CERTIFICATION TEST REPORT

Report Number. : S-4791440365-E5V2

Applicant	:	SAMSUNG ELECTRONICS CO., LTD. 129 SAMSUNG-RO, YEONGTONG-GU, SUWON-SI, GYEONGGI-DO, 16677, KOREA
Model	:	SM-A166U, SM-A166U1, SM-S166V
FCC ID	:	A3LSMA166U
EUT Description	:	GSM/WCDMA/LTE/5G NR Phone + BT/BLE, DTS/UNII a/b/g/n/ac and NFC
Test Standard(s)	:	FCC 47 CFR PART 15 SUBPART C

Date Of Issue:
2024-10-18

Prepared by:
UL KOREA LTD.
26th floor, 152, Teheran-ro, Gangnam-gu Seoul, 06236, Korea

Suwon Test Site: UL KOREA LTD. Suwon Laboratory
218 Maeyeong-ro, Yeongtong-gu
Suwon-si, Gyeonggi-do, 16675, Korea
TEL: (031) 337-9902
FAX: (031) 213-5433

IAS ACCREDITED Testing Laboratory TL-637

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	2024-10-04	Initial issue	Myeongjun Kwon
V2	2024-10-18	Updated to address TCB's question	Myeongjun Kwon

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	SAMSUNG ELECTRONICS CO., LTD.
EUT DESCRIPTION:	GSM/WCDMA/LTE/5G NR Phone + BT/BLE, DTS/UNII a/b/g/n/ac and NFC.
MODEL NUMBER:	SM-A166U, SM-A166U1, SM-S166V
SERIAL NUMBER:	R3CX807W82F, R3CX807W74Y, R3CX807W7RA (CONDUCTED); R3CX807W3JV, R3CX807W8JT, R3CX807W38R (RADIATED)
DATE TESTED:	2024-08-12 - 2024-10-04

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
47 CFR Part 15 Subpart C	Complies

UL KOREA LTD. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL KOREA LTD. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL KOREA LTD. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL KOREA LTD. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by IAS, any agency of the Federal Government, or any agency of any government.

Approved & Released For
UL KOREA LTD. By:

Seokhwan Hong
Suwon Lab Engineer
UL KOREA LTD.

Tested By:

Myeongjun Kwon
Suwon Lab Engineer
UL KOREA LTD.

2. TEST METHODOLOGY

1. FCC 47 CFR Part 2.
2. FCC 47 CFR Part 15.
3. KDB 558074 D01 DTS Meas Guidance v05r02.
4. ANSI C63.10-2020.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea. Line conducted emissions are measured only at the 218 address. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

218 Maeyeong-ro
☒ Chamber 1(3m semi-anechoic chamber)
☒ Chamber 2(3m semi-anechoic chamber)
☒ Chamber 3(3m semi-anechoic chamber)
☐ Chamber 4(3m Full-anechoic chamber)
☐ Chamber 5(3m Full-anechoic chamber)

UL KOREA LTD. is accredited by IAS, Laboratory Code TL-637. The full scope of accreditation can be viewed at https://www.iasonline.org/wp-content/uploads/2017/05/TL-637-cert-New.pdf.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations and is traceable to recognized national standards.

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)
28.9 dBuV/m = 36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB

AC Corrected Reading (dBuV) = Measured Voltage (dBuV) + Extension Cord Loss (dB) + Cable Loss (dB)
44.72 dBuV = 34.72 dBuV + 9.9 dB + 0.1 dB

4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	2.79 dB
Radiated Disturbance, 9 kHz to 30 MHz	1.69 dB
Radiated Disturbance, 30 MHz to 1 GHz	4.07 dB
Radiated Disturbance, 1 GHz to 18 GHz	4.99 dB
Radiated Disturbance, Above 18 GHz	5.96 dB

Uncertainty figures are valid to a confidence level of 95%.

4.4. DECISION RULE

Decision rule for statement(s) of conformity is based on Clause 4.4.3 in IEC Guide 115:2023.

5. EQUIPMENT UNDER TEST

5.1. EUT DESCRIPTION

The EUT is a GSM/WCDMA/LTE/5G NR Phone + BT/BLE, DTS/UNII a/b/g/n/ac and NFC.
This test report addresses the DSS(WLAN) operational mode.

Representative model	Difference	Derivative model
		SM-A166U1, SM-S166V
SM-A166U	Hardware	Same
	Software	The UI has changed according to Service Provider

The model SM-A166U was used for final testing and is representative of the test results in this report.

WiFi operating mode

Frequency rage	Mode	ANT 1
2.4GHz (2412 MHz ~ 2472 MHz)	802.11b SISO	TX/RX
	802.11g SISO	TX/RX
	802.11n(HT20) SISO	TX/RX

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum total conducted average output power as follows:

Frequency Range [MHz]	Mode	Output Power [dBm]	Output Power [mW]
		ANT1	ANT1
2412 - 2472	802.11b SISO	20.26	106.17
	802.11g SISO	19.31	85.31
	802.11n(HT20) SISO	19.22	83.56

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

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.

The internal antenna was Permanently attached.
Therefore, this E.U.T Complies with the requirement of §15.203.

The radio utilizes a internal antenna, with a maximum gain of: -4.9 dBi

“Antenna D(WiFi)” as indicated in antenna specification are written as ANT1 in this report.

UL KOREA LTD. Suwon Laboratory FORM ID: FCC_15C(05)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

5.4. TESTED CHANNELS LIST

Ch.	Frequency [MHz]	11b	11g	11n(HT20)
		SISO	SISO	SISO
1	2 412	O	O	O
2	2 417			
6	2 437	O	O	O
10	2 457			
11	2 462	O	O	O
12	2 467	O	O	O
13	2 472	O	O	O

Note. Tested channels are applied to all test items.

5.5. WORST-CASE CONFIGURATION AND MODE

The fundamentals of the EUT were investigated in three orthogonal orientations X, Y and Z on 1TX SISO mode. It was determined that Z orientation was the worst-case for 1TX SISO mode.

i. Worst case of antenna axis: Z

Radiated and power line conducted tests were performed with EUT connected to AC power adapter as the worst-case configuration. Radiated harmonics spurious 1~18 GHz Low/Mid/High channels,18-26GHz were performed with the EUT set at the worst mode. Radiated emission below 1GHz and power line conducted emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

Simultaneous transmission with related transmitters were investigated and no noticeable emission was found.

Based on the baseline scan, the worst-case data rates were:
802.11b mode: 1 Mbps 1TX
802.11g mode: 6 Mbps 1TX
802.11n HT20 mode: MCS0 1TX

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Charger	SAMSUNG	EP-TA800	R37TC7A00JBDKA	N/A
Data Cable	SAMSUNG	EP-DN980	GH39-02115A	N/A

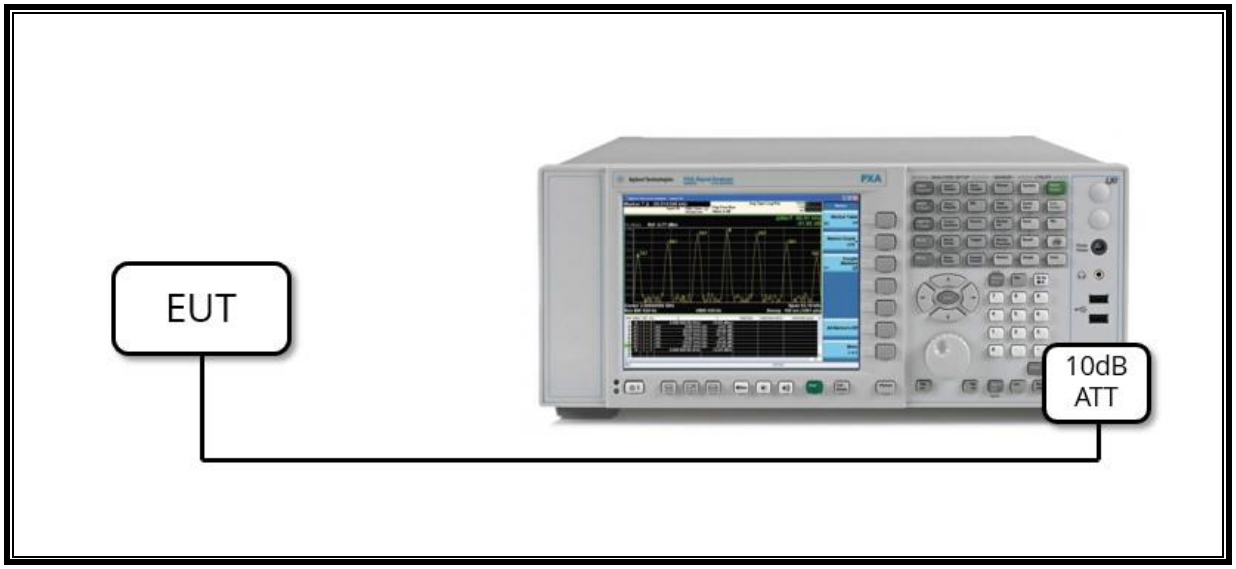
I/O CABLE

I/O Cable List						
Cable No.	**Port**	**# of identical ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	DC Power	1	C Type	Shielded	1.0 m	N/A

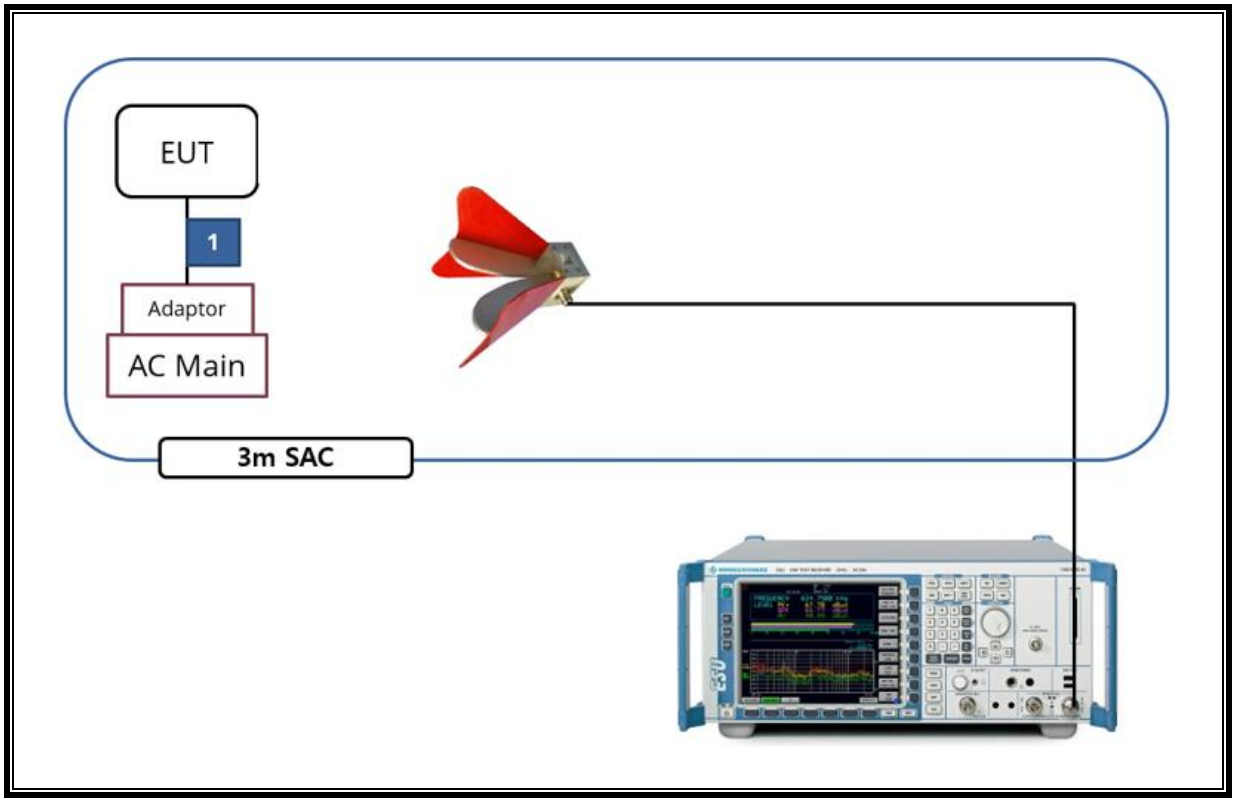
TEST SETUP

The EUT is a stand-alone unit during the tests.
Test software in hidden menu exercised the EUT to enable DTS mode.

SETUP DIAGRAM FOR TESTS (CONDUCTED TEST SETUP)



SETUP DIAGRAM FOR TESTS (RADIATED TEST SETUP)



UL KOREA LTD. Suwon Laboratory FORM ID: FCC_15C(05)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

6. MEASUREMENT METHOD

6 dB BW : ANSI C63.10-2020, Section 11.8.2 Option 2

OUTPUT POWER : ANSI C63.10-2020, Section 11.9.2.3.1 Method AVGPM

POWER SPECTRAL DENSITY : ANSI C63.10-2020, Section 11.10.3 & 11.10.5 Method AVGPSD-1 and Method AVGPSD-2

Out-of-band Emissions (Conducted) : ANSI C63.10-2020, Section 11.11 Emissions in nonrestricted frequency bands

Out-of-band Emissions in Non-restricted Bands: ANSI C63.10-2020, Section 11.11 Emissions in nonrestricted frequency bands

Out-of-band Emissions in Restricted Bands: ANSI C63.10-2020, Section 11.12 Emissions in restricted frequency bands

AC Power Line Conducted Emission : ANSI C63.10-2020, Section 6.2

7. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

Test Equipment List				
Description	**Manufacturer**	**Model**	**S/N**	**Cal Due**
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB 9163	750	2026-07-30
Antenna, Horn, 18 GHz	ETS	3117	00168717	2026-07-17
Antenna, Horn, 40 GHz	ETS	3116C	00166155	2026-07-23
Preamplifier	ETS	3116C-PA	00168841	2025-07-25
Preamplifier, 1000 MHz	Sonoma	310N	341282	2025-07-22
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	2029169	2025-07-23
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54170614	2025-07-24
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54490312	2025-01-03
Spectrum Analyzer, 44 GHz	KEYSIGHT	N9040B	MY60080268	2025-01-03
RF Switching Unit	TA Engineering	TA-018S-16	SW-1	N/A
Average Power Sensor	Agilent / HP	U2000A	MY54270007	2025-07-23
Average Power Sensor	Agilent / HP	U2000A	MY54260010	2025-07-23
Attenuator	PASTERNACK	PE7087-10	A001	2025-07-23
Attenuator	PASTERNACK	PE7087-10	A008	2025-07-23
EMI Test Receive, 40 GHz	R&S	ESU40	100439	2025-07-23
EMI Test Receive, 40 GHz	R&S	ESU40	100457	2025-07-22
EMI Test Receive, 3 GHz	R&S	ESR 3	101832	2025-07-22
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	009	2025-07-22
High Pass Filter 3GHz	Micro-Tronics	HPM17543	010	2025-07-22
High Pass Filter 6GHz	Micro-Tronics	HPS17542	21	2025-07-23
LISN	R&S	ENV216	101837	2025-07-22
Antenna, Loop, 9kHz-30MHz	R&S	HFH2-Z2	100418	2025-09-07
UL Software				
Description	**Manufacturer**	**Model**	**Version**	
Radiated software	UL	UL EMC	Ver 9.5	
AC Line Conducted software	UL	UL EMC	Ver 9.5	

8. SUMMARY TABLE

FCC Part Section	Test Description	Test Limit	Test Condition	Test Result
15.247 (a)(2)	Occupied Bandwidth(6dB)	> 500kHz	Conducted	Complies
2.1051, 15.247(d)	Band Edge / Conducted Spurious Emission	-30 dBc		Complies
15.247 (b)(3)	TX conducted output power	< 30 dBm		Complies
15.247(e)	PSD	< 8 dBm/3kHz		Complies
15.207(a)	AC Power Line conducted emissions	Section 11	Power Line conducted	Complies
15.205, 15.209	Radiated Spurious Emission	< 54dBuV/m(Av)	Radiated	Complies

UL KOREA LTD. Suwon Laboratory FORM ID: FCC_15C(05)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

9. ANTENNA PORT TEST RESULTS

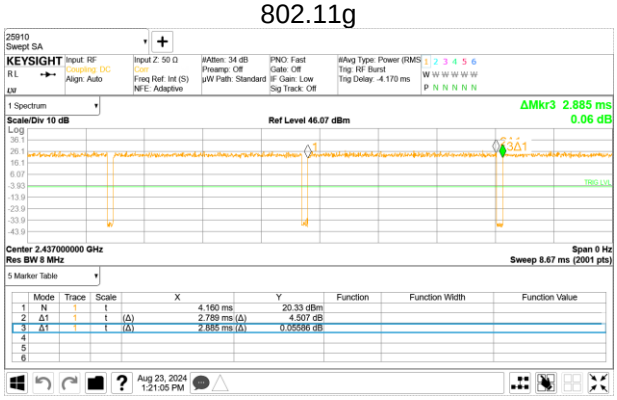
9.1. ON TIME AND DUTY CYCLE

LIMITS
None; for reporting purposes only.

Mode	On Time [ms]	Period [ms]	Duty Cycle X [Linear]	Duty Cycle X [%]	Duty Cycle Correction Factor[dB]	1/T Minimum VBW[kHz]
802.11b SISO	8.596	8.689	0.989	98.930	0.00	0.12
802.11g SISO	2.789	2.885	0.967	96.672	0.15	0.36
802.11n(HT20) SISO	5.381	5.472	0.983	98.337	0.00	0.19

Note. According to ANSI C63.10 Section 11.6, do not apply the Duty Cycle Correction Factor judging that a duty cycle of greater than or equal to 98% is continuous signal.

802.11g



9.2. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)
The minimum 6 dB bandwidth shall be at least 500 kHz.

TEST PROCEDURE

Reference to ANSI C63.10-2020, Section 11.8.2 Option 2: The transmitter output is connected to a spectrum analyzer with the RBW set to 1% to 5% of OBW, the VBW >= 3 x RBW, peak detector and max hold.

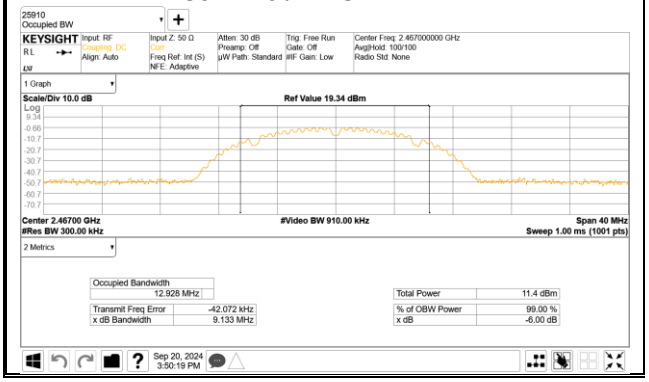
RESULTS

- Please refer to the next page

WORST CASE TEST PLOTS

ANT1

802.11b / 12 CHANNEL



9.2.1. 802.11b SISO MODE IN THE 2.4 GHz BAND

Channel	Frequency [MHz]	6 dB Bandwidth [MHz]	Minimum Limit [MHz]
		ANT 1	
1	2 412	9.14	0.5
6	2 437	9.14	
11	2 462	9.16	
12	2 467	9.13	
13	2 472	9.14	
Worst		**9.13**	

9.2.2. 802.11g SISO MODE IN THE 2.4 GHz BAND

Channel	Frequency [MHz]	6 dB Bandwidth [MHz]	Minimum Limit [MHz]
		ANT 1	
1	2 412	16.27	0.5
6	2 437	16.35	
11	2 462	16.28	
12	2 467	16.22	
13	2 472	16.42	
Worst		**16.22**	

9.2.3. 802.11n HT20 SISO MODE IN THE 2.4 GHz BAND

Channel	Frequency [MHz]	6 dB Bandwidth [MHz]	Minimum Limit [MHz]
		ANT 1	
1	2 412	17.49	0.5
6	2 437	17.49	
11	2 462	17.52	
12	2 467	17.47	
13	2 472	17.45	
Worst		**17.45**	

9.3. OUTPUT POWER

LIMITS

FCC §15.247 (b) (3)

For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt, based on the use of antennas with directional gains that do not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST PROCEDURE

Measurements perform using a wideband RF frame average power sensor.
The cable assembly insertion loss and duty cycle correction factor was entered as an offset in the power sensor to allow for direct reading of power.
Output power measurement was performed utilizing the 8.3.2.3 under KDB558074 D01 15.247 Meas Guidance.

UL KOREA LTD. Suwon Laboratory FORM ID: FCC_15C(05)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

9.3.1. TEST RESULTS

- 802.11b, g, n mode

Mode	Channel	Frequency [MHz]	Average Power	Power Limit [dBm]
			ANT1 [dBm]	
802.11b	1	2 412	20.15	30.00
	6	2 437	19.89	
	11	2 462	20.26	
	12	2 467	7.92	
	13	2 472	5.56	
Worst Case			**20.26**	
802.11g	1	2 412	18.85	
	6	2 437	19.31	
	11	2 462	18.81	
	12	2 467	6.90	
	13	2 472	5.16	
Worst Case			**19.31**	
802.11n HT20	1	2 412	18.74	
	6	2 437	19.22	
	11	2 462	18.78	
	12	2 467	6.94	
	13	2 472	5.13	
Worst Case			**19.22**	

- Calculation of Output Power result
Average Power = Meas. Power + Duty Cycle CF

9.4. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247 (e)

The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

TEST PROCEDURE

Power Spectral Density was performed utilizing the section 8.4 under KDB558074 D01 15.247 Meas Guidance.

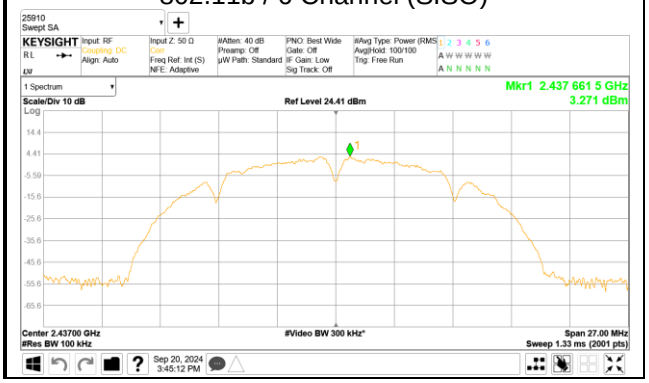
RESULTS

- Please refer to the next page

WORST CASE TEST PLOTS

ANT 1

802.11b / 6 Channel (SISO)



9.4.1. 802.11b/g/n HT20 MODE TEST RESULTS

- SISO MODE

Mode	Channel	Frequency [MHz]	Meas PSD [dBm/100kHz]	DCCF [dB]	Total Corr'd PSD [dBm/100kHz]	PSD Limit [dBm/3kHz]
			ANT1			
802.11b	1	2 412	2.822	0.00	2.822	8.00 Note
	6	2 437	3.271	0.00	3.271	
	11	2 462	2.948	0.00	2.948	
	12	2 467	-9.126	0.00	-9.126	
	13	2 472	-9.492	0.00	-9.492	
802.11g	1	2 412	-1.214	0.15	-1.064	
	6	2 437	-0.869	0.15	-0.719	
	11	2 462	-1.297	0.15	-1.147	
	12	2 467	-13.314	0.15	-13.164	
	13	2 472	-13.237	0.15	-13.087	
802.11n HT20	1	2 412	-1.300	0.00	-1.300	
	6	2 437	-1.264	0.00	-1.264	
	11	2 462	-1.491	0.00	-1.491	
	12	2 467	-13.032	0.00	-13.032	
	13	2 472	-13.512	0.00	-13.512	

- Calculation of Output PSD result

- 1TX : Corr'd PSD = Meas PSD + Duty Cycle CF

Note. RBW 100kHz measurement data is lower than 3kHz limit.

9.5. CONDUCTED SPURIOUS EMISSIONS

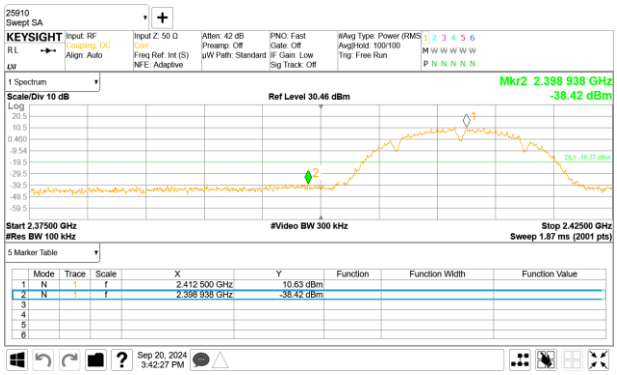
LIMITS

FCC §15.247 (d)

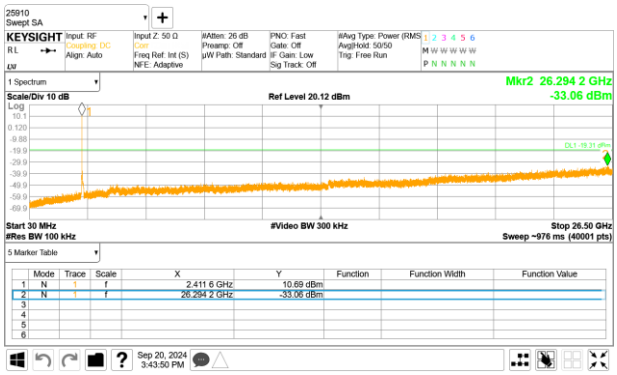
Output power was measured based on the use of average measurement therefore the required attenuation is 30 dB.

RESULTS

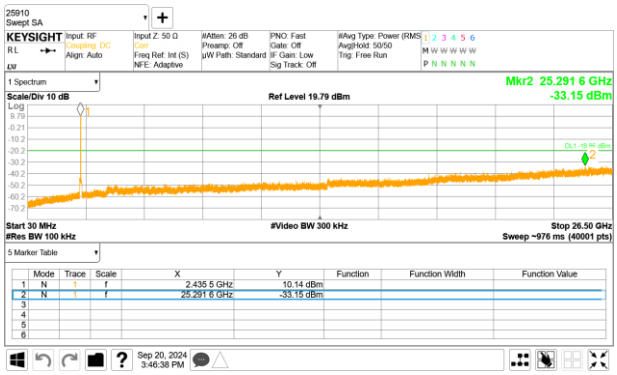
9.5.1. 802.11b MODE



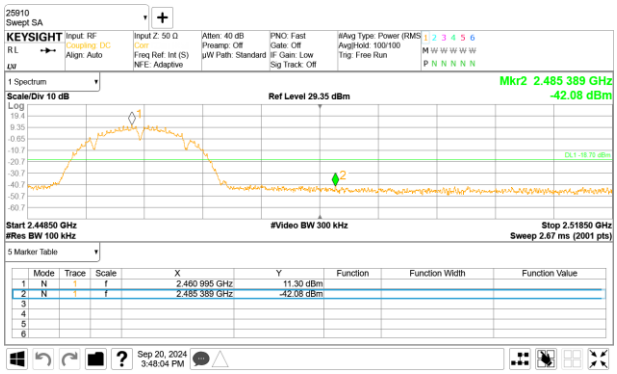
1 Channel Band-edge



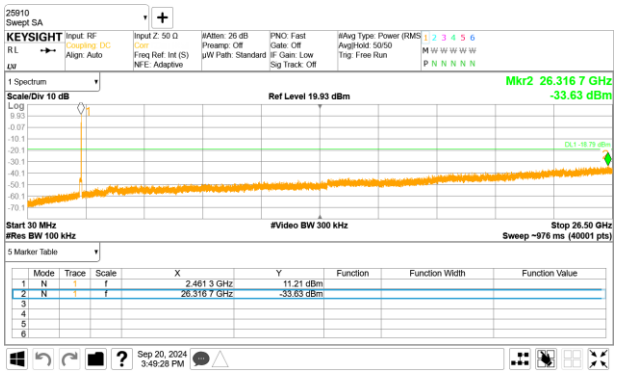
Out-Of-Band 1 Channel



Out-Of-Band 6 Channel

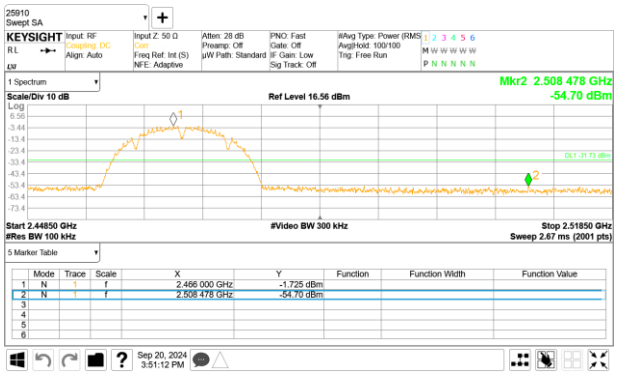


11 Channel Band-edge

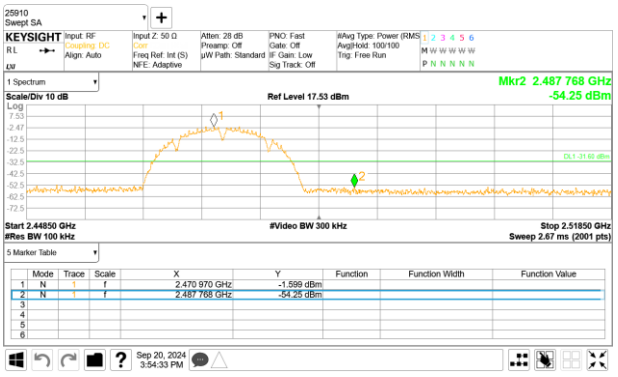


Out-Of-Band 11 Channel

UL KOREA LTD. Suwon Laboratory FORM ID: FCC_15C(05)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

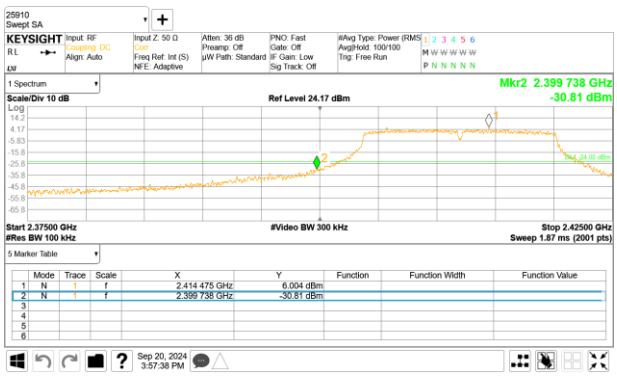


12 Channel Band-edge

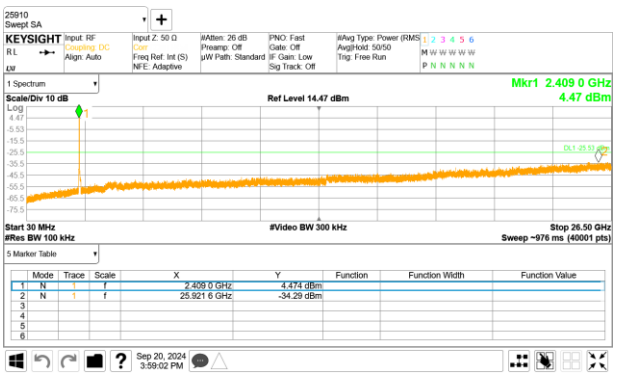


13 Channel Band-edge

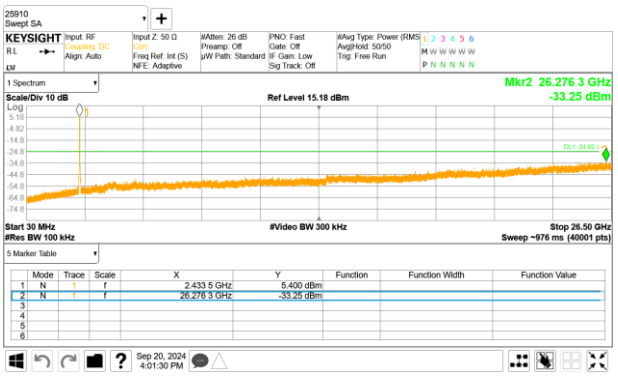
9.5.2. 802.11g MODE



1 Channel Band-edge

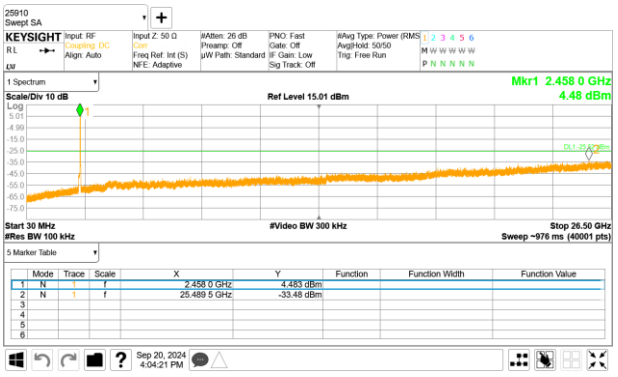


Out-Of-Band 1 Channel

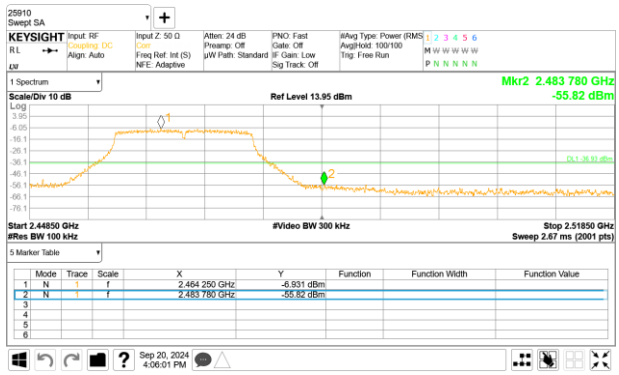


Out-Of-Band 6 Channel

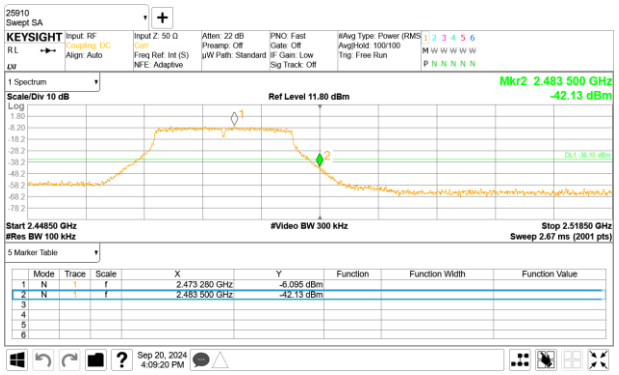
11 Channel Band-edge



Out-Of-Band 11 Channel



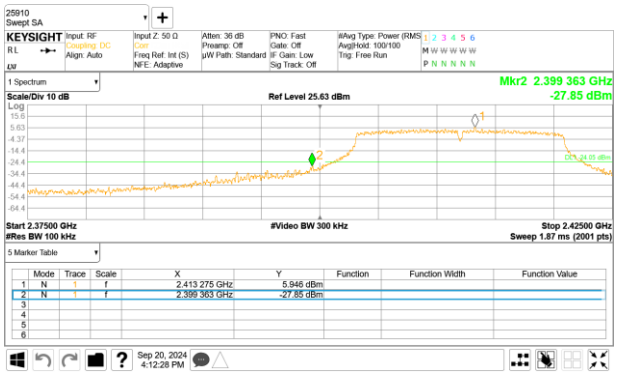
12 Channel Band-edge



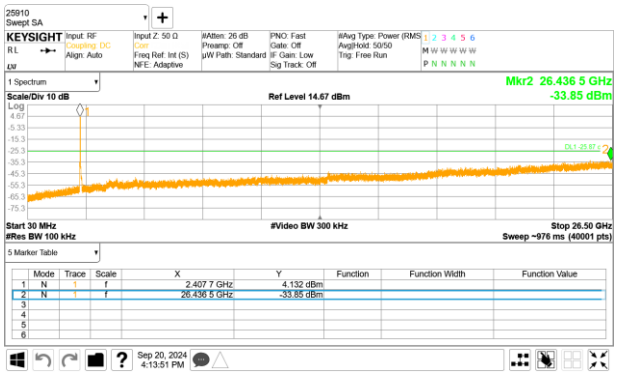
13 Channel Band-edge

UL KOREA LTD. Suwon Laboratory FORM ID: FCC_15C(05)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

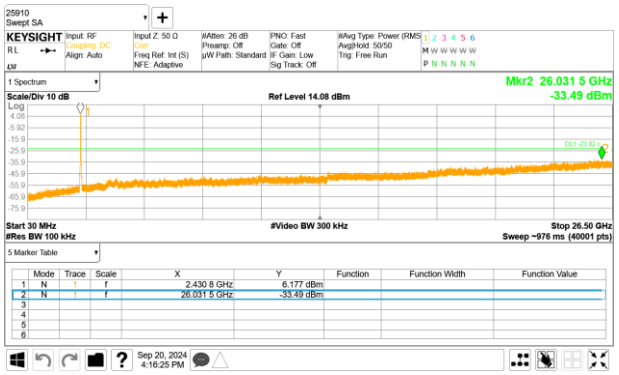
9.5.3. 802.11n HT20 MODE



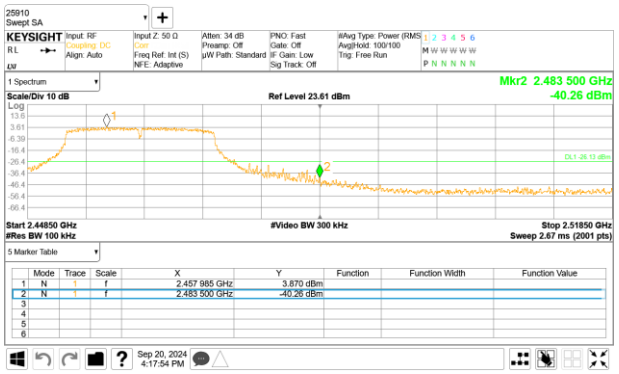
1 Channel Band-edge



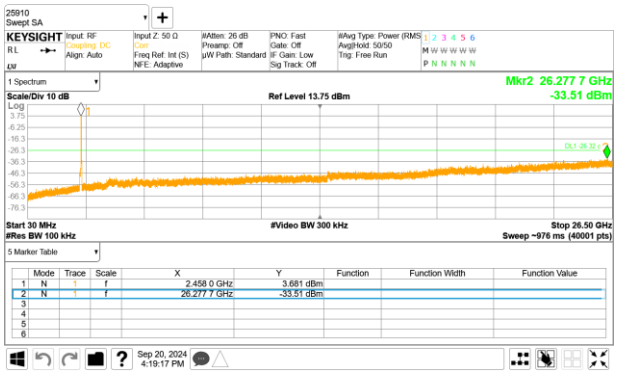
Out-Of-Band 1 Channel



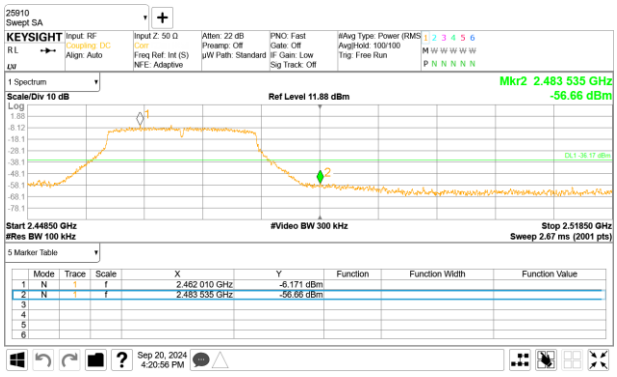
Out-Of-Band 6 Channel



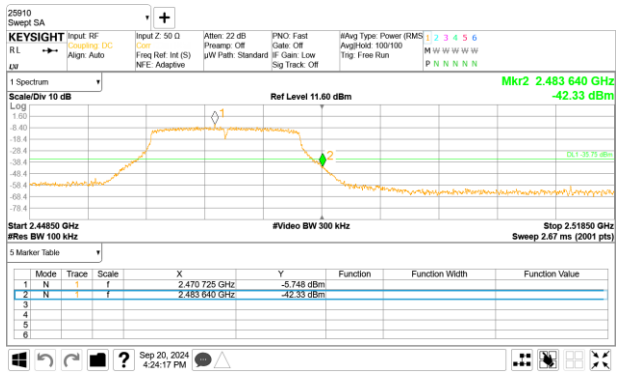
11 Channel Band-edge



Out-Of-Band 11 Channel



12 Channel Band-edge



13 Channel Band-edge

UL KOREA LTD. Suwon Laboratory FORM ID: FCC_15C(05)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

10. RADIATED TEST RESULTS

LIMITS

FCC §15.205 and §15.209

Limits for radiated disturbance of an intentional radiator		
Frequency range (MHz)	Limits (μV/m)	Measurement Distance (m)
0.009 – 0.490	2400 / F (kHz)	300
0.490 – 1.705	24000 / F (kHz)	30
1.705 – 30.0	30	30
30 – 88	100**	3
88 - 216	150**	3
216 – 960	200**	3
Above 960	500	3

** Except as provided in paragraph (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.

FCC Part 15.205 (a) : Only spurious emissions are permitted in any of the frequency bands listed below :

MHz	MHz	MHz	MHz	GHz	GHz
0.009 ~ 0.110	8.41425 ~ 8.41475	108 ~ 121.94	1300 ~ 1427	4.5 ~ 5.15	14.47 ~ 14.5
0.495 ~ 0.505	12.29 ~ 12.293	123 ~ 138	1435 ~ 1626.5	5.35 ~ 5.46	15.35 ~ 16.2
2.1735 ~ 2.1905	12.51975 ~ 12.52025	149.9 ~ 150.05	1645.5 ~ 1646.5	7.25 ~ 7.75	17.7 ~ 21.4
4.125 ~ 4.128	12.57675 ~ 12.57725	156.52475 ~	1660 ~ 1710	8.025 ~ 8.5	22.01 ~ 23.12
4.17725 ~ 4.17775	13.36 ~ 13.41	156.52525	1718.8 ~ 1722.2	9.0 ~ 9.2	23.6 ~ 24.0
4.20725 ~ 4.20775	16.42 ~ 16.423	156.7 ~ 156.9	2200 ~ 2300	9.3 ~ 9.5	31.2 ~ 31.8
6.215 ~ 6.218	16.69475 ~ 16.69525	162.0125 ~	2310 ~ 2390	10.6 ~ 12.7	36.43 ~ 36.5
6.26775 ~ 6.26825	16.80425 ~ 16.80475	167.17	2483.5 ~ 2500	13.25 ~ 13.4	Above 38.6
6.31175 ~ 6.31225	25.5 ~ 25.67	167.72 ~ 173.2	2655 ~ 2900		
8.291 ~ 8.294	37.5 ~ 38.25	240 ~ 285	3260 ~ 3267		
8.362 ~ 8.366	73 ~ 74.6	322 ~ 335.4	3332 ~ 3339		
8.37625 ~ 8.38675	74.8 ~ 75.2	399.90 ~ 410	3345.8 ~ 3358		
		608 ~ 614	3600 ~ 4400		
		960 ~ 1240			

▪ FCC Part 15.205(b) : The field strength of emissions appearing within these frequency bands shall not exceed the limits shown in §15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in §15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in §15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in §15.35 apply to these measurements.

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane for below 1 GHz and 150 cm for above 1 GHz. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.10. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz for peak measurements and add duty cycle factor for average measurements.
(Restriced bandedge, Final detection of spurious harmonic emissions)

Duty cycle factor = 10log (1/x) For this sample:

802.11b SISO mode = 0.00 dB (98.93%)
802.11g SISO mode = 0.15 dB (96.67%)
802.11n(HT20) SISO mode = 0.00 dB (98.34%)

Pre-scans to detect harmonic and spurious emissions, the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 30 kHz for peak measurements.

The spectrum from 1 GHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band.
(From 30MHz to 1GHz, test was performed with the EUT set to transmit at the channel with highest output power)

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

Note : Emission was pre-scanned from 9 kHz to 30 MHz; No emissions were detected which was at least 20dB below the specification limit (consider distance correction factor).
Per FCC part 15.31(o), test results were not reported.

Although these tests were performed other than open area test site, adequate comparison measurements were confirmed against 30 m open are test site.
Therefore, sufficient tests were made to demonstrate that the alternative site produces results that correlate with the one of tests made in an open field based on KDB 414788.

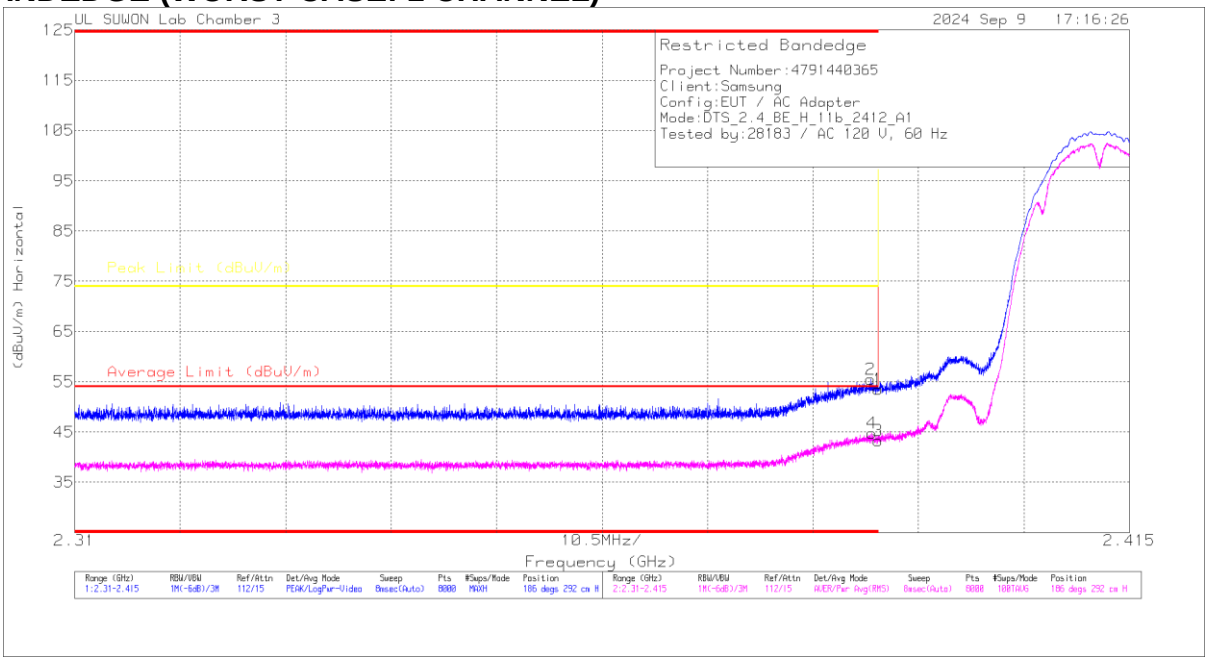
UL KOREA LTD. Suwon Laboratory FORM ID: FCC_15C(05)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

10.1. TRANSMITTER ABOVE 1 GHz

10.1.1. TX ABOVE 1 GHz 802.11b MODE IN THE 2.4 GHz BAND

1TX Antenna 1

BANDEDGE (WORST CASE: 1 CHANNEL)



HORIZONTAL RESULT

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	Antenna_957_Factor(dB/m)	10dB_Path Loss(dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	46.23	Pk	32.1	-24.8	0	53.53	-	-	74	-20.47	186	292	H
2	* 2.38923	48.19	Pk	32.1	-24.8	0	55.49	-	-	74	-18.51	186	292	H
3	* 2.39	36.03	RMS	32.1	-24.8	0	43.33	54	-10.67	-	-	186	292	H
4	* 2.38938	37.46	RMS	32.1	-24.8	0	44.76	54	-9.24	-	-	186	292	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

BANDEDGE TEST DATA

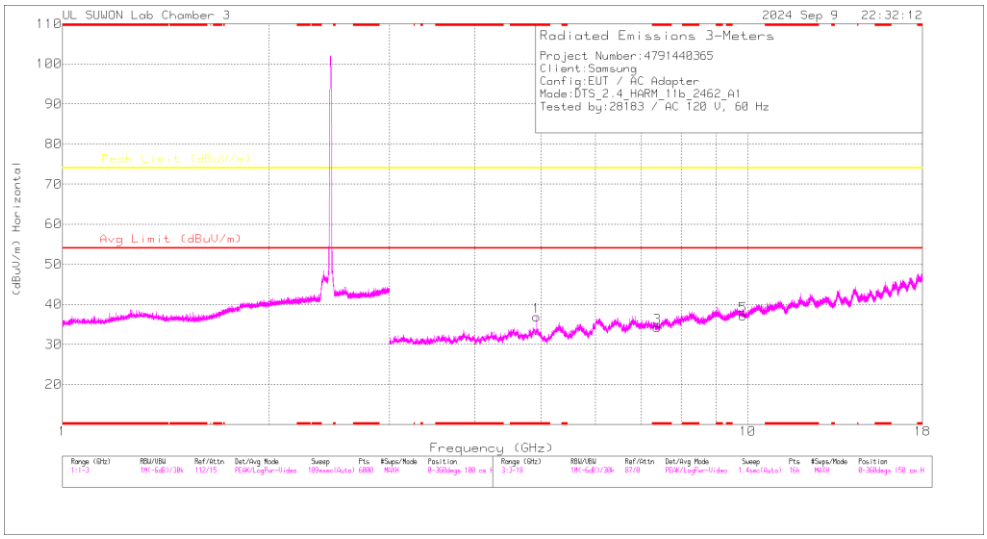
Freq. [MHz]	Antenna	Frequency [GHz]	Reading [dBuV]	Detector Mode	ANT Factor [dB/m]	Loss [dB]	DC Corr [dB]	Result [dBuV/m]	AV Limit [dBuV/m]	AV Margin [dB]	PK Limit [dBuV/m]	PK Margin [dB]	Azimuth [Degs]	Height [cm]	Polarity
2412	ANT1	* 2.39	46.23	Pk	32.10	-24.80	0.00	53.53	-	-	74.00	-20.47	186	292	H
		* 2.38923	48.19	Pk	32.10	-24.80	0.00	55.49	-	-	74.00	**-18.51**	186	292	H
		* 2.39	36.03	RMS	32.10	-24.80	0.00	43.33	54.00	-10.67	-	-	186	292	H
		* 2.38938	37.46	RMS	32.10	-24.80	0.00	44.76	54.00	**-9.24**	-	-	186	292	H
		* 2.39	45.21	Pk	32.10	-24.80	0.00	52.51	-	-	74.00	-21.49	270	111	V
		* 2.38967	47.96	Pk	32.10	-24.80	0.00	55.26	-	-	74.00	-18.74	270	111	V
		* 2.39	36.04	RMS	32.10	-24.80	0.00	43.34	54.00	-10.66	-	-	270	111	V
		* 2.38801	36.61	RMS	32.10	-24.80	0.00	43.91	54.00	-10.09	-	-	270	111	V
2462	ANT1	* 2.4835	46.18	Pk	32.40	-24.80	0.00	53.78	-	-	74.00	-20.22	199	400	H
		* 2.48494	47.42	Pk	32.40	-24.80	0.00	55.02	-	-	74.00	-18.98	199	400	H
		* 2.4835	35.74	RMS	32.40	-24.80	0.00	43.34	54.00	-10.66	-	-	199	400	H
		* 2.48416	36.79	RMS	32.40	-24.80	0.00	44.39	54.00	-9.61	-	-	199	400	H
		* 2.4835	45.03	Pk	32.40	-24.80	0.00	52.63	-	-	74.00	-21.37	285	104	V
		* 2.48452	46.39	Pk	32.40	-24.80	0.00	53.99	-	-	74.00	-20.01	285	104	V
		* 2.4835	34.95	RMS	32.40	-24.80	0.00	42.55	54.00	-11.45	-	-	285	104	V
		* 2.48389	35.46	RMS	32.40	-24.80	0.00	43.06	54.00	-10.94	-	-	285	104	V
2467	ANT1	* 2.4835	42.96	Pk	32.40	-24.80	0.00	50.56	-	-	74.00	-23.44	207	313	H
		2.501	44.97	Pk	32.40	-24.80	0.00	52.57	-	-	74.00	-21.43	207	313	H
		* 2.4835	31.57	RMS	32.40	-24.80	0.00	39.17	54.00	-14.83	-	-	207	313	H
		* 2.4842	33.00	RMS	32.40	-24.80	0.00	40.60	54.00	-13.40	-	-	207	313	H
		* 2.4835	42.45	Pk	32.40	-24.80	0.00	50.05	-	-	74.00	-23.95	283	104	V
		2.513	44.82	Pk	32.40	-24.70	0.00	52.52	-	-	74.00	-21.48	283	104	V
		* 2.4835	31.95	RMS	32.40	-24.80	0.00	39.55	54.00	-14.45	-	-	283	104	V
		2.559	32.95	RMS	32.40	-24.70	0.00	40.65	54.00	-13.35	-	-	283	104	V
2472	ANT1	* 2.4835	41.71	Pk	32.40	-24.80	0.00	49.31	-	-	74.00	-24.69	205	134	H
		2.512	44.22	Pk	32.40	-24.80	0.00	51.82	-	-	74.00	-22.18	205	134	H
		* 2.4835	31.32	RMS	32.40	-24.80	0.00	38.92	54.00	-15.08	-	-	205	134	H
		2.551	32.78	RMS	32.40	-24.70	0.00	40.48	54.00	-13.52	-	-	205	134	H
		* 2.4835	41.64	Pk	32.40	-24.80	0.00	49.24	-	-	74.00	-24.76	265	103	V
		2.540	44.33	Pk	32.40	-24.70	0.00	52.03	-	-	74.00	-21.97	265	103	V
		* 2.4835	31.75	RMS	32.40	-24.80	0.00	39.35	54.00	-14.65	-	-	265	103	V
		2.559	32.74	RMS	32.40	-24.70	0.00	40.44	54.00	-13.56	-	-	265	103	V

Note1. Pk - Peak detector, RMS - RMS detectior
Note2. * - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

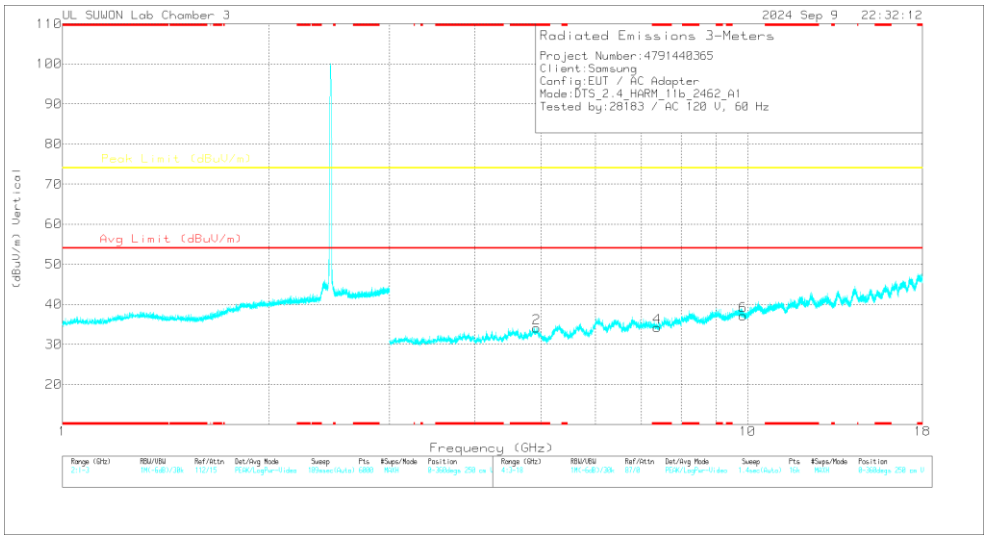
UL KOREA LTD. Suwon Laboratory FORM ID: FCC_15C(05)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

HARMONICS AND SPURIOUS EMISSIONS(WORST CASE: 11 CHANNEL)

CH 11 RESULTS



HORIZONTAL



VERTICAL

Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	Antenna_957_ Factor(dB/m)	3GHz_HP_Pat h Loss(dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.92396	41.52	PK2	34.2	-30	0	45.72	-	-	74	-28.28	171	101	H
* 4.92405	33.59	MAv1	34.2	-30	0	37.79	54	-16.21	-	-	171	101	H
* 4.92385	39.96	PK2	34.2	-30	0	44.16	-	-	74	-29.84	288	110	V
* 4.92399	29.85	MAv1	34.2	-30	0	34.05	54	-19.95	-	-	288	110	V
* 7.38742	34.06	PK2	35.7	-25.3	0	44.46	-	-	74	-29.54	0	100	H
* 7.38653	34.7	PK2	35.7	-25.4	0	45	-	-	74	-29	0	100	V
9.84631	31.91	PK2	37.1	-21.4	0	47.61	-	-	74	-26.39	0	100	H
9.84554	32.1	PK2	37.1	-21.4	0	47.8	-	-	74	-26.2	0	100	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PK2 - KDB558074 Method: Maximum Peak
MAv1 - KDB558074 Option 1 Maximum RMS Average

HARMONICS AND SPURIOUS EMISSIONS TEST DATA

Freq. [MHz]	Antenna	Frequency [GHz]	Reading [dBuV]	Detector Mode	ANT Factor [dB/m]	Loss [dB]	DC Corr [dB]	Result [dBuV/m]	AV Limit [dBuV/m]	AV Margin [dB]	PK Limit [dBuV/m]	PK Margin [dB]	Azimuth [Degs]	Height [cm]	Polarity
2412	ANT1	* 4.81904	26.98	PK2	34.30	-30.00	0.00	31.28	-	-	74.00	-42.72	170	108	H
		* 4.82395	32.19	MAv1	34.30	-30.10	0.00	36.39	54.00	-17.61	-	-	170	108	H
		* 4.82221	38.99	PK2	34.30	-30.10	0.00	43.19	-	-	74.00	-30.81	0	100	V
		7.235	35.41	PK2	35.80	-25.80	0.00	45.41	-	-	74.00	-28.59	0	100	H
		7.236	35.29	PK2	35.80	-25.80	0.00	45.29	-	-	74.00	-28.71	0	100	V
		9.647	33.32	PK2	36.80	-21.80	0.00	48.32	-	-	74.00	-25.68	0	100	H
		9.648	32.72	PK2	36.80	-21.80	0.00	47.72	-	-	74.00	-26.28	0	100	V
2437	ANT1	* 4.87383	41.06	PK2	34.20	-29.80	0.00	45.46	-	-	74.00	-28.54	178	103	H
		* 4.87395	33.07	MAv1	34.20	-29.80	0.00	37.47	54.00	-16.53	-	-	178	103	H
		* 4.87417	39.28	PK2	34.20	-29.80	0.00	43.68	-	-	74.00	-30.32	0	100	V
		* 7.31142	34.78	PK2	35.80	-25.50	0.00	45.08	-	-	74.00	-28.92	0	100	H
		* 7.31082	35.48	PK2	35.80	-25.50	0.00	45.78	-	-	74.00	-28.22	0	100	V
		9.746	33.24	PK2	36.90	-21.60	0.00	48.54	-	-	74.00	**-25.46**	0	100	H
		9.749	32.34	PK2	36.90	-21.50	0.00	47.74	-	-	74.00	-26.26	0	100	V
2462	ANT1	* 4.92396	41.52	PK2	34.20	-30.00	0.00	45.72	-	-	74.00	-28.28	171	101	H
		* 4.92405	33.59	MAv1	34.20	-30.00	0.00	37.79	54.00	**-16.21**	-	-	171	101	H
		* 4.92385	39.96	PK2	34.20	-30.00	0.00	44.16	-	-	74.00	-29.84	288	110	V
		* 4.92399	29.85	MAv1	34.20	-30.00	0.00	34.05	54.00	-19.95	-	-	288	110	V
		* 7.38742	34.06	PK2	35.70	-25.30	0.00	44.46	-	-	74.00	-29.54	0	100	H
		* 7.38653	34.70	PK2	35.70	-25.40	0.00	45.00	-	-	74.00	-29.00	0	100	V
		9.846	31.91	PK2	37.10	-21.40	0.00	47.61	-	-	74.00	-26.39	0	100	H
		9.846	32.10	PK2	37.10	-21.40	0.00	47.80	-	-	74.00	-26.20	0	100	V

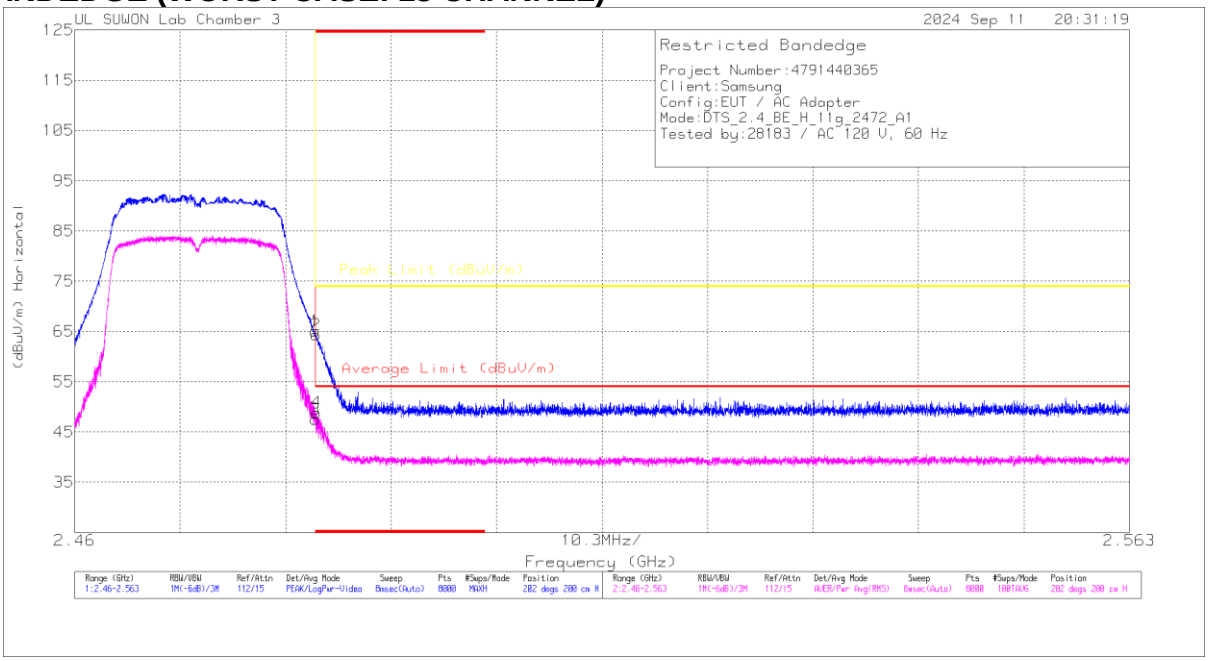
Note1. PK2 - KDB558074 Method: Maximum Peak / MAv1 - KDB558074 Option 1 Maximum RMS Average
Note2. * - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

UL KOREA LTD. Suwon Laboratory FORM ID: FCC_15C(05)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

10.1.2. TX ABOVE 1 GHz 802.11g MODE IN THE 2.4 GHz BAND

1TX Antenna 1

BANDEDGE (WORST CASE: 13 CHANNEL)



HORIZONTAL RESULT

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	Antenna_957_Factor(dB/m)	10dB_Path Loss(dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.4835	57.45	Pk	32.4	-24.8	0	65.05	-	-	74	-8.95	202	200	H
2	* 2.48358	56.77	Pk	32.4	-24.8	0	64.37	-	-	74	-9.63	202	200	H
3	* 2.4835	39.78	RMS	32.4	-24.8	.15	47.53	54	-6.47	-	-	202	200	H
4	* 2.4836	41.12	RMS	32.4	-24.8	.15	48.87	54	-5.13	-	-	202	200	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

BANDEDGE TEST DATA

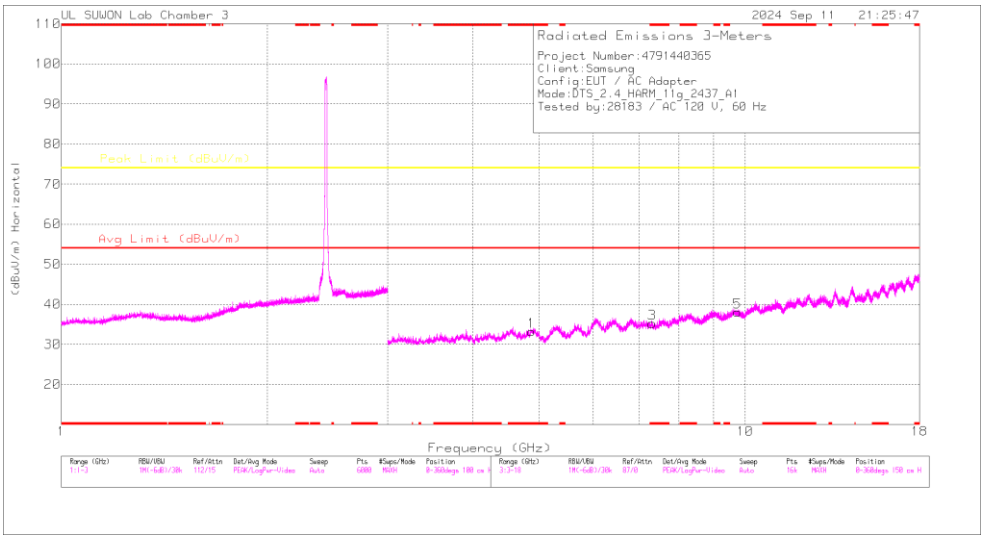
Freq. [MHz]	Antenna	Frequency [GHz]	Reading [dBuV]	Detector Mode	ANT Factor [dB/m]	Loss [dB]	DC Corr [dB]	Result [dBuV/m]	AV Limit [dBuV/m]	AV Margin [dB]	PK Limit [dBuV/m]	PK Margin [dB]	Azimuth [Degs]	Height [cm]	Polarity
2412	ANT1	* 2.39	52.86	Pk	32.10	-24.80	0.00	60.16	-	-	74.00	-13.84	189	293	H
		* 2.38989	54.49	Pk	32.10	-24.80	0.00	61.79	-	-	74.00	-12.21	189	293	H
		* 2.39	40.32	RMS	32.10	-24.80	0.15	47.77	54.00	-6.23	-	-	189	293	H
		* 2.38998	40.19	RMS	32.10	-24.80	0.15	47.64	54.00	-6.36	-	-	189	293	H
		* 2.39	52.23	Pk	32.10	-24.80	0.00	59.53	-	-	74.00	-14.47	258	369	V
		* 2.38983	53.41	Pk	32.10	-24.80	0.00	60.71	-	-	74.00	-13.29	258	369	V
		* 2.39	39.69	RMS	32.10	-24.80	0.15	47.14	54.00	-6.86	-	-	258	369	V
		* 2.38979	39.93	RMS	32.10	-24.80	0.15	47.38	54.00	-6.62	-	-	258	369	V
2462	ANT1	* 2.4835	47.89	Pk	32.40	-24.80	0.00	55.49	-	-	74.00	-18.51	207	111	H
		* 2.48389	51.11	Pk	32.40	-24.80	0.00	58.71	-	-	74.00	-15.29	207	111	H
		* 2.4835	36.68	RMS	32.40	-24.80	0.15	44.43	54.00	-9.57	-	-	207	111	H
		* 2.48363	37.36	RMS	32.40	-24.80	0.15	45.11	54.00	-8.89	-	-	207	111	H
		* 2.4835	46.48	Pk	32.40	-24.80	0.00	54.08	-	-	74.00	-19.92	247	103	V
		* 2.4836	48.45	Pk	32.40	-24.80	0.00	56.05	-	-	74.00	-17.95	247	103	V
		* 2.4835	35.79	RMS	32.40	-24.80	0.15	43.54	54.00	-10.46	-	-	247	103	V
		* 2.48354	36.63	RMS	32.40	-24.80	0.15	44.38	54.00	-9.62	-	-	247	103	V
2467	ANT1	* 2.4835	43.68	Pk	32.40	-24.80	0.00	51.28	-	-	74.00	-22.72	205	110	H
		2.536	45.34	Pk	32.40	-24.80	0.00	52.94	-	-	74.00	-21.06	205	110	H
		* 2.4835	31.95	RMS	32.40	-24.80	0.00	39.55	54.00	-14.45	-	-	205	110	H
		* 2.4847	33.26	RMS	32.40	-24.80	0.00	40.86	54.00	-13.14	-	-	205	110	H
		* 2.4835	41.27	Pk	32.40	-24.80	0.00	48.87	-	-	74.00	-25.13	283	105	V
		* 2.48547	44.88	Pk	32.40	-24.80	0.00	52.48	-	-	74.00	-21.52	283	105	V
		* 2.4835	32.07	RMS	32.40	-24.80	0.15	39.82	54.00	-14.18	-	-	283	105	V
		2.520	32.90	RMS	32.40	-24.80	0.15	40.65	54.00	-13.35	-	-	283	105	V
2472	ANT1	* 2.4835	57.45	Pk	32.40	-24.80	0.00	65.05	-	-	74.00	**-8.95**	202	200	H
		* 2.48358	56.77	Pk	32.40	-24.80	0.00	64.37	-	-	74.00	-9.63	202	200	H
		* 2.4835	39.78	RMS	32.40	-24.80	0.15	47.53	54.00	-6.47	-	-	202	200	H
		* 2.4836	41.12	RMS	32.40	-24.80	0.15	48.87	54.00	**-5.13**	-	-	202	200	H
		* 2.4835	53.92	Pk	32.40	-24.80	0.00	61.52	-	-	74.00	-12.48	267	123	V
		* 2.48353	55.36	Pk	32.40	-24.80	0.00	62.96	-	-	74.00	-11.04	267	123	V
		* 2.4835	37.82	RMS	32.40	-24.80	0.15	45.57	54.00	-8.43	-	-	267	123	V
		* 2.48369	38.83	RMS	32.40	-24.80	0.15	46.58	54.00	-7.42	-	-	267	123	V

Note1. Pk - Peak detector, RMS - RMS detectior
Note2. * - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

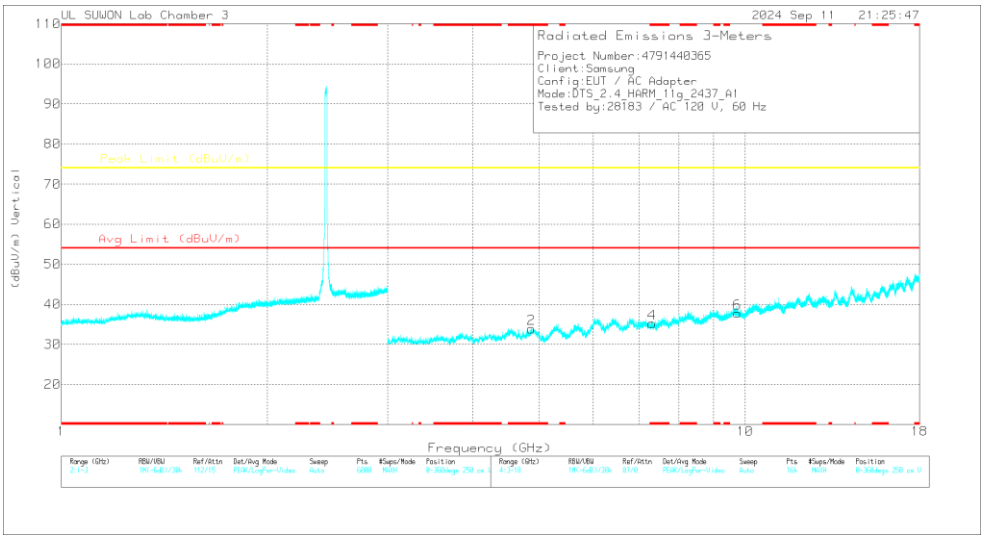
UL KOREA LTD. Suwon Laboratory FORM ID: FCC_15C(05)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

HARMONICS AND SPURIOUS EMISSIONS (WORST CASE: 6 CHANNEL)

CH 6 RESULTS



HORIZONTAL



VERTICAL

Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	Antenna_957_Factor(dB/m)	3GHz_HP_Path Loss(dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.87494	39.22	PK2	34.2	-29.8	0	43.62	-	-	74	-30.38	0	100	H
* 7.30582	35.34	PK2	35.8	-25.5	0	45.64	-	-	74	-28.36	0	100	H
9.74311	32.4	PK2	36.9	-21.6	0	47.7	-	-	74	-26.3	0	100	H
* 4.86448	39.1	PK2	34.2	-29.9	0	43.4	-	-	74	-30.6	0	100	V
* 7.31231	35.32	PK2	35.8	-25.5	0	45.62	-	-	74	-28.38	0	100	V
9.74778	33.07	PK2	36.9	-21.6	0	48.37	-	-	74	-25.63	0	100	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PK2 - KDB558074 Method: Maximum Peak
MAv1 - KDB558074 Option 1 Maximum RMS Average

HARMONICS AND SPURIOUS EMISSIONS TEST DATA

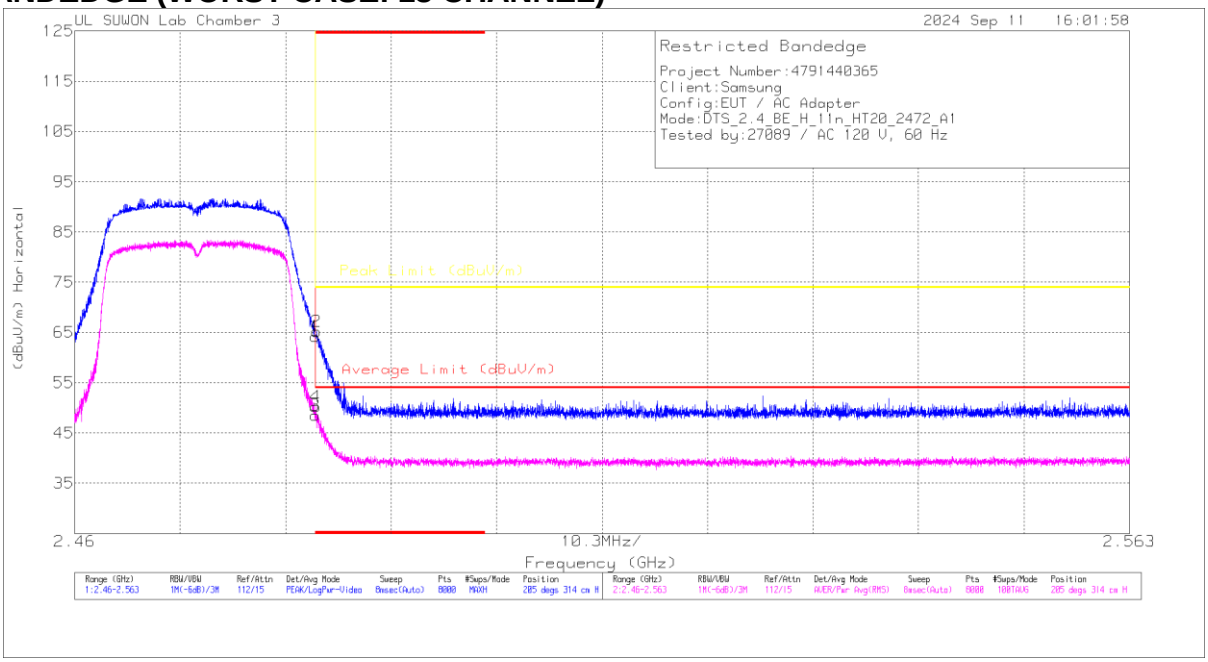
Freq. [MHz]	Antenna	Frequency [GHz]	Reading [dBuV]	Detector Mode	ANT Factor [dB/m]	Loss [dB]	DC Corr [dB]	Result [dBuV/m]	AV Limit [dBuV/m]	AV Margin [dB]	PK Limit [dBuV/m]	PK Margin [dB]	Azimuth [Degs]	Height [cm]	Polarity
2412	ANT1	* 4.81962	25.09	PK2	34.30	-30.00	0.00	29.39	-	-	74.00	-44.61	0	100	H
		7.238	25.88	PK2	35.80	-25.70	0.00	35.98	-	-	74.00	-38.02	0	100	H
		9.647	25.49	PK2	36.80	-21.70	0.00	40.59	-	-	74.00	-33.41	0	100	H
		* 4.82085	29.04		34.30	-30.00	0.00	33.34	-	-	74.00	-40.66	0	100	V
		7.233	27.65	PK2	35.80	-25.80	0.00	37.65	-	-	74.00	-36.35	0	100	V
		9.646	22.77	PK2	36.80	-21.70	0.00	37.87	-	-	74.00	-36.13	0	100	V
2437	ANT1	* 4.87494	39.22	PK2	34.20	-29.80	0.00	43.62	-	-	74.00	-30.38	0	100	H
		* 7.30582	35.34	PK2	35.80	-25.50	0.00	45.64	-	-	74.00	-28.36	0	100	H
		9.743	32.40	PK2	36.90	-21.60	0.00	47.70	-	-	74.00	-26.30	0	100	H
		* 4.86448	39.10	PK2	34.20	-29.90	0.00	43.40	-	-	74.00	-30.60	0	100	V
		* 7.31231	35.32	PK2	35.80	-25.50	0.00	45.62	-	-	74.00	-28.38	0	100	V
		9.748	33.07	PK2	36.90	-21.60	0.00	48.37	-	-	74.00	**-25.63**	0	100	V
2462	ANT1	* 4.92393	39.38	PK2	34.20	-30.00	0.00	43.58	-	-	74.00	-30.42	0	100	H
		* 7.38536	34.40	PK2	35.70	-25.40	0.00	44.70	-	-	74.00	-29.30	0	100	H
		9.851	31.89	PK2	37.10	-21.40	0.00	47.59	-	-	74.00	-26.41	0	100	H
		* 4.92233	39.44	PK2	34.20	-29.90	0.00	43.74	-	-	74.00	-30.26	0	100	V
		* 7.38837	34.27	PK2	35.70	-25.30	0.00	44.67	-	-	74.00	-29.33	0	100	V
		9.850	31.84	PK2	37.10	-21.40	0.00	47.54	-	-	74.00	-26.46	0	100	V

Note1. PK2 - KDB558074 Method: Maximum Peak / MAv1 - KDB558074 Option 1 Maximum RMS Average
Note2. * - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

10.1.3. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 2.4 GHz BAND

1TX Antenna 1

BANDEDGE (WORST CASE: 13 CHANNEL)



HORIZONTAL RESULT

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	Antenna_957_Factor(dB/m)	10dB_Path Loss(dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.4835	56.6	Pk	32.4	-24.8	0	64.2	-	-	74	-9.8	205	314	H
2	* 2.48364	57.56	Pk	32.4	-24.8	0	65.16	-	-	74	-8.84	205	314	H
3	* 2.4835	40.9	RMS	32.4	-24.8	0	48.5	54	-5.5	-	-	205	314	H
4	* 2.48353	42.7	RMS	32.4	-24.8	0	50.3	54	-3.7	-	-	205	314	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

BANDEDGE TEST DATA

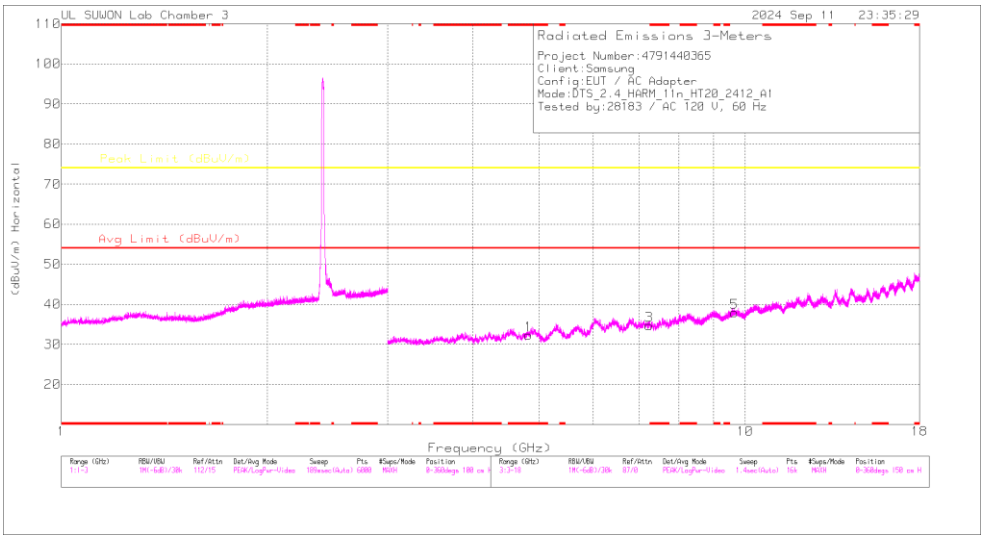
Freq. [MHz]	Antenna	Frequency [GHz]	Reading [dBuV]	Detector Mode	ANT Factor [dB/m]	Loss [dB]	DC Corr [dB]	Result [dBuV/m]	AV Limit [dBuV/m]	AV Margin [dB]	PK Limit [dBuV/m]	PK Margin [dB]	Azimuth [Degs]	Height [cm]	Polarity
2412	ANT1	* 2.39	54.25	Pk	32.10	-24.80	0.00	61.55	-	-	74.00	-12.45	200	234	H
		* 2.3893	58.00	Pk	32.10	-24.80	0.00	65.30	-	-	74.00	-8.70	200	234	H
		* 2.39	41.02	RMS	32.10	-24.80	0.00	48.32	54.00	-5.68	-	-	200	234	H
		* 2.38992	41.80	RMS	32.10	-24.80	0.00	49.10	54.00	-4.90	-	-	200	234	H
		* 2.39	55.02	Pk	32.10	-24.80	0.00	62.32	-	-	74.00	-11.68	257	370	V
		* 2.38888	58.19	Pk	32.10	-24.80	0.00	65.49	-	-	74.00	**-8.51**	257	370	V
		* 2.39	40.70	RMS	32.10	-24.80	0.00	48.00	54.00	-6.00	-	-	257	370	V
		* 2.38992	41.86	RMS	32.10	-24.80	0.00	49.16	54.00	-4.84	-	-	257	370	V
2462	ANT1	* 2.4835	54.92	Pk	32.40	-24.80	0.00	62.52	-	-	74.00	-11.48	186	280	H
		* 2.48402	56.98	Pk	32.40	-24.80	0.00	64.58	-	-	74.00	-9.42	186	280	H
		* 2.4835	37.84	RMS	32.40	-24.80	0.00	45.44	54.00	-8.56	-	-	186	280	H
		* 2.48371	39.35	RMS	32.40	-24.80	0.00	46.95	54.00	-7.05	-	-	186	280	H
		* 2.4835	50.13	Pk	32.40	-24.80	0.00	57.73	-	-	74.00	-16.27	298	106	V
		* 2.48396	55.02	Pk	32.40	-24.80	0.00	62.62	-	-	74.00	-11.38	298	106	V
		* 2.4835	35.22	RMS	32.40	-24.80	0.00	42.82	54.00	-11.18	-	-	298	106	V
		* 2.48372	36.68	RMS	32.40	-24.80	0.00	44.28	54.00	-9.72	-	-	298	106	V
2467	ANT1	* 2.4835	44.07	Pk	32.40	-24.80	0.00	51.67	-	-	74.00	-22.33	204	314	H
		* 2.48377	46.28	Pk	32.40	-24.80	0.00	53.88	-	-	74.00	-20.12	204	314	H
		* 2.4835	32.54	RMS	32.40	-24.80	0.00	40.14	54.00	-13.86	-	-	204	314	H
		* 2.48501	33.31	RMS	32.40	-24.80	0.00	40.91	54.00	-13.09	-	-	204	314	H
		* 2.4835	42.64	Pk	32.40	-24.80	0.00	50.24	-	-	74.00	-23.76	268	104	V
		2.545	44.20	Pk	32.40	-24.60	0.00	52.00	-	-	74.00	-22.00	268	104	V
		* 2.4835	32.08	RMS	32.40	-24.80	0.00	39.68	54.00	-14.32	-	-	268	104	V
		* 2.48503	33.09	RMS	32.40	-24.80	0.00	40.69	54.00	-13.31	-	-	268	104	V
2472	ANT1	* 2.4835	56.60	Pk	32.40	-24.80	0.00	64.20	-	-	74.00	-9.80	205	314	H
		* 2.48364	57.56	Pk	32.40	-24.80	0.00	65.16	-	-	74.00	-8.84	205	314	H
		* 2.4835	40.90	RMS	32.40	-24.80	0.00	48.50	54.00	-5.50	-	-	205	314	H
		* 2.48353	42.70	RMS	32.40	-24.80	0.00	50.30	54.00	**-3.70**	-	-	205	314	H
		* 2.4835	55.94	Pk	32.40	-24.80	0.00	63.54	-	-	74.00	-10.46	268	103	V
		* 2.48353	56.33	Pk	32.40	-24.80	0.00	63.93	-	-	74.00	-10.07	268	103	V
		* 2.4835	39.09	RMS	32.40	-24.80	0.00	46.69	54.00	-7.31	-	-	268	103	V
		* 2.48351	40.96	RMS	32.40	-24.80	0.00	48.56	54.00	-5.44	-	-	268	103	V

Note1. Pk - Peak detector, RMS - RMS detectior
Note2. * - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

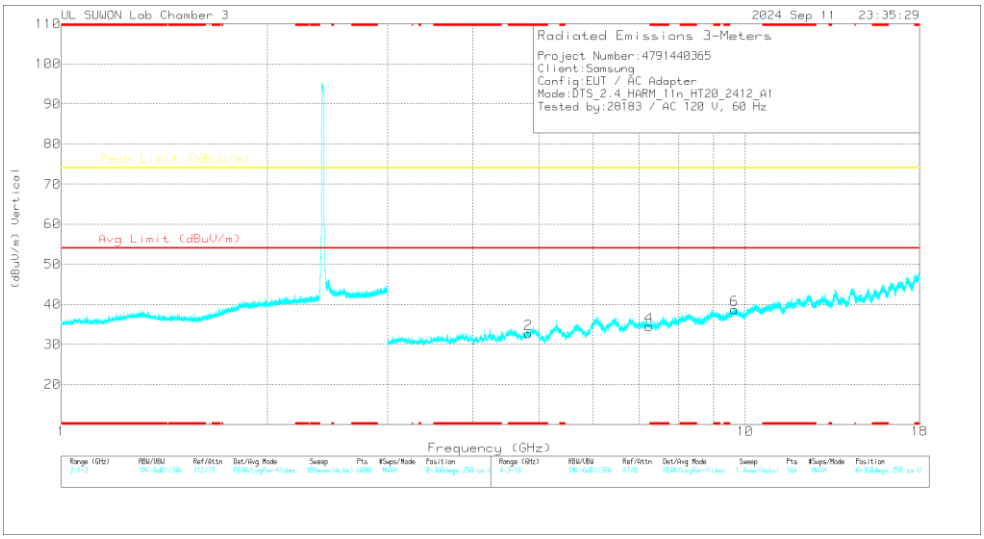
UL KOREA LTD. Suwon Laboratory FORM ID: FCC_15C(05)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

HARMONICS AND SPURIOUS EMISSIONS (WORST CASE: 1 CHANNEL)

CH 1 RESULTS



HORIZONTAL



VERTICAL

Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	Antenna_957_Factor(dB/m)	3GHz_HP_Path Loss(dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.82778	38.64	PK2	34.2	-30	0	42.84	-	-	74	-31.16	0	100	H
7.23454	34.98	PK2	35.8	-25.8	0	44.98	-	-	74	-29.02	0	100	H
9.64717	32.81	PK2	36.8	-21.8	0	47.81	-	-	74	-26.19	0	100	H
* 4.82173	38.46	PK2	34.3	-30	0	42.76	-	-	74	-31.24	0	100	V
7.23839	35.17	PK2	35.8	-25.7	0	45.27	-	-	74	-28.73	0	100	V
9.64883	33.83	PK2	36.8	-21.8	0	48.83	-	-	74	-25.17	0	100	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
PK2 - KDB558074 Method: Maximum Peak
MAv1 - KDB558074 Option 1 Maximum RMS Average

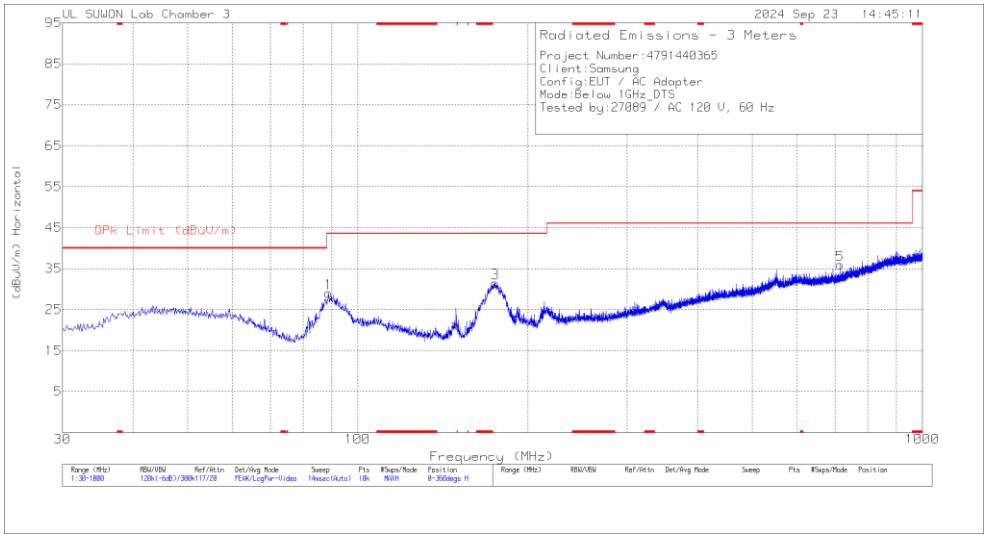
HARMONICS AND SPURIOUS EMISSIONS TEST DATA

Freq. [MHz]	Antenna	Frequency [GHz]	Reading [dBuV]	Detector Mode	ANT Factor [dB/m]	Loss [dB]	DC Corr [dB]	Result [dBuV/m]	AV Limit [dBuV/m]	AV Margin [dB]	PK Limit [dBuV/m]	PK Margin [dB]	Azimuth [Degs]	Height [cm]	Polarity
2412	ANT1	* 4.82778	38.64	PK2	34.20	-30.00	0.00	42.84	-	-	74.00	-31.16	0	100	H
		7.235	34.98	PK2	35.80	-25.80	0.00	44.98	-	-	74.00	-29.02	0	100	H
		9.647	32.81	PK2	36.80	-21.80	0.00	47.81	-	-	74.00	-26.19	0	100	H
		* 4.82173	38.46	PK2	34.30	-30.00	0.00	42.76	-	-	74.00	-31.24	0	100	V
		7.238	35.17	PK2	35.80	-25.70	0.00	45.27	-	-	74.00	-28.73	0	100	V
		9.649	33.83	PK2	36.80	-21.80	0.00	48.83	-	-	74.00	**-25.17**	0	100	V
2437	ANT1	* 4.86999	39.59	PK2	34.20	-29.90	0.00	43.89	-	-	74.00	-30.11	0	100	H
		* 7.31099	34.99	PK2	35.80	-25.50	0.00	45.29	-	-	74.00	-28.71	0	100	H
		9.746	32.18	PK2	36.90	-21.60	0.00	47.48	-	-	74.00	-26.52	0	100	H
		* 4.87583	38.87	PK2	34.20	-29.80	0.00	43.27	-	-	74.00	-30.73	0	100	V
		* 7.31227	35.28	PK2	35.80	-25.50	0.00	45.58	-	-	74.00	-28.42	0	100	V
		9.747	32.32	PK2	36.90	-21.60	0.00	47.62	-	-	74.00	-26.38	0	100	V
2462	ANT1	* 4.92004	39.65	PK2	34.20	-29.90	0.00	43.95	-	-	74.00	-30.05	0	100	H
		* 7.38241	34.73	PK2	35.70	-25.40	0.00	45.03	-	-	74.00	-28.97	0	100	H
		9.844	31.57	PK2	37.10	-21.40	0.00	47.27	-	-	74.00	-26.73	0	100	H
		* 4.93206	39.25	PK2	34.30	-30.00	0.00	43.55	-	-	74.00	-30.45	0	100	V
		* 7.38877	34.60	PK2	35.70	-25.30	0.00	45.00	-	-	74.00	-29.00	0	100	V
		9.848	32.14	PK2	37.10	-21.40	0.00	47.84	-	-	74.00	-26.16	0	100	V

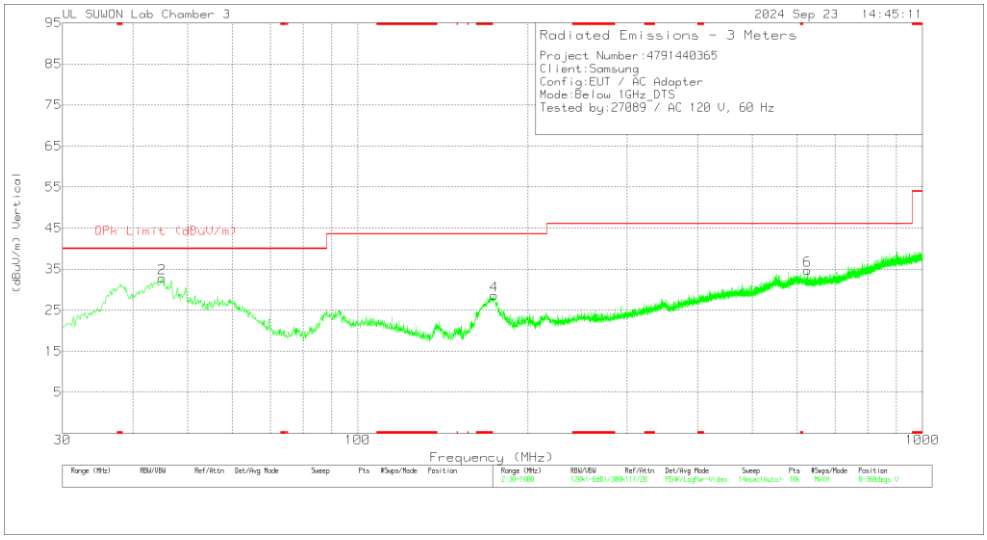
Note1. PK2 - KDB558074 Method: Maximum Peak / MAv1 - KDB558074 Option 1 Maximum RMS Average
Note2. * - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

UL KOREA LTD. Suwon Laboratory FORM ID: FCC_15C(05)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

10.2. WORST CASE BELOW 1 GHZ



HORIZONTAL



VERTICAL

Below 1GHz DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Antenna_845_Factor(dB/m)	Below_1G_Path Loss(dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	88.7881	45.14	Pk	15.4	-31.5	0	29.04	43.52	-14.48	0-360	200	H
3	175.224	47.93	Pk	14.6	-31	0	31.53	43.52	-11.99	0-360	100	H
5	714.4056	40.5	Pk	24.7	-29.2	0	36	46.02	-10.02	0-360	100	H
2	45.0366	45.12	Pk	19.6	-31.9	0	32.82	40	-7.18	0-360	100	V
4	174.3509	44.93	Pk	14.6	-30.9	0	28.63	43.52	-14.89	0-360	100	V
6	626.3205	39.95	Pk	24.3	-29.5	0	34.75	46.02	-11.27	0-360	100	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector

11. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

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.

TEST PROCEDURE

The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.10.

The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

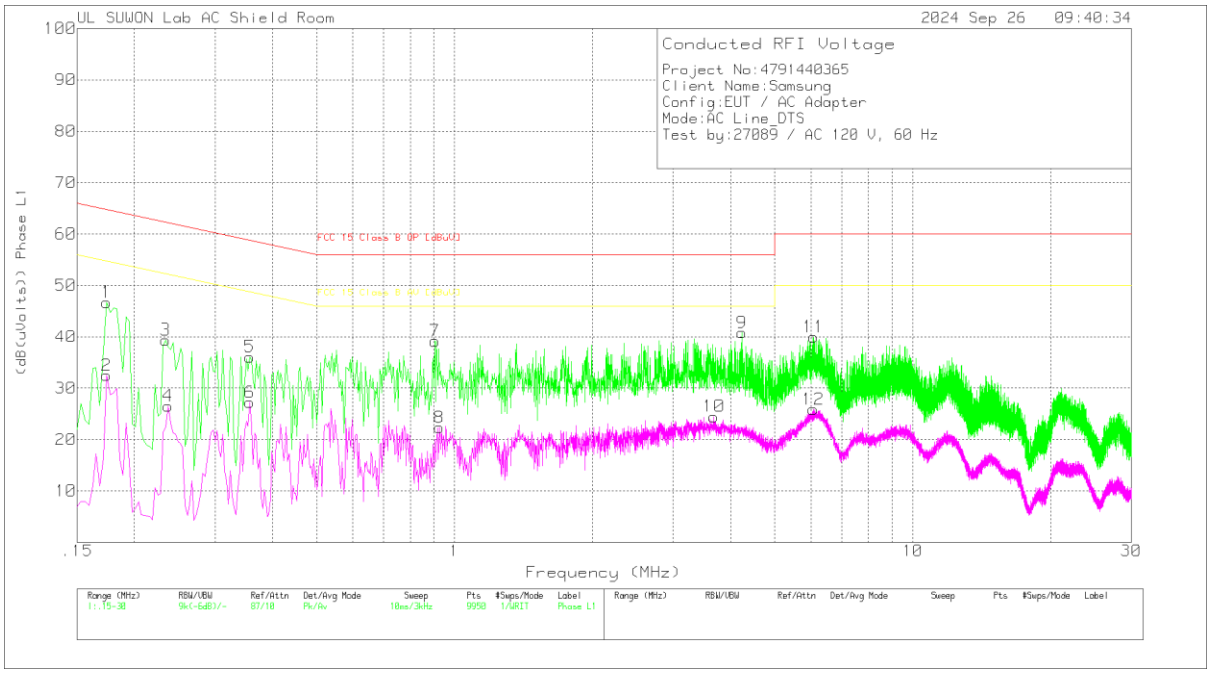
Line conducted data is recorded for both NEUTRAL and HOT lines.

RESULTS

UL KOREA LTD. Suwon Laboratory FORM ID: FCC_15C(05)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

11.1.1. AC Power Line

LINE 1 DATA

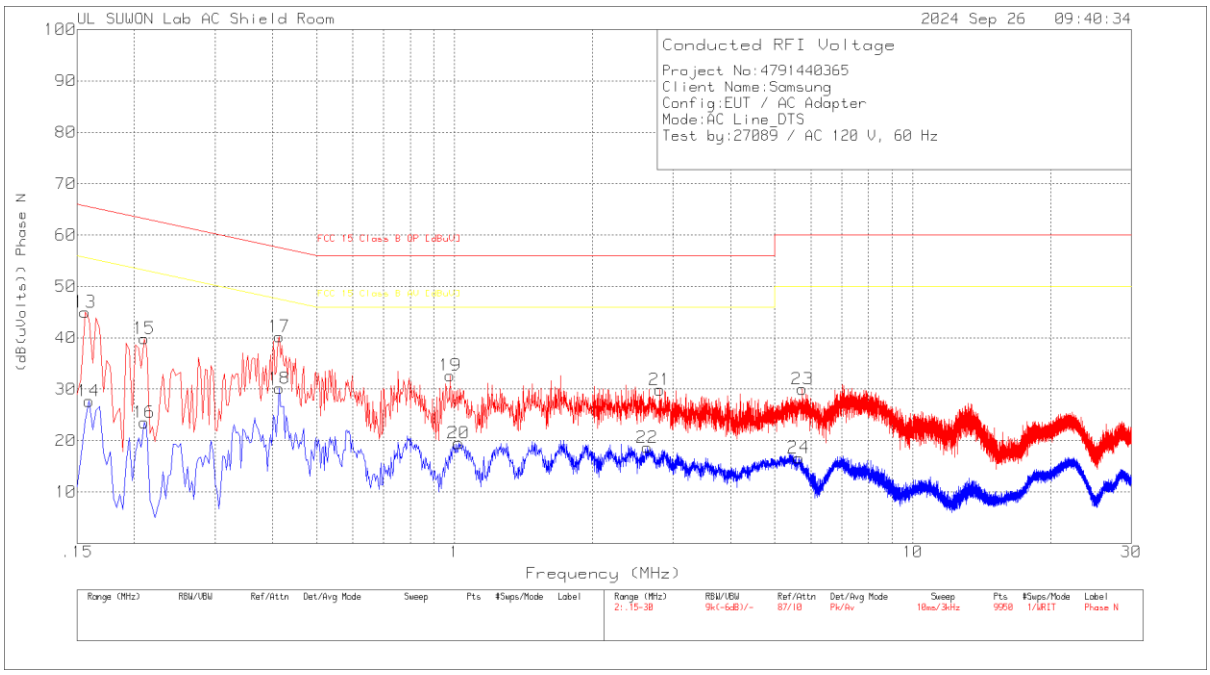


Trace Markers
Range 1: Phase L1 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	101836_With EX_L1 [dB]	Cable Loss [dB]	Corrected Reading [dBuV]	FCC 15 Class B QP [dBuV]	Margin (dB)	FCC 15 Class B AV [dBuV]	Margin (dB)
1	.174	36.61	Pk	10	.1	46.71	64.77	-18.06	-	-
2	.174	22.4	Av	10	.1	32.5	-	-	54.77	-22.27
3	.234	29.56	Pk	9.7	.1	39.36	62.31	-22.95	-	-
4	.237	16.74	Av	9.7	.1	26.54	-	-	52.2	-25.66
5	.357	26.19	Pk	9.8	.1	36.09	58.8	-22.71	-	-
6	.357	17.34	Av	9.8	.1	27.24	-	-	48.8	-21.56
7	.906	29.27	Pk	9.8	.1	39.17	56	-16.83	-	-
8	.927	12.44	Av	9.8	.1	22.34	-	-	46	-23.66
9	4.236	31.01	Pk	9.7	.1	40.81	56	-15.19	-	-
10	3.681	14.69	Av	9.7	.1	24.49	-	-	46	-21.51
11	6.072	29.96	Pk	9.8	.2	39.96	60	-20.04	-	-
12	6.066	15.88	Av	9.8	.2	25.88	-	-	50	-24.12

Pk - Peak detector
Av - Average detection

LINE 2 DATA



Trace Markers

Range 2: Phase N .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	101836_With EX_N [dB]	Cable Loss [dB]	Corrected Reading [dBuV]	FCC 15 Class B QP [dBuV]	Margin (dB)	FCC 15 Class B AV [dBuV]	Margin (dB)
13	.156	35.08	Pk	9.8	.1	44.98	65.67	-20.69	-	-
14	.159	17.78	Av	9.8	.1	27.68	-	-	55.52	-27.84
15	.21	29.96	Pk	9.8	.1	39.86	63.21	-23.35	-	-
16	.21	13.64	Av	9.8	.1	23.54	-	-	53.21	-29.67
17	.414	30.34	Pk	9.8	.1	40.24	57.57	-17.33	-	-
18	.414	20.27	Av	9.8	.1	30.17	-	-	47.57	-17.4
19	.978	22.77	Pk	9.8	.1	32.67	56	-23.33	-	-
20	1.02	9.69	Av	9.7	.1	19.49	-	-	46	-26.51
21	2.805	20.08	Pk	9.7	.1	29.88	56	-26.12	-	-
22	2.631	8.88	Av	9.7	.1	18.68	-	-	46	-27.32
23	5.745	20.02	Pk	9.8	.2	30.02	60	-29.98	-	-
24	5.64	6.64	Av	9.8	.2	16.64	-	-	50	-33.36

Pk - Peak detector
Av - Average detection

END OF TEST REPORT

UL KOREA LTD. Suwon Laboratory FORM ID: FCC_15C(05)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433