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TEST REPORT

FCC WPT Test for SLBWC120
Certification

APPLICANT
SLASH B SLASH Co., LTD.

REPORT NO.
HCT-RF-2306-FC003

DATE OF ISSUE
July 4, 2023

Tested by
Jeong Ho Kim

Technical Manager
Jong Seok Lee

Accredited by KOLAS, Republic of KOREA

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TEST REPORT

FCC WPT Test for SLBWC120

REPORT NO.
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Additional Model
-

Applicant	**SLASH B SLASH Co., LTD.** 34F, 63-1, Geumjeong-ro, Geumjeong-gu, Busan, Republic of Korea
Eut Type Model Name	SLBS Edge Wireless Charger SLBWC120
FCC ID	2BBPASLBWC120
Frequency Range:	127 kHz
Max. Transmit Power:	7.26 dB V/m @300 m
FCC Classification	Part 15 Low Power Transmitter Below 1705 kHz (DCD)
FCC Rule Part(s)	FCC Part 15, Subpart C (15.209)

The result shown in this test report refer only to the sample(s) tested unless otherwise stated.
This test results were applied only to the test methods required by the standard.

REVISION HISTORY

The revision history for this test report is shown in table.

Revision No.	Date of Issue	Description
0	July 04, 2023	Initial Release

Engineering Statement:
The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. It is further stated that upon the basis of the measurements made, the equipment tested is capable of operation in accordance with the requirements of the FCC Rules under normal use and maintenance.

KOLAS Statement:

The above Test Report is the accredited test result by (KS Q) ISO/IEC 17025 and KOLAS(Korea Laboratory Accreditation Scheme), which signed the ILAC-MRA. (KOLAS Accreditation No. KT197)

If this report is required to confirmation of authenticity, please contact to www.hct.co.kr

CONTENTS

1. EUT DESCRIPTION

Model	SLBWC120
Additional Model	-
EUT Type	SLBS Edge Wireless Charger
Power Supply	DC 9 V
Frequency of Operation	127 kHz
Max. Transmit Power	7.26 dB V/m @300 m
Travel Adapter Information (For Testing)	Model : EP-TA800(SAMSUNG) Type : C to C PDO(Power Data Objective) 5V(3A), 9V(2.77A) PPS(Programmable Power Supply) 3.3-5.9V(3A), 3.3-11V(2.25A)
Date(s) of Tests	June 08, 2023 ~ June 23, 2023
Serial number	BT1131
Manufacturer	**WITS VINA CO., LTD.** Lot CN 16-1, Yen Binh Industrial Park, Hong Tien Ward, Pho Yen City, Thai Nguyen Province, Vietnam

2. TEST METHODOLOGY

The measurement procedure described in the American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Device (ANSI C63.10-2013) is used in the measurement of the test device.

EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

EUT EXERCISE

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. According to its specifications, the EUT must comply with the requirements of the Section 15.205, 15.207 and 15.209 under the FCC Rules Part 15 Subpart C.

GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 6.2 of ANSI C63.10. (Version :2013) Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-peak and average detector modes.

Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane below 1 GHz. Above 1 GHz with 1.5 m using absorbers between the EUT and receive antenna. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3 m away from the receiving antenna, which varied from 1 m to 4 m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes according to the requirements in Section 6.6.5 of ANSI C63.10. (Version: 2013).

3. INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment's, which is traceable to recognized national standards.
Especially, all antenna for measurement is calibrated in accordance with the requirements of C63.5 (Version : 2017).

4. FACILITIES AND ACCREDITATIONS

FACILITIES

The SAC(Semi-Anechoic Chamber) and conducted measurement facility used to collect the radiated data are located at the 74, Seoicheon-ro 578beon-gil,
Majang-myeon, Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA.
The site is constructed in conformance with the requirements of ANSI C63.4. (Version :2014) and CISPR Publication 22.
Detailed description of test facility was submitted to the Commission and accepted dated April 02, 2018 (Registration Number: KR0032).

EQUIPMENT

Radiated emissions are measured with one or more of the following types of Linearly polarized antennas: tuned dipole, bi-conical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements. Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers. Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.
All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

5. ANTENNA REQUIREMENTS

According to FCC 47 CFR § 15.203:

"An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section."

(1) The antennas of this E.U.T are permanently attached.

(2) The E.U.T Complies with the requirement of § 15.203

6. MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of

ANSI C63.10-2013.

All measurement uncertainty values are shown with a coverage factor of $k = 2$ to indicate a 95 % level of confidence.

The measurement data shown herein meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

Parameter	Expanded Uncertainty (dB)
Conducted Disturbance (150 kHz ~ 30 MHz)	1.90 (Confidence level about 95 %, k=2)
Radiated Disturbance (9 kHz ~ 30 MHz)	4.14 (Confidence level about 95 %, k=2)
Radiated Disturbance (30 MHz ~ 1 GHz)	5.82 (Confidence level about 95 %, k=2)
Radiated Disturbance (1 GHz ~ 18 GHz)	5.74 (Confidence level about 95 %, k=2)
Radiated Disturbance (18 GHz ~ 40 GHz)	5.76 (Confidence level about 95 %, k=2)
Radiated Disturbance (Above 40 GHz)	5.52 (Confidence level about 95 %, k=2)

7. WORST CASE CONFIGURATION

Mode	EUT State	Position of Client device	Client device
Wireless Power Charging	Charging from EUT to Client device	X	Jig
		Z	

Note:

1. Client device: Jig .
2. The EUT was tested in 4 Charging modes, the worst case configuration results are reported.

Test mode	WPT (EUT) + Client device (Jig)
1.	WPT (10 W / 1.12 A) 9 V
2.(Worst case)	**WPT (15 W / 1.66 A) 9 V**

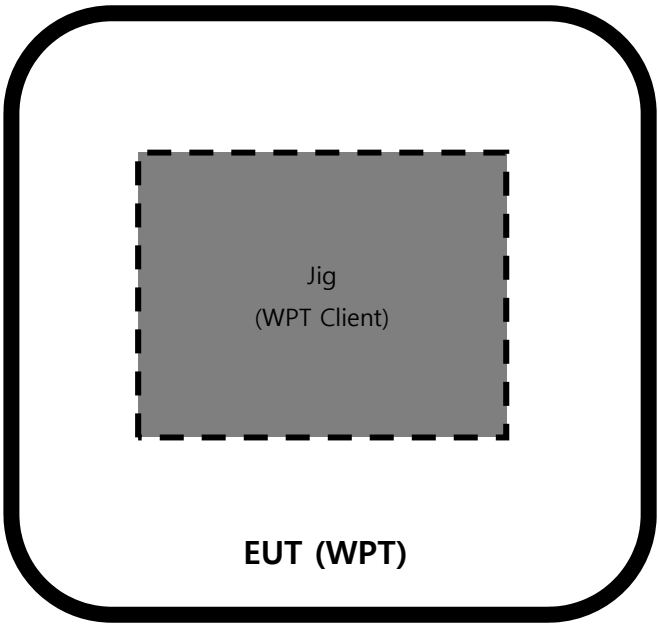
- Worst case : 15 W

3. All position of loop antenna were investigated and the worst position results are reported.
   - Position : Horizontal, Vertical, Coplaner Horizontal
   - Worst Position : Horizontal
4. The EUT was tested in 2 axis(X,Z) and the worst position results are reported.
   - Axis : X, Z
   - Worst Axis : X

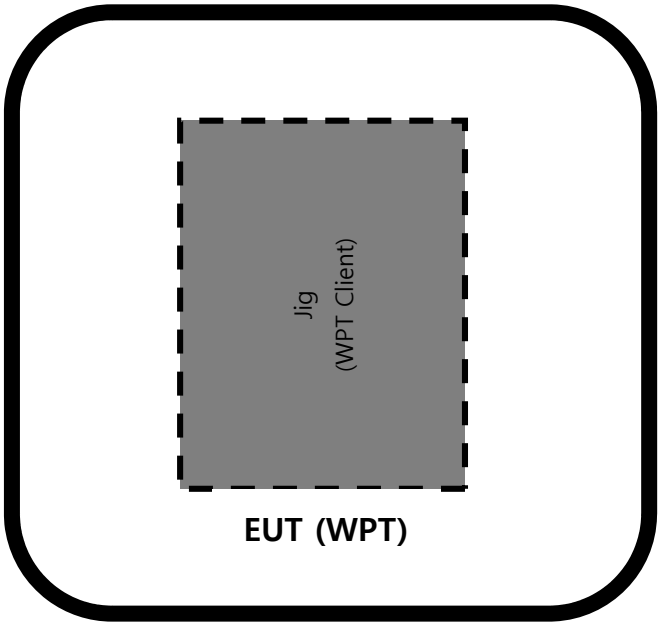
AC Power line Conducted Emissions

1. All modes of operation were investigated and the worst case configuration results are reported.
   - Mode : EUT(WPT) + Travel Adapter + Jig(Client device)
   - Worstcase : EUT(WPT) + Travel Adapter + Jig(Client device)

Test Setup Diagram:



Jig X position



Jig Z position

8. TEST SUMMARY

Test Description	FCC Rule	Limit	Condition	Result
Radiated emission	§ 15.209	cf. Section 9	Radiated	Pass
AC Power Line Conducted Emission	§ 15.207	cf. Section 10		Pass
Emission bandwidth.	§ 2.1049	See note1		See note1

Note:

1. For reporting purposes only.

9. RADIATED EMISSION MEASUREMENT

Test Settings

1. Analyzer frequency set to the frequency of the radiated spurious emission of interest.
2. RBW :
   9 kHz – 150 kHz : 300 Hz
   150 kHz – 30 MHz : 10 kHz
   30 MHz – 1G Hz : 100 kHz
3. VBW : ≥ 3 x RBW
4. Sweep time : Auto couple
5. Detector : Peak
6. Trace : Maxhold
7. Trace was allowed to stabilize

Limit

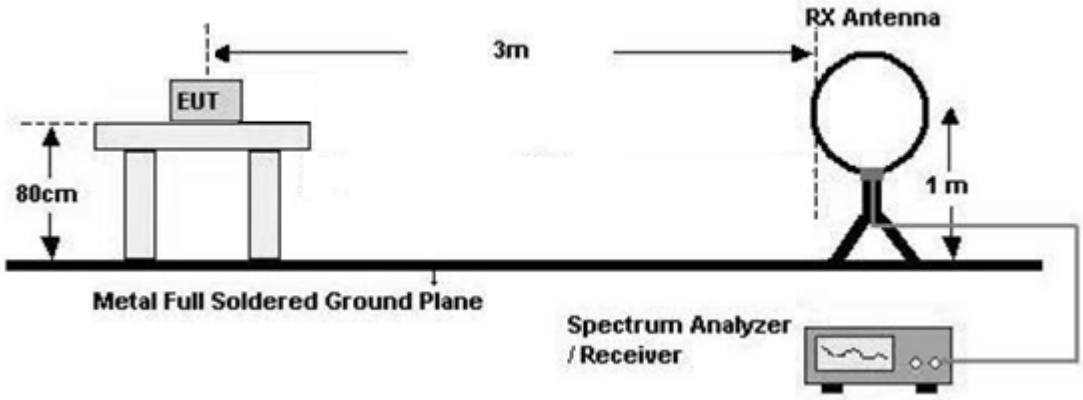
Except as provided elsewhere in this paragraph the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Rule Part	Frequency (MHz)	Limit
Part 15.209	0.009 ~ 0.490	2400/F(kHz) μV/m@300 m
	0.490 ~1.705	24000/F(kHz) μV/m@30 m
	1.705 ~ 30	30 μV/m@30 m
	30 ~ 88	100 ** μV/m@3 m
	88 ~ 216	150 ** μV/m@3 m
	216 ~ 960	200 ** μV/m@3 m
	Above 960	500 μV/m@3 m

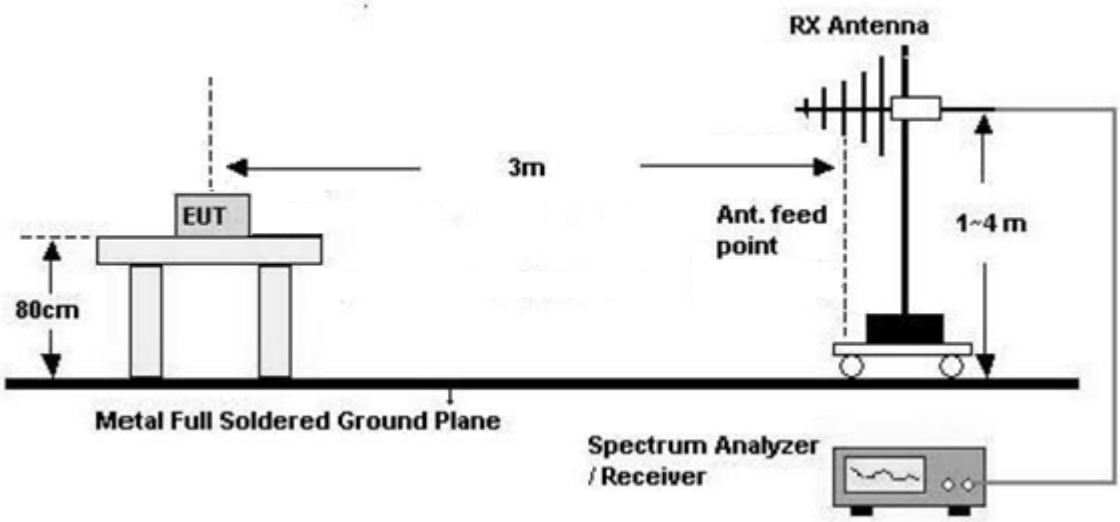
** Except as provided in 15.209(g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g. 15.231 and 15.241.

Test Set-up

Below 30 MHz



30 MHz - 1 GHz



Test Procedure of Radiated spurious emissions(Below 30 MHz)

1. The EUT was placed on a non-conductive table located on semi-anechoic chamber.
2. The loop antenna was placed at a location 3 m from the EUT.
3. The EUT is placed on a turntable, which is 0.8 m above ground plane.
4. We have done x, y, z planes in EUT and horizontal and vertical polarization and Parallel to the ground plane in detecting antenna.
5. The limit is converted from microvolts/meter to decibel microvolts/meter. Sample Calculation:

   * Result Value(dBμV/m@30 m)

     = Measured Value(dBμV/m@3 m) + Ant factor(dB/m) + Cable Loss(dB)

– Distance Correction Factor(dB)

6. Distance Correction

* 0.009 MHz – 0.490 MHz :

40log(3 m/300 m) = - 80 dB

* 0.490 MHz – 30 MHz :

40log(3 m/30 m) = - 40 dB

7. Plots were taken without using any correction factors.

8. The worst case plots are reported.

KDB 414788 OFS and Chamber Correlation Justification

Base on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field.

OFS and chamber correlation testing had been performed and chamber measured test result is the worst case test result.

Test Procedure of Radiated spurious emissions(Below 1 GHz)

1. The EUT was placed on a non-conductive table located on semi-anechoic chamber.
2. The EUT is placed on a turntable, which is 0.8m above ground plane.
3. The Hybrid antenna was placed at a location 3 m from the EUT, which is varied from 1m to 4m to find out the highest emissions.
4. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
5. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
6. Spectrum Setting

(1) Measurement Type(Peak):

- Measured Frequency Range : 30 MHz – 1 GHz
- Detector = Peak
- Trace = Maxhold
- RBW = 100 kHz
- VBW ≥ 3 x RBW

7. Total = Measured Value + Antenna Factor(A.F) + Cable Loss(C.L)
8. Measurement value only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.

▣Test Result

Frequency	Measrued Value	Ant.Factor	Cable Loss	Distance Correction	Result Value	Limit	Margin
(kHz)	(dBμV/m) @3m	(dB/m)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
#127.0	67.03	19.60	0.63	-80.00	7.26	25.53	18.27
638.4	35.46	19.50	0.63	-40.00	15.59	31.50	15.91
1917.0	16.56	19.50	0.63	-40.00	-3.31	29.54	32.85

Note:

1. Mode: Horizontal , 15W
2. “#”: Fundamental Frequency
3. EUT state: Charging from EUT to Client device
4. 30 MHz – 1GHz : No Critical peaks found

Frequency	Measrued Value	Ant.Factor	Cable Loss	Distance Correction	Result Value	Limit	Margin
(kHz)	(dBμV/m) @3m	(dB/m)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
#127.0	58.02	19.60	0.63	-80.00	-1.75	25.53	27.28
638.4	27.31	19.50	0.63	-40.00	7.44	31.50	24.06
9436.0	23.31	19.50	0.63	-40.00	3.44	29.54	26.10

Note:

1. Mode: Vertical , 15W
2. “#”: Fundamental Frequency
3. EUT state: Charging from EUT to Client device
4. 30 MHz – 1GHz : No Critical peaks found

Frequency	Measrued Value	Ant.Factor	Cable Loss	Distance Correction	Result Value	Limit	Margin
(kHz)	(dBμV/m) @3m	(dB/m)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
#127.0	60.78	19.60	0.63	-80.00	1.01	25.53	24.52
638.4	29.78	19.50	0.63	-40.00	9.91	31.50	21.59
1917.0	13.06	19.50	0.63	-40.00	-6.81	29.54	36.35

Note:

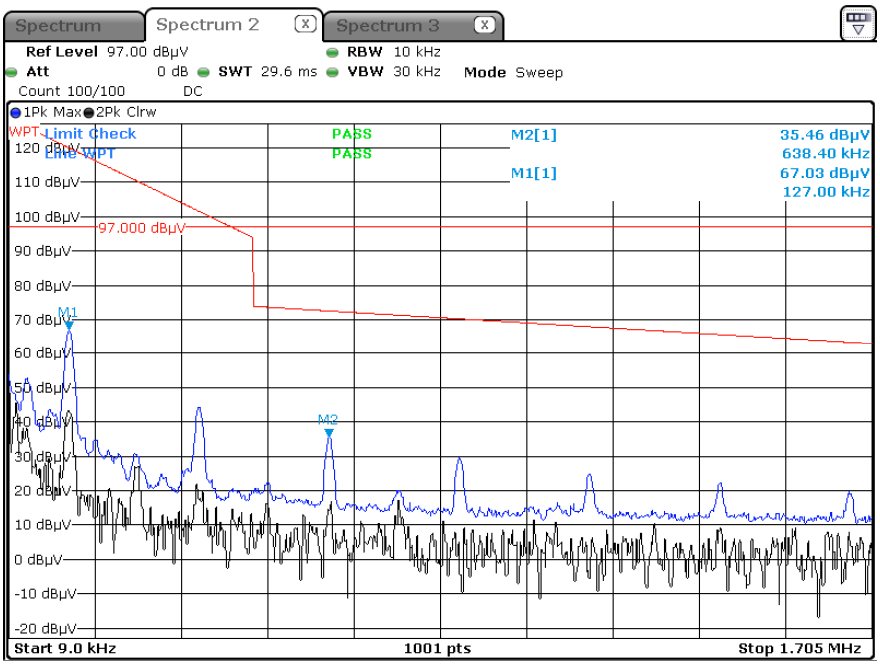
1. Mode: Coplanar-Horizontal , 15W
2. “#”: Fundamental Frequency
3. EUT state: Charging from EUT to Client device
4. 30 MHz – 1GHz : No Critical peaks found

▣Test Plot

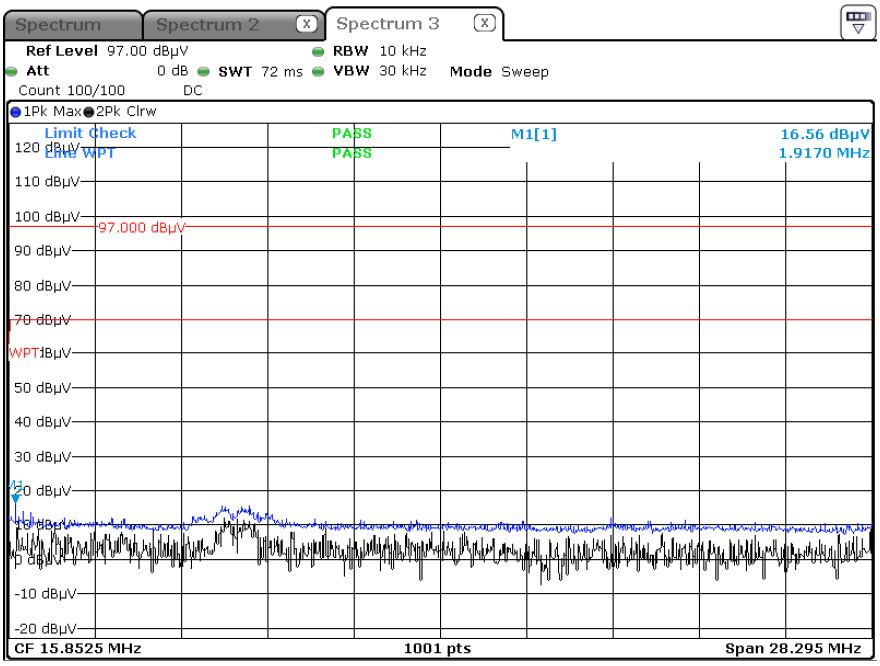
In order to simplify the report, the worst case results are reported.

Worst case: EUT Mode: Horizontal , 15W

Frequency Range : 9 kHz – 1.705 MHz



Frequency Range : 1.705 MHz – 30 MHz



Frequency Range : 30 MHz – 1 GHz

(30 MHz – 1GHz : No Critical peaks found)

10. POWERLINE CONDUCTED EMISSIONS

Limit

For an intentional radiator 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, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN).

Frequency Range (MHz)	Limits (dBμV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56[a]	56 to 46[a]
0.50 to 5	56	46
5 to 30	60	50

[a]Decreases with the logarithm of the frequency.

Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line (LINE and NEUTRAL) and ground at the power terminals.

Test Configuration

See test photographs attached in Annex A for the actual connections between EUT and support equipment.

Test Procedure

1. The EUT is placed on a wooden table 80 cm above the reference ground plane.
2. The EUT is connected via LISN to a test power supply.
3. The measurement results are obtained as described below:
4. Detectors : Quasi Peak and Average Detector.
5. The EUT is the device operating below 30 MHz.
   - For unterminated the Antenna, the AC line conducted tests are performed with the antenna connected
   - For terminated the Antenna, the AC line conducted tests are performed with a dummy load connected to the EUT antenna output terminal.

Sample Calculation

Quasi-peak(Final Result) = Measured Value + Correction Factor

▣ Test Result & Plot

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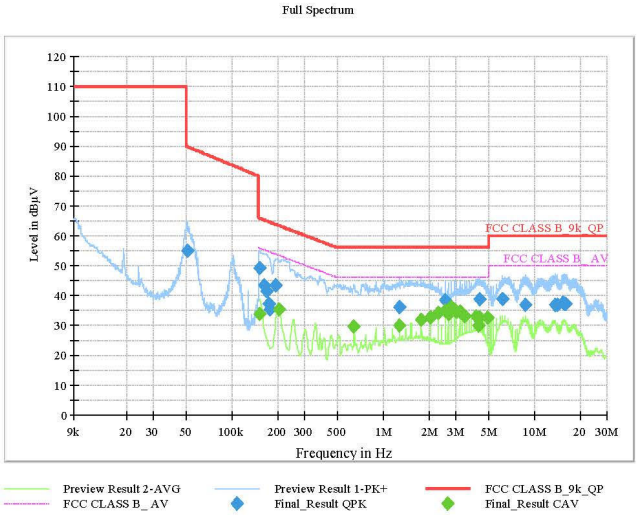
Test Report

Common Information

Operating Conditions : WPT



Final_Result_QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.0505	54.89	89.92	35.03	1000.0	0.200	N	OFF	9.6
0.1523	49.31	65.88	16.56	1000.0	9.000	N	OFF	9.6
0.1635	43.65	65.28	21.63	1000.0	9.000	N	OFF	9.6
0.1680	41.40	65.06	23.66	1000.0	9.000	N	OFF	9.6
0.1748	37.38	64.73	27.35	1000.0	9.000	N	OFF	9.6
0.1793	35.55	64.52	28.97	1000.0	9.000	N	OFF	9.6
0.1950	43.53	63.82	20.29	1000.0	9.000	N	OFF	9.6
1.2773	36.20	56.00	19.80	1000.0	9.000	L1	OFF	9.7
2.5553	38.51	56.00	17.49	1000.0	9.000	L1	OFF	9.8
4.3418	38.67	56.00	17.33	1000.0	9.000	N	OFF	9.8
6.1305	38.88	60.00	21.12	1000.0	9.000	L1	OFF	9.9
8.7270	36.74	60.00	23.26	1000.0	9.000	L1	OFF	10.0
13.7940	37.05	60.00	22.95	1000.0	9.000	L1	OFF	10.2
14.0505	36.82	60.00	23.18	1000.0	9.000	L1	OFF	10.2
15.3285	37.80	60.00	22.20	1000.0	9.000	L1	OFF	10.2
15.6705	37.21	60.00	22.79	1000.0	9.000	L1	OFF	10.2
15.8438	37.44	60.00	22.56	1000.0	9.000	L1	OFF	10.2
15.9338	37.19	60.00	22.81	1000.0	9.000	L1	OFF	10.2

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WPT 2 / 2

Final_Result_CAV

Frequency (MHz)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.1523	33.99	55.88	21.89	1000.0	9.000	N	OFF	9.6
0.2040	35.22	53.45	18.22	1000.0	9.000	L1	OFF	9.7
0.6383	29.44	46.00	16.56	1000.0	9.000	L1	OFF	9.7
1.2773	30.14	46.00	15.86	1000.0	9.000	L1	OFF	9.7
1.7880	31.97	46.00	14.03	1000.0	9.000	L1	OFF	9.7
2.0445	32.63	46.00	13.37	1000.0	9.000	L1	OFF	9.7
2.2988	34.22	46.00	11.78	1000.0	9.000	L1	OFF	9.7
2.5553	35.12	46.00	10.88	1000.0	9.000	L1	OFF	9.8
2.6835	33.75	46.00	12.25	1000.0	9.000	L1	OFF	9.8
2.8095	36.30	46.00	9.70	1000.0	9.000	L1	OFF	9.8
2.9378	35.47	46.00	10.53	1000.0	9.000	L1	OFF	9.8
3.0660	34.67	46.00	11.33	1000.0	9.000	L1	OFF	9.8
3.1943	34.62	46.00	11.38	1000.0	9.000	L1	OFF	9.8
3.4485	33.13	46.00	12.87	1000.0	9.000	L1	OFF	9.8
4.0875	33.05	46.00	12.95	1000.0	9.000	L1	OFF	9.8
4.2158	30.17	46.00	15.83	1000.0	9.000	L1	OFF	9.8
4.3440	32.71	46.00	13.29	1000.0	9.000	L1	OFF	9.8
4.8548	32.52	46.00	13.48	1000.0	9.000	L1	OFF	9.8

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11. EMISSION BANDWIDTH PLOT

Test Settings

1. Analyzer frequency set to the frequency of the radiated spurious emission of interest
2. RBW : 300 Hz
   (Because the measured signal is CW/CW-like, adjusting the RBW per C63.10 would not be practical since measured bandwidth will always follow the RBW and the result will be approximately twice the RBW.)
3. VBW : ≥ 3 x RBW
4. Sweep time : Auto couple
5. Detector : Peak
6. Trace : Maxhold
7. Trace was allowed to stabilize

Limit

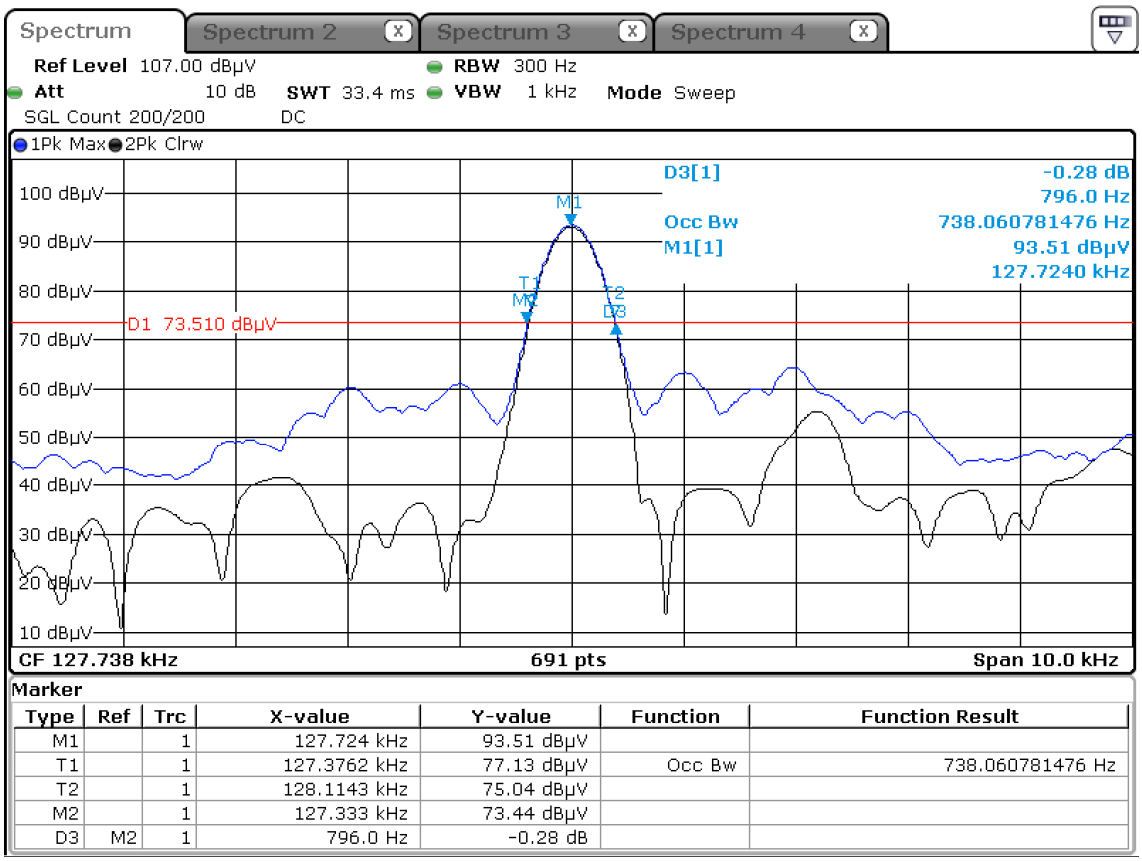
None

(for reporting purposes only.)

▣Test Result

EUT Mode	Test Frequency (kHz)	Occupied Bandwidth 99% BW(Hz)	20dB BW(Hz)
X , EUT + jig , 15W	127.724	738.06	796.0

▣Test Plot



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	127.724 kHz	93.51 dBµV		
T1		1	127.3762 kHz	77.13 dBµV	Occ Bw	738.060781476 Hz
T2		1	128.1143 kHz	75.04 dBµV		
M2		1	127.333 kHz	73.44 dBµV		
D3	M2	1	796.0 Hz	-0.28 dB		

In order to simplify the report, the worst case results are reported.

12. LIST OF TEST EQUIPMENT

Equipment	Model	Manufacturer	Serial No.	Due to Calibration	Calibration Interval
Controller(Antenna mast)	CO3000	Innco system	CO3000-4p	N/A	N/A
Antenna Position Tower	MA4640/800-XP-EP	Innco system	N/A	N/A	N/A
Controller	EM1000	Audix	060520	N/A	N/A
Turn Table	N/A	Audix	N/A	N/A	N/A
Loop Antenna	FMZB 1513	Rohde & Schwarz	1513-333	03/17/2024	Biennial
Hybrid Antenna	VULB 9168	Schwarzbeck	760	02/24/2025	Biennial
Horn Antenna	BBHA 9120D	Schwarzbeck	02299	03/24/2024	Biennial
Horn Antenna (15GHz ~ 40 GHz)	BBHA9170	Schwarzbeck	BBHA9170342	09/29/2024	Biennial
Spectrum Analyzer	FSV40	Rohde & Schwarz	100901	03/27/2024	Annual
Signal Analyzer	N9030A	Agilent	MY52350879	01/02/2024	Annual
RF Switching System	FMSR-04B (3G HPF+LNA)	T&M SYSTEM	S2L1	01/16/2024	Annual
RF Switching System	FMSR-04B (10dB ATT+LNA)	T&M SYSTEM	S2L2	01/16/2024	Annual
RF Switching System	FMSR-04B (3dB ATT+LNA)	T&M SYSTEM	S2L3	01/16/2024	Annual
RF Switching System	FMSR-04B (LNA)	T&M SYSTEM	S2L4	01/16/2024	Annual
RF Switching System	FMSR-04B (7G HPF+LNA)	T&M SYSTEM	S2L5	01/16/2024	Annual

Note:

1. Equipment listed above that calibrated during the testing period was set for test after the calibration.
2. Equipment listed above that has a calibration due date during the testing period, the testing is completed before equipment expiration date.
3. Especially, all antenna for measurement is calibrated in accordance with the requirements of C63.5(Version : 2017).

13. Annex A_TEST SETUP PHOTO

Please refer to test setup photo file no. as follows;

No.	Description
1	HCT-RF-2306-FC003-P