



# FCC CERTIFICATION REPORT

**Test Report No.** : E1/2017/90088  
**Applicant** : SHARP CORPORATION, IoT Communication BU  
**Address** : 2-13-1, Hachihonmatsu-lida, Higashi-hiroshima-shi, Hiroshima,  
739-0192, Japan  
**Manufacturer** : Sharp Corporation  
**Address** : 1 Takumi-cho, Sakai-ku, Sakai City, Osaka 590-8522, Japan

**Equipment Under Test (EUT) :**  
**Product Name** : Mobile phone

**Standards** : FCC Part 15:2017, Subpart B, Class B  
**FCC Designation Numbers** : 916890 / TW1087

**Date of Receipt** : Ser. 15, 2017  
**Date of Test** : Ser. 15 ~ Oct. 12, 2017  
**Date of Issue** : Nov. 01, 2017

<b>Test Result :</b>	<b>PASS</b>
----------------------	-------------

In the configuration tested, the EUT complied with the standards specified above.

**Remarks :**

This report details the results of the testing carried out on one sample, the results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

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**Tested By:**

*Ivan Hsieh*

**Date**

Nov. 01, 2017

**Ivan Hsieh (Engineer)**

**Approved By**

*Eddy Cheng*

**Date**

Nov. 01, 2017

**Eddy Cheng (Asst. Supervisor)**



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## Revision History

Report Number	Revision	Description	Issue Date
E1/2017/90088	Rev.00	Initial creation of document	Nov. 01, 2017

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# 1. General Information

## 1.1 Applicant & Manufacturer Information

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 Hiroshima, 739-0192, Japan  
 Manufacturer : Sharp Corporation  
 Address of Manufacturer : 1 Takumi-cho, Sakai-ku, Sakai City, Osaka 590-  
 8522, Japan

## 1.2 General Description of EUT

Product Name : Mobile phone

## 1.3 Details of EUT

Power Supply : AC 100~240V, 50~60Hz  
 Worst case : CE worst case : Config 4  
 Below RE worst case : Config 2  
 Above RE worst case : Config 1  
 Highest operate description : 1094.4 MHz  
 Adapter : Model No.: 0401PWA HS-SIA  
 Supplier : au

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SK22	FCC 15B			
	Config 1	Config2	Config 3	Config 4
Applicable standard	FCC 15B			
Accessories	EUT + AC Adaptor(au 0401PWA HS-SIA) +USB Cable	EUT +USB Cable(to PC)	EUT + AC Adaptor(au 0401PWA HS-SIA) +USB Cable	EUT + AC Adaptor(au 0401PWA HS-SIA) + Cradle +USB Cable +EARPHONE
Main function	<b>Speech</b>	<b>Data Link+Camera</b>	<b>Audio</b>	<b>Cradle Charger</b>
Additional function	BT+WIFI +GPS+NFC			
Description				
radiated emission	GSM 850/1900 WCDMA B1 LTE B1	Data Read/Write + Camera Rec	MP3	Cradle Charger + MP3
conducted emission (DC Power)	NA	NA	NA	NA
conducted emission (AC Power)	GSM 850/1900 WCDMA B1 LTE B1	Data Read/Write + Camera Rec	MP3	Cradle Charger + MP3

## 1.4 Operation Procedure

### Config 1

1. Let EUT install the SIM Card & SD Card.
2. Let USB Port of EUT connect to the Adapter.
3. Set the BT mouse to pair with EUT.
4. Set WiFi to obtain IP Address and execute Ping IP Address.
5. Turned on the GPS function & NFC function.
6. Set up the base station and test GSM / WCDMA / LTE connection.
7. Started the test.

### Config 2

1. Let EUT install the SIM Card & SD Card.
2. Let USB Port of EUT connect to the PC and execute Data R/W.
3. Set the BT mouse to pair with EUT.
4. Set WiFi to obtain IP Address and execute Ping IP Address.
5. Turned on the GPS function & NFC function.
6. Turned on the camera function, selected Camera and pressed REC.
7. Started the test.

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### Config 3

1. Let EUT install the SIM Card & SD Card.
2. Let USB Port of EUT connect to the Adapter.
3. Set the BT mouse to pair with EUT.
4. Set WiFi to obtain IP Address and execute Ping IP Address.
5. Turned on the GPS function & NFC function.
6. Played the MP3 music.
7. Started the test.

### Config 4

1. Let EUT install the SIM Card & SD Card.
2. Let USB Port of EUT connect to the Earphone.
3. Set the BT mouse to pair with EUT.
4. Set WiFi to obtain IP Address and execute Ping IP Address.
5. Turned on the GPS function & NFC function.
6. Played the MP3 music.
7. Let USB Port of Cradle connect to the Adapter.
8. Put the EUT into Cradle to charge.
9. Started the test.

## 1.5 Description of Support Units

PRODUCT	MANUFACTURER	MODEL NO.	SERIAL NO.
Micro SD	Transcend	Micro SDHC (Class4)	N/A
BT Mouse	Logitech	M555b	N/A
Radio Communication Analyzer	R&S	CMU200	102189
Radio Communication Analyzer	R&S	CMU500	1201.002K50-152303-Zr
AP	BUFFALO	WZR-HP-G300NH2	44066221202559[[G]]
GPS Signal Generator	Spectracom	GSG53 GNSS4	200218
Mouse	DELL	MS111-T	CN-OKW2YH-71616-345-OL7T
Printer	HP	VCVRA-1004	CN33K19J3F
Notebook	DELL	P37G	H55Z0Z1

### Support Equipment Used in Tested Cable

Cable Type	Core	Length	Shielding/Non-shielding
N/A	N/A	N/A	N/A

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### 1.6 Modification List

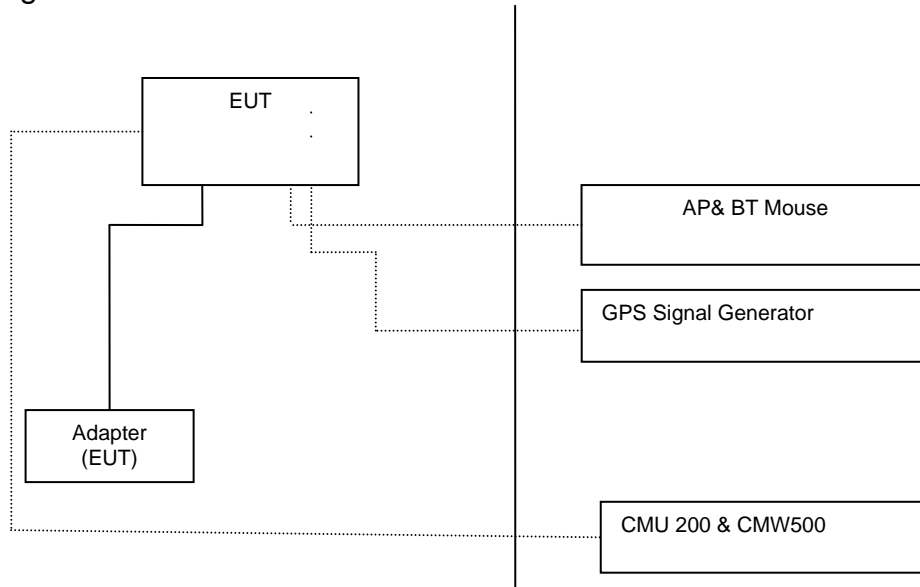
No modification was made by SGS Taiwan Electronics & Communication Laboratory.

### 1.7 Accessories Cable List

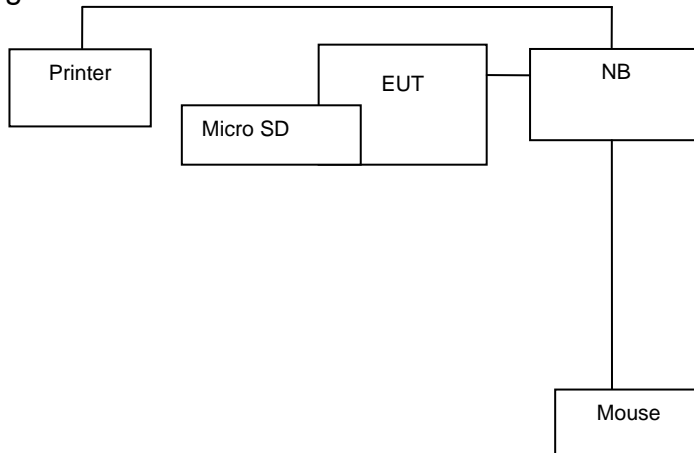
Cable Type	Core	Length	Shielding/Non-shielding
USB Cable	N/A	1M	Shielding
USB to Audio Cable	N/A	0.12M	Shielding
Earphone	N/A	1.25M	Non-shielding

### 1.8 Test Set-Up Configuration

Config 1



Config2

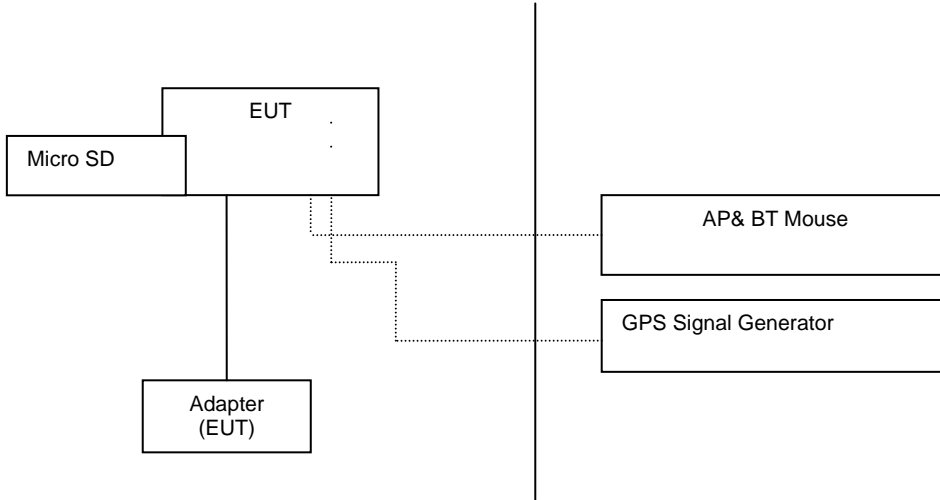


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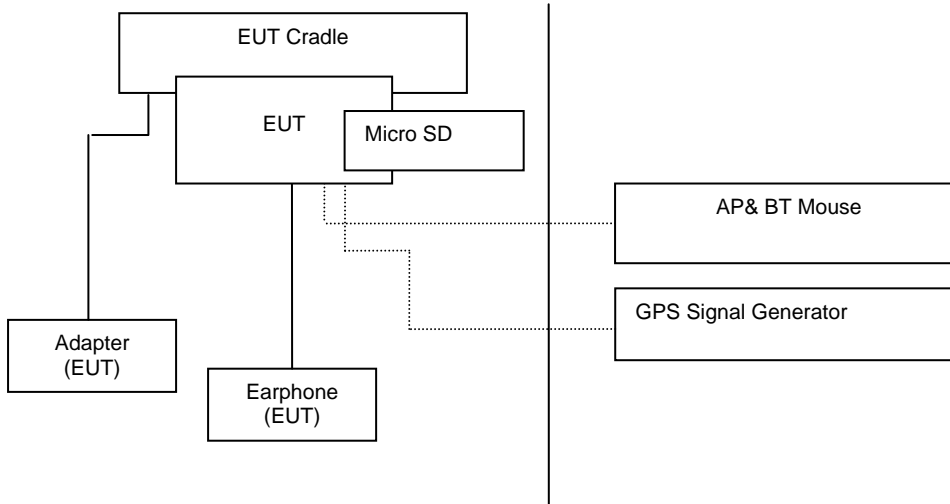
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Config 3



Config 4



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## 1.9 Measurement Procedure

Conducted Emission Testing was performed according to ANSI C63.4:2014 in a shielded room with peripherals placed on a table, 0.8m high over a metal floor. It was located more than required distance away from the shielded room wall.

Radiated Emission Testing was performed according to ANSI C63.4:2014 at the 3/10m semi-anechoic chamber. The EUT was placed on a 0.8m high table along with the peripherals. The turn table was placed 10m distance from the antenna. Cables were placed in a position to produce maximum emissions as determined by experimentation, and operation mode was selected for production of maximum emission.

The frequencies and amplitudes of maximum emission were measured at varying azimuths, antenna heights and antenna polarities. Maximum emission levels are then reported.

## 1.10 Standards Applicable for Testing

Tests to be carried out under FCC Part 15, Subpart B/CISPR 22

Test Standards	Status
FCC Part 15, Subpart B/ CISPR 22	Applicable
Deviation from Standard	No deviation

## 1.11 Summary of Results

Standard	Test Type	Highest Emission			
		Result	Phase/Pol.	Frequency(MHz)	Margin(dB)
FCC Part 15 Subpart B Class B	Conducted Emission	PASS	Line	0.6020	-13.75 (QP)
			Neutral	0.8020	-18.87 (QP)
	Radiated Emission	PASS	Hor.	221.2900	-7.80 (QP)

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## 2. EMISSION

### 2.1 Test Results

	Results
Conducted Emission	<b>Pass</b>
Radiated Emission	<b>Pass</b>

### 2.2 Frequency Range

#### FCC Part 15, Subpart B:

Conducted Emission : 150 kHz - 30 MHz

Radiated Emission : See below table

Highest frequency generated or Upper frequency of measurement  
used in the device or on which the range (MHz)  
device operates or tunes (MHz)

Below 1.705	30
1.705 - 108	1000
108 - 500	2000
500 - 1000	5000
Above 1000	5th harmonic of the highest frequency or 40 GHz, whichever is lower

### 2.3 Limits of Conducted and Radiated Emission

#### 2.3.1 Limits of Conducted Emission

##### FCC Part 15, Subpart B/CISPR 22:

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi - peak	Average	Quasi - peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	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 to 0.50 MHz.

(3) All emanation from a class A/B digital device or system, including any network of conductors and apparatus connected there to, shall not exceed the level of field strengths specified above.

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**2.3.2 Limits of Radiated Emissions**

**FCC Part 15, Subpart B Limit:**

- Detector Function : Quasi – Peak

FREQUENCY (MHz)	Class A (at 10m)	Class B (at 3m)
	dBuV/m	dBuV/m
30~88	39	40
88~216	43.5	43.5
216~960	46.44	46
Above 960	49.54	54

- Detector Function : Peak , Average

FREQUENCY (MHz)	Class A (dBuV/m) (at 3m)		Class B (dBuV/m) (at 3m)	
	Peak	Average	Peak	Average
Above 1000	79.3	59.3	73.9	53.9

**CISPR 22 Limit:**

- Detector Function : Quasi – Peak

FREQUENCY (MHz)	Class A (at 10m)	Class B (at 10m)
	dBuV/m	dBuV/m
30-230	40	30
230-1000	47	37

NOTE 1 The lower limit shall apply at the transition frequency.

NOTE 2 Additional provisions may be required for cases where interference occurs.

FREQUENCY (GHz)	Class A (dBuV/m) (at 3m)		Class B (dBuV/m) (at 3m)	
	Average	Peak	Average	Peak
1~3	56	76	50	70
3~6	60	80	54	74

NOTE The lower limit applies at the transition frequency.

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## 2.4. Test of Conducted Emission

### 2.4.1 Test Equipments

SGS Conducted_Emission HWAYA Conducted Room No.A EMC					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
EMI Test Receiver	R&S	ESCI 3	101311	2017/6/23	2018/6/22
Coaxial Cables	EMC Instruments Corp	EMCRG58-BM-BM-3000	160812	2017/8/30	2018/8/29
LISN	SCHWARZBECK	NSLK 8127	8127-648	2017/6/18	2018/6/17
Pulse Limiter	Narda S.T.S.	PMM PL01	1110X30602	2017/8/12	2018/8/11
LISN	Schwarzbeck	NSLK 8128	NSLK8128-300	2017/9/4	2018/9/3
Universal Digital Radio Communication Tester	R&S	CMU 200	122498	2016/11/9	2017/11/8
Wideband Radio Communication Tester	R&S	CMW 500	152303	2017/2/23	2018/2/22
Test S/W	Farad	EZ-EMC	Ver. SGS-03A2	N.C.R.	N.C.R.

SGS Taiwan LTD. Electronics & Communication Laboratory  
 No.2, Keji 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)  
 Measurement Uncertainty of Conducted Emission  
 Expanded uncertainty (K=2) of conducted emission is 2.25 dB

### 2.4.2 Operating Environment

Temperature : 25 degree C

Humidity : 58 %RH

Atmospheric Pressure : 992 mBar

### 2.4.3 Measurement Level Calculation

Factor = LISN insertion loss + Cable loss + Pulse Limiter Insertion Loss

Measurement Level = Reading Level + Factor

Over (Margin) = Measurement Level – Limit

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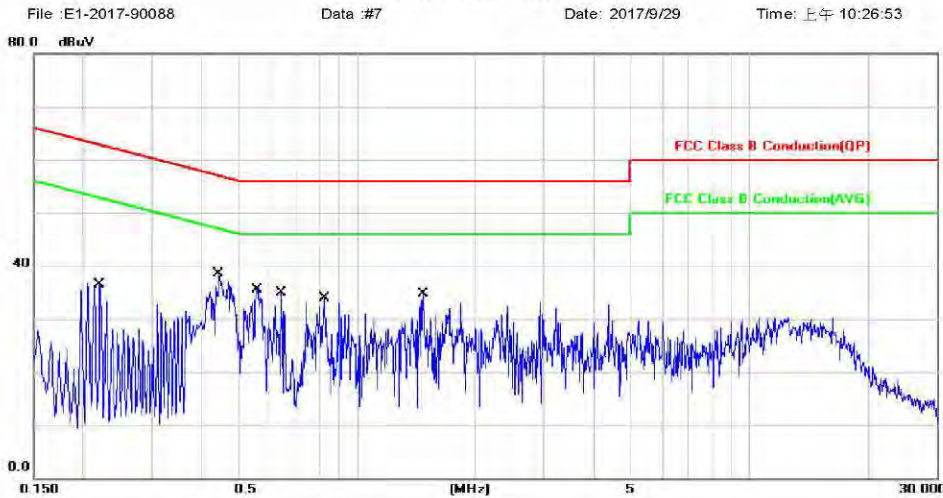


2.4.4 Measurement Data:

Config\_1\_L

Site : Conduction Room      Phase: **L1**      Temperature: 25 °C  
 Limit: FCC Class B Conduction(QP)      Power: AC 120V/60Hz      Humidity: 58 %  
 Mode: Config 1  
 Note:

Conducted Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV	dBuV	dB		
1		0.2220	32.00	0.03	32.03	62.74	-30.71	QP	
2		0.2220	21.30	0.03	21.33	52.74	-31.41	AVG	
3	*	0.4460	31.50	0.04	31.54	56.95	-25.41	QP	
4		0.4460	20.20	0.04	20.24	46.95	-26.71	AVG	
5		0.5580	28.33	0.05	28.38	56.00	-27.62	QP	
6		0.5580	18.76	0.05	18.81	46.00	-27.19	AVG	
7		0.6420	29.88	0.05	29.93	56.00	-26.07	QP	
8		0.6420	19.34	0.05	19.39	46.00	-26.61	AVG	
9		0.8300	24.99	0.06	25.05	56.00	-30.95	QP	
10		0.8300	14.56	0.06	14.62	46.00	-31.38	AVG	
11		1.4780	23.59	0.15	23.74	56.00	-32.26	QP	
12		1.4780	15.12	0.15	15.27	46.00	-30.73	AVG	

\*:Maximum data    x:Over limit    !:over margin

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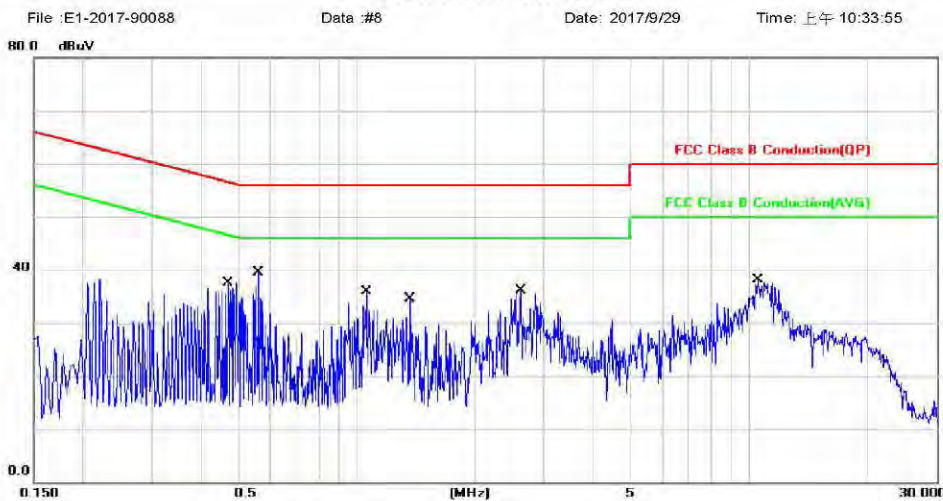
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### Config\_1\_N

Site : Conduction Room      Phase: **N**      Temperature: 25 °C  
 Limit: FCC Class B Conduction(QP)      Power: AC 120V/60Hz      Humidity: 58 %  
 Mode: Config 1  
 Note:

#### Conducted Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV	dBuV	dB		
1		0.4700	29.39	0.12	29.51	56.51	-27.00	QP	
2		0.4700	17.19	0.12	17.31	46.51	-29.20	AVG	
3	*	0.5620	34.33	0.12	34.45	56.00	-21.55	QP	
4		0.5620	21.24	0.12	21.36	46.00	-24.64	AVG	
5		1.0580	28.51	0.14	28.65	56.00	-27.35	QP	
6		1.0580	16.45	0.14	16.59	46.00	-29.41	AVG	
7		1.3620	26.73	0.18	26.91	56.00	-29.09	QP	
8		1.3620	15.82	0.18	16.00	46.00	-30.00	AVG	
9		2.6140	30.71	0.26	30.97	56.00	-25.03	QP	
10		2.6140	18.08	0.26	18.34	46.00	-27.66	AVG	
11		10.5380	32.89	0.49	33.38	60.00	-26.62	QP	
12		10.5380	20.18	0.49	20.67	50.00	-29.33	AVG	

\*:Maximum data    x:Over limit    !:over margin

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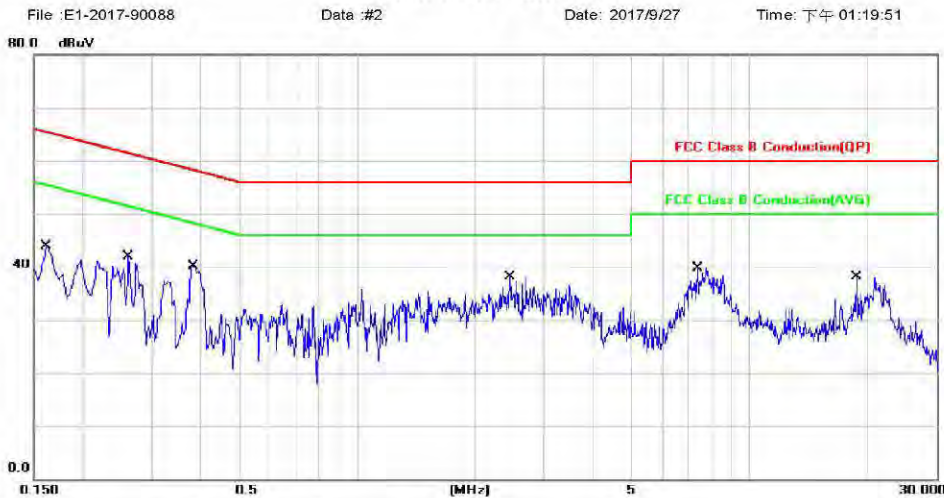
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### Config\_2\_L

Site : Conduction Room      Phase: **L1**      Temperature: 25 °C  
 Limit: FCC Class B Conduction(QP)      Power: From System      Humidity: 58 %  
 Mode: Config 2  
 Note: AC 120V/60Hz

#### Conducted Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV	dBuV	dB		
1		0.1620	35.60	0.12	35.72	65.36	-29.64	QP	
2		0.1620	22.21	0.12	22.33	55.36	-33.03	AVG	
3		0.2620	31.92	0.11	32.03	61.37	-29.34	QP	
4		0.2620	23.79	0.11	23.90	51.37	-27.47	AVG	
5		0.3820	36.40	0.12	36.52	58.24	-21.72	QP	
6 *		0.3820	29.61	0.12	29.73	48.24	-18.51	AVG	
7		2.4540	29.23	0.25	29.48	56.00	-26.52	QP	
8		2.4540	19.36	0.25	19.61	46.00	-26.39	AVG	
9		7.3900	29.85	0.38	30.23	60.00	-29.77	QP	
10		7.3900	17.92	0.38	18.30	50.00	-31.70	AVG	
11		18.7860	26.01	0.71	26.72	60.00	-33.28	QP	
12		18.7860	18.33	0.71	19.04	50.00	-30.96	AVG	

\*:Maximum data    x:Over limit    !:over margin

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### Config\_2\_N

Site : Conduction Room      Phase: **N**      Temperature: 25 ℃  
 Limit: FCC Class B Conduction(QP)      Power: From System      Humidity: 58 %  
 Mode: Config 2  
 Note: AC 120V/60Hz

#### Conducted Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV	dBuV	dB		
1		0.2460	38.19	0.11	38.30	61.89	-23.59	QP	
2		0.2460	25.19	0.11	25.30	51.89	-26.59	AVG	
3		0.3740	35.00	0.12	35.12	58.41	-23.29	QP	
4		0.3740	23.90	0.12	24.02	48.41	-24.39	AVG	
5		1.3180	26.90	0.17	27.07	56.00	-28.93	QP	
6		1.3180	17.84	0.17	18.01	46.00	-27.99	AVG	
7		2.4020	30.93	0.25	31.18	56.00	-24.82	QP	
8		2.4020	21.42	0.25	21.67	46.00	-24.33	AVG	
9		7.6300	33.80	0.38	34.18	60.00	-25.82	QP	
10		7.6300	27.60	0.38	27.98	50.00	-22.02	AVG	
11		20.9220	37.50	0.76	38.26	60.00	-21.74	QP	
12 *		20.9220	29.00	0.76	29.76	50.00	-20.24	AVG	

\*:Maximum data    x:Over limit    !:over margin

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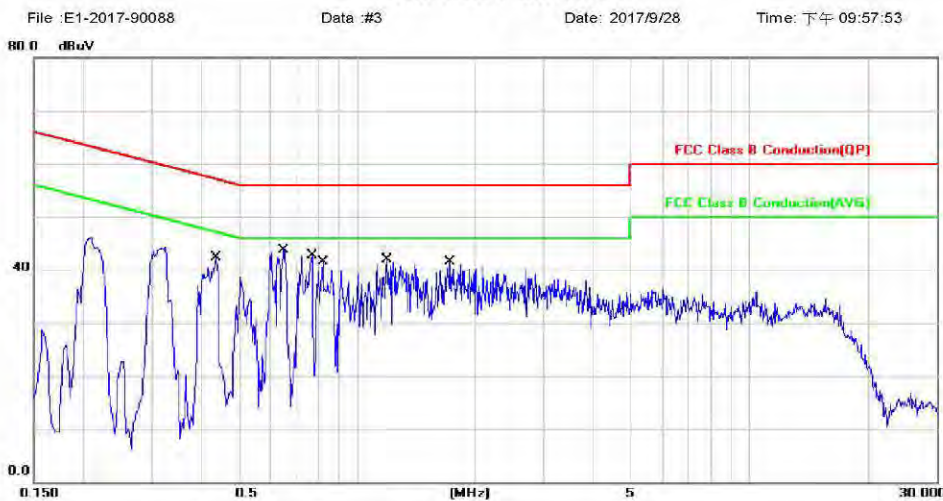
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### Config\_3\_L

Site : Conduction Room      Phase: **L1**      Temperature: 25 °C  
 Limit: FCC Class B Conduction(QP)      Power: AC 120V/60Hz      Humidity: 58 %  
 Mode: Config 3  
 Note:

#### Conducted Emission



No.	Mk.	Freq.	Reading	Correct	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV	dBuV	dB		
1		0.4380	39.20	0.04	39.24	57.10	-17.86	QP	
2		0.4380	26.00	0.04	26.04	47.10	-21.06	AVG	
3	*	0.6540	38.80	0.05	38.85	56.00	-17.15	QP	
4		0.6540	25.20	0.05	25.25	46.00	-20.75	AVG	
5		0.7700	37.60	0.06	37.66	56.00	-18.34	QP	
6		0.7700	17.80	0.06	17.86	46.00	-28.14	AVG	
7		0.8180	38.50	0.06	38.56	56.00	-17.44	QP	
8		0.8180	22.00	0.06	22.06	46.00	-23.94	AVG	
9		1.1940	32.90	0.10	33.00	56.00	-23.00	QP	
10		1.1940	18.90	0.10	19.00	46.00	-27.00	AVG	
11		1.7260	32.40	0.19	32.59	56.00	-23.41	QP	
12		1.7260	18.20	0.19	18.39	46.00	-27.61	AVG	

\*:Maximum data    x:Over limit    !:over margin

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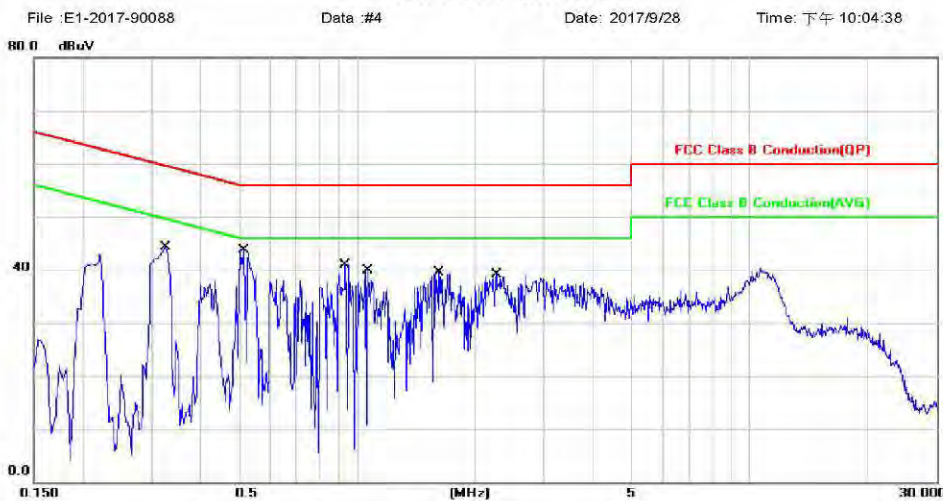
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### Config\_3\_N

Site : Conduction Room      Phase: **N**      Temperature: 25 °C  
 Limit: FCC Class B Conduction(QP)      Power: AC 120V/60Hz      Humidity: 58 %  
 Mode: Config 3  
 Note:

#### Conducted Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV	dBuV	dB		
1		0.3260	41.40	0.12	41.52	59.55	-18.03	QP	
2		0.3260	30.60	0.12	30.72	49.55	-18.83	AVG	
3 *		0.5140	40.80	0.12	40.92	56.00	-15.08	QP	
4		0.5140	27.80	0.12	27.92	46.00	-18.08	AVG	
5		0.9340	36.40	0.13	36.53	56.00	-19.47	QP	
6		0.9340	19.00	0.13	19.13	46.00	-26.87	AVG	
7		1.0700	35.50	0.14	35.64	56.00	-20.36	QP	
8		1.0700	17.60	0.14	17.74	46.00	-28.26	AVG	
9		1.6180	34.50	0.20	34.70	56.00	-21.30	QP	
10		1.6180	19.10	0.20	19.30	46.00	-26.70	AVG	
11		2.2660	33.70	0.25	33.95	56.00	-22.05	QP	
12		2.2660	18.30	0.25	18.55	46.00	-27.45	AVG	

\*:Maximum data    x:Over limit    !:over margin

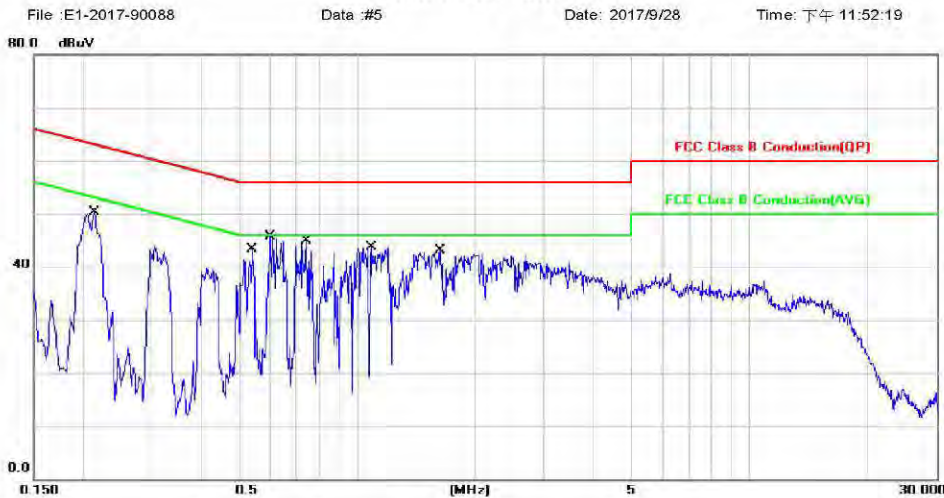
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### Config\_4\_L

Site : Conduction Room      Phase: **L1**      Temperature: 25 ℃  
 Limit: FCC Class B Conduction(QP)      Power: AC 120V/60Hz      Humidity: 58 %  
 Mode: Config 4  
 Note:

#### Conducted Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV	dBuV	dB		
1		0.2140	46.00	0.03	46.03	63.05	-17.02	QP	
2		0.2140	37.90	0.03	37.93	53.05	-15.12	AVG	
3		0.5420	38.30	0.05	38.35	56.00	-17.65	QP	
4		0.5420	24.70	0.05	24.75	46.00	-21.25	AVG	
5 *		0.6020	42.20	0.05	42.25	56.00	-13.75	QP	
6		0.6020	26.70	0.05	26.75	46.00	-19.25	AVG	
7		0.7460	40.80	0.06	40.86	56.00	-15.14	QP	
8		0.7460	25.10	0.06	25.16	46.00	-20.84	AVG	
9		1.0900	38.90	0.09	38.99	56.00	-17.01	QP	
10		1.0900	23.20	0.09	23.29	46.00	-22.71	AVG	
11		1.6300	38.30	0.17	38.47	56.00	-17.53	QP	
12		1.6300	24.00	0.17	24.17	46.00	-21.83	AVG	

\*:Maximum data    x:Over limit    !:over margin

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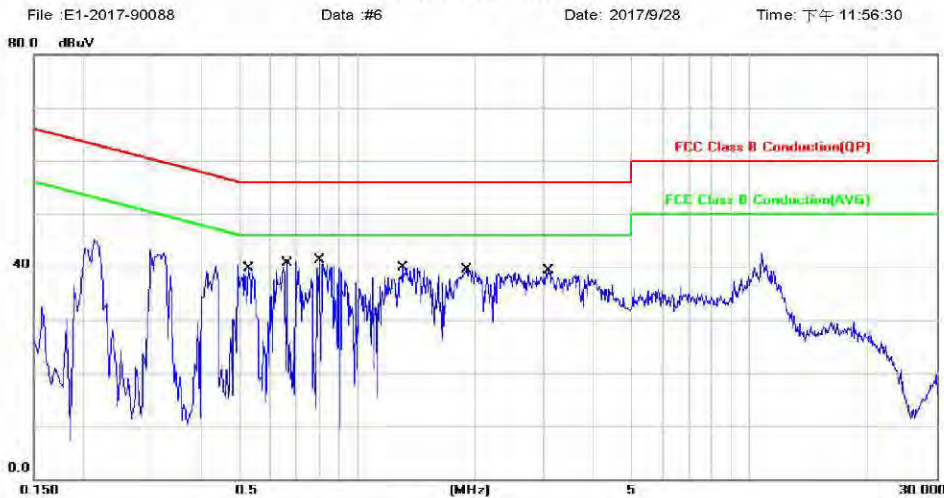
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### Config\_4\_N

Site : Conduction Room      Phase: **N**      Temperature: 25 ℃  
 Limit: FCC Class B Conduction(QP)      Power: AC 120V/60Hz      Humidity: 58 %  
 Mode: Config 4  
 Note:

#### Conducted Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV	dBuV	dB		
1		0.5300	36.90	0.12	37.02	56.00	-18.98	QP	
2		0.5300	23.60	0.12	23.72	46.00	-22.28	AVG	
3		0.6620	34.40	0.12	34.52	56.00	-21.48	QP	
4		0.6620	17.40	0.12	17.52	46.00	-28.48	AVG	
5 *		0.8020	37.00	0.13	37.13	56.00	-18.87	QP	
6		0.8020	19.10	0.13	19.23	46.00	-26.77	AVG	
7		1.3060	35.30	0.17	35.47	56.00	-20.53	QP	
8		1.3060	18.80	0.17	18.97	46.00	-27.03	AVG	
9		1.9060	34.40	0.24	34.64	56.00	-21.36	QP	
10		1.9060	17.90	0.24	18.14	46.00	-27.86	AVG	
11		3.0860	34.40	0.26	34.66	56.00	-21.34	QP	
12		3.0860	20.20	0.26	20.46	46.00	-25.54	AVG	

\*:Maximum data    x:Over limit    !:over margin

File :E1-2017-90088\Data #6

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## 2.5 Test of Radiated Emission

### 2.5.1 Test Equipments

#### Below 1GHz

SGS Radiated_Below_1GHz HWAYA 10m EMC					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
EMI Test Receiver	R&S	ESCI 7	100950	2017/12/7	2018/12/6
EMI Test Receiver	R&S	ESCI 3	101343	2016/12/21	2017/12/20
Broadband Antenna	SCHWAZBECK	VULB9168	9168-628	2017/9/8	2018/9/7
Broadband Antenna	SCHWAZBECK	VULB9168	9168-629	2017/9/12	2018/9/11
Pre Amplifier	EMC Instruments Corp.	EMC330	980178	2017/3/31	2018/3/30
Pre Amplifier	EMC Instruments Corp.	EMC330	980179	2017/3/31	2018/3/30
Coaxial Cable	EMC Instruments	EMCCFD400-NM-NM	150917	2017/9/18	2018/9/17
Coaxial Cable	EMC Instruments	EMCCFD400-NM-NM	150919	2017/9/18	2018/9/17
Coaxial Cable	EMC Instruments	EMCCFD400-NM-NM	150820	2017/9/18	2018/9/17
Coaxial Cable	EMC Instruments	EMCCFD400-NM-NM	150918	2017/9/18	2018/9/17
Coaxial Cable	EMC Instruments	EMCCFD400-NM-NM	150821	2017/9/18	2018/9/17
Coaxial Cable	EMC Instruments	EMCCFD400-NM-NM	150822	2017/9/18	2018/9/17
Universal Digital Radio Communication Tester	R&S	CMU 200	122498	2016/11/9	2017/11/8
Wideband Radio Communication Tester	R&S	CMW 500	152303	2017/2/23	2018/2/22
Controller	MF	MF-7802	N/A	N.C.R.	N.C.R.
Controller	MF	MF-7802	N/A	N.C.R.	N.C.R.
Antenna Master	MF	N/A	N/A	N.C.R.	N.C.R.
Antenna Master	MF	N/A	N/A	N.C.R.	N.C.R.
Antenna Master	MF	N/A	N/A	N.C.R.	N.C.R.
Turn Table	MF	N/A	N/A	N.C.R.	N.C.R.
Site NSA	Chance Most	10M Chamber	10M SAC	2016/12/31	2017/12/31
Test S/W	Farad	EZ-EMC	Ver. SGS-03A2	N.C.R.	N.C.R.

SGS Taiwan LTD. Electronics & Communication Laboratory  
 No.2, Keji 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)  
 Measurement Uncertainty of Radiated Emission  
 Expanded uncertainty of radiated emission is 4.09 dB. (30MHz ~ 1000MHz)

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## Above 1GHz

SGS Radiated_Above_1GHz HWAYA 966A EMC					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
Spectrum Analyzer	R&S	FSV 40	101419	2017/3/1	2018/2/28
EMI Test Receiver	R&S	ESR 7	101459	2017/2/17	2018/2/16
Horn Antenna	SCHWARZBECK	BBHA9120D	BBHA9120D67 3	2016/10/14	2017/10/13
Pre Amplifier	EMC Instruments Corp.	EMC012645B	980216	2017/4/25	2018/4/24
Coaxial Cable	JUNFLOW	MWX221-NMSNMS	J0778929	2017/4/23	2018/4/22
Coaxial Cable	Huber+Suhner	SUCOFLEX 104PEA	30255/4PEA	2017/4/23	2018/4/22
Coaxial Cable	EMC Instruments	EMC104-SM-SM	140927	2017/4/23	2018/4/22
Coaxial Cable	Huber+Suhner	SUCOFLEX 102	MY 2152/2	2017/6/5	2018/6/4
Coaxial Cable	Huber+Suhner	SUCOFLEX 102	MY 2153/2	2017/6/5	2018/6/4
Universal Digital Radio Communication Tester	R&S	CMU 200	122498	2016/11/9	2017/11/8
Wideband Radio Communication Tester	R&S	CMW 500	152303	2017/2/23	2018/2/22
Controller	MF	MF-7802	N.C.R.	N.C.R.	N.C.R.
Antenna Master	MF	N/A	N/A	N.C.R.	N.C.R.
Turn Table	MF	N/A	N/A	N.C.R.	N.C.R.
Site VSWR	SGS	966 Chamber A	SAC-A	2017/1/12	2018/1/11
Test S/W	Farad	EZ-EMC	Ver. SGS-03A2	N.C.R.	N.C.R.

SGS Taiwan LTD. Electronics & Communication Laboratory  
 No.2, Keji 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)  
 Measurement Uncertainty of Radiated Emission  
 Expanded uncertainty (k=2) of radiated emission measurement is 5.05 dB. (1-6GHz)  
 Expanded uncertainty (k=2) of radiated emission measurement is 5.07 dB. (6-18GHz)

## 2.5.2 Operating Environment

Temperature : 25 degree C

Humidity : 65 %RH

Atmospheric Pressure : 996 mBar

## 2.5.3 Measurement Level Calculation

Correction Factor = Antenna Factor + Cable loss- Amplifier Gain

Measurement Level = Reading Level + Correction Factor

Over (Margin) = Measurement Level – Limit

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2.5.4 Measurement Data

Below 1GHz

Config\_1\_H

Site: SGS 10m Chamber  
 Limit: CISPR22 Class B 10M Radiation  
 Mode: Config\_1  
 Note: LTE B1 Link

Polarization: *Horizontal*  
 Power: AC 120V/60Hz  
 Distance:

Temperature: 25 °C  
 Humidity: 65 %

Radiated Emission



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measurement dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		51.2000	26.49	-11.19	15.30	30.00	-14.70	QP	
2		180.1000	27.81	-12.31	15.50	30.00	-14.50	QP	
3		795.5300	25.93	-0.23	25.70	37.00	-11.30	QP	
4		853.7700	25.26	0.14	25.40	37.00	-11.60	QP	
5		913.9900	25.19	0.91	26.10	37.00	-10.90	QP	
6 *		966.2900	25.23	1.67	26.90	37.00	-10.10	QP	

\*:Maximum data x:Over limit !:over margin

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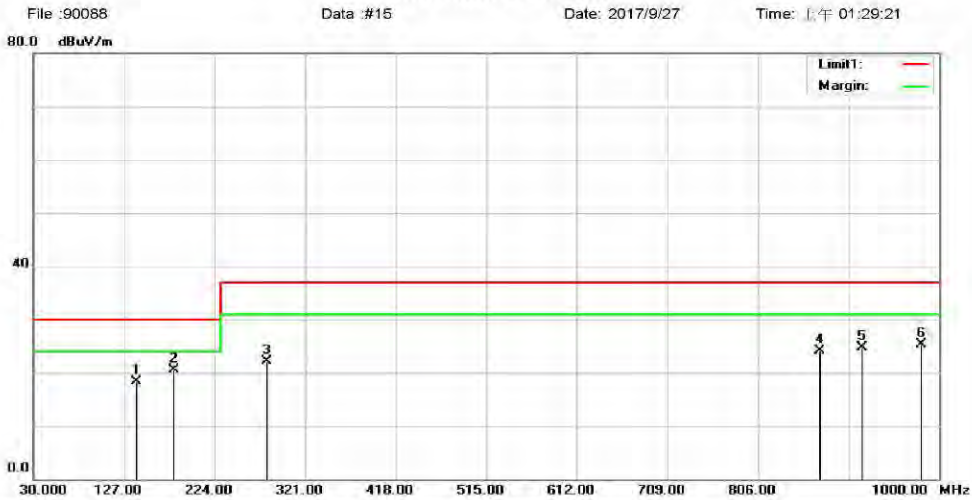




### Config\_1\_V

Site: SGS 10m Chamber      Polarization: **Vertical**      Temperature: 25 °C  
 Limit: CISPR22 Class B 10M Radiation      Power: AC 120V/60Hz      Humidity: 65 %  
 Mode: Config\_1      Distance:  
 Note: LTE B1 Link

### Radiated Emission



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		140.0500	29.80	-11.50	18.30	30.00	-11.70	QP	
2	*	180.0900	33.01	-12.51	20.50	30.00	-9.50	QP	
3		280.1400	32.90	-10.70	22.20	37.00	-14.80	QP	
4		872.7900	23.84	0.36	24.20	37.00	-12.80	QP	
5		916.8400	23.80	0.90	24.70	37.00	-12.30	QP	
6		980.0100	23.90	1.40	25.30	37.00	-11.70	QP	

\*:Maximum data    x:Over limit    !:over margin

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## Config\_2\_H

Site: SGS 10m Chamber

Polarization: *Horizontal*

Temperature: 25 °C

Limit: CISPR22 Class B 10M Radiation

Power: From System

Humidity: 65 %

Mode: Config\_2

Distance:

Note: SD Card Read

### Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		
1		65.1500	33.98	-12.88	21.10	30.00	-8.90	QP	
2	*	221.2900	36.45	-14.25	22.20	30.00	-7.80	QP	
3		266.4800	36.24	-11.34	24.90	37.00	-12.10	QP	
4		720.4400	26.95	-1.15	25.80	37.00	-11.20	QP	
5		935.2500	25.13	1.37	26.50	37.00	-10.50	QP	
6		994.5000	25.09	1.61	26.70	37.00	-10.30	QP	

\*:Maximum data x:Over limit !:over margin

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### Config\_2\_V

Site: SGS 10m Chamber      Polarization: **Vertical**      Temperature: 25 °C  
 Limit: CISPR22 Class B 10M Radiation      Power: From System      Humidity: 65 %  
 Mode: Config\_2      Distance:  
 Note: SD Card Read

### Radiated Emission



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measurement dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	152.2400	31.27	-10.97	20.30	30.00	-9.70	QP	
2		514.1100	25.29	-5.09	20.20	37.00	-16.80	QP	
3		608.7700	24.65	-3.05	21.60	37.00	-15.40	QP	
4		701.7300	24.86	-1.46	23.40	37.00	-13.60	QP	
5		915.4900	23.80	0.90	24.70	37.00	-12.30	QP	
6		994.3200	23.96	1.54	25.50	37.00	-11.50	QP	

\*:Maximum data    x:Over limit    !:over margin

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### Config\_3\_H

Site: SGS 10m Chamber

Polarization: *Horizontal*

Temperature: 25 °C

Limit: CISPR22 Class B 10M Radiation

Power: AC 120V/60Hz

Humidity: 65 %

Mode: Config\_3

Distance:

Note: Play MP3

### Radiated Emission



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		52.9500	25.84	-11.34	14.50	30.00	-15.50	QP	
2		161.7400	26.10	-11.20	14.90	30.00	-15.10	QP	
3		826.5300	25.14	-0.04	25.10	37.00	-11.90	QP	
4		912.4800	25.23	0.87	26.10	37.00	-10.90	QP	
5	*	965.8300	25.14	1.66	26.80	37.00	-10.20	QP	
6		996.9100	24.80	1.60	26.40	37.00	-10.60	QP	

\*:Maximum data    x:Over limit    !:over margin

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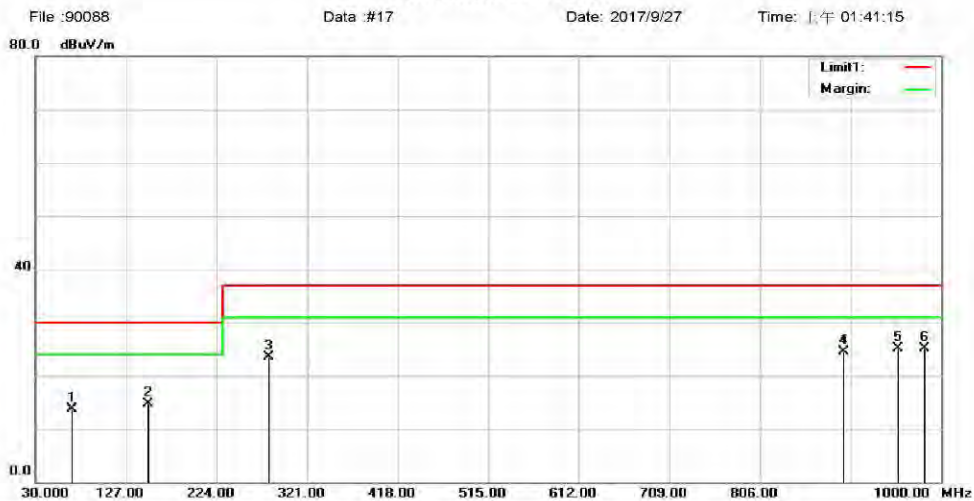
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### Config\_3\_V

Site: SGS 10m Chamber	Polarization: <b>Vertical</b>	Temperature: 25 °C
Limit: CISPR22 Class B 10M Radiation	Power: AC 120V/60Hz	Humidity: 65 %
Mode: Config_3	Distance:	
Note: Play MP3		

### Radiated Emission



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		68.6000	27.09	-13.39	13.70	30.00	-16.30	QP	
2		151.0000	25.73	-10.93	14.80	30.00	-15.20	QP	
3		280.0800	34.20	-10.70	23.50	37.00	-13.50	QP	
4		894.4500	23.79	0.71	24.50	37.00	-12.50	QP	
5		953.3600	23.96	1.14	25.10	37.00	-11.90	QP	
6 *		982.3400	23.78	1.42	25.20	37.00	-11.80	QP	

\*:Maximum data    x:Over limit    !:over margin

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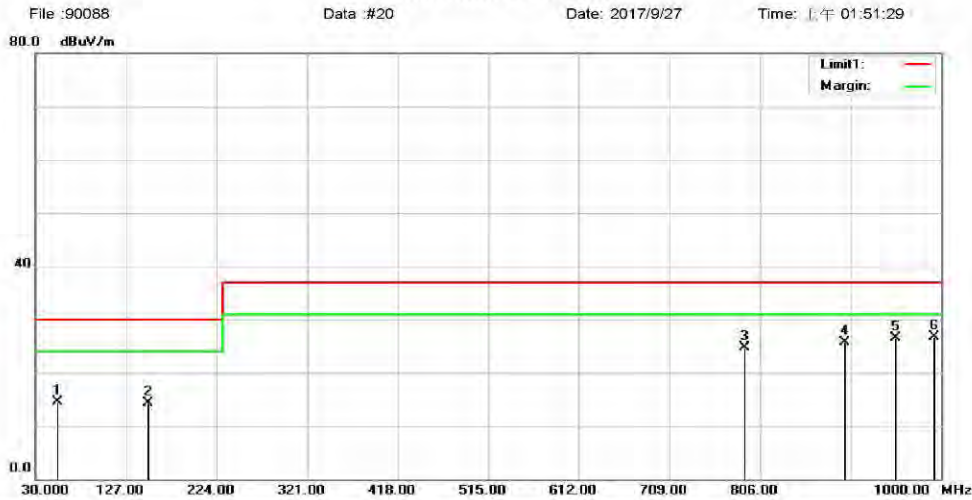




### Config\_4\_H

Site: SGS 10m Chamber	Polarization: <i>Horizontal</i>	Temperature: 25 °C
Limit: CISPR22 Class B 10M Radiation	Power: AC 120V/60Hz	Humidity: 65 %
Mode: Config_4	Distance:	
Note: Cradle Charger+Play MP3		

### Radiated Emission



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		53.8700	26.01	-11.41	14.60	30.00	-15.40	QP	
2		150.0200	26.00	-11.60	14.40	30.00	-15.60	QP	
3		789.3100	24.96	-0.26	24.70	37.00	-12.30	QP	
4		896.3900	25.24	0.56	25.80	37.00	-11.20	QP	
5		951.0300	24.90	1.70	26.60	37.00	-10.40	QP	
6 *		993.0100	25.08	1.62	26.70	37.00	-10.30	QP	

\*:Maximum data    x:Over limit    !:over margin

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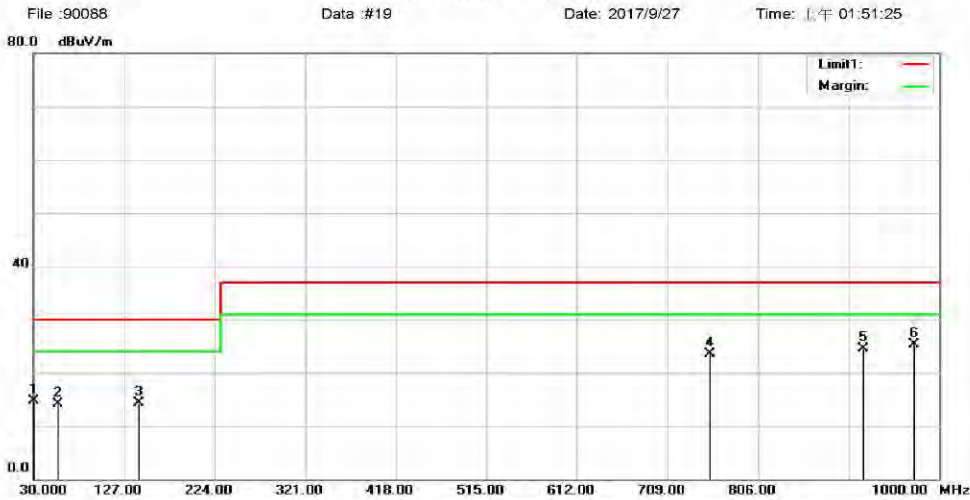
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### Config\_4\_V

Site: SGS 10m Chamber      Polarization: **Vertical**      Temperature: 25 °C  
 Limit: CISPR22 Class B 10M Radiation      Power: AC 120V/60Hz      Humidity: 65 %  
 Mode: Config\_4      Distance:  
 Note: Cradle Charger+Play MP3

### Radiated Emission



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		30.6000	27.23	-12.43	14.80	30.00	-15.20	QP	
2		55.9900	25.38	-11.18	14.20	30.00	-15.80	QP	
3		142.3600	25.75	-11.35	14.40	30.00	-15.60	QP	
4		754.3900	23.69	-0.19	23.50	37.00	-13.50	QP	
5		918.3800	23.69	0.91	24.60	37.00	-12.40	QP	
6	*	972.6000	23.97	1.33	25.30	37.00	-11.70	QP	

\*:Maximum data    x:Over limit    !:over margin

File :90088\Data #19

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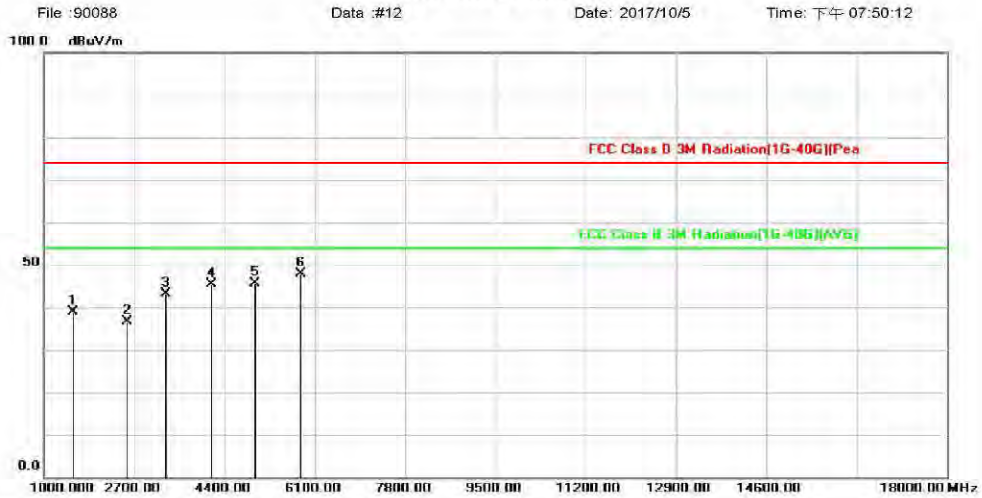


Above 1GHz

Config\_1\_H

Site: SGS 966 Chamber A      Polarization: **Horizontal**      Temperature: 21 °C  
 Limit: FCC Class B 3M Radiation(1G-40G)(Pea      Power: AC 120V/60Hz      Humidity: 84 %  
 Mode: Config\_1      Distance:  
 Note:

Radiated Emission



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		1544.000	55.44	-16.60	38.84	74.00	-35.16	peak	
2		2581.000	50.59	-13.92	36.67	74.00	-37.33	peak	
3		3295.000	55.84	-12.76	43.08	74.00	-30.92	peak	
4		4162.000	56.37	-10.94	45.43	74.00	-28.57	peak	
5		4978.000	54.28	-8.57	45.71	74.00	-28.29	peak	
6	*	5828.000	55.16	-7.31	47.85	74.00	-26.15	peak	

\*:Maximum data    x:Over limit    !:over margin

File :90088\Data #12

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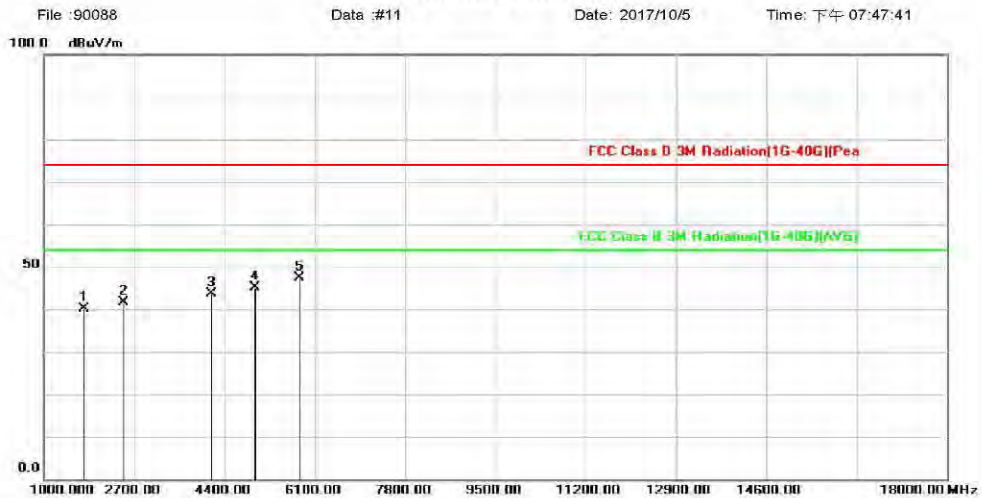
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### Config\_1\_V

Site: SGS 966 Chamber A      Polarization: **Vertical**      Temperature: 21 °C  
 Limit: FCC Class B 3M Radiation(1G-40G)(Pea)      Power: AC 120V/60Hz      Humidity: 84 %  
 Mode: Config\_1      Distance:  
 Note:

### Radiated Emission



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		1748.000	56.37	-16.15	40.22	74.00	-33.78	peak	
2		2513.000	55.82	-14.07	41.75	74.00	-32.25	peak	
3		4162.000	54.61	-10.94	43.67	74.00	-30.33	peak	
4		4978.000	53.75	-8.57	45.18	74.00	-28.82	peak	
5 *		5811.000	54.66	-7.34	47.32	74.00	-26.68	peak	

\*:Maximum data    x:Over limit    !:over margin

File : 90088\Data : #11

Page: 1

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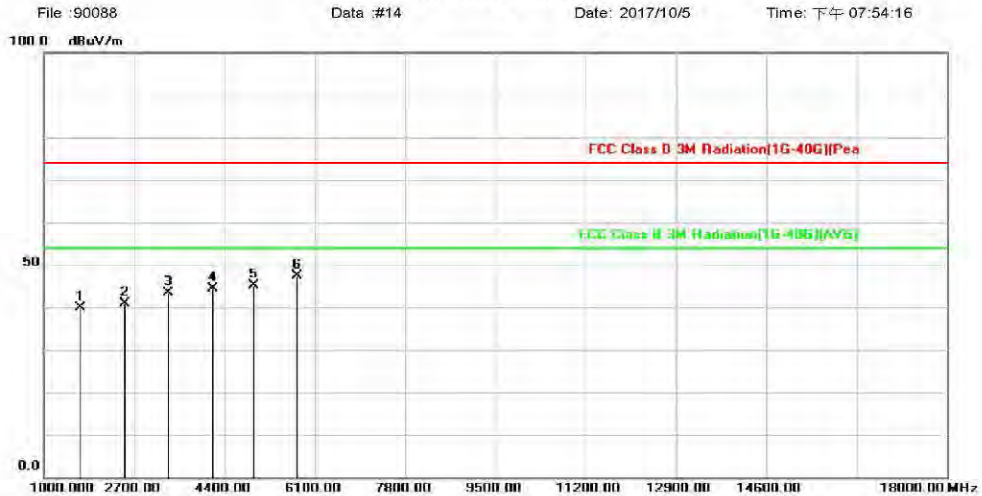




### Config\_2\_H

Site: SGS 966 Chamber A      Polarization: **Horizontal**      Temperature: 21 °C  
 Limit: FCC Class B 3M Radiation(1G-40G)(Pea)      Power: AC 120V/60Hz      Humidity: 84 %  
 Mode: Config\_2      Distance:

### Radiated Emission



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measurement dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		1680.000	56.15	-16.30	39.85	74.00	-34.15	peak	
2		2530.000	54.89	-14.03	40.86	74.00	-33.14	peak	
3		3346.000	56.10	-12.72	43.38	74.00	-30.62	peak	
4		4179.000	55.24	-10.91	44.33	74.00	-29.67	peak	
5		4944.000	53.76	-8.69	45.07	74.00	-28.93	peak	
6	*	5760.000	54.81	-7.44	47.37	74.00	-26.63	peak	

\*:Maximum data    x:Over limit    !:over margin

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Page: 1

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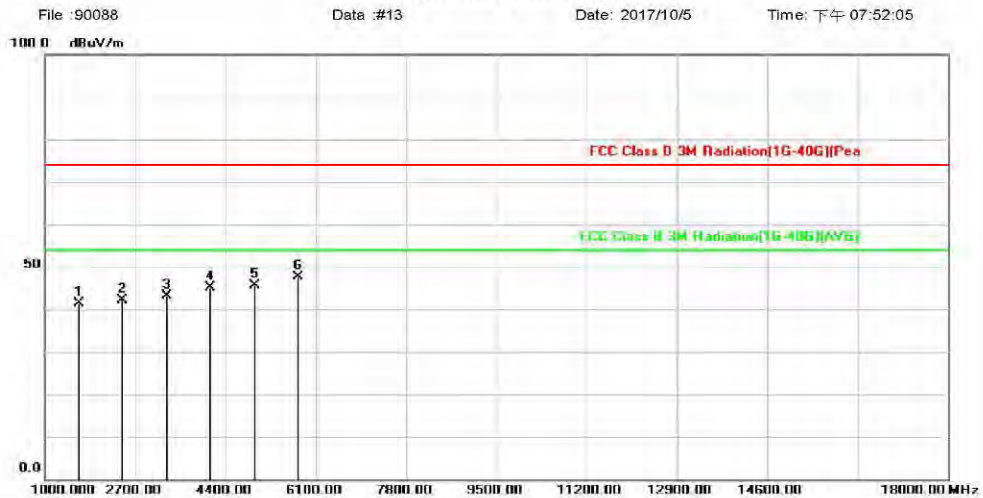
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### Config\_2\_V

Site: SGS 966 Chamber A      Polarization: **Vertical**      Temperature: 21 °C  
 Limit: FCC Class B 3M Radiation(1G-40G)(Pea)      Power: AC 120V/60Hz      Humidity: 84 %  
 Mode: Config\_2      Distance:

### Radiated Emission



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measurement dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		1646.000	57.81	-16.38	41.43	74.00	-32.57	peak	
2		2462.000	56.43	-14.21	42.22	74.00	-31.78	peak	
3		3295.000	55.92	-12.76	43.16	74.00	-30.84	peak	
4		4111.000	56.13	-11.05	45.08	74.00	-28.92	peak	
5		4944.000	54.22	-8.69	45.53	74.00	-28.47	peak	
6	*	5760.000	55.07	-7.44	47.63	74.00	-26.37	peak	

\*:Maximum data    x:Over limit    !:over margin

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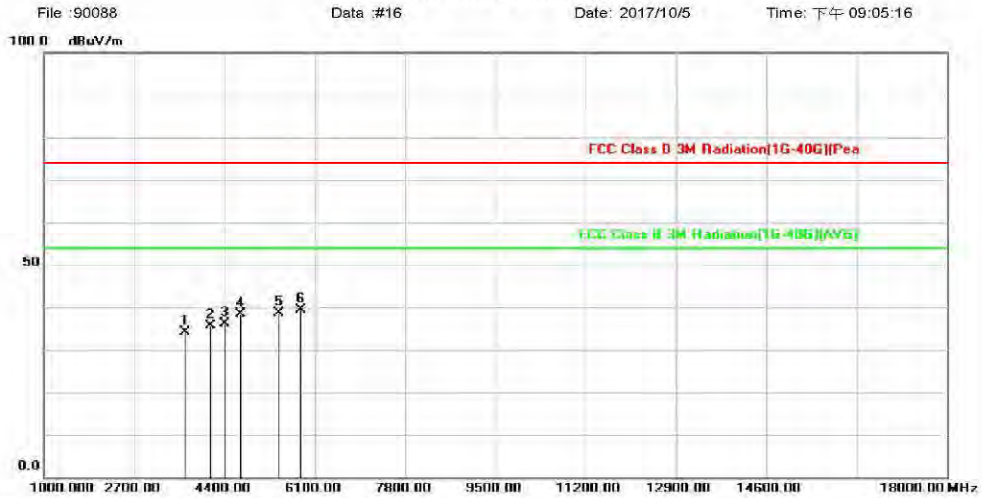
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### Config\_3\_H

Site: SGS 966 Chamber A      Polarization: **Horizontal**      Temperature: 21 °C  
 Limit: FCC Class B 3M Radiation(1G-40G)(Pea      Power: AC 120V/60Hz      Humidity: 84 %  
 Mode: Config\_3      Distance:  
 Note:

### Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		
1		3669.000	46.27	-12.16	34.11	74.00	-39.89	peak	
2		4145.000	46.67	-10.98	35.69	74.00	-38.31	peak	
3		4400.000	46.44	-10.42	36.02	74.00	-37.98	peak	
4		4706.000	47.83	-9.50	38.33	74.00	-35.67	peak	
5		5420.000	46.56	-7.99	38.57	74.00	-35.43	peak	
6	*	5845.000	46.75	-7.28	39.47	74.00	-34.53	peak	

\*:Maximum data    x:Over limit    !:over margin

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### Config\_3\_V

Site: SGS 966 Chamber A      Polarization: **Vertical**      Temperature: 21 °C  
 Limit: FCC Class B 3M Radiation(1G-40G)(Pea      Power: AC 120V/60Hz      Humidity: 84 %  
 Mode: Config\_3      Distance:  
 Note:

### Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		
1		2683.000	47.99	-13.69	34.30	74.00	-39.70	peak	
2		3125.000	47.32	-12.89	34.43	74.00	-39.57	peak	
3		4298.000	47.19	-10.64	36.55	74.00	-37.45	peak	
4		4825.000	47.42	-9.10	38.32	74.00	-35.68	peak	
5		5454.000	47.06	-7.96	39.10	74.00	-34.90	peak	
6	*	5794.000	47.41	-7.37	40.04	74.00	-33.96	peak	

\*:Maximum data    x:Over limit    !:over margin

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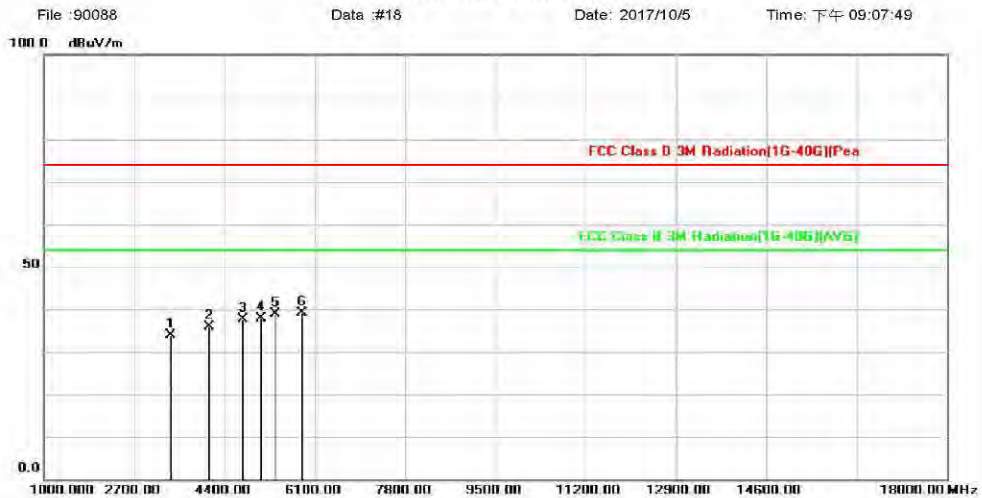




### Config\_4\_H

Site: SGS 966 Chamber A      Polarization: **Horizontal**      Temperature: 21 °C  
 Limit: FCC Class B 3M Radiation(1G-40G)(Pea)      Power: AC 120V/60Hz      Humidity: 84 %  
 Mode: Config\_4      Distance:  
 Note:

### Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		
1		3397.000	46.45	-12.68	33.77	74.00	-40.23	peak	
2		4111.000	46.81	-11.05	35.76	74.00	-38.24	peak	
3		4740.000	46.95	-9.38	37.57	74.00	-36.43	peak	
4		5080.000	46.26	-8.41	37.85	74.00	-36.15	peak	
5		5352.000	46.85	-8.08	38.77	74.00	-35.23	peak	
6	*	5862.000	46.44	-7.25	39.19	74.00	-34.81	peak	

\*:Maximum data    x:Over limit    !:over margin

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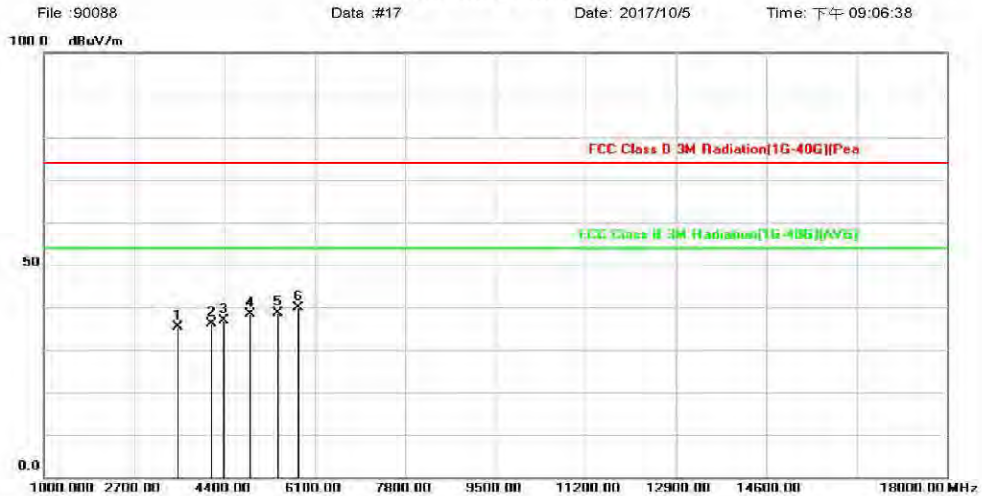
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### Config\_4\_V

Site: SGS 966 Chamber A      Polarization: **Vertical**      Temperature: 21 °C  
 Limit: FCC Class B 3M Radiation(1G-40G)(Pea)      Power: AC 120V/60Hz      Humidity: 84 %  
 Mode: Config\_4      Distance:

### Radiated Emission



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measurement dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		3533.000	47.80	-12.52	35.28	74.00	-38.72	peak	
2		4162.000	47.07	-10.94	36.13	74.00	-37.87	peak	
3		4383.000	47.32	-10.46	36.86	74.00	-37.14	peak	
4		4876.000	47.20	-8.91	38.29	74.00	-35.71	peak	
5		5403.000	46.63	-8.02	38.61	74.00	-35.39	peak	
6	*	5794.000	47.22	-7.37	39.85	74.00	-34.15	peak	

\*:Maximum data    x:Over limit    !:over margin

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