

Report No. : FC010618-04



FCC EMI TEST REPORT

FCC ID	: AK8-PM1300BV
Equipment	: Communication Device
Brand Name	: Sony
Applicant	: Sony Corporation
	1-7-1 Konan, Minato-ku, Tokyo, 108-0075, Japan
Manufacturer	: Sony Network Communications Inc.
	4-12-3 Higashi-Shinagawa, Shinagawa-ku,
	Tokyo, 140-0002, Japan
Standard	: FCC 47 CFR FCC Part 15 Subpart B

The product was received on Jan. 17, 2020 and testing was started from Mar. 30, 2020 and completed on Jul. 08, 2020. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, 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 INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Louis Wu

Approved by: Louis Wu SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory

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



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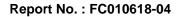
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History of this test report

Report No.	Version	Description	Issued Date	
FC010618-04	01	Initial issue of report	Sep. 25, 2020	
FC010618-04	02	Revising test description	Oct. 13, 2020	
FC010618-04	03	Revising test description	Oct. 14, 2020	





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 5.38 dB at 20.679 MHz
3.2	15.109	Radiated Emission	Pass	Under limit 4.87 dB at 719.670 MHz

Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

Reviewed by: Dara Chiu

Report Producer: Ann Lee



1. General Description

1.1. Product Feature of Equipment Under Test

LTE, Bluetooth, and GNSS.

Product Specification subjective to this standard						
Antenna Type	WWAN: Monopole Antenna Bluetooth: PIFA Antenna GPS / Glonass: PIFA Antenna					
EUT Information List						
HW Version	SW Version S/N		Performed Test Item			
A	02.00 824880610B1 824832615		Radiated Emission Conducted Emission			

Accessory List				
AC Adoptor	Model Name : UCH20			
AC Adapter	S/N : 2118W10507474			
	Model Name : UCB20			
USB Cable	S/N : A394635019S			
Detterry	Model Name : AHB381936HPC			
Battery	S/N : N/A			

Note:

1. Above EUT list used are electrically identical per declared by manufacturer.

2. Above the accessories list are used to exercise the EUT during test, and the serial number of each type of accessories is listed in each section of this report.

3. For other wireless features of this EUT, test report will be issued separately.

1.2. Modification of EUT

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



1.3. Test Location

Test Site	SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory		
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.		
Test Site No.	CO05-HY		
	SPORTON INTERNATIONAL INC. EMC & Wireless Communications		
Test Site	Laboratory		
Test Site Test Site Location			
	Laboratory No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-0868		

FCC Designation No.: TW1093 and TW1098

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.



Test Configuration of Equipment Under Test 2.

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). For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (X plane) were recorded in this report.

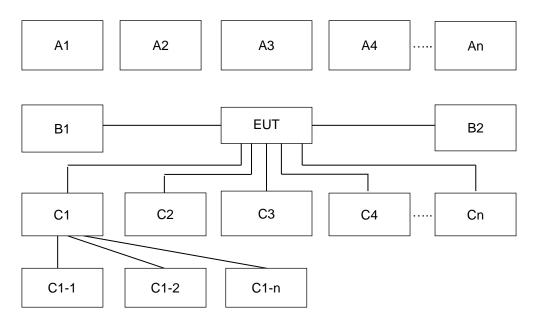
Test Items	Function Type
AC Conducted Emission	Mode 1: LTE Cat M1 Band 26 (Middle Channel) Idle + Bluetooth Idle + Ring + GPS Rx + Adapter
EIIISSION	Mode 2: EUT with USB Cable (Data Link with Notebook)
Radiated Emissions	Mode 1: LTE Cat M1 Band 26 (Middle Channel) Idle + Bluetooth Idle + Ring + GPS Rx + Adapter
Emissions	Mode 2: EUT with USB Cable (Data Link with Notebook)
Remark:	

1. Data Link with Notebook means data application transferred mode between EUT and Notebook. 2. For radiation emission mode 1 after pre-scanned the cellular band (LTE Cat M1 Band 26 L/M/H

CH); only the worst case for cellular band test data of this mode was reported.



2.2. Connection Diagram of Test System



	Test Setup								
Ne	Wineless Station	Composition Turns			Те	st Mo	de		
No.	Wireless Station	Connection Type		2	-	-	-	-	-
A1	Phone	Bluetooth	Х	-	-	-	-	-	-
A2	System Simulator	LTE	Х	-	-	-	-	-	-
A3	GPS Station	GPS		-	-	-	-	-	-
No.	Power Source	Connection Type	1	2	-	-	-	-	-
B1	AC : 120V/60Hz	AC Power Cable	Х	-	-	-	-	-	-
B2	Power from System	AC Power Cable	-	Х	-	-	-	-	-
No.	Setup Peripherals	Connection Type	1	2	-	-	-	-	-
C1	Earphone	Earphone jack	Х	-	-	-	-	-	-
C2	Notebook	USB Cable	-	Х	-	-	-	-	-
C2-1	Music Player	USB cable to C2	-	Х	-	-	-	-	-
C2-2	AP Router	RJ-45 Cable to C2	-	Х	-	-	-	-	-



2.3.	Support Unit used in test c	configuration and system
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Item	Equipment	Brand Name	Model Name	FCC ID	Data Cable	Power Cord
1.	System Simulator	Anritsu	8821C	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.	Music Player	Apple	A1285	FCC DoC	Shielded, 1.0 m	N/A
5.	Notebook	ASUS	P2430U	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
6.	Notebook	DELL	Latitude E5480	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
7.	Phone	Samsung	SM-A730F/DS	N/A	N/A	N/A
8.	Phone	ASUS	Asus-Zenfone5	N/A	N/A	N/A
9.	USB Cable	SONY	UCB20	N/A	N/A	N/A
10.	Earphone	SONY	STH40D	N/A	N/A	N/A
11.	Adapter	SONY	AC-0060	N/A	N/A	N/A

2.4. EUT Operation Test Setup

The EUT was in 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, 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. Turn on Ring 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	Conducted	limit (dBuV)
(MHz)	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

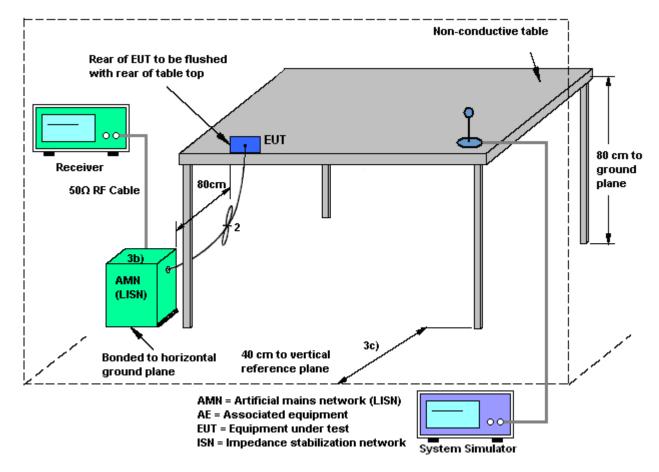
Refer a test equipment and calibration data table in this test report.

3.1.3 Test Procedure

- 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.
- 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.

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FAX : 886-3-328-4978	Issued Date	: Oct. 14, 2020
Report Template No.: BU5-FD15B Version 2.5	Report Version	: 03



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

3.2.2. Measuring Instruments

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

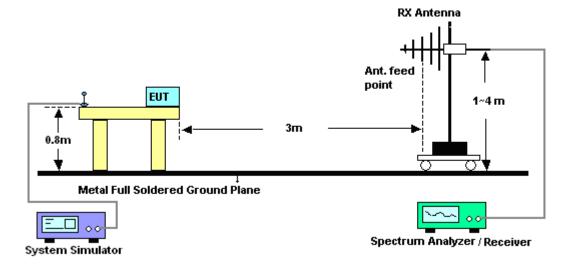
3.2.3. Test Procedures

- 1. The EUT was placed on a turntable with 0.8 meter above ground.
- 2. The EUT was set 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 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.
- 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

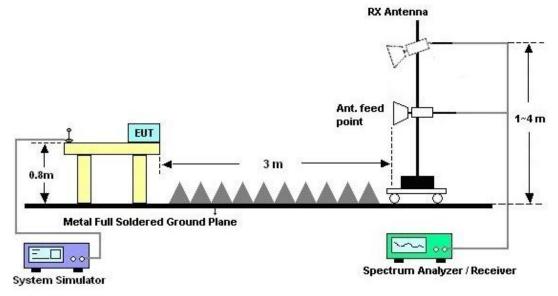


3.2.4. Test Setup of Radiated Emission

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	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Mar. 30, 2020~ Apr. 20, 2020	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESR3	102388	9kHz~3.6GHz	Nov. 15, 2019	Mar. 30, 2020~ Apr. 20, 2020	Nov. 14, 2020	Conduction (CO05-HY)
Hygrometer	Testo	608-H1	34913912	N/A	Nov. 07, 2019	Mar. 30, 2020~ Apr. 20, 2020	Nov. 06, 2020	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz~30MHz	Nov. 20, 2019	Mar. 30, 2020~ Apr. 20, 2020	Nov. 19, 2020	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100081	9kHz~30MHz	Nov. 15, 2019	Mar. 30, 2020~ Apr. 20, 2020	Nov. 14, 2020	Conduction (CO05-HY)
Software	Rohde & Schwarz	EMC32 V10.30	N/A	N/A	N/A	Mar. 30, 2020~ Apr. 20, 2020	N/A	Conduction (CO05-HY)
LF Cable	HUBER + SUHNER	RG-214/U	LF01	N/A	Jan. 02, 2020	Mar. 30, 2020~ Apr. 20, 2020	Jan. 01, 2021	Conduction (CO05-HY)
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100851	N/A	Jan. 02, 2020	Mar. 30, 2020~ Apr. 20, 2020	Jan. 01, 2021	Conduction (CO05-HY)
Amplifier	SONOMA	310N	187311	9kHz~1GHz	Oct. 22, 2019	Apr. 20, 2020~ Jul. 08, 2020	Oct. 21, 2020	Radiation (03CH10-HY)
Bilog Antenna	TESEQ	CBL 6111D & 00800N1D01N -06	35413 & 02	30MHz~1GHz	Feb. 11, 2020	Apr. 20, 2020~ Jul. 08, 2020	Feb. 10, 2021	Radiation (03CH10-HY)
Horn Antenna	SCHWARZBE CK	BBHA 9120 D	9120D-132 5	1GHz~18GHz	Oct. 09, 2019	Apr. 20, 2020~ Jul. 08, 2020	Oct. 08, 2020	Radiation (03CH10-HY)
Preamplifier	Jet-Power	JAP00101800- 30-10P	160118550 004	1GHz~18GHz	Sep. 27, 2019	Apr. 20, 2020~ Jul. 08, 2020	Sep. 26, 2020	Radiation (03CH10-HY)
Spectrum Analyzer	Keysight	N9010A	MY542004 85	10Hz~44GHz	Feb. 10, 2020	Apr. 20, 2020~ Jul. 08, 2020	Feb. 09, 2021	Radiation (03CH10-HY)
Controller	EMEC	EM 1000	N/A	Control Turn table & Ant Mast	N/A	Apr. 20, 2020~ Jul. 08, 2020	N/A	Radiation (03CH10-HY)
Antenna Mast	EMEC	AM-BS-4500- B	N/A	1~4m	N/A	Apr. 20, 2020~ Jul. 08, 2020	N/A	Radiation (03CH10-HY)
Turn Table	EMEC	TT 2200	N/A	0~360 Degree	N/A	Apr. 20, 2020~ Jul. 08, 2020	N/A	Radiation (03CH10-HY)
Software	Audix	E3 6.2009-8-24	RK-00104 2	N/A	N/A	Apr. 20, 2020~ Jul. 08, 2020	N/A	Radiation (03CH10-HY)
EMI Test Receiver	Agilent	N9038A(MXE)	MY532900 45	20MHz~8.4GHz	Jan. 18, 2020	Apr. 20, 2020~ Jul. 08, 2020	Jan. 17, 2021	Radiation (03CH10-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104 / 102	MY11692/ 4PE, MY11693/ 4PE, MY2855/2	30MHz~1GHz	Nov. 07, 2019	Apr. 20, 2020~ Jul. 08, 2020	Nov. 06, 2020	Radiation (03CH10-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104 / 102	MY11692/ 4PE, MY11693/ 4PE, MY2855/2	1GHz~18GHz	Nov. 07, 2019	Apr. 20, 2020~ Jul. 08, 2020	Nov. 06, 2020	Radiation (03CH10-HY)



5. Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of	2.2
Confidence of 95% (U=2Uc(y))	2.5

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of	5.2
Confidence of 95% (U=2Uc(y))	5.5

Uncertainty of Radiated Emission Measurement (1000 MHz ~ 6000 MHz)

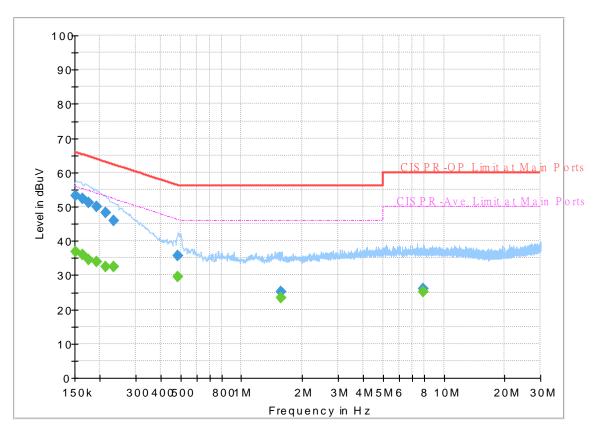
Measuring Uncertainty for a Level of	4.6
Confidence of 95% (U=2Uc(y))	4.6



Appendix A. AC Conducted Emission Test Results

Test Engineer : To		Temperature :	21~25 ℃
	Tom Lee	Relative Humidity :	42~50%

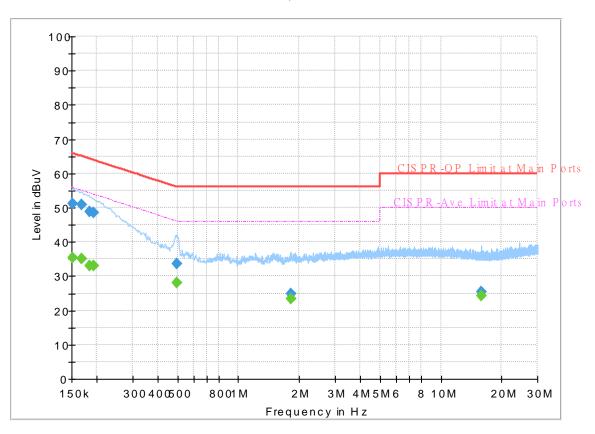
Test Mode : Test Voltage : Phase : Mode 1 120Vac/60Hz Line



Full Spectrum

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.151890		36.76	55.90	19.14	L1	OFF	19.6
0.151890	53.22		65.90	12.68	L1	OFF	19.6
0.165120		35.97	55.20	19.23	L1	OFF	19.6
0.165120	52.34		65.20	12.86	L1	OFF	19.6
0.176550		34.60	54.65	20.05	L1	OFF	19.6
0.176550	51.14		64.65	13.51	L1	OFF	19.6
0.192750		33.92	53.92	20.00	L1	OFF	19.6
0.192750	50.03		63.92	13.89	L1	OFF	19.6
0.213090		32.47	53.08	20.61	L1	OFF	19.6
0.213090	48.24		63.08	14.84	L1	OFF	19.6
0.234960		32.56	52.27	19.71	L1	OFF	19.6
0.234960	45.98		62.27	16.29	L1	OFF	19.6
0.485250		29.67	46.25	16.58	L1	OFF	19.6
0.485250	35.70		56.25	20.55	L1	OFF	19.6
1.560840		23.43	46.00	22.57	L1	OFF	19.6
1.560840	25.18		56.00	30.82	L1	OFF	19.6
7.940220		25.20	50.00	24.80	L1	OFF	20.0
7.940220	26.14		60.00	33.86	L1	OFF	20.0

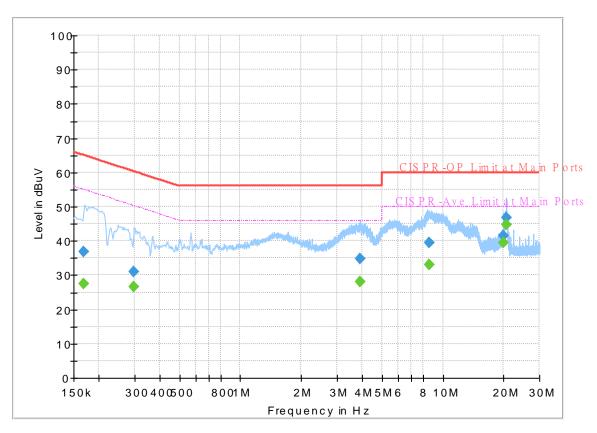
Test Mode : Test Voltage : Phase : Mode 1 120Vac/60Hz Neutral



Full Spectrum

Frequency	QuasiPeak	CAverage	Limit	Margin	Line	Filter	Corr.
(MHz)	(dBuV)	(dBuV)	(dBuV)	(dB)			(dB)
0.152520		35.43	55.86	20.43	Ν	OFF	19.6
0.152520	51.31		65.86	14.55	Ν	OFF	19.6
0.167910		35.04	55.06	20.02	Ν	OFF	19.6
0.167910	50.82		65.06	14.24	Ν	OFF	19.6
0.183750		33.08	54.31	21.23	Ν	OFF	19.6
0.183750	48.87		64.31	15.44	Ν	OFF	19.6
0.192390		33.14	53.93	20.79	Ν	OFF	19.6
0.192390	48.50		63.93	15.43	Ν	OFF	19.6
0.496500		27.97	46.06	18.09	Ν	OFF	19.6
0.496500	33.75		56.06	22.31	Ν	OFF	19.6
1.810320		23.47	46.00	22.53	Ν	OFF	19.6
1.810320	24.82		56.00	31.18	Ν	OFF	19.6
15.864000		24.39	50.00	25.61	Ν	OFF	20.3
15.864000	25.58		60.00	34.42	Ν	OFF	20.3

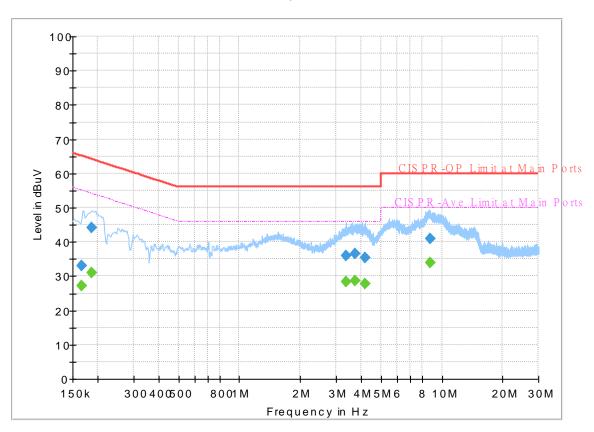
Test Mode : Test Voltage : Phase : Mode 2 Power From System Line



FullSpectrum

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.167280		27.60	55.09	27.49	L1	OFF	19.5
0.167280	36.93		65.09	28.16	L1	OFF	19.5
0.298050		26.71	50.30	23.59	L1	OFF	19.5
0.298050	31.07		60.30	29.23	L1	OFF	19.5
3.894360		27.97	46.00	18.03	L1	OFF	19.7
3.894360	34.75		56.00	21.25	L1	OFF	19.7
8.527020		32.98	50.00	17.02	L1	OFF	19.9
8.527020	39.38		60.00	20.62	L1	OFF	19.9
19.850280		39.61	50.00	10.39	L1	OFF	20.2
19.850280	41.51		60.00	18.49	L1	OFF	20.2
20.679000		44.62	50.00	5.38	L1	OFF	20.2
20.679000	46.92		60.00	13.08	L1	OFF	20.2

Test Mode : Test Voltage : Phase : Mode 2 Power From System Neutral



FullSpectrum

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.165750		27.28	55.17	27.89	Ν	OFF	19.6
0.165750	33.01		65.17	32.16	Ν	OFF	19.6
0.186000		30.99	54.21	23.22	Ν	OFF	19.6
0.186000	44.16		64.21	20.05	Ν	OFF	19.6
3.376860		28.38	46.00	17.62	Ν	OFF	19.7
3.376860	35.93		56.00	20.07	Ν	OFF	19.7
3.737850		28.65	46.00	17.35	Ν	OFF	19.7
3.737850	36.64		56.00	19.36	Ν	OFF	19.7
4.179210		27.67	46.00	18.33	Ν	OFF	19.7
4.179210	35.49		56.00	20.51	Ν	OFF	19.7
8.801250		33.83	50.00	16.17	Ν	OFF	20.0
8.801250	40.81		60.00	19.19	Ν	OFF	20.0



Appendix B. Radiated Emission Test Result

