

# ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

## INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART C REQUIREMENT

OF

**Applicant:** Jingletek Co., Ltd.  
No.40, Renzhong 7th St., Rende Dist., Tainan City 717

**Product Name:** Wireless Charging Pad

**Brand Name:** STRIKE

**Model No.:** SKTP1CP2

**Model Difference:** N/A

**FCC ID:** 2ARL2-JGSK01

**Report Number:** E2/2018/90057

**FCC Rule Part** Part 15C

**Issue Date:** Jan. 18, 2018

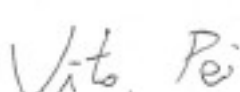
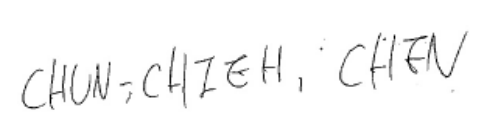
**Date of Test:** Sep. 26, 2018~ Oct. 05, 2018

**Date of EUT Received:** Sep. 26, 2018

**We hereby certify that:**

The above equipment was tested by SGS Taiwan Ltd. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10:2013 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits.

The test results of this report relate only to the tested sample identified in this report.

**Tested By:**  
Vito Pei / Sr. Engineer**Approved By:**  
Chun Chieh Chen / Asst. SupervisorTesting Laboratory  
0513

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## Revision History

Report Number	Revision	Description	Effected Page	Issue Date	Revised By
E2/2018/90057	Rev.00	Initial creation of document	All	Dec. 19, 2018	Tiffany Kao
E2/2018/90057	Rev.01	Updated information for chapter 1	4	Jan. 18, 2018	Tiffany Kao

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## 1 GENERAL INFORMATION

### 1.1 Product Description

General:

Product Name:	Wireless Charging Pad
Brand Name:	STRIKE
Model No.:	SKTP1CP2
Model Difference:	N/A
Hardware Version:	N/A
Software Version:	N/A
Power Supply:	5V DC from USB Cable

WPC:

Operating Frequency	140KHz
Transmit Power	< 123dBuV/m at 3m.
Number of Channels	1
Antenna Type	Loop Antenna
Modulation Type	ASK

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## 1.2 Test Methodology

FCC Part 15, Subpart C

ANSI C63.10:2013

Note: All test items have been performed and record as per the above standards..

## 1.3 Test Facility

SGS Taiwan Ltd. Electronics & Communication Laboratory No.2, Keji 1st Rd.,  
Guishan District, Taoyuan City, Taiwan 333 code 0513)

FCC Registration Numbers are: 735305 / TW0002

## 1.4 Special Accessories

There is no special accessory used while test was conducted.

## 1.5 Equipment Modifications

There was no modification incorporated into the EUT.

## 1.6 Radiated Emission Test Sites For Measurements From 9 kHz To 30 MHz

Radiated emission below 30MHz is measured in a 9m\*9m\*6m semi-anechoic chamber, the measurements correspond to those obtained at an open-field test site. And there is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.

After Pre-scanned the low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit per 15.31(o) was not reported.

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## 2 SYSTEM TEST CONFIGURATION

### 2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

### 2.2 EUT Exercise

The Transmitter was operated in the normal operating mode. the Tx frequency was fixed which was for the purpose of the measurements.

### 2.3 Test Procedure

#### 2.3.1 Conducted Emissions (Not apply in the report)

The EUT is a placed on as turn table which is 0.8m above ground plane. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz,. The CISPR Quasi-Peak and Average detector mode is employed according to §15.107. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

#### 2.3.2 Radiated Emissions

The EUT is a placed on as turn table. For emissions testing at or below 1 GHz, the table height shall be 0.8 m above the reference ground plane. For emission measurements above 1 GHz, the table height shall be 1.5 m above the reference ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this transmitter (EUT) was rotated through three orthogonal axes and measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made “while keeping the antenna in the ‘cone of radiation’ from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response.” is still within the 3dB illumination BW of the measurement antenna.

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- Remark 1. Emission level in dBuV/m=20 log (uV/m)  
:
2. Measurement was performed at an antenna to the closed point of EUT distance of 3 meters.
  3. Distance extrapolation factor =  $40 \log (\text{required distance} / \text{test distance})$  (dB);
  4. The measurement was undertaken in closer distance at 3m, where extrapolation factor is offset to convert the limit of the measurement.  
Ex.  $20 \cdot \log(30) + 40 \cdot \log(30/3) = 69.54 \text{ dBuV/m}$
  5. Only spurious frequency is permitted to locate within the Restricted Bands specified in provision of §15.205.
  6. The general radiated emission limits in §15.209 apply for the spurious emission generate from UE, except for the fundamental emission where the respective section specifies otherwise.

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## 2.4 Configuration of Tested System

Fig. 2-1 Emission test set up configuration

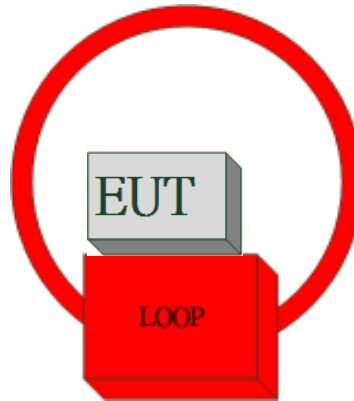


Fig. 2-2 Conduction test set up configuration



Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Data Cable	Power Cord
1.	WPC Test software	Tera Term	N/A	N/A	N/A	N/A
2.	Notebook	Lenovo	T470	P0001293	Shielded	Unshielded

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### 3 SUMMARY OF TEST RESULTS

FCC Rules	Description Of Test	Result
§15.207	AC Power Line Conducted Emission	Compliant
§15.209	Radiated Emission Limits, general requirement	Compliant
§15.215 (c)	20 dB & 99% OCCUPIED BANDWIDTH	Compliant
§15.203	Antenna Requirement	Compliant

### 4 DESCRIPTION OF TEST MODES

The EUT stay in continuous transmitting mode. The frequency 125MHz is the default channel to test, where it is the only manipulative channel as this application supports.

The field strength of spurious radiation emission was measured as EUT stand-up position (H mode) and lie down position (E1, E2 mode), the worst case E1 position was reported.

The data rate as the lowest supported is selected while tests are conducted.

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## 5 MEASUREMENT UNCERTAINTY

Test Items	Uncertainty
AC Power Line Conducted Emission	+/- 2.586 dB
Frequency Stability	+/- 123.36 Hz
20 dB OCCUPIED BANDWIDTH	+/- 123.36 Hz
Temperature	+/- 0.8 °C
Humidity	+/- 4.7 %
DC / AC Power Source	DC= +/- 1%, AC=+/- 0.2%

Radiated Spurious Emission:

Measurement uncertainty	9kHz - 30MHz: +/- 2.3dB
-------------------------	-------------------------

Measurement uncertainty (Polarization : <b>Vertical</b> )	30MHz - 180MHz: +/- 3.37dB
	180MHz -417MHz: +/- 3.19dB
	0.417GHz-1GHz: +/- 3.19dB

Measurement uncertainty (Polarization : <b>Horizontal</b> )	30MHz - 167MHz: +/- 4.22dB
	167MHz -500MHz: +/- 3.44dB
	0.5GHz-1GHz: +/- 3.39dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

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## 6 CONDUCTED EMISSIONS TEST

## 6.1 Limitation

## Conducted Emission

According to section 15.207(a) Conducted Emission Limits is as following.

Frequency range MHz	Limits dB (uV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

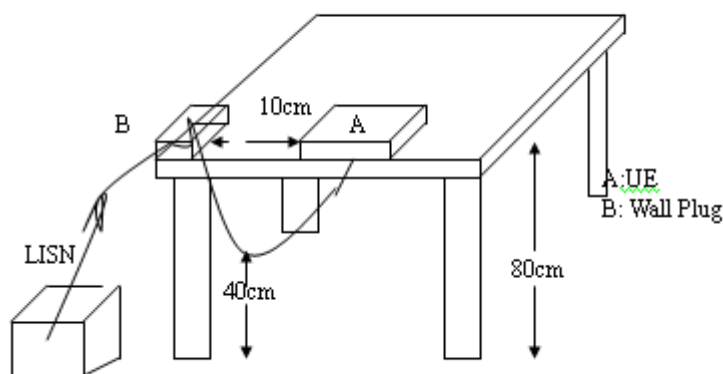
Note

- 1.The lower limit shall apply at the transition frequencies
- 2.The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

## 6.2 Measurement Procedure:

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Sweep frequency starting from 150 kHz to 30 MHz for phase L1.
4. Repeating the measurement as lists above for phase neutral.

### 6.3 Test SET-UP (Block Diagram of Configuration)



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**6.4 Measurement Equipment Used:**

Conducted Emission Test Site					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
LISN	TESEQ	NNB 51	36076	2018/02/14	2019/02/13
EMI Test Receiver	R&S	ESCI	101300	2017/11/02	2018/11/01
Coaxial Cable	EMC Instruments Corp	EMC5D-BM-BM-3000	1401004	2018/05/25	2019/05/24
Notebook	Lenovo	T470	P0001293	N/A	N/A

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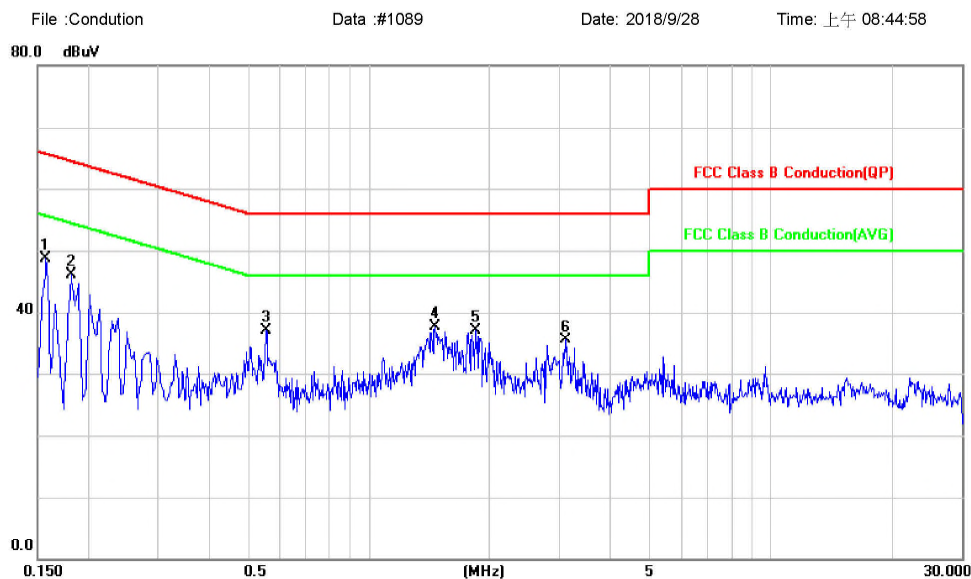
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## 6.5 Measurement Result:

Site : Conduction Room	Phase: L1	Temperature: 23 °C
Limit: FCC Class B Conduction(QP)	Power: AC 120V/60Hz	Humidity: 64 %
Mode:		
Note:		

## Conducted Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1580	29.08	19.67	48.75	65.57	-16.82	peak	
2		0.1820	26.44	19.70	46.14	64.39	-18.25	peak	
3		0.5580	16.85	20.18	37.03	56.00	-18.97	peak	
4		1.4700	17.46	20.18	37.64	56.00	-18.36	peak	
5		1.8500	16.66	20.45	37.11	56.00	-18.89	peak	
6		3.0980	15.12	20.35	35.47	56.00	-20.53	peak	

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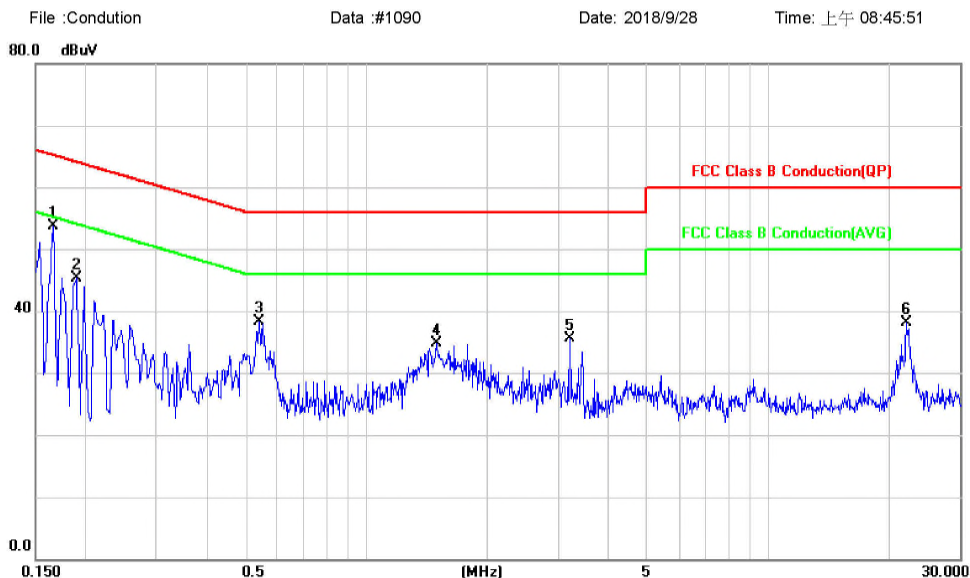
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Site : Conduction Room  
Limit: FCC Class B Conduction(QP)  
Mode:  
Note:

Phase: **N**  
Power: AC 120V/60Hz

Temperature: 23 °C  
Humidity: 64 %

### Conducted Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1660	34.13	19.66	53.79	65.16	-11.37	peak	
2		0.1900	25.61	19.70	45.31	64.04	-18.73	peak	
3		0.5420	18.13	20.19	38.32	56.00	-17.68	peak	
4		1.4980	14.44	20.18	34.62	56.00	-21.38	peak	
5		3.2180	15.17	20.31	35.48	56.00	-20.52	peak	
6		22.0700	18.02	20.10	38.12	60.00	-21.88	peak	

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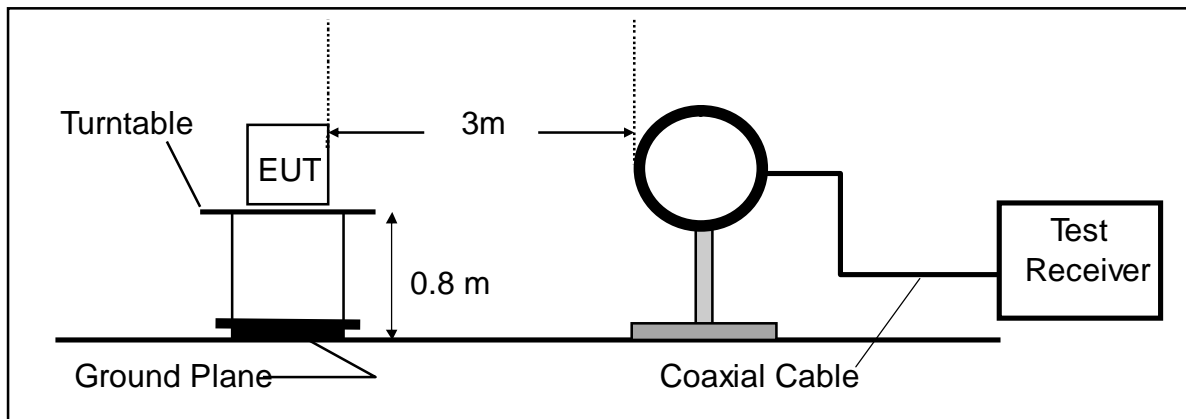
## 7 RADIATED EMISSION TEST

### 7.1 Measurement Procedure

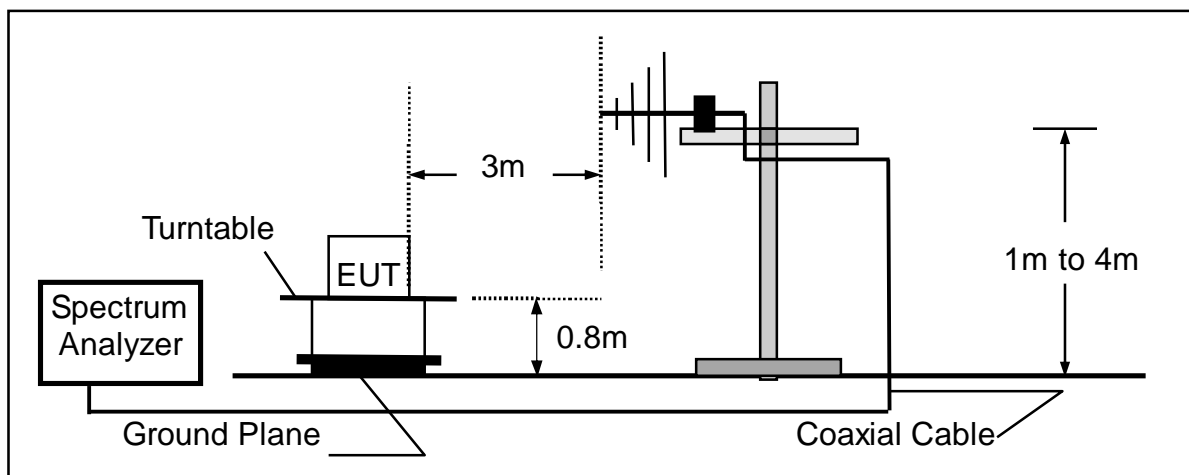
1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.

### 7.2 Test SET-UP (Block Diagram of Configuration)

#### (A) Radiated Emission Test Set-Up, Frequency Below 30MHz



#### (B) Radiated Emission Test Set-Up, Frequency Below 1000MHz



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### 7.3 Measurement Equipment Used:

SGS 966 Chamber No.C					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Broadband Antenna	TESEQ	CBL 6112D	35243	2017/11/10	2018/11/09
Loop Antenna	ETS.LINDGREN	6502	148045	2018/09/26	2019/09/25
EMI Test Receiver	R&S	ESU 40	100363	2018/04/11	2019/04/10
Pre-Amplifier	EMC Instruments	EMC330	980096	2017/12/26	2018/12/25
Coaxial Cable	Huber+Suhner	RG 214/U	W21.01	2017/12/26	2018/12/25
Coaxial Cable	Huber Suhner	SUCOFLEX 104	MY17388/4	2017/12/26	2018/12/25
Coaxial Cable	Huber Suhner	RG 214/U	W22.03	2017/12/26	2018/12/25

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## 7.4 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CL - AG$$

Where	FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
	RA = Reading Amplitude	AG = Amplifier Gain
	AF = Antenna Factor	

## 7.5 Field Strength of Fundamental Emission

### 7.5.1 Limit

#### Below 30MHz

Frequency (MHz)	Limit (μV/m)	Measurement distance (meters)	Remark
0.009-0.490	2400/F(kHz)	300	Quasi-Peak Value
0.490-1.705	24000/F(kHz)	30	Quasi-Peak Value
1.705-30.0	30	30	Quasi-Peak Value

#### Above 30MHz

Frequency (MHz)	Limit (dBμV/m @3m)	Remark
30-88	40	Quasi-Peak Value
88-216	43.5	Quasi-Peak Value
216-960	46	Quasi-Peak Value
Above 960	54	Quasi-Peak Value
Above 1GHz	54	Average Value
	74	Peak Value

#### Note:

1. The measurement was undertaken in closer distance at 3m, where extrapolation factor is offset to convert the limit of the measurement.  $Ex. 20 \cdot \log(30) + 40 \cdot \log(30/3) = 69.54 \text{ dB}\mu\text{V/m}$
2. The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.
3. Actual FS(dBμV/m) = Spectrum. Reading level(dBμV) + Factor(dB)

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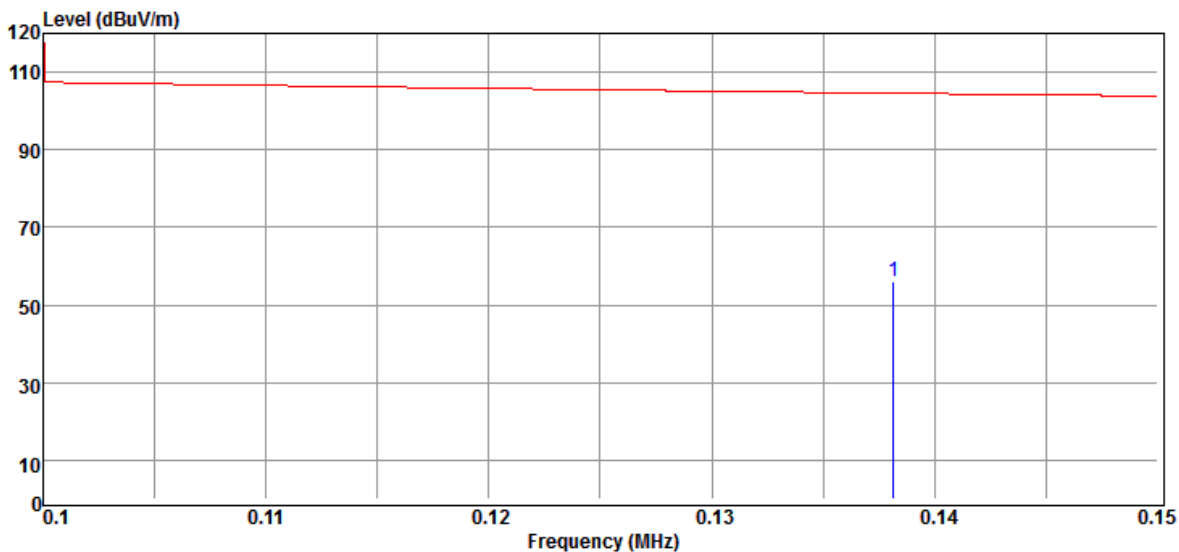
Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

“F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

### 7.5.2 Below 30 MHz test result

Operation Mode	:WPC	Test Date	:2018-09-27
Test Mode	:Main	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:VERTICAL
Test Channel	:140 KHz	Engineer	:Enzo



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dB $\mu$ V	Factor dB	Actual FS dB $\mu$ V/m	Limit @3m dB $\mu$ V/m	Margin dB
0.14	Peak	45.00	11.12	56.12	104.59	-48.47

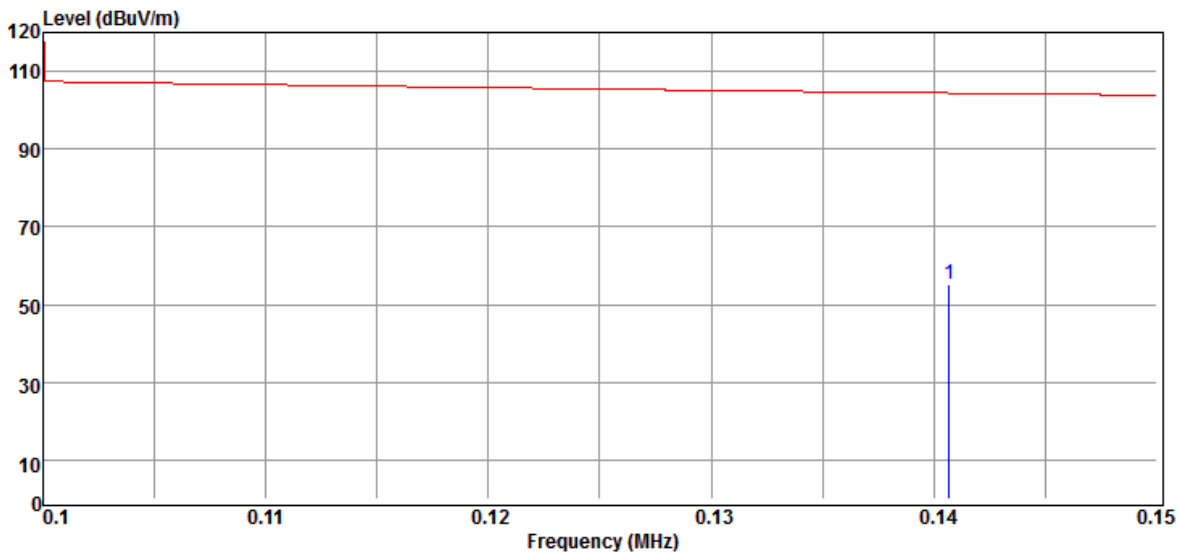
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Operation Mode	:WPC	Test Date	:2018-09-27
Test Mode	:Main	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:HORIZONTAL
Test Channel	:140 KHz	Engineer	:Enzo



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
0.14	Peak	43.94	11.12	55.06	104.43	-49.37

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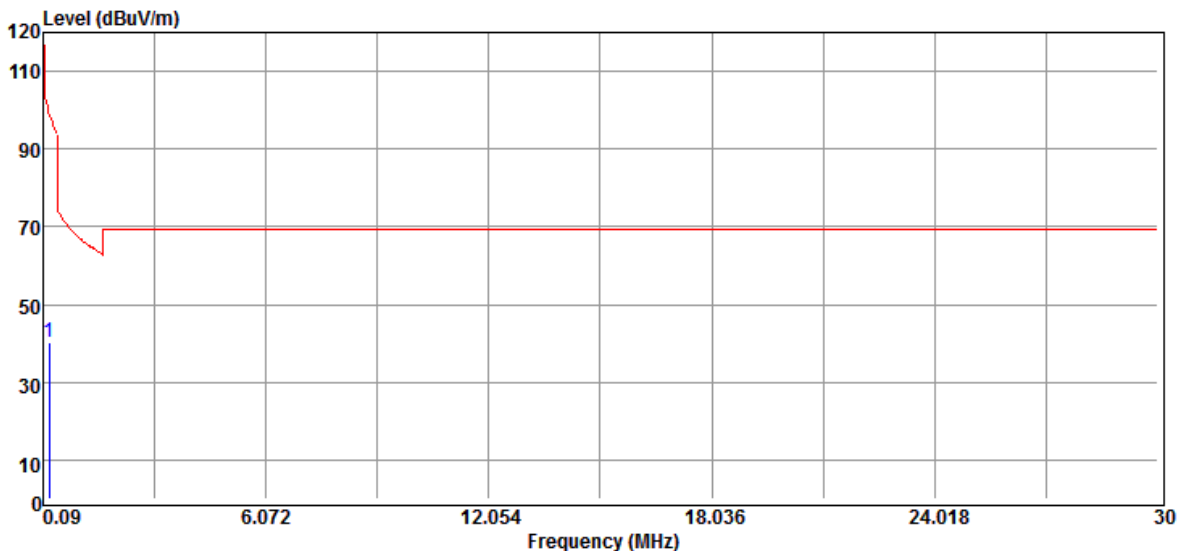
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**7.5.3 Above 30MHz test result**

Operation Mode :WPC  
 Test Mode :Tx  
 EUT Pol :H Plan  
 Test Channel :140 KHz

Test Date :2018-09-27  
 Temp./Humi. :25/60  
 Antenna Pol. :VERTICAL  
 Engineer :Enzo



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
0.28	Peak	29.07	11.37	40.44	99.39	-58.95

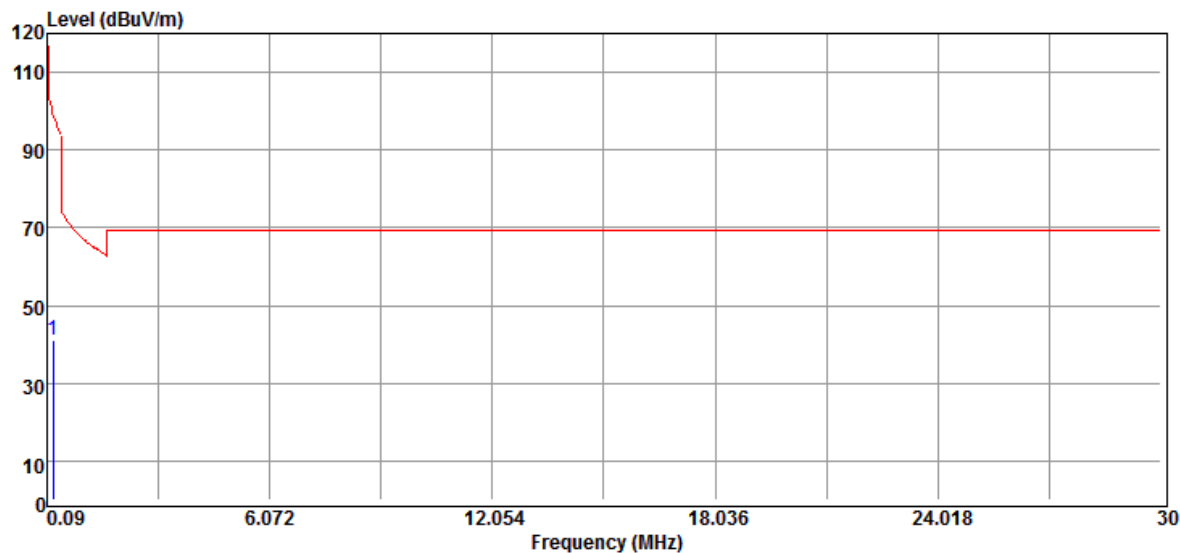
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Operation Mode	:WPC	Test Date	:2018-09-27
Test Mode	:Tx	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:HORIZONTAL
Test Channel	:140 KHz	Engineer	:Enzo



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
0.28	Peak	29.59	11.37	40.96	99.39	-58.43

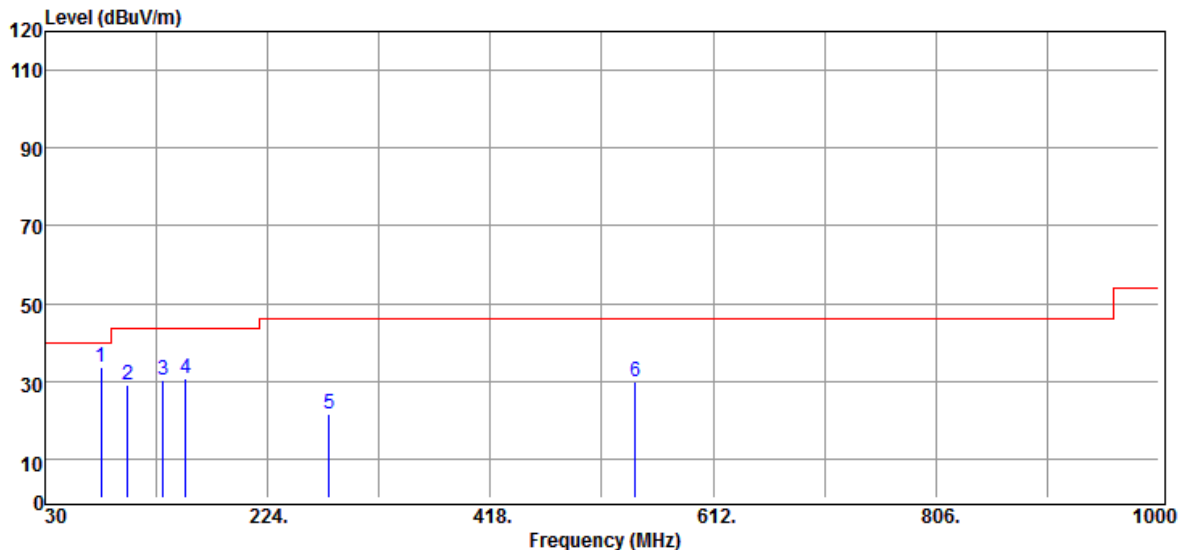
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Operation Mode	:WPC	Test Date	:2018-09-27
Test Mode	:Tx	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:VERTICAL
Test Channel	:140 KHz	Engineer	:Enzo



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
78.50	Peak	50.57	-17.02	33.55	40.00	-6.45
101.78	Peak	43.70	-14.49	29.21	43.50	-14.29
132.82	Peak	41.72	-11.57	30.15	43.50	-13.35
152.22	Peak	43.65	-12.82	30.83	43.50	-12.67
277.35	Peak	31.91	-10.23	21.68	46.00	-24.32
544.10	Peak	33.03	-3.25	29.78	46.00	-16.22

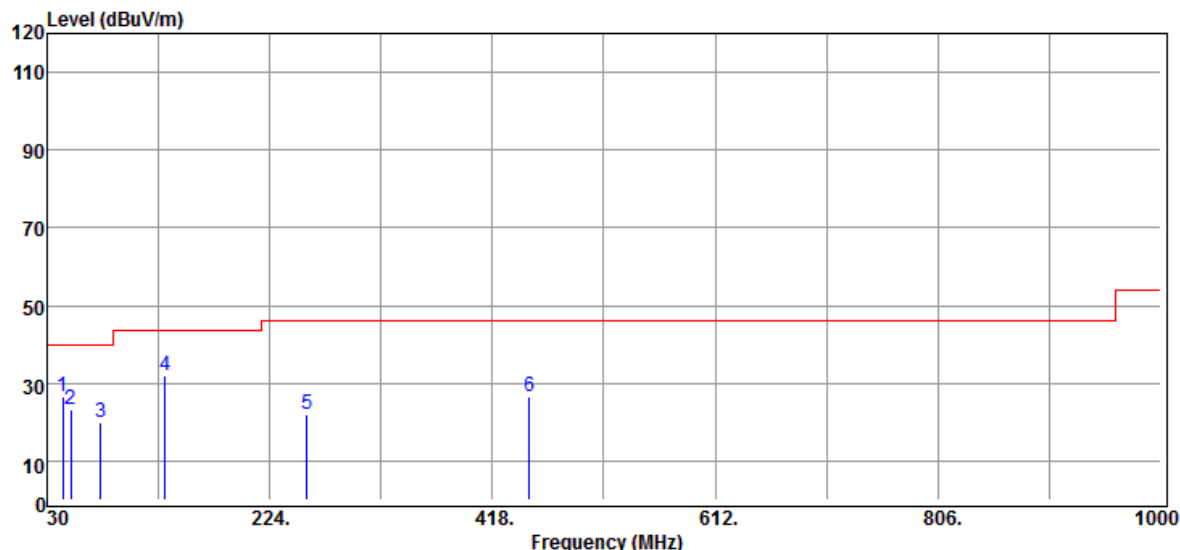
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Operation Mode	:WPC	Test Date	:2018-09-27
Test Mode	:Tx	Temp./Humi.	:25/60
EUT Pol	:H Plan	Antenna Pol.	:HORIZONTAL
Test Channel	:140 KHz	Engineer	:Enzo



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
43.58	Peak	38.21	-11.43	26.78	40.00	-13.22
50.37	Peak	39.52	-16.09	23.43	40.00	-16.57
76.56	Peak	37.33	-17.21	20.12	40.00	-19.88
132.82	Peak	43.39	-11.57	31.82	43.50	-11.68
256.01	Peak	32.22	-10.28	21.94	46.00	-24.06
450.01	Peak	32.06	-5.56	26.50	46.00	-19.50

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## 8 20 dB & 99% OCCUPIED BANDWIDTH MEASUREMENT

### 8.1 Standard Applicable:

§2.1049 & §15.215 (c)

### 8.2 Limit:

None

### 8.3 Test Set-up

Refer to section 6.2 in this report

### 8.4 Measurement Procedure

20dB bandwidth

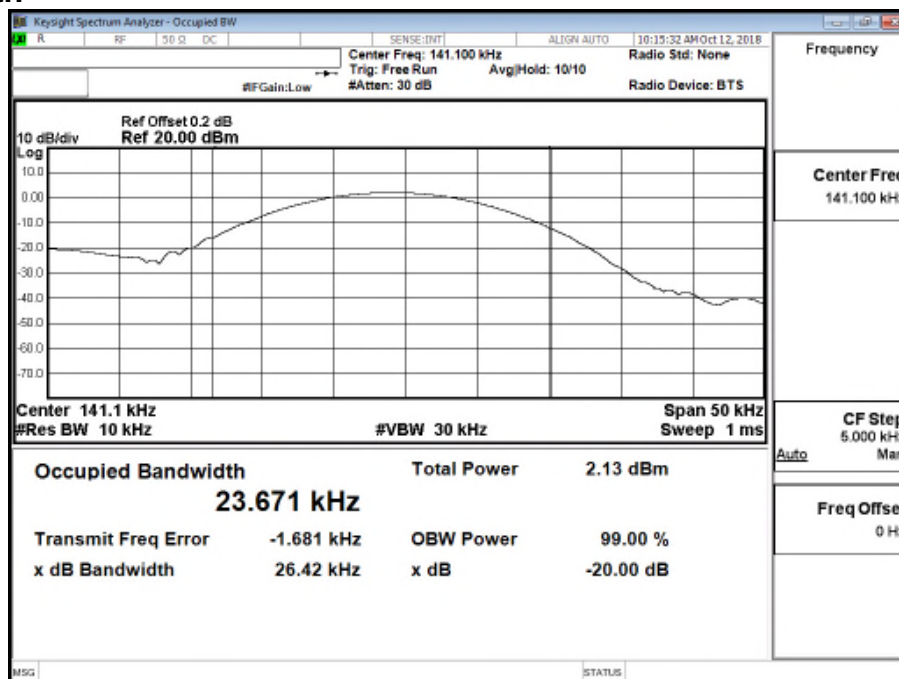
1. The transmitter output (antenna port) was connected to the spectrum analyzer in peak mode.
2. 20dB Bandwidth the resolution bandwidth of 200 Hz and the video bandwidth of 1 kHz were used.
3. Measured the spectrum width with power higher than 20dB below carrier.
4. Turn on the 99% bandwidth function, max reading

### 8.5 Measurement Equipment Used:

Refer to section 8.3 in this report

### 8.6 Measurement Result

#### -20dB Bandwidth



20dB Bandwidth	99% Bandwidth	Limit
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26.42 kHz	23.671 kHz	No requirement
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## 9 ANTENNA REQUIREMENT

### 9.1 Standard Applicable:

According to §15.203, Antenna requirement.

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. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.

### 9.2 Antenna Connected Construction:

The antenna is designed as permanently attached and no consideration of replacement. Please see EUT photo and antenna spec. for details.

*~ End of Report ~*

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