

Amphenol® RF



# RF Antenna Solutions Guide

Enabling IoT Technology

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# ABOUT AMPHENOL RF

**Amphenol RF, a division of Amphenol Corporation, is the largest manufacturer of radio frequency connectors, coaxial adapters and RF cable assemblies in the world.**

With a global team of experienced engineers, Amphenol RF is able to offer the broadest portfolio of standard RF products on the market today.

As a leader in design and manufacturing of RF interconnect products, our dedicated team of engineers specialize in custom product development to meet the challenges of design-specific constraints.

## GLOBAL PRESENCE



With a global presence, Amphenol RF has experienced engineers and production capabilities in multiple regions across the globe. Our experienced cross-functional teams oversee the entire process from the initial design through delivery, and beyond.

Amphenol RF has a global footprint of operations in North America, Europe and Asia.

# ANTENNAS OVERVIEW

RF (Radio Frequency) antennas are crucial components in wireless communication systems, playing a fundamental role in transmitting and receiving electromagnetic waves in the radio frequency spectrum.

These antennas are designed to efficiently radiate or capture RF signals, enabling various wireless technologies such as radio broadcasting, Wi-Fi, cellular networks, satellite communication and RFID systems, among others.

RF antennas serve as the interface between electronic devices and the surrounding electromagnetic environment. They are responsible for converting electrical signals into electromagnetic waves for transmission, or vice versa, for reception. Depending on their design and characteristics, RF antennas can focus, direct, or disperse radio waves in specific directions to optimize communication.

RF antennas cover a wide range of frequencies within the radio spectrum, typically from a few kilohertz (kHz) to several gigahertz (GHz). Different applications require antennas tuned to specific frequency bands, such as AM and FM radio bands, VHF and UHF television bands, cellular frequencies, and more.

RF antennas come in various shapes and sizes, each tailored to suit specific applications. Some common types include:

## ANTENNA ELECTRICAL CONCEPT

- Dipole
- Monopole
- Loop
- IFA
- PIFA

## INTERNAL AND EXTERNAL ANTENNAS

- Flexible Printed Circuit (FPC) and Printed Circuit Board (PCB)
- Near Field Communication (NFC)
- Embedded Chip
- Embedded GNSS and GPS Patch
- Swivel
- Bar
- Stick
- Connector Mount
- Adhesive Mount
- IP65-68

RF antennas are indispensable components in modern wireless communication systems, enabling the efficient exchange of information across a wide range of frequencies and applications. Their design and characteristics are tailored to the specific needs of each application, allowing for reliable and high-performance wireless communication.



They are available in a variety of configurations to meet the needs of design specific requirements for applications such as:

- Mobile Phone (4G, LTE, 5G-FR1, WiFi, Bluetooth)
- Laptop/Tablet (4G, LTE, 5G-FR1, WiFi, Bluetooth)
- Access Point (WiFi, Bluetooth)
- Active/Switchable Antennas
- NFC Antenna (Wireless Charging)
- 5G-FR1, UWB
- FM Antenna
- CMMB Antenna
- Wireless Charged Antenna
- Automotive Antennas (Cellular, FM, WiFi, Bluetooth)
- GPS/GNSS Antenna

# EXTERNAL ANTENNAS

External antennas, as the name suggests, are antennas mounted outside of electronic devices or structures to enhance wireless communication. They are a vital component in various applications, including cellular networks, Wi-Fi routers, satellite communication, and more. These antennas come in diverse shapes and sizes, from the familiar external antennas on Wi-Fi routers to large parabolic dishes for long-distance communication. External antennas are employed to extend signal range, improve signal quality, and overcome obstacles or interference. They are especially useful in environments with weak or obstructed signals, such as rural areas or densely populated urban settings, as they can significantly enhance the performance and reliability of wireless communication systems.



## FEATURES AND BENEFITS

- Familiar RF interface connections (SMA, RP-SMA, N-Type)
- Single, dual and wideband options
- Common antennas applications are supported
- Straight and swivel whip style designs
- Panel and external mounted cable designs
- Waterproof IP67 configurations available

## APPLICATIONS

- ACCESS POINT
- RADIO
- NAVIGATION
- ROUTERS/GATEWAY/MESH
- SET-TOP BOX
- SURVEYING EQUIPMENT
- SECURITY CAMERAS

# ORDERING INFORMATION

## EXTERNAL ANTENNAS



SMA  
ST1228-30-001-A

|                         |                        |
|-------------------------|------------------------|
| Frequency Range (GHz)   | 2.4 - 2.5 • 5.15 - 7.2 |
| Return Loss (dB)        | < -10 • < -10          |
| Max Input Power (W)     | 1                      |
| Gain, Peak/Average (dB) | 2.4/-1.2 • 2.5/-3.2    |
| Efficiency, Average (%) | 75 • 48                |
| Length (mm)             | 172.5                  |
| Diameter (mm)           | 12.9                   |
| Mechanical Feature      | Hinged w/ Swivel       |
| Temperature Range (°C)  | -30 to 75              |
| RoHS                    | RoHS Compliant         |
| IP Rating               | Not Rated              |



N-TYPE  
ST1226-41-301-B

|                         |                       |
|-------------------------|-----------------------|
| Frequency Range (GHz)   | 2.4 - 2.5 • 4.9 - 7.2 |
| Return Loss (dB)        | < -10 • < -10         |
| Max Input Power (W)     | 1                     |
| Gain, Peak/Average (dB) | 3.7/-1.0 • 6.3/-1.5   |
| Efficiency, Average (%) | 79 • 71               |
| Length (mm)             | 215                   |
| Diameter (mm)           | 20                    |
| Mechanical Feature      | N/A                   |
| Temperature Range (°C)  | -30 to 70             |
| RoHS                    | RoHS Compliant        |
| IP Rating               | IP67                  |



RP-SMA  
ST1228-30-502-A

|                         |                        |
|-------------------------|------------------------|
| Frequency Range (GHz)   | 2.4 - 2.5 • 5.15 - 7.2 |
| Return Loss (dB)        | < -10 • < -10          |
| Max Input Power (W)     | 1                      |
| Gain, Peak/Average (dB) | 2.7/-1.4 • 4.4/-2.0    |
| Efficiency, Average (%) | 73 • 63                |
| Length (mm)             | 133.5                  |
| Diameter (mm)           | 10                     |
| Mechanical Feature      | Hinged w/ Swivel       |
| Temperature Range (°C)  | -40 to 80              |
| RoHS                    | RoHS Compliant         |
| IP Rating               | Not Rated              |



SMA  
ST1228-30-001-B

|                         |                        |
|-------------------------|------------------------|
| Frequency Range (GHz)   | 2.4 - 2.5 • 5.15 - 7.2 |
| Return Loss (dB)        | < -10 • < -10          |
| Max Input Power (W)     | 1                      |
| Gain, Peak/Average (dB) | 2.7/-1.4 • 4.4/-2.0    |
| Efficiency, Average (%) | 73 • 63                |
| Length (mm)             | 162                    |
| Diameter (mm)           | 13                     |
| Mechanical Feature      | Hinged w/ Swivel       |
| Temperature Range (°C)  | -40 to 85              |
| RoHS                    | RoHS Compliant         |
| IP Rating               | Not Rated              |



RP-SMA  
ST1256-32-501-A

|                         |                        |
|-------------------------|------------------------|
| Frequency Range (GHz)   | 2.4 - 2.5 • 5.15 - 7.2 |
| Return Loss (dB)        | < -9.5 • < -9.5        |
| Max Input Power (W)     | 1                      |
| Gain, Peak/Average (dB) | 2.2/-2.9 • 0.9/-4.3    |
| Efficiency, Average (%) | 51 • 37                |
| Length (mm)             | 162                    |
| Diameter (mm)           | 60                     |
| Mechanical Feature      | Hinged w/ Swivel       |
| Temperature Range (°C)  | -40 to 80              |
| RoHS                    | RoHS Compliant         |
| IP Rating               | Not Rated              |



RP-SMA  
ST1228-30-501-A

|                         |                                          |
|-------------------------|------------------------------------------|
| Frequency Range (GHz)   | 2.4 - 2.5 • 5.15 - 5.825 • 5.925 - 7.125 |
| Return Loss (dB)        | < -10 • < -10 • < -5                     |
| Max Input Power (W)     | 1                                        |
| Gain, Peak/Average (dB) | 2.5/-0.7 • 4.0/-1.2 • 4.2/-1.6           |
| Efficiency, Average (%) | 85 • 75 • 70                             |
| Length (mm)             | 123.7 (bent)                             |
| Diameter (mm)           | 12.7                                     |
| Mechanical Feature      | Hinged w/ Swivel                         |
| Temperature Range (°C)  | -30 to 70                                |
| RoHS                    | RoHS Compliant                           |
| IP Rating               | IP67                                     |



RP-SMA  
ST1228-40-501-A

|                         |                                          |
|-------------------------|------------------------------------------|
| Frequency Range (GHz)   | 2.4 - 2.5 • 5.15 - 5.825 • 5.925 - 7.125 |
| Return Loss (dB)        | < -10 • < -10 • < -6                     |
| Max Input Power (W)     | 1                                        |
| Gain, Peak/Average (dB) | 4.4/-1.3 • 4.1/-1.3 • 4.7/-1.2           |
| Efficiency, Average (%) | 74 • 73 • 76                             |
| Length (mm)             | 203 (bent)                               |
| Diameter (mm)           | 12.7                                     |
| Mechanical Feature      | Hinged w/ Swivel                         |
| Temperature Range (°C)  | -30 to 70                                |
| RoHS                    | RoHS Compliant                           |
| IP Rating               | IP67                                     |



SMA  
ST1222-30-001-A  
RP-SMA  
ST1222-30-501-A

|                         |                                         |
|-------------------------|-----------------------------------------|
| Frequency Range (GHz)   | 2.4 - 2.5 • 5.15 - 5.85 • 5.925 - 7.125 |
| Return Loss (dB)        | < -10                                   |
| Max Input Power (W)     | 5                                       |
| Gain, Peak/Average (dB) | 1.7/-2.4 • 3.5/-1.2 • 4.4/-1.1          |
| Efficiency, Average (%) | 57 • 79 • 77                            |
| Length (mm)             | 136 • 114 (bent)                        |
| Diameter (mm)           | 10                                      |
| Mechanical Feature      | Hinged                                  |
| Temperature Range (°C)  | -40 to 85                               |
| RoHS                    | RoHS Compliant                          |
| IP Rating               | Not Rated                               |



N-TYPE  
ST0426-41-301-B

|                         |                       |
|-------------------------|-----------------------|
| Frequency Range (GHz)   | 0.6 - 0.96 • 1.55 - 6 |
| Return Loss (dB)        | < -5.1 • < -5.1       |
| Max Input Power (W)     | 1                     |
| Gain, Peak/Average (dB) | 2.8/-3.5 • 3.2/-4.7   |
| Efficiency, Average (%) | 45 • 34               |
| Length (mm)             | 215                   |
| Diameter (mm)           | 20                    |
| Mechanical Feature      | N/A                   |
| Temperature Range (°C)  | -30 to 70             |
| RoHS                    | RoHS Compliant        |
| IP Rating               | IP67                  |

# ORDERING INFORMATION

## EXTERNAL ANTENNAS



SMA  
[ST0456-32-001-A](#)

|                         |                          |
|-------------------------|--------------------------|
| Frequency Range (GHz)   | 0.69 - 0.96 • 1.7 - 5.95 |
| Return Loss (dB)        | < -6 • < -7.4            |
| Max Input Power (W)     | 1                        |
| Gain, Peak/Average (dB) | 2.2/-3.2 • 0.9/-6.3      |
| Efficiency, Average (%) | 47 • 23                  |
| Length (mm)             | 162                      |
| Diameter (mm)           | 60                       |
| Mechanical Feature      | Hinged w/ Swivel         |
| Temperature Range (°C)  | -40 to 80                |
| RoHS                    | RoHS Compliant           |
| IP Rating               | Not Rated                |



SMA  
[ST0428-31-001-A](#)  
RP-SMA  
[ST0428-31-501-A](#)

|                         |                                                               |
|-------------------------|---------------------------------------------------------------|
| Frequency Range (GHz)   | 0.69 - 0.96 • 1.7 - 2.2 • 2.3 - 2.7 • 3.3 - 3.8 • 5.15 - 5.95 |
| Return Loss (dB)        | < -7 • < -10 • < -7 • < -10 • < -7                            |
| Max Input Power (W)     | 1                                                             |
| Gain, Peak/Average (dB) | 2.9/-4.0 • 2.3/-2.2 • 2.3/-2.3 • 2.0/-1.7 • 4.7/-2.1          |
| Efficiency, Average (%) | 41 • 61 • 60 • 60 • 61                                        |
| Length (mm)             | 134 • 115 (bent)                                              |
| Diameter (mm)           | 10                                                            |
| Mechanical Feature      | Hinged w/ Swivel                                              |
| Temperature Range (°C)  | -40 to 85                                                     |
| RoHS                    | RoHS Compliant                                                |
| IP Rating               | Not Rated                                                     |



SMA  
[ST1326-30-001-A](#)  
RP-SMA  
[ST1326-30-501-A](#)

|                         |                                                               |
|-------------------------|---------------------------------------------------------------|
| Frequency Range (GHz)   | 0.69 - 0.96 • 1.7 - 2.2 • 2.3 - 2.7 • 3.3 - 3.8 • 5.15 - 5.95 |
| Return Loss (dB)        | < -10                                                         |
| Max Input Power (W)     | 2                                                             |
| Gain, Peak/Average (dB) | 5.0/-4.6 • 4.0/-2.1 • 4.0/-2.4 • 3.2/-2.0 • 3.2/-2.0          |
| Efficiency, Average (%) | 35 • 63 • 57 • 58 • 58                                        |
| Length (mm)             | 151 • 128 (bent)                                              |
| Diameter (mm)           | 1                                                             |
| Mechanical Feature      | Hinged w/ Swivel                                              |
| Temperature Range (°C)  | -40 to 85                                                     |
| RoHS                    | RoHS Compliant                                                |
| IP Rating               | Not Rated                                                     |



SMA  
[ST0326-40-001-B](#)  
RP-SMA  
[ST0326-40-501-B](#)

|                         |                                                                                |
|-------------------------|--------------------------------------------------------------------------------|
| Frequency Range (GHz)   | 0.698 - 0.8 • 0.8 - 0.96 • 1.71 - 2.17 • 2.3 - 2.69 • 3.3 - 5.0 • 5.15 - 5.925 |
| Return Loss (dB)        | < -3 • < -7 • < -7 • < -7 • < -7 • < -5                                        |
| Max Input Power (W)     | 1                                                                              |
| Gain, Peak/Average (dB) | 3.0/-4.2 • 3.2/-4.6 • 3.1/-1.3 • 3.2/-1.2 • 5.5/-1.5 • 5.5/-2.6                |
| Efficiency, Average (%) | 38 • 35 • 75 • 75 • 71 • 55                                                    |
| Length (mm)             | 220 (bent)                                                                     |
| Diameter (mm)           | 13                                                                             |
| Mechanical Feature      | Hinged w/ Swivel                                                               |
| Temperature Range (°C)  | -40 to 65                                                                      |
| RoHS                    | RoHS Compliant                                                                 |
| IP Rating               | N/A                                                                            |



SMA  
[ST0428-31-002-A](#)

|                         |                                                                     |
|-------------------------|---------------------------------------------------------------------|
| Frequency Range (GHz)   | 0.617 - 0.95 • 1.42 - 1.52 • 1.71 - 2.69 • 3.3 - 5.0 • 5.15 - 5.925 |
| Return Loss (dB)        | < -6 • < -7 • < -7 • < -7 • < -7                                    |
| Max Input Power (W)     | 1                                                                   |
| Gain, Peak/Average (dB) | 1.8/-3.8 • 2.2/-2.8 • 3.3/-1.7 • 3.0/-1.9 • 3.8/-2.6                |
| Efficiency, Average (%) | 42 • 52 • 68 • 65 • 55                                              |
| Length (mm)             | 142 (bent)                                                          |
| Diameter (mm)           | 13                                                                  |
| Mechanical Feature      | Hinged w/ Swivel                                                    |
| Temperature Range (°C)  | -40 to 85                                                           |
| RoHS                    | RoHS Compliant                                                      |
| IP Rating               | N/A                                                                 |



RP-SMA  
[ST0228-30-503-A](#)

|                         |                  |
|-------------------------|------------------|
| Frequency Range (GHz)   | 5.85 - 5.925 GHz |
| Return Loss (dB)        | < -9.5           |
| Max Input Power (W)     | 1                |
| Gain, Peak/Average (dB) | 5.6/-1.5         |
| Efficiency, Average (%) | 70               |
| Length (mm)             | 169              |
| Diameter (mm)           | 13               |
| Mechanical Feature      | Hinged w/ Swivel |
| Temperature Range (°C)  | -40 to 80        |
| RoHS                    | RoHS Compliant   |
| IP Rating               | Not Rated        |



SMA  
[ST0428-40-001-B](#)

|                         |                         |
|-------------------------|-------------------------|
| Frequency Range (GHz)   | 0.69 - 0.96 • 1.7 - 5.9 |
| Return Loss (dB)        | < -6 • < -6             |
| Max Input Power (W)     | 1                       |
| Gain, Peak/Average (dB) | 4.1/-2.7 • 4.8/-1.7     |
| Efficiency, Average (%) | 54 • 68                 |
| Length (mm)             | 222                     |
| Diameter (mm)           | 12.9                    |
| Mechanical Feature      | Hinged w/ Swivel        |
| Temperature Range (°C)  | -30 to 75               |
| RoHS                    | RoHS Compliant          |
| IP Rating               | Not Rated               |



SMA  
[ST0226-30-002-A](#)  
RP-SMA  
[ST0226-30-502-A](#)

|                         |                         |
|-------------------------|-------------------------|
| Frequency Range (GHz)   | 2.4 - 2.5 • 5.15 - 5.85 |
| Return Loss (dB)        | < -10                   |
| Max Input Power (W)     | 1                       |
| Gain, Peak/Average (dB) | 3.0/-0.6 • 3.4/-1.3     |
| Efficiency, Average (%) | 86 • 75                 |
| Length (mm)             | 109 • 88 (bent)         |
| Diameter (mm)           | 10                      |
| Mechanical Feature      | Hinged                  |
| Temperature Range (°C)  | -40 to 85               |
| RoHS                    | RoHS Compliant          |
| IP Rating               | Not Rated               |



SMA  
[ST0228-30-002-A](#)  
RP-SMA  
[ST0228-30-502-A](#)

|                         |                         |
|-------------------------|-------------------------|
| Frequency Range (GHz)   | 2.4 - 2.5 • 5.15 - 5.85 |
| Return Loss (dB)        | < -10                   |
| Max Input Power (W)     | 2                       |
| Gain, Peak/Average (dB) | 2.7/-0.5 • 4.0/-0.6     |
| Efficiency, Average (%) | 89 • 87                 |
| Length (mm)             | 109 • 88 (bent)         |
| Diameter (mm)           | 10                      |
| Mechanical Feature      | Hinged                  |
| Temperature Range (°C)  | -40 to 85               |
| RoHS                    | RoHS Compliant          |
| IP Rating               | Not Rated               |

# ORDERING INFORMATION

## EXTERNAL ANTENNAS



SMA  
ST0228-30-001-A  
RP-SMA  
ST0228-30-501-A

|                         |                         |
|-------------------------|-------------------------|
| Frequency Range (GHz)   | 2.4 - 2.5 • 5.15 - 5.85 |
| Return Loss (dB)        | <-10                    |
| Max Input Power (W)     | 2                       |
| Gain, Peak/Average (dB) | 2.0/1.6 • 3.0/-1.1      |
| Efficiency, Average (%) | 75 • 78                 |
| Length (mm)             | 196 • 166 (bent)        |
| Diameter (mm)           | 10                      |
| Mechanical Feature      | Hinged                  |
| Temperature Range (°C)  | -40 to 85               |
| RoHS                    | RoHS Compliant          |
| IP Rating               | Not Rated               |



RP-SMA  
ST0226-40-501-B

|                         |                         |
|-------------------------|-------------------------|
| Frequency Range (GHz)   | 2.4 - 2.5 • 5.15 - 5.85 |
| Return Loss (dB)        | <-10 • <-10             |
| Max Input Power (W)     | 1                       |
| Gain, Peak/Average (dB) | 3.5/-1.7 • 5.7/-1.8     |
| Efficiency, Average (%) | 68 • 67                 |
| Length (mm)             | 200                     |
| Diameter (mm)           | 13                      |
| Mechanical Feature      | N/A                     |
| Temperature Range (°C)  | -40 to 85               |
| RoHS                    | RoHS Compliant          |
| IP Rating               | IP65                    |



SMA  
ST0230-31-001-A

|                         |                         |
|-------------------------|-------------------------|
| Frequency Range (GHz)   | 2.4 - 2.5 • 5.15 - 5.85 |
| Return Loss (dB)        | <-10 • <-10             |
| Max Input Power (W)     | 1                       |
| Gain, Peak/Average (dB) | 3.2/-3.1 • 2.0/-3.7     |
| Efficiency, Average (%) | 50 • 43                 |
| Length (mm)             | 105.1                   |
| Diameter (mm)           | 30.1                    |
| Mechanical Feature      | N/A                     |
| Temperature Range (°C)  | -40 to 85               |
| RoHS                    | RoHS Compliant          |
| IP Rating               | IP67                    |



RP-SMA  
ST0226-10-501-A

|                         |                         |
|-------------------------|-------------------------|
| Frequency Range (GHz)   | 2.4 - 2.5 • 5.15 - 5.85 |
| Return Loss (dB)        | <-6 • <-7.4             |
| Max Input Power (W)     | 1                       |
| Gain, Peak/Average (dB) | 2.5/-1.9 • 2.2/-2.0     |
| Efficiency, Average (%) | 65 • 63                 |
| Length (mm)             | 47.5                    |
| Diameter (mm)           | 10                      |
| Mechanical Feature      | N/A                     |
| Temperature Range (°C)  | -20 to 70               |
| RoHS                    | RoHS Compliant          |
| IP Rating               | IP65                    |



N-TYPE  
ST0226-41-301-B

|                         |                         |
|-------------------------|-------------------------|
| Frequency Range (GHz)   | 2.4 - 2.5 • 4.9 - 5.825 |
| Return Loss (dB)        | <-9 • <-9               |
| Max Input Power (W)     | 1                       |
| Gain, Peak/Average (dB) | 3.5/-1.3 • 6.0/-2.0     |
| Efficiency, Average (%) | 75 • 64                 |
| Length (mm)             | 215                     |
| Diameter (mm)           | 20                      |
| Mechanical Feature      | N/A                     |
| Temperature Range (°C)  | -30 to 70               |
| RoHS                    | RoHS Compliant          |
| IP Rating               | IP67                    |



RP-SMA  
ST0227-41-501-A

|                         |                          |
|-------------------------|--------------------------|
| Frequency Range (GHz)   | 2.4 - 2.5 • 5.15 - 5.825 |
| Return Loss (dB)        | <-10 • <-10              |
| Max Input Power (W)     | 2                        |
| Gain, Peak/Average (dB) | 3.0/-2.4 • 2.0/-5.2      |
| Efficiency, Average (%) | 57 • 30                  |
| Length (mm)             | 115 (cable)              |
| Diameter (mm)           | 22                       |
| Mechanical Feature      | N/A                      |
| Temperature Range (°C)  | -40 to 65                |
| RoHS                    | RoHS Compliant           |
| IP Rating               | N/A                      |



SMA  
ST0228-30-003-A

|                         |                         |
|-------------------------|-------------------------|
| Frequency Range (GHz)   | 2.4 - 2.5 • 5.15 - 5.82 |
| Return Loss (dB)        | <-10 • <-10             |
| Max Input Power (W)     | 1                       |
| Gain, Peak/Average (dB) | 2.1/-1.2 • 3.1/-1.5     |
| Efficiency, Average (%) | 76 • 70                 |
| Length (mm)             | 172.5                   |
| Diameter (mm)           | 12.9                    |
| Mechanical Feature      | Hinged w/ Swivel        |
| Temperature Range (°C)  | -30 to 75               |
| RoHS                    | RoHS Compliant          |
| IP Rating               | Not Rated               |



SMA  
ST0428-41-001-A

|                         |                        |
|-------------------------|------------------------|
| Frequency Range (GHz)   | 0.7 - 0.96 • 1.7 - 5.8 |
| Return Loss (dB)        | <-4.4 • <-5.1          |
| Max Input Power (W)     | 1                      |
| Gain, Peak/Average (dB) | 3.1/-4.5 • 4.7/-3.0    |
| Efficiency, Average (%) | 36 • 50                |
| Length (mm)             | 230                    |
| Diameter (mm)           | 13                     |
| Mechanical Feature      | Hinged w/ Swivel       |
| Temperature Range (°C)  | -40 to 70              |
| RoHS                    | RoHS Compliant         |
| IP Rating               | IP66                   |



SMA  
ST0430-31-001-A

|                         |                        |
|-------------------------|------------------------|
| Frequency Range (GHz)   | 0.7 - 0.96 • 1.7 - 5.0 |
| Return Loss (dB)        | <-6 • <-6              |
| Max Input Power (W)     | 1                      |
| Gain, Peak/Average (dB) | 4.6/-2.7 • 2.4/-3.5    |
| Efficiency, Average (%) | 54 • 45                |
| Length (mm)             | 105.1                  |
| Diameter (mm)           | 30.1                   |
| Mechanical Feature      | N/A                    |
| Temperature Range (°C)  | -40 to 85              |
| RoHS                    | RoHS Compliant         |
| IP Rating               | IP67                   |

# ORDERING INFORMATION

## EXTERNAL ANTENNAS



SMA  
**ST0457-20-001-A**  
RP-SMA  
**ST0457-20-501-A**

|                         |                                                 |
|-------------------------|-------------------------------------------------|
| Frequency Range (GHz)   | 0.69 - 0.96 • 1.7 - 2.2 • 2.3 - 2.7 • 3.3 - 3.8 |
| Return Loss (dB)        | *GP needed, <-5                                 |
| Max Input Power (W)     | 10                                              |
| Gain, Peak/Average (dB) | 0.8/-2.6 • 3.7/-1.3 • 3.2/-1.7 • 2.0/-2.9       |
| Efficiency, Average (%) | 60 • 75 • 68 • 54                               |
| Length (mm)             | 72 • 40 (bent)                                  |
| Diameter (mm)           | 10                                              |
| Mechanical Feature      | Hinged w/ Swivel                                |
| Temperature Range (°C)  | -40 to 85                                       |
| RoHS                    | RoHS Compliant                                  |
| IP Rating               | Not Rated                                       |



SMA  
**ST0356-32-001-A**  
RP-SMA  
**ST0356-32-501-A**

|                         |                                     |
|-------------------------|-------------------------------------|
| Frequency Range (GHz)   | 0.69 - 0.96 • 1.7 - 2.2 • 2.3 - 2.7 |
| Return Loss (dB)        | <-7 • <-8 • <-10                    |
| Max Input Power (W)     | 2                                   |
| Gain, Peak/Average (dB) | 3.0/-2.7 • 1.7/-3.3 • 2.2/-3.6      |
| Efficiency, Average (%) | 55 • 47 • 44                        |
| Length (mm)             | 170 • 1000 (cable)                  |
| Diameter (mm)           | 83x48                               |
| Mechanical Feature      | N/A                                 |
| Temperature Range (°C)  | -40 to 85                           |
| RoHS                    | RoHS Compliant                      |
| IP Rating               | Not Rated                           |



SMA  
**ST0330-31-002-1**  
RP-SMA  
**ST0330-31-502-1**

|                         |                                     |
|-------------------------|-------------------------------------|
| Frequency Range (GHz)   | 0.69 - 0.96 • 1.7 - 2.2 • 2.3 - 2.7 |
| Return Loss (dB)        | <-5 • <-10 • <-10                   |
| Max Input Power (W)     | 2                                   |
| Gain, Peak/Average (dB) | 0.6/-2.8 • 0.2/-5.4 • 1.6/-5.8      |
| Efficiency, Average (%) | 55 • 29 • 27                        |
| Length (mm)             | 115 • 1000 (cable)                  |
| Diameter (mm)           | 10                                  |
| Mechanical Feature      | N/A                                 |
| Temperature Range (°C)  | -40 to 85                           |
| RoHS                    | RoHS Compliant                      |
| IP Rating               | IP67                                |



SMA  
**ST0326-30-004-A**  
RP-SMA  
**ST0326-30-504-A**

|                         |                                     |
|-------------------------|-------------------------------------|
| Frequency Range (GHz)   | 0.69 - 0.96 • 1.7 - 2.2 • 2.3 - 2.7 |
| Return Loss (dB)        | <-5 • <-10 • <-10                   |
| Max Input Power (W)     | 1                                   |
| Gain, Peak/Average (dB) | 4.7/-3.7 • 4.0/-1.5 • 4.1/-1.2      |
| Efficiency, Average (%) | 43 • 71 • 76                        |
| Length (mm)             | 151 • 128 (bent)                    |
| Diameter (mm)           | 10                                  |
| Mechanical Feature      | Hinged w/ Swivel                    |
| Temperature Range (°C)  | -40 to 85                           |
| RoHS                    | RoHS Compliant                      |
| IP Rating               | Not Rated                           |



N-TYPE  
**ST0326-41-301-B**

|                         |                          |
|-------------------------|--------------------------|
| Frequency Range (GHz)   | 0.69 - 0.96 • 1.72 - 2.7 |
| Return Loss (dB)        | <-6 • <-10               |
| Max Input Power (W)     | 1                        |
| Gain, Peak/Average (dB) | 2.1/-2.0 • 2.9/-1.7      |
| Efficiency, Average (%) | 62 • 67                  |
| Length (mm)             | 215                      |
| Diameter (mm)           | 20                       |
| Mechanical Feature      | N/A                      |
| Temperature Range (°C)  | -30 to 70                |
| RoHS                    | RoHS Compliant           |
| IP Rating               | IP67                     |



SMA  
**ST0330-31-001-A**

|                         |                        |
|-------------------------|------------------------|
| Frequency Range (GHz)   | 0.7 - 0.96 • 1.7 - 2.7 |
| Return Loss (dB)        | <-6 • <-10             |
| Max Input Power (W)     | 1                      |
| Gain, Peak/Average (dB) | 3.8/-2.4 • 3.2/-3.1    |
| Efficiency, Average (%) | 57 • 49                |
| Length (mm)             | 105.1                  |
| Diameter (mm)           | 30.1                   |
| Mechanical Feature      | N/A                    |
| Temperature Range (°C)  | -40 to 85              |
| RoHS                    | RoHS Compliant         |
| IP Rating               | IP67                   |



SMA  
**ST0126-30-501-A**

|                         |                |
|-------------------------|----------------|
| Frequency Range (GHz)   | 2.4 - 2.5      |
| Return Loss (dB)        | <-10           |
| Max Input Power (W)     | 1              |
| Gain, Peak/Average (dB) | 2.0/-1.2       |
| Efficiency, Average (%) | 77             |
| Length (mm)             | 130            |
| Diameter (mm)           | 10             |
| Mechanical Feature      | N/A            |
| Temperature Range (°C)  | -20 to 65      |
| RoHS                    | RoHS Compliant |
| IP Rating               | IP65           |



SMA  
**ST0128-30-501-A**

|                         |                  |
|-------------------------|------------------|
| Frequency Range (GHz)   | 2.4 - 2.5        |
| Return Loss (dB)        | <-10             |
| Max Input Power (W)     | 1                |
| Gain, Peak/Average (dB) | 5.0/-1.1         |
| Efficiency, Average (%) | 77               |
| Length (mm)             | 194              |
| Diameter (mm)           | 13               |
| Mechanical Feature      | Hinged w/ Swivel |
| Temperature Range (°C)  | -40 to 85        |
| RoHS                    | RoHS Compliant   |
| IP Rating               | Not Rated        |



N-TYPE  
**ST0504-22-201-B**

|                         |                                   |
|-------------------------|-----------------------------------|
| Frequency Range (GHz)   | 1561 MHz • 1575.42 MHz • 1602 MHz |
| Return Loss (dB)        | <-10 • <-10 • <-10                |
| Max Input Power (W)     | 2                                 |
| Gain, Peak/Average (dB) | 3.5 • 4.8                         |
| Efficiency, Average (%) | 86 • 88                           |
| Length (mm)             | 84                                |
| Diameter (mm)           | 66.5                              |
| Mechanical Feature      | N/A                               |
| Temperature Range (°C)  | -40 to 85                         |
| RoHS                    | RoHS Compliant                    |
| IP Rating               | IP67                              |

# ORDERING INFORMATION

## EXTERNAL ANTENNAS



RP-SMA  
ST0628-40-501-B

|                         |                               |
|-------------------------|-------------------------------|
| Frequency Range (GHz)   | 860 - 876 MHz • 902 - 928 MHz |
| Return Loss (dB)        | < -10 • < -10                 |
| Max Input Power (W)     | 1                             |
| Gain, Peak/Average (dB) | 3.0/-2.0 • 2.4/-1.5           |
| Efficiency, Average (%) | 63 • 71                       |
| Length (mm)             | 222                           |
| Diameter (mm)           | 12.9                          |
| Mechanical Feature      | Hinged w/ Swivel              |
| Temperature Range (°C)  | -30 to 75                     |
| RoHS                    | RoHS Compliant                |
| IP Rating               | Not Rated                     |



N-TYPE  
ST0626-41-301-B

|                         |                |
|-------------------------|----------------|
| Frequency Range (GHz)   | 902 - 928 MHz  |
| Return Loss (dB)        | < -14          |
| Max Input Power (W)     | 200            |
| Gain, Peak/Average (dB) | 2.5/-0.6       |
| Efficiency, Average (%) | 86             |
| Length (mm)             | 240.6          |
| Diameter (mm)           | 27             |
| Mechanical Feature      | N/A            |
| Temperature Range (°C)  | -40 to 70      |
| RoHS                    | RoHS Compliant |
| IP Rating               | IP67           |



SMA  
ST0628-30-001-A

|                         |                |
|-------------------------|----------------|
| Frequency Range (GHz)   | 868 - 915 MHz  |
| Return Loss (dB)        | < -8           |
| Max Input Power (W)     | 1              |
| Gain, Peak/Average (dB) | 2.4/-0.8       |
| Efficiency, Average (%) | 83             |
| Length (mm)             | 160            |
| Diameter (mm)           | 13             |
| Mechanical Feature      | N/A            |
| Temperature Range (°C)  | -40 to 70      |
| RoHS                    | RoHS Compliant |
| IP Rating               | Not Rated      |



SMA  
ST0628-30-002-A

|                         |                  |
|-------------------------|------------------|
| Frequency Range (GHz)   | 863 - 873 MHz    |
| Return Loss (dB)        | < -7             |
| Max Input Power (W)     | 1                |
| Gain, Peak/Average (dB) | 1.9/-5.0         |
| Efficiency, Average (%) | 32               |
| Length (mm)             | 109              |
| Diameter (mm)           | 10               |
| Mechanical Feature      | Hinged w/ Swivel |
| Temperature Range (°C)  | -40 to 70        |
| RoHS                    | RoHS Compliant   |
| IP Rating               | IP67             |



N-TYPE  
ST0626-41-302-B

|                         |                |
|-------------------------|----------------|
| Frequency Range (GHz)   | 863 - 873 MHz  |
| Return Loss (dB)        | < -14          |
| Max Input Power (W)     | 200            |
| Gain, Peak/Average (dB) | 2.2/-0.8       |
| Efficiency, Average (%) | 82             |
| Length (mm)             | 240.6          |
| Diameter (mm)           | 27             |
| Mechanical Feature      | N/A            |
| Temperature Range (°C)  | -40 to 70      |
| RoHS                    | RoHS Compliant |
| IP Rating               | IP67           |



RP-SMA  
ST0626-30-501-B

|                         |                |
|-------------------------|----------------|
| Frequency Range (GHz)   | 868 MHz        |
| Return Loss (dB)        | < -6           |
| Max Input Power (W)     | 1              |
| Gain, Peak/Average (dB) | 3.6/-1.7       |
| Efficiency, Average (%) | 68             |
| Length (mm)             | 128            |
| Diameter (mm)           | 10             |
| Mechanical Feature      | N/A            |
| Temperature Range (°C)  | -20 to 65      |
| RoHS                    | RoHS Compliant |
| IP Rating               | IP65           |



SMA  
ST0628-30-004-A

|                         |                  |
|-------------------------|------------------|
| Frequency Range (GHz)   | 433 MHz          |
| Return Loss (dB)        | < -6             |
| Max Input Power (W)     | 1                |
| Gain, Peak/Average (dB) | 0.7/-4.8         |
| Efficiency, Average (%) | 33               |
| Length (mm)             | 109              |
| Diameter (mm)           | 10               |
| Mechanical Feature      | Hinged w/ Swivel |
| Temperature Range (°C)  | -10 to 60        |
| RoHS                    | RoHS Compliant   |
| IP Rating               | IP67             |

# FLEXIBLE PRINTED CIRCUIT (FPC) AND PRINTED CIRCUIT BOARD (PCB) ANTENNAS

Flexible Printed Circuit (FPC) and Printed Circuit Board (PCB) are two common types of antennas used in electronic devices. They serve the same fundamental purpose of transmitting and receiving radio frequency (RF) signals and are both essential components in electronic devices.

FPC antennas are flexible and can conform to various shapes and designs, making them suitable for applications where space is limited or irregular, such as wearables, IoT devices, and curved surfaces.

PCB antennas are flat, rigid, and are integrated directly onto the printed circuit board of electronic devices. They have a planar, board-like appearance.



## FEATURES AND BENEFITS

- Ideal for IoT, Wi-Fi and LTE applications
- Dual-band, multi-band and wide-band options available
- Secure adhesive mount backing for easy install
- Flexible options for use in compact IoT devices
- Low profile design
- Reliable RF performance

## APPLICATIONS

- WI-FI ENABLED LAWN MOWERS
- SMART TV'S
- SMART SPEAKERS
- NAVIGATION SYSTEMS
- DRONES
- ROUTERS
- TABLETS

# ORDERING INFORMATION

## INTERNAL FPC & PCB ANTENNAS



ST1124-00-401-A

|                        |                            |
|------------------------|----------------------------|
| Wireless Protocol      | Ultra Wide Band            |
| Frequency Range (GHz)  | 6.35 - 7.91 • 7.93 - 8.44  |
| Material               | FPC • PI • Adhesive 3M 367 |
| Return Loss (dB)       | <-10 • <-10                |
| Power (W) 50 Ohm       | 1                          |
| Gain,Peak/Average (dB) | 6.0/-0.9 • 5.1/-0.8        |
| Efficiency/Average (%) | 81 • 91                    |
| Dimensions (mm)        | 15 x 17.4 x 0.2            |
| Cable Length (mm)      | 100 mm standard            |
| Temperature Range (°C) | -40 to 85                  |
| RoHS                   | RoHS Compliant             |



ST1124-11-401-A

|                        |                                                       |
|------------------------|-------------------------------------------------------|
| Wireless Protocol      | Ultra Wide Band                                       |
| Frequency Range (GHz)  | 3.18 - 4.74 • 4.76 - 6.33 • 6.35 - 7.91 • 7.93 - 8.44 |
| Material               | FPC • PI • Adhesive 3M 367                            |
| Return Loss (dB)       | <-10 • <-10 • <-10 • <-10                             |
| Power (W) 50 Ohm       | 1                                                     |
| Gain,Peak/Average (dB) | 3.6/-0.7 • 4.3/-1.1 • 4.3/-1.4 • 4.5/-1.5             |
| Efficiency/Average (%) | 86 • 78 • 72 • 71                                     |
| Dimensions (mm)        | 24.1 x 34 x 0.2                                       |
| Cable Length (mm)      | 100 mm standard                                       |
| Temperature Range (°C) | -40 to 85                                             |
| RoHS                   | RoHS Compliant                                        |



ST1125-00-401-A

|                        |                            |
|------------------------|----------------------------|
| Wireless Protocol      | Ultra Wide Band            |
| Frequency Range (GHz)  | 6.35 - 7.91 • 7.93 - 8.44  |
| Material               | FPC • PI • Adhesive 3M 367 |
| Return Loss (dB)       | <-10 • <-10                |
| Power (W) 50 Ohm       | 1                          |
| Gain,Peak/Average (dB) | 3.8/-1.4 • 3.7/-0.8        |
| Efficiency/Average (%) | 72 • 83                    |
| Dimensions (mm)        | 13.1 x 16.4 x 0.45         |
| Cable Length (mm)      | 100 mm standard            |
| Temperature Range (°C) | -40 to 85                  |
| RoHS                   | RoHS Compliant             |



ST1125-11-401-A

|                        |                                                       |
|------------------------|-------------------------------------------------------|
| Wireless Protocol      | Ultra Wide Band                                       |
| Frequency Range (GHz)  | 3.18 - 4.74 • 4.76 - 6.33 • 6.35 - 7.91 • 7.93 - 8.44 |
| Material               | FPC • PI • Adhesive 3M 367                            |
| Return Loss (dB)       | <-10 • <-10 • <-10 • <-10                             |
| Power (W) 50 Ohm       | 1                                                     |
| Gain,Peak/Average (dB) | 3.8/-0.7 • 5.0/-1.1 • 4.5/-0.9 • 4.3/-0.5             |
| Efficiency/Average (%) | 85 • 78 • 82 • 89                                     |
| Dimensions (mm)        | 23 x 35 x 0.45                                        |
| Cable Length (mm)      | 100 mm standard                                       |
| Temperature Range (°C) | -40 to 85                                             |
| RoHS                   | RoHS Compliant                                        |



ST1225-10-401-A

|                        |                              |
|------------------------|------------------------------|
| Wireless Protocol      | Wi-Fi 6E                     |
| Frequency Range (GHz)  | 2.4 - 2.5 • 5.15 - 7.2       |
| Material               | PCB • FR-4 • Adhesive 3M 467 |
| Return Loss (dB)       | <-7 • <-6                    |
| Power (W) 50 Ohm       | 1                            |
| Gain,Peak/Average (dB) | 2.6/4.1 • -3.5/2.0           |
| Efficiency/Average (%) | 44 • 65                      |
| Dimensions (mm)        | 30 x 7 x 0.85                |
| Cable Length (mm)      | 100 mm standard              |
| Temperature Range (°C) | -40 to 85                    |
| RoHS                   | RoHS Compliant               |



ST1225-20-001-A

|                        |                              |
|------------------------|------------------------------|
| Wireless Protocol      | Wi-Fi 6E                     |
| Frequency Range (GHz)  | 2.4 - 2.5 • 5.15 - 7.2       |
| Material               | PCB • FR-4 • Adhesive 3M 467 |
| Return Loss (dB)       | <-10 • <-10                  |
| Power (W) 50 Ohm       | 1                            |
| Gain,Peak/Average (dB) | 3.4/4.2 • -1.7/-1.6          |
| Efficiency/Average (%) | 68 • 70                      |
| Dimensions (mm)        | 50.4 x 13.8 x 0.7            |
| Cable Length (mm)      | 100 mm standard              |
| Temperature Range (°C) | -40 to 85                    |
| RoHS                   | RoHS Compliant               |



ST1224-10-401-A

|                        |                            |
|------------------------|----------------------------|
| Wireless Protocol      | Wi-Fi 6E                   |
| Frequency Range (GHz)  | 2.4 - 2.5 • 5.15 - 7.2     |
| Material               | FPC • PI • Adhesive 3M 367 |
| Return Loss (dB)       | <-10 • <-10                |
| Power (W) 50 Ohm       | 1                          |
| Gain,Peak/Average (dB) | 2.1/3.6 • -1.2/-1.1        |
| Efficiency/Average (%) | 77 • 78                    |
| Dimensions (mm)        | 30 x 10 x .02              |
| Cable Length (mm)      | 100 mm standard            |
| Temperature Range (°C) | -40 to 85                  |
| RoHS                   | RoHS Compliant             |



ST0224-10-401-A

|                        |                            |
|------------------------|----------------------------|
| Wireless Protocol      | Wi-Fi                      |
| Frequency Range (GHz)  | 2.4 - 2.5 • 5.15 - 5.85    |
| Material               | FPC • PI • Adhesive 3M 367 |
| Return Loss (dB)       | <-10 • <-10                |
| Power (W) 50 Ohm       | 1                          |
| Gain,Peak/Average (dB) | 2.1/3.1 • -1.2/-1.5        |
| Efficiency/Average (%) | 77 • 71                    |
| Dimensions (mm)        | 30 x 10 x 0.2              |
| Cable Length (mm)      | 100 mm standard            |
| Temperature Range (°C) | -40 to 85                  |
| RoHS                   | RoHS Compliant             |



ST0225-10-401-A

|                        |                              |
|------------------------|------------------------------|
| Wireless Protocol      | Wi-Fi                        |
| Frequency Range (GHz)  | 2.4 - 2.5 • 5.15 - 5.85      |
| Material               | PCB • FR-4 • Adhesive 3M 467 |
| Return Loss (dB)       | <-10 • <-10                  |
| Power (W) 50 Ohm       | 1                            |
| Gain,Peak/Average (dB) | 2.6/2.6 • -3.8/-1.6          |
| Efficiency/Average (%) | 42 • 69                      |
| Dimensions (mm)        | 25 x 7 x 0.85                |
| Cable Length (mm)      | 100 mm standard              |
| Temperature Range (°C) | -40 to 85                    |
| RoHS                   | RoHS Compliant               |

# ORDERING INFORMATION

## INTERNAL FPC & PCB ANTENNAS



ST0412-20-001-A

|                        |                            |
|------------------------|----------------------------|
| Wireless Protocol      | LTE 5G-NR                  |
| Frequency Range (GHz)  | 0.69 - 0.96 • 1.7 - 4.2    |
| Material               | FPC • PI • Adhesive 3M 367 |
| Return Loss (dB)       | <-6 • <-6                  |
| Power (W) 50 Ohm       | 1                          |
| Gain,Peak/Average (dB) | 3.1/2.7 • -3.7/-2.0        |
| Efficiency/Average (%) | 41 • 63                    |
| Dimensions (mm)        | 95 x 15 x 0.2              |
| Cable Length (mm)      | 100 mm standard            |
| Temperature Range (°C) | -40 to 85                  |
| RoHS                   | RoHS Compliant             |



ST0425-20-401-A

|                        |                              |
|------------------------|------------------------------|
| Wireless Protocol      | LTE 5G-NR                    |
| Frequency Range (GHz)  | 0.69 - 0.96 • 1.7 - 4.2      |
| Material               | PCB • FR-4 • Adhesive 3M 467 |
| Return Loss (dB)       | <-6 • <-6                    |
| Power (W) 50 Ohm       | 1                            |
| Gain,Peak/Average (dB) | 4.2/4.2 • -3.0/-3.0          |
| Efficiency/Average (%) | 50 • 51                      |
| Dimensions (mm)        | 95 x 15 x 0.85               |
| Cable Length (mm)      | 100 mm standard              |
| Temperature Range (°C) | -40 to 85                    |
| RoHS                   | RoHS Compliant               |



ST0324-30-401-A

|                        |                         |
|------------------------|-------------------------|
| Wireless Protocol      | NB-IoT LTE              |
| Frequency Range (GHz)  | 0.69 - 0.96 • 1.7 - 2.7 |
| Material               | N/A                     |
| Return Loss (dB)       | <-6 • <-6               |
| Power (W) 50 Ohm       | 1                       |
| Gain,Peak/Average (dB) | 2.2/-3.6 • 3.0/-3.9     |
| Efficiency/Average (%) | 44 • 41                 |
| Dimensions (mm)        | 117 x 9.5 x 0.25        |
| Cable Length (mm)      | 180 mm standard         |
| Temperature Range (°C) | -30 to 70               |
| RoHS                   | RoHS Compliant          |

# NEAR FIELD COMMUNICATION (NFC)

Near Field Communication (NFC) antennas are essential components in modern wireless technology, enabling short-range, contactless communication between electronic devices. These antennas are designed to operate within the near-field region, typically within a few centimeters, facilitating data exchange, secure payments, and various other applications. NFC antennas are commonly found in smartphones, smart cards, payment terminals, and IoT devices, making them a key enabler of convenient and secure interactions, such as mobile payments, electronic access control, and data sharing. Their ability to quickly establish connections by simply bringing devices close together has led to widespread adoption in a wide range of industries, enhancing user experiences and simplifying everyday tasks.



## FEATURES AND BENEFITS

- Ideal for compact IoT applications
- Adhesive mount options with and without cable
- Operates at 13.56 MHz
- Designed to support NFC-Forum wireless protocols
- Short range data transfer capabilities

## APPLICATIONS

- SMART PHONES
- TABLETS
- HANDHELD GAMING SYSTEMS
- PAYMENT SYSTEMS
- TICKETING SYSTEMS
- BLUETOOTH PAIRING

# ORDERING INFORMATION

## NFC ANTENNAS



ST0812-00-N01-U

|                             |                                 |
|-----------------------------|---------------------------------|
| Frequency Range (MHz)*      | 13 - 15.5                       |
| Material                    | FPC • Ferrite • Adhesive 3M 467 |
| Impedance ( $\Omega$ )*     | 20 - 30                         |
| Inductance ( $\mu$ H)**     | 2.53                            |
| Resistance ( $\Omega$ )**   | 2.41                            |
| Self Res. Frequency (MHz)** | 27.41                           |
| Q-Factor**                  | 30.4                            |
| Dimensions (mm)             | 15 x 19 x 0.2                   |
| Temperature Range (°C)      | -40 to 85                       |
| RoHS                        | RoHS Compliant                  |



ST0812-00-N02-U

|                             |                                 |
|-----------------------------|---------------------------------|
| Frequency Range (MHz)*      | 13 - 15.5                       |
| Material                    | FPC • Ferrite • Adhesive 3M 467 |
| Impedance ( $\Omega$ )*     | 20 - 30                         |
| Inductance ( $\mu$ H)**     | 2.28                            |
| Resistance ( $\Omega$ )**   | 2.22                            |
| Self Res. Frequency (MHz)** | 29.55                           |
| Q-Factor**                  | 31.6                            |
| Dimensions (mm)             | 17 x 14 x 0.2                   |
| Temperature Range (°C)      | -40 to 85                       |
| RoHS                        | RoHS Compliant                  |



ST0815-00-N01-U

|                             |                                 |
|-----------------------------|---------------------------------|
| Frequency Range (MHz)*      | 13 - 15.5                       |
| Material                    | FPC • Ferrite • Adhesive 3M 467 |
| Impedance ( $\Omega$ )*     | 20 - 30                         |
| Inductance ( $\mu$ H)**     | 5.64                            |
| Resistance ( $\Omega$ )**   | 2.13                            |
| Self Res. Frequency (MHz)** | 27.39                           |
| Q-Factor**                  | 37.9                            |
| Dimensions (mm)             | 15 x 19 x 0.6                   |
| Temperature Range (°C)      | -40 to 85                       |
| RoHS                        | RoHS Compliant                  |



ST0815-00-N02-U

|                             |                                 |
|-----------------------------|---------------------------------|
| Frequency Range (MHz)*      | 13 - 15.5                       |
| Material                    | FPC • Ferrite • Adhesive 3M 467 |
| Impedance ( $\Omega$ )*     | 20 - 30                         |
| Inductance ( $\mu$ H)**     | 4.35                            |
| Resistance ( $\Omega$ )**   | 1.83                            |
| Self Res. Frequency (MHz)** | 34.17                           |
| Q-Factor**                  | 47.7                            |
| Dimensions (mm)             | 17 x 14 x 0.6                   |
| Temperature Range (°C)      | -40 to 85                       |
| RoHS                        | RoHS Compliant                  |



ST0812-00-N01-A

|                             |                                 |
|-----------------------------|---------------------------------|
| Frequency Range (MHz)*      | 13.56                           |
| Material                    | FPC • Ferrite • Adhesive 3M 467 |
| Impedance ( $\Omega$ )*     | 20 • 30                         |
| Inductance ( $\mu$ H)**     | 2.37                            |
| Resistance ( $\Omega$ )**   | 1.38                            |
| Self Res. Frequency (MHz)** | 24.35                           |
| Q-Factor**                  | 22.1                            |
| Dimensions (mm)             | 15 x 19 x 0.35                  |
| Temperature Range (°C)      | -40 to 85                       |
| RoHS                        | RoHS Compliant                  |



ST0812-11-N01-A

|                             |                                 |
|-----------------------------|---------------------------------|
| Frequency Range (MHz)*      | 13.56                           |
| Material                    | FPC • Ferrite • Adhesive 3M 467 |
| Impedance ( $\Omega$ )*     | 20 • 30                         |
| Inductance ( $\mu$ H)**     | 1.75                            |
| Resistance ( $\Omega$ )**   | 1.49                            |
| Self Res. Frequency (MHz)** | 93.59                           |
| Q-Factor**                  | 56.7                            |
| Dimensions (mm)             | 30 x 34 x 0.35                  |
| Temperature Range (°C)      | -40 to 85                       |
| RoHS                        | RoHS Compliant                  |



ST0812-11-N02-A  
NFC FORUM

|                             |                                 |
|-----------------------------|---------------------------------|
| Frequency Range (MHz)*      | 13.56                           |
| Material                    | FPC • Ferrite • Adhesive 3M 467 |
| Impedance ( $\Omega$ )*     | 20 - 30                         |
| Inductance ( $\mu$ H)**     | 1.54                            |
| Resistance ( $\Omega$ )**   | 1.64                            |
| Self Res. Frequency (MHz)** | 84.27                           |
| Q-Factor**                  | 49.4                            |
| Dimensions (mm)             | 45 x 34 x 0.35                  |
| Temperature Range (°C)      | -40 to 85                       |
| RoHS                        | RoHS Compliant                  |



ST0815-00-N01-A

|                             |                                 |
|-----------------------------|---------------------------------|
| Frequency Range (MHz)*      | 13.56                           |
| Material                    | PCB • Ferrite • Adhesive 3M 467 |
| Impedance ( $\Omega$ )*     | 20 - 30                         |
| Inductance ( $\mu$ H)**     | 1.96                            |
| Resistance ( $\Omega$ )**   | 0.88                            |
| Self Res. Frequency (MHz)** | 71.04                           |
| Q-Factor**                  | 76.2                            |
| Dimensions (mm)             | 15 x 19 x 1                     |
| Temperature Range (°C)      | -40 to 85                       |
| RoHS                        | RoHS Compliant                  |



ST0815-11-N01-A

|                             |                                 |
|-----------------------------|---------------------------------|
| Frequency Range (MHz)*      | 13.56                           |
| Material                    | PCB • Ferrite • Adhesive 3M 467 |
| Impedance ( $\Omega$ )*     | 20 - 30                         |
| Inductance ( $\mu$ H)**     | 1.74                            |
| Resistance ( $\Omega$ )**   | 1.03                            |
| Self Res. Frequency (MHz)** | 83.67                           |
| Q-Factor**                  | 65.2                            |
| Dimensions (mm)             | 30 x 34 x 0.6                   |
| Temperature Range (°C)      | -40 to 85                       |
| RoHS                        | RoHS Compliant                  |

# ORDERING INFORMATION

## NFC ANTENNAS



ST0815-N02-A  
NFC FORUM

|                             |                                 |
|-----------------------------|---------------------------------|
| Frequency Range (MHz)*      | 13.56                           |
| Material                    | PCB • Ferrite • Adhesive 3M 467 |
| Impedance (Ω)*              | 20 - 30                         |
| Inductance (μH)**           | 1.54                            |
| Resistance (Ω)**            | 1.12                            |
| Self Res. Frequency (MHz)** | 74.05                           |
| Q-Factor**                  | 58.3                            |
| Dimensions (mm)             | 45 x 34 x 0.6                   |
| Temperature Range (°C)      | -40 to 85                       |
| RoHS                        | RoHS Compliant                  |



ST0812-21-N01-A  
NFC Reader

|                             |                   |
|-----------------------------|-------------------|
| Frequency Range (MHz)*      | 13.56             |
| Material                    | FPCB • Ferrite    |
| Impedance (Ω)*              | 20 - 30           |
| Inductance (μH)**           | 1.67              |
| Resistance (Ω)**            | 1.9               |
| Self Res. Frequency (MHz)** | 66.9              |
| Q-Factor**                  | 42.1              |
| Dimensions (mm)             | 57.8 x 40.3 x 0.5 |
| Temperature Range (°C)      | -40 to 85         |
| RoHS                        | RoHS Compliant    |



ST0812-22-N01-A  
NFC FORUM

|                             |                 |
|-----------------------------|-----------------|
| Frequency Range (MHz)*      | 13.56           |
| Material                    | FPCB • Ferrite  |
| Impedance (Ω)*              | 20 - 30         |
| Inductance (μH)**           | 2.11            |
| Resistance (Ω)**            | 1.4             |
| Self Res. Frequency (MHz)** | 52.98           |
| Q-Factor**                  | 51.9            |
| Dimensions (mm)             | 86 x 53.4 x 0.5 |
| Temperature Range (°C)      | -40 to 85       |
| RoHS                        | RoHS Compliant  |

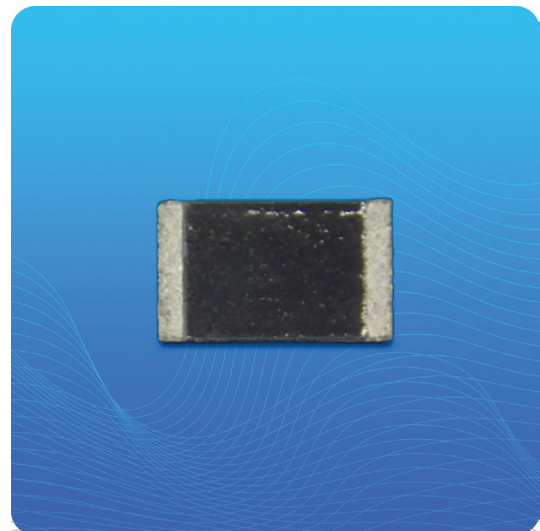


ST0824-20-401-A  
NFC Reader

|                             |                           |
|-----------------------------|---------------------------|
| Frequency Range (MHz)*      | 13.56                     |
| Material                    | FPCB • Ferrite • Adhesive |
| Impedance (Ω)*              | 20 - 30                   |
| Inductance (μH)**           | 2.27                      |
| Resistance (Ω)**            | 2.05                      |
| Self Res. Frequency (MHz)** | 30.37                     |
| Q-Factor**                  | 40.4                      |
| Dimensions (mm)             | 55 x 17 x 0.45            |
| Temperature Range (°C)      | -40 to 85                 |
| RoHS                        | RoHS Compliant            |

# EMBEDDED CHIP ANTENNAS

Embedded chip antennas are compact and integrated antennas designed to be directly mounted on a printed circuit board (PCB) or embedded within electronic devices. These antennas are often used in wireless communication applications, such as Wi-Fi, Bluetooth, GPS, and IoT devices, due to their small size and ease of integration. Embedded chip antennas offer the advantage of saving space, reducing manufacturing costs, and simplifying the design process. Their performance can vary based on factors like PCB layout and surrounding components, but advancements in antenna technology have led to the development of highly efficient embedded chip antennas that provide reliable wireless connectivity in a wide range of devices, from smartphones and tablets to smart home devices and industrial sensors.



## FEATURES AND BENEFITS

- Reliable RF performance up to 8.5 GHz supporting cellular (4G/5G-FR1), Wi-Fi/Bluetooth/BLE and LoRa/UWB/GNSS protocols
- SMT, surface mount on PCB
- Tape and reel packaging
- Ideal for compact IoT applications and consumer devices

## APPLICATIONS

- IOT "SMART" DEVICES
- MEDICAL DEVICES
- SET-TOP BOXES AND ROUTERS
- MOBILE ELECTRONIC WALLETS
- BLUETOOTH SPEAKERS

# ORDERING INFORMATION

## EMBEDDED CHIP ANTENNAS



ST1247-00-001-F

|                         |                 |
|-------------------------|-----------------|
| Frequency Range         | 6.2 - 8.5 GHz   |
| Return Loss (dB)        | < -10           |
| Max Input Power (W)     | 2               |
| Gain, Peak/Average (dB) | 3.2 • -2.0      |
| Efficiency/Average (%)  | 63              |
| Dimensions (mm)         | 3.2 x 1.6 x 1.1 |
| Temperature Range (°C)  | -40 to 85       |
| RoHS                    | RoHS Compliant  |



ST1143-00-N01-E

|                         |                     |
|-------------------------|---------------------|
| Frequency Range         | 3.71 - 8.44 GHz     |
| Return Loss (dB)        | < -6 • < -6         |
| Max Input Power (W)     | 2                   |
| Gain, Peak/Average (dB) | 3.6/-0.7 • 4.5/-1.4 |
| Efficiency/Average (%)  | 85 • 72             |
| Dimensions (mm)         | 8 x 6 x 0.5         |
| Temperature Range (°C)  | -40 to 125          |
| RoHS                    | RoHS Compliant      |



ST1243-00-N01-B

|                         |                            |
|-------------------------|----------------------------|
| Frequency Range         | 2.4 - 2.5 • 5.15 - 7.2 GHz |
| Return Loss (dB)        | < -10 • < -5               |
| Max Input Power (W)     | 1                          |
| Gain, Peak/Average (dB) | 2.8/-3.2 • 2.1/-3.2        |
| Efficiency/Average (%)  | 48 • 48                    |
| Dimensions (mm)         | 3.2 x 1.6 x 0.5            |
| Temperature Range (°C)  | -40 to 85                  |
| RoHS                    | RoHS Compliant             |



ST1247-00-001-A

|                         |                                |
|-------------------------|--------------------------------|
| Frequency Range         | 2.5 • 5.15 • 7.2 GHz           |
| Return Loss (dB)        | < -10                          |
| Max Input Power (W)     | 2                              |
| Gain, Peak/Average (dB) | 3.1/-1.0 • 5.3/-1.1 • 5.2/-1.4 |
| Efficiency/Average (%)  | 79 • 78 • 72                   |
| Dimensions (mm)         | 10 x 4 x 1.5                   |
| Temperature Range (°C)  | -40 to 85                      |
| RoHS                    | RoHS Compliant                 |



ST0443-10-N01-B

|                         |                             |
|-------------------------|-----------------------------|
| Frequency Range         | 0.61 - 0.96 • 1.7 - 5.9 GHz |
| Return Loss (dB)        | < -4 • < -4                 |
| Max Input Power (W)     | 5                           |
| Gain, Peak/Average (dB) | 2.5/-2.5 • 3.8/-3.0         |
| Efficiency/Average (%)  | 57 • 50                     |
| Dimensions (mm)         | 35 x 5 x 4                  |
| Temperature Range (°C)  | -40 to 85                   |
| RoHS                    | RoHS Compliant              |



ST0243-00-N01-B

|                         |                             |
|-------------------------|-----------------------------|
| Frequency Range         | 2.4 - 2.5 • 5.15 - 5.85 GHz |
| Return Loss (dB)        | < -10 • < -10               |
| Max Input Power (W)     | 2                           |
| Gain, Peak/Average (dB) | 1.6/-2.0 • 2.3/-3.2         |
| Efficiency/Average (%)  | 63 • 48                     |
| Dimensions (mm)         | 3.2 x 1.6 x 0.5             |
| Temperature Range (°C)  | -40 to 85                   |
| RoHS                    | RoHS Compliant              |



ST0347-10-001-A

|                         |                                         |
|-------------------------|-----------------------------------------|
| Frequency Range         | 0.69 - 0.96 • 1.7 - 2.2 • 2.3 - 2.7 GHz |
| Return Loss (dB)        | < -4 • < -7 • < -8                      |
| Max Input Power (W)     | 1                                       |
| Gain, Peak/Average (dB) | 4.7/-3.4 • 3.6/-1.6 • 4.3/-0.9          |
| Efficiency/Average (%)  | 46 • 69 • 81                            |
| Dimensions (mm)         | 40 x 8 x 3.2                            |
| Temperature Range (°C)  | -40 to 85                               |
| RoHS                    | RoHS Compliant                          |



ST0343-10-N01-B

|                         |                                              |
|-------------------------|----------------------------------------------|
| Frequency Range         | 0.69 - 0.96 • 1.7 - 2.7 GHz                  |
| Return Loss (dB)        | < -6 • < -6                                  |
| Max Input Power (W)     | 5                                            |
| Gain, Peak/Average (dB) | 3.5/-2.2 • 5.6/-1.2                          |
| Efficiency/Average (%)  | 60 • 76                                      |
| Dimensions (mm)         | 35 x 5 x 4                                   |
| Temperature Range (°C)  | -40 to 85                                    |
| RoHS                    | Non-condensing 65°C 95% RH<br>RoHS Compliant |



ST0147-00-010-A

|                         |                |
|-------------------------|----------------|
| Frequency Range         | 2.4 - 2.5 GHz  |
| Return Loss (dB)        | < -10          |
| Max Input Power (W)     | 2              |
| Gain, Peak/Average (dB) | 3.3 • -1.1     |
| Efficiency/Average (%)  | 77             |
| Dimensions (mm)         | 5 x 2 x 1      |
| Temperature Range (°C)  | -40 to 85      |
| RoHS                    | RoHS Compliant |

# ORDERING INFORMATION

## EMBEDDED CHIP ANTENNAS



ST0147-00-011-A

|                        |                   |
|------------------------|-------------------|
| Frequency Range        | 2.4 - 2.5 GHz     |
| Return Loss (dB)       | < -7              |
| Max Input Power (W)    | 2                 |
| Gain,Peak/Average (dB) | 3.7 - -1.0        |
| Efficiency/Average (%) | 80                |
| Dimensions (mm)        | 3.05 x 1.6 x 0.55 |
| Temperature Range (°C) | -40 to 85         |
| RoHS                   | RoHS Compliant    |



ST0243-00-N02-B

|                        |                |
|------------------------|----------------|
| Frequency Range        | 2.4 - 2.5 GHz  |
| Return Loss (dB)       | < -10          |
| Max Input Power (W)    | 1              |
| Gain,Peak/Average (dB) | 2.3 - -1.6     |
| Efficiency/Average (%) | 69             |
| Dimensions (mm)        | 5 x 3 x 0.5    |
| Temperature Range (°C) | -25 to 70      |
| RoHS                   | RoHS Compliant |



ST0243-00-N01-U

|                        |                |
|------------------------|----------------|
| Frequency Range        | 2.4 - 2.5 GHz  |
| Return Loss (dB)       | < -10          |
| Max Input Power (W)    | 2              |
| Gain,Peak/Average (dB) | 3.3/-3.1       |
| Efficiency/Average (%) | 49             |
| Dimensions (mm)        | 2 x 1.2 x 0.6  |
| Temperature Range (°C) | -40 to 85      |
| RoHS                   | RoHS Compliant |



ST0143-00-N01-F

|                        |                   |
|------------------------|-------------------|
| Frequency Range        | 2.4 - 2.5         |
| Return Loss (dB)       | < -9              |
| Max Input Power (W)    | 1                 |
| Gain,Peak/Average (dB) | 2.7/-3.5          |
| Efficiency/Average (%) | 45                |
| Dimensions (mm)        | 2.0 x 1.25 x 0.29 |
| Temperature Range (°C) | -40 to 85         |
| RoHS                   | RoHS Compliant    |



ST0543-00-N07-U

|                        |                 |
|------------------------|-----------------|
| Frequency Range        | 1.56 - 1.606    |
| Return Loss (dB)       | < -10           |
| Max Input Power (W)    | 2               |
| Gain,Peak/Average (dB) | 2.9/-1.7        |
| Efficiency/Average (%) | 67              |
| Dimensions (mm)        | 3.2 x 1.6 x 0.5 |
| Temperature Range (°C) | -40 to 85       |
| RoHS                   | RoHS Compliant  |



ST0543-00-N08-U

|                        |                 |
|------------------------|-----------------|
| Frequency Range        | 1.56 - 1.59     |
| Return Loss (dB)       | < -10           |
| Max Input Power (W)    | 1               |
| Gain,Peak/Average (dB) | 2.9/-1.6        |
| Efficiency/Average (%) | 70              |
| Dimensions (mm)        | 3.2 x 1.6 x 0.5 |
| Temperature Range (°C) | -25 to 70       |
| RoHS                   | RoHS Compliant  |



ST0543-00-N01-B

|                        |                     |
|------------------------|---------------------|
| Frequency Range        | 1.176 - 1.575       |
| Return Loss (dB)       | < -9.5 - < -9.5     |
| Max Input Power (W)    | 2                   |
| Gain,Peak/Average (dB) | 1.8/-3.7 - 2.1/-2.3 |
| Efficiency/Average (%) | 43 - 59             |
| Dimensions (mm)        | 5.0 x 3.0 x 0.5     |
| Temperature Range (°C) | -40 to 85           |
| RoHS                   | RoHS Compliant      |



ST0643-00-N04-A

|                        |                |
|------------------------|----------------|
| Frequency Range        | 902 - 928 MHz  |
| Return Loss (dB)       | < -10          |
| Max Input Power (W)    | 2              |
| Gain,Peak/Average (dB) | 1.6/-2.9       |
| Efficiency/Average (%) | 52             |
| Dimensions (mm)        | 5 x 3 x 0.5    |
| Temperature Range (°C) | -40 to 85      |
| RoHS                   | RoHS Compliant |



ST0643-00-N02-A

|                        |                |
|------------------------|----------------|
| Frequency Range        | 915 - 919 MHz  |
| Return Loss (dB)       | < -10          |
| Max Input Power (W)    | 1              |
| Gain,Peak/Average (dB) | 1.8 - -1.8     |
| Efficiency/Average (%) | 65             |
| Dimensions (mm)        | 5 x 3 x 0.5    |
| Temperature Range (°C) | -25 to 70      |
| RoHS                   | RoHS Compliant |

# ORDERING INFORMATION

## EMBEDDED CHIP ANTENNAS



ST0643-00-N03-A

|                        |                |
|------------------------|----------------|
| Frequency Range        | 863 - 870 MHz  |
| Return Loss (dB)       | < -10          |
| Max Input Power (W)    | 2              |
| Gain,Peak/Average (dB) | 0.7/-2.5       |
| Efficiency/Average (%) | 56             |
| Dimensions (mm)        | 5 x 3 x 0.5    |
| Temperature Range (°C) | -40 to 85      |
| RoHS                   | RoHS Compliant |

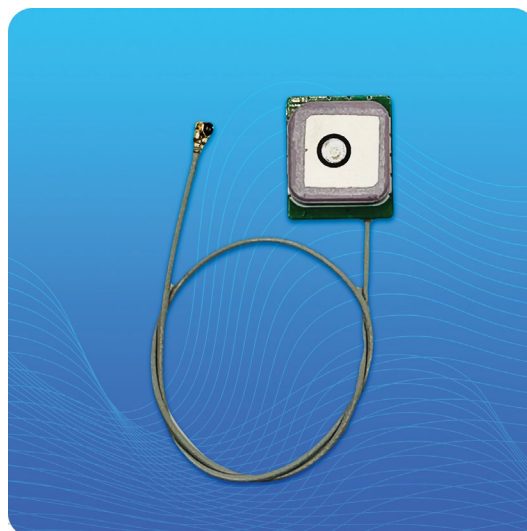


ST0643-00-N01-A

|                        |                |
|------------------------|----------------|
| Frequency Range        | 433 MHz        |
| Return Loss (dB)       | < -10          |
| Max Input Power (W)    | 1              |
| Gain,Peak/Average (dB) | 0.9 • -1.8     |
| Efficiency/Average (%) | 66             |
| Dimensions (mm)        | 5 x 3 x 0.5    |
| Temperature Range (°C) | -25 to 70      |
| RoHS                   | RoHS Compliant |

# EMBEDDED GNSS AND GPS PATCH ANTENNAS

Embedded GNSS (Global Navigation Satellite System) and GPS (Global Positioning System) patch antennas are compact, specialized antennas designed to receive signals from satellite constellations for accurate positioning and navigation. These antennas are commonly integrated into electronic devices such as smartphones, tablets, and GPS-enabled wearables. Their patch antenna design, consisting of a patch element on a dielectric substrate, allows them to resonate at the GNSS/GPS frequencies and capture signals from multiple satellites. This enables devices to determine their precise geographical location, making them indispensable for applications like turn-by-turn navigation, location-based services, and asset tracking. The integration of GNSS/GPS patch antennas into small and portable devices has revolutionized the way we navigate and interact with location-based information in our daily lives.



## FEATURES AND BENEFITS

- Compact and lightweight design
- Smooth SMT process
- Active antennas include LNA and cable
- Operates in multiple bands (GPS, GLONASS, Beidu)
- High-efficiency performance

## APPLICATIONS

- HANDHELD AND PORTABLE NAVIGATION DEVICES
- FLEET MANAGEMENT
- IOT "SMART" DEVICES
- E-BIKE
- AUTOMOTIVE AND INFOTAINMENT
- ASSET TRACKING

# ORDERING INFORMATION

## EMBEDDED GNSS/GPS ANTENNAS



ST0543-00-N02-U

|                                                |                        |
|------------------------------------------------|------------------------|
| Frequency Range                                | 1575.42 ± 1 • 1602 ± 5 |
| Return Loss (dB)                               | < -10 • < -10          |
| Gain (dBi) @ Zenith<br>at 20 mm x 20 mm ground | -5.5 typ. • -2.0 typ.  |
| Bandwidth (MHz)                                | 10 • 9                 |
| Efficiency (%) @ Center Frequency              | 40 • 47                |
| Axial Ratio (dB)                               | —                      |
| Polarization                                   | —                      |
| Impedance (Ω)                                  | 50                     |
| Dimensions (mm)                                | 15 x 15 x 4            |
| Temperature Range (°C)                         | -40 to 105             |
| RoHS                                           | RoHS Compliant         |



ST0543-00-N04-U

|                                                |                      |
|------------------------------------------------|----------------------|
| Frequency Range                                | 1575.42 ± 1          |
| Return Loss (dB)                               | < -10 • < -10        |
| Gain (dBi) @ Zenith<br>at 20 mm x 20 mm ground | -0.5 typ. • 1.0 typ. |
| Bandwidth (MHz)                                | 5 • 5                |
| Efficiency (%) @ Center Frequency              | 80 • 82              |
| Axial Ratio (dB)                               | —                    |
| Polarization                                   | —                    |
| Impedance (Ω)                                  | 50                   |
| Dimensions (mm)                                | 18 x 18 x 4          |
| Temperature Range (°C)                         | -40 to 105           |
| RoHS                                           | RoHS Compliant       |



ST0543-00-N06-U

|                                                |                      |
|------------------------------------------------|----------------------|
| Frequency Range                                | 1575.42 ± 1          |
| Return Loss (dB)                               | < -10 • < -10        |
| Gain (dBi) @ Zenith<br>at 20 mm x 20 mm ground | -0.5 typ. • 2.0 typ. |
| Bandwidth (MHz)                                | 8 • 8                |
| Efficiency (%) @ Center Frequency              | 78 • 83              |
| Axial Ratio (dB)                               | —                    |
| Polarization                                   | —                    |
| Impedance (Ω)                                  | 50                   |
| Dimensions (mm)                                | 25.1 x 25.1 x 4      |
| Temperature Range (°C)                         | -40 to 105           |
| RoHS                                           | RoHS Compliant       |



ST0543-00-404-U

|                                                |                        |
|------------------------------------------------|------------------------|
| Frequency Range                                | 1575.42 ± 1 • 1602 ± 5 |
| Return Loss (dB)                               | < -10 • < -10          |
| Gain (dBi) @ Zenith<br>at 20 mm x 20 mm ground | -0.5 typ. • 2.0 typ.   |
| Bandwidth (MHz)                                | 8 • 8                  |
| Efficiency (%) @ Center Frequency              | 78 • 83                |
| Axial Ratio (dB)                               | —                      |
| Polarization                                   | —                      |
| Impedance (Ω)                                  | 50                     |
| Dimensions (mm)                                | 25.1 x 25.1 x 7.4      |
| Temperature Range (°C)                         | -40 to 85              |
| RoHS                                           | RoHS Compliant         |



ST0543-00-405-U

|                                                |                        |
|------------------------------------------------|------------------------|
| Frequency Range                                | 1575.42 ± 1 • 1602 ± 5 |
| Return Loss (dB)                               | < -10 • < -10          |
| Gain (dBi) @ Zenith<br>at 20 mm x 20 mm ground | -0.5 typ. • 1.0 typ.   |
| Bandwidth (MHz)                                | 5 • 5                  |
| Efficiency (%) @ Center Frequency              | 80 • 82                |
| Axial Ratio (dB)                               | —                      |
| Polarization                                   | —                      |
| Impedance (Ω)                                  | 50                     |
| Dimensions (mm)                                | 18 x 18 x 7.1          |
| Temperature Range (°C)                         | -20 to 85              |
| RoHS                                           | RoHS Compliant         |



ST0543-00-406-U

|                                                |                        |
|------------------------------------------------|------------------------|
| Frequency Range                                | 1575.42 ± 1 • 1602 ± 5 |
| Return Loss (dB)                               | < -10 • < -10          |
| Gain (dBi) @ Zenith<br>at 20 mm x 20 mm ground | -0.5 typ. • -2.0 typ.  |
| Bandwidth (MHz)                                | 10 • 9                 |
| Efficiency (%) @ Center Frequency              | 40 • 47                |
| Axial Ratio (dB)                               | —                      |
| Polarization                                   | —                      |
| Impedance (Ω)                                  | 50                     |
| Dimensions (mm)                                | 19 x 16 x 6.4          |
| Temperature Range (°C)                         | -20 to 85              |
| RoHS                                           | RoHS Compliant         |



ST0543-00-N10-U

|                                                |                        |
|------------------------------------------------|------------------------|
| Frequency Range                                | 1575.42 ± 1 • 1602 ± 5 |
| Return Loss (dB)                               | < -10.9 • < -10.9      |
| Gain (dBi) @ Zenith<br>at 20 mm x 20 mm ground | 2.6 typ. • 3.4 typ.    |
| Bandwidth (MHz)                                | 3 • 4                  |
| Efficiency (%) @ Center Frequency              | 65 • 61                |
| Axial Ratio (dB)                               | —                      |
| Polarization                                   | —                      |
| Impedance (Ω)                                  | 50                     |
| Dimensions (mm)                                | 15 x 15 x 4            |
| Temperature Range (°C)                         | -40 to 105             |
| RoHS                                           | RoHS Compliant         |



ST0543-00-N12-U

|                                                |                        |
|------------------------------------------------|------------------------|
| Frequency Range                                | 1575.42 ± 1 • 1602 ± 5 |
| Return Loss (dB)                               | < -10.9 • < -10.9      |
| Gain (dBi) @ Zenith<br>at 20 mm x 20 mm ground | 3.1 typ. • 4.5 typ.    |
| Bandwidth (MHz)                                | 4 • 4                  |
| Efficiency (%) @ Center Frequency              | 67 • 63                |
| Axial Ratio (dB)                               | —                      |
| Polarization                                   | —                      |
| Impedance (Ω)                                  | 50                     |
| Dimensions (mm)                                | 18 x 18 x 4            |
| Temperature Range (°C)                         | -40 to 105             |
| RoHS                                           | RoHS Compliant         |



ST0543-00-N01-U

|                                                |                |
|------------------------------------------------|----------------|
| Frequency Range                                | 1575.42 ± 1    |
| Return Loss (dB)                               | < -10          |
| Gain (dBi) @ Zenith<br>at 20 mm x 20 mm ground | -1 typ.        |
| Bandwidth (MHz)                                | 19             |
| Efficiency (%) @ Center Frequency              | 68             |
| Axial Ratio (dB)                               | 3 typ.         |
| Polarization                                   | RHCP           |
| Impedance (Ω)                                  | 50             |
| Dimensions (mm)                                | 15 x 15 x 4    |
| Temperature Range (°C)                         | -40 to 105     |
| RoHS                                           | RoHS Compliant |

# ORDERING INFORMATION

## EMBEDDED GNSS/GPS ANTENNAS



ST0543-00-N03-U

|                                                 |                        |
|-------------------------------------------------|------------------------|
| Frequency Range                                 | 1575.42 ± 1 • 1602 ± 5 |
| Return Loss (dB)                                | < -10                  |
| Gain (dBic) @ Zenith<br>at 20 mm x 20 mm ground | 2.5 typ.               |
| Bandwidth (MHz)                                 | 8                      |
| Efficiency (%) @ Center Frequency               | 72                     |
| Axial Ratio (dB)                                | 3 typ.                 |
| Polarization                                    | RHCP                   |
| Impedance (Ω)                                   | 50                     |
| Dimensions (mm)                                 | 18 x 18 x 4            |
| Temperature Range (°C)                          | -40 to 105             |
| RoHS                                            | RoHS Compliant         |



ST0543-00-N05-U

|                                                 |                        |
|-------------------------------------------------|------------------------|
| Frequency Range                                 | 1575.42 ± 1 • 1602 ± 5 |
| Return Loss (dB)                                | < -10                  |
| Gain (dBic) @ Zenith<br>at 20 mm x 20 mm ground | 3.5 typ.               |
| Bandwidth (MHz)                                 | 10                     |
| Efficiency (%) @ Center Frequency               | 85                     |
| Axial Ratio (dB)                                | 3 typ.                 |
| Polarization                                    | RHCP                   |
| Impedance (Ω)                                   | 50                     |
| Dimensions (mm)                                 | 25.1 x 25.1 x 4        |
| Temperature Range (°C)                          | -40 to 105             |
| RoHS                                            | RoHS Compliant         |



ST0543-00-401-U

|                                                 |                   |
|-------------------------------------------------|-------------------|
| Frequency Range                                 | 1575.42 ± 1       |
| Return Loss (dB)                                | < -10             |
| Gain (dBic) @ Zenith<br>at 20 mm x 20 mm ground | 2.0 typ.          |
| Bandwidth (MHz)                                 | 10                |
| Efficiency (%) @ Center Frequency               | 80                |
| Axial Ratio (dB)                                | 3 typ.            |
| Polarization                                    | RHCP              |
| Impedance (Ω)                                   | 50                |
| Dimensions (mm)                                 | 25.1 x 25.1 x 6.5 |
| Temperature Range (°C)                          | -40 to 85         |
| RoHS                                            | RoHS Compliant    |



ST0543-00-402-U

|                                                 |                 |
|-------------------------------------------------|-----------------|
| Frequency Range                                 | 1575.42 ± 1     |
| Return Loss (dB)                                | < -10           |
| Gain (dBic) @ Zenith<br>at 20 mm x 20 mm ground | 2.5 typ.        |
| Bandwidth (MHz)                                 | 8               |
| Efficiency (%) @ Center Frequency               | 72              |
| Axial Ratio (dB)                                | 4 typ.          |
| Polarization                                    | RHCP            |
| Impedance (Ω)                                   | 50              |
| Dimensions (mm)                                 | 18 x 18.5 x 4.5 |
| Temperature Range (°C)                          | -20 to 85       |
| RoHS                                            | RoHS Compliant  |



ST0543-00-403-U

|                                                 |                        |
|-------------------------------------------------|------------------------|
| Frequency Range                                 | 1575.42 ± 1 • 1602 ± 5 |
| Return Loss (dB)                                | < -10                  |
| Gain (dBic) @ Zenith<br>at 20 mm x 20 mm ground | -0.5 typ.              |
| Bandwidth (MHz)                                 | 9                      |
| Efficiency (%) @ Center Frequency               | 65                     |
| Axial Ratio (dB)                                | 4 typ.                 |
| Polarization                                    | RHCP                   |
| Impedance (Ω)                                   | 50                     |
| Dimensions (mm)                                 | 15 x 15 x 6.7          |
| Temperature Range (°C)                          | -20 to 85              |
| RoHS                                            | RoHS Compliant         |



ST0543-00-N09-U

|                                                 |                |
|-------------------------------------------------|----------------|
| Frequency Range                                 | 1575.42 ± 1    |
| Return Loss (dB)                                | < -10.9        |
| Gain (dBic) @ Zenith<br>at 20 mm x 20 mm ground | 2.1 typ.       |
| Bandwidth (MHz)                                 | 8              |
| Efficiency (%) @ Center Frequency               | 69             |
| Axial Ratio (dB)                                | 3 typ.         |
| Polarization                                    | RHCP           |
| Impedance (Ω)                                   | 50             |
| Dimensions (mm)                                 | 15 x 15 x 4    |
| Temperature Range (°C)                          | -40 to 105     |
| RoHS                                            | RoHS Compliant |



ST0543-00-N11-U

|                                                 |                |
|-------------------------------------------------|----------------|
| Frequency Range                                 | 1575.42 ± 1    |
| Return Loss (dB)                                | < -10.9        |
| Gain (dBic) @ Zenith<br>at 20 mm x 20 mm ground | 2.8 typ.       |
| Bandwidth (MHz)                                 | 8              |
| Efficiency (%) @ Center Frequency               | 73             |
| Axial Ratio (dB)                                | 3 typ.         |
| Polarization                                    | RHCP           |
| Impedance (Ω)                                   | 50             |
| Dimensions (mm)                                 | 18 x 18 x 4    |
| Temperature Range (°C)                          | -40 to 105     |
| RoHS                                            | RoHS Compliant |



ST0543-11-N01-U

|                                                 |                |
|-------------------------------------------------|----------------|
| Frequency Range                                 | 1575.42 ± 1    |
| Return Loss (dB)                                | < -10.9        |
| Gain (dBic) @ Zenith<br>at 20 mm x 20 mm ground | 3.5 typ.       |
| Bandwidth (MHz)                                 | 14             |
| Efficiency (%) @ Center Frequency               | 84             |
| Axial Ratio (dB)                                | 3 typ.         |
| Polarization                                    | RHCP           |
| Impedance (Ω)                                   | 50             |
| Dimensions (mm)                                 | 25 x 25 x 4    |
| Temperature Range (°C)                          | -40 to 105     |
| RoHS                                            | RoHS Compliant |



ST0785-22-001-A

|                                                 |                     |
|-------------------------------------------------|---------------------|
| Frequency Range                                 | 1561 ± 2 • 1602 ± 4 |
| Return Loss (dB)                                | < -6 • < -6         |
| Gain (dBic) @ Zenith<br>at 20 mm x 20 mm ground | 0.5 typ. • 3.0 typ. |
| Bandwidth (MHz)                                 | 5 • 9               |
| Efficiency (%) @ Center Frequency               | 49 • 62             |
| Axial Ratio (dB)                                | –                   |
| Polarization                                    | –                   |
| Impedance (Ω)                                   | 50                  |
| Dimensions (mm)                                 | N/A                 |
| Temperature Range (°C)                          | -40 to 85           |
| RoHS                                            | RoHS Compliant      |

# ORDERING INFORMATION

## EMBEDDED GNSS/GPS ANTENNAS



ST0948-22-001-A

|                                                 |                     |
|-------------------------------------------------|---------------------|
| Frequency Range                                 | 1561 ± 2 • 1602 ± 4 |
| Return Loss (dB)                                | < -9.5 • < -9.5     |
| Gain (dBic) @ Zenith<br>at 20 mm x 20 mm ground | 2.0 typ. • 3.0 typ. |
| Bandwidth (MHz)                                 | 5 • 9               |
| Efficiency (%) @ Center Frequency               | 72 • 71             |
| Axial Ratio (dB)                                | –                   |
| Polarization                                    | –                   |
| Impedance (Ω)                                   | 50                  |
| Dimensions (mm)                                 | N/A                 |
| Temperature Range (°C)                          | -40 to 80           |
| RoHS                                            | RoHS Compliant      |



ST0985-22-001-A

|                                                 |                     |
|-------------------------------------------------|---------------------|
| Frequency Range                                 | 1561 ± 2 • 1602 ± 4 |
| Return Loss (dB)                                | < -6 • < -6         |
| Gain (dBic) @ Zenith<br>at 20 mm x 20 mm ground | 0.5 typ. • 3.0 typ. |
| Bandwidth (MHz)                                 | 5 • 9               |
| Efficiency (%) @ Center Frequency               | 49 • 62             |
| Axial Ratio (dB)                                | –                   |
| Polarization                                    | –                   |
| Impedance (Ω)                                   | 50                  |
| Dimensions (mm)                                 | N/A                 |
| Temperature Range (°C)                          | -40 to 85           |
| RoHS                                            | RoHS Compliant      |



ST0543-11-N03-U

|                                                 |                          |
|-------------------------------------------------|--------------------------|
| Frequency Range                                 | 1227.6 ± 1 • 1575.42 ± 1 |
| Return Loss (dB)                                | < -10 • < -10            |
| Gain (dBic) @ Zenith<br>at 20 mm x 20 mm ground | 4.9 typ. • 5.5 typ.      |
| Bandwidth (MHz)                                 | N/A                      |
| Efficiency (%) @ Center Frequency               | 69 • 78                  |
| Axial Ratio (dB)                                | 3 typ. • 3 typ.          |
| Polarization                                    | RHCP                     |
| Impedance (Ω)                                   | 50                       |
| Dimensions (mm)                                 | 40.2 x 40.2 x 6          |
| Temperature Range (°C)                          | -40 to 85                |
| RoHS                                            | RoHS Compliant           |



ST0543-11-N01-E

|                                                 |                          |
|-------------------------------------------------|--------------------------|
| Frequency Range                                 | 1227.6 ± 1 • 1575.42 ± 1 |
| Return Loss (dB)                                | < -10 • < -10            |
| Gain (dBic) @ Zenith<br>at 20 mm x 20 mm ground | 3.1 typ. • 4.1 typ.      |
| Bandwidth (MHz)                                 | 9 • 10                   |
| Efficiency (%) @ Center Frequency               | 48 • 63                  |
| Axial Ratio (dB)                                | 3 typ.                   |
| Polarization                                    | RHCP                     |
| Impedance (Ω)                                   | 50                       |
| Dimensions (mm)                                 | 25 x 25 x 4.5            |
| Temperature Range (°C)                          | -40 to 85                |
| RoHS                                            | RoHS Compliant           |



ST0543-11-N02-E

|                                                 |                          |
|-------------------------------------------------|--------------------------|
| Frequency Range                                 | 1176.5 ± 1 • 1575.42 ± 1 |
| Return Loss (dB)                                | < -10 • < -10            |
| Gain (dBic) @ Zenith<br>at 20 mm x 20 mm ground | 2.7 typ. • 4.5 typ.      |
| Bandwidth (MHz)                                 | N/A                      |
| Efficiency (%) @ Center Frequency               | 35 • 70                  |
| Axial Ratio (dB)                                | 3 typ. • 3 typ.          |
| Polarization                                    | RHCP                     |
| Impedance (Ω)                                   | 50                       |
| Dimensions (mm)                                 | 25 x 25 x 4.5            |
| Temperature Range (°C)                          | -40 to 85                |
| RoHS                                            | RoHS Compliant           |

# ORDERING INFORMATION

## RFID PATCH ANTENNAS



ST0684-11-402-U

|                                      |                   |
|--------------------------------------|-------------------|
| Frequency Range (GHz)                | 915               |
| Return Loss (dB)                     | < -10.9           |
| Gain (dBic) @ Zenith                 | -0.35 typ.        |
| Average Gain (dB) @ Center Frequency | -2.5              |
| Efficiency (%) @ Center Frequency    | 56                |
| Axial Ratio (dB) @ Zenith            | 3 typ.            |
| Polarization                         | RHCP              |
| Impedance (Ω)                        | 50                |
| Dimensions (mm)                      | 49.5 × 49.5 × 7.5 |
| Temperature Range (°C)               | -40 to 105        |
| RoHS                                 | RoHS Compliant    |



ST0684-11-403-U

|                                      |                   |
|--------------------------------------|-------------------|
| Frequency Range (GHz)                | 915               |
| Return Loss (dB)                     | < -15             |
| Gain (dBic) @ Zenith                 | 0.8 typ.          |
| Average Gain (dB) @ Center Frequency | N/A               |
| Efficiency (%) @ Center Frequency    | 33                |
| Axial Ratio (dB) @ Zenith            | 3 typ.            |
| Polarization                         | RHCP              |
| Impedance (Ω)                        | 50                |
| Dimensions (mm)                      | 33.0 × 33.0 × 4.8 |
| Temperature Range (°C)               | -40 to 105        |
| RoHS                                 | RoHS Compliant    |



ST0684-11-401-U

|                                      |                   |
|--------------------------------------|-------------------|
| Frequency Range (GHz)                | 868               |
| Return Loss (dB)                     | < -10.9           |
| Gain (dBic) @ Zenith                 | -0.8 typ.         |
| Average Gain (dB) @ Center Frequency | -1.9              |
| Efficiency (%) @ Center Frequency    | 65                |
| Axial Ratio (dB) @ Zenith            | 3 typ.            |
| Polarization                         | RHCP              |
| Impedance (Ω)                        | 50                |
| Dimensions (mm)                      | 49.5 × 49.5 × 7.5 |
| Temperature Range (°C)               | -40 to 105        |
| RoHS                                 | RoHS Compliant    |

## EMBEDDED SPRING ANTENNAS



ST0686-10-N02-U

|                         |                   |
|-------------------------|-------------------|
| Frequency Range         | 915               |
| Return Loss (dB)        | < -9.5            |
| Max Input Power (W)     | 1                 |
| Gain, Peak/Average (dB) | 2.1/-2.3          |
| Efficiency/Average (%)  | 59                |
| Dimensions (mm)         | 36.6 × 8.3 × Ø6.0 |
| Temperature Range (°C)  | -40 to 105        |
| RoHS                    | RoHS Compliant    |



ST0686-10-N01-U

|                         |                   |
|-------------------------|-------------------|
| Frequency Range         | 868               |
| Return Loss (dB)        | < -9.5            |
| Max Input Power (W)     | 1                 |
| Gain, Peak/Average (dB) | 2.5/-2.3          |
| Efficiency/Average (%)  | 58                |
| Dimensions (mm)         | 38.8 × 8.3 × Ø6.0 |
| Temperature Range (°C)  | -40 to 105        |
| RoHS                    | RoHS Compliant    |



ST0686-20-N01-U

|                         |                   |
|-------------------------|-------------------|
| Frequency Range         | 433               |
| Return Loss (dB)        | < -9.5            |
| Max Input Power (W)     | 1                 |
| Gain, Peak/Average (dB) | -0.5/-3.1         |
| Efficiency/Average (%)  | 49                |
| Dimensions (mm)         | 82.0 × 8.3 × Ø6.0 |
| Temperature Range (°C)  | -40 to 105        |
| RoHS                    | RoHS Compliant    |

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