

**Anritsu** envision : ensure

# 5G Solutions Catalog

2019 Vol. 2





Anritsu continues,

**Timely, optimum, high-quality measurement solutions**  
**Extensive lineup and experience from Wireless to Wired leading to 3G, 4G to 5G**  
**Measurement solution corresponding to the utilization of 5G technology such as IoT, Automotive**

We will contribute to customer's 5G product development and future innovation of network.

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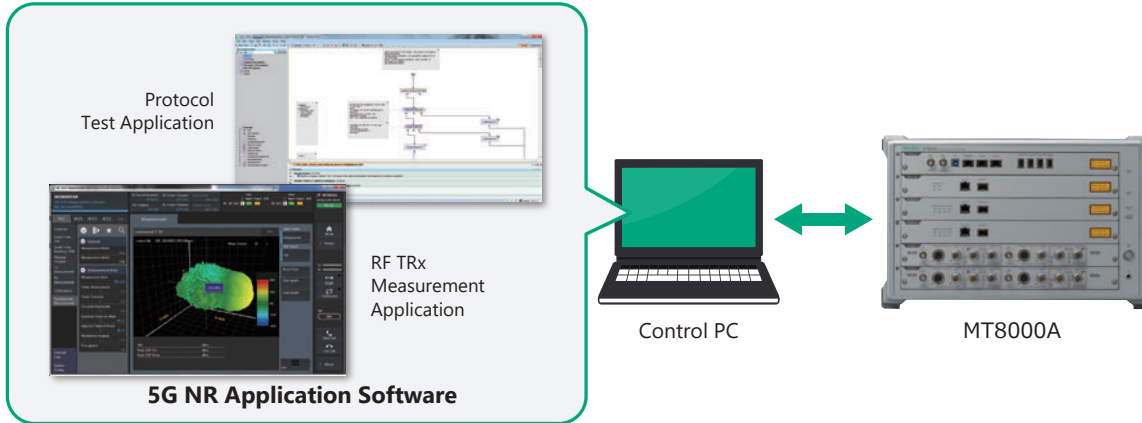
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# Total Evaluation of 5G NR Chipsets and Device RF/Protocol Performance

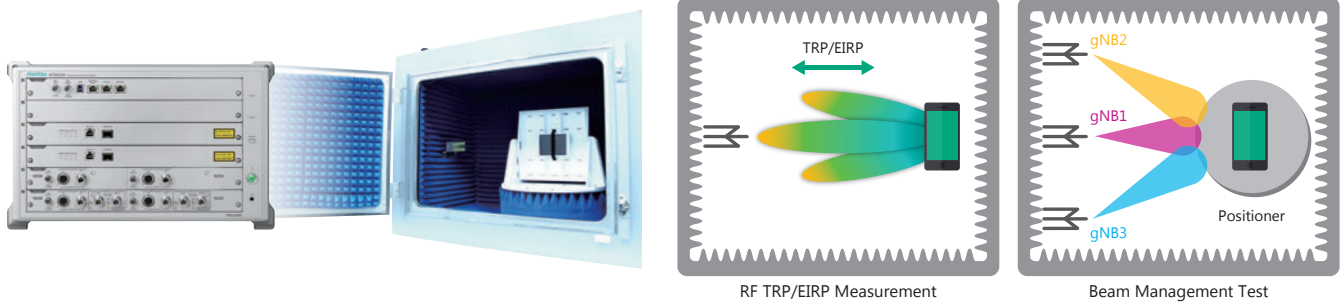
## Radio Communication Test Station MT8000A

### All-in-One 5G RF Measurements and Protocol Tests

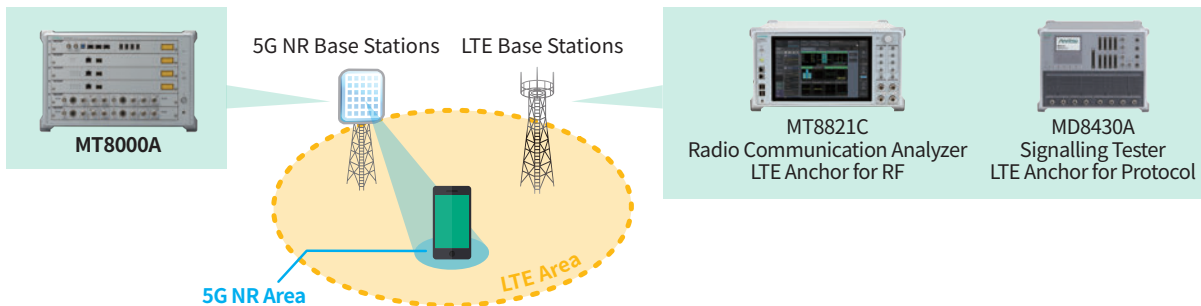
- RF/Protocol Tests with Choice of Measurement Modules for Test Applications



- From Sub-6 GHz to mmWave — RF Measurements and Beam-Forming Tests



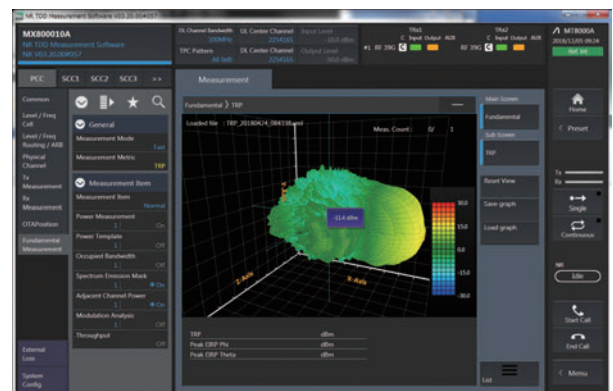
- Supports Current LTE Test Applications with Easy 5G-to-LTE NSA (Non-Standalone) Test Environment Configuration



- RF Tests Using Easy-to-Use High Visibility GUI



Occupied Bandwidth



Total Radiated Power (TRP)

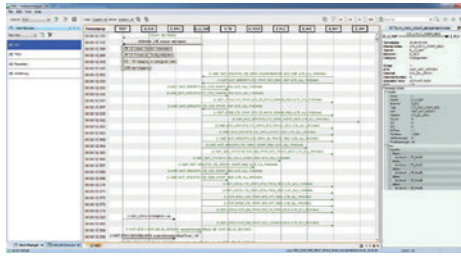
# Total Evaluation of 5G NR Chipsets and Device RF/Protocol Performance

## Radio Communication Test Station MT8000A

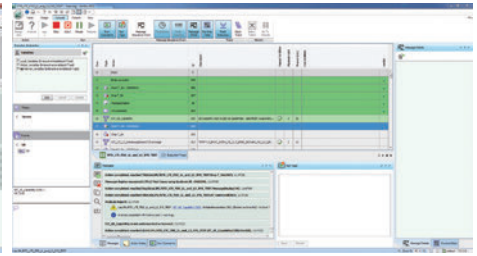
- Powerful Automated Protocol Test Support



Test Execution Screen (RTD)



Log Analysis Screen (RTD)



Consecutive Test Case Execution Example

<https://www.anritsu.com/test-measurement/products/mt8000a>



## OTA Solutions for 5G NR Terminal Tests and Measurement Applications

- Shield Box MA8161A**
- RF Chamber MA8171A**
- CATR Anechoic Chamber MA8172A**

MA8161A: Simple OTA environment for mmWave protocol tests

MA8171A: Integrated RF/Protocol test and measurement OTA environment for beam management, etc.

MA8172A: 3GPP-compliant Compact Antenna Test Range (CATR) method for mmWave R&D and Conformance tests

Main Specification	MA8161A	MA8171A	MA8172A
Frequency	600 MHz to 6 GHz 24 GHz to 43.5 GHz	800 MHz to 3.8 GHz 24 GHz to 40 GHz	600 MHz to 87 GHz
Dimensions (mm)	434 (W) × 271 (H) × 328 (D)	Main Frame Only 1460 (W) × 1210 (H) × 1000 (D) With Stand 1460 (W) × 1785 (H) × 1000 (D)	2200 (W) × 1980 (H) × 1200 (D)

\* Range when frequency set to standard; excluding projections

<https://www.anritsu.com/test-measurement/mobile-wireless-communications/shield-box>



MA8161A



MA8171A



MA8172A

## 5G NR Signal and Modulation Analyses

### Signal Analyzer MS2690A/91A/92A Signal Analyzer MS2850A Vector Signal Generator MG3710E

#### Efficient and Accurate Evaluation of 5G Base Stations and UE RF Characteristics

- Excellent absolute amplitude accuracy, modulation accuracy and analysis bandwidth
- Optimum dynamic range with one-button EVM measurement
- Supports 5G NR as well as LTE/LTE-A and WAN digital modulation analysis

The high-end Spectrum Analyzer MS2690A/91A/92A features excellent dynamic range for analysis of 5G NR Sub-6 GHz uplink and downlink signals as well as measurement of RF characteristics in combination with the 5G Measurement Software MX269051A (basic license).

The 3GPP TS 38.211, TS 38.212, and TS 38.213 5G NR FR1 waveform patterns can be generated using the 5G NR TDD Sub-6 GHz MX269913A software of MS2690A/91A/92A or the Vector Signal Generator MG3710E.

With an analysis bandwidth of 1 GHz max. and a frequency range of 9 kHz to either 32 GHz or 44.5 GHz, the low-cost Spectrum/Signal Analyzer MS2850A offers excellent cost performance for microwave and mmWave band communications systems, such as 5G. The built-in 5G measurement software in combination with a maximum analysis bandwidth of the 1 GHz, excellent amplitude and phase flatness performance, and wide dynamic range support efficient, detailed and high-accuracy, efficient measurements.

<https://www.anritsu.com/test-measurement/products/ms2850a>



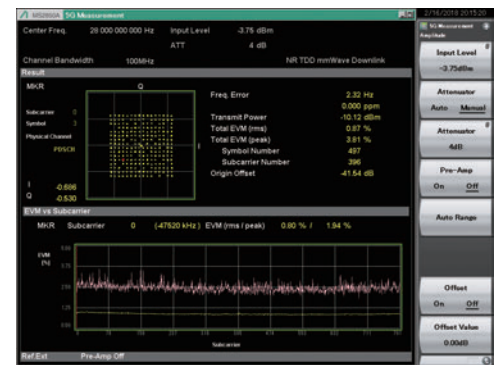
<https://www.anritsu.com/test-measurement/products/mg3710e>



Signal Analyzer MS2850A



Vector Signal Generator MG3710E



Basic MS2850A Measurement Screen (EVM vs. Subcarrier)

## 5G NR Passive Device Evaluations

### ShockLine Vector Network Analyzer (VNA) Series



#### Compact, Low-Cost VNA for S-Parameter Measurement and Time Domain Analyses

- Low cost compared to conventional VNA
- Compact design for easy use on production lines and laboratory benchtops

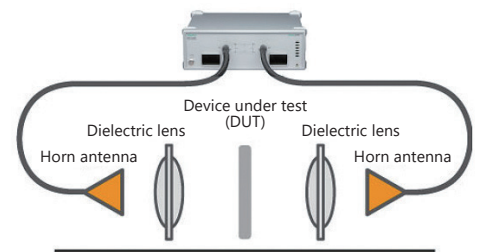
The Vector Network Analyzer ShockLine™ series is targeted at S-parameter measurements of RF, microwave, and mmWave components and devices as well as time-domain analyses. Its compact size and low cost make it ideal for both production-line and RND applications.



#### Usage: Measurement of material dielectric constant and loss tangent

- Configuring measurement systems using free space method without requiring anechoic chamber
- Measuring dielectric constant and loss tangent of materials used by 5G, etc.

<https://www.anritsu.com/test-measurement/support/resource-center/shockline>



## 3GPP RF Conformance Tests

### New Radio RF Conformance Test System ME7873NR

#### For 5G with 3G and 4G Reliability

- Supports 3GPP TS 38.521/TS 38.533 defined 5G NR RF and RRM tests
- Supports both 5G NR standalone (SA) and non-standalone (NSA) modes
- Configure 5G NR Sub-6 GHz and mmWave band OTA test environment in combination with CATR Anechoic Chamber MA8172A
- Upgradable from MR7873A supporting W-CDMA/LTE/LTE-Advanced (LTE-A)/LTE-A Pro RF and Carrier Acceptance Tests (CAT)
- Easy customized RF test system configuration matching required conditions
- Registered with GCF/PTCRB as 5G NR test platform TP250 to support early time to market (TTM) 3GPP compliant terminal deployment

#### CATR Anechoic Chamber MA8172A

- Uses 3GPP-compliant Compact Antenna Test Range (CATR) method
- 3-minute disassembly for transport with excellent portability and fast setup time

<https://www.anritsu.com/test-measurement/products/me7873nr>



ME7873NR

MA8172A

## 3GPP Protocol Conformance and Carrier Acceptance Tests

### 5G NR Mobile Device Test Platform ME7834NR

#### All-in-One Support for Both 5G NR Protocol Conformance Tests and Carrier Acceptance Tests

- Supports 3GPP TS 38.523 defined 5G NR protocol tests
- Supports both 5G NR standalone (SA) and non-standalone (NSA) modes
- Supports 5G NR Sub-6 GHz and mmWave band OTA tests in combination with RF Chamber MA8171A and RF converter
- Supports multiple Radio Access Technologies (RAT) including W-CDMA/LTE/LTE-Advanced (LTE-A)/LTE-A Pro, etc.
- Registered with GCF/PTCRB as 5G NR test platform TP250 to support early time to market (TTM) 3GPP compliant terminal deployment

#### RF Chamber MA8171A

- For both RF measurements and Protocol tests
- Configure automated 5G NR Protocol test system in OTA environment in combination with ME7834NR

<https://www.anritsu.com/test-measurement/products/me7834nr>



ME7834NR

MA8171A

# 5G NR Antenna Array Simulation and Field Environment Emulation

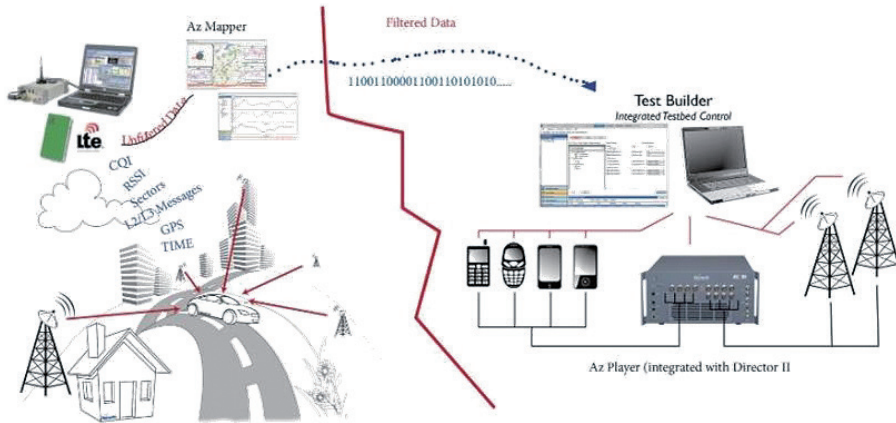
## Channel Emulator ACE-RNX

### Supports 3GPP, IEEE, etc., Fading Model Link Data

- 5G 3GPP RAN1 3D Channel Models (CDL Models A-E)
- 5G 3GPP TDL Channel Models, etc.

### Replay Field Measurement Environment from Captured Logs

Actual drive test logs can be replayed easily in carriers' and equipment vendors' laboratories.



Channel Emulator ACE-RNX  
Frequency: 380 MHz to 6000 MHz  
Bandwidth: ≤100 MHz

<https://www.anritsu.com/test-measurement/products/acernx>



## For 5G NR Device Production Lines

### Universal Wireless Test Set MT8870A

#### Complex Testing and Evaluation of Smartphones and Tablets Supporting 5G NR and Other Wireless Communications Standards

- Low-cost, high-speed measurement for production lines with futureproof expandability
- Supports various wireless communications standards in addition to 5G NR Sub-6 GHz

<https://www.anritsu.com/test-measurement/products/mt8870a>



# 5G Mobile Network eCPRI/RoE, Latency, and Clock Sync Measurements

## Network Master Pro MT1000A



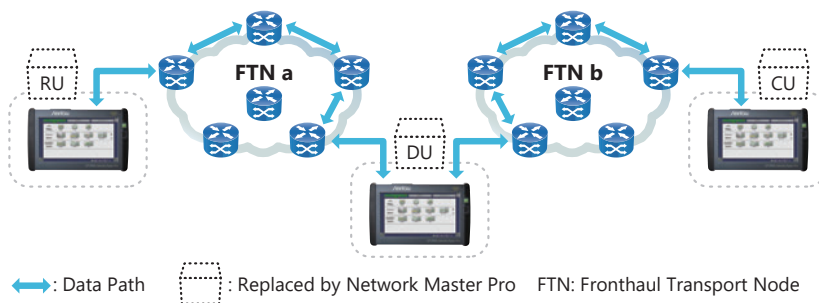
With support for the eCPRI/RoE, accurate latency, and PTP clock synchronization measurements, the Network Master Pro MT1000A is the ideal solution for deploying faster and lower-latency 5G mobile networks.

### eCPRI/RoE 25G Dual-Port Solution

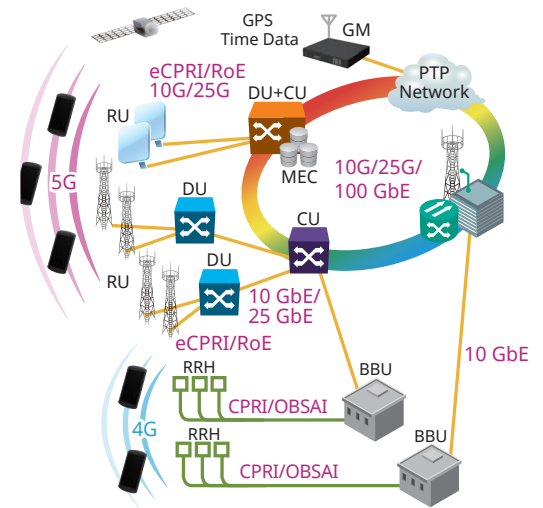
Support for 5G requires revisiting the configuration of existing fronthaul and backhaul network segments for conversion of packet-based protocols to eCPRI and RoE (Radio over Ethernet) technologies.

25G eCPRI/RoE Dual Port measurement (using MU100011A) offers high-accuracy one-way latency measurements of transport networks as well as efficient signal generation and analysis; uRLLC (ultra-low latency communications) tests are also supported.

These features play a key role in Fronthaul Transport Node (FTN) evaluations supporting Next Generation Fronthaul Interface (NGFI) configuration.



<https://www.anritsu.com/test-measurement/solutions/mt1000a-05/index>



## eCPRI/RoE Optical Module Evaluations

### BERTWave™ MP2110A



One unit supports both BER measurements of eCPRI/RoE optical modules used by 5G Mobile networks as well as Eye pattern analysis. The sampling oscilloscope covers both NRZ signals and PAM4 signals up to 53 Gbaud; Eye pattern analysis of CPRI to eCPRI/RoE bit rates is also supported.

#### Sampling Oscilloscope

- Install up to 4ch
- Fast speed of 250 ksamples/s max. for 1 million samples in about 5 seconds
- High sensitivity of -15 dBm (typ., SMF)
- Wide bandwidth: Optical 35 GHz (SMF) and 25 GHz (MMF); Electrical 40 GHz
- Low Jitter of 200 fs rms (typ.)
- Both NRZ and PAM4 signal analyses at up to 53 Gbaud for PAM4
- Built-in clock recovery unit supporting both NRZ and PAM4
- NRZ Jitter type analysis

#### BERT

- Install up to 4ch
- Low-Jitter (600 fs rms typ.) PPG
- High-Sensitivity (25 mV typ.) ED

<https://www.anritsu.com/test-measurement/products/mp2110a>





# Active Optical Device Evaluation

## Optical Spectrum Analyzer MS9740B

**Efficient Mass-Production of Active Optical Devices used by Optical Fiber Communications for Next-Generation 5G Mobile and Cloud Services**

**Simultaneous Wide Dynamic Range and Fast Measurements for Optical Rx Bandwidths used by Most Customers**

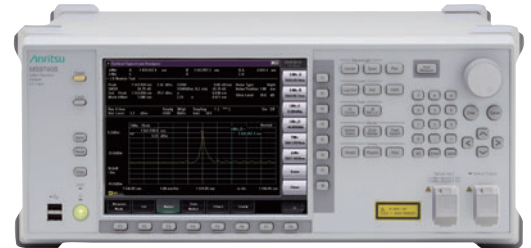
- SMSR measurement of better than 45 dB
- Fast measurement processing time\* (0.35 s for 30 nm wavelength sweep)

**Keeps Same Basic Performance and Functions as Previous Models for Production-Line Compatibility**

- Wide wavelength band (600 nm to 1750 nm) supporting evaluation of all active optical devices
- Measurement application menus for active optical devices, including LD modules, WDM, etc.

**All-in-One Support for SMF and MMF**

\*: Sweeping in Fast mode; continuous time for wavelength sweep, analysis, and transfer to remote server



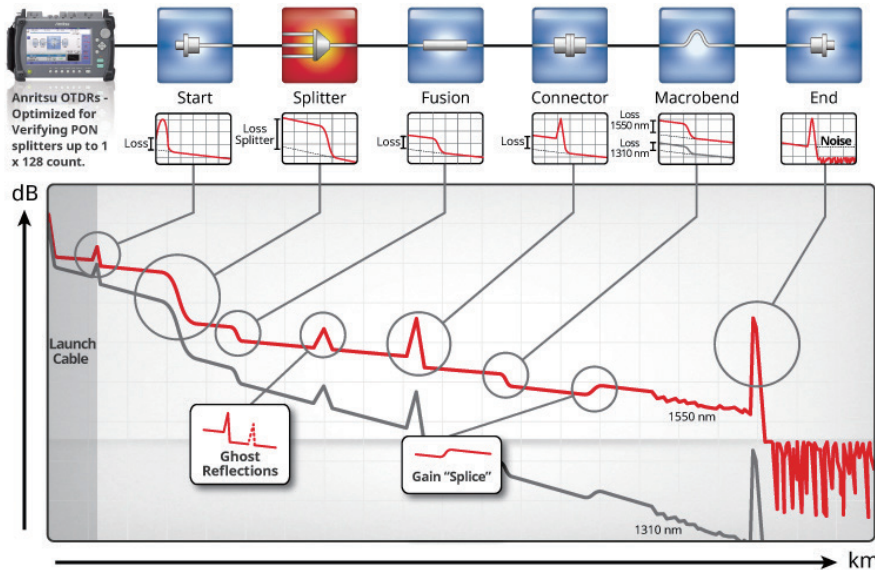
<https://www.anritsu.com/test-measurement/solutions/ms9740b-501/index>



# 5G Optical Fiber Network I&M

## ACCESS Master (OTDR, Optical Time Domain Reflectometer) MT9085 Series

With functions for detecting and measuring PON optical splitters used by mobile fronthaul as well as for measuring events, such as fiber loss and reflections, in 5G mobile networks with high accuracy, plus a unique detection algorithm for easy display of measurement results, the ACCESS Master MT9085 series is ideal for deploying large-capacity 5G mobile network infrastructure. Moreover, for greatly improved operability, the MT9085 series adds a touch screen to its predecessor's popular rotary knob and hard keys.



<https://www.anritsu.com/test-measurement/solutions/mt9085series-501/index>



# 5G NR Base-Station Field Performance Measurements and Coverage Mapping

## Field Master Pro™ MS2090A

- Frequency Range: 9 kHz to 9/14/20/26.5/32/43.5/54 GHz
- Supports RF measurements of GSM, LTE, and 5G base stations, as well as 5G demods.
- TX spurious up to 54 GHz

### Usage: 5G NR Base Station Measurement —

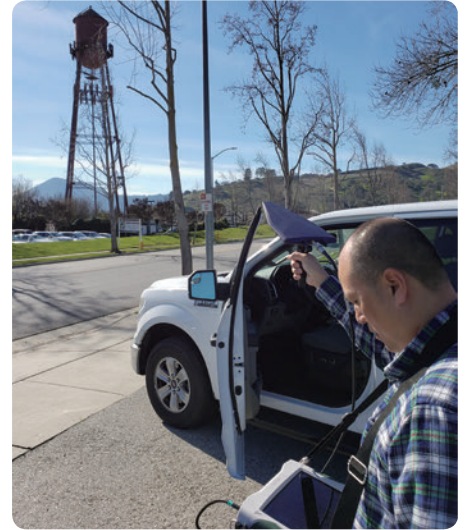
#### 3GPP TS 38.104 V15 gNB Base Station Performance Evaluation

- Frequency error
- Time offset
- Cell/Sector ID
- Modulation quality
- Unwanted emissions
- FR1 & FR2
- Occupied bandwidth
- Adjacent channel leakage ratio
- Tx spurious up to 12.75 GHz
- EIRP
- Synchronization Signal Block (SSB)
- Up to 64 beams supported

### Usage: 5G Coverage Mapping

Plot indoor and outdoor coverage maps from 5G NR gNB. Displayed measurements include channel power, EIRP, and RSRP.

<https://www.anritsu.com/test-measurement/products/ms2090a>



## 5G Measuring Instruments and Components

### Power Sensor MA2400/MA24000 Series

#### Full Line of Power Sensors for 5G NR mmWave Measurements

- Power Master™ Frequency Selectable mmWave Power Analyzer MA24507A (9 kHz to 70 GHz, V (m) connector)
- Power Master™ Frequency Selectable mmWave Power Analyzer MA24510A (9 kHz to 110 GHz, W (m) connector)
- Microwave CW USB Power Sensor MA24330A (10 MHz to 33 GHz, K (m) connector)
- Microwave CW USB Power Sensor MA24340A (10 MHz to 40 GHz, K (m) connector)
- Microwave CW USB Power Sensor MA24350A (10 MHz to 50 GHz, V (m) connector)
- Thermal Sensor MA24004A (10 MHz to 40 GHz, K (m) connector)
- Thermal Sensor MA24005A (10 MHz to 50 GHz, V (m) connector)

<https://www.anritsu.com/test-measurement/rf-microwave/power-meters-and-sensors>



### RF/Microwave/mmWave Components

#### Full Line of Connectors, Cables, and Adapters for 5G NR mmWave Measurements

Anritsu plays a pioneering role in microwave connector high-frequency technologies with a focus on meeting customers' requirements. With a product family of test equipment supporting frequencies up to 40 GHz, Anritsu also manufactures K Connectors™ for use up to 40 GHz as well as Extended-K Connectors™ up 43.5 GHz.

What sets Anritsu connector and component technology apart from other manufacturers is that Anritsu is committed to providing the best performance possible for 5G applications. Not only has 5G NR affected sub-6 GHz frequencies, it has also found a home in the microwave spectrum at 26 GHz to 28 GHz as well as the upcoming 37 GHz to 43.5 GHz.

Anritsu provides repeatability and an accurate uncertainty budget by offering components that are mode-free and traceable to 43.5 GHz.

<https://www.anritsu.com/components-accessories>



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