



# TEST REPORT

**APPLICANT** : Xingtel Xiamen Group Co., Ltd.  
**PRODUCT NAME** : Facial Recognition Door Lock  
**MODEL NAME** : XL-9192  
**BRAND NAME** : N/A  
**FCC ID** : QMH-XL-9192  
**STANDARD(S)** : 47 CFR Part 15 Subpart C  
**RECEIPT DATE** : 2019-07-15  
**TEST DATE** : 2019-07-15 to 2019-07-17  
**ISSUE DATE** : 2019-07-19

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Change History		
Version	Date	Reason for change
1.0	2019-07-19	First edition



# 1. Technical Information

**Note:** Provide by applicant.

## 1.1. Applicant and Manufacturer Information

<b>Applicant:</b>	Xingtel Xiamen Group Co., Ltd.
<b>Applicant Address:</b>	Xingtel Building,Chuangxin Road, Torch Hi-Tech Industrial District,Xiamen 361006, PR China
<b>Manufacturer:</b>	Xingtel Xiamen Group Co., Ltd.
<b>ManufacturerAddress:</b>	Xingtel Building,Chuangxin Road, Torch Hi-Tech Industrial District,Xiamen 361006, PR China

## 1.2. Equipment Under Test (EUT) Description

<b>Product Name:</b>	Facial Recognition Door Lock	
<b>Serial No:</b>	(N/A, marked #1 by test site)	
<b>Hardware Version:</b>	S3_1V4	
<b>Software Version:</b>	1.0.9 Z6	
<b>Frequency Range:</b>	13.553MHz-13.567MHz	
<b>Operating Frequency:</b>	13.56MHz	
<b>Data Rate:</b>	106kBd	
<b>Modulation Type:</b>	ASK	
<b>Antenna Type:</b>	Monopole antenna	
<b>Accessory Information</b>	Battery	
	Brand Name:	GP
	Model No:	GN15A
	Serial No:	N/A
	Capacity:	N/A
	Rated Voltage:	1.5V
	Number:	8
<b>Ancillary Equipment:</b>	Adapter	
	Manufacturer:	Xiamen Meitu Mobile Technology Co.,Ltd.
	Brand Name:	Apple
	Model No.:	MA-1804
	Serial No.:	CY84V1000140

**Note 1:** We set the maximum data rate(the worst case) of EUT during the test.

**Note 2:** For a more detailed description, please refer to Specification or User's Manual supplied by



the applicant and/or manufacturer.

### 1.3. Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 15 Subpart C for the EUT FCC ID Certification:

No	Identity	Document Title
1	47 CFR Part 15 Subpart C	Radio Frequency Devices

Test detailed items/section required by FCC rules and results are as below:

No.	Section	Description	Test Date	Test Engineer	Result
1	15.203	Antenna Requirement	N/A	N/A	PASS
2	15.207	Conducted Emission	July.16 2019	Qijie Xiao	PASS
3	15.209 15.225(a)(b)(c)(d)	Radiated Emission	July.16 2019	Qijie Xiao	PASS
4	15.225(e)	Frequency Tolerance	July.16 2019	Elvis Wang	PASS
5	15.215(c)	20dB Bandwidth	July.16 2019	Elvis Wang	PASS

**Note:** The tests were performed according to the method of measurements prescribed in ANSI C63.10-2013. The EUT has been tested under continuous operating condition.

### 1.4. Environmental Conditions

During the measurement, the environmental conditions were within the listed ranges:

Temperature (°C):	15 - 35
Relative Humidity (%):	30 -60
Atmospheric Pressure (kPa):	86-106



## 2.47 CFR Part 15C Requirements

### 2.1. Antenna requirement

#### 2.1.1. Applicable Standard

According to FCC 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

#### 2.1.2. Result:

The EUT has a permanently and irreplaceable attached antenna. Please refer to the EUT internal photos.

**Result: Compliant**

### 2.2. Conducted Emission

#### 2.2.1. Test Requirement

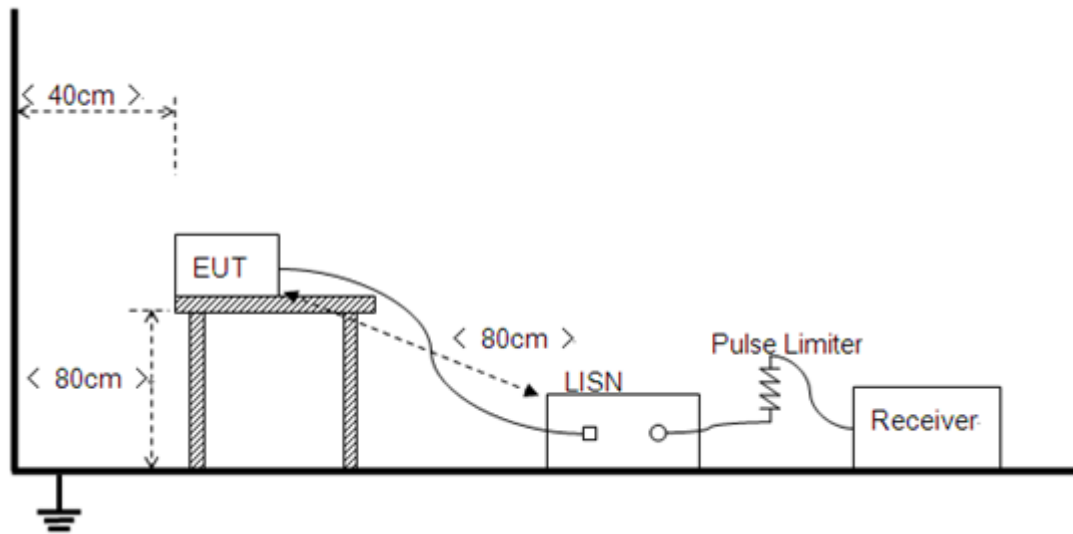
According to FCC section 15.207, the radio frequency voltage that is conducted back onto the AC power line on any frequency within the band 150kHz to 30MHz shall not exceed the limits in the following table, as measured using a 50 $\mu$ H/50 $\Omega$  line impedance stabilization network (LISN).

Frequency range (MHz)	Conducted Limit (dB $\mu$ V)	
	Quai-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
5 - 30	60	50

NOTE:

- (a) The lower limit shall apply at the band edges.
- (b) The limit decreases linearly with the logarithm of the frequency in the range 0.15 - 0.50MHz.

### 2.2.2. Test Setup



The EUT is placed on a 0.8m high insulating table, which stands on the grounded conducting floor, and keeps 0.4m away from the grounded conducting wall. The EUT is connected to the power mains through a LISN which provides 50Ω/50μH of coupling impedance for the measuring instrument. A Pulse Limiter is used to protect the measuring instrument. The factors of the whole test system are calibrated to correct the reading.

### 2.2.3. Test Result

The maximum conducted interference is searched using Peak (PK), if the emission levels more than the AV and QP limits, and that have narrow margins from the AV and QP limits will be re-measured with AV and QP detectors. Tests for both L phase and N phase lines of the power mains connected to the EUT are performed. Refer to recorded points and plots below.



**A. Test setup:**

Test Mode: ADAPTER + EUT(NFC Card mode)

Test Voltage: AC 120V/60Hz

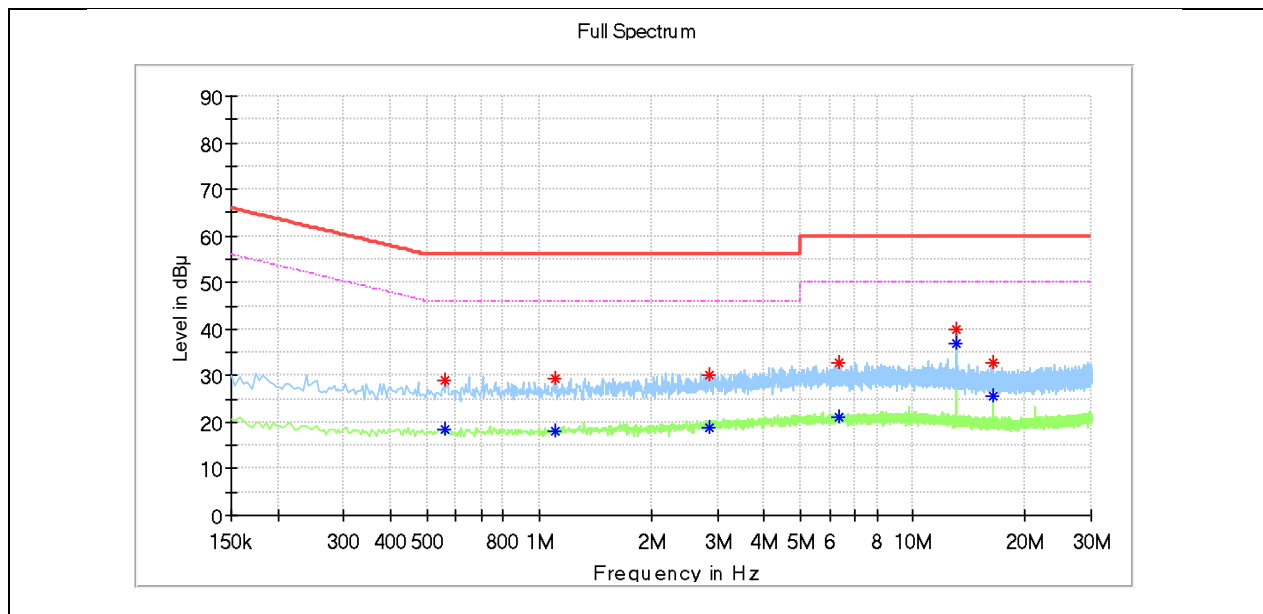
The measurement results are obtained as below:

$$E \text{ [dB}\mu\text{V]} = U_R + L_{\text{Cable loss}} \text{ [dB]} + \text{Corr.}$$

$U_R$ : Receiver Reading

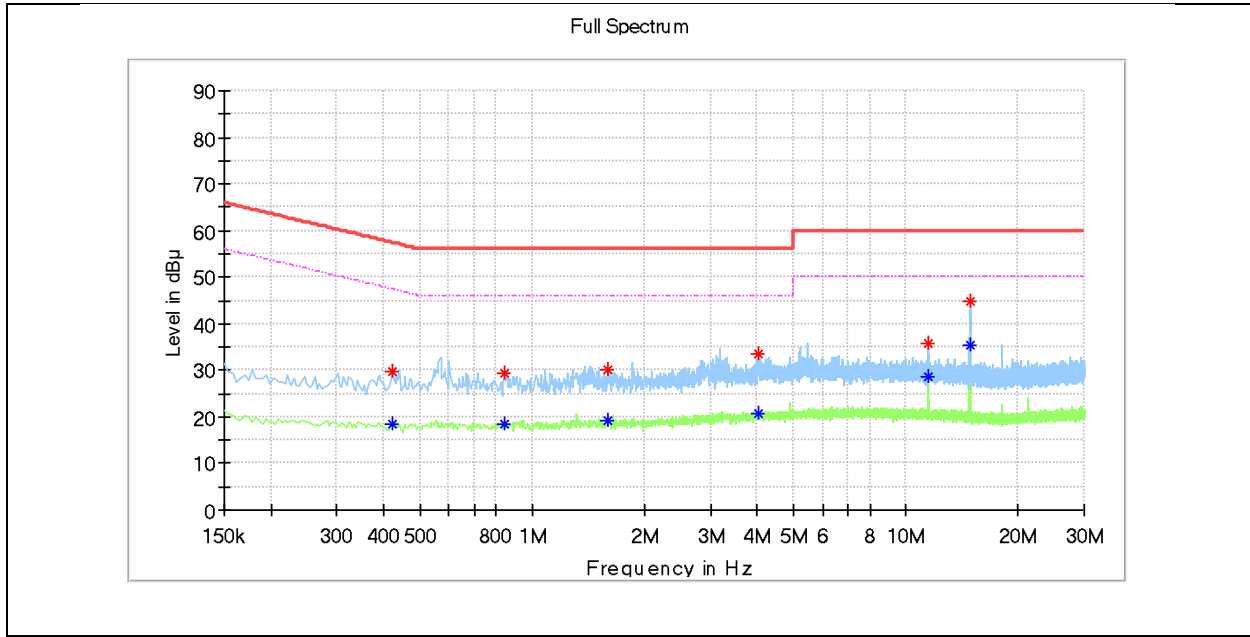
Corr.: Voltage division factor of LISN

**Test Plots:**



(L Phase)

Frequency (MHz)	Quasi-peak (dBμV)	MaxPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)	Verdict
0.562000	---	---	18.45	46.00	27.55	L1	10.2	PASS
0.562000	---	29.16	---	56.00	26.84	L1	10.2	PASS
1.102000	---	---	18.18	46.00	27.82	L1	10.3	PASS
1.102000	---	29.46	---	56.00	26.54	L1	10.3	PASS
2.850000	---	---	18.70	46.00	27.30	L1	10.4	PASS
2.850000	---	30.27	---	56.00	25.73	L1	10.4	PASS
6.318000	---	---	21.28	50.00	28.72	L1	10.5	PASS
6.318000	---	32.79	---	60.00	27.21	L1	10.5	PASS
13.078000	---	---	36.78	50.00	13.22	L1	10.7	PASS
13.078000	---	40.03	---	60.00	19.97	L1	10.7	PASS
16.358000	---	---	25.53	50.00	24.47	L1	10.7	PASS
16.358000	---	32.65	---	60.00	27.35	L1	10.7	PASS



(N Phase)

Frequency (MHz)	Quasi-peak (dBμV)	MaxPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)	Verdict
0.422000	---	---	18.61	47.41	28.80	N	10.2	PASS
0.422000	---	29.68	---	57.41	27.73	N	10.2	PASS
0.842000	---	---	18.55	46.00	27.45	N	10.3	PASS
0.842000	---	29.49	---	56.00	26.51	N	10.3	PASS
1.594000	---	---	19.04	46.00	26.96	N	10.3	PASS
1.594000	---	30.15	---	56.00	25.85	N	10.3	PASS
4.026000	---	---	20.66	46.00	25.34	N	10.4	PASS
4.026000	---	33.60	---	56.00	22.40	N	10.4	PASS
11.506000	---	---	28.53	50.00	21.47	N	10.6	PASS
11.514000	---	35.73	---	60.00	24.27	N	10.6	PASS
14.826000	---	---	35.26	50.00	14.74	N	10.7	PASS
14.830000	---	44.81	---	60.00	15.19	N	10.7	PASS



**B. Test setup:**

Test Mode: ADAPTER + EUT (Face recognition mode + NFC Card mode)

Test Voltage: AC 120V/60Hz

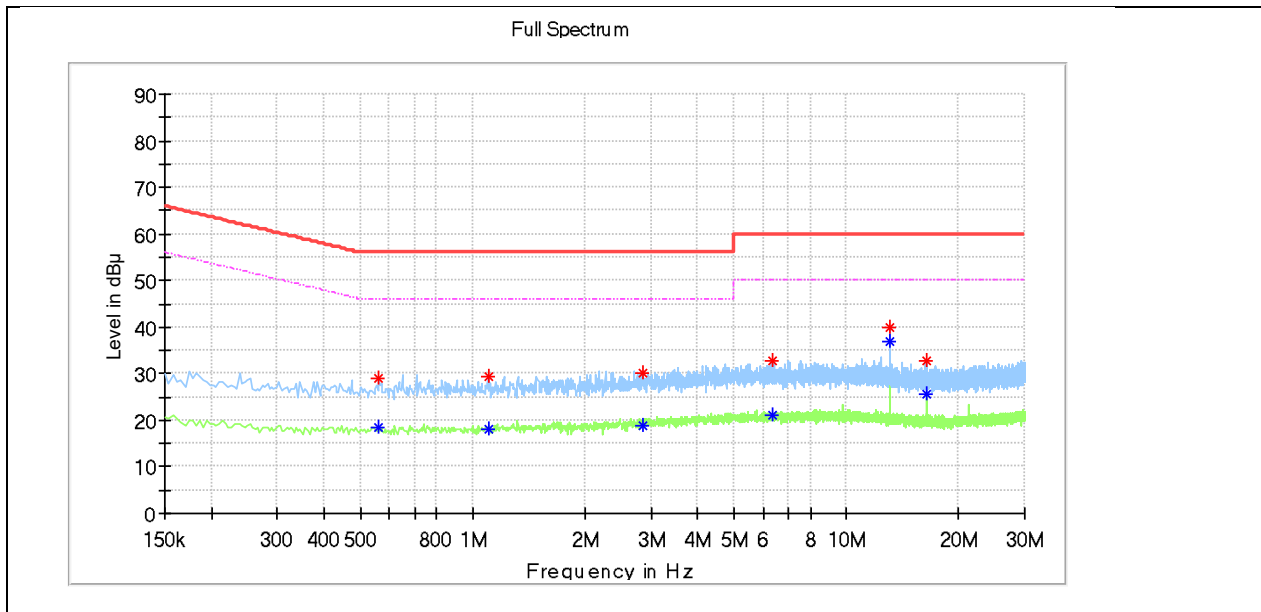
The measurement results are obtained as below:

$$E \text{ [dB}\mu\text{V]} = U_R + L_{\text{Cable loss}} \text{ [dB]} + A_{\text{Factor}}$$

$U_R$ : Receiver Reading

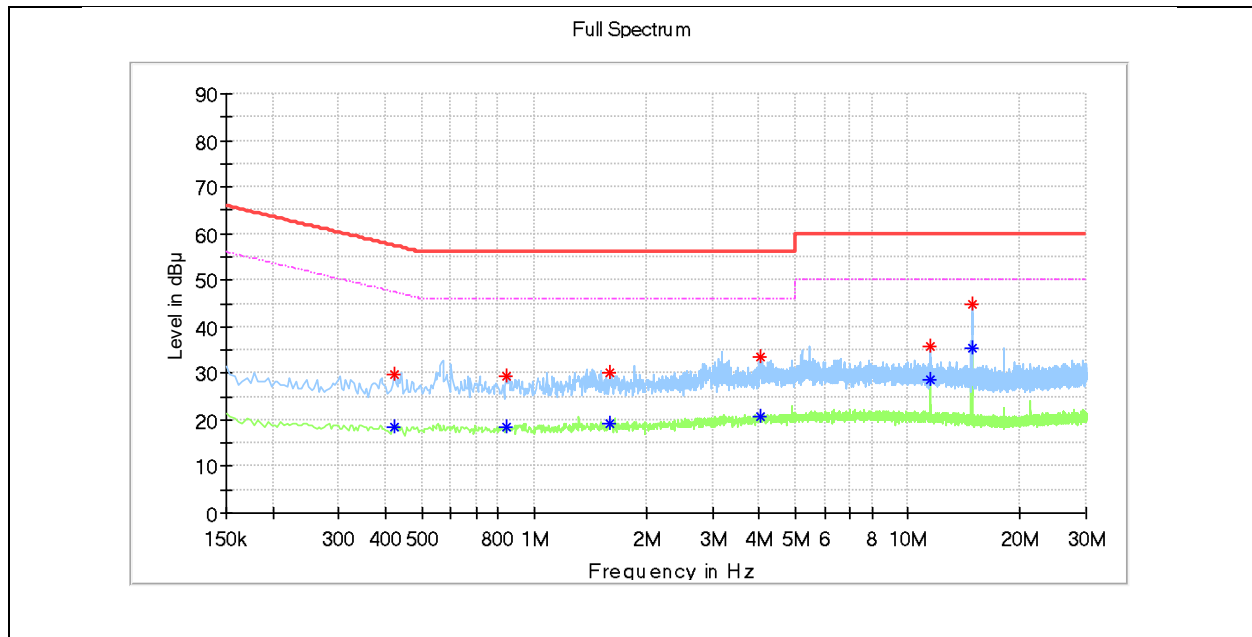
$A_{\text{Factor}}$ : Voltage division factor of LISN

**Test Plots:**



(L Phase)

Frequency (MHz)	Quasi-peak (dBμV)	MaxPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)	Verdict
0.346000	---	---	18.16	49.06	30.90	L1	10.2	PASS
0.346000	---	29.11	---	59.06	29.95	L1	10.2	PASS
0.922000	---	---	17.80	46.00	28.20	L1	10.3	PASS
0.922000	---	28.22	---	56.00	27.78	L1	10.3	PASS
2.550000	---	---	18.89	46.00	27.11	L1	10.3	PASS
2.550000	---	30.65	---	56.00	25.35	L1	10.3	PASS
5.238000	---	---	21.03	50.00	28.97	L1	10.4	PASS
5.238000	---	31.44	---	60.00	28.56	L1	10.4	PASS
13.094000	---	---	36.89	50.00	13.11	L1	10.7	PASS
13.094000	---	40.89	---	60.00	19.11	L1	10.7	PASS
16.378000	---	---	25.87	50.00	24.13	L1	10.7	PASS
16.378000	---	33.46	---	60.00	26.54	L1	10.7	PASS



(N Phase)

Frequency (MHz)	Quasi-peak (dBμV)	MaxPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)	Verdict
0.450000	---	---	18.71	46.88	28.16	N	10.2	PASS
0.450000	---	29.99	---	56.88	26.89	N	10.2	PASS
0.970000	---	---	18.56	46.00	27.44	N	10.3	PASS
0.970000	---	29.73	---	56.00	26.27	N	10.3	PASS
1.994000	---	---	18.80	46.00	27.20	N	10.3	PASS
1.994000	---	29.01	---	56.00	26.99	N	10.3	PASS
4.882000	---	---	20.08	46.00	25.92	N	10.4	PASS
4.882000	---	31.69	---	56.00	24.31	N	10.4	PASS
9.834000	---	---	25.79	50.00	24.21	N	10.6	PASS
9.834000	---	34.97	---	60.00	25.03	N	10.6	PASS
13.114000	---	---	36.76	50.00	13.24	N	10.7	PASS
13.114000	---	40.73	---	60.00	19.27	N	10.7	PASS



## 2.3. Radiated Emission

### 2.3.1. Test Requirement

#### Radiated Emission <30MHz (9 kHz-30MHz, E-field)

According to FCC section 15.225, for <30MHz, Radiated emissions were measured according to ANSIC63.4. The EUT was set to transmit at the highest output power. The EUT was set 30 meter away from the measuring antenna. The loop antenna was positioned 1 meter above the ground from the center of the loop. The measuring bandwidth was set to 10KHz. (Note: During testing the receive antenna was rotated about its axis to maximize the emission from the EUT)

There was no detected Restricted bands and Radiated Spurious emission below 30MHz. The 30m limit was converted to 3m Limit using square factor(x) as it was found by measurements as follows;  
 $3\text{ m Limit (dBuV/m)} = 20\log(X) + 40\log(30/3) = 20\log(15848) + 40\log(30/3) = 124\text{dBuV}$

Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency range (MHz)	Field Strength( $\mu\text{V/m}$ )	Distance(m)
0.009 ~ 0.490	2400/F(KHz)	300
0.490 ~ 1.705	24000/F(KHz)	30
1.705 ~ 30	30	30

Frequency range (MHz)	Field Strength@30m		Field Strength@3m
	$\mu\text{V/m}$	$\text{dB}\mu\text{V/m}$	$\text{dB}\mu\text{V/m}$
Below 13.110	30	29.5	69.5
13.110 ~ 13.410	106	40.5	80.5
13.410 ~ 13.553	334	50.5	90.5
13.553 ~ 13.567	15.848	84	124
13.567 ~ 13.710	334	50.5	90.5
13.710 ~ 14.010	106	40.5	80.5
Above 14.010	30	29.5	69.5

NOTE: a) Field Strength ( $\text{dB}\mu\text{V/m}$ ) =  $20 \cdot \log[\text{Field Strength } (\mu\text{V/m})]$ .

b) In the emission tables above, the tighter limit applies at the band edges.

**Radiated Emission >30MHz (30MHz-1GHz, E-field)**

According to FCC section 15.205, the field strength of radiated emissions from intentional radiators at a distance of 3 meters shall not exceed the following values:

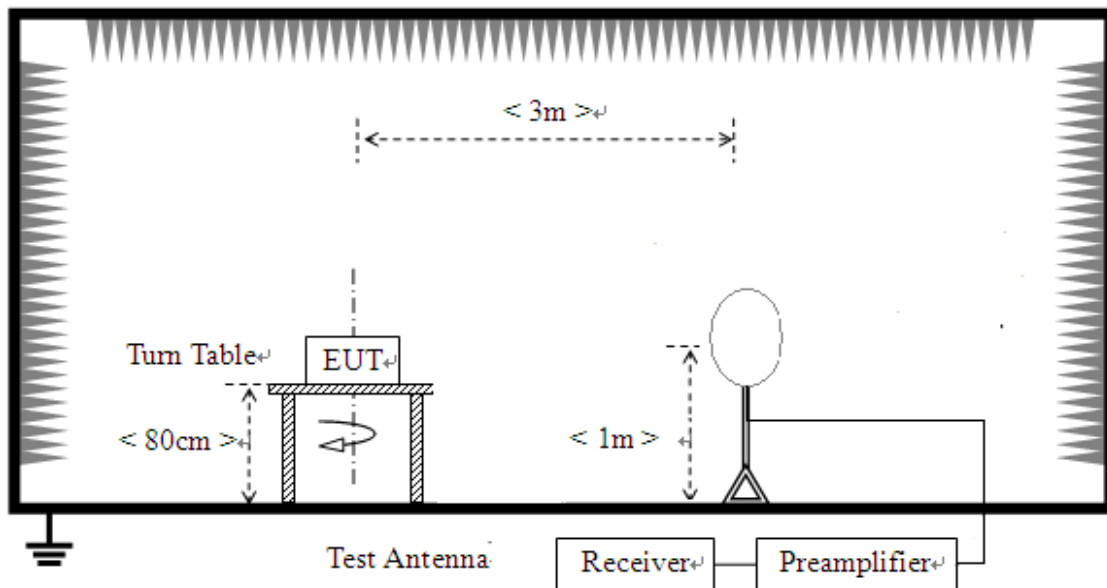
Frequency range (MHz)	Field Strength	
	$\mu\text{V/m}$	$\text{dB}\mu\text{V/m}$
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

NOTE: a) Field Strength ( $\text{dB}\mu\text{V/m}$ ) =  $20 \cdot \log[\text{Field Strength } (\mu\text{V/m})]$ .

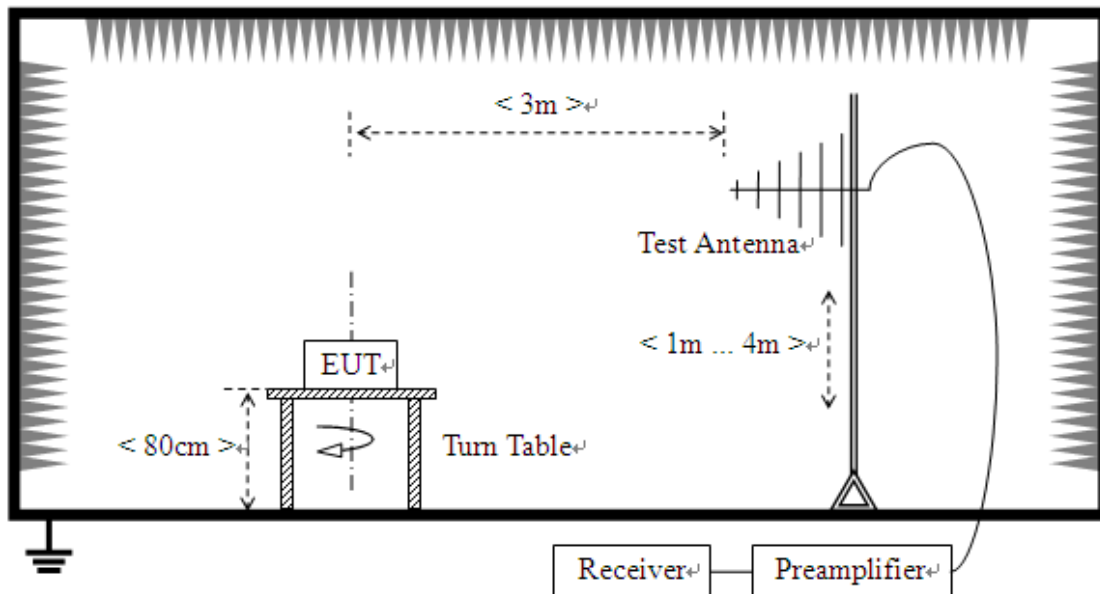
b) In the emission tables above, the tighter limit applies at the band edges.

**2.3.2. Test Setup**

1) For radiated emissions below 30MHz



## 2) For radiated emissions from 30MHz to 1GHz



The test is performed in a 3m Semi-Anechoic Chamber; the antenna factor, cable loss and so on of the site (factors) is calculated to correct the reading. The EUT is placed on a 0.8m high insulating Turn Table, and keeps 3m away from the Test Antenna, which is mounted on a variable-height antenna master tower.

For the test Antenna:

In the frequency range of 9 kHz to 30MHz, magnetic field is measured with Loop Test Antenna. The Test Antenna is positioned with its plane vertical at 1m distance from the EUT. The center of the Loop Test Antenna is 1m above the ground. During the measurement the Loop Test Antenna rotates about its vertical axis for maximum response at each azimuth about the EUT.

In the frequency range above 30MHz, Bi-Log Test Antenna (30MHz to 1GHz) was used. Test Antenna is 3m away from the EUT. Test Antenna height is varied from 1m to 4m above the ground to determine the maximum value of the field strength. The emission levels at both horizontal and vertical polarizations should be tested.

### 2.3.3. Test Result

According to ANSI C63.10, because of peak detection will yield amplitudes equal to or greater than amplitudes measured with the quasi-peak (or average) detector, the measurement data from a spectrum analyzer peak detector will represent the worst-case results, if the peak measured value complies with the quasi-peak limit, it is unnecessary to perform an quasi-peak measurement.



The measurement results are obtained as below:

Test Mode1:ADAPTER + EUT(Face recognition mode+ NFC Card mode)

Test Mode2:ADAPTER + EUT(NFC Card mode)

Test Mode3: EUT(Face recognition mode+ NFC Card mode)

Test Mode4: EUT(NFC Card mode)

Test Voltage:AC 120V/60Hz

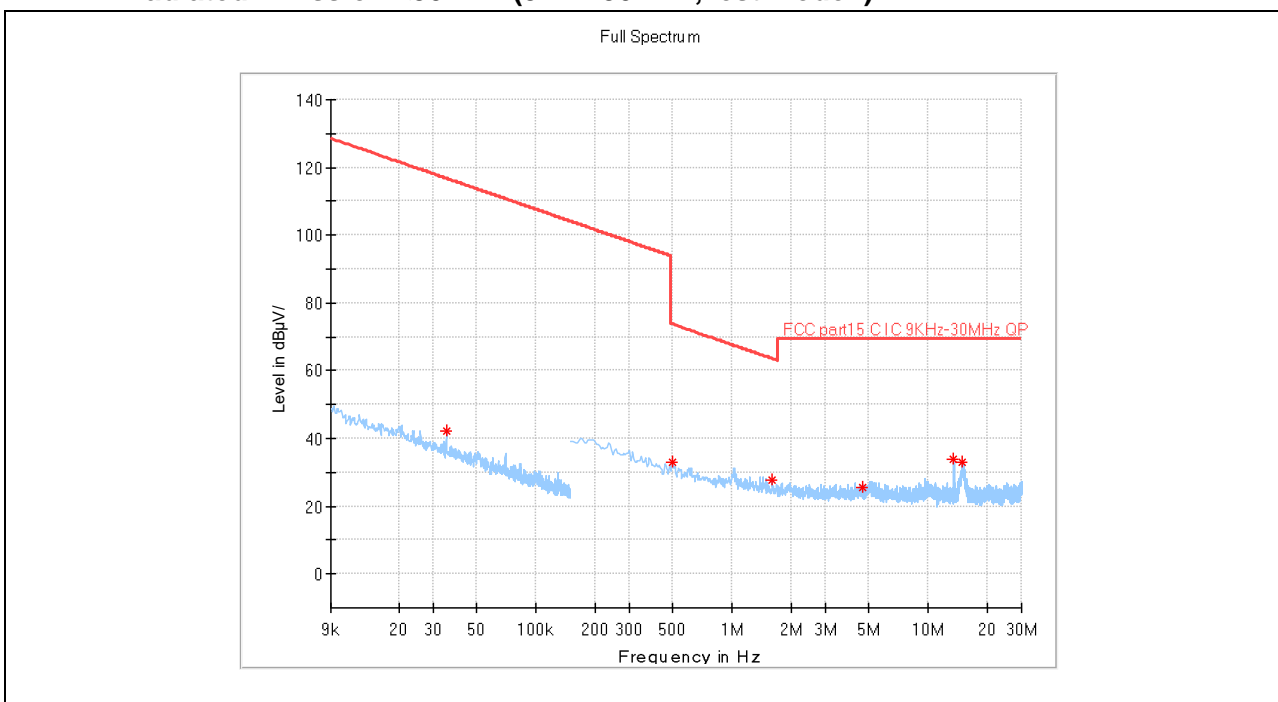
The measurement results are obtained as below:

$E [dB \mu V] = UR + LCable\ loss [dB] + Corr.$

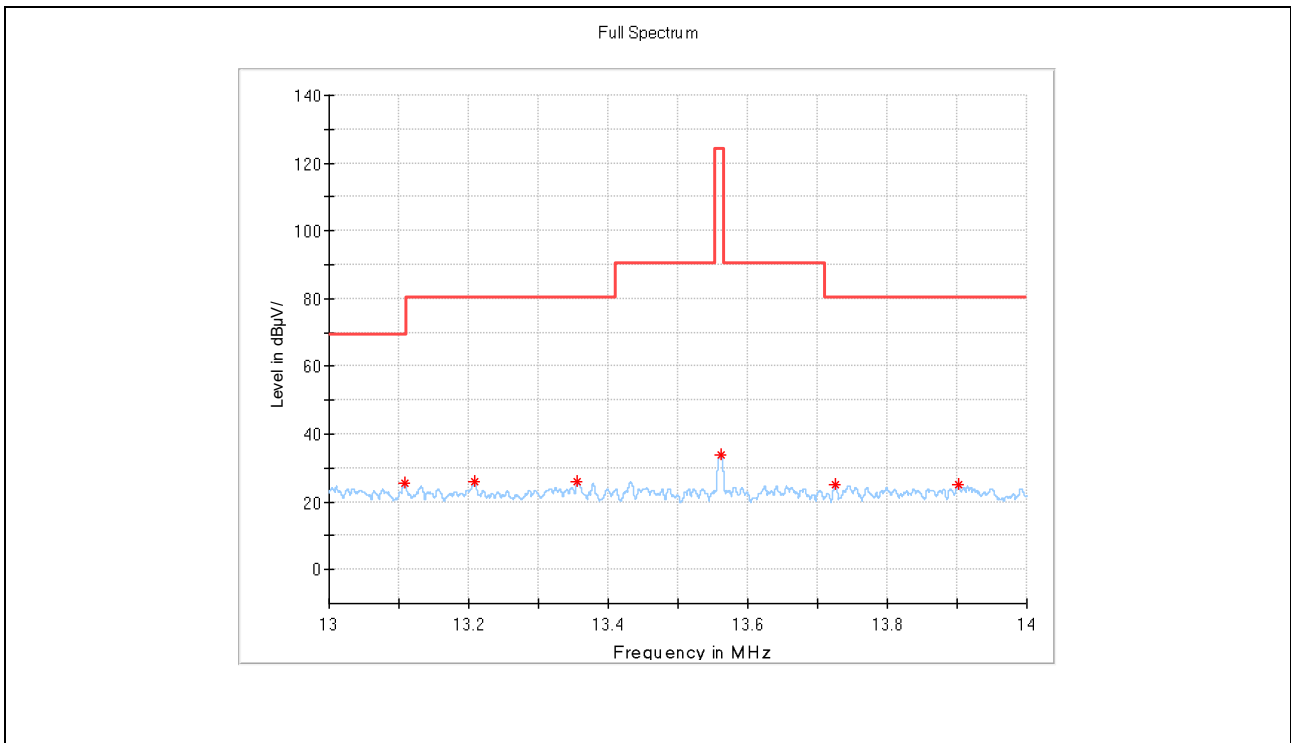
UR: Receiver Reading

Corr.: Voltage division factor of LISN

**A. Radiated Emission <30MHz (9kHz-30MHz,Test mode1)**

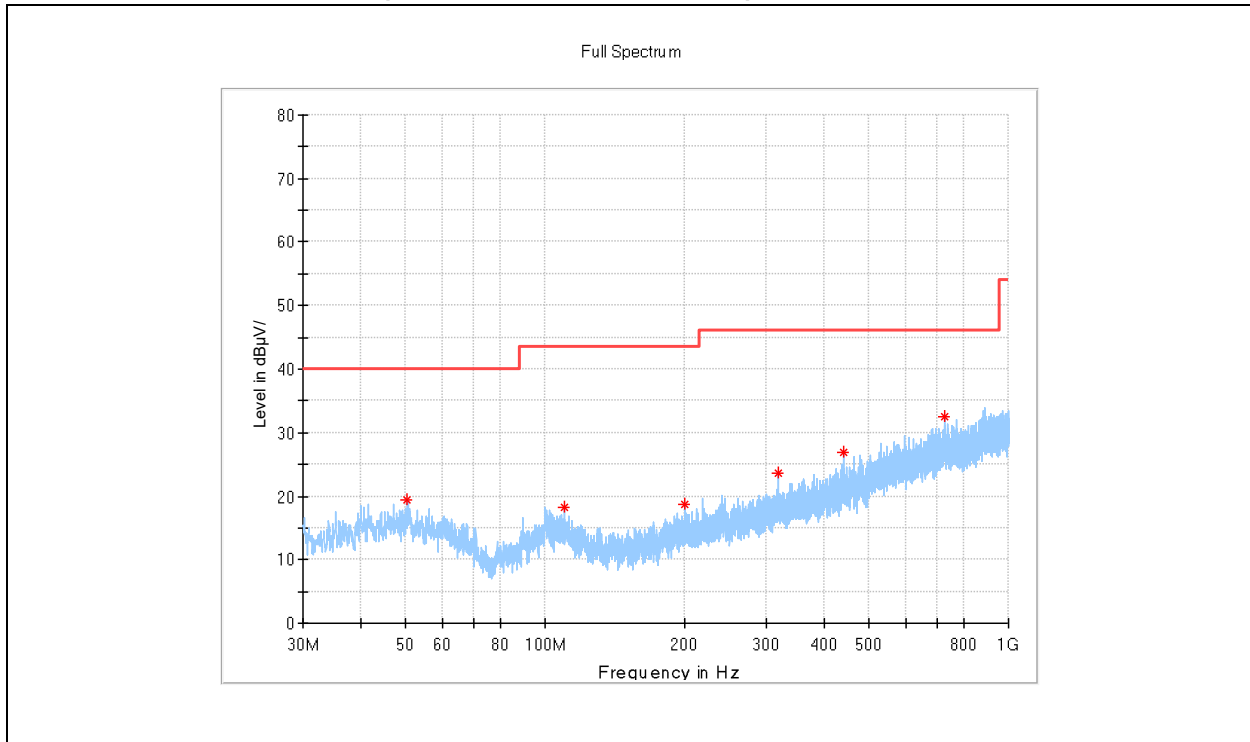


Frequency (MHz)	MaxPeak (dBµV/m)	Quasi Peak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Corr. (dB/m)	Verdict
0.034909	42.36	---	116.73	74.37	V	20.4	PASS
0.501177	32.89	---	73.61	40.72	V	21.7	PASS
1.602993	27.85	---	63.53	35.69	V	20.4	PASS
4.667007	25.68	---	69.53	43.85	V	20.6	PASS
13.560552	34.00	---	69.51	35.51	V	20.8	PASS
15.057441	32.85	---	69.51	36.66	V	28.3	PASS



Frequency (MHz)	MaxPeak (dBµV/m)	Quasi Peak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Corr. (dB/m)	Verdict
13.108088	25.64	---	69.50	43.86	V	20.8	PASS
13.208235	25.75	---	80.50	54.75	V	20.8	PASS
13.356324	25.83	---	80.50	54.67	V	20.8	PASS
13.561177	34.04	---	124.00	89.96	V	20.8	PASS
13.725294	25.04	---	80.50	55.46	V	20.8	PASS
13.902353	24.99	---	80.50	55.51	V	20.8	PASS

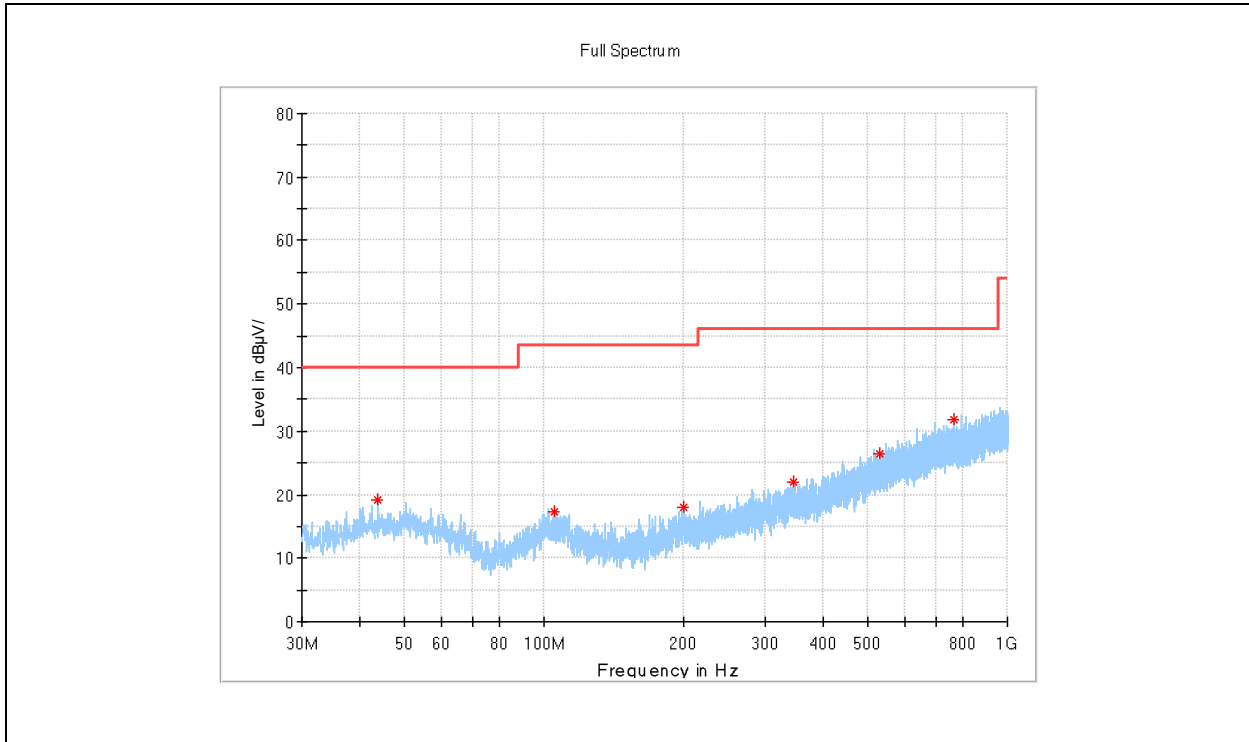
**Radiated Emission >30MHz (30MHz-1GHz, Test mode1)**



(30MHz – 1GHz, Test Antenna Horizontal)

Frequency (MHz)	MaxPeak (dBµV/m)	Quasi Peak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Corr. (dB/m)	Verdict
50.450833	19.51	---	40.00	20.49	H	16.1	PASS
109.944167	18.28	---	43.50	25.22	H	14.9	PASS
200.477500	18.76	---	43.50	24.74	H	14.3	PASS
318.898333	23.59	---	46.00	22.41	H	17.8	PASS
440.310000	26.90	---	46.00	19.10	H	20.6	PASS
728.885000	32.53	---	46.00	13.47	H	25.3	PASS

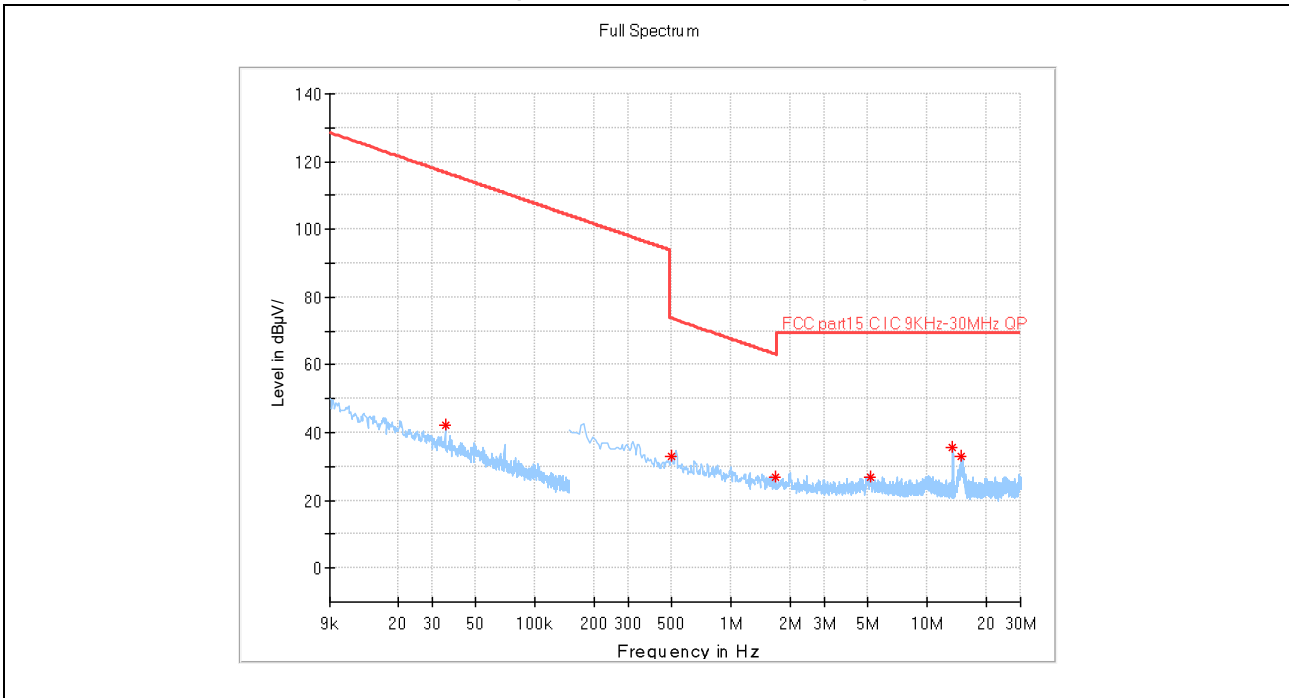




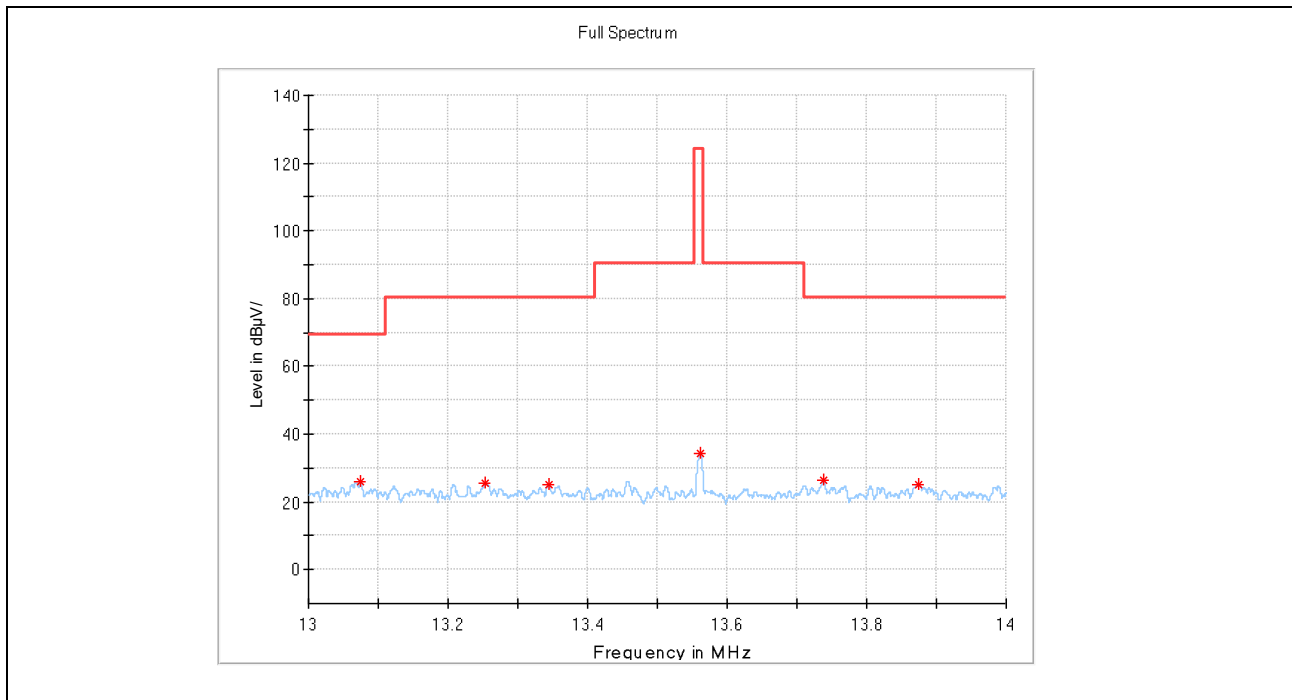
(30MHz – 1GHz, Test Antenna Vertical)

Frequency (MHz)	MaxPeak (dBµV/m)	Quasi Peak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Corr. (dB/m)	Verdict
43.822500	19.09	---	40.00	20.91	V	15.3	PASS
105.619583	17.40	---	43.50	26.10	V	14.2	PASS
200.679583	18.12	---	43.50	25.38	V	14.2	PASS
345.694583	22.06	---	46.00	23.94	V	18.1	PASS
529.428750	26.39	---	46.00	19.61	V	22.2	PASS
769.301667	31.80	---	46.00	14.20	V	26.2	PASS

**B. Radiated Emission <30MHz (9kHz-30MHz,Test mode2)**

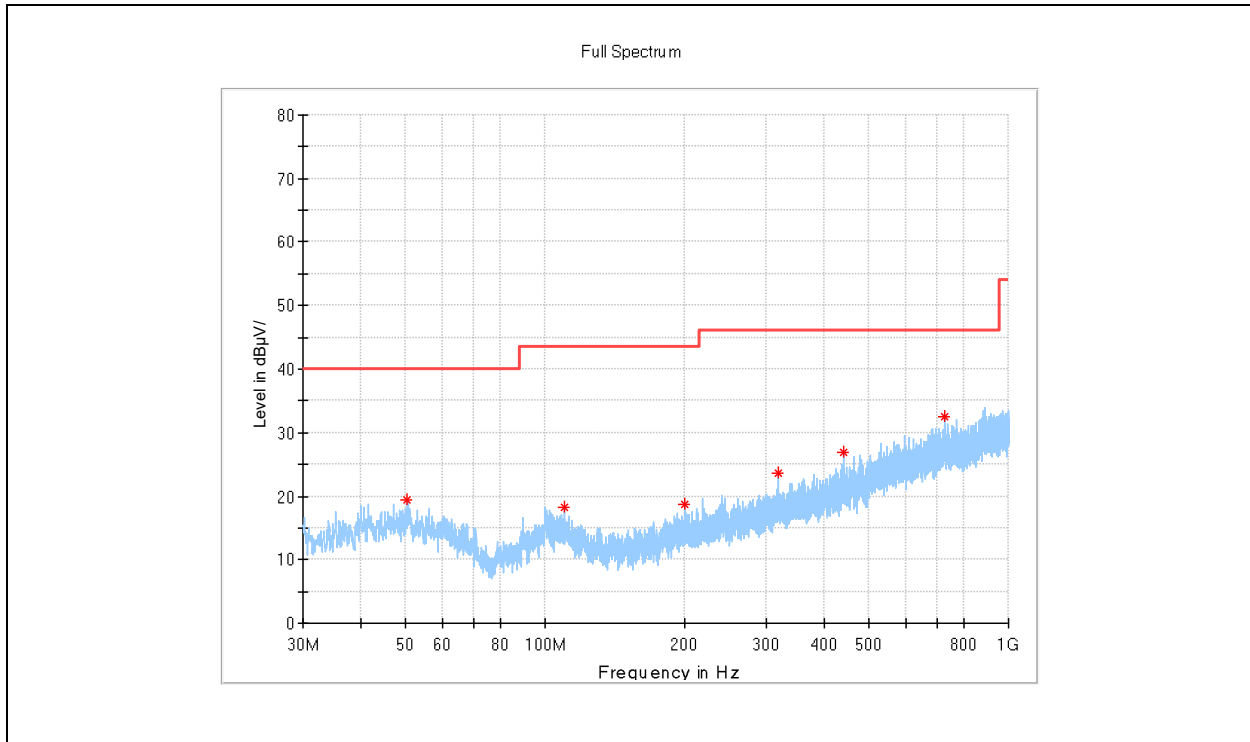


Frequency (MHz)	MaxPeak (dBµV/m)	Quasi Peak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Corr. (dB/m)	Verdict
0.034909	42.07	---	116.73	74.67	V	20.4	PASS
0.501177	32.85	---	73.61	40.76	V	21.7	PASS
1.682007	27.01	---	63.12	36.11	V	20.4	PASS
5.149875	27.04	---	69.53	42.49	V	21.8	PASS
13.560552	35.51	---	69.51	34.00	V	20.8	PASS
14.991596	32.95	---	69.51	36.56	V	28.6	PASS



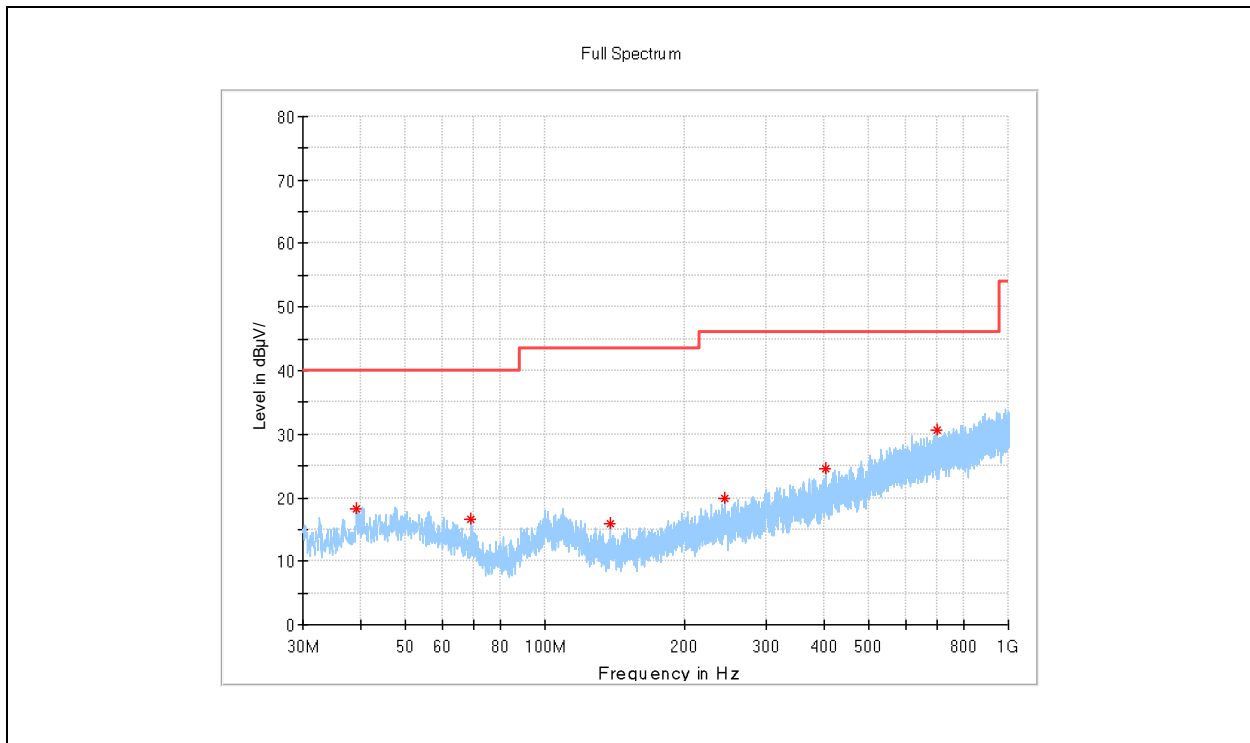
Frequency (MHz)	MaxPeak (dBµV/m)	Quasi Peak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Corr. (dB/m)	Verdict
13.074265	25.76	---	69.50	43.74	V	20.8	PASS
13.253677	25.36	---	80.50	55.14	V	20.8	PASS
13.343824	24.91	---	80.50	55.59	V	20.8	PASS
13.560735	34.50	---	124.00	89.50	V	20.8	PASS
13.737794	26.20	---	80.50	54.30	V	20.8	PASS
13.873677	25.22	---	80.50	55.28	V	20.8	PASS

**Radiated Emission >30MHz (30MHz-1GHz, Test mode2)**



(30MHz – 1GHz, Test Antenna Horizontal)

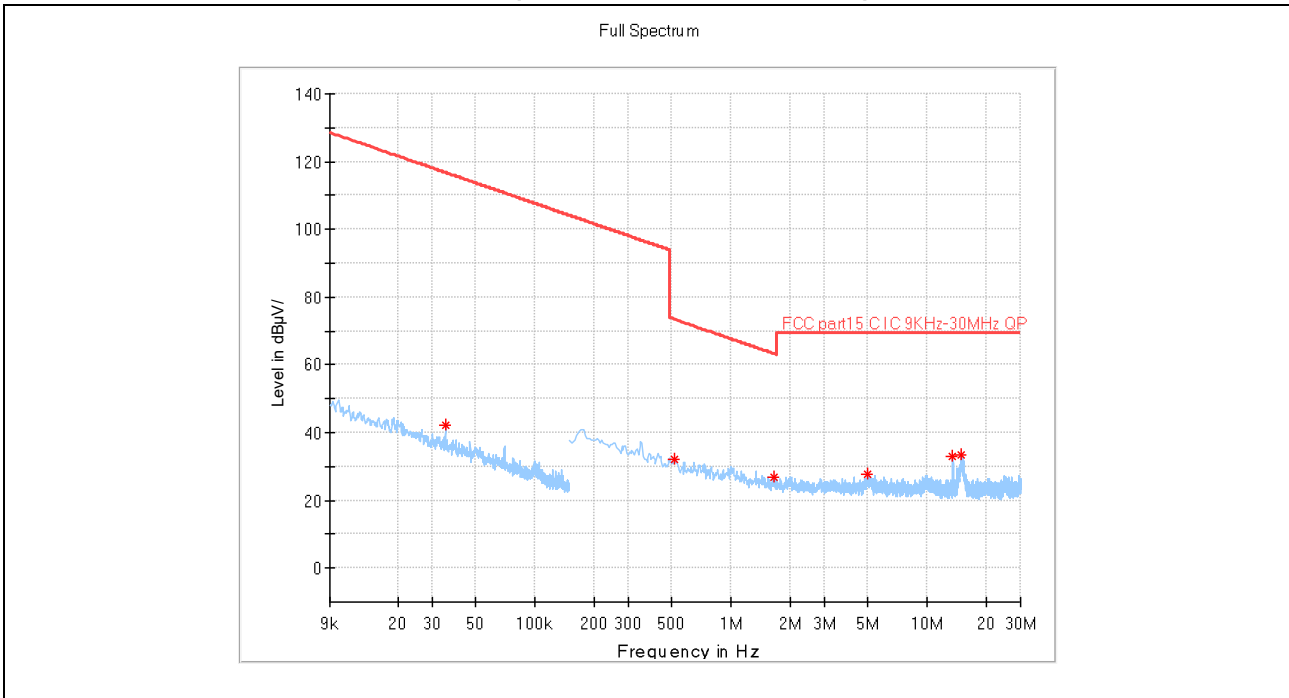
Frequency (MHz)	MaxPeak (dBµV/m)	Quasi Peak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Corr. (dB/m)	Verdict
50.410417	18.40	---	40.00	21.60	H	16.1	PASS
100.082500	17.89	---	43.50	25.61	H	15.2	PASS
196.920833	17.08	---	43.50	26.42	H	13.7	PASS
333.367500	22.38	---	46.00	23.62	H	17.2	PASS
499.399167	26.58	---	46.00	19.42	H	21.9	PASS
825.076667	31.64	---	46.00	14.36	H	26.4	PASS



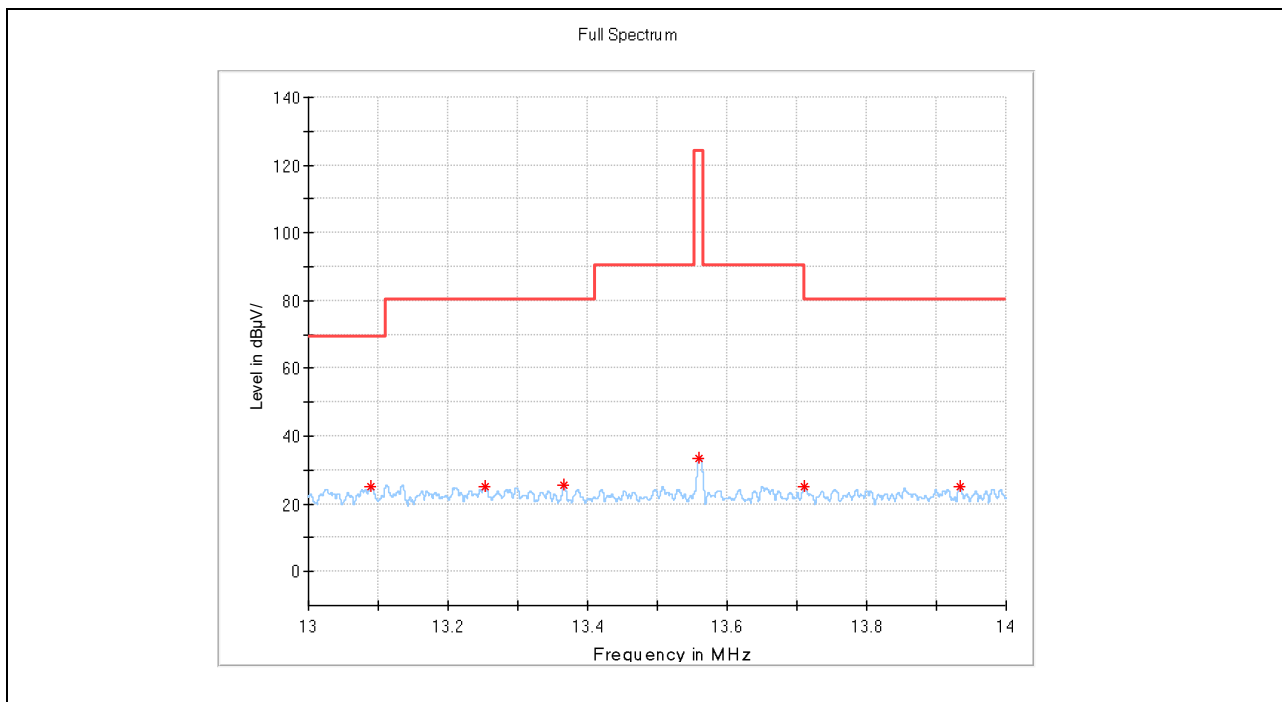
(30MHz – 1GHz, Test Antenna Vertical)

Frequency (MHz)	MaxPeak (dBµV/m)	Quasi Peak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Corr. (dB/m)	Verdict
39.093750	18.24	---	40.00	21.76	V	14.3	PASS
69.325417	16.50	---	40.00	23.50	V	12.2	PASS
138.599583	15.92	---	43.50	27.58	V	11.7	PASS
244.087083	19.95	---	46.00	26.05	V	14.9	PASS
404.339167	24.49	---	46.00	21.51	V	19.3	PASS
702.169583	30.71	---	46.00	15.29	V	24.9	PASS

**C. Radiated Emission <30MHz (9kHz-30MHz,Test mode3)**

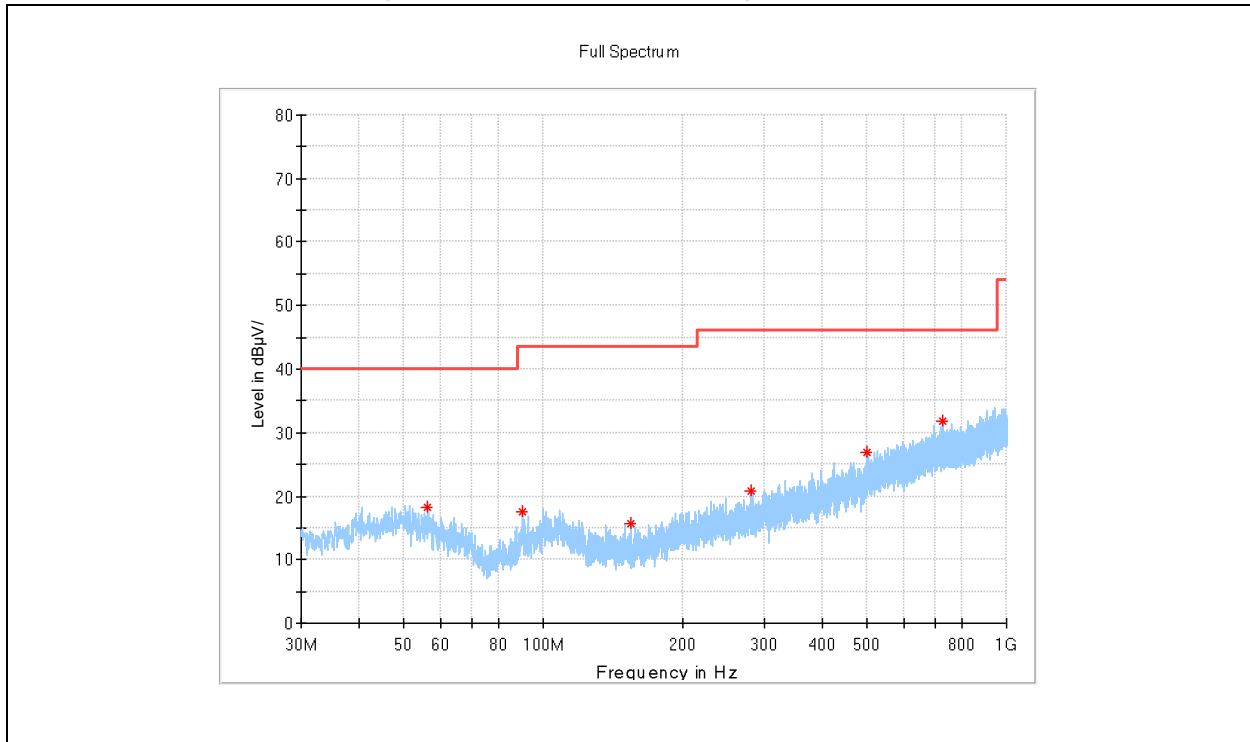


Frequency (MHz)	MaxPeak (dBµV/m)	Quasi Peak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Corr. (dB/m)	Verdict
0.034909	42.30	---	116.73	74.43	V	20.4	PASS
0.518735	31.90	---	73.31	41.40	V	21.2	PASS
1.651280	26.82	---	63.28	36.46	V	20.4	PASS
4.987456	27.67	---	69.53	41.85	V	22.2	PASS
13.560552	33.08	---	69.51	36.43	V	20.8	PASS
14.965257	33.48	---	69.51	36.03	V	28.4	PASS



Frequency (MHz)	MaxPeak (dBµV/m)	Quasi Peak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Corr. (dB/m)	Verdict
13.090294	24.93	---	69.50	44.57	V	20.8	PASS
13.253088	24.98	---	80.50	55.52	V	20.8	PASS
13.366324	25.57	---	80.50	54.93	V	20.8	PASS
13.559559	33.51	---	124.00	90.49	V	20.8	PASS
13.710735	25.03	---	80.50	55.47	V	20.8	PASS
13.933677	25.28	---	80.50	55.22	V	20.8	PASS

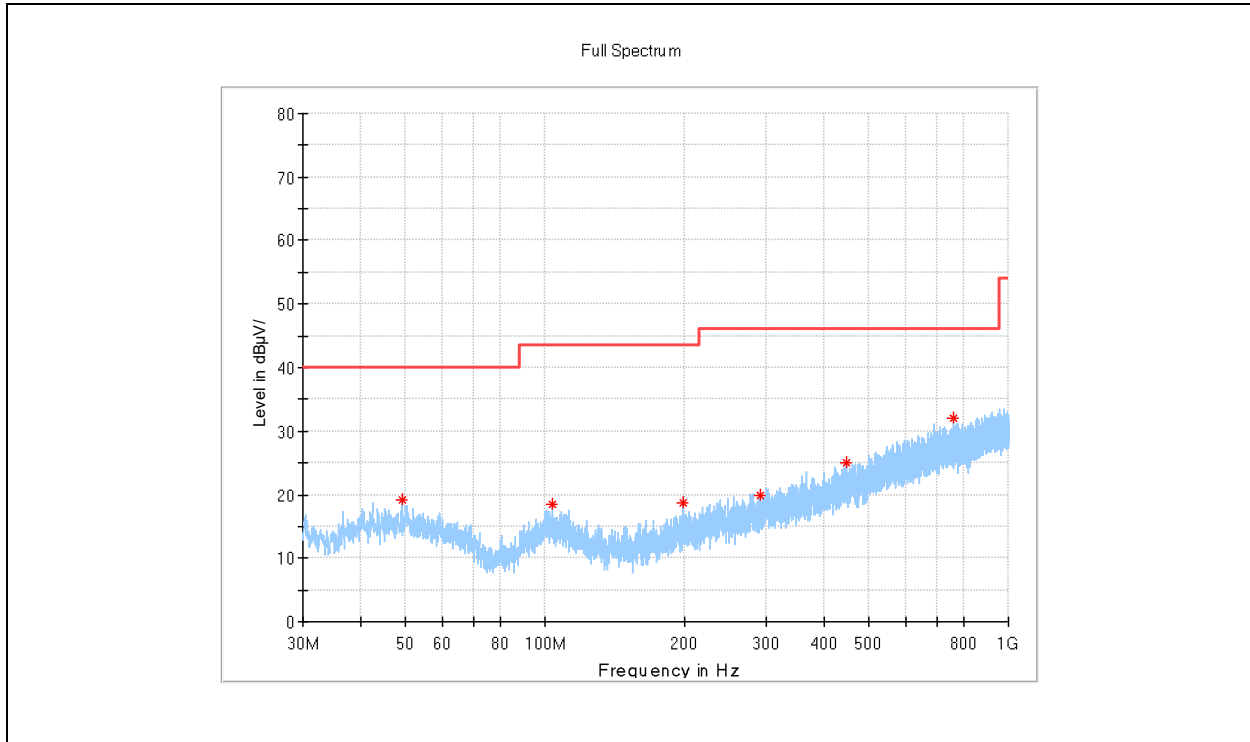
**Radiated Emission >30MHz (30MHz-1GHz, Test mode3)**



(30MHz – 1GHz, Test Antenna Horizontal)

Frequency (MHz)	MaxPeak (dBµV/m)	Quasi Peak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Corr. (dB/m)	Verdict
56.392083	18.15	---	40.00	21.85	H	14.7	PASS
90.220833	17.59	---	43.50	25.91	H	13.3	PASS
154.160000	15.65	---	43.50	27.85	H	10.8	PASS
281.917083	20.92	---	46.00	25.08	H	16.4	PASS
500.369167	26.98	---	46.00	19.02	H	22.0	PASS
728.440417	31.71	---	46.00	14.29	H	25.3	PASS

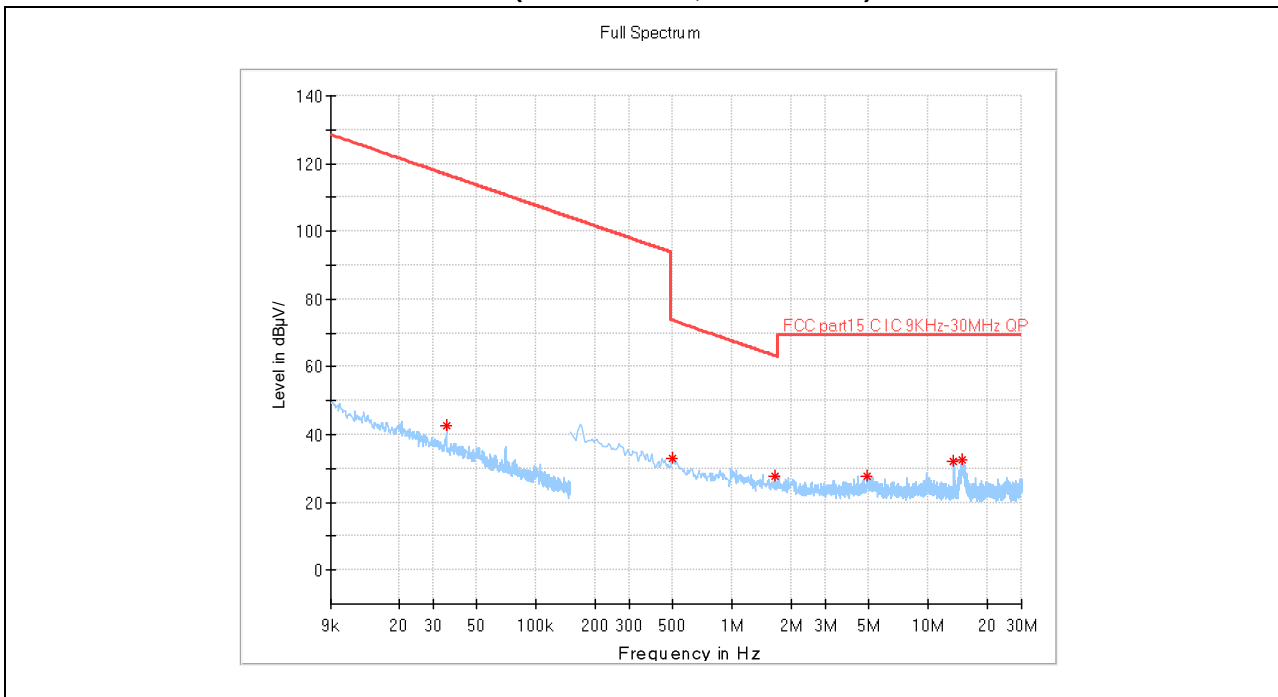




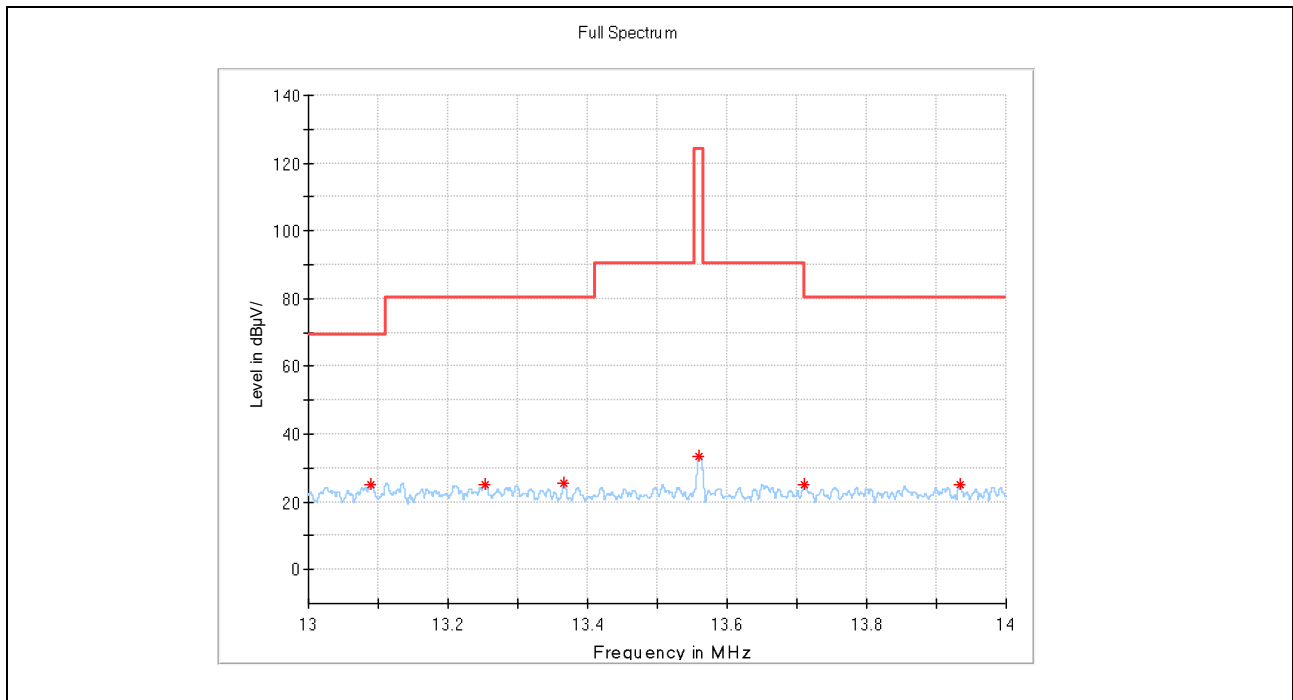
(30MHz – 1GHz, Test Antenna Vertical)

Frequency (MHz)	MaxPeak (dBµV/m)	Quasi Peak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Corr. (dB/m)	Verdict
49.036250	19.29	---	49.036250	19.29	V	15.6	PASS
103.922083	18.58	---	103.922083	18.58	V	14.3	PASS
198.335417	18.66	---	198.335417	18.66	V	14.0	PASS
290.566250	19.89	---	290.566250	19.89	V	15.8	PASS
446.332083	24.96	---	446.332083	24.96	V	19.7	PASS
759.561250	32.03	---	759.561250	32.03	V	26.2	PASS

**D. Radiated Emission <30MHz (9kHz-30MHz,Test mode4)**

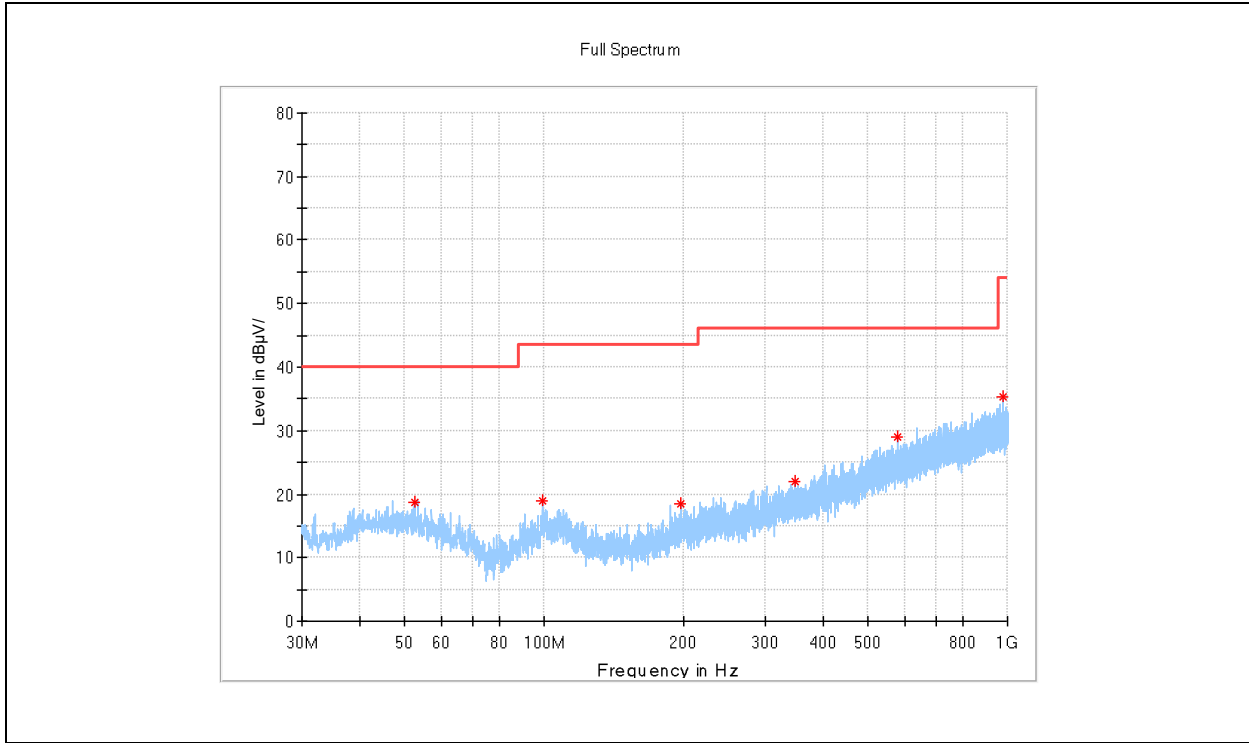


Frequency (MHz)	MaxPeak (dBµV/m)	Quasi Peak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Corr. (dB/m)	Verdict
0.034909	42.77	---	116.73	73.97	V	20.4	PASS
0.496787	33.10	---	73.68	40.58	V	21.5	PASS
1.655669	27.71	---	63.25	35.55	V	20.4	PASS
4.908441	27.87	---	69.53	41.66	V	21.5	PASS
13.560552	32.20	---	69.51	37.31	V	20.8	PASS
15.000375	32.56	---	69.51	36.95	V	28.7	PASS



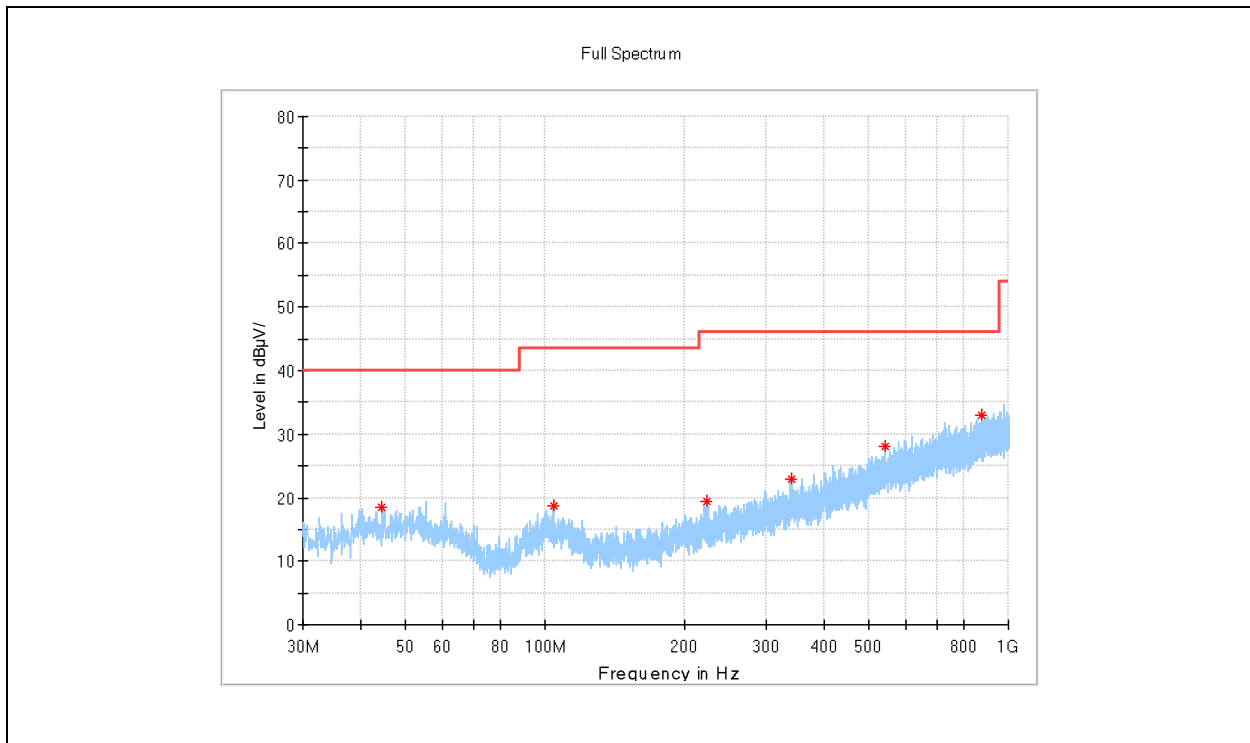
Frequency (MHz)	MaxPeak (dBµV/m)	Quasi Peak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Corr. (dB/m)	Verdict
13.090294	24.93	---	69.50	44.57	V	20.8	PASS
13.253088	24.98	---	80.50	55.52	V	20.8	PASS
13.366324	25.57	---	80.50	54.93	V	20.8	PASS
13.559559	33.51	---	124.00	90.49	V	20.8	PASS
13.710735	25.03	---	80.50	55.47	V	20.8	PASS
13.933677	25.28	---	80.50	55.22	V	20.8	PASS

**Radiated Emission >30MHz (30MHz-1GHz, Test mode4)**



(30MHz – 1GHz, Test Antenna Horizontal)

Frequency (MHz)	MaxPeak (dBµV/m)	Quasi Peak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Corr. (dB/m)	Verdict
52.390833	18.71	---	40.00	21.29	H	15.4	PASS
99.112500	18.89	---	43.50	24.61	H	14.5	PASS
197.284583	18.54	---	43.50	24.96	H	13.8	PASS
347.230417	22.05	---	46.00	23.95	H	18.0	PASS
579.181667	28.96	---	46.00	17.04	H	23.1	PASS
974.820417	35.41	---	54.00	18.59	H	28.6	PASS



(30MHz – 1GHz, Test Antenna Vertical)

Frequency (MHz)	MaxPeak (dBµV/m)	Quasi Peak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Corr. (dB/m)	Verdict
44.509583	18.56	---	40.00	21.44	V	15.4	PASS
104.083750	18.62	---	43.50	24.88	V	14.3	PASS
223.070417	19.50	---	46.00	26.50	V	14.3	PASS
340.319167	22.93	---	46.00	23.07	V	18.2	PASS
542.321667	28.12	---	46.00	17.88	V	22.4	PASS
878.143750	33.07	---	46.00	12.93	V	27.6	PASS



## 2.4. Frequency Tolerance

### 2.4.1. Test Requirement

According to FCC section 15.225, the devices operating in the 13.553~13.567 MHz shall maintain the carrier frequency within 0.01% of the operating frequency over the temperature variation of -20°C to +50°C using an environmental chamber. The primary supply voltage is varied from 85% to 115% of the voltage normally at the input to the device or at the power supply terminals if cables are not normally supplied.

### 2.4.2. Test Setup



The EUT, which is powered by the DC Power Supply directly, is located in the Temperature Chamber. The EUT was measured by transmitter mode continuously.



**2.4.3. Test Result**

Operating Frequency: 13,560,000 Hz

Deference Voltage: 6.0V

Deviant Limit:  $\pm 0.01\%$

**Test result:**

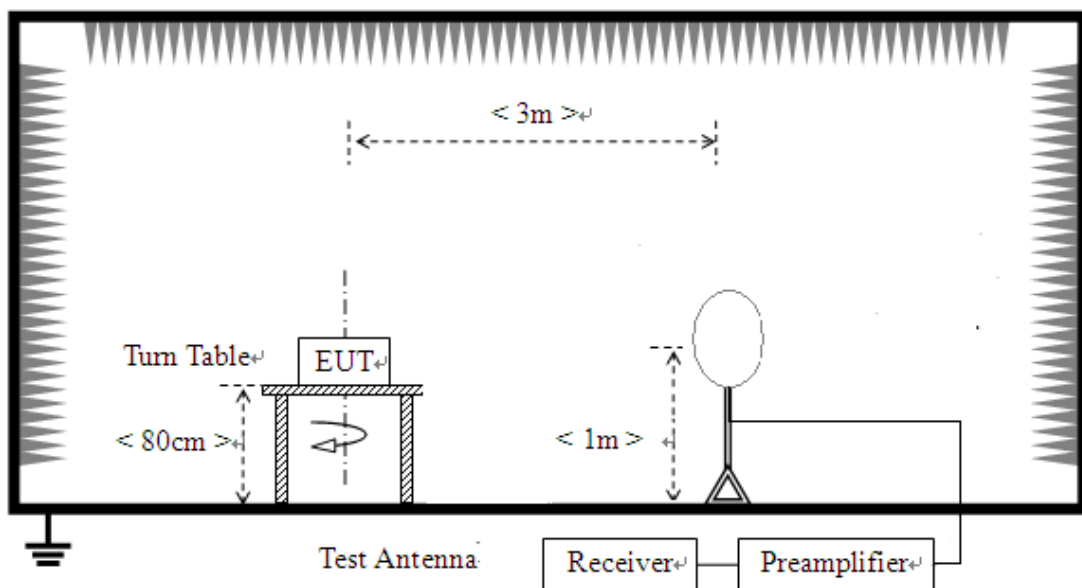
VOLTAGE (%)	Test Conditions		Fre. Dev. (Hz)	Deviation (%)	Verdict
	Power (VDC)	Temperature (°C)			
100	6	-20	237	0.00175	PASS
100		-10	246	0.00181	
100		0	281	0.00207	
100		10	302	0.00223	
100		20	284	0.00209	
100		25	310	0.00229	
100		30	277	0.00204	
100		40	290	0.00214	
100		50	303	0.00223	
85		5.1	20	288	
115	6.9	20	272	0.00201	

## 2.5.20dB Bandwidth

### 2.5.1. Standard Applicable

According to FCC section 15.215(c), the 20dB bandwidth should be contained within the frequency band designated in the rule section under which the EUT is operated, it was measured with a spectrum analyzer connected the EUT while the EUT is operating in transmission mode.

### 2.5.2. Test Setup

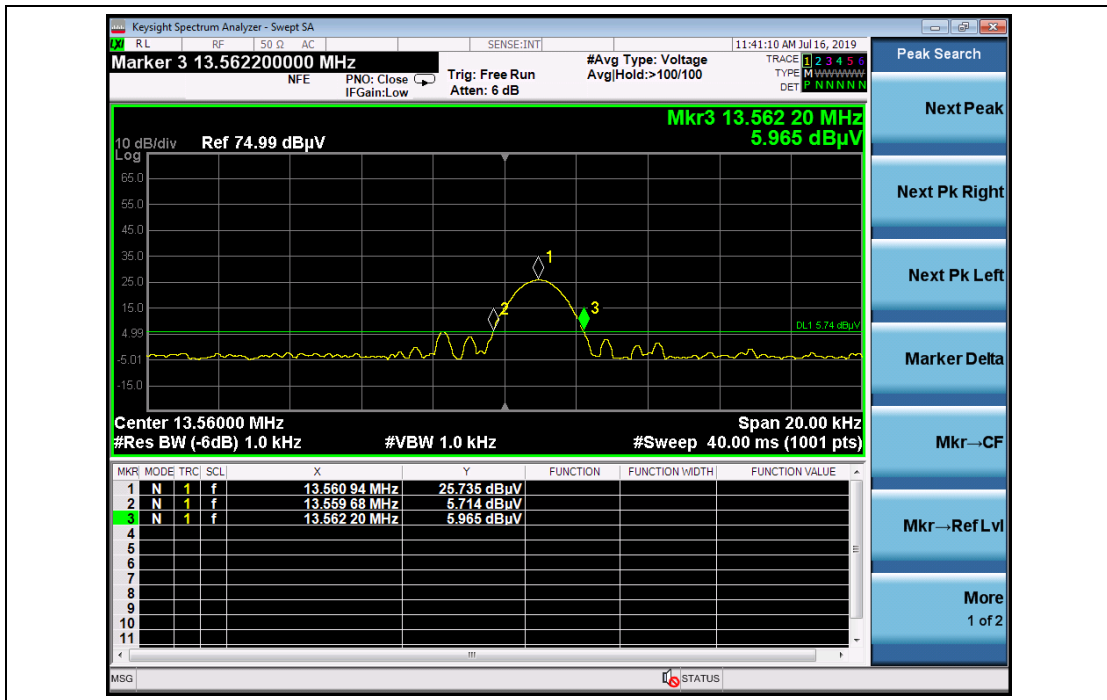






2.5.3. Test Result

Centre Frequency	Measurement		Limit		Verdict
	20dB Bandwidth (kHz)	Frequency Range (MHz)	20dB Bandwidth (kHz)	Frequency Range(MHz)	
13.56MHz	2.52	13.559 to 13.561	14	13.553 to 13.567	PASS





## Annex A Test Uncertainty

The uncertainty is calculated using the methods suggested in the "Guide to the Expression of Uncertainty in Measurement" (GUM) published by ISO.

### Uncertainty of Conducted Emission Measurement

Measuring Uncertainty for a Level of Confidence of 95%(U=2Uc(y))	9kHz-150kHz	±3.10 dB
	150kHz-30MHz	±2.61dB

### Uncertainty of Radiated Emission Measurement

Measuring Uncertainty for a Level of Confidence of 95%(U=2Uc(y))	30MHz-200MHz	±3.87dB
	200MHz-1000MHz	±4.07dB



## Annex B Testing Laboratory Information

### 1. Identification of the Responsible Testing Laboratory

<b>Department:</b>	Kehu-Morlab Test Laboratory
<b>Address:</b>	Unit 101, No.1732 Gangzhong Road, Xiamen Area, Pilot Free Trade Zone (Fujian) China
<b>Responsible Test Lab Manager:</b>	Mr. Di Dehai
<b>Telephone:</b>	+86 592 5612050
<b>Facsimile:</b>	+86 592 5612095

### 2. Identification of the Responsible Testing Location

<b>Name:</b>	Kehu-Morlab Test Laboratory
<b>Address:</b>	Unit 101, No.1732 Gangzhong Road, Xiamen Area, Pilot Free Trade Zone (Fujian) China

### 3. Accreditation Certificate

<b>Accredited Testing Laboratory:</b>	The FCC designation number is CN1249. ( Kehu-Morlab Test Laboratory )
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### 4. Test Equipment Utilized

#### Conducted Emission Test Equipments

No	Equipment Name	Serial No.	Model No.	Manufacturer	Cal.Date	Cal.Due Date
1	EMI Receiver	102174	ESR3	ESR3	2019.01.08	2020.01.07
2	LISN	101338	ENV432	ENV432	2019.01.14	2020.01.13
3	Pulse Limiter (10dB)	317	VTSD 9561 F	VTSD 9561 F	2019.01.03	2020.01.02
4	Coaxial cable(BNC) (30MHz-3GHz)	EMC01	N/A	Morlab	N/A	N/A

#### Radiated Test Equipments

No.	Equipment Name	Serial No.	Model No.	Manufacturer	Cal. Date	Cal.Due Date
1	Anechoic Chamber	N/A	9m*6m*6m	ETS-Lindgren	2017.07.21	2020.07.20
2	Receiver	R&S	ESR7	101799	2019.01.07	2020.01.06



3	Active Ring Antenna	FMZB 1513 #269	FMZB 1513	Schwarzbeck	2019.01.12	2020.01.11
4	Linear Log Periodic Broad Band Antenna	949	VULB 9163	Schwarzbeck	2018.09.25	2019.09.24
5	Coaxial cable (N male) (9kHz -3GHz)	EMC02	N/A	Morlab	N/A	N/A

**List of Software Used**

No.	Model	Version Number	Producer	Test Item
1	EMC 32	V10.00.00	R&S	RE
2	EMC 32	V10.20.01	R&S	CE

————— END OF REPORT —————