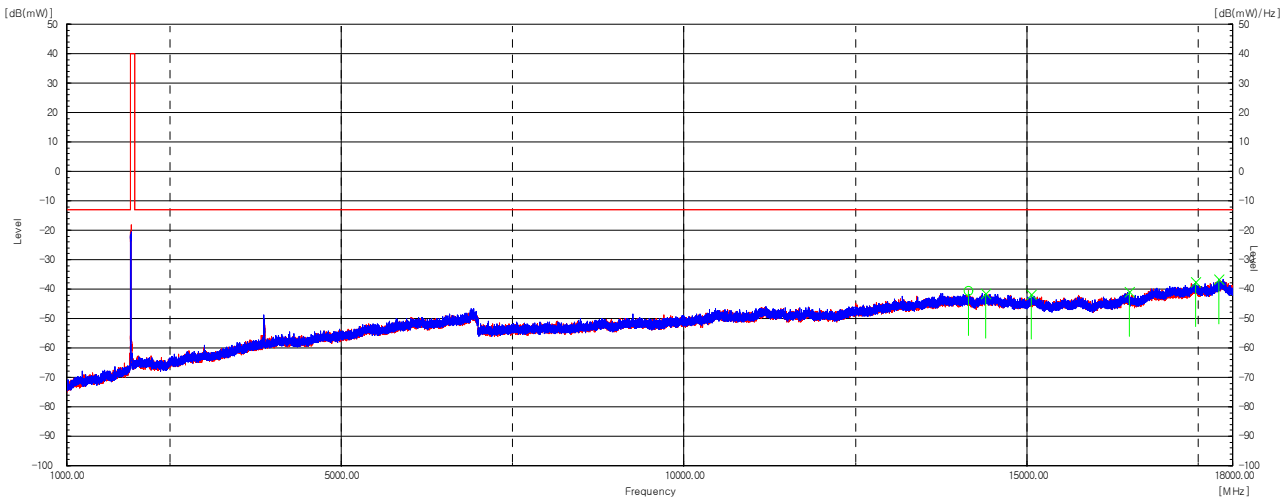


Test mode : LTE 1C 15 MHz_16QAM_Lowest (Worst case)

Frequency Range : 30 MHz - 1 GHz

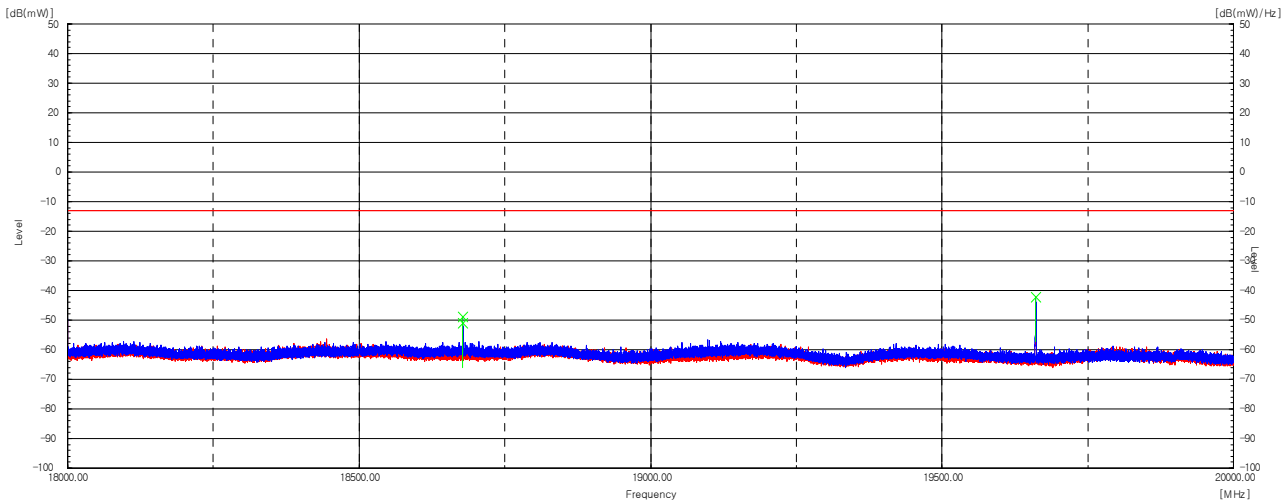
Frequency [MHz]	Pol.	Reading [dB(μV)]	c.f [dB(1/m)]	Result PK [dB(μV/m)]	Limit QP [dB(μV/m)]	Margin QP-PK [dB]	Height [cm]	Angle [deg]
The emissions 20 dB lower than the limit.								

Frequency Range : 1 GHz - 18 GHz



Frequency [MHz]	Pol.	Reading [dBm]	Space Loss [dB]	EIRP[dBm]	Limit[dBm]	Margin[dB]	Height [cm]	Angle [deg]
The emissions 20 dB lower than the limit.								

Frequency Range : 18 GHz - 20 GHz



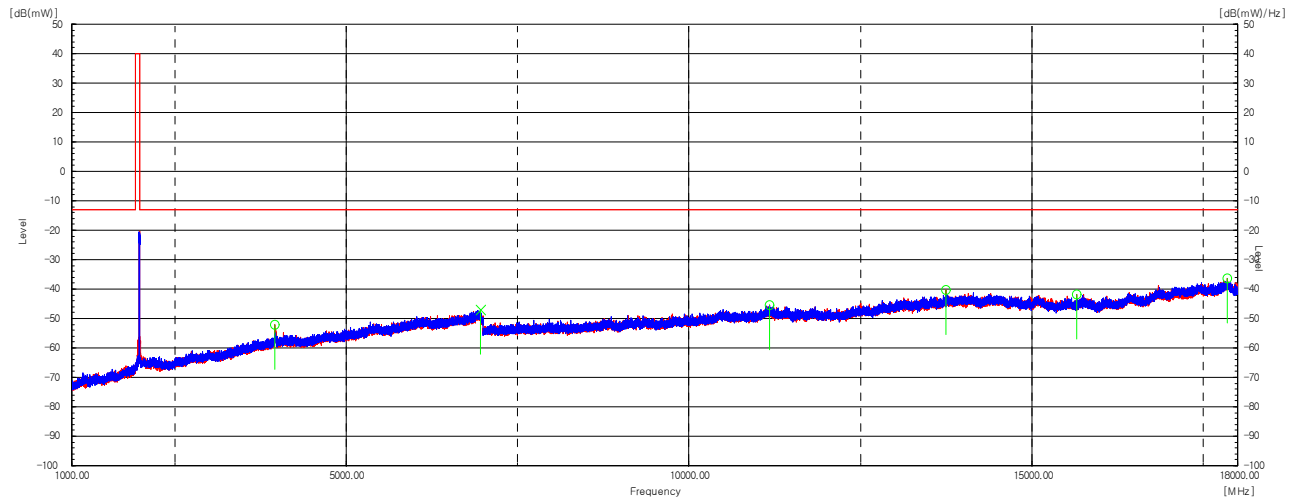
Frequency [MHz]	Pol.	Reading [dBm]	Space Loss [dB]	EIRP[dBm]	Limit[dBm]	Margin[dB]	Height [cm]	Angle [deg]
The emissions 20 dB lower than the limit.								

Test mode : LTE 1C 20 MHz_16QAM_Highest (Worst case)

Frequency Range : 30 MHz - 1 GHz

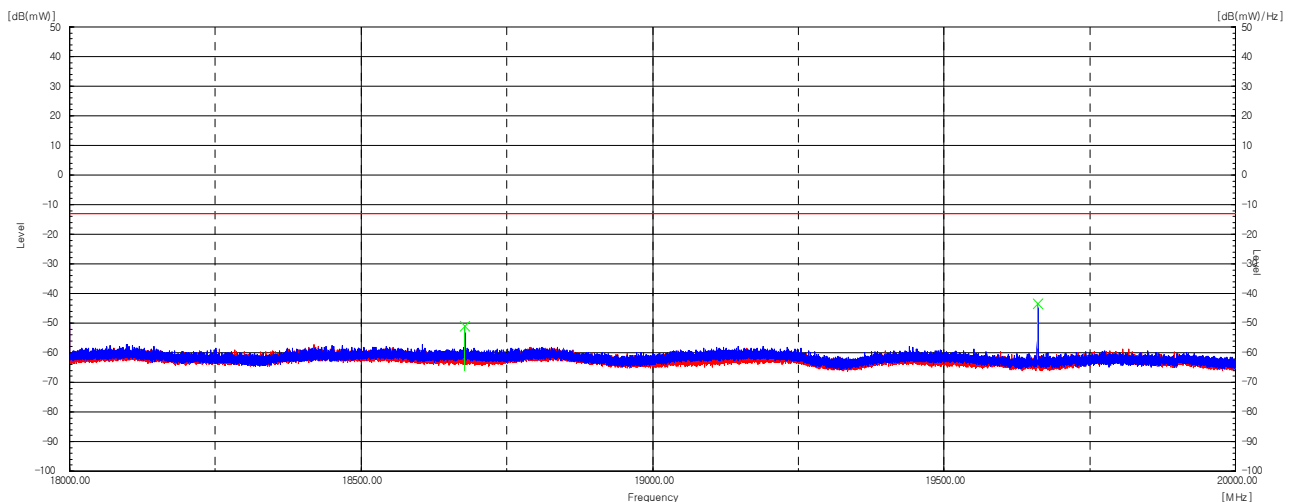
Frequency [MHz]	Pol.	Reading [dB(μV)]	c.f [dB(1/m)]	Result PK [dB(μV/m)]	Limit QP [dB(μV/m)]	Margin QP-PK [dB]	Height [cm]	Angle [deg]
The emissions 20 dB lower than the limit.								

Frequency Range : 1 GHz - 18 GHz



Frequency [MHz]	Pol.	Reading [dBm]	Space Loss [dB]	EIRP[dBm]	Limit[dBm]	Margin[dB]	Height [cm]	Angle [deg]
The emissions 20 dB lower than the limit.								

Frequency Range : 18 GHz - 20 GHz



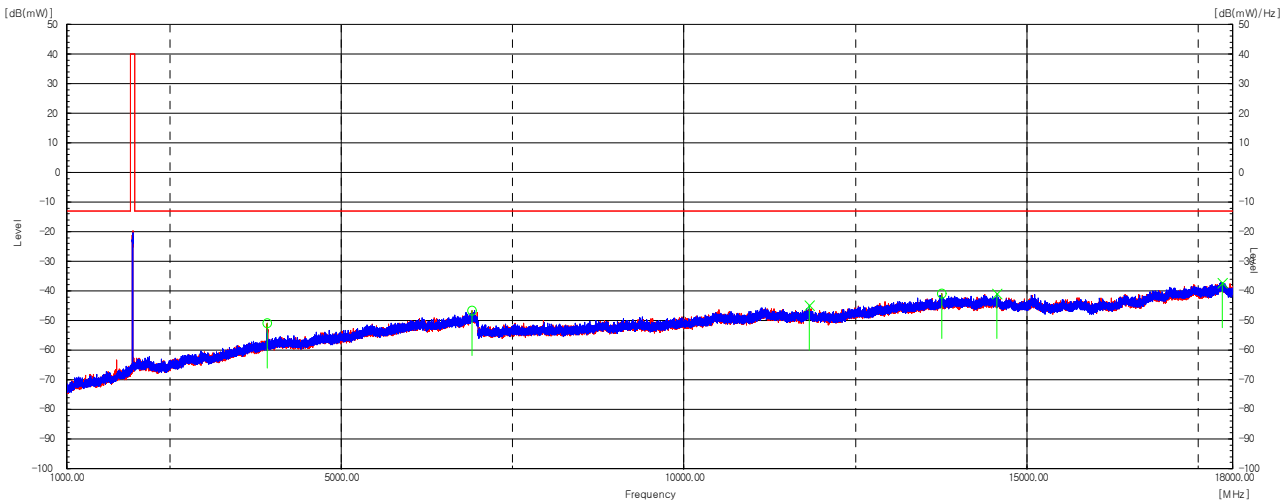
Frequency [MHz]	Pol.	Reading [dBm]	Space Loss [dB]	EIRP[dBm]	Limit[dBm]	Margin[dB]	Height [cm]	Angle [deg]
The emissions 20 dB lower than the limit.								

Test mode : Contiguous_LTE 2C 5 MHz + 5 MHz_256QAM_Middle (Worst case)

Frequency Range : 30 MHz - 1 GHz

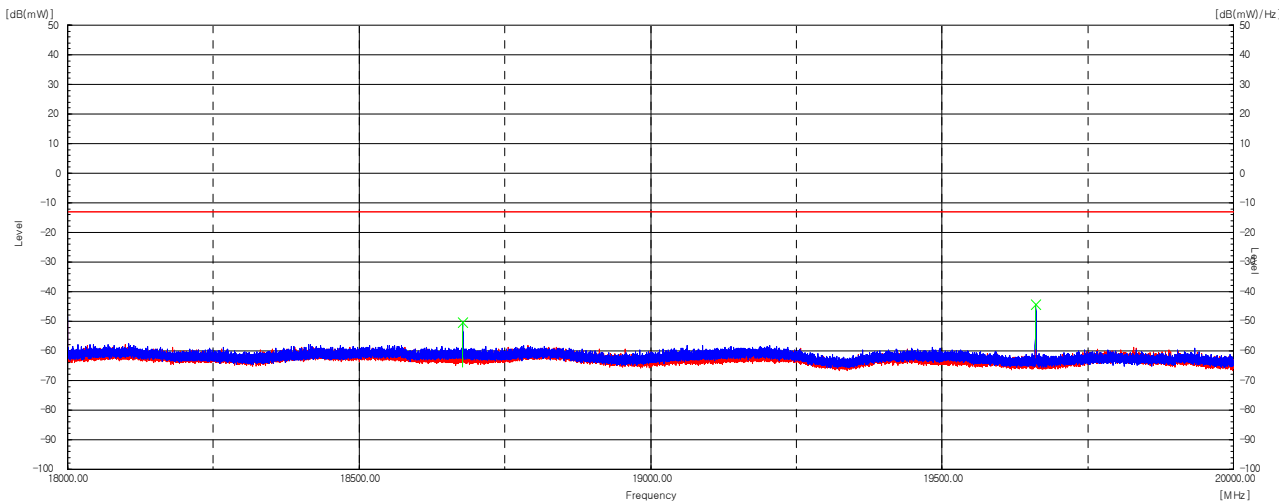
Frequency [MHz]	Pol.	Reading [dB(μV)]	c.f [dB(1/m)]	Result PK [dB(μV/m)]	Limit QP [dB(μV/m)]	Margin QP-PK [dB]	Height [cm]	Angle [deg]
The emissions 20 dB lower than the limit.								

Frequency Range : 1 GHz - 18 GHz



Frequency [MHz]	Pol.	Reading [dBm]	Space Loss [dB]	EIRP[dBm]	Limit[dBm]	Margin[dB]	Height [cm]	Angle [deg]
The emissions 20 dB lower than the limit.								

Frequency Range : 18 GHz - 20 GHz



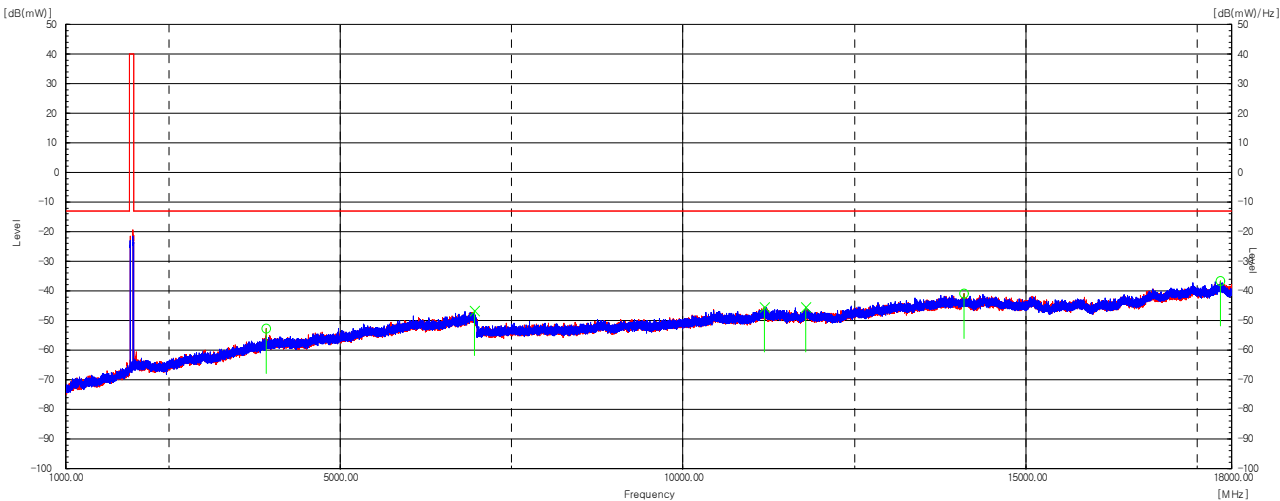
Frequency [MHz]	Pol.	Reading [dBm]	Space Loss [dB]	EIRP[dBm]	Limit[dBm]	Margin[dB]	Height [cm]	Angle [deg]
The emissions 20 dB lower than the limit.								

Test mode : Non-Contiguous_LTE 2C 5 MHz + 5 MHz_256QAM_Middle (Worst case)

Frequency Range : 30 MHz - 1 GHz

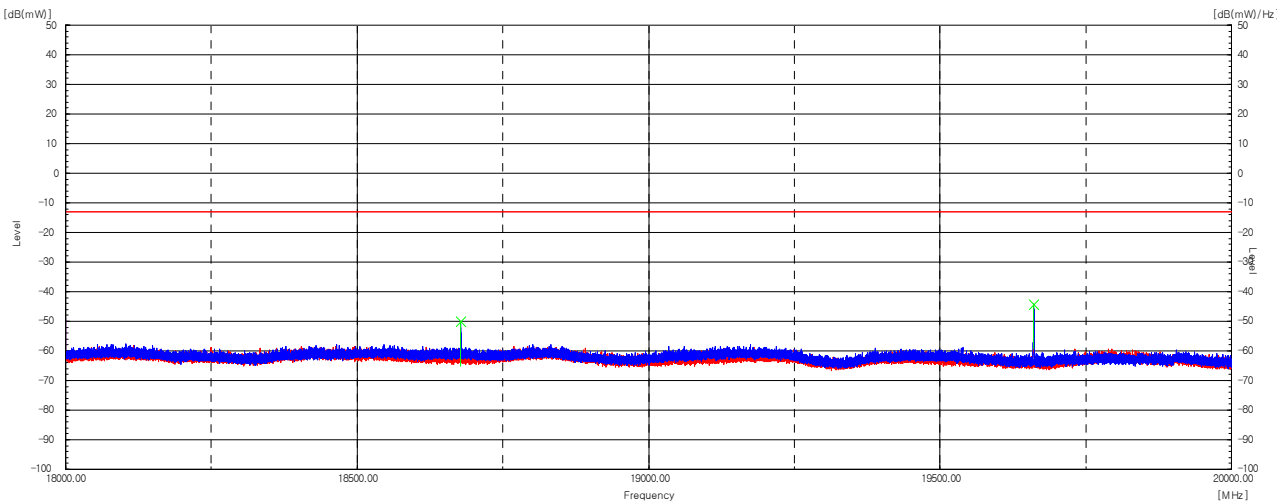
Frequency [MHz]	Pol.	Reading [dB(μV)]	c.f [dB(1/m)]	Result PK [dB(μV/m)]	Limit QP [dB(μV/m)]	Margin QP-PK [dB]	Height [cm]	Angle [deg]
The emissions 20 dB lower than the limit.								

Frequency Range : 1 GHz - 18 GHz



Frequency [MHz]	Pol.	Reading [dBm]	Space Loss [dB]	EIRP[dBm]	Limit[dBm]	Margin[dB]	Height [cm]	Angle [deg]
The emissions 20 dB lower than the limit.								

Frequency Range : 18 GHz - 20 GHz



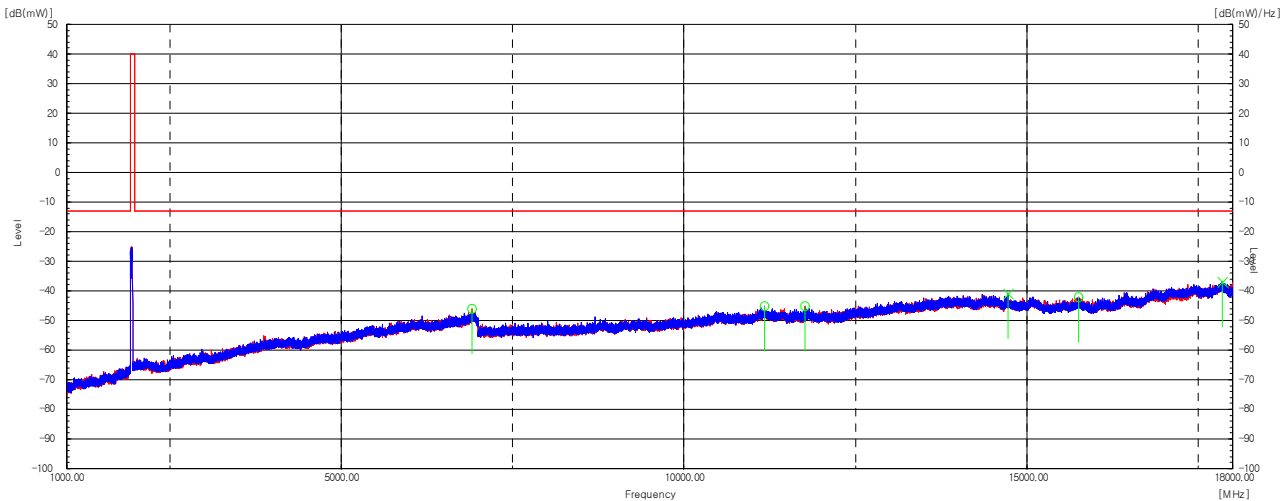
Frequency [MHz]	Pol.	Reading [dBm]	Space Loss [dB]	EIRP[dBm]	Limit[dBm]	Margin[dB]	Height [cm]	Angle [deg]
The emissions 20 dB lower than the limit.								

Test mode : Contiguous_LTE 2C 10 MHz + 20 MHz_QPSK_Lowest (Worst case)

Frequency Range : 30 MHz - 1 GHz

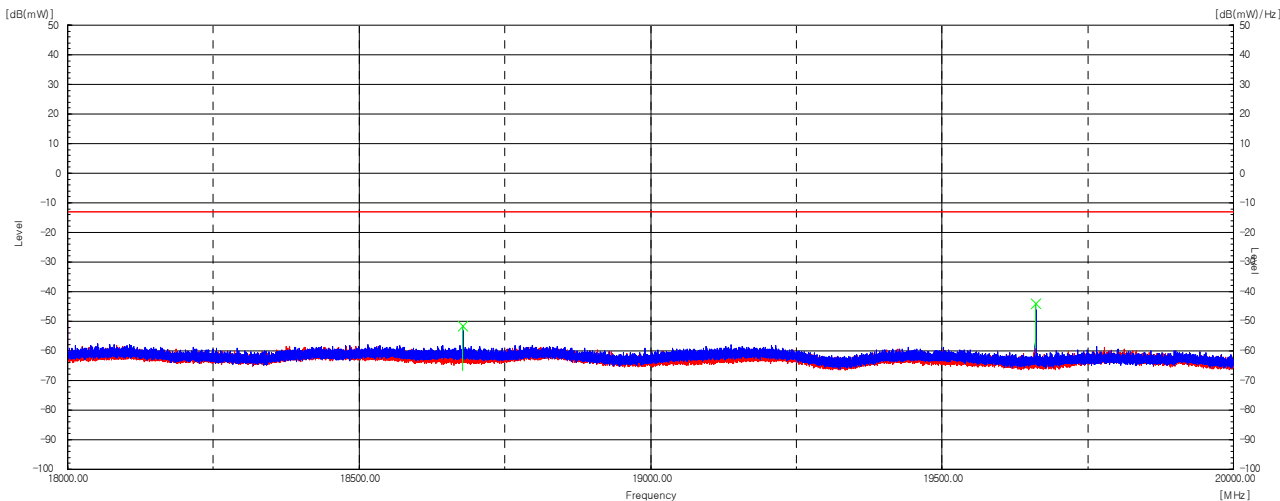
Frequency [MHz]	Pol.	Reading [dB(μV)]	c.f [dB(1/m)]	Result PK [dB(μV/m)]	Limit QP [dB(μV/m)]	Margin QP-PK [dB]	Height [cm]	Angle [deg]
The emissions 20 dB lower than the limit.								

Frequency Range : 1 GHz - 18 GHz



Frequency [MHz]	Pol.	Reading [dBm]	Space Loss [dB]	EIRP[dBm]	Limit[dBm]	Margin[dB]	Height [cm]	Angle [deg]
The emissions 20 dB lower than the limit.								

Frequency Range : 18 GHz - 20 GHz



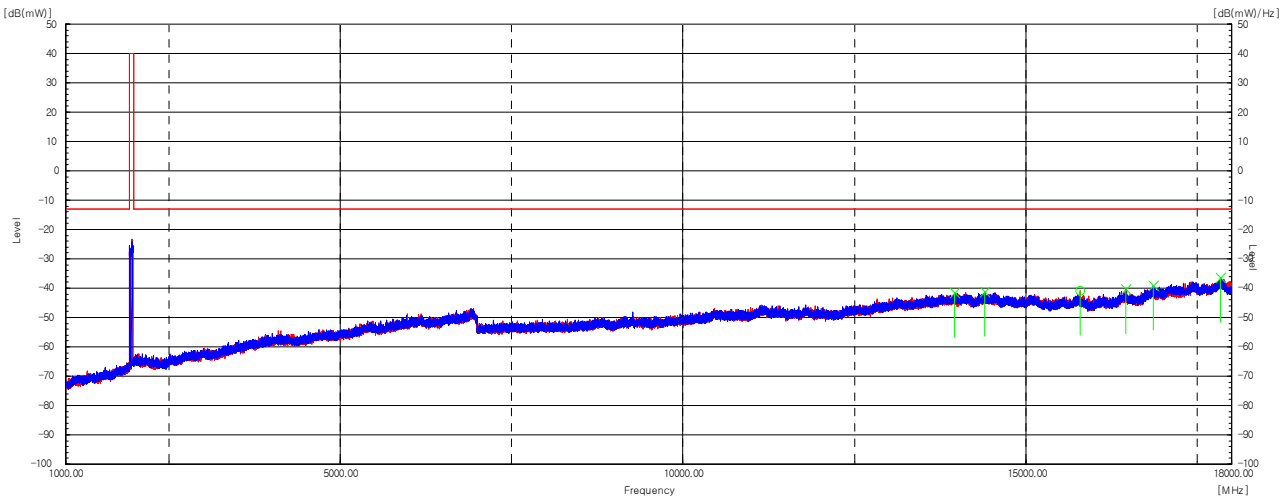
Frequency [MHz]	Pol.	Reading [dBm]	Space Loss [dB]	EIRP[dBm]	Limit[dBm]	Margin[dB]	Height [cm]	Angle [deg]
The emissions 20 dB lower than the limit.								

Test mode : Non-Contiguous_LTE 2C 10 MHz + 20 MHz_QPSK_Lowest (Worst case)

Frequency Range : 30 MHz - 1 GHz

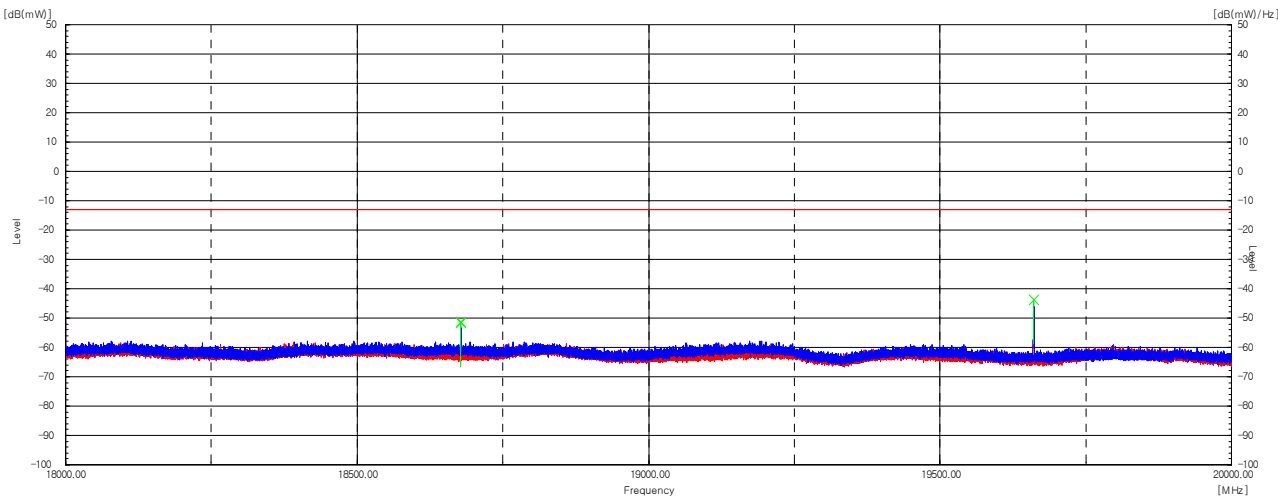
Frequency [MHz]	Pol.	Reading [dB(μV)]	c.f [dB(1/m)]	Result PK [dB(μV/m)]	Limit QP [dB(μV/m)]	Margin QP-PK [dB]	Height [cm]	Angle [deg]
The emissions 20 dB lower than the limit.								

Frequency Range : 1 GHz - 18 GHz



Frequency [MHz]	Pol.	Reading [dBm]	Space Loss [dB]	EIRP[dBm]	Limit[dBm]	Margin[dB]	Height [cm]	Angle [deg]
The emissions 20 dB lower than the limit.								

Frequency Range : 18 GHz - 20 GHz



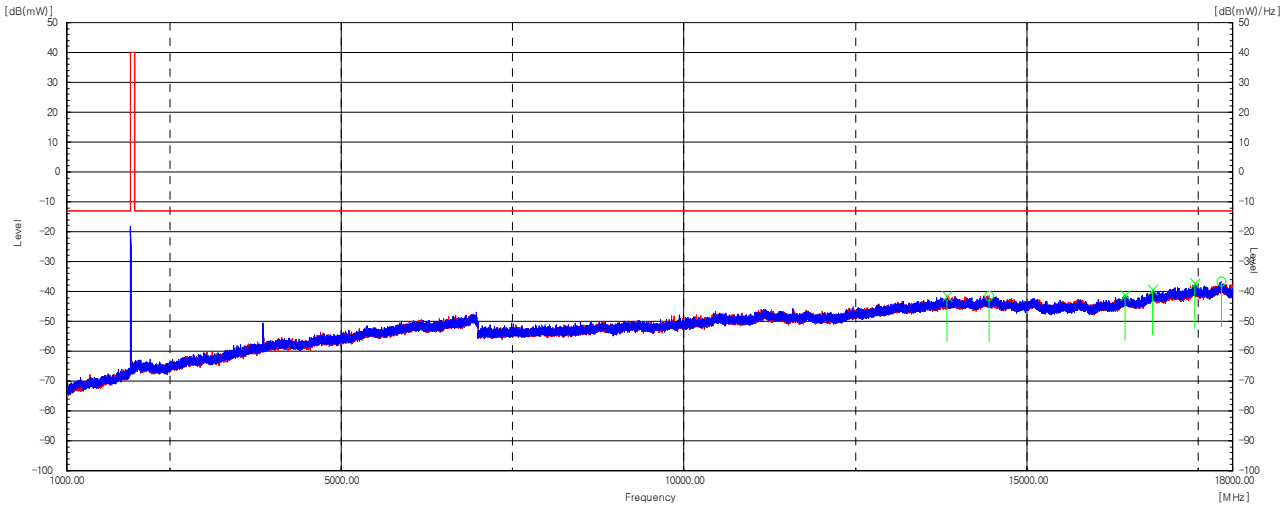
Frequency [MHz]	Pol.	Reading [dBm]	Space Loss [dB]	EIRP[dBm]	Limit[dBm]	Margin[dB]	Height [cm]	Angle [deg]
The emissions 20 dB lower than the limit.								

Test mode : NR 1C 5 MHz_QPSK_Lowest (Worst case)

Frequency Range : 30 MHz - 1 GHz

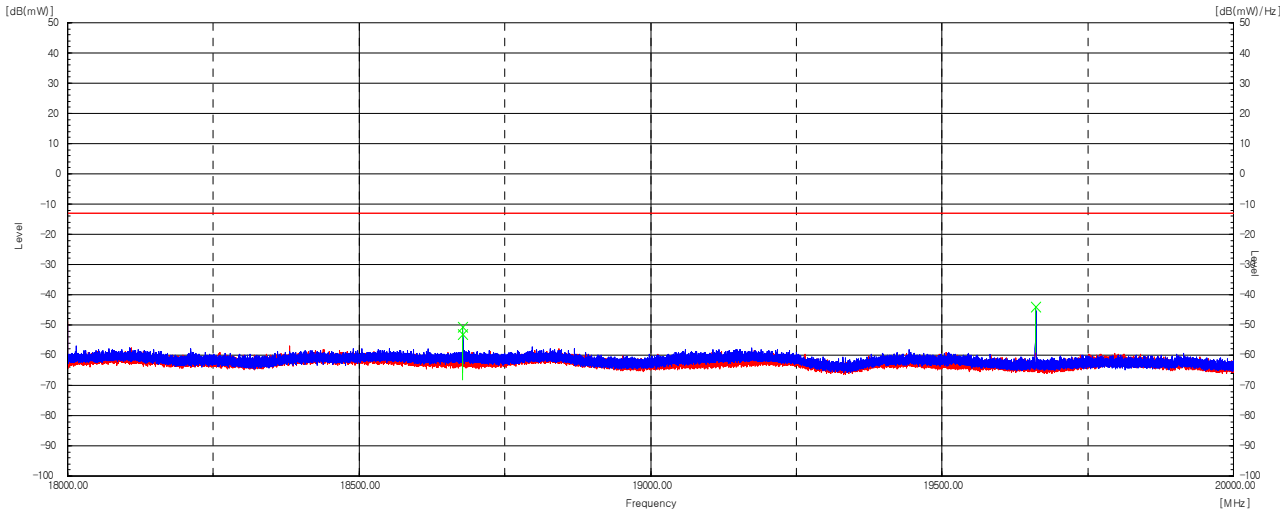
Frequency [MHz]	Pol.	Reading [dB(μV)]	c.f [dB(1/m)]	Result PK [dB(μV/m)]	Limit QP [dB(μV/m)]	Margin QP-PK [dB]	Height [cm]	Angle [deg]
The emissions 20 dB lower than the limit.								

Frequency Range : 1 GHz - 18 GHz



Frequency [MHz]	Pol.	Reading [dBm]	Space Loss [dB]	EIRP[dBm]	Limit[dBm]	Margin[dB]	Height [cm]	Angle [deg]
The emissions 20 dB lower than the limit.								

Frequency Range : 18 GHz - 20 GHz



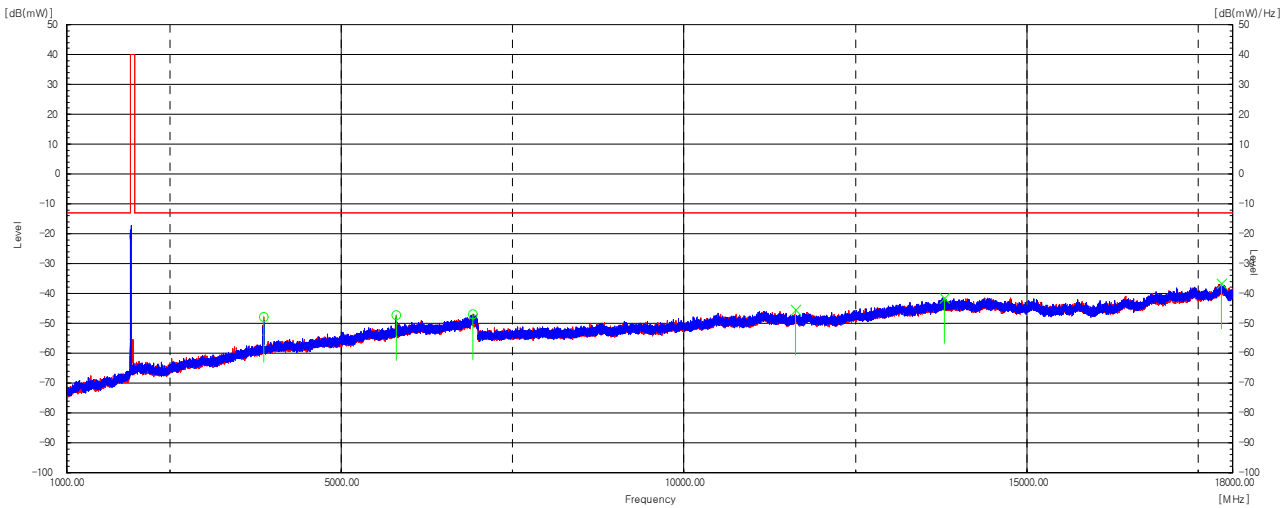
Frequency [MHz]	Pol.	Reading [dBm]	Space Loss [dB]	EIRP[dBm]	Limit[dBm]	Margin[dB]	Height [cm]	Angle [deg]
The emissions 20 dB lower than the limit.								

Test mode : NR 1C 10 MHz_QPSK_Lowest (Worst case)

Frequency Range : 30 MHz - 1 GHz

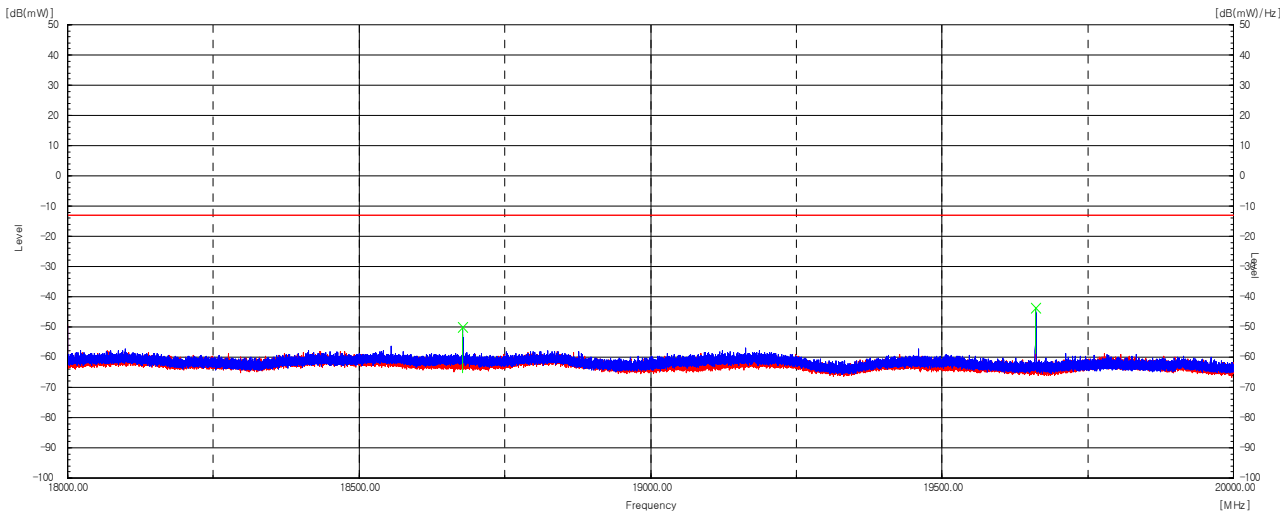
Frequency [MHz]	Pol.	Reading [dB(μV)]	c.f [dB(1/m)]	Result PK [dB(μV/m)]	Limit QP [dB(μV/m)]	Margin QP-PK [dB]	Height [cm]	Angle [deg]
The emissions 20 dB lower than the limit.								

Frequency Range : 1 GHz - 18 GHz



Frequency [MHz]	Pol.	Reading [dBm]	Space Loss [dB]	EIRP[dBm]	Limit[dBm]	Margin[dB]	Height [cm]	Angle [deg]
The emissions 20 dB lower than the limit.								

Frequency Range : 18 GHz - 20 GHz



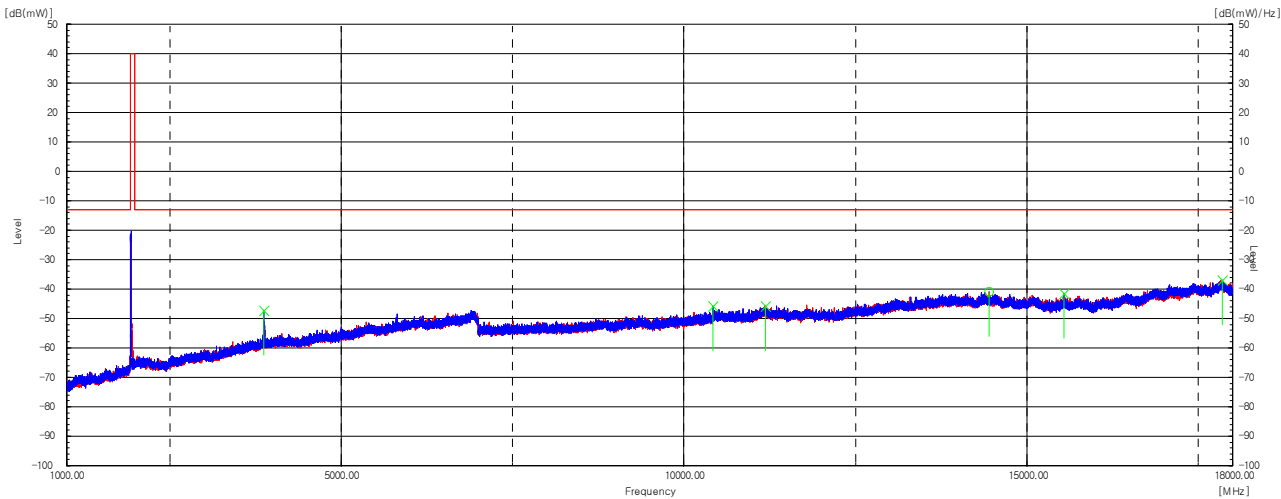
Frequency [MHz]	Pol.	Reading [dBm]	Space Loss [dB]	EIRP[dBm]	Limit[dBm]	Margin[dB]	Height [cm]	Angle [deg]
The emissions 20 dB lower than the limit.								

Test mode : NR 1C 15 MHz_64QAM_Lowest (Worst case)

Frequency Range : 30 MHz - 1 GHz

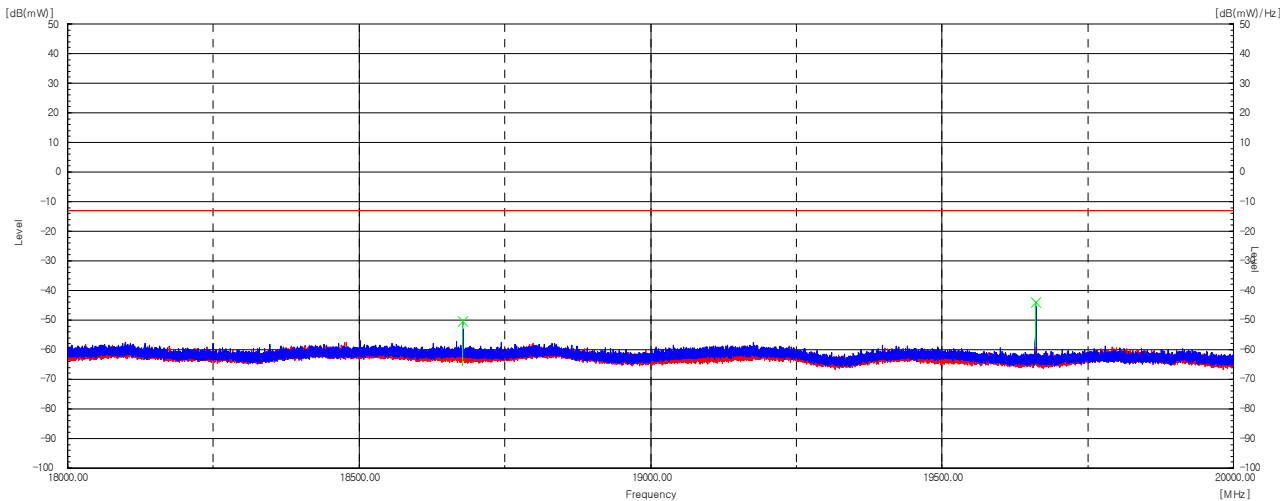
Frequency [MHz]	Pol.	Reading [dB(μV)]	c.f [dB(1/m)]	Result PK [dB(μV/m)]	Limit QP [dB(μV/m)]	Margin QP-PK [dB]	Height [cm]	Angle [deg]
The emissions 20 dB lower than the limit.								

Frequency Range : 1 GHz - 18 GHz



Frequency [MHz]	Pol.	Reading [dBm]	Space Loss [dB]	EIRP[dBm]	Limit[dBm]	Margin[dB]	Height [cm]	Angle [deg]
The emissions 20 dB lower than the limit.								

Frequency Range : 18 GHz - 20 GHz



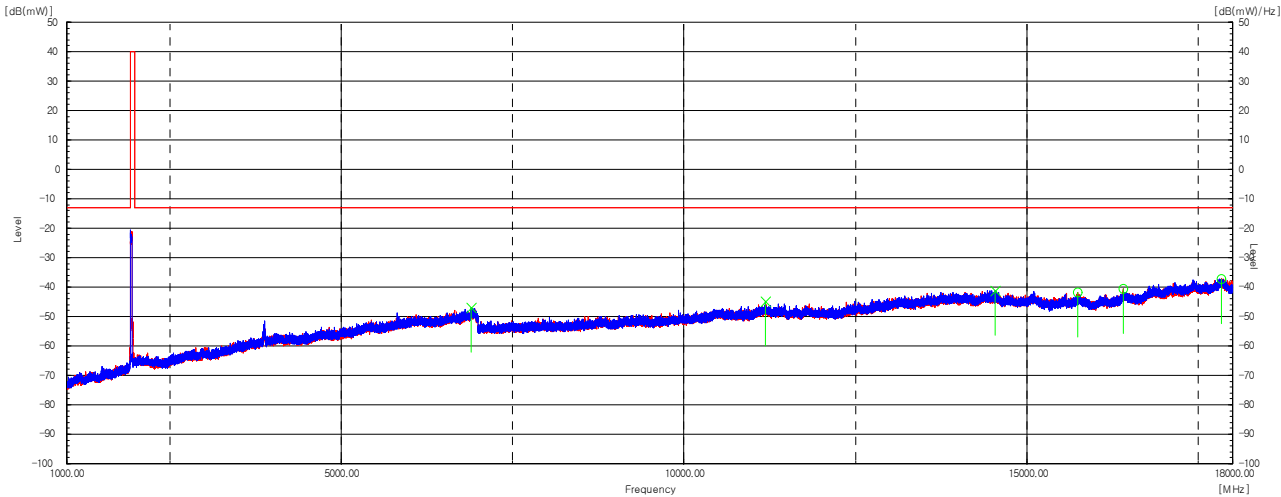
Frequency [MHz]	Pol.	Reading [dBm]	Space Loss [dB]	EIRP[dBm]	Limit[dBm]	Margin[dB]	Height [cm]	Angle [deg]
The emissions 20 dB lower than the limit.								

Test mode : NR 1C 20 MHz_256QAM_Lowest (Worst case)

Frequency Range : 30 MHz - 1 GHz

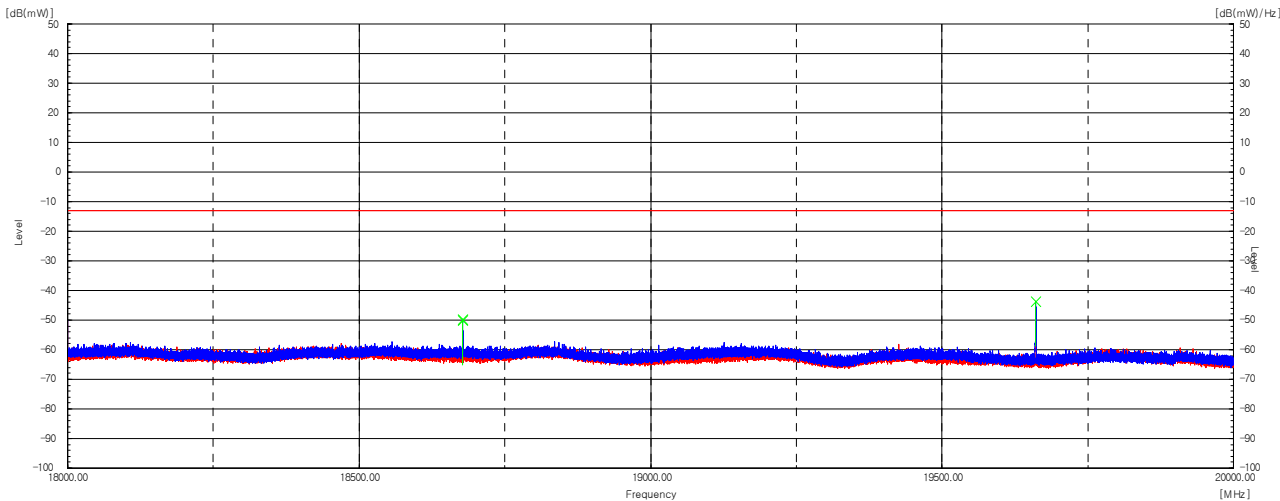
Frequency [MHz]	Pol.	Reading [dB(μV)]	c.f [dB(1/m)]	Result PK [dB(μV/m)]	Limit QP [dB(μV/m)]	Margin QP-PK [dB]	Height [cm]	Angle [deg]
The emissions 20 dB lower than the limit.								

Frequency Range : 1 GHz - 18 GHz



Frequency [MHz]	Pol.	Reading [dBm]	Space Loss [dB]	EIRP[dBm]	Limit[dBm]	Margin[dB]	Height [cm]	Angle [deg]
The emissions 20 dB lower than the limit.								

Frequency Range : 18 GHz - 20 GHz



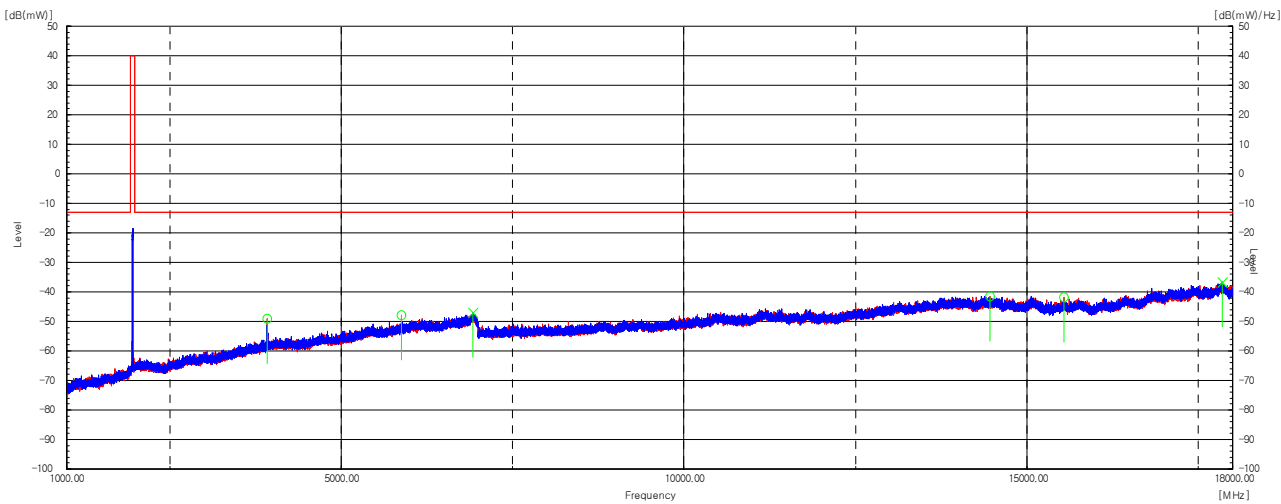
Frequency [MHz]	Pol.	Reading [dBm]	Space Loss [dB]	EIRP[dBm]	Limit[dBm]	Margin[dB]	Height [cm]	Angle [deg]
The emissions 20 dB lower than the limit.								

Test mode : Contiguous_LTE 1C 5 MHz + NR 1C 5 MHz_16QAM_Lowest
(Worst case)

Frequency Range : 30 MHz - 1 GHz

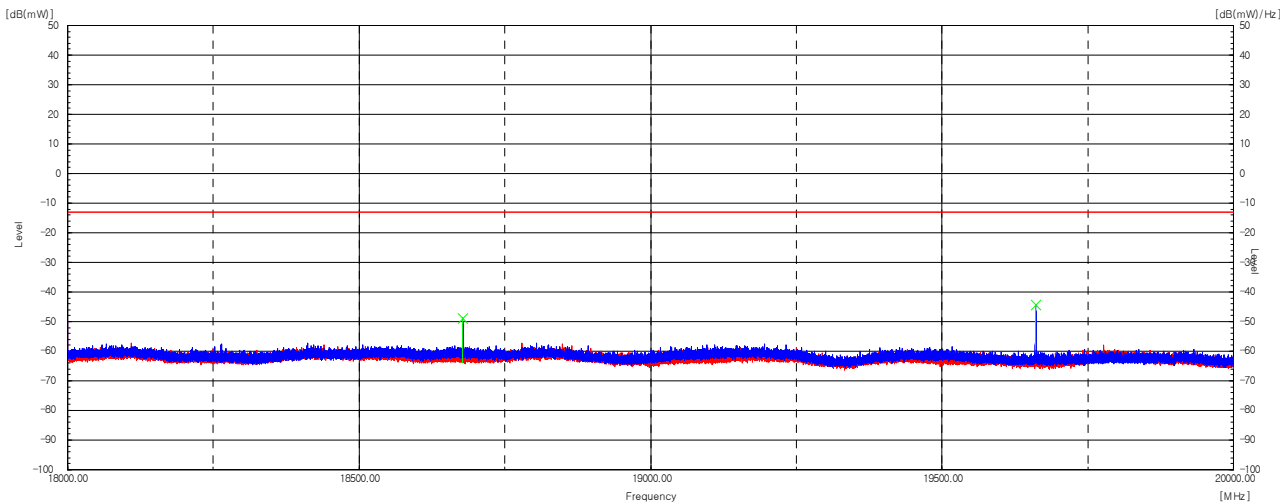
Frequency [MHz]	Pol.	Reading [dB(μV)]	c.f [dB(1/m)]	Result PK [dB(μV/m)]	Limit QP [dB(μV/m)]	Margin QP-PK [dB]	Height [cm]	Angle [deg]
The emissions 20 dB lower than the limit.								

Frequency Range : 1 GHz - 18 GHz



Frequency [MHz]	Pol.	Reading [dBm]	Space Loss [dB]	EIRP[dBm]	Limit[dBm]	Margin[dB]	Height [cm]	Angle [deg]
The emissions 20 dB lower than the limit.								

Frequency Range : 18 GHz - 20 GHz



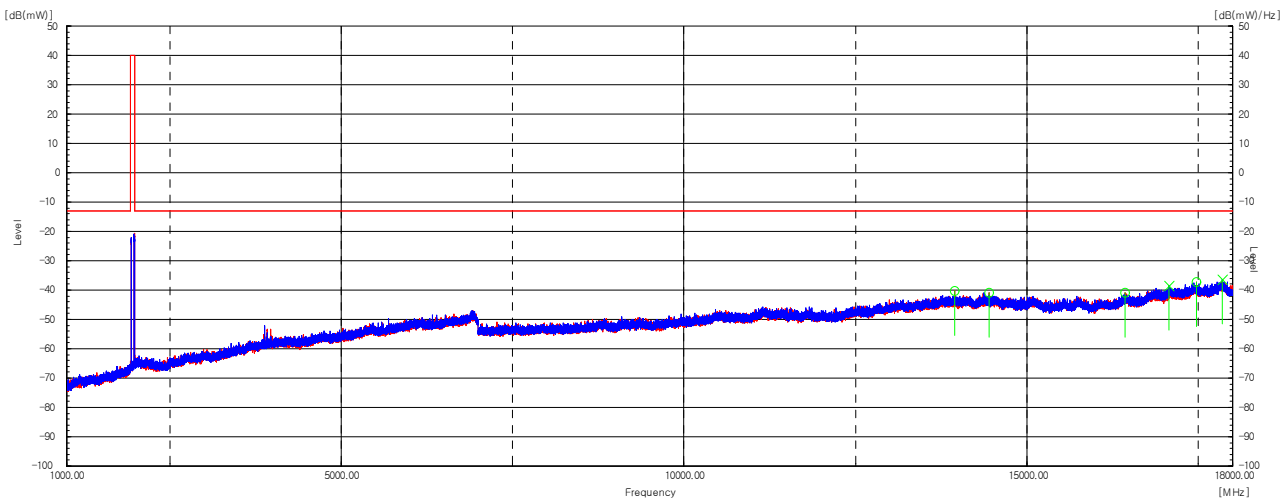
Frequency [MHz]	Pol.	Reading [dBm]	Space Loss [dB]	EIRP[dBm]	Limit[dBm]	Margin[dB]	Height [cm]	Angle [deg]
The emissions 20 dB lower than the limit.								

Test mode : Non-Contiguous_LTE 1C 5 MHz + NR 1C 5 MHz_16QAM_Lowest
(Worst case)

Frequency Range : 30 MHz - 1 GHz

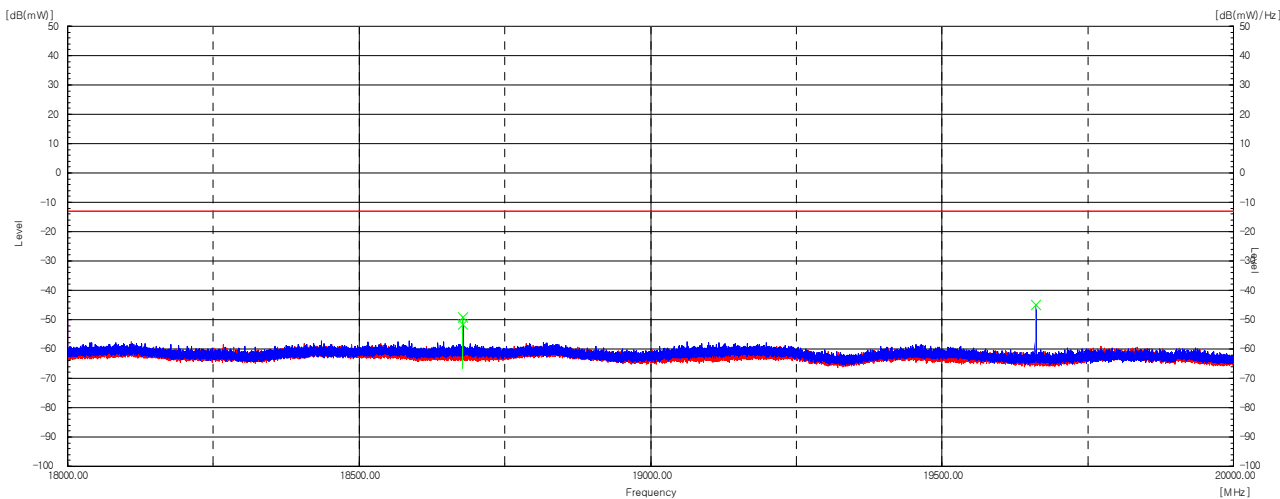
Frequency [MHz]	Pol.	Reading [dB(μV)]	c.f [dB(1/m)]	Result PK [dB(μV/m)]	Limit QP [dB(μV/m)]	Margin QP-PK [dB]	Height [cm]	Angle [deg]
The emissions 20 dB lower than the limit.								

Frequency Range : 1 GHz - 18 GHz



Frequency [MHz]	Pol.	Reading [dBm]	Space Loss [dB]	EIRP[dBm]	Limit[dBm]	Margin[dB]	Height [cm]	Angle [deg]
The emissions 20 dB lower than the limit.								

Frequency Range : 18 GHz - 20 GHz



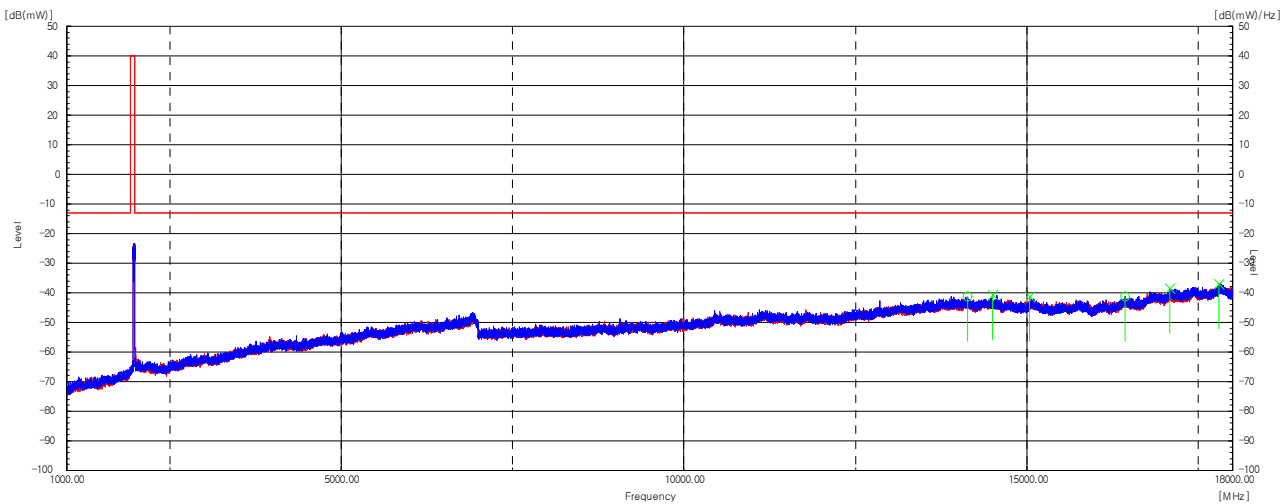
Frequency [MHz]	Pol.	Reading [dBm]	Space Loss [dB]	EIRP[dBm]	Limit[dBm]	Margin[dB]	Height [cm]	Angle [deg]
The emissions 20 dB lower than the limit.								

Test mode : Contiguous_LTE 2C 5 MHz + 10 MHz + NR 1C 10 MHz_16QAM_Highest
(Worst case)

Frequency Range : 30 MHz - 1 GHz

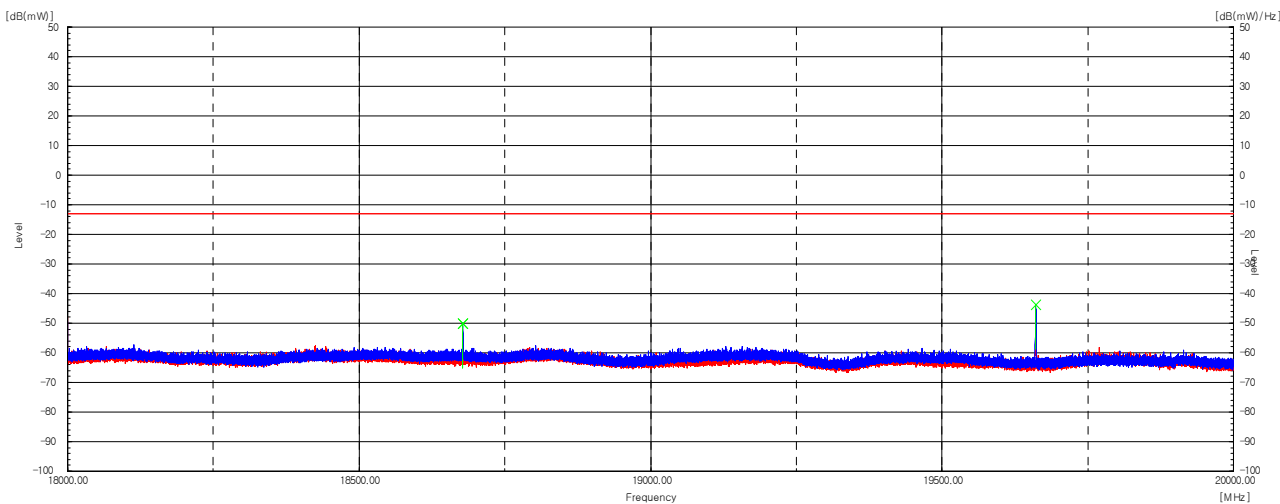
Frequency [MHz]	Pol.	Reading [dB(μV)]	c.f [dB(1/m)]	Result PK [dB(μV/m)]	Limit QP [dB(μV/m)]	Margin QP-PK [dB]	Height [cm]	Angle [deg]
The emissions 20 dB lower than the limit.								

Frequency Range : 1 GHz - 18 GHz



Frequency [MHz]	Pol.	Reading [dBm]	Space Loss [dB]	EIRP[dBm]	Limit[dBm]	Margin[dB]	Height [cm]	Angle [deg]
The emissions 20 dB lower than the limit.								

Frequency Range : 18 GHz - 20 GHz



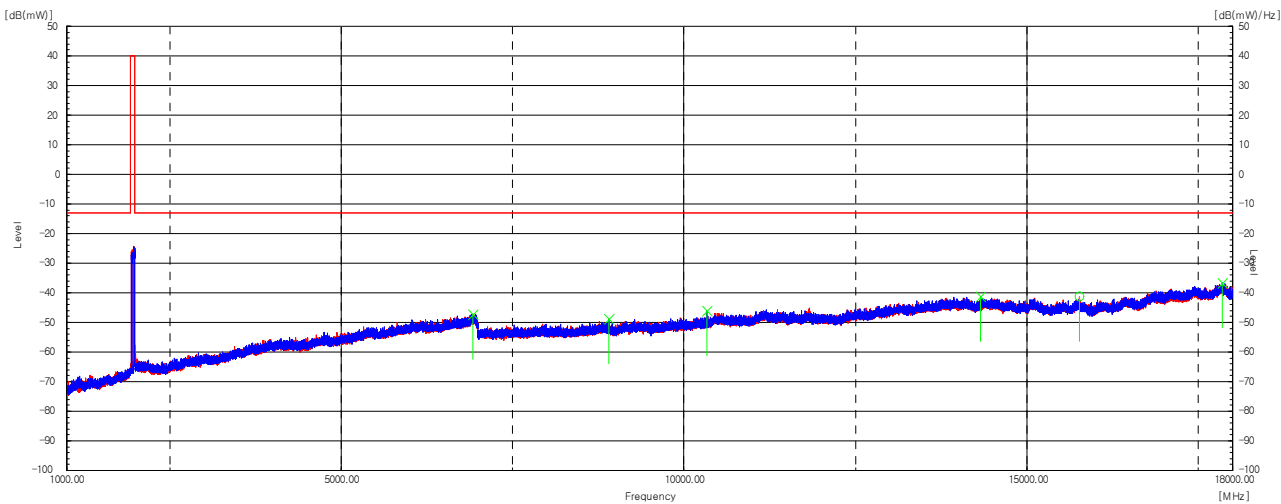
Frequency [MHz]	Pol.	Reading [dBm]	Space Loss [dB]	EIRP[dBm]	Limit[dBm]	Margin[dB]	Height [cm]	Angle [deg]
The emissions 20 dB lower than the limit.								

Test mode : Non-Contiguous_LTE 2C 5 MHz + 10 MHz + NR 1C 10 MHz
_16QAM_Highest (Worst case)

Frequency Range : 30 MHz - 1 GHz

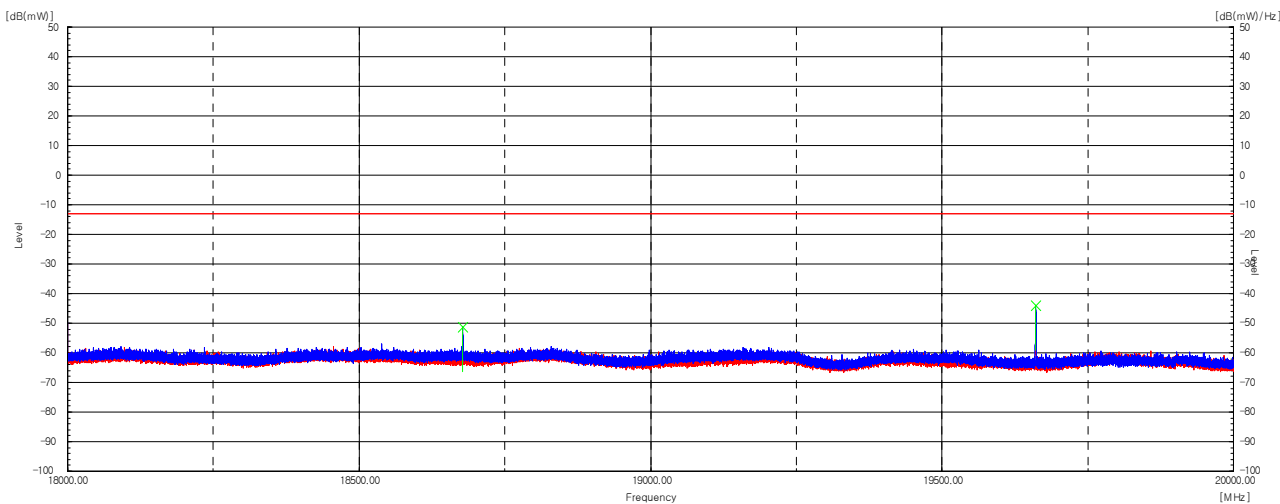
Frequency [MHz]	Pol.	Reading [dB(μV)]	c.f [dB(1/m)]	Result PK [dB(μV/m)]	Limit QP [dB(μV/m)]	Margin QP-PK [dB]	Height [cm]	Angle [deg]
The emissions 20 dB lower than the limit.								

Frequency Range : 1 GHz - 18 GHz



Frequency [MHz]	Pol.	Reading [dBm]	Space Loss [dB]	EIRP[dBm]	Limit[dBm]	Margin[dB]	Height [cm]	Angle [deg]
The emissions 20 dB lower than the limit.								

Frequency Range : 18 GHz - 20 GHz



Frequency [MHz]	Pol.	Reading [dBm]	Space Loss [dB]	EIRP[dBm]	Limit[dBm]	Margin[dB]	Height [cm]	Angle [deg]
The emissions 20 dB lower than the limit.								

 element	CTK Co., Ltd. (Ho-dong), 113, Yejik-ro, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea Tel: +82-31-339-9970 Fax: +82-31-624-9501	Report No.: CTK-2024-03370 Page (271) / (274) Pages	
---	---	---	--

4.8 Frequency Stability

Test Overview :

Some transmitter requirements specify frequency stability tests with variations of supply voltage and temperature, to show that the transmitter is capable of maintaining its assigned carrier frequency.

Test Settings :

1. Temperature: The temperature is varied from -30°C to +50°C in 10°C increments using an environmental chamber.
2. Primary Supply Voltage: The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

Test Procedures :

ANSI C63.26-2015 - Section 5.6

1. Device is placed at the Temp & Humidity Chamber. The Temp & Humidity Chamber could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.
2. The test voltage range is from minimum to maximum working voltage. Each step shall be record the frequency error rate.
3. The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the $\pm 0.5^{\circ}\text{C}$ during the measurement testing. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.

Test Data

Operating frequency			1 962.5 MHz		
Reference voltage / temperature			-48 Vdc / 20 °C		

Voltage (%)	Temperature (°C)	Frequency (Hz)	Frequency Error(Hz)	Deviation (Hz)	Frequency Error (ppm)
100	+20(Ref)	1962 507 515	7515.0	0.0	0.0000
	-30	1962 507 508	7508.0	-7.0	-0.0036
	-20	1962 507 511	7511.0	-4.0	-0.0020
	-10	1962 507 511	7511.0	-4.0	-0.0020
	0	1962 507 512	7512.0	-3.0	-0.0015
	+10	1962 507 512	7512.0	-3.0	-0.0015
	+30	1962 507 512	7512.0	-3.0	-0.0015
	+40	1962 507 511	7511.0	-4.0	-0.0020
	+50	1962 507 513	7513.0	-2.0	-0.0010
115	+20	1962 507 516	7516.0	1.0	0.0005
85	+20	1962 507 515	7515.0	0.0	0.0000

5. APPENDIX A – Test Equipment Used For Tests

	Name of Equipment	Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date
1	Signal Analyzer	Keysight	N9020B	MY57431080	2024-03-21	2025-03-21
2	Signal Analyzer	Agilent	N9020A	MY50510240	2024-07-05	2025-07-05
3	Signal Analyzer	Agilent	N9020A	MY50200096	2024-11-26	2025-11-26
4	Signal Generator	Rohde & Schwarz	SMB100A	175528	2024-03-21	2025-03-21
5	MXG Vector Signal Generator	Agilent	N5182A	MY50143486	2024-11-26	2025-11-26
6	RF Switch System	TNM SYSTEM	TMX81D	TM20100002	2024-05-10	2025-05-10
7	System DC Power Supply	Agilent	6674A	US36372372	2024-03-29	2025-03-29
8	RF Coaxial Attenuator	BIRD	300-WA-FFN-20	0057292	2024-03-29	2025-03-29
9	RF Coaxial Attenuator	BIRD	300-WA-FFN-20	0057293	2024-03-29	2025-03-29
10	RF Coaxial Attenuator	BIRD	300-WA-FFN-20	0057294	2024-03-29	2025-03-29
11	RF Coaxial Attenuator	BIRD	300-WA-FFN-20	0057295	2024-03-29	2025-03-29
12	Signal Analyzer	Rohde & Schwarz	FSV30	100925	2024-11-26	2025-11-26
13	Spectrum Analyzer	Rohde & Schwarz	FSV40	101574	2024-01-15	2025-01-15
14	EMI TEST RECEIVER	Rohde & Schwarz	ESW44	102039	2024-04-29	2025-04-29
15	Bilog Antenna	TESEQ	CBL6111D	60654	2024-08-21	2025-08-21
16	Attenuator	PASTERNAK	PE7AP006-06	L20210504000 023	2024-07-31	2025-07-31
17	AMPLIFIER	SONOMA	310N	411011	2024-07-31	2025-07-31
18	Preamplifier	Agilent	8449B	3008A00620	2024-04-11	2025-04-11
19	Double Ridged Guide Antenna	ETS-Lindgren	3115	00078895	2024-04-16	2025-04-16

	Cable	Manufacturer	Model No.	Serial No.	Check Date
1	RF Cable (Conducted)	Junkosha Inc.	MWX221	1512S151	2024-10-02
2	RF Cable (Conducted)	Junkosha Inc.	MWX221	1512S148	2024-10-02
3	RF Cable (Line Conducted)	Canare Corporation	L-5D2W	N/A	2024-03-05
4	RF Cable (9 kHz - 1 GHz Radiated)	HUBER+SUHNER	SUCOFLEX 104	MY27558/4	2024-03-05
5	RF Cable (9 kHz - 1 GHz Radiated)	HUBER+SUHNER	L-5D2W	N/A	2024-03-05
6	RF Cable (1 GHz - 18 GHz Radiated)	Junkosha Inc.	MWX221	2008S246	2023-06-28
7	RF Cable (1 GHz - 18 GHz Radiated)	Junkosha Inc.	MWX221	J0970749	2023-06-28
8	RF Cable (1 GHz - 18 GHz Radiated)	Sensorview Co., LTD	13A26	TPC2204060007	2023-06-28
9	RF Cable (18 GHz - 40 GHz Radiated)	Sensorview Co., LTD	9S40	TPC2204060009	2023-06-28
10	RF Cable (18 GHz - 40 GHz Radiated)	Sensorview Co., LTD	9A40	TP210713-001	2023-06-28

-END-