



FCC EMI TEST REPORT

FCC ID : RWO-RZ350259
Equipment : Smartphone
Brand Name : RAZER
Model Name : RZ35-0259
Applicant : Razer Inc.
201 3rd Street, Suite 900, San Francisco,
CA 94103, USA
Manufacturer : Razer Inc.
201 3rd Street, Suite 900, San Francisco,
CA 94103, USA
Standard : FCC 47 CFR FCC Part 15 Subpart B

The product was received on Jul. 17, 2018 and testing was started from Aug. 06, 2018 and completed on Aug. 21, 2018. We, SPORTON INTERNATIONAL 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 report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Approved by: Jones Tsai

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory

No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)



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History of this test report

Report No.	Version	Description	Issued Date
FC871722	01	Initial issue of report	Sep. 27, 2018



Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.1	15.107	AC Conducted Emission	Pass	Under limit 9.17 dB at 0.492 MHz
3.2	15.109	Radiated Emission	Pass	Under limit 4.52 dB at 36.000 MHz for Quasi-Peak

Reviewed by: Louis Wu

Report Producer: Polly Tsai



1. General Description

1.1. Product Feature of Equipment Under Test

GSM/WCDMA/LTE, Bluetooth, Wi-Fi 2.4GHz 802.11b/g/n, Wi-Fi 5GHz 802.11a/n/ac, NFC, GNSS, and WPC.

Product Specification subjective to this standard	
Antenna Type	WWAN: PIFA Antenna WLAN <Ant. 1>: PIFA Antenna <Ant. 2>: PIFA Antenna Bluetooth: PIFA Antenna GPS/Glonass/BDS: PIFA Antenna NFC: Loop Antenna WPC: Loop Antenna

1.2. Modification of EUT

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

1.3. Test Location

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code : 1190) and the FCC designation No. TW1093 and TW1095 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC Test.

Test Site	SPORTON INTERNATIONAL INC.	
Test Site Location	No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978	
Test Site No.	Sporton Site No.	
	CO05-HY	03CH06-HY

Test Site	SPORTON INTERNATIONAL INC.	
Test Site Location	No. 30-2, Dingfu Tsuen, Linkou District, New Taipei City, Taiwan 244, R.O.C. TEL: +886-2-2603-5367 / +886-2-2601-1640 FAX: +886-2-2601-1695	
Test Site No.	Sporton Site No.	
	OS04-LK	

1.4. Applicable Standards

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

- ♦ FCC 47 CFR FCC 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

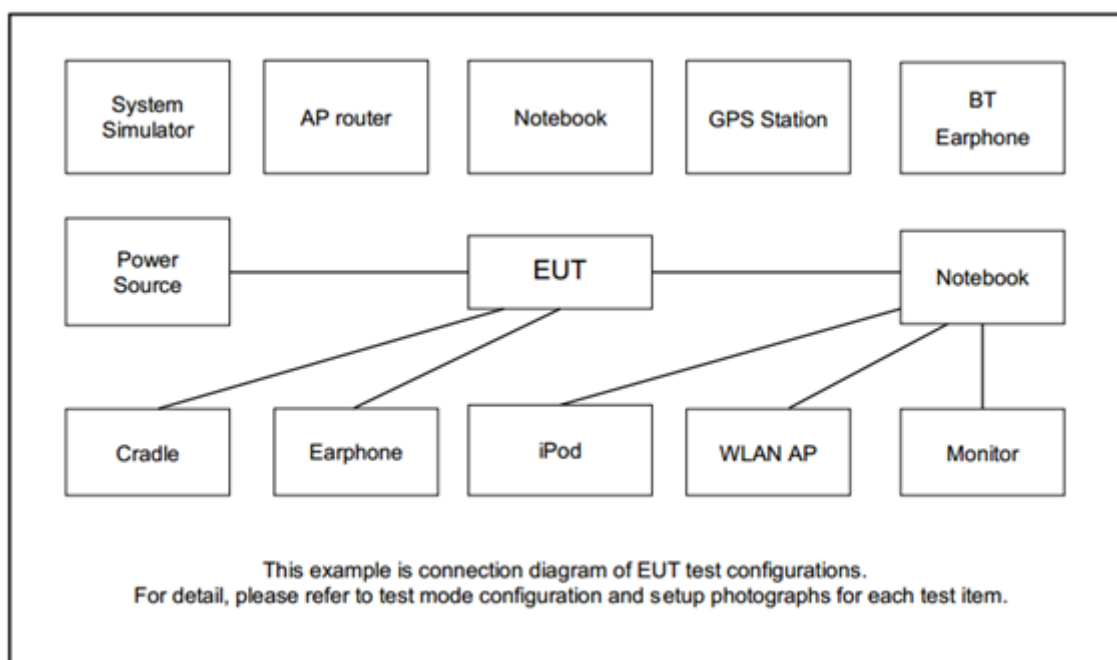
2.1. Test Mode

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: GSM850 Idle + Bluetooth Idle + WLAN (2.4GHz) Idle + GPS Rx + USB Type C Cable (Charging from Adapter 1) + SIM 1
	Mode 2: GSM1900 Idle + Bluetooth Idle + WLAN (5GHz) Idle + Camera (Front) + USB Type C Cable (Charging from Adapter 1) + SIM 2
	Mode 3: WCDMA Band II Idle + Bluetooth Idle + WLAN (2.4GHz) Idle + Camera (Rear) + USB Type C Cable (Charging from Adapter 1) + SIM 1
	Mode 4: LTE Band 4 Idle + Bluetooth Idle + WLAN (2.4GHz) Idle + MPEG4 + USB Type C Cable (Charging from Adapter 1) + SIM 1
	Mode 5: LTE Band 17 Idle + Bluetooth Idle + WLAN (5GHz) Idle + NFC on + USB Type C Cable (Data Link with Notebook) + SIM 1
	Mode 6: LTE Band 5 Idle + Bluetooth Idle + WLAN (5GHz) Idle + MPEG4 + WPC Charging + SIM 1
Radiated Emissions	Mode 1: GSM850 Idle + Bluetooth Idle + WLAN (2.4GHz) Idle + GPS Rx + Earphone + Audio Cable + SIM 1
	Mode 2: GSM1900 Idle + Bluetooth Idle + WLAN (5GHz) Idle + Camera (Front) + USB Type C Cable (Charging from Adapter 1) + SIM 2
	Mode 3: WCDMA Band II Idle + Bluetooth Idle + WLAN (2.4GHz) Idle + Camera (Rear) + USB Type C Cable (Charging from Adapter 1) + SIM 1
	Mode 4: WCDMA Band V Idle + Bluetooth Idle + WLAN (5GHz) Idle + MPEG4 + USB Type C Cable (Charging from Adapter 1) + SIM 1
	Mode 5: LTE Band 4 Idle + Bluetooth Idle + WLAN (2.4GHz) Idle + NFC on + USB Type C Cable (Data Link with Notebook) + SIM 1
	Mode 6: LTE Band 5 Idle + Bluetooth Idle + WLAN (5GHz) Idle + MPEG4 + WPC Charging + SIM 1
Remark: 1. The worst case of AC is mode 5; only the test data of this mode was reported. 2. The worst case of RE is mode 5; only the test data of this mode was reported. 3. Data Linking 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.	System Simulator	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8 m
2.	GPS Station	Pendulum	GSG-54	N/A	N/A	Unshielded, 1.8 m
3.	WLAN AP	ASUS	RT-AC66U	MSQ-RTAC66U	N/A	Unshielded, 1.8 m
4.	Bluetooth Earphone	Sony Ericsson	MW600	PY7DDA-2029	N/A	N/A
5.	iPod	Apple	A1285	FCC DoC	Shielded, 1.0 m	N/A
6.	iPod Earphone	Apple	N/A	Verification	Unshielded, 1.0 m	N/A
7.	Notebook	DELL	Latitude 5480	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
8.	SD Card	Transcend	MicroSDHC 8GB Class 10	FCC DoC	N/A	N/A
9.	SD Card	SanDisk	MicroSD HC	FCC DoC	N/A	N/A
10.	Wireless Power Charger	LG	WCD-110	BEJWCD110	N/A	N/A



2.4. EUT Operation Test Setup

The EUT was in GSM or WCDMA or LTE idle mode during the testing. The EUT was synchronized with the BCCH, and had been continuous receiving mode by setting paging reorganization of the system simulator.

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 Laptop and EUT via USB cable.
2. Execute "GPS Test" to make the EUT receive continuous signals from GPS station.
3. Execute "Video player" to play MPEG4 files.
4. Turn on camera to capture images.
5. Turn on NFC function.

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.

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.

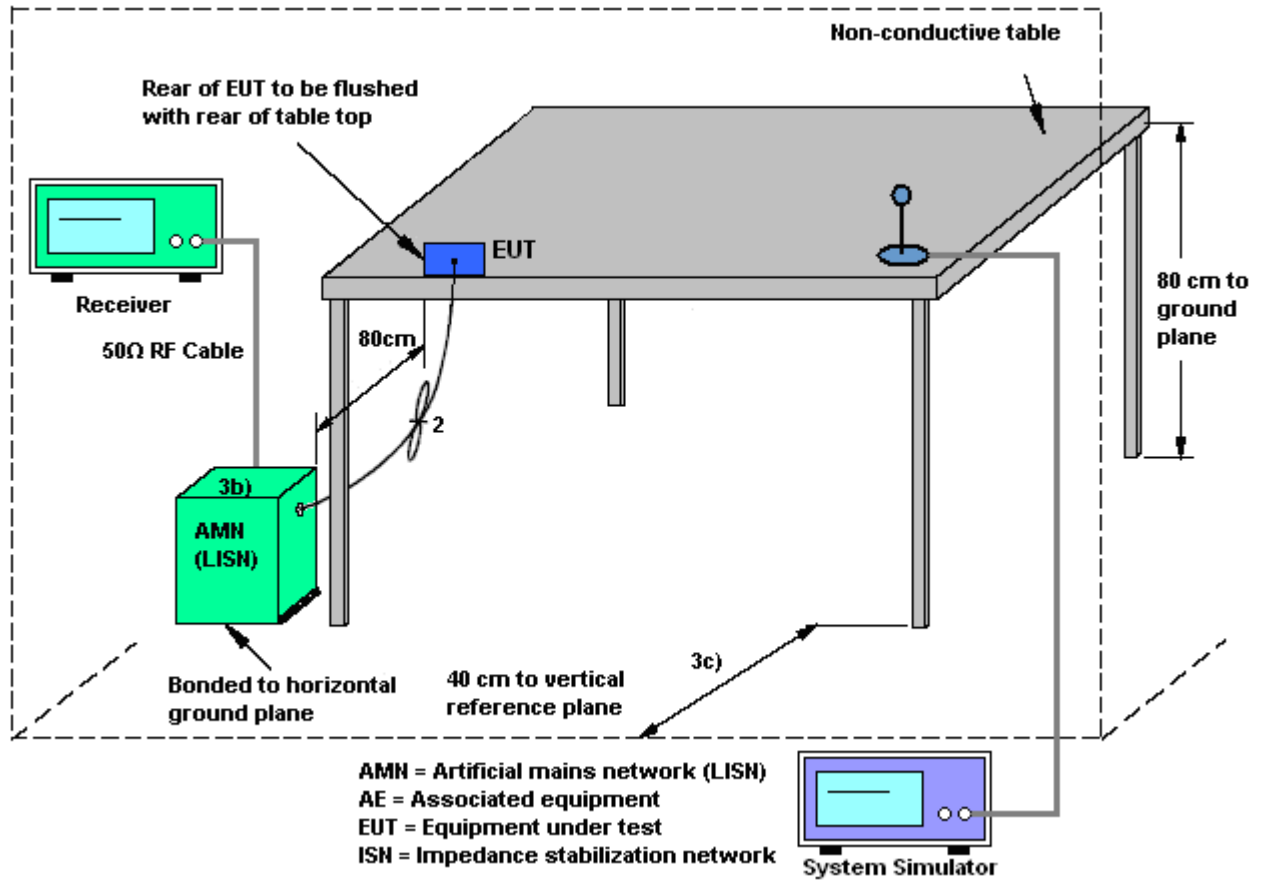
3.1.2 Measuring Instruments

Refer a test equipment and calibration data table in 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



3.1.5 Test Result of AC Conducted Emission

Please refer to Appendix A.

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:

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
Above 960	500	3

Frequency (MHz)	Field Strength (dBuV/meter)	Measurement Distance (meters)
30 – 230	30	10
230 – 1000	37	10

Note: Measurement follows the CISPR 22 limit line as below :

15.109 (g) As an alternative to the radiated emission limits shown in paragraphs (a) and (b) of this section, digital devices may be shown to comply with the standards contained in Third Edition of the International Special Committee on Radio Interference (CISPR), Pub. 22, "Information Technology Equipment - Radio Disturbance Characteristics - Limits and Methods of Measurement"

3.2.2. Measuring Instruments

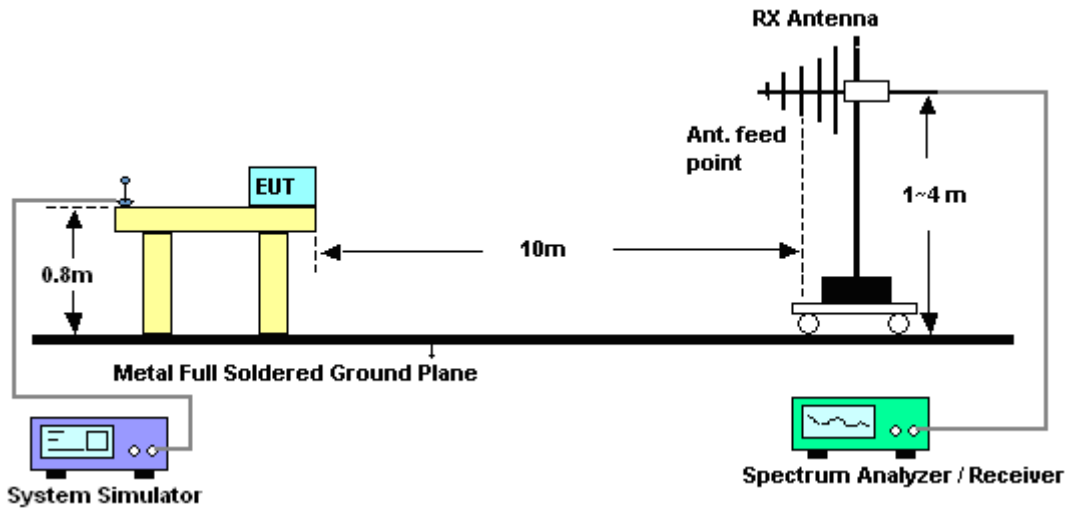
Refer a test equipment and calibration data table in this test report.

3.2.3. Test Procedures

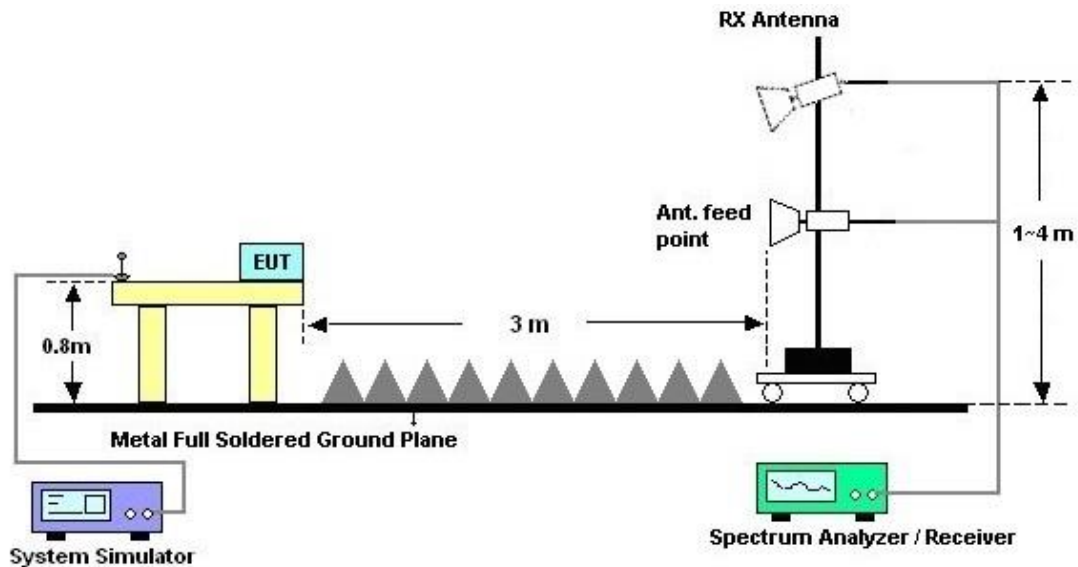
1. The EUT was placed on a turntable with 0.8 meter above ground.
2. The EUT was set 10 meters (30M~1G) and 3 meters (1G~ 13G) from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. The table was rotated 360 degrees to determine the position of the 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 (dB μ V/m) = 20 log Emission level (μ V/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

Please refer to Appendix B.



4. List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Aug. 08, 2018~ Aug. 21, 2018	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESR3	102388	9KHz~3.6GHz	Dec. 08, 2017	Aug. 08, 2018~ Aug. 21, 2018	Dec. 07, 2018	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz~30MHz	Nov. 30, 2017	Aug. 08, 2018~ Aug. 21, 2018	Nov. 29, 2018	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100081	9kHz~30MHz	Dec. 08, 2017	Aug. 08, 2018~ Aug. 21, 2018	Dec. 07, 2018	Conduction (CO05-HY)
Software	Rohde & Schwarz	EMC32 V10.30	N/A	N/A	N/A	Aug. 08, 2018~ Aug. 21, 2018	N/A	Conduction (CO05-HY)
LF Cable	HUBER + SUHNER	RG-214/U	LF01	N/A	Jan. 03, 2018	Aug. 08, 2018~ Aug. 21, 2018	Jan. 02, 2019	Conduction (CO05-HY)
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100851	N/A	Jan. 03, 2018	Aug. 08, 2018~ Aug. 21, 2018	Jan. 02, 2019	Conduction (CO05-HY)
Amplifier	HP	8447D	2944A074 68	10 kHz ~ 1.3GHz	Jan. 16, 2018	Aug. 06, 2018	Jan. 15, 2019	Radiation (OS04-LK)
Spectrum Analyzer	R&S	FSP 7	100639	9 kHz ~ 7 GHz	Nov. 22, 2017	Aug. 06, 2018	Nov. 21, 2018	Radiation (OS04-LK)
Test Receiver	R&S	ESCS 30	838251/00 4	9 kHz ~ 2.75 GHz	Dec. 22, 2017	Aug. 06, 2018	Dec. 21, 2018	Radiation (OS04-LK)
Bilog Antenna with 5dB Attenuator	TESEQ & EMCI	CBL6112B & N-6-05	35377 & AT-N0518	30 MHz ~ 2 GHz	Jul. 07, 2018	Aug. 06, 2018	Jul. 06, 2019	Radiation (OS04-LK)
Turn Table	EMCO	2080	9711-2021	0 ~ 360 degree	N.C.R	Aug. 06, 2018	N.C.R	Radiation (OS04-LK)
Antenna Mast	EMCO	2075	9711-2115	1 m ~ 4 m	N.C.R	Aug. 06, 2018	N.C.R	Radiation (OS04-LK)
RF Cable-R10m	BELDEN	RG8/U	CB011	30 MHz ~ 1 GHz	Dec. 20, 2017	Aug. 06, 2018	Dec. 19, 2018	Radiation (OS04-LK)
Software	Audix	E3	4.0	-	N.C.R	Aug. 06, 2018	N.C.R	Radiation (OS04-LK)
EMI Test Receiver	Rohde & Schwarz	ESU26	100472	20Hz~26.5GHz	Jan. 04, 2018	Aug. 21, 2018	Jan. 03, 2019	Radiation (03CH06-HY)
Preamplifier	Agilent	8449B	3008A019 17	1GHz~26.5GHz	Apr. 23, 2018	Aug. 21, 2018	Apr. 22, 2019	Radiation (03CH06-HY)
Antenna Mast	MF	MF-7802	MF780208 212	1m~4m	N/A	Aug. 21, 2018	N/A	Radiation (03CH06-HY)
Turn Table	INN-CO	DS2000	420/650/00	0-360 degree	N/A	Aug. 21, 2018	N/A	Radiation (03CH06-HY)
Horn Antenna	SCHWARZBE CK	BBHA 9120 D	BBHA 9120 D 1212	1GHz ~ 18GHz	May 10, 2018	Aug. 21, 2018	May 09, 2019	Radiation (03CH06-HY)
Test Software	AUDIX	e3	6.2009-8-2 4(k5)	N/A	N/A	Aug. 21, 2018	N/A	Radiation (03CH06-HY)
RF Cable	Infinet/Sunhner	LL142/SF104	CA3601-3 601-HLL	1GHz-26GHz	Nov. 24, 2017	Aug. 21, 2018	Nov. 23, 2018	Radiation (03CH06-HY)
Filter	Microwave	H1G013G1	SN477215	1.0G High Pass	Dec. 07, 2017	Aug. 21, 2018	Dec. 06, 2018	Radiation (03CH06-HY)

5. Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	2.70
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Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	2.90
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Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	4.70
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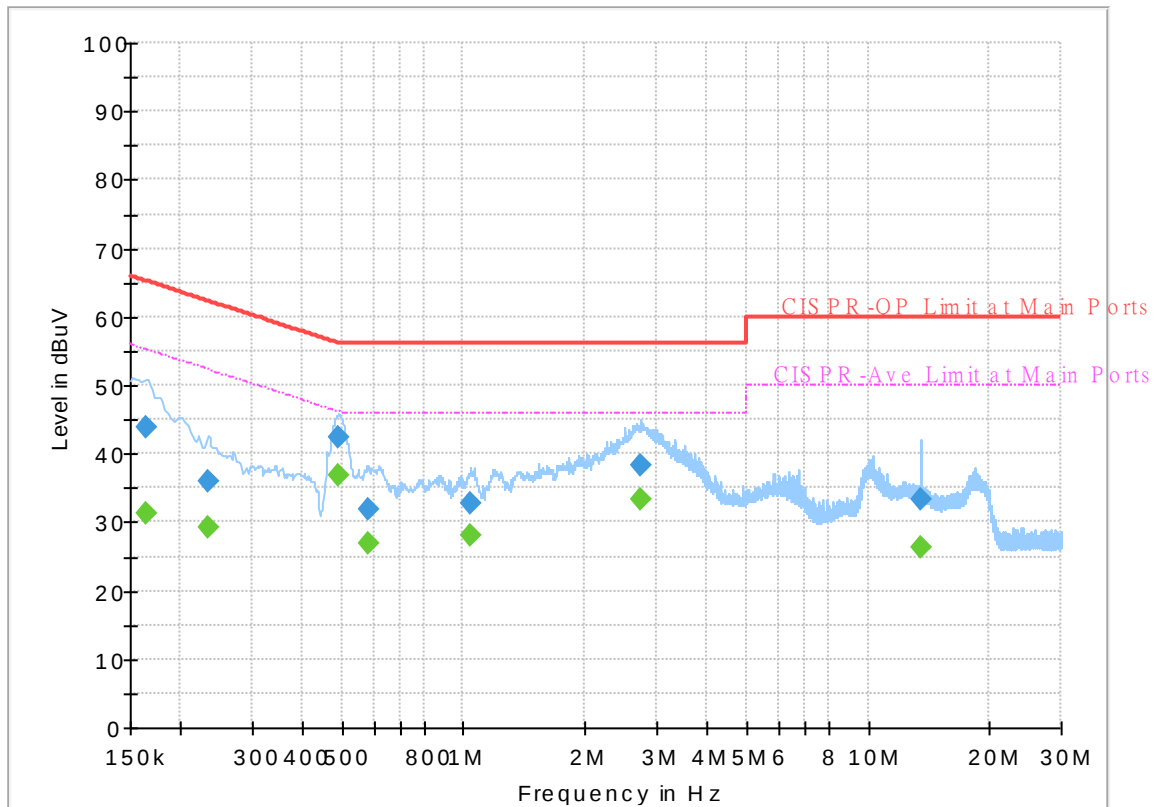
Appendix A. AC Conducted Emission Test Results

Test Engineer :	Arthur Hsieh and Kai-Chun Chu	Temperature :	21~25°C
		Relative Humidity :	50~55%

EUT Information

Report NO : 871722
Test Mode : Mode 5
Test Voltage : Power From System
Phase : Line

Full Spectrum



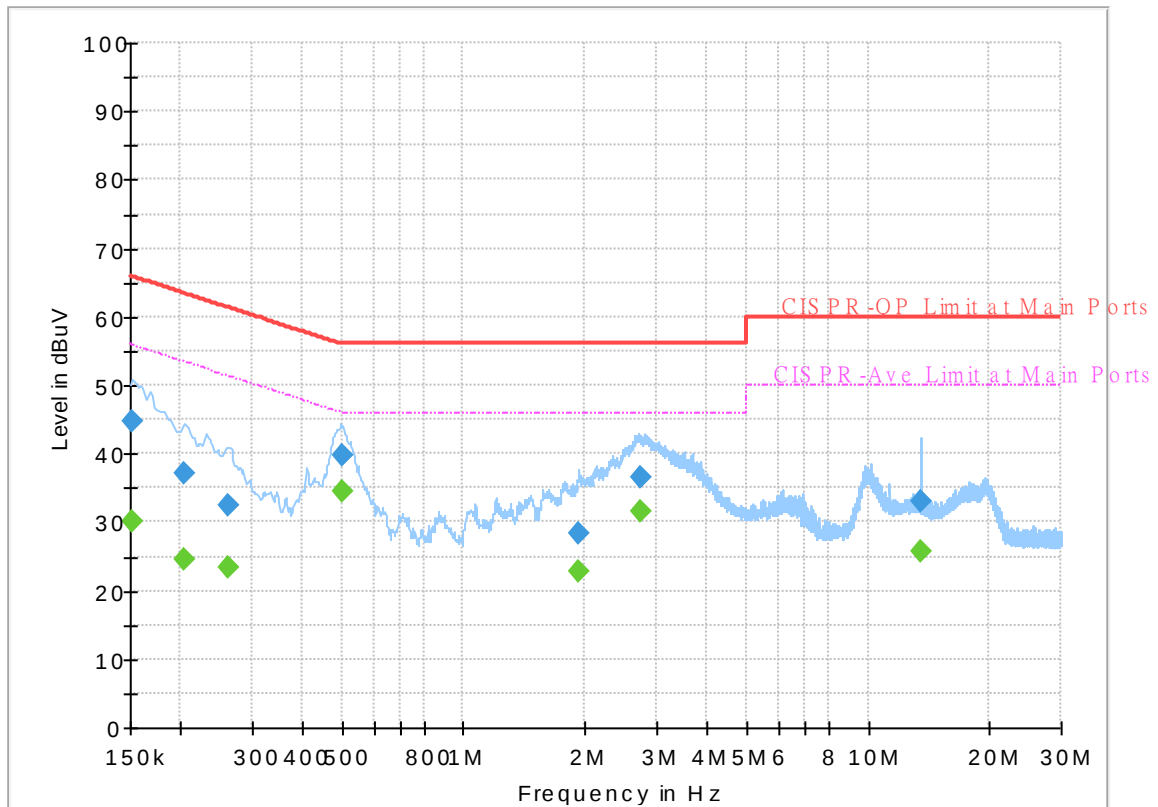
Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.163500	---	31.20	55.28	24.08	L1	OFF	19.5
0.163500	43.92	---	65.28	21.36	L1	OFF	19.5
0.233250	---	29.10	52.33	23.23	L1	OFF	19.5
0.233250	35.82	---	62.33	26.51	L1	OFF	19.5
0.492000	---	36.96	46.13	9.17	L1	OFF	19.5
0.492000	42.35	---	56.13	13.78	L1	OFF	19.5
0.579750	---	26.85	46.00	19.15	L1	OFF	19.5
0.579750	31.82	---	56.00	24.18	L1	OFF	19.5
1.041000	---	28.02	46.00	17.98	L1	OFF	19.5
1.041000	32.71	---	56.00	23.29	L1	OFF	19.5
2.739750	---	33.45	46.00	12.55	L1	OFF	19.5
2.739750	38.24	---	56.00	17.76	L1	OFF	19.5
13.560000	---	26.38	50.00	23.62	L1	OFF	19.7
13.560000	33.29	---	60.00	26.71	L1	OFF	19.7

EUT Information

Report NO : 871722
Test Mode : Mode 5
Test Voltage : Power From System
Phase : Neutral

Full Spectrum

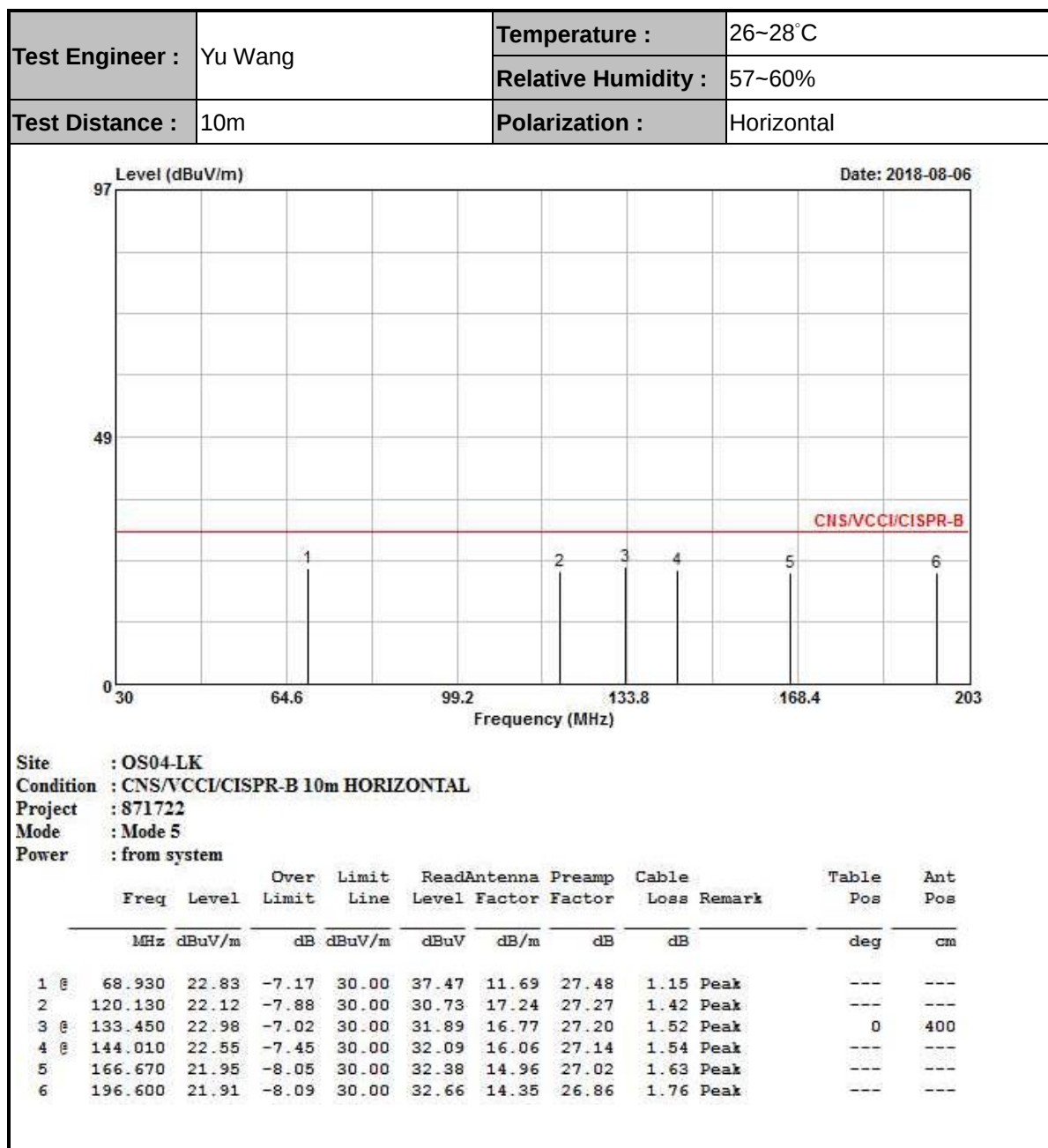


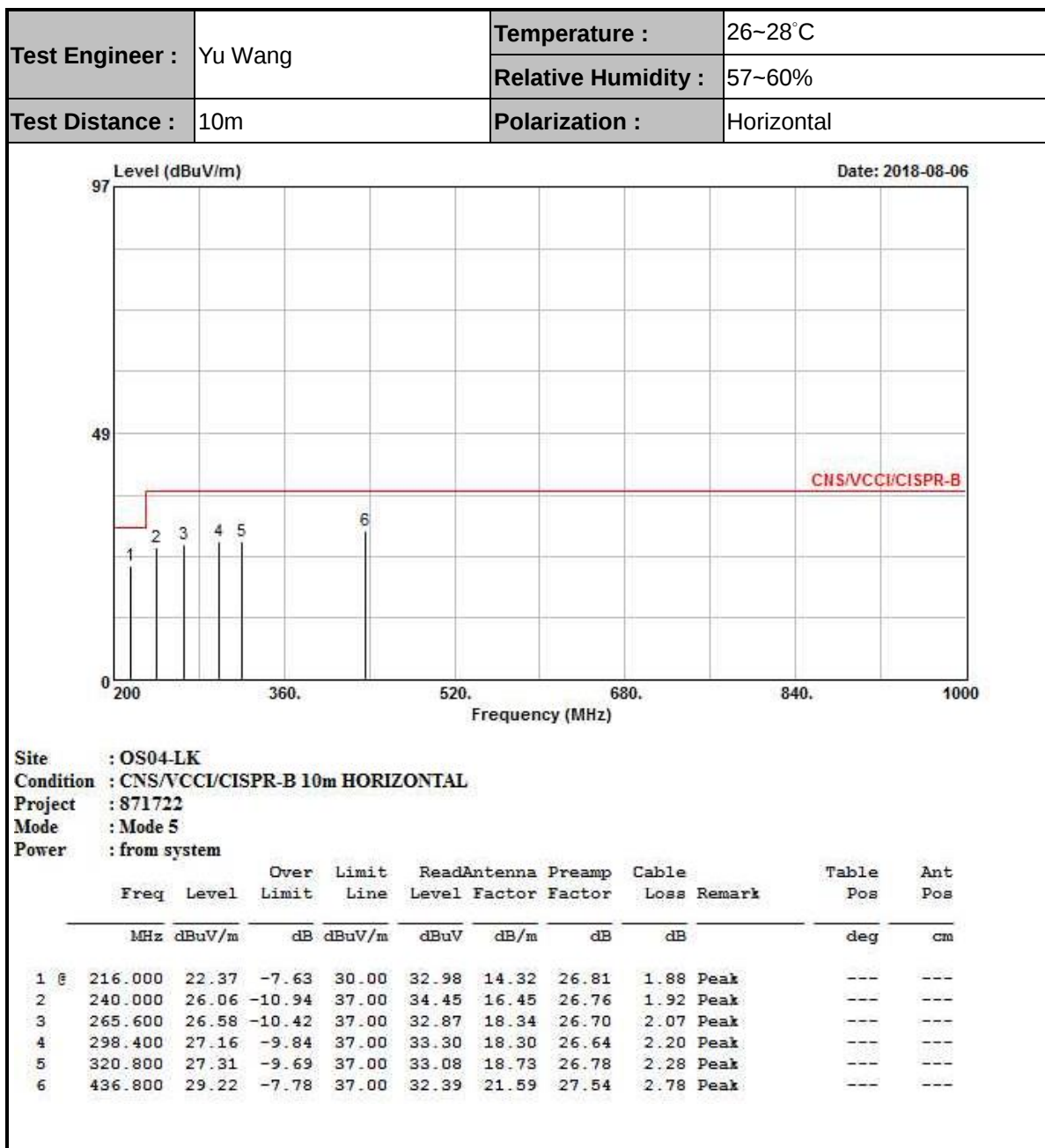
Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.152250	---	30.26	55.88	25.62	N	OFF	19.5
0.152250	44.66	---	65.88	21.22	N	OFF	19.5
0.204000	---	24.57	53.45	28.88	N	OFF	19.5
0.204000	37.00	---	63.45	26.45	N	OFF	19.5
0.262500	---	23.49	51.35	27.86	N	OFF	19.5
0.262500	32.47	---	61.35	28.88	N	OFF	19.5
0.501000	---	34.36	46.00	11.64	N	OFF	19.5
0.501000	39.71	---	56.00	16.29	N	OFF	19.5
1.923000	---	22.84	46.00	23.16	N	OFF	19.6
1.923000	28.42	---	56.00	27.58	N	OFF	19.6
2.742000	---	31.55	46.00	14.45	N	OFF	19.5
2.742000	36.41	---	56.00	19.59	N	OFF	19.5
13.560000	---	25.72	50.00	24.28	N	OFF	19.8
13.560000	33.11	---	60.00	26.89	N	OFF	19.8



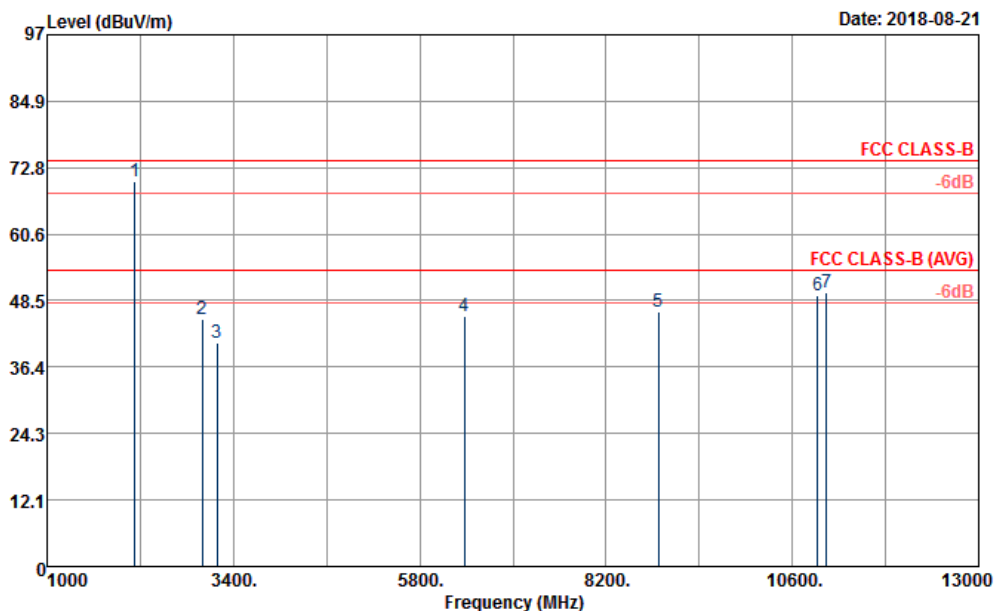
Appendix B. Radiated Emission Test Result





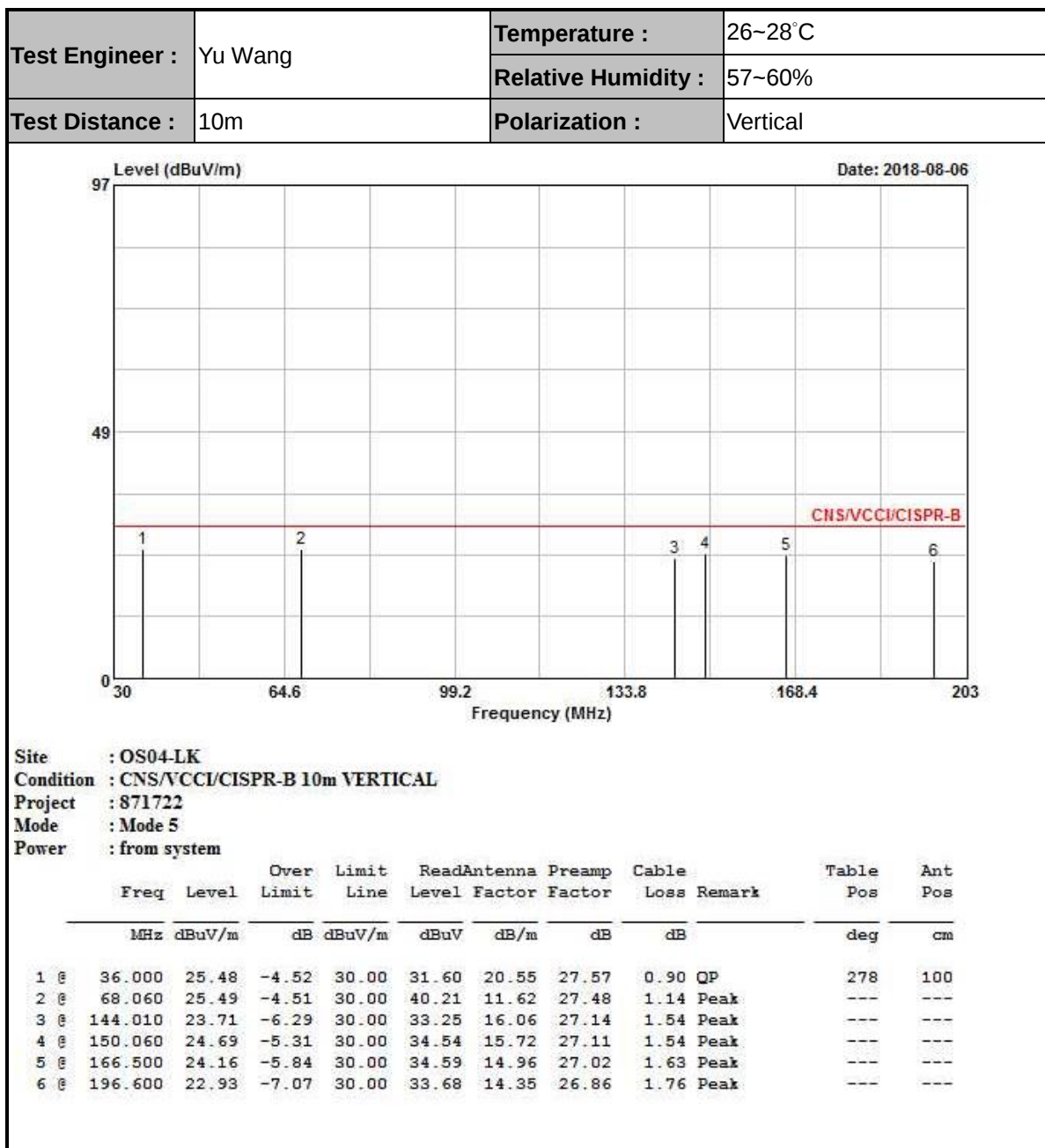


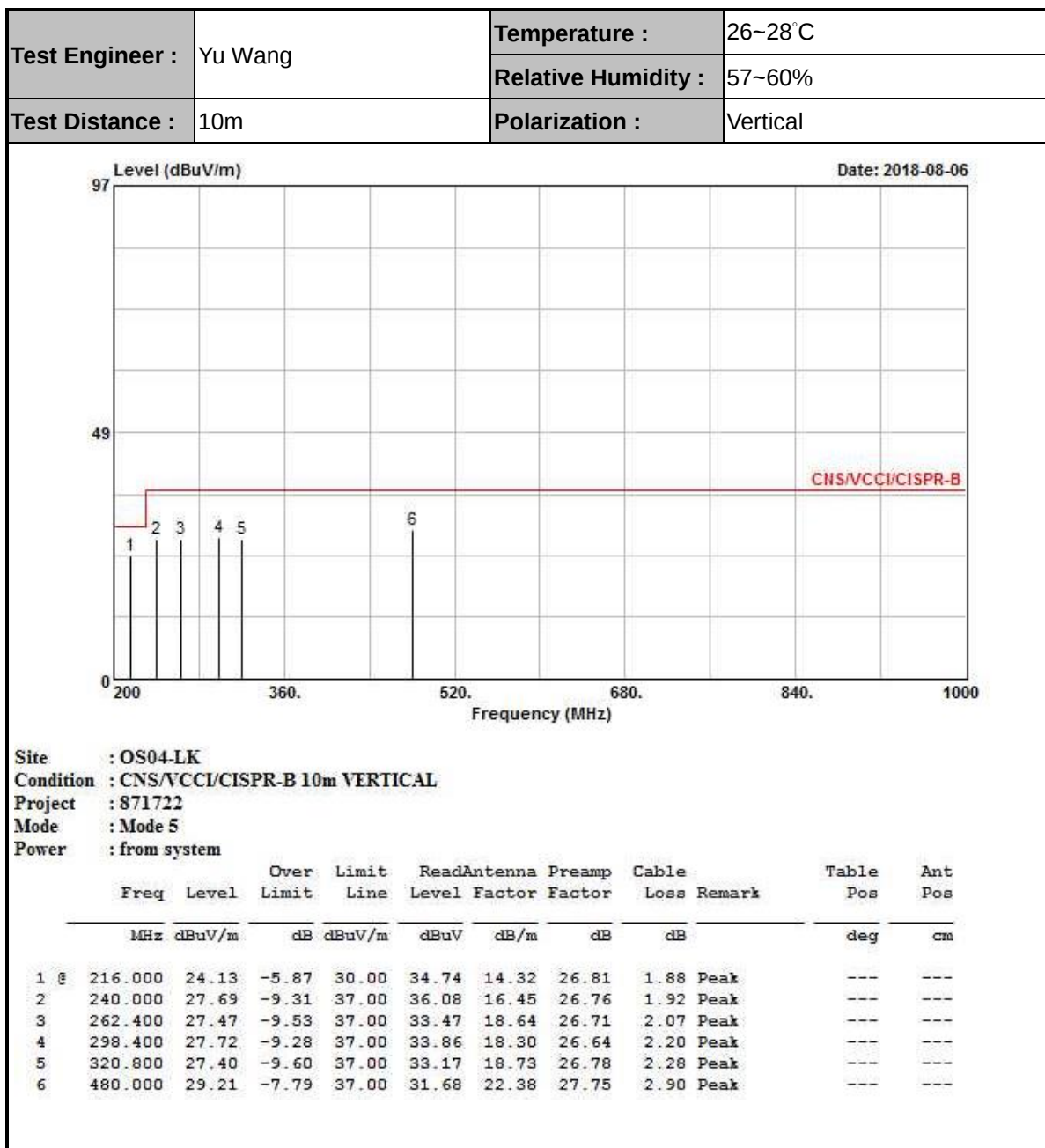
Test Engineer :	Donny Tang	Temperature :	25~26°C
		Relative Humidity :	50~52%
Test Distance :	3m	Polarization :	Horizontal
Remark :	#1 is system simulator signal which can be ignored.		



Site : 03CH06-HY
Condition : FCC CLASS-B 3m 9120D_1212_180510 HORIZONTAL
Project : 871722
Power : From System
Memo : Mode 5

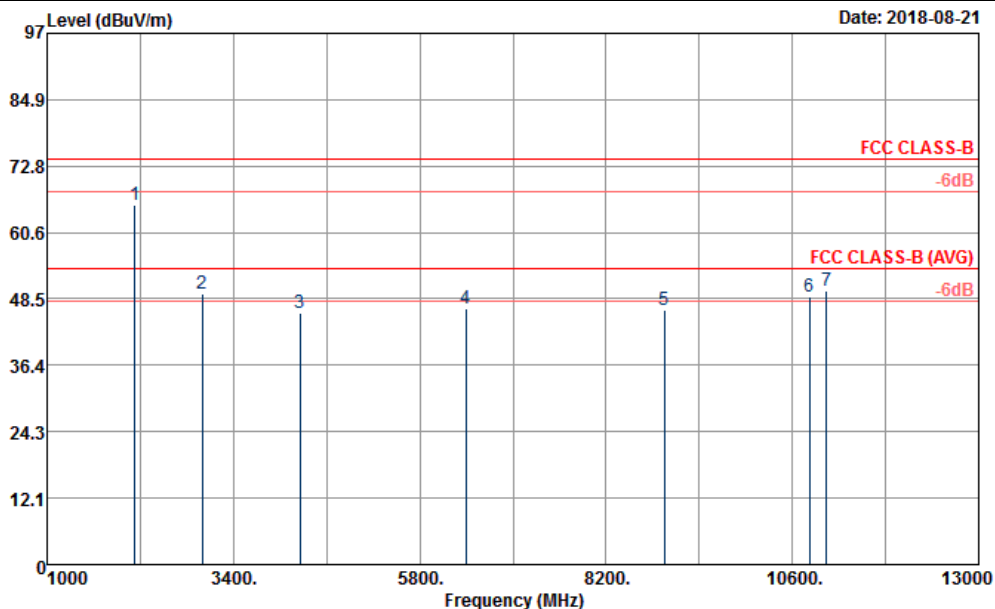
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	2132.00	70.18			98.09	26.53	6.66	61.10	---	---	Peak
2	3000.00	45.12	-28.88	74.00	69.89	28.50	8.13	61.40	---	---	Peak
3	3192.00	40.83	-33.17	74.00	65.15	28.61	8.55	61.48	---	---	Peak
4	6374.00	45.65	-28.35	74.00	58.39	33.70	12.14	58.58	---	---	Peak
5	8878.00	46.57	-27.43	74.00	52.18	37.29	14.86	57.76	---	---	Peak
6	10924.00	49.37	-24.63	74.00	49.19	40.12	16.72	56.66	---	---	Peak
7	11044.00	49.88	-24.12	74.00	49.27	40.17	16.91	56.47	100	112	Peak







Test Engineer :	Donny Tang	Temperature :	25~26°C
		Relative Humidity :	50~52%
Test Distance :	3m	Polarization :	Vertical
Remark :	#1 is system simulator signal which can be ignored.		



Site : 03CH06-HY
Condition : FCC CLASS-B 3m 9120D_1212_180510 VERTICAL
Project : 871722
Power : From System
Memo : Mode 5

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Cable Preamp	A/Pos	T/Pos	
	MHz	dBuV/m	dB	dBuV/m	dBuV	Loss Factor	cm	deg	Remark
1	2132.00	65.66			93.57	26.53	6.66	61.10	--- --- Peak
2	2994.00	49.44	-24.56	74.00	74.24	28.46	8.13	61.39	--- --- Peak
3	4262.00	46.04	-27.96	74.00	67.31	30.13	9.62	61.02	--- --- Peak
4	6390.00	46.84	-27.16	74.00	59.52	33.75	12.16	58.59	--- --- Peak
5	8950.00	46.37	-27.63	74.00	51.91	37.42	14.89	57.85	--- --- Peak
6	10822.00	49.00	-25.00	74.00	49.32	39.99	16.57	56.88	--- --- Peak
7	11042.00	50.04	-23.96	74.00	49.43	40.17	16.91	56.47	100 196 Peak