



FCC Test Report

APPLICANT : Honeywell International Inc.
EQUIPMENT : GRIP 7" Tablet
BRAND NAME : Touch Screen
MODEL NAME : WTS700
MARKETING NAME : GRIP
FCC ID : CFS8DLWTS700
STANDARD : FCC CFR Title 47 Part 15 Subpart B
CLASSIFICATION : Certification

The product was received on May 15, 2018 and testing was completed on Jun. 23, 2018. We, Sporton International (Kunshan) Inc., would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI C63.4-2014 and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International (Kunshan) Inc., the test report shall not be reproduced except in full.

Approved by: James Huang / Manager



NVLAP LAB CODE 600155-0

Sporton International (Kunshan) Inc.

***No.3-2 Ping-Xiang Rd, Kunshan Development Zone Kunshan City Jiangsu Province 215335
China***



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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FC851504	Rev. 01	Initial issue of report	Jul. 30, 2018



SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.107	AC Conducted Emission	< 15.107 limits	PASS	Under limit 6.97 dB at 0.171 MHz
3.2	15.109	Radiated Emission	< 15.109 limits	PASS	Under limit 4.93 dB at 47.46 MHz



1. General Description

1.1. Applicant

Honeywell International Inc.

2 Corporate Center Drive, Suite 100 Melville, New York ,United States 11747

1.2. Manufacturer

Huaqin Telecom Technology Co.,Ltd

Building 1 & 9 & 11, NO.399 Keyuan Road, Zhangjiang Hi-tech Park, Pudong New District, Shanghai, China

1.3. Product Feature of Equipment Under Test

Product Feature	
Equipment	GRIP 7" Tablet
Brand Name	Touch Screen
Model Name	WTS700
Marketing Name	GRIP
FCC ID	CFS8DLWTS700
EUT supports Radios application	WLAN 2.4GHz 802.11b/g/n HT20/HT40 WLAN 5GHz 802.11a/n HT20/HT40 Bluetooth BR/EDR/LE
HW Version	A6r5b
SW Version	ZQ1989_V009_20180525
EUT Stage	Identical Prototype

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.4. Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx Frequency	802.11b/g/n: 2412 MHz ~ 2462 MHz 802.11a/n: 5180 MHz ~ 5240 MHz; 5260 MHz ~ 5320 MHz; 5500 MHz ~ 5700 MHz 5745 MHz ~ 5825 MHz Bluetooth: 2402 MHz ~ 2480 MHz
Rx Frequency	802.11b/g/n: 2412 MHz ~ 2462 MHz 802.11a/n: 5180 MHz ~ 5240 MHz; 5260 MHz ~ 5320 MHz; 5500 MHz ~ 5700 MHz 5745 MHz ~ 5825 MHz Bluetooth: 2402 MHz ~ 2480 MHz
Antenna Type	WLAN : IFA Antenna Bluetooth : IFA Antenna
Type of Modulation	802.11b : DSSS (DBPSK / DQPSK / CCK) 802.11a/g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM) Bluetooth LE : GFSK Bluetooth (1Mbps) : GFSK Bluetooth (2Mbps) : $\pi/4$ -DQPSK Bluetooth (3Mbps) : 8-DPSK

1.5. Modification of EUT

No modifications are made to the EUT during all test items.

1.6. Test Location

Sporton International (Kunshan) Inc. is accredited to ISO 17025 by National Voluntary Laboratory Accreditation Program (NVLAP code: 600155-0) and the FCC designation No. is CN5013.

Test Site	Sporton International (Kunshan) Inc.		
Test Site Location	No.3-2 Ping-Xiang Rd, Kunshan Development Zone Kunshan City Jiangsu Province 215335 China TEL : +86-512-57900158 FAX : +86-512-57900958		
Test Site No.	Sporton Site No.		FCC Test Firm Registration No.
	CO01-KS	03CH02-KS	630927

Note: The test site complies with ANSI C63.4 2014 requirement.

1.7. Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- FCC CFR Title 47 Part 15 Subpart B
- ANSI C63.4-2014

Remark: All test items were verified and recorded according to the standards and without any deviation during the test.

2. Test Configuration of Equipment Under Test

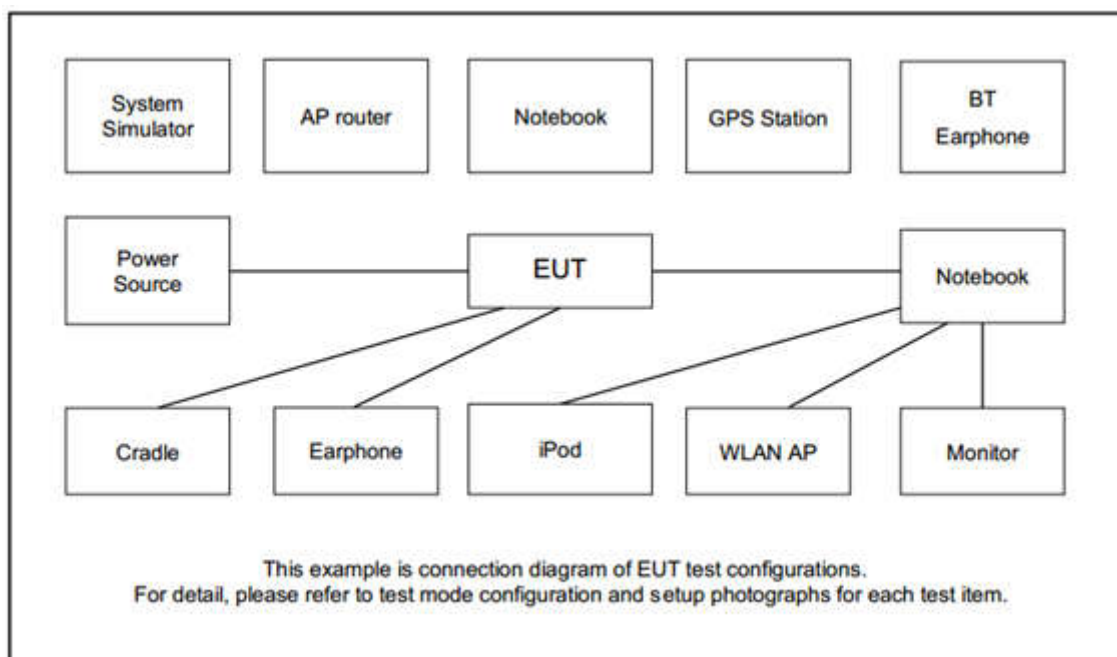
2.1. Test Mode

The EUT has been associated with peripherals pursuant to ANSI C63.4-2014 and configuration operated in a manner tended to maximize its emission characteristics in a typical application.

Frequency range investigated: conduction emission (150 kHz to 30 MHz), radiation emission (30MHz to the 5th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower).

Test Items	Function Type
AC Conducted Emission	Mode 1: WLAN(2.4G) Idle + Camera Front + Battery + Bluetooth Earphone + Adapter
	Mode 2: WLAN(5G) Idle + MPEG4 + Battery + Bluetooth Earphone + Adapter + Cradle
	Mode 3: WLAN(2.4G) Idle + Camera Front + Battery + Bluetooth Earphone + USB Cable(Data Link with Notebook)
Radiated Emissions	Mode 1: WLAN(2.4G) Idle + Camera Front + Battery + Bluetooth Earphone + Adapter
	Mode 2: WLAN(5G) Idle + MPEG4 + Battery + Bluetooth Earphone + Adapter + Cradle
	Mode 3: WLAN(5G) Idle + MPEG4 + Battery + Bluetooth Earphone + Adapter + Wall charge
	Mode 4: WLAN(5G) Idle + MPEG4 + Battery + Bluetooth Earphone + USB Cable(Data Link with Notebook)
Remark: 1. The worst case of AC is mode 1; only the test data of this mode is reported. 2. The worst case of RE is mode 2; only the test data of this mode is reported. 3. Data Link with Notebook means data application transferred mode between EUT and Notebook.	

2.2.Connection Diagram of Test System



2.3. Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	WLAN AP	D-Link	DIR-855	KA2DIR855A2	N/A	Unshielded, 1.8m
2.	WLAN AP	TP-LINK	TL-WDR5600	N/A	N/A	Unshielded, 1.8m
3.	Notebook	Lenovo	G480	PRC4	N/A	AC I/P: Unshielded, 1.8 m DC O/P: Shielded, 1.8 m
4.	Notebook	Lenovo	Y510P	N/A	N/A	AC I/P: Unshielded, 1.8 m DC O/P: Shielded, 1.8 m
5.	Bluetooth Earphone	Lenovo	LBH308	N/A	N/A	N/A
6.	Bluetooth Earphone	Lenovo	LBH308	N/A	N/A	N/A
7.	USB Cable	N/A	N/A	N/A	Shielded, 1.2m	N/A
8.	iPod	Apple	A1199	Fcc DoC	Shielded, 1.2m	N/A
9.	SD Card	Kingston	8GB	N/A	N/A	N/A
10.	SD Card	SanDisk	Ultra	N/A	N/A	N/A

2.4. EUT Operation Test Setup

At the same time, the EUT was attached to the Bluetooth earphone or WLAN AP, and the following programs installed in the EUT were programmed during the test.

1. Data application is transferred between Notebook and EUT via USB cable.
2. Execute "Video player" to play MPEG4 files.
3. Turn on camera to capture images.

3. Test Result

3.1. Test of AC Conducted Emission Measurement

3.1.1 Limits of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

<Class B Limit>

Frequency of emission (MHz)	Conducted limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

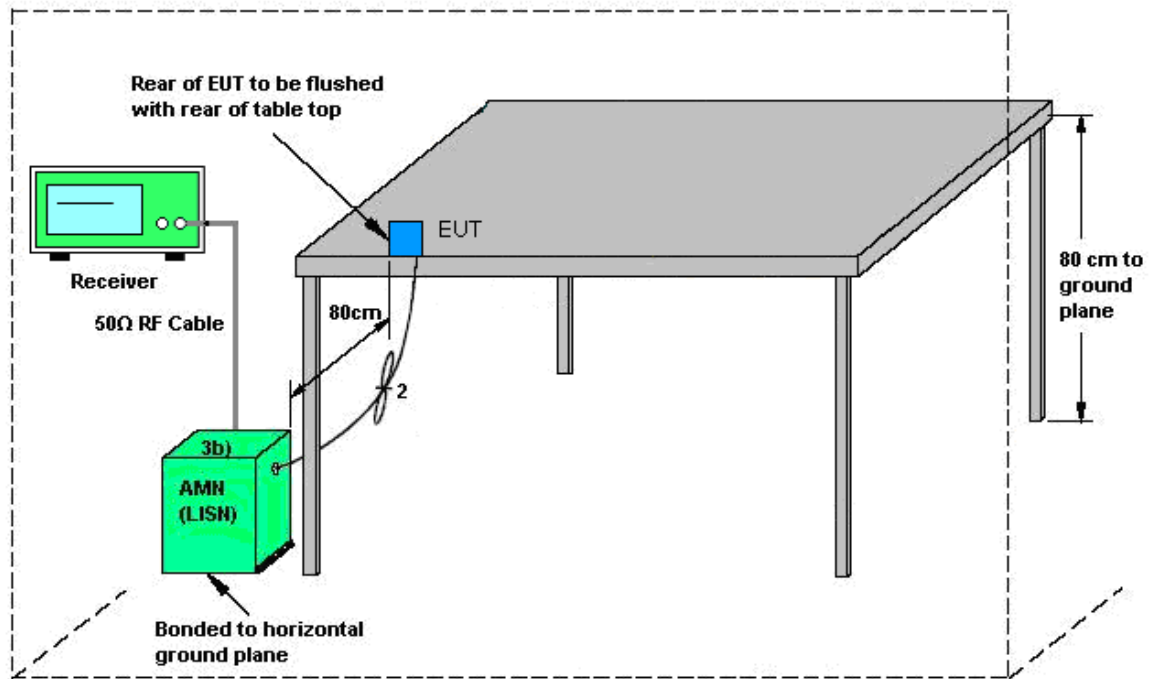
3.1.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.1.3 Test Procedure

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth (IF Bandwidth = 9kHz) with Maximum Hold Mode. Then measurement is also conducted by Average Detector and Quasi-Peak Detector Function respectively.

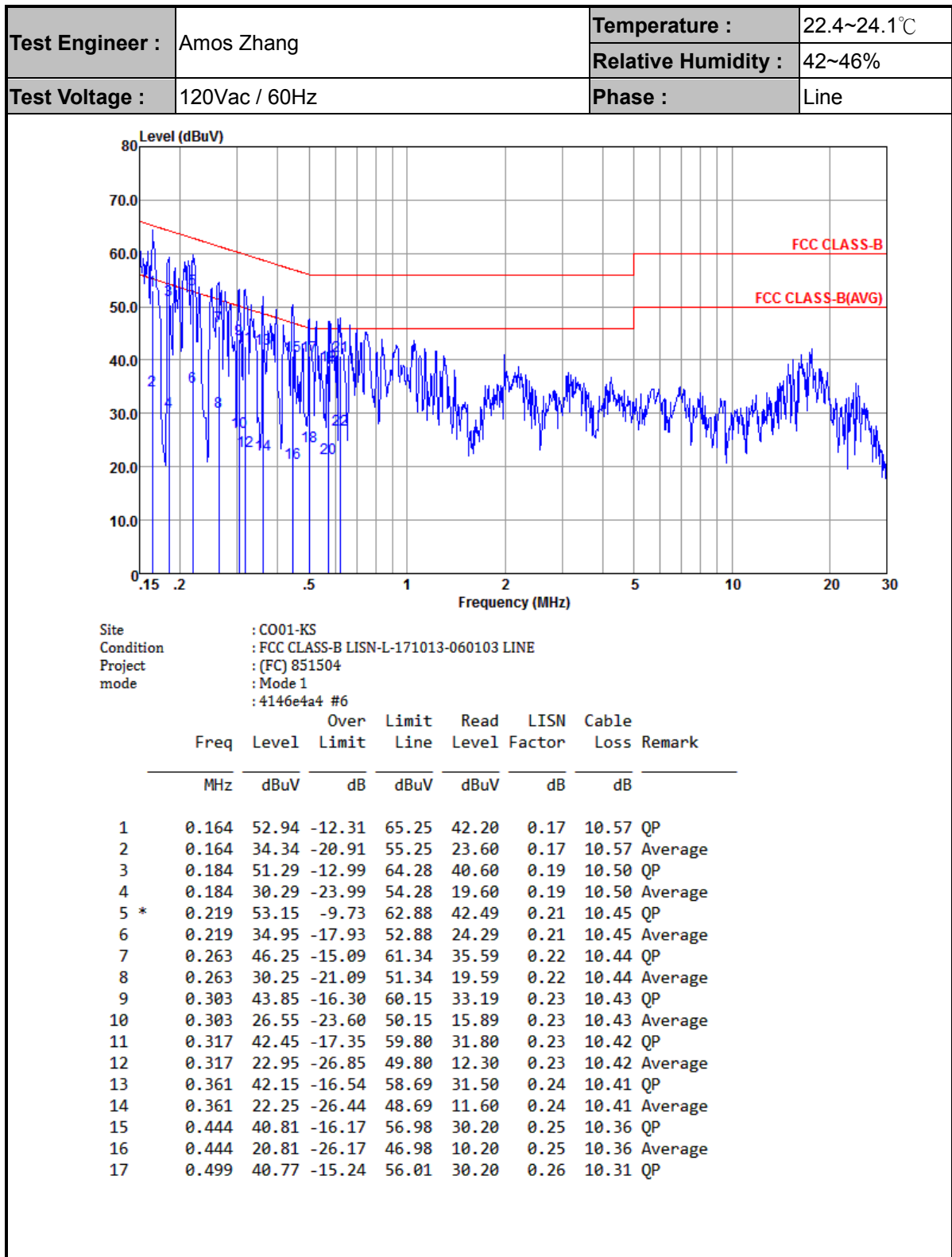
3.1.4 Test Setup



AMN = Artificial mains network (LISH)
 AE = Associated equipment
 EUT = Equipment under test
 ISN = Impedance stabilization network

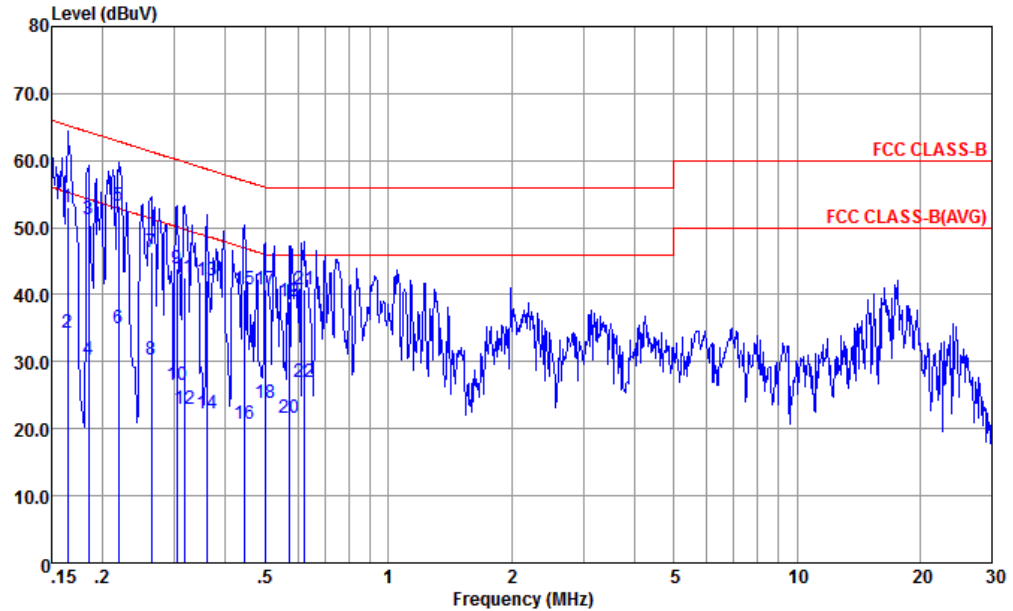


3.1.5 Test Result of AC Conducted Emission





Test Engineer :	Amos Zhang	Temperature :	22.4~24.1℃
		Relative Humidity :	42~46%
Test Voltage :	120Vac / 60Hz	Phase :	Line

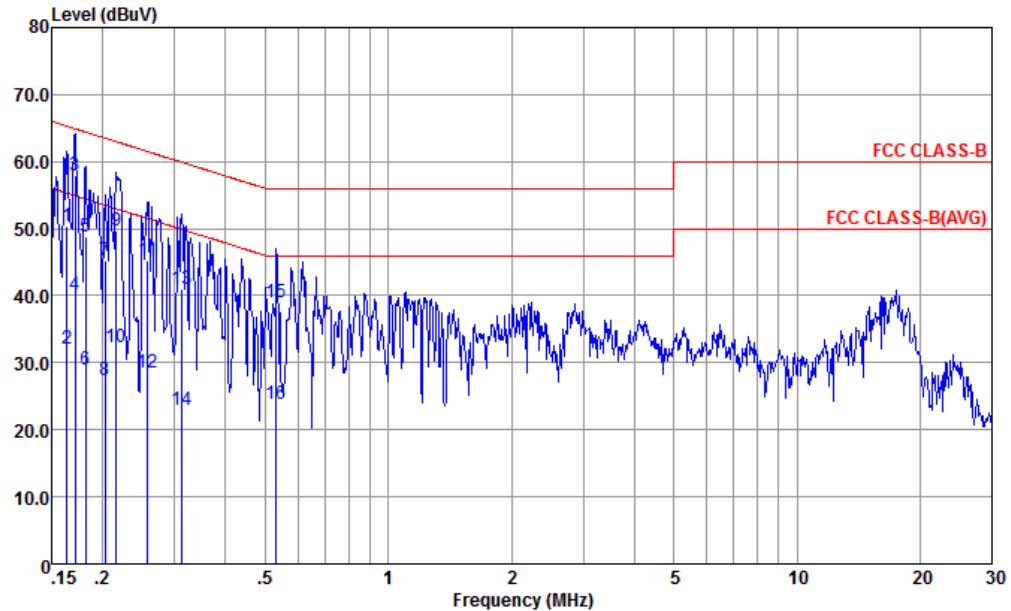


Site : CO01-KS
Condition : FCC CLASS-B LISN-L-171013-060103 LINE
Project : (FC) 851504
mode : Mode 1
: 4146e4a4 #6

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV		dBuV	dBuV			
18	0.499	23.87	-22.14	46.01	13.30	0.26	10.31	Average
19	0.570	39.01	-16.99	56.00	28.50	0.26	10.25	QP
20	0.570	21.71	-24.29	46.00	11.20	0.26	10.25	Average
21	0.624	40.67	-15.33	56.00	30.20	0.26	10.21	QP
22	0.624	27.07	-18.93	46.00	16.60	0.26	10.21	Average



Test Engineer :	Amos Zhang	Temperature :	22.4~24.1℃
		Relative Humidity :	42~46%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral



Site : CO01-KS
Condition : FCC CLASS-B LISN-N-171013-060103 NEUTRAL
Project : (FC) 851504
mode : Mode 1
: 4146e4a4 #6

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.163	50.45	-14.85	65.30	39.60	0.28	10.57	QP
2	0.163	32.05	-23.25	55.30	21.20	0.28	10.57	Average
3 *	0.171	57.93	-6.97	64.90	47.10	0.28	10.55	QP
4	0.171	40.03	-14.87	54.90	29.20	0.28	10.55	Average
5	0.182	48.89	-15.53	64.42	38.10	0.28	10.51	QP
6	0.182	28.99	-25.43	54.42	18.20	0.28	10.51	Average
7	0.203	45.33	-18.16	63.49	34.60	0.28	10.45	QP
8	0.203	27.33	-26.16	53.49	16.60	0.28	10.45	Average
9	0.216	49.63	-13.33	62.96	38.90	0.28	10.45	QP
10	0.216	32.33	-20.63	52.96	21.60	0.28	10.45	Average
11	0.258	45.22	-16.29	61.51	34.50	0.28	10.44	QP
12	0.258	28.62	-22.89	51.51	17.90	0.28	10.44	Average
13	0.313	40.91	-18.97	59.88	30.21	0.28	10.42	QP
14	0.313	22.91	-26.97	49.88	12.21	0.28	10.42	Average
15	0.532	39.07	-16.93	56.00	28.50	0.29	10.28	QP
16	0.532	23.87	-22.13	46.00	13.30	0.29	10.28	Average

3.2. Test of Radiated Emission Measurement

3.2.1. Limit of Radiated Emission

The emissions from an unintentional radiator shall not exceed the field strength levels specified in the following table:

<Class B Limit>

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

3.2.2. Measuring Instruments

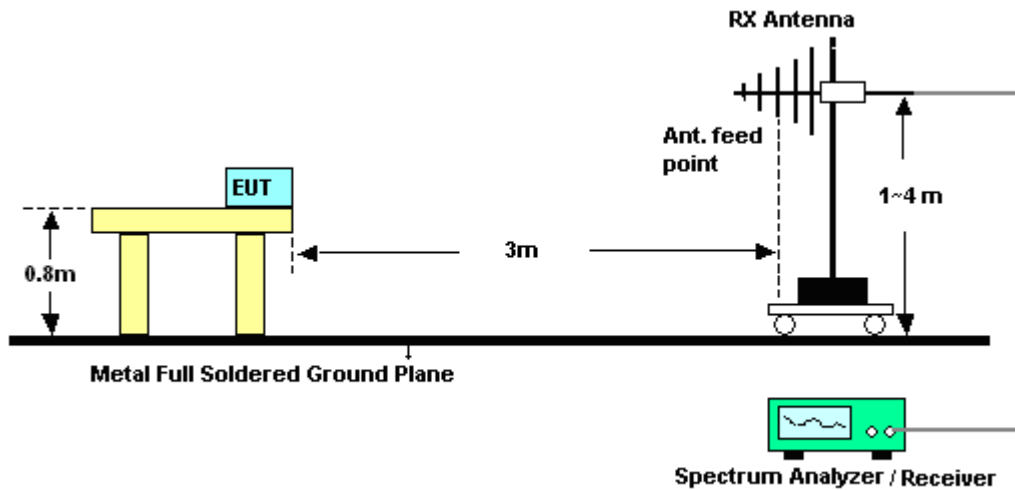
The measuring equipment is listed in the section 4 of this test report.

3.2.3. Test Procedures

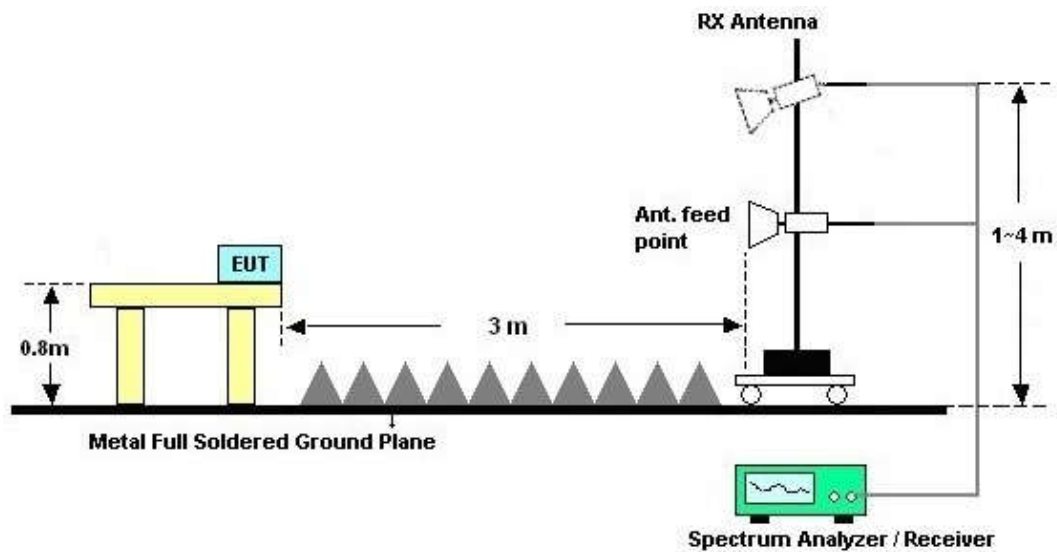
1. The EUT was placed on a turntable with 0.8 meter above ground.
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiation.
4. The antenna is a Bi-Log antenna and its height is adjusted between one to four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
5. For each suspected emission, the EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
6. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode (RBW=120kHz/VBW=300kHz for frequency below 1GHz; RBW=1MHz VBW=3MHz (Peak), RBW=1MHz/VBW=10Hz (Average) for frequency above 1GHz).
7. If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, peak values of EUT will be reported. Otherwise, the emission will be repeated by using the quasi-peak method and reported.
8. Emission level (dBμV/m) = 20 log Emission level (μV/m)
9. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

3.2.4. Test Setup of Radiated Emission

For radiated emissions from 30MHz to 1GHz

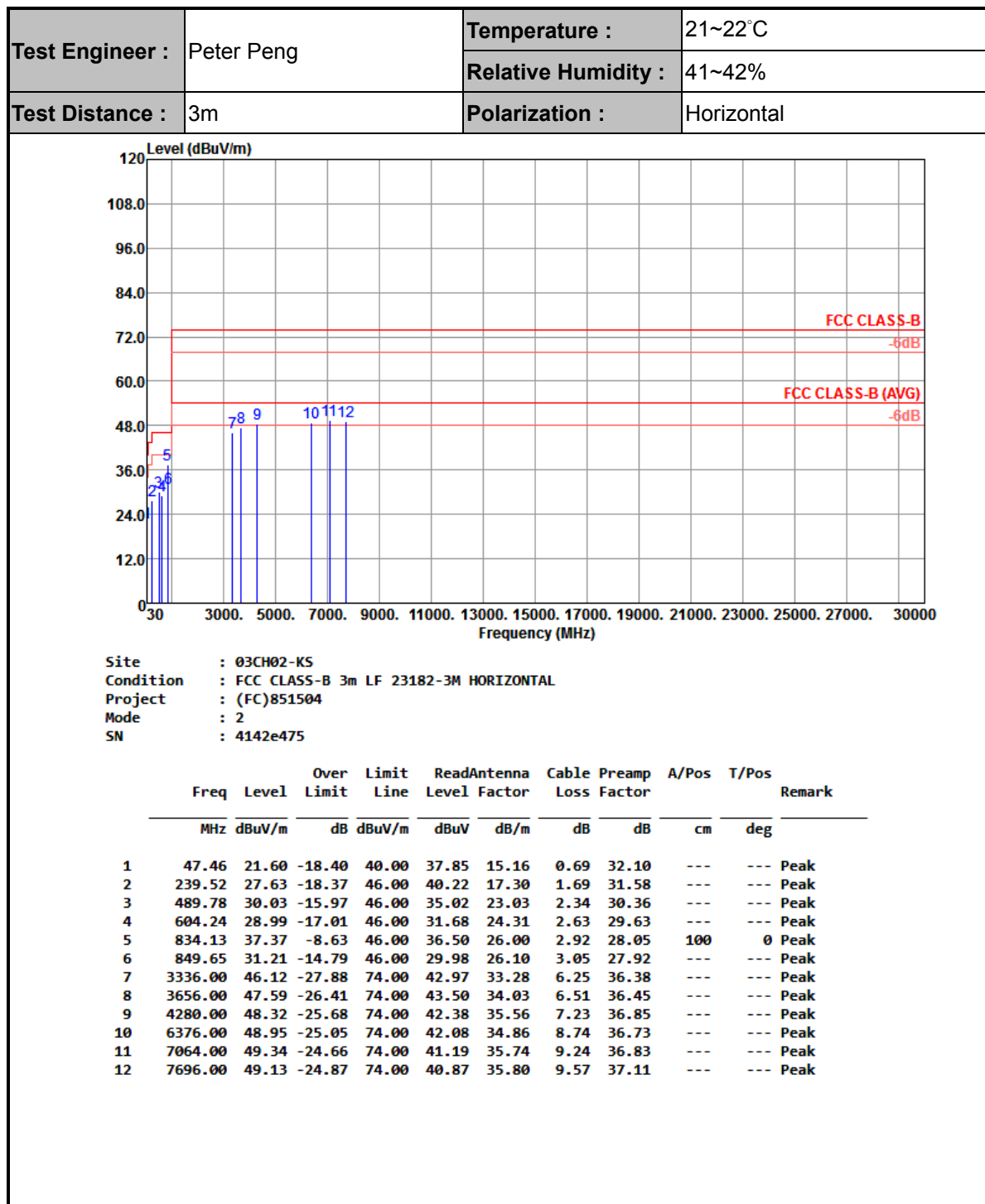


For radiated emissions above 1GHz



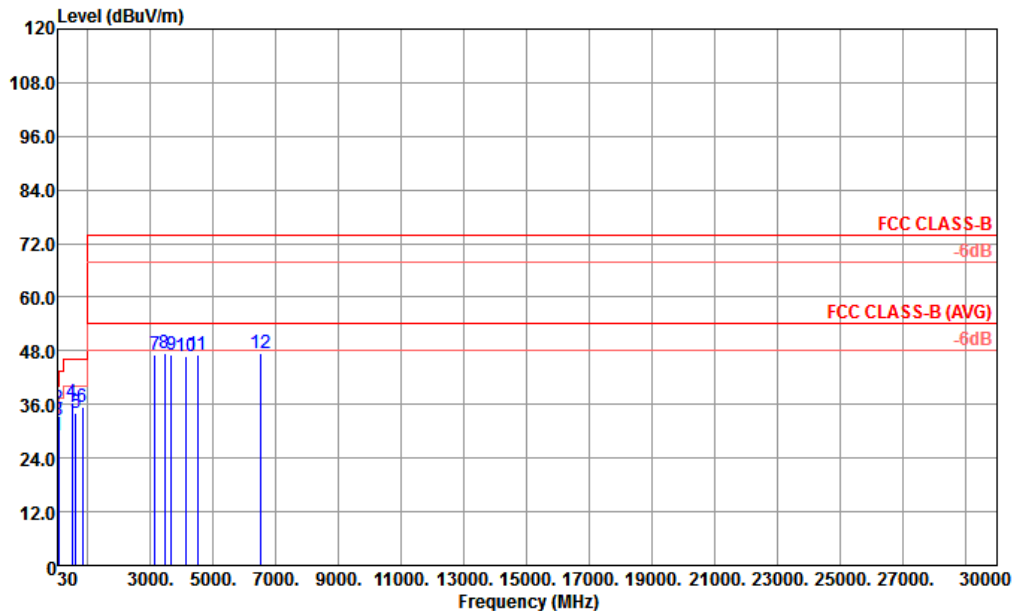


3.2.5. Test Result of Radiated Emission





Test Engineer :	Peter Peng	Temperature :	21~22°C
		Relative Humidity :	41~42%
Test Distance :	3m	Polarization :	Vertical



Site : 03CH02-KS
 Condition : FCC CLASS-B 3m LF 23182-3M VERTICAL
 Project : (FC)851504
 Mode : 2
 SN : 4142e475

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	32.91	29.15	-10.85	40.00	37.79	22.79	0.61	32.04	---	---	Peak
2	47.46	35.07	-4.93	40.00	51.32	15.16	0.69	32.10	100	0	Peak
3	57.16	32.29	-7.71	40.00	50.82	12.82	0.78	32.13	---	---	Peak
4	489.78	36.44	-9.56	46.00	41.43	23.03	2.34	30.36	---	---	Peak
5	604.24	33.98	-12.02	46.00	36.67	24.31	2.63	29.63	---	---	Peak
6	834.13	35.41	-10.59	46.00	34.54	26.00	2.92	28.05	---	---	Peak
7	3144.00	47.20	-26.80	74.00	45.09	32.96	6.12	36.97	---	---	Peak
8	3448.00	47.58	-26.42	74.00	44.20	33.46	6.32	36.40	---	---	Peak
9	3672.00	47.27	-26.73	74.00	43.09	34.14	6.51	36.47	---	---	Peak
10	4128.00	46.69	-27.31	74.00	41.09	35.32	7.09	36.81	---	---	Peak
11	4504.00	47.03	-26.97	74.00	40.59	35.90	7.39	36.85	---	---	Peak
12	6488.00	47.60	-26.40	74.00	40.59	34.88	8.80	36.67	---	---	Peak



4. List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
EMI Receiver	R&S	ESCI7	100768	9kHz~7GHz;	Apr. 19, 2018	Jun. 21, 2018	Apr. 18, 2019	Conduction (CO01-KS)
AC LISN	MessTec	AN3016	060103	9kHz~30MHz	Oct. 13, 2017	Jun. 21, 2018	Oct. 12, 2018	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060105	9kHz~30MHz	Oct. 13, 2017	Jun. 21, 2018	Oct. 12, 2018	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP0000008 11	AC 0V~300V, 45Hz~1000Hz	Oct. 12, 2017	Jun. 21, 2018	Oct. 11, 2018	Conduction (CO01-KS)
Transient limiter	COM-POWER	LIT-153	531040	150kHz~30MHz	Aug. 25, 2017	Jun. 21, 2018	Aug. 24, 2018	Conduction (CO01-KS)
EMI Test Receiver	R&S	ESR7	101403	9kHz~7GHz;Ma x 30dBm	Aug. 08, 2017	Jun. 23, 2018	Aug. 07, 2018	Radiation (03CH02-KS)
EXA Spectrum Analyzer	Keysight	N9010A	MY55150208	10Hz~44G,MAX 30dB	Apr. 17, 2018	Jun. 23, 2018	Apr. 16, 2019	Radiation (03CH02-KS)
Bilog Antenna	TeseQ	CBL6112D	23182	30MHz~2GHz	Jan. 29, 2018	Jun. 23, 2018	Jan. 28, 2019	Radiation (03CH02-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	75957	1GHz~18GHz	Oct. 21, 2017	Jun. 23, 2018	Oct. 20, 2018	Radiation (03CH02-KS)
SHF-EHF Horn	Schwarzbeck	BBHA 9170	BBHA170249	15GHz~40GHz	Feb. 07, 2018	Jun. 23, 2018	Feb. 06, 2019	Radiation (03CH02-KS)
Amplifier	SONOMA	310N	187289	9KHz~1GHz	Aug. 07, 2017	Jun. 23, 2018	Aug. 06, 2018	Radiation (03CH02-KS)
Amplifier	Agilent	8449B	3008A02384	1~26.5GHz Gain 30dB	Oct. 12, 2017	Jun. 23, 2018	Oct. 11, 2018	Radiation (03CH02-KS)
Amplifier	MITEQ	TTA1840-35-H G	1887435	18~40GHz	Oct. 12, 2017	Jun. 23, 2018	Oct. 11, 2018	Radiation (03CH02-KS)
AC Power Source	Chroma	61601	61601000247 3	N/A	NCR	Jun. 23, 2018	NCR	Radiation (03CH02-KS)
Turn Table	MF	MF7802	N/A	0~360 degree	NCR	Jun. 23, 2018	NCR	Radiation (03CH02-KS)
Antenna Mast	MF	MF7802	N/A	1 m~4 m	NCR	Jun. 23, 2018	NCR	Radiation (03CH02-KS)

NCR: No Calibration Required

5. Uncertainty of Evaluation

Uncertainty of Conducted Emission Measurement (150 kHz ~ 30 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	2.9 dB
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Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	4.2 dB
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Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	4.2 dB
--	--------

Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	4.7 dB
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