Anritsu Advancing beyond

RF Signaling call box, Signal Analyzer and Signal Generator for 5G/LTE User Equipment RF Evaluation

Signal Analyzer MS2830A/MS2840A/MS2850A
Vector Signal Analyzer MG3710A/MG3710E
RF/Microwave Signal Generator MG3690C/MG362x1A series
Radio Communication Test Station MT8000A
Radio Communication Analyzer MT8821C

The RF conformance test certifying compliance with 3GPP and national/regional laws and regulations must be passed after completing product development before 5G/LTE user equipment can be released commercially. To avoid the risk of increased development costs as a result of failing the RF conformance test, it is essential to prepare for the final test by performing preliminary evaluations from the prototype stage.

Although it is better to use the same conformance test system as the certification body for the preliminary evaluations, this is unusual due to the high required investment. Therefore, the main in-band tests are conducted using an RF Signaling call box that can be evaluated in the call connected and the user equipment. Additionally, a signal analyzer is used for out-of-band tests, such as TRx spurious emissions, and a vector signal generator and CW signal generator are used together as an interference signal source for receiver sensitivity and throughput tests. Anritsu offers these instruments along with sub-6 GHz 5G and LTE interference waveform patterns for easier 3GPP receiver tests.

Development/ Prototyping → **Design Verification** → **Quality Assurance Test** → **Conformance Test**

<In-house>
Use RF Signaling call box, signal analyzer and signal generator.
Ideally, use a conformance test system at the final design stages.

<Certification body>
Use conformance test system.

3GPP
- **In-band Tests**

RF Signaling call box


MT8000A (5G)


MT8821C (LTE)

3GPP
- **Out-of-band Tests**
- **Interference Tests**

Signal Analyzer
for spurious tests (to 43/44.5 GHz)


MS2830A/MS2840A /MS2850A

Vector Signal Generator
for interference tests (modulated wave, to 6 GHz)


MG3710A/MG3710E

Interference Waveform Pattern
- MX371055A (5G)
- MX371054A (LTE)

CW Signal Generator
for interference tests (CW, to 20 GHz)


MG3690C
MG362x1A series

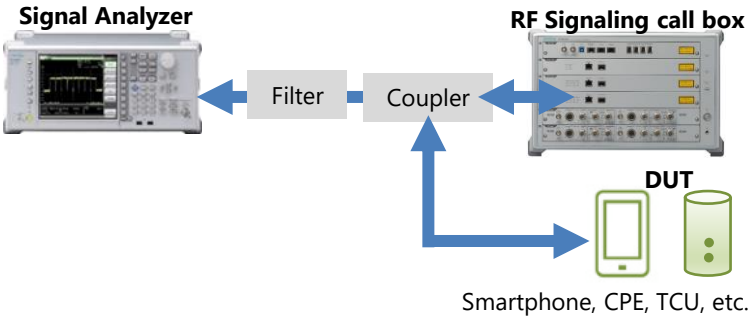
Conformance Test System

Main 3GPP Test Items and Measuring Instruments

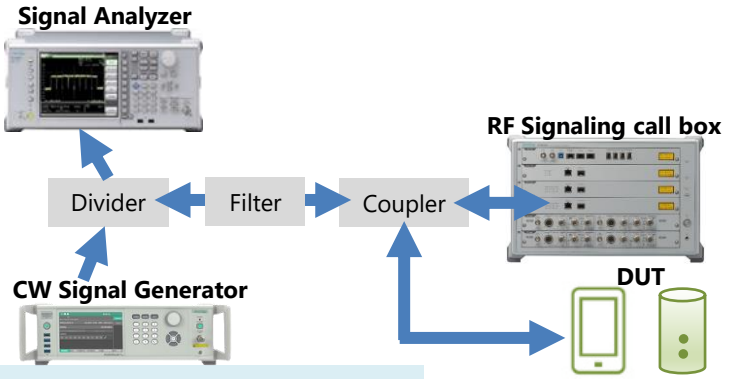
Test Items	Signal Analyzer  MS2830A/MS2840A /MS2850A	Vector Signal Generator  MG3710A/MG3710E **Interference Waveform Pattern** • MX371055A (5G) • MX371054A (LTE)	CW Signal Generator  MG3690C MG362x1A series	RF Signaling call box  MT8000A (5G) MT8821C (LTE)
UE Maximum Output Power, Minimum Output Power, Absolute Power Tolerance, Frequency Error, In-band Emissions, Occupied Bandwidth, Spectrum Emission Mask, Adjacent Channel Leakage Ratio, Maximum Input Level, etc.				✓
Tx Spurious Emissions	✓			✓
Transmit Intermodulation	✓		✓	✓
Adjacent Channel Selectivity		✓		✓
In-Band Blocking		✓		✓
Out-of-Band Blocking			✓	✓
Narrowband Blocking			✓	✓
Wideband Intermodulation		✓	✓	✓
Rx Spurious Emissions	✓			✓

Typical Setups

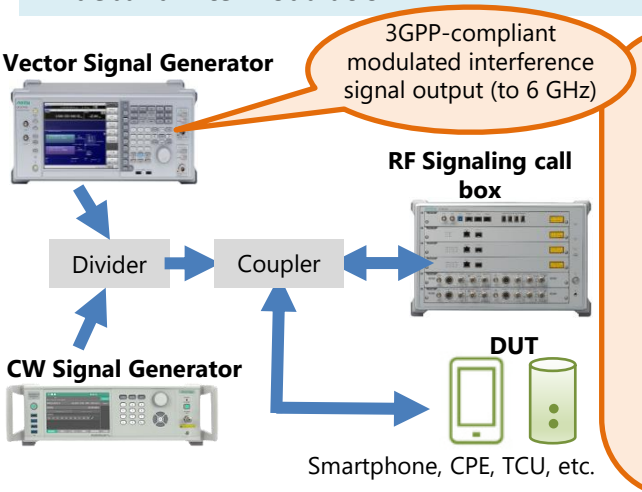
Tx Spurious Emissions



Tx Intermodulation



Wideband Intermodulation



5G NR Interference Waveform Pattern MX371055A

Channel bandwidth [MHz]	SCS [kHz]	Allocated resource blocks	Modulation
5	15	25	QPSK
10	15	52	QPSK
15	15	79	QPSK
20	15	106	QPSK
40	15	216	QPSK
50	15	270	QPSK
10	30	24	QPSK
15	30	38	QPSK
20	30	51	QPSK
40	30	106	QPSK
50	30	133	QPSK
60	30	162	QPSK
80	30	217	QPSK
90	30	245	QPSK
100	30	273	QPSK

LTE Interference Waveform Pattern MX371054A

Channel bandwidth [MHz]	SCS [kHz]	Allocated resource blocks	Modulation
1.4	15	6	QPSK
3	15	15	QPSK
5	15	25	QPSK
10	15	50	QPSK
20	15	100	QPSK

- Compliant with 3GPP TS 38.521-1V17 and 3GPP TS 36.521-1V16. Provides waveform patterns with stated conditions.
- Supports FDD/TDD, single carrier and stand-alone (SA).
- Customers do not need to understand the standard and once installed can create and use waveform patterns as they are.
- Used by Adjacent Channel Selectivity, In-Band Blocking, and Wideband Intermodulation tests.

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公知 2022-1 MJM No. MX371055A/54A-Leaflet-E-L-2-(1.00)