CERTIFICATION TEST REPORT

Report Number. : 4790160839-E3V2

Applicant	:	SAMSUNG ELECTRONICS CO., LTD. 129 SAMSUNG-RO, YEONGTONG-GU, SUWON-SI, GYEONGGI-DO, 16677, KOREA
Model	:	SM-A536B/DS
FCC ID	:	A3LSMA536B
EUT Description	:	GSM/WCDMA/LTE 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:
2022-01-07

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	2021-12-29	Initial issue	SunGeun Lee
V2	2022-01-07	Updated to address TCB's question	SunGeun Lee

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218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	SAMSUNG ELECTRONICS CO., LTD.
EUT DESCRIPTION:	GSM/WCDMA/LTE Phone + BT/BLE, DTS/UNII a/b/g/n/ac, and NFC
MODEL NUMBER:	SM-A536B/DS
SERIAL NUMBER:	R3CRA0RNS7M, R3CRA0RNQHP (CONDUCTED, Original); R3CRA0RNRAJ, R3CRA0RNTME (RADIATED, Original); R3CRA0RS3CF (RADIATED, Spot-check);
DATE TESTED:	2021-11-19 ~ 2021-12-28(Original); 2021-12-17 ~ 2021-12-28(Spot-Check);

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 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:

SunGeun Lee
Suwon Lab Engineer
UL Korea, Ltd.

1.1. INTRODUCTION OF TEST DATA REUSE

This report referenced from the FCC ID: A3LSMA536E DTS WLAN(FCC CFR 47 Part 15C). And the applicant takes full responsibility that the test data as referenced in this report represent compliance for this FCC ID.

1.2. DIFFERENCE

The FCC ID: A3LSMA536B shares the same enclosure and circuit board as FCC ID: A3LSMA536E. The WLAN antennas and surrounding circuitry and layout are identical between these two units.

After confirming through preliminary radiated emissions that the performance of the FCC ID: A3LSMA536E remains representative of FCC ID: A3LSMA536B. The test data of FCC ID: A3LSMA536E being submitted for this application to cover WLAN features.

1.3. SPOT CHECK VERIFICATION DATA

(Worst case of the radiated band-edge and radiated spurious emissions)

Band	Test Item	Mode	Frequency	Test Limit	Original model	Spot check model	Deviation	Remark
					SM-A536E/DS Results	SM-A536B/DS Results		
					FCC ID : A3LSMA536E	FCC ID : A3LSMA536B		
DTS WLAN (2.4GHz)	Band Edge	802.11b 2467 MHz	2467 MHz	54 dBuV/m	46.25 dBuV/m	42.05 dBuV/m	-4.20 dB	
	RSE	802.11b 2412 MHz	9648 MHz	74 dBuV/m	48.92 dBuV/m	49.22 dBuV/m	0.30 dB	
	Band Edge	802.11g 2472 MHz	2472 MHz	54 dBuV/m	51.13 dBuV/m	50.85 dBuV/m	-0.28 dB	
	RSE	802.11g 2412 MHz	9648 MHz	74 dBuV/m	48.20 dBuV/m	48.95 dBuV/m	0.75 dB	
	Band Edge	802.11n HT20 2462 MHz	2462 MHz	54 dBuV/m	51.02 dBuV/m	45.57 dBuV/m	-5.45 dB	
	RSE	802.11n HT20 2457 MHz	9828 MHz	74 dBuV/m	48.04 dBuV/m	48.16 dBuV/m	0.12 dB	

Comparison of two models, upper deviation is within 3 dB range and all test results are under FCC Technical Limits.

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1.4. REFERENCE DETAIL

Reference application that contains the reused reference data in the individual test reports:

Equipment Class	Reference FCC ID (Parent)	Application Type	Reference Test report number	Exhibit Type	Variant Test Report Number	Data Re-used
PCE	A3LSMA536E	Original Grant	4790160849-E2	Test Report	4790160839-E2	All
DTS	A3LSMA536E	Original Grant	4790160849-E3 (802.11b/g/n)	Test Report	4790160839-E3 (802.11b/g/n)	All
			4790160849-E4 Bluetooth LE	Test Report	4790160839-E4 Bluetooth LE	All
DSS	A3LSMA536E	Original Grant	4790160849-E5 (Bluetooth)	Test Report	4790160839-E5 (Bluetooth)	All
NII	A3LSMA536E	Original Grant	4790160849-E6 (802.11a/n/ac)	Test Report	4790160839-E6 (802.11a/n/ac)	All
DXX	A3LSMA536E	Original Grant	4790160849-E7 (NFC)	Test Report	4790160839-E7 (NFC)	All

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2. TEST METHODOLOGY

1. FCC CFR 47 Part 2.
2. FCC CFR 47 Part 15.
3. KDB 558074 D01 DTS Meas Guidance v05r02.
4. ANSI C63.10-2013.
5. KDB 484596 D01 Referencing Test Data v01

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
☒ Chamber 2
☒ Chamber 3

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

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	3.02 dB
Radiated Disturbance, 30 MHz to 1 GHz	4.05 dB
Radiated Disturbance, 1 GHz to 18 GHz	5.78 dB
Radiated Disturbance, 18 GHz to 40 GHz	5.58 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 Procedure 2, Clause 4.4.3 in IEC Guide 115:2007.

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218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

5. EQUIPMENT UNDER TEST

5.1. EUT DESCRIPTION

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

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]
2412 - 2472	802.11b SISO	18.71	74.30
	802.11g SISO	16.82	48.08
	802.11n(HT20) SISO	17.39	54.83

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.

Bands [MHz]	ANT Gain [dBi]
2 412 ~ 2 472	-5.00

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5.4. TESTED CHANNELS LIST

Ch.	Frequency [MHz]	11b [SISO]	11g [SISO]	11n(HT20) [SISO]
1	2 412	O	O	O
6	2 437	O	O	O
10	2 457		O	O
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

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.
Radiated emission above 1GHz was performed with the EUT set to transmit low/mid/High Channels.

Worst case of antenna axis: Z

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

All radiated and power line conducted tests were performed attached with travel adapter for the worst case condition mode.

Test case configuration for 802.11b, g, n HT20 modes: Conducted, Radiated

SISO Target[dBm]				
Ch.	Freq.	802.11b	802.11g	802.11n HT20
1	2412	18	17	17
6	2437	18	17	17
10	2457		17	17
11	2462	18	14	14
12	2467	18	8	5
13	2472	18	7	5

Radiated Band-Edge, Conducted Band-Edge
Radiated Band-Edge, Radiated Spurious Emission, Conducted Band-Edge, Conducted Spurious Emission, PSD
Radiated Spurious Emission, Conducted Spurious Emission, PSD

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Charger	SAMSUNG	EP-TA800	R37N3MAH988DK3	N/A
Data Cable	SAMSUNG	EP-DN980	N/A	N/A

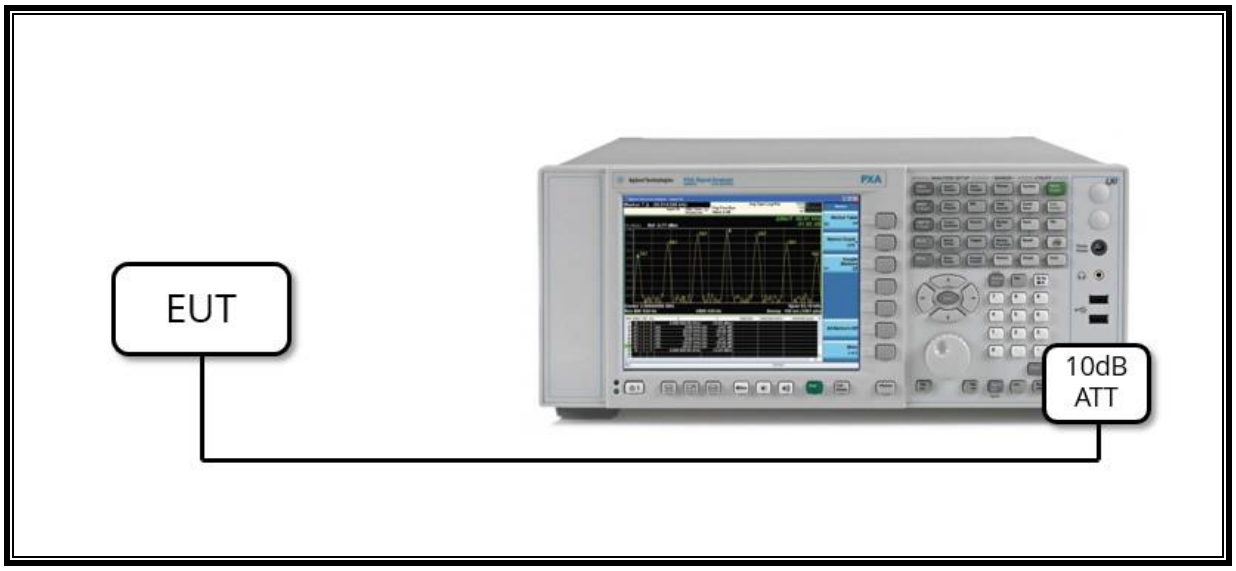
I/O CABLE

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

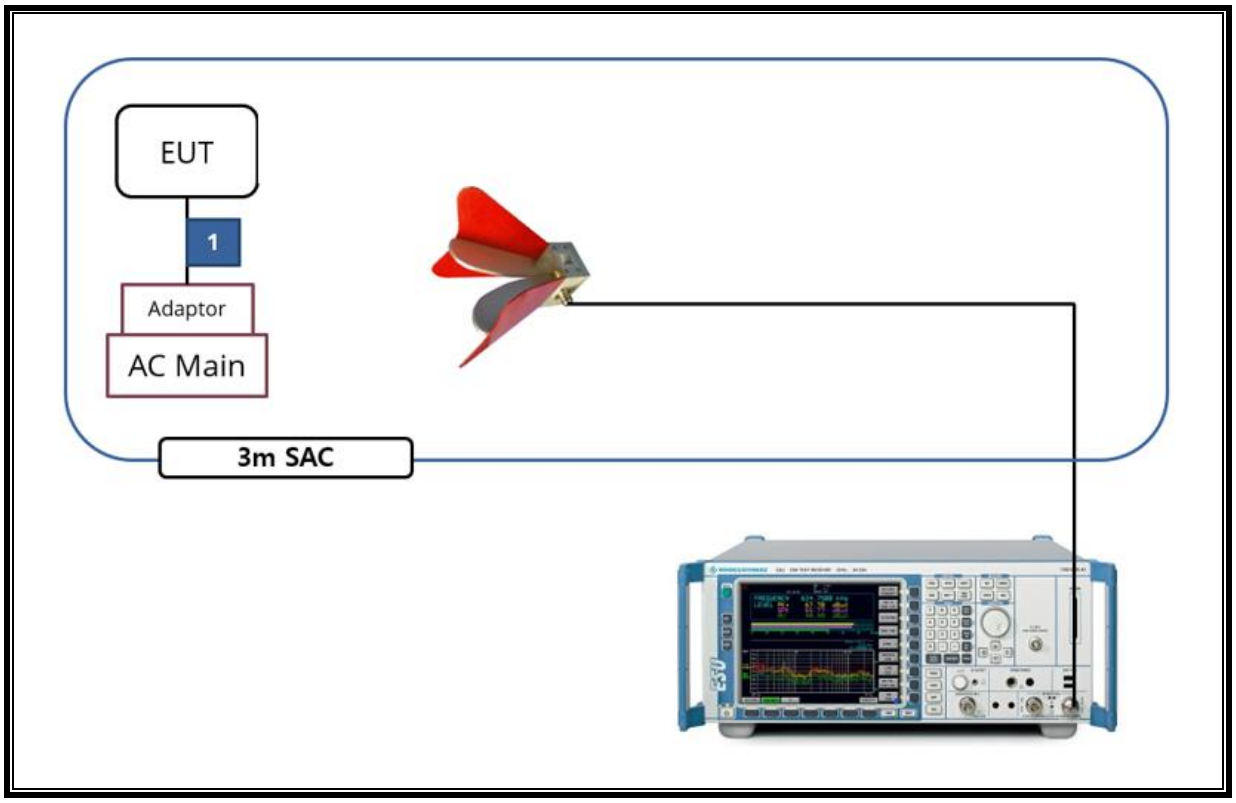
TEST SETUP

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)



6. MEASUREMENT METHOD

6 dB BW : ANSI C63.10-2013, Section 11.8.2 Option 2

OUTPUT POWER : ANSI C63.10-2013, Section 11.9.2.3.1 Method AVGPM

POWER SPECTRAL DENSITY : ANSI C63.10-2013, Section 11.10.3 & 11.10.5 Method AVGPSD-1 and Method AVGPSD-2

Out-of-band Emissions (Conducted) : ANSI C63.10-2013, Section 11.11 Emissions in nonrestricted frequency bands

Out-of-band Emissions in Non-restricted Bands: ANSI C63.10-2013, Section 11.11 Emissions in nonrestricted frequency bands

Out-of-band Emissions in Restricted Bands : ANSI C63.10-2013, Section 11.12 Emissions in restricted frequency bands

AC Power Line Conducted Emission : ANSI C63.10-2013, Section 6.2

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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	VULB9163	750	2022/08/19
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	749	2022/08/13
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	845	2022/08/13
Antenna, Horn, 18 GHz	ETS	3115	00167211	2022/07/27
Antenna, Horn, 18 GHz	ETS	3115	00161451	2022/08/15
Antenna, Horn, 18 GHz	ETS	3117	00168724	2022/07/27
Antenna, Horn, 18 GHz	ETS	3117	00168717	2022/08/15
Antenna, Horn, 40 GHz	ETS	3116C	00166155	2022/08/04
Preamplifier	ETS	3116C-PA	00168841	2022/08/04
Preamplifier, 1000 MHz	Sonoma	310N	341282	2022/08/02
Preamplifier, 1000 MHz	Sonoma	310N	351741	2022/08/02
Preamplifier, 1000 MHz	Sonoma	310N	370599	2022/08/02
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1876511	2022/08/02
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1896138	2022/08/02
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	2029168	2022/08/02
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54170614	2022/08/04
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54490312	2022/08/04
Spectrum Analyzer, 44 GHz	KEYSIGHT	N9030B	MY60070693	2022/01/03
Average Power Sensor	Agilent / HP	U2000	MY54270007	2022/08/04
Average Power Sensor	Agilent / HP	U2000	MY54260010	2022/08/04
Attenuator	PASTERNACK	PE7087-10	A001	2022/08/03
Attenuator	PASTERNACK	PE7087-10	A008	2022/08/03
Attenuator	PASTERNACK	PE7004-10	2	2022/08/02
Attenuator	PASTERNACK	PE7087-10	A009	2022/08/03
EMI Test Receive, 40 GHz	R&S	ESU40	100439	2022/08/02
EMI Test Receive, 40 GHz	R&S	ESU40	100457	2022/08/02
EMI Test Receive, 3 GHz	R&S	ESR3	101832	2022/08/02
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	009	2022/08/02
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	015	2022/08/02
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	019	2022/08/02
High Pass Filter 3GHz	Micro-Tronics	HPM17543	010	2022/08/02
High Pass Filter 3GHz	Micro-Tronics	HPM17543	015	2022/08/02
High Pass Filter 3GHz	Micro-Tronics	HPM17543	020	2022/08/02
High Pass Filter 6GHz	Micro-Tronics	HPS17542	009	2022/08/02
High Pass Filter 6GHz	Micro-Tronics	HPS17542	016	2022/08/02
High Pass Filter 6GHz	Micro-Tronics	HPS17542	020	2022/08/02
LISN	R&S	ENV-216	101837	2022/08/05
Antenna, Loop, 9kHz-30MHz	R&S	HFH2-Z2	100418	2023/10/06

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	PASS
2.1051, 15.247(d)	Band Edge / Conducted Spurious Emission	-30 dBc		PASS
15.247 (b)(3)	TX conducted output power	< 30 dBm		PASS
15.247(e)	PSD	< 8 dBm/3kHz		PASS
15.207(a)	AC Power Line conducted emissions	Section 11	Power Line conducted	PASS
15.205, 15.209	Radiated Spurious Emission	< 54dBuV/m(Av)	Radiated	PASS

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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	16.380	16.530	0.991	99.09	-	0.06
802.11g SISO	2.790	2.867	0.973	97.31	0.12	0.36
802.11n(HT20) SISO	2.594	2.711	0.957	95.68	0.19	0.39

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.

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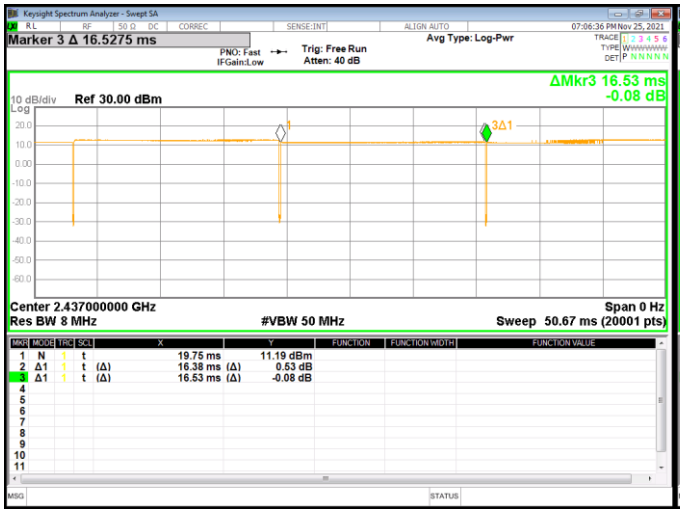
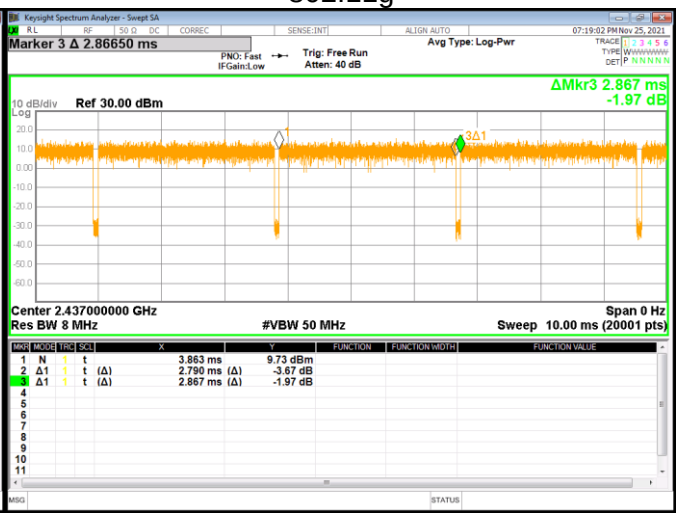
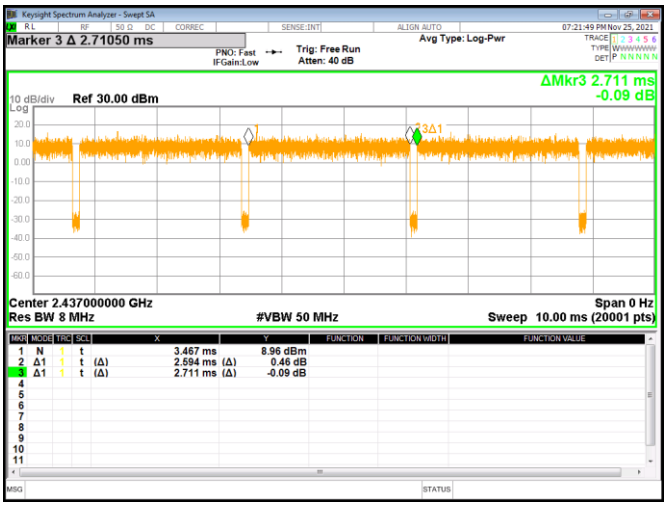
802.11b



802.11g



802.11n HT20



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 KDB 558074 D01 15.247 Meas Guidance: The transmitter output is connected to a spectrum analyzer with the RBW set to100 kHz, the VBW >= 3 x RBW, peak detector and max hold.

ANSI C63.10-2013, Section 11.8.1

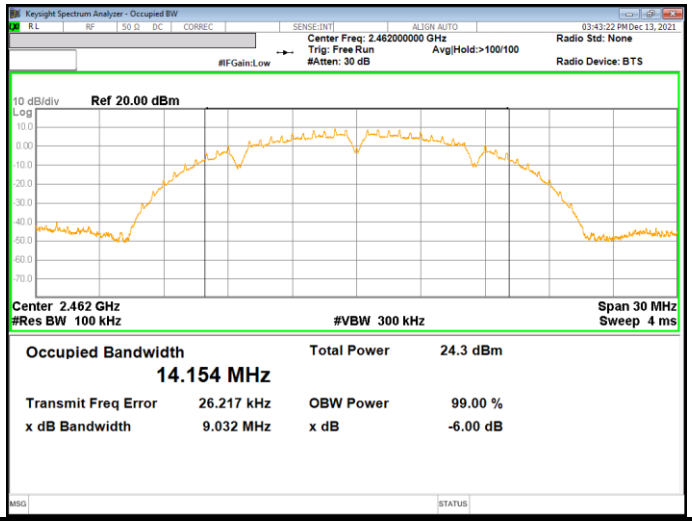
RESULTS

- Please refer to the next page

WORST CASE TEST PLOTS

ANT1

802.11b 11 CHANNEL



9.2.1. 802.11b MODE IN THE 2.4 GHz BAND

Channel	Frequency [MHz]	6 dB Bandwidth [MHz]	Minimum Limit [MHz]
		ANT 1	
1	2 412	10.040	0.5
6	2 437	9.553	
11	2 462	9.032	
12	2 467	9.048	
13	2 472	9.529	
Worst		**9.032**	

9.2.2. 802.11g MODE IN THE 2.4 GHz BAND

Channel	Frequency [MHz]	6 dB Bandwidth [MHz]	Minimum Limit [MHz]
		ANT 1	
1	2 412	16.300	0.5
6	2 437	16.320	
10	2 457	16.360	
11	2 462	16.320	
12	2 467	16.320	
13	2 472	16.330	
Worst		**16.300**	

9.2.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

Channel	Frequency [MHz]	6 dB Bandwidth [MHz]	Minimum Limit [MHz]
		ANT 1	
1	2 412	17.300	0.5
6	2 437	17.560	
10	2 457	16.680	
11	2 462	17.040	
12	2 467	17.290	
13	2 472	17.300	
Worst		**16.680**	

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.

ANSI C63.10-2013, Section 11.9.2.3.1 Method AVGPM

9.3.1. TEST RESULTS

- 802.11b,g,n mode

Mode	Channel	Frequency [MHz]	Average Power [dBm]	Power Limit [dBm]
802.11b	1	2 412	18.71	30.00
	6	2 437	18.04	
	11	2 462	18.62	
	12	2 467	18.20	
	13	2 472	17.42	
Worst Case			18.71	
802.11g	1	2 412	16.82	
	6	2 437	16.71	
	10	2 457	16.50	
	11	2 462	14.28	
	12	2 467	7.71	
	13	2 472	6.69	
Worst Case			16.82	
802.11n HT20	1	2 412	16.62	
	6	2 437	16.70	
	10	2 457	17.39	
	11	2 462	14.22	
	12	2 467	5.31	
	13	2 472	4.62	
Worst Case			17.39	

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

9.4. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247 (e)

RSS-247 (5.2) (b)

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 section8.4 under KDB558074 D01 15.247 Meas Guidance.

ANSI C63.10-2013, Section 11.10.3 & 11.10.5

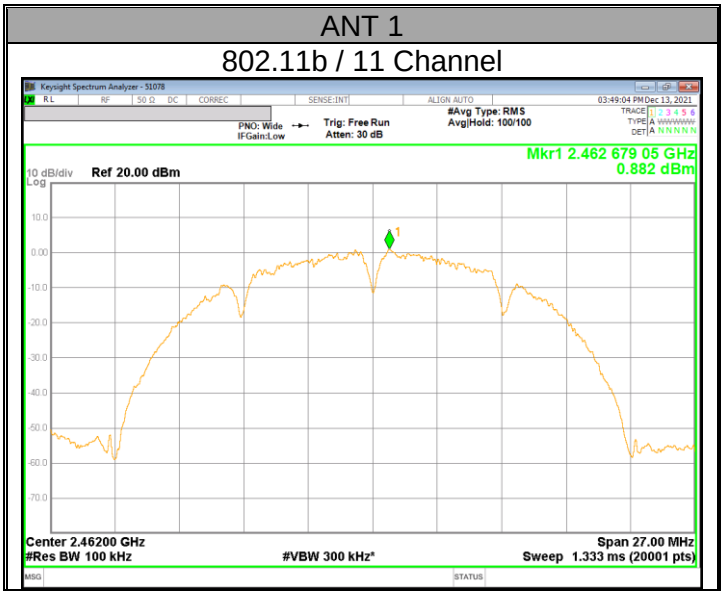
RESULTS

- Please refer to the next page

WORST CASE TEST PLOTS

ANT 1

802.11b / 11 Channel



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

Mode	Channel	Frequency [MHz]	Meas PSD [dBm/100kHz]	DCCF	Total Corr'd PSD [dBm/100kHz]	PSD Limit [dBm/3kHz]
802.11b	1	2 412	-1.326	-	-1.326	8.00[Note]
	6	2 437	-0.615	-	-0.615	
	11	2 462	0.882	-	0.882	
	12	2 467	0.202	-	0.202	
	13	2 472	-0.916	-	-0.916	
802.11g	1	2 412	-2.698	0.12	-2.578	
	6	2 437	-3.919	0.12	-3.799	
	10	2 457	-2.167	0.12	-2.047	
	11	2 462	-5.842	0.12	-5.722	
	12	2 467	-7.009	0.12	-6.889	
	13	2 472	-8.993	0.12	-8.873	
802.11n HT20	1	2 412	-4.476	0.19	-4.286	
	6	2 437	-3.978	0.19	-3.788	
	10	2 457	-2.945	0.19	-2.755	
	11	2 462	-5.906	0.19	-5.716	
	12	2 467	-7.671	0.19	-7.481	
	13	2 472	-8.960	0.19	-8.770	

- Calculation of Output PSD result
- 1TX : Corr'd PSD = Meas PSD + Duty Cycle CF
Note1. RBW 100kHz measurement data is lower than 3kHz limit.

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9.5. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

RSS-247 5.5

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

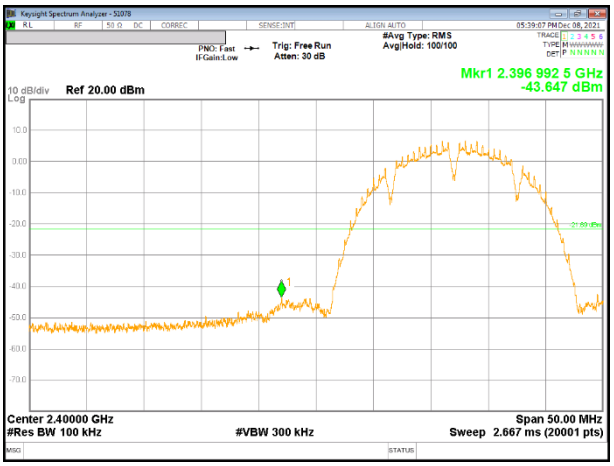
TEST PROCEDURE

KDB 558074 D01 v05r02, Section 8.5
ANSI C63.10-2013, Section 11.11.3

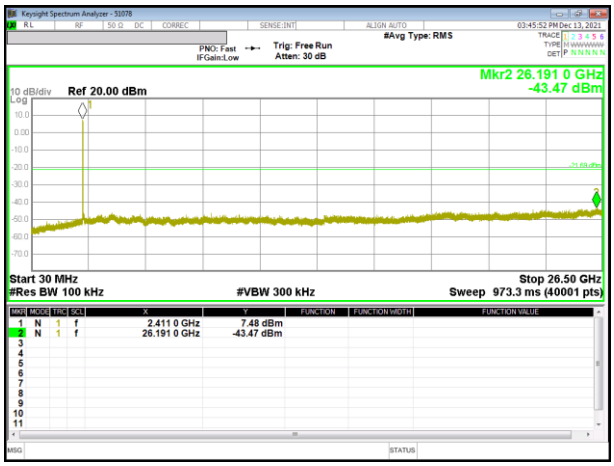
RESULTS

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_15C(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

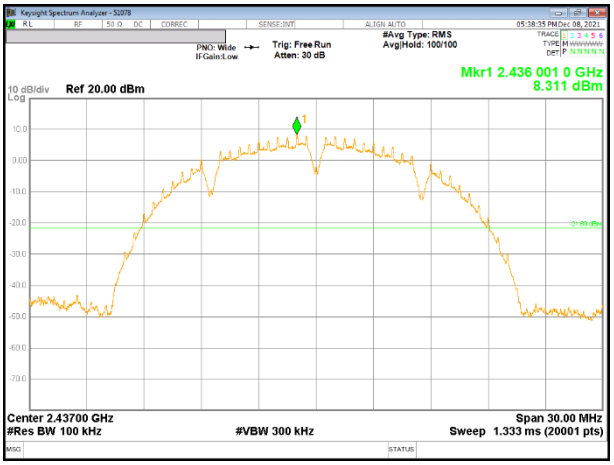
9.5.1. 802.11b MODE



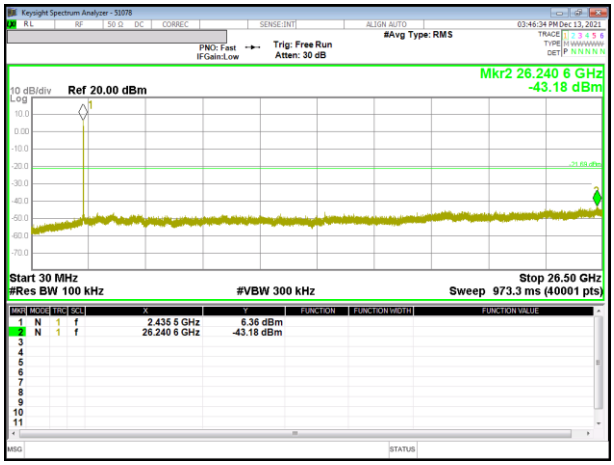
1 Channel Band-edge



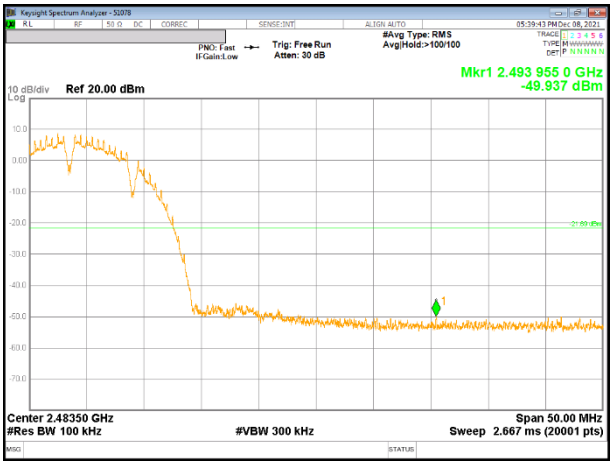
Out-Of-Band 1 Channel



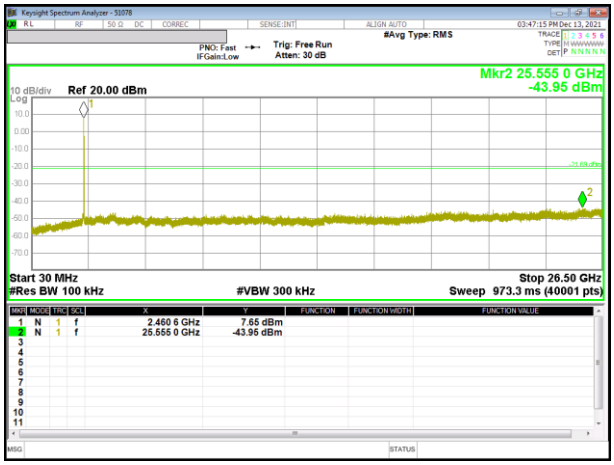
In-Band Reference Level



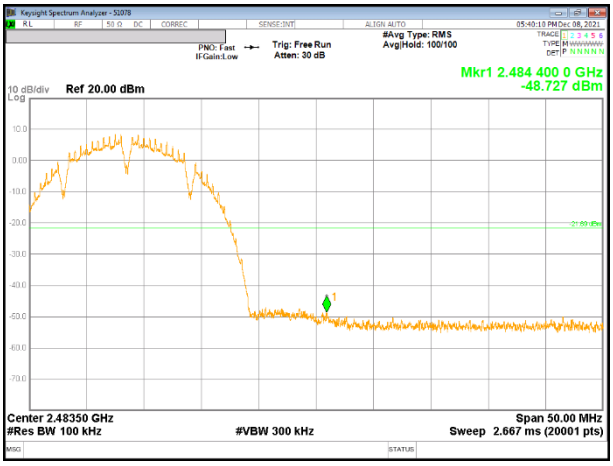
Out-Of-Band 6 Channel



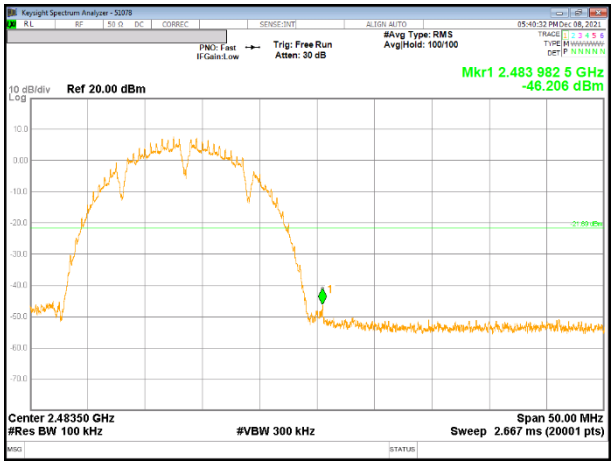
11 Channel Band-edge



Out-Of-Band 11 Channel

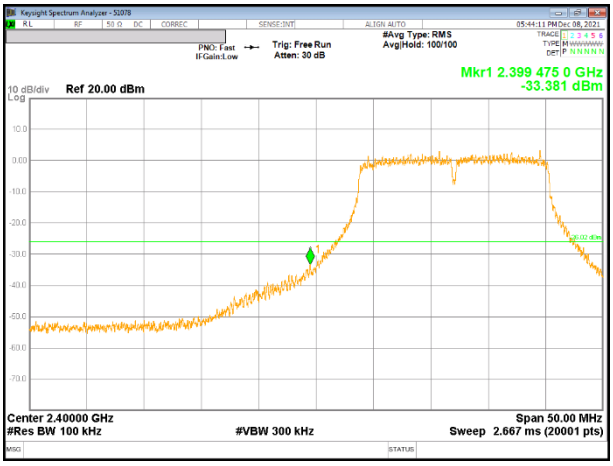


12 Channel Band-edge

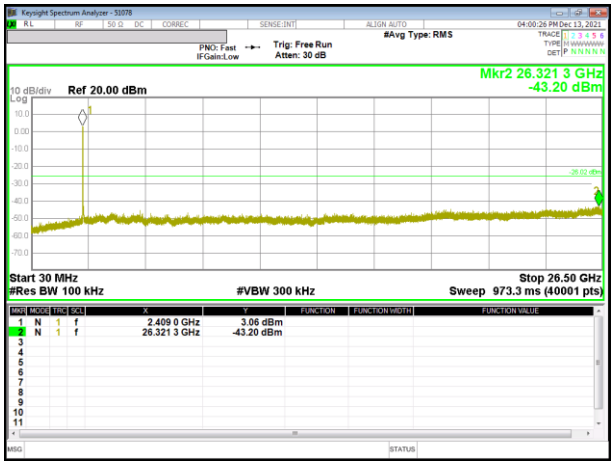


13 Channel Band-edge

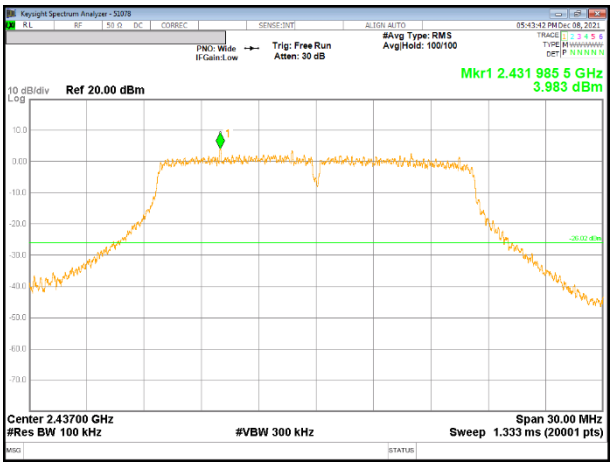
9.5.2. 802.11g MODE



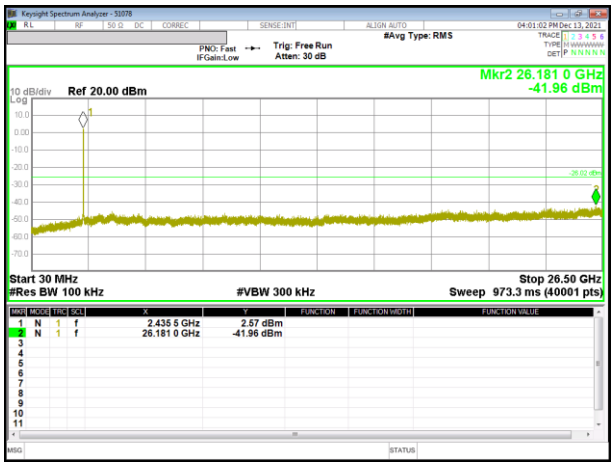
1 Channel Band-edge



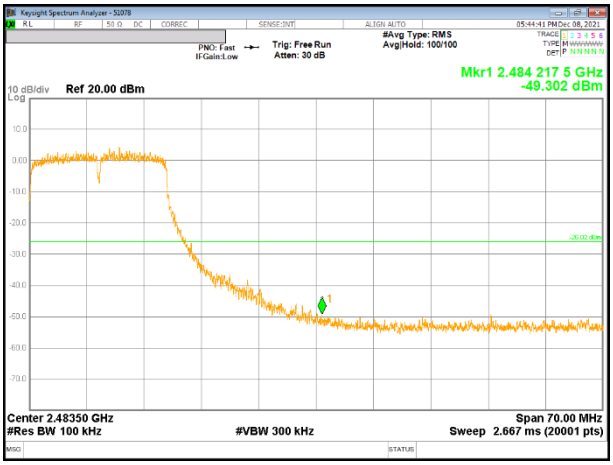
Out-Of-Band 1 Channel



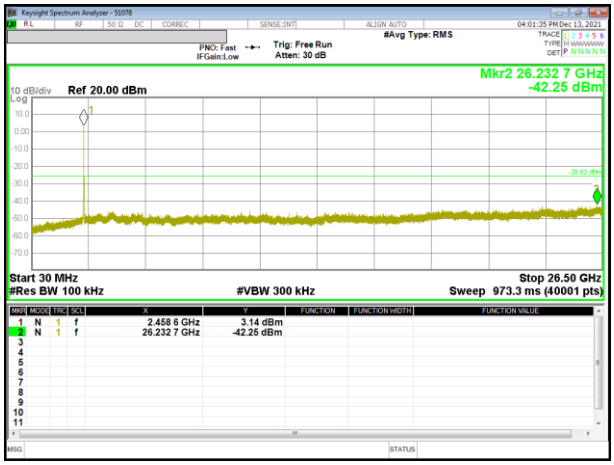
In-Band Reference Level



Out-Of-Band 6 Channel



10 Channel Band-edge



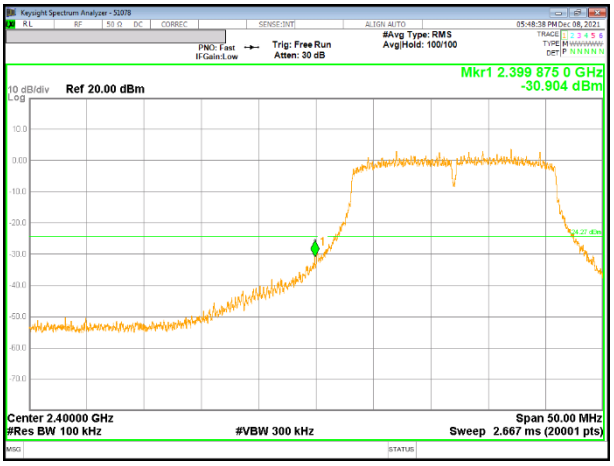
Out-Of-Band 10 Channel

11 Channel Band-edge

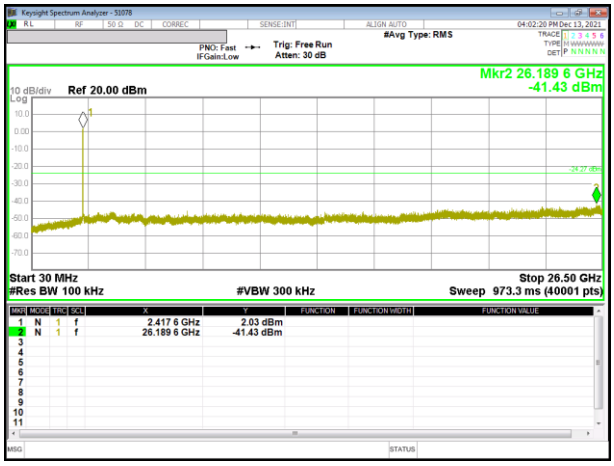
12 Channel Band-edge

13 Channel Band-edge

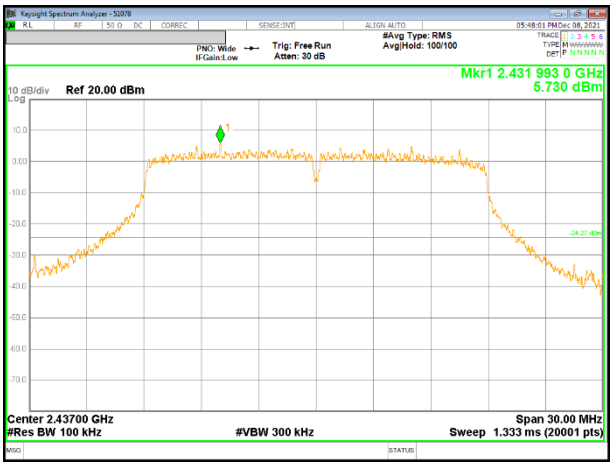
9.5.3. 802.11n HT20 MODE



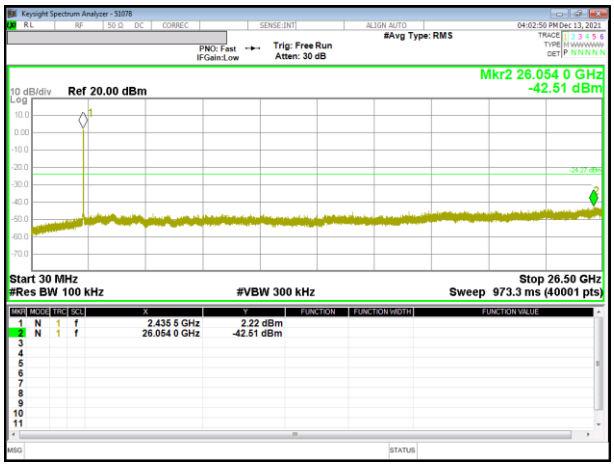
1 Channel Band-edge



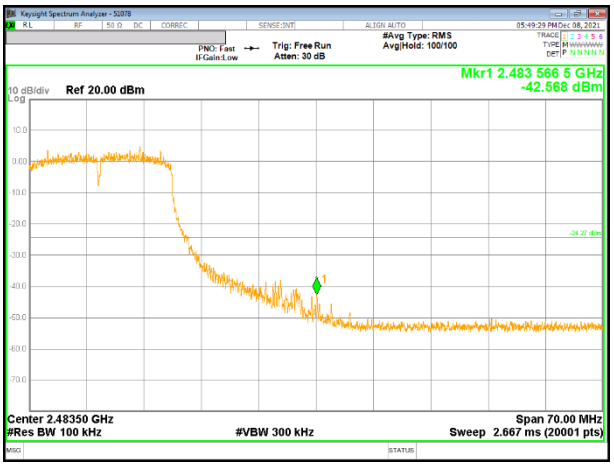
Out-Of-Band 1 Channel



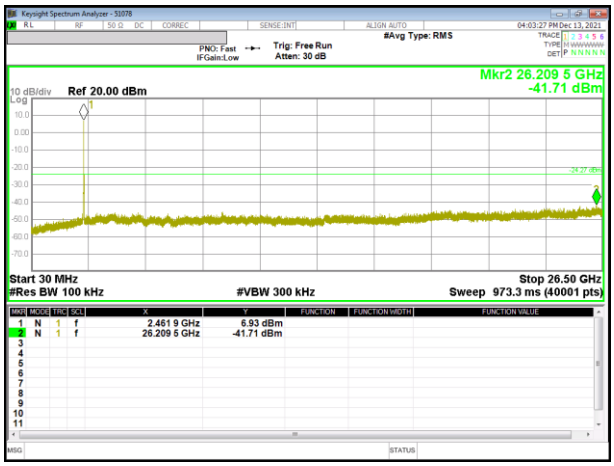
In-Band Reference Level



Out-Of-Band 6 Channel



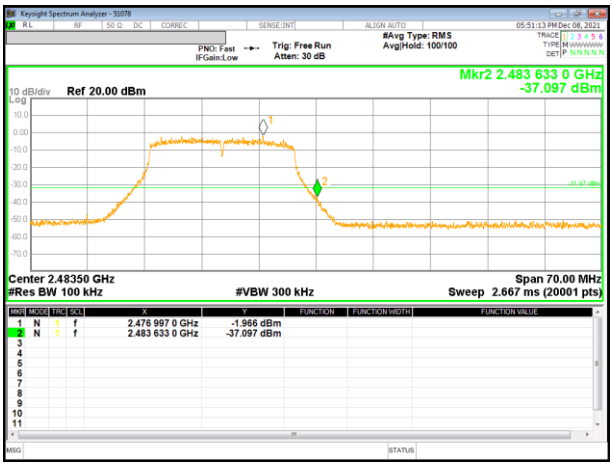
10 Channel Band-edge



Out-Of-Band 10 Channel

11 Channel Band-edge

12 Channel Band-edge



13 Channel Band-edge

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 dB (duty cycle > 98%);
802.11g SISO mode = 0.12 dB (97.31%);
802.11n(HT20) SISO mode = 0.19 dB (95.68%);

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.

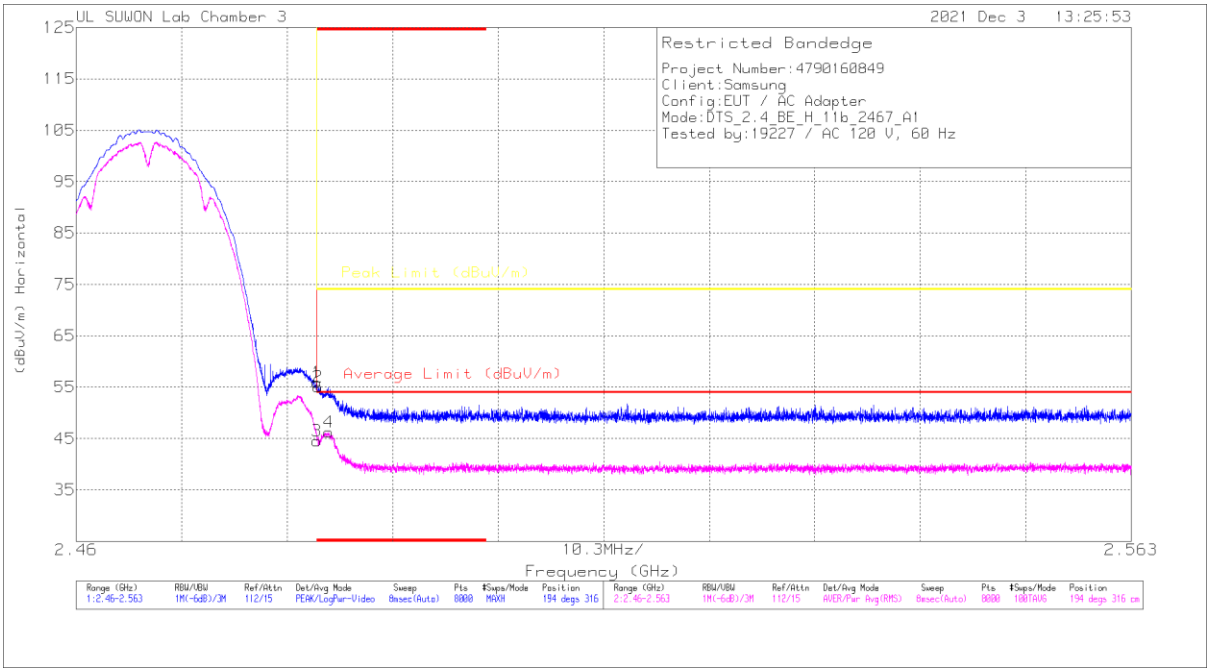
UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_15C(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

10.1. TRANSMITTER ABOVE 1 GHz

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

BANDEDGE (ANT1 WORST CASE: 12 CHANNEL)

Horizontal RESULT



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00218957	10dB_ATT[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	48.28	Pk	32.9	-25.3	0	55.88	-	-	74	-18.12	194	316	H
2	* 2.48362	47.43	Pk	32.9	-25.3	0	55.03	-	-	74	-18.97	194	316	H
3	* 2.4835	36.91	RMS	32.9	-25.3	0	44.51	54	-9.49	-	-	194	316	H
4	* 2.48467	38.65	RMS	32.9	-25.3	0	46.25	54	-7.75	-	-	194	316	H

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

BANDEDGE TEST DATA

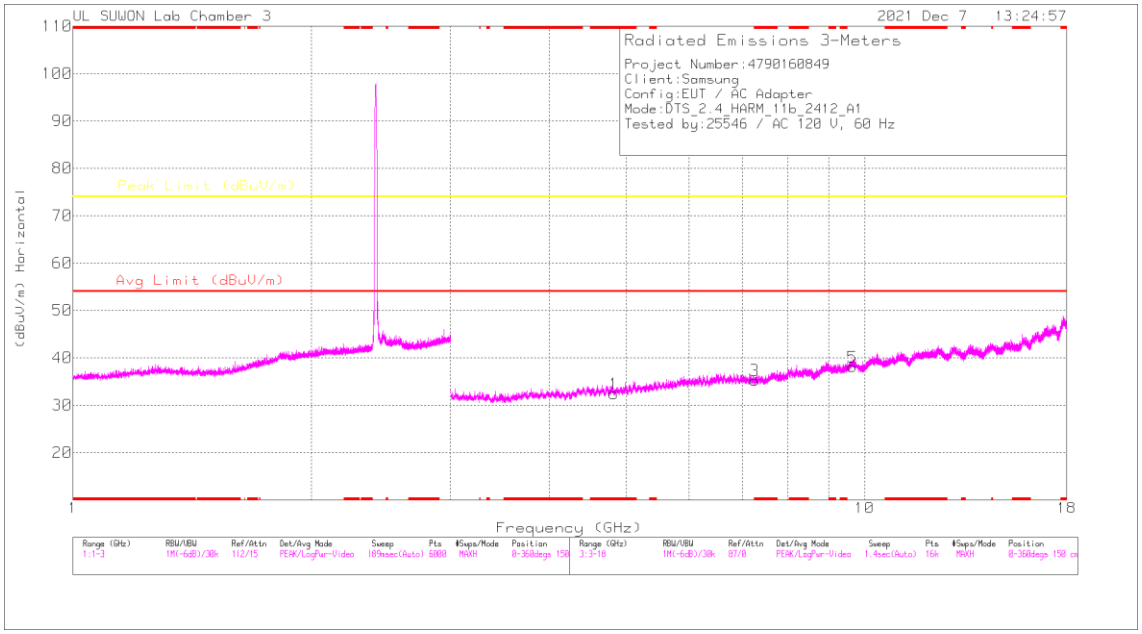
Freq. [MHz]	Antenna	Frequency [GHz]	Reading [dBuV]	Detector Mode	ANT Factor	Loss [dB]	DC Corr [dB]	Result [dBuV/m]	AV Limit [dBuV/m]	AV Margin [dB]	PK Limit [dBuV/m]	PK Margin [dB]	Azimuth [Degs]	Height [cm]	Polarity
2412	ANT1	* 2.39	41.73	Pk	32.80	-25.40	0.00	49.13	-	-	74.00	-24.87	195	386	H
		* 2.37372	44.97	Pk	32.70	-25.40	0.00	52.27	-	-	74.00	-21.73	195	386	H
		* 2.39	32.60	RMS	32.80	-25.40	0.00	40.00	54.00	-14.00	-	-	195	386	H
		* 2.38986	33.25	RMS	32.80	-25.40	0.00	40.65	54.00	-13.35	-	-	195	386	H
		* 2.39	41.74	Pk	32.80	-25.40	0.00	49.14	-	-	74.00	-24.86	300	110	V
		* 2.3791	44.65	Pk	32.70	-25.40	0.00	51.95	-	-	74.00	-22.05	300	110	V
		* 2.39	31.73	RMS	32.80	-25.40	0.00	39.13	54.00	-14.87	-	-	300	110	V
		* 2.33804	32.93	RMS	32.60	-25.40	0.00	40.13	54.00	-13.87	-	-	300	110	V
2462	ANT1	* 2.4835	44.08	Pk	32.90	-25.30	0.00	51.68	-	-	74.00	-22.32	193	283	H
		2.503	44.87	Pk	32.90	-25.20	0.00	52.57	-	-	74.00	-21.43	193	283	H
		* 2.4835	34.22	RMS	32.90	-25.30	0.00	41.82	54.00	-12.18	-	-	193	283	H
		* 2.48382	33.70	RMS	32.90	-25.30	0.00	41.30	54.00	-12.70	-	-	193	283	H
		* 2.4835	42.53	Pk	32.90	-25.30	0.00	50.13	-	-	74.00	-23.87	283	101	V
		2.551	44.71	Pk	32.90	-25.20	0.00	52.41	-	-	74.00	-21.59	283	101	V
		* 2.4835	32.87	RMS	32.90	-25.30	0.00	40.47	54.00	-13.53	-	-	283	100	V
		* 2.48382	33.57	RMS	32.90	-25.30	0.00	41.17	54.00	-12.83	-	-	283	100	V
2467	ANT1	* 2.4835	48.28	Pk	32.90	-25.30	0.00	55.88	-	-	74.00	**-18.12**	194	316	H
		* 2.48362	47.43	Pk	32.90	-25.30	0.00	55.03	-	-	74.00	-18.97	194	316	H
		* 2.4835	36.91	RMS	32.90	-25.30	0.00	44.51	54.00	-9.49	-	-	194	316	H
		* 2.48467	38.65	RMS	32.90	-25.30	0.00	46.25	54.00	**-7.75**	-	-	194	316	H
		* 2.4835	44.88	Pk	32.90	-25.30	0.00	52.48	-	-	74.00	-21.52	298	101	V
		* 2.4845	45.99	Pk	32.90	-25.30	0.00	53.59	-	-	74.00	-20.41	298	101	V
		* 2.4835	33.88	RMS	32.90	-25.30	0.00	41.48	54.00	-12.52	-	-	298	100	V
		* 2.48456	35.41	RMS	32.90	-25.30	0.00	43.01	54.00	-10.99	-	-	298	100	V
2472	ANT1	* 2.4835	44.75	Pk	32.90	-25.30	0.00	52.35	-	-	74.00	-21.65	196	354	H
		* 2.48384	47.79	Pk	32.90	-25.30	0.00	55.39	-	-	74.00	-18.61	196	354	H
		* 2.4835	34.15	RMS	32.90	-25.30	0.00	41.75	54.00	-12.25	-	-	196	354	H
		* 2.48579	36.96	RMS	32.90	-25.30	0.00	44.56	54.00	-9.44	-	-	196	354	H
		* 2.4835	43.67	Pk	32.90	-25.30	0.00	51.27	-	-	74.00	-22.73	297	103	V
		* 2.48353	46.83	Pk	32.90	-25.30	0.00	54.43	-	-	74.00	-19.57	297	103	V
		* 2.4835	32.93	RMS	32.90	-25.30	0.00	40.53	54.00	-13.47	-	-	297	103	V
		* 2.48577	35.21	RMS	32.90	-25.30	0.00	42.81	54.00	-11.19	-	-	297	103	V

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

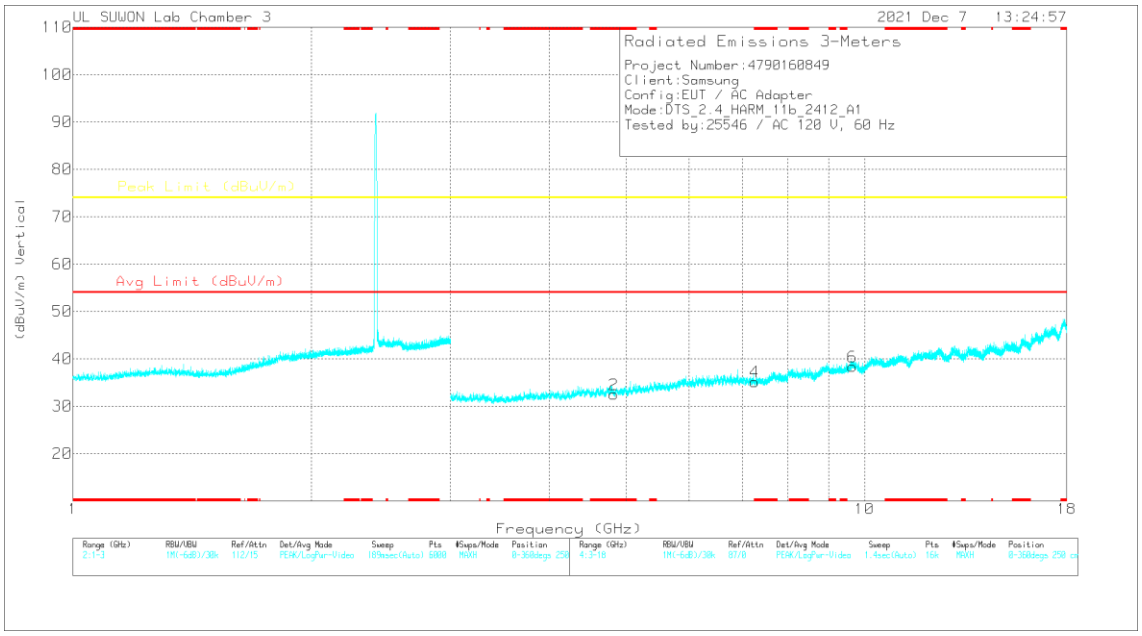
UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_15C(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

HARMONICS AND SPURIOUS EMISSIONS (ANT1 WORST CASE: 1 CHANNEL)

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	3117_00218957	3GHz_HP[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
* 4.82459	39.44	PK2	34.6	-30.7	0	43.34	-	-	74	-30.66	0	100	H
* 4.82726	38.85	PK2	34.6	-30.7	0	42.75	-	-	74	-31.25	0	100	V
* 7.25509	35.17	PK2	36	-26	0	45.17	-	-	74	-28.83	0	100	H
* 7.26442	34.93	PK2	36	-25.9	0	45.03	-	-	74	-28.97	0	100	V
9.64988	33.42	PK2	37.4	-21.9	0	48.92	-	-	74	-25.08	0	100	H
9.65374	33.16	PK2	37.4	-21.8	0	48.76	-	-	74	-25.24	0	100	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PK2 - KDB558074 Method: Maximum Peak

HARMONICS AND SPURIOUS EMISSIONS TEST DATA

Freq. [MHz]	Antenna	Frequency [GHz]	Reading [dBuV]	Detector Mode	ANT Factor	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	* 4.82459	39.44	PK2	34.60	-30.70	0.00	43.34	-	-	74.00	-30.66	0	100	H
		* 4.82726	38.85	PK2	34.60	-30.70	0.00	42.75	-	-	74.00	-31.25	0	100	V
		* 7.25509	35.17	PK2	36.00	-26.00	0.00	45.17	-	-	74.00	-28.83	0	100	H
		* 7.26442	34.93	PK2	36.00	-25.90	0.00	45.03	-	-	74.00	-28.97	0	100	V
		9.650	33.42	PK2	37.40	-21.90	0.00	48.92	-	-	74.00	**-25.08**	0	100	H
		9.654	33.16	PK2	37.40	-21.80	0.00	48.76	-	-	74.00	-25.24	0	100	V
2437	ANT1	* 4.86609	39.92	PK2	34.60	-31.10	0.00	43.42	-	-	74.00	-30.58	0	100	H
		* 7.30281	35.31	PK2	36.00	-25.70	0.00	45.61	-	-	74.00	-28.39	0	100	H
		9.752	32.83	PK2	37.50	-21.70	0.00	48.63	-	-	74.00	-25.37	0	100	H
		* 4.86616	40.11	PK2	34.60	-31.10	0.00	43.61	-	-	74.00	-30.39	0	100	V
		* 7.30851	35.83	PK2	36.00	-25.60	0.00	46.23	-	-	74.00	-27.77	0	100	V
		9.744	32.39	PK2	37.50	-21.70	0.00	48.19	-	-	74.00	-25.81	0	100	V
2462	ANT1	* 4.92854	40.04	PK2	34.70	-31.30	0.00	43.44	-	-	74.00	-30.56	360	100	H
		* 4.92104	40.54	PK2	34.70	-31.30	0.00	43.94	-	-	74.00	-30.06	360	100	V
		* 7.39132	35.19	PK2	36.00	-25.00	0.00	46.19	-	-	74.00	-27.81	360	100	H
		* 7.37882	34.31	PK2	36.00	-25.10	0.00	45.21	-	-	74.00	-28.79	360	100	V
		9.850	32.70	PK2	37.70	-21.90	0.00	48.50	-	-	74.00	-25.50	360	100	H
		9.848	32.39	PK2	37.70	-21.90	0.00	48.19	-	-	74.00	-25.81	360	100	V

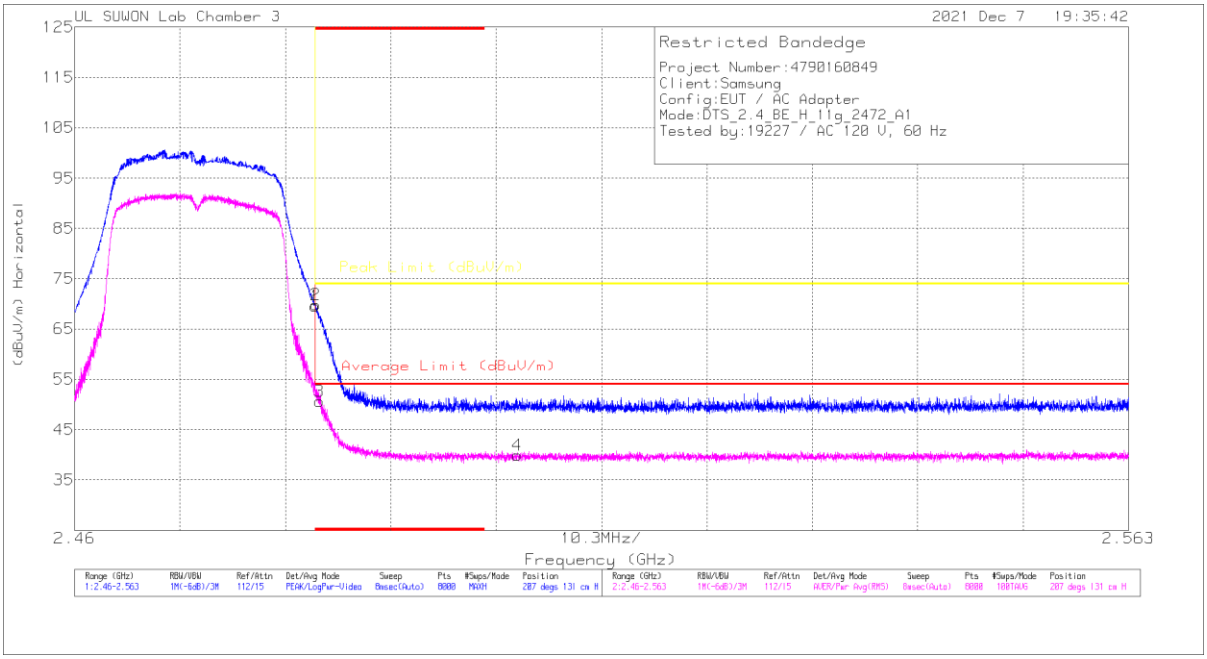
Note1. PK2 - KDB558074 Method: Maximum Peak / MAv1 - KDB558074 Option 1 Maximum RMS Average
Note2. * - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_15C(04)
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

BANDEDGE (ANT1 WORST CASE: 13 CHANNEL)

HORIZONTAL RESULT



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00218957	10dB_ATT[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	62	Pk	32.9	-25.3	0	69.6	-	-	74	-4.4	207	131	H
2	* 2.48354	62.21	Pk	32.9	-25.3	0	69.81	-	-	74	-4.19	207	131	H
3	* 2.48394	42.88	RMS	32.9	-25.3	.12	50.6	54	-3.4	-	-	207	131	H
4	2.50329	32.06	RMS	32.9	-25.2	.12	39.88	54	-14.12	-	-	207	131	H

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

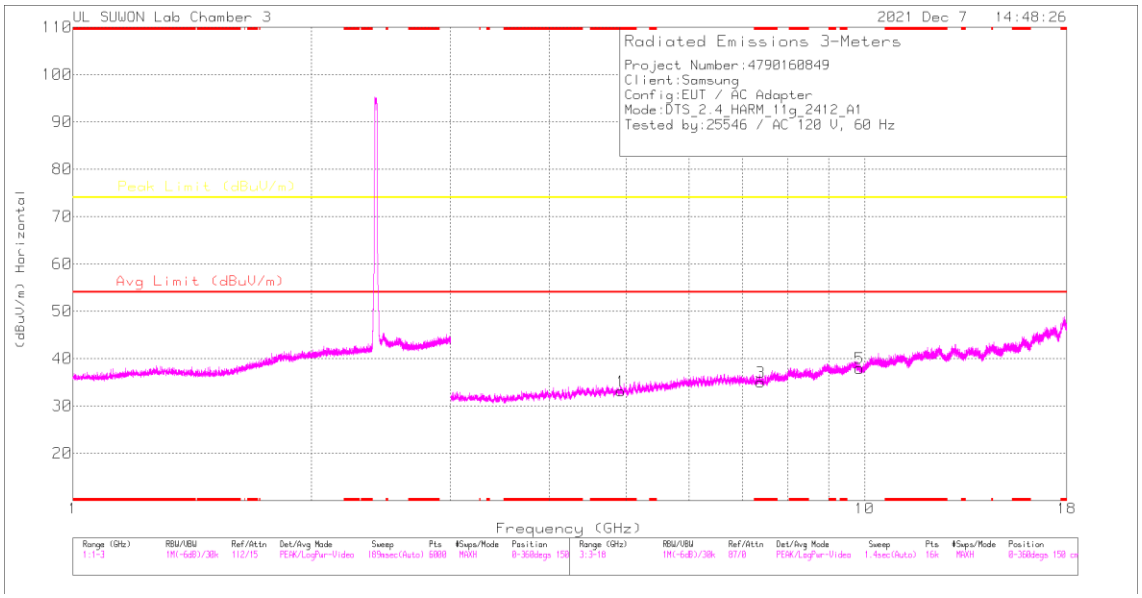
BANDEDGE TEST DATA

Freq. [MHz]	Antenna	Frequency [GHz]	Reading [dBuV]	Detector Mode	ANT Factor	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	43.88	Pk	32.80	-25.40	0.00	51.28	-	-	74.00	-22.72	194	338	H
		* 2.38984	46.41	Pk	32.80	-25.40	0.00	53.81	-	-	74.00	-20.19	194	338	H
		* 2.39	33.33	RMS	32.80	-25.40	0.12	40.85	54.00	-13.15	-	-	194	338	H
		* 2.38989	34.31	RMS	32.80	-25.40	0.12	41.83	54.00	-12.17	-	-	194	338	H
		* 2.39	43.21	Pk	32.80	-25.40	0.00	50.61	-	-	74.00	-23.39	300	111	V
		* 2.33312	44.88	Pk	32.50	-25.30	0.00	52.08	-	-	74.00	-21.92	300	111	V
		* 2.39	32.69	RMS	32.80	-25.40	0.12	40.21	54.00	-13.79	-	-	300	111	V
		* 2.38989	33.33	RMS	32.80	-25.40	0.12	40.85	54.00	-13.15	-	-	300	111	V
2457	ANT1	* 2.4835	46.73	Pk	32.90	-25.30	0.00	54.33	-	-	74.00	-19.67	196	364	H
		* 2.48408	49.86	Pk	32.90	-25.30	0.00	57.46	-	-	74.00	-16.54	196	364	H
		* 2.4835	34.95	RMS	32.90	-25.30	0.12	42.67	54.00	-11.33	-	-	196	364	H
		* 2.48359	36.15	RMS	32.90	-25.30	0.12	43.87	54.00	-10.13	-	-	196	364	H
		* 2.4835	45.63	Pk	32.90	-25.30	0.00	53.23	-	-	74.00	-20.77	288	101	V
		* 2.48465	48.99	Pk	32.90	-25.30	0.00	56.59	-	-	74.00	-17.41	288	101	V
		* 2.4835	35.09	RMS	32.90	-25.30	0.12	42.81	54.00	-11.19	-	-	288	101	V
		* 2.48355	35.38	RMS	32.90	-25.30	0.12	43.10	54.00	-10.90	-	-	288	101	V
2462	ANT1	* 2.4835	53.64	Pk	32.90	-25.30	0.00	61.24	-	-	74.00	-12.76	20	362	H
		* 2.48398	56.63	Pk	32.90	-25.30	0.00	64.23	-	-	74.00	-9.77	20	362	H
		* 2.4835	36.11	RMS	32.90	-25.30	0.12	43.83	54.00	-10.17	-	-	20	362	H
		* 2.48395	38.15	RMS	32.90	-25.30	0.12	45.87	54.00	-8.13	-	-	20	362	H
		* 2.4835	49.46	Pk	32.90	-25.30	0.00	57.06	-	-	74.00	-16.94	98	348	V
		* 2.48362	52.23	Pk	32.90	-25.30	0.00	59.83	-	-	74.00	-14.17	98	348	V
		* 2.4835	33.83	RMS	32.90	-25.30	0.12	41.55	54.00	-12.45	-	-	98	348	V
		* 2.48395	35.46	RMS	32.90	-25.30	0.12	43.18	54.00	-10.82	-	-	98	348	V
2467	ANT1	* 2.4835	54.08	Pk	32.90	-25.30	0.00	61.68	-	-	74.00	-12.32	202	204	H
		* 2.48469	55.63	Pk	32.90	-25.30	0.00	63.23	-	-	74.00	-10.77	202	204	H
		* 2.4835	41.81	RMS	32.90	-25.30	0.12	49.53	54.00	-4.47	-	-	202	204	H
		* 2.48358	41.96	RMS	32.90	-25.30	0.12	49.68	54.00	-4.32	-	-	202	204	H
		* 2.4835	50.13	Pk	32.90	-25.30	0.00	57.73	-	-	74.00	-16.27	294	100	V
		* 2.48453	51.70	Pk	32.90	-25.30	0.00	59.30	-	-	74.00	-14.70	294	100	V
		* 2.4835	38.23	RMS	32.90	-25.30	0.12	45.95	54.00	-8.05	-	-	294	100	V
		* 2.48353	38.96	RMS	32.90	-25.30	0.12	46.68	54.00	-7.32	-	-	294	100	V
2472	ANT1	* 2.4835	62.00	Pk	32.90	-25.30	0.00	69.60	-	-	74.00	-4.40	207	131	H
		* 2.48354	62.21	Pk	32.90	-25.30	0.00	69.81	-	-	74.00	**-4.19**	207	131	H
		* 2.48394	42.88	RMS	32.90	-25.30	0.12	50.60	54.00	-3.40	-	-	207	131	H
		2.503	32.06	RMS	32.90	-25.20	0.12	39.88	54.00	-14.12	-	-	207	131	H
		* 2.4835	59.59	Pk	32.90	-25.30	0.00	67.19	-	-	74.00	-6.81	269	102	V
		* 2.48358	59.97	Pk	32.90	-25.30	0.00	67.57	-	-	74.00	-6.43	269	102	V
		* 2.4835	42.18	RMS	32.90	-25.30	0.12	49.90	54.00	-4.10	-	-	269	102	V
		* 2.48386	43.41	RMS	32.90	-25.30	0.12	51.13	54.00	**-2.87**	-	-	269	102	V

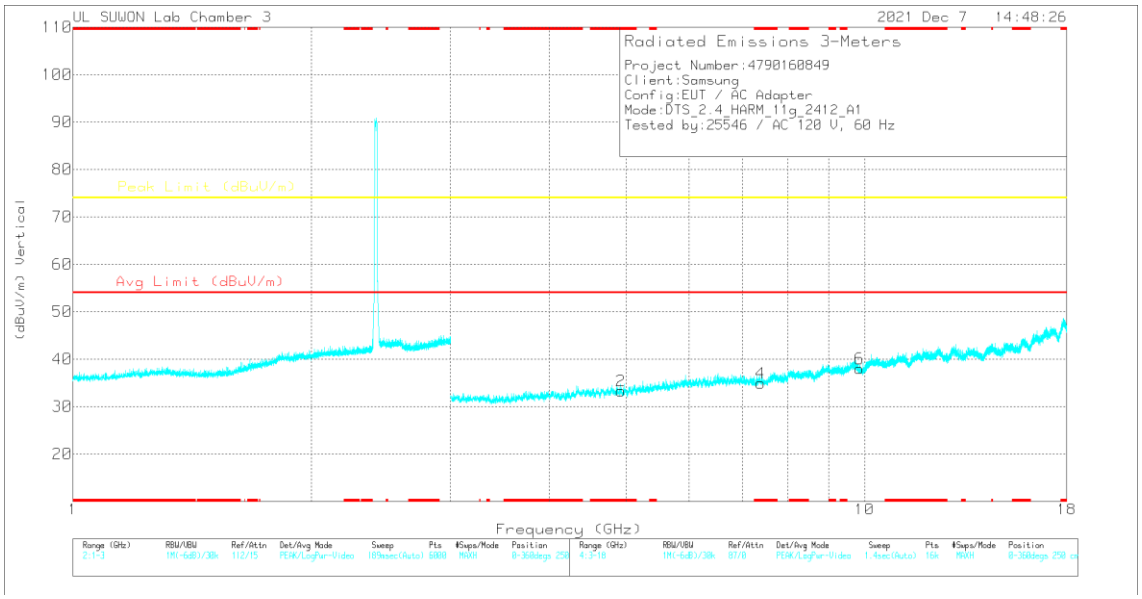
Note1. Pk - Peak detector, RMS - RMS detectior
Note2. * - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

HARMONICS AND SPURIOUS EMISSIONS (ANT1 WORST CASE: 1 CHANNEL)

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	3117_00218957	3GHz_HP[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
* 4.91431	40	PK2	34.7	-31.3	0	43.4	-	-	74	-30.6	0	100	H
* 4.91686	39.91	PK2	34.7	-31.3	0	43.31	-	-	74	-30.69	0	100	V
* 7.39058	34.41	PK2	36	-25	0	45.41	-	-	74	-28.59	0	100	H
* 7.38104	34.82	PK2	36	-25.1	0	45.72	-	-	74	-28.28	0	100	V
9.85094	32.12	PK2	37.7	-21.9	0	47.92	-	-	74	-26.08	0	100	H
9.85158	32.4	PK2	37.7	-21.9	0	48.2	-	-	74	-25.8	0	100	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PK2 - KDB558074 Method: Maximum Peak

HARMONICS AND SPURIOUS EMISSIONS TEST DATA

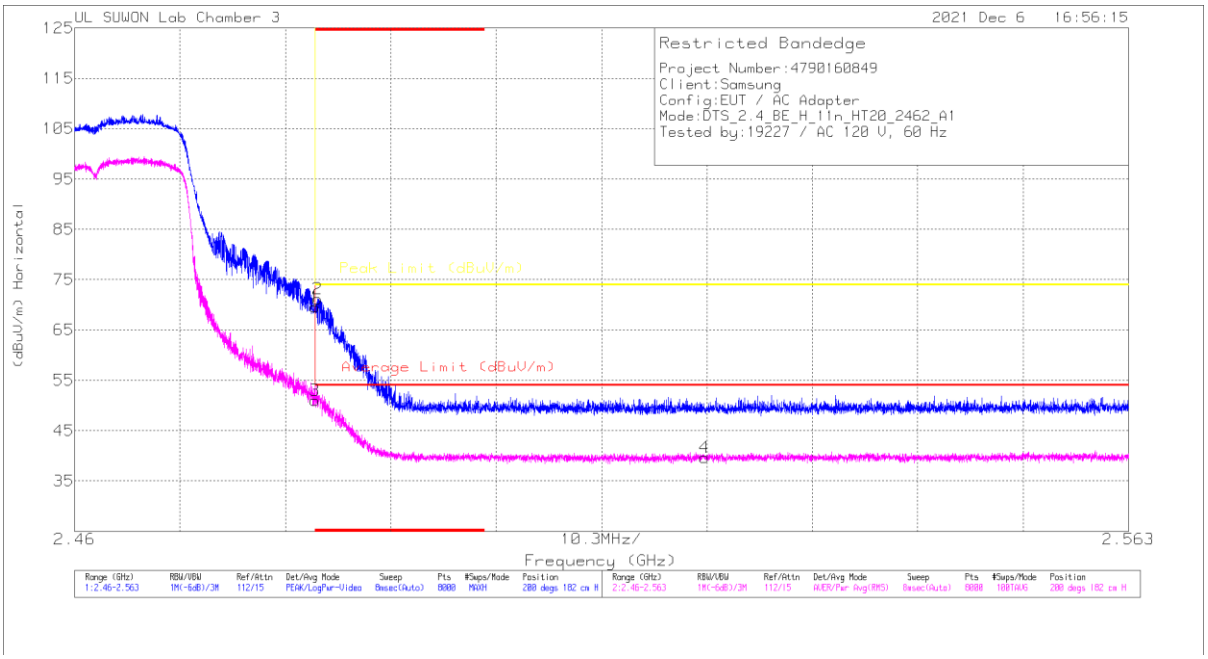
Freq. [MHz]	Antenna	Frequency [GHz]	Reading [dBuV]	Detector Mode	ANT Factor	Loss [dB]	DC Corr [dB]	Result [dBuV/m]	AV Limit [dBuV/m]	AV Margin [dB]	PK Limit [dBuV/m]	PK Margin [dB]	Azimuth [Degs]	Height [cm]	Polarity
2412	ANT1	* 4.91431	40.00	PK2	34.70	-31.30	0.00	43.40	-	-	74.00	-30.60	0	100	H
		* 4.91686	39.91	PK2	34.70	-31.30	0.00	43.31	-	-	74.00	-30.69	0	100	V
		* 7.39058	34.41	PK2	36.00	-25.00	0.00	45.41	-	-	74.00	-28.59	0	100	H
		* 7.38104	34.82	PK2	36.00	-25.10	0.00	45.72	-	-	74.00	-28.28	0	100	V
		9.851	32.12	PK2	37.70	-21.90	0.00	47.92	-	-	74.00	-26.08	0	100	H
		9.852	32.40	PK2	37.70	-21.90	0.00	48.20	-	-	74.00	**-25.80**	0	100	V
2437	ANT1	* 4.87121	30.41	PK2	34.60	-31.10	0.00	33.91	-	-	74.00	-40.09	0	100	H
		* 4.86429	32.40	PK2	34.60	-31.00	0.00	36.00	-	-	74.00	-38.00	0	100	V
		* 7.3028	27.13	PK2	36.00	-25.70	0.00	37.43	-	-	74.00	-36.57	0	100	H
		* 7.30408	24.09	PK2	36.00	-25.70	0.00	34.39	-	-	74.00	-39.61	0	100	V
		9.756	25.29	PK2	37.50	-21.70	0.00	41.09	-	-	74.00	-32.91	0	100	H
		9.747	23.45	PK2	37.50	-21.70	0.00	39.25	-	-	74.00	-34.75	0	100	V
2457	ANT1	* 4.87121	30.41	PK2	34.60	-31.10	0.00	33.91	-	-	74.00	-40.09	0	100	H
		* 4.86429	32.40	PK2	34.60	-31.00	0.00	36.00	-	-	74.00	-38.00	0	100	V
		* 7.3028	27.13	PK2	36.00	-25.70	0.00	37.43	-	-	74.00	-36.57	0	100	H
		* 7.30408	24.09	PK2	36.00	-25.70	0.00	34.39	-	-	74.00	-39.61	0	100	V
		9.756	25.29	PK2	37.50	-21.70	0.00	41.09	-	-	74.00	-32.91	0	100	H
		9.747	23.45	PK2	37.50	-21.70	0.00	39.25	-	-	74.00	-34.75	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

BANDEDGE (ANT1 WORST CASE: 11 CHANNEL)

HORIZONTAL RESULT



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00218957	10dB_ATT[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	61.99	Pk	32.9	-25.3	0	69.59	-	-	74	-4.41	200	182	H
2	* 2.48373	63.65	Pk	32.9	-25.3	0	71.25	-	-	74	-2.75	200	182	H
3	* 2.4835	43.23	RMS	32.9	-25.3	.19	51.02	54	-2.98	-	-	200	182	H
4	2.52156	31.75	RMS	32.9	-25.2	.19	39.64	54	-14.36	-	-	200	182	H

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

BANDEDGE TEST DATA

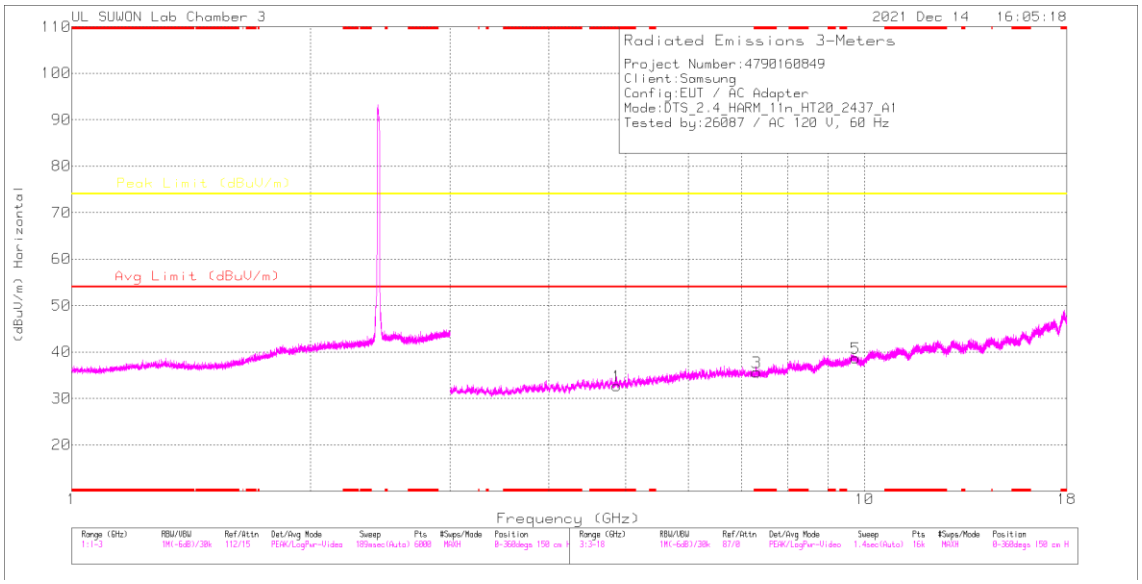
Freq. [MHz]	Antenna	Frequency [GHz]	Reading [dBuV]	Detector Mode	ANT Factor	Loss [dB]	DC Corr [dB]	Result [dBuV/m]	AV Limit [dBuV/m]	AV Margin [dB]	PK Limit [dBuV/m]	PK Margin [dB]	Azimuth [Degs]	Height [cm]	Polarity
2412	ANT1	* 2.39	49.06	Pk	32.80	-25.40	0.00	56.46	-	-	74.00	-17.54	198	238	H
		* 2.38959	51.75	Pk	32.80	-25.40	0.00	59.15	-	-	74.00	-14.85	198	238	H
		* 2.39	37.07	RMS	32.80	-25.40	0.19	44.66	54.00	-9.34	-	-	198	238	H
		* 2.38964	36.67	RMS	32.80	-25.40	0.19	44.26	54.00	-9.74	-	-	198	238	H
		* 2.39	46.63	Pk	32.80	-25.40	0.00	54.03	-	-	74.00	-19.97	283	108	V
		* 2.38988	47.11	Pk	32.80	-25.40	0.00	54.51	-	-	74.00	-19.49	283	108	V
		* 2.39	33.34	RMS	32.80	-25.40	0.19	40.93	54.00	-13.07	-	-	283	108	V
		* 2.38989	34.62	RMS	32.80	-25.40	0.19	42.21	54.00	-11.79	-	-	283	108	V
2457	ANT1	* 2.4835	54.34	Pk	32.90	-25.30	0.00	61.94	-	-	74.00	-12.06	182	369	H
		* 2.48356	55.82	Pk	32.90	-25.30	0.00	63.42	-	-	74.00	-10.58	182	369	H
		* 2.4835	35.93	RMS	32.90	-25.30	0.19	43.72	54.00	-10.28	-	-	182	369	H
		* 2.48371	37.18	RMS	32.90	-25.30	0.19	44.97	54.00	-9.03	-	-	182	369	H
		* 2.4835	51.19	Pk	32.90	-25.30	0.00	58.79	-	-	74.00	-15.21	264	355	V
		* 2.48371	54.88	Pk	32.90	-25.30	0.00	62.48	-	-	74.00	-11.52	264	355	V
		* 2.4835	35.20	RMS	32.90	-25.30	0.19	42.99	54.00	-11.01	-	-	264	355	V
		* 2.48368	37.18	RMS	32.90	-25.30	0.19	44.97	54.00	-9.03	-	-	264	355	V
2462	ANT1	* 2.4835	61.99	Pk	32.90	-25.30	0.00	69.59	-	-	74.00	-4.41	200	182	H
		* 2.48373	63.65	Pk	32.90	-25.30	0.00	71.25	-	-	74.00	**-2.75**	200	182	H
		* 2.4835	43.23	RMS	32.90	-25.30	0.19	51.02	54.00	**-2.98**	-	-	200	182	H
		2.522	31.75	RMS	32.90	-25.20	0.19	39.64	54.00	-14.36	-	-	200	182	H
		* 2.4835	59.77	Pk	32.90	-25.30	0.00	67.37	-	-	74.00	-6.63	281	348	V
		* 2.48384	62.36	Pk	32.90	-25.30	0.00	69.96	-	-	74.00	-4.04	281	348	V
		* 2.48396	41.76	RMS	32.90	-25.30	0.19	49.55	54.00	-4.45	-	-	281	348	V
		2.520	31.54	RMS	32.90	-25.30	0.19	39.33	54.00	-14.67	-	-	281	348	V
2467	ANT1	* 2.4835	54.17	Pk	32.90	-25.30	0.00	61.77	-	-	74.00	-12.23	198	179	H
		* 2.48362	57.97	Pk	32.90	-25.30	0.00	65.57	-	-	74.00	-8.43	198	179	H
		* 2.4835	41.30	RMS	32.90	-25.30	0.19	49.09	54.00	-4.91	-	-	198	179	H
		* 2.48353	41.14	RMS	32.90	-25.30	0.19	48.93	54.00	-5.07	-	-	198	179	H
		* 2.4835	51.83	Pk	32.90	-25.30	0.00	59.43	-	-	74.00	-14.57	271	103	V
		* 2.48373	53.95	Pk	32.90	-25.30	0.00	61.55	-	-	74.00	-12.45	271	103	V
		* 2.4835	37.29	RMS	32.90	-25.30	0.19	45.08	54.00	-8.92	-	-	271	103	V
		* 2.48382	37.18	RMS	32.90	-25.30	0.19	44.97	54.00	-9.03	-	-	271	103	V
2472	ANT1	* 2.48396	60.66	Pk	32.90	-25.30	0.00	68.26	-	-	74.00	-5.74	203	224	H
		2.501	41.42	Pk	32.90	-25.20	0.00	49.12	-	-	74.00	-24.88	203	224	H
		* 2.48396	43.21	RMS	32.90	-25.30	0.19	51.00	54.00	-3.00	-	-	203	224	H
		* 2.48811	32.93	RMS	32.90	-25.20	0.19	40.82	54.00	-13.18	-	-	203	224	H
		* 2.4835	62.33	Pk	32.90	-25.30	0.00	69.93	-	-	74.00	-4.07	295	103	V
		* 2.48354	62.97	Pk	32.90	-25.30	0.00	70.57	-	-	74.00	-3.43	295	103	V
		* 2.48394	41.06	RMS	32.90	-25.30	0.19	48.85	54.00	-5.15	-	-	295	103	V
		2.503	31.85	RMS	32.90	-25.20	0.19	39.74	54.00	-14.26	-	-	295	103	V

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

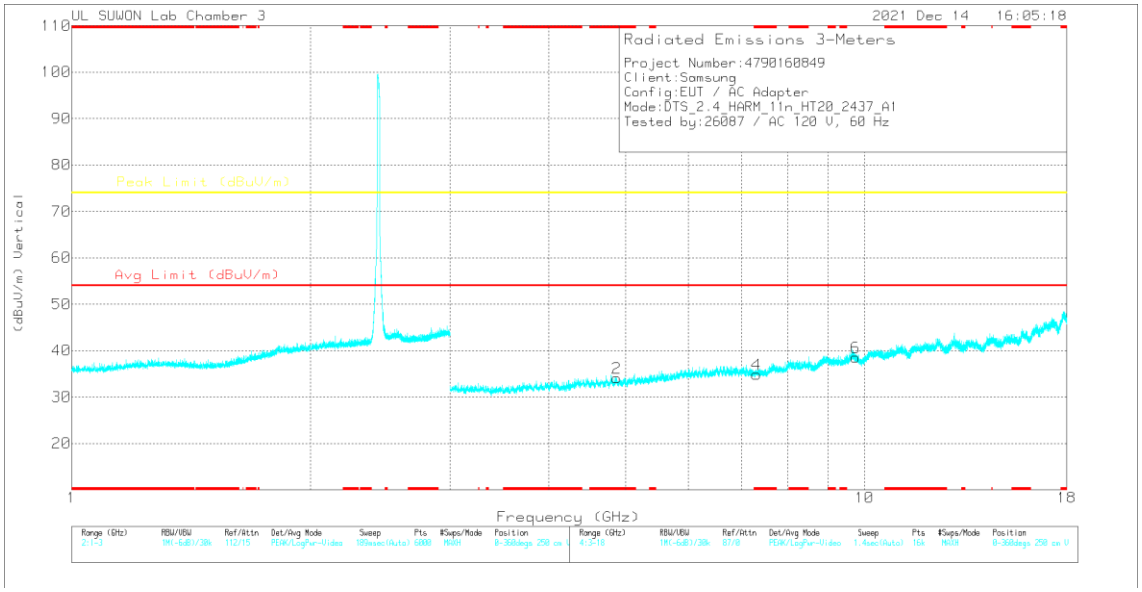
UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_15C(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

HARMONICS AND SPURIOUS EMISSIONS (ANT1 WORST CASE: 6 CHANNEL)

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	3117_00218957	3GHz_HP[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
* 4.86876	40.39	PK2	34.6	-31.1	0	43.89	-	-	74	-30.11	360	100	H
* 4.88328	39.6	PK2	34.7	-31.4	0	42.9	-	-	74	-31.1	360	100	V
* 7.30644	35.33	PK2	36	-25.7	0	45.63	-	-	74	-28.37	360	100	H
* 7.3068	35.67	PK2	36	-25.7	0	45.97	-	-	74	-28.03	360	100	V
9.74281	32.62	PK2	37.5	-21.7	0	48.42	-	-	74	-25.58	360	100	H
9.74332	33.05	PK2	37.5	-21.7	0	48.85	-	-	74	-25.15	360	100	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PK2 - KDB558074 Method: Maximum Peak

HARMONICS AND SPURIOUS EMISSIONS TEST DATA

Freq. [MHz]	Antenna	Frequency [GHz]	Reading [dBuV]	Detector Mode	ANT Factor	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	* 4.82454	39.13	PK2	34.60	-30.70	0.00	43.03	-	-	74.00	-30.97	360	100	H
		* 4.83417	38.91	PK2	34.60	-30.70	0.00	42.81	-	-	74.00	-31.19	360	100	V
		7.240	35.86	PK2	36.00	-26.00	0.00	45.86	-	-	74.00	-28.14	360	100	H
		7.240	35.98	PK2	36.00	-26.00	0.00	45.98	-	-	74.00	-28.02	360	100	V
		9.655	33.22	PK2	37.40	-21.90	0.00	48.72	-	-	74.00	-25.28	360	100	H
		9.642	32.64	PK2	37.40	-22.00	0.00	48.04	-	-	74.00	-25.96	360	100	V
2437	ANT1	* 4.86876	40.39	PK2	34.60	-31.10	0.00	43.89	-	-	74.00	-30.11	360	100	H
		* 4.88328	39.60	PK2	34.70	-31.40	0.00	42.90	-	-	74.00	-31.10	360	100	V
		* 7.30644	35.33	PK2	36.00	-25.70	0.00	45.63	-	-	74.00	-28.37	360	100	H
		* 7.3068	35.67	PK2	36.00	-25.70	0.00	45.97	-	-	74.00	-28.03	360	100	V
		9.743	32.62	PK2	37.50	-21.70	0.00	48.42	-	-	74.00	-25.58	360	100	H
		9.743	33.05	PK2	37.50	-21.70	0.00	48.85	-	-	74.00	**-25.15**	360	100	V
2457	ANT1	* 4.91626	40.07	PK2	34.70	-31.30	0.00	43.47	-	-	74.00	-30.53	360	100	H
		* 4.91425	39.74	PK2	34.70	-31.30	0.00	43.14	-	-	74.00	-30.86	360	100	V
		* 7.37504	35.15	PK2	36.00	-25.10	0.00	46.05	-	-	74.00	-27.95	360	100	H
		* 7.36352	34.72	PK2	36.00	-25.20	0.00	45.52	-	-	74.00	-28.48	360	100	V
		9.833	32.14	PK2	37.70	-21.80	0.00	48.04	-	-	74.00	-25.96	360	100	H
		9.834	32.00	PK2	37.70	-21.90	0.00	47.80	-	-	74.00	-26.20	360	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

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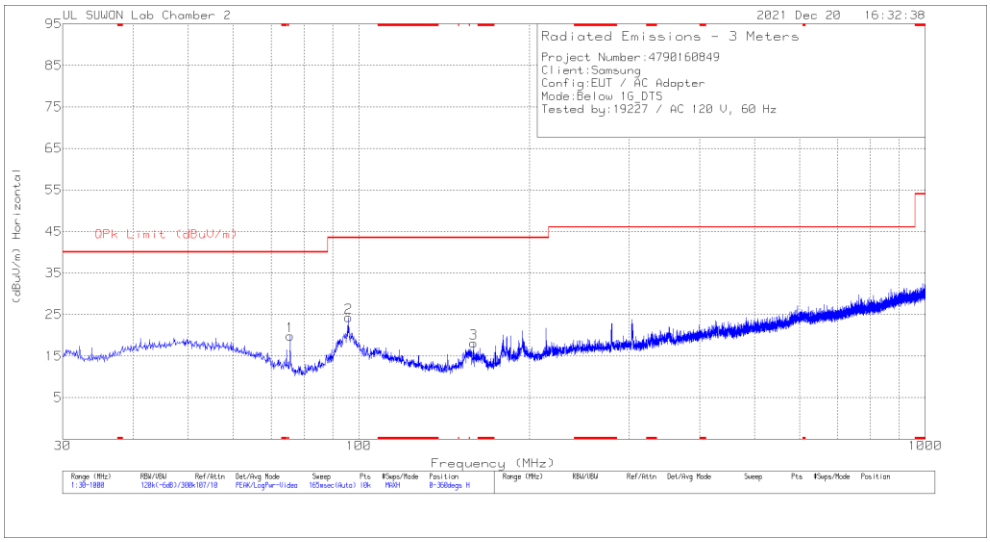
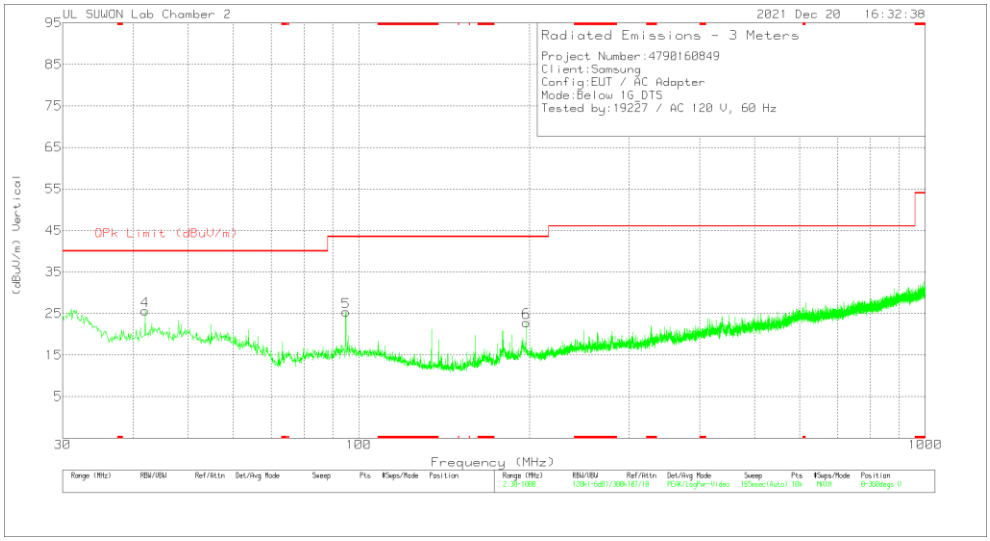
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

10.2. WORST CASE BELOW 1 GHZ



HORIZONTAL



VERTICAL

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	VULB9163_749	Below 1G[dB]	DC Corr (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	75.687	38.28	Pk	13	-31.4	0	19.88	40	-20.12	0-360	100	H
2	95.96	38.76	Pk	16.8	-31.3	0	24.26	43.52	-19.26	0-360	100	H
3	159.398	34.86	Pk	14.2	-31	0	18.06	43.52	-25.46	0-360	100	H
4	41.931	38.21	Pk	19.1	-31.7	0	25.61	40	-14.39	0-360	100	V
5	94.893	40.23	Pk	16.5	-31.3	0	25.43	43.52	-18.09	0-360	100	V
6	197.616	36.16	Pk	17.4	-30.7	0	22.86	43.52	-20.66	0-360	100	V

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.

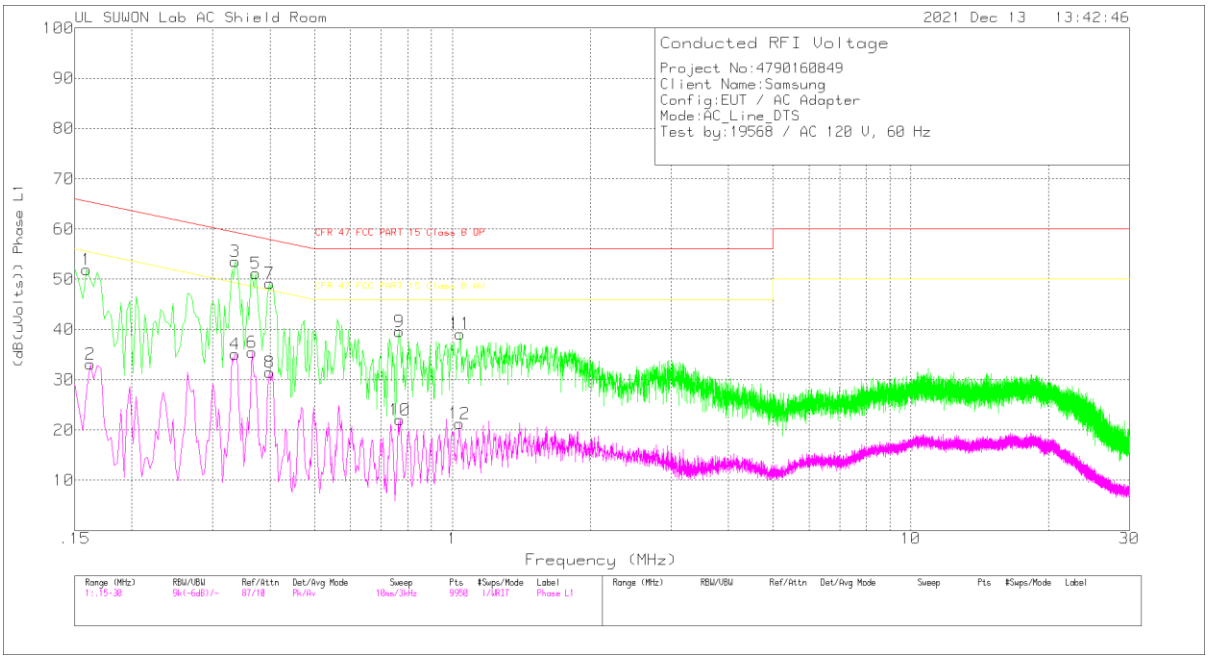
The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

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

RESULTS

11.1.1. AC Power Line

LINE 1 RESULTS



Trace Markers

Range 1: Phase L1 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	101836_With EX_L1[dB]	CABLELOSS(dB)	Corrected Reading (dB(uVolts))	CFR 47 FCC PART 15 Class B QP	Margin (dB)	CFR 47 FCC PART 15 Class B AV	Margin (dB)
1	.159	41.97	Pk	9.8	.1	51.87	65.52	-13.65	-	-
2	.162	23.07	Av	9.9	.1	33.07	-	-	55.36	-22.29
3	.336	43.53	Pk	9.8	.2	53.53	59.3	-5.77	-	-
4	.336	25.06	Av	9.8	.2	35.06	-	-	49.3	-14.24
5	.372	41.17	Pk	9.8	.2	51.17	58.46	-7.29	-	-
6	.366	25.52	Av	9.8	.2	35.52	-	-	48.59	-13.07
7	.399	39.21	Pk	9.8	.2	49.21	57.87	-8.66	-	-
8	.399	21.49	Av	9.8	.2	31.49	-	-	47.87	-16.38
9	.765	29.55	Pk	9.8	.2	39.55	56	-16.45	-	-
10	.768	12.04	Av	9.8	.2	22.04	-	-	46	-23.96
11	1.038	29.15	Pk	9.7	.3	39.15	56	-16.85	-	-
12	1.035	11.28	Av	9.7	.3	21.28	-	-	46	-24.72

Pk - Peak detector
Av - Average detection

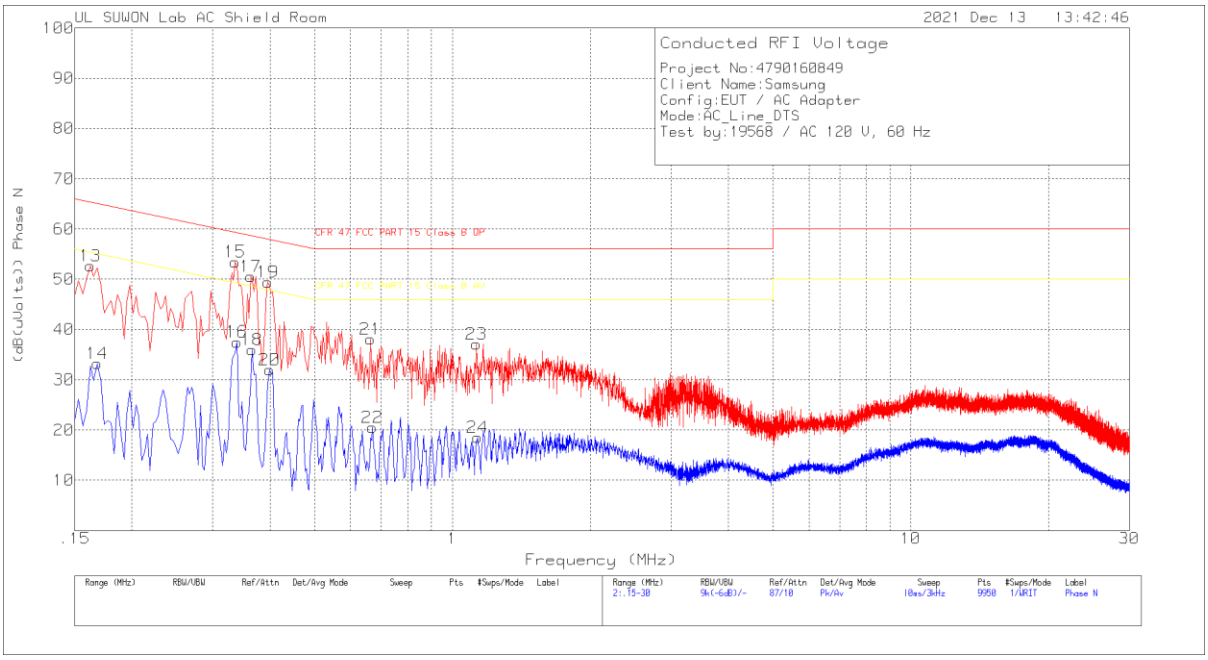
Quasi-Peak Emissions

Range 1: Phase L1 .15 - 30MHz

Frequency (MHz)	Meter Reading (dBuV)	Det	101836_With EX_L1[dB]	CABLELOSS(dB)	Corrected Reading (dB(uVolts))	CFR 47 FCC PART 15 Class B QP	Margin (dB)	CFR 47 FCC PART 15 Class B AV	Margin (dB)
.33525	41.78	Qp	9.8	.2	51.78	59.32	-7.54	-	-
.37125	39.18	Qp	9.8	.2	49.18	58.47	-9.29	-	-
.39975	37.81	Qp	9.8	.2	47.81	57.86	-10.05	-	-

Qp - Quasi-Peak detector

LINE 2 RESULTS



Trace Markers

Range 2: Phase N .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	101836_With EX_N[dB]	CABLELOSS(dB)	Corrected Reading (dB(uVolts))	CFR 47 FCC PART 15 Class B QP	Margin (dB)	CFR 47 FCC PART 15 Class B AV	Margin (dB)
13	.162	42.73	Pk	9.9	.1	52.73	65.36	-12.63	-	-
14	.168	23.15	Av	10	.1	33.25	-	-	55.06	-21.81
15	.336	43.48	Pk	9.8	.2	53.48	59.3	-5.82	-	-
16	.339	27.53	Av	9.8	.2	37.53	-	-	49.23	-11.7
17	.363	40.58	Pk	9.8	.2	50.58	58.66	-8.08	-	-
18	.366	25.95	Av	9.8	.2	35.95	-	-	48.59	-12.64
19	.396	39.48	Pk	9.8	.2	49.48	57.94	-8.46	-	-
20	.399	22.03	Av	9.8	.2	32.03	-	-	47.87	-15.84
21	.663	28.08	Pk	9.8	.2	38.08	56	-17.92	-	-
22	.669	10.55	Av	9.8	.2	20.55	-	-	46	-25.45
23	1.128	27.11	Pk	9.7	.3	37.11	56	-18.89	-	-
24	1.134	8.49	Av	9.7	.3	18.49	-	-	46	-27.51

Pk - Peak detector
Av - Average detection

Quasi-Peak Emissions

Range 2: Phase N .15 - 30MHz

Frequency (MHz)	Meter Reading (dBuV)	Det	101836_With EX_N[dB]	CABLELOSS(dB)	Corrected Reading (dB(uVolts))	CFR 47 FCC PART 15 Class B QP	Margin (dB)	CFR 47 FCC PART 15 Class B AV	Margin (dB)
.33525	41.44	Qp	9.8	.2	51.44	59.32	-7.88	-	-
.36375	37.56	Qp	9.8	.2	47.56	58.64	-11.08	-	-
.39675	37.04	Qp	9.8	.2	47.04	57.92	-10.88	-	-

Qp - Quasi-Peak detector

END OF TEST REPORT

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_15C(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433