

ANNEX B_EMI TEST RESULT

REVISION HISTORY

The revision history for this test report is shown in table.

Revision No.	Date of Issue	Description
0	May 29, 2019	Initial Release

The device bearing the trade name and model specified above, has been shown to comply with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.4-2014. (See Test Report if any modifications were made for compliance)

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

HCT certifies that no party to application has been denied the FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C 862

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1. GENERAL INFORMATION

1.1 Details of Support Equipment

All equipment descriptions used in the tested system (including inserted cards) are:

Device Type	Model Name	Manufacturer	Tech. Information
EUT	SM-T727V	SAMSUNG	-
TA	EP-TA200	SOLUM	Input: AC 100~240 V, 50~60 Hz, 0.5 A Output: DC 9.0 V, 1.67 A or DC 5.0 V, 2.0 A
Data Cable	EP-DT725BWE	KSD	-
Earphone	EHS64AVFWE	ALMUS	-
Ear-jack Gender	KCA-ET-2-0305	KSD	-
Micro SD Card	-	SAMSUNG	-

1.2 Cable Description

Product Name	Port	Power Cord Shielded (Y/N)	I/O Cable Shielded (Y/N)	Length (m)
EUT	USB Type C	Y	N/A	(P) 1.0
	USB Type C (Ear-jack Gender)	N/A	N	(D) 0.09
Ear-jack Gender	Earphone	N/A	N	(D) 1.2

NOTE. The marked "(D)" means the data cable and "(P)" means the power cable.

1.3 Noise Suppression Parts on Cable (I/O Cable)

Product Name	Port	Ferrite Bead (Y/N)	Location	Metal Hood (Y/N)	Location
EUT	USB Type C	N	N/A	Y	Both End
	USB Type C (Ear-jack Gender)	N	N/A	Y	Both End
Ear-jack Gender	Earphone	N	N/A	Y	EUT End

1.4 Test Facility

Test site is located at 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, South Korea.

Those measurement facilities are constructed in conformance with the requirements of ANSI C63.4-2014.

The Normalized site attenuations (30 MHz to 1 GHz) and Site validation (1 GHz to 18 GHz) were performed in accordance with the standard in ANSI C63.4-2014

Measurement Facilities	Designation No.
Radiated Field strength measurement facility 3 m Semi Anechoic chamber	KR0032
Radiated Field strength measurement facility 10 m Semi Anechoic chamber #1	
Radiated Field strength measurement facility 10 m Semi Anechoic chamber #2	

1.5 Calibration of Measuring Instrument

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturers recommendations for utilizing calibration equipment, which is traceable to recognized national standards. Especially, all antenna for measurement is calibrated in accordance with the requirements of C63.5 (Version : 2006).

1.6 Measurement Uncertainty

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.4-2014. All measurement uncertainty values are shown with a coverage factor of $k = 2$ to indicate a 95 % level of confidence. The measurement data shown herein meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

Parameter	Expanded Uncertainty
Conducted Emission (0.15 MHz to 30 MHz)	1.82 dB
Radiated Emissions (30 MHz to 1 GHz)	5.20 dB
Radiated Emissions (1 GHz to 18 GHz)	5.24 dB
Radiated Emissions (18 GHz to 40 GHz)	5.40 dB

2. DESCRIPTION OF TEST

2.1 Measurement of Conducted Emission

The test procedure was in accordance with ANSI C63.4-2014, Clause 7.3

- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN).
If the EUT is connected to the PC through USB, the AC power-line adapter of the PC is directly connected to a line impedance stabilization network (LISN).
Other support units were connected to the power mains through another LISN. The two LISNs provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Both conducted lines are measured in Quasi-Peak and Average mode, including the worst-case data points for each tested configuration.
- c. The frequency range from 150 kHz to 30 MHz was searched.

Conducted Emission Limits

Frequency (MHz)	Resolution Bandwidth (kHz)	Class A		Class B	
		Quasi-Peak (dB μ V)	Average (dB μ V)	Quasi-Peak (dB μ V)	Average (dB μ V)
0.15 to 0.5	9	79	66	66 to 56*	56 to 46*
0.5 to 5	9	73	60	56	46
5 to 30	9	73	60	60	50

NOTE. Decreases with the logarithm of the frequency.

2.2 Measurement of Radiated Emission

The test procedure was in accordance with ANSI C63.4-2014, Clause 8.3

- a. The EUT was placed on the top of a turn table 0.8 meters above the ground at a semi-anechoic chamber.
The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 m away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna height is varied from 1 m to 4 m 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.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 m to 4 m and the turn table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Quasi-Peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to Peak and Average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz.
- g. Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response.
(1 GHz to 40 GHz)

Radiated Emission Limits

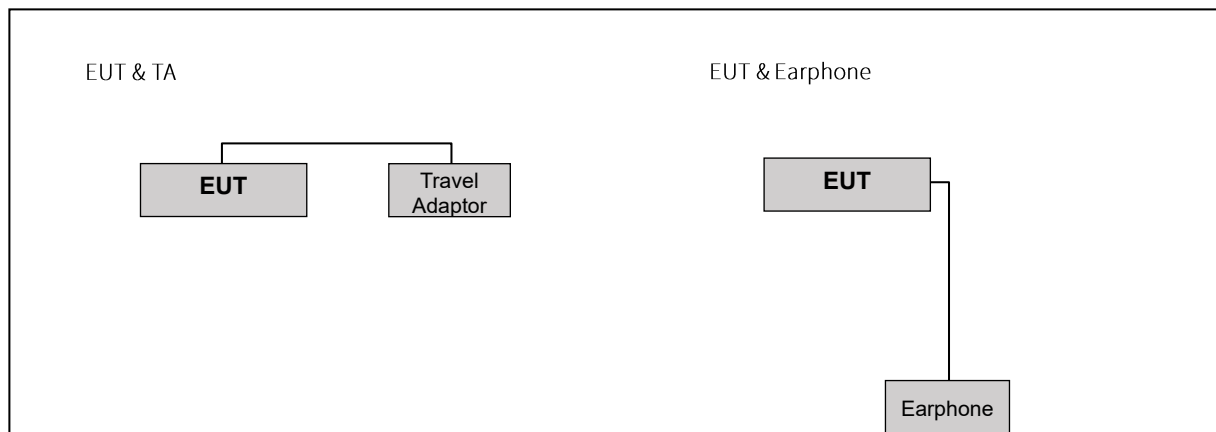
Frequency (MHz)	Class A			Class B		
	Antenna Distance (m)	Field Strength (μ V/m)	Quasi-Peak (dB μ V/m)	Antenna Distance (m)	Field Strength (μ V/m)	Quasi-Peak (dB μ V/m)
30 to 88	10	90	39.0	3	100	40.0
88 to 216	10	150	43.5	3	150	43.5
216 to 960	10	210	46.4	3	200	46.0
Above 960	10	300	49.5	3	500	54.0
Frequency (MHz)	Antenna Distance (m)	Class A		Class B		
		Peak (dB μ V/m)	Average (dB μ V/m)	Peak (dB μ V/m)	Average (dB μ V/m)	
Above 1 000	3	80	60	74	54	

2.2.1 Frequency Range of Radiated Measurements

An unintentional radiator, including a digital device, the spectrum shall be investigated from the lowest radio frequency signal generated or used in the device, without going below the lowest frequency for which a Radiated Emission limit is specified, up to the frequency shown in the following table

Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 1.705	30
1.705 to 108	1 000
108 to 500	2 000
500 to 1 000	5 000
Above 1 000	5th harmonic of the highest frequency or 40 GHz, whichever is lower
Below 1.705	30

2.3 Configuration of Tested System



Non-Conductive Table

Power Line: 120 VAC 60 Hz

3. PRELIMINARY TEST

During preliminary tests, the following operating mode was investigated.

WCDMA 850 Idle (Low/Middle/High CH)

LTE B5 Idle (Low/Middle/High CH)

LTE B13 Idle (Low/Middle/High CH)

NOTE. The worst band is tested.

3.1 Conducted Emission

It was tested the following operating mode, after connecting all peripheral devices.

Operating Modes:

Receiver mode (LTE B13 Low CH Idle)

3.2 Radiated Emission

It was tested the following operating mode, after connecting all peripheral devices.

Operating Modes:

[EUT+TA]

Receiver mode (LTE B5 Low CH Idle)

Receiver mode (LTE B5 High CH Idle)

Receiver mode (LTE B13 Middle CH Idle)

Receiver mode (LTE B5 Middle CH Idle)

Receiver mode (LTE B13 Low CH Idle)

Receiver mode (LTE B13 High CH Idle)

[EUT+EARPHONE]

Receiver mode (LTE B5 Low CH Idle)

Receiver mode (LTE B5 High CH Idle)

Receiver mode (LTE B13 Middle CH Idle)

Receiver mode (LTE B5 Middle CH Idle)

Receiver mode (LTE B13 Low CH Idle)

Receiver mode (LTE B13 High CH Idle)

NOTE.

1. Three orientations have been investigated and the worst case orientation is reported.

2. The worst case of operating mode is reported.

4. CONDUCTED EMISSION AND RADIATED EMISSION TEST SUMMARY

4.1 Conducted Emission

4.1.1 Measuring instruments

	Type	Manufacturer	Model Name	Serial Number	Calibration Cycle	Calibration Date
<input checked="" type="checkbox"/>	EMI Test Receiver	Rohde & Schwarz	ESCI	100584	1 year	06.25.2018
<input checked="" type="checkbox"/>	LISN	Rohde & Schwarz	ENV216	102245	1 year	12.12.2018
<input checked="" type="checkbox"/>	RADIO COMMUNICATION ANALYZER	ANRITSU	MT8820C	6201138643	1 year	08.21.2018
<input checked="" type="checkbox"/>	Software	Rohde & Schwarz	EMC32 VER8.54.0	-	-	-

4.1.2 Operating Condition

The test results of conducted emission at mains ports provide the following information:

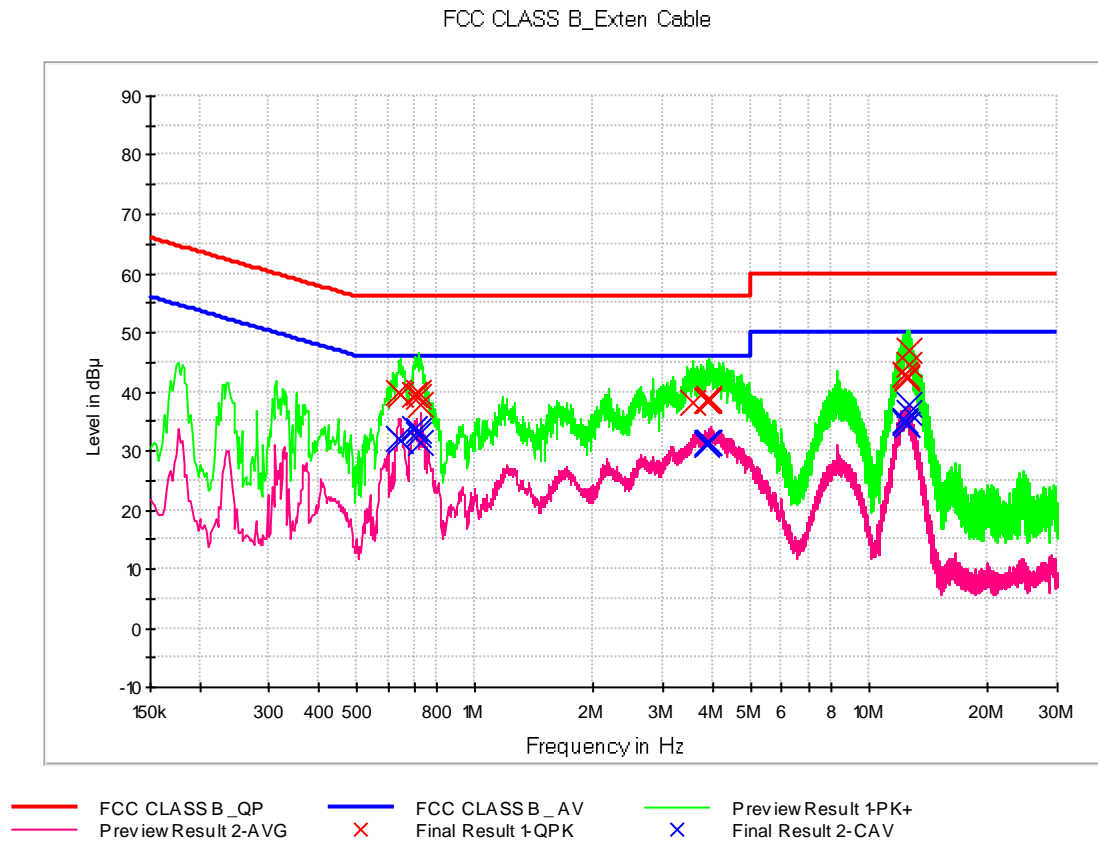
Test Standard Used	FCC CFR 47 PART 15 Subpart B Class B ANSI C63.4-2014
Detector	Quasi-Peak, CISPR-Average
Bandwidth	9 kHz (6 dB)
Operating Mode	Receiver mode (LTE B13 Low CH Idle)
Kind of Test Site	Shielded Room
Temperature	24.3 °C
Relative Humidity	44.6 %
Test Date	May 28, 2019

-Calculation Formula:

1. Conductor L1 = Hot, Conductor N = Neutral
2. Corr. = LISN Factor + Cable Loss
3. QuasiPeak or CAverage= Receiver Reading + Corr.
4. Margin = Limit – QuasiPeak or CAverage

4.1.3 Measuring Data

Figure 1: Conducted Emission, AC Main Port, Line (L1)



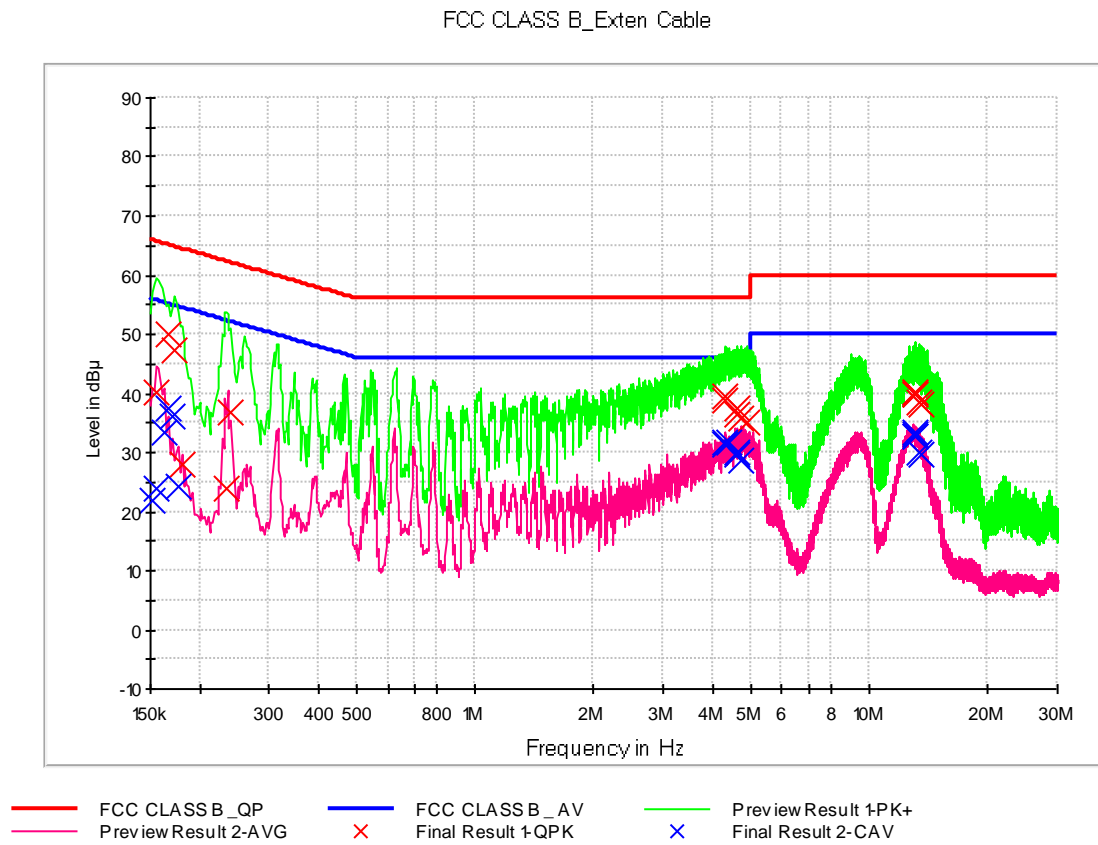
QuasiPeak Final Result, Line (L1)

Frequency (MHz)	QuasiPeak (dBμ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμ V)
0.640000	39.9	9.000	L1	9.8	16.1	56.0
0.644000	39.4	9.000	L1	9.8	16.6	56.0
0.706000	39.6	9.000	L1	9.8	16.4	56.0
0.718000	39.8	9.000	L1	9.8	16.2	56.0
0.722000	39.1	9.000	L1	9.8	16.9	56.0
0.730000	37.6	9.000	L1	9.8	18.4	56.0
3.566000	38.1	9.000	L1	9.9	17.9	56.0
3.882000	38.4	9.000	L1	10.0	17.6	56.0
3.894000	38.4	9.000	L1	10.0	17.6	56.0
3.904000	38.3	9.000	L1	10.0	17.7	56.0
3.908000	38.4	9.000	L1	10.0	17.6	56.0
3.912000	38.7	9.000	L1	10.0	17.3	56.0
12.300000	43.0	9.000	L1	10.3	17.0	60.0
12.376000	42.8	9.000	L1	10.3	17.2	60.0
12.410000	42.5	9.000	L1	10.3	17.5	60.0
12.420000	42.3	9.000	L1	10.3	17.7	60.0
12.588000	46.8	9.000	L1	10.3	13.2	60.0
12.598000	44.4	9.000	L1	10.3	15.6	60.0

CAverage Final Result, Line (L1)

Frequency (MHz)	CAverage (dBμ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμ V)
0.640000	32.1	9.000	L1	9.8	13.9	46.0
0.644000	31.6	9.000	L1	9.8	14.4	46.0
0.706000	33.6	9.000	L1	9.8	12.4	46.0
0.718000	33.4	9.000	L1	9.8	12.6	46.0
0.722000	32.8	9.000	L1	9.8	13.2	46.0
0.730000	31.3	9.000	L1	9.8	14.7	46.0
3.862000	31.1	9.000	L1	10.0	14.9	46.0
3.894000	31.3	9.000	L1	10.0	14.7	46.0
3.904000	31.3	9.000	L1	10.0	14.7	46.0
3.908000	31.4	9.000	L1	10.0	14.6	46.0
3.912000	31.4	9.000	L1	10.0	14.6	46.0
3.926000	31.4	9.000	L1	10.0	14.6	46.0
12.298000	35.1	9.000	L1	10.3	14.9	50.0
12.376000	34.9	9.000	L1	10.3	15.1	50.0
12.410000	34.4	9.000	L1	10.3	15.6	50.0
12.420000	34.5	9.000	L1	10.3	15.5	50.0
12.568000	37.7	9.000	L1	10.3	12.3	50.0
12.598000	36.5	9.000	L1	10.3	13.5	50.0

Figure 2: Conducted Emission, AC Main Port, Line (N)



QuasiPeak Final Result, Line (N)

Frequency (MHz)	QuasiPeak (dB μ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.156000	40.2	9.000	N	9.8	25.4	65.7
0.166000	49.9	9.000	N	9.8	15.3	65.2
0.172000	47.4	9.000	N	9.8	17.5	64.9
0.180000	27.8	9.000	N	9.8	36.7	64.5
0.234000	23.8	9.000	N	9.9	38.5	62.3
0.240000	36.8	9.000	N	9.9	25.3	62.1
4.324000	39.6	9.000	N	10.2	16.4	56.0
4.328000	39.0	9.000	N	10.2	17.0	56.0
4.612000	37.3	9.000	N	10.2	18.7	56.0
4.628000	36.4	9.000	N	10.2	19.6	56.0
4.716000	35.9	9.000	N	10.2	20.1	56.0
4.916000	35.1	9.000	N	10.2	20.9	56.0
13.044000	40.0	9.000	N	10.6	20.0	60.0
13.096000	40.3	9.000	N	10.6	19.7	60.0
13.128000	39.9	9.000	N	10.6	20.1	60.0
13.146000	39.8	9.000	N	10.6	20.2	60.0
13.456000	38.5	9.000	N	10.6	21.5	60.0
13.514000	38.2	9.000	N	10.6	21.8	60.0

CAverage Final Result, Line (N)

Frequency (MHz)	CAverage (dBμ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμ V)
0.152000	21.8	9.000	N	9.8	34.1	55.9
0.156000	23.7	9.000	N	9.8	31.9	55.7
0.162000	33.4	9.000	N	9.8	22.0	55.4
0.166000	37.5	9.000	N	9.8	17.7	55.2
0.170000	36.0	9.000	N	9.8	18.9	55.0
0.176000	24.1	9.000	N	9.8	30.6	54.7
4.324000	31.5	9.000	N	10.2	14.5	46.0
4.328000	31.8	9.000	N	10.2	14.2	46.0
4.414000	31.6	9.000	N	10.2	14.4	46.0
4.612000	30.0	9.000	N	10.2	16.0	46.0
4.628000	29.7	9.000	N	10.2	16.3	46.0
4.714000	28.8	9.000	N	10.2	17.2	46.0
13.044000	33.2	9.000	N	10.6	16.8	50.0
13.096000	33.1	9.000	N	10.6	16.9	50.0
13.128000	32.8	9.000	N	10.6	17.2	50.0
13.146000	32.7	9.000	N	10.6	17.3	50.0
13.456000	30.0	9.000	N	10.6	20.0	50.0
13.514000	29.6	9.000	N	10.6	20.4	50.0

4.2 Radiated Emission Below 1 GHz

4.2.1 Measuring instruments

Type	Manufacturer	Model Name	Serial Number	Calibration Cycle	Calibration Date
<input checked="" type="checkbox"/> EMI test receiver	Rohde & Schwarz	ESU40	100524	1 year	05.17.2019
<input checked="" type="checkbox"/> Trilog antenna	Schwarzbeck	VULB 9168	255	2 year	03.26.2019
<input checked="" type="checkbox"/> Antenna master	INNCO Systems	MA4640-XP-ET	-	N/A	-
<input checked="" type="checkbox"/> Antenna master controller	INNCO Systems	CO 3000	CO3000/870/ 35990515/L	N/A	-
<input checked="" type="checkbox"/> Turn Table	INNCO Systems	1060	-	N/A	-
<input checked="" type="checkbox"/> Turn table controller	INNCO Systems	CO2000	CO2000/095/ 7590304/L	N/A	-
<input checked="" type="checkbox"/> RADIO COMMUNICATION ANALYZER	ANRITSU	MT8820C	6201138643	1 year	08.21.2018
<input checked="" type="checkbox"/> Antenna (for Communication)	Schwarzbeck	USLP9142	VSLP 9142-200	-	-
<input checked="" type="checkbox"/> Software	Rohde & Schwarz	EMC32 VER8.40.0	-	-	-

4.2.2 Operating Condition

The test results of radiated emission provide the following information:

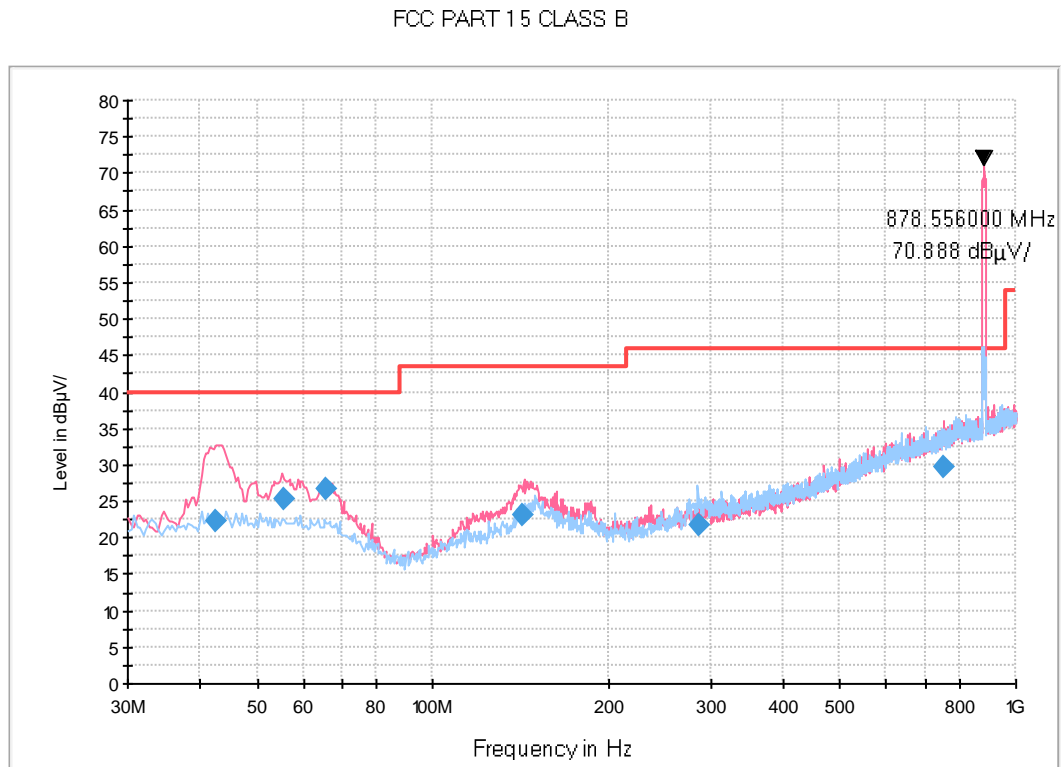
Used Test Standard	FCC CFR 47 PART 15 Subpart B Class B ANSI C63.4-2014
Detector	Quasi-Peak
Bandwidth	120 kHz (6 dB)
Operating Mode	[TA] Receiver mode (LTE B5 Middle CH Idle) [TA] Receiver mode (LTE B13 Low CH Idle) [Earphone] Receiver mode (LTE B5 Middle CH Idle) [Earphone] Receiver mode (LTE B13 Low CH Idle)
Kind of Test Site	3 m semi anechoic chamber
Temperature	23.6 °C
Relative Humidity	43.4 %
Test Date	May 27, 2019

- Calculation Formula:

1. POL. H = Horizontal, POL. V = Vertical
2. QuasiPeak = Reading (Receiver Reading) + Corr.
3. Corr. (Correction Factor) = Antenna Factor + Cable Loss
4. Margin = Limit - QuasiPeak

4.2.3 Measuring Data

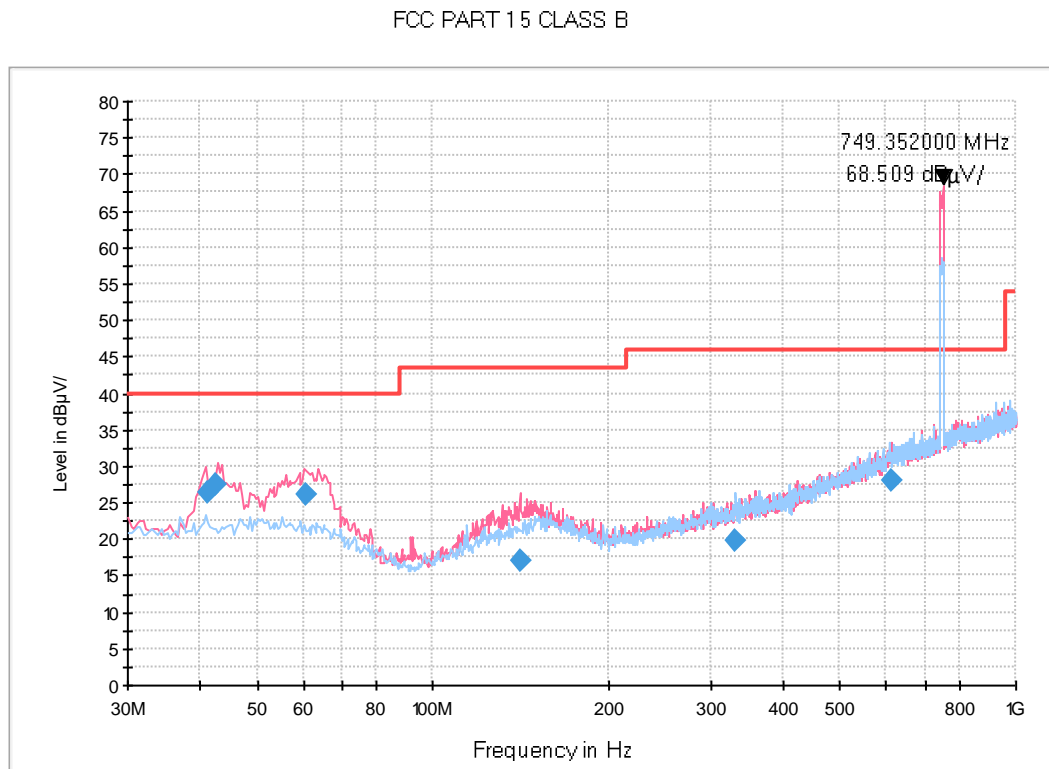
Figure 3: Radiated Emission, [TA] Receiver mode (LTE B5 Middle CH Idle)



- note. 1. LTE B5 Middle ch Rx Frequency: 878.556 MHz
 2. These are signals for fundamental frequency from the base station

Frequency (MHz)	Quasi Peak (dBμ V/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμ V/m)
42.432800	22.3	115.8	V	75.0	19.2	17.7	40.0
55.548000	25.3	100.0	V	134.0	19.6	14.7	40.0
65.800000	26.6	100.0	V	110.0	18.6	13.4	40.0
142.957600	23.2	100.0	V	30.0	19.2	20.3	43.5
285.375200	21.6	100.0	H	103.0	20.0	24.4	46.0
753.955200	29.8	100.0	V	102.0	29.6	16.2	46.0

Figure 4: Radiated Emission, [TA] Receiver mode (LTE B13 Low CH Idle)

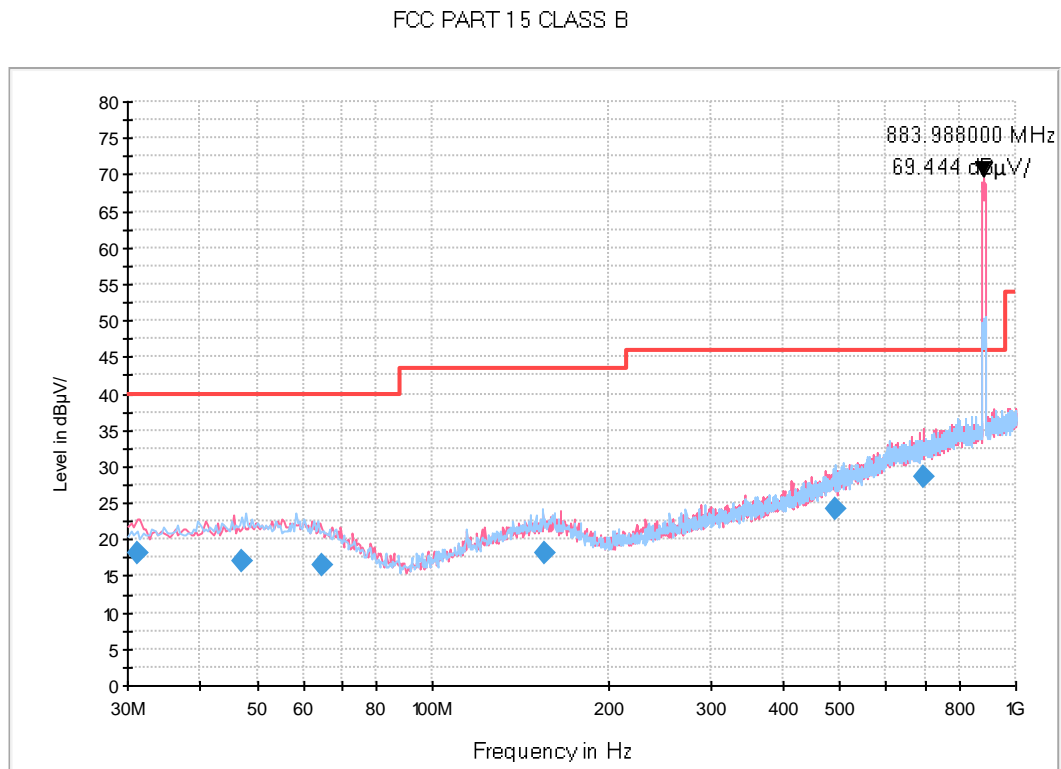


note. 1. LTE B13 Low ch Rx Frequency: 749.352 MHz

2. These are signals for fundamental frequency from the base station

Frequency (MHz)	Quasi Peak (dB μ V/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)
41.332000	26.3	115.7	V	128.0	19.1	13.7	40.0
42.596800	27.6	116.9	V	301.0	19.2	12.4	40.0
60.773600	26.1	100.0	V	96.0	19.3	13.9	40.0
141.889600	17.1	100.0	V	156.0	19.1	26.4	43.5
330.144000	19.9	125.0	H	118.0	21.3	26.1	46.0
611.544800	27.9	125.2	V	97.0	27.6	18.1	46.0

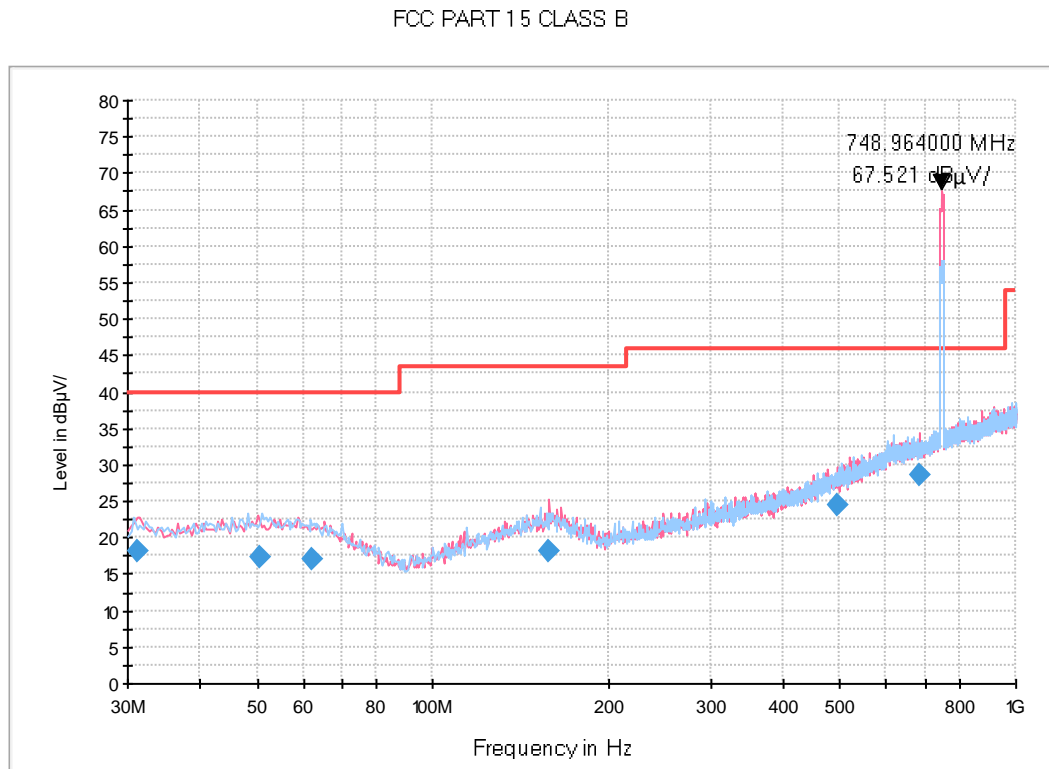
Figure 5: Radiated Emission, [Earphone] Receiver mode (LTE B5 Middle CH Idle)



- note. 1. LTE B5 Middle ch Rx Frequency: 883.988 MHz
2. These are signals for fundamental frequency from the base station

Frequency (MHz)	Quasi Peak (dBμ V/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμ V/m)
31.160800	18.0	100.0	V	99.0	18.4	22.0	40.0
47.279200	17.1	115.7	H	34.0	19.6	22.9	40.0
64.606400	16.6	100.0	H	118.0	18.8	23.4	40.0
155.230400	18.2	100.0	H	96.0	19.7	25.3	43.5
489.919200	24.3	100.0	H	87.0	25.0	21.7	46.0
693.908000	28.7	116.7	V	223.0	28.7	17.3	46.0

Figure 6: Radiated Emission, [Earphone] Receiver mode (LTE B13 Low CH Idle)



note. 1. LTE B13 Low ch Rx Frequency: 748.964 MHz

2. These are signals for fundamental frequency from the base station

Frequency (MHz)	Quasi Peak (dBµ V/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµ V/m)
31.088800	18.1	100.0	V	299.0	18.4	21.9	40.0
50.684000	17.4	100.0	H	106.0	19.8	22.6	40.0
62.091200	16.9	125.3	H	330.0	19.1	23.1	40.0
157.659200	18.2	100.0	V	127.0	19.8	25.3	43.5
494.644800	24.4	117.8	V	157.0	25.2	21.6	46.0
682.982400	28.6	100.0	V	122.0	28.6	17.4	46.0

4.3 Radiated Emission Above 1 GHz

4.3.1 Measuring instruments

	Type	Manufacturer	Model Name	Serial Number	Calibration Cycle	Calibration Date
<input checked="" type="checkbox"/>	EMI test receiver	Rohde & Schwarz	ESU40	100524	1 year	05.17.2019
<input checked="" type="checkbox"/>	Antenna master	INNCO Systems	MA4640-XP-ET	-	N/A	-
<input checked="" type="checkbox"/>	Antenna master controller	INNCO Systems	CO3000	CO3000/870/ 35990515/L	N/A	-
<input checked="" type="checkbox"/>	Turn table	INNCO Systems	1060	-	N/A	-
<input checked="" type="checkbox"/>	Turn table controller	INNCO Systems	CO2000	CO2000/095/ 7590304/L	N/A	-
<input checked="" type="checkbox"/>	Horn antenna	Schwarzbeck	BBHA 9120D	01836	2 year	07.20.2018
<input checked="" type="checkbox"/>	Low Noise amplifier	TESTEK	TK-PA18H	170034-L	1 year	03.04.2019
<input checked="" type="checkbox"/>	Power Amplifier	TESTEK	TK-PA1840H	170030-L	1 year	12.17.2019
<input checked="" type="checkbox"/>	Horn Antenna	Schwarzbeck	BBHA 9170	BBHA 9170 #786	2 year	12.05.2017
<input checked="" type="checkbox"/>	RADIO COMMUNICATION ANALYZER	ANRITSU	MT8820C	6201138643	1 year	08.21.2018
<input checked="" type="checkbox"/>	ANTENNA (for Communication)	Schwarzbeck	USLP9142	VSLP 9142-200	-	-
<input checked="" type="checkbox"/>	Software	Rohde & Schwarz	EMC32 VER8.40.0	-	-	-

4.3.2 Operating Condition

The test results of radiated emission provide the following information:

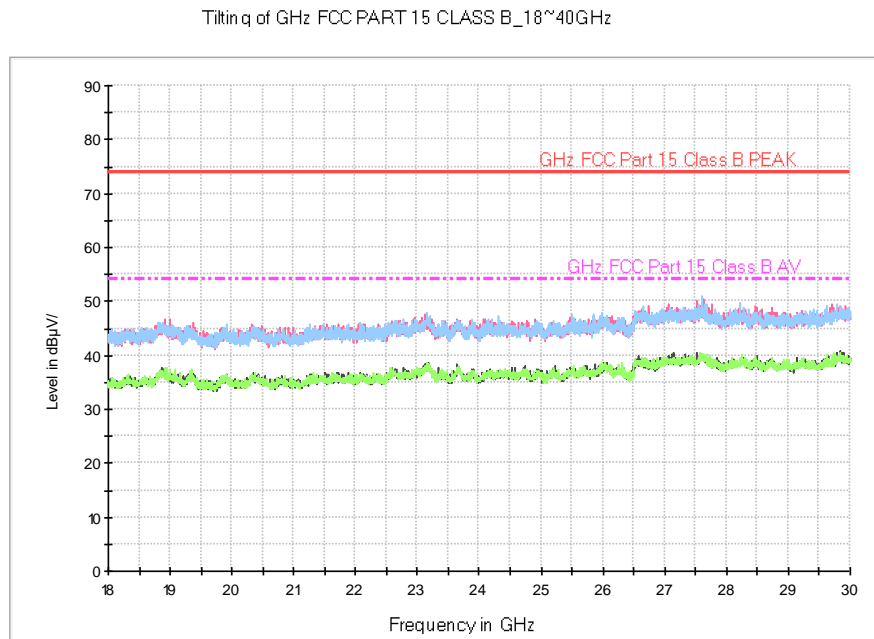
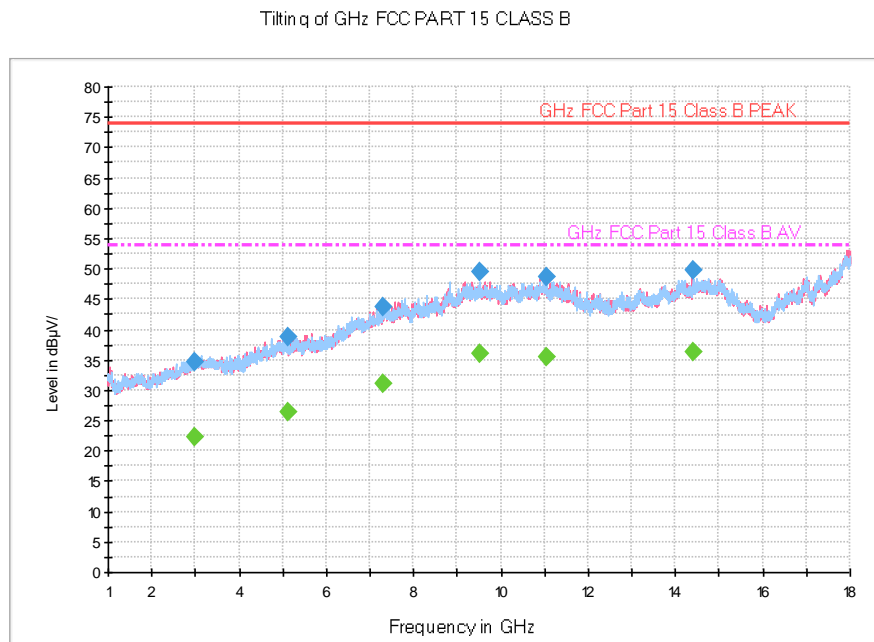
Used Test Standard	FCC CFR 47 PART 15 Subpart B Class B ANSI C63.4-2014
Detector	Peak mode: Peak (RBW: 1 MHz, VBW: 3 MHz) CISPR-Average mode: Peak (RBW: 1 MHz, VBW: 10 Hz)
Highest Frequency	5 8250 MHz
Tested Frequency Range	1 GHz to 30 GHz
Operation Mode	[TA] Receiver mode (LTE B5 Middle CH Idle) [TA] Receiver mode (LTE B13 Low CH Idle) [Earphone] Receiver mode (LTE B5 Middle CH Idle) [Earphone] Receiver mode (LTE B13 Low CH Idle)
Kind of Test Site	3 m semi anechoic chamber
Temperature	23.6 °C
Relative Humidity	43.4 %
Test Date	May 27, 2019

- Calculation Formula:

1. POL. H = Horizontal, POL. V = Vertical
2. Peak or CAverage = Reading (Receiver Reading) + Corr.
3. Corr. (Correction Factor) = Antenna Factor+ Cable Loss –Amplifier Gain
4. Margin = Limit - Peak or CAverage

4.3.3 Measuring Data

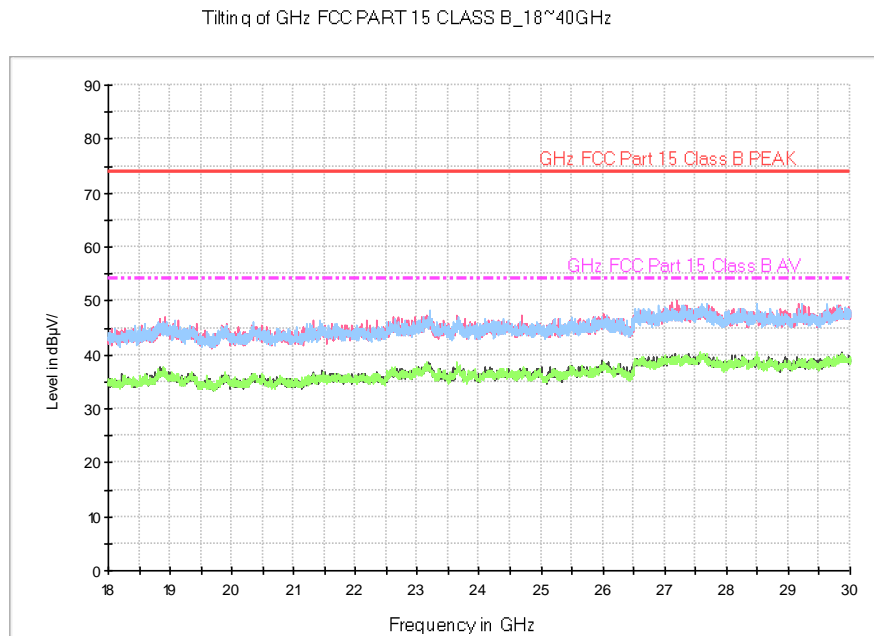
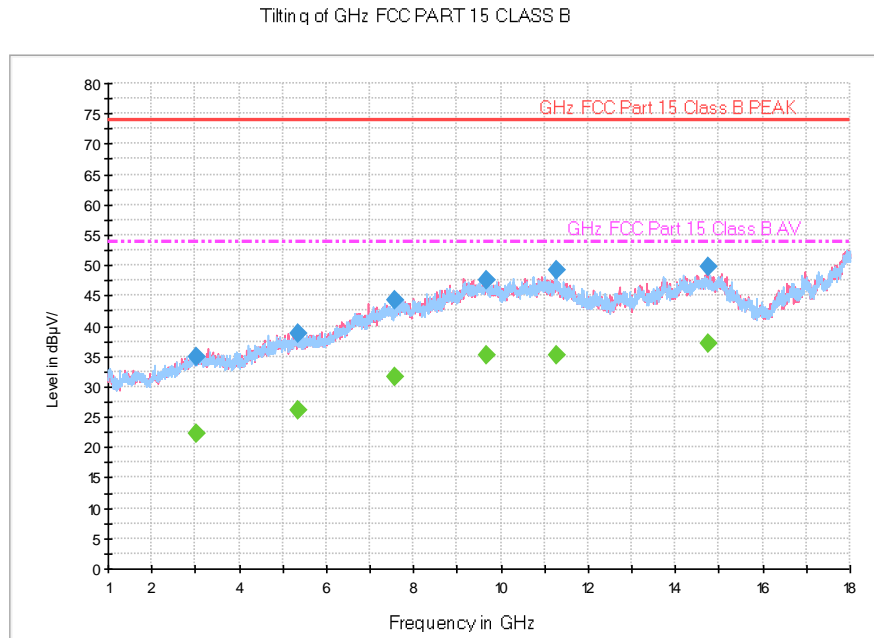
Figure 7: Radiated Emission, [TA] Receiver mode (LTE B5 Middle CH Idle)



Frequency (MHz)	Peak (dB μ V/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)
2989.190000	34.6	100.0	V	245.0	-21.1	39.4	74.0
5134.055000	38.7	306.4	H	289.0	-15.6	35.3	74.0
7299.015000	43.8	150.0	V	0.0	-9.8	30.2	74.0
9521.305000	49.5	122.9	H	3.0	-5.1	24.5	74.0
11042.290000	48.6	150.0	H	9.0	-2.4	25.4	74.0
14392.300000	49.8	203.4	V	101.0	0.5	24.2	74.0

Frequency (MHz)	CAverage (dB μ V/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)
2989.190000	22.2	100.0	V	245.0	-21.1	31.8	54.0
5134.055000	26.4	306.4	H	289.0	-15.6	27.6	54.0
7299.015000	31.0	150.0	V	0.0	-9.8	23.0	54.0
9521.305000	36.0	122.9	H	3.0	-5.1	18.0	54.0
11042.290000	35.6	150.0	H	9.0	-2.4	18.4	54.0
14392.300000	36.3	203.4	V	101.0	0.5	17.7	54.0

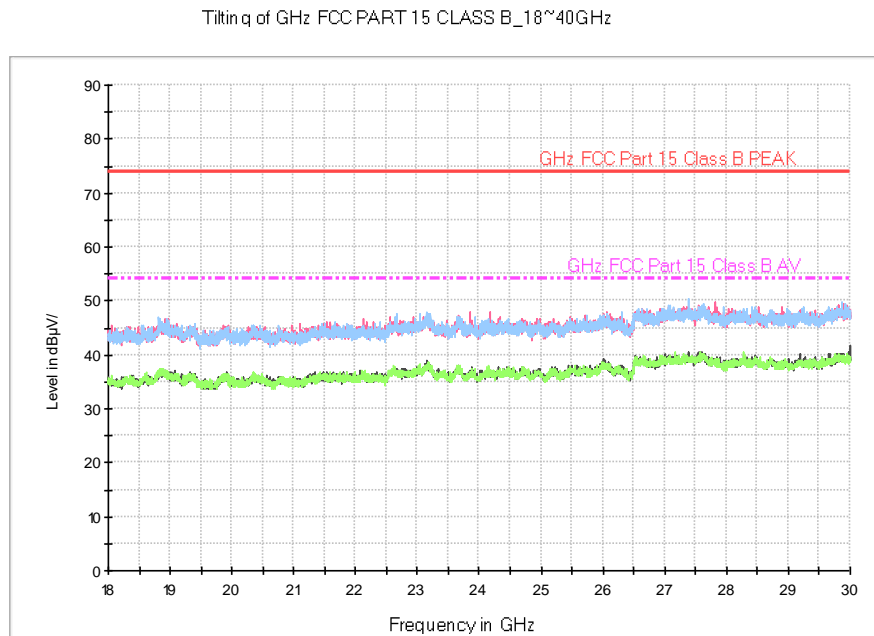
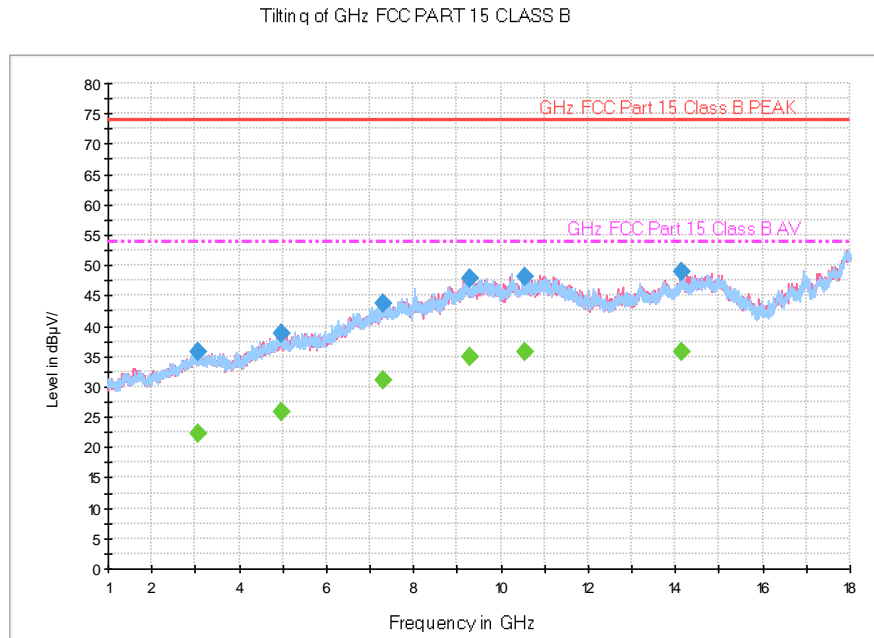
Figure 8: Radiated Emission, [TA] Receiver mode (LTE B13 Low CH Idle)



Frequency (MHz)	Peak (dB μ V/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)
3008.270000	34.9	248.5	V	338.0	-21.0	39.1	74.0
5372.640000	38.7	231.5	V	207.0	-15.3	35.3	74.0
7564.840000	44.3	148.5	H	218.0	-9.2	29.7	74.0
9662.120000	47.7	350.0	H	0.0	-5.1	26.3	74.0
11278.500000	49.3	139.8	V	0.0	-2.4	24.7	74.0
14743.115000	49.9	100.0	V	346.0	1.0	24.1	74.0

Frequency (MHz)	CAverage (dB μ V/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)
3008.270000	22.2	248.5	V	338.0	-21.0	31.8	54.0
5372.640000	26.2	231.5	V	207.0	-15.3	27.8	54.0
7564.840000	31.7	148.5	H	218.0	-9.2	22.3	54.0
9662.120000	35.1	350.0	H	0.0	-5.1	18.9	54.0
11278.500000	35.3	139.8	V	0.0	-2.4	18.7	54.0
14743.115000	37.1	100.0	V	346.0	1.0	16.9	54.0

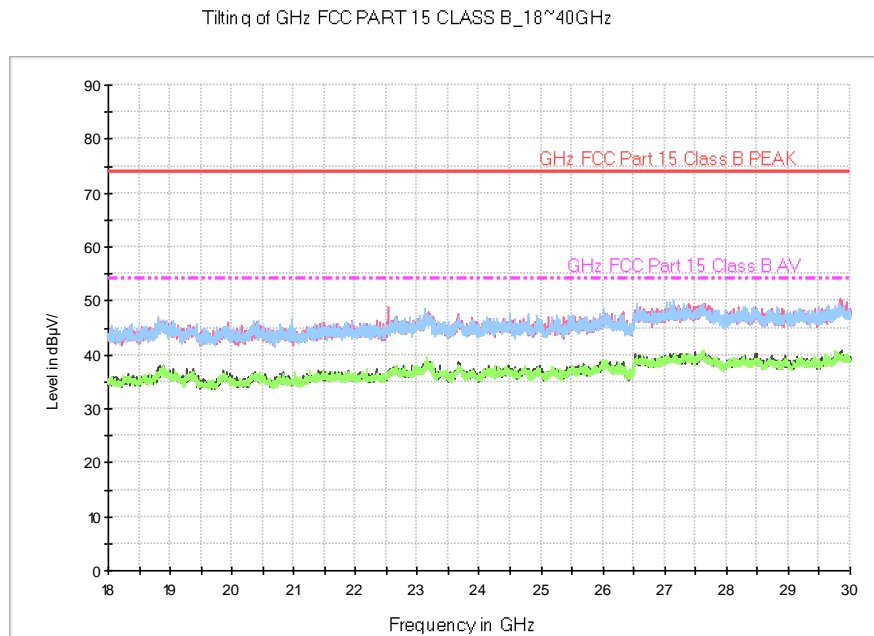
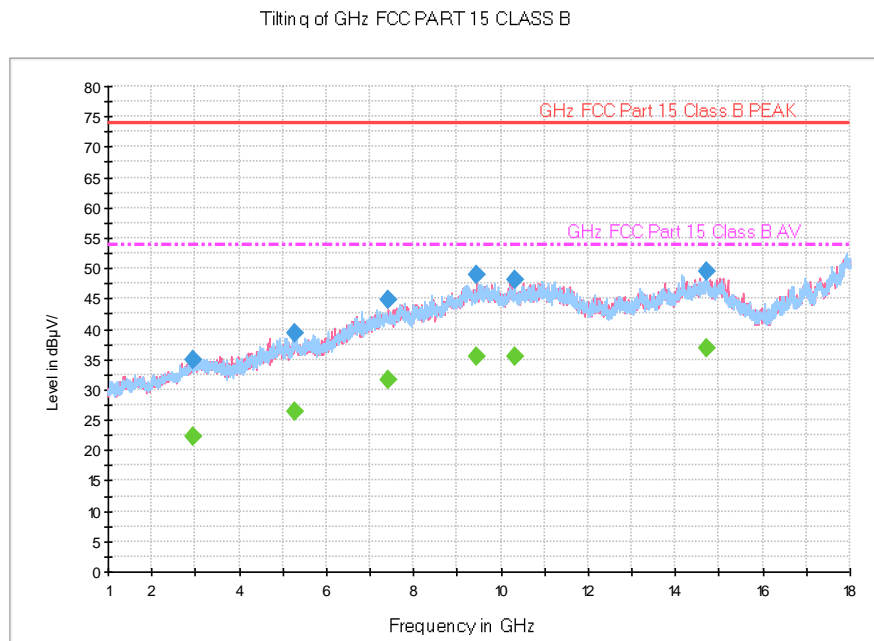
Figure 9: Radiated Emission, [Earphone] Receiver mode (LTE B5 Middle CH Idle)



Frequency (MHz)	Peak (dB μ V/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)
3069.805000	35.7	141.6	V	315.0	-20.9	38.3	74.0
4954.040000	38.8	217.4	H	50.0	-15.9	35.2	74.0
7298.845000	43.8	100.0	V	271.0	-9.8	30.2	74.0
9284.790000	47.9	291.5	H	4.0	-5.7	26.1	74.0
10549.070000	48.1	149.9	V	110.0	-3.2	25.9	74.0
14147.825000	49.0	350.0	H	4.0	-0.1	25.0	74.0

Frequency (MHz)	CAverage (dB μ V/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)
3069.805000	22.3	141.6	V	315.0	-20.9	31.7	54.0
4954.040000	25.9	217.4	H	50.0	-15.9	28.1	54.0
7298.845000	31.1	100.0	V	271.0	-9.8	22.9	54.0
9284.790000	35.0	291.5	H	4.0	-5.7	19.0	54.0
10549.070000	35.7	149.9	V	110.0	-3.2	18.3	54.0
14147.825000	35.8	350.0	H	4.0	-0.1	18.2	54.0

Figure 10: Radiated Emission, [Earphone] Receiver mode (LTE B13 Low CH Idle)



Frequency (MHz)	Peak (dB μ V/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)
2963.550000	34.9	137.8	H	280.0	-21.2	39.1	74.0
5270.550000	39.4	100.0	V	188.0	-15.4	34.6	74.0
7402.275000	44.8	100.0	V	0.0	-9.5	29.2	74.0
9453.105000	48.9	150.0	V	52.0	-5.3	25.1	74.0
10309.015000	48.1	150.0	H	101.0	-4.0	25.9	74.0
14723.050000	49.4	100.0	H	194.0	1.0	24.6	74.0

Frequency (MHz)	CAverage (dB μ V/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)
2963.550000	22.2	137.8	H	280.0	-21.2	31.8	54.0
5270.550000	26.3	100.0	V	188.0	-15.4	27.7	54.0
7402.275000	31.7	100.0	V	0.0	-9.5	22.3	54.0
9453.105000	35.4	150.0	V	52.0	-5.3	18.6	54.0
10309.015000	35.3	150.0	H	101.0	-4.0	18.7	54.0
14723.050000	36.9	100.0	H	194.0	1.0	17.1	54.0

5. EMI Test Setup Photo

Please refer to Annex C and test setup photo file no. as follows;

Revision No.	Date of Issue	File No.
0	May 29, 2019	HCT-RF-1905-FC032-P

End of report