FCC CFR47 PART 15 SUBPART C

CERTIFICATION TEST REPORT

FOR

GSM/WCDMA/LTE Phone + BT/BLE, DTS/UNII a/b/g/n/ac, ANT+ and NFC

MODEL NUMBER : SM-G9287

FCC ID: A3LSMG9287

REPORT NUMBER: 15K21156-E5

ISSUE DATE: JUL 11, 2015

Prepared for
SAMSUNG ELECTRONICS CO., LTD.
129 SAMSUNG-RO, YEONGTONG-GU, SUWON-SI,
GYEONGGI-DO, 443-742, KOREA

Prepared by
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ACCREDITED
TL-637

Revision History

Rev.	Issue Date	Revisions	Revised By
--	07/11/15	Initial issue	SungGil Park

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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, ANT+ and NFC
MODEL NUMBER:	SM-G9287
SERIAL NUMBER:	R38G50YKSZV (RADIATED); R38G50YKT6K (CONDUCTED)
DATE TESTED:	JUN 17 - JUL 11, 2015

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:

CY Choi
Suwon Lab Engineer
UL Korea, Ltd.

Tested By:

SungGil Park
Suwon Lab Engineer
UL Korea, Ltd.

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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10-2009, FCC CFR 47 Part 2, FCC CFR 47 Part 15.

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, 443-823, 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

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:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)

36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

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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%.

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5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a GSM/WCDMA/LTE Phone+BT/BLE, DTS/UNII a/b/g/n/ac, ANT+ and NFC.
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 +	96.96	48.56	3.00

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an FPCB antennas, with a maximum gain of -1.55 dBi.

5.4. WORST-CASE CONFIGURATION AND MODE

Radiated emission and power line conducted emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

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

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5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Charger	SAMSUNG	EP-TA20UWE	R37FBRA0BL1DK3	N/A
Data Cable	SAMSUNG	EP-DG925UWE	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	Mini-USB	Shielded	0.8m	N/A
2	Audio	1	Mini-Jack	Unshielded	1.0m	N/A

TEST SETUP

The EUT is set to continuously transmit in ANT + test mode.

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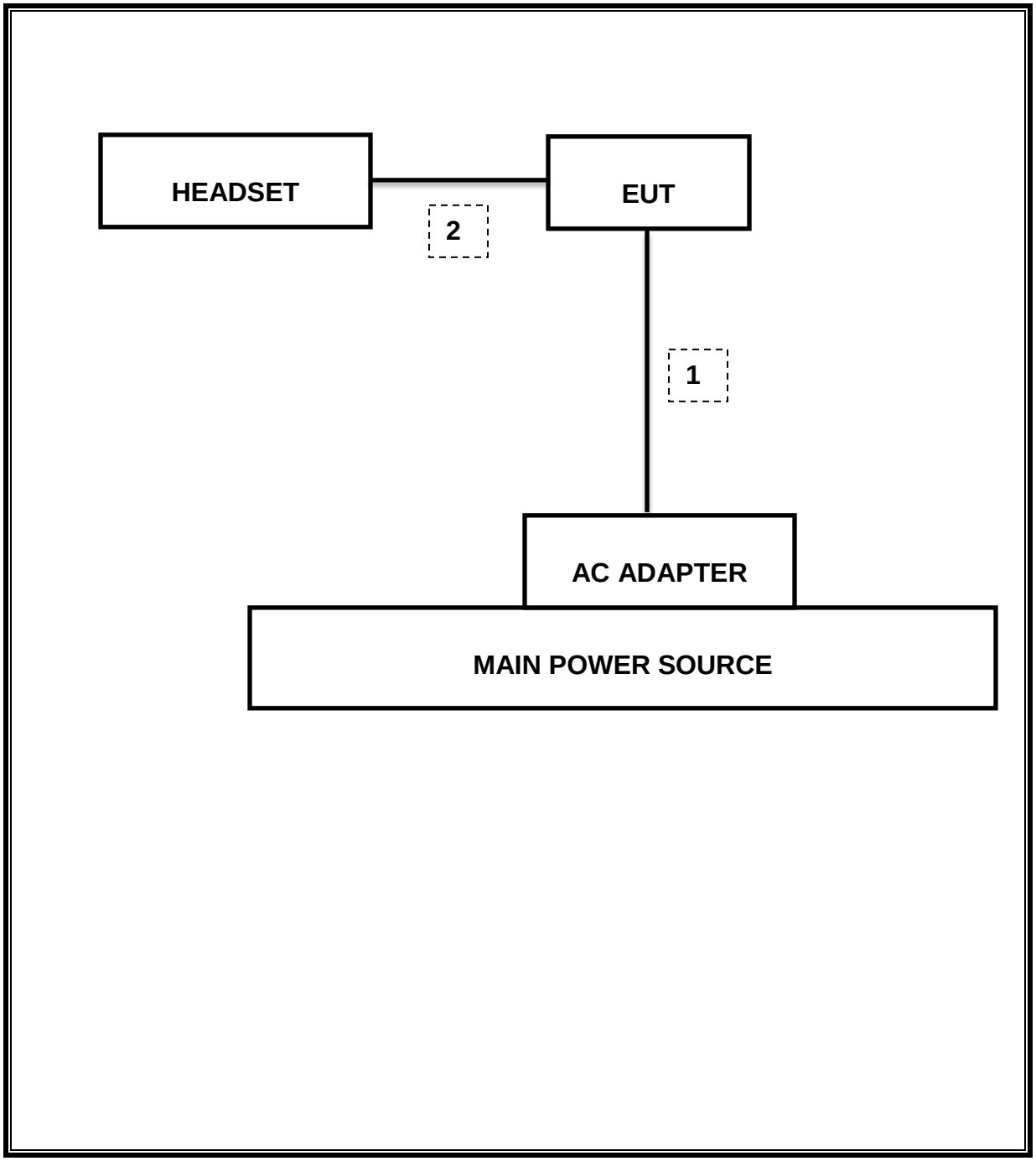
SETUP DIAGRAM FOR TESTS



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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	950	11-17-15
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	949	04-25-16
Antenna, Horn, 18 GHz	ETS	3117	00168717	06-17-16
Antenna, Horn, 18 GHz	ETS	3117	00168724	06-17-16
Antenna, Horn, 40 GHz	ETS	3116C	00166255	09-23-15
Antenna, Horn, 40 GHz	ETS	3116C-PA	00168841	09-29-15
Preamplifier, 1000 MHz	Sonoma	310N	341282	11-17-15
Preamplifier, 1000 MHz	Sonoma	310N	351741	05-19-16
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1876511	11-18-15
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54170614	09-23-15
Bluetooth Tester	TESCOM	TC-3000C	3000C000546	11-17-15
Average Power Sensor	R&S	NRZ-Z91	102681	11-17-15
Average Power Sensor	Agilent / HP	U2000	MY54270007	09-23-15
EMI Test Receive, 40 GHz	R&S	ESU40	100457	04-30-16
EMI Test Receive, 40 GHz	R&S	ESU40	100439	11-17-15
EMI Test Receive, 3 GHz	R&S	ESR3	101832	11-17-15
Attenuator / Switch driver	HP	11713A	3748A04272	N/A
Low Pass Filter 3GHz	Micro-Tronics	LPS17541	009	11-17-15
High Pass Filter 5GHz	Micro-Tronics	HPS17542	009	11-17-15
High Pass Filter 6GHz	Micro-Tronics	HPM17543	010	11-17-15
LISN	R&S	ENV-216	101836	04-09-16
LISN	R&S	ENV-216	101837	04-09-16

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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 [MHz]
Low	2402	1.009
Mid	2441	1.009
High	2480	1.010
Worst		1.010

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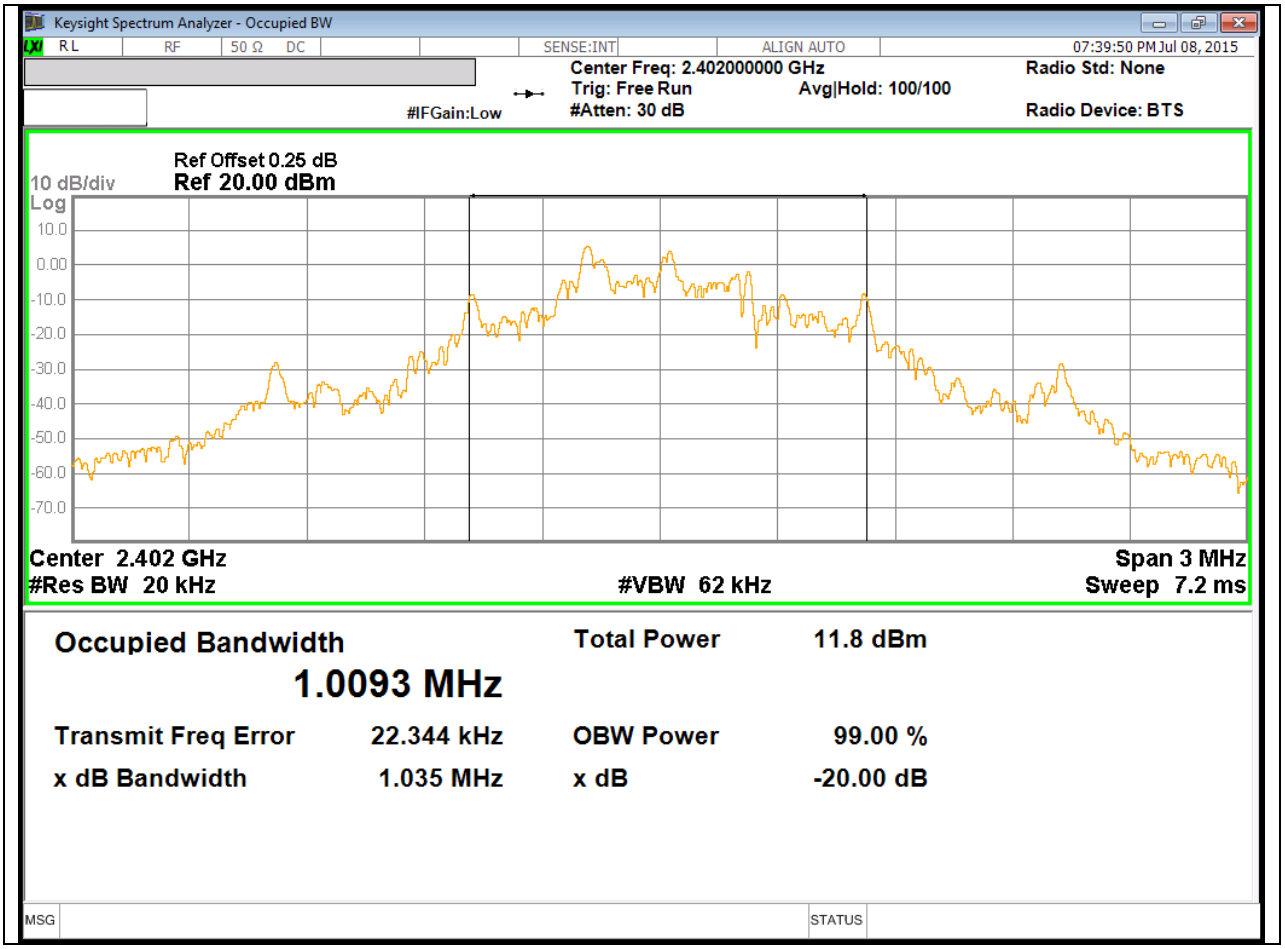
99% BANDWIDTH PLOTS

LOW CHANNEL



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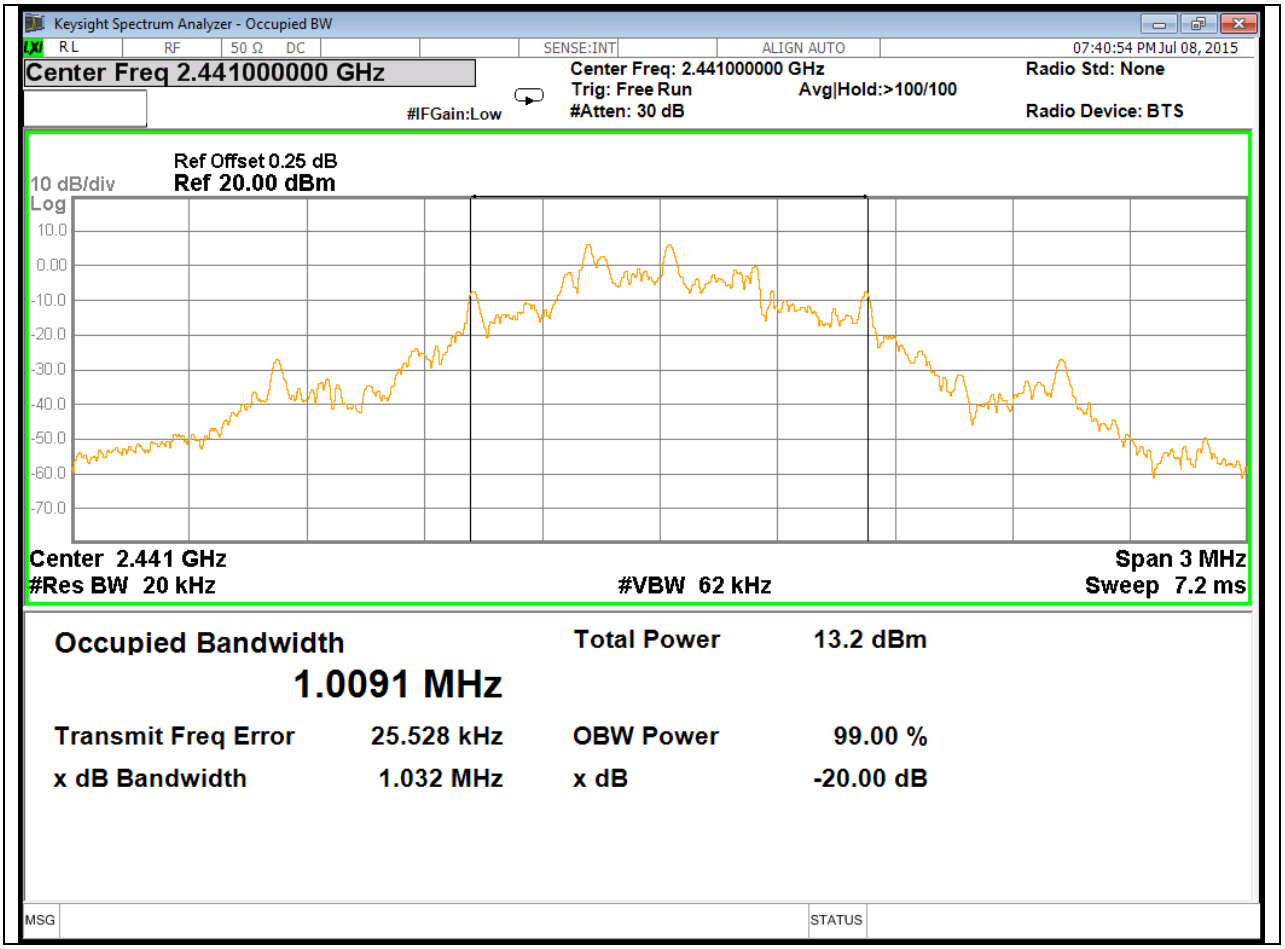
MID CHANNEL



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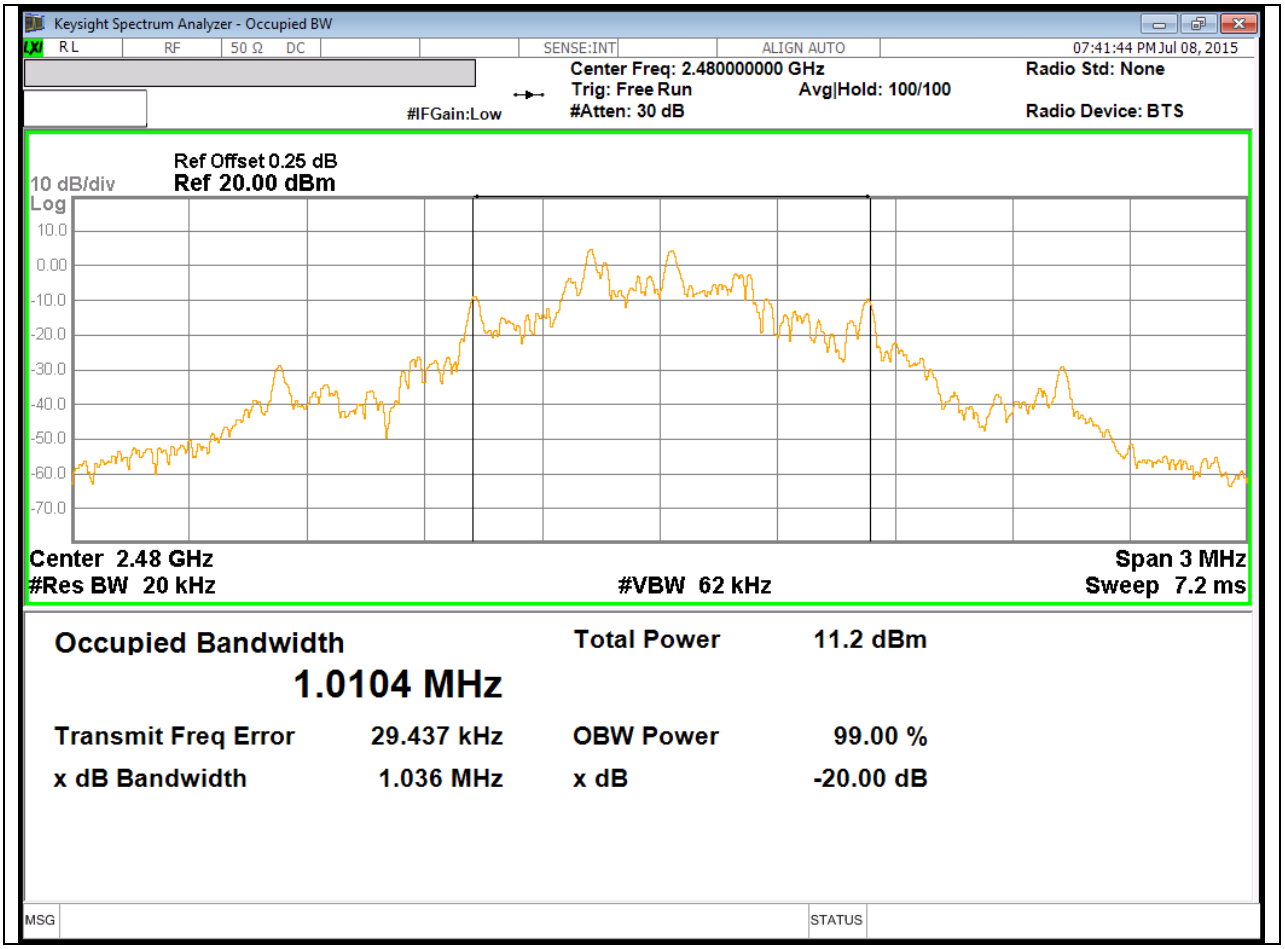
HIGH CHANNEL



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7.2. TRANSMITTER RADIATED EMISSIONS

TEST PROCEDURE

ANSI C63.10: 2009

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.

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
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.

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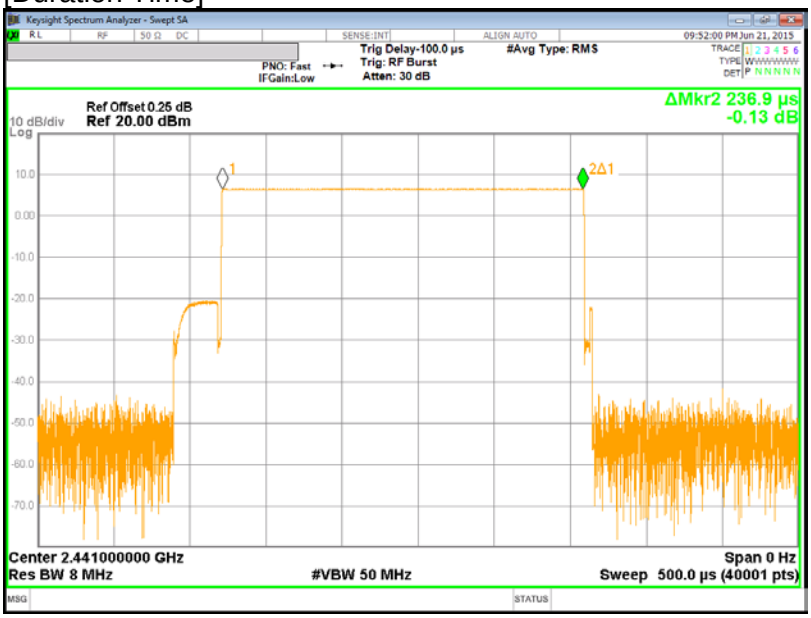
RESULTS

7.2.1. DUTY CYCLE

[Duty Cycle]

[Duration Time]



Duty Cycle = ON time / Period = 0.2369 / 62.50 = 0.38%
Duty Cycle Factor= 20log(0.0038) = 48.40 dB
VBW=1/(0.2369ms)= 4.221 kHz

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7.2.2. FUNDAMENTAL FREQUENCY RADIATED EMISSION

FCC
UL SUWON LAB
Chamber 2

Project #:	15K21156
Report #:	15K21156
Date& Time:	2015-07-04
Test Engr:	Steven.Kim

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

M% = ((t1+t2+t3+…)/T) * 66.83% = 0.38%

Av Reading = Pk Reading + 20*log(M%)
20 * log (M%) = -48.40

Freq.	Pk Rdg	Av Rdg	AF	Closs	Pre-amp	Pk Level	Av Level	Pk Limit	Av Limit	Pk Margin	Avg Margin	Pol	Az	Height
(MHz)	(dBuV)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	FCC_B	FCC_B	(dB)	(dB)	(H/V)	(Deg)	(Meter)
Low channel														
2402.00	81.59	33.19	32.00	-27.01	0.00	86.58	38.18	114.00	94.00	-27.42	-55.82	3mV	0.00	1.00
2402.00	91.97	43.57	32.00	-27.01	0.00	96.96	48.56	114.00	94.00	-17.04	-45.44	3mH	0.00	2.00
Mid channel														
2442.00	83.39	34.99	32.00	-27.01	0.00	88.38	39.98	114.00	94.00	-25.62	-54.02	3mV	0.00	1.00
2442.00	91.87	43.47	32.00	-27.01	0.00	96.86	48.46	114.00	94.00	-17.14	-45.54	3mH	0.00	2.00
High channel														
2480.00	85.28	36.88	32.00	-27.01	0.00	90.27	41.87	114.00	94.00	-23.73	-52.13	3mV	0.00	1.00
2480.00	91.80	43.40	32.00	-27.01	0.00	96.79	48.39	114.00	94.00	-17.21	-45.61	3mH	0.00	2.00

AVG VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

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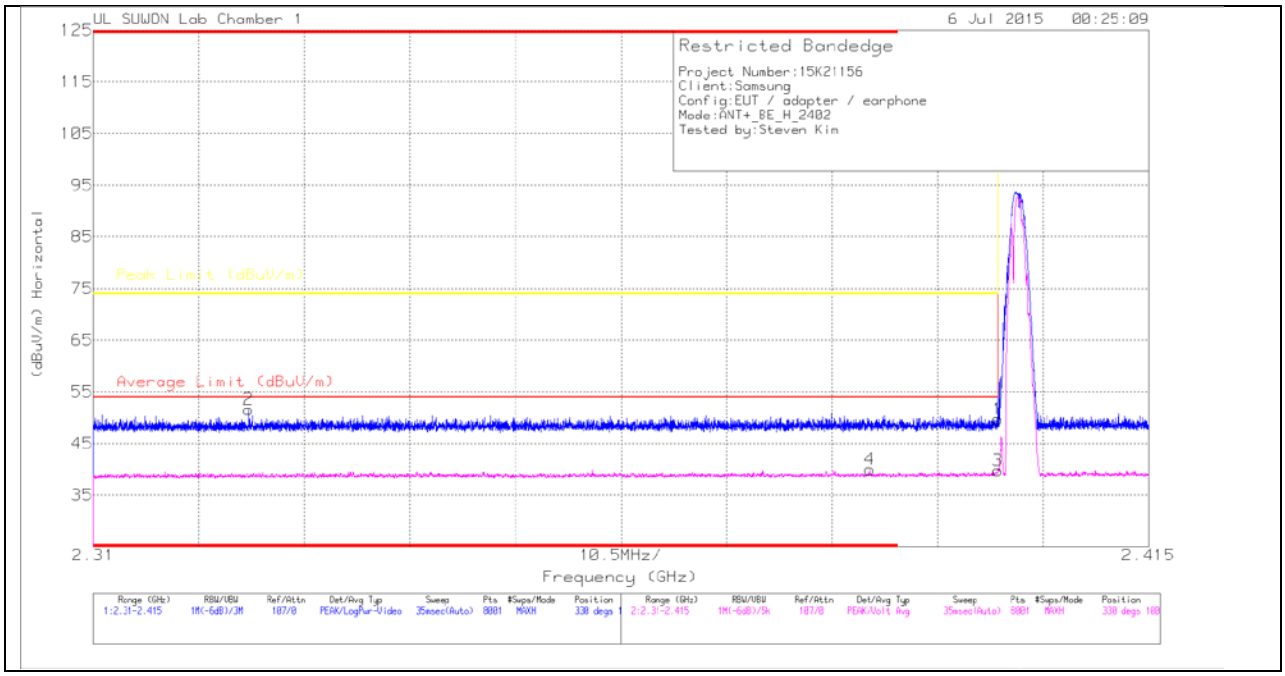
7.2.3. TRANSMITTER RESTRICTED BAND EDGES

BANDEDGE (LOW CHANNEL, HORIZONTAL)



HORIZONTAL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_2_10 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	40.71	Pk	31.8	-22.8	49.71	-	-	74	-24.29	330	100	H
2	* 2.325	42.82	Pk	31.7	-22.9	51.62	-	-	74	-22.38	330	100	H
3	2.4	30.77	VB1T	31.8	-22.8	39.77	54	-14.23	-	-	330	100	H
4	* 2.387	30.98	VB1T	31.8	-22.8	39.98	54	-14.02	-	-	330	100	H

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

Pk - Peak detector

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

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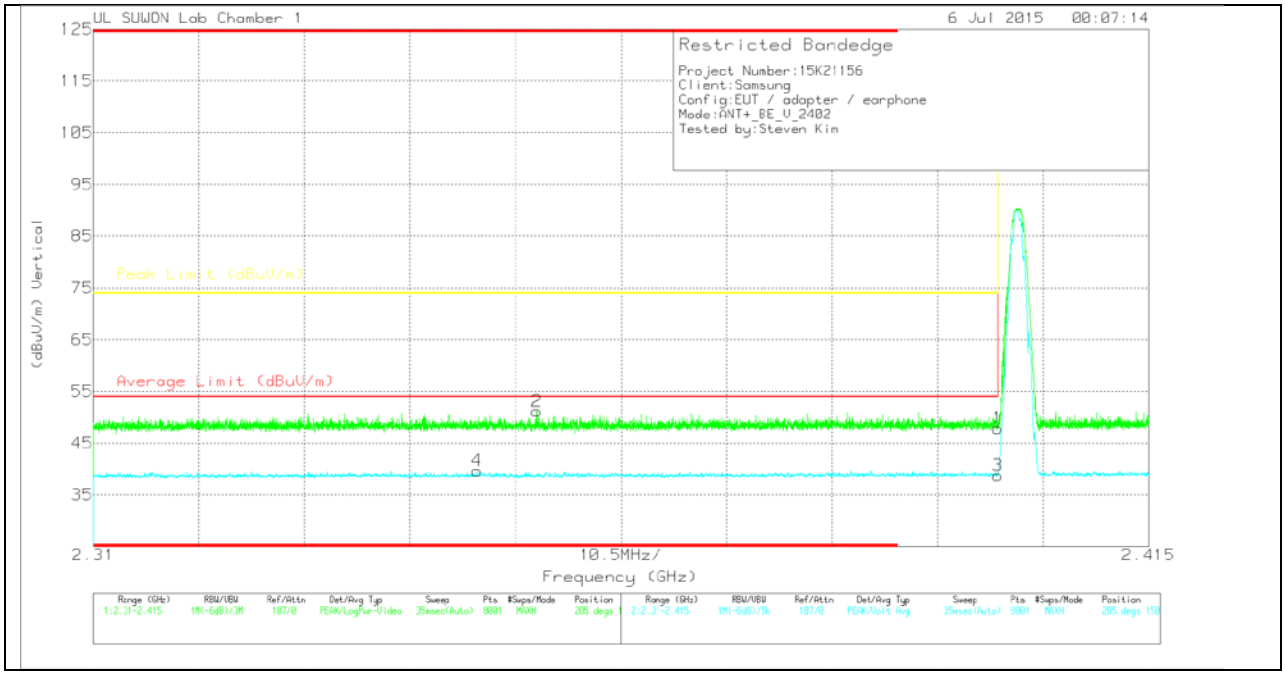
VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_2_10 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	38.89	Pk	31.8	-22.8	47.89	-	-	74	-26.11	205	150	V
2	* 2.354	42.39	Pk	31.7	-22.9	51.19	-	-	74	-22.81	205	150	V
3	2.4	29.77	VB1T	31.8	-22.8	38.77	54	-15.23	-	-	205	150	V
4	* 2.348	30.88	VB1T	31.7	-22.9	39.68	54	-14.32	-	-	205	150	V

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

Pk - Peak detector

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

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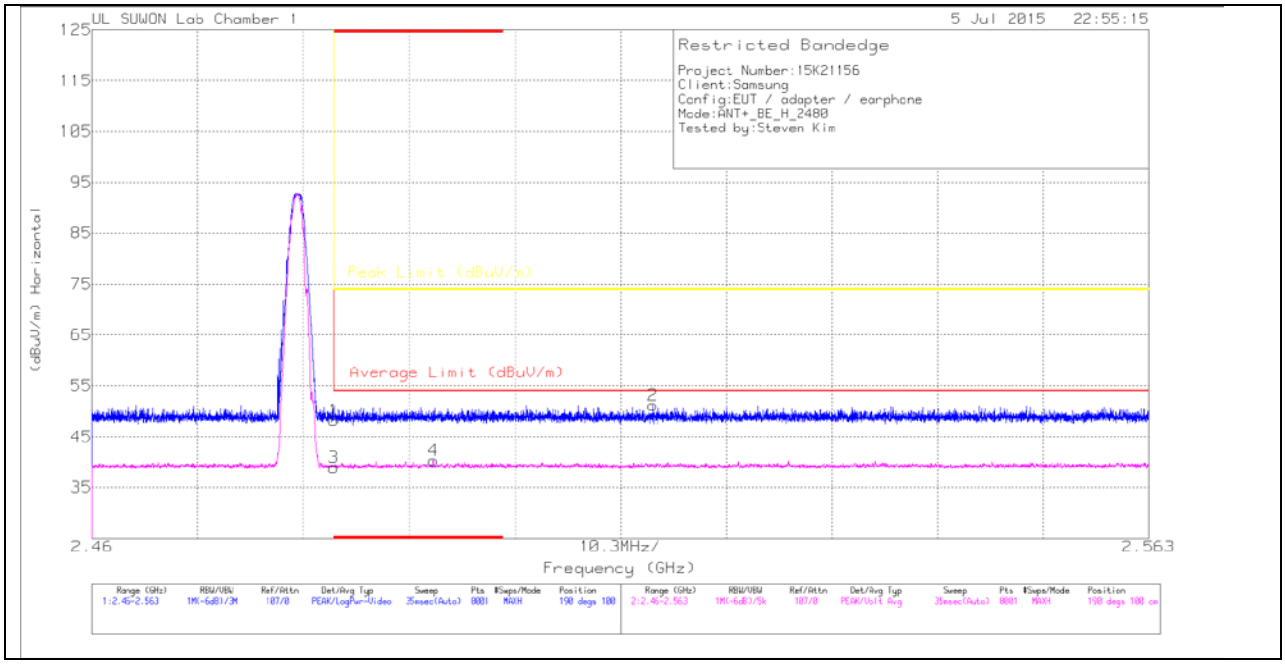
AUTHORIZED BANDEDGE (HIGH CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_2_10 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	38.81	Pk	32	-22.6	48.21	-	-	74	-25.79	190	100	H
2	2.515	41.84	Pk	32	-22.6	51.24	-	-	74	-22.76	190	100	H
3	* 2.484	29.58	VB1T	32	-22.6	38.98	54	-15.02	-	-	190	100	H
4	* 2.493	30.93	VB1T	32	-22.6	40.33	54	-13.67	-	-	190	100	H

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

Pk - Peak detector

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

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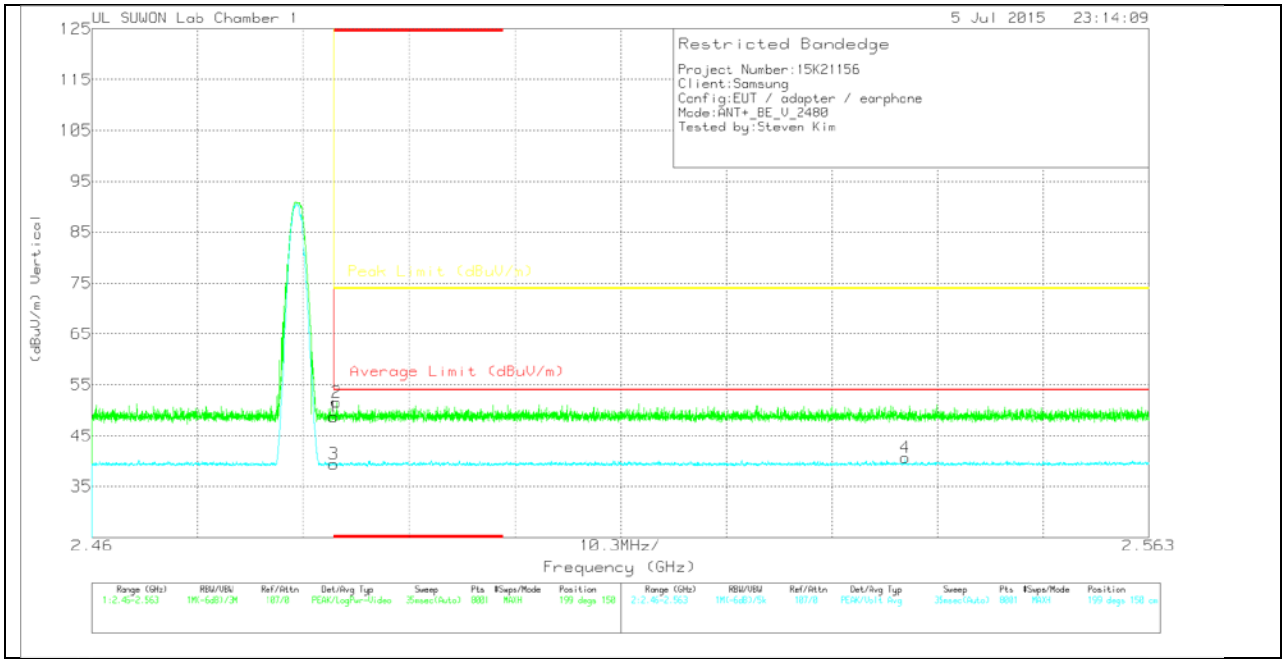
VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_2_10 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	39.36	Pk	32	-22.6	48.76	-	-	74	-25.24	199	150	V
2	* 2.484	42.17	Pk	32	-22.6	51.57	-	-	74	-22.43	199	150	V
3	* 2.484	29.99	VB1T	32	-22.6	39.39	54	-14.61	-	-	199	150	V
4	2.539	31.23	VB1T	32	-22.6	40.63	54	-13.37	-	-	199	150	V

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

Pk - Peak detector

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

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HARMONICS AND SPURIOUS EMISSIONS ABOVE 1GHz

HARMONICS

FCC
UL SUWON LAB
Chamber 2

Project #:	15K21156
Report #:	15K21156
Date& Time:	2015-07-04
Test Engr:	Steven.Kim

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

M% = ((t1+t2+t3+…)/T) * 66.83% = 0.38%

Av Reading = Pk Reading + 20*log(M%)
20 * log (M%) = -48.40

Freq.	Pk Rdg	Av Rdg	AF	Closs	Pre-amp	Pk Level	Av Level	Pk Limit	Av Limit	Pk Margin	Avg Margin	Pol	Az	Height
(MHz)	(dBuV)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	FCC_B	FCC_B	(dB)	(dB)	(H/V)	(Deg)	(Meter)
Low channel														
4804.00	36.91	27.72	35.00	-25.70	0.00	46.21	37.02	74.00	54.00	-27.79	-16.98	3mV	0.00	1.00
4804.00	37.48	27.86	35.00	-25.70	0.00	46.78	37.16	74.00	54.00	-27.22	-16.84	3mH	0.00	2.00
Mid channel														
4884.00	36.83	27.45	35.00	-25.70	0.00	46.13	36.75	74.00	54.00	-27.87	-17.25	3mV	0.00	1.00
4884.00	36.40	27.39	35.00	-25.70	0.00	45.70	36.69	74.00	54.00	-28.30	-17.31	3mH	0.00	2.00
High channel														
4960.00	36.27	27.45	35.00	-25.70	0.00	45.57	36.75	74.00	54.00	-28.43	-17.25	3mV	0.00	1.00
4960.00	36.48	28.20	35.00	-25.70	0.00	45.78	37.50	74.00	54.00	-28.22	-16.50	3mH	0.00	2.00

AVG VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

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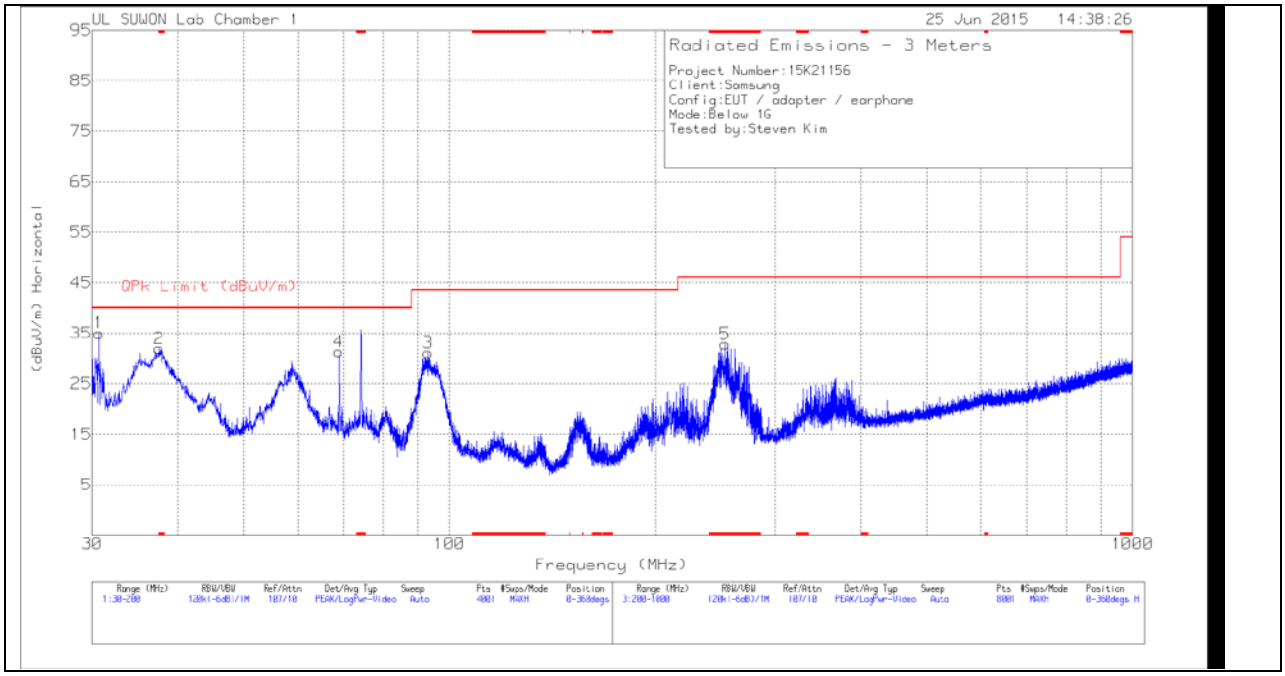
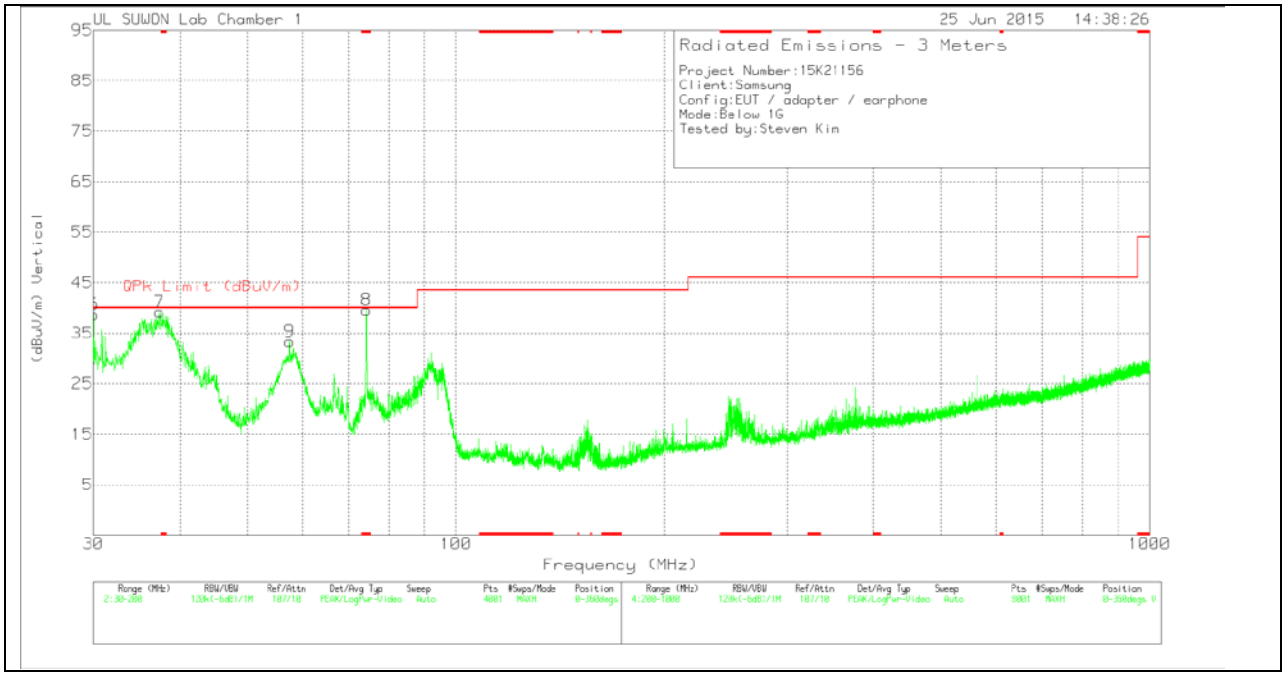
7.2.4. SPURIOUS BELOW 1 GHz

SPURIOUS EMISSIONS 30 TO 1000 MHz (HORIZONTAL)



VERTICAL PLOT



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BELOW 1 GHz TABLE

TRACE MARKERS

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	VULB9163-750	Bi-Log	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	30.7225	55.21	Pk	10.3	-30.5	35.01	40	-4.99	0-360	100	H
2	* 37.5225	50.86	Pk	11.5	-30.4	31.96	40	-8.04	0-360	300	H
3	93.07	50.41	Pk	10.1	-29.4	31.11	43.52	-12.41	0-360	200	H
4	68.8875	51.15	Pk	10	-29.8	31.35	40	-8.65	0-360	400	H
6	30.0425	58.92	Pk	10.3	-30.5	38.72	40	-1.28	0-360	200	V
7	37.395	58.21	Pk	11.4	-30.4	39.21	40	-.79	0-360	100	V
8	* 74.2425	60.8	Pk	8.5	-29.7	39.6	40	-.4	0-360	100	V
9	57.54	50.47	Pk	12.9	-30	33.37	40	-6.63	0-360	100	V
5	* 253.3	48.25	Pk	12.4	-27.8	32.85	46.02	-13.17	0-360	100	H

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

Pk - Peak detector

Radiated Emissions

Frequency (MHz)	Meter Reading (dBuV)	Det	VULB9163 -750	Bi-Log	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
30.1557	47.23	Qp	10.3	-30.5	27.03	40	-12.97	246	100	V
37.155	55.06	Qp	11.3	-30.4	35.96	40	-4.04	326	113	V
* 74.0025	38.75	Qp	8.5	-29.7	17.55	40	-22.45	136	109	V

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

Qp - Quasi-Peak detector

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8. 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

ANSI C63.10 - 2009

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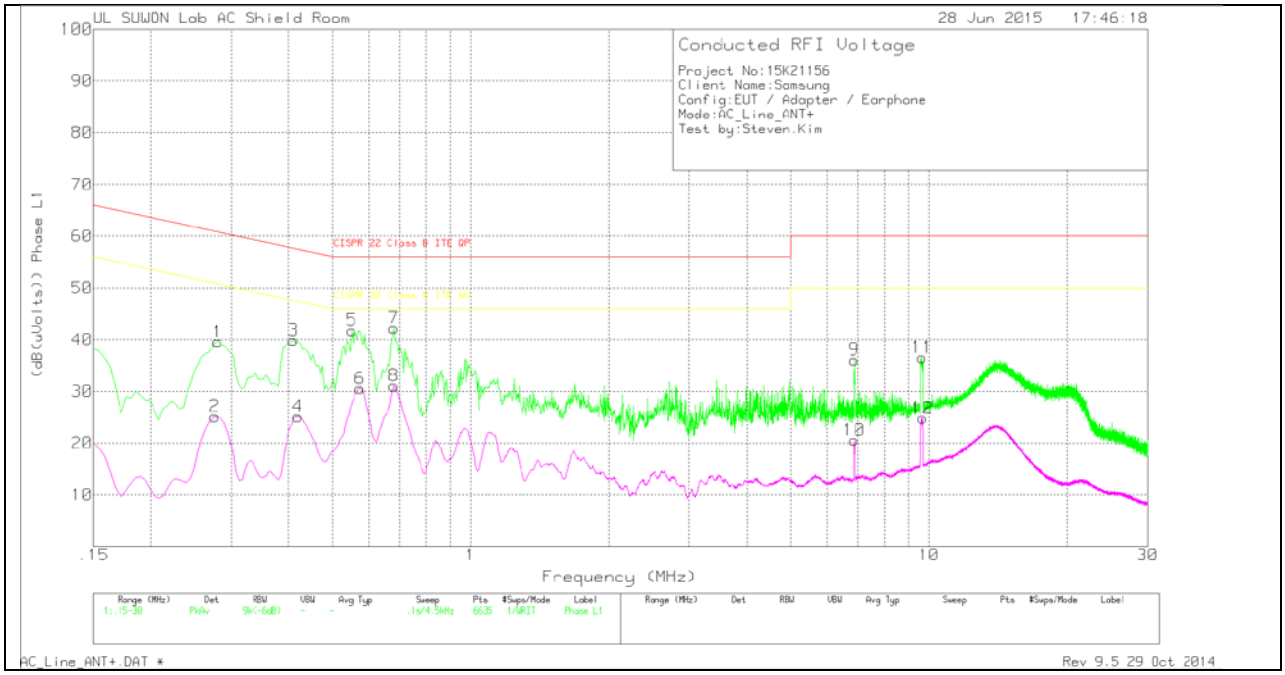
RESULTS

6 WORST EMISSIONS

LINE 1 PLOT



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LINE 1 RESULTS

TRACE MARKERS

Phase L1 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	101837_with ex-cord_L1	CE Shield Room	Corrected Reading (dBuV)	CISPR 22 Class B ITE QP	Margin (dB)	CISPR 22 Class B ITE AV	Margin (dB)
1	.2805	29.8	Pk	9.8	0	39.6	60.8	-21.2	-	-
2	.276	15.38	Av	9.8	0	25.18	-	-	50.94	-25.76
3	.411	29.79	Pk	10.1	0	39.89	57.63	-17.74	-	-
4	.42	15.05	Av	10.1	0	25.15	-	-	47.45	-22.3
5	.5505	31.73	Pk	10.1	0	41.83	56	-14.17	-	-
6	.573	20.47	Av	10.1	0	30.57	-	-	46	-15.43
7	.681	32.17	Pk	10.1	0	42.27	56	-13.73	-	-
8	.681	21.01	Av	10.1	0	31.11	-	-	46	-14.89
9	6.8685	26.22	Pk	9.8	.1	36.12	60	-23.88	-	-
10	6.864	10.71	Av	9.8	.1	20.61	-	-	50	-29.39
11	9.654	26.46	Pk	9.9	.2	36.56	60	-23.44	-	-
12	9.681	14.77	Av	9.9	.2	24.87	-	-	50	-25.13

Pk - Peak detector

Av - Average detection

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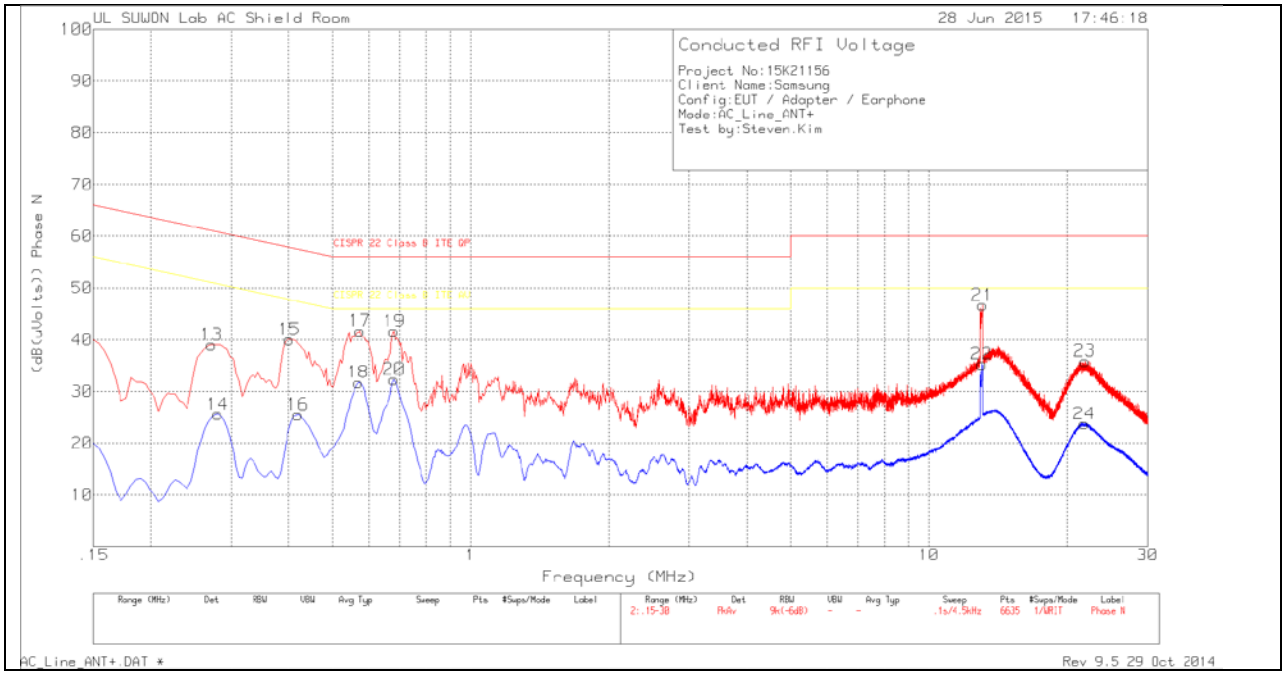
LINE 2 PLOT



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LINE 2 RESULTS

TRACE MARKERS

Phase N .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	101837_with ex-cord_N	CE Shield Room	Corrected Reading (dBuV)	CISPR 22 Class B ITE QP	Margin (dB)	CISPR 22 Class B ITE AV	Margin (dB)
13	.2715	29.23	Pk	9.8	0	39.03	61.07	-22.04	-	-
14	.2805	15.8	Av	9.8	0	25.6	-	-	50.8	-25.2
15	.402	29.94	Pk	10.1	0	40.04	57.81	-17.77	-	-
16	.42	15.42	Av	10.1	0	25.52	-	-	47.45	-21.93
17	.573	31.61	Pk	10.1	0	41.71	56	-14.29	-	-
18	.5685	21.65	Av	10.1	0	31.75	-	-	46	-14.25
19	.681	31.68	Pk	10	0	41.68	56	-14.32	-	-
20	.681	22.32	Av	10	0	32.32	-	-	46	-13.68
21	13.074	36.28	Pk	10.2	.2	46.68	60	-13.32	-	-
22	13.038	24.9	Av	10.2	.2	35.3	-	-	50	-14.7
23	21.8625	24.98	Pk	10.7	.2	35.88	60	-24.12	-	-
24	21.831	12.87	Av	10.7	.2	23.77	-	-	50	-26.23

Pk - Peak detector

Av - Average detection

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