' 3") | 3000 (10') | 1000 (3' 3") | | |
| Termination | 4G/5G | 2 x SN | 2 x SMA plug 2x FAKRA D | | RA D Jack | | |

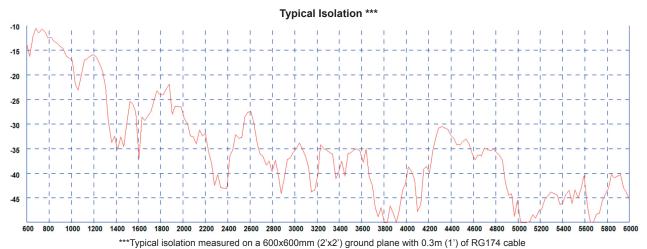
^{*}Swept peak gain and efficiency simulated in CST Microwave Studio with all elements fed together without cable loss on a 600x600mm (2'x2') ground plane

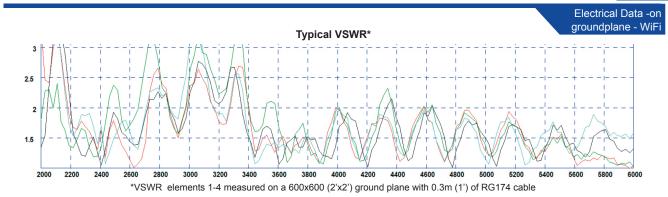
^{**}Typical isolation measured on a 600x600mm (2'x2') ground plane with 0.3m (1') of RG174 cable

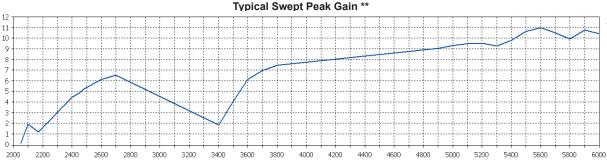




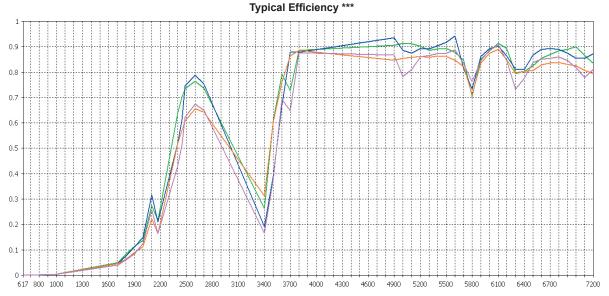




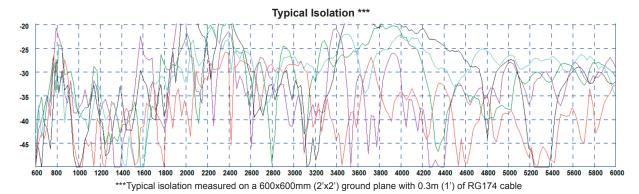




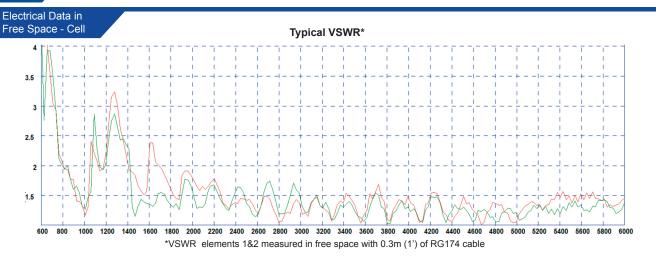
**Swept peak gain simulated in CST Microwave Studio with all elements fed together without cable loss on 600x600mm (2'x2') ground plane

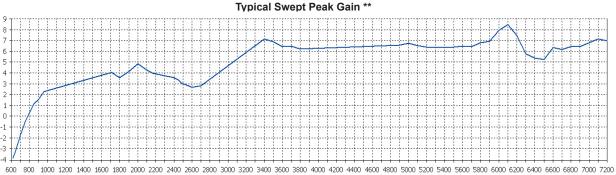


***Efficiency simulated in CST Microwave Studio with all elements fed together without cable loss on 600x600mm (2'x2') ground plane

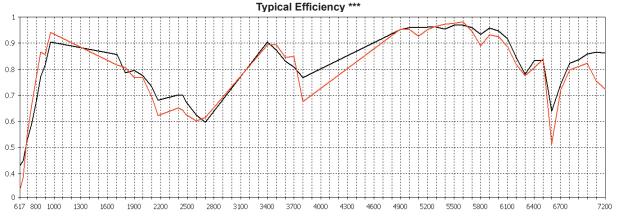


W: www.panorama-antennas.com

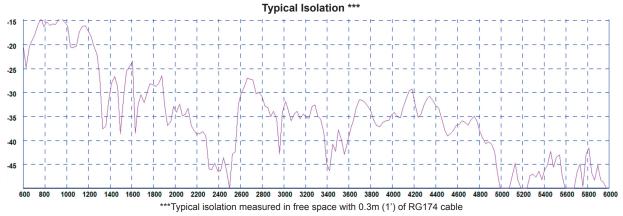


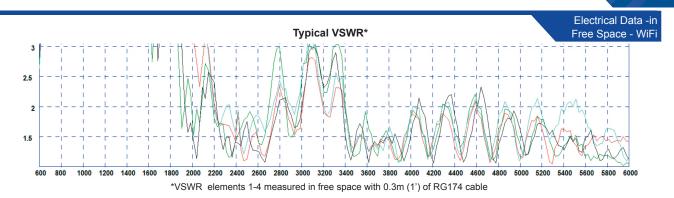


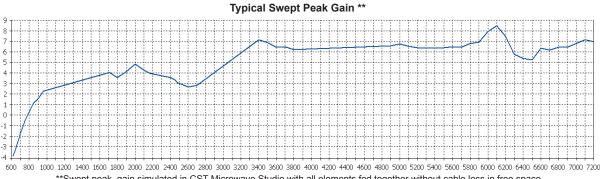
**Swept peak gain simulated in CST Microwave Studio with all elements fed together without cable loss in free space



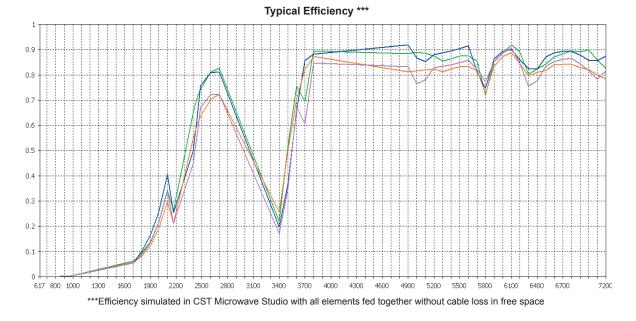
***Efficiency simulated in CST Microwave Studio with all elements fed together without cable loss in free space

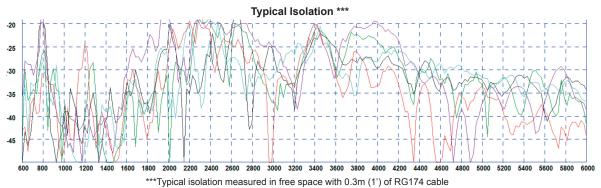


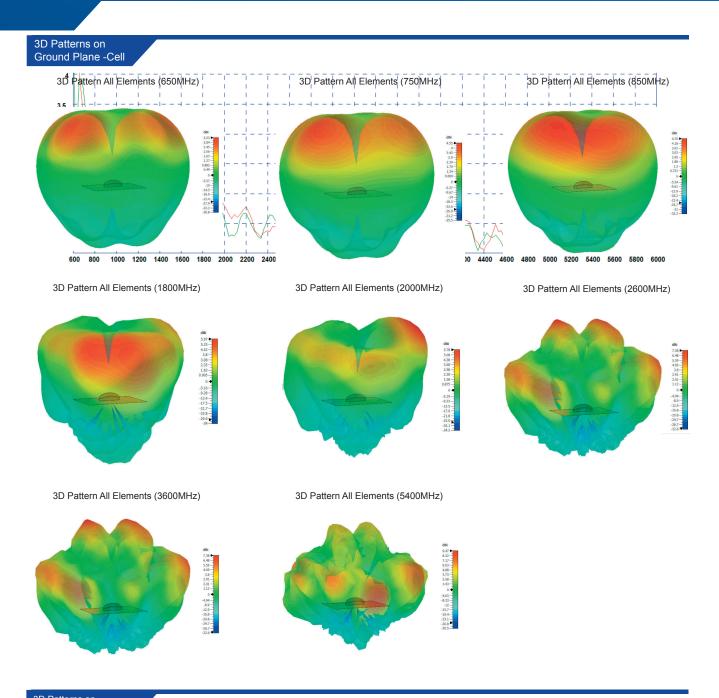




**Swept peak gain simulated in CST Microwave Studio with all elements fed together without cable loss in free space

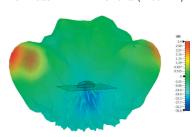




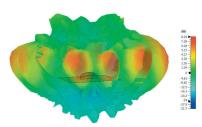


3D Patterns on Ground Plane -WIFI

3D Pattern All WiFi Elements (2450MHz)

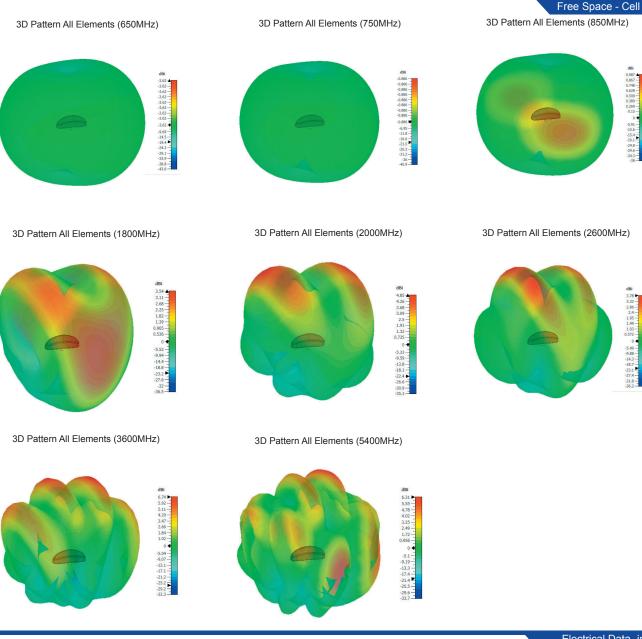


3D Pattern All WiFi Elements (5400MHz)

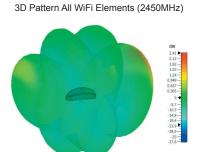


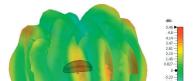
3D patterns all simulated in CST Microwave Studio with all elements of same type fed together excluding cable loss

Electrical Data -in



Electrical Data -in Free Space - WiFi





3D Pattern All WiFi Elements (5400MHz)

3D patterns all simulated in CST Microwave Studio with all elements of same type fed together excluding cable loss