

F200 Large Hybrid Reverberation/Anechoic Chamber

MIMO OTA, WIoT, EMC, DFF, PNF, SNF, CATR, 3GPP/CTIA/PTCRB testing

200 MHz to 220 GHz

The F200 large-size hybrid Reverberation/Anechoic Chamber represents the most versatile and advanced OTA test system in the market today. The F200 can test large form-factor DUTs of up to 2m and 500kg for up to 16x16 MIMO and 8DLCC and 4UL CC, including full-body phantoms, a turntable, and a five axis positioner. Test modes include Direct Far Field, Spherical or Planar Near Field and Compact Antenna Test Range for antenna and 3GPP/CTIA/PTCRB OTA testing in both RC and AC modes for a unique frequency bandwidth with an unprecedented level of automation and report.

Main Features

- Dimensions: 5.1 m (L) x 4.1 m (W) x 3.1 m (H) (Custom-extendable)
- RC Mode 200 MHz to 6/18/40 GHz
- AC Mode 200/600 MHz to 18/40/60/110/220 GHz
- DUT Weight: up to 50/200 kg (500/1000kg optional)
- RC silent operation of stirrer and turntable
- Graphic User Interface (GUI) for Windows OS
- Mains power: 100-240 VAC 50-60 Hz
- DUT plugged-in (100-240 v 16A AC)
- Best isotropy (0.5 dB STD) and repeatability (0.25 dB STD) on the market¹
- Integrated Automatic Vector Network Analyzer and Base Station Emulator control
- Compatible with integrated Channel Emulators for enhanced fading emulation
- Penetration filters (USB, RJ45, FO, DB9, AC, DC)
- Waveguide trap-door
- RF isolation (shielding): ~100 dB
- MIMO Antenna Studio, MIMO Analyzer Studio and MIMO RCS studio for results analysis and customized reports

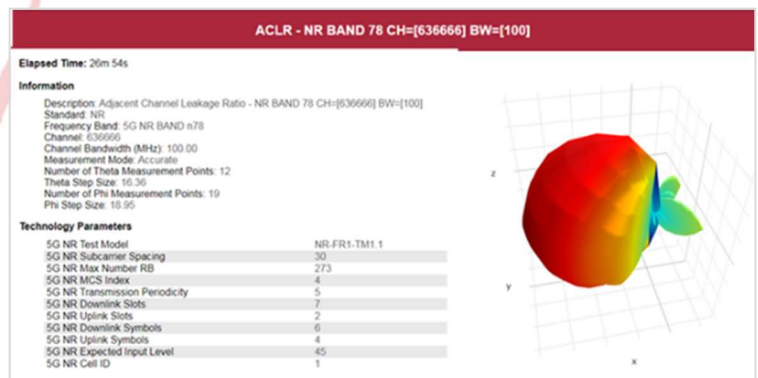


Measurement system

The F200 is a hybrid large-size test platform with both reverberation and anechoic chamber modes. The F200 has the same unique test features of its E-Series RC counterparts, and it is also reverse-convertible into an anechoic chamber, allowing Direct Far Field (DFF), Spherical/Planar Near Field (SNF/PNF) and Compact Antenna Test Range (CATR) tests of antennas and standardized key performance indicators (KPIs) for 3GPP, CTIA and PTCRB. Conversion from RC to AC or vice versa can be performed within half a day.

In RC Mode, large form-factor devices (dimension larger than 42cm) under test (DUTs) like laptops, large TV sets, solar and trash compactors, drones, car cockpits, fridges or washing and vending machines can be tested, among others. With RC Test Volumes¹ up to 4.5 m³, the F200 is able to efficiently measure Efficiency, Correlation, Diversity Gain, MIMO Capacity, TRP, TIS, TPUT, CQI, MTS, M2TxDT of antennas and devices with extreme accuracy, unheard-of repeatability and with the shortest signalling test times in the market using a single and intuitive Graphic User Interface. Wearables, W-IoT, MTC and EMC testing can also be made with F200 in RC Mode. Unique Smart-Attachment, Smart hand-over, Smart call-drop and Early-stop embedded EMITE

algorithms allow for an unprecedented control and automation of your Active OTA measurements using F200, which can be run overnight without human supervision for up to 16x16 and 8DLCC. Coexistence test of 2G/3G/4G/5G and real eNodeB/gNodeB testing or VDT-OTA is also possible. Typical testing times are under 1 minute for TRP and 3 minutes for TIS². In-house pre-calibrated isotropy of 0.5 dB and STD deviation of 0.25 dB are typical². The CTIA-approved Large Form Factor Test Plan was developed using F200 as a test platform



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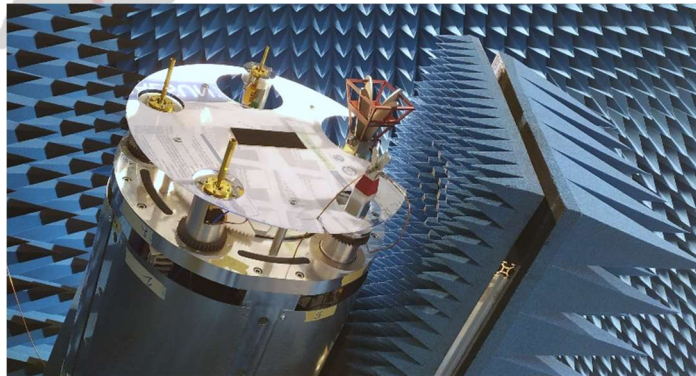
MIMO OTA, WiOT, EMC, DFF, PNF, SNF, CATR, 3GPP/CTIA/PTCRB testing

200 MHz to 220 GHz

for validation, and can be used for the GSM, GPRS, EGPRS, WCDMA, CDMA 1xRTT, CDMA 1xEVDO, LTE, NTN NB-IoT and 5G (EN-DC, NR-DC, SA, SA CA, NR RedCap) cellular standards.

In AC Mode the F200 can test antennas under test (AuTs) up to 2m and 1000kg, in Direct Far Field (DFF), Planar and Spherical Near Field (PNF/SNF) and Compact Antenna Test Ranges (CATR) to provide for efficiency, gain, 2D & 3D radiation patterns measurements and all the standardized 3GPP (in chapters 6 and 7 of TS.38.521-1/2/3), CTIA and PTCRB 4G and 5G OTA testing key performance indicators (KPIs) for up to 220 GHz.

The CATR mode can include a unique fully-automated antenna feed carousel (optional), capable of testing non-stop in both vertical and horizontal polarizations from 1 GHz up to 220 GHz, saving days of manual changes normally required to make a complete set of measurements. gNodeB OTA testing is accomplished with just the push of a button, operating overnight without supervision. The system uses an automated vector signal generator, vector signal analyzer and test algorithms, with the measurements controlled by the system's software and graphical interface. The carousel rotates several antennas to the CATR focal point and uses an embedded mmWave down conversion hardware module developed by EMITE that integrates mmWave oscillators, switches, amplifiers, multipliers, mixers and combiners to create several RF paths with various signal levels to measure OTA to 220 GHz. The separate RF paths protect the test instruments from excessive input power and maintain the link budget for spurious emissions testing (worst case). The antenna



carousel can be combined with a "barbecue" positioner for the base station being tested, which enables automated loading and unloading of heavy equipment at the chamber entrance.

Key Features

- Friendly single Graphic User Interface (GUI)
- Full control and automation of test instruments
- User-defined PASS/FAIL criteria and evaluation
- Smart-attachment, smart call-drop handling, smart hand-over control to allow different figures of merit, different technologies and different frequency bands within the same test batch
- OTA testing 24/7 from 30 MHz to 220 GHz including Spurious Emissions
- 5G Base Station Testing
- Radar Cross Section (RCS) testing

Optionals

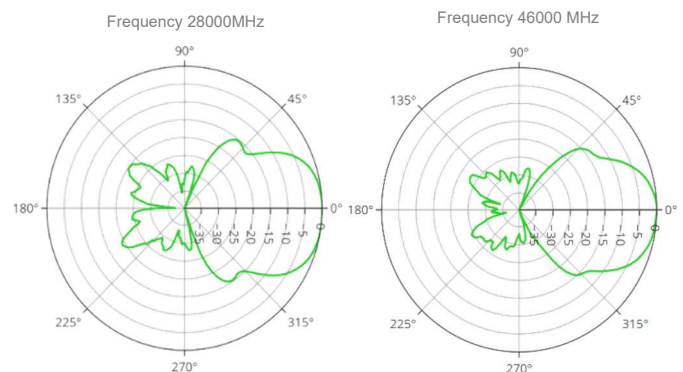
- Chamber Size Extensions
- Control room
- Ad-hoc adaptation to room restrictions
- AuT/DuT weight Extension up to 500/1000 kg
- Extension for EMC Testing (IEC 61000-4-21, RTCA DO-160)
- Motorized floor/upper slides
- Automated 2.5m sliding door and flushed entrance
- Removable absorber lining
- CCTV monitoring
- 8-h response support hotline
- ISO17025 certification

¹ Using novel source-stirring in LTE @ 751 MHz

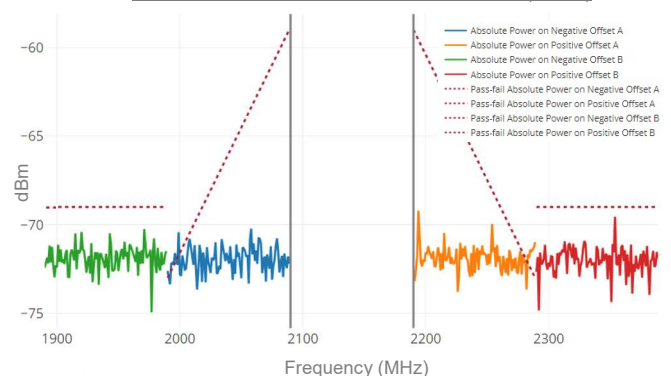
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2D Radiation Patterns



Out of Band Unwanted Emission measurement (OBUE)



www.emite-ing.com

EMITE, Parcela 2.3R, 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