

## FCC Test Report

**Report No.:** RFBEOA-WTW-P21030189

**FCC ID:** BYG-PHC18

**Test Model:** PHC 18

**Received Date:** Mar. 5, 2021

**Test Date:** Jun. 24 to 25, 2021

**Issued Date:** Sep. 8, 2021

**Applicant:** Sangean Electronics Inc.

**Address:** No. 18, Lane 7, Li-De Street, Chung Ho District, New Taipei City, 235, Taiwan

**Issued By:** Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch  
Lin Kou Laboratories

**Lab Address:** No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan

**FCC Registration /**  
**Designation Number:** 198487 / TW2021



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## Table of Contents

<b>Release Control Record</b> .....	<b>3</b>
<b>1      Certificate of Conformity</b> .....	<b>4</b>
<b>2      Summary of Test Results</b> .....	<b>5</b>
2.1    Measurement Uncertainty.....	5
2.2    Modification Record .....	5
<b>3      General Information</b> .....	<b>6</b>
3.1    General Description of EUT .....	6
3.2    Description of Test Modes.....	6
3.2.1 Test Mode Applicability and Tested Channel Detail.....	7
3.3    Description of Support Units .....	8
3.3.1 Configuration of System under Test .....	8
3.4    General Description of Applied Standards .....	9
<b>4      Test Types and Results</b> .....	<b>10</b>
4.1    Radiated Emission and Bandedge Measurement.....	10
4.1.1 Limits of Radiated Emission and Bandedge Measurement .....	10
4.1.2 Test Instruments .....	11
4.1.3 Test Procedures.....	12
4.1.4 Deviation from Test Standard .....	12
4.1.5 Test Set Up .....	13
4.1.6 EUT Operating Conditions.....	13
4.1.7 Test Results .....	14
<b>5      Pictures of Test Arrangements</b> .....	<b>30</b>
<b>Appendix – Information of the Testing Laboratories</b> .....	<b>31</b>

### Release Control Record

Issue No.	Description	Date Issued
RFBEOA-WTW-P21030189	Original release.	Sep. 8, 2021

## 1 Certificate of Conformity

**Product:** Phone Charger

**Brand:** FESTOOL

**Test Model:** PHC 18

**Sample Status:** Engineering sample

**Applicant:** Sangean Electronics Inc.

**Test Date:** Jun. 24 to 25, 2021

**Standards:** 47 CFR FCC Part 15, Subpart C (Section 15.209)

ANSI C63.10:2013

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions specified in this report.

**Prepared by :** Annie Chang, **Date:** Sep. 8, 2021

Annie Chang / Senior Specialist

**Approved by :** Rex Lai, **Date:** Sep. 8, 2021

Rex Lai / Associate Technical Manager

## 2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (Section 15.209)			
FCC Clause	Test Item	Result	Remarks
15.207	AC Power Conducted Emission	N/A	Power supply is 18Vdc from Battery
15.209	Radiated Emission Test	Pass	Meet the requirement of limit. Minimum passing margin is -8.77dB at 33.88MHz

Note:

1. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
2. N/A: Not Applicable

### 2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	2.38 dB
	30MHz ~ 1000MHz	5.70 dB

### 2.2 Modification Record

There were no modifications required for compliance.

### 3 General Information

#### 3.1 General Description of EUT

Product	Phone Charger
Brand	FESTOOL
Test Model	PHC 18
Sample Status	Engineering sample
Power Supply Rating	I/P rating: 18Vdc from battery O/P rating: 9W
Modulation Type	ASK
Operating Frequency	111-140kHz
Antenna Type	Coil antenna
Field Strength	4.32dBuV/m (@300m) (AV)
Dimensions	96.75cm <sup>2</sup> (Length = 125mm, Width = 77.4mm)
Accessory Device	N/A
Data Cable Supplied	N/A
Maximum Power Output from the Charging Coil	9W

Note:

1. The EUT is a Phone Charger with Qi charging function.
2. The EUT consumes power from the following battery. (For support unit only)

Battery	
Battery 1	FESTOOL, BP 18 Li 6,2 ASI (18Vdc, 6.2Ah, with Bluetooth function)
Battery 2	FESTOOL, BP 18 Li 5,2 ASI (18Vdc, 5.2Ah, with Bluetooth function)
Battery 3	FESTOOL, BP 18 Li 4,0 HPC-ASI (18Vdc, 4.0Ah, with Bluetooth function)
Battery 4	FESTOOL, BP 18 Li 3,1 CI (18Vdc, 3.1Ah, with Bluetooth function)
Battery 5	FESTOOL, BP BP 18 Li 6,2 AS (18Vdc, 6.2Ah)
Battery 6	FESTOOL, BP 18 Li 5,2 AS (18Vdc, 5.2Ah)
Battery 7	FESTOOL, BP 18 Li 4,0 HPC-AS (18Vdc, 4.0Ah)
Battery 8	FESTOOL, BP 18 Li 3,1 C (18Vdc, 3.1Ah)

The above batteries were pre-tested and **Battery 1** was the worst case for final test.

3. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

#### 3.2 Description of Test Modes

The following test frequency is provided to this EUT:

Test Frequency (kHz)	Test Mode
133	Charging Mode with max Load
137	Standby Mode

### 3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable To		Description
	RE<1G	PLC	
A	✓	Note 2	Charging Mode with max Load
B	✓	Note 2	Standby Mode

Where **RE<1G**: Radiated Emission below 1GHz

**PLC**: Power Line Conducted Emission

**NOTE:** 1. The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **X-plane**.  
 2. No need to concern of Conducted Emission due to the EUT is powered by battery.

#### Radiated Emission Test (Below 1GHz):

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Operating Frequency (kHz)	Tested Frequency (kHz)
A	111-140	133
B	111-140	137

#### Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested by
RE<1G	25 deg. C, 66% RH	18Vdc	Ian Chang

### 3.3 Description of Support Units

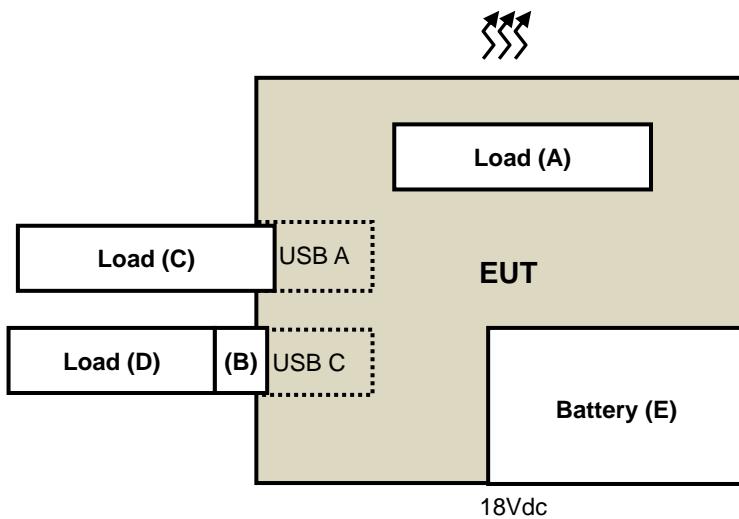
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Load	N/A	N/A	N/A	N/A	Supplied by client
B.	USB Type C to A adapter	i-gota	N/A	N/A	N/A	Provided by Lab
C.	Load	N/A	N/A	N/A	N/A	Provided by Lab
D.	Load	N/A	N/A	N/A	N/A	Provided by Lab
E.	Battery	FESTOOL	BP 18 Li 6,2 ASI	N/A	N/A	Supplied by client

#### 3.3.1 Configuration of System under Test

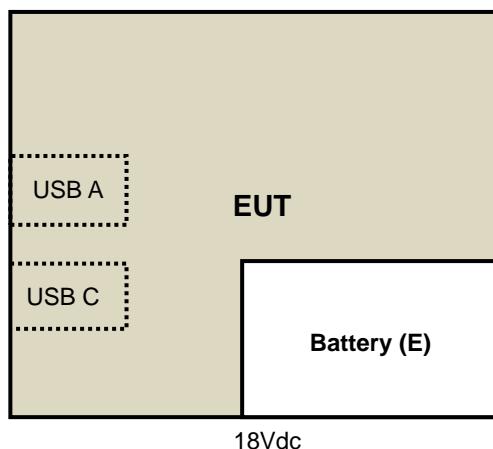
##### Charging Mode:

Test Mode A



##### Standby Mode:

Test Mode B



### 3.4 General Description of Applied Standards

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

#### 47 CFR FCC Part 15, Subpart C (Section 15.209)

ANSI C63.10-2013

All test items have been performed and recorded as per the above standards.

## 4 Test Types and Results

### 4.1 Radiated Emission and Bandedge Measurement

#### 4.1.1 Limits of Radiated Emission and Bandedge Measurement

##### For Frequency Below 30MHz

Frequency (MHz)	Field Strength (dBuV/m)		Measurement Distance (meters)
	uV/m	dBuV/m	
0.009 – 0.490	2400 / F (kHz)	48.52-13.80	300
0.490 – 1.705	24000 / F (kHz)	33.80-22.97	30
1.705 – 30.0	30	29.54	30

##### For Frequency Between 30-1000MHz

Frequency (MHz)	Field Strength (dBuV/m)		Measurement Distance (meters)
	uV/m	dBuV/m	
30-88	100	40.0	3
88-216	150	43.5	3
216-960	200	46.0	3
Above 960	500	54.0	3

#### 4.1.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
HP Preamplifier	8447D	2432A03504	Feb. 18, 2021	Feb. 17, 2022
MITEQ Preamplifier	AMF-6F-260400-33-8P	892164	Feb. 18, 2021	Feb. 17, 2022
Agilent TEST RECEIVER	N9038A	MY51210129	Mar. 12, 2021	Mar. 11, 2022
Schwarzbeck Antenna	VULB 9168	139	Nov. 6, 2020	Nov. 5, 2021
ADT. Turn Table	TT100	0306	NA	NA
ADT. Tower	AT100	0306	NA	NA
Software	Radiated_V7.6.15.9.5	NA	NA	NA
SUHNER RF cable With 4dB PAD	SF102	Cable-CH6-01	Jul. 9, 2020	Jul. 8, 2021
EMEC RF cable With 3/4dB PAD	EM102-KMKM	01	Aug. 21, 2020	Aug. 20, 2021
KEYSIGHT Spectrum Analyzer	N9030A	MY54490260	Jul. 22, 2020	Jul. 21, 2021
Loop Antenna EMC1	LPA600	270	Aug. 23, 2019	Aug. 22, 2021
ROHDE & SCHWARZ Spectrum Analyzer	FSV40	101042	Sep. 8, 2020	Sep. 7, 2021

**NOTE:** 1. The calibration interval of the above test instruments is 12/24 months. And the calibrations are traceable to NML/ROC and NIST/USA.  
 2. The test was performed in Chamber No. 6.

#### 4.1.3 Test Procedures

##### For Radiated emission below 30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and the rotatable 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, except for the frequency band (9kHz-90kHz, 110kHz-490kHz) set to average detect function and peak detect function.

Note:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 200Hz at frequency range 9kHz to 150kHz.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency range 150kHz to 30MHz.

##### For Radiated emission above 30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters (for below 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. 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.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable 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.

Note:

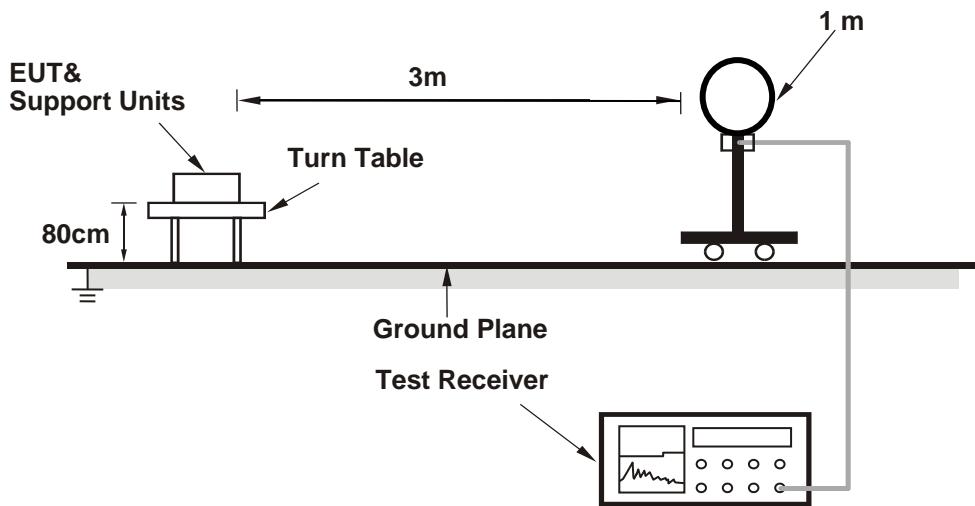
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. All modes of operation were investigated and the worst-case emissions are reported.

#### 4.1.4 Deviation from Test Standard

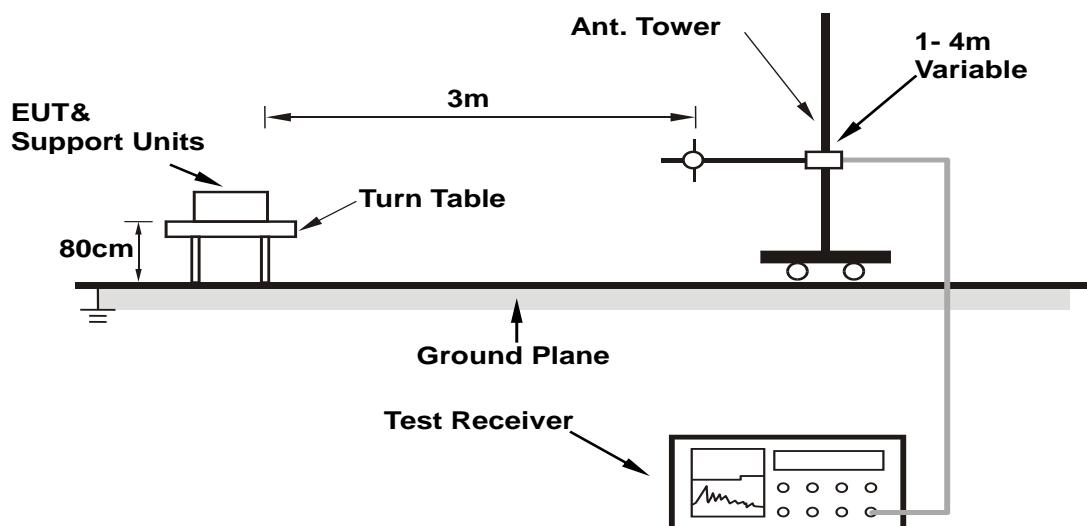
No deviation.

#### 4.1.5 Test Set Up

##### For Radiated emission below 30MHz



##### For Radiated emission 30MHz to 1GHz



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

#### 4.1.6 EUT Operating Conditions

Set the EUT under transmission condition continuously at specific channel frequency.

#### 4.1.7 Test Results

For 9kHz ~ 490kHz Data:

##### Charging Mode

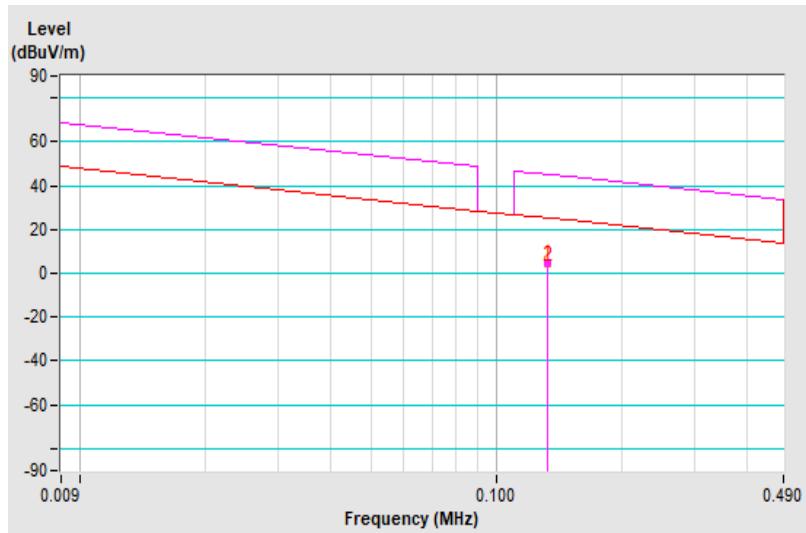
<b>Test Frequency</b>	133kHz	<b>Detector Function</b>	Peak (PK)
<b>Frequency Range</b>	9kHz ~ 490kHz		Average (AV)
<b>Test Mode</b>	A		

Antenna Polarity : Parallel								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*0.133	4.82 PK	45.12	-40.30	1.00	154	65.71	-60.89
2	*0.133	4.32 AV	25.12	-20.80	1.00	154	65.21	-60.89

##### Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + Distance Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " \* ": Fundamental frequency.
6. The test distance for below 0.49MHz is 3m, extrapolate the measured field strength to a distance of 300 meters.

Distance factor@3m =  $40 * \log(3/300) = -80\text{dB}$



<b>Test Frequency</b>	133kHz	<b>Detector Function</b>	Peak (PK)
<b>Frequency Range</b>	9kHz ~ 490kHz		Average (AV)
<b>Test Mode</b>	A		

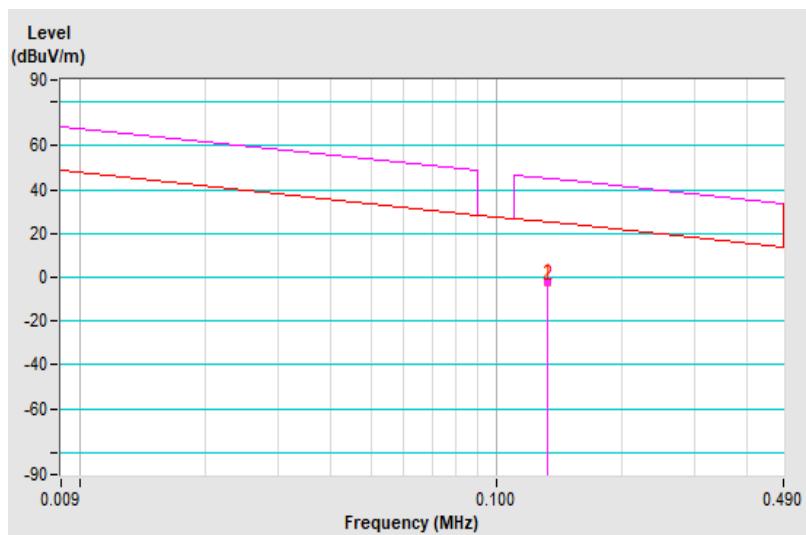
**Antenna Polarity : Perpendicular**

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*0.133	-2.03 PK	45.12	-47.15	1.00	66	58.86	-60.89
2	*0.133	-2.49 AV	25.12	-27.61	1.00	66	58.40	-60.89

**Remarks:**

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + Distance Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " \* ": Fundamental frequency.
6. The test distance for below 0.49MHz is 3m, extrapolate the measured field strength to a distance of 300 meters.

Distance factor@3m =  $40 \times \log(3/300) = -80$ dB



<b>Test Frequency</b>	133kHz	<b>Detector Function</b>	Peak (PK)
<b>Frequency Range</b>	9kHz ~ 490kHz		Average (AV)
<b>Test Mode</b>	A		

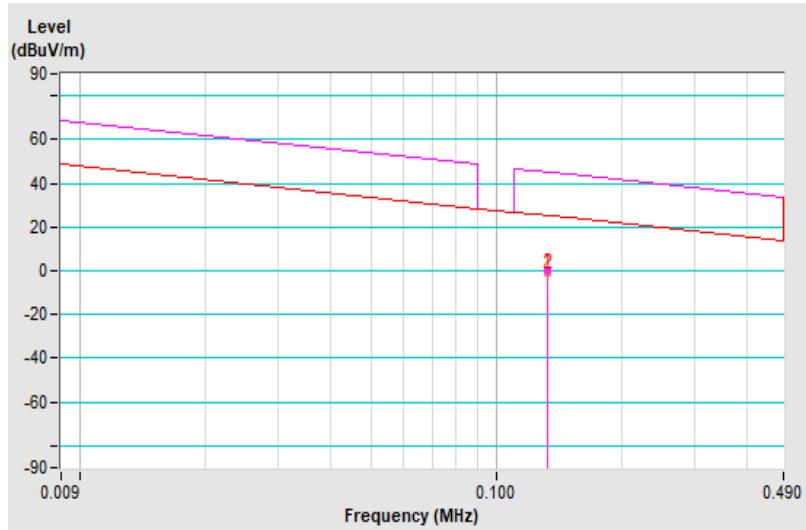
**Antenna Polarity : Ground-parallel**

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*0.133	-0.33 PK	45.12	-45.45	1.00	344	60.56	-60.89
2	*0.133	-0.75 AV	25.12	-25.87	1.00	344	60.14	-60.89

**Remarks:**

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + Distance Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " \* ": Fundamental frequency.
6. The test distance for below 0.49MHz is 3m, extrapolate the measured field strength to a distance of 300 meters.

Distance factor@3m =  $40 \times \log(3/300) = -80$ dB



**Standby Mode**

<b>Test Frequency</b>	137kHz	<b>Detector Function</b>	Peak (PK)
<b>Frequency Range</b>	9kHz ~ 490kHz		Average (AV)
<b>Test Mode</b>	B		

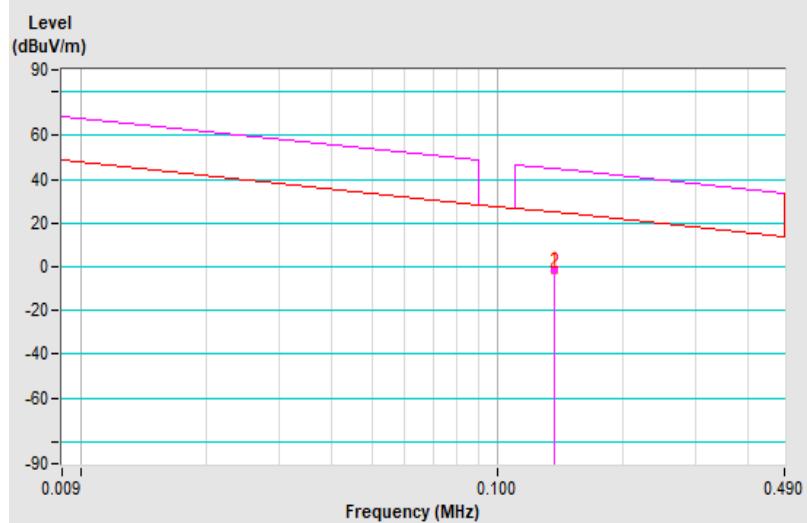
**Antenna Polarity : Parallel**

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*0.137	-1.45 PK	44.87	-46.32	1.00	291	59.60	-61.05
2	*0.137	-1.66 AV	24.87	-26.53	1.00	291	59.39	-61.05

**Remarks:**

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + Distance Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " \* ": Fundamental frequency.
6. The test distance for below 0.49MHz is 3m, extrapolate the measured field strength to a distance of 300 meters.

Distance factor@3m =  $40 \cdot \log(3/300) = -80 \text{ dB}$



<b>Test Frequency</b>	137kHz	<b>Detector Function</b>	Peak (PK)
<b>Frequency Range</b>	9kHz ~ 490kHz		Average (AV)
<b>Test Mode</b>	B		

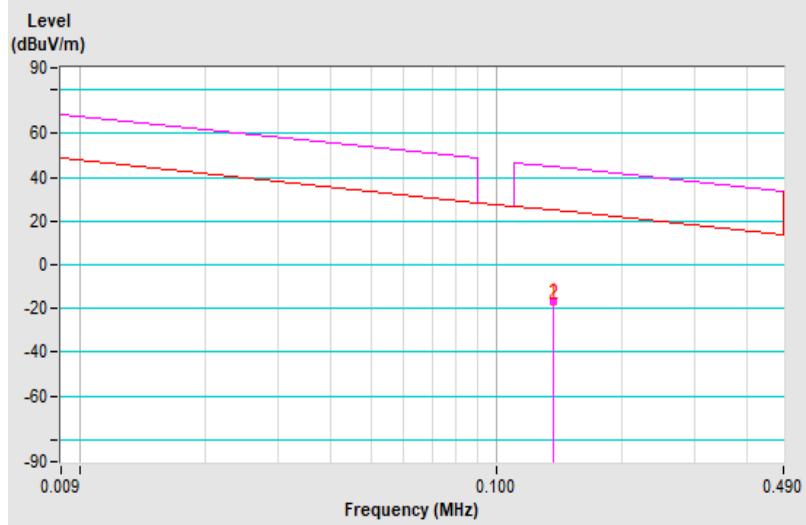
**Antenna Polarity : Perpendicular**

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*0.137	-16.49 PK	44.87	-61.36	1.00	343	44.56	-61.05
2	*0.137	-16.88 AV	24.87	-41.75	1.00	343	44.17	-61.05

**Remarks:**

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + Distance Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " \* ": Fundamental frequency.
6. The test distance for below 0.49MHz is 3m, extrapolate the measured field strength to a distance of 300 meters.

Distance factor@3m =  $40 \times \log(3/300) = -80$ dB



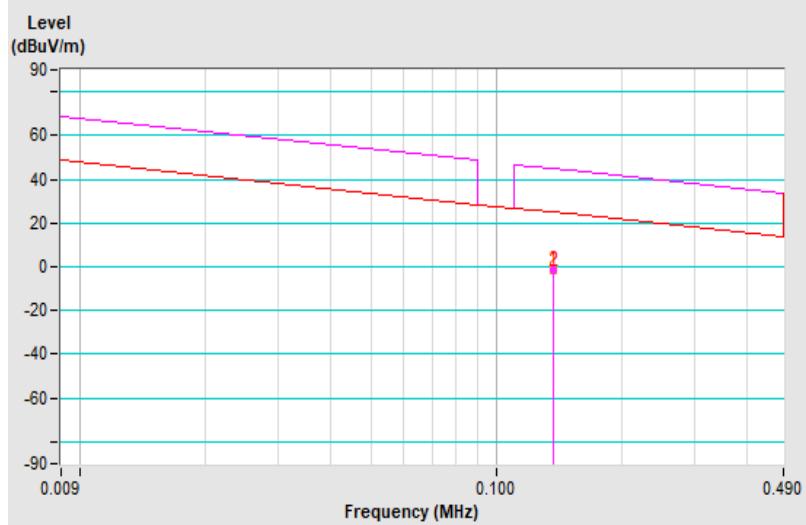
<b>Test Frequency</b>	137kHz	<b>Detector Function</b>	Peak (PK)	
<b>Frequency Range</b>	9kHz ~ 490kHz		Average (AV)	
<b>Test Mode</b>	B			

Antenna Polarity : Ground-parallel								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*0.137	-1.18 PK	44.87	-46.05	1.00	13	59.87	-61.05
2	*0.137	-1.34 AV	24.87	-26.21	1.00	13	59.71	-61.05

**Remarks:**

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + Distance Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " \* ": Fundamental frequency.
6. The test distance for below 0.49MHz is 3m, extrapolate the measured field strength to a distance of 300 meters.

Distance factor@3m =  $40 \times \log(3/300) = -80$ dB



For 490kHz ~ 30MHz Data:

Charging Mode

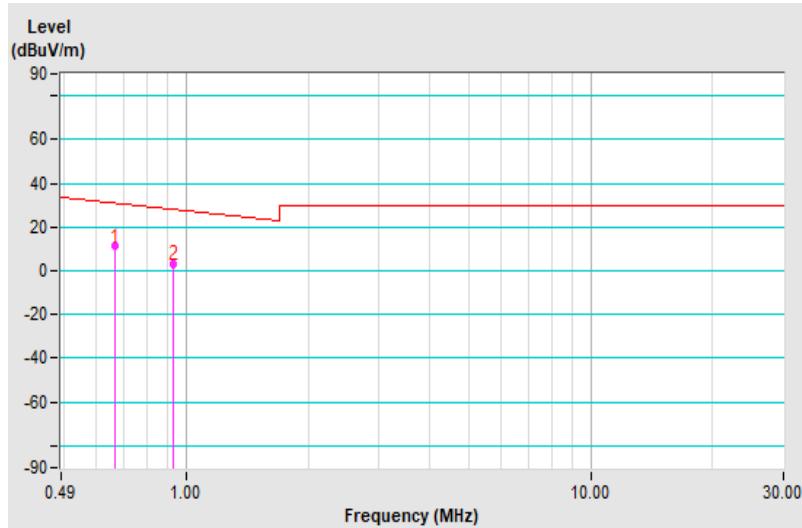
<b>Test Frequency</b>	133kHz	<b>Detector Function</b>	Quasi-Peak (QP)	
<b>Frequency Range</b>	490kHz ~ 30MHz			
<b>Test Mode</b>	A			

Antenna Polarity : Parallel								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	0.665	11.06 QP	31.15	-20.09	1.00	41	43.52	-32.46
2	0.931	3.06 QP	28.22	-25.16	1.00	137	37.62	-34.56

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + Distance Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " \* ": Fundamental frequency.
6. The test distance for below 30MHz is 3m, extrapolate the measured field strength to a distance of 30 meters.

Distance factor@3m =  $40 \times \log(3/30) = -40$ dB



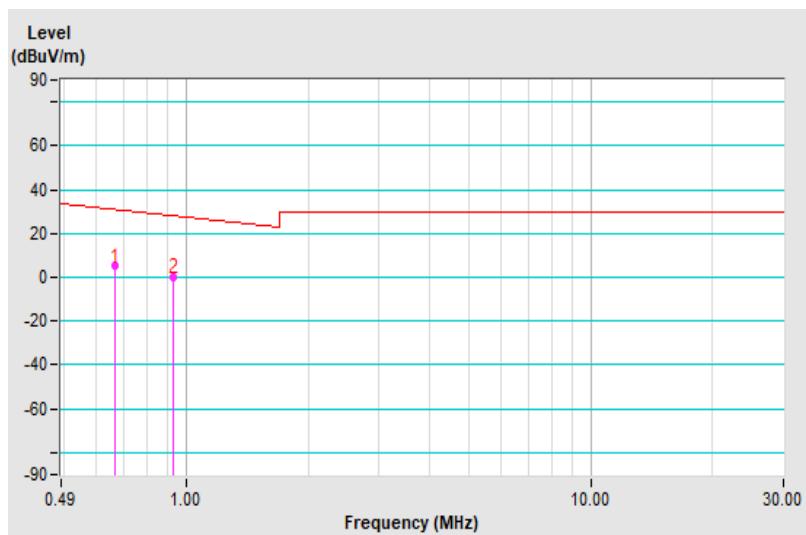
<b>Test Frequency</b>	133kHz	<b>Detector Function</b>	Quasi-Peak (QP)
<b>Frequency Range</b>	490kHz ~ 30MHz		
<b>Test Mode</b>	A		

Antenna Polarity : Perpendicular								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	0.665	5.22 QP	31.15	-25.93	1.00	95	37.68	-32.46
2	0.931	0.00 QP	28.22	-28.22	1.00	158	34.56	-34.56

**Remarks:**

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + Distance Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " \* ": Fundamental frequency.
6. The test distance for below 30MHz is 3m, extrapolate the measured field strength to a distance of 30 meters.

Distance factor@3m =  $40 * \log(3/30) = -40\text{dB}$



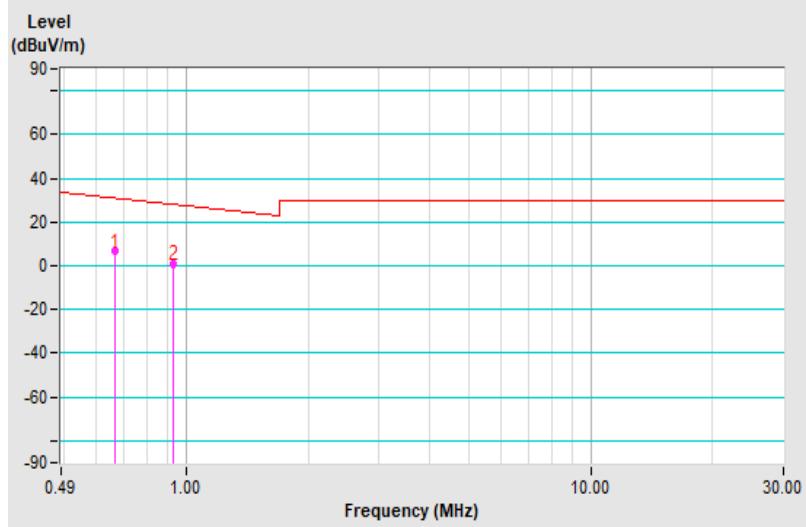
<b>Test Frequency</b>	133kHz	<b>Detector Function</b>	Quasi-Peak (QP)	
<b>Frequency Range</b>	490kHz ~ 30MHz			
<b>Test Mode</b>	A			

Antenna Polarity : Ground-parallel								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	0.665	6.78 QP	31.15	-24.37	1.00	102	39.24	-32.46
2	0.931	0.78 QP	28.22	-27.44	1.00	45	35.34	-34.56

**Remarks:**

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + Distance Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " \* ": Fundamental frequency.
6. The test distance for below 30MHz is 3m, extrapolate the measured field strength to a distance of 30 meters.

Distance factor@3m =  $40 * \log(3/30) = -40\text{dB}$



**Standby Mode**

<b>Test Frequency</b>	137kHz	<b>Detector Function</b>	Quasi-Peak (QP)	
<b>Frequency Range</b>	490kHz ~ 30MHz			
<b>Test Mode</b>	B			

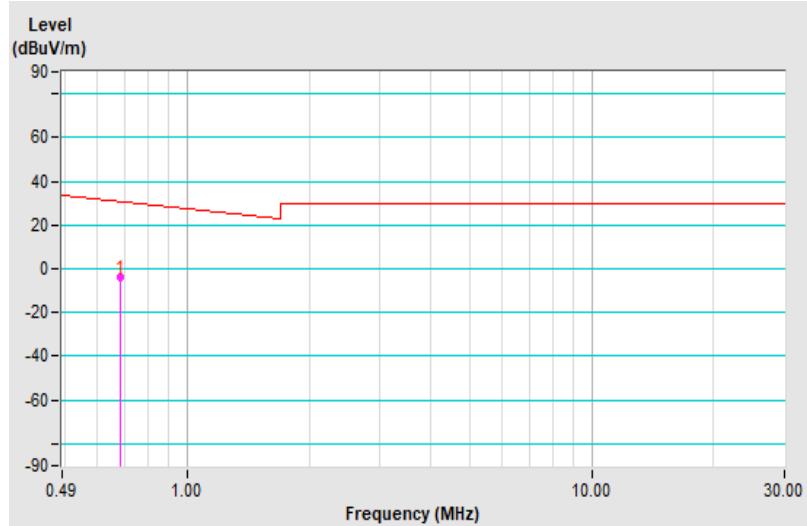
**Antenna Polarity : Parallel**

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	0.685	-3.89 QP	30.89	-34.78	1.00	268	28.74	-32.63

**Remarks:**

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + Distance Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " \* ": Fundamental frequency.
6. The test distance for below 30MHz is 3m, extrapolate the measured field strength to a distance of 30 meters.

Distance factor@3m =  $40 \times \log(3/30) = -40\text{dB}$



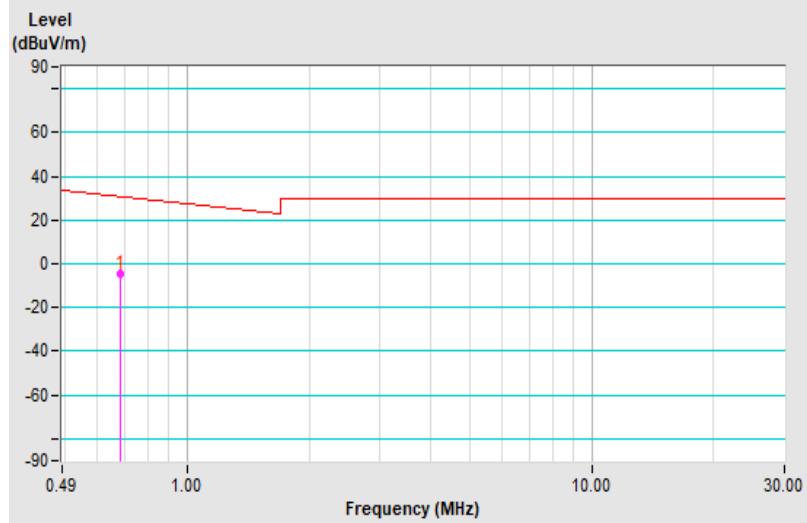
<b>Test Frequency</b>	137kHz	<b>Detector Function</b>	Quasi-Peak (QP)	
<b>Frequency Range</b>	490kHz ~ 30MHz			
<b>Test Mode</b>	B			

Antenna Polarity : Perpendicular								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	0.685	-4.38 QP	30.89	-35.27	1.00	358	28.25	-32.63

**Remarks:**

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + Distance Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " \* ": Fundamental frequency.
6. The test distance for below 30MHz is 3m, extrapolate the measured field strength to a distance of 30 meters.

Distance factor@3m =  $40 * \log(3/30) = -40\text{dB}$



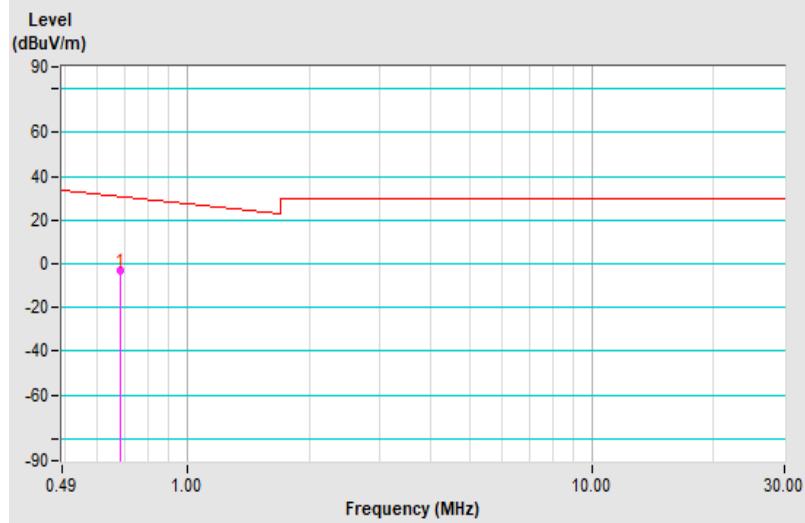
<b>Test Frequency</b>	137kHz	<b>Detector Function</b>	Quasi-Peak (QP)	
<b>Frequency Range</b>	490kHz ~ 30MHz			
<b>Test Mode</b>	B			

Antenna Polarity : Ground-parallel								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	0.685	-3.28 QP	30.89	-34.17	1.00	164	29.35	-32.63

**Remarks:**

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + Distance Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " \* ": Fundamental frequency.
6. The test distance for below 30MHz is 3m, extrapolate the measured field strength to a distance of 30 meters.

Distance factor@3m =  $40 * \log(3/30) = -40\text{dB}$



Above 30MHz Data:

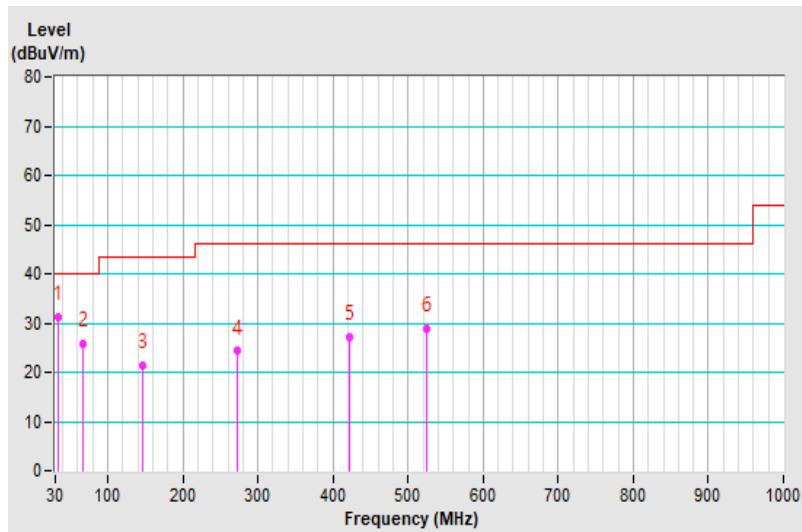
Charging Mode

Test Frequency	133kHz	Detector Function	Quasi-Peak (QP)	
Frequency Range	30MHz ~ 1GHz			
Test Mode	A			

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	33.88	31.23 QP	40.00	-8.77	2.49 H	160	39.73	-8.50
2	66.86	25.89 QP	40.00	-14.11	2.22 H	133	34.25	-8.36
3	146.40	21.44 QP	43.50	-22.06	2.84 H	194	28.03	-6.59
4	271.53	24.25 QP	46.00	-21.75	3.16 H	226	29.52	-5.27
5	420.91	27.12 QP	46.00	-18.88	3.44 H	254	28.61	-1.49
6	524.70	28.90 QP	46.00	-17.10	3.67 H	277	28.35	0.55

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.

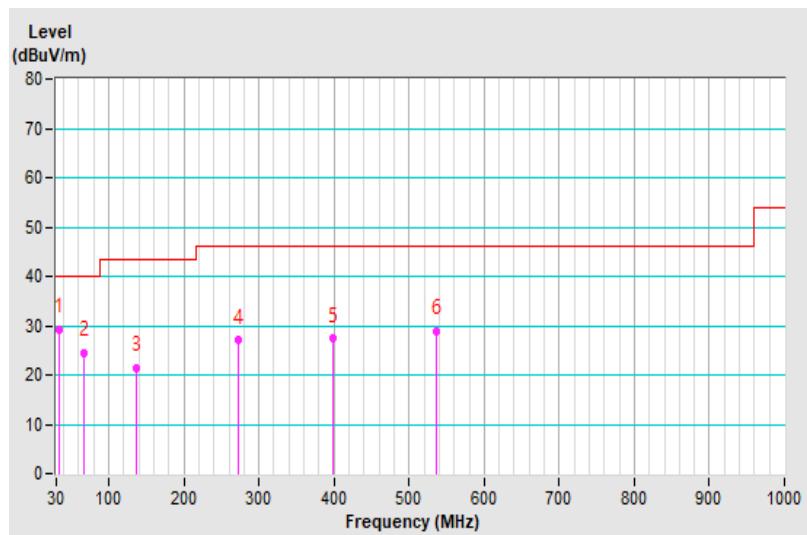


<b>Test Frequency</b>	133kHz	<b>Detector Function</b>	Quasi-Peak (QP)
<b>Frequency Range</b>	30MHz ~ 1GHz		
<b>Test Mode</b>	A		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	33.88	29.31 QP	40.00	-10.69	2.08 V	128	37.81	-8.50
2	66.86	24.57 QP	40.00	-15.43	2.60 V	178	32.93	-8.36
3	136.70	21.37 QP	43.50	-22.13	3.00 V	218	28.65	-7.28
4	272.50	26.95 QP	46.00	-19.05	3.24 V	242	32.15	-5.20
5	397.63	27.34 QP	46.00	-18.66	3.44 V	262	29.51	-2.17
6	535.37	28.94 QP	46.00	-17.06	3.76 V	293	28.32	0.62

**Remarks:**

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.



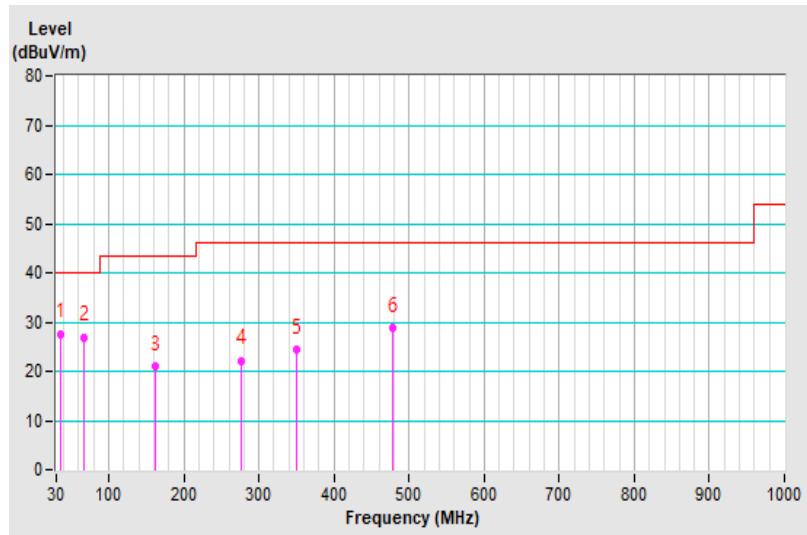
**Standby Mode**

<b>Test Frequency</b>	137kHz	<b>Detector Function</b>	Quasi-Peak (QP)
<b>Frequency Range</b>	30MHz ~ 1GHz		
<b>Test Mode</b>	B		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	34.85	27.47 QP	40.00	-12.53	1.97 H	230	35.92	-8.45
2	66.86	26.92 QP	40.00	-13.08	2.26 H	259	35.28	-8.36
3	160.95	20.90 QP	43.50	-22.60	2.53 H	285	27.23	-6.33
4	276.38	21.96 QP	46.00	-24.04	2.70 H	302	26.98	-5.02
5	350.10	24.25 QP	46.00	-21.75	2.90 H	322	27.60	-3.35
6	477.17	28.67 QP	46.00	-17.33	3.12 H	344	28.88	-0.21

**Remarks:**

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.

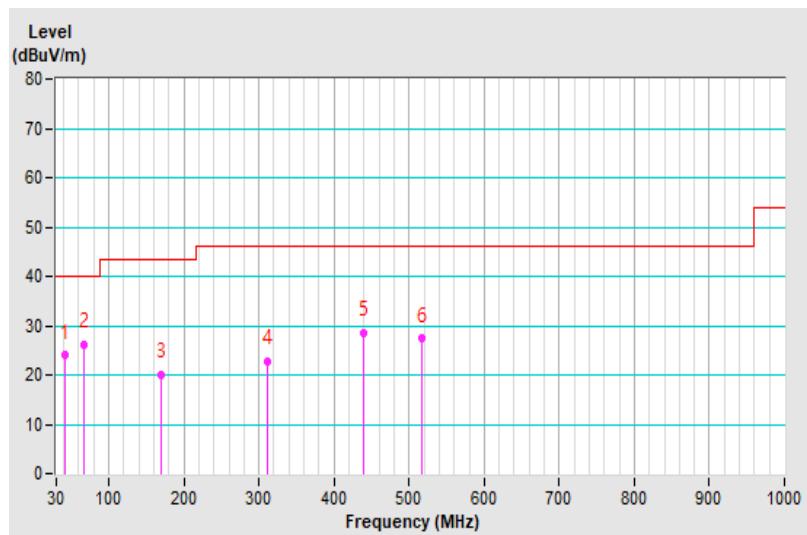


<b>Test Frequency</b>	137kHz	<b>Detector Function</b>	Quasi-Peak (QP)
<b>Frequency Range</b>	30MHz ~ 1GHz		
<b>Test Mode</b>	B		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	41.64	23.92 QP	40.00	-16.08	2.19 V	177	31.35	-7.43
2	66.86	26.07 QP	40.00	-13.93	1.92 V	151	34.43	-8.36
3	168.71	20.10 QP	43.50	-23.40	2.36 V	195	26.59	-6.49
4	311.30	22.71 QP	46.00	-23.29	2.58 V	216	26.63	-3.92
5	438.37	28.60 QP	46.00	-17.40	2.88 V	245	29.51	-0.91
6	516.94	27.30 QP	46.00	-18.70	3.20 V	278	26.82	0.48

**Remarks:**

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.



## 5 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo).

## Appendix – Information of the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are FCC recognized accredited test firms and accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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**Web Site:** [www.bureauveritas-adt.com](http://www.bureauveritas-adt.com)

The address and road map of all our labs can be found in our web site also.

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