FUJITSU

BroadOne™ LS 100
Residential Femtocell

The BroadOne LS 100 residential femtocell delivers field-proven, interoperable 4G/LTE. Already widely deployed, this femtocell also offers unparalleled interference management and signal quality.

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High-Quality Residential LTE Wireless Access

The Fujitsu BroadOne™ LS 100 series femtocell is a small and lightweight indoor base station that provides high-quality wireless access in residential areas. The femtocell offers unique interference control capabilities, high-efficiency frequency usage, and excellent voice quality. Overall, the BroadOne LS 100 femtocell not only reduces operations cost for mobile service providers, it also delivers a unmatched user experience to subscribers.

Plug-and-Play
The BroadOne LS 100 femtocell has a plug-and-play function that enables simple automatic installation when the unit is connected to a broadband network. The Wi-Fi capability for the femtocell performs seamless handover between LTE and Wi-Fi, which enables dynamic traffic offloading.
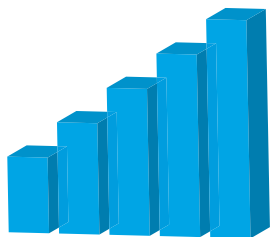
Voice over LTE
The Fujitsu BroadOne LS 100 femtocell supports Voice over LTE (VoLTE). This relieves the cell of simultaneous voice calls. VoLTE efficiently and seamlessly handles all simultaneous calls based on network capacity, whereas 3G systems typically only provide a best-effort approach for handling simultaneous calls.

The femtocell utilizes a high-priority Quality of Service (QoS) channel for voice to ensure that the quality is sufficient to support the voice call over other "best effort" services. Since VoLTE utilizes Voice over IP (VoIP), it can sustain better voice fidelity than traditional 3G voice, as the sampling rate can be significantly higher than the 3G voice sampling, thus providing high-quality voice connections, assuming the data channel is sufficient. Since VoLTE is utilizing another data channel within the LTE link, it has the ability to extend the battery life of the user equipment (UE) over other femtocell products that utilize only 3G voice.

Superior User Experience
In addition to operations cost savings for service providers, the BroadOne LS 100 femtocell can enhance residential customer loyalty and retention by increasing end-user service quality. The femtocell offers full 4G access, five-bar indoor coverage, and faster mobile data service, especially among high-end subscribers who operate multiple smart devices in their homes.
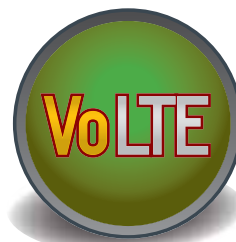
**5 BARS
All The Time**
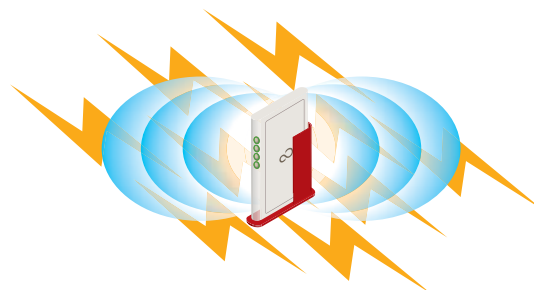
Reduced Interference

**Faster
Data Rates**

**Voice over
LTE**

Features and Benefits

Interference Control and Optimal RF Resource Allocation

The Fujitsu BroadOne LS 100 series femtocell uses a cognitive and learning mechanism, which can directly measure interference or measure the interference situation via the User Equipment (UE) feedback, and make intelligent decisions on radio frequency (RF) resource allocation. The interference control algorithms require no assistance from macrocells or neighboring femtocells. The femtocell itself makes multiple measurements, including information from the UE, enabling the femtocell to learn the current interference situation on the downlink and uplink, in addition to the current locations of UE. From these, the RF resources are allocated in an optimum way to maximize the capacity and minimize the interference. There are four main interference control mechanisms:

- Power control
- Timing control
- Frequency/bandwidth control
- Switching control

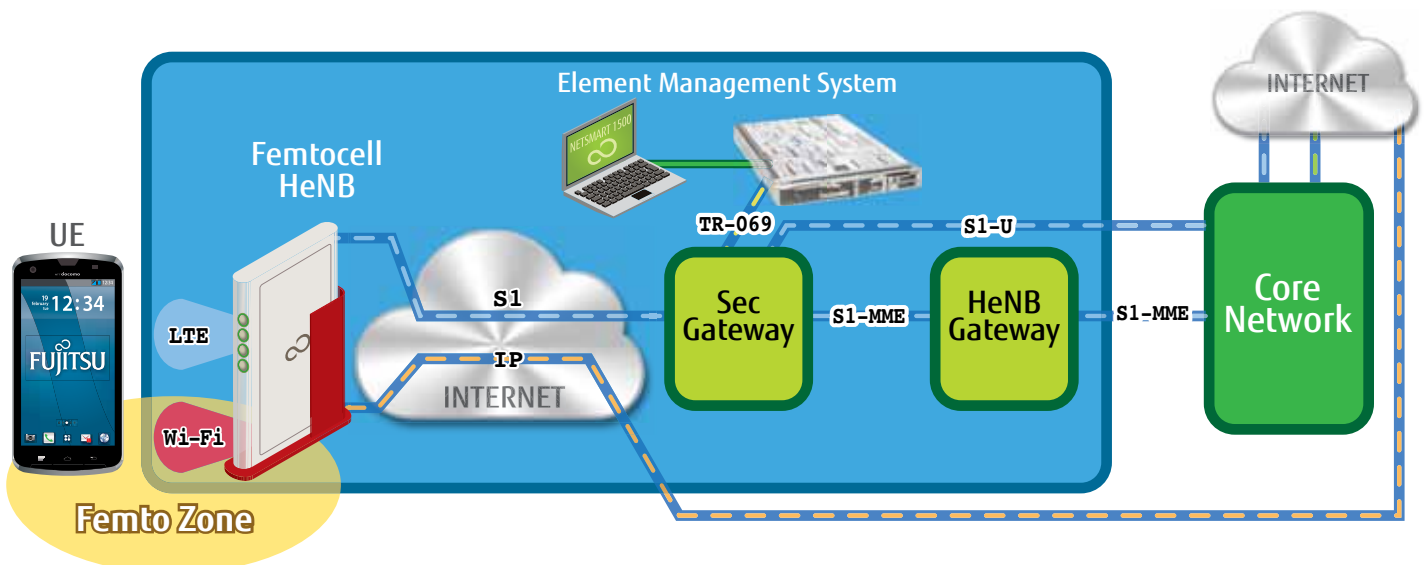## Plug-and-Play and Self-Configuration

The BroadOne LS 100 femtocell provides plug-and-play self-configuration functionality. This auto-configuration capability enables service providers to put the femtocell into service on the network and configure the necessary parameters automatically without any action from the customer.

Installation can be accomplished in three easy steps, after which the femtocell is ready for service use:

1. Connect the Ethernet cable.
2. Power on the femtocell.
3. Wait for the system to complete auto configuration
   - Auto configuration consists of femtocell authentication, IPSec security tunnel and software/configuration download.

Wi-Fi Interworking

With Wi-Fi interworking functionality, the femtocell allows local IP access between IP UE devices on the same LAN. The femtocell enables interworking of both LTE and Wi-Fi technologies without burdening the network with its traffic load. Wi-Fi Interworking also allows LTE to work simultaneously with Wi-Fi devices.

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Features and Specifications

System Overview	LTE	• AWS, 700 MHz RF
		  8 users
		  5, 10 and 15 MHz bandwidth
		• 2x2 MIMO downlink for improved coverage/capacity
		• Uplink diversity for improved coverage/capacity
		• Circuit Switched Fallback (CSFB)
		• Interference control (power/timing/bandwidth/switching) and interference management
		• Voice over LTE
		• Up to 37 Mbps @ 5 MHz,
		  Up to 75 Mbps @ 10 MHz and
		  Up to 112 Mbps @ 15 MHz (DL) LTE throughput
		• Interworking with Wi-Fi
		• Plug & play

	Wi-Fi	• Dual-band 2.4 GHz and 5 GHz RF • MIMO downlink for improved coverage/capacity • Interworking with LTE • Up to 54 Mbps @ 802.11g and up to 300 Mbps @ 802.11n • Wireless security (WPA2, WPA-PSK, 128/64-bit WEP)
	HeNodeB Gateway	• Supports 186,000 FAP (Femto Access Points) • S1 control plane termination (SCTP/S1-AP) • S1 user plane traffic offload (3GPP TR 23.829) • 10 Gbps throughput • MME LTE/4G, Wi-Fi, 3G support • 40 Gbps (packet processing performance/blade) • RTM hard disk drive • Redundant power supply • Fan cooling • 13U chassis with 14 slots (12 packet blades + 2 switch blades) • Advanced TCAR standard (PCIMG3.0) compliant • Ipv4/IPv6 Support (per RFC 1883) • Paging Optimization • Closed/Hybrid/Open Mode Handover • MOCN (S1/X2)

System Overview (continued)	HeNB EMS	• Remote control (reboot/reset/shut down) • Performance management/ maintenance • Alarm & fault management • Security management • Supports up to 1,000,000 FAP • 3G/LTE/Wi-Fi tri-mode support • 3GPP Release 9 compliant • HTTP/TLS/SOAP/TR-069 (CWMP)/ SNMP support • Wi-Fi tunneling • System event records • TR-069 RPC configuration management • Software download • Inventory information management • System scheduling management • Supervisory control management • Subscriber management • Northbound Interface support • Daylight savings time
Available Interfaces	Femtocell	• LTE AWS, 700 MHZ RF interface • Wi-Fi 2.4 and 5 GHz dual-band RF interface • LAN Ethernet (RJ45) • External GPS antenna (1575.4 MHz) • AC/DC power connector • Backhaul 100Base-T/1000Base-T interface
Operating Environment	Femtocell	• Temperature: 32–122° F (0–50 °C) • Humidity: –5 to 95% non-condensing • Indoor environment
	AC adapter	• Temperature: 32–104° F (0–40 °C) • Humidity: –5 to 95% non-condensing • Indoor environment
Maximum Power Consumption (heat dissipation)	Input power	100–240 VAC
	Femtocell power consumption	13.5 W (46.0 BTU)
	LTE output power	10 mW per carrier @10 MHz (0.00056 BTU)
	Wi-Fi output power	5 mW per MHz (0.00028 BTU)
	AC adapter output voltage	12 VDC (+/– 5%)

Features and Specifications

Physical Characteristics (H x W x D)	Femtocell	• Dimensions: 8.66" x 5.12" x 0.98" (220 mm x 130 mm x 25 mm) • Weight: 1.8 lbs (700g)
	AC adapter	• Dimensions: 7.5"x 3.52" x 1.8" (189.5 mm x 89.5 mm x 45.5 mm) • Weight: 1.15 lbs (521g)
Regulatory and Standards Compliance	• FCC/IC - FCC Title 47 Part 2, Part 15 (Class B), Part 24, Part 27, Part 68/ ICES-003 • UL/CE - UL 60950-1/CISPR 22 • Safety - UL 60825-1/60825-2 • 3GPP Release 9 • IEEE 802.11 a, b, g, n (Wi-Fi)	

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