

# E500 – Reverberation Chamber

## Passive, Active and Time-Domain MIMO OTA Testing

### 690 MHz to 6 GHz

### Main Features

- Dimensions: 2750 mm (L) x 1545 mm (W) x 2000 mm (H)
- Mains power: 100-240 VAC 50-60 Hz
- Authorized for AT&T 10776 R57 (19091) testing
- MIMO Graphic User Interface (GUI) for Windows
- Fully automated measurements with control of VNA, eNodeB, CE and AP
- 2G/3G SISO/TxD/MIMO OTA
- WLAN, 4G, Bluetooth, M2M, W-IoT, wearables and LTE-A CA MIMO OTA
- Up to 256QAM 4x4 MIMO OTA x 4DL CC Carrier Aggregation testing
- Up to 8x8 Antenna MIMO testing
- Time-domain measurements
- Windows, Android, iOS, MacX, Linux, UWP and Tizen UE apps
- Hierarchical levels of automated testing
- Data interface: USB, GPIB, Ethernet (TCP/IP)
- RF isolation (shielding): ~ 100 dB
- Enhanced repeatability with autocalibration
- SMA, USB, RJ45 and AC/DC power supply connectors on turntable (optional)
- DB9/RJ45/FO/USB/Waveguide penetrations (optional)
- AC/DC filters for DUT power supply (optional)
- Can be served in pieces and re-assembled in-situ (optional)



### Measurement system

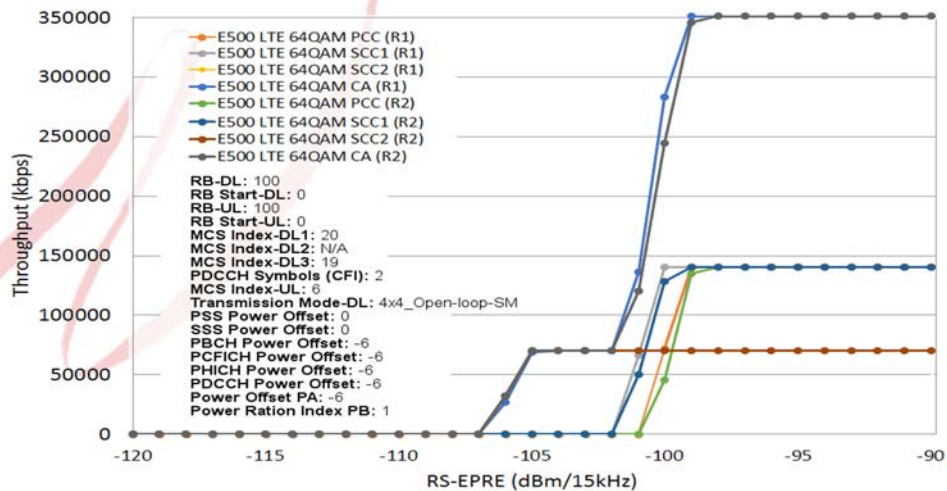
The E-Series E500 is a multicavity mode-stirred source-stirred reverberation chamber that provides the testing capabilities of its I-Series counterpart plus unique up to 8x8 passive mode MIMO measurement capabilities [Efficiency, Correlation, Mutual Coupling, MIMO Capacity, Diversity Gain (ADG, EDG, IDG), loss effects (DGL, CL.MIMO), Mean Effective Gain (MEG), Effective MEG (EMEG), Branch Power Ratio (BPR)], active MIMO Over-The-Air (OTA) 3GPP/CTIA Figures of Merit for WLAN (including ac), 2G, 3G, 4G cellular including CA up to 256QAM 4x4 MIMO x 4DL CC and any wireless LAN system (Total Radiated Power (TRP), Total Isotropic Sensitivity (TIS), MIMO Throughput (TPUT), CQI, MIMO TIS and MIMO TRP), time-domain measurements [VDT-OTA, RMS Delay Spread (RMS DS), Power Delay Profile (PDP), Coherence Bandwidth (CBW), Path Loss (PL), Standard Deviation (STD), TCP/UDP Throughput versus time, path loss or averaged received power in both downlink and uplink paths] and channel parameters (PDF, CDF, Scatterplot, K-factor, eigenvalues) for a wide variety of Rayleigh, Rician, NIST Indoor-Urban, isotropic SCME Urban-Macro<sup>#</sup>, isotropic SCME Urban-Micro<sup>#</sup> and other fading environments, all united in one single and intuitive interface.

Typical testing times are under 1 minute for TRP and 6 minutes for TIS\*. Typical accuracies are under 0.5 dB STD\*.

All Cellular standards to date

All Wireless standards to date

EMITE test systems are now used at major operators, OEMs, test labs and antenna manufacturers, with presence in America, Europe, Asia and Oceania.



LTE-A 3DL CC MIMO OTA TPUT test with 4x4+4x4+2x2 MIMO using a smartphone and E500, exhibiting ~350 Mbps total Throughput and very good repeatability.

The E500 mode-stirred reverberation chamber has participated in several 3GPP and CTIA standardization bodies LTE MIMO OTA and M2M SISO OTA Round Robin campaigns as candidate test methodology.

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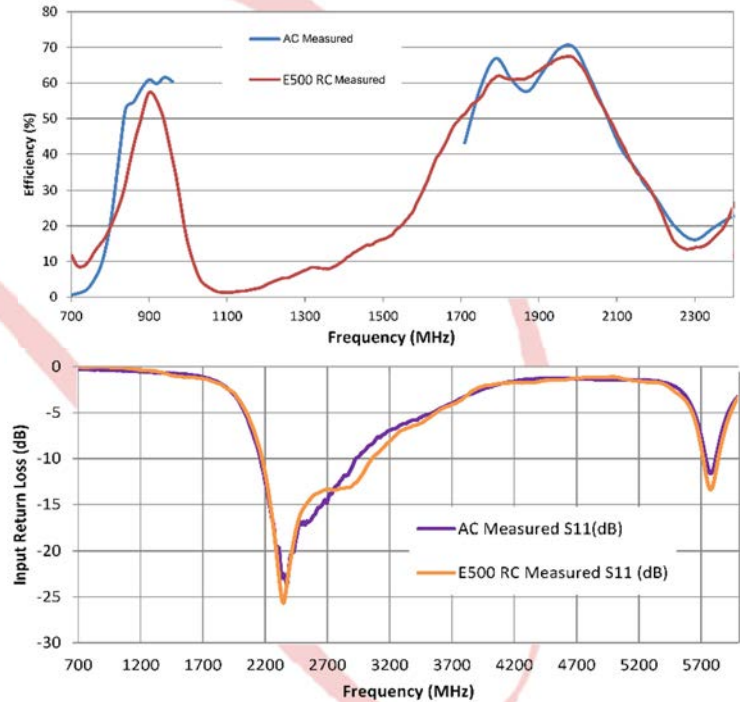
## Unique Features – only with EMITE

- Largest available list of testable Figures of Merit
- Testing overnight without human intervention for both cellular and WLAN technologies
- One-shot calibration for all frequency bands and technologies with one single VNA measurement
- No-VNA calibration method (without the need for a VNA) yielding  $\pm 0.1$  dB STD accuracies
- Regular and Downlink power inverse TPUT averaging procedures
- Easy Attachment, Smart Attachment, Smart hand-over, Early-Stop and Smart call-drop handling algorithms
- Stepwise and continuous stirring
- On-line assistance & 24h/365d Support
- Import/Export calibration files facilities
- MIMO Throughput Sensitivity (MTS) search

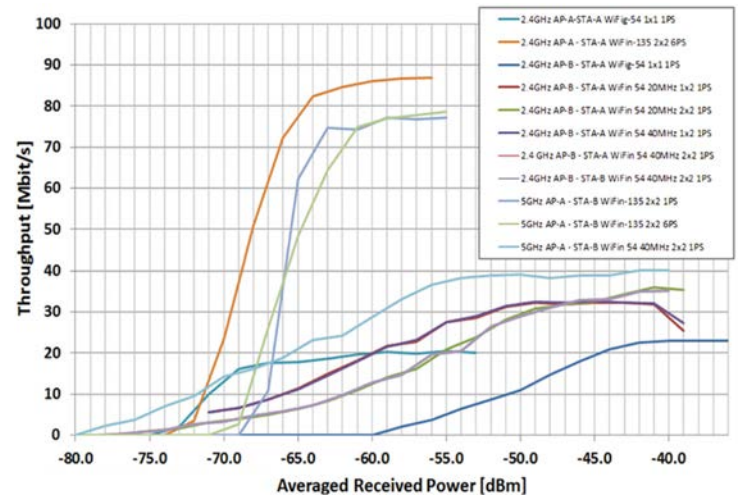
## Additional deliveries according to customer's specifications

- 17025-Accredited calibration
- Programming drivers of user-selected auxiliary test equipment and Access Points
- Installation of hardware and software
- Full day course to operating personnel
- Precision discone reference antennas
- SPEAG Phantom packages
- Absorbers for chamber loading
- Chamber Turntable with integrated SMA, USB, RJ45 and AC/DC power supply connectors
- Device Under Test Holders
- 3.5mm Calibration kit
- Acoustic Quality Testing
- Wide variety of support and maintenance options

Radiation efficiency and Total radiation efficiency of two different antennas



Different TCP Throughputs versus averaged received power measured with E500 for IEEE 802.11g and 802.11n standards at 2.4 and 5 GHz with different MIMO antenna configurations and for two different Access Points and two different STATIONS



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The products are patent protected

\*Using novel source-stirring in LTE  
#In combination with a channel emulator.  
Please note that ITU-R completed the assessment of true 4G technologies for LTE-Advanced and WirelessMAN-Advanced, which left 808.11n, WiMAX, HSPA+ and LTE as 3.99G, as reported by the ITU-R Study Group 5



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EMITE. Edif. CEDIT. Parque Tecnológico Fuente Álamo. Ctra. El Estrecho-Lobosillo km 2  
E-30320 Fuente Álamo de Murcia. ESPAÑA / SPAIN

Tel. +34 968 100 181 | Fax +34 968 100 381 | sales@emite-ing.com