



# 5G Base Station Manufacturing Test Solution

Radio Communication Test Station

MT8000A

Base Station Test Suite for NR mmWave MX800045A

Base Station Test Suite for NR Sub-6 GHz MX800046A

# Product Outline: 5G Base Station Manufacturing Test Solution

**Radio Communication Test Station**

**Base Station Test Suite for mmWave**

**Base Station Test Suite for NR sub-6 GHz**

**MT8000A**

**MX800045A**

**MX800046A**

Combining the MX800045A/MX800046A with the MT8000A supports 5G base station (BTS) non-signalling RF tests as a manufacturing solution for 5G BTS.



## ■ Features

### ✓ All-in-one TRx tests

Tx Tests: Tx power, Transmit On/Off power, frequency error, EVM, TAE, OBW, ACLR, OBUE

Rx Tests: Rx sensitivity, Dynamic range, ACS, In-band blocking, In-channel selectivity

### ✓ All-in-one support for both Sub-6 GHz and mmWave frequency bands

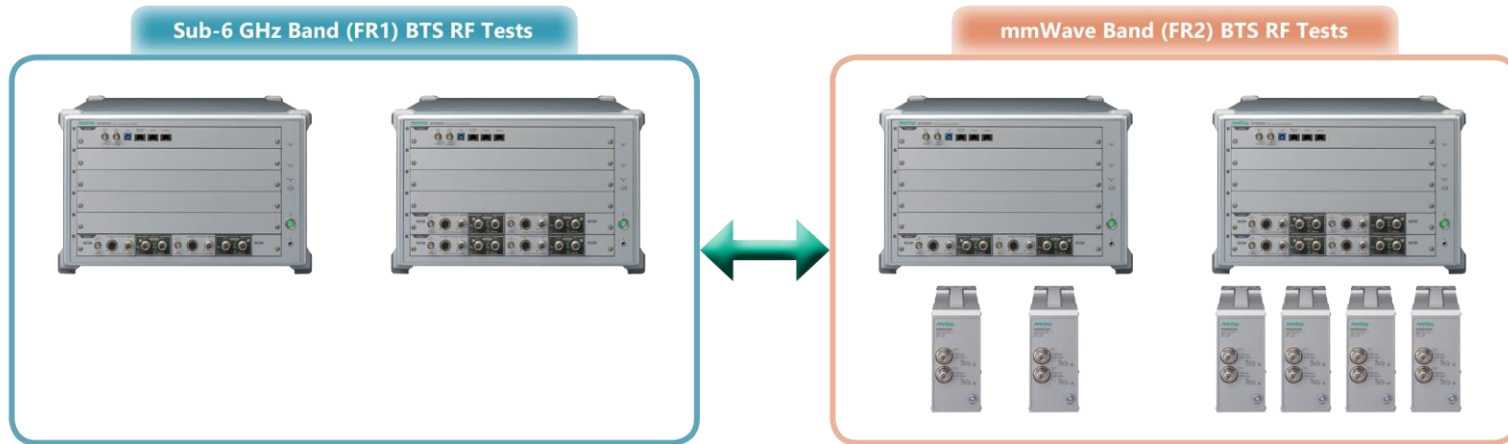
One MT8000A covers all main sub-6 GHz and mmWave frequency bands

### ✓ High test efficiency using simultaneous and parallel measurements

Simultaneous and parallel measurements using up to four TRx ports improves production efficiency while cutting costs.

# Features: Sub-6 GHz and mmWave Support

Connecting the RF converter (MA80003A) supports mmWave measurements. All the main sub-6 GHz and mmWave frequency bands are covered by one MT8000A unit.



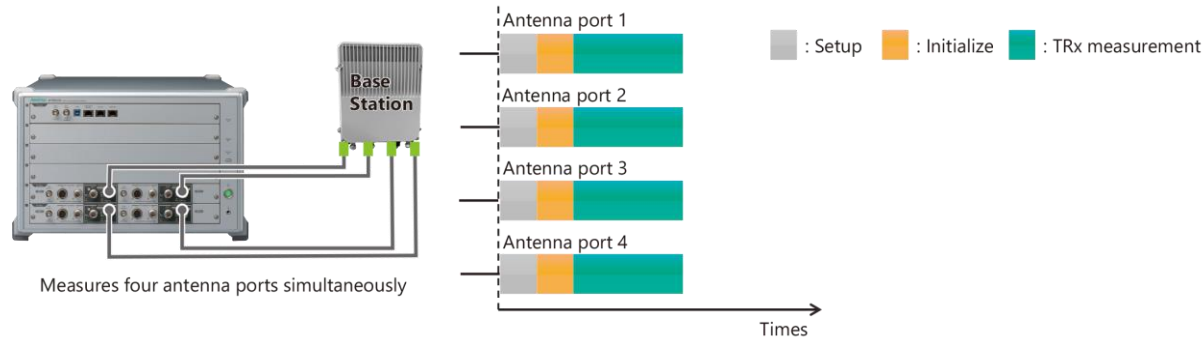
## Supported Frequency Range

	Frequency Range	Max. Analysis and Modulation Bandwidth
Sub-6 GHz band	0.4 GHz~ 6 GHz	20 MHz (0.4 GHz ≤ Setting Frequency < 0.6 GHz) 200 MHz (0.6 GHz ≤ Setting Frequency < 3.3 GHz) 400 MHz (3.3 GHz ≤ Setting Frequency < 6 GHz)
mmWave	24.25 GHz ~ 29.5 GHz 37.0 GHz~ 43.5 GHz	1 GHz

# Features: Simultaneous/Parallel Measurements at Four RF Ports

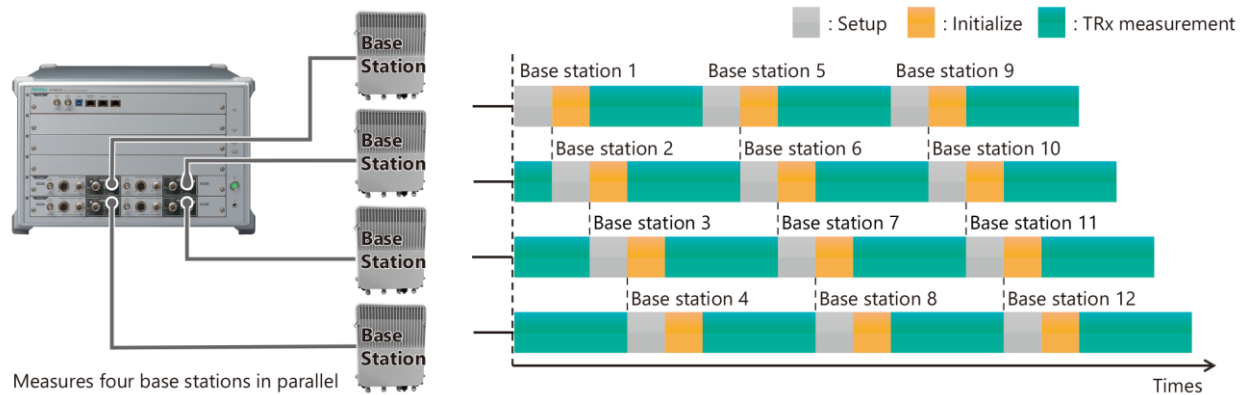
## Simultaneous Measurement

The MT8000A can perform RF tests with up to four TRx ports simultaneously to shorten test times for multi-antenna BTS.



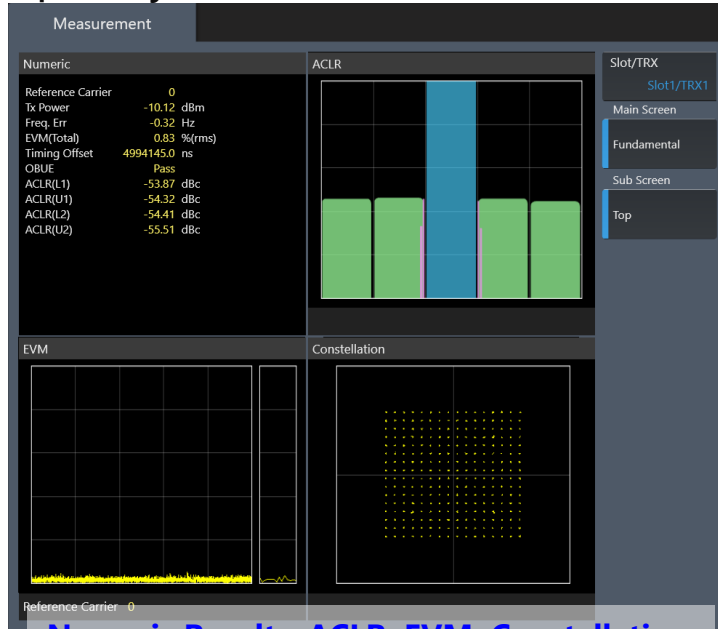
## Parallel Measurement

The MT8000A can perform RF tests independently with up to four TRx ports. Unlike conventional testing systems requiring one instrument per test, one MT8000A can measure up to four systems to cut costs by centralizing test instruments.



# Features: Measurement Software

The measurement software can measure multiple test items, such as downlink signal frequency error, EVM, ACLR, OBUE, etc., specified by 5G NR standards all at once.



**Numeric Results, ACLR, EVM, Constellation**

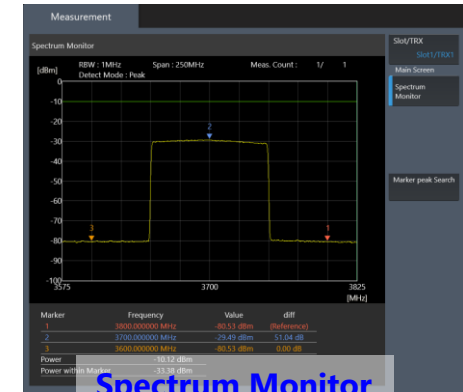
## Numeric Results

- Tx Power
- Freq. Error
- EVM (Total)
- Time Offset
- OBUE (Pass/Fail display)
- ACLR
- On/Off Power\*
- Ramp up/down\*

\*: Requires MX800046A-011.

## Graphs

- ACLR
- EVM
- Constellation
- Spectrum Monitor



**Spectrum Monitor**

The measurement software can measure multiple component carriers (CC) all at once to cut multi-carrier signal measurement times.

Measurement Software	Sub-carrier Spacing	Channel Bandwidth	Max. Component Carrier No.
MX800045A Base Station Test Suite for mmWave	120 kHz	100 MHz	8
		200 MHz	4
		400 MHz	2
MX800046A Base Station Test Suite for NR Sub-6 GHz	15 kHz	20 MHz	2
	30 kHz	20, 40, 60, 80, 100 MHz	2

# Features: Measurement Software Option (MX800046A-011)

The MX800046A-011 Transmit On/Off Power Measurement Software Option is installed to measure Transmit On/Off Power (3GPP TS38.141-1, 6.4.1 Transmitter OFF power, 6.4.2 Transmitter transient period).

A wide dynamic range is supported by combining the separately measured Transmit On and Transmit Off Power results.

Batch measurement with other test items is supported.

Slot1 / TRX1

Measurement Item

OBW On

OBUE On

ACLR On

Modulation Analysis On

Transmit On/Off power On

Slot1 / TRX2

Slot2 / TRX1

Slot2 / TRX2

Measurement

Fundamental > Numeric

Modulation Analysis

Reference Carrier 0

Freq. Err 0.31

EVM(Total) 0.75

Timing Offset -25.1

Occupied Bandwidth

OBW 97.222

OBUE

OBUE Pass

ACLR

ACLR(L1) 8 dBc

ACLR(U1) -55.37 dBc

ACLR(L2) -54.75 dBc

ACLR(U2) -57.32 dBc

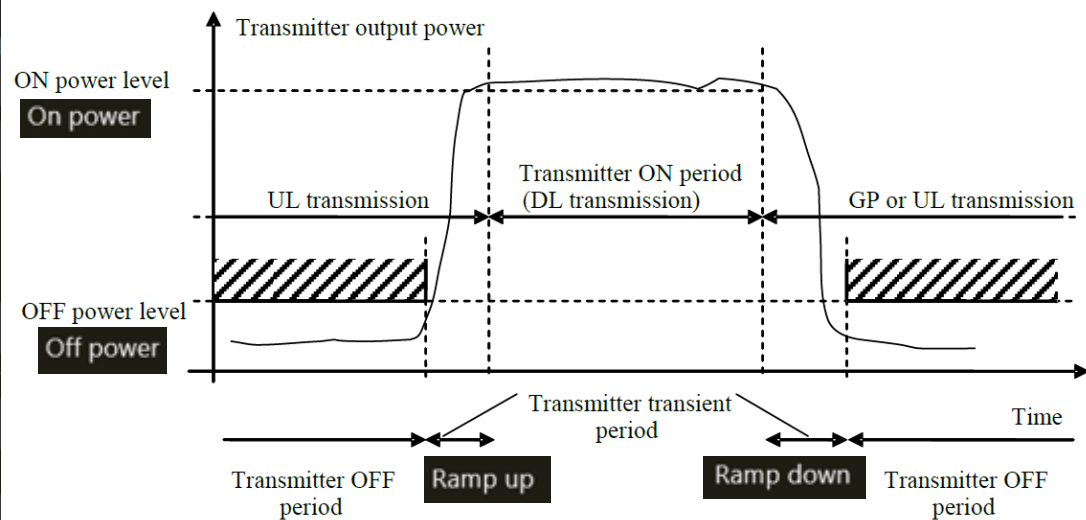
Transmit On/Off power ( 1 / 1 )

On power -0.02 dBm

Off power -89.33 dBm/MHz

Ramp up 1.579 us

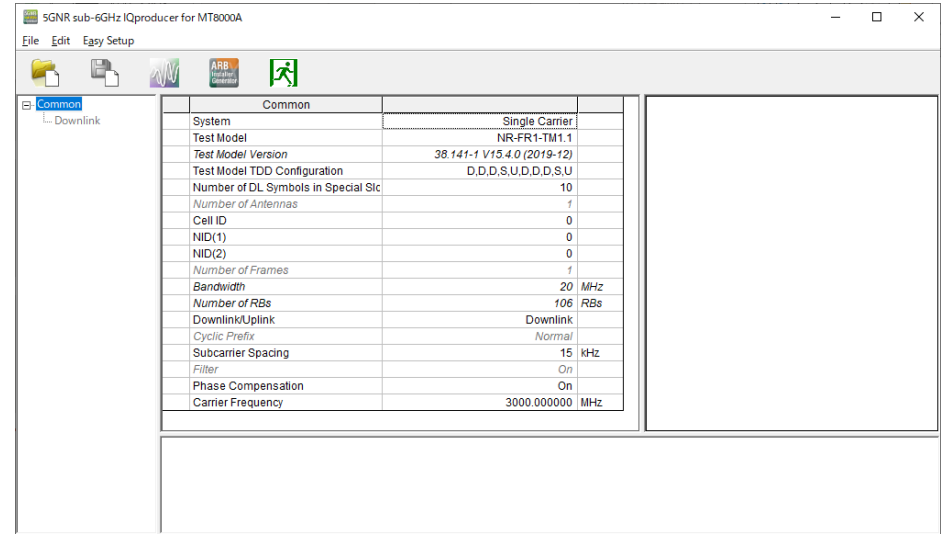
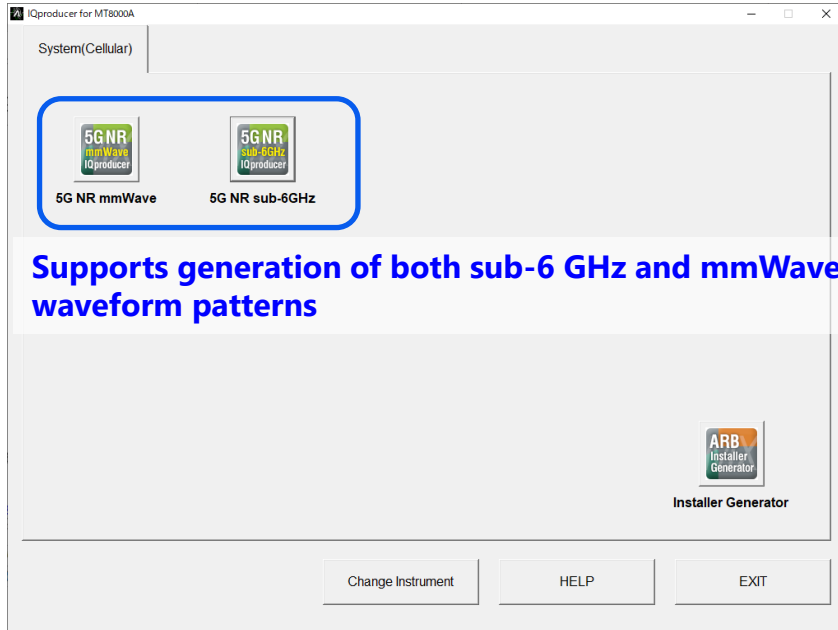
Ramp down 1.563 us



- **On Power, Off Power**  
Average power at base station ON and OFF periods
- **Ramp up, Ramp down**  
Transition time from OFF to ON or ON to OFF period

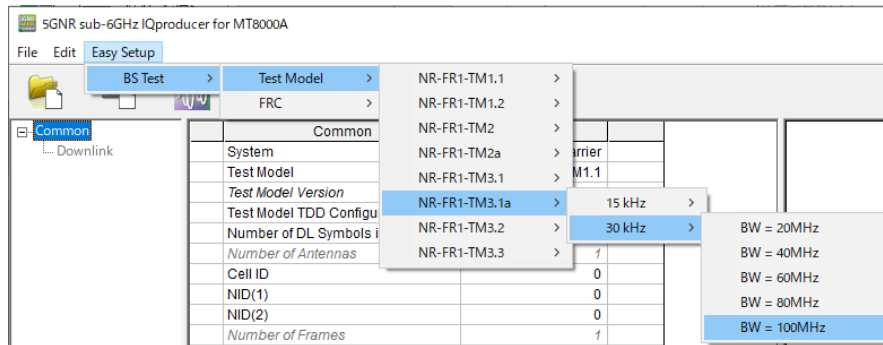
# Features: Waveform Pattern Generation Software

The signal generation software can generate both FRC waveform patterns used at 5G BTS Rx tests as well as Test Model signals used at Tx tests.

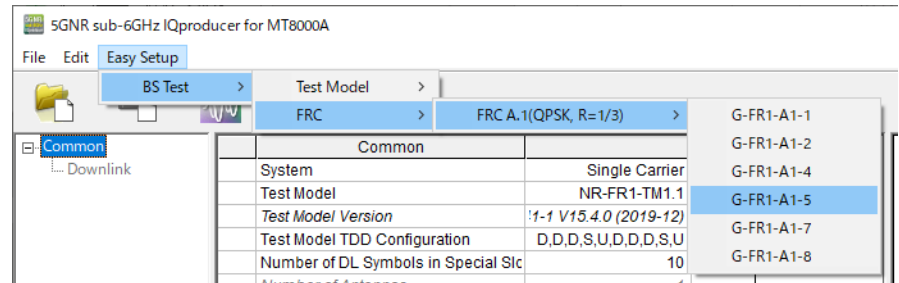


User can select 3GPP-defined test conditions from the Easy Setup menu tree to set parameters at setting screens for easy waveform pattern generation.

## Test Model



## FRC



# MX800045A Support for 3GPP PHY Layer Standards

## Sub-carrier Spacing and Channel Bandwidths

Sub-carrier Spacing (SCS)		120 kHz				
Channel Bandwidth		BW (1CC)	50	100	200	400
	SCS	120 kHz		✓	✓	✓

## Signal Analyzer/Signal Generator Support

	Signal Analyzer	Signal Generator
Downlink Signals	NR-FR2-TM1.1 NR-FR2-TM2 NR-FR2-TM3.1	
Uplink Signals	-	G-FR2-A1-2 G-FR2-A1-3 G-FR2-A1-5
Measurable and Generated PHY Channels	PDCCH, PDSCH	PDCCH, PDSCH (Downlink) PUSCH (Uplink)
Supported Modulations	QPSK, 16QAM, 64QAM, 256QAM, Auto	QPSK, 16QAM, 64QAM, 256QAM



# MX800046A Support for 3GPP PHY Layer Standards

## Sub-carrier Spacing and Channel Bandwidths

Sub-carrier Spacing (SCS)		15 kHz, 30 kHz													
Channel BW	BW	5	10	15	20	25	30	40	50	60	70	80	90	100	
	SCS	15 kHz				✓					-	-	-	-	-
		30 kHz				✓			✓		✓		✓		✓

## Signal Analyzer/Signal Generator Support

	Signal Analyzer	Signal Generator
Downlink Signals	NR-FR1-TM1.1 NR-FR1-TM1.2 NR-FR1-TM2 NR-FR1-TM2a NR-FR1-TM3.1 NR-FR1-TM3.1a NR-FR1-TM3.2 NR-FR1-TM3.3	
Uplink Signals		G-FR1-A1-1 G-FR1-A1-2 G-FR1-A1-4 G-FR1-A1-5 G-FR1-A1-7 G-FR1-A1-8
Measurable and Generated PHY Channels	PDCCH, PDSCH	PDCCH, PDSCH (Downlink) PDSCH (Uplink)
Supported Modulations	QPSK, 16QAM, 64QAM, 256QAM, Auto	QPSK, 16QAM, 64QAM, 256QAM

# Key Signal Analyzer Performance

Item	MX80046A	MX800045A
Frequency Range Setting	0.4 GHz to 6 GHz	24.25 GHz to 29.5 GHz 37 GHz to 43.5 GHz
Max. Modulation Analysis Bandwidth	0.4 GHz to 0.6 GHz: 20 MHz 0.6 GHz to 3.3 GHz: 200 MHz 3.3 GHz to 6 GHz: 400 MHz	1 GHz
Level Setting Range	-50 to +26 dBm	-70 to +10 dBm
Level Accuracy	0.4 GHz to 3 GHz Input $\geq -20$ dBm: $\pm 1.0$ dB, $\pm 0.5$ dB typ. Input $\geq -40$ dBm: $\pm 1.0$ dB, $\pm 0.7$ dB typ. 3 GHz to 6 GHz Input $\geq -40$ dBm: $\pm 1.0$ dB	24.25 to 29.5 GHz: $\pm 1.5$ dB, $\pm 1.0$ dB typ. 37 GHz to 40 GHz: $\pm 2.0$ dB, $\pm 1.5$ dB typ. 40 GHz to 43.5 GHz: $\pm 2.0$ dB, $\pm 1.5$ dB typ.
EVM	(100 MHz BW, 256QAM) 3.7 GHz: 0.91% meas. 4.5 GHz: 0.96% meas. 5 GHz: 0.95% meas.	(100 MHz BW, 256QAM) 28 GHz: 1.56% meas. 39 GHz: 2.04% meas.
ACLR	(100 MHz BW, QPSK) 3.7 GHz: -50.36 dBc meas. 4.5 GHz: -49.62 dBc meas. 5 GHz: -49.12 dBc meas.	(100 MHz BW, QPSK) 28 GHz: -47.17 dBc meas. 39 GHz: -47.04 dBc meas.

(typ.) Not guaranteed performance; indicates value satisfying most products  
(nom.): Not guaranteed performance; listed as reference when using product  
(meas.): Not guaranteed performance; typical data for instrument chosen at random

# Key Signal Generator Performance

Item	MX800046A	MX800045A
Frequency Range Setting	0.4 GHz to 6 GHz	24.25 GHz to 29.5 GHz 37 GHz to 43.5 GHz
Max. Modulation Bandwidth	0.4 GHz to 0.6 GHz: 20 MHz 0.6 GHz to 3.3 GHz: 200 MHz 3.3 GHz to 6 GHz: 400 MHz	1 GHz
Level Setting Range	-110 to -10 dBm (Main) -110 to 0 dBm (AUX)	-70 to +15 dBm
Level Accuracy	(Input $\geq$ -100 dBm, CW) 0.4 GHz to 3 GHz: $\pm 1.0$ dB, $\pm 0.7$ dB typ. 3 GHz to 6 GHz: $\pm 1.0$ dB	(-70 dBm $\leq$ Input $\leq$ +10 dBm, CW) 24.25 to 29.5 GHz: $\pm 1.5$ dB 37 GHz to 40 GHz: $\pm 2.0$ dB, $\pm 1.5$ dB typ.
EVM	(100 MHz BW, 256QAM) 3.7 GHz: 1.00% (Main), 0.95% (AUX) meas. 4.5 GHz: 1.04% (Main), 1.03% (AUX) meas. 5 GHz: 1.06% (Main), 1.02% (AUX) meas.	(100 MHz BW, 64QAM) 25 GHz: 1.14% meas. 39 GHz: 1.92% meas.
ACLR	(100 MHz BW, QPSK) 3.7 GHz: -46.4 dBc (Main), -47.28 dBc (AUX) meas. 4.5 GHz: -44.94 dBc (Main), -45.54 dBc (AUX) meas. 5 GHz: -45.47 dBc (Main), -45.67 dBc (AUX) meas.	(100 MHz BW, QPSK) 25 GHz: -47.9 dBc meas. 39 GHz: -47.3 dBc meas.

(typ.) Not guaranteed performance; indicates value satisfying most products  
(nom.): Not guaranteed performance; listed as reference when using product  
(meas.): Not guaranteed performance; typical data for instrument chosen at random

# List of Supported 3GPP Measurements

## Base Station Test Suite for mmWave **MX800045A**

	Signal Analyzer	Signal Generator
参照規格	3GPP TS 38.141-2 V15.4.0 (2019-12)	
対応測定項目	6. Radiated transmitter characteristics <ul style="list-style-type: none"> <li>- 6.2 Radiated transmit power</li> <li>- 6.3 OTA base station output power</li> <li>- 6.4 OTA output power dynamics</li> <li>- 6.6.2 OTA frequency error</li> <li>- 6.6.3 OTA modulation quality</li> <li>- 6.6.4 OTA time alignment error</li> <li>- 6.7.2 OTA occupied bandwidth</li> <li>- 6.7.3 OTA ACLR</li> <li>- 6.7.4 OTA OBUE</li> </ul>	7. Radiated receiver characteristics <ul style="list-style-type: none"> <li>- 7.3 OTA Reference sensitivity level</li> </ul>

## Base Station Test Suite for sub-6GHz **MX800046A**

	Signal Analyzer	Signal Generator
参照規格	3GPP TS 38.141-1 V15.12.0 (2022-03)	
対応測定項目	6. Transmitter characteristics <ul style="list-style-type: none"> <li>- 6.2 BS output power</li> <li>- 6.3.2 RE power control dynamic range</li> <li>- 6.3.3 Total power dynamic range</li> <li>- 6.4.1 Transmitter OFF power *</li> <li>- 6.4.2 Transmitter transient period *</li> <li>- 6.5.2 Frequency error</li> <li>- 6.5.3 Modulation quality</li> <li>- 6.5.4 Time alignment error</li> <li>- 6.6.2 Occupied bandwidth</li> <li>- 6.6.3 ACLR</li> <li>- 6.6.4 Operating band unwanted emissions</li> </ul>	7. Receiver characteristics <ul style="list-style-type: none"> <li>- 7.2 Reference sensitivity level</li> <li>- 7.3 Dynamic range</li> <li>- 7.4.1 ACS</li> <li>- 7.4.2 In-band blocking</li> <li>- 7.8 In-channel selectivity</li> </ul>

\* Requires MX800046A-011

The Anritsu logo is displayed in a bold, green, sans-serif font. Below it, the tagline "Advancing beyond" is written in a smaller, black, sans-serif font. The background features a light green gradient with several curved, parallel lines in shades of green and yellow on the right side.

# Anritsu

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