

Test Item	Tested Channel	Channel Bandwidth	Modulation	Mode
Peak to Average Ratio	26797 (824.70 MHz) 26915 (836.50 MHz) 27033 (848.30 MHz)	1.4 MHz	QPSK / 16QAM	1 RB
	26805 (825.50 MHz) 26915 (836.50 MHz) 27025 (847.50 MHz)	3 MHz	QPSK / 16QAM	1 RB
	26815 (826.50 MHz) 26915 (836.50 MHz) 27015 (846.50 MHz)	5 MHz	QPSK / 16QAM	1 RB
	26840 (829.00 MHz) 26915 (836.50 MHz) 26990 (844.00 MHz)	10 MHz	QPSK / 16QAM	1 RB
	26865 (831.50 MHz) 26915 (836.50 MHz) 26965 (841.50 MHz)	15 MHz	QPSK / 16QAM	1 RB
Conducted Emission	26797 (824.70 MHz) 26915 (836.50 MHz) 27033 (848.30 MHz)	1.4 MHz	QPSK	1 RB Full RB
	26805 (825.50 MHz) 26915 (836.50 MHz) 27025 (847.50 MHz)	3 MHz	QPSK	1 RB Full RB
	26815 (826.50 MHz) 26915 (836.50 MHz) 27015 (846.50 MHz)	5 MHz	QPSK	1 RB Full RB
	26840 (829.00 MHz) 26915 (836.50 MHz) 26990 (844.00 MHz)	10 MHz	QPSK	1 RB Full RB
	26865 (831.50 MHz) 26915 (836.50 MHz) 26965 (841.50 MHz)	15 MHz	QPSK	1 RB Full RB
Radiated Spurious Emissions below 1GHz	26915 (836.50 MHz)	15 MHz	QPSK	1 RB
Radiated Spurious Emissions above 1GHz	26797 (824.70 MHz) 26915 (836.50 MHz) 27033 (848.30 MHz)	1.4 MHz	QPSK	1 RB
	26815 (826.50 MHz) 26915 (836.50 MHz) 27015 (846.50 MHz)	5 MHz	QPSK	1 RB
	26865 (831.50 MHz) 26915 (836.50 MHz) 26965 (841.50 MHz)	15 MHz	QPSK	1 RB

For Cat-M1 Band 26 (Part 90)

Test Item	Tested Channel	Channel Bandwidth	Modulation	Mode
ERP	26697 (814.70 MHz) 26740 (819.00 MHz) 26783 (823.30 MHz)	1.4 MHz	QPSK / 16QAM	1 RB Half RB Full RB
	26705 (815.50 MHz) 26740 (819.00 MHz) 26775 (822.50 MHz)	3 MHz	QPSK / 16QAM	1 RB Half RB Full RB
	26715 (816.50 MHz) 26740 (819.00 MHz) 26765 (821.50 MHz)	5 MHz	QPSK / 16QAM	1 RB Half RB Full RB
	26740 (819.00 MHz)	10 MHz	QPSK / 16QAM	1 RB Half RB Full RB
Modulation Characteristics	26740 (819.00 MHz)	10MHz	QPSK / 16QAM	Full RB
Frequency Stability	26697 (814.70 MHz) 26783 (823.30 MHz)	1.4 MHz	QPSK	Full RB
	26705 (815.50 MHz) 26775 (822.50 MHz)	3 MHz	QPSK	Full RB
	26715 (816.50 MHz) 26765 (821.50 MHz)	5 MHz	QPSK	Full RB
	26740 (819.00 MHz)	10 MHz	QPSK	Full RB
Occupied Bandwidth	26697 (814.70 MHz) 26740 (819.00 MHz) 26783 (823.30 MHz)	1.4 MHz	QPSK / 16QAM	Full RB
	26705 (815.50 MHz) 26740 (819.00 MHz) 26775 (822.50 MHz)	3 MHz	QPSK / 16QAM	Full RB
	26715 (816.50 MHz) 26740 (819.00 MHz) 26765 (821.50 MHz)	5 MHz	QPSK / 16QAM	Full RB
	26740 (819.00 MHz)	10 MHz	QPSK / 16QAM	Full RB
Conducted Emission	26697 (814.70 MHz) 26740 (819.00 MHz) 26783 (823.30 MHz)	1.4 MHz	QPSK	1 RB Full RB
	26705 (815.50 MHz) 26740 (819.00 MHz) 26775 (822.50 MHz)	3 MHz	QPSK	1 RB Full RB
	26715 (816.50 MHz) 26740 (819.00 MHz) 26765 (821.50 MHz)	5 MHz	QPSK	1 RB Full RB
	26740 (819.00 MHz)	10 MHz	QPSK	1 RB Full RB

Test Item	Tested Channel	Channel Bandwidth	Modulation	Mode
Radiated Spurious Emissions below 1GHz	26740 (819.00 MHz)	10 MHz	QPSK	1 RB
Radiated Spurious Emissions above 1GHz	26697 (814.70 MHz)	1.4 MHz	QPSK	1 RB
	26740 (819.00 MHz)			
	26783 (823.30 MHz)			
	26715 (816.50 MHz)	5 MHz	QPSK	1 RB
	26740 (819.00 MHz)			
	26765 (821.50 MHz)	10 MHz	QPSK	1 RB
	26740 (819.00 MHz)			

For Cat-M1 Band 66

Test Item	Tested Channel	Channel Bandwidth	Modulation	Mode
EIRP	131979 (1710.70 MHz) 132322 (1745.00 MHz) 132665 (1779.30 MHz)	1.4 MHz	QPSK / 16QAM	1 RB Half RB Full RB
	131987 (1711.50 MHz) 132322 (1745.00 MHz) 132657 (1778.50 MHz)	3 MHz	QPSK / 16QAM	1 RB Half RB Full RB
	131997 (1712.50 MHz) 132322 (1745.00 MHz) 132647 (1777.50 MHz)	5 MHz	QPSK / 16QAM	1 RB Half RB Full RB
	132022 (1715.00 MHz) 132322 (1745.00 MHz) 132622 (1775.00 MHz)	10 MHz	QPSK / 16QAM	1 RB Half RB Full RB
	132047 (1717.50 MHz) 132322 (1745.00 MHz) 132597 (1772.50 MHz)	15 MHz	QPSK / 16QAM	1 RB Half RB Full RB
	132072 (1720.00 MHz) 132322 (1745.00 MHz) 132572 (1770.00 MHz)	20 MHz	QPSK / 16QAM	1 RB Half RB Full RB
Modulation Characteristics	132322 (1745.00 MHz)	20 MHz	QPSK / 16QAM	Full RB
Frequency Stability	131979 (1710.70 MHz) 132665 (1779.30 MHz)	1.4 MHz	QPSK	Full RB
	131987 (1711.50 MHz) 132657 (1778.50 MHz)	3 MHz	QPSK	Full RB
	131997 (1712.50 MHz) 132647 (1777.50 MHz)	5 MHz	QPSK	Full RB
	132022 (1715.00 MHz) 132622 (1775.00 MHz)	10 MHz	QPSK	Full RB
	132047 (1717.50 MHz) 132597 (1772.50 MHz)	15 MHz	QPSK	Full RB
	132072 (1720.00 MHz) 132572 (1770.00 MHz)	20 MHz	QPSK	Full RB
Occupied Bandwidth	131979 (1710.70 MHz) 132322 (1745.00 MHz) 132665 (1779.30 MHz)	1.4 MHz	QPSK / 16QAM	Full RB
	131987 (1711.50 MHz) 132322 (1745.00 MHz) 132657 (1778.50 MHz)	3 MHz	QPSK / 16QAM	Full RB
	131997 (1712.50 MHz) 132322 (1745.00 MHz) 132647 (1777.50 MHz)	5 MHz	QPSK / 16QAM	Full RB
	132022 (1715.00 MHz) 132322 (1745.00 MHz) 132622 (1775.00 MHz)	10 MHz	QPSK / 16QAM	Full RB
	132047 (1717.50 MHz) 132322 (1745.00 MHz) 132597 (1772.50 MHz)	15 MHz	QPSK / 16QAM	Full RB
	132072 (1720.00 MHz) 132322 (1745.00 MHz) 132572 (1770.00 MHz)	20 MHz	QPSK / 16QAM	Full RB

Test Item	Tested Channel	Channel Bandwidth	Modulation	Mode
Peak to Average Ratio	131979 (1710.70 MHz) 132322 (1745.00 MHz) 132665 (1779.30 MHz)	1.4 MHz	QPSK / 16QAM	1 RB
	131987 (1711.50 MHz) 132322 (1745.00 MHz) 132657 (1778.50 MHz)	3 MHz	QPSK / 16QAM	1 RB
	131997 (1712.50 MHz) 132322 (1745.00 MHz) 132647 (1777.50 MHz)	5 MHz	QPSK / 16QAM	1 RB
	132022 (1715.00 MHz) 132322 (1745.00 MHz) 132622 (1775.00 MHz)	10 MHz	QPSK / 16QAM	1 RB
	132047 (1717.50 MHz) 132322 (1745.00 MHz) 132597 (1772.50 MHz)	15 MHz	QPSK / 16QAM	1 RB
	132072 (1720.00 MHz) 132322 (1745.00 MHz) 132572 (1770.00 MHz)	20 MHz	QPSK / 16QAM	1 RB
Conducted Emission	131979 (1710.70 MHz) 132322 (1745.00 MHz) 132665 (1779.30 MHz)	1.4 MHz	QPSK	1 RB Full RB
	131987 (1711.50 MHz) 132322 (1745.00 MHz) 132657 (1778.50 MHz)	3 MHz	QPSK	1 RB Full RB
	131997 (1712.50 MHz) 132322 (1745.00 MHz) 132647 (1777.50 MHz)	5 MHz	QPSK	1 RB Full RB
	132022 (1715.00 MHz) 132322 (1745.00 MHz) 132622 (1775.00 MHz)	10 MHz	QPSK	1 RB Full RB
	132047 (1717.50 MHz) 132322 (1745.00 MHz) 132597 (1772.50 MHz)	15 MHz	QPSK	1 RB Full RB
	132072 (1720.00 MHz) 132322 (1745.00 MHz) 132572 (1770.00 MHz)	20 MHz	QPSK	1 RB Full RB
Radiated Spurious Emissions below 1GHz	132322 (1745.00 MHz)	20 MHz	QPSK	1 RB
Radiated Spurious Emissions above 1GHz	131979 (1710.70 MHz) 132322 (1745.00 MHz) 132665 (1779.30 MHz)	1.4 MHz	QPSK	1 RB
	131997 (1712.50 MHz) 132322 (1745.00 MHz) 132647 (1777.50 MHz)	5 MHz	QPSK	1 RB
	132072 (1720.00 MHz) 132322 (1745.00 MHz) 132572 (1770.00 MHz)	20 MHz	QPSK	1 RB

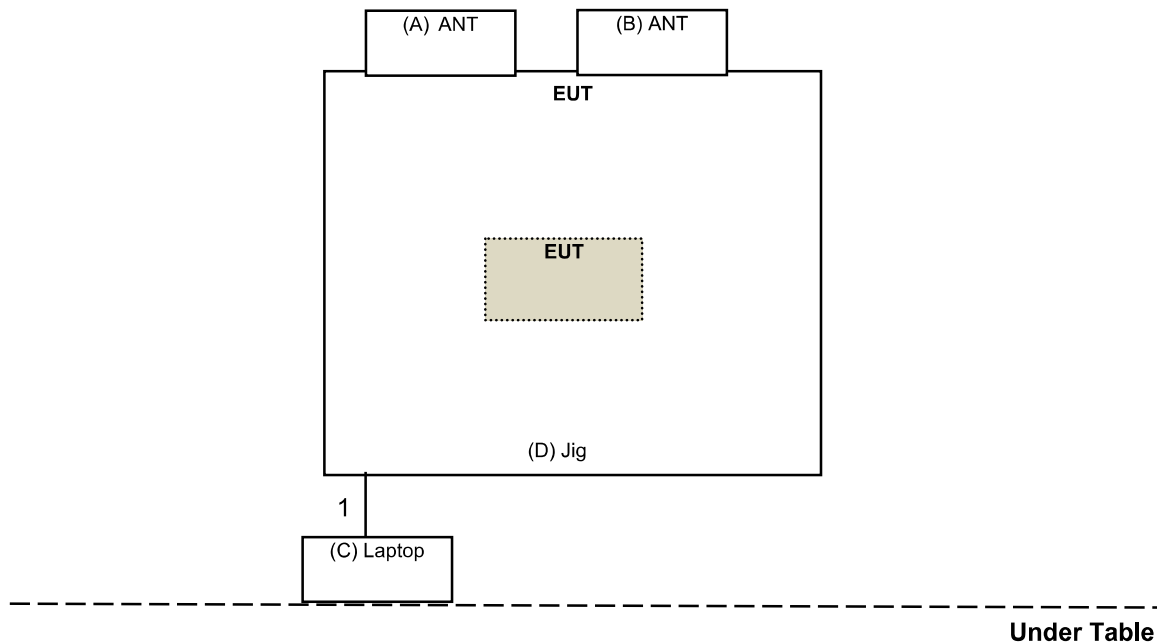
For Cat-M1 Band 85

Test Item	Tested Channel	Channel Bandwidth	Modulation	Mode
ERP	134027 (700.5MHz)	5MHz	QPSK / 16QAM	1 RB
	134092 (707.0MHz)			Half RB
	134157 (713.5MHz)	10MHz	QPSK / 16QAM	Full RB
	134052 (703.0MHz)			1 RB
	134092 (707.0MHz)			Half RB
	134132 (711.0MHz)			Full RB
Modulation Characteristics	134092 (707.0MHz)	10MHz	QPSK / 16QAM	Full RB
Frequency Stability	134027 (700.5MHz)	5MHz	QPSK	Full RB
	134157 (713.5MHz)			Full RB
	134052 (703.0MHz)	10MHz	QPSK	Full RB
	134132 (711.0MHz)			Full RB
Occupied Bandwidth	134027 (700.5MHz)	5MHz	QPSK / 16QAM	Full RB
	134092 (707.0MHz)			Full RB
	134157 (713.5MHz)	10MHz	QPSK / 16QAM	Full RB
	134052 (703.0MHz)			Full RB
Peak to Average Ratio	134027 (700.5MHz)	5MHz	QPSK / 16QAM	1 RB
	134092 (707.0MHz)			1 RB
	134157 (713.5MHz)	10MHz	QPSK / 16QAM	1 RB
	134052 (703.0MHz)			1 RB
Conducted Emission	134027 (700.5MHz)	5MHz	QPSK	1 RB
	134092 (707.0MHz)			Full RB
	134157 (713.5MHz)	10MHz	QPSK	1 RB
	134052 (703.0MHz)			Full RB
	134092 (707.0MHz)			Full RB
	134132 (711.0MHz)			Full RB
Radiated Spurious Emissions below 1GHz	134092 (707.0MHz)	10MHz	QPSK	1 RB
Radiated Spurious Emissions above 1GHz	134027 (700.5MHz)	5MHz	QPSK	1 RB
	134092 (707.0MHz)			1 RB
	134157 (713.5MHz)	10MHz	QPSK	1 RB
	134052 (703.0MHz)			1 RB
	134092 (707.0MHz)			1 RB
	134132 (711.0MHz)			1 RB

3.4 Test Program Used and Operation Descriptions

There is no need to controlling software during the test, and the EUT can be paired with the Radio Communication Analyzer to test the connection when it is powered on.

3.5 Connection Diagram of EUT and Peripheral Devices



3.6 Configuration of Peripheral Devices and Cable Connections

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A	ANT	RFLINK	RF21.S00940A	N/A	N/A	Supplied by applicant
B	ANT	RFLINK	RF21.S00940A	N/A	N/A	Supplied by applicant
C	Laptop	Lenovo	L440	R9-0GFJKK	N/A	Provided by Lab
D	Jig	N/A	N/A	N/A	N/A	Supplied by applicant

ID	Cable Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1	USB typeC Cable	1	0.9	Yes	No	Supplied by applicant

4 Test Instruments

The calibration interval of the all test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.1 Effective Radiated Power and Equivalent Isotropically Radiated Power

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
PXA Signal Analyzer KEYSIGHT	N9030B	MY57140488	2025/3/11	2026/3/10
Radio Communication Analyzer Anritsu	MT8821C	6201462755	2024/3/13	2025/3/12
Wideband Radio Communication Tester R&S	CMW500	152443	2024/8/7	2025/8/6
Software BV	ADT_RF Test Software V6.6.5.4	N/A	N/A	N/A

Notes:

1. The test was performed in Oven room.
2. Tested Date: 2025/3/12

4.2 Modulation Characteristics

Refer to section 4.1 to get information of the instruments.

4.3 Peak to Average Ratio

Refer to section 4.1 to get information of the instruments.

4.4 Bandwidth

Refer to section 4.1 to get information of the instruments.

4.5 Conducted Spurious Emissions

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
PXA Signal Analyzer KEYSIGHT	N9030B	MY57140488	2025/3/11	2026/3/10
Radio Communication Analyzer Anritsu	MT8821C	6261806803	2025/2/19	2026/2/18
Wideband Radio Communication Tester R&S	CMW500	152443	2024/8/7	2025/8/6
Software BV	ADT_RF Test Software V6.6.5.4	N/A	N/A	N/A

Notes:

1. The test was performed in Oven room.
2. Tested Date: 2025/3/12

4.6 Radiated Spurious Emissions below 1GHz

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Software BV ADT	ADT_Radiated_ V7.6.15.9.5	NA	NA	NA
Antenna Tower Max-Full	MFT-151SS-0.5T	NA	NA	NA
Turn Table Max-Full	MF-7802BS	NA	NA	NA
Turn Table Controller Max-Full	MF-7802BS	MF780208674	NA	NA
EMI Test Receiver R&S	ESR3	102782	2024/12/10	2025/12/9
Signal & Spectrum Analyzer R&S	FSW43	101866	2024/3/26	2025/3/25
Loop Antenna TESEQ	HLA 6121	45745	2024/8/21	2025/8/20
Loop Antenna Electro-Metrics	EM-6879	264	2025/3/6	2026/3/5
Preamplifier EMCI	EMC001340	980201	2024/9/24	2025/9/23
RF Coaxial Cable EMCI	5D-NM-BM	140901	2024/9/24	2025/9/23
Preamplifier EMCI	EMC330N	980782	2025/1/14	2026/1/13
Bi_Log Antenna Schwarzbeck	VULB 9168	9168-1213	2024/10/14	2025/10/13
RF Coaxial Cable EMCI	EMCCFD400-NM-NM-500	201233	2025/1/14	2026/1/13
RF Coaxial Cable EMCI	EMCCFD400-NM-NM-3000	201235	2025/1/14	2026/1/13
RF Coaxial Cable EMCI	EMCCFD400-NM-NM-9000	201236(with PAD)	2025/1/14	2026/1/13

Notes:

1. The test was performed in WM - 966 chamber 8.
2. Tested Date: 2025/3/3

4.7 Radiated Spurious Emissions above 1GHz

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Software BV ADT	ADT_Radiated_ V7.6.15.9.5	NA	NA	NA
Antenna Tower Max-Full	MFT-151SS-0.5T	NA	NA	NA
Turn Table Max-Full	MF-7802BS	NA	NA	NA
Turn Table Controller Max-Full	MF-7802BS	MF780208674	NA	NA
EMI Test Receiver R&S	ESR3	102782	2024/12/10	2025/12/9
Signal & Spectrum Analyzer R&S	FSW43	101866	2024/3/26	2025/3/25
Loop Antenna TESEQ	HLA 6121	45745	2024/8/21	2025/8/20
Loop Antenna Electro-Metrics	EM-6879	264	2025/3/6	2026/3/5
Preamplifier EMCI	EMC001340	980201	2024/9/24	2025/9/23
RF Coaxial Cable EMCI	5D-NM-BM	140901	2024/9/24	2025/9/23
Horn Antenna RFSPIN	DRH18-E	210103A18E	2024/12/26	2025/12/25
Preamplifier EMCI	EMC118A45SE	980808	2024/12/26	2025/12/25
RF Coaxial Cable EMCI	EMC104-SM-SM-1000	210102	2025/1/14	2026/1/13
RF Coaxial Cable EMCI	EMC104-SM-SM-3000	201231	2025/1/14	2026/1/13
RF Coaxial Cable EMCI	EMC104-SM-SM-9000	201243	2025/1/14	2026/1/13
Preamplifier EMCI	EMC184045SE	980788	2025/1/14	2026/1/13
Horn Antenna Schwarzbeck	BBHA 9170	9170-1049	2024/11/10	2025/11/9
RF Coaxial Cable EMCI	EMC101G-KM-KM-5000	201261	2025/1/14	2026/1/13
RF Coaxial Cable EMCI	EMC101G-KM-KM-3000	201258	2025/1/14	2026/1/13
RF Coaxial Cable EMCI	EMC101G-KM-KM-2000	201254	2025/1/14	2026/1/13

Notes:

1. The test was performed in WM - 966 chamber 8.
2. Tested Date: 2025/2/26 ~ 2025/3/11

4.8 Frequency Stability

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
3-channel DC power supply JIN YIH Technology	ODP3033	ODP30332128138	N/A	N/A
Digital Multimeter Fluke	87-III	70360742	2024/7/5	2025/7/4
Signal and spectrum analyzer R&S	FSV3044	101105	2025/2/25	2026/2/24
Software BV	ADT_RF Test Software V6.6.5.4	N/A	N/A	N/A
Temperature & Humidity Chamber TERCHY	HRM-120RF	931022	2025/1/9	2026/1/8
Radio Communication Analyzer Anritsu	MT8821C	6201462755	2024/3/13	2025/3/12

Notes:

1. The test was performed in Oven room.
2. Tested Date: 2025/3/12

5 Limits of Test Items

5.1 Effective Radiated Power and Equivalent Isotropically Radiated Power

For Cat-M1 Band 2, Cat-M1 Band 25:

Mobile and portable stations are limited to 2 watts EIRP.

For Cat-M1 Band 4, Cat-M1 Band 66:

Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz bands are limited to 1 watt EIRP.

For Cat-M1 Band 5, Cat-M1 Band 26 (Part 22):

The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

For Cat-M1 Band 8:

Mobile, control and auxiliary test stations must not exceed 10 watts ERP.

For Cat-M1 Band 12, Cat-M1 Band 85:

Portable stations (hand-held devices) in the 600 MHz uplink band and the 698-746 MHz band, and fixed and mobile stations in the 600 MHz uplink band are limited to 3 watts ERP.

For Cat-M1 Band 13:

Portable stations (hand-held devices) transmitting in the 746-757 MHz, 776-788 MHz, and 805-806 MHz bands are limited to 3 watts ERP.

For Cat-M1 Band 14:

Control stations and mobile stations transmitting in the 758-768 MHz band and the 788-798 MHz band are limited to 30 watts ERP.

For Cat-M1 Band 26 (Part 90):

The maximum output power of the transmitter for mobile stations is 100 watts (20 dBw) ERP.

5.2 Modulation Characteristics

A curve or equivalent data which shows that the equipment will meet the modulation requirements of the rules under which the equipment is to be licensed.

5.3 Peak to Average Ratio

In measuring transmissions in this band using an average power technique, the peak to-average ratio (PAR) of the transmission may not exceed 13 dB.

5.4 Bandwidth

According to FCC 47 CFR part 2.1049, the occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5% of the total mean power radiated by a given emission.

5.5 Conducted Spurious Emissions

For Cat-M1 Band 2, Cat-M1 Band 5, Cat-M1 Band 25, Cat-M1 Band 26 (Part 22):

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB. The emission limit equal to -13 dBm.

For Cat-M1 Band 4:

According to FCC 47 CFR part 27.53(h), for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log(P)$ dB. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

For Cat-M1 Band 8:

According to FCC 47 CFR part 27.1509(a), the power of any emission outside a licensee's frequency band of operation shall be attenuated below the transmitter power (P) by at least $43 + 10 \log(P)$ dB. The limit of emission is equal to -13 dBm. Compliance with the provisions of paragraphs (a) and (b) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the licensee's band, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

For Cat-M1 Band 12, Cat-M1 Band 85:

According to FCC 47 CFR part 27.53(g), for operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least $43 + 10 \log(P)$ dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

For Cat-M1 Band 13:

According to FCC 47 CFR part 27.53(c)(2), for on any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log(P)$ dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

According to FCC 47 CFR part 27.53(c)(4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than $65 + 10 \log(P)$ dB in a 6.25 kHz band segment, for mobile and portable stations.

For operations in the 775-788 MHz, emissions in the band 1559-1610 MHz shall be limited to -70 dBW/MHz (EIRP). The limit of emissions is equal to -40 dBm.

For Cat-M1 Band 14:

According to FCC 47 CFR part 90.543 (e), for operations in the 758-768 MHz and the 788-798 MHz bands, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

(1) On all frequencies between 769-775 MHz and 799-805 MHz, by a factor not less than $65 + 10 \log(P)$ dB in a 6.25 kHz band segment, for mobile and portable stations.

(2) On any frequency between 775-788 MHz, above 805 MHz, and below 758 MHz, by at least $43 + 10 \log(P)$ dB.

According to FCC 47 CFR part 90.543 (f), for operations in the 758-775 MHz and 788-805 MHz bands, all emissions including harmonics in the band 1559-1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth.

For Cat-M1 Band 26 (Part 90):

According to FCC 47 CFR part 90.691 shall be tested the emission masks. For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $116 \log_{10}(f/6.1)$ decibels or $50 + 10 \log_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.

For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

For §90.691(a), RBW = 300 Hz for offset less than 37.5 kHz from channel edge and RBW = 100 kHz for offsets greater than 37.5 kHz is allowed.

For Cat-M1 Band 66:

According to FCC 47 CFR part 27.53(h), for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log(P)$ dB. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

5.6 Radiated Spurious Emissions below 1GHz

For Cat-M1 Band 2, Cat-M1 Band 5, Cat-M1 Band 25, Cat-M1 Band 26 (Part 22):

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB. The emission limit equal to -13 dBm.

For Cat-M1 Band 4:

According to FCC 47 CFR part 27.53(h), for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log(P)$ dB. The limit of emission is equal to -13 dBm.

For Cat-M1 Band 8:

According to FCC 47 CFR part 27.1509(a), the power of any emission outside a licensee's frequency band of operation shall be attenuated below the transmitter power (P) by at least $43 + 10 \log(P)$ dB. The limit of emission is equal to -13 dBm.

For Cat-M1 Band 12, Cat-M1 Band 85:

According to FCC 47 CFR part 27.53(g), for operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least $43 + 10 \log(P)$ dB. The limit of emissions is equal to -13 dBm.

For Cat-M1 Band 13:

According to FCC 47 CFR part 27.53(c)(2), for on any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log(P)$ dB. The limit of emissions is equal to -13 dBm.

For operations in the 775-788 MHz, emissions in the band 1559-1610 MHz shall be limited to -70 dBW/MHz (EIRP). The limit of emissions is equal to -40 dBm.

For Cat-M1 Band 14:

According to FCC 47 CFR part 90.543 (e), for operations in the 758-768 MHz and the 788-798 MHz bands, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log(P)$ dB.

For Cat-M1 Band 26 (Part 90):

For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

For §90.691(a), RBW = 100 kHz for offset greater than 37.5 kHz from channel edge is allowed.

For Cat-M1 Band 66:

According to FCC 47 CFR part 27.53(h), for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log(P)$ dB. The limit of emission is equal to -13 dBm.

5.7 Radiated Spurious Emissions above 1GHz

For Cat-M1 Band 2, Cat-M1 Band 5, Cat-M1 Band 25, Cat-M1 Band 26 (Part 22):

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB. The emission limit equal to -13 dBm.

For Cat-M1 Band 4:

According to FCC 47 CFR part 27.53(h), for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log(P)$ dB. The limit of emission is equal to -13 dBm.

For Cat-M1 Band 8:

According to FCC 47 CFR part 27.1509(a), the power of any emission outside a licensee's frequency band of operation shall be attenuated below the transmitter power (P) by at least $43 + 10 \log(P)$ dB. The limit of emission is equal to -13 dBm.

For Cat-M1 Band 12, Cat-M1 Band 85:

According to FCC 47 CFR part 27.53(g), for operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least $43 + 10 \log(P)$ dB. The limit of emissions is equal to -13 dBm.

For Cat-M1 Band 13:

According to FCC 47 CFR part 27.53(c)(2), for on any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log(P)$ dB. The limit of emissions is equal to -13 dBm.

For operations in the 775-788 MHz, emissions in the band 1559-1610 MHz shall be limited to -70 dBW/MHz (EIRP). The limit of emissions is equal to -40 dBm.

For Cat-M1 Band 14:

According to FCC 47 CFR part 90.543 (e), for operations in the 758-768 MHz and the 788-798 MHz bands, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log(P)$ dB.

According to FCC 47 CFR part 90.543 (f), for operations in the 758-775 MHz and 788-805 MHz bands, all emissions including harmonics in the band 1559-1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth.

For Cat-M1 Band 26 (Part 90):

For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

For §90.691(a), RBW = 100 kHz for offset greater than 37.5 kHz from channel edge is allowed.

For Cat-M1 Band 66:

According to FCC 47 CFR part 27.53(h), for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log(P)$ dB. The limit of emission is equal to -13 dBm.

5.8 Frequency Stability

For Cat-M1 Band 5, Cat-M1 Band 26 (Part 90):

1.5 ppm is for base and fixed station. 2.5 ppm is for mobile station.

For Cat-M1 Band 2, Cat-M1 Band 4, Cat-M1 Band 8, Cat-M1 Band 12, Cat-M1 Band 13, Cat-M1 Band 25, Cat-M1 Band 26 (Part 22), Cat-M1 Band 66, Cat-M1 Band 85:

The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation (authorized frequency block).

Cat-M1 Band 14:

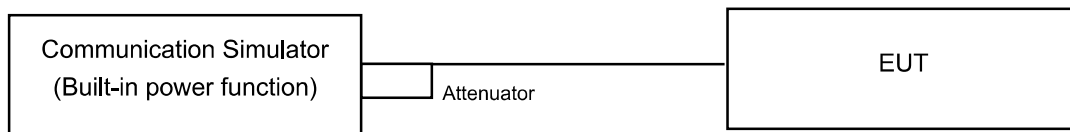
The frequency stability of mobile, portable and control transmitters operating in the wideband segment must be 1.25 parts per million or better when AFC is locked to a base station, and 5 parts per million or better when AFC is not locked.

6 Test Arrangements

6.1 Effective Radiated Power and Equivalent Isotropically Radiated Power

6.1.1 Test Setup

Conducted Power Measurement:



6.1.2 Test Procedure

Conducted Power Measurement:

The EUT is configured by emulator to set data modulation and maximum power using WWAN technology. The average (rms) power measurement was performed on emulator and power value was measured from power function on emulator. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

Maximum EIRP / ERP

The relevant equation for determining the maximum ERP or EIRP from the measured RF output power is given in Equation as follows:

$$\text{EIRP} = P_{\text{Meas}} + G_T$$

$$\text{ERP} = P_{\text{Meas}} + G_T - 2.15$$

where

ERP or EIRP effective radiated power or equivalent isotropically radiated power, respectively

(expressed in the same units as P_{Meas} , e.g., dBm or dBW)

P_{Meas} measured transmitter output power or PSD, in dBm or dBW

G_T gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP)

6.2 Modulation Characteristics

6.2.1 Test Setup

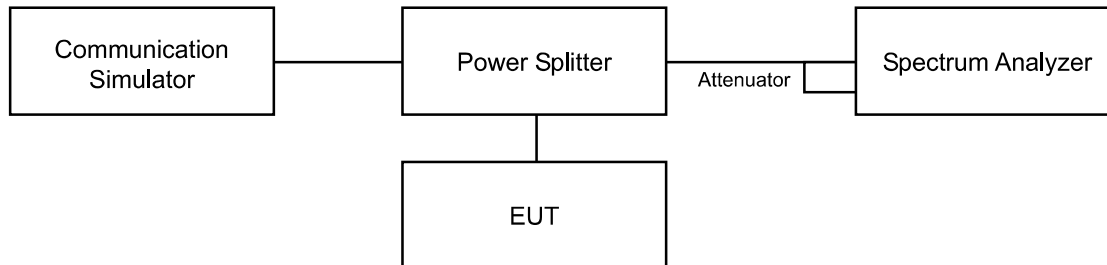


6.2.2 Test Procedure

Connect the EUT to Communication Simulator via the antenna connector, the frequency band is set as EUT supported Modulation and Channels, the EUT output is matched with 50 ohm load, the waveform quality and constellation of the EUT was tested.

6.3 Peak to Average Ratio

6.3.1 Test Setup

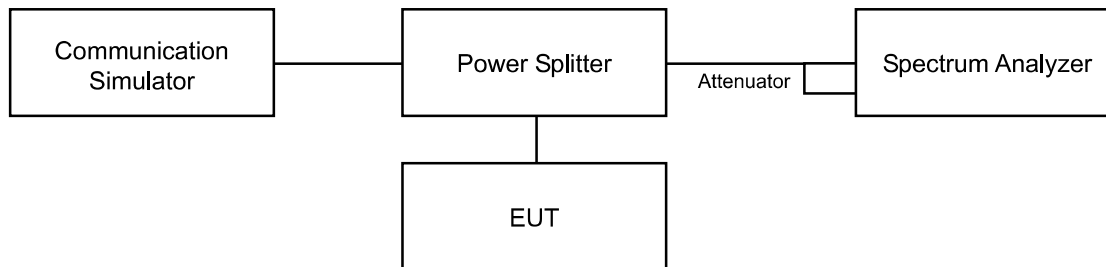


6.3.2 Test Procedure

- Set resolution/measurement bandwidth $\geq$ signal's occupied bandwidth;
- Set the number of counts to a value that stabilizes the measured CCDF curve;
- Record the maximum PAPR level associated with a probability of 0.1%.

6.4 Bandwidth

6.4.1 Test Setup



6.4.2 Test Procedure

For the 26 dBc bandwidth measurement method, please refer to section 5.4.3 of ANSI C63.26.

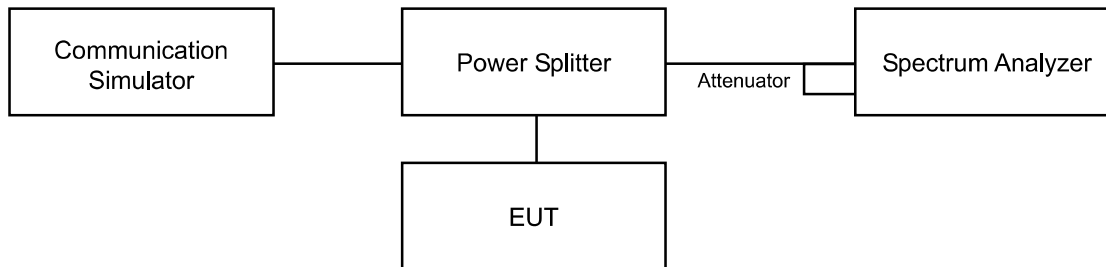
- a. The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the spectrum analyzer shall be wide enough to see sufficient roll off of the signal to make the measurement.
- b. The nominal RBW shall be in the range of 1% to 5% of the anticipated OBW, and the VBW shall be set $\geq 3 \times \text{RBW}$.
- c. Set the reference level of the instrument as required to prevent the signal amplitude from exceeding the maximum spectrum analyzer input mixer level for linear operation. See guidance provided in 4.2.3.
- d. The dynamic range of the spectrum analyzer at the selected RBW shall be more than 10 dB below the target “-X dB” requirement, i.e., if the requirement calls for measuring the -26 dB OBW, the spectrum analyzer noise floor at the selected RBW shall be at least 36 dB below the reference level.
- e. Set spectrum analyzer detection mode to peak, and the trace mode to max hold.
- f. Determine the following reference values: Set the EUT to transmit a modulated signal. Allow the trace to stabilize. Set the spectrum analyzer marker to the highest level of the displayed trace (this is the reference value).
- g. Determine the “-X dB amplitude” as equal to (Reference Value - X). Alternatively, this calculation can be performed on the spectrum analyzer using the delta-marker measurement function.
- h. Place two markers, one at the lowest and the other at the highest frequency of the envelope of the spectral display such that each marker is at or slightly below the “-X dB amplitude” determined in step f). If a marker is below this “-X dB amplitude” value it should be as close as possible to this value. The OBW is the positive frequency difference between the two markers.
- i. The OBW shall be reported by providing plot(s) of the measuring instrument display, to include markers depicting the relevant frequency and amplitude information (e.g., marker table). The frequency and amplitude axis and scale shall be clearly labeled. Tabular data may be reported in addition to the plot(s).

For the occupied bandwidth measurement method, please refer to section 5.4.4 of ANSI C63.26.

- a. The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the spectrum analyzer shall be wide enough to see sufficient roll off of the signal to make the measurement.
- b. The nominal RBW shall be in the range of 1% to 5% of the anticipated OBW, and the VBW shall be set $\geq 3 \times \text{RBW}$.
- c. Set the reference level of the instrument as required to prevent the signal amplitude from exceeding the maximum spectrum analyzer input mixer level for linear operation. See guidance provided in 4.2.3.
- d. The dynamic range of the spectrum analyzer at the selected RBW shall be more than 10 dB below the target “-X dB” requirement, i.e., if the requirement calls for measuring the -26 dB OBW, the spectrum analyzer noise floor at the selected RBW shall be at least 36 dB below the reference level.
- e. Set spectrum analyzer detection mode to peak, and the trace mode to max hold.
- f. Determine the reference value by either of the following:
 - g. 1) Set the EUT to transmit a modulated signal. Allow the trace to stabilize. Set the spectrum analyzer marker to the highest level of the displayed trace (this is the reference value).
 - h. 2) Set the EUT to transmit an unmodulated carrier. Set the spectrum analyzer marker to the level of the carrier.
- i. Determine the “-X dB amplitude” as equal to (Reference Value - X). Alternatively, this calculation can be performed on the spectrum analyzer using the delta-marker measurement function.
- j. If the reference value was determined using an unmodulated carrier, turn the EUT modulation on, then either clear the existing trace or start a new trace on the spectrum analyzer and allow the new trace to stabilize. Otherwise the trace from step f) shall be used for step i).
- k. Place two markers, one at the lowest and the other at the highest frequency of the envelope of the spectral display such that each marker is at or slightly below the “-X dB amplitude” determined in step f). If a marker is below this “-X dB amplitude” value it should be as close as possible to this value. The OBW is the positive frequency difference between the two markers. The spectral envelope can cross the “-X dB amplitude” at multiple points. The lowest or highest frequency shall be selected as the frequencies that are the farthest away from the center frequency at which the spectral envelope crosses the “-X dB amplitude.”
- l. The OBW shall be reported by providing plot(s) of the measuring instrument display, to include markers depicting the relevant frequency and amplitude information (e.g., marker table). The frequency and amplitude axis and scale shall be clearly labeled. Tabular data may be reported in addition to the plot(s).

6.5 Conducted Spurious Emissions

6.5.1 Test Setup



6.5.2 Test Procedure

- Measurement refer to ANSI C63.26 section 5.7.
- All measurements were done at 3 channels: low, middle and high operational frequency range.
- Measuring frequency range is from 9 kHz up to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower. 20 dB attenuation pad is connected with spectrum.
- The fundamental frequency above 1 GHz, the spectrum set RBW = 1 MHz, VBW = 3 MHz, Detector = Average.
- The fundamental frequency below 1 GHz, the spectrum set RBW ≥ 100 kHz, VBW $\geq 3 \times$ RBW, Detector = Average.
- Measuring frequency band edge, narrow RBW (no less than 1% of the OBW) is used for conducted emission measurement.

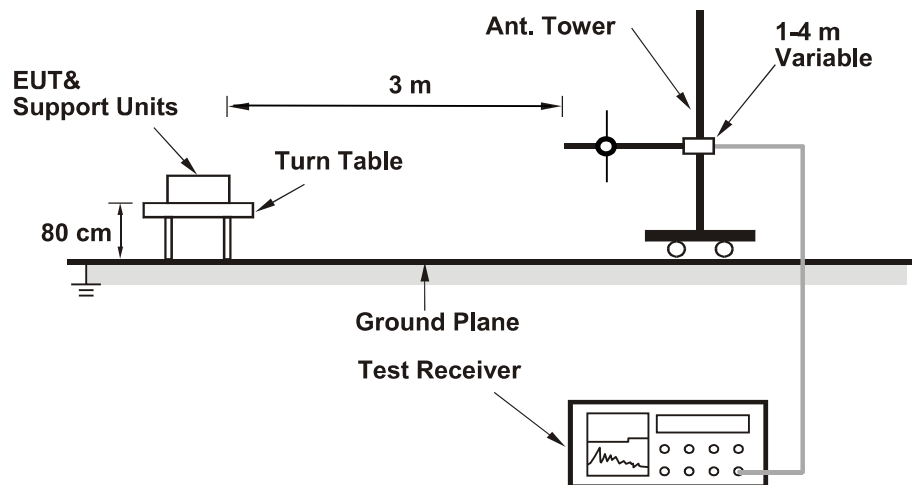
For Emission Mask:

- Measurement refer to ANSI C63.26 section 5.7.
- All measurements were done at 2 channels: low and high operational frequency range.
- According to FCC 47 CFR part 90.691(a), the spectrum set RBW = 300 Hz for offset less than 37.5 kHz from channel edge and RBW = 100 kHz for offsets greater than 37.5 kHz is allowed.
- Record the maximum power value test plot.

6.6 Radiated Spurious Emissions below 1GHz

6.6.1 Test Setup

For radiated emission 30 MHz to 1 GHz



For the actual test configuration, please refer to the attached file (Test Setup Photo).

6.6.2 Test Procedure

The EUT is configured by emulator to set data modulation and maximum power using WWAN technology.

- In the semi-anechoic chamber, EUT placed on the 0.8 m (below or equal 1 GHz) height of turn table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1 m to 4 m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.
- The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- Perform a field strength measurement and record the worse read value, is the field strength value via a spectrum reading obtained corrected for antenna factor, cable loss and pre-amplifier factor and then mathematically convert the measured field strength level to EIRP/ERP level.
- Following C63.26 section 5.5 and 5.2.7
- $EIRP \text{ (dBm)} = E \text{ (dB}\mu\text{V/m)} + 20\log(D) - 104.8$; where D is the measurement distance (in the far field region) in m.
- $ERP \text{ (dBm)} = E \text{ (dB}\mu\text{V/m)} + 20\log(D) - 104.8 - 2.15$; where D is the measurement distance (in the far field region) in m.

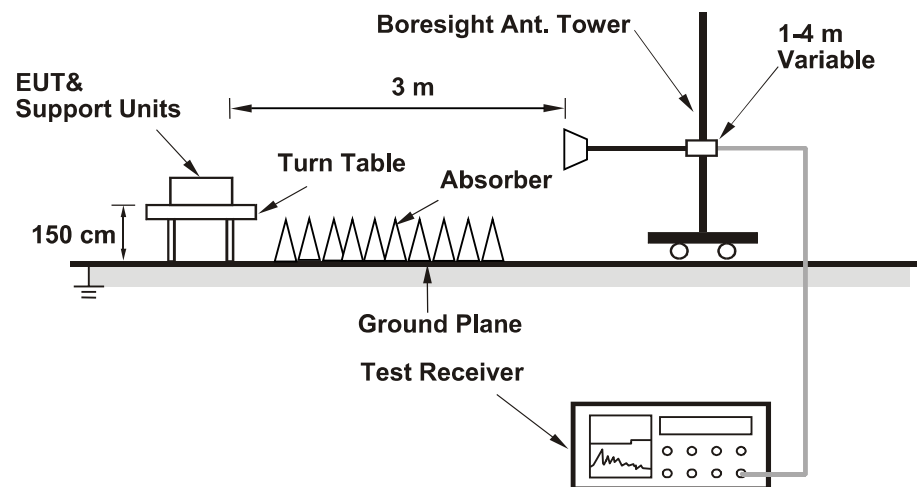
Note:

- The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz/3 MHz.
- The emission levels were against the limit of frequency range 9 kHz ~ 30 MHz:
The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

6.7 Radiated Spurious Emissions above 1GHz

6.7.1 Test Setup

For radiated emission above 1 GHz



For the actual test configuration, please refer to the attached file (Test Setup Photo).

6.7.2 Test Procedure

The EUT is configured by emulator to set data modulation and maximum power using WWAN technology.

- In the semi-anechoic chamber, EUT placed on the 1.5 m height of turn table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1 m to 4 m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.
- The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- Perform a field strength measurement and record the worse read value, is the field strength value via a spectrum reading obtained corrected for antenna factor, cable loss and pre-amplifier factor and then mathematically convert the measured field strength level to EIRP/ERP level.
- Following C63.26 section 5.5 and 5.2.7
- $EIRP \text{ (dBm)} = E \text{ (dB}\mu\text{V/m)} + 20\log(D) - 104.8$; where D is the measurement distance (in the far field region) in m.
- $ERP \text{ (dBm)} = E \text{ (dB}\mu\text{V/m)} + 20\log(D) - 104.8 - 2.15$; where D is the measurement distance (in the far field region) in m.

Note:

- The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz/3 MHz. Set detector = average.