



FCC CFR47 PART 15 SUBPART C

ANT+

CERTIFICATION TEST REPORT

FOR

GSM/WCDMA/LTE Tablet + Bluetooth/BLE, DTS/UNII a/b/g/n/ac and ANT+

MODEL NUMBER : SM-T825C

FCC ID: A3LSMT825C

REPORT NUMBER: 4787821324-E5V2

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Prepared for
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Revision History

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
V1	02/24/17	Initial issue	Junwhan Lee
V2	03/13/17	Revised section 7.2	Junwhan Lee

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: SAMSUNG ELECTRONICS CO., LTD.
EUT DESCRIPTION: GSM/WCDMA/LTE Tablet + Bluetooth/BLE, DTS/UNII a/b/g/n/ac and ANT+
MODEL NUMBER: SM-T825C
SERIAL NUMBER: R22HC0097EN (RADIATED);
R22HC00QNAA (CONDUCTED)
DATE TESTED: JAN 24, 2017 - FEB 01, 2017

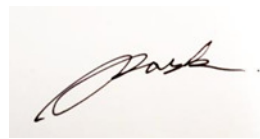
APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C	Pass

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:

Tested By:



SungGil Park
Suwon Lab Engineer
UL Korea, Ltd.

Junwhan Lee
Suwon Lab Engineer
UL Korea, Ltd.

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with following methods.

1. FCC CFR 47 Part 2.
2. FCC CFR 47 Part 15.
3. ANSI C63.10-2013.

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	
<input type="checkbox"/>	Chamber 1
<input checked="" type="checkbox"/>	Chamber 2

UL Korea, Ltd. is accredited by IAS, Laboratory Code TL-637. The full scope of accreditation can be viewed at <http://www.iasonline.org/PDF/TL/TL-637.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:

$$\begin{aligned} \text{Field Strength (dBuV/m)} &= \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \\ &\text{Cable Loss (dB)} - \text{Preamp Gain (dB)} \\ 36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} &= 28.9 \text{ dBuV/m} \end{aligned}$$

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	2.32 dB
Radiated Disturbance, Below 1GHz	4.14 dB
Radiated Disturbance, Above 1 GHz	5.97 dB

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a GSM/WCDMA/LTE Tablet + Bluetooth/BLE, DTS/UNII a/b/g/n/ac and ANT+. This test report addresses the ANT+ operational mode.

5.2. MAXIMUM OUTPUT POWER

The ANT+ mode has maximum output fundamental field strength as follows:

Frequency Range [MHz]	Mode	Peak E-field Strength [dBuV/m]	Avg E-field Strength [dBuV/m]	Distance [m]
2402 - 2480	ANT+	94.04	42.10	3.00

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an internal antenna, with a maximum gain of -1.83 dBi

5.4. 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.

The fundamental of the EUT was investigated in three orthogonal orientations X, Y and Z it was determined that Y orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in Y orientation.

5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Adapter	SAMSUNG	EP-TA200	R37HB5B0CH1SE3	N/A
Data Cable	SAMSUNG	EP-DN930CWE	N/A	N/A
Earphone	SAMSUNG	EO-EG920BW	N/A	N/A

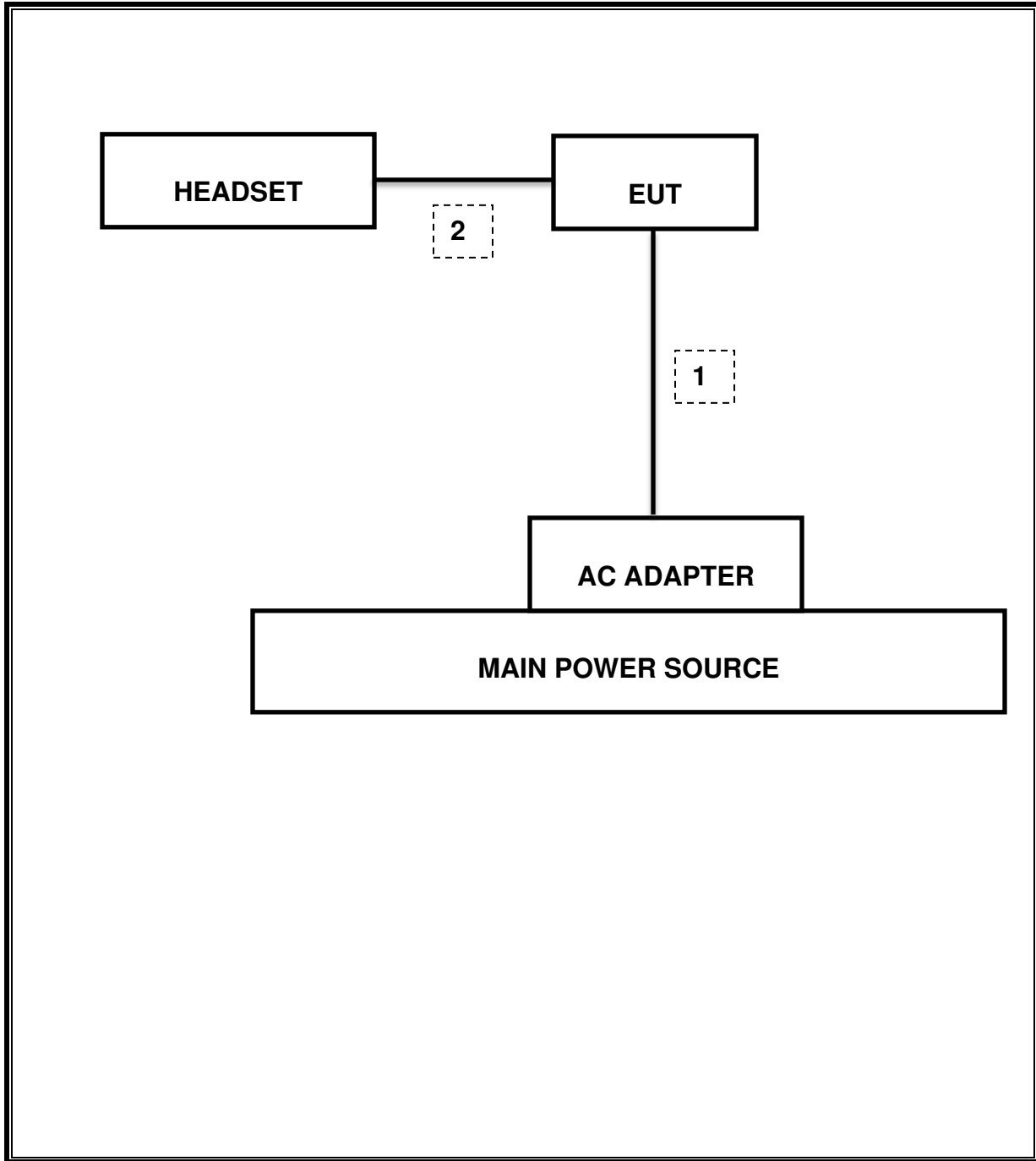
I/O CABLES

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	DC Power	1	C Type USB	Shielded	1.2m	N/A
2	Audio	2	Mini-Jack	Unshielded	1.1m	N/A

TEST SETUP

The EUT is set to continuously transmit in ANT + test mode.
Test software in hidden menu exercised the EUT to enable ANT+ mode.

SETUP DIAGRAM FOR TESTS



6. 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	10-14-18
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	749	04-25-17
Antenna, Horn, 18 GHz	ETS	3115	00167211	10-14-18
Antenna, Horn, 18 GHz	ETS	3115	00161451	03-17-17
Antenna, Horn, 18 GHz	ETS	3117	00168724	06-17-17
Antenna, Horn, 18 GHz	ETS	3117	00168717	06-17-17
Antenna, Horn, 40 GHz	ETS	3116C	00166155	11-30-17
Antenna, Horn, 40 GHz	ETS	3116C-PA	00168841	12-15-17
Preamplifier, 1000 MHz	Sonoma	310N	341282	08-17-17
Preamplifier, 1000 MHz	Sonoma	310N	351741	08-16-17
Preamplifier	ETS	3115-PA	00167475	08-17-17
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1896138	08-16-17
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54170614	08-17-17
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54490312	08-16-17
EMI Test Receive, 40 GHz	R&S	ESU40	100439	08-17-17
EMI Test Receive, 40 GHz	R&S	ESU40	100457	08-16-17
EMI Test Receive, 3 GHz	R&S	ESR3	101832	08-16-17
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	009	08-17-17
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	015	08-16-17
High Pass Filter 3GHz	Micro-Tronics	HPM17543	010	08-17-17
High Pass Filter 3GHz	Micro-Tronics	HPM17543	015	08-16-17
High Pass Filter 6GHz	Micro-Tronics	HPM17542	009	08-17-17
High Pass Filter 6GHz	Micro-Tronics	HPM17542	016	08-16-17
LISN	R&S	ENV-216	101836	08-16-17
LISN	R&S	ENV-216	101837	08-16-17
Antenna, Loop, 9kHz-30MHz	R&S	HFH2-Z2	100418	11-25-17
UL Software				
Description	Manufacturer	Model	Version	
Radiated software	UL	UL EMC	Ver 9.5	
AC Line Conducted software	UL	UL EMC	Ver 9.5	

7. LIMITS AND RESULTS

7.1. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

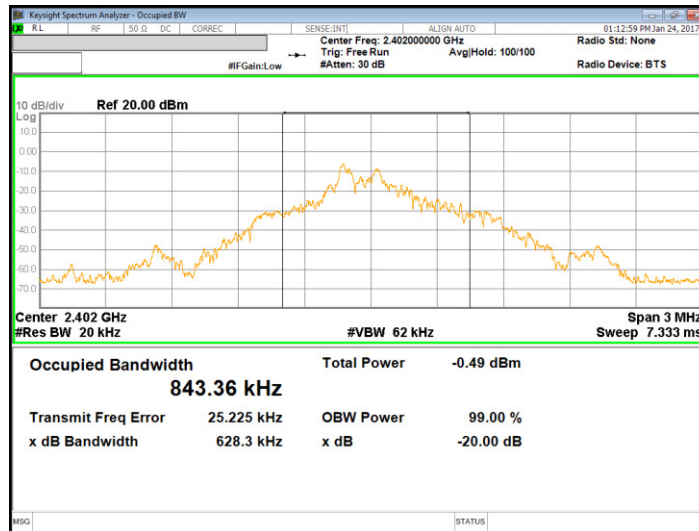
The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

RESULTS

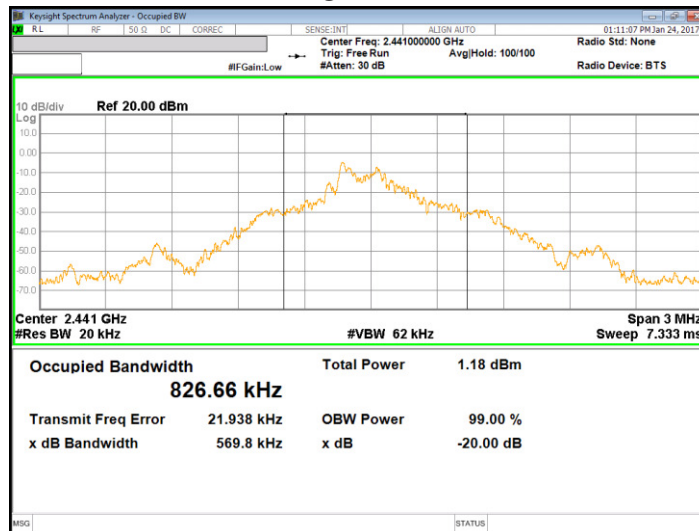
Channel	Frequency [MHz]	99% Bandwidth [KHz]	20 dB Bandwidth [KHz]
Low	2402	843.36	628.30
Mid	2441	826.66	569.80
High	2480	862.14	608.10
Worst		862.14	628.30

99% BANDWIDTH PLOTS

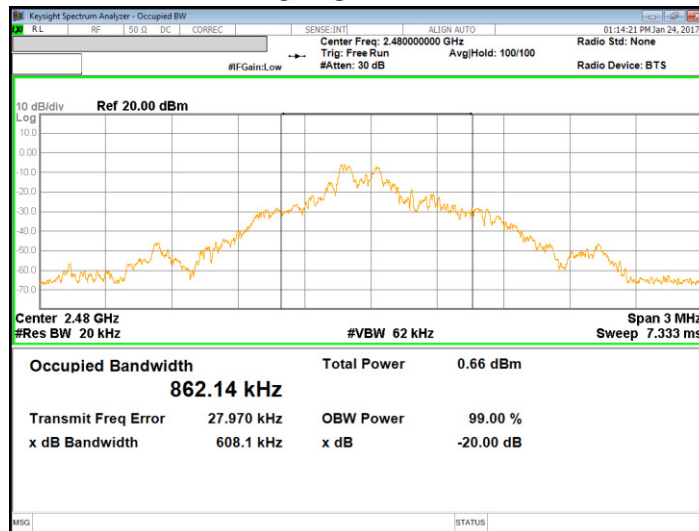
LOW CHANNEL



MID CHANNEL



HIGH CHANNEL



7.2. TRANSMITTER RADIATED EMISSIONS

TEST PROCEDURE

ANSI C63.10: 2013

LIMIT

FCC §15.249

Operation within the bands 902–928 MHz, 2400–2483.5 MHz, 5725–5875 MHz, and 24.0–24.25 GHz.

(a) Except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental frequency	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (microvolts/meter)
902-928 MHz	50	500
2400-2483.5 MHz	50	500
5725-5875 MHz	50	500
24.0-24.25 GHz	250	2500

(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in § 15.209, whichever is the lesser attenuation.

(e) As shown in Sec. 15.35(b), for frequencies above 1000 MHz, the field strength limits in paragraphs (a) and (b) of this section are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

FCC §15.205 and §15.209

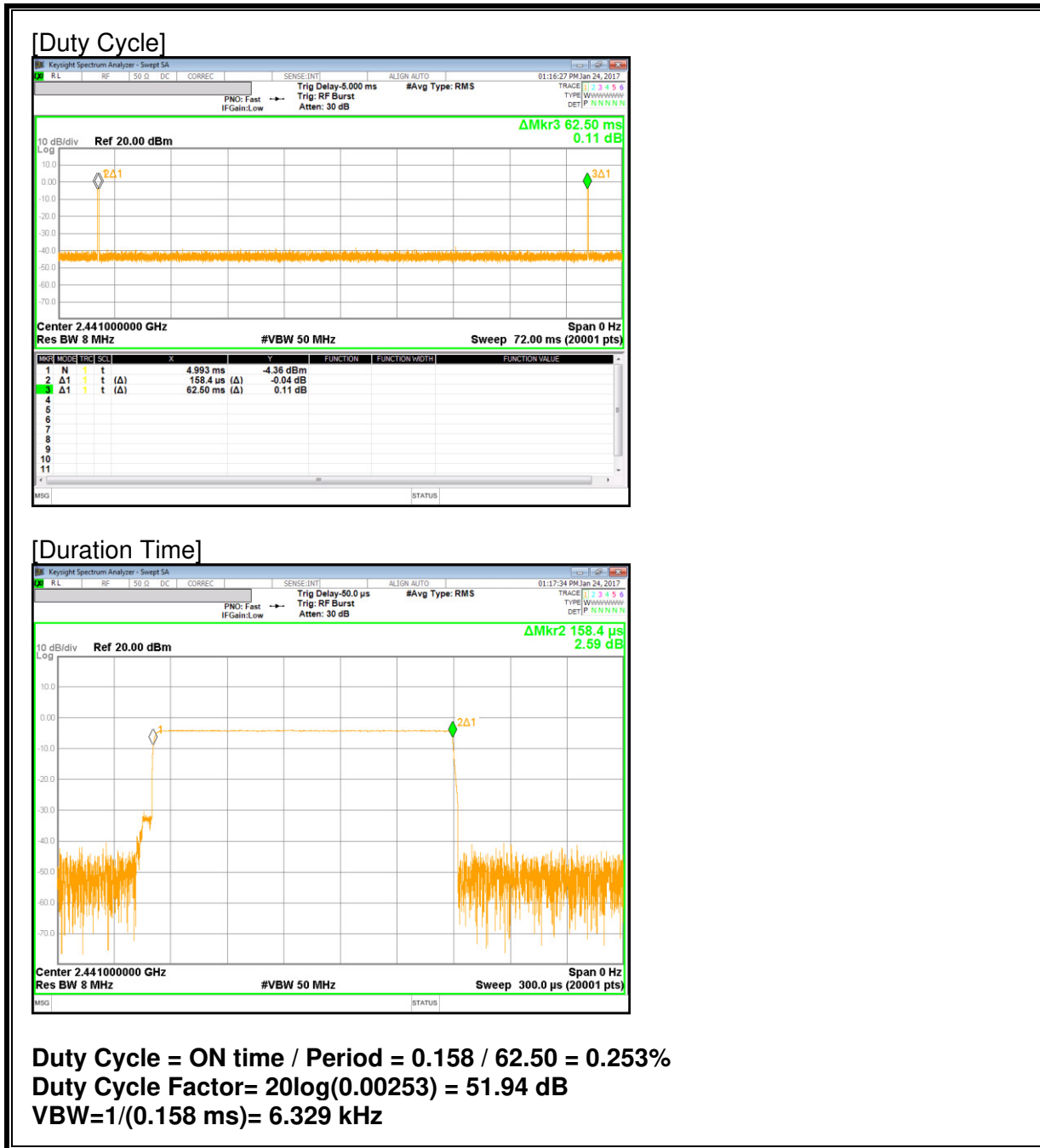
Limits for radiated disturbance of an intentional radiator		
Frequency range (MHz)	Limits (μV/m)	Measurement Distance (m)
0.009 – 0.490	2400 / F (kHz)	300
0.490 – 1.705	24000 / F (kHz)	30
1.705 – 30.0	30	30
30 – 88	100**	3
88 - 216	150**	3
216 – 960	200**	3
Above 960	500	3

** 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.


Note : Emission was pre-scanned from 9KHz to 30MHz; 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.

RESULTS

7.2.1. DUTY CYCLE



7.2.2. FUNDAMENTAL FREQUENCY RADIATED EMISSION

 FCC UL SUWON LAB Chamber 2	Project #: 4787821324 Report #: 4787821324 Date & Time: 2017-02-01 Test Engr: YH Lim
	Company: Samsung EUT Description: GSM/WCDMA/LTE Tablet + Bluetooth/BLE, DTS/UNII a/b/g/n/ac and ANT+. Test Configuration: Y POSITION Type of Test: FCC Mode of Operation: Transmitting : ANT+ mode

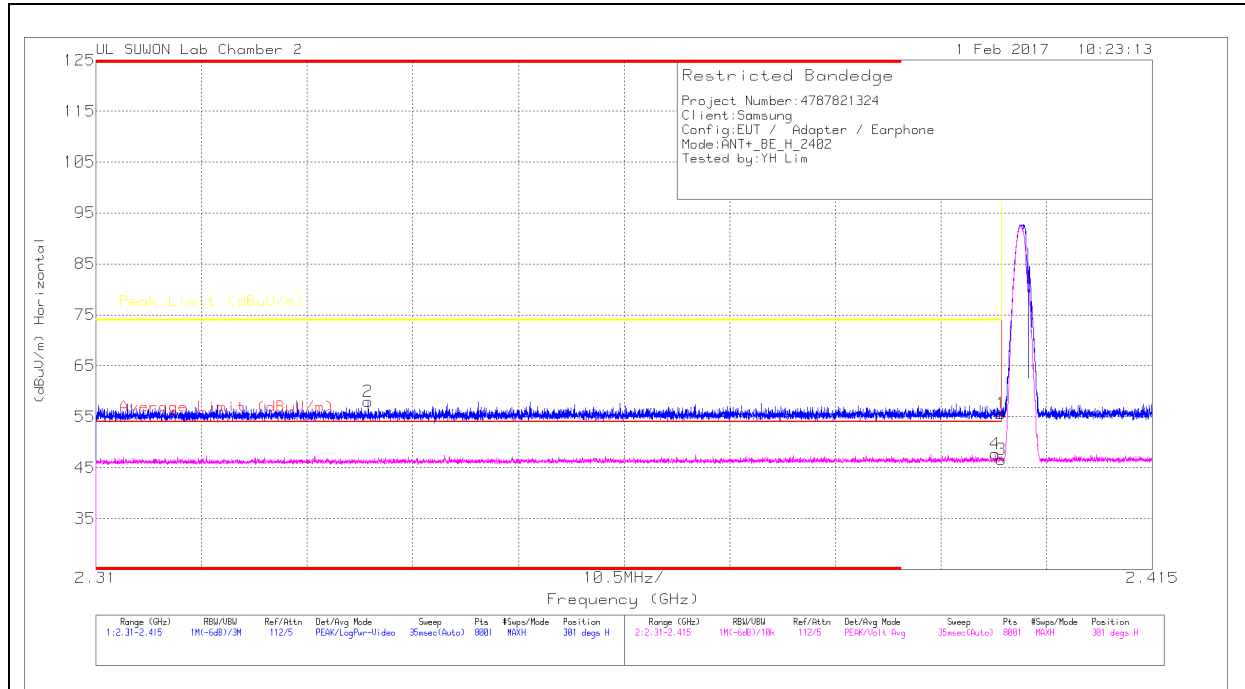
M% = ((t1+t2+t3+...)/T) * 66.83% = 0.25%

Av Reading = Pk Reading + 20*log(M%)
20 * log (M%) = -51.94

Freq. (MHz)	Pk Rdg (dBuV)	Av Rdg (dBuV)	AF (dB)	Closs (dB)	Pre-amp (dB)	Pk Level (dBuV/m)	Av Level (dBuV/m)	Pk Limit FCC_B	Av Limit FCC_B	Pk Margin (dB)	Avg Margin (dB)	Pol (H/V)	Az (Deg)	Height (Meter)
Low channel														
2402.00	82.12	30.18	32.00	-27.01	0.00	87.11	35.17	114.00	94.00	-26.89	-58.83	3mV	0.00	1.00
2402.00	89.05	37.11	32.00	-27.01	0.00	94.04	42.10	114.00	94.00	-19.96	-51.90	3mH	0.00	2.00
Mid channel														
2441.00	82.82	30.88	32.00	-27.01	0.00	87.81	35.87	114.00	94.00	-26.19	-58.13	3mV	0.00	1.00
2441.00	87.17	35.23	32.00	-27.01	0.00	92.16	40.22	114.00	94.00	-21.84	-53.78	3mH	0.00	2.00
High channel														
2480.00	82.88	30.94	32.00	-27.01	0.00	87.87	35.93	114.00	94.00	-26.13	-58.07	3mV	0.00	1.00
2480.00	86.95	35.01	32.00	-27.01	0.00	91.94	40.00	114.00	94.00	-22.06	-54.00	3mH	0.00	2.00

7.2.3. TRANSMITTER RESTRICTED BAND EDGES

BANDEDGE (LOW CHANNEL, HORIZONTAL)



HORIZONTAL DATA

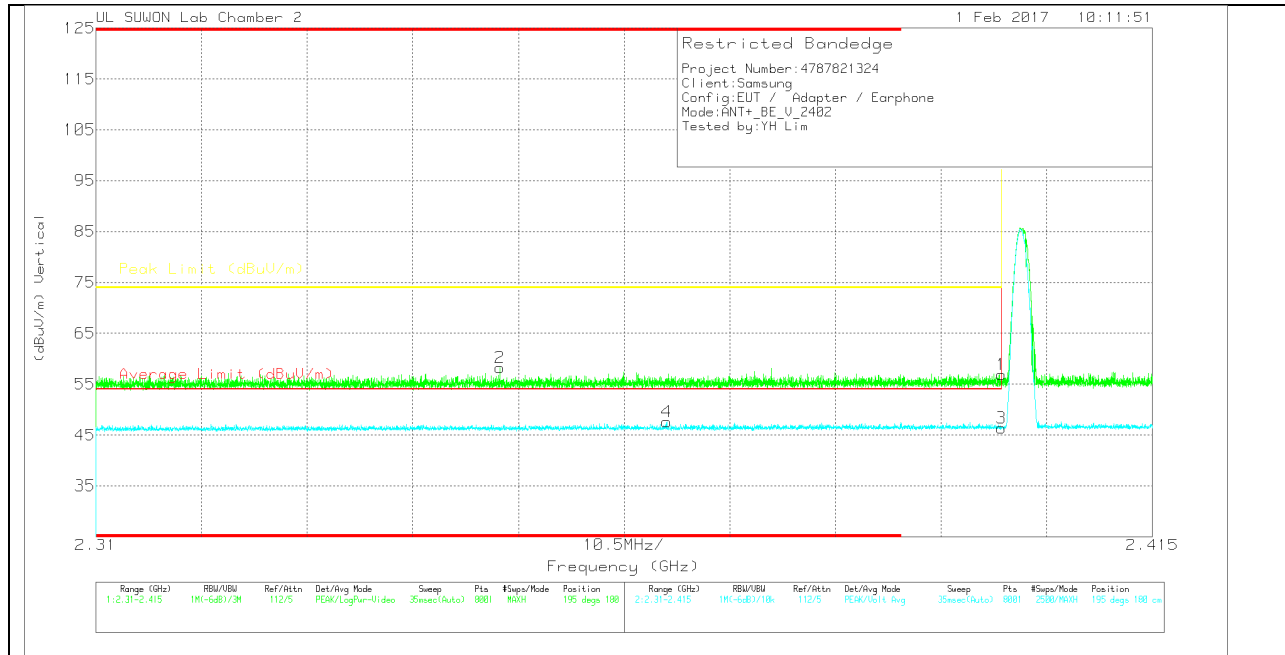
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(0016 8724)_150 619	10dB[dB]	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	2.4	42.1	Pk	31.7	-18.2	55.6	-	-	74	-18.4	301	185	H
2	* 2.337	44.67	Pk	31.6	-18.3	57.97	-	-	74	-16.03	301	185	H
3	2.4	33.12	V1TV	31.7	-18.2	46.62	54	-7.38	-	-	301	185	H
4	2.399	34.28	V1TV	31.7	-18.2	47.78	54	-6.22	-	-	301	185	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(0016 8724)_150 619	10dB[dB]	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	2.4	43.34	Pk		-18.2	56.84	-	-	74	-17.16	195	180	V
2	* 2.35	44.96	Pk		-18.3	58.26	-	-	74	-15.74	195	180	V
3	2.4	32.87	V1TV		-18.2	46.37	54	-7.63	-	-	195	180	V
4	* 2.367	34.19	V1TV		-18.3	47.59	54	-6.41	-	-	195	180	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

V1TV - $V_B=1/T_{on}$, Linear Voltage Average where: T_{on} is packet duration

AUTHORIZED BANDEDGE (HIGH CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

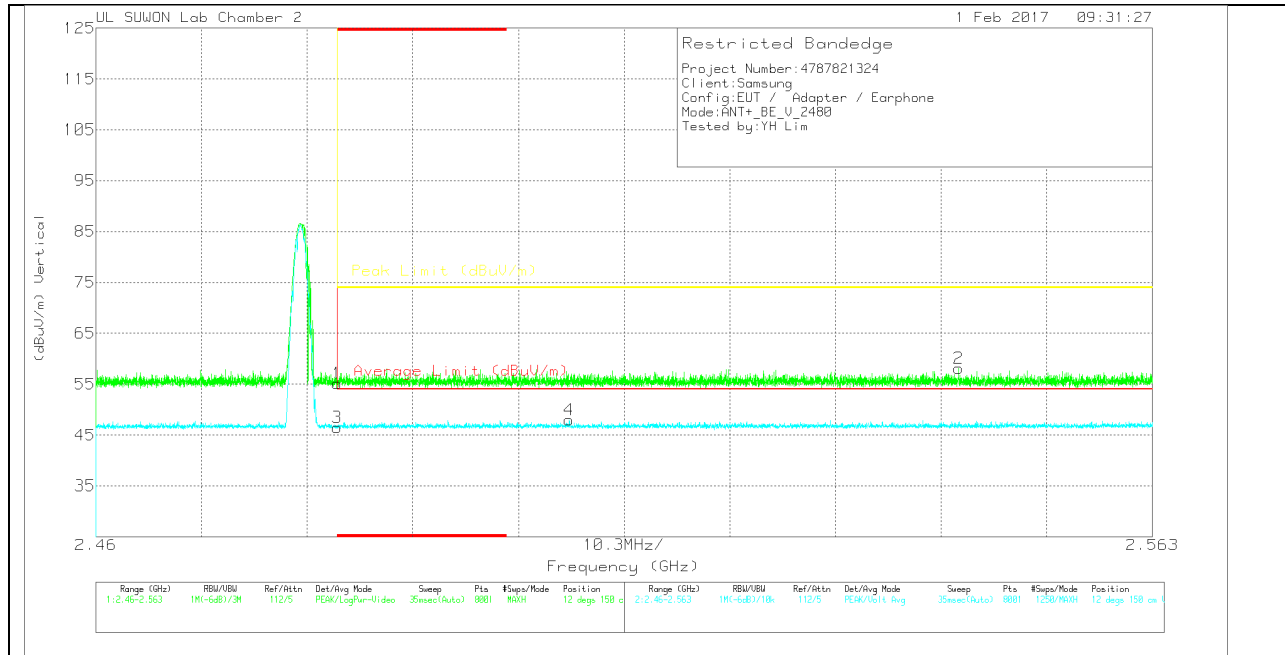
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(0016 8724)_150 619	10dB[dB]	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	41.32	Pk		-18	55.12	-	-	74	-18.88	300	240	H
2	2.521	44.91	Pk		-18	58.81	-	-	74	-15.19	300	240	H
3	* 2.484	32.69	V1TV		-18	46.49	54	-7.51	-	-	300	240	H
4	2.539	34.43	V1TV		-18	48.33	54	-5.67	-	-	300	240	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

V1TV - $VB=1/Ton$, Linear Voltage Average where: Ton is packet duration

VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(0016 8724)_150 619	10dB[dB]	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	41.39	Pk		-18	55.19	-	-	74	-18.81	12	150	V
2	2.544	44.19	Pk		-18	58.09	-	-	74	-15.91	12	150	V
3	* 2.484	32.72	V1TV		-18	46.52	54	-7.48	-	-	12	150	V
4	2.506	34.04	V1TV		-18	47.94	54	-6.06	-	-	12	150	V


* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

V1TV - VB=1/Ton, Linear Voltage Average where: Ton is packet duration

HARMONICS AND SPURIOUS EMISSIONS ABOVE 1GHz

HARMONICS



FCC
UL SUWON LAB
Chamber 2

Project #: 4787821324
Report #: 4787821324
Date & Time: 2017-02-01
Test Engr: YH Lim

Company: Samsung
EUT Description: GSM/WCDMA/LTE Tablet + Bluetooth/BLE, DTS/UNII a/b/g/n/ac and ANT+.
Test Configuration: Y POSITION
Type of Test: FCC
Mode of Operation: Transmitting : ANT+ mode

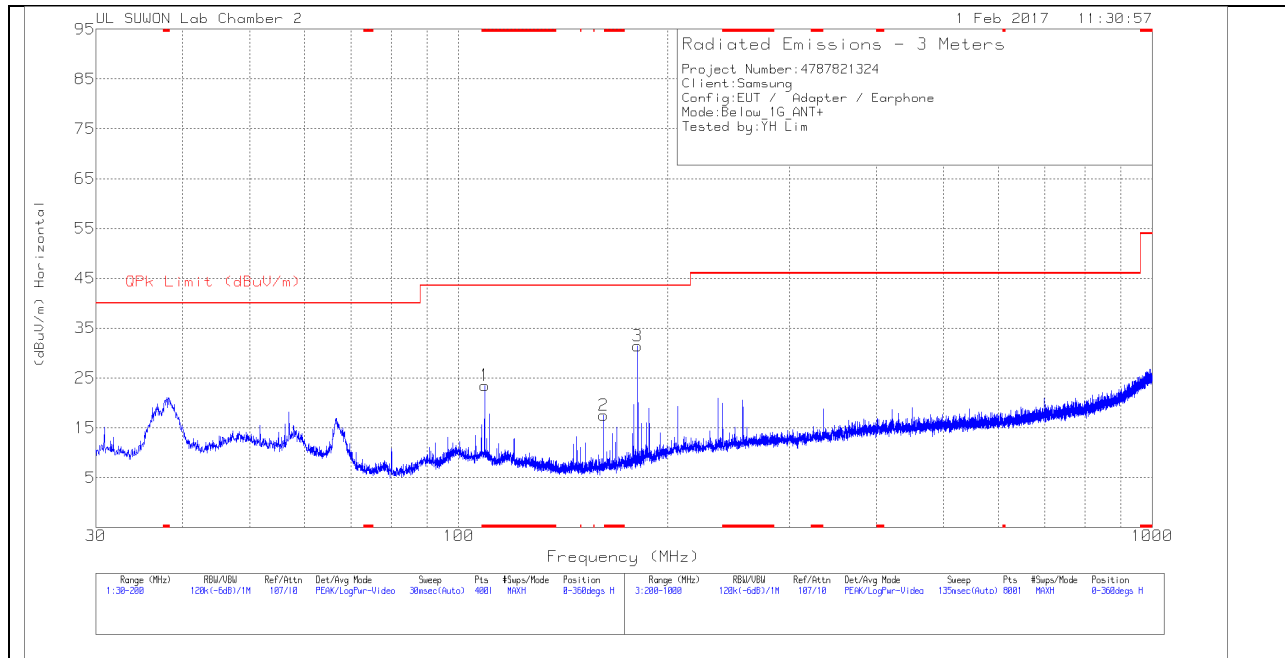
M% = ((t1+t2+t3+...)/T) * 66.83% = 0.25%

Av Reading = Pk Reading + 20*log(M%)
20 * log (M%) = -51.94

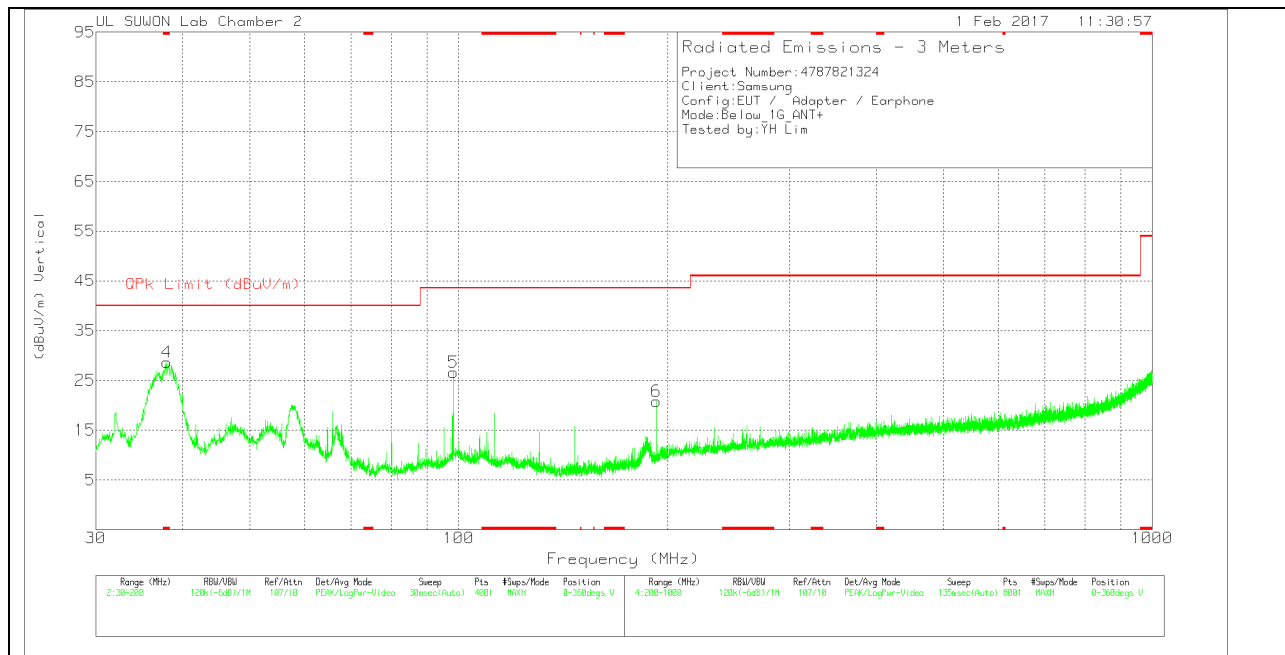
Freq. (MHz)	Pk Rdg (dBuV)	Av Rdg (dBuV)	AF (dB)	Closs (dB)	Pre-amp (dB)	Pk Level (dBuV/m)	Av Level (dBuV/m)	Pk Limit FCC B	Av Limit FCC B	Pk Margin (dB)	Avg Margin (dB)	Pol (H/V)	Az (Deg)	Height (Meter)
Low channel														
4804.00	39.09	28.68	35.00	-25.70	0.00	48.39	37.98	74.00	54.00	-25.61	-16.02	3mV	0.00	1.00
4804.00	40.12	28.41	35.00	-25.70	0.00	49.42	37.71	74.00	54.00	-24.58	-16.29	3mH	0.00	2.00
Mid channel														
4882.00	39.71	28.80	35.00	-25.70	0.00	49.01	38.10	74.00	54.00	-24.99	-15.90	3mV	0.00	1.00
4882.00	39.94	29.01	35.00	-25.70	0.00	49.24	38.31	74.00	54.00	-24.76	-15.69	3mH	0.00	2.00
High channel														
4960.00	40.49	30.08	35.00	-25.70	0.00	49.79	39.38	74.00	54.00	-24.21	-14.62	3mV	0.00	1.00
4960.00	42.63	29.23	35.00	-25.70	0.00	51.93	38.53	74.00	54.00	-22.07	-15.47	3mH	0.00	2.00

7.2.4. SPURIOUS BELOW 1 GHz

SPURIOUS EMISSIONS 30 TO 1000 MHz (HORIZONTAL)



VERTICAL PLOT



BELOW 1 GHz TABLE

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	VULB9163-749	30-1000MHz[dB]	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 109.0075	43.73	Pk	10.8	-31	23.53	43.52	-19.99	0-360	400	H
2	161.835	39.62	Pk	8.6	-30.7	17.52	43.52	-26	0-360	200	H
3	181.215	52.38	Pk	9.6	-30.6	31.38	43.52	-12.14	0-360	200	H
4	* 37.9475	48.37	Pk	11.9	-31.6	28.67	40	-11.33	0-360	100	V
5	98.255	46.48	Pk	11.2	-31.1	26.58	43.52	-16.94	0-360	200	V
6	192.945	40.64	Pk	10.7	-30.5	20.84	43.52	-22.68	0-360	100	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

8. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

Frequency of emission (MHz)	Conducted limit (dB μ V)	
	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.

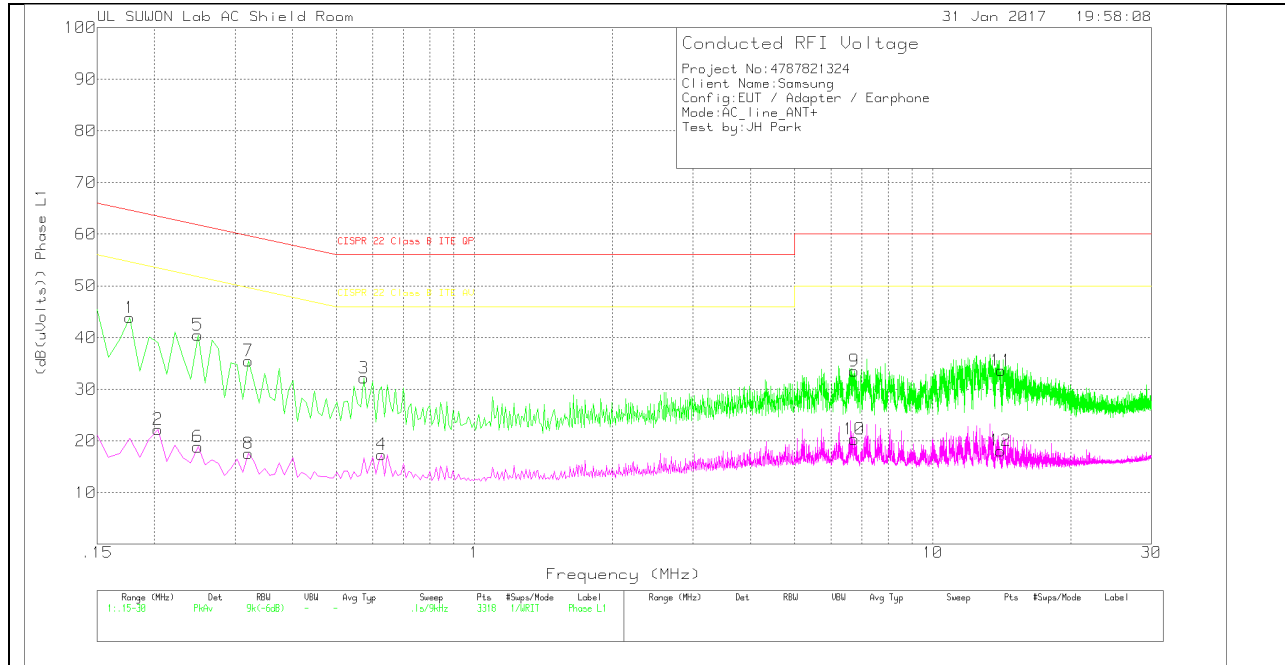
The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

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

RESULTS

6 WORST EMISSIONS

LINE 1 PLOT



LINE 1 RESULTS

Trace Markers

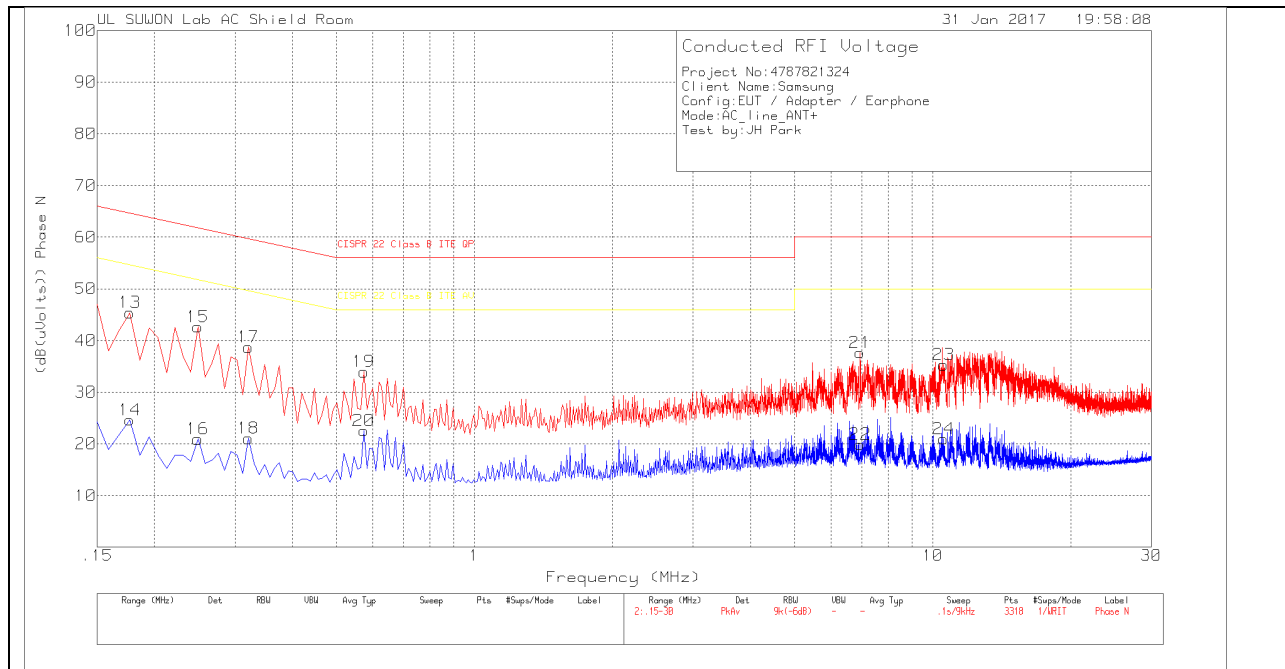
Phase L1 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	101837_w ith ex-cord_L1	CE Shield Room	Corrected Reading (dB(uVolts))	CISPR 22 Class B ITE QP	Margin (dB)	CISPR 22 Class B ITE AV	Margin (dB)
1	.177	33.84	Pk	10	0	43.84	64.63	-20.79	-	-
2	.204	12.31	Av	9.9	0	22.21	-	-	53.45	-31.24
3	.573	22.26	Pk	9.9	0	32.16	56	-23.84	-	-
4	.627	7.47	Av	9.9	0	17.37	-	-	46	-28.63
5	.249	30.79	Pk	9.7	0	40.49	61.79	-21.3	-	-
6	.249	9.17	Av	9.7	0	18.87	-	-	51.79	-32.92
7	.321	25.7	Pk	9.8	0	35.5	59.68	-24.18	-	-
8	.321	7.75	Av	9.8	0	17.55	-	-	49.68	-32.13
9	6.747	23.55	Pk	9.9	.1	33.55	60	-26.45	-	-
10	6.747	10.32	Av	9.9	.1	20.32	-	-	50	-29.68
11	14.109	23.34	Pk	10.1	.2	33.64	60	-26.36	-	-
12	14.055	7.82	Av	10.1	.2	18.12	-	-	50	-31.88

Pk - Peak detector

Av - Average detection

LINE 2 PLOT



LINE 2 RESULTS

Trace Markers

Phase N .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	101837_w ith ex-cord_N	CE Shield Room	Corrected Reading (dB(uVolts))	CISPR 22 Class B ITE QP	Margin (dB)	CISPR 22 Class B ITE AV	Margin (dB)
13	.177	35.39	Pk	10	0	45.39	64.63	-19.24	-	-
14	.177	14.64	Av	10	0	24.64	-	-	54.63	-29.99
15	.249	32.93	Pk	9.7	0	42.63	61.79	-19.16	-	-
16	.249	11.24	Av	9.7	0	20.94	-	-	51.79	-30.85
17	.321	28.91	Pk	9.8	0	38.71	59.68	-20.97	-	-
18	.321	11.26	Av	9.8	0	21.06	-	-	49.68	-28.62
19	.573	24.06	Pk	9.9	0	33.96	56	-22.04	-	-
20	.573	12.67	Av	9.9	0	22.57	-	-	46	-23.43
21	6.945	27.62	Pk	9.9	.1	37.62	60	-22.38	-	-
22	6.945	9.9	Av	9.9	.1	19.9	-	-	50	-30.1
23	10.563	24.99	Pk	10.1	.2	35.29	60	-24.71	-	-
24	10.563	10.65	Av	10.1	.2	20.95	-	-	50	-29.05

Pk - Peak detector

Av - Average detection