

## Cisco 819 4G LTE 2.5 Machine-to-Machine Integrated Services Routers with Wi-Fi for Asia, Australia, and Selected Latin America Regions

The Cisco® 819 4G LTE 2.5 M2M Integrated Services Routers (ISR) with Wi-Fi are the smallest Cisco IOS® Software routers with support for integrated 4G LTE wireless WAN (mobile broadband backhaul) and WLAN capabilities (Figure 1). They are rapidly deployable, highly available, reliable, and secure, and are designed specifically for machine-to-machine (M2M) applications. Markets that benefit from these applications include small business, financial, healthcare, and retail. Fully integrated with Cisco IOS Software, the 819 4G LTE ISRs deliver enterprise-class features, including highly secure data, voice, and video communications, to stationary and mobile network nodes across wired and wireless links. These ISRs are the industry leader in providing enterprise-grade wired-line-like functionality such as QoS for cellular, Multi-VRF, advanced VPN, and unified communications solutions over LTE.

**Figure 1.** Cisco 819 4G LTE 2.5 M2M ISR with Wi-Fi



A critical component of the Cisco M2M architecture, the Cisco 819 4G LTE ISRs serve as the single horizontal platform that enhances the Cisco implementation of “any device, anywhere” across multiple industries, including

small business, small remote branch, banking, retail, healthcare, and government. They also provide the ability to extend Cisco product-based networks to small branch offices with a relatively low incremental investment, as well as to enable managed services offerings based on Cisco architecture.

Cisco IOS Mobile IP delivers transparent roaming across multiple wireless networks capable of covering wide geographic areas. Additionally, the 819 ISRs have enterprise-class built-in wireless LAN (WLAN) capability. The 819 platforms concurrently support both Fourth-Generation Long-Term Wireless (4G LTE) for wireless WAN (WWAN) backhaul and Cisco dual-radio WLAN on the same platform. A Cisco Aironet® 3500 Series Access Point is integrated into the ISRs, providing 802.11a/b/g/n 2X3 multiple-input/multiple-output (MIMO). The access point includes Cisco CleanAir® technology to create a self-healing, self-optimizing WLAN. Moreover, with the advantage of dual radios, the integrated access point can serve both as an access point and as a client to a wireless mesh network. This provides another source for WAN diversity, along with Gigabit Ethernet, serial, and cellular. The access point's ClientLink feature improves reliability and coverage for legacy devices, and dynamic frequency selection (DFS) allows it to detect and avoid interference with radar signals to comply with regulatory domains. More information on the Cisco Aironet 3500 Series Access Point is available at [http://www.cisco.com/en/US/prod/collateral/wireless/ps5678/ps10981/data\\_sheet\\_c78-594630.html](http://www.cisco.com/en/US/prod/collateral/wireless/ps5678/ps10981/data_sheet_c78-594630.html).

## Product Overview

The Cisco 819 4G LTE ISRs support the latest Third-Generation Partnership Project (3GPP) Release 9 Category 3 LTE standards. They provide persistent, reliable LTE connectivity with fallback and transparent handoff to earlier technologies. The following models are available:

- **Cisco 4G LTE 819GW 2.5:** Multimode LTE 2.5 for carriers that operate FDD LTE 700-MHz (band 28), 850-MHz (band 5 CLR), 850-MHz (bands 18 and 19 Low), 900-MHz (band 8), 1500-MHz (band 21), 1800-MHz (band 3), 2100-MHz (band 1), or 2600-MHz (band 7) networks; the multimode 819 4G LTE 2.5 routers are backward-compatible with Universal Mobile Telecommunications Service (UMTS) and Dual Carrier High-Speed Packet Access Plus (DC-HSPA+): 800 MHz (band 19 Japan), 850 MHz (band 5), 850 MHz (band 6 Japan), 900 MHz (band 8), 1800 MHz (band 9), 2100 MHz (band 1), and TD-SCDMA 39.
  - Multimode LTE 2.5 for carriers that operate TDD LTE 1900-MHz (band 39), 2300-MHz (band 40), 2500-MHz (band 41), or 2600-MHz (band 38) networks.
  - Multimode LTE 2.5 for carrier aggregation band combinations: 1+(8,18,19,21); 3+(5,7,19,28); 7+(5,7,28); 19+21, 38+38, 39+39, 40+40, 41+41.

### The Cisco 819 4G LTE ISRs include a broad range of enterprise-class features:

- Security services, including firewall, intrusion prevention, VPN, and Cisco ISR Web Security with ScanSafe, which requires no additional hardware or client software. This enables branch offices, manufacturing sites, hospitals, and banks, for example, to intelligently redirect web traffic to the cloud to enforce granular security and acceptable use policies over user web traffic. With this solution, you can deploy market-leading web security quickly and easily to protect branch-office users from web-based threats, such as viruses, while saving bandwidth, money, and resources.
- Cisco WAN optimization system, consisting of Wide Area Application Services (WAAS) Express routers and Wide Area Application Engine (WAEs) that work together to optimize TCP traffic in your network. When client and server applications attempt to communicate with each other, the network intercepts the traffic and acts on behalf of the client application and the destination server.

- Additional WAN options such as serial and Gigabit Ethernet WAN interfaces and a 4-port 10/100 Fast Ethernet managed switch for LAN connectivity. Quality-of-service (QoS) features are included for optimizing voice and video applications.
- Cisco Configuration Professional, a web-based configuration tool that simplifies setup and deployment. Centralized management capabilities give network managers visibility into and control over the network configurations at remote sites.
- 4G LTE WWAN data services. With enhanced data rates and improved latency (30 milliseconds or less), WWAN services are an ideal way to supplement traditional wired-line services. 4G LTE WWAN data services have average data rates well in excess of ISDN speeds, with theoretical limits of 100 Mbps on the downlink and 50 Mbps on the uplink. Actual data speed depends on the service provider's network. With 4G LTE data rates, the ISRs offer a primary WAN link capable of running comprehensive branch-office services, including voice and video services. The 4G LTE WWAN data services can also be used as a cost-effective alternative in areas where broadband services are either not available or very expensive. Cisco is building on these performance milestones and adding support for wireless to our wide variety of WAN interface alternatives.
- **Multiple-PDN (packet data networks):** This feature allows configuration of multiple active (Access Point Names) APN so that Internet traffic can be kept separate from the corporate traffic. (Available Q1, 2017)
- **4G LTE multiple-bearer QoS for cellular:** The 819 ISRs support 4G LTE multiple-bearer QoS. Detailed information on the bearer is part of the "show" command, SNMP-MIBs. etc. A service provider is required to launch this service. (Available Q2, 2017)
- **Multi-VRF for cellular:** The 819 ISRs support Multi Virtual Route Forwarding (Multi-VRF) for cellular network. Multi-VRF is a Cisco proprietary implementation over and above the 3GPP spec and requires a Cisco ASR 5000 Packet Gateway (PGW) as the headend at the service provider's network. A service provider is required to launch this service.
- **Enterprise-grade unified communication solutions over LTE:** The 819 ISRs support voice and video and can be integrated with Cisco Unified Communications cloud or premises-based infrastructure.

## Business Benefits and Application Examples

Businesses are looking for ways to reduce costs, increase revenue, and improve business continuity. The 4G LTE wireless connectivity, which is 10 to 15 times faster and has 5 times lower latency than 3G links, allows a small enterprise branch office or remote office to set up comprehensive media services in a matter of hours, without worrying about availability of broadband services and the need to lay down lines. Wireless carriers offer flexible, usage-based data plans that can be customized to meet the needs and price points of the business customer. As WAN backup alternatives, 3G and 4G LTE wireless offer greater WAN diversity and resiliency because they are independent of the local terrestrial infrastructure. The 819 4G LTE ISRs enable businesses to stay productive during service provider downtime or a network failure.

### Ability to Host Networks in Motion

The 819 4G LTE ISRs use standards-based Mobile IP features in Cisco IOS Software to host networks in motion. Transitions to different wireless networks are transparent to the users and devices (such as laptops, smart devices, and surveillance cameras), and applications maintain continuous connectivity without the user's manual intervention as WAN links change. In addition to allowing a single node or device to stay connected, the 819 4G LTE ISRs allow an entire mobile network or subnet to stay connected. The dual-radio WLAN on the 819 can serve as both a client and an access point.

## Retail VPN

Retail stores migrating from dialup connections for point-of-sale transactions can use the WWAN capability of the 819 4G LTE ISRs for low-cost broadband access, with the required security to comply with payment-card-industry and other data security requirements. Multiple devices and applications can then be added to the store network to take advantage of the increased bandwidth and to enable highly secure mobility and enhance productivity.

## Managed Services

Service providers and value-added resellers can use the 819 4G LTE ISRs as a platform to offer differentiated business-class security and WLAN services for small and medium-sized business customers. Superior management capabilities such as Simple Network Management Protocol (SNMP) support for 3G MIB with 4G MIB extension and Cisco Configuration Professional make remote management and provisioning easier.

## Primary Features and Benefits

Table 1 lists the features and benefits of the Cisco 819 4G LTE ISRs.

**Table 1.** Features and Benefits

Features	Benefits
<b>Smallest Cisco ISR in Form Factor</b>	
<b>Single platform for multiple applications</b>	<ul style="list-style-type: none"><li>This single architecture is uniquely designed for deployments in multiple remote applications such as ATMs, kiosks, small branch offices, remote teleworker sites, gas stations, and telemetry, and across all industries.</li></ul>
<b>Router mounting</b>	<ul style="list-style-type: none"><li>Supports a variety of mounting options, floor mount, and wall mount, and offers both AC and DC power options, allowing for deployment flexibility.</li></ul>
<b>Lightweight, compact size with low power consumption</b>	<ul style="list-style-type: none"><li>Can be deployed in many different environments where space, heat dissipation, and low power consumption are critical factors.</li></ul>
<b>Increased performance to run concurrent services</b>	<ul style="list-style-type: none"><li>Performance allows customers to take advantage of broadband network speeds while running highly secure, concurrent data, voice, video, and wireless services.</li></ul>
<b>Enhanced security</b>	<ul style="list-style-type: none"><li>An integrated stateful and application inspection firewall provides network perimeter security and high-speed IP Security (IPsec); Triple Data Encryption Standard (3DES) and Advanced Encryption Standard (AES) encryption offer data privacy over the Internet.</li><li>Intrusion prevention enforces security policies in a larger enterprise or service provider network.</li><li>Content filtering offers category-based URL classification and blocking, thus providing increased productivity and better use of company resources.</li><li>ScanSafe web security and filtering solution requires no additional hardware or client software. Enables remote locations to intelligently redirect web traffic to the cloud to enforce granular security and acceptable use policies over user web traffic.</li></ul>
<b>Integrated WLAN access point</b>	<ul style="list-style-type: none"><li>Integrates the Cisco Aironet 3500 802.11 a/b/g/n access point for mission-critical applications. By intelligently avoiding interference, the WLAN feature offers performance protection for 802.11n networks to help ensure reliable application delivery. The 2X3 MIMO access point comes with Cisco CleanAir, the industry's first technology to create a self-healing, self-optimizing wireless network.</li><li>With dual radios, the access point can serve both as an access point and as a client to a wireless mesh network concurrently, providing another source for WAN diversity.</li><li>The access point's ClientLink feature improves reliability and coverage for legacy devices.</li><li>Dynamic frequency selection (DFS) allows the access point to detect and avoid interference with radar signals to comply with regulatory domains. More information on the Aironet 3500 Series access point is available at: <a href="http://www.cisco.com/en/US/prod/collateral/wireless/ps5678/ps10981/data_sheet_c78-594630.html">http://www.cisco.com/en/US/prod/collateral/wireless/ps5678/ps10981/data_sheet_c78-594630.html</a></li></ul>
<b>Multiple WAN and LAN Connections</b>	
<b>Four-port 10/100-Mbps managed switch</b>	<ul style="list-style-type: none"><li>Allows for multiple Ethernet device connectivity in a small office or other remote location with the ability to designate a port as the network edge.</li><li>VLANs allow for secure segmentation of network resources.</li><li>Multiple LAN and WAN devices can be connected to standard 10/100 Ethernet or serial interfaces.</li></ul>



Features	Benefits
<b>WAN diversity</b>	<ul style="list-style-type: none"> <li>Multiple WAN links are supported: Gigabit Ethernet, serial, and 4G LTE provide for business continuity and WAN diversity. With 4G LTE WWAN, provide transport-independent, intelligent path control, application optimization, and secure connectivity on any device, over any connection, and to any cloud.</li> </ul>
<b>Transparent Roaming Between Wireless Networks</b>	
<b>Dual subscriber identity module (SIM) support</b>	<ul style="list-style-type: none"> <li>Dual SIMs provide for high reliability and cellular multihoming support for LTE and HSPA-based networks using common firmware (FW) technology within the same region (failover). North America dual SIMs provide switchover with different FW technology.</li> </ul>
<b>Cisco IOS Mobile IP features</b>	<ul style="list-style-type: none"> <li>Mobile IP offers transparent roaming for mobile networks, establishing a transparent Internet connection regardless of location or movement. This enables mission-critical applications to stay connected even when roaming between networks.</li> <li>Assigned IP addresses to the home network are maintained in private or public networks.</li> </ul>
<b>Cisco IOS Mobile network features</b>	<ul style="list-style-type: none"> <li>Allows an entire subnet or mobile network to maintain connectivity to the home network while roaming.</li> </ul>
<b>Multiple wireless WAN technologies</b>	<ul style="list-style-type: none"> <li>Users can use the best wireless (4G LTE, 3.7G, or 3.5G) technology or network available.</li> </ul>
<b>Advanced IP Services in Standards-Based Cisco IOS Software</b>	
<b>Advanced security features</b>	<ul style="list-style-type: none"> <li>Authorization and authentication determine which individuals and devices have access to the network.</li> <li>Firewall protection provides perimeter security when using public networks.</li> <li>3DES and AES encryption provide for highly secure VPNs when transmitting and receiving data over public networks.</li> <li>Intrusion detection monitors potential malicious activity within the network.</li> </ul>
<b>QoS features</b>	<ul style="list-style-type: none"> <li>Provides traffic precedence to delay-sensitive or prioritized applications.</li> <li>Facilitates low-latency routing of delay-sensitive applications such as streaming video. (Available Q2, 2017)</li> </ul>
<b>IP Multicast</b>	<ul style="list-style-type: none"> <li>Allows efficient broadcast of data or video for increased situational awareness, multiuser communications, or surveillance applications.</li> </ul>
<b>Management and manageability</b>	<ul style="list-style-type: none"> <li>Network managers can remotely manage and monitor networks with SNMP, Telnet, or HTTP, and locally through a console port.</li> <li>Support for extensive 3G and 4G LTE-based MIBs allows for centralized management of remote devices and gives network managers visibility into and control over the network configuration at the remote site.</li> <li>Network managers can reset to a predesignated golden image as well as configure an ISR through Cisco IOS Software or through an external reset button.</li> <li>Network managers can upgrade 3.5G, 3.7G, and 4G LTE firmware and router configurations remotely and confirm enhancement verification.</li> <li>Tight integration with Cisco IOS Software allows you to self-monitor the functions of the 3.5G, 3.7G, and 4G LTE modems and automatically recover from a failure.</li> <li>Cisco Configuration Professional provides a web-based tool that simplifies setup and deployment.</li> <li>Intuitive network management tools such as Cisco Prime™ and HP OpenView are supported.</li> </ul>
<b>Cisco WAN Optimization</b>	<ul style="list-style-type: none"> <li>Cisco WAAS Express routers and WAEs work together to optimize TCP network traffic. When client and server applications attempt to communicate with each other, the network intercepts the traffic and acts on behalf of the client application and the destination server.</li> <li>WAAS Express is supported on the serial/Gigabit Ethernet WAN interface and up to 2 Mbps.</li> </ul>


## Product Specifications

Table 2 provides 4G LTE specifications for the Cisco 819 4G LTE ISRs.

**Table 2.** 4G LTE Specifications

Region Theaters	C819GW-LTE-LA-NK9	C819GW-LTE-LA-QK9	C819GW-LTE-LA-CK9
<b>Bands</b>	LTE bands 1, 3, 5, 7, 8, 18, 19, 21, 28, 38, 39, 40, 41 FDD LTE 700 MHz (band 28), 850 MHz (band 5 CLR), 850 MHz (bands 18 and 19 Low), 900 MHz (band 8), 1500 MHz (band 21), 1800 MHz (band 3), 2100 MHz (band 1), or 2600 MHz (band 7) TDD LTE 1900 MHz (band 39), 2300 MHz (band 40), 2500 MHz (band 41), or 2600 MHz (band 38) Carrier aggregation band combinations: 1+(8,18,19,21); 3+(5,7,19,28); 7+(5,7,28); 19+21, 38+38, 39+39,40+40, 41+41	LTE bands 1, 3, 5, 7, 8, 18, 19, 21, 28, 38, 39, 40, 41 FDD LTE 700 MHz (band 28), 850 MHz (band 5 CLR), 850 MHz (bands 18 and 19 Low), 900 MHz (band 8), 1500 MHz (band 21), 1800 MHz (band 3), 2100 MHz (band 1), or 2600 MHz (band 7) TDD LTE 1900 MHz (band 39), 2300 MHz (band 40), 2500 MHz (band 41), or 2600 MHz (band 38) Carrier aggregation band combinations: 1+(8,18,19,21); 3+(5,7,19,28); 7+(5,7,28); 19+21, 38+38, 39+39,40+40, 41+41	LTE bands 1, 3, 5, 7, 8, 18, 19, 21, 28, 38, 39, 40, 41 FDD LTE 700 MHz (band 28), 850 MHz (band 5 CLR), 850 MHz (bands 18 and 19 Low), 900 MHz (band 8), 1500 MHz (band 21), 1800 MHz (band 3), 2100 MHz (band 1), or 2600 MHz (band 7) TDD LTE 1900 MHz (band 39), 2300 MHz (band 40), 2500 MHz (band 41), or 2600 MHz (band 38) Carrier aggregation band combinations: 1+(8,18,19,21); 3+(5,7,19,28); 7+(5,7,28); 19+21, 38+38, 39+39,40+40, 41+41
<b>Theoretical Category 4 download/upload speeds*</b>	150 Mbps and 50 Mbps UL	150 Mbps and 50 Mbps UL	150 Mbps and 50 Mbps UL
<b>Australia</b>	✓	X	X
<b>Japan</b>	X	✓	X
<b>China</b>	X	X	✓
<b>India</b>	✓	X	X
<b>Southeast Asia</b>	X	X	✓ (Select Countries)
<b>Latin America</b>	✓ (Select Countries)	X	X

Item	Specification
<b>4G LTE modem form factor</b>	<ul style="list-style-type: none"> <li>Embedded (included with the router)</li> <li>Upgrade FW Image Switching provisioning from (-LA SKUs) flash (FW-7430-LTE-AU or FW-7430-LTE-GN or FW-7430-LTE-JN)</li> <li>-AU FW is specific for Telstra, non Telstra should use the -GN Generic FW, -JN is specific for NTT DoCoMo, and -GN Generic FW for all other APAC/LATAM countries</li> </ul>
<b>Important 4G LTE features</b>	<ul style="list-style-type: none"> <li>Automatic switch failover between primary and backup link</li> <li>Multichannel-interface-processor (MIP) profile configuration</li> <li>Code Division Multiple Access (CDMA) data retry</li> <li>3G MIB with 4G LTE MIB extension and traps</li> <li>Remotely initiated data callback using voice</li> <li>Remotely initiated data callback using Short Message Service (SMS)</li> <li>Remote firmware upgrade over 4G LTE</li> <li>Virtual diagnostic monitoring</li> <li>SIM lock and unlock capabilities</li> </ul>
<b>Dual SIM support</b> 	<ul style="list-style-type: none"> <li>High reliability, and cellular multihoming support for dual mini (2FF) SIM card socket; compliant with ISO-7816-2 (SIM mechanical)</li> </ul>
<b>SMS and GPS</b> 	<ul style="list-style-type: none"> <li>GPS antenna: SMA connector (separate active GPS with SMA antenna option) (SW support available Q1, 2017)</li> <li>Send and receive SMS (maximum 160 characters)</li> <li>Standalone GPS, needs line of sight</li> <li>Configure multiple profile</li> </ul>

Item	Specification
<b>MIBs</b> 	<ul style="list-style-type: none"> <li>Enhanced 3G MIB with 4G LTE MIB extension (4G parameters are covered with 3G MIB and 4G LTE MIB extension)</li> <li>ENTITY MIB</li> <li>IF MIB</li> <li>3G WWAN MIB persistence</li> </ul>
<b>4G LTE network management and diagnostics</b>	<ul style="list-style-type: none"> <li>In-band and out-of-band management using Telnet (Cisco IOS Software command-line interface [CLI]) and SNMP, including MIB II and other extensions</li> <li>Industry-standard 4G LTE diagnostics and monitoring tools (QUALCOMM CDMA Air Interface Tester [CAIT] and Spirent Universal Diagnostic Monitor [UDM])</li> </ul>
<b>Modem information</b>	<ul style="list-style-type: none"> <li><b>Modem form factor:</b> Embedded Peripheral Component Interconnect (PCI) minicard</li> <li>Sierra Wireless MC7430 with Qualcomm MDM9230</li> </ul>
<b>Programming interfaces</b>	<ul style="list-style-type: none"> <li>Cisco IOS Software CLI</li> </ul>
<b>Wireless technologies supported (performance and throughput)</b>	<p>Cisco LTE 2.5 LTE bands 1, 3, 5, 7, 8, 18, 19, 21, 28, 38, 39, 40, 41 and carrier aggregation combinations</p> <p>Backward compatibility:</p> <ul style="list-style-type: none"> <li>UMTS and HSPA+: 800 MHz (band 19), 850 MHz (band 5), 850 MHz (band 6), 900 MHz (band 8), 1800 MHz (band 9), and 2100 MHz (band 1)</li> <li>HSPA+ speed download up to Category 20 (42.2 Mbps) and upload up to Category 6 (5.76 Mbps)</li> <li>DC-HSPA+ speed DL with Category 26 (62 Mbps) and UL up to Category 8 (11.5 Mbps) TD-SCDMA 39 (China Mobile support)</li> </ul>
<b>Included antenna</b>	<ul style="list-style-type: none"> <li>Two multiband swivel-mount dipole antennas (4G- LTE-ANTM-D) and one extender (4G-AE010-R) are included with all Cisco 819 4G LTE ISRs.</li> <li>WLAN: Three multiband swivel-mount dipole antennas (AIR-ANTM2050D-R) are included for all 819 SKUs that have WLAN functionality.</li> </ul>
<b>LED indicators for 4G</b>	<ul style="list-style-type: none"> <li>Received signal strength indication (RSSI) (green)</li> <li>WLAN (green/blue/red/white)</li> <li>WWAN (green)</li> <li>SIM status (green/yellow)</li> <li>3G and 4G LTE service (green/amber)</li> <li>GPS (green/yellow)</li> <li>SYS (green/yellow)</li> <li>ACT (green/off)</li> <li>For a detailed LED description including for WLAN, please see the 819 Deployment Guide.</li> </ul>
<b>Carrier support</b>	<ul style="list-style-type: none"> <li>For an updated list of carriers that offer services on 819 4G LTE ISRs, please visit <a href="http://www.cisco.com/go/m2m">http://www.cisco.com/go/m2m</a>.</li> </ul>

**Note:** LTE Category 4 download/upload speeds depend on specific carrier channel bandwidth and carrier LTE network provisioning.

Table 3 lists the software features supported on the 819 4G LTE ISRs.

**Table 3.** Cisco IOS Software Features on Cisco 819 4G LTE ISRs: Advanced IP Features Set (Default)

Feature	Description
<b>Cisco IOS Software requirement</b>	<ul style="list-style-type: none"> <li>Cisco IOS Software feature set: Universal Cisco IOS Software image (Advanced IP Services with Full Security license)</li> <li>Cisco IOS Software Release 15.6(2)T1 with modem firmware 2.14.3.x or later release with respective modem firmware.</li> </ul>
<b>IP and IP services features</b>	<ul style="list-style-type: none"> <li>Routing Information Protocol Versions 1 and 2 (RIPv1 and RIPv2)</li> <li>Generic routing encapsulation (GRE) and multipoint GRE (MGRE)</li> <li>Cisco Express Forwarding</li> <li>Standard 802.1d Spanning Tree Protocol</li> <li>Layer 2 Tunneling Protocol (L2TP)</li> <li>Layer 2 Tunneling Protocol Version 3 (L2TPv3)</li> <li>Network Address Translation</li> <li>Dynamic Host Configuration Protocol (DHCP) server, relay, and client</li> <li>Dynamic DNS (DDNS)</li> </ul>



Feature	Description
	<ul style="list-style-type: none"> <li>• DNS Proxy</li> <li>• DNS Spoofing</li> <li>• Access control lists (ACLs)</li> <li>• IPv4 and IPv6 Multicast</li> <li>• Open Shortest Path First (OSPF)</li> <li>• Border Gateway Protocol (BGP)</li> <li>• Enhanced Interior Gateway Routing Protocol (EIGRP)</li> <li>• Virtual Route Forwarding (VRF) Lite</li> <li>• Next Hop Resolution Protocol (NHRP)</li> <li>• Bidirectional Forwarding Detection (BFD)</li> <li>• Web Cache Communication Protocol (WCCP)</li> <li>• Data-Link Switching (DLSW)</li> </ul>
<b>Switch features</b>	<ul style="list-style-type: none"> <li>• Auto Media Device In/Media Device Cross Over (MDI-MDX)</li> <li>• 16 802.1Q VLANs</li> <li>• MAC filtering</li> <li>• Switched Port Analyzer (SPAN)</li> <li>• Storm control</li> <li>• Smart ports</li> <li>• Secure MAC address</li> <li>• Internet Group Management Protocol Version 3 (IGMPv3) snooping</li> <li>• 802.1X</li> </ul>
<b>Security features</b>	<p><b>Secure Connectivity:</b></p> <ul style="list-style-type: none"> <li>• Secure Sockets Layer (SSL) VPN for secure remote access</li> <li>• Hardware-accelerated DES, 3DES, AES 128, AES 192, and AES 256</li> <li>• Public-key-infrastructure (PKI) support</li> <li>• 20 IPsec tunnels</li> <li>• Cisco Easy VPN Client and Server</li> <li>• Network Address Translation (NAT) transparency</li> <li>• Dynamic Multipoint VPN (DMVPN)</li> <li>• Tunnel-less Group Encrypted Transport VPN</li> <li>• IPsec stateful failover</li> <li>• VRF-aware IPsec</li> <li>• IPsec over IPv6</li> <li>• Adaptive control technology</li> <li>• Session Initiation Protocol (SIP) application layer gateway</li> </ul> <p><b>Cisco IOS Firewall:</b></p> <ul style="list-style-type: none"> <li>• Zone-based policy firewall</li> <li>• VRF-aware stateful inspection routing firewall</li> <li>• Stateful inspection transparent firewall</li> <li>• Advanced application inspection and control</li> <li>• Secure HTTP (HTTPS), FTP, and Telnet Authentication Proxy</li> <li>• Dynamic and static port security</li> <li>• Firewall stateful failover</li> <li>• VRF-aware firewall</li> </ul> <p><b>Content Filtering:</b></p> <ul style="list-style-type: none"> <li>• Subscription-based content filtering with Trend Micro</li> <li>• Support for Websense and SmartFilter</li> <li>• Cisco IOS Software blacklists and whitelists</li> </ul> <p><b>Integrated Threat Control:</b></p> <ul style="list-style-type: none"> <li>• Intrusion prevention system (IPS)</li> <li>• Control Plane Policing</li> <li>• Flexible Packet Matching</li> <li>• Network foundation protection</li> </ul>
<b>QoS features</b>	<ul style="list-style-type: none"> <li>• Low Latency Queuing (LLQ)</li> <li>• Weighted Fair Queuing (WFQ)</li> </ul>



Feature	Description
	<ul style="list-style-type: none"> <li>• Class-Based WFQ (CBWFQ)</li> <li>• Class-Based Traffic Shaping (CBTS)</li> <li>• Class-Based Traffic Policing (CBTP)</li> <li>• Policy-Based Routing (PBR)</li> <li>• Class-Based QoS MIB</li> <li>• Class of service (CoS)-to-differentiated services code point (DSCP) mapping</li> <li>• Class-Based Weighted Random Early Detection (CBWRED)</li> <li>• Network-Based Application Recognition (NBAR)</li> <li>• Link fragmentation and interleaving (LFI)</li> <li>• Resource Reservation Protocol (RSVP)</li> <li>• Real-Time Transport Protocol (RTP) header compression (cRTP)</li> <li>• Differentiated Services (DiffServ)</li> <li>• QoS preclassify and prefragmentation</li> <li>• Hierarchical QoS (HQoS)</li> </ul>
<b>Management features</b>	<ul style="list-style-type: none"> <li>• Cisco Configuration Professional</li> <li>• Cisco Configuration Express</li> <li>• Cisco Configuration Engine support</li> <li>• Cisco AutoInstall</li> <li>• IP service-level agreement (IP SLA)</li> <li>• Cisco IOS Embedded Event Manager (EEM)</li> <li>• Cisco Prime</li> <li>• Cisco Security Manager</li> <li>• Telnet, SNMPv3, Secure Shell (SSH) Protocol, CLI, and HTTP management</li> <li>• RADIUS and TACACS+</li> <li>• Out-of-band management with external modem through virtual auxiliary port</li> </ul>
<b>High-availability features</b>	<ul style="list-style-type: none"> <li>• Virtual Router Redundancy Protocol (VRRP) (RFC 2338)</li> <li>• Hot Standby Router Protocol (HSRP)</li> <li>• Multigroup HSRP (MHSRP)</li> <li>• Dial backup with external modem through virtual auxiliary port</li> <li>• Dual SIM support for cellular multihoming</li> </ul>
<b>Metro Ethernet features</b>	<ul style="list-style-type: none"> <li>• Ethernet operations, administration, and maintenance (OAM)</li> <li>• Ethernet Local Management Interface (LMI)</li> <li>• IP SLA for Ethernet</li> </ul>
<b>IPv6 features</b>	<ul style="list-style-type: none"> <li>• IPv6 addressing architecture</li> <li>• IPv6 name resolution</li> <li>• IPv6 statistics</li> <li>• IPv6 translation: Transport packets between IPv6-only and IPv4-only endpoints (NAT-PT)</li> <li>• Internet Control Message Protocol Version 6 (ICMPv6)</li> <li>• IPv6 DHCP (Available Q2, 2017)</li> </ul>
<b>Number of recommended users</b>	20

Table 4 lists the system specifications, and Table 5 lists antenna specifications for the Cisco 819 4G LTE ISRs.

**Table 4.** System Specifications

Feature	Specification
<b>Memory</b>	
<b>Default and maximum DRAM</b>	1 GB
<b>Default and maximum flash memory</b>	1 GB
<b>Interface Support</b>	
<b>Console or auxiliary port</b>	<ul style="list-style-type: none"> <li>• RJ-45: Single dual-purpose port, which provides direct connection to a console or external modem for management or backup access point</li> </ul>

Feature	Specification																																												
<b>Mini-USB port (RSVD)</b>	<ul style="list-style-type: none"> <li>Mini-USB port to support remote 4G LTE diagnostics and monitoring tools (QUALCOMM CAIT and Spirent UDM)*</li> </ul>																																												
<b>WAN interfaces</b>	<ul style="list-style-type: none"> <li>WWAN with 4G LTE, 3.7G, and 3.5G speeds</li> <li>10/100/1000 Gigabit Ethernet port</li> <li>Cisco Smart Serial Interface (sync, async, and bisync)</li> </ul>																																												
<b>WLAN Features</b>	<ul style="list-style-type: none"> <li>2x3 MIMO with two spatial streams</li> <li>Maximal ratio combining (MRC)</li> <li>Legacy beamforming</li> <li>20- and 40-MHz channels</li> <li>PHY data rates up to 300 Mbps</li> <li>Packet aggregation: A-MPDU (Tx/Rx), A-MSDU (Tx/Rx)</li> <li>802.11 dynamic frequency selection (DFS)</li> <li>Cyclic shift diversity (CSD) support</li> </ul>																																												
<b>LAN interfaces</b>	<ul style="list-style-type: none"> <li>Four 10/100 Fast Ethernet ports</li> </ul>																																												
<b>System LEDs</b>	<ul style="list-style-type: none"> <li>System OK (green/amber)</li> <li>Activity (green)</li> <li>Speed and link for Gigabit Ethernet WAN port (green)</li> <li>Speed and link for all Fast Ethernet LAN ports (green)</li> </ul>																																												
<b>Serial WAN interface</b>	<ul style="list-style-type: none"> <li>Support for both synchronous and asynchronous modes</li> <li>Synchronous maximum speed of up to 8 Mbps</li> <li>Asynchronous maximum speed of up to 115.2 kbps</li> <li>Support for bisync modes</li> <li>Support for network clock synchronization</li> </ul>																																												
<b>Serial protocol support</b>	<ul style="list-style-type: none"> <li>EIA-232, EIA-449, EIA-530, EIA-530A, V.35, and X.21</li> </ul>																																												
<b>Cisco Smart Serial Cabling</b>	<p>Cisco Smart Serial connectors and supported cables:</p> <table border="1"> <thead> <tr> <th>Product Number</th> <th>Cable Type</th> <th>Length</th> <th>Connector Type</th> </tr> </thead> <tbody> <tr> <td>CAB-SS-V35MT</td> <td>V.35 DTE</td> <td>10 ft (3m)</td> <td>Male</td> </tr> <tr> <td>CAB-SS-V35FC</td> <td>V.35 DCE</td> <td>10 ft (3m)</td> <td>Female</td> </tr> <tr> <td>CAB-SS-232MT</td> <td>EIA/TIA-232 DTE</td> <td>10 ft (3m)</td> <td>Male</td> </tr> <tr> <td>CAB-SS-232FC</td> <td>EIA/TIA-232 DCE</td> <td>10 ft (3m)</td> <td>Female</td> </tr> <tr> <td>CAB-SS-449MT</td> <td>EIA/TIA-449 DTE</td> <td>10 ft (3m)</td> <td>Male</td> </tr> <tr> <td>CAB-SS-449FC</td> <td>EIA/TIA-449 DCE</td> <td>10 ft (3m)</td> <td>Female</td> </tr> <tr> <td>CAB-SS-X21MT</td> <td>X.21 DTE</td> <td>10 ft (3m)</td> <td>Male</td> </tr> <tr> <td>CAB-SS-X21FC</td> <td>X.21 DCE</td> <td>10 ft (3m)</td> <td>Female</td> </tr> <tr> <td>CAB-SS-530MT</td> <td>EIA/TIA-530 DTE</td> <td>10 ft (3m)</td> <td>Male</td> </tr> <tr> <td>CAB-SS-530AMT</td> <td>EIA/TIA-530A DTE</td> <td>10 ft (3m)</td> <td>Male</td> </tr> </tbody> </table>	Product Number	Cable Type	Length	Connector Type	CAB-SS-V35MT	V.35 DTE	10 ft (3m)	Male	CAB-SS-V35FC	V.35 DCE	10 ft (3m)	Female	CAB-SS-232MT	EIA/TIA-232 DTE	10 ft (3m)	Male	CAB-SS-232FC	EIA/TIA-232 DCE	10 ft (3m)	Female	CAB-SS-449MT	EIA/TIA-449 DTE	10 ft (3m)	Male	CAB-SS-449FC	EIA/TIA-449 DCE	10 ft (3m)	Female	CAB-SS-X21MT	X.21 DTE	10 ft (3m)	Male	CAB-SS-X21FC	X.21 DCE	10 ft (3m)	Female	CAB-SS-530MT	EIA/TIA-530 DTE	10 ft (3m)	Male	CAB-SS-530AMT	EIA/TIA-530A DTE	10 ft (3m)	Male
Product Number	Cable Type	Length	Connector Type																																										
CAB-SS-V35MT	V.35 DTE	10 ft (3m)	Male																																										
CAB-SS-V35FC	V.35 DCE	10 ft (3m)	Female																																										
CAB-SS-232MT	EIA/TIA-232 DTE	10 ft (3m)	Male																																										
CAB-SS-232FC	EIA/TIA-232 DCE	10 ft (3m)	Female																																										
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CAB-SS-530MT	EIA/TIA-530 DTE	10 ft (3m)	Male																																										
CAB-SS-530AMT	EIA/TIA-530A DTE	10 ft (3m)	Male																																										
<b>Physical Characteristics</b>																																													
<b>Physical dimensions (H x W x D)</b>	1.67 x 7.7 x 9.0 in. (42 x 196 x 229 mm)																																												
<b>Weight</b>	2.3 lb (1.0 kg)																																												
<b>Mean time between failure (MTBF—Ground Benign)</b>	263,000 hours																																												
<b>Maximum platform power consumption</b>	19W																																												
<b>Environmental operating range</b>	5° to 122°F (-15° to 50°C) (functional up to 131°F [55°C] non-3GPP compliant)																																												
<b>Operating altitude</b>	50°C up to 5000 ft Above 5000 ft derate maximum operating temperature 1.50°C per 1000 ft Maximum altitude: 10,000 ft																																												
<b>Standard safety certifications</b>	<ul style="list-style-type: none"> <li>UL 60950-1, 2nd edition</li> <li>CAN/CSA C22.2 No. 60950-1, 2nd edition</li> <li>EN 60950-1, 2nd edition</li> <li>CB to IEC 60950-1, 2nd edition with all group differences and national deviations</li> </ul>																																												

Feature	Specification
<b>EMC emissions</b>	EN55022/CISPR22, CFR 47 Part 15, ICES003, VCCI-V-3, AS/NZS CISPR22, CNS13438, EN300-386, EN61000-3-2, EN61000-3-3, and EN61000-6-1
<b>EMC immunity</b>	EN55024/CISPR24, (EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, EN61000-4-11), and EN300-386
<b>Radio immunity</b>	EN301 489-1, EN 301 489-7, and EN301 489-24
<b>Cellular radio</b>	EN 301 908-1, EN 301 908-2, EN 301 511, 47 CFR Part 22, 47 CFR Part 24, and EN 301 908-13
<b>Power specifications</b>	<p><b>AC Power Adapter:</b></p> <ul style="list-style-type: none"> <li>• Maximum power consumption: 25W</li> <li>• Meets efficiency Level V</li> <li>• Input voltage and currents supported: 100–264 VAC &lt;0.5A</li> <li>• Maximum output power rating: 20W</li> <li>• For IP41 need additional enclosure</li> </ul> <p><b>DC Power Adapter:</b></p> <ul style="list-style-type: none"> <li>• Maximum power consumption: 26W</li> <li>• Input voltage and currents supported: 10 VDC minimum, 13.8 VDC nominal, 36 VDC maximum operating, and 42 VDC absolute maximum</li> <li>• Maximum output power rating: 20W</li> <li>• IP41 compliant</li> <li>• Default: PWR2-20W-AC AC power supply</li> </ul>

**Table 5.** Antenna Specifications

Item	Specification
<b>Included antenna</b>	Two multiband 4G LTE swivel-mount dipole antennas (4G-LTE-ANTM-D) and one extender (4G-AE010-R)
<b>Diversity (dual antennas) MIMO</b>	<b>C819GW-LTE:</b> Diversity supported MIMO 2X2
<b>Antenna 4G-LTE-ANTM-O-3-X</b>	<p><b>Description:</b></p> <ul style="list-style-type: none"> <li>• Multiband low-profile indoor or outdoor omnidirectional antenna (IP67 ingress protection)</li> <li>• Ceiling mount, dual 4G LTE and standalone GPS</li> </ul> <p><b>Electrical Specifications:</b></p> <ul style="list-style-type: none"> <li>• <b>Frequency range:</b> 698 to 960 MHz and 1710 to 2700 MHz</li> <li>• <b>Gain:</b> 2.5 decibels relative to isotropic (dBi)</li> <li>• <b>Maximum power:</b> 3W</li> <li>• <b>Connector:</b> SMA with TNC male adapters, and SMA for GPS</li> <li>• <b>Voltage standing wave ratio (VSWR):</b> &lt; 2.5:1</li> <li>• <b>Nominal impedance:</b> 50 ohms</li> <li>• <b>Polarization:</b> Linear vertical</li> </ul> <p><b>Mechanical Specifications:</b></p> <ul style="list-style-type: none"> <li>• <b>Radome material:</b> White, Black, Red, or Blue ABS, UL-94 V0</li> <li>• <b>Cable:</b> 4 ft (1.2 m) RG174 VW-1 compliant</li> <li>• <b>Height and base diameter:</b> 3.5 in (90 mm) and 5 in (137 mm)</li> <li>• <b>Temperature rating:</b> –40° to 185°F (–40° to 85°C)</li> <li>• <b>Mounting:</b> 5/8-inch lug with serrated face nut (5/8-inch-diameter hole through mounting surface)</li> <li>• <b>Can be used with the following cable extensions:</b> 4G-CAB-ULL-20 and 4G-CAB-ULL-50</li> </ul>
<b>Antenna 4G-ANTM-OM-CM</b>	<p><b>Description:</b></p> <ul style="list-style-type: none"> <li>• Multiband indoor omnidirectional antenna</li> <li>• Ceiling mount</li> </ul> <p><b>Electrical Specifications:</b></p> <ul style="list-style-type: none"> <li>• <b>Frequency range:</b> 698 to 960 MHz, 1575 MHz, and 1710 to 2690 MHz</li> <li>• <b>Gain:</b> 1 and 1.5 dBi (700 to 960 MHz), 1.7 and 3.2 dBi (1700 to 2200 MHz), 3 and 4 dBi (2500 to 2700 MHz)</li> <li>• <b>Maximum power:</b> 50W</li> <li>• <b>Connector:</b> TNC male</li> <li>• <b>VSWR:</b> 2.0:1 and 3.01:1 or less for GPS</li> <li>• <b>Nominal impedance:</b> 50 ohms</li> <li>• <b>Polarization:</b> Linear vertical</li> </ul>

Item	Specification
	<p><b>Mechanical Specifications:</b></p> <ul style="list-style-type: none"> <li>• <b>Radome material:</b> White ABS</li> <li>• <b>Dimensions (outside dimensions x height):</b> 5.64 in. x 2.0 in. (143.3 x 50.8 mm)</li> <li>• <b>Weight:</b> 6.0 oz (170.1 g)</li> <li>• <b>Temperature rating:</b> -40° to 185°F (-40° to 85°C)</li> <li>• <b>Can be used with the following cable extensions:</b> 3G-CAB-ULL-20 and 3G-CAB-ULL-50</li> </ul>
<p><b>Antenna 4G- LTE-ANTM-D</b></p>	<p><b>Description:</b></p> <ul style="list-style-type: none"> <li>• Cisco 4G LTE and 3G omnidirectional dipole antenna</li> <li>• Articulating joint; can be rotated 360 degrees and is capable of maneuvering into three stop positions: 0 degrees, 45 degrees, and 90 degrees</li> <li>• Plug threaded TNC connector: Directly mount the antenna on any Cisco 4G LTE or 3G enhanced high-speed WAN interface card (EHWIC) with a TNC connector; the threads on the connector must comply with the ANSI 7/16-28 UNEF 2B thread specification</li> <li>• Multiband swivel-mount dipole antenna</li> <li>• Faceplate mount (dual units included with all Cisco 4G LTE WWAN)</li> </ul> <p><b>Electrical Specifications:</b></p> <ul style="list-style-type: none"> <li>• <b>Operating frequency ranges:</b> 698 to 806 MHz, 824 to 894 MHz, 925 to 960 MHz, 1710 to 1885 MHz, 1920 to 1980 MHz, 2110 to 2170 MHz, and 2500 to 2690 MHz</li> <li>• <b>Maximum peak gain:</b> 2 dBi</li> <li>• <b>Maximum input power:</b> 3W</li> <li>• <b>Connector:</b> TNC plug</li> <li>• <b>VSWR:</b> &lt; 2.5:1 or less</li> <li>• <b>Characteristic impedance:</b> 50 ohms</li> </ul> <p><b>Mechanical Specifications:</b></p> <ul style="list-style-type: none"> <li>• <b>Antenna dimensions (L x W x D):</b> 9 x 1.2 x 7/16 in. (229 x 30.5 x 11 mm)</li> <li>• <b>Temperature rating:</b> -22° to 158°F (-30° to 70°C)</li> <li>• <b>Antenna base and random color:</b> Cisco Raven Black</li> </ul>
<p><b>Antenna extension 4G-AE015-R</b></p>	<p><b>Description:</b></p> <ul style="list-style-type: none"> <li>• Single-unit antenna extension base (15 ft [457.2 cm])</li> </ul> <p><b>Electrical Specifications:</b></p> <ul style="list-style-type: none"> <li>• <b>Frequency range:</b> 6 GHz</li> <li>• <b>Attenuation:</b> Less than 3 dB at or below 2.5 GHz</li> <li>• <b>Base connector:</b> TNC socket</li> <li>• <b>Pigtail connector:</b> TNC plug</li> </ul> <p><b>Mechanical Specifications:</b></p> <ul style="list-style-type: none"> <li>• <b>Base material:</b> Cisco gray UL94 V0 PC/ABS plastic</li> <li>• <b>Dimensions:</b> 2.8 x 2.4 x 1.8 in. (7.1 x 6.1 x 4.6 cm)</li> <li>• <b>Weight:</b> 6 oz (170.1 g)</li> <li>• <b>Cable:</b> 15 ft (457.2 cm) nonplenum rated Pro-Flex Plus 195</li> </ul>
<p><b>Antenna extension 4G-AE010-R</b></p>	<p><b>Description:</b></p> <ul style="list-style-type: none"> <li>• Single-unit antenna extension base (10 ft [304.8 cm], one cable included)</li> </ul> <p><b>Electrical Specifications:</b></p> <ul style="list-style-type: none"> <li>• <b>Frequency range:</b> 6 GHz</li> <li>• <b>Attenuation:</b> Less than 3 dB at or below 2.5 GHz</li> <li>• <b>Base connector:</b> TNC socket</li> <li>• <b>Pigtail connector:</b> TNC plug</li> </ul> <p><b>Mechanical Specifications:</b></p> <ul style="list-style-type: none"> <li>• <b>Base material:</b> UL 94 V0PC and ABS plastic</li> <li>• <b>Dimensions:</b> 2.8 x 2.4 x 1.8 in. (7.1 x 6.1 x 4.6 cm)</li> <li>• <b>Weight:</b> 6 oz (170.1 g)</li> <li>• <b>Cable:</b> 10 ft (304.8 cm) nonplenum rated Pro-Flex Plus 195</li> </ul>

Item	Specification
ANT-4G-OMNI-OUT-N	<p><b>Description: Cisco outdoor omnidirectional antenna for 2G, 3G, and 4G LTE cellular</b></p> <ul style="list-style-type: none"> <li>• UV-stable radome</li> <li>• Mast-mounting bracket</li> <li>• Applicable for both 2G and 3G solutions</li> <li>• Domestic LTE 700 band and global LTE 2600 band</li> <li>• Domestic cellular and global GSM</li> <li>• WiMAX 2300 and 2500</li> </ul> <p><b>Electrical Specifications:</b></p> <ul style="list-style-type: none"> <li>• <b>Frequency ranges:</b> 698 to 960 MHz, 1710 to 2170 MHz, and 2300 to 2700 MHz</li> <li>• <b>Nominal gain (dBi):</b> 698 to 960 MHz = 1.5 dBi, and 1710 to 2700 MHz = 3.5 dBi</li> <li>• <b>3 dB beam width (E plane):</b> 698 to 960 MHz = 81 degrees, 1710 to 2170 MHz = 75 degrees, and 2300 to 2700 MHz = 100 degrees</li> <li>• <b>3 dB beam width (H plane):</b> 360 degrees, omnidirectional</li> <li>• <b>Polarization:</b> Vertical and linear</li> <li>• <b>Normal impedance:</b> 50 ohms</li> <li>• <b>VSWR:</b> &lt; 2.5:1 (698 to 960 MHz) and &lt; 2.0:1 (1710 to 2690 MHz)</li> <li>• <b>Radiation pattern:</b> Omnidirectional</li> </ul> <p><b>Mechanical Specifications:</b></p> <ul style="list-style-type: none"> <li>• <b>Mount style:</b> Mast mount, upright position only</li> <li>• <b>Environment:</b> Outdoor</li> <li>• <b>Connector:</b> N-type socket</li> <li>• <b>Antenna length (height):</b> 9.8 x 1 in. (24.9 x 2.45 cm)</li> <li>• <b>Weight:</b> 1.5 lb (0.68 kg)</li> <li>• <b>Dimensions (H x outside dimensions):</b> 9.8 x 1 in. (248 x 24.5 mm)</li> <li>• <b>Operating temperature range:</b> -22° to 158°F (-30° to 70°C)</li> <li>• <b>Storage temperature:</b> -40° to 185°F (-40° to 85°C)</li> <li>• <b>Maximum power:</b> 20W</li> <li>• <b>Radome:</b> Polycarbonate, UV, white</li> <li>• <b>Material substance compliance:</b> ROHS compliant</li> </ul>

Item	Specification
ANT-4G-SR-OUT-TNC	<p><b>Description: Cisco integrated 4G LTE low-profile outdoor saucer antenna:</b></p> <ul style="list-style-type: none"> <li>• Applicable for both 3G and 4G LTE solutions</li> <li>• Domestic LTE 700 band and global LTE 2600 band</li> <li>• Domestic cellular and global GSM</li> <li>• Weatherproof UV stable radome</li> <li>• Performance optimized</li> <li>• Excellent flame rating</li> </ul> <p><b>Electrical Specifications:</b></p> <ul style="list-style-type: none"> <li>• <b>Frequency ranges:</b> 698 to 960 MHz and 1710 to 2700 MHz</li> <li>• <b>Peak gain with 1-ft cable:</b> 1.5 dBi (698 to 960 MHz) and 3.7 dBi (1710 to 2700 MHz)</li> <li>• <b>Peak gain with 15-ft cable:</b> 0.8 dBi (698 to 960 MHz) and 0.2 dBi (1710 to 2700 MHz)</li> <li>• <b>Average efficiency with 1-ft cable:</b> 90% (698 to 960 MHz) and 82% (1710 to 2700 MHz)</li> <li>• <b>Average efficiency with 15-ft cable:</b> 60% (698 to 960 MHz) and 40% (1710 to 2700 MHz)</li> <li>• <b>Polarization:</b> Linear and vertical</li> <li>• <b>Nominal impedance:</b> 50 ohms</li> <li>• <b>VSWR (maximum):</b> 2.0:1 (698 to 960 MHz) and 2.0:1 (1710 to 2700 MHz)</li> <li>• <b>H-plane (3-dB beam width):</b> Omnidirectional</li> </ul> <p><b>Mechanical Specifications:</b></p> <ul style="list-style-type: none"> <li>• <b>Power:</b> 3W</li> <li>• <b>Cable:</b> 15-ft LMR 195</li> <li>• <b>RF connector:</b> Type N (f); TNC (plug) available</li> <li>• <b>Mount style:</b> Ceiling mount</li> <li>• <b>Radome:</b> PC/ABS, UV stable, black</li> <li>• <b>Material substance compliance:</b> RoHS compliant</li> <li>• <b>Operational temperature:</b> -22° to 158°F (-30° to 70°C)</li> <li>• <b>Storage temperature:</b> -40° to 185°F (-40° to 85°C)</li> <li>• <b>Environment:</b> Indoor</li> <li>• <b>Dimensions (H x outside dimensions):</b> 3.4 x 7.9 in. (87 x 200 mm)</li> </ul>
ANT-4G-PNL-OUT-N	<p><b>Description: Cisco multiband panel outdoor 4G LTE antenna:</b></p> <ul style="list-style-type: none"> <li>• Supports 3G and 4G LTE solutions</li> <li>• Supports bands</li> <li>• Wall-mount and mast-mount</li> <li>• Indoor and outdoor</li> <li>• Dual type-N socket connector</li> </ul> <p><b>Electrical Specifications:</b></p> <ul style="list-style-type: none"> <li>• <b>Frequency ranges:</b> 698 to 960 MHz and 1710 to 2700 MHz</li> <li>• <b>VSWR:</b> 2.0:1 maximum</li> <li>• <b>Gain:</b> 5.5 to 10.5 dBi (698 to 960 MHz) and 6.5 to 9.0 dBi (1710 to 2700 MHz)</li> <li>• <b>3-dB beam width (vertical plane):</b> 55 to 70 degrees = 698 to 960 MHz, 53 to 98 degrees = 1710 to 2200 MHz, 60 to 70 degrees = 2200 to 2500 MHz, and 55 to 70 degrees = 2500 to 2700 MHz</li> <li>• <b>3-dB beam width (horizontal plane):</b> 55 to 70 degrees = 698 to 960 MHz and 50 to 90 degrees = 1710 to 2200 MHz</li> <li>• <b>F/B ratio:</b> &gt; 15 dB, typical 20 dB = 698 to 960 MHz, and &gt; 17 dB, typical 23 dB = 1700 to 2700 MHz</li> <li>• <b>Isolation:</b> &gt; 30 dB</li> <li>• <b>Polarization:</b> Slant +/- 45 degrees</li> <li>• <b>Nominal impedance:</b> 50 ohms</li> <li>• <b>Radiation pattern:</b> Directional</li> </ul>

Item	Specification
	<p><b>Mechanical Specifications:</b></p> <ul style="list-style-type: none"> <li>• <b>Mount style:</b> Wall or mast mount</li> <li>• <b>Environment:</b> Outdoor</li> <li>• <b>Connector:</b> Dual type-N socket (direct connect or dual 12 in. [30 cm])</li> <li>• <b>Antenna length (height):</b> 11.6 in. (2.95 cm)</li> <li>• <b>Temperature range (operating):</b> –22° to 158°F (–30° to 70°C)</li> <li>• <b>Storage temperature:</b> –40° to 185°F (–40° to 85°C)</li> <li>• <b>Wind rating:</b> 160 km per hr</li> <li>• <b>IP rating:</b> IP54</li> <li>• <b>Radome:</b> Polycarbonate, UV resistant, white</li> </ul> <p>Material substance compliance: <b>ROHS compliant</b></p>
<p><b>CGR-LA-NM-NF*</b> <b>CGR-LA-NF-NF*</b></p>	<p><b>Description: Cisco Lightning Arrestor</b></p> <ul style="list-style-type: none"> <li>• Broadband operation</li> <li>• DC continuity for outdoor powering</li> <li>• Reversed installation</li> </ul> <p><b>Permanently installed gas capsule</b></p> <p><b>Feature Description</b></p> <ul style="list-style-type: none"> <li>• <b>Arrestor type:</b> Gas discharge tube</li> <li>• <b>Main path connectors:</b> Port 1: protected, N plug (male), Port 2: unprotected, N jack (female, bulkhead side)</li> <li>• <b>Impedance:</b> 50 ohms</li> <li>• <b>Frequency range:</b> 0 MHz to 5800 MHz</li> <li>• <b>Return loss:</b> Greater than or equal to 20 dB</li> <li>• <b>Insertion loss:</b> Less than or equal to 0.2 dB</li> <li>• <b>RF CW power:</b> Less than or equal to 60W</li> <li>• <b>Surge current handling capability:</b> 10 single, multiple kA (test pulse 8/20 ms)</li> <li>• <b>Residual pulse energy:</b> 250 microsecond typically (test pulse 4 kV 1.2/50 microsecond; 2kA 8/20 microsecond), main path (protected side)</li> <li>• <b>Operating temperature range:</b> –40°F to 185°F (–40°C to 85°C)</li> <li>• <b>Waterproof rating:</b> IP67 (according to IEC 60529, data refer to the coupled state)</li> <li>• <b>Mounting and grounding:</b> MH24 (bulkhead)</li> <li>• <b>Material</b> <ul style="list-style-type: none"> <li>◦ <b>Housing:</b> brass</li> <li>◦ <b>Port 1 center contact:</b> gold-plated brass</li> <li>◦ <b>Port 2 center contract:</b> copper beryllium alloy</li> </ul> </li> </ul>

\* –N antenna works with –N cables and –N lightning arrestor



## Ordering Information

For Cisco 819 4G LTE ISR ordering information, please visit the [Cisco Ordering home](#) page and refer to Tables 6 and 7.

**Table 6.** Ordering Information

Product	Description
<b>Cisco 819G 4G LTE with WiFi Integrated Services Routers</b>	
<b>C819GW-LTE-LA-NK9</b>	Compact Cisco 819 Secure Multimode 4G LTE M2M ISR Sierra Wireless MC7430/Qualcomm MDM9230 for Australia and India, FDD LTE bands 1, 3, 5, 7, 8, 18, 19, 21, 28, and TDD LTE bands 38, 39, 40, 41 with carrier aggregations, UMTS/HSPA+ bands, TD-SCDMA 39 and Dual Wi-Fi Radio for Australia, India, and some LATAM countries
<b>C819GW-LTE-LA-QK9</b>	Compact Cisco 819 Secure Multimode 4G LTE M2M ISR Sierra Wireless MC7430/Qualcomm MDM9230 for Japan, FDD LTE bands 1, 3, 5, 7, 8, 18, 19, 21, 28, and TDD LTE bands 38, 39, 40, 41 bands with carrier aggregations, UMTS/HSPA+ bands, TD-SCDMA 39 and Dual Wi-Fi Radio for Japan
<b>C819GW-LTE-LA-CK9</b>	Compact Cisco 819 Secure Multimode 4G LTE M2M ISR Sierra Wireless MC7430/Qualcomm MDM9230 for China and Southeast Asia, FDD LTE bands 1, 3, 5, 7, 8, 18, 19, 21, 28, and TDD LTE bands 38, 39, 40, 41 bands with carrier aggregations, UMTS/HSPA+ bands, TD-SCDMA 39 and Dual Wi-Fi Radio for China
<b>Power Supplies and Mounting Brackets</b>	
<b>PWR2-20W-AC</b>	AC power adapter for the Cisco 810 level ISRs (default)
<b>PWR2-20W-12VDC</b>	12V DC power adapter for vehicle for the Cisco 810 level ISRs
<b>PWR2-20W-24VDC</b>	24V DC power adapter for vehicle for the Cisco 810 level ISRs
<b>ACS-810-FWM</b>	Floor mount and wall mount kit for the Cisco 810 level ISRs
<b>C810-POE-SPL</b>	C810 PoE+ power supply splitter
<b>IOS Software and Licenses</b>	
<b>S84GUK9-15602T</b>	Cisco 810 level IOS Universal Data (default)
<b>S84GNPEK9-15602T</b>	Cisco 810 level IOS Universal Data with no payload encryption
<b>FW-7430-LTE-AU</b>	Cisco MC7430 Australia (Telstra) modem image switching provisioning firmware
<b>FW-7430-LTE-JP</b>	Cisco MC7430 Japan modem image switching provisioning firmware
<b>FW-7430-LTE-GN</b>	Cisco MC7430 Generic (for all other countries and SPs) modem image switching provisioning firmware
<b>SL-810-AIS</b>	Cisco 810 level Advanced IP Services license (default)
<b>SL-810-ADVSEC</b>	Cisco 810 level Advanced Security Software license (default)
<b>SL-810-AIS-NPE</b>	Cisco 810 level Advanced IP Services license with no payload encryption (default with NPE IOS image)
<b>SL-810-ADVSEC-NPE</b>	Cisco 810 level Advanced Security Software license with no payload encryption (default with NPE IOS image)

**Table 7.** Antenna Ordering Information

Description	Part Number
<b>Multi-Band Integrated 3-in-1 Indoor/Outdoor IP67 Antenna with GPS</b>	4G-LTE-ANTM-O-3-X 4G-LTE-ANTM-O-3-X= (Spare) X = R (Red); X = B (Black); X = W (White); X = C (Blue);
<b>Multi-Band Swivel Mount Dipole Antenna – Faceplate Mount (dual included)</b>	4G-LTE-ANTM-D 4G-LTE-ANTM-D= (Spare)
<b>Multi-Band Omnidirectional Antenna – Ceiling Mount</b>	4G-ANTM-OM-CM 4G-ANTM-OM-CM= (Spare)
<b>Single Unit Antenna Extension Base (10-ft, one cable included)</b>	4G-AE010-R 4G-AE010-R= (Spare)
<b>Single Unit Antenna Extension Base (15-ft cable)</b>	4G-AE015-R 4G-AE015-R= (Spare)
<b>50-ft (15m) Ultra Low Loss LMR 400 Cable with TNC Connector</b>	4G-CAB-ULL-50 4G-CAB-ULL-50= (Spare)
<b>20-ft (6m) Ultra Low Loss LMR 400 Cable with TNC Connector</b>	4G-CAB-ULL-20 4G-CAB-ULL-20= (Spare)
<b>25-ft (7.5 m) Low Loss LMR 240 Cable with TNC Connector</b>	4G-CAB-LMR240-25 4G-CAB-LMR240-25= (Spare)
<b>50-ft (15 m) Low Loss LMR 240 Cable with TNC Connector</b>	4G-CAB-LMR240-50 4G-CAB-LMR240-50= (Spare)
<b>75-ft (23 m) Low Loss LMR 240 Cable with TNC Connector</b>	4G-CAB-LMR240-75 4G-CAB-LMR240-75= (Spare)
<b>Standalone active SMA GPS antenna with 17-ft (5 m) extender</b>	GPS-ACT-ANTM-SMA GPS-ACT-ANTM-SMA= (Spare)
<b>C819 Power Cable Lock 25 units spare</b>	C819-PWRCAB-LCK25= (Spare)
<b>Multiband Omni-Directional Stick Outdoor 4G Antenna</b>	ANT-4G-OMNI-OUT-N
<b>Multiband Low-Profile Saucer Outdoor 4G Antenna</b>	ANT-4G-SR-OUT-TNC
<b>Multiband Panel Outdoor 4G Antenna</b>	ANT-4G-PNL-OUT-N
<b>50-ft (15 m) Ultra Low Loss LMR 400 Cable TNC-N Connector</b>	CAB-L400-50-TNC-N
<b>20-ft (6 m) Ultra Low Loss LMR 400 Cable with TNC-N Connector</b>	CAB-L400-20-TNC-N
<b>20-ft (6m) Ultra Low Loss LMR 400 Cable with N Connectors</b>	CAB-L400-20-N-N
<b>Lightning Arrestor Kit: female to female</b>	CGR-LA-NF-NF
<b>Lightning Arrestor Kit: male to female</b>	CGR-LA-NM-NF
<b>4G LTE Lightning Arrestor</b>	4G-ACC-OUT-LA 4G-ACC-OUT-LA= (Spare)

\* –N antenna works with –N cables and –N lightning arrestor

## For More Information

For more information about the Cisco 819 ISRs, visit <http://www.cisco.com/go/m2m> or contact your local Cisco account representative.

For more information regarding the Cisco 800 Series ISRs and options, contact your Cisco representative or go to <http://www.cisco.com/go/isr>.

For –N antenna and cable installation guidance, visit <http://www.cisco.com/en/US/docs/routers/connectedgrid/antennas/installing/overview.html>

## Cisco and Partner Services for the Enterprise Networks Architecture

Enable the Cisco Enterprise Networks Architecture and the business solutions that run on it with intelligent, personalized services from Cisco and our partners. Backed by deep networking expertise and a broad ecosystem of partners, these services can help you plan, build, and run a network that enables you to expand geographically, embrace new business models, and promote business innovation. Whether you are looking to transition to a Cisco Enterprise Networks Architecture, solve specific business problems, or improve operational efficiency, we have a service that can help you get the most from your IT environment. For more information, please visit <http://www.cisco.com/go/services>.

## Warranty Coverage and Technical Service Options

The Cisco 819 Integrated Services Routers come with the Cisco 1-year limited hardware warranty. Adding a contract for a technical service offering such as Cisco Smart Net Total Care<sup>®</sup> Service provides benefits not available with the warranty, including access to OS updates, Cisco.com online resources, and Cisco Technical Assistance Center (TAC) support services. Table 8 shows the available technical services.

For information about Cisco warranties, visit <http://www.cisco.com/go/warranty>.

For information about Cisco Technical Services, visit <http://www.cisco.com/go/ts>.

**Table 8.** Cisco Technical Services for Cisco 819 Integrated Services Routers

Technical Services
<b>Cisco Smart Net Total Care Service</b> <ul style="list-style-type: none"><li>• Global access to the Cisco TAC 24 hours a day</li><li>• Unrestricted access to the extensive Cisco.com resources, communities, and tools</li><li>• Next-business-day, 8 x 5 x 4, 24 x 7 x 4, and 24 x 7 x 2 advance hardware replacement<sup>1</sup> and onsite parts replacement and installation available</li><li>• Ongoing operating system software updates within the licensed feature set<sup>2</sup></li><li>• Proactive diagnostics and real-time alerts on Smart Call Home-enabled devices</li></ul>
<b>Cisco Smart Foundation Service</b> <ul style="list-style-type: none"><li>• Next-business-day advance hardware replacement as available</li><li>• Business-hours access to small and medium-sized business (SMB) Cisco TAC (access levels vary by region)</li><li>• Access to Cisco.com SMB knowledge base</li><li>• Online technical resources through Smart Foundation Portal</li><li>• Operating system software bug fixes and patches</li></ul>

<sup>1</sup>Advance hardware replacement is available in various service-level combinations. For example, 8 x 5 x next business day (NBD) indicates that shipment will be initiated during the standard 8-hour business day, 5 days a week (the generally accepted business days within the relevant region), with NBD delivery. Where NBD is not available, same-day shipment is provided. Restrictions apply; please review the appropriate service descriptions for details.

<sup>2</sup>Cisco operating system updates include maintenance releases, minor updates, and major updates within the licensed feature set.



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