Product Brochure

Anritsu envision:ensure

5G Solutions Catalog

2020 Summer

5G Testing Anritsu

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.

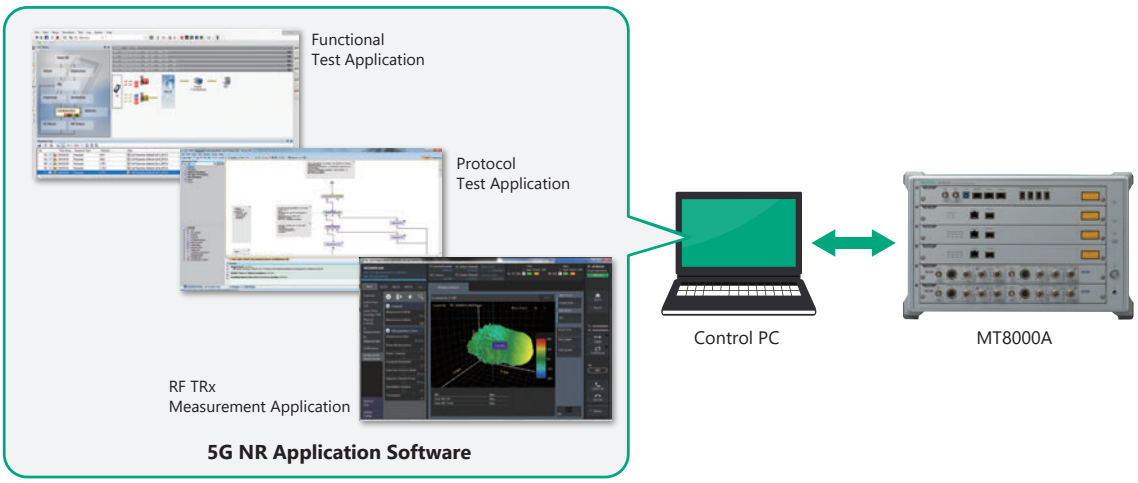
Contents

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

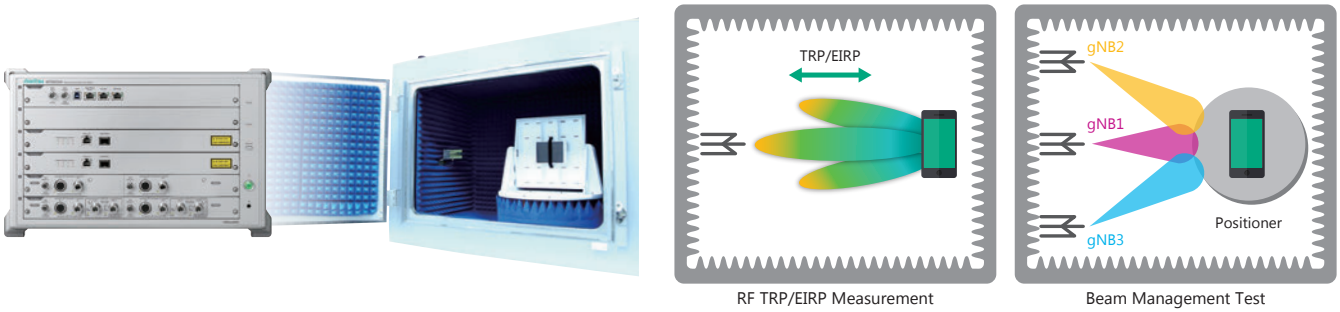
Radio Communication Test Station MT8000A

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

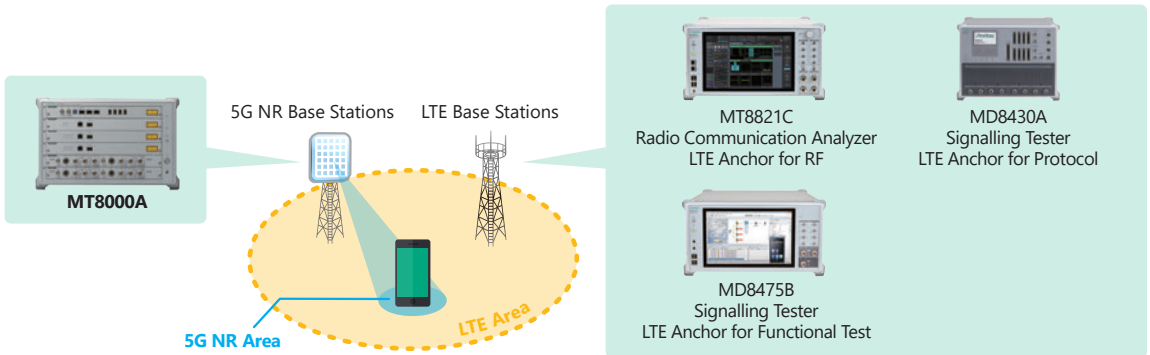
• RF, Protocol and Functional Tests with Choice of Measurement Modules for Test Applications



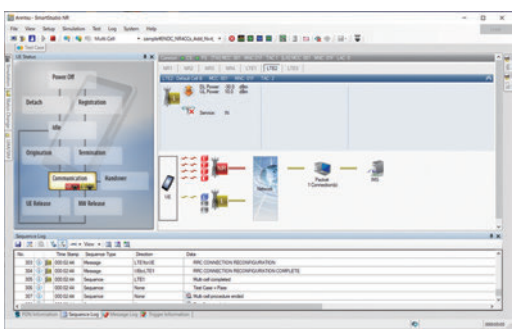
• From Sub-6 GHz to mmWave — RF Measurements and Beam-Forming Tests



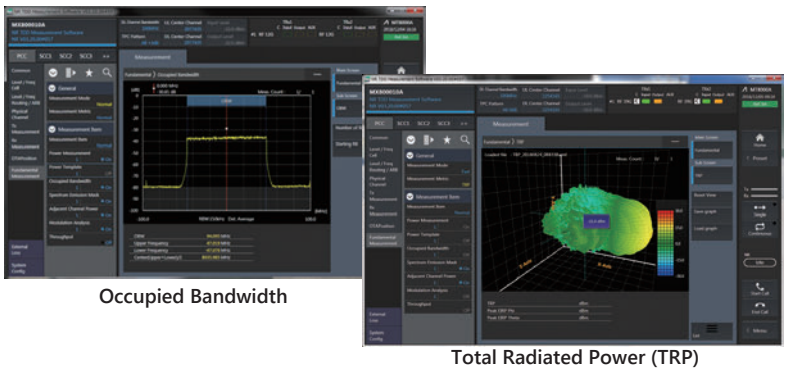
• Supports Current LTE Test Applications with Easy 5G-to-LTE NSA (Non-Standalone) Test Environment Configuration



• SmartStudio NR MX800070A Simulates 5G/LTE Base Stations and Core Networks using State Machine GUI



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

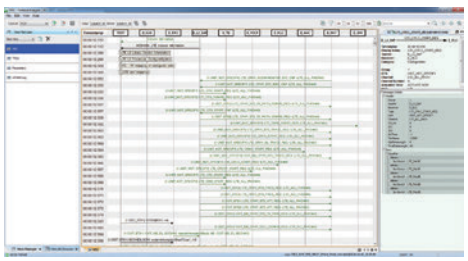


Total Evaluation of 5G NR Chipsets and Device RF/Protocol Performance

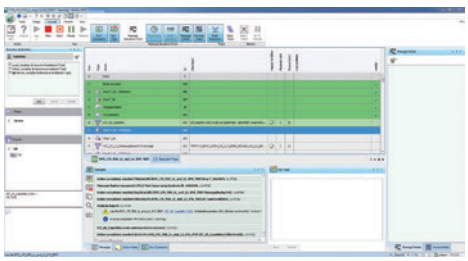
Radio Communication Test Station MT8000A

• Powerful Automated Protocol Test Support

Test Execution Screen (RTD)



Log Analysis Screen (RTD)



Consecutive Test Case Execution Example

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

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 TDD/FDD as well as LTE/LTE-A and WAN digital modulation analysis

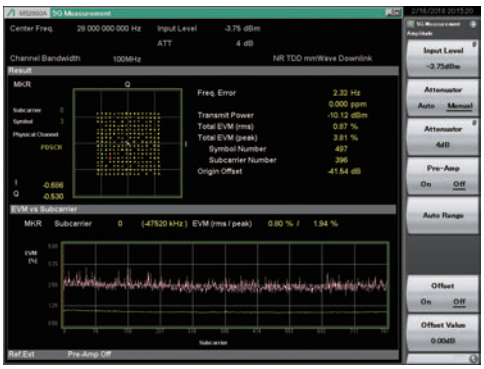
The high-end Spectrum Analyzer MS2690A/91A/92A features excellent dynamic range for analysis of 5G NR Sub-6 GHz uplink and downlink signals as well as measurement of RF characteristics in combination with the 5G Measurement Software MX269051A (basic license).

The Vector Signal Generator MG3710E is a vector signal generator that can support two RF outputs with 6 GHz upper frequency limit and 160 MHz wide RF modulation.
The built-in two RF outputs cuts equipment costs for receiver tests, such as Adjacent Channel Selectivity and Receiver Intermodulation, which require two modulation signal sources.
The 3GPP TS 38.211, TS 38.212, and TS 38.213 5G NR sub-6 GHz waveform patterns can be generated with MG3710E or vector signal generator option of MS2690A/91A/92A.

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 wide analysis bandwidth supporting for millimeter wave, excellent amplitude and phase flatness performance, and wide dynamic range support efficient, detailed and high-accuracy, efficient measurements.

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

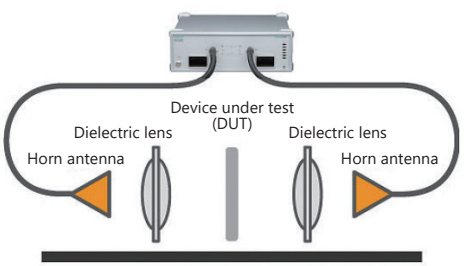
Compact, Low-Cost VNA for S-Parameter Measurement and Time Domain Analyses

- 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.



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 compliant 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
- Upgrade from ME7873LA 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

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 compliant 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
- Upgrade from ME7834LA supporting 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

MA8171A

ME7834NR

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

Reduced Costs

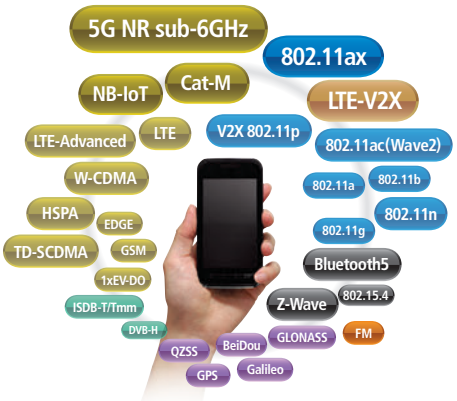
- Up to four test modules in one main frame
- Low-cost modular design
- Stable platform for long-term production-line operation

Faster Measurement

- Fast CPU and large memory built into each test module
- Supports latest fast measurement technologies
  - · Ping-Pong Measurement
  - · Multi DUT Measurement Scheduler
  - · TRx Parallel Measurement

Futureproof Expandability

- Expandable platform supporting various wireless standards by adding software
- High-performance hardware supporting future wireless standards
  - · 10 MHz to 6 GHz
  - · 160 MHz bandwidth



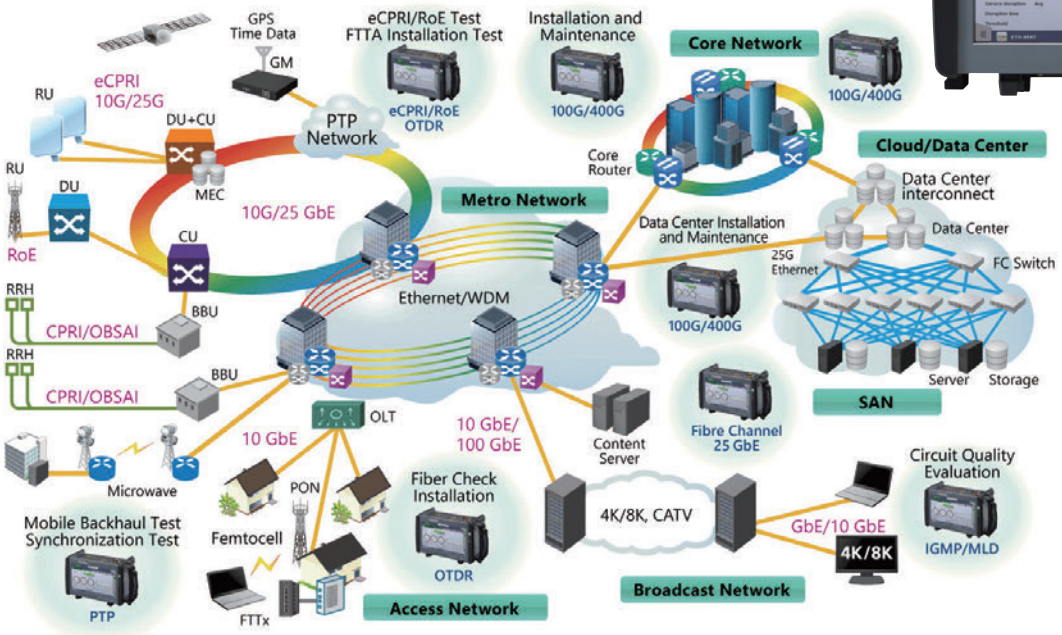
For Various Network Testing Including 400 GbE Supporting 5G NR

Network Master Pro MT1040A

Network Master Pro

Battery Powered Tester for Network Field Evaluations Including 400G Ethernet

- One unit supports multiple standards, including OTN, eCPRI/RoE, Fibre Channel
- Optical fiber line measurement with OTDR module. Simple optical module check function
- Built-in 400G Ethernet FEC analysis function
- Easy-to-use GUI with 9-inch touchscreen for better operability
- More efficient work with automated-measurement tools supporting one-button tests



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

Network Master Pro MT1000A

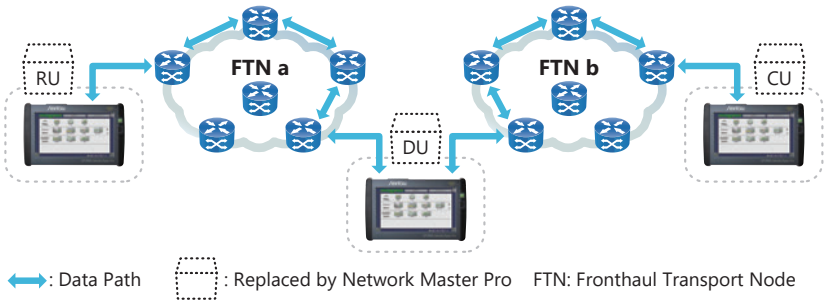
With support for the eCPRI/RoE, accurate latency, and PTP clock synchronization measurements, the Network Master Pro MT1000A is the ideal solution for deploying faster and lower-latency 5G mobile networks.

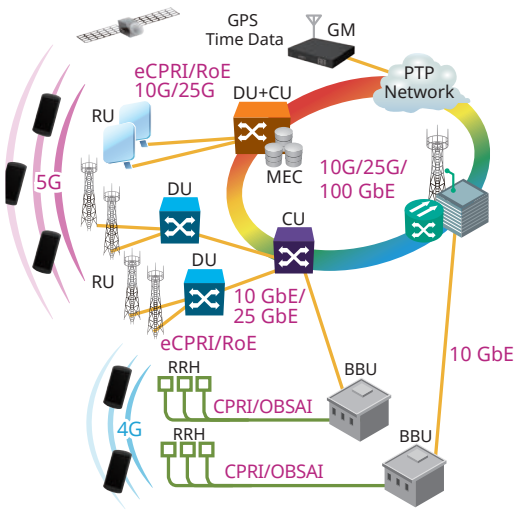
eCPRI/RoE 25G Dual-Port Solution

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.





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. High-speed measurement at 1 million samples (msa) per 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
- Easy, fast, high-sensitivity PAM4 TDECQ measurements

BERT

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

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

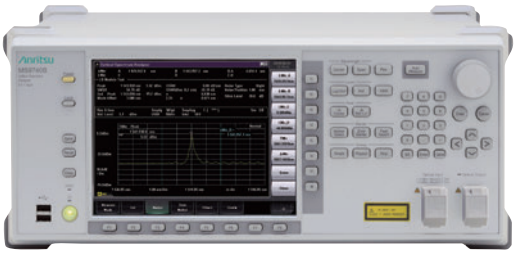
- SMSR measurement of better than 45 dB
- Fast measurement processing time* (0.35 s for 30 nm wavelength sweep)

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

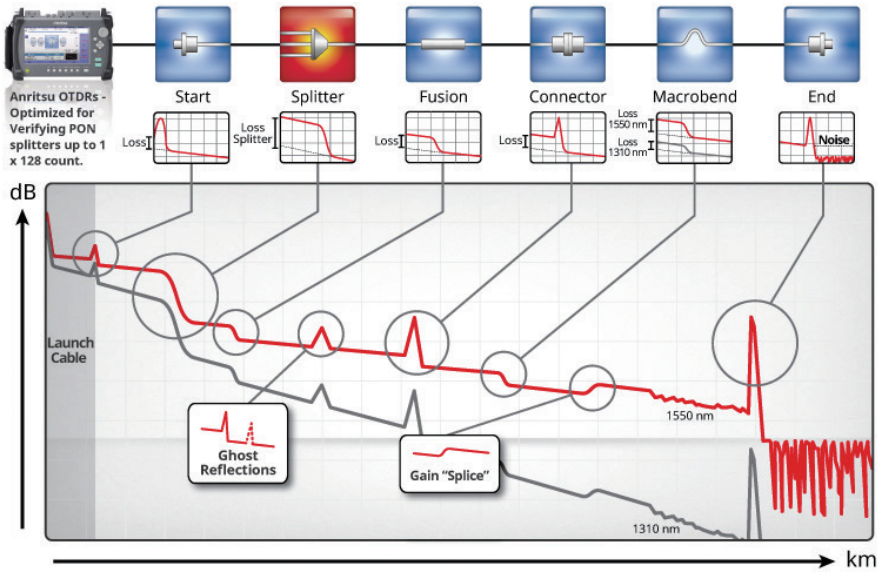
*: Sweeping in Fast mode; continuous time for wavelength sweep, analysis, and transfer to remote server



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.



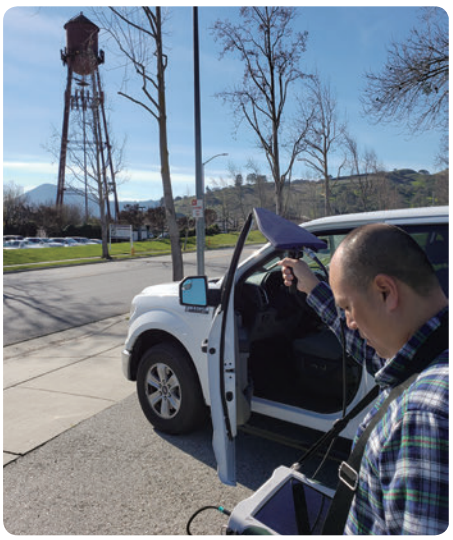
https://www.anritsu.com/test-measurement/solutions/mt9085series-501/index

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

Field Master Pro™ MS2090A

The rapid introduction of 5G NR networks requires an instrument that can validate the performance of gNB base stations quickly in a field environment. In both the 3.5 GHz and millimeter-wave (28 and 39 GHz) bands, the adoption of active antenna systems means that new test methods need to be considered. Some radios may have test monitor ports integrated, but many operators will make gNB transmitter measurements over the air (OTA).

RF Measurements
- Unwanted emissions
- Occupied bandwidth
- Adjacent channel leakage ratio
- Transmitter spurious to 12.75 GHz
- Carrier aggregation (up to 8 carriers)
- Multi-beam measurements: up to 64 beams
- Multi PCI measurements: multiple physical cell IDs
- EIRP: to 3GPP TS 38.141-2



Demodulation Measurements
- Physical cell ID, sector ID
- Cell group
- Frequency error
- Time offset
- SS-RSRP (dBm), SS-RSRQ (dB), SS-SINR (dB)
- Sync and demod status indicators
- Block measurements (PSS, SSS, PBCH, PBCH-DMRS)
- Average EVM, Peak EVM (@subcarrier/symbol)
- Beam power (dBm)

5G Measuring Instruments and Components

Power Sensor MA2400/MA24000 Series

Full Line of Power Sensors for 5G NR Sub-6 GHz and 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)
USB Peak Power Sensor MA24406A (50 MHz to 6 GHz, VBW 195 MHz max. N (m) connector)
USB Peak Power Sensors MA2444xA Series (50 MHz to 40 GHz, K (m) connector)
Microwave Universal USB Power Sensor MA24218A (10 MHz to 18 GHz, N (m) connector)
Microwave Universal USB Power Sensor MA24208A (10 MHz to 8 GHz, N (m) connector)
Microwave USB Power Sensor MA24108A (10 MHz to 8 GHz, N (m) connector)
Universal Power Sensors (Average) MA248xD Series (10 MHz to 18 GHz, N (m) connector)
Wideband Power Sensors (Peak and Average) MA249xA Series (50 MHz to 18 GHz, N (m) connector)

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.