



FCC CERTIFICATION REPORT

Test Report No. : MH/2018/B0213

Applicant : Sharp Corporation, Mobile Communication B.U.

Address : 2-13-1, Hachihonmatsu-lida, Higashi-hiroshima-shi, Hiroshima
739-0192, Japan

Manufacturer : Sharp Corporation

Address : 1 Takumi-cho, Sakai-ku, Sakai-Shi, Osaka 590-8522, Japan

Equipment Under Test (EUT) :

Product Name : Cellular Phone

Standards : FCC Part 15, Subpart B, Class B

FCC Designation Numbers : 916890 / TW1087

Date of Receipt : Nov. 22, 2018

Date of Test : Nov. 22 ~ Dec. 05, 2018

Date of Issue : Dec. 19, 2018

Test Result :	PASS
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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.

The conformity assessment statement in this report is based solely on the test results, measurement uncertainty is excluded.

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Tested By:

Lowka Chen

Date

Dec. 19, 2018

Lowka Chen (Engineer)

Approved By

Eddy Cheng

Date

Dec. 19, 2018

Eddy Cheng (Asst. Supervisor)



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Revision History

Report Number	Revision	Description	Issue Date
MH/2018/B0213	Rev.00	Initial creation of document	Dec. 19, 2018

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1. General Information

1.1 Applicant & Manufacturer Information

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Manufacturer : Sharp Corporation
Address of Manufacturer : 1 Takumi-cho, Sakai-ku, Sakai-Shi, Osaka 590-8522, Japan

1.2 General Description of EUT

Product Name : Cellular Phone

1.3 Details of EUT

Power Supply : AC 100~240V, 50/60Hz
Highest operate description : 2480 MHz
Battery : 3.8V, 1680mAh, 6.38Wh
Cradle : Model No.: A
Supplier : A
Worst case : CE, Above RE worst case : Config 1
Below RE worst case : Config 3

FCC ID : APYHRO00269	DDR	PCB	(Select which one is worst case)
Type~A	Main Source	Main Source	V
Type~B	2 nd source-1	Main Source	V
Type~C	2 nd source-2	2 nd source	Worst case

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Accessories List: AC Charger : Salom/XN-2QC25 Data Cable : L6KU2001-CS-H PHF : Sony / MDR-EX15AP Conversion plug : n/a / SHX11QVA Cradle(In Box) : A	Config 1	Config 2	Config 3	Config 4
Applicable standard	FCC 15B			
Accessories	EUT + AC Adaptor +USB Cable	EUT +USB Cable	EUT + Conversion plug +PHF	EUT +USB Cable + Cradle +Adapter
Main function	Speech	Data Link	Camera	Charging
Additional function	BT+WiFi +GPS			
Description				
radiated emission	GSM 1900 WCDMA BII LTE B02	Data R/W	MP4/ ;REC mode ;play REC	Charging
conducted emission (DC Power)	NA	NA	NA	NA
conducted emission (AC Power)	GSM 1900 WCDMA BII LTE B02	Data R/W	NA	Charging

1.4 Operation Procedure

Config 1

1. Let EUT plug in SD Card & SIM Card, connect to Adapter with USB cable and turn it on.
2. Execute 1k source.
3. NB & EUT with Link AP-WiFi (2.4G), NB execute ping EUT IP.
4. Turn on BT function and connect to the Bluetooth speaker.
5. Set up base station, set channel (GSM 1900, WCDMA B2, LTE B2) and transfer data.
6. Set up GPS simulator and turn on GPS test app.
7. Start the test.

Config 2

1. Let EUT plug in SD Card & SIM Card, connect to NB_1 with USB cable.
2. Execute 1k source.
3. NB_2 & EUT with Link AP-WiFi Worst (2.4G), NB execute ping EUT IP.
4. Turn on BT function and connect to the Bluetooth speaker.
5. Set up GPS simulator and turn on GPS test app.
6. Execute Data Read/Write in NB_1 with EUT.
7. Start the test.

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**Config 3**

1. Let EUT plug in SD Card & SIM Card.
2. Let EUT connect to USB to Audio Cable, headphones, and execute 1k audio source.
3. NB_2 & EUT with Link AP-WiFi Worst (2.4G), NB execute ping EUT IP.
4. Turn on BT function and connect to the Bluetooth speaker.
5. Set up GPS simulator and turn on GPS test app.
6. Turn on the CAMERA function, test the recording function and play the video file.
7. Start the test.

Config 4

1. Let Cradle connect to Adapter with USB cable.
2. Let EUT plug in SD Card & SIM Card and turn it on.
3. Turn on BT function and connect to the Bluetooth speaker.
4. Turn on WiFi function and connect with NB_2 WiFi-AP, ping EUT IP Address.
5. Set up GPS simulator and turn on GPS test app.
6. Place EUT on Cradle to charge
7. Start the test.

1.5 Description of Support Units

PRODUCT	MANUFACTURER	MODEL NO.	SERIAL NO.
SIM Card	R&S	CMW-Z05	8952530076180138474
Micro SD	Transcend	SDHC (Class 4)	N/A
BT Speaker	Creative	MF8090	YFMF8090245R00855Y
Radio Communication Analyzer	R&S	CMU200	102189
Radio Communication Analyzer	R&S	CMW500	1201.002K50-152303-Zr
AP	BUFFALO	WZR-HP-G300NH2	44066221202559[[G]]
GPS Signal Generator	Spectracom	GSG53 GNSS4	200218
Mouse	Logitech	M-U0026	1738HS05FH98
Notebook (RE, HRE)	DELL	Latitude E5430	COVZYW1
Notebook (CE)	DELL	P56F	59WSJ72
Earphone	SONY	MDR-EX15AP	N/A
Adapter	Salom	XN-2QC25	N/A

Support Equipment Used in Tested Cable

Cable Type	Core	Length	Shielding/Non-shielding
USB Cable	N/A	1.8m	Shielding

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1.6 Modification List

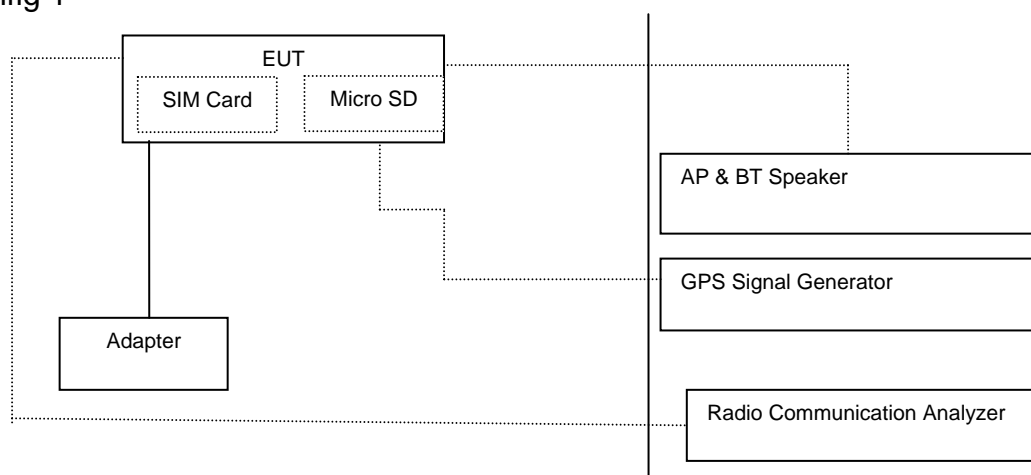
No modification was made by SGS Taiwan Electronics & Communication Laboratory.

1.7 Accessories Cable List

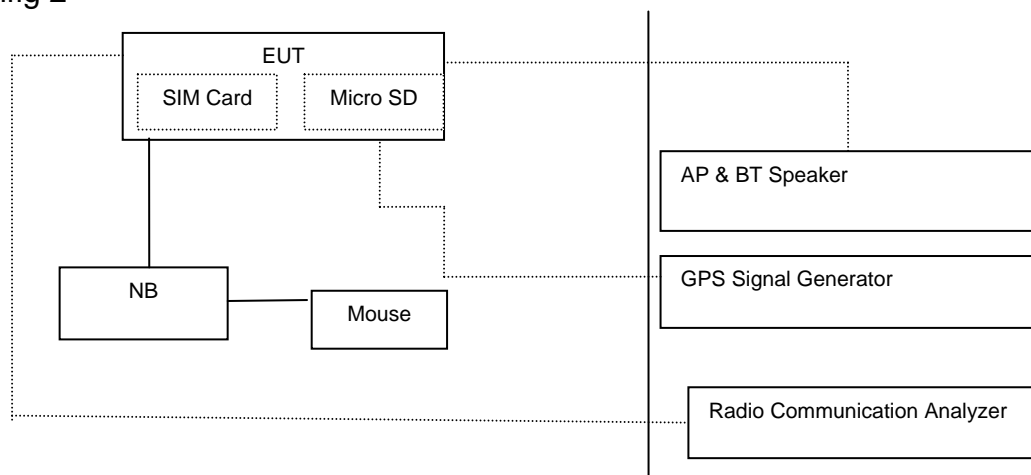
Cable Type	Core	Length	Shielding/Non-shielding
USB Cable	N/A	1m	Shielding
Earphone Cable	N/A	1.25m	Non-shielding

1.8 Test Set-Up Configuration

Config 1



Config 2

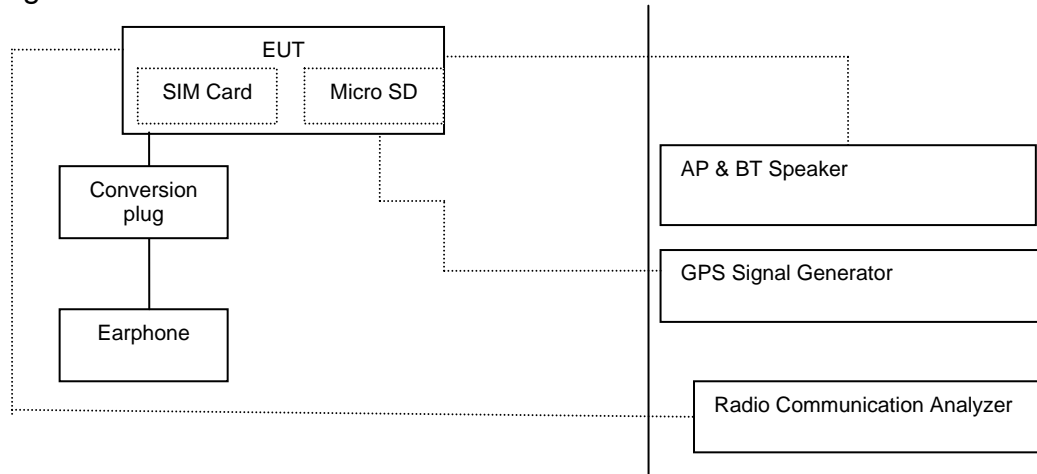


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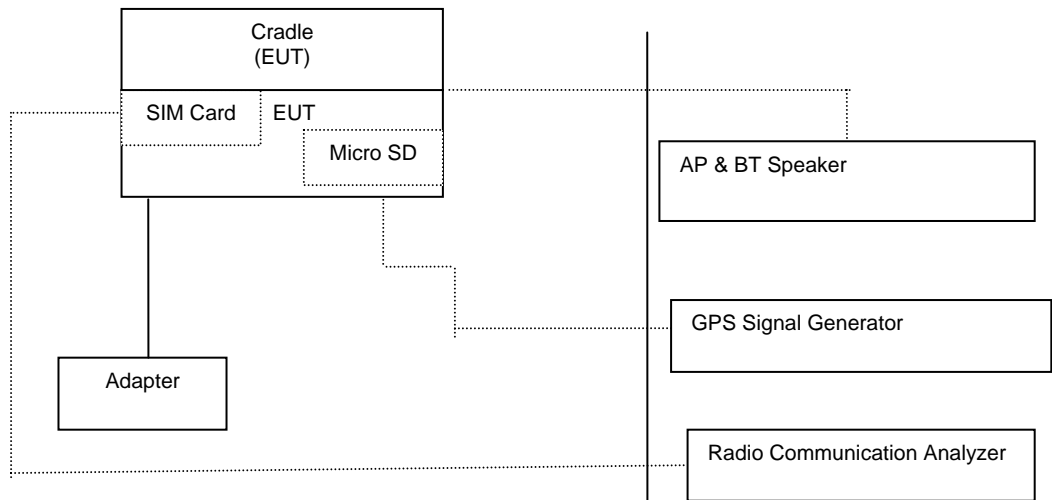
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Config 3



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

Highest Emission					
Standard	Test Type	Result	Phase/Pol.	Frequency(MHz)	Margin(dB)
FCC Part 15 Subpart B Class B	Conducted Emission	PASS	Line	0.2060	-12.59 (QP)
			Neutral	0.1540	-18.16 (QP)
	Radiated Emission	PASS	Hor.	250.9960	-2.70 (QP)

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2. EMISSION

2.1 Test Results

	Results
Conducted Emission	Pass
Radiated Emission	Pass

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	101342	2018/1/31	2019/1/30
Coaxial Cables	EMC Instruments Corp	EMCRG58-BM-BM-3000	160812	2018/8/12	2019/8/11
LISN	Schwarzbeck	NSLK 8127	8127-648	2018/7/9	2019/7/8
Pulse Limiter	Narda S.T.S.	PMM PL01	1110X30602	2018/8/12	2019/8/11
LISN	Schwarzbeck	NSLK 8128	NSLK8128-300	2018/9/3	2019/9/2
Universal Digital Radio Communication Tester	R&S	CMU 200	119988	2018/2/22	2019/2/21
Wideband Radio Communication Tester	R&S	CMW 500	152303	2018/2/21	2019/2/20
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 Ulab(K=2) of conducted emission is 2.25 dB
 Theory values uncertainty Ucispr 16-4-2 :2011+A1_2014 (K=2) of AC mains conducted Emission is 3.44dB

2.4.2 Operating Environment

Temperature : 20 degree C

Humidity : 65 %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:

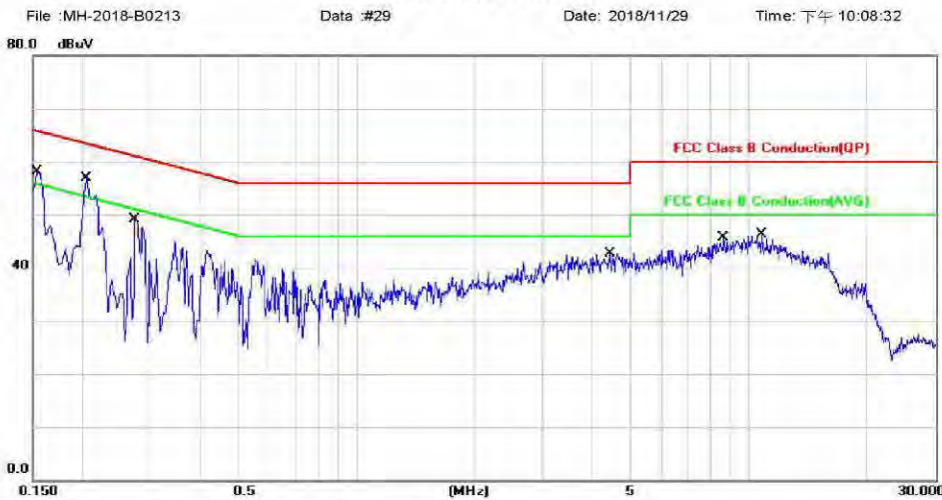
Config_1_L

Site : Conduction Room A
 Limit: FCC Class B Conduction(QP)
 Mode: Config_1
 Note: Type-C (6643418) : LTE B02

Phase: **L1**
 Power: AC 120V/60Hz

Temperature: 20 °C
 Humidity: 65 %

Conducted Emission



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1540	51.94	0.04	51.98	65.78	-13.80	QP	
2		0.1540	27.12	0.04	27.16	55.78	-28.62	AVG	
3 *		0.2060	50.75	0.03	50.78	63.37	-12.59	QP	
4		0.2060	35.36	0.03	35.39	53.37	-17.98	AVG	
5		0.2740	43.47	0.05	43.52	61.00	-17.48	QP	
6		0.2740	26.42	0.05	26.47	51.00	-24.53	AVG	
7		4.4340	35.39	0.32	35.71	56.00	-20.29	QP	
8		4.4340	26.72	0.32	27.04	46.00	-18.96	AVG	
9		8.6500	35.76	0.43	36.19	60.00	-23.81	QP	
10		8.6500	26.65	0.43	27.08	50.00	-22.92	AVG	
11		10.8020	36.37	0.49	36.86	60.00	-23.14	QP	
12		10.8020	26.75	0.49	27.24	50.00	-22.76	AVG	

*:Maximum data x:Over limit l:over margin

File :MH-2018-B0213\Data :#29

Page: 1

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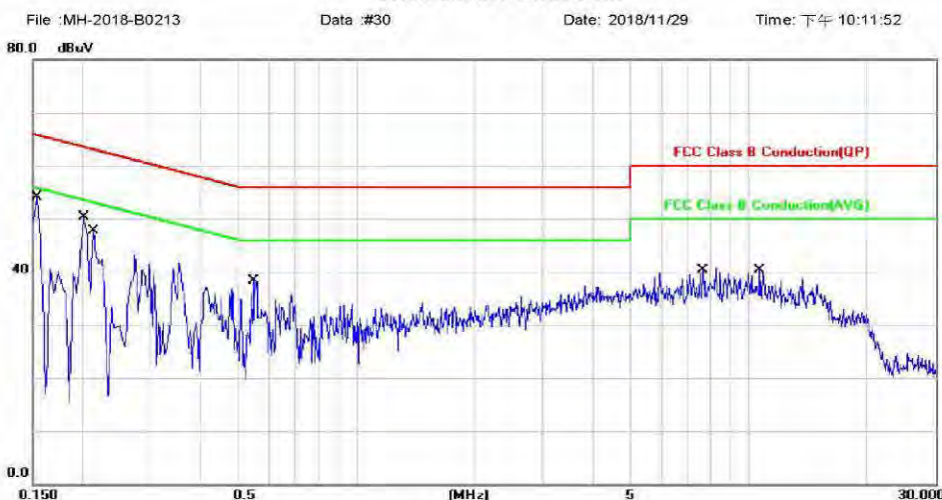
Config_1_N

Site : Conduction Room A
 Limit: FCC Class B Conduction(QP)
 Mode: Config_1
 Note: Type-C (6643418) : LTE B02

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

Temperature: 20 °C
 Humidity: 65 %

Conducted Emission



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over		
		MHz	Level	Factor	ment			Detector	Comment
			dBuV	dB	dBuV	dBuV	dB		
1	*	0.1540	47.58	0.04	47.62	65.78	-18.16	QP	
2		0.1540	22.75	0.04	22.79	55.78	-32.99	AVG	
3		0.2020	33.77	0.04	33.81	63.53	-29.72	QP	
4		0.2020	20.35	0.04	20.39	53.53	-33.14	AVG	
5		0.2140	32.79	0.04	32.83	63.05	-30.22	QP	
6		0.2140	22.19	0.04	22.23	53.05	-30.82	AVG	
7		0.5500	29.09	0.15	29.24	56.00	-26.76	QP	
8		0.5500	20.86	0.15	21.01	46.00	-24.99	AVG	
9		7.6700	33.49	0.36	33.85	60.00	-26.15	QP	
10		7.6700	25.38	0.36	25.74	50.00	-24.26	AVG	
11		10.6900	31.84	0.42	32.26	60.00	-27.74	QP	
12		10.6900	24.01	0.42	24.43	50.00	-25.57	AVG	

*:Maximum data x:Over limit l:over margin

File : MH-2018-B0213\Data : #30

Page: 1

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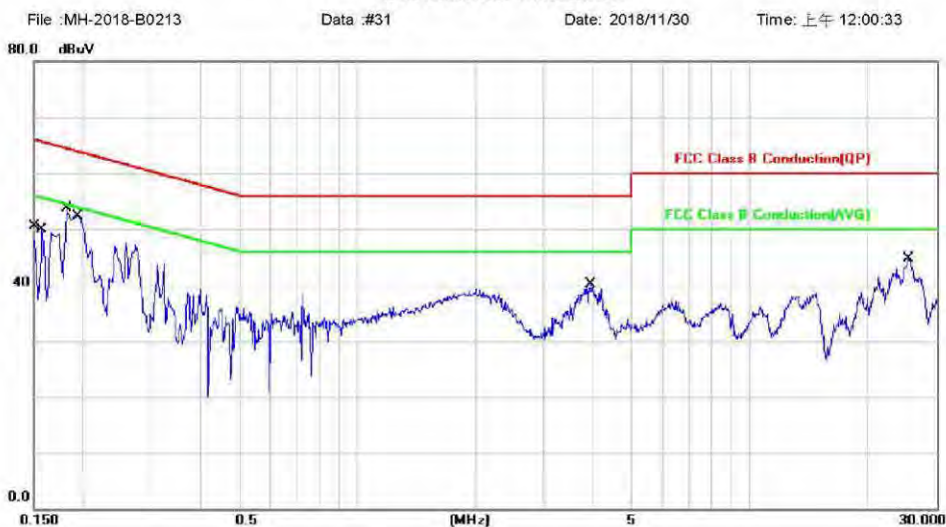
Config_2_L

Site : Conduction Room A
 Limit: FCC Class B Conduction(QP)
 Mode: Config_2
 Note: Type-C (6643418) ; Data Write

Phase: L1
 Power: From System

Temperature: 20 °C
 Humidity: 65 %

Conducted Emission



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over		
		MHz	Level	Factor	ment			Detector	Comment
			dBuV	dB	dBuV	dBuV	dB		
1		0.1500	44.14	0.04	44.18	66.00	-21.82	QP	
2		0.1500	24.44	0.04	24.48	56.00	-31.52	AVG	
3		0.1580	42.78	0.04	42.82	65.57	-22.75	QP	
4		0.1580	24.31	0.04	24.35	55.57	-31.22	AVG	
5 *		0.1820	50.78	0.03	50.81	64.39	-13.58	QP	
6		0.1820	34.43	0.03	34.46	54.39	-19.93	AVG	
7		0.1940	49.87	0.03	49.90	63.86	-13.96	QP	
8		0.1940	37.40	0.03	37.43	53.86	-16.43	AVG	
9		3.9340	35.11	0.31	35.42	56.00	-20.58	QP	
10		3.9340	26.47	0.31	26.78	46.00	-19.22	AVG	
11		25.3620	39.40	1.13	40.53	60.00	-19.47	QP	
12		25.3620	34.11	1.13	35.24	50.00	-14.76	AVG	

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

File : MH-2018-B0213\Data : #31

Page: 1

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Config_2_N

Site : Conduction Room A
Limit: FCC Class B Conduction(QP)
Mode: Config_2
Note: Type-C (6643418) : Data Write

Phase: **N**
Power: From System

Temperature: 20 °C
Humidity: 65 %

Conducted Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV	dBuV	dB		
1		0.1540	43.42	0.04	43.46	65.78	-22.32	QP	
2		0.1540	25.01	0.04	25.05	55.78	-30.73	AVG	
3		0.1620	41.91	0.04	41.95	65.36	-23.41	QP	
4		0.1620	24.15	0.04	24.19	55.36	-31.17	AVG	
5 *		0.1820	50.17	0.04	50.21	64.39	-14.18	QP	
6		0.1820	32.23	0.04	32.27	54.39	-22.12	AVG	
7		2.7260	32.58	0.28	32.86	56.00	-23.14	QP	
8		2.7260	23.57	0.28	23.85	46.00	-22.15	AVG	
9		14.8300	38.16	0.50	38.66	60.00	-21.34	QP	
10		14.8300	31.99	0.50	32.49	50.00	-17.51	AVG	
11		25.8100	32.95	0.82	33.77	60.00	-26.23	QP	
12		25.8100	27.27	0.82	28.09	50.00	-21.91	AVG	

*:Maximum data x:Over limit l:over margin

File : MH-2018-B0213\Data : #32

Page: 1

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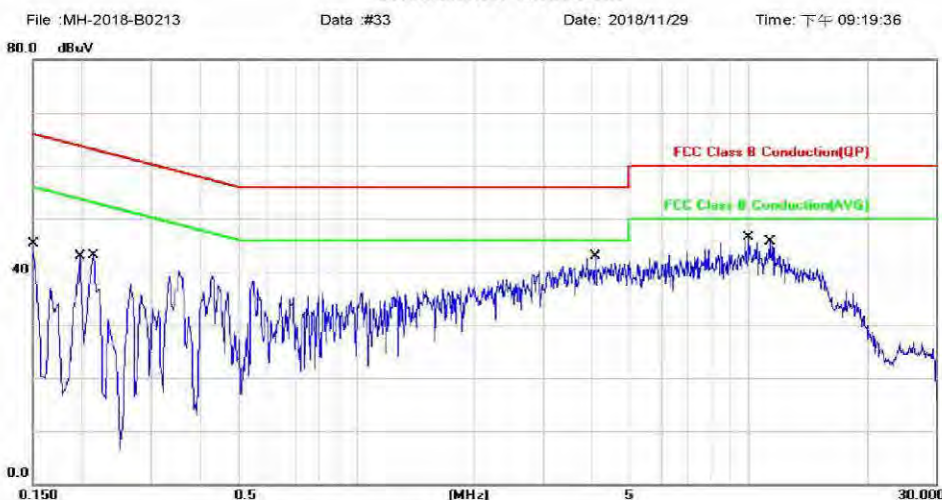
Config_4_L

Site : Conduction Room A
 Limit: FCC Class B Conduction(QP)
 Mode: Config_4
 Note: Type-C (6643418)

Phase: L1
 Power: AC 120V/60Hz

Temperature: 20 °C
 Humidity: 65 %

Conducted Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV	dBuV	dB		
1		0.1500	46.24	0.04	46.28	66.00	-19.72	QP	
2		0.1500	23.49	0.04	23.53	56.00	-32.47	AVG	
3		0.1980	38.74	0.03	38.77	63.69	-24.92	QP	
4		0.1980	21.90	0.03	21.93	53.69	-31.76	AVG	
5		0.2140	39.80	0.03	39.83	63.05	-23.22	QP	
6		0.2140	23.95	0.03	23.98	53.05	-29.07	AVG	
7		4.0780	36.45	0.31	36.76	56.00	-19.24	QP	
8 *		4.0780	26.49	0.31	26.80	46.00	-19.20	AVG	
9		10.0420	36.91	0.46	37.37	60.00	-22.63	QP	
10		10.0420	26.24	0.46	26.70	50.00	-23.30	AVG	
11		11.3660	34.60	0.51	35.11	60.00	-24.89	QP	
12		11.3660	25.33	0.51	25.84	50.00	-24.16	AVG	

*:Maximum data x:Over limit l:over margin

File : MH-2018-B0213\Data : #33

Page: 1

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Config_4_N

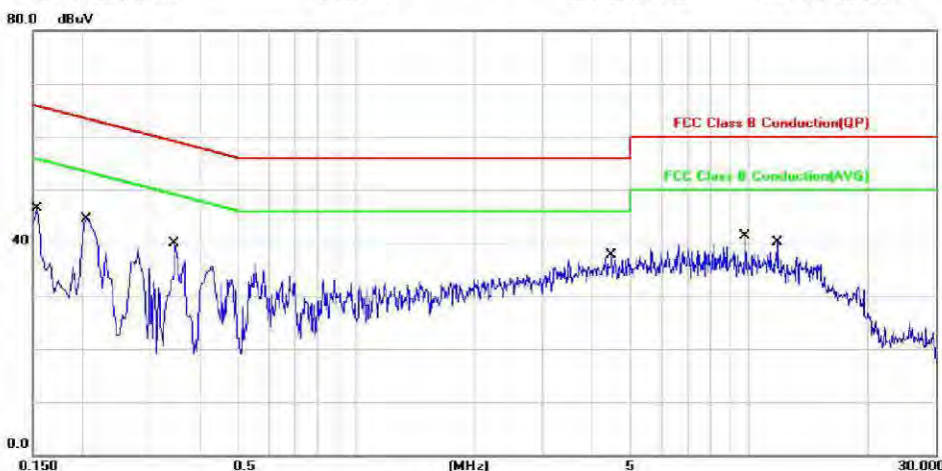
Site : Conduction Room A
Limit: FCC Class B Conduction(QP)
Mode: Config_4
Note: Type-C (6643418)

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

Temperature: 20 °C
Humidity: 65 %

Conducted Emission

File : MH-2018-B0213 Data : #34 Date : 2018/11/29 Time : 下午 09:21:56



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over		
		MHz	Level	Factor	ment			Detector	Comment
			dBuV	dB	dBuV	dBuV	dB		
1		0.1540	41.25	0.04	41.29	65.78	-24.49	QP	
2		0.1540	17.93	0.04	17.97	55.78	-37.81	AVG	
3	*	0.2060	42.71	0.04	42.75	63.37	-20.62	QP	
4		0.2060	28.90	0.04	28.94	53.37	-24.43	AVG	
5		0.3460	35.74	0.09	35.83	59.06	-23.23	QP	
6		0.3460	27.38	0.09	27.47	49.06	-21.59	AVG	
7		4.4780	29.47	0.31	29.78	56.00	-26.22	QP	
8		4.4780	21.43	0.31	21.74	46.00	-24.26	AVG	
9		9.8300	30.09	0.40	30.49	60.00	-29.51	QP	
10		9.8300	22.51	0.40	22.91	50.00	-27.09	AVG	
11		11.9220	28.35	0.44	28.79	60.00	-31.21	QP	
12		11.9220	20.90	0.44	21.34	50.00	-28.66	AVG	

*:Maximum data x:Over limit l:over margin

File : MH-2018-B0213\Data : #34

Page : 1

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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	2017/12/12	2018/12/11
EMI Test Receiver	R&S	ESCI 3	101343	2018/1/31	2019/1/30
Broadband Antenna	SCHWAZBECK	VULB9168	9168-628	2018/9/7	2019/9/6
Broadband Antenna	SCHWAZBECK	VULB9168	9168-629	2018/9/7	2019/9/6
Pre Amplifier	EMC Instruments Corp.	EMC330	980178	2018/3/31	2019/3/30
Pre Amplifier	EMC Instruments Corp.	EMC330	980179	2018/3/31	2019/3/30
Coaxial Cable	EMC Instruments	EMCCFD400-NM-NM	150917	2018/9/18	2019/9/17
Coaxial Cable	EMC Instruments	EMCCFD400-NM-NM	150919	2018/9/18	2019/9/17
Coaxial Cable	EMC Instruments	EMCCFD400-NM-NM	150820	2018/9/18	2019/9/17
Coaxial Cable	EMC Instruments	EMCCFD400-NM-NM	150918	2018/9/18	2019/9/17
Coaxial Cable	EMC Instruments	EMCCFD400-NM-NM	150821	2018/9/18	2019/9/17
Coaxial Cable	EMC Instruments	EMCCFD400-NM-NM	150822	2018/9/18	2019/9/17
Universal Digital Radio Communication Tester	R&S	CMU 200	119988	2018/2/22	2019/2/21
Wideband Radio Communication Tester	R&S	CMW 500	152303	2018/2/21	2019/2/20
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	2017/12/31	2018/12/30
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 Ulab (K=2) of radiated emission is 4.09 dB. (30MHz ~ 1000MHz)
 Theory values uncertainty Ucispr 16-4-2:2011+A1:2014 (K=2) of radiated emission is 5.22 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	2018/5/15	2019/5/14
EMI Test Receiver	R&S	ESR 7	101459	2018/2/21	2019/2/20
Horn Antenna	SCHWARZBECK	BBHA9120D	BBHA9120D285	2018/10/26	2019/10/25
Pre Amplifier	EMC Instruments Corp.	EMC012645B	980216	2018/3/31	2019/3/30
Coaxial Cable	JUNFLOW	MWX221-NMSNMS	J0778929	2018/4/23	2019/4/22
Coaxial Cable	Huber+Suhner	SUCCOFLEX 104PEA	30255/4PEA	2018/4/23	2019/4/22
Coaxial Cable	EMC Instruments	EMC104-SM-SM	140927	2018/4/23	2019/4/22
Coaxial Cable	Huber+Suhner	SUCOFLEX 102	MY 2651/2	2018/6/5	2019/6/4
Coaxial Cable	Huber+Suhner	SUCOFLEX 102	MY 2153/2	2018/6/5	2019/6/4
Universal Digital Radio Communication Tester	R&S	CMU 200	119988	2018/2/22	2019/2/21
Wideband Radio Communication Tester	R&S	CMW 500	152303	2018/2/21	2019/2/20
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	2018/1/12	2019/1/11
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) Theory values uncertainty Ucispr 16-4-2:2011+A1:2014 (K=2) of radiated emission measurement is 5.18 dB.(1-6GHz)					

2.5.2 Operating Environment

Temperature : 24 degree C

Humidity : 66 %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 B02

Polarization: **Horizontal**
Power: AC 120V/60Hz
Distance: 10m

Temperature: 24 °C
Humidity: 66 %

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	Comment
1		49.4000	24.22	-10.96	13.26	30.00	-16.74	QP	
2		156.1000	24.72	-11.17	13.55	30.00	-16.45	QP	
3		579.9900	24.02	-3.18	20.84	37.00	-16.16	QP	
4		804.0600	23.90	0.91	24.81	37.00	-12.19	QP	
5		928.2200	23.93	2.89	26.82	37.00	-10.18	QP	
6 *		967.0200	24.04	3.10	27.14	37.00	-9.86	QP	

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

File :MH-2018-B0213\Data :#24

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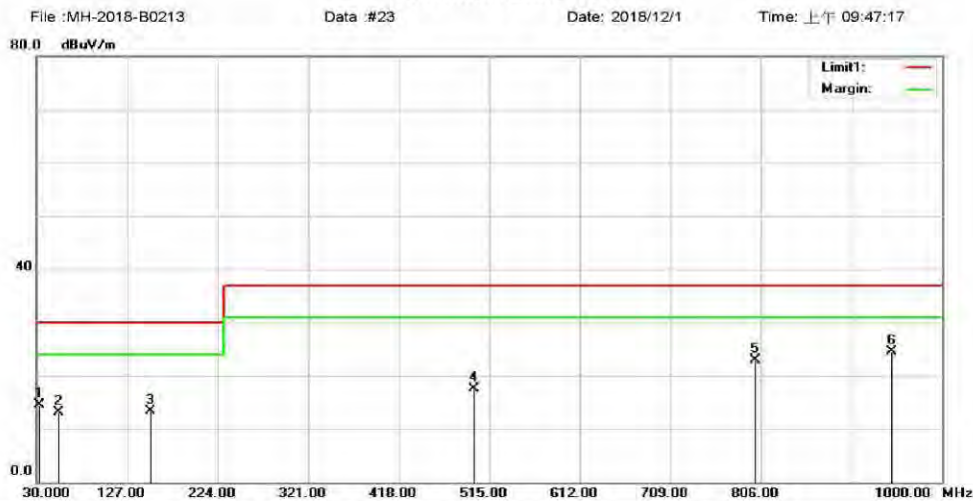
Config_1_V

Site: SGS 10m Chamber
 Limit: CISPR22 Class B 10M Radiation
 Mode: Config_1
 Note: LTE B02

Polarization: **Vertical**
 Power: AC 120V/60Hz
 Distance: 10m

Temperature: 24 °C
 Humidity: 66 %

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		32.9100	26.37	-11.95	14.42	30.00	-15.58	QP	
2		54.2500	24.03	-10.95	13.08	30.00	-16.92	QP	
3		152.2200	24.00	-10.72	13.28	30.00	-16.72	QP	
4		498.5100	22.82	-5.23	17.59	37.00	-19.41	QP	
5		800.1800	22.43	0.50	22.93	37.00	-14.07	QP	
6 *		946.6500	22.65	1.92	24.57	37.00	-12.43	QP	

*: Maximum data x: Over limit f: over margin

File: MH-2018-B0213 Data: #23

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Config_2_H

Site: SGS 10m Chamber
 Limit: CISPR22 Class B 10M Radiation
 Mode: Config_2
 Note: SD card read

Polarization: *Horizontal*
 Power: From sysetm
 Distance: 10m

Temperature: 24 °C
 Humidity: 66 %

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		
1		99.8400	31.51	-16.13	15.38	30.00	-14.62	QP	
2		154.1600	26.35	-11.13	15.22	30.00	-14.78	QP	
3		238.5500	31.58	-12.51	19.07	37.00	-17.93	QP	
4		794.3600	23.39	0.82	24.21	37.00	-12.79	QP	
5		916.5800	23.28	2.37	25.65	37.00	-11.35	QP	
6 *		964.1100	23.23	3.13	26.36	37.00	-10.64	QP	

*: Maximum data x: Over limit f: over margin

File: MH-2018-B0213>Data: #26

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Config_2_V

Site: SGS 10m Chamber
 Limit: CISPR22 Class B 10M Radiation
 Mode: Config_2
 Note: SD card read

Polarization: **Vertical**
 Power: From system
 Distance: 10m

Temperature: 24 °C
 Humidity: 66 %

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		30.0000	28.18	-12.10	16.08	30.00	-13.92	QP	
2		41.6400	25.70	-11.25	14.45	30.00	-15.55	QP	
3		104.6900	30.45	-14.97	15.48	30.00	-14.52	QP	
4 *		154.1600	31.38	-10.68	20.70	30.00	-9.30	QP	
5		232.7300	30.52	-13.39	17.13	37.00	-19.87	QP	
6		973.8100	22.49	2.08	24.57	37.00	-12.43	QP	

*: Maximum data x: Over limit f: over margin

File: MH-2018-B0213>Data: #25

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Config_3_H

Site: SGS 10m Chamber
 Limit: CISPR22 Class B 10M Radiation
 Mode: Config_3
 Note: REC

Polarization: **Horizontal**
 Power: From Battery
 Distance: 10m

Temperature: 24 °C
 Humidity: 66 %

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		
1	*	250.9960	46.29	-11.99	34.30	37.00	-2.70	QP	
2		313.7370	35.61	-9.77	25.84	37.00	-11.16	QP	
3		628.4900	23.48	-1.84	21.64	37.00	-15.36	QP	
4		760.4100	23.29	0.77	24.06	37.00	-12.94	QP	
5		847.7100	23.48	1.48	24.96	37.00	-12.04	QP	
6		955.3800	23.33	3.23	26.56	37.00	-10.44	QP	

*: Maximum data x: Over limit f: over margin

File: MH-2018-B0213>Data: #28

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Config_3_V

Site: SGS 10m Chamber
 Limit: CISPR22 Class B 10M Radiation
 Mode: Config_3
 Note: REC

Polarization: **Vertical**
 Power: From Battery
 Distance: 10m

Temperature: 24 °C
 Humidity: 66 %

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		
1		39.7000	24.19	-11.50	12.69	30.00	-17.31	QP	
2 *		251.0000	38.97	-11.79	27.18	37.00	-9.82	QP	
3		313.7550	33.58	-9.52	24.06	37.00	-12.94	QP	
4		700.2700	22.69	-1.31	21.38	37.00	-15.62	QP	
5		916.5800	22.64	1.80	24.44	37.00	-12.56	QP	
6		940.8300	22.47	1.95	24.42	37.00	-12.58	QP	

*: Maximum data x: Over limit f: over margin

File: MH-2018-B0213>Data: #27

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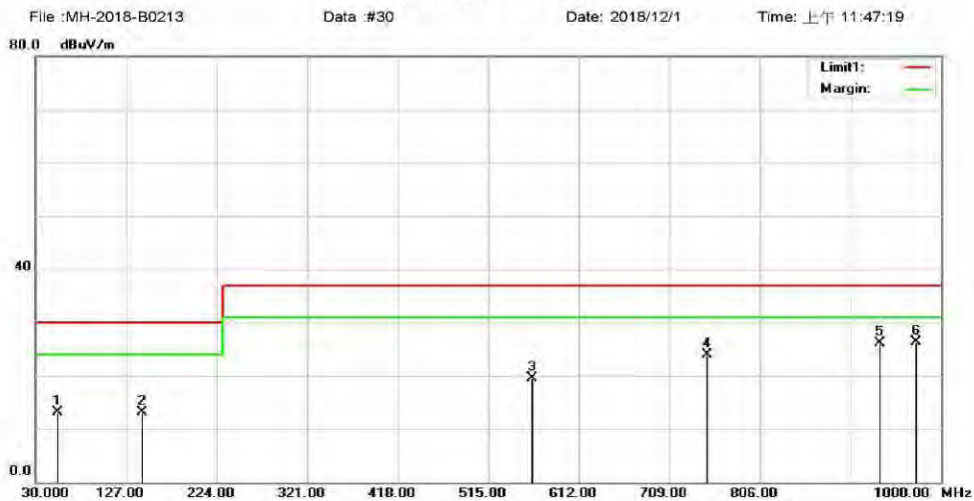
Config_4_H

Site: SGS 10m Chamber
 Limit: CISPR22 Class B 10M Radiation
 Mode: Config_4
 Note:

Polarization: **Horizontal**
 Power: AC 120V/60Hz
 Distance: 10m

Temperature: 24 °C
 Humidity: 66 %

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		54.2500	24.28	-11.25	13.03	30.00	-16.97	QP	
2		144.4600	24.40	-11.26	13.14	30.00	-16.86	QP	
3		561.5600	23.44	-3.88	19.56	37.00	-17.44	QP	
4		749.7400	23.19	0.70	23.89	37.00	-13.11	QP	
5		934.0400	23.17	2.98	26.15	37.00	-10.85	QP	
6 *		973.8100	23.19	3.10	26.29	37.00	-10.71	QP	

*: Maximum data x: Over limit f: over margin

File: MH-2018-B0213>Data: #30

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Config_4_V

Site: SGS 10m Chamber

Polarization: **Vertical**

Temperature: 24 °C

Limit: CISPR22 Class B 10M Radiation

Power: AC 120V/60Hz

Humidity: 66 %

Mode: Config_4

Distance: 10m

Note:

Radiated Emission



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over		
		MHz	Level	Factor	ment			Detector	Comment
			dBuV	dB/m	dBuV/m	dBuV/m	dB		
1		39.7000	27.82	-11.50	16.32	30.00	-13.68	QP	
2		71.7100	27.74	-13.53	14.21	30.00	-15.79	QP	
3		71.7100	27.75	-13.53	14.22	30.00	-15.78	QP	
4		153.1900	24.16	-10.78	13.38	30.00	-16.62	QP	
5		229.8200	23.50	-13.81	9.69	30.00	-20.31	QP	
6		808.9100	22.58	0.50	23.08	37.00	-13.92	QP	
7 *		970.9000	22.42	2.00	24.42	37.00	-12.58	QP	

*:Maximum data x:Over limit f:over margin

File: MH-2018-B0213>Data: #29

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Above 1GHz

1GHz-18GHz

Config_1_H

Site: SGS 966 Chamber A

Limit: FCC Class B 3M Radiation(1G-40G)(Pea

Mode: Config_1

Note:

Polarization: **Horizontal**

Power: AC 120V/60Hz

Distance:

Temperature: 20 °C

Humidity: 61 %

Radiated Emission

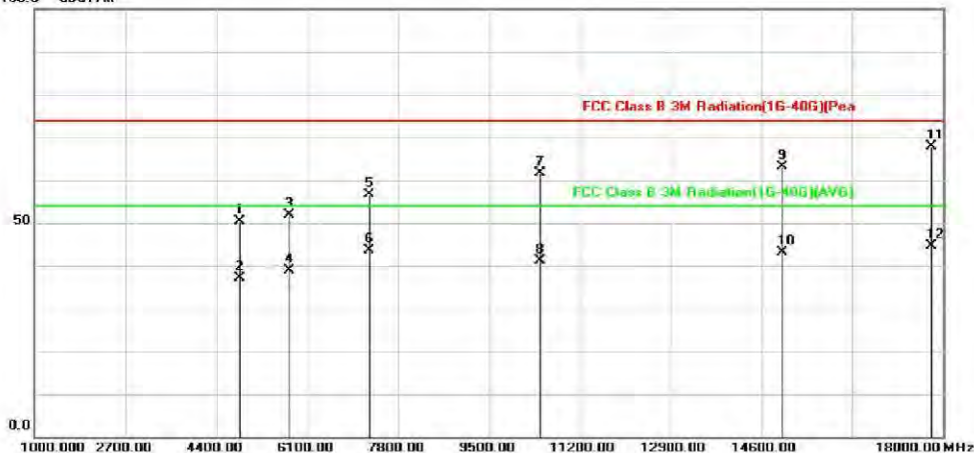
File :B0213

Data :#12

Date: 2018/12/3

Time: 下午 07:38:19

100.0 dBuV/m



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over		
		MHz	Level	Factor	ment			Detector	Comment
			dBuV	dB/m	dBuV/m	dBuV/m	dB		
1		4838.963	57.58	-7.30	50.28	74.00	-23.72	peak	
2		4838.963	44.42	-7.30	37.12	54.00	-16.88	AVG	
3		5781.525	57.04	-5.25	51.79	74.00	-22.21	peak	
4		5781.525	44.20	-5.25	38.95	54.00	-15.05	AVG	
5		7275.577	56.27	0.32	56.59	74.00	-17.41	peak	
6		7275.577	43.21	0.32	43.53	54.00	-10.47	AVG	
7		10467.322	54.98	6.72	61.70	74.00	-12.30	peak	
8		10467.322	34.33	6.72	41.05	54.00	-12.95	AVG	
9		14991.400	53.11	9.99	63.10	74.00	-10.90	peak	
10		14991.400	33.25	9.99	43.24	54.00	-10.76	AVG	
11	*	17791.275	53.61	14.38	67.99	74.00	-6.01	peak	
12		17791.275	30.21	14.38	44.59	54.00	-9.41	AVG	

*:Maximum data x:Over limit l:over margin

File :B0213\Data :#12

Page: 1

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Config_1_V

Site: SGS 966 Chamber A

Polarization: **Vertical**

Temperature: 20 °C

Limit: FCC Class B 3M Radiation(1G-40G)(Pea

Power: AC 120V/60Hz

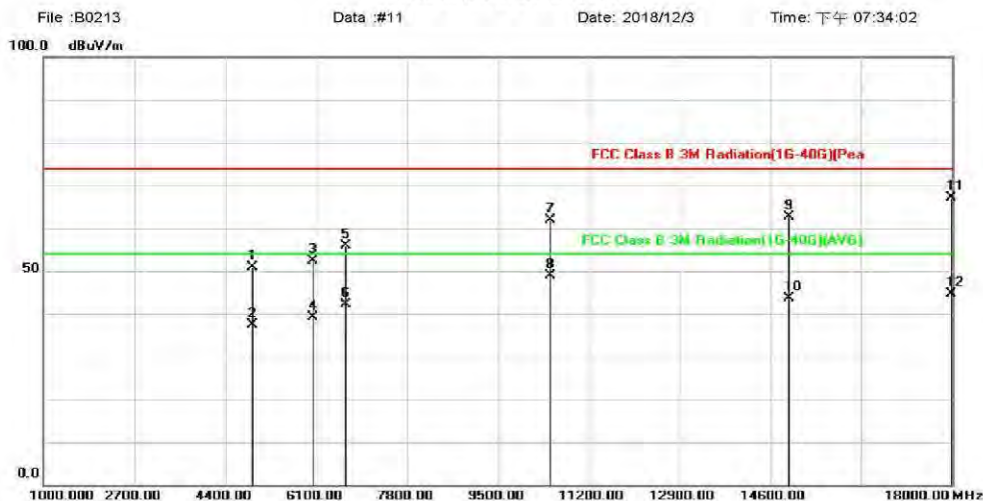
Humidity: 61 %

Mode: Config_1

Distance:

Note:

Radiated Emission



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over		
		MHz	Level	Factor	ment			Detector	Comment
			dBuV	dB/m	dBuV/m	dBuV/m	dB		
1		4914.515	58.14	-7.21	50.93	74.00	-23.07	peak	
2		4914.515	44.66	-7.21	37.45	54.00	-16.55	AVG	
3		6047.991	56.60	-4.25	52.35	74.00	-21.65	peak	
4		6047.991	43.49	-4.25	39.24	54.00	-14.76	AVG	
5		6656.005	57.35	-1.43	55.92	74.00	-18.08	peak	
6		6656.005	43.68	-1.43	42.25	54.00	-11.75	AVG	
7		10481.664	55.02	6.80	61.82	74.00	-12.18	peak	
8 *		10481.664	42.15	6.80	48.95	54.00	-5.05	AVG	
9		14952.075	52.79	9.96	62.75	74.00	-11.25	peak	
10		14952.075	33.60	9.96	43.56	54.00	-10.44	AVG	
11		17979.314	51.45	15.66	67.11	74.00	-6.89	peak	
12		17979.314	29.06	15.66	44.72	54.00	-9.28	AVG	

*:Maximum data x:Over limit l:over margin

File :B0213>Data :#11

Page: 1

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Config_2_H

Site: SGS 966 Chamber A

Polarization: **Horizontal**

Temperature: 20 °C

Limit: FCC Class B 3M Radiation(1G-40G)(Pea

Power: AC 120V/60Hz

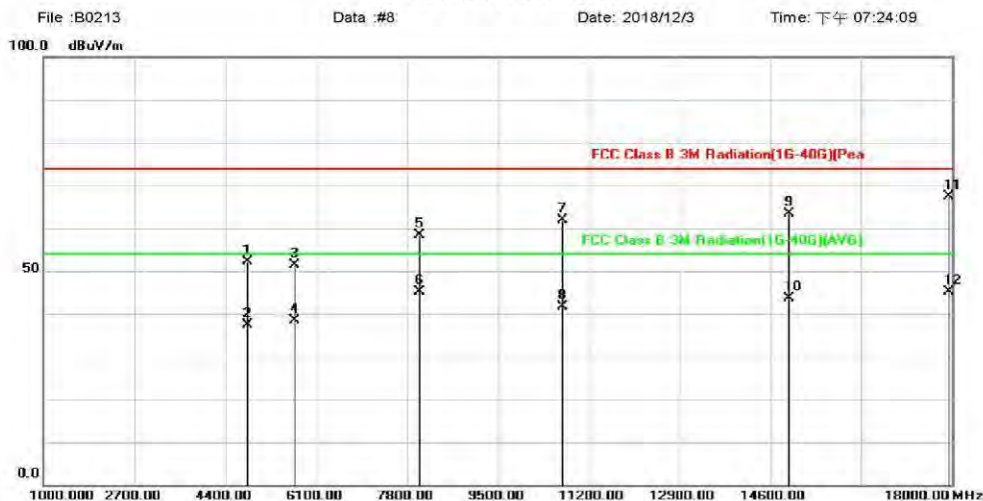
Humidity: 61 %

Mode: Config_2

Distance:

Note:

Radiated Emission



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over		
		MHz	Level	Factor	ment			Detector	Comment
			dBuV	dB/m	dBuV/m	dBuV/m	dB		
1		4829.496	59.43	-7.30	52.13	74.00	-21.87	peak	
2		4829.496	44.65	-7.30	37.35	54.00	-16.65	AVG	
3		5712.906	56.95	-5.46	51.49	74.00	-22.51	peak	
4		5712.906	43.94	-5.46	38.48	54.00	-15.52	AVG	
5		8042.625	55.87	2.39	58.26	74.00	-15.74	peak	
6		8042.625	42.73	2.39	45.12	54.00	-8.88	AVG	
7		10704.423	55.33	6.45	61.78	74.00	-12.22	peak	
8		10704.423	35.27	6.45	41.72	54.00	-12.28	AVG	
9		14954.532	53.32	9.97	63.29	74.00	-10.71	peak	
10		14954.532	33.61	9.97	43.58	54.00	-10.42	AVG	
11	*	17946.732	51.82	15.44	67.26	74.00	-6.74	peak	
12		17946.732	29.62	15.44	45.06	54.00	-8.94	AVG	

*:Maximum data x:Over limit l:over margin

File :B0213\Data :#8

Page: 1

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Config_2_V

Site: SGS 966 Chamber A

Polarization: **Vertical**

Temperature: 20 °C

Limit: FCC Class B 3M Radiation(1G-40G)(Pea

Power: AC 120V/60Hz

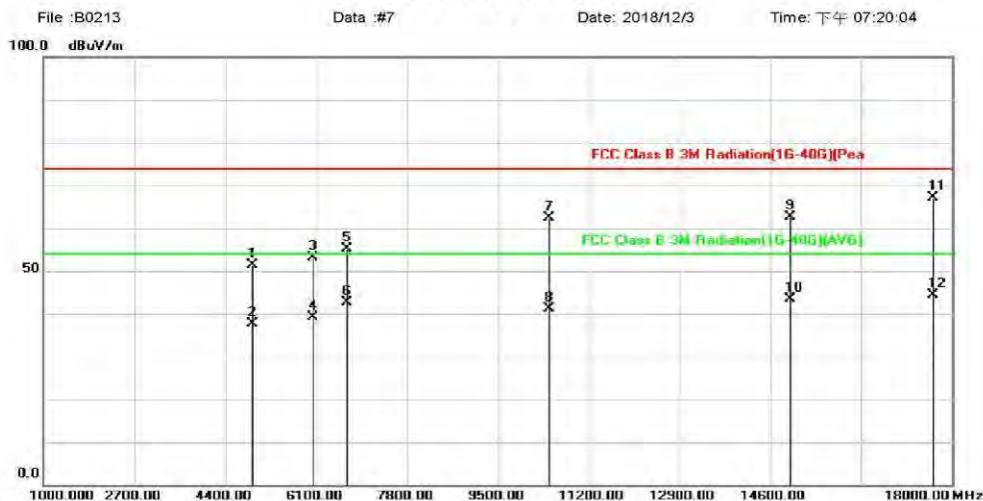
Humidity: 61 %

Mode: Config_2

Distance:

Note:

Radiated Emission



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over		
		MHz	Level	Factor	ment			Detector	Comment
			dBuV	dB/m	dBuV/m	dBuV/m	dB		
1		4912.607	58.58	-7.21	51.37	74.00	-22.63	peak	
2		4912.607	44.77	-7.21	37.56	54.00	-16.44	AVG	
3		6049.619	57.26	-4.24	53.02	74.00	-20.98	peak	
4		6049.619	43.48	-4.24	39.24	54.00	-14.76	AVG	
5		6679.029	56.46	-1.37	55.09	74.00	-18.91	peak	
6		6679.029	44.07	-1.37	42.70	54.00	-11.30	AVG	
7		10456.086	55.66	6.66	62.32	74.00	-11.68	peak	
8		10456.086	34.38	6.66	41.04	54.00	-12.96	AVG	
9		14974.410	52.54	9.99	62.53	74.00	-11.47	peak	
10		14974.410	33.50	9.99	43.49	54.00	-10.51	AVG	
11	*	17644.279	53.87	13.38	67.25	74.00	-6.75	peak	
12		17644.279	31.02	13.38	44.40	54.00	-9.60	AVG	

*:Maximum data x:Over limit l:over margin

File :B0213\Data :#7

Page: 1

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Config_3_H

Site: SGS 966 Chamber A

Polarization: **Horizontal**

Temperature: 20 °C

Limit: FCC Class B 3M Radiation(1G-40G)(Pea

Power: AC 120V/60Hz

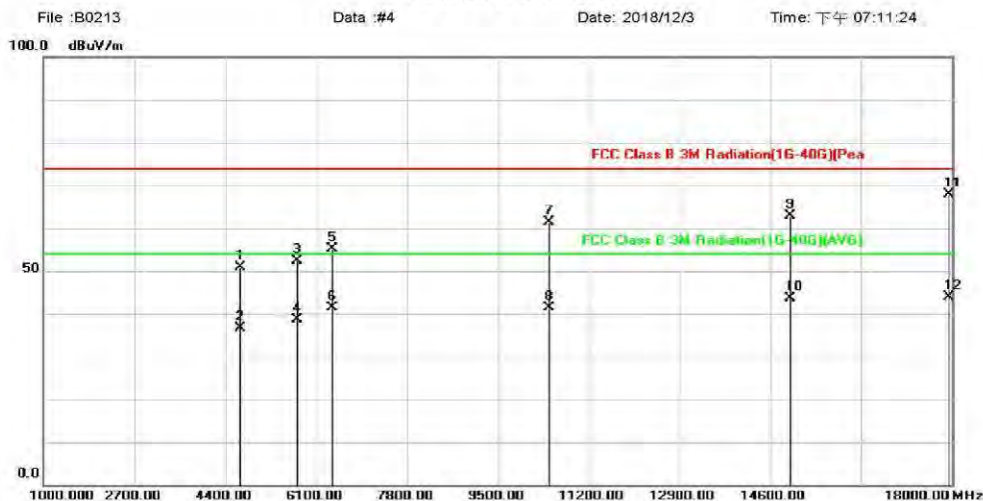
Humidity: 61 %

Mode: Config_3

Distance:

Note:

Radiated Emission



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over		
		MHz	Level	Factor	ment			Detector	Comment
			dBuV	dB/m	dBuV/m	dBuV/m	dB		
1		4685.064	58.27	-7.47	50.80	74.00	-23.20	peak	
2		4685.064	43.99	-7.47	36.52	54.00	-17.48	AVG	
3		5750.193	57.72	-5.35	52.37	74.00	-21.63	peak	
4		5750.193	43.89	-5.35	38.54	54.00	-15.46	AVG	
5		6413.869	56.86	-1.63	55.23	74.00	-18.77	peak	
6		6413.869	43.04	-1.63	41.41	54.00	-12.59	AVG	
7		10459.130	54.72	6.68	61.40	74.00	-12.60	peak	
8		10459.130	34.76	6.68	41.44	54.00	-12.56	AVG	
9		14974.260	52.91	9.99	62.90	74.00	-11.10	peak	
10		14974.260	33.52	9.99	43.51	54.00	-10.49	AVG	
11	*	17944.245	52.44	15.42	67.86	74.00	-6.14	peak	
12		17944.245	28.40	15.42	43.82	54.00	-10.18	AVG	

*:Maximum data x:Over limit l:over margin

File :B0213\Data :#4

Page: 1

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Config_3_V

Site: SGS 966 Chamber A

Polarization: **Vertical**

Temperature: 20 °C

Limit: FCC Class B 3M Radiation(1G-40G)(Pea

Power: AC 120V/60Hz

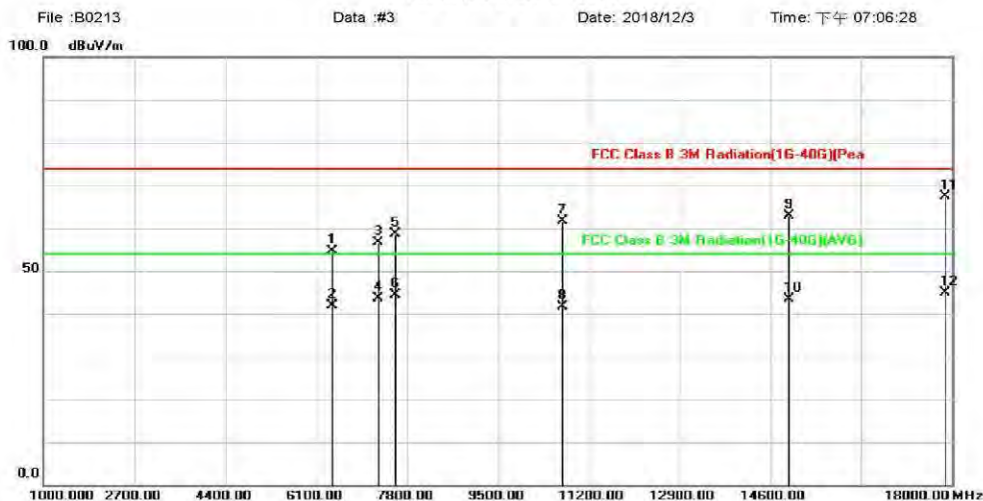
Humidity: 61 %

Mode: Config_3

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		6402.214	56.31	-1.71	54.60	74.00	-19.40	peak	
2		6402.214	43.47	-1.71	41.76	54.00	-12.24	AVG	
3		7277.705	56.40	0.32	56.72	74.00	-17.28	peak	
4		7277.705	43.33	0.32	43.65	54.00	-10.35	AVG	
5		7593.373	57.44	1.18	58.62	74.00	-15.38	peak	
6		7593.373	43.17	1.18	44.35	54.00	-9.65	AVG	
7		10709.977	55.09	6.44	61.53	74.00	-12.47	peak	
8		10709.977	35.29	6.44	41.73	54.00	-12.27	AVG	
9		14955.721	52.83	9.97	62.80	74.00	-11.20	peak	
10		14955.721	33.40	9.97	43.37	54.00	-10.63	AVG	
11 *		17866.857	52.50	14.89	67.39	74.00	-6.61	peak	
12		17866.857	29.91	14.89	44.80	54.00	-9.20	AVG	

*:Maximum data x:Over limit l:over margin

File :B0213\Data :#3

Page: 1

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Config_4_H

Site: SGS 966 Chamber A

Polarization: **Horizontal**

Temperature: 20 °C

Limit: FCC Class B 3M Radiation(1G-40G)(Pea

Power: AC 120V/60Hz

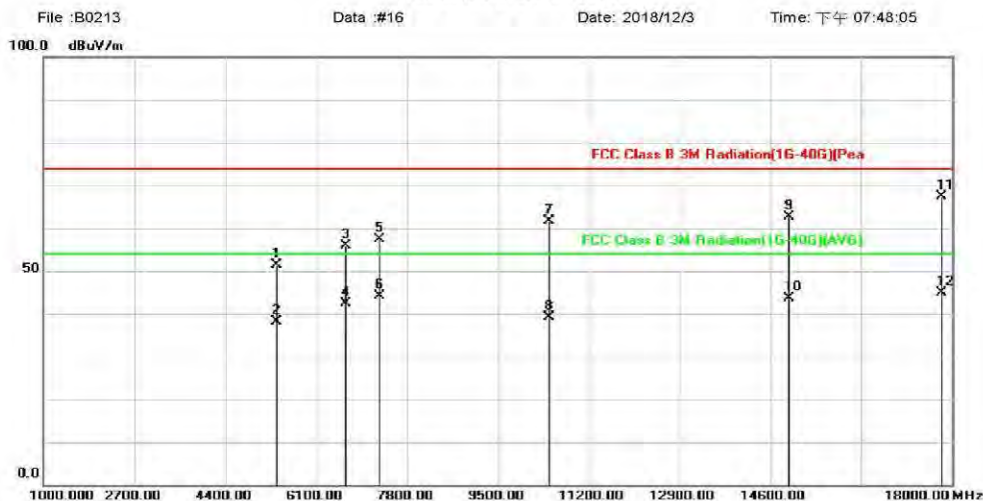
Humidity: 61 %

Mode: Config_4

Distance:

Note:

Radiated Emission



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over		
		MHz	dBuV	Factor	ment			Detector	Comment
1		5355.756	57.74	-6.40	51.34	74.00	-22.66	peak	
2		5355.756	44.55	-6.40	38.15	54.00	-15.85	AVG	
3		6664.666	57.22	-1.40	55.82	74.00	-18.18	peak	
4		6664.666	43.69	-1.40	42.29	54.00	-11.71	AVG	
5		7293.463	56.98	0.37	57.35	74.00	-16.65	peak	
6		7293.463	43.88	0.37	44.25	54.00	-9.75	AVG	
7		10468.021	54.89	6.73	61.62	74.00	-12.38	peak	
8		10468.021	32.36	6.73	39.09	54.00	-14.91	AVG	
9		14944.965	52.63	9.97	62.60	74.00	-11.40	peak	
10		14944.965	33.59	9.97	43.56	54.00	-10.44	AVG	
11	*	17816.097	52.86	14.54	67.40	74.00	-6.60	peak	
12		17816.097	30.35	14.54	44.89	54.00	-9.11	AVG	

*:Maximum data x:Over limit l:over margin

File :B0213Data :#16

Page: 1

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SGS Taiwan Ltd.

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Config_4_V

Site: SGS 966 Chamber A

Polarization: **Vertical**

Temperature: 20 °C

Limit: FCC Class B 3M Radiation(1G-40G)(Pea

Power: AC 120V/60Hz

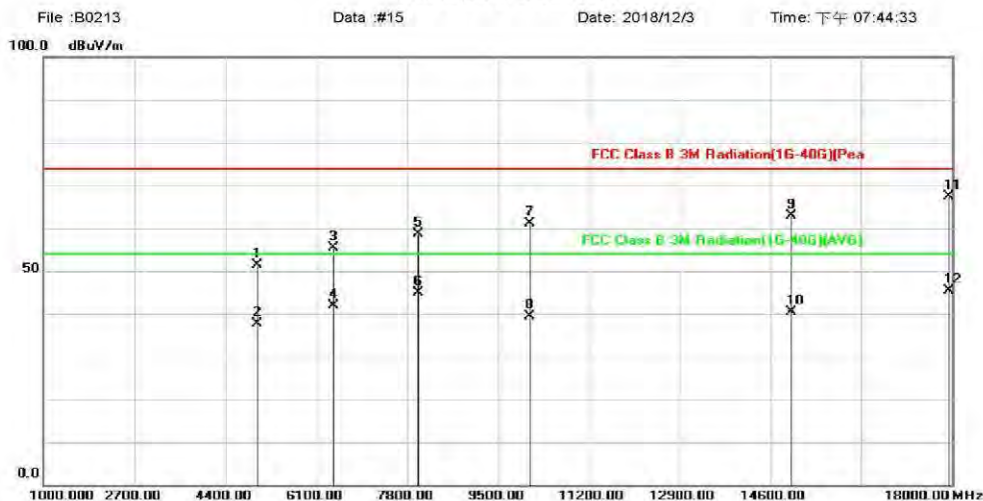
Humidity: 61 %

Mode: Config_4

Distance:

Note:

Radiated Emission



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over		
		MHz	Level	Factor	ment			Detector	Comment
			dBuV	dB/m	dBuV/m	dBuV/m	dB		
1		5007.754	58.54	-7.09	51.45	74.00	-22.55	peak	
2		5007.754	44.79	-7.09	37.70	54.00	-16.30	AVG	
3		6422.481	57.01	-1.56	55.45	74.00	-18.55	peak	
4		6422.481	43.44	-1.56	41.88	54.00	-12.12	AVG	
5		8008.476	56.13	2.39	58.52	74.00	-15.48	peak	
6		8008.476	42.53	2.39	44.92	54.00	-9.08	AVG	
7		10110.671	56.23	4.80	61.03	74.00	-12.97	peak	
8		10110.671	34.47	4.80	39.27	54.00	-14.73	AVG	
9		14987.713	52.96	9.99	62.95	74.00	-11.05	peak	
10		14987.713	30.34	9.99	40.33	54.00	-13.67	AVG	
11 *		17945.903	52.03	15.44	67.47	74.00	-6.53	peak	
12		17945.903	29.86	15.44	45.30	54.00	-8.70	AVG	

*:Maximum data x:Over limit l:over margin

File :B0213>Data :#15

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The frequency band during 18GHz till 26.5 GHz that was not reported was verified with no extra obvious finding except ambient signals.

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