FCC CFR47 PART 15 SUBPART C

DTS Wireless LAN

CERTIFICATION TEST REPORT

FOR

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

MODEL NUMBER : SM-T719

FCC ID: A3LSMT719

REPORT NUMBER: 16K22866-E1V2

ISSUE DATE: MAR 31, 2016

Prepared for
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129 SAMSUNG-RO, YEONGTONG-GU, SUWON-SI,
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ACCREDITED
TL-637

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	03/18/16	Initial issue	Junwhan Lee
V2	03/31/16	Revised description of antenna gain on page 31	Junwhan Lee

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	SAMSUNG ELECTRONICS CO., LTD.
EUT DESCRIPTION:	GSM/WCDMA/LTE Tablet + BT/BLE, DTS/UNII a/b/g/n/ac and ANT+
MODEL NUMBER:	SM-T719
SERIAL NUMBER:	R32H2000PJA (RADIATED); R32H20000WM (CONDUCTED)
DATE TESTED:	FEB 15, 2016 - MAR 10, 2016

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:

Junwhan Lee
Suwon Lab Engineer
UL Korea, Ltd.

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, 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

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

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 GSM/WCDMA/LTE Tablet + BT/BLE, DTS/UNII a/b/g/n/ac and ANT+.
This test report addresses the DTS (WLAN) operational mode.

WiFi MIMO Condition

Frequency	Mode	Antenna 1	Antenna 2
2.4 GHz	802.11b	TX / RX	TX / RX
	802.11g	TX / RX	TX / RX
	802.11n	TX / RX	TX / RX
	802.11n MIMO	TX / RX	TX / RX
5 GHz	802.11a	TX / RX	TX / RX
	802.11n	TX / RX	TX / RX
	802.11ac	TX / RX	TX / RX
	802.11n/ac MIMO	TX / RX	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]	
		Antenna1	Antenna2	Antenna1	Antenna2
2412 - 2472	802.11b	19.27	19.31	84.53	85.31
	802.11g	15.96	16.00	39.45	39.81
	802.11g MIMO	18.99		79.25	
	802.11n SISO	15.80	16.40	38.02	43.65
	802.11n MIMO	19.09		81.10	

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes FPCB antennas, with a antenna1's maximum gain of -4.78 dBi and antenna2's maximum gain of -9.6 dBi .

5.4. LIST OF TEST REDUCTION AND MODES

The output power on covered modes is equal to or less than one referenced.

2400 - 2483.5 MHz Authorized Frequency Band (Antenna Port & Radiated Testing)		
Frequency Range (MHz)	Mode	Covered by
2412 - 2472	802.11b Legacy 1TX	802.11b Legacy 1TX
	802.11g Legacy 1TX	802.11g CDD 2TX
	802.11n 1TX	802.11n HT20 CDD 2TX
	802.11n STBC 2TX	802.11n HT20 CDD 2TX

5.5. 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.

Based on the baseline scan, the worst-case data rates were:

802.11b mode: 1 Mbps
802.11g mode: 6 Mbps
802.11n HT20 mode: MCS0

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Charger	SAMSUNG	EP-TA20EWE	R37G4AH1402DK3	N/A
Data Cable	SAMSUNG	EP-DG925UWE	N/A	N/A
Earphone	SAMSUNG	EO-EG900BW	N/A	N/A

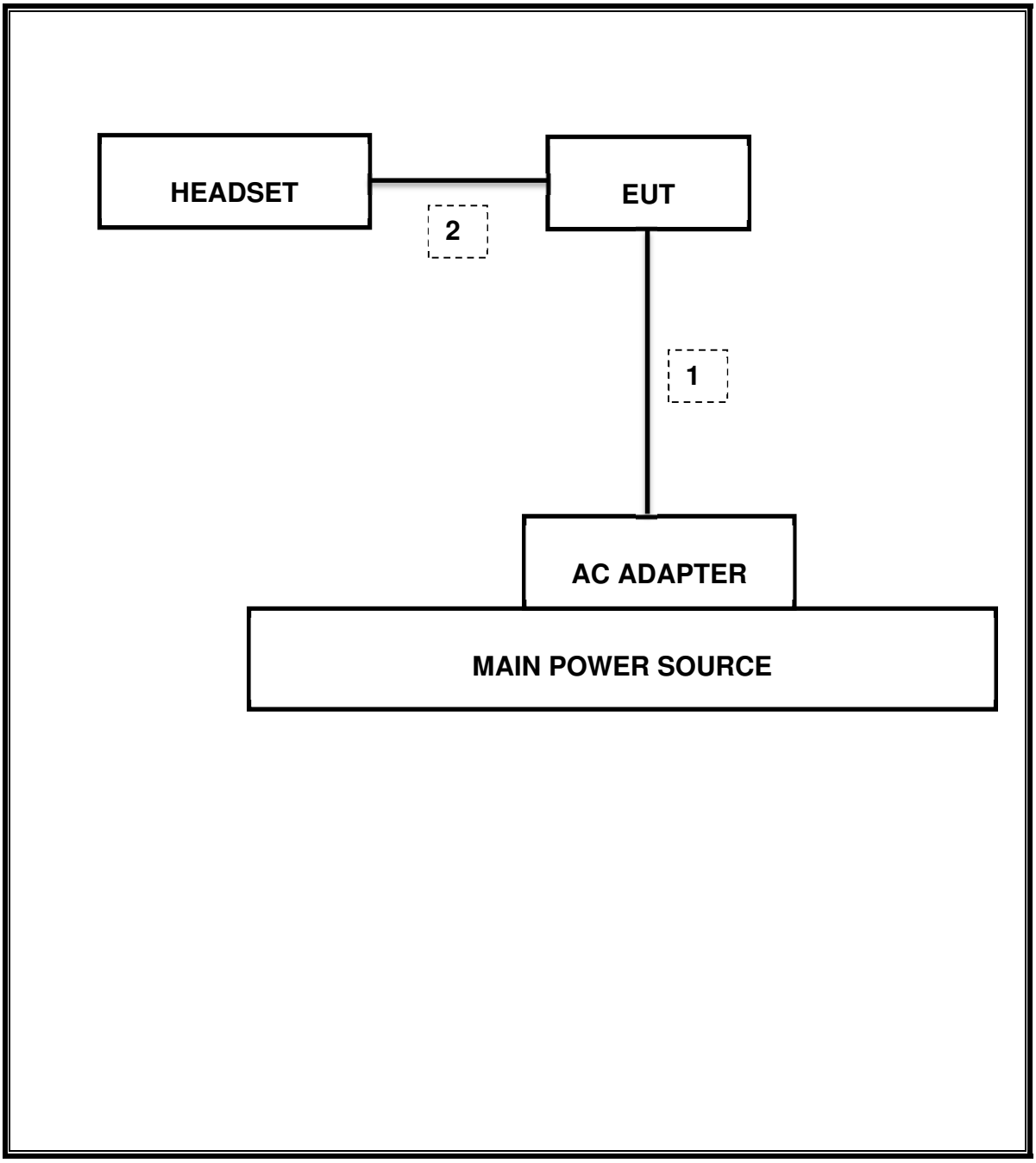
I/O CABLES

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

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	750	11-17-16
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	749	04-25-17
Antenna, Horn, 18 GHz	ETS	3115	00167211	09-20-16
Antenna, Horn, 18 GHz	ETS	3115	00161451	05-17-17
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	09-23-16
Antenna, Horn, 40 GHz	ETS	3116C-PA	00168841	08-24-17
Preamplifier, 1000 MHz	Sonoma	310N	341282	08-18-16
Preamplifier, 1000 MHz	Sonoma	310N	351741	08-18-16
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1876511	08-18-16
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1896138	08-18-16
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54170614	08-19-16
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54490312	08-19-16
Bluetooth Tester	TESCOM	TC-3000C	3000C000546	08-18-16
Average Power Sensor	R&S	NRZ-Z91	102681	08-18-16
Average Power Sensor	Agilent / HP	U2000	MY54270007	08-18-16
EMI Test Receive, 40 GHz	R&S	ESU40	100439	08-19-16
EMI Test Receive, 40 GHz	R&S	ESU40	100457	08-19-16
EMI Test Receive, 3 GHz	R&S	ESR3	101832	08-19-16
Attenuator / Switch driver	HP	11713A	3748A04272	N/A
Low Pass Filter 3GHz	Micro-Tronics	LPS17541	009	08-18-16
Low Pass Filter 3GHz	Micro-Tronics	LPS17541	015	08-18-16
High Pass Filter 5GHz	Micro-Tronics	HPS17542	009	08-18-16
High Pass Filter 6GHz	Micro-Tronics	HPM17543	010	08-18-16
High Pass Filter 5GHz	Micro-Tronics	HPS17542	016	08-18-16
High Pass Filter 6GHz	Micro-Tronics	HPM17543	015	08-18-16
LISN	R&S	ENV-216	101836	08-19-16
LISN	R&S	ENV-216	101837	08-19-16

7. MEASUREMENT METHODS

KDB 558074 D01 DTS Meas Guidance v03r04: Measurement Procedure §9.2.3.1 AVGPM is used for average power and §10.5 AVGPSD-2 is used for power spectral density.

Unwanted emissions within Restricted Bands are measured using traditional radiated procedures.

Band edge emissions within Restricted Bands are measured using RMS with duty cycle factor offset method.

8. ON TIME, DUTY CYCLE AND MEASUREMENT METHODS

LIMITS

None; for reporting purposes only.

8.1. ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time B [msec)	Period [msec]	Duty Cycle x [linear]	Duty Cycle [%]	Duty Cycle Correction Factor [dB]	1/T Minimum VBW [kHz]
2400MHz Bands						
802.11b	8.624	8.726	0.988	98.8%	0.00	0.010
802.11g	1.432	1.530	0.936	93.6%	0.29	0.698
802.11n HT20	1.34	1.438	0.932	93.2%	0.31	0.746

[802.11b Mode]

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[802.11g Mode]

[802.11n Mode]

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9. SUMMARY TABLE

FCC Part Section	Test Description	Test Limit	Test Condition	Test Result	Worst Case
15.247 (a)(2)	Occupied Band width (6dB)	>500KHz	Conducted	Pass	7.53 MHz
2.1051, 15.247 (d)	Band Edge / Conducted Spurious Emission	-20dBc		Pass	-41.119 dBm
15.247	TX conducted output power	<30dBm		Pass	19.31 dBm
15.247	PSD	<8dBm		Pass	-11.64 dBm
15.207 (a)	AC Power Line conducted emissions	Section 10	Power Line conducted	Pass	47.71 dBuV (QP)
15.205, 15.209	Radiated Spurious Emission	< 54dBuV/m	Radiated	Pass	51.89 dBuV/m (QP)

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10. ANTENNA PORT TEST RESULTS

10.1. 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 DTS Meas Guidance v03r04: The transmitter output is connected to a spectrum analyzer with the RBW set to100KHz, the VBW >= 3 x RBW, peak detector and max hold.

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RESULTS

10.1.1. 802.11b MODE IN THE 2.4 GHz BAND

Channel	Frequency [MHz]	6 dB Bandwidth [MHz]		Minimum Limit [MHz]
		Primary Antenna 1	Secondary Antenna 2	
Low	2412	8.048	7.530	0.5
Mid	2437	8.527	8.055	0.5
High	2462	8.048	8.016	0.5
12	2467	8.037	7.581	0.5
13	2472	8.063	7.555	0.5
Worst		7.53		

10.1.2. 802.11g MODE IN THE 2.4 GHz BAND

Channel	Frequency [MHz]	6 dB Bandwidth [MHz]		Minimum Limit [MHz]
		Primary Antenna 1	Secondary Antenna 2	
Low	2412	16.297	15.714	0.5
Mid	2437	15.908	15.914	0.5
High	2462	16.045	16.303	0.5
12	2467	15.928	16.312	0.5
13	2472	16.310	15.337	0.5
Worst		15.337		

10.1.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

Channel	Frequency [MHz]	6 dB Bandwidth [MHz]		Minimum Limit [MHz]
		Chain 0	Chain 1	
Low	2412	17.035	16.088	0.5
Mid	2437	16.375	16.081	0.5
High	2462	16.093	17.151	0.5
12	2467	16.076	16.912	0.5
13	2472	17.303	15.475	0.5
Worst		15.475		

10.1.4. 6 dB BANDWIDTH PLOTS

[Primary Antenna] 802.11b Mode Low CH

[Secondary Antenna] 802.11b Mode Low CH

[Primary Antenna] 802.11b Mode Middle CH

[Secondary Antenna] 802.11b Mode Middle CH

[Primary Antenna] 802.11b Mode High CH

[Secondary Antenna] 802.11b Mode High CH

[Primary Antenna] 802.11b Mode 12 CH

[Secondary Antenna] 802.11b Mode 12 CH

[Primary Antenna] 802.11b Mode 13 CH

[Secondary Antenna] 802.11b Mode 13 CH

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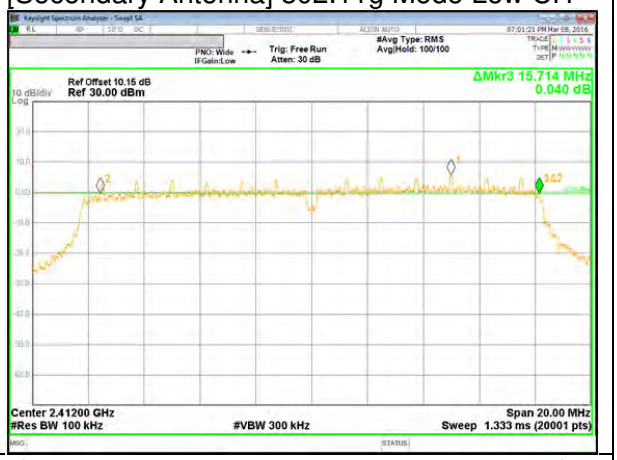
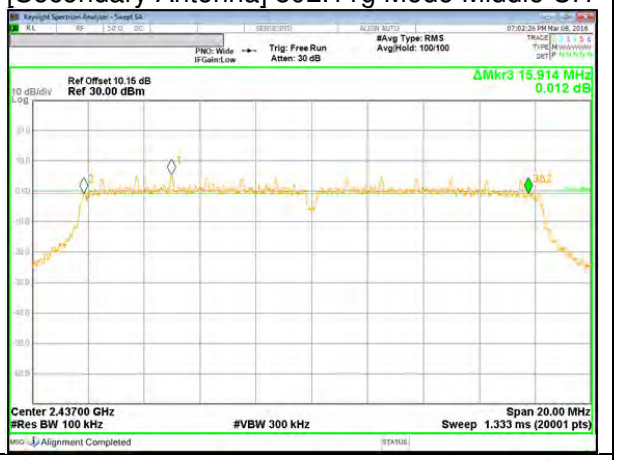
[Primary Antenna] 802.11g Mode Low CH

[Secondary Antenna] 802.11g Mode Low CH



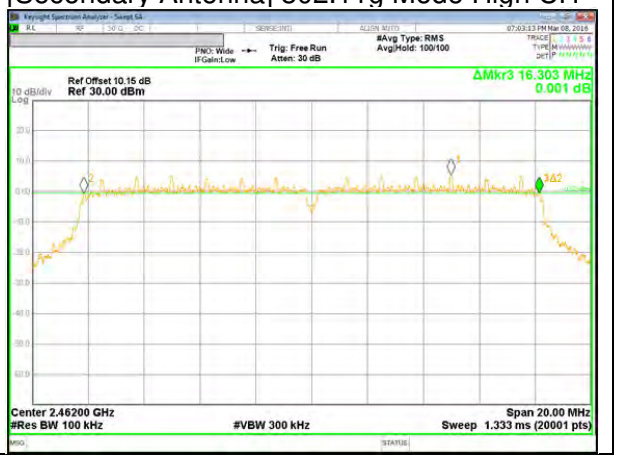
[Primary Antenna] 802.11g Mode Middle CH

[Secondary Antenna] 802.11g Mode Middle CH



[Primary Antenna] 802.11g Mode High CH

[Secondary Antenna] 802.11g Mode High CH



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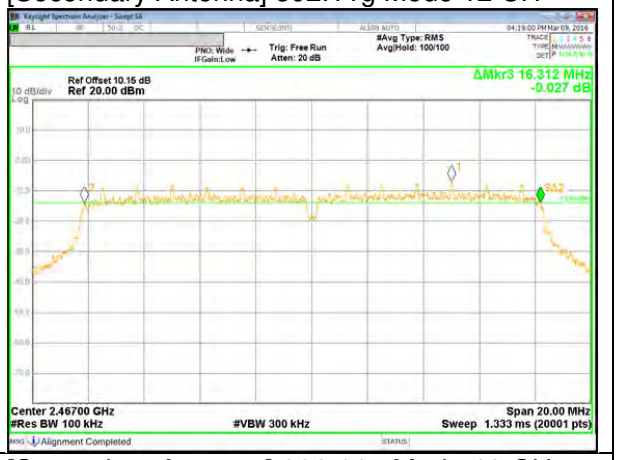
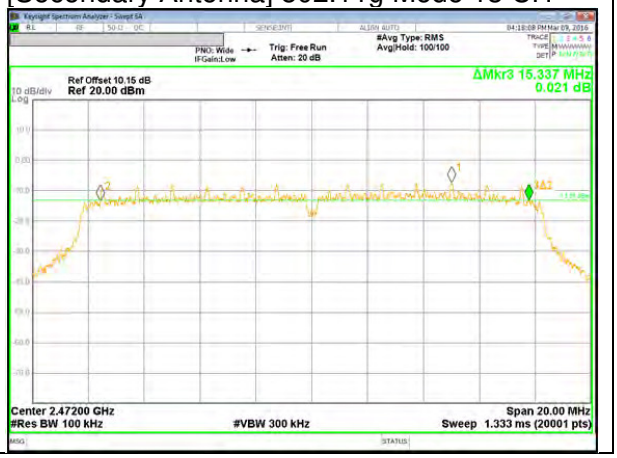
[Primary Antenna] 802.11g Mode 12 CH

[Secondary Antenna] 802.11g Mode 12 CH



[Primary Antenna] 802.11g Mode 13 CH

[Secondary Antenna] 802.11g Mode 13 CH



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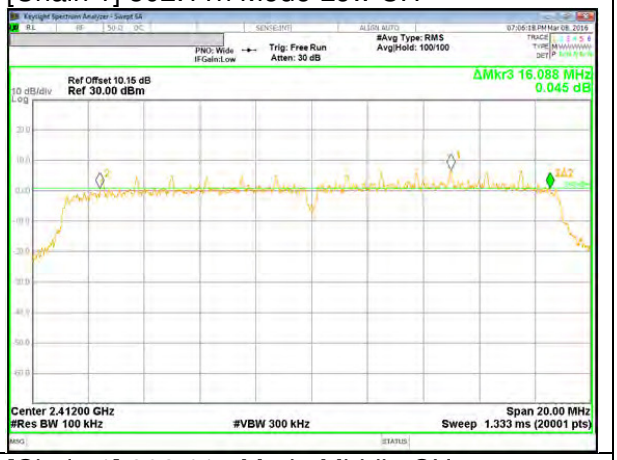
[Chain 0] 802.11n Mode Low CH

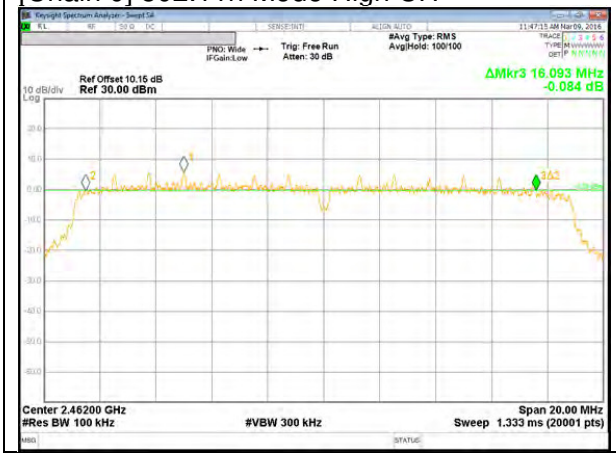
[Chain 1] 802.11n Mode Low CH



[Chain 0] 802.11n Mode Middle CH

[Chain 1] 802.11n Mode Middle CH

[Chain 0] 802.11n Mode High CH



[Chain 1] 802.11n Mode High CH

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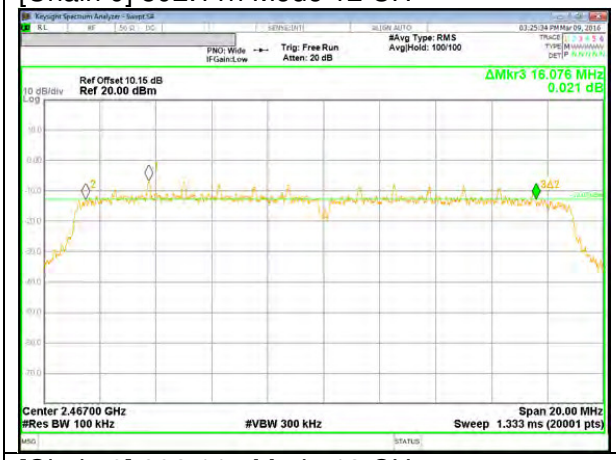
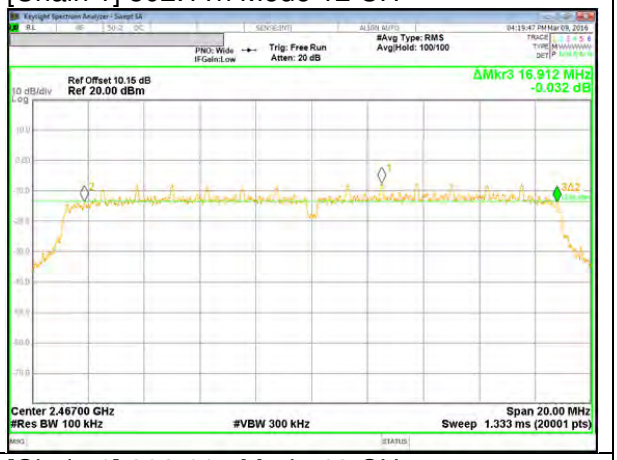
[Chain 0] 802.11n Mode 12 CH

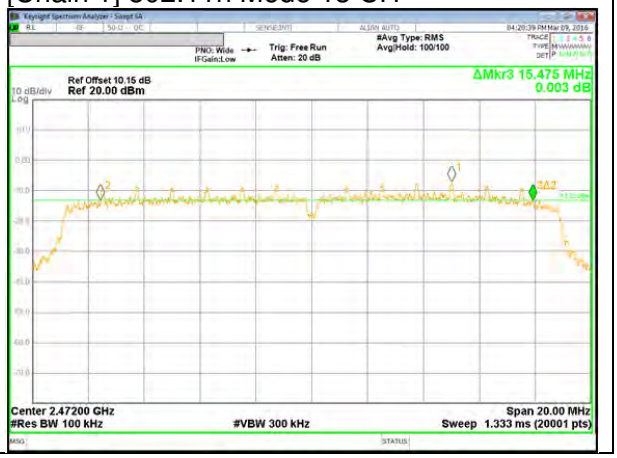


[Chain 1] 802.11n Mode 12 CH



[Chain 0] 802.11n Mode 13 CH

[Chain 1] 802.11n Mode 13 CH



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10.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

10.2.1. 802.11b MODE IN THE 2.4 GHz BAND

Channel	Frequency [MHz]	99% Bandwidth [MHz]	
		Primary Antenna 1	Secondary Antenna 2
Low	2412	12.968	12.823
Mid	2437	12.972	12.831
High	2462	13.184	12.961
12	2467	12.984	13.010
13	2472	13.168	12.869
Worst		12.823	

10.2.2. 802.11g MODE IN THE 2.4 GHz BAND

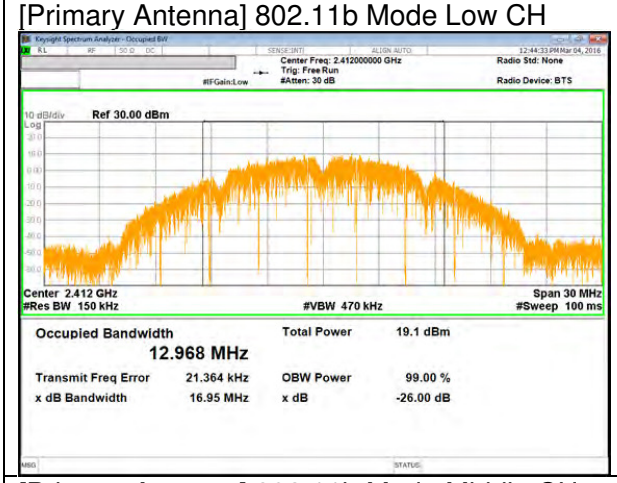
Channel	Frequency [MHz]	99% Bandwidth [MHz]	
		Primary Antenna 1	Secondary Antenna 2
Low	2412	16.433	16.396
Mid	2437	16.396	16.404
High	2462	16.405	16.425
12	2467	16.431	16.414
13	2472	16.409	16.355
Worst		16.355	

10.2.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

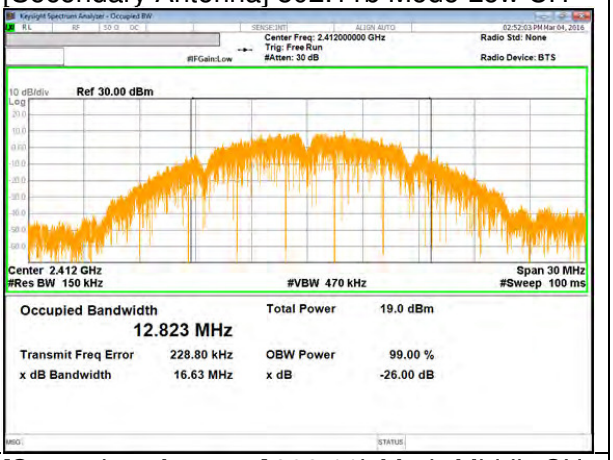
Channel	Frequency [MHz]	99% Bandwidth [MHz]	
		Primary Antenna 1	Secondary Antenna 2
Low	2412	17.580	17.631
Mid	2437	17.555	17.605
High	2462	17.602	17.611
12	2467	17.558	17.628
13	2472	17.637	17.543
Worst		17.543	

10.2.4. 99% BANDWIDTH PLOTS

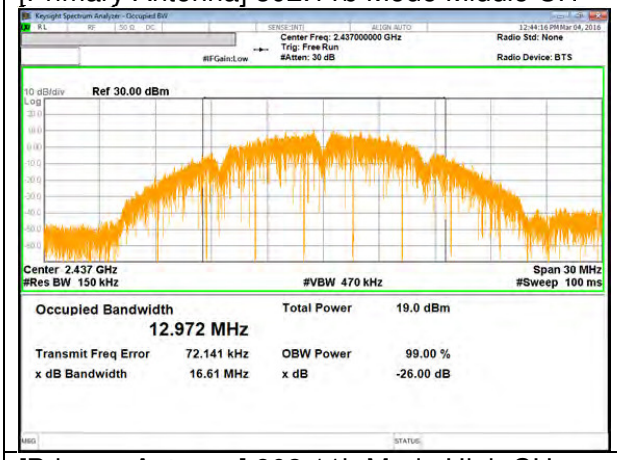
[Primary Antenna] 802.11b Mode Low CH



[Secondary Antenna] 802.11b Mode Low CH



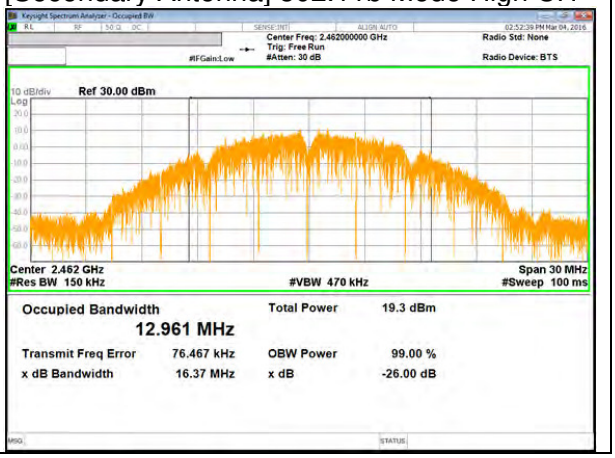
[Primary Antenna] 802.11b Mode Middle CH



[Secondary Antenna] 802.11b Mode Middle CH

[Primary Antenna] 802.11b Mode High CH

[Secondary Antenna] 802.11b Mode High CH



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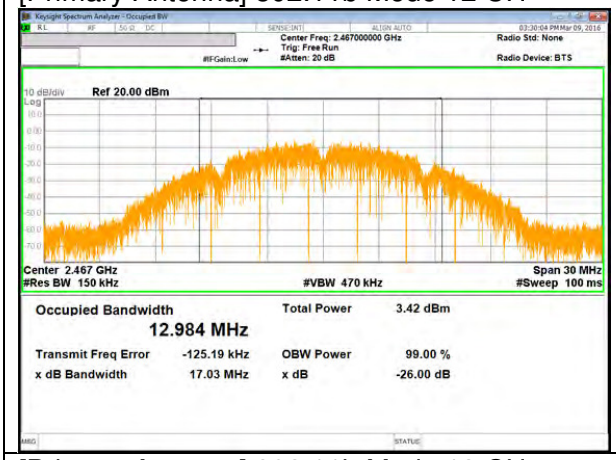
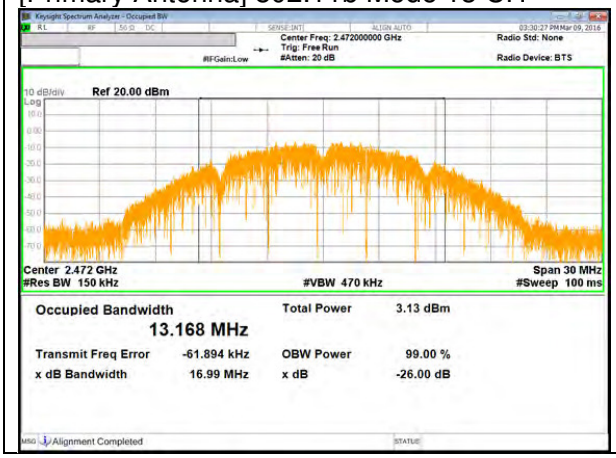
[Primary Antenna] 802.11b Mode 12 CH

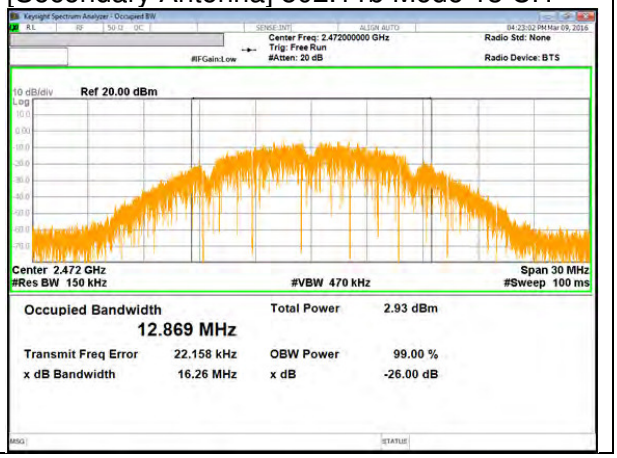


[Secondary Antenna] 802.11b Mode 12 CH

[Primary Antenna] 802.11b Mode 13 CH



[Secondary Antenna] 802.11b Mode 13 CH



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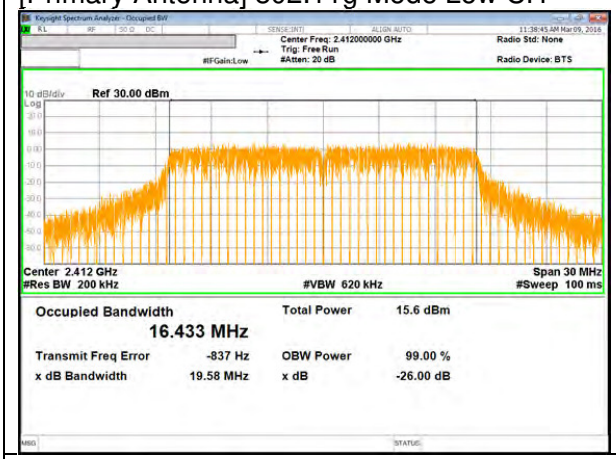
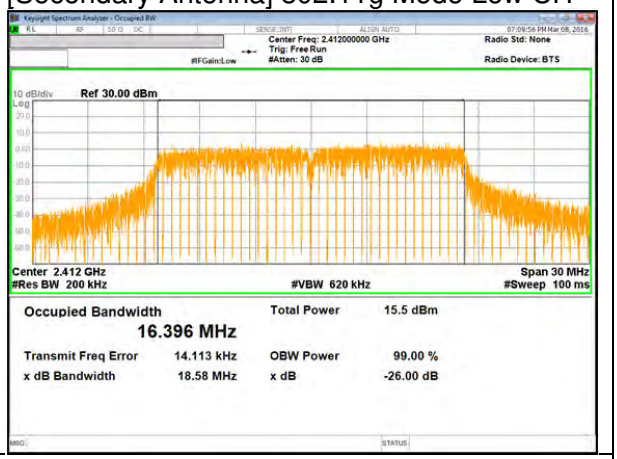
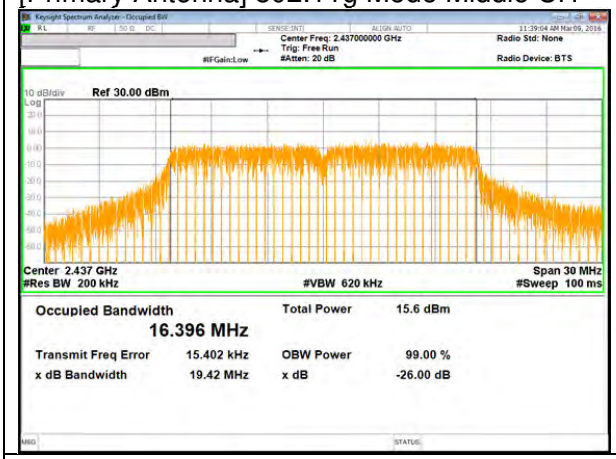
[Primary Antenna] 802.11g Mode Low CH



[Secondary Antenna] 802.11g Mode Low CH

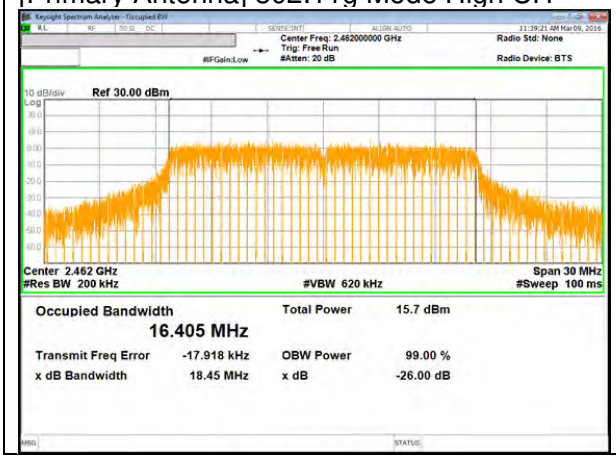


[Primary Antenna] 802.11g Mode Middle CH

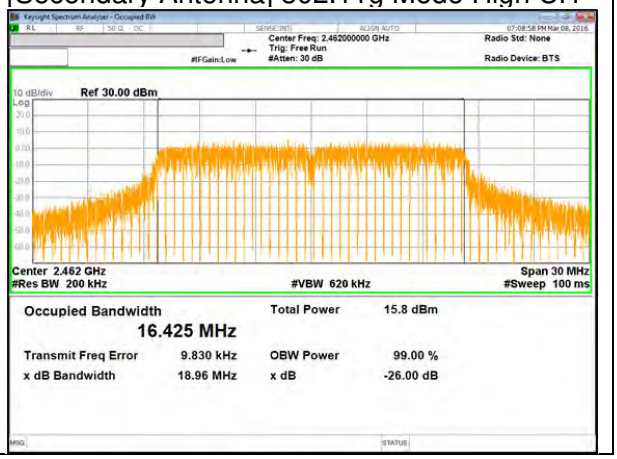


[Secondary Antenna] 802.11g Mode Middle CH

[Primary Antenna] 802.11g Mode High CH



[Secondary Antenna] 802.11g Mode High CH



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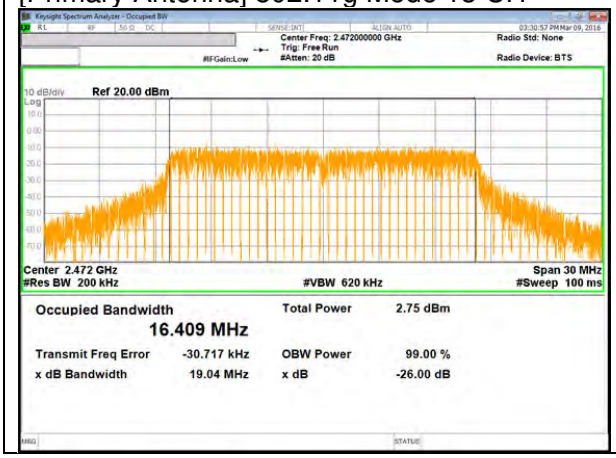
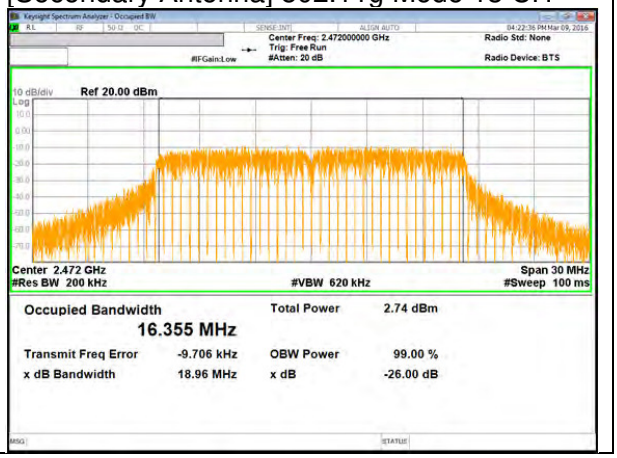
[Primary Antenna] 802.11g Mode 12 CH

[Secondary Antenna] 802.11g Mode 12 CH

[Primary Antenna] 802.11g Mode 13 CH



[Secondary Antenna] 802.11g Mode 13 CH



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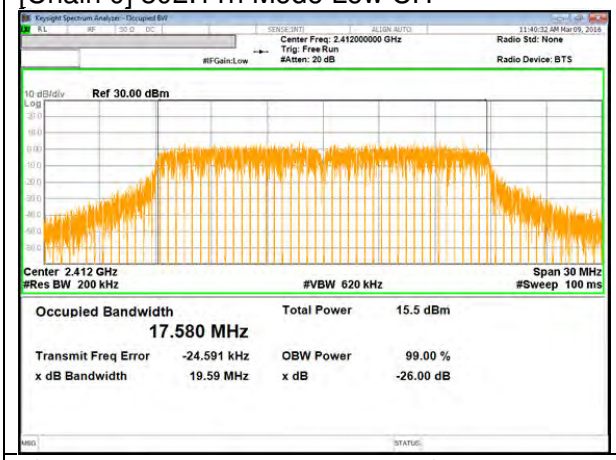
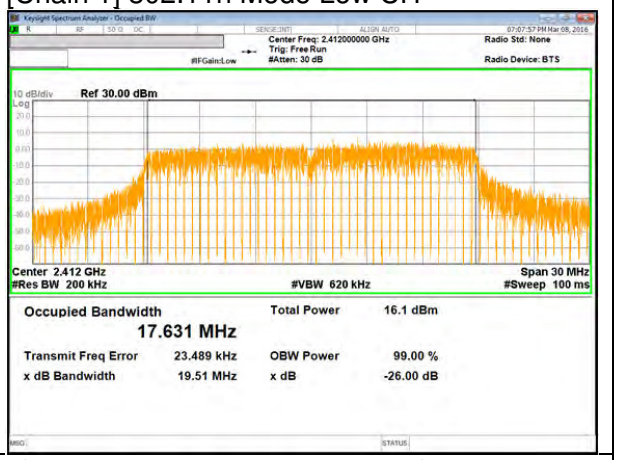
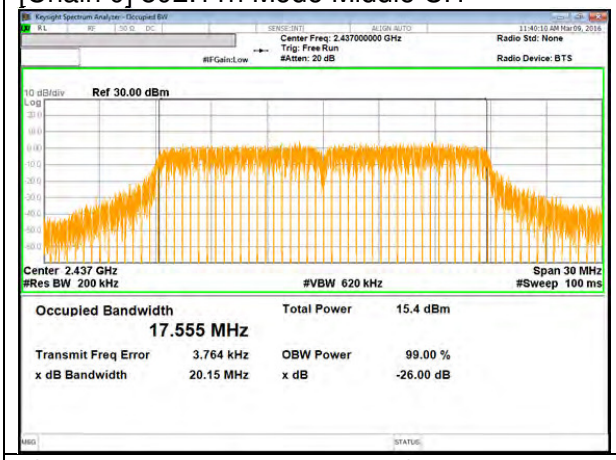
[Chain 0] 802.11n Mode Low CH



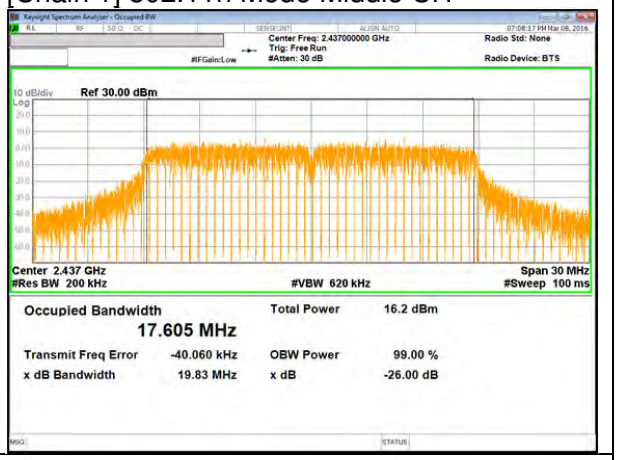
[Chain 1] 802.11n Mode Low CH



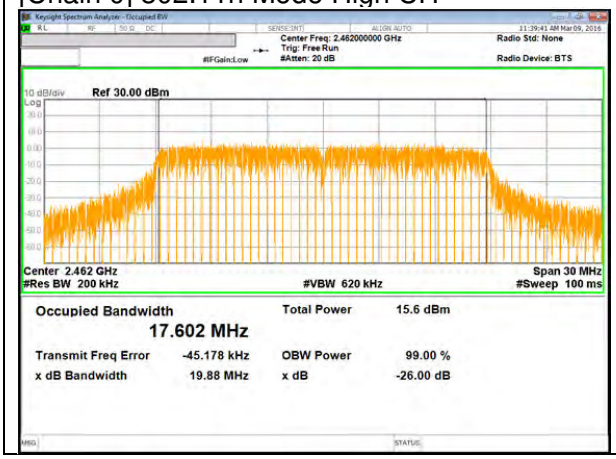
[Chain 0] 802.11n Mode Middle CH



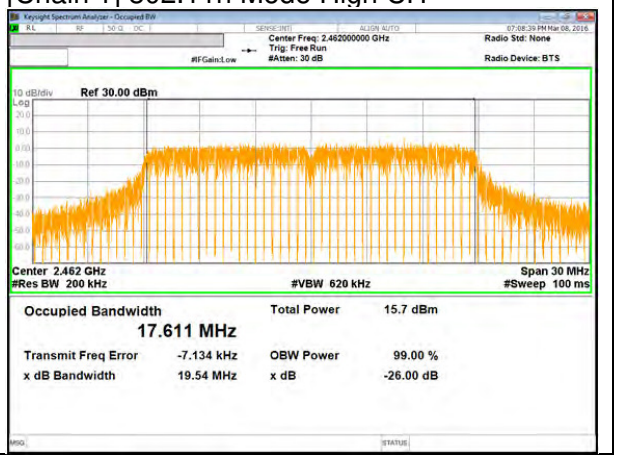
[Chain 1] 802.11n Mode Middle CH



[Chain 0] 802.11n Mode High CH



[Chain 1] 802.11n Mode High CH



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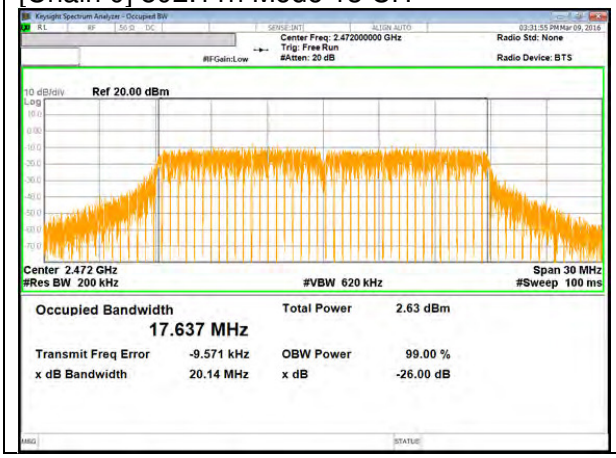
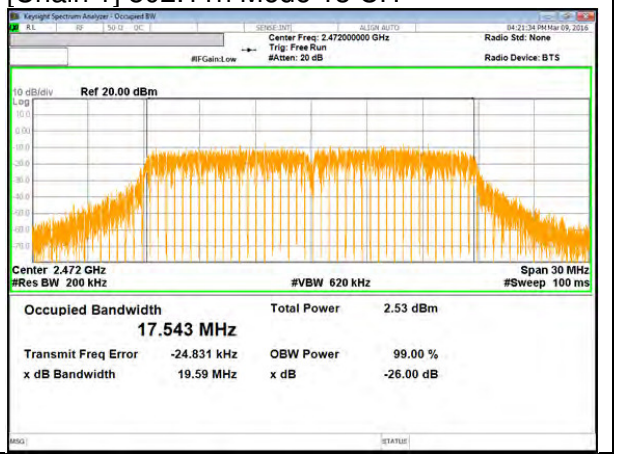
[Chain 0] 802.11n Mode 12 CH

[Chain 1] 802.11n Mode 12 CH

[Chain 0] 802.11n Mode 13 CH



[Chain 1] 802.11n Mode 13 CH



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10.3. OUTPUT POWER

LIMITS

FCC §15.247

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

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 10.1 dB (including 10 dB pad and 0.1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

DIRECTIONAL ANTENNA GAIN

For Power: The TX chains are uncorrelated and the antenna gains are unequal among the chains. The directional gain is:

2.4GHz

Chain 0 Antenna Gain [dBi]	Chain 1 Antenna Gain [dBi]	Uncorrelated Chains Directional Gain [dBi]
-4.78	-9.60	-6.55

For PSD: The TX chains are correlated and the antenna gains are unequal among the chains. The directional gain is:

2.4GHz

Chain 0 Antenna Gain [dBi]	Chain 1 Antenna Gain [dBi]	Correlated Chains Directional Gain [dBi]
-4.78	-9.60	-3.85

- IEEE 802.11b Mode is not supported MIMO operation. So can't transmit on two antennas as the same time.

RESULTS

10.3.1. 802.11b MODE IN THE 2.4 GHz BAND

Limits

Channel	Frequency [MHz]	Directional Gain Primary [dBi]	Directional Gain Secondary [dBi]	FCC Power Limit [dBm]	IC Power Limit [dBm]	IC EIRP Limit [dBm]	Max Power [dBm]
Low	2412	-4.78	-9.6	30.00	30.00	36.00	30.00
Mid	2437	-4.78	-9.6	30.00	30.00	36.00	30.00
High	2462	-4.78	-9.6	30.00	30.00	36.00	30.00
12	2467	-4.78	-9.6	30.00	30.00	36.00	30.00
13	2472	-4.78	-9.6	30.00	30.00	36.00	30.00

Duty Cycle CF [dB]	0.00	**Included in Calculations of Corr'd Power**

Results

Channel	Frequency [MHz]	Primary Meas Power [dBm]	Secondary Meas Power [dBm]	Maximum Power [dBm]	Power Limit [dBm]	Margin [dB]
Low	2412	19.27	19.07	19.27	30.00	-10.73
Mid	2437	19.04	18.97	19.04	30.00	-10.96
High	2462	19.19	19.31	19.31	30.00	-10.69
12	2467	3.31	3.30	3.31	30.00	-26.69
13	2472	3.25	3.15	3.25	30.00	-26.75
Worst				19.31		

10.3.2. 802.11g MODE IN THE 2.4 GHz BAND

Limits

Channel	Frequency [MHz]	Directional Gain Primary [dBi]	Directional Gain Secondary [dBi]	FCC Power Limit [dBm]	IC Power Limit [dBm]	IC EIRP Limit [dBm]	Max Power [dBm]
Low	2412	-4.78	-9.6	30.00	30.00	36.00	30.00
Mid	2437	-4.78	-9.6	30.00	30.00	36.00	30.00
High	2462	-4.78	-9.6	30.00	30.00	36.00	30.00
12	2467	-4.78	-9.6	30.00	30.00	36.00	30.00
13	2472	-4.78	-9.6	30.00	30.00	36.00	30.00

Duty Cycle CF [dB]	0.29	**Included in Calculations of Corr'd Power**

Results

Channel	Frequency [MHz]	Chain 0 Meas Power [dBm]	Chain 1 Meas Power [dBm]	Maximum Power [dBm]	Power Limit [dBm]	Margin [dB]
Low	2412	15.95	15.55	18.76	30.00	-11.24
Mid	2437	15.77	15.60	18.70	30.00	-11.3
High	2462	15.96	16.00	18.99	30.00	-11.01
12	2467	3.06	3.07	6.08	30.00	-23.92
13	2472	3.04	2.88	5.97	30.00	-24.03
Worst				18.99		

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10.3.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

Limits

Channel	Frequency [MHz]	Directional Gain [dBi]	FCC Power Limit [dBm]	IC Power Limit [dBm]	IC EIRP Limit [dBm]	Max Power [dBm]
Low	2412	-6.55	30.00	30.00	36.00	30.00
Mid	2437	-6.55	30.00	30.00	36.00	30.00
High	2462	-6.55	30.00	30.00	36.00	30.00
12	2467	-6.55	30.00	30.00	36.00	30.00
13	2472	-6.55	30.00	30.00	36.00	30.00

Duty Cycle CF [dB]	0.31	**Included in Calculations of Corr'd Power**

Results

Channel	Frequency [MHz]	Chain 0 Meas Power [dBm]	Chain 1 Meas Power [dBm]	Total Corr'd Power [dBm]	Power Limit [dBm]	Margin [dB]
Low	2412	15.78	16.36	19.09	30.00	-10.91
Mid	2437	15.61	16.4	19.03	30.00	-10.97
High	2462	15.80	15.82	18.82	30.00	-11.18
12	2467	3.13	2.84	6.00	30.00	-24
13	2472	2.99	2.66	5.84	30.00	-24.16
Worst				19.09		

10.4. PSD

LIMITS

FCC §15.247

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 "Method AVGPSD-2" under KDB558074 D01 DTS Meas Guidance v03r04

RESULTS

10.4.1. 802.11b MODE IN THE 2.4 GHz BAND

Channel	Frequency [MHz]	Primary Antenna 1 [dBm]	Secendary Antenna 2 [dBm]	Max PSD [dBm]	Limit [dBm]	Margin [dB]
Low	2412	-11.64	-11.89	-11.64	8.00	-19.64
Mid	2437	-12.24	-11.84	-11.84	8.00	-19.84
High	2462	-12.20	-11.69	-11.69	8.00	-19.69
12	2467	-26.55	-27.97	-26.55	8.00	-34.55
13	2472	-27.89	-27.62	-27.62	8.00	-35.62

Duty Cycle CF [dB]	0.00	Included in Calculations of PPSD

10.4.2. 802.11g MODE IN THE 2.4 GHz BAND

Channel	Frequency [MHz]	Primary Antenna 1 [dBm]	Secendary Antenna 2 [dBm]	Total PSD [dBm]	Limit [dBm]	Margin [dB]
Low	2412	-18.32	-17.96	-14.83	8.00	-22.83
Mid	2437	-18.03	-18.53	-14.97	8.00	-22.97
High	2462	-17.83	-18.11	-14.67	8.00	-22.67
12	2467	-30.68	-31.19	-27.62	8.00	-35.62
13	2472	-29.58	-31.06	-26.95	8.00	-34.95

Duty Cycle CF [dB]	0.29	**Included in Calculations of PPSD**

10.4.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

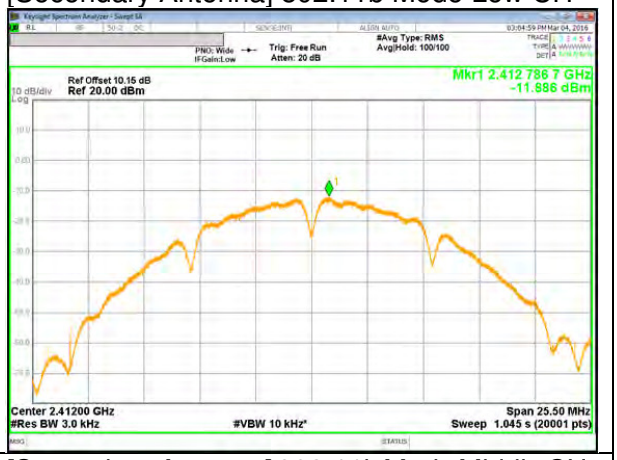
Channel	Frequency [MHz]	Chain 0 Meas [dBm]	Chain 1 Meas [dBm]	Total PSD [dBm]	Limit [dBm]	Margin [dB]
Low	2412	-18.80	-17.11	-14.56	8.00	-22.56
Mid	2437	-18.20	-17.42	-14.47	8.00	-22.47
High	2462	-17.98	-18.14	-14.74	8.00	-22.74
12	2467	-29.72	-29.69	-26.38	8.00	-34.38
13	2472	-30.42	-31.22	-27.48	8.00	-35.48

Duty Cycle CF [dB]	0.31	**Included in Calculations of PPSD**

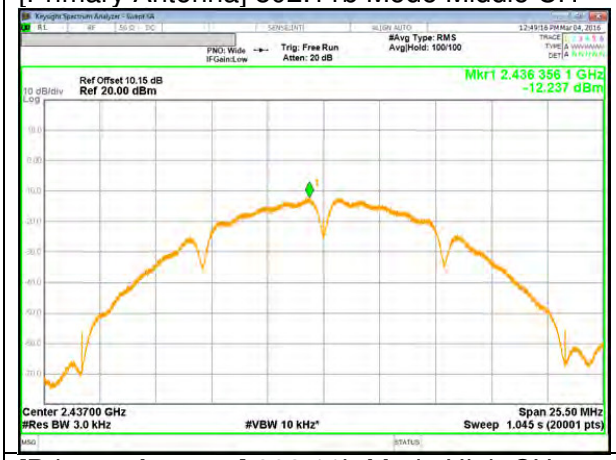
10.4.4. PSD PLOTS

[Primary Antenna] 802.11b Mode Low CH

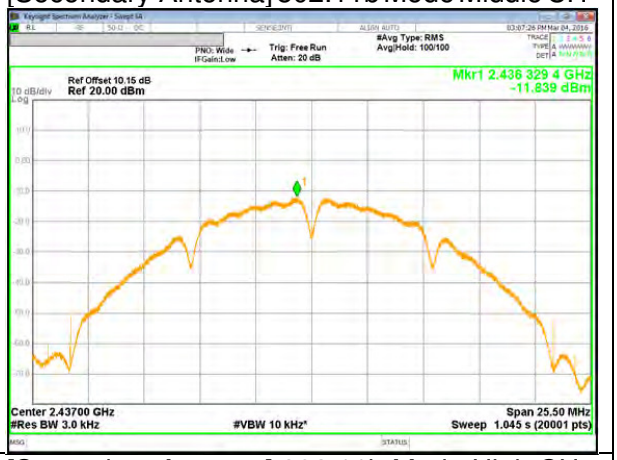
[Secondary Antenna] 802.11b Mode Low CH



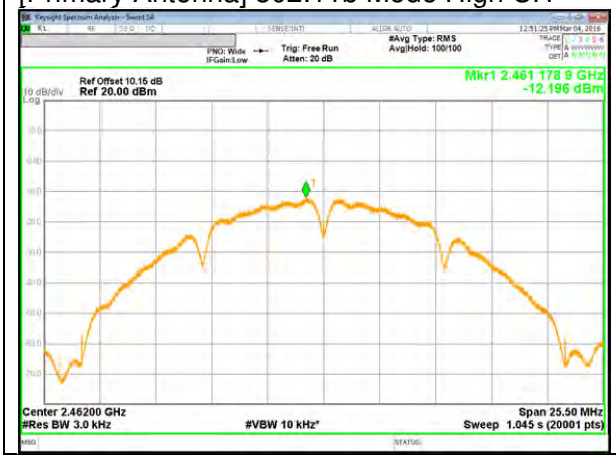
[Primary Antenna] 802.11b Mode Middle CH



[Secondary Antenna] 802.11b Mode Middle CH



[Primary Antenna] 802.11b Mode High CH



[Secondary Antenna] 802.11b Mode High CH

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[Primary Antenna] 802.11b Mode 12 CH

[Secondary Antenna] 802.11b Mode 12 CH

[Primary Antenna] 802.11b Mode 13 CH

[Secondary Antenna] 802.11b Mode 13 CH

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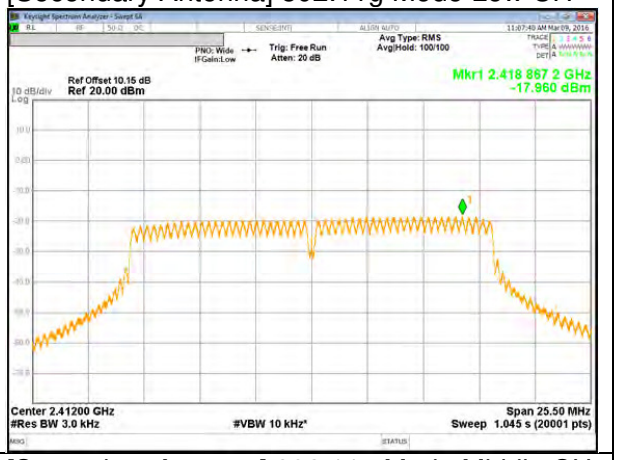
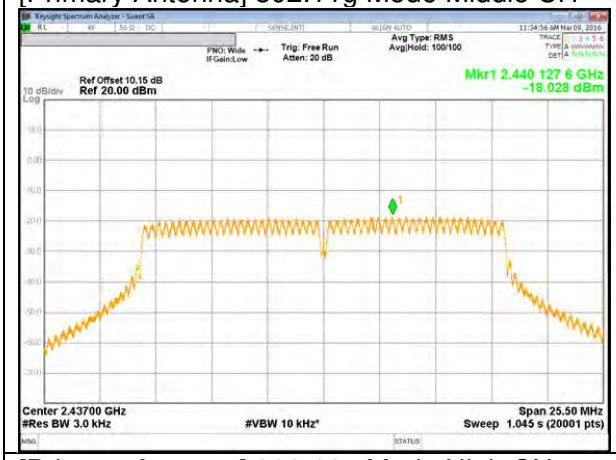
[Primary Antenna] 802.11g Mode Low CH

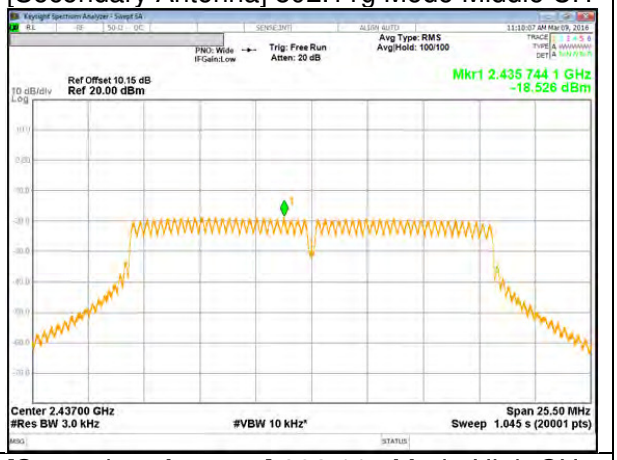
[Secondary Antenna] 802.11g Mode Low CH



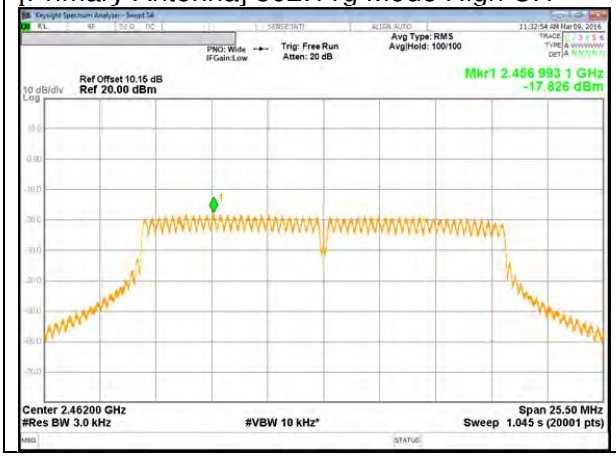
[Primary Antenna] 802.11g Mode Middle CH



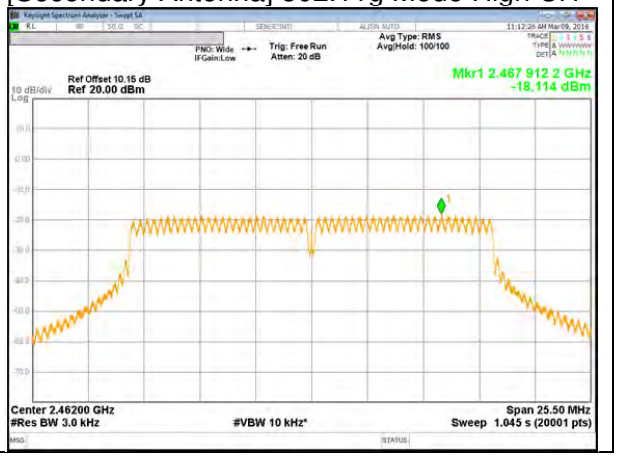
[Secondary Antenna] 802.11g Mode Middle CH



[Primary Antenna] 802.11g Mode High CH



[Secondary Antenna] 802.11g Mode High CH



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[Primary Antenna] 802.11g Mode 12 CH

[Secondary Antenna] 802.11g Mode 12 CH

[Primary Antenna] 802.11g Mode 13 CH

[Secondary Antenna] 802.11g Mode 13 CH

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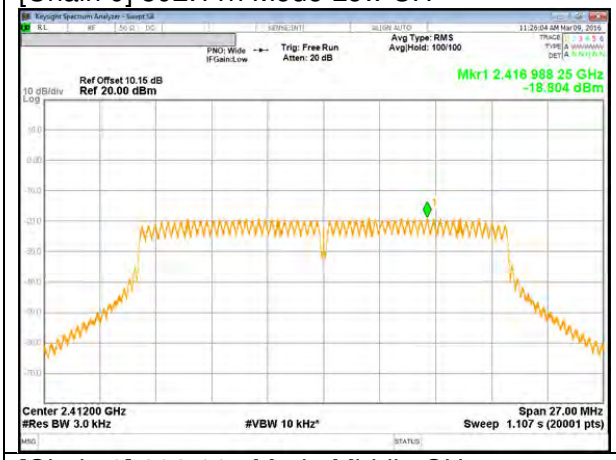
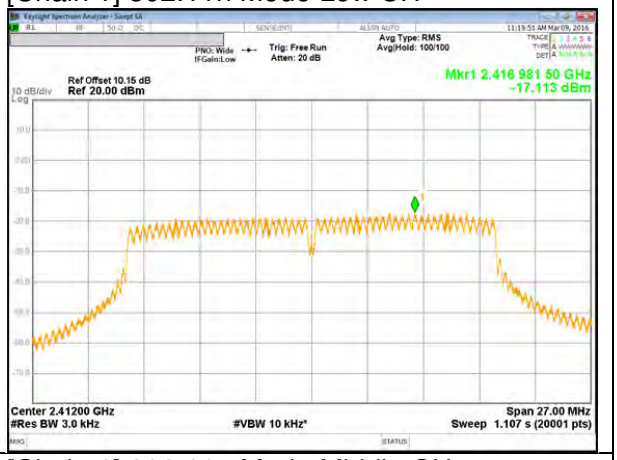
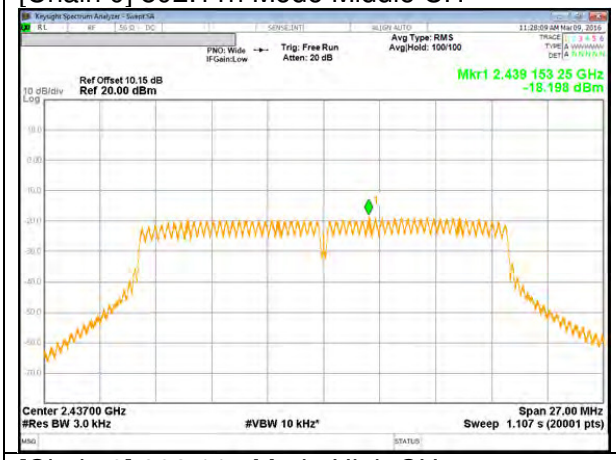
[Chain 0] 802.11n Mode Low CH



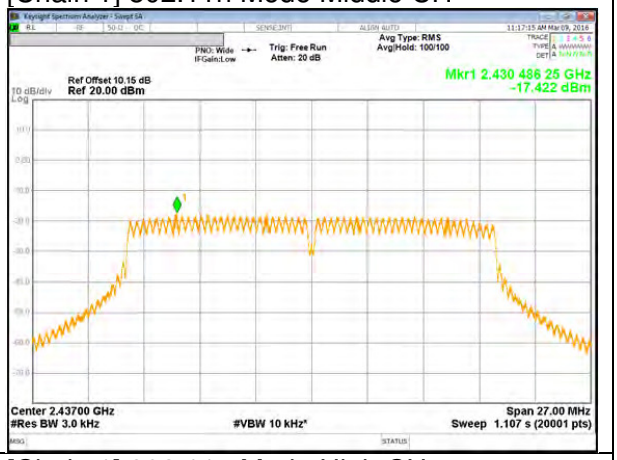
[Chain 1] 802.11n Mode Low CH



[Chain 0] 802.11n Mode Middle CH

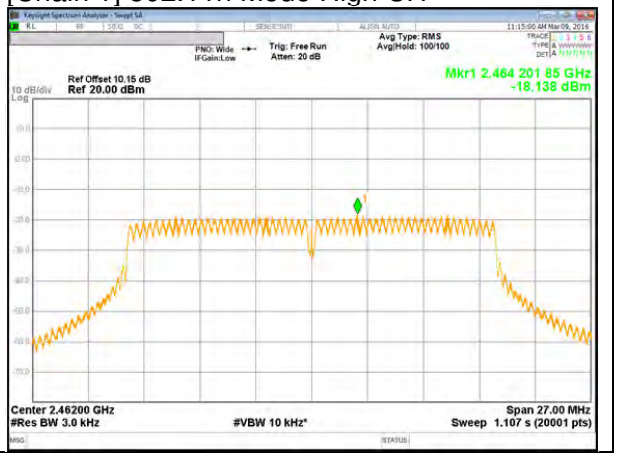


[Chain 1] 802.11n Mode Middle CH



[Chain 0] 802.11n Mode High CH

[Chain 1] 802.11n Mode High CH



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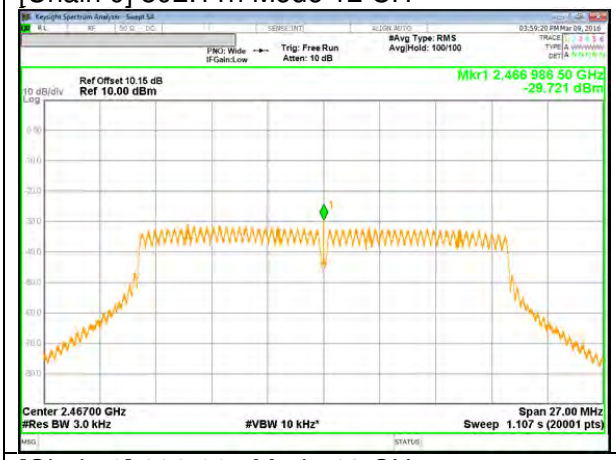
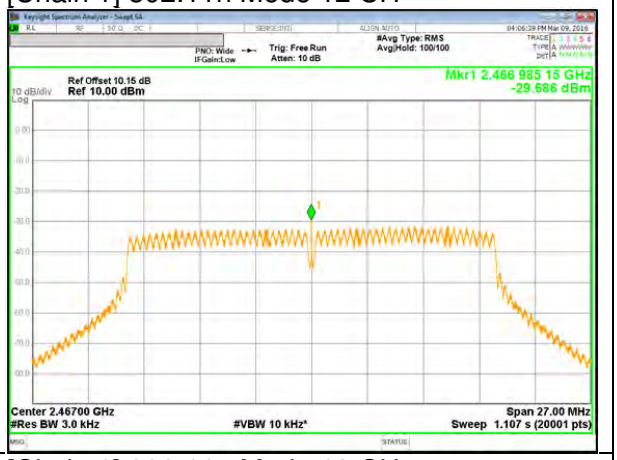
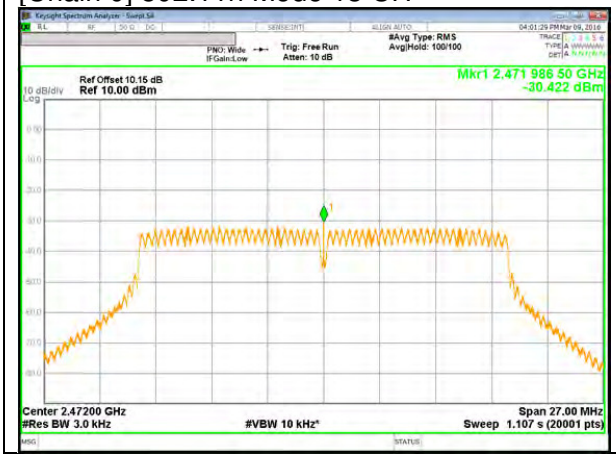
[Chain 0] 802.11n Mode 12 CH



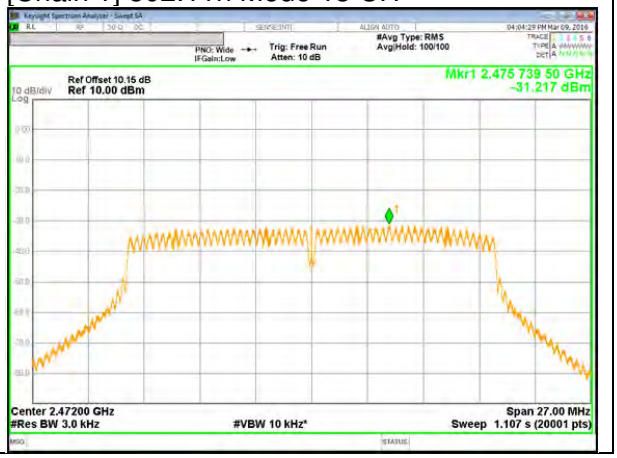
[Chain 1] 802.11n Mode 12 CH



[Chain 0] 802.11n Mode 13 CH



[Chain 1] 802.11n Mode 13 CH



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10.5. OUT-OF-BAND EMISSIONS

LIMITS

FCC §15.247 (d)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer with RBW = 100 kHz, VBW = 300 kHz, peak detector, and max hold. Measurements utilizing these settings are made of the in-band reference level, bandedge (where measurements to the general radiated limits will not be made) and out-of-band emissions.

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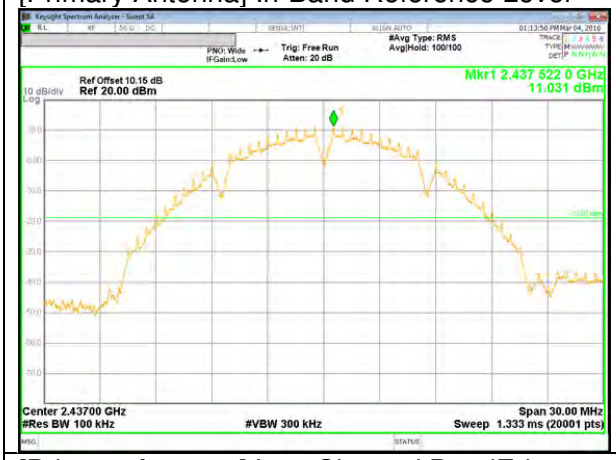
RESULTS

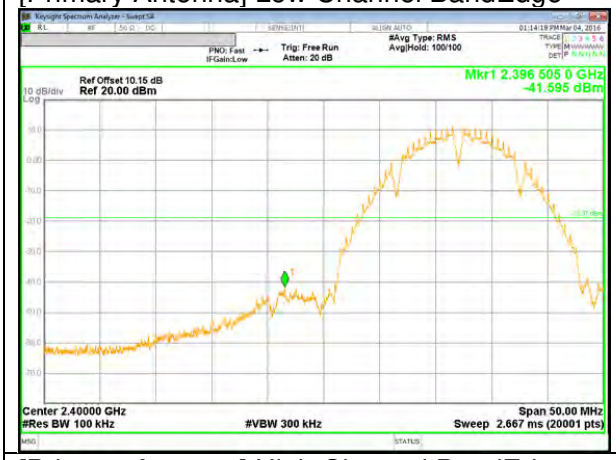
10.5.1. 802.11b MODE IN THE 2.4 GHz BAND

[Primary Antenna] In-Band Reference Level

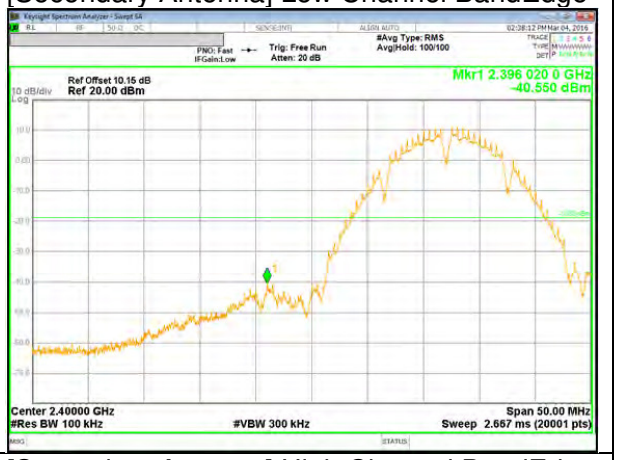


[Secondary Antenna] In-Band Reference Level

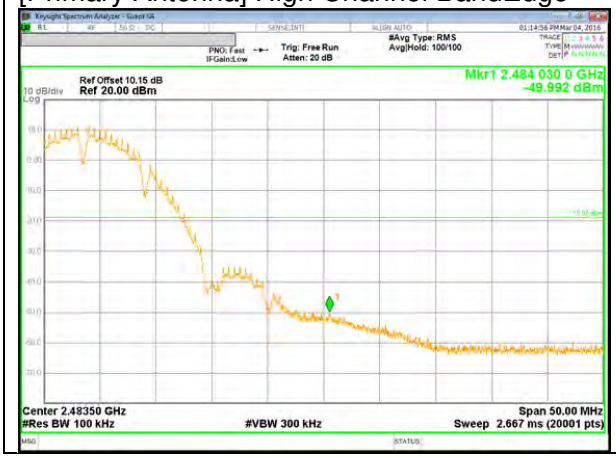
[Primary Antenna] Low Channel BandEdge



[Secondary Antenna] Low Channel BandEdge

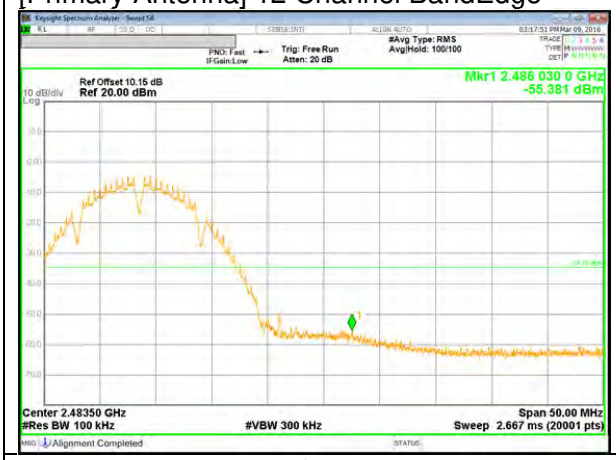


[Primary Antenna] High Channel BandEdge



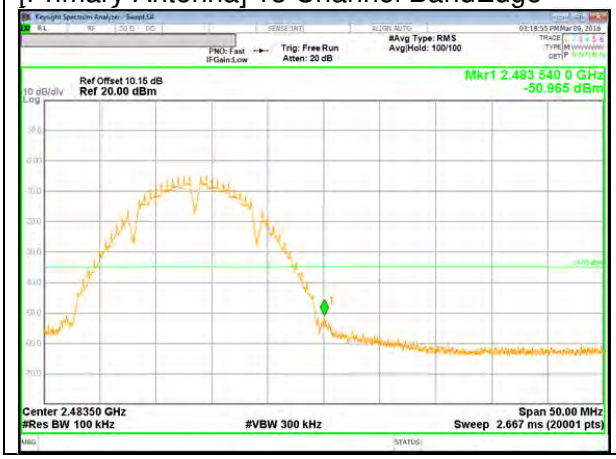
[Secondary Antenna] High Channel BandEdge

[Primary Antenna] 12 Channel BandEdge

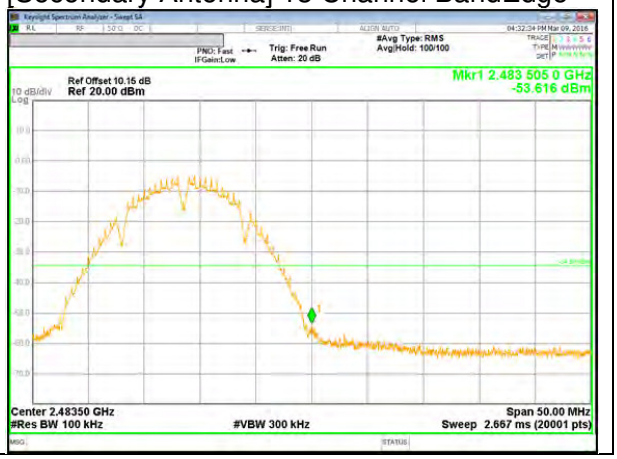


[Secondary Antenna] 12 Channel BandEdge

[Primary Antenna] 13 Channel BandEdge



[Secondary Antenna] 13 Channel BandEdge



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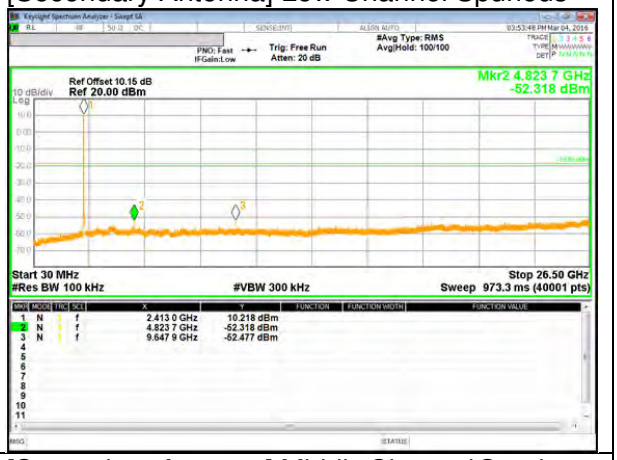
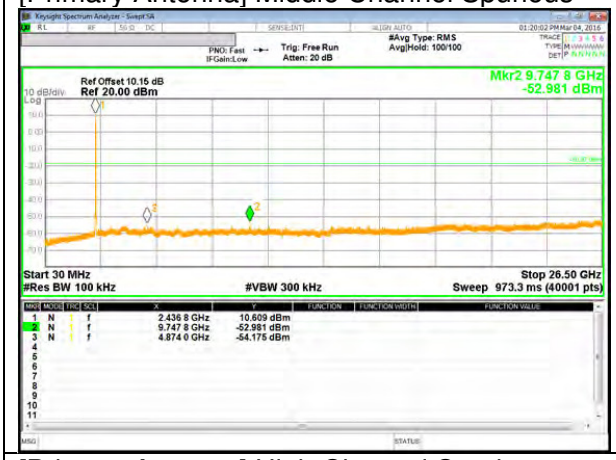
[Primary Antenna] Low Channel Spurious

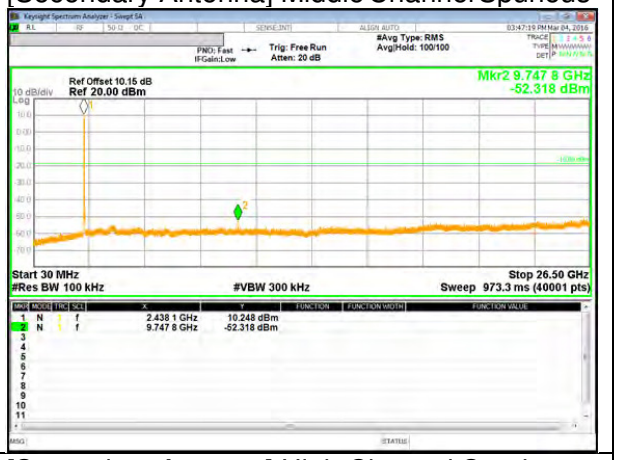
[Secondary Antenna] Low Channel Spurious



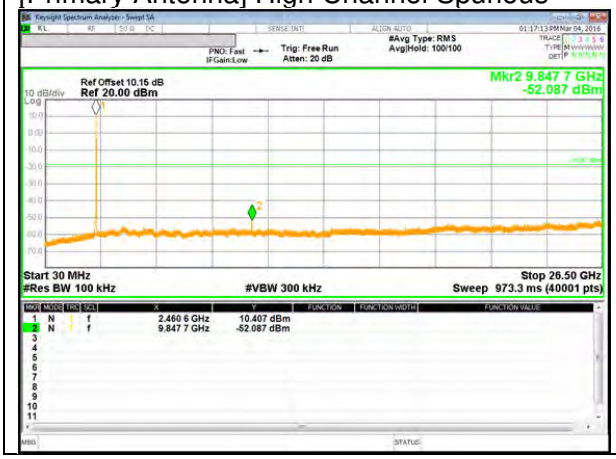
[Primary Antenna] Middle Channel Spurious



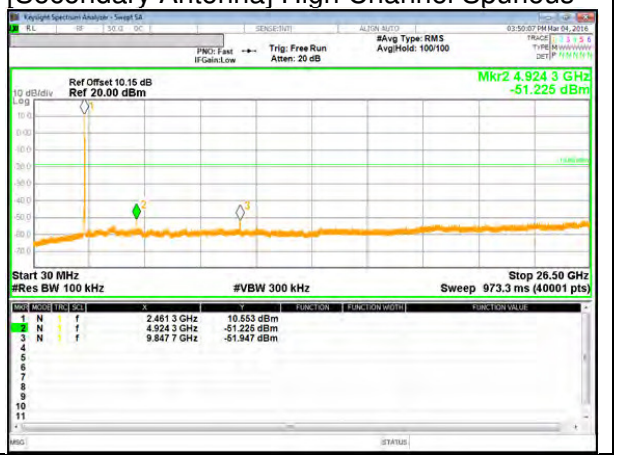
[Secondary Antenna] Middle Channel Spurious



[Primary Antenna] High Channel Spurious



[Secondary Antenna] High Channel Spurious



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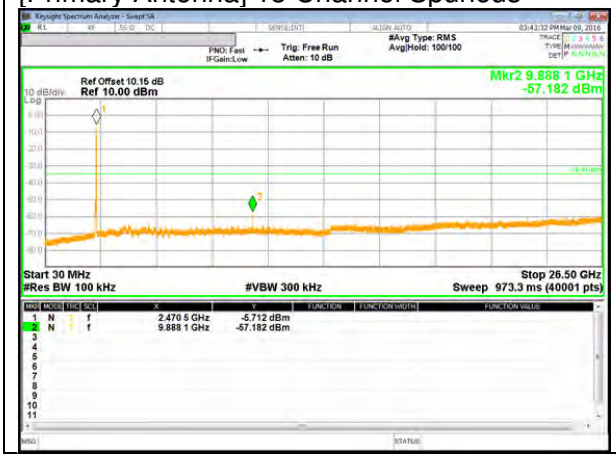
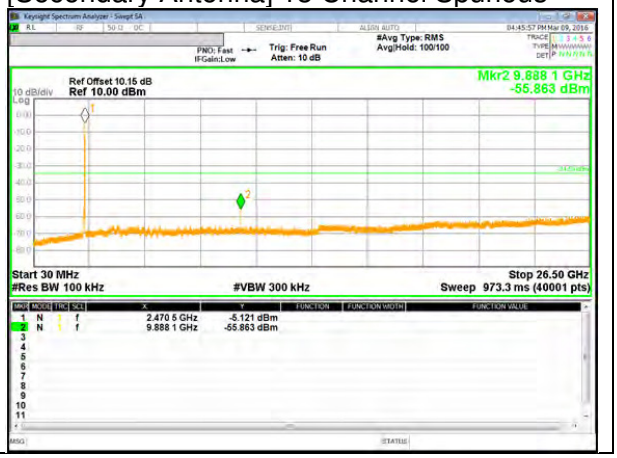
[Primary Antenna] 12 Channel Spurious

[Secondary Antenna] 12 Channel Spurious

[Primary Antenna] 13 Channel Spurious



[Secondary Antenna] 13 Channel Spurious



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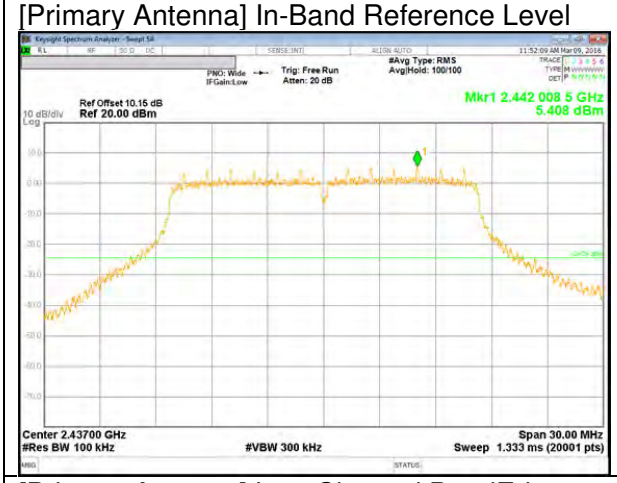
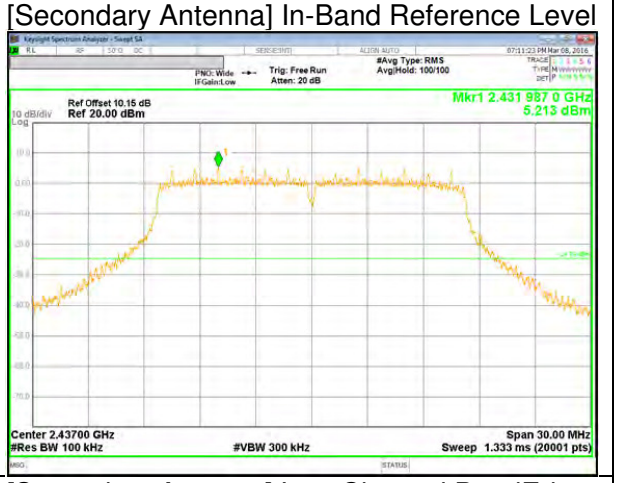
10.5.2. 802.11g MODE IN THE 2.4 GHz BAND

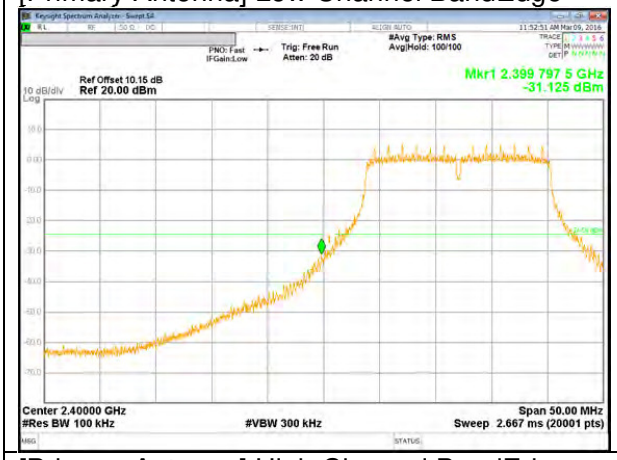
[Primary Antenna] In-Band Reference Level



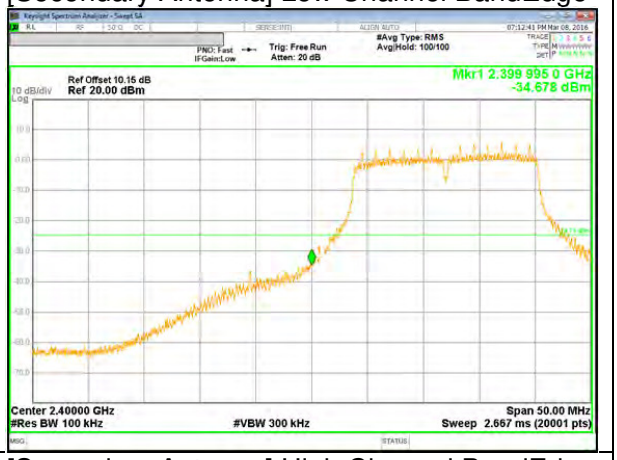
[Secondary Antenna] In-Band Reference Level



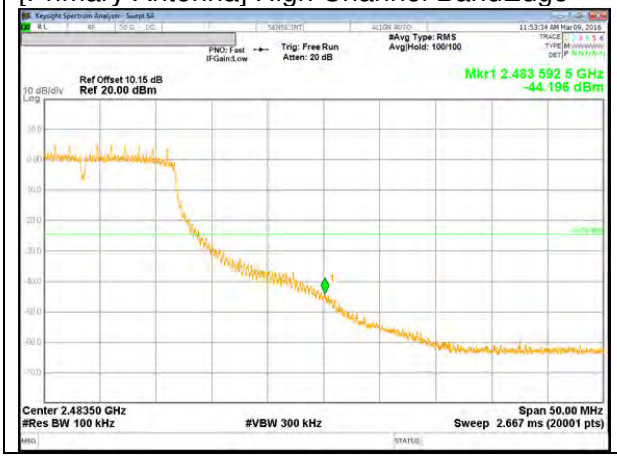
[Primary Antenna] Low Channel BandEdge



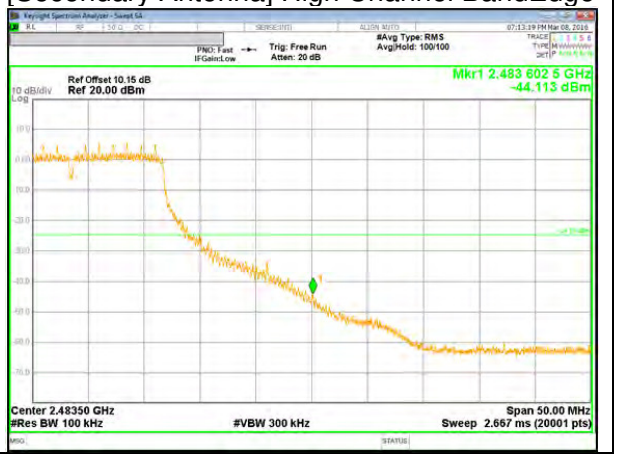
[Secondary Antenna] Low Channel BandEdge



[Primary Antenna] High Channel BandEdge



[Secondary Antenna] High Channel BandEdge



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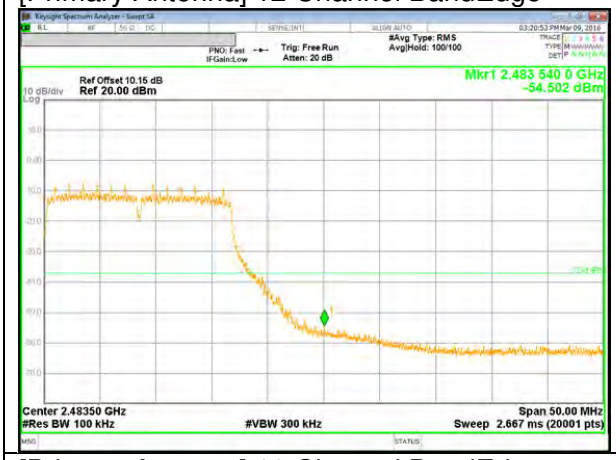
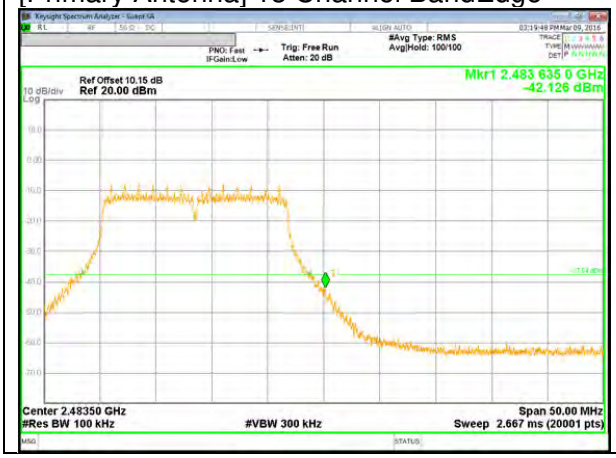
[Primary Antenna] 12 Channel BandEdge

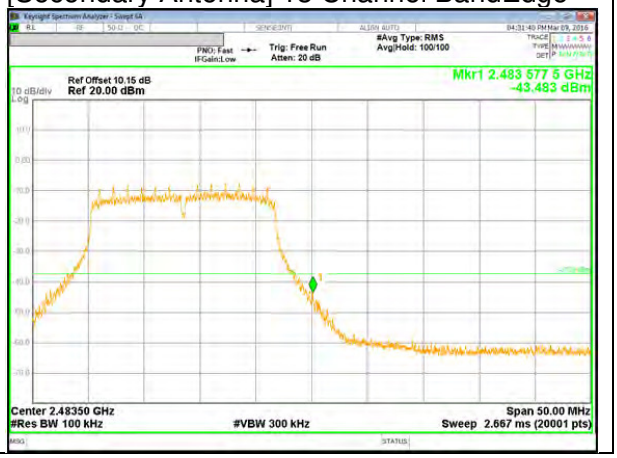


[Secondary Antenna] 12 Channel BandEdge

[Primary Antenna] 13 Channel BandEdge



[Secondary Antenna] 13 Channel BandEdge



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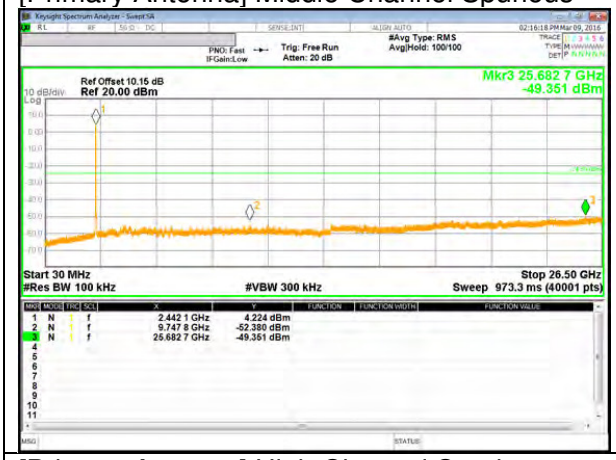
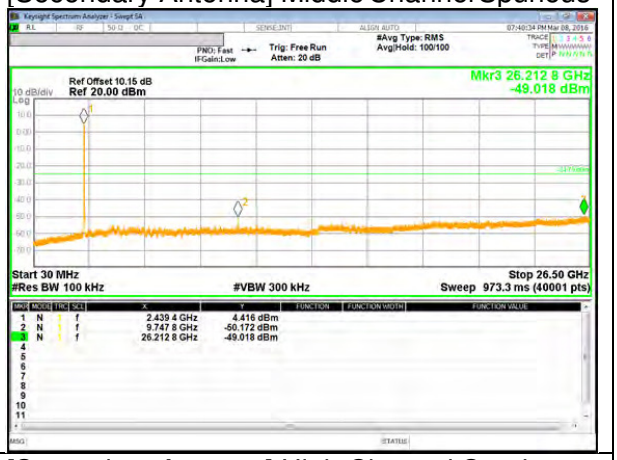
[Primary Antenna] Low Channel Spurious

[Secondary Antenna] Low Channel Spurious

[Primary Antenna] Middle Channel Spurious



[Secondary Antenna] Middle Channel Spurious



[Primary Antenna] High Channel Spurious

[Secondary Antenna] High Channel Spurious

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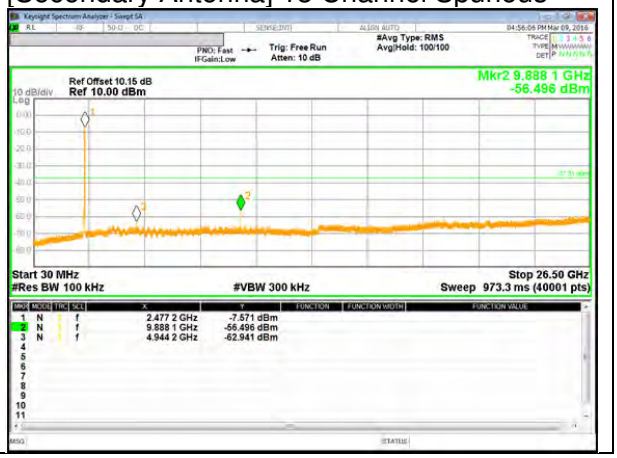
[Primary Antenna] 12 Channel Spurious

[Secondary Antenna] 12 Channel Spurious

[Primary Antenna] 13 Channel Spurious

[Secondary Antenna] 13 Channel Spurious



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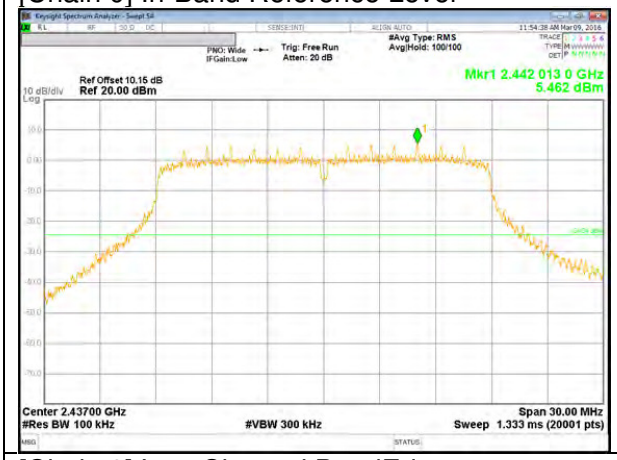
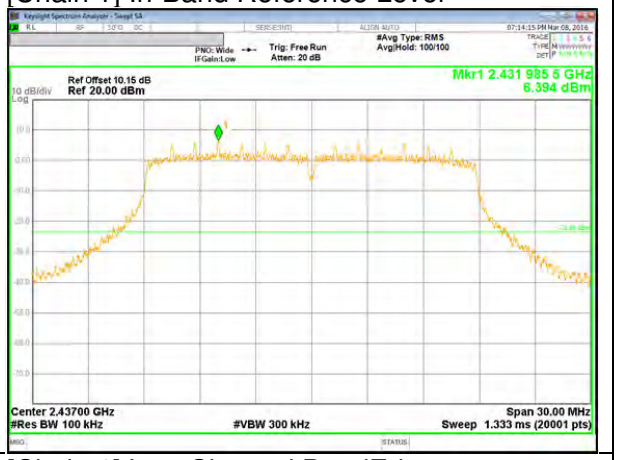
10.5.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

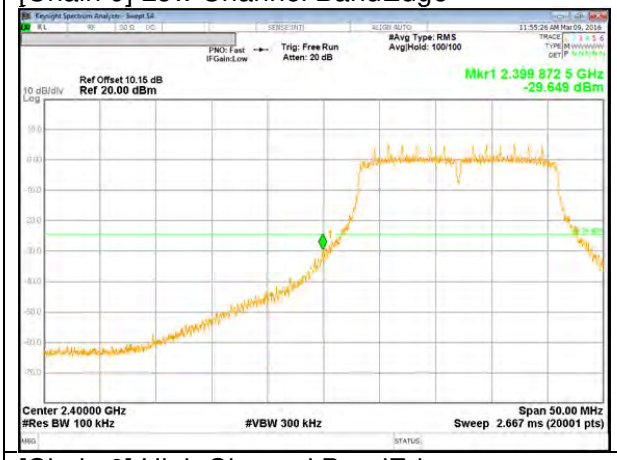
[Chain 0] In-Band Reference Level



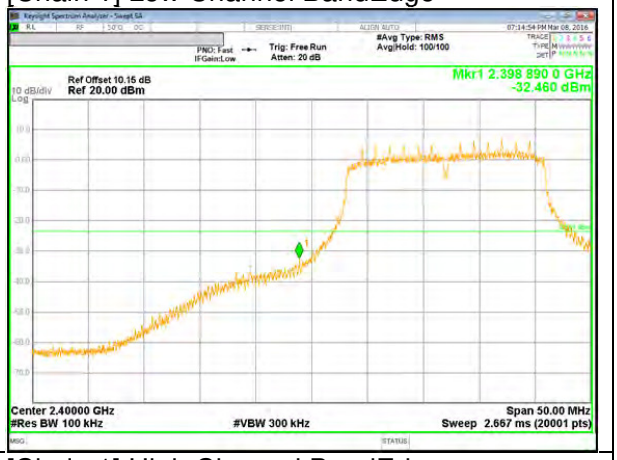
[Chain 1] In-Band Reference Level



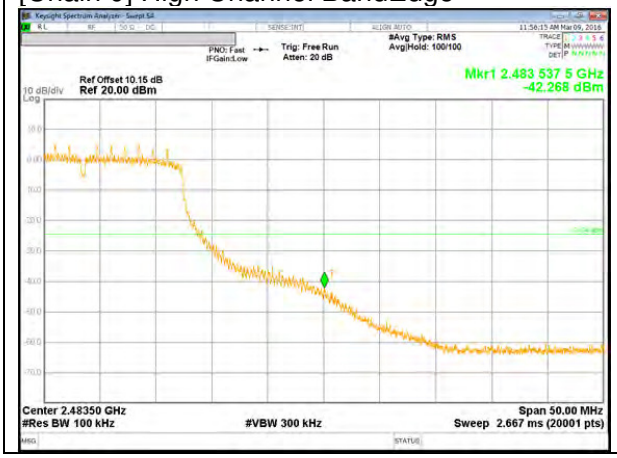
[Chain 0] Low Channel BandEdge



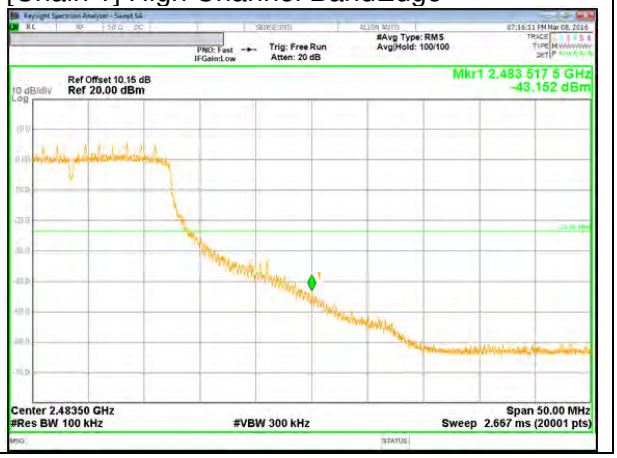
[Chain 1] Low Channel BandEdge



[Chain 0] High Channel BandEdge



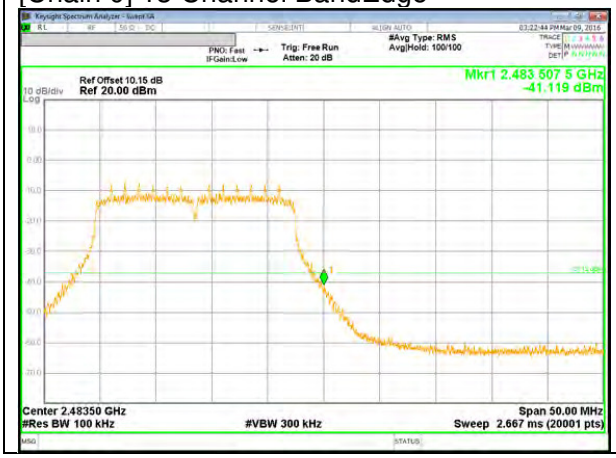
[Chain 1] High Channel BandEdge



[Chain 0] 12 Channel BandEdge

[Chain 1] 12 Channel BandEdge

[Chain 0] 13 Channel BandEdge



[Chain 1] 13 Channel BandEdge

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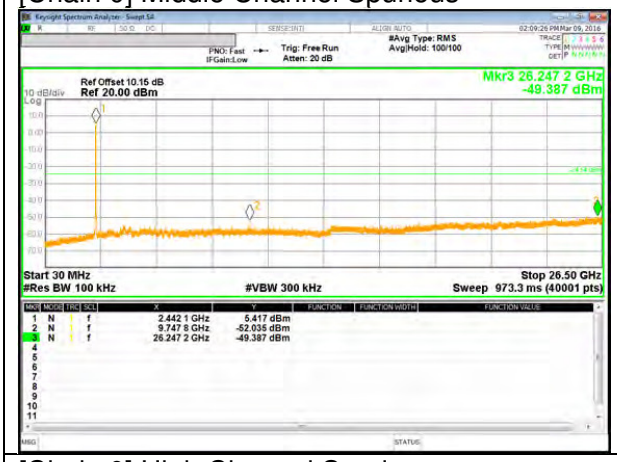
[Chain 0] Low Channel Spurious

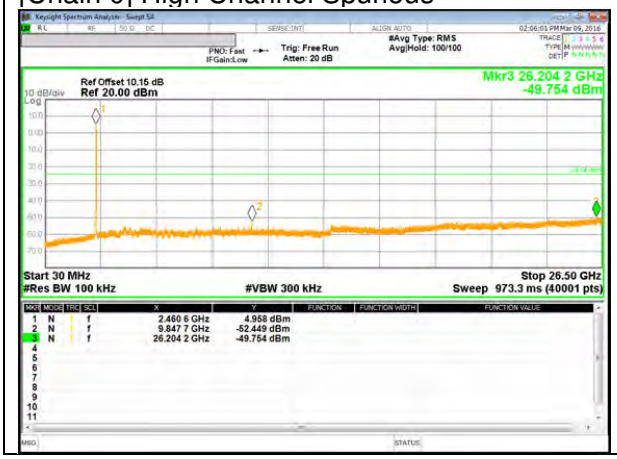
[Chain 1] Low Channel Spurious

[Chain 0] Middle Channel Spurious



[Chain 1] Middle Channel Spurious

[Chain 0] High Channel Spurious



[Chain 1] High Channel Spurious

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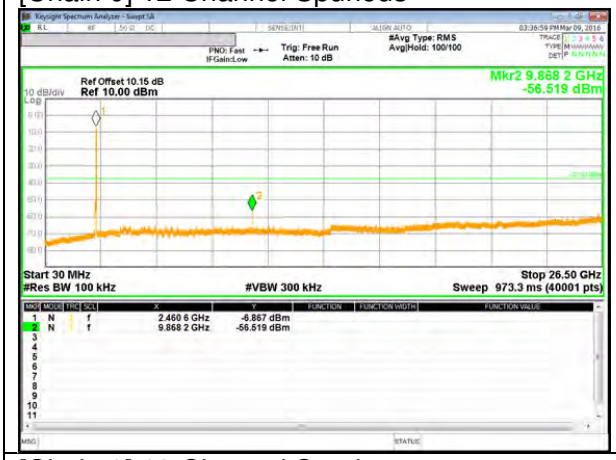
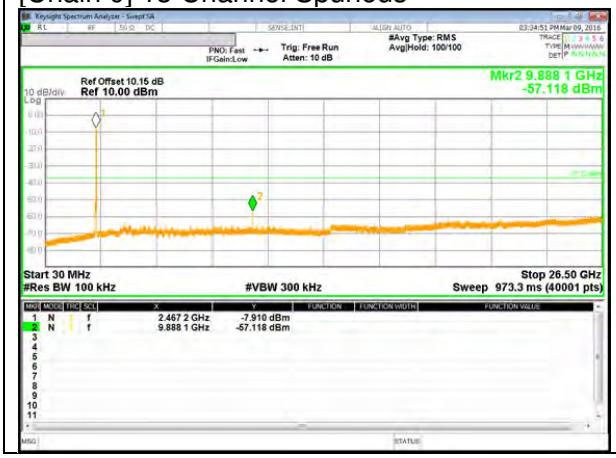
[Chain 0] 12 Channel Spurious



[Chain 1] 12 Channel Spurious

[Chain 0] 13 Channel Spurious



[Chain 1] 13 Channel Spurious

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11. RADIATED TEST RESULTS

11.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane. The antenna to EUT distance is 3 meters.

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. Duty cycle factor= 10log (1/x) For this sample B mode = 0dB (duty cycle >98%); G mode = 0.29dB; N mode = 0.31dB.

The spectrum from 30 MHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band.

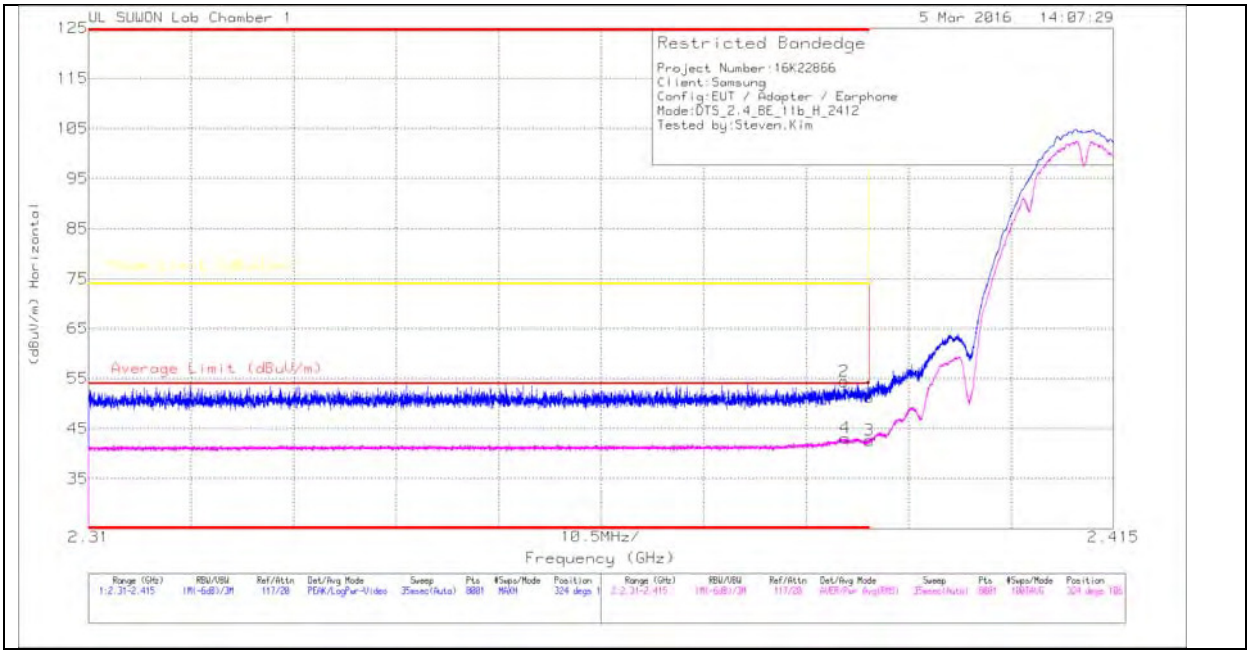
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized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

11.2. TRANSMITTER ABOVE 1 GHz

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

RESTRICTED BANDEDGE (LOW CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

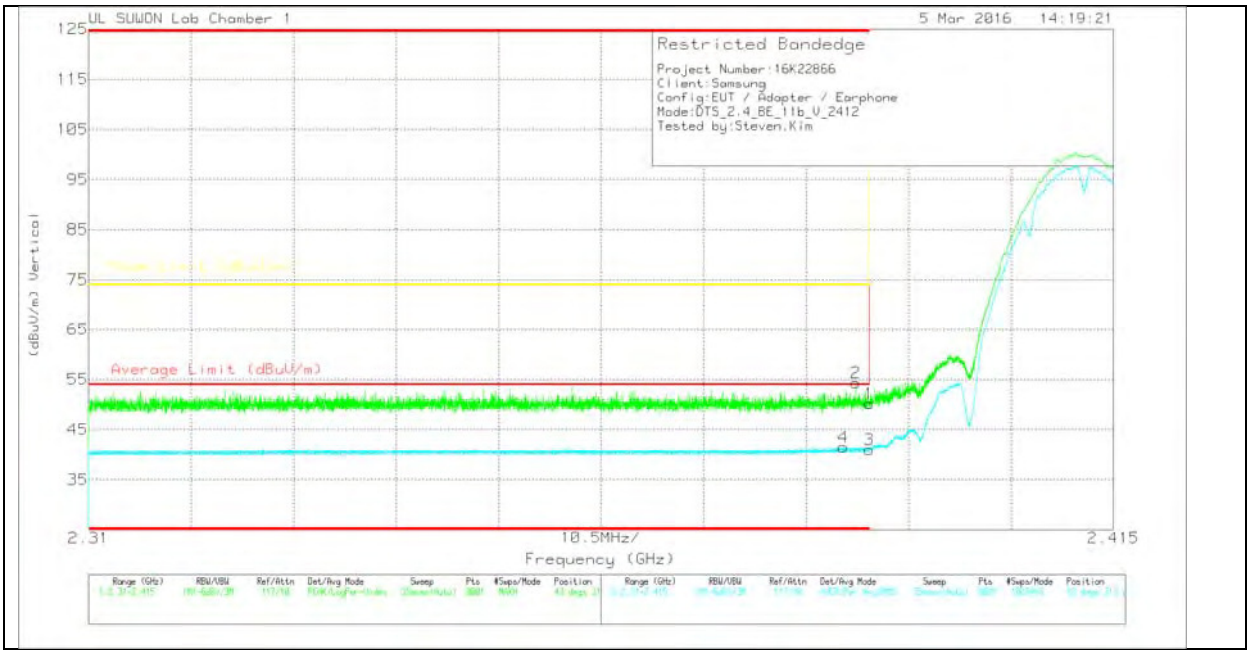
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_2	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	48.52	Pk	31.8	-29	0	51.32	-	-	74	-22.68	324	106	H
2	* 2.387	51.59	Pk	31.8	-29	0	54.39	-	-	74	-19.61	324	106	H
3	* 2.39	39.87	RMS	31.8	-29	0	42.67	54	-11.33	-	-	324	106	H
4	* 2.388	40.34	RMS	31.8	-29	0	43.14	54	-10.86	-	-	324	106	H

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

Pk - Peak detector

RMS - RMS detection

VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_2	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	47.39	Pk	31.8	-29	0	50.19	-	-	74	-23.81	43	313	V
2	* 2.389	51.52	Pk	31.8	-29	0	54.32	-	-	74	-19.68	43	313	V
3	* 2.39	38.17	RMS	31.8	-29	0	40.97	54	-13.03	-	-	43	313	V
4	* 2.387	38.67	RMS	31.8	-29	0	41.47	54	-12.53	-	-	43	313	V

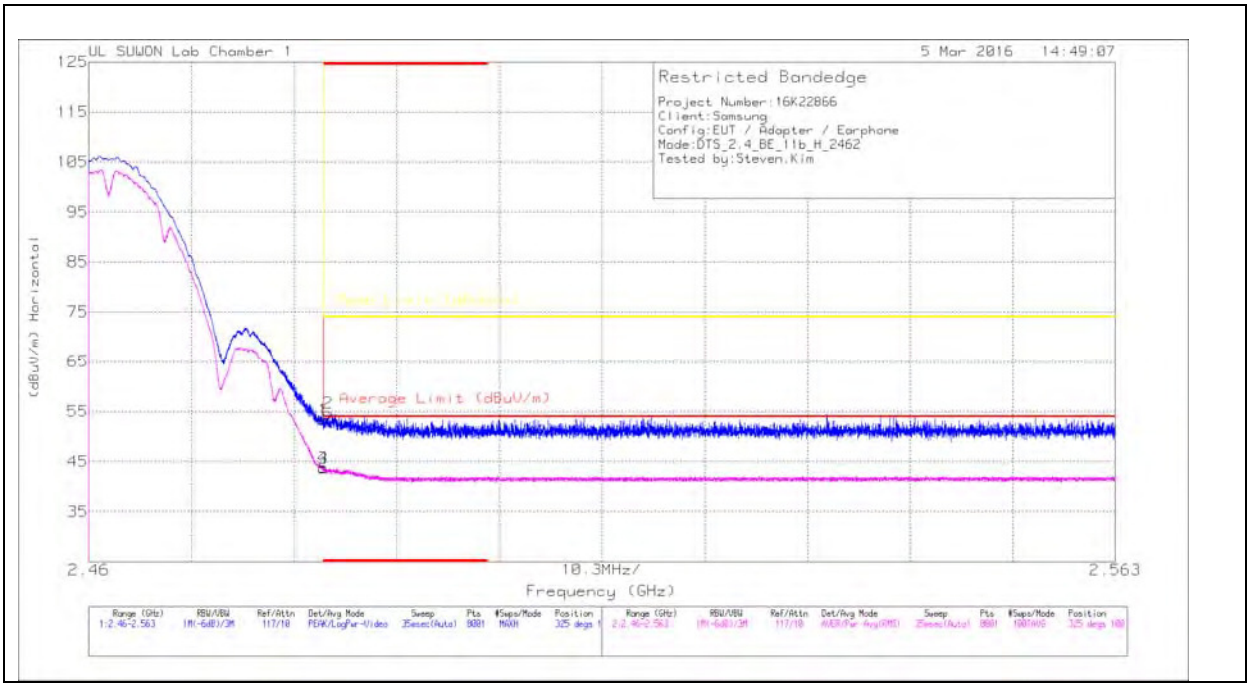
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

RMS - RMS detection

AUTHORIZED BANDEDGE (HIGH CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

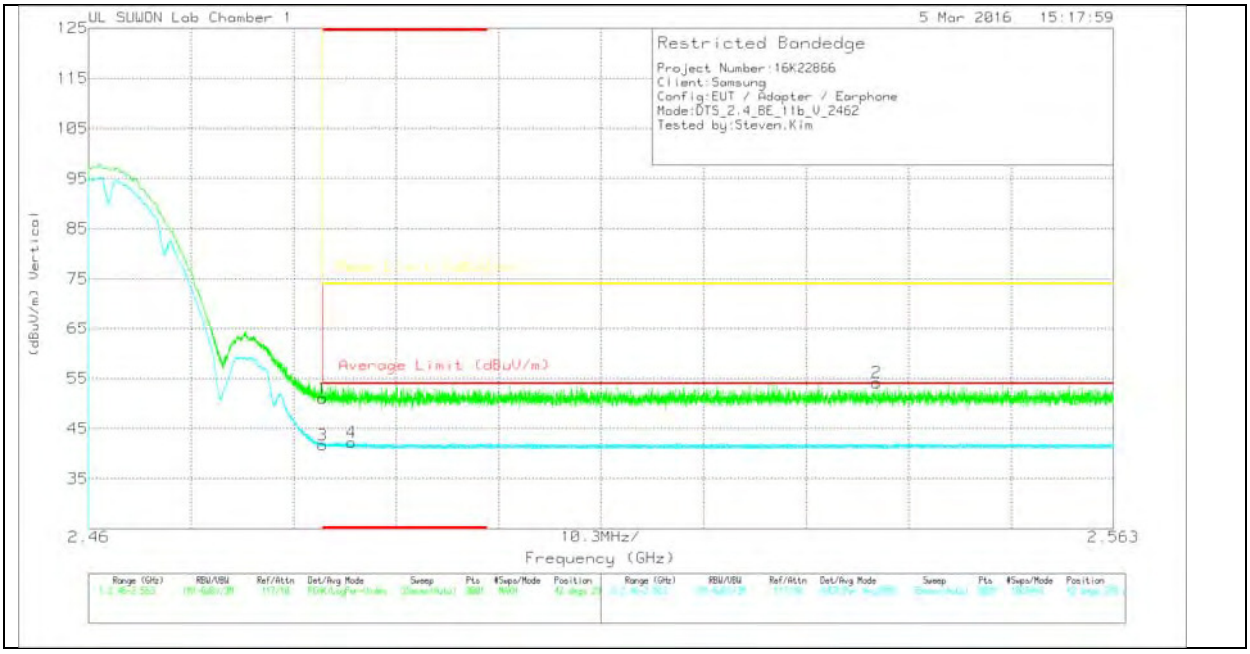
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_2	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	49.61	Pk	32	-28.3	0	53.31	-	-	74	-20.69	325	100	H
2	* 2.484	50.95	Pk	32	-28.3	0	54.65	-	-	74	-19.35	325	100	H
3	* 2.484	39.99	RMS	32	-28.3	0	43.69	54	-10.31	-	-	325	100	H
4	* 2.484	40.13	RMS	32	-28.3	0	43.83	54	-10.17	-	-	325	100	H

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

Pk - Peak detector

RMS - RMS detection

VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_2	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	* 2.484	47.3	Pk	32	-28.3	0	51	-	-	74	-23	42	298	V
2	2.539	50.45	Pk	32	-28.3	0	54.15	-	-	74	-19.85	42	298	V
3	* 2.484	38.05	RMS	32	-28.3	0	41.75	54	-12.25	-	-	42	298	V
4	* 2.486	38.56	RMS	32	-28.3	0	42.26	54	-11.74	-	-	42	298	V

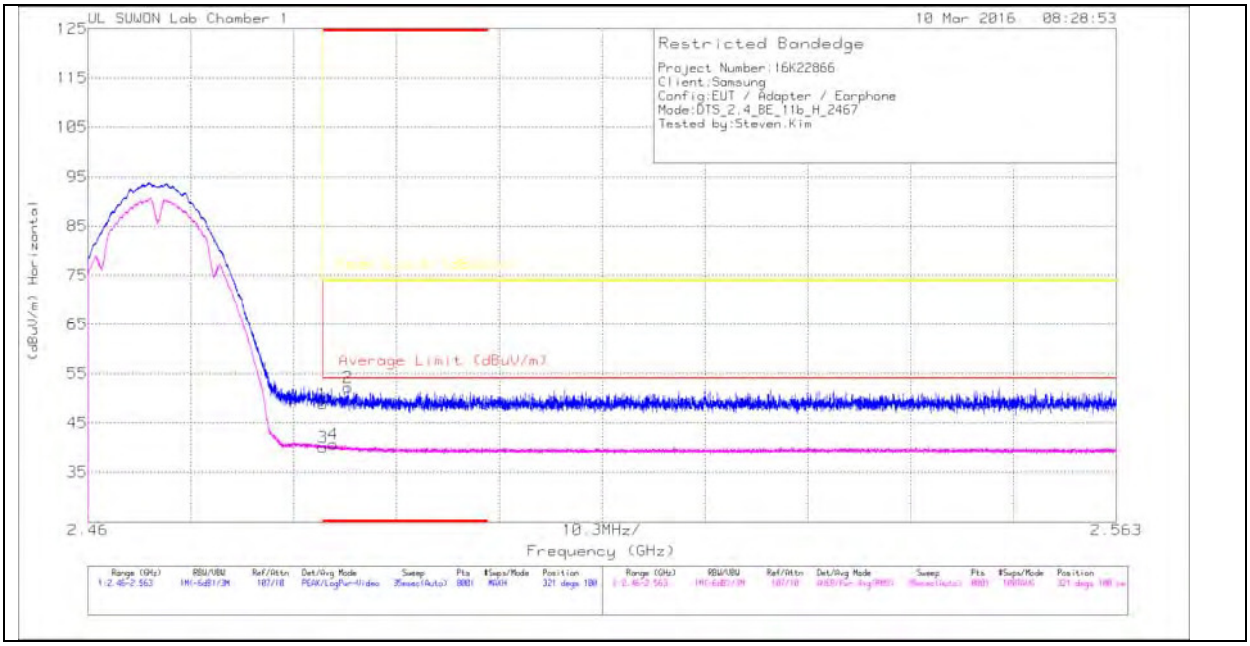
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

RMS - RMS detection

AUTHORIZED BANDEDGE (12 CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_2	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	* 2.484	45.15	Pk	32	-28.3	0	48.85	-	-	74	-25.15	321	100	H
2	* 2.486	48.46	Pk	32	-28.3	0	52.16	-	-	74	-21.84	321	100	H
3	* 2.484	36.39	RMS	32	-28.3	0	40.09	54	-13.91	-	-	321	100	H
4	* 2.485	36.94	RMS	32	-28.3	0	40.64	54	-13.36	-	-	321	100	H

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

Pk - Peak detector

RMS - RMS detection

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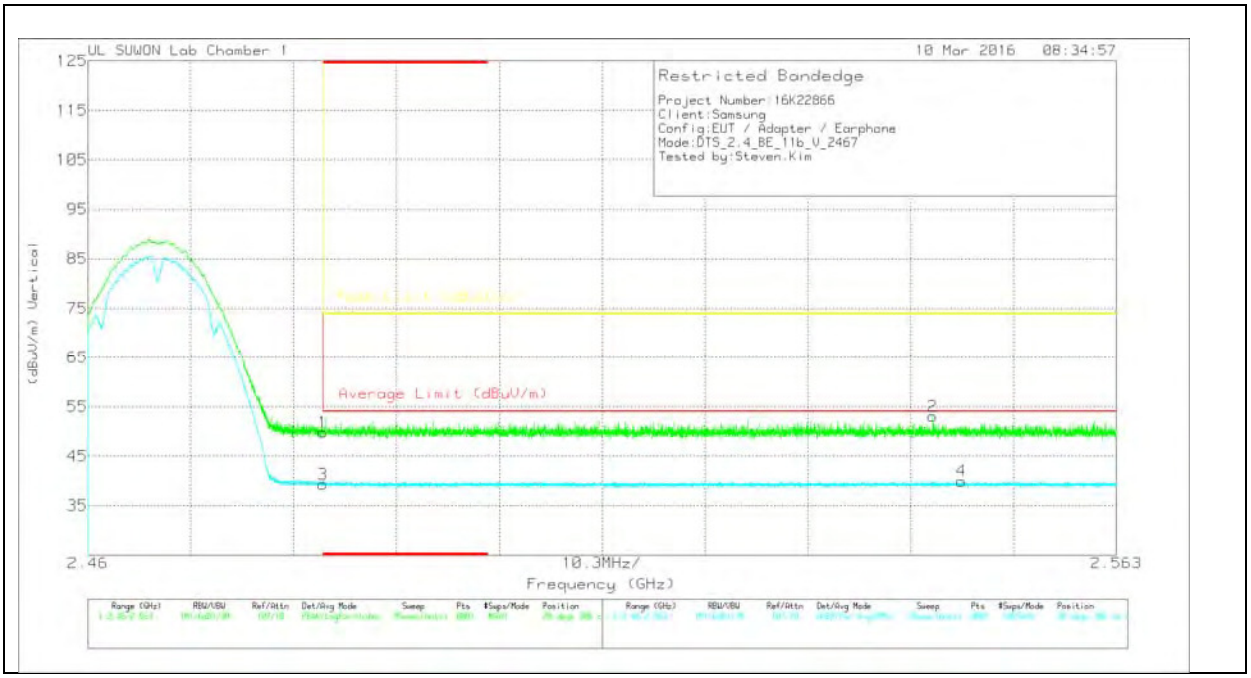
VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_2	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	* 2.484	46.14	Pk	32	-28.3	0	49.84	-	-	74	-24.16	20	306	V
2	2.545	49.24	Pk	32	-28.2	0	53.04	-	-	74	-20.96	20	306	V
3	* 2.484	35.57	RMS	32	-28.3	0	39.27	54	-14.73	-	-	20	306	V
4	2.547	36.2	RMS	32	-28.2	0	40	54	-14	-	-	20	306	V

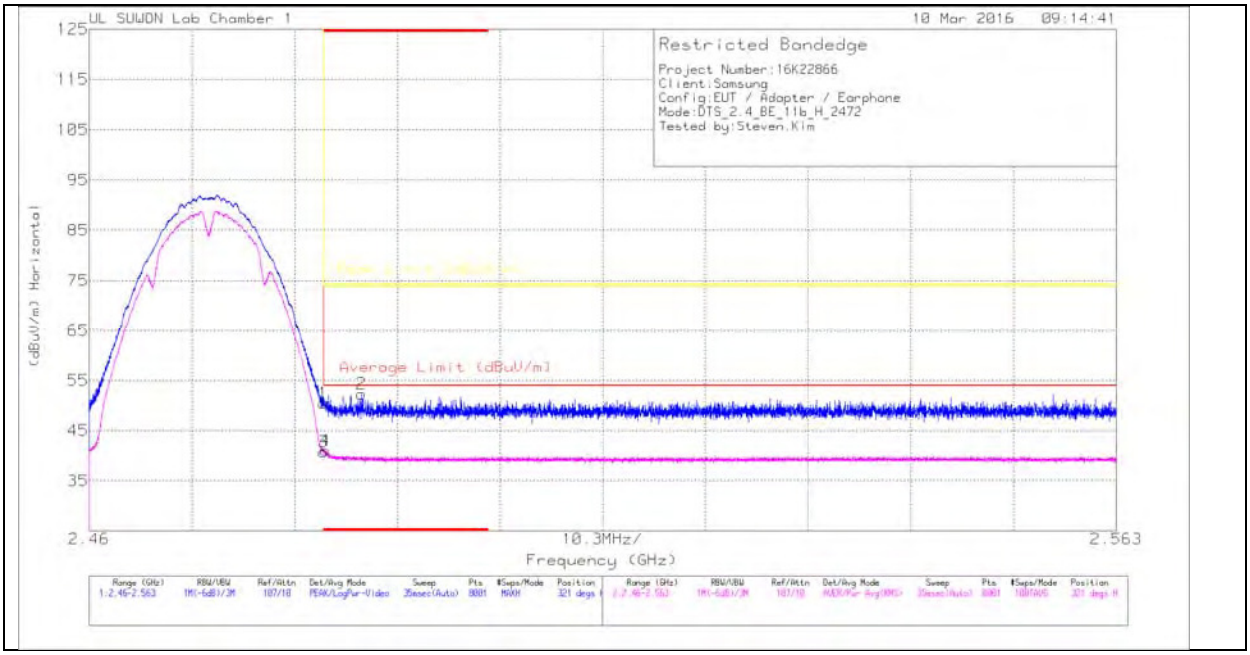
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

RMS - RMS detection

AUTHORIZED BANDEDGE (13 CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_2	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	* 2.484	46.83	Pk	32	-28.3	0	50.53	-	-	74	-23.47	321	100	H
2	* 2.487	48.66	Pk	32	-28.3	0	52.36	-	-	74	-21.64	321	100	H
3	* 2.484	37.11	RMS	32	-28.3	0	40.81	54	-13.19	-	-	321	100	H
4	* 2.484	37.4	RMS	32	-28.3	0	41.1	54	-12.9	-	-	321	100	H

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

Pk - Peak detector

RMS - RMS detection

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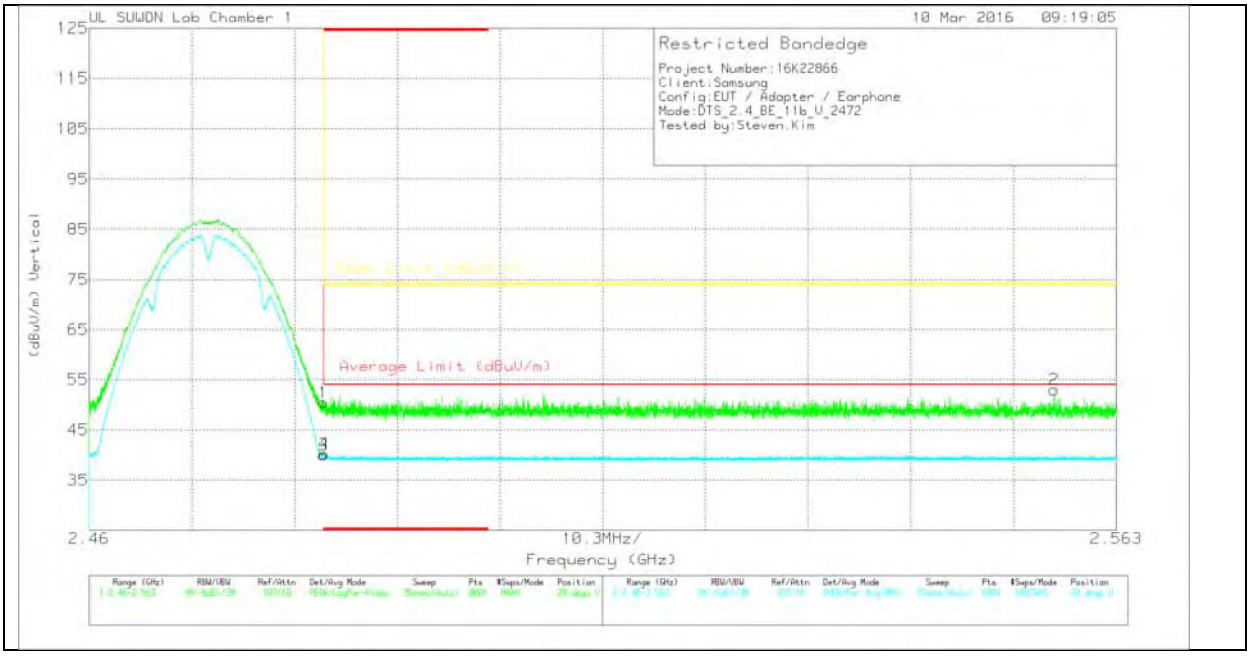
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 443-823, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_2	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	* 2.484	46.78	Pk	32	-28.3	0	50.48	-	-	74	-23.52	20	306	V
2	2.557	49.2	Pk	32	-28.2	0	53	-	-	74	-21	20	306	V
3	* 2.484	36.34	RMS	32	-28.3	0	40.04	54	-13.96	-	-	20	306	V
4	* 2.484	36.59	RMS	32	-28.3	0	40.29	54	-13.71	-	-	20	306	V

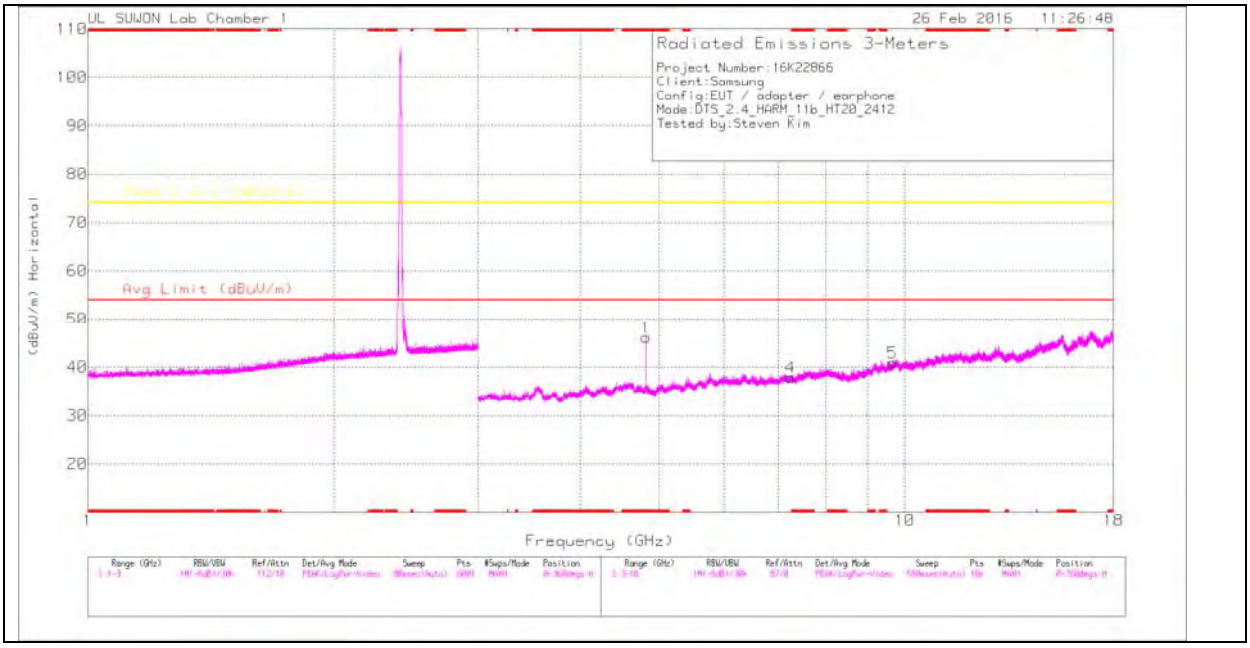
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

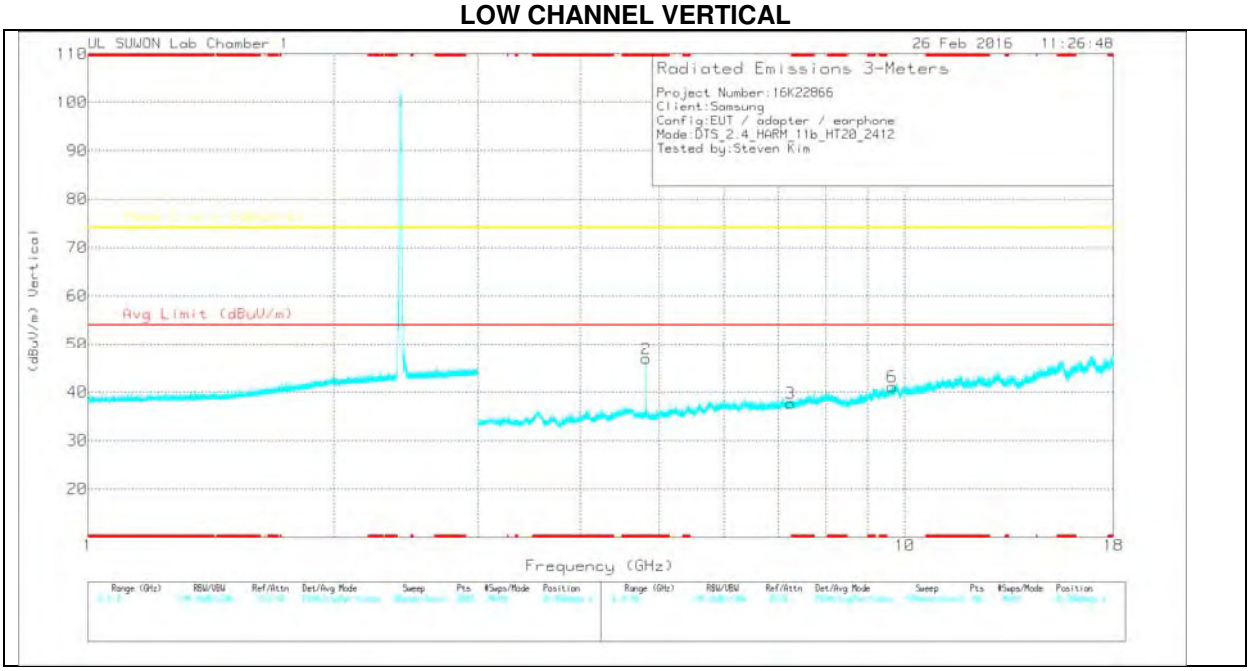
RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL



LOW CHANNEL 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.

LOW CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_3	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.823	46	PK	34	-33.8	0	46.2	-	-	74	-27.8	0-360	100	H
4	7.237	33.07	PK	35.7	-30.9	0	37.87	-	-	74	-36.13	0-360	200	H
5	9.649	31.22	PK	37.1	-27.4	0	40.92	-	-	74	-33.08	0-360	100	H
2	* 4.823	46.7	PK	34	-33.8	0	46.9	-	-	74	-27.1	0-360	100	V
3	7.237	32.96	P	35.7	-30.9	0	37.76	-	-	74	-36.24	0-360	200	V
6	9.647	31.47	KPK	37.1	-27.4	0	41.17	-	-	74	-32.83	0-360	100	V

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

PK – Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_3	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.824	51.84	PK2	34	-33.8	0	52.04	-	-	74	-21.96	196	250	H
* 4.824	46.94	MAv1	34	-33.8	0	47.14	54	-6.86	-	-	196	250	H
* 4.824	52.8	PK2	34	-33.8	0	53	-	-	74	-21	145	276	V
* 4.824	46.36	MAv1	34	-33.8	0	46.56	54	-7.44	-	-	145	276	V

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

PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

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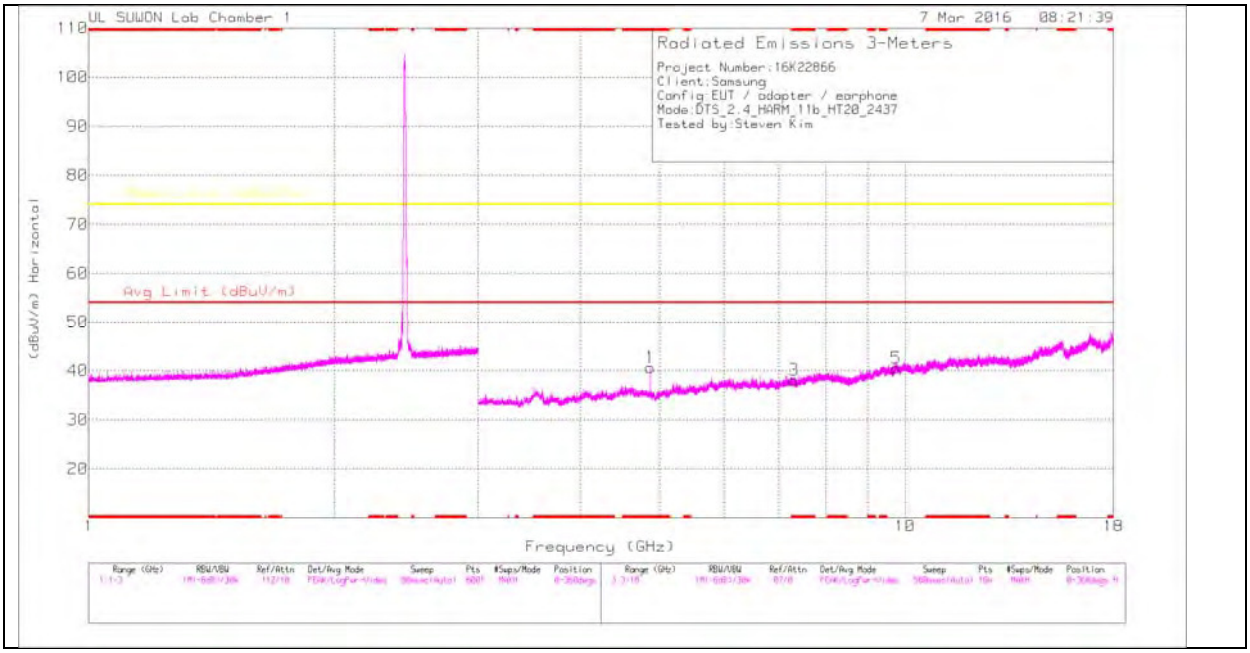
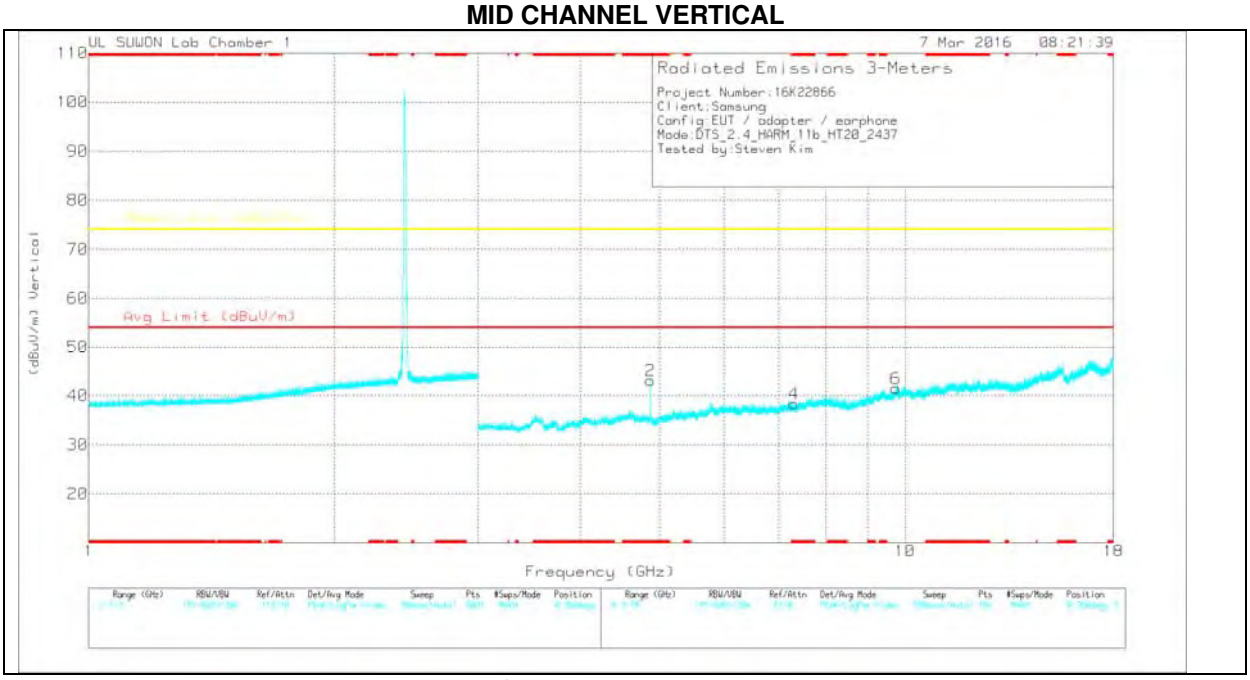
MID CHANNEL HORIZONTAL



MID CHANNEL 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.

MID CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_3	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.874	40.66	PK	34	-34	0	40.66	-	-	74	-33.34	0-360	100	H
3	* 7.311	33.35	PK	35.7	-30.9	0	38.15	-	-	74	-35.85	0-360	100	H
5	9.748	30.14	PK	37.2	-26.8	0	40.54	-	-	74	-33.46	0-360	200	H
2	* 4.874	43.13	PK	34	-34	0	43.13	-	-	74	-30.87	0-360	100	V
4	* 7.316	33.46	PK	35.8	-30.9	0	38.36	-	-	74	-35.64	0-360	100	V
6	9.745	31.22	PK	37.2	-26.9	0	41.52	-	-	74	-32.48	0-360	200	V

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

PK – Peak Detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_3	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.874	50.87	PK2	34	-34	0	50.87	-	-	74	-23.13	210	340	H
* 4.874	44.06	MAv1	34	-34	0	44.06	54	-9.94	-	-	210	340	H
* 4.874	50.85	PK2	34	-34	0	50.85	-	-	74	-23.15	149	298	V
* 4.874	44.47	MAv1	34	-34	0	44.47	54	-9.53	-	-	149	298	V

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

PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

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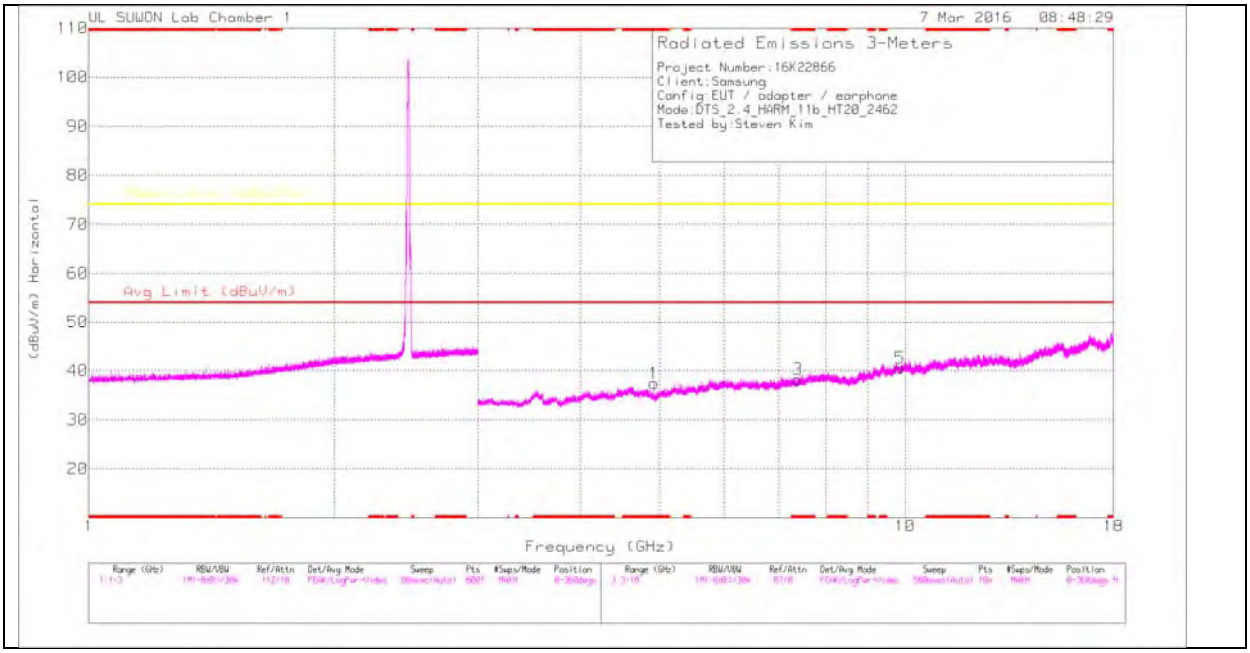
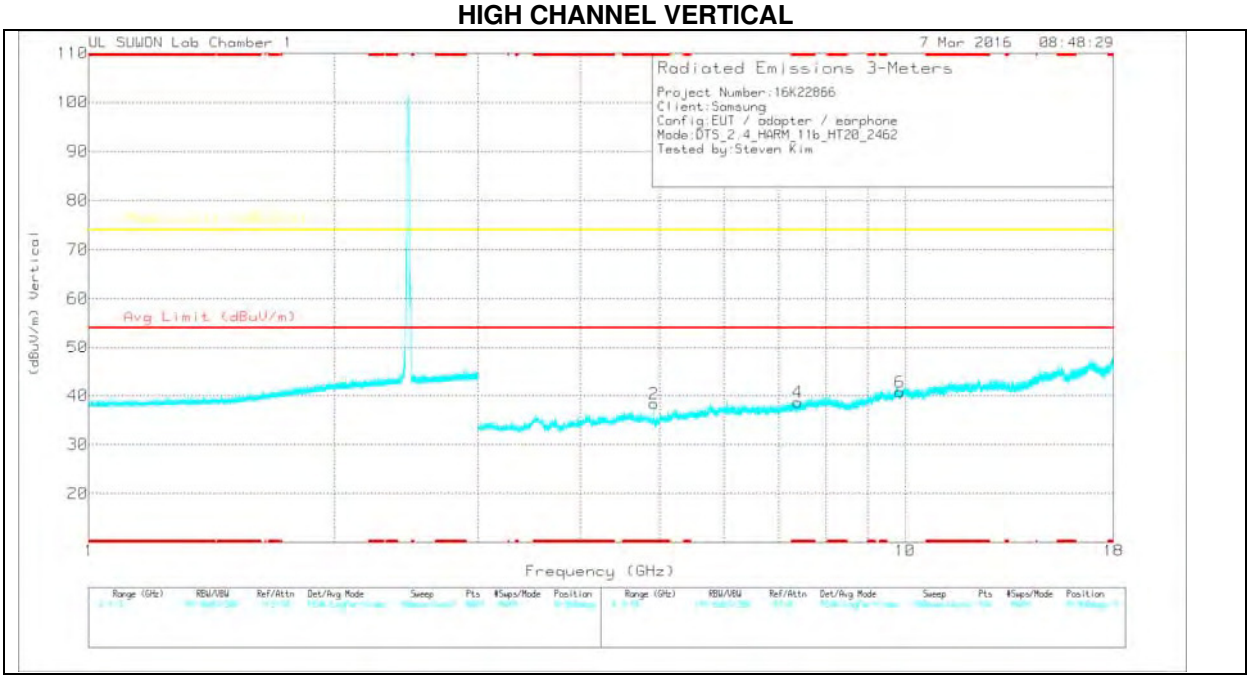
HIGH CHANNEL HORIZONTAL



HIGH CHANNEL 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.

HIGH CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_3	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.924	37.45	PK	34	-34	0	37.45	-	-	74	-36.55	0-360	200	H
3	* 7.383	33.18	PK	35.8	-30.7	0	38.28	-	-	74	-35.72	0-360	100	H
5	9.848	30.84	PK	37.3	-27.6	0	40.54	-	-	74	-33.46	0-360	100	H
2	* 4.924	38.34	PK	34	-34	0	38.34	-	-	74	-35.66	0-360	100	V
4	* 7.385	33.55	PK	35.8	-30.7	0	38.65	-	-	74	-35.35	0-360	100	V
6	9.848	31.06	PK	37.3	-27.6	0	40.76	-	-	74	-33.24	0-360	100	V

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

PK – Peak Detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_3	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.926	46.46	PK2	34	-34	0	46.46	-	-	74	-27.54	303	236	H
* 4.924	34.19	MAv1	34	-34	0	34.19	54	-19.81	-	-	303	236	H
* 4.924	47.83	PK2	34	-34	0	47.83	-	-	74	-26.17	144	325	V
* 4.924	36.95	MAv1	34	-34	0	36.95	54	-17.05	-	-	144	325	V

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

PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

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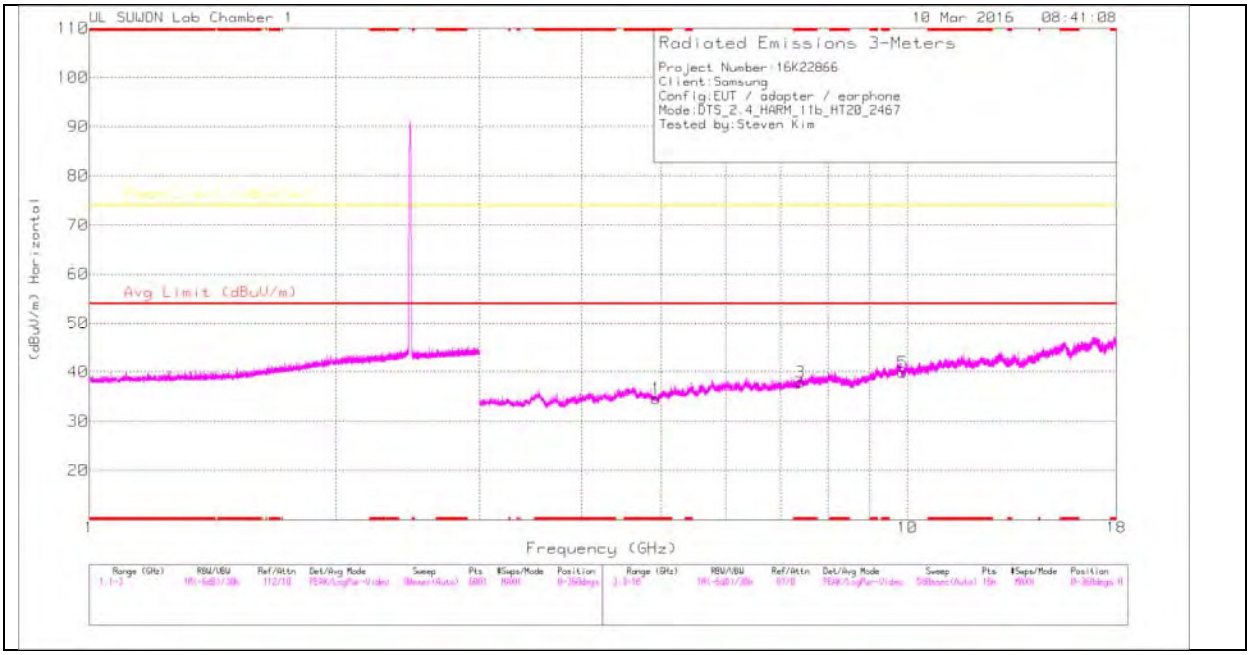
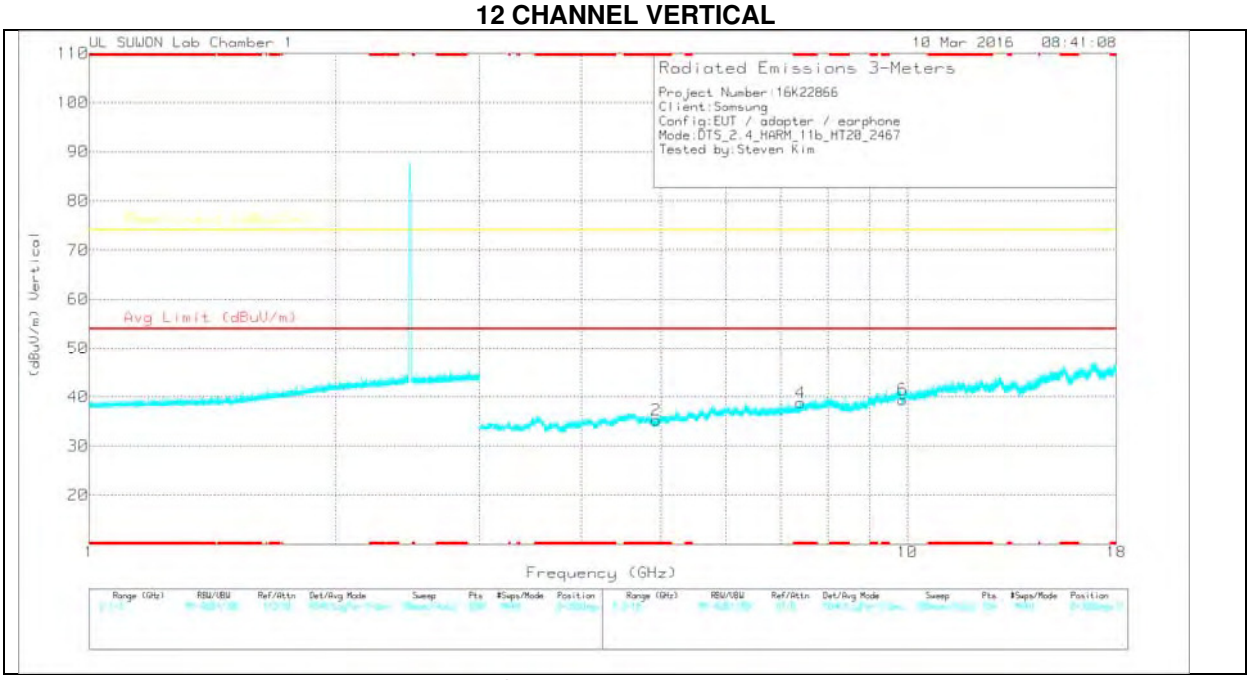
12 CHANNEL HORIZONTAL



12 CHANNEL 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.

12 CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_3	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.934	34.59	PK	34	-34	0	34.59	-	-	74	-39.41	0-360	200	H
3	* 7.404	32.72	PK	35.8	-30.6	0	37.92	-	-	74	-36.08	0-360	200	H
5	9.868	30.51	PK	37.3	-27.9	0	39.91	-	-	74	-34.09	0-360	200	H
2	* 4.934	35.27	PK	34	-34	0	35.27	-	-	74	-38.73	0-360	200	V
4	* 7.4	33.57	PK	35.8	-30.6	0	38.77	-	-	74	-35.23	0-360	100	V
6	9.868	30.07	PK	37.3	-27.9	0	39.47	-	-	74	-34.53	0-360	200	V

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

PK – Peak Detector

Note: Only peak measurement was performed. Because peak measurement result of unwanted emission is less than average limit (54dBuV/m).

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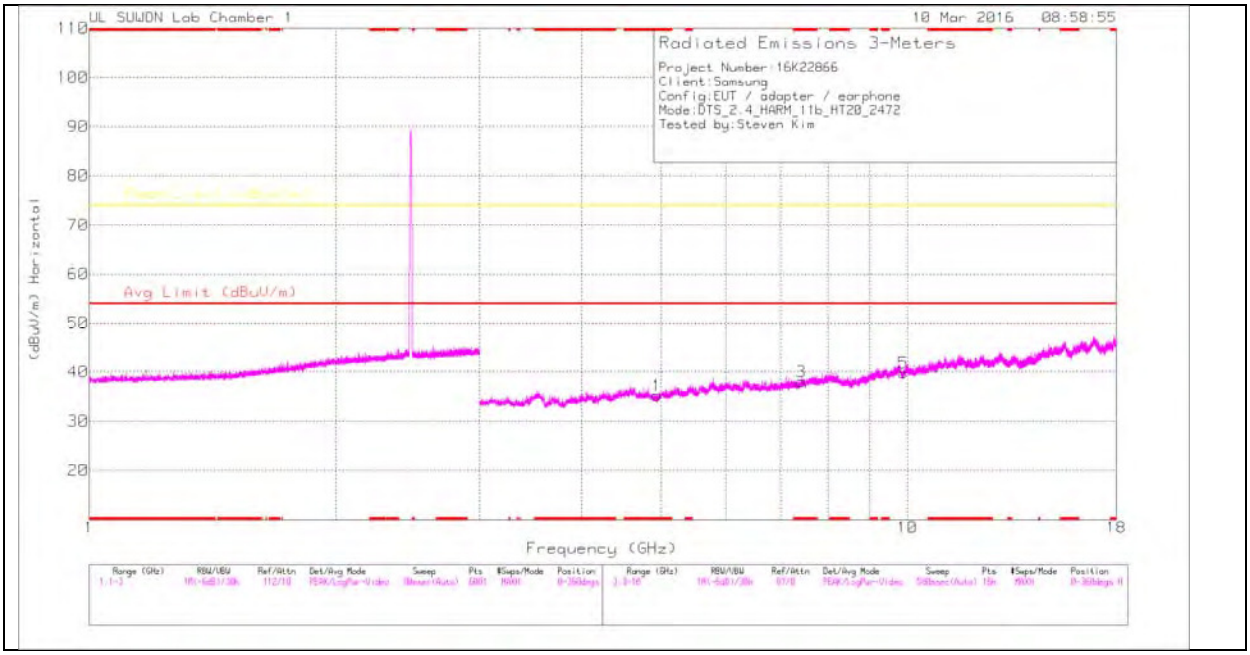
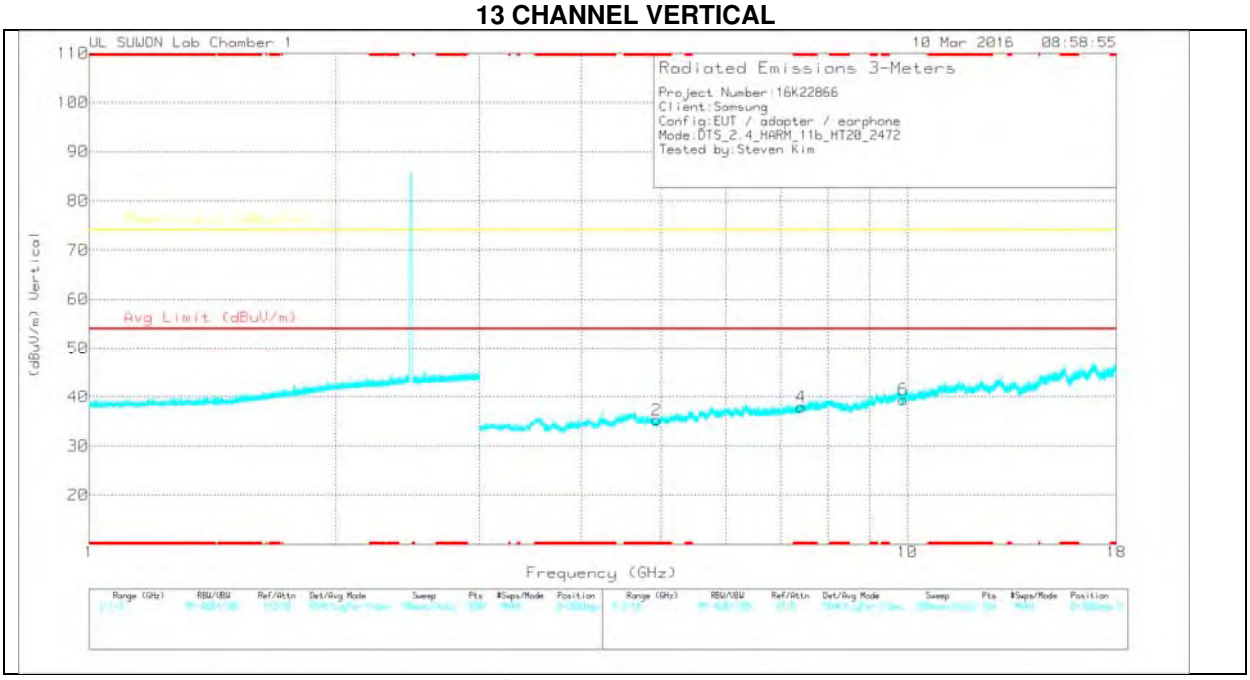
13 CHANNEL HORIZONTAL



13 CHANNEL 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.

13 CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_3	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.941	35.21	PK	34	-34	0	35.21	-	-	74	-38.79	0-360	100	H
3	* 7.417	32.92	PK	35.8	-30.7	0	38.02	-	-	74	-35.98	0-360	100	H
5	9.886	30.37	PK	37.3	-27.9	0	39.77	-	-	74	-34.23	0-360	200	H
2	* 4.94	35.3	PK	34	-34	0	35.3	-	-	74	-38.7	0-360	100	V
4	* 7.417	32.85	PK	35.8	-30.7	0	37.95	-	-	74	-36.05	0-360	200	V
6	9.886	30.07	PK	37.3	-27.9	0	39.47	-	-	74	-34.53	0-360	200	V

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

PK – Peak Detector

Note: Only peak measurement was performed. Because peak measurement result of unwanted emission is less than average limit (54dBuV/m).

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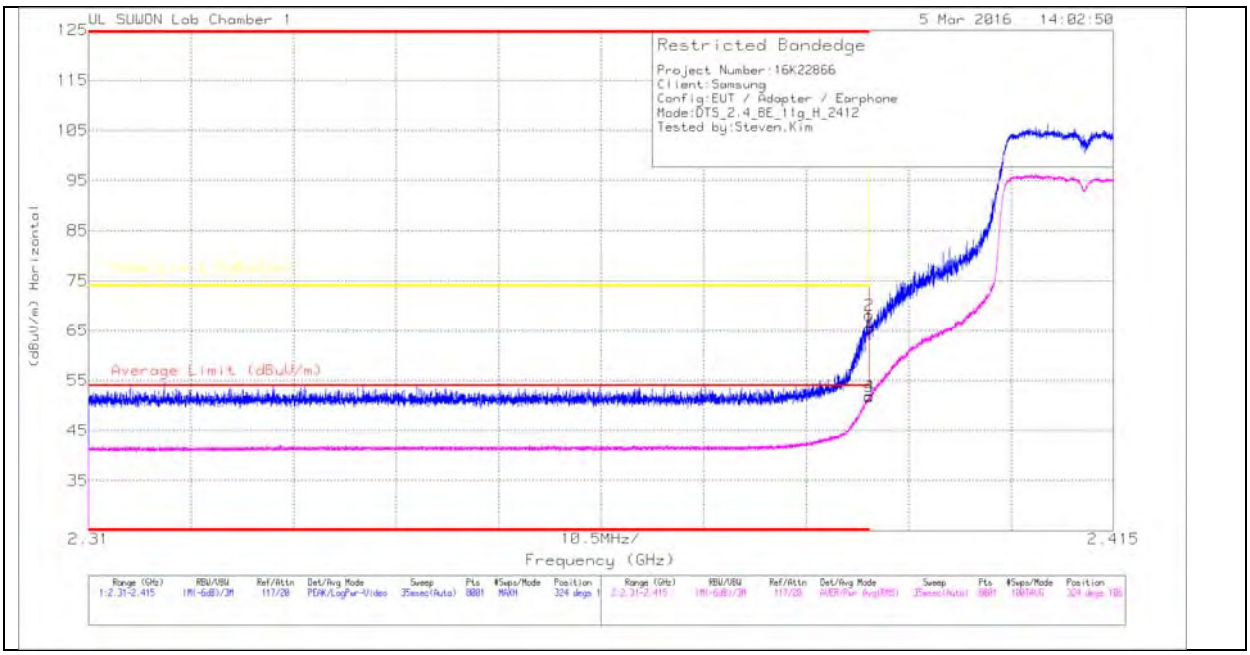
11.2.2. TX ABOVE 1 GHz 802.11g 2TX CDD MODE IN THE 2.4 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_2	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	62.83	Pk	31.8	-29	0	65.63	-	-	74	-8.37	324	106	H
2	* 2.39	65.34	Pk	31.8	-29	0	68.14	-	-	74	-5.86	324	106	H
3	* 2.39	48.68	RMS	31.8	-29	.29	51.77	54	-2.23	-	-	324	106	H
4	* 2.39	48.8	RMS	31.8	-29	.29	51.89	54	-2.11	-	-	324	106	H

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

Pk - Peak detector

RMS - RMS detection

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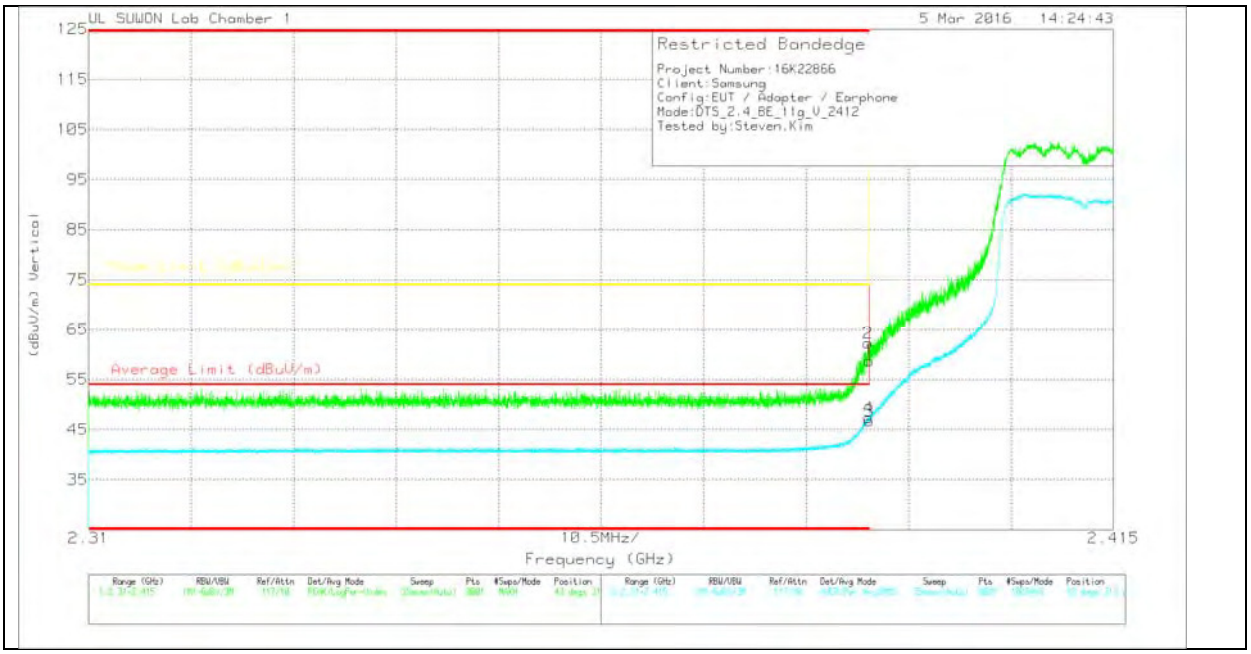
VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_2	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	55.96	Pk	31.8	-29	0	58.76	-	-	74	-15.24	43	313	V
2	* 2.39	59.45	Pk	31.8	-29	0	62.25	-	-	74	-11.75	43	313	V
3	* 2.39	43.62	RMS	31.8	-29	.29	46.71	54	-7.29	-	-	43	313	V
4	* 2.39	44.23	RMS	31.8	-29	.29	47.32	54	-6.68	-	-	43	313	V

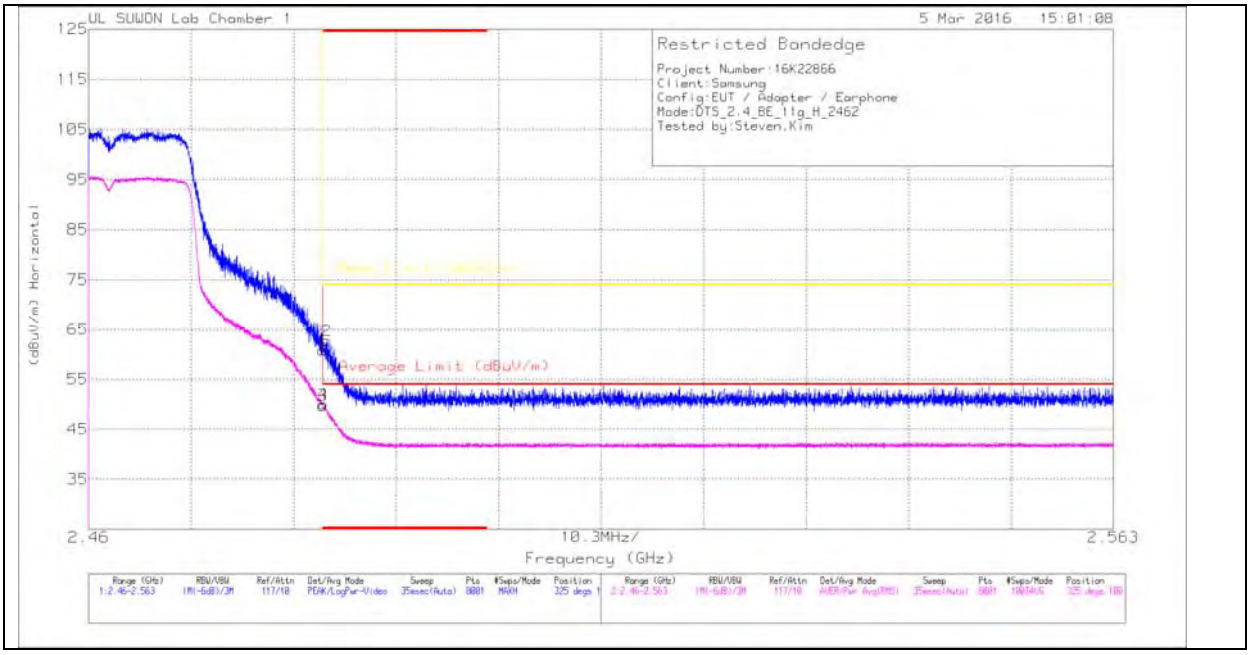
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

RMS - RMS detection

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	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	* 2.484	57.17	Pk	32	-28.3	0	60.87	-	-	74	-13.13	325	100	H
2	* 2.484	59.07	Pk	32	-28.3	0	62.77	-	-	74	-11.23	325	100	H
3	* 2.484	45.77	RMS	32	-28.3	.29	49.76	54	-4.24	-	-	325	100	H
4	* 2.484	46.04	RMS	32	-28.3	.29	50.03	54	-3.97	-	-	325	100	H

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

Pk - Peak detector

RMS - RMS detection

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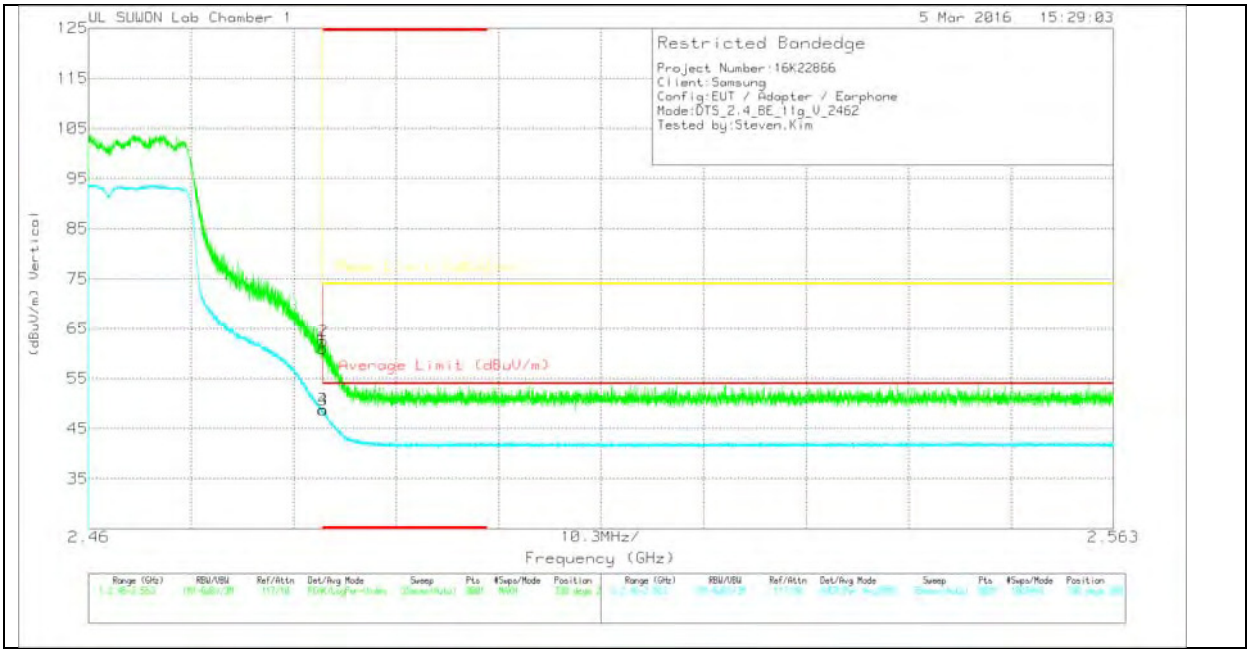
VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_2	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	* 2.484	57.22	Pk	32	-28.3	0	60.92	-	-	74	-13.08	338	240	V
2	* 2.484	58.81	Pk	32	-28.3	0	62.51	-	-	74	-11.49	338	240	V
3	* 2.484	44.74	RMS	32	-28.3	.29	48.73	54	-5.27	-	-	338	240	V
4	* 2.484	44.79	RMS	32	-28.3	.29	48.78	54	-5.22	-	-	338	240	V

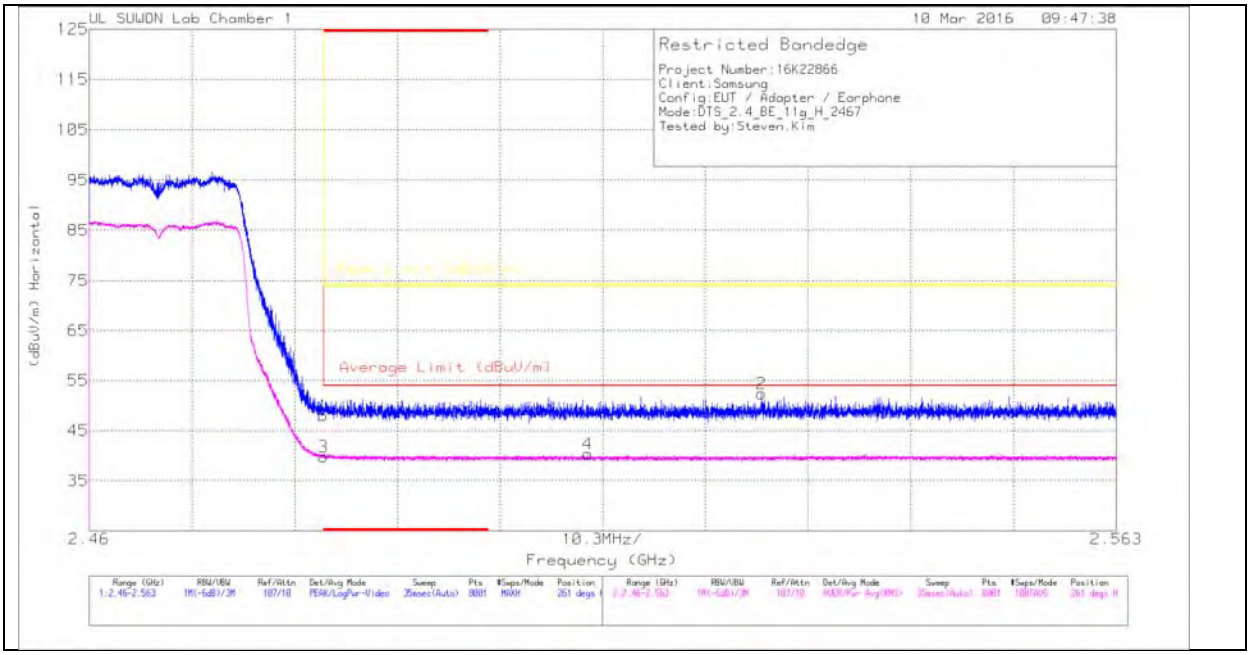
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

RMS - RMS detection

AUTHORIZED BANDEDGE (12 CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_2	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	* 2.484	44.35	Pk	32	-28.3	0	48.05	-	-	74	-25.95	261	100	H
2	2.527	48.69	Pk	32	-28.3	0	52.39	-	-	74	-21.61	261	100	H
3	* 2.484	35.81	RMS	32	-28.3	.29	39.8	54	-14.2	-	-	261	100	H
4	2.51	36.4	RMS	32	-28.3	.29	40.39	54	-13.61	-	-	261	100	H

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

Pk - Peak detector

RMS - RMS detection

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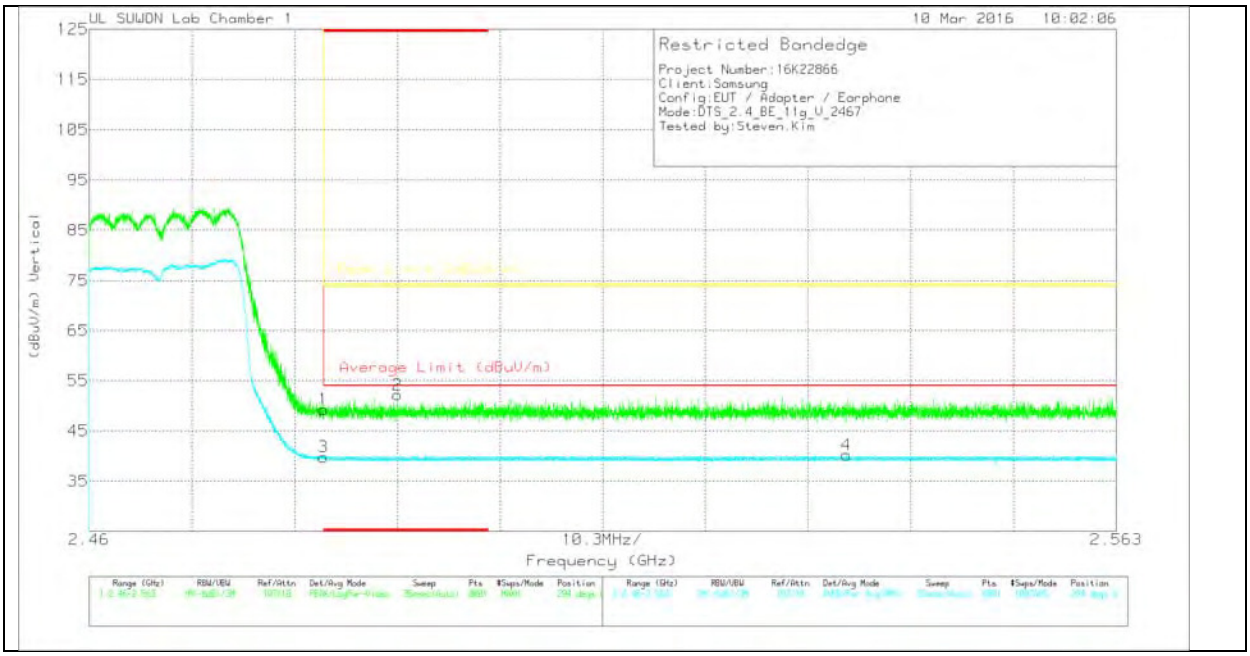
VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_2	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	* 2.484	45.63	Pk	32	-28.3	0	49.33	-	-	74	-24.67	294	342	V
2	* 2.491	48.49	Pk	32	-28.3	0	52.19	-	-	74	-21.81	294	342	V
3	* 2.484	35.84	RMS	32	-28.3	.29	39.83	54	-14.17	-	-	294	342	V
4	2.536	36.22	RMS	32	-28.3	.29	40.21	54	-13.79	-	-	294	342	V

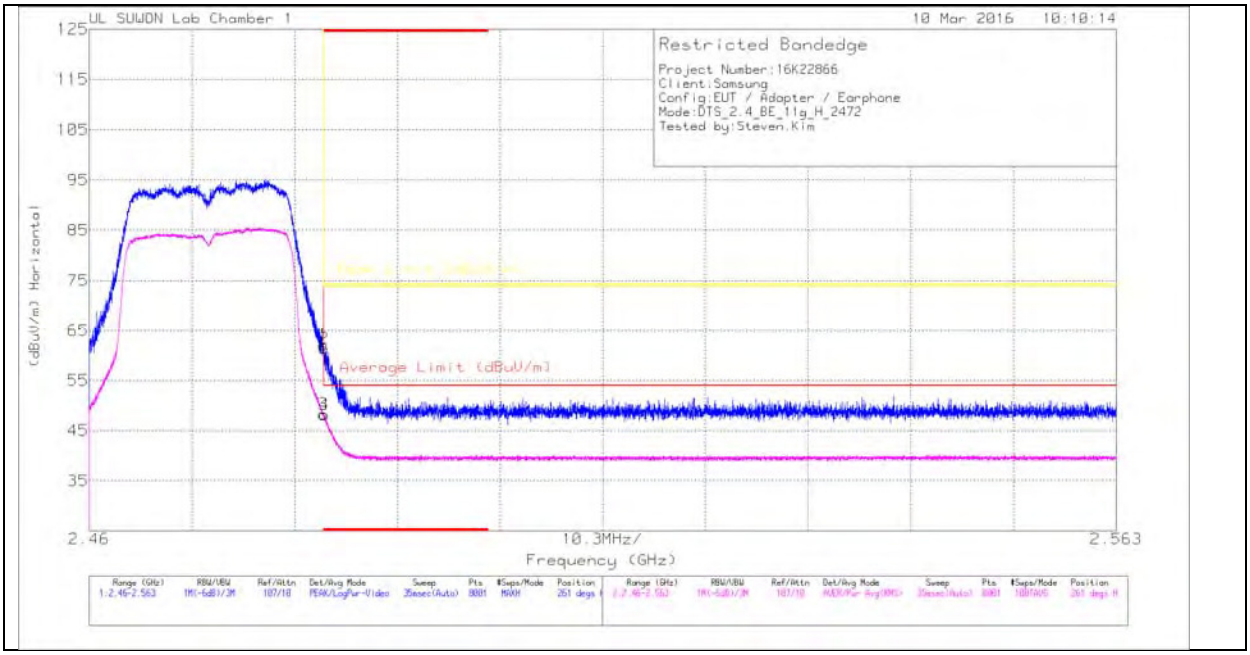
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

RMS - RMS detection

AUTHORIZED BANDEDGE (13 CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

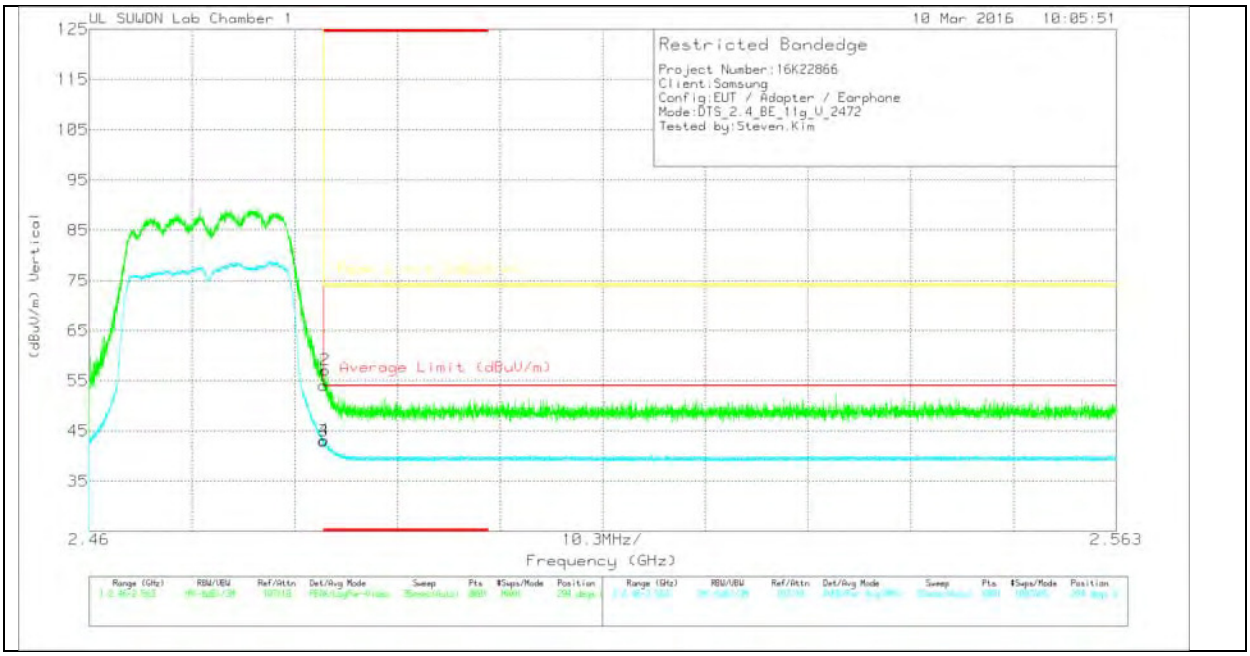
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_2	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	58.37	Pk	32	-28.3	0	62.07	-	-	74	-11.93	261	100	H
2	* 2.484	57.74	Pk	32	-28.3	0	61.44	-	-	74	-12.56	261	100	H
3	* 2.484	44.33	RMS	32	-28.3	.29	48.32	54	-5.68	-	-	261	100	H
4	* 2.484	44.15	RMS	32	-28.3	.29	48.14	54	-5.86	-	-	261	100	H

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

Pk - Peak detector

RMS - RMS detection

VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_2	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	* 2.484	50.35	Pk	32	-28.3	0	54.05	-	-	74	-19.95	294	342	V
2	* 2.484	53.42	Pk	32	-28.3	0	57.12	-	-	74	-16.88	294	342	V
3	* 2.484	39	RMS	32	-28.3	.29	42.99	54	-11.01	-	-	294	342	V
4	* 2.484	39.22	RMS	32	-28.3	.29	43.21	54	-10.79	-	-	294	342	V

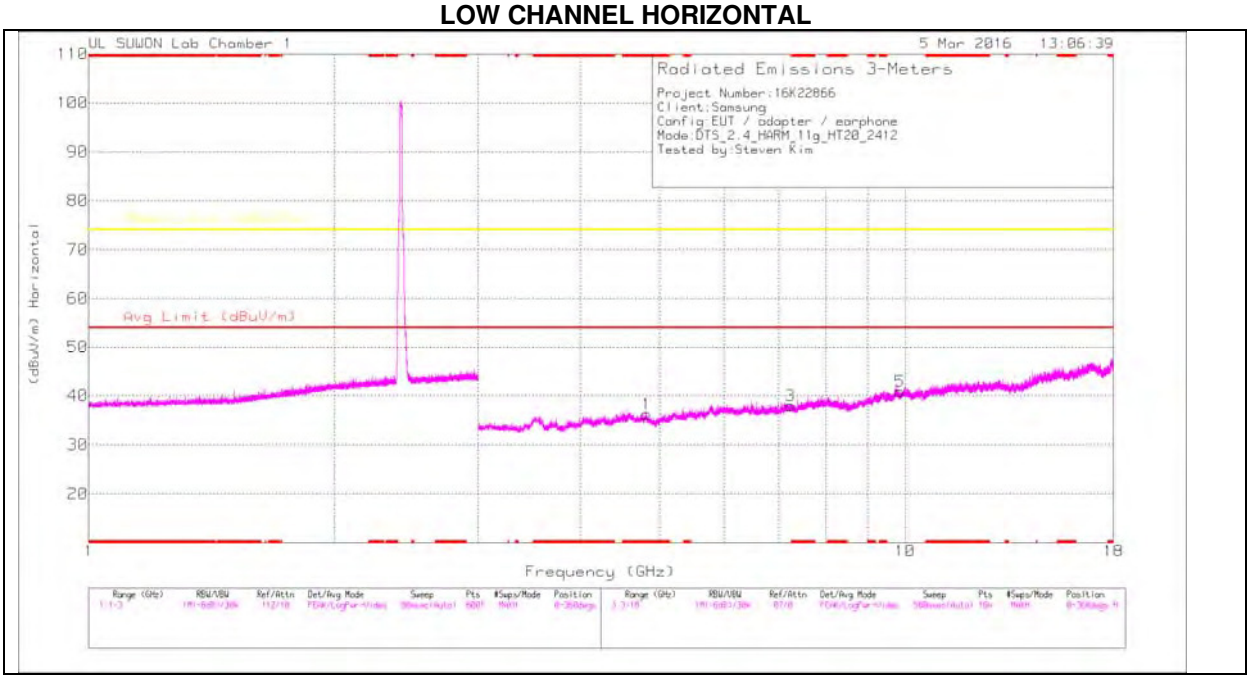
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

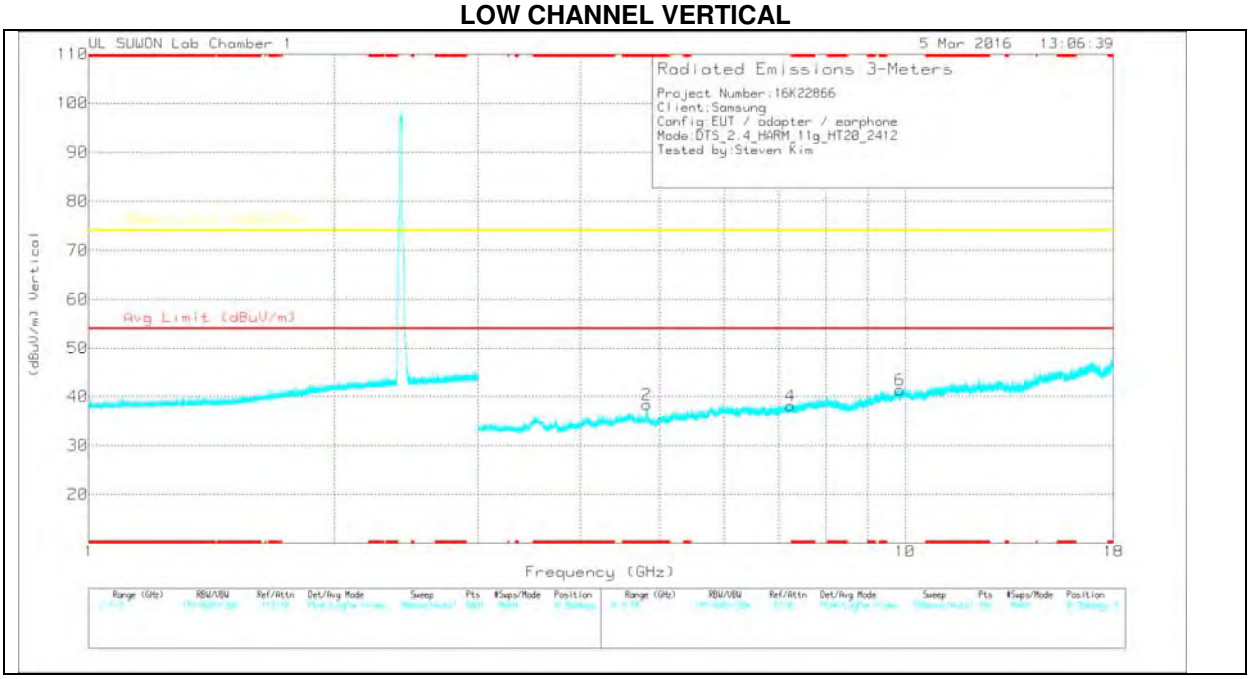
RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL



LOW CHANNEL 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.

LOW CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_3	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.821	36.03	PK	34	-33.8	0	36.23	-	-	74	-37.77	0-360	200	H
3	7.238	33.17	PK	35.7	-30.9	0	37.97	-	-	74	-36.03	0-360	100	H
5	9.852	31.27	PK	37.3	-27.7	0	40.87	-	-	74	-33.13	0-360	100	H
2	* 4.823	38.16	PK	34	-33.8	0	38.36	-	-	74	-35.64	0-360	100	V
4	7.238	33.29	PK	35.7	-30.9	0	38.09	-	-	74	-35.91	0-360	100	V
6	9.859	31.89	PK	37.3	-27.8	0	41.39	-	-	74	-32.61	0-360	200	V

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

PK – Peak Detector

Note: Only peak measurement was performed. Because peak measurement result of unwanted emission is less than average limit (54dBuV/m).

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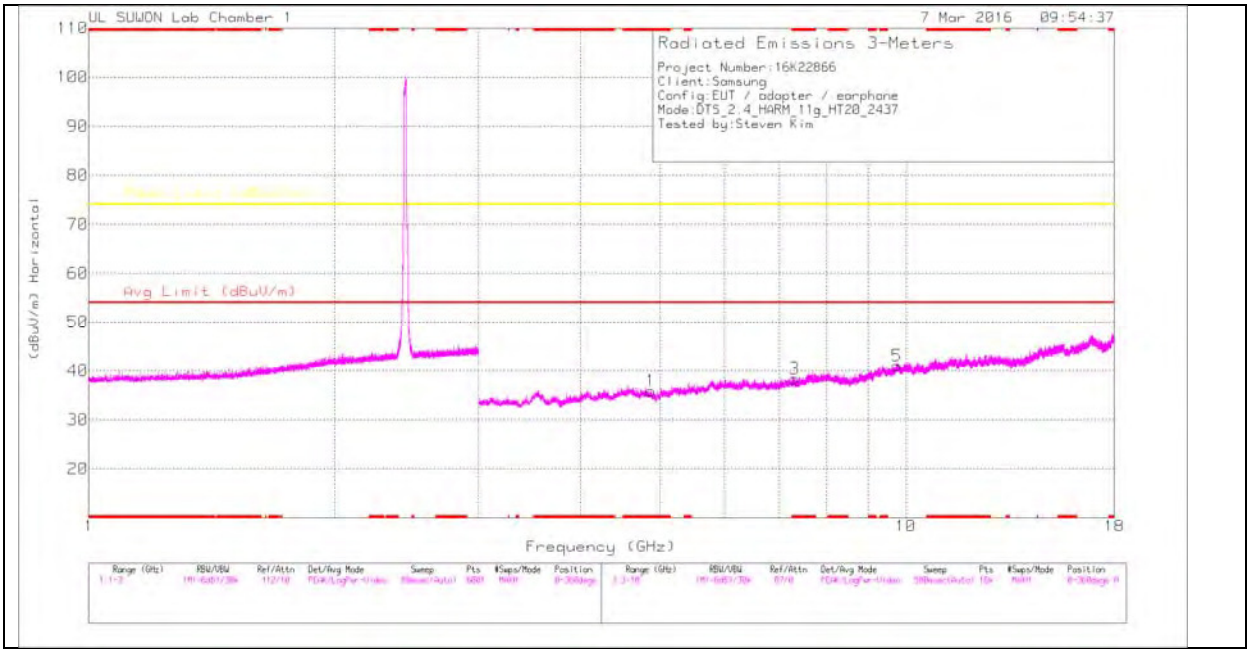
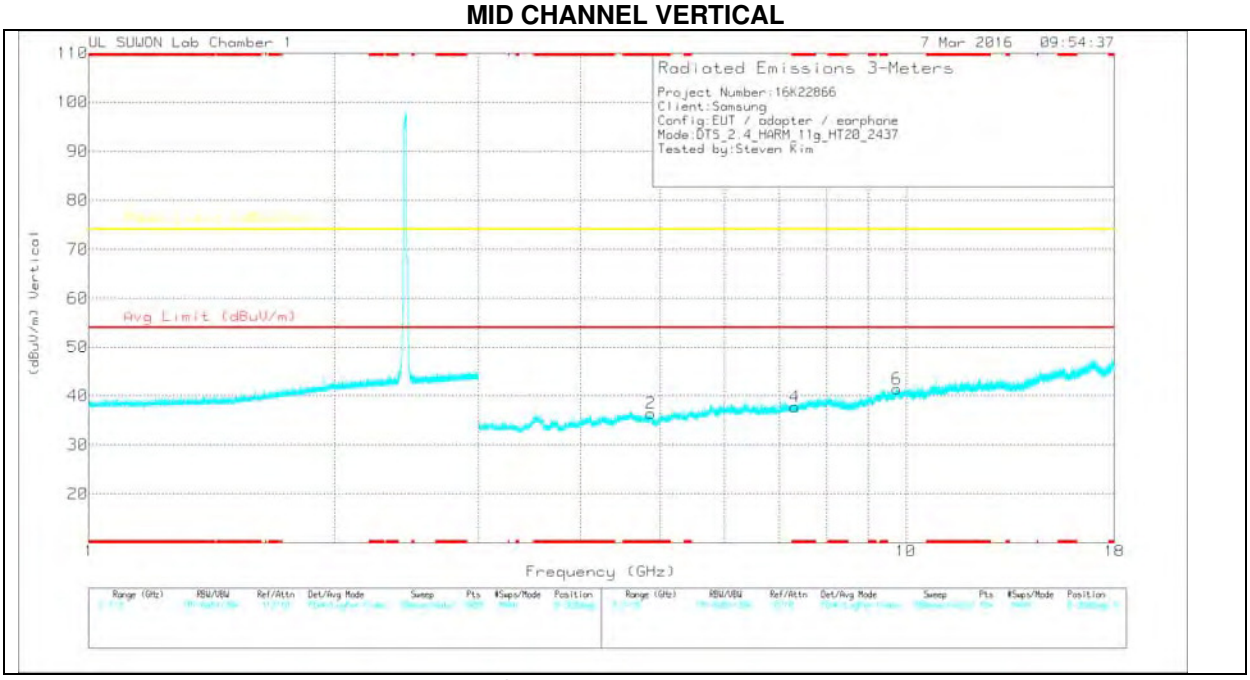
MID CHANNEL HORIZONTAL



MID CHANNEL 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.

MID CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_3	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.874	35.94	PK	34	-34	0	35.94	-	-	74	-38.06	0-360	200	H
3	* 7.308	33.6	PK	35.7	-30.9	0	38.4	-	-	74	-35.6	0-360	200	H
5	9.747	30.73	PK	37.2	-26.9	0	41.03	-	-	74	-32.97	0-360	200	H
2	* 4.874	36.44	PK	34	-34	0	36.44	-	-	74	-37.56	0-360	100	V
4	* 7.312	32.91	PK	35.7	-30.9	0	37.71	-	-	74	-36.29	0-360	100	V
6	9.749	31.01	PK	37.2	-26.8	0	41.41	-	-	74	-32.59	0-360	200	V

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

PK – Peak Detector

Note: Only peak measurement was performed. Because peak measurement result of unwanted emission is less than average limit (54dBuV/m).

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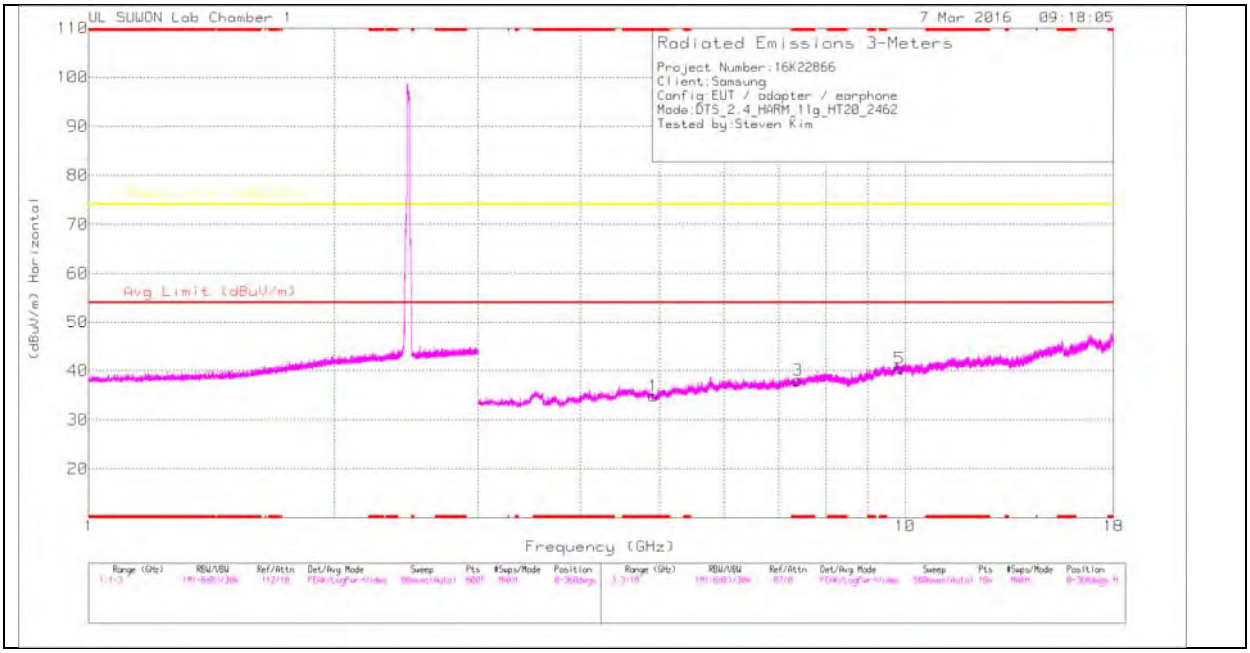
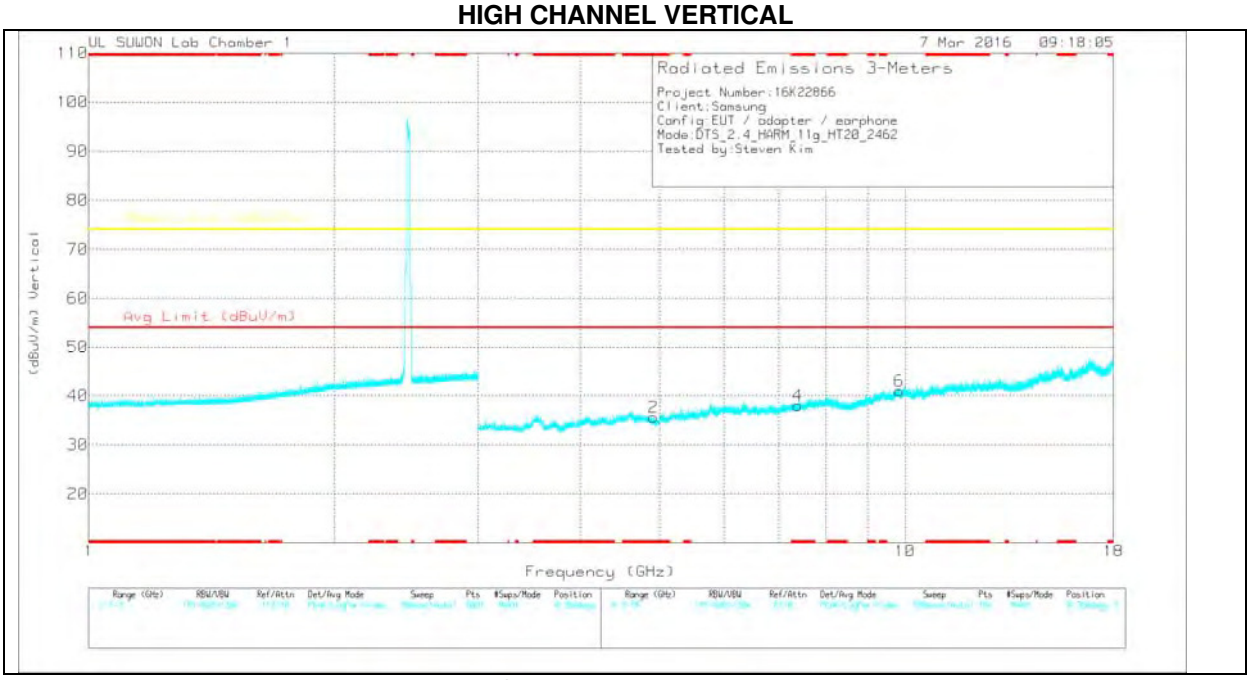
HIGH CHANNEL HORIZONTAL



HIGH CHANNEL 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.

HIGH CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_3	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.921	34.84	PK	34	-34	0	34.84	-	-	74	-39.16	0-360	100	H
3	* 7.386	32.97	PK	35.8	-30.7	0	38.07	-	-	74	-35.93	0-360	100	H
5	9.844	30.71	PK	37.3	-27.5	0	40.51	-	-	74	-33.49	0-360	200	H
2	* 4.919	35.62	PK	34	-34	0	35.62	-	-	74	-38.38	0-360	100	V
4	* 7.385	32.88	PK	35.8	-30.7	0	37.98	-	-	74	-36.02	0-360	100	V
6	9.843	31.17	PK	37.3	-27.5	0	40.97	-	-	74	-33.03	0-360	200	V

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

PK – Peak Detector

Note: Only peak measurement was performed. Because peak measurement result of unwanted emission is less than average limit (54dBuV/m).

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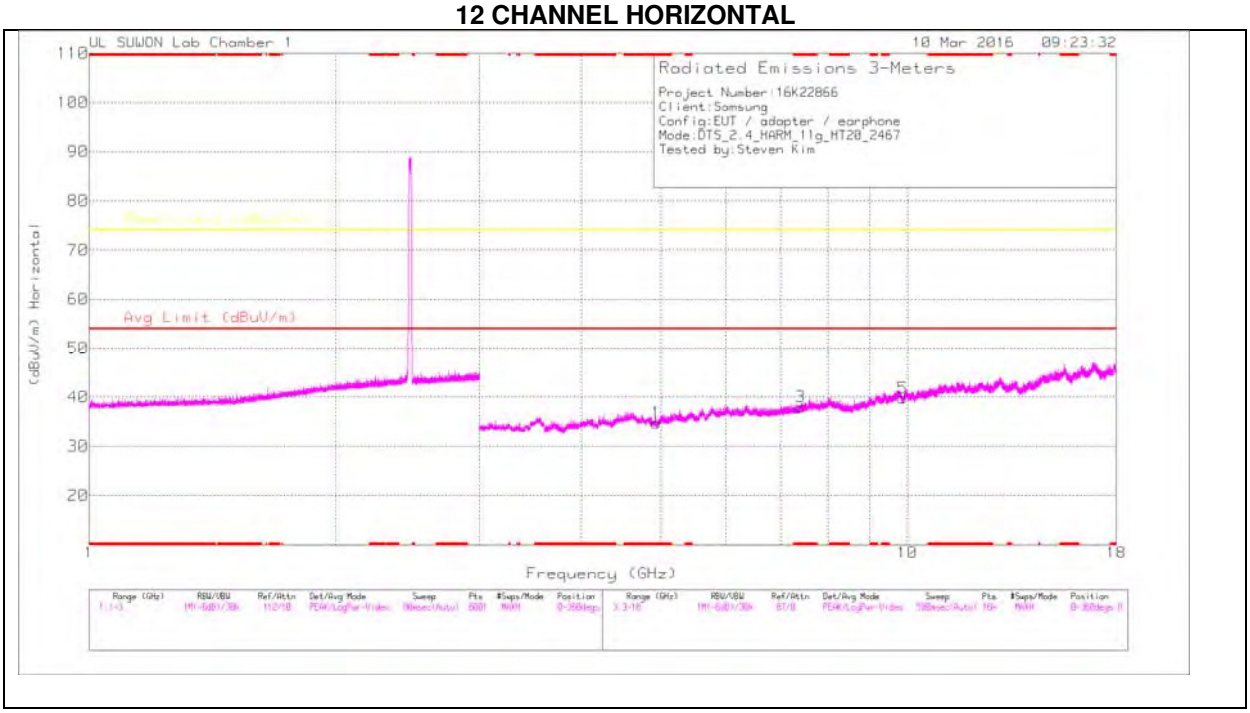
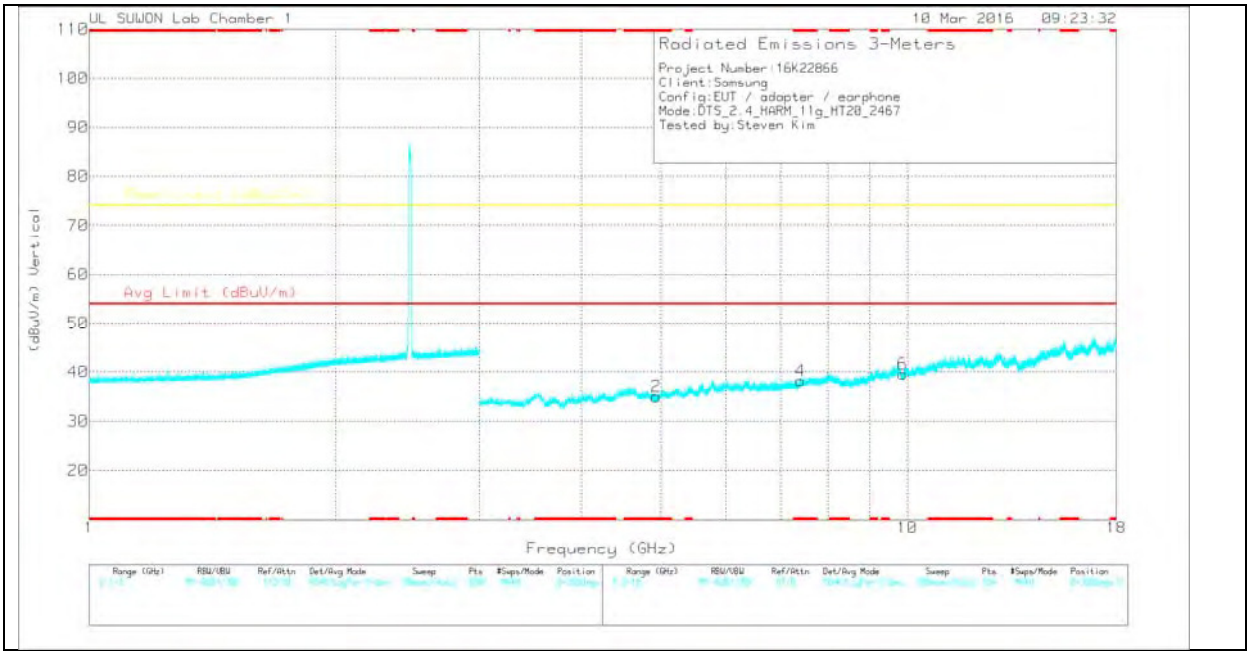
12 CHANNEL HORIZONTAL



12 CHANNEL 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.

12 CHANNEL DATA

Trace Markers

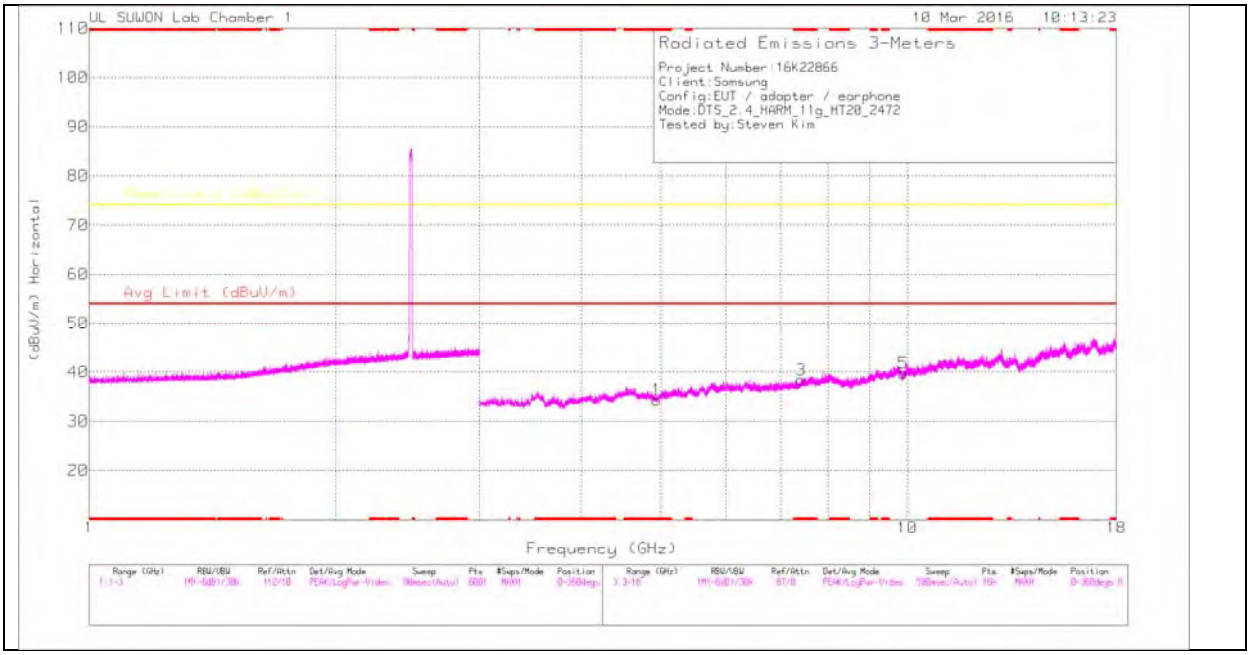
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_3	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.93	34.74	PK	34	-34	0	34.74	-	-	74	-39.26	0-360	200	H
3	* 7.401	32.79	PK	35.8	-30.6	0	37.99	-	-	74	-36.01	0-360	100	H
5	9.87	30.39	PK	37.3	-27.9	0	39.79	-	-	74	-34.21	0-360	100	H
2	* 4.929	35.01	PK	34	-34	0	35.01	-	-	74	-38.99	0-360	100	V
4	* 7.4	33	PK	35.8	-30.6	0	38.2	-	-	74	-35.8	0-360	100	V
6	9.87	30.18	PK	37.3	-27.9	0	39.58	-	-	74	-34.42	0-360	200	V

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

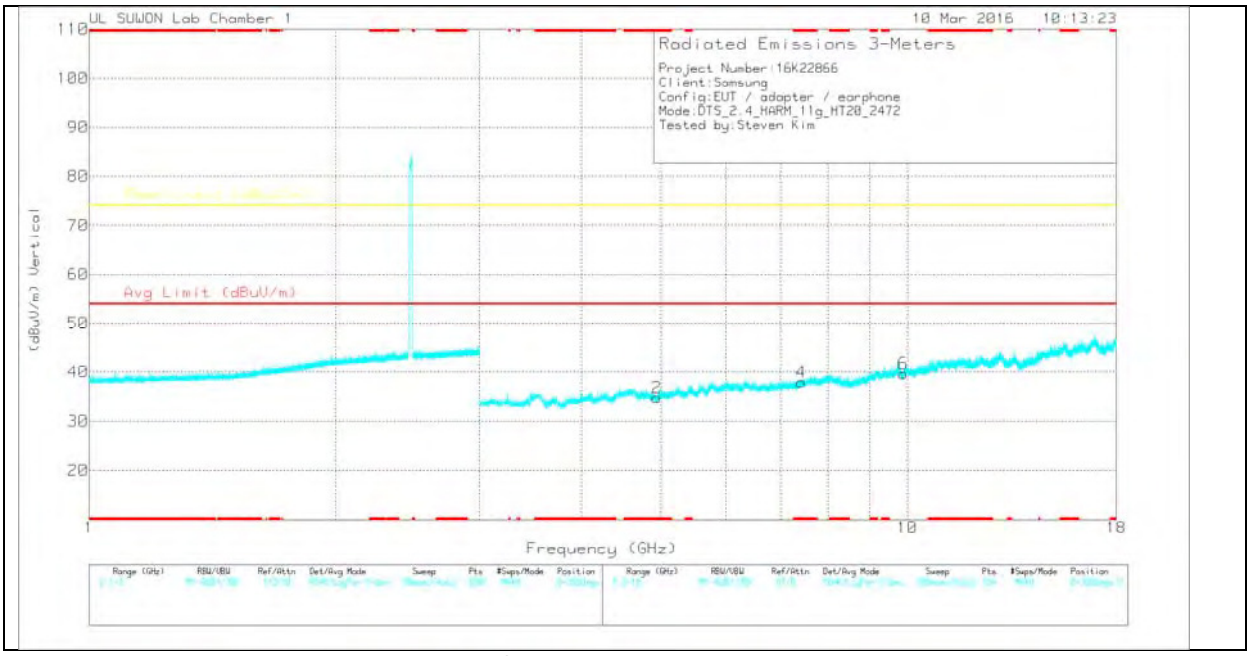
PK – Peak Detector

Note: Only peak measurement was performed. Because peak measurement result of unwanted emission is less than average limit (54dBuV/m).

13 CHANNEL HORIZONTAL



13 CHANNEL 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.

13 CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_3	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.942	34.35	PK	34	-34	0	34.35	-	-	74	-39.65	0-360	100	H
3	* 7.418	33.34	PK	35.8	-30.7	0	38.44	-	-	74	-35.56	0-360	100	H
5	9.887	30.36	PK	37.3	-27.9	0	39.76	-	-	74	-34.24	0-360	100	H
2	* 4.943	34.8	PK	34	-34	0	34.8	-	-	74	-39.2	0-360	200	V
4	* 7.418	32.84	PK	35.8	-30.7	0	37.94	-	-	74	-36.06	0-360	100	V
6	9.887	30.29	PK	37.3	-27.9	0	39.69	-	-	74	-34.31	0-360	200	V

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

PK – Peak Detector

Note: Only peak measurement was performed. Because peak measurement result of unwanted emission is less than average limit (54dBuV/m).

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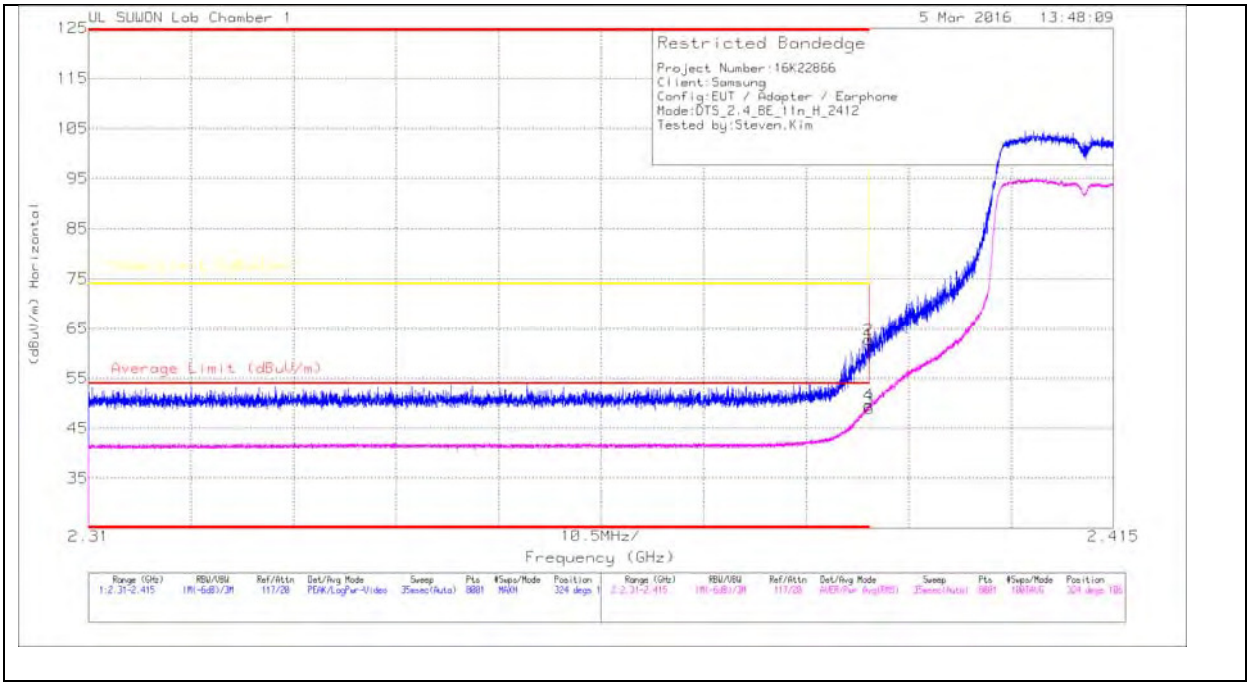
11.2.3. TX ABOVE 1 GHz 802.11n HT20 2TX CDD MODE IN THE 2.4 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

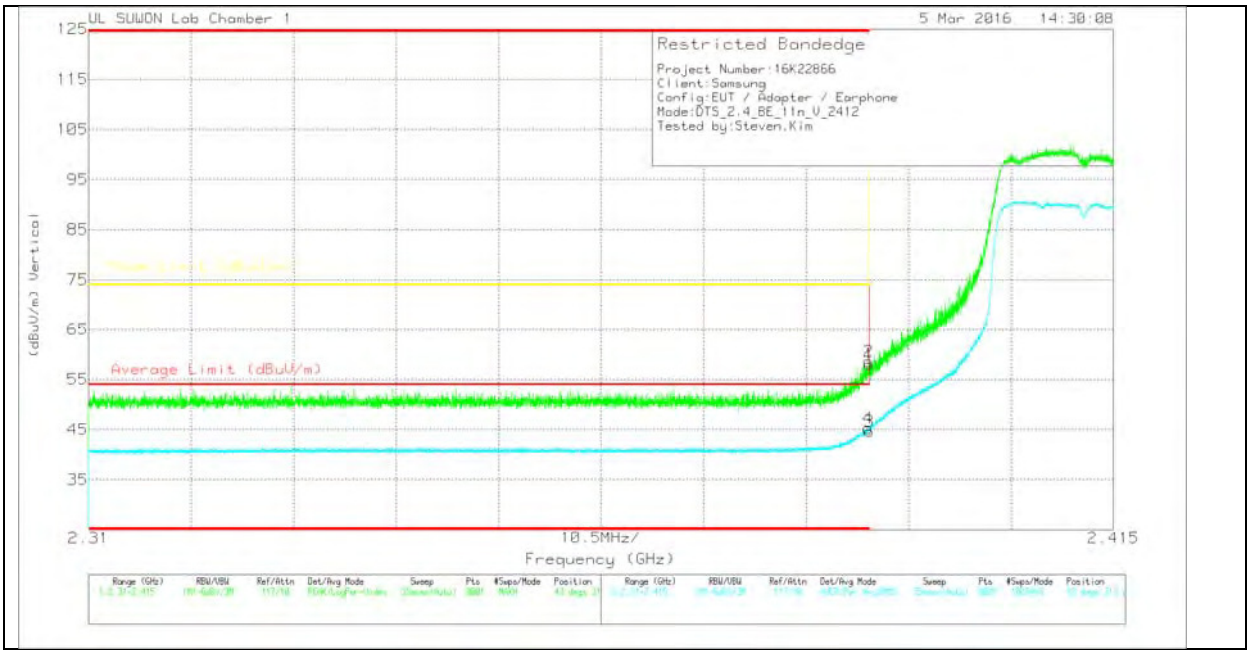
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_2	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	58.78	Pk	31.8	-29	0	61.58	-	-	74	-12.42	324	106	H
2	* 2.39	59.95	Pk	31.8	-29	0	62.75	-	-	74	-11.25	324	106	H
3	* 2.39	45.83	RMS	31.8	-29	.31	48.94	54	-5.06	-	-	324	106	H
4	* 2.39	46.48	RMS	31.8	-29	.31	49.59	54	-4.41	-	-	324	106	H

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

Pk - Peak detector

RMS - RMS detection

VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_2	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	55.25	Pk	31.8	-29	0	58.05	-	-	74	-15.95	43	313	V
2	* 2.39	55.76	Pk	31.8	-29	0	58.56	-	-	74	-15.44	43	313	V
3	* 2.39	41.56	RMS	31.8	-29	.31	44.67	54	-9.33	-	-	43	313	V
4	* 2.39	42.13	RMS	31.8	-29	.31	45.24	54	-8.76	-	-	43	313	V

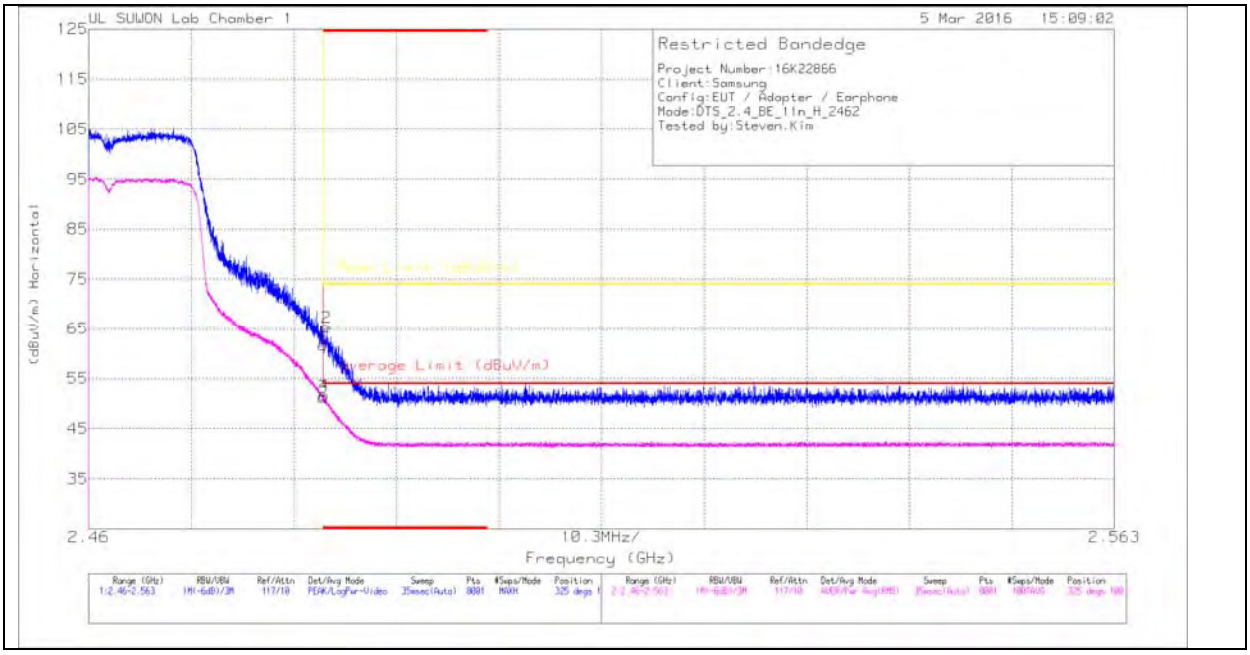
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

RMS - RMS detection

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	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	* 2.484	58.02	Pk	32	-28.3	0	61.72	-	-	74	-12.28	325	100	H
2	* 2.484	61.59	Pk	32	-28.3	0	65.29	-	-	74	-8.71	325	100	H
3	* 2.484	47.3	RMS	32	-28.3	.31	51.31	54	-2.69	-	-	325	100	H
4	* 2.484	47.6	RMS	32	-28.3	.31	51.61	54	-2.39	-	-	325	100	H

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

Pk - Peak detector

RMS - RMS detection

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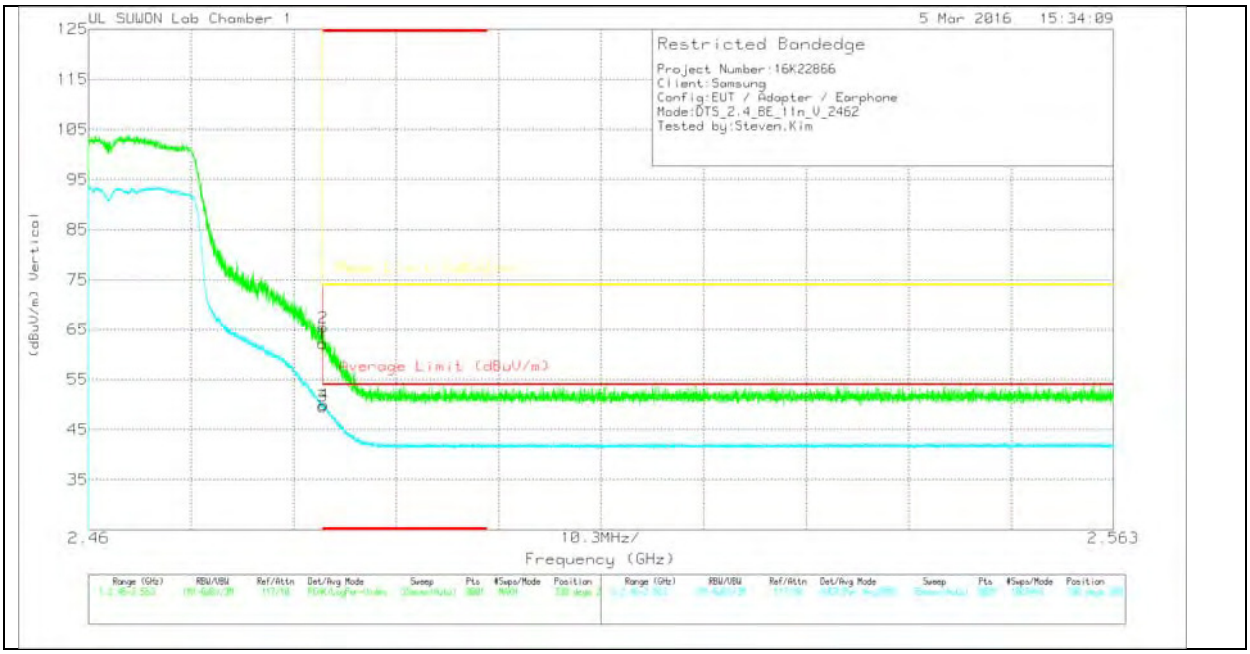
VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_2	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	* 2.484	58.46	Pk	32	-28.3	0	62.16	-	-	74	-11.84	338	240	V
2	* 2.484	61.72	Pk	32	-28.3	0	65.42	-	-	74	-8.58	338	240	V
3	* 2.484	45.63	RMS	32	-28.3	.31	49.64	54	-4.36	-	-	338	240	V
4	* 2.484	45.88	RMS	32	-28.3	.31	49.89	54	-4.11	-	-	338	240	V

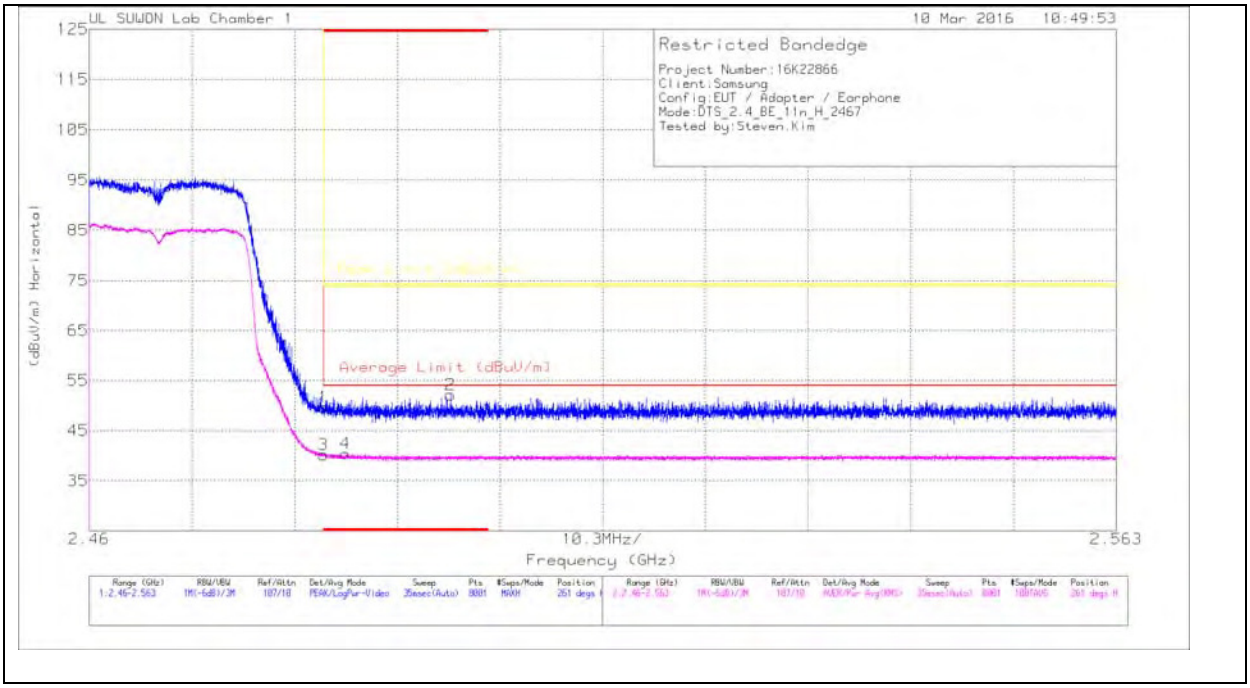
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

RMS - RMS detection

AUTHORIZED BANDEDGE (12 CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_2	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	* 2.484	46.01	Pk	32	-28.3	0	49.71	-	-	74	-24.29	261	100	H
2	* 2.496	48.44	Pk	32	-28.3	0	52.14	-	-	74	-21.86	261	100	H
3	* 2.484	36.21	RMS	32	-28.3	.31	40.22	54	-13.78	-	-	261	100	H
4	* 2.486	36.43	RMS	32	-28.3	.31	40.44	54	-13.56	-	-	261	100	H

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

Pk - Peak detector

RMS - RMS detection

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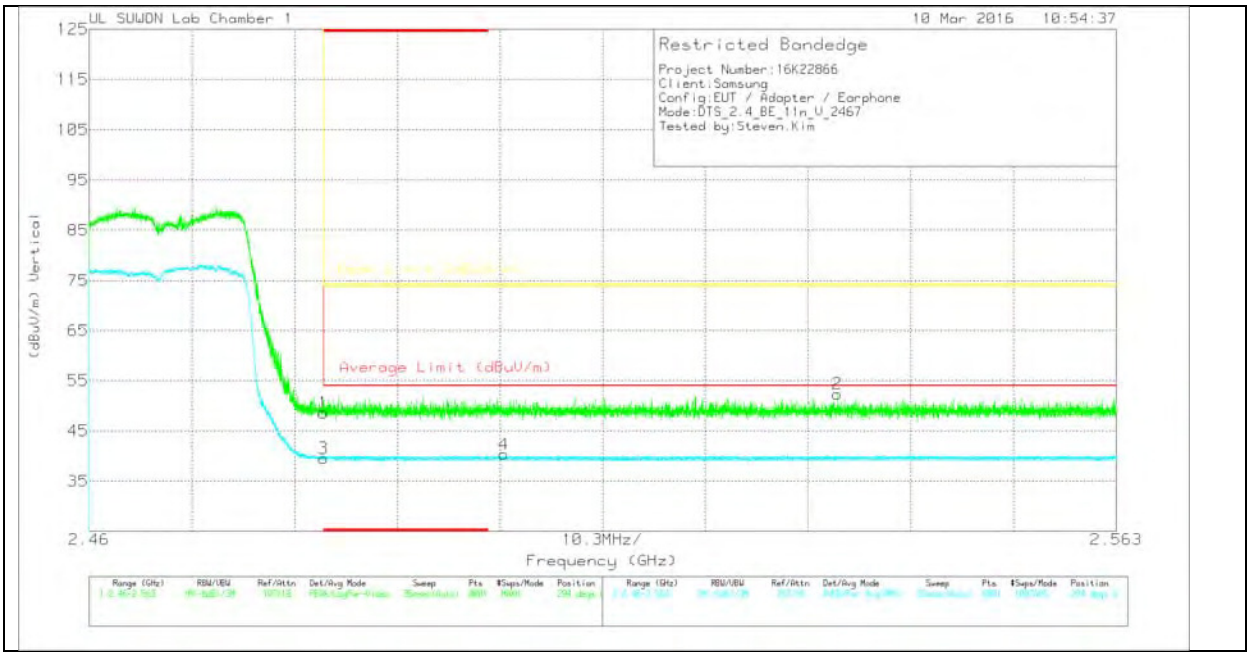
VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_2	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	* 2.484	44.91	Pk	32	-28.3	0	48.61	-	-	74	-25.39	294	342	V
2	2.535	48.67	Pk	32	-28.3	0	52.37	-	-	74	-21.63	294	342	V
3	* 2.484	35.56	RMS	32	-28.3	.31	39.57	54	-14.43	-	-	294	342	V
4	2.502	36.36	RMS	32	-28.3	.31	40.37	54	-13.63	-	-	294	342	V

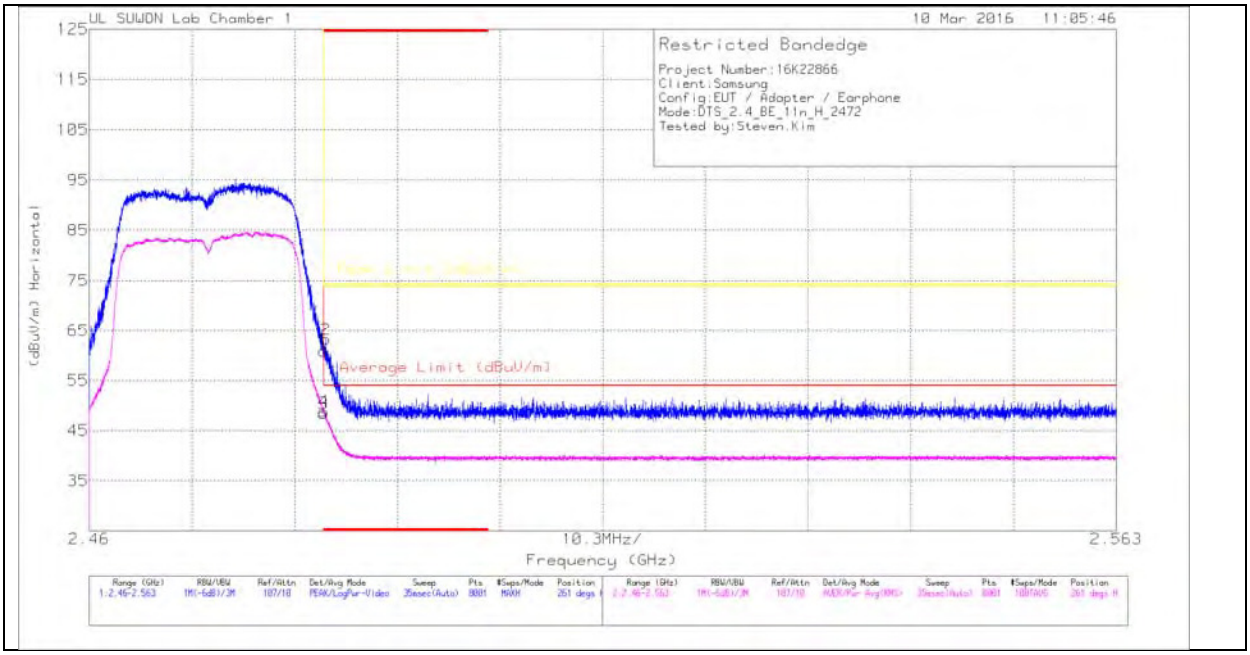
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

RMS - RMS detection

AUTHORIZED BANDEDGE (13 CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_2	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	* 2.484	57.19	Pk	32	-28.3	0	60.89	-	-	74	-13.11	261	100	H
2	* 2.484	59.54	Pk	32	-28.3	0	63.24	-	-	74	-10.76	261	100	H
3	* 2.484	44.42	RMS	32	-28.3	.31	48.43	54	-5.57	-	-	261	100	H
4	* 2.484	44.79	RMS	32	-28.3	.31	48.8	54	-5.2	-	-	261	100	H

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

Pk - Peak detector

RMS - RMS detection

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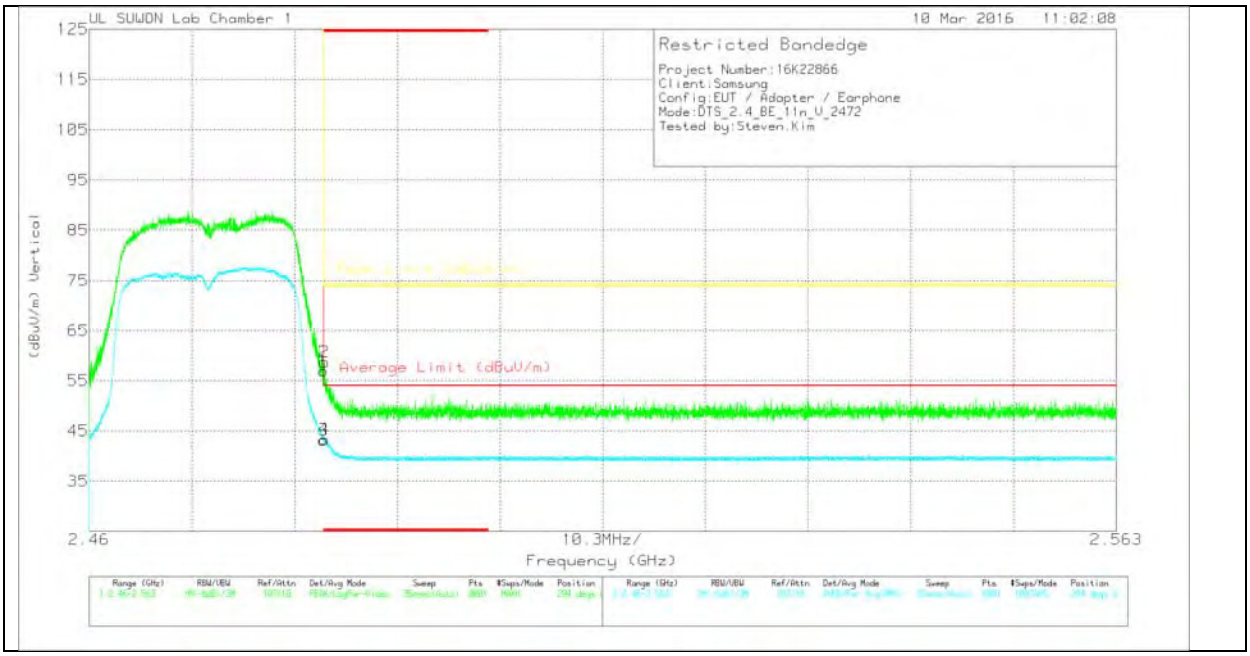
VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_2	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	* 2.484	53.27	Pk	32	-28.3	0	56.97	-	-	74	-17.03	294	342	V
2	* 2.484	55.01	Pk	32	-28.3	0	58.71	-	-	74	-15.29	294	342	V
3	* 2.484	39.2	RMS	32	-28.3	.31	43.21	54	-10.79	-	-	294	342	V
4	* 2.484	39.35	RMS	32	-28.3	.31	43.36	54	-10.64	-	-	294	342	V

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

Pk - Peak detector

RMS - RMS detection

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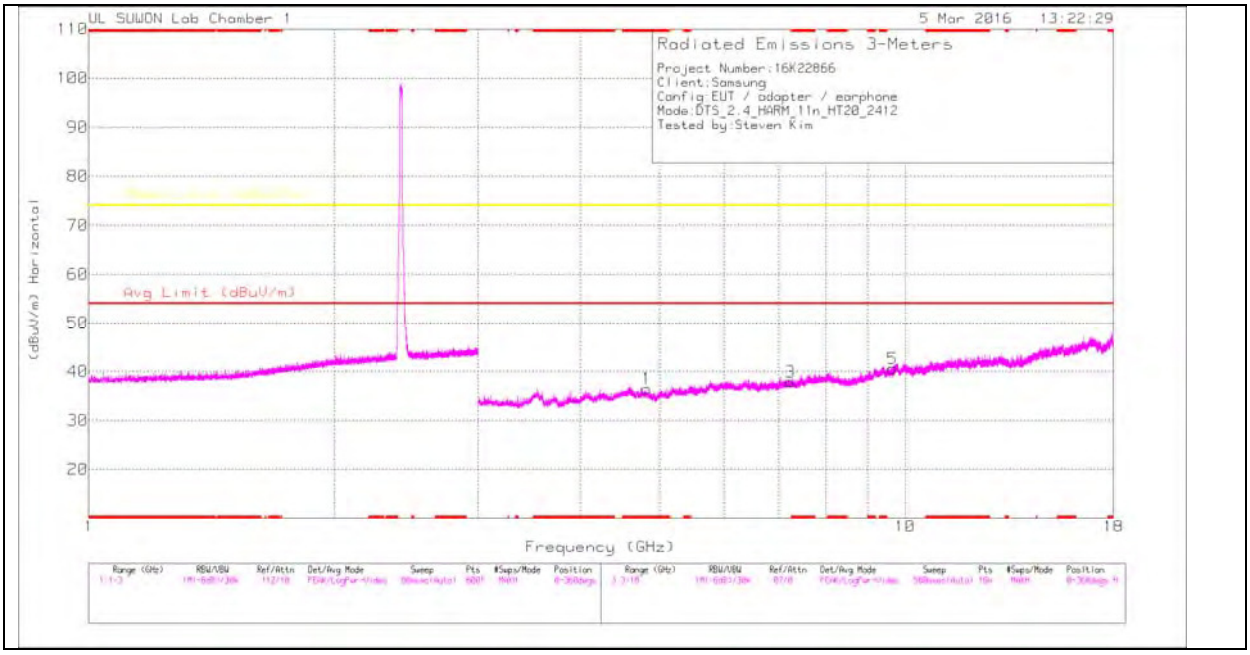
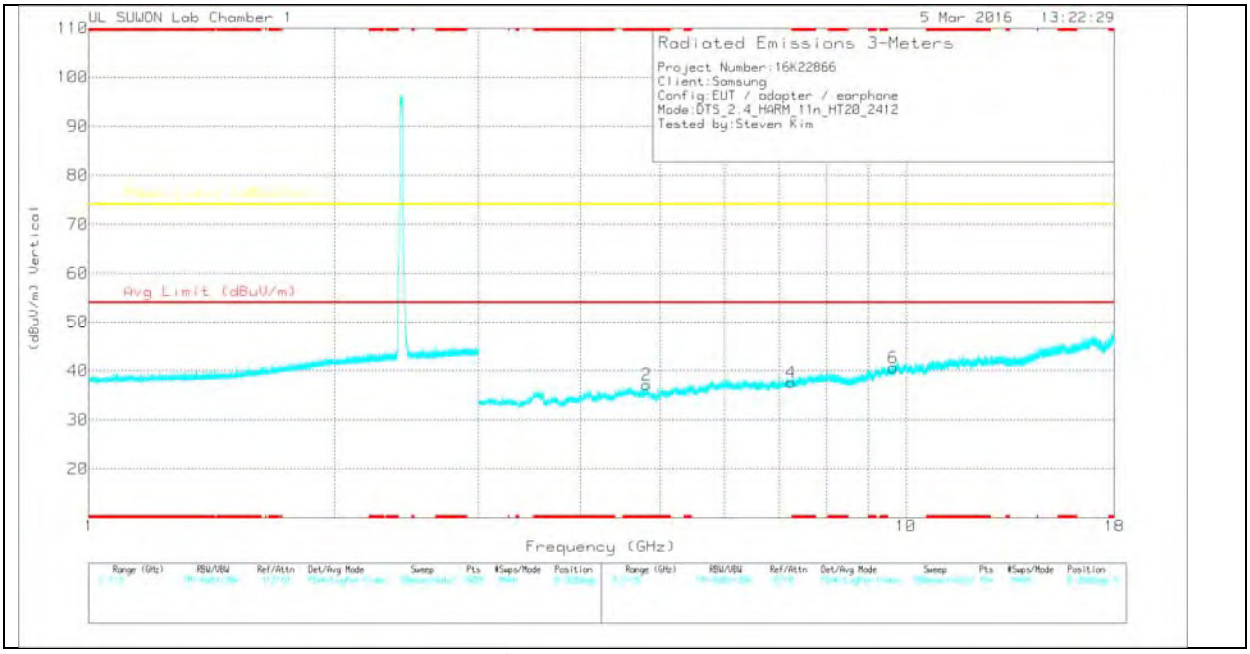
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL



LOW CHANNEL 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.

LOW CHANNEL DATA

Trace Markers

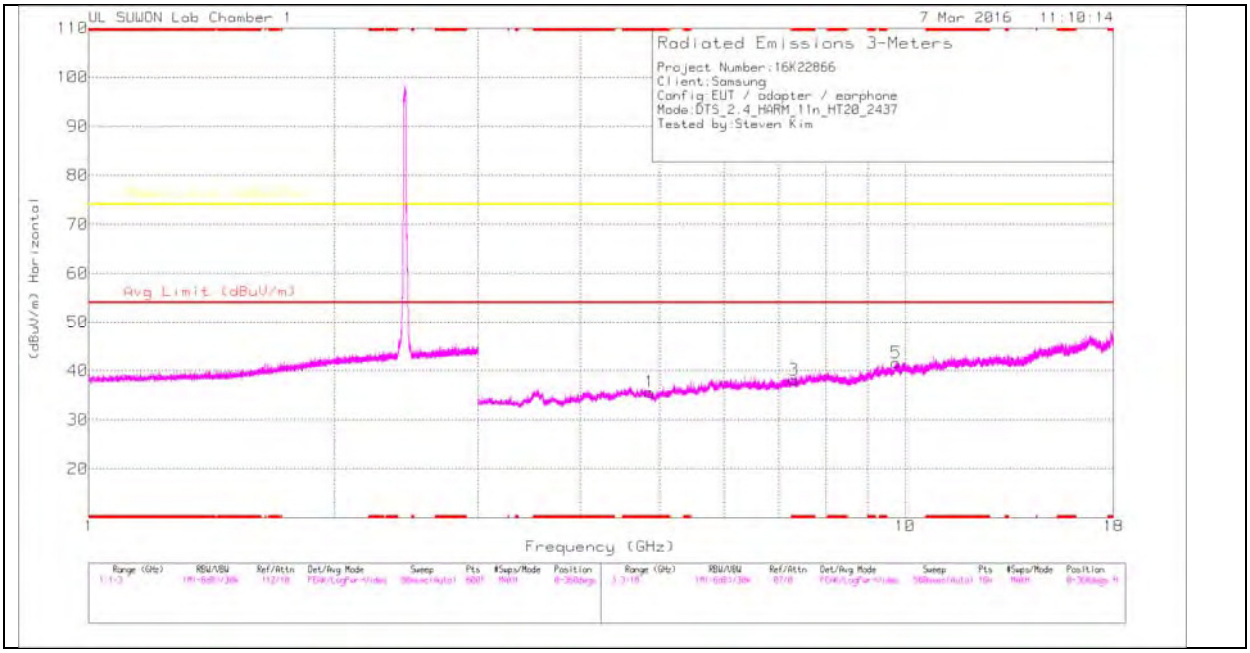
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_3	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.822	36.33	PK	34	-33.8	0	36.53	-	-	74	-37.47	0-360	100	H
3	7.237	33.1	PK	35.7	-30.9	0	37.9	-	-	74	-36.1	0-360	200	H
5	9.65	30.89	PK	37.1	-27.4	0	40.59	-	-	74	-33.41	0-360	200	H
2	* 4.819	36.96	PK	34	-33.8	0	37.16	-	-	74	-36.84	0-360	100	V
4	7.238	32.83	PK	35.7	-30.9	0	37.63	-	-	74	-36.37	0-360	100	V
6	9.648	30.91	PK	37.1	-27.4	0	40.61	-	-	74	-33.39	0-360	100	V

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

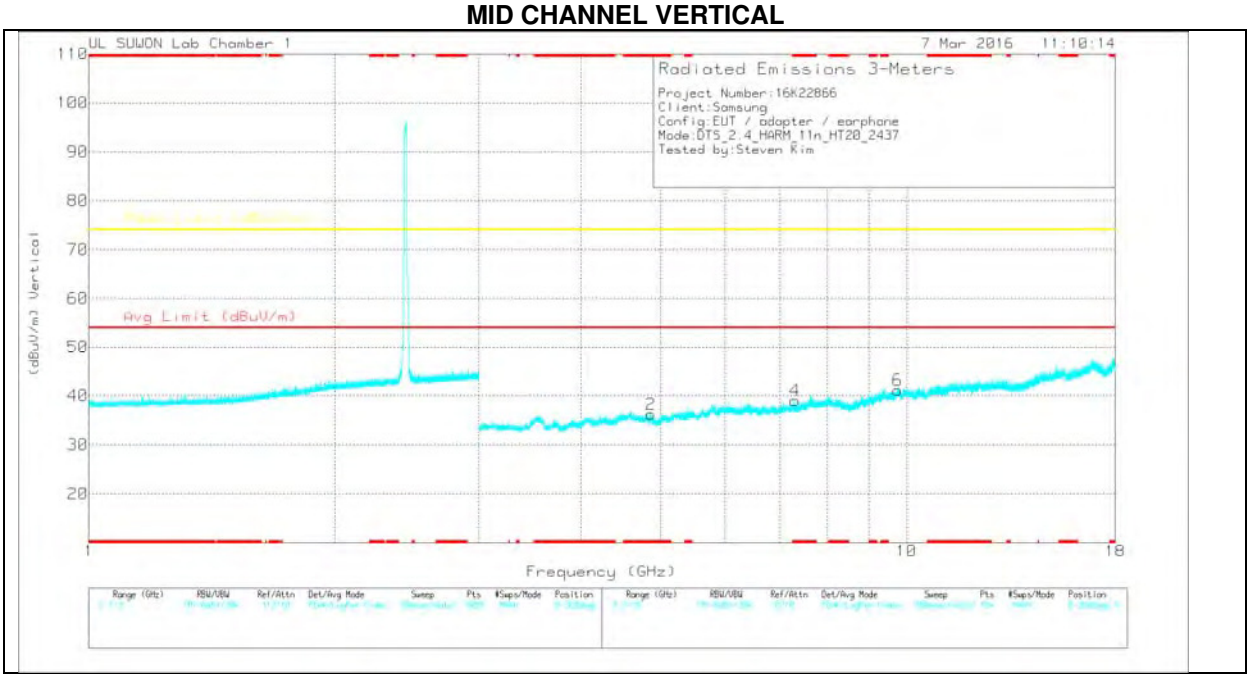
PK – Peak Detector

Note: Only peak measurement was performed. Because peak measurement result of unwanted emission is less than average limit (54dBuV/m).

MID CHANNEL HORIZONTAL



MID CHANNEL 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.

MID CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_3	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.87	35.69	PK	34	-34	0	35.69	-	-	74	-38.31	0-360	100	H
3	* 7.309	33.37	PK	35.7	-30.9	0	38.17	-	-	74	-35.83	0-360	200	H
5	9.757	31.16	PK	37.2	-26.7	0	41.66	-	-	74	-32.34	0-360	200	H
2	* 4.87	36.26	PK	34	-34	0	36.26	-	-	74	-37.74	0-360	100	V
4	* 7.307	34.23	PK	35.7	-30.9	0	39.03	-	-	74	-34.97	0-360	200	V
6	9.758	30.65	PK	37.2	-26.7	0	41.15	-	-	74	-32.85	0-360	200	V

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

PK – Peak Detector

Note: Only peak measurement was performed. Because peak measurement result of unwanted emission is less than average limit (54dBuV/m).

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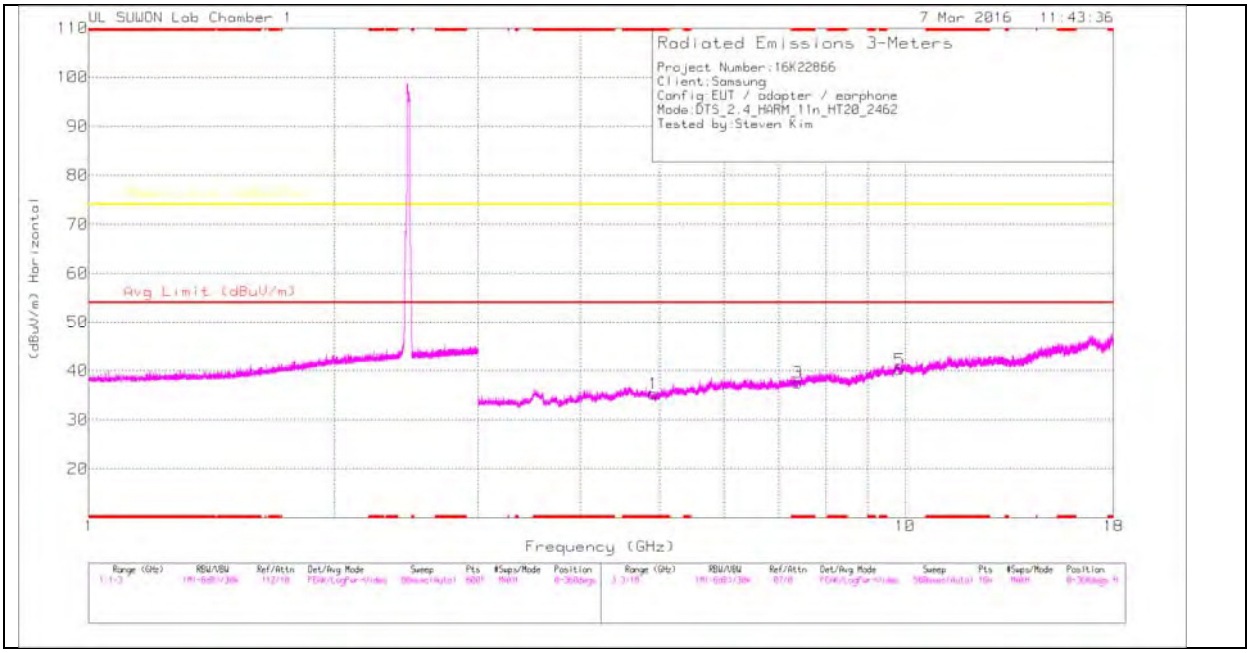
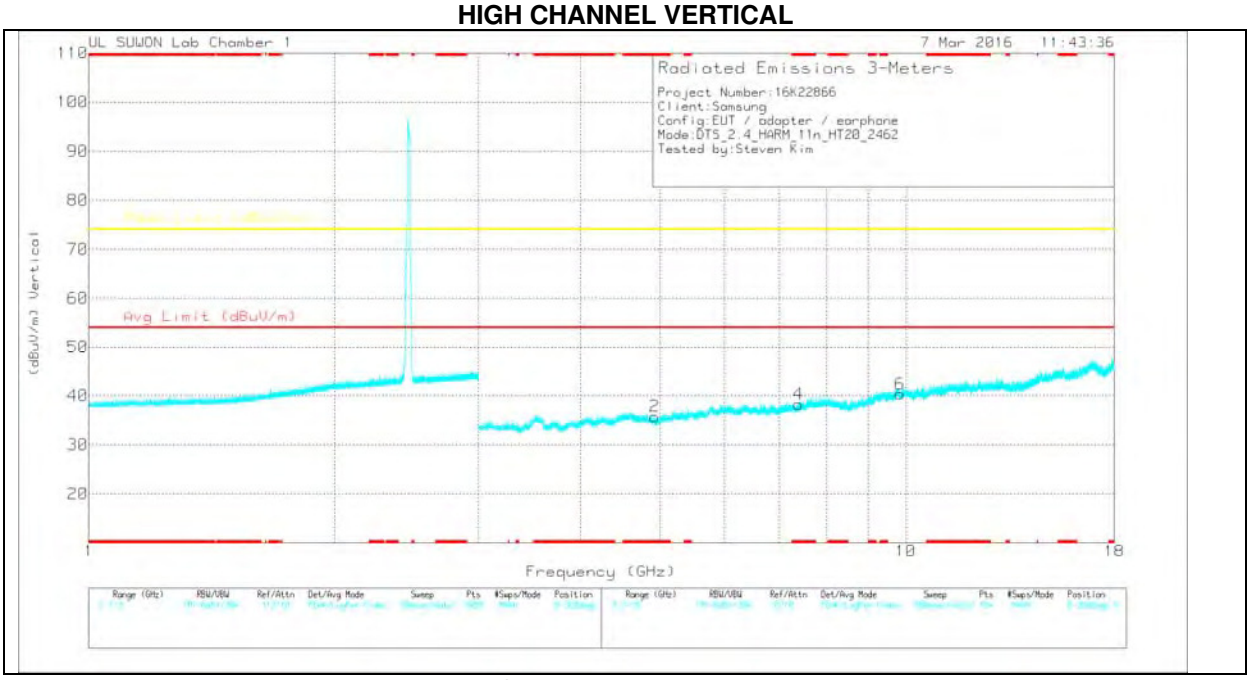
HIGH CHANNEL HORIZONTAL



HIGH CHANNEL 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.

HIGH CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_3	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.917	35.32	PK	34	-34	0	35.32	-	-	74	-38.68	0-360	100	H
3	* 7.388	32.47	PK	35.8	-30.7	0	37.57	-	-	74	-36.43	0-360	200	H
5	9.845	30.41	PK	37.3	-27.5	0	40.21	-	-	74	-33.79	0-360	100	H
2	* 4.923	35.81	PK	34	-34	0	35.81	-	-	74	-38.19	0-360	100	V
4	* 7.388	33.2	PK	35.8	-30.7	0	38.3	-	-	74	-35.7	0-360	100	V
6	9.841	30.48	PK	37.3	-27.4	0	40.38	-	-	74	-33.62	0-360	100	V

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

PK – Peak Detector

Note: Only peak measurement was performed. Because peak measurement result of unwanted emission is less than average limit (54dBuV/m).

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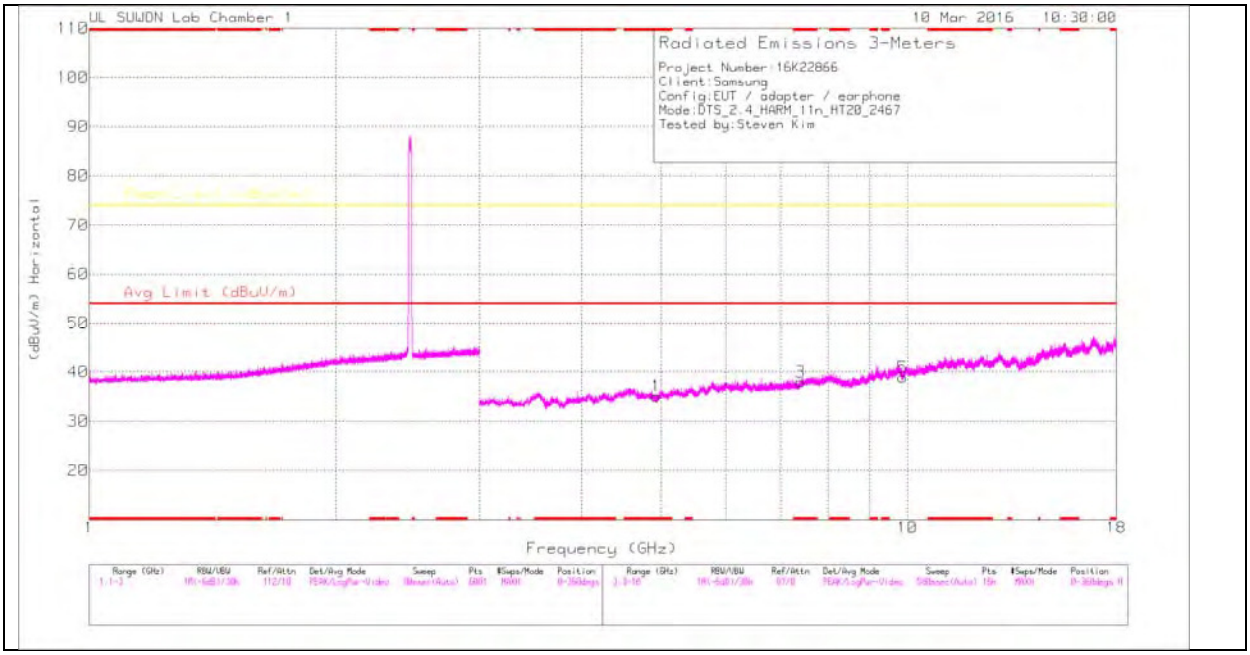
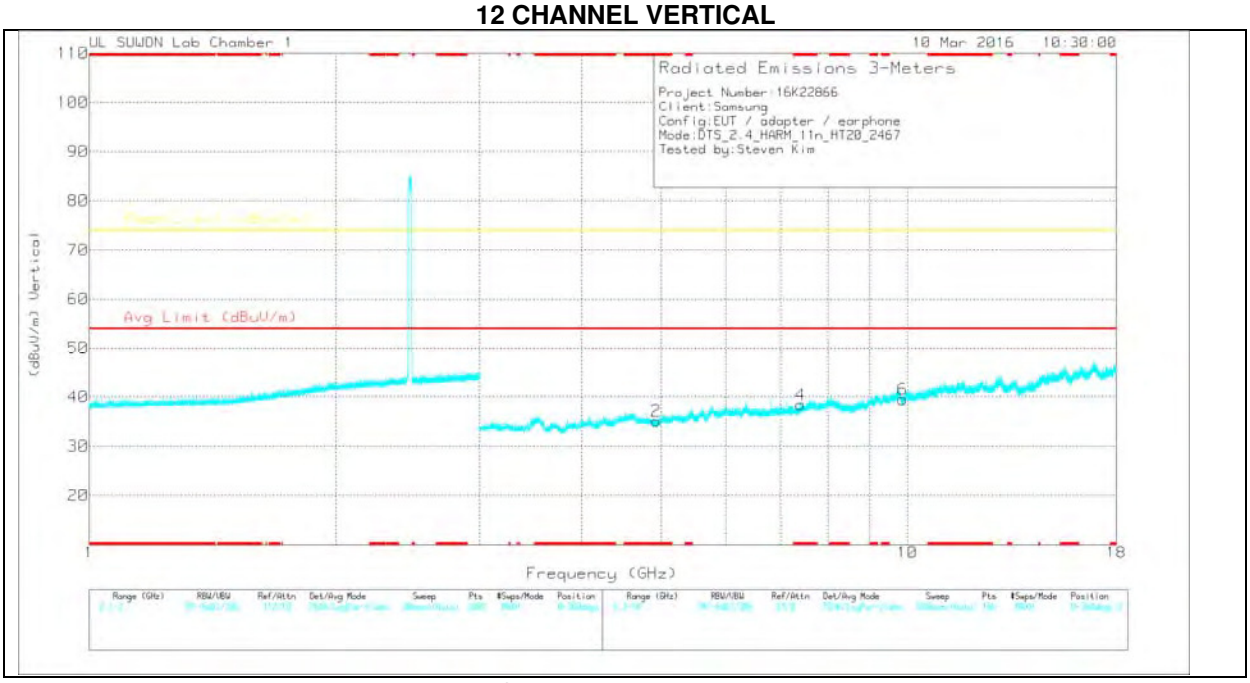
12 CHANNEL HORIZONTAL



12 CHANNEL 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.

12 CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_3	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.934	35.11	PK	34	-34	0	35.11	-	-	74	-38.89	0-360	100	H
3	* 7.399	32.77	PK	35.8	-30.6	0	37.97	-	-	74	-36.03	0-360	200	H
5	9.873	29.63	PK	37.3	-28	0	38.93	-	-	74	-35.07	0-360	200	H
2	* 4.93	35.11	PK	34	-34	0	35.11	-	-	74	-38.89	0-360	200	V
4	* 7.401	33.24	PK	35.8	-30.6	0	38.44	-	-	74	-35.56	0-360	200	V
6	9.867	30.11	PK	37.3	-27.9	0	39.51	-	-	74	-34.49	0-360	200	V

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

PK – Peak Detector

Note: Only peak measurement was performed. Because peak measurement result of unwanted emission is less than average limit (54dBuV/m).

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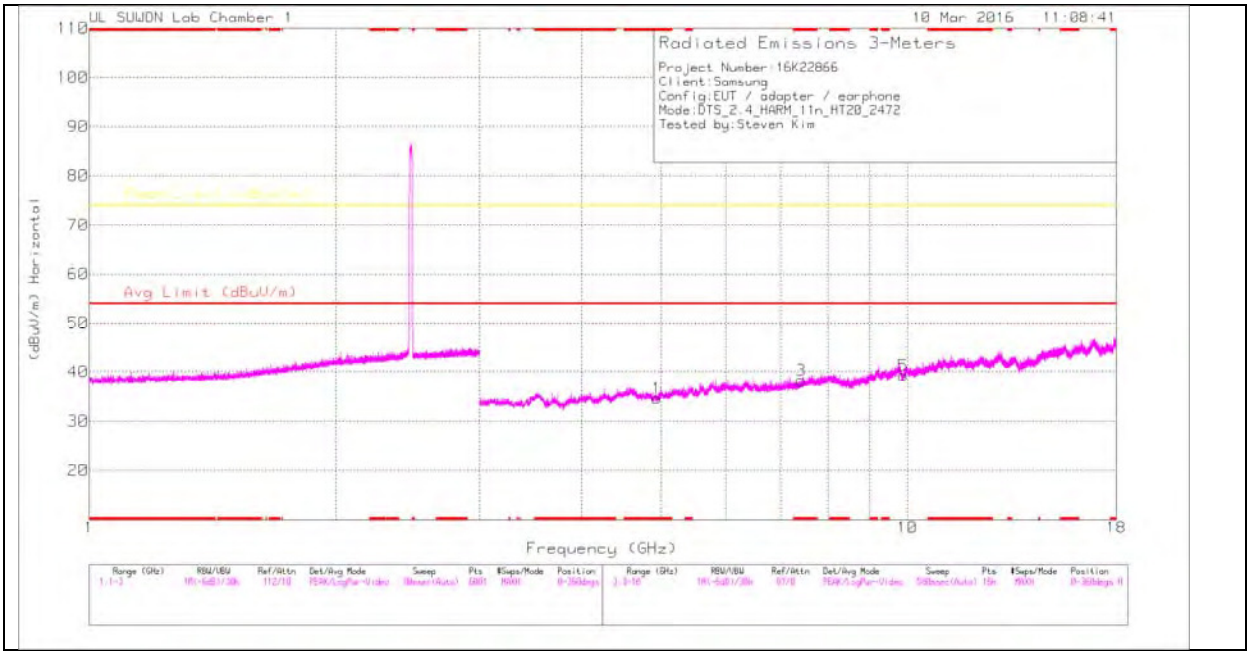
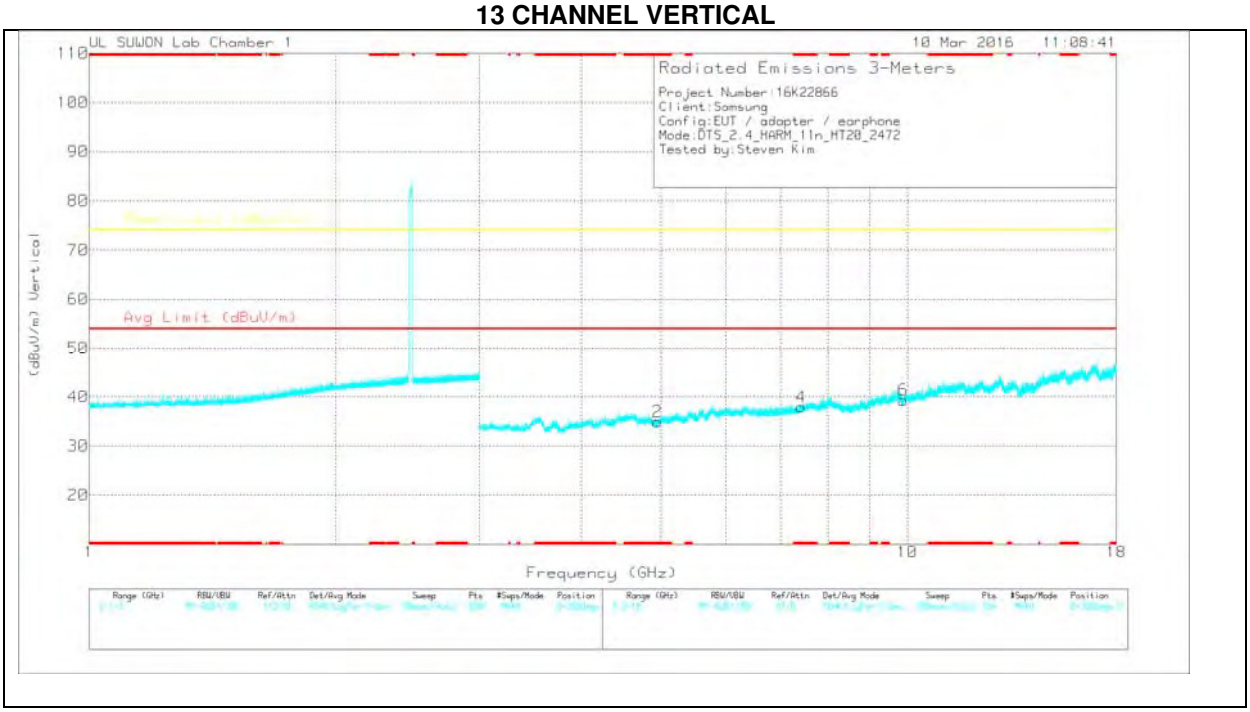
13 CHANNEL HORIZONTAL



13 CHANNEL 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.

13 CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_3	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.943	34.66	PK	34	-34	0	34.66	-	-	74	-39.34	0-360	200	H
3	* 7.414	33.15	PK	35.8	-30.7	0	38.25	-	-	74	-35.75	0-360	100	H
5	9.888	29.79	PK	37.3	-27.8	0	39.29	-	-	74	-34.71	0-360	100	H
2	* 4.952	34.96	PK	34	-34	0	34.96	-	-	74	-39.04	0-360	200	V
4	* 7.417	32.83	PK	35.8	-30.7	0	37.93	-	-	74	-36.07	0-360	200	V
6	9.889	29.88	PK	37.3	-27.8	0	39.38	-	-	74	-34.62	0-360	100	V

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

PK – Peak Detector

Note: Only peak measurement was performed. Because peak measurement result of unwanted emission is less than average limit (54dBuV/m).

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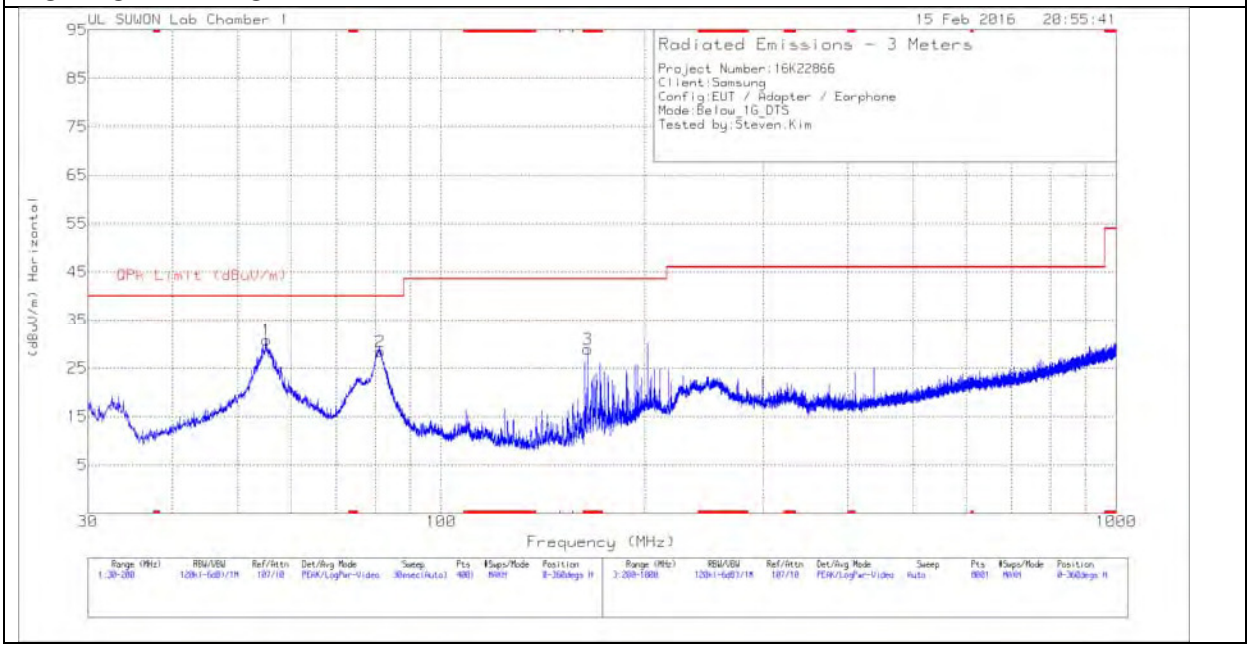
11.3. WORST-CASE BELOW 1 GHz

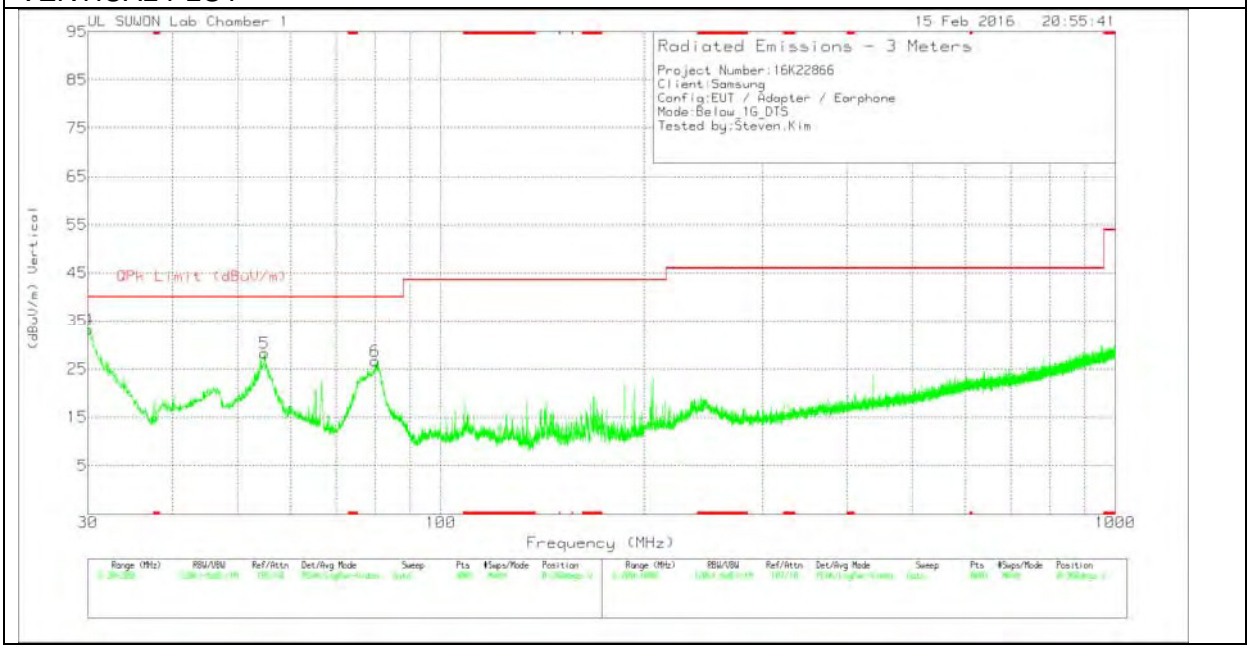
SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)

HORIZONTAL PLOT



SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, VERTICAL)

VERTICAL PLOT



Below 1G Data

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	55.16	47.66	Pk	13.2	-30	30.86	40	-9.14	0-360	400	H
2	81.2975	50.83	Pk	7.2	-29.6	28.43	40	-11.57	0-360	200	H
3	* 164.895	48.72	Pk	8.7	-28.5	28.92	43.52	-14.6	0-360	300	H
4	30.0425	53.39	Pk	10.3	-30.5	33.19	40	-6.81	0-360	100	V
5	54.7775	45.01	Pk	13.3	-30	28.31	40	-11.69	0-360	100	V
6	80.0225	49.34	Pk	6.9	-29.6	26.64	40	-13.36	0-360	100	V

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

Pk - Peak detector

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12. 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 2009.

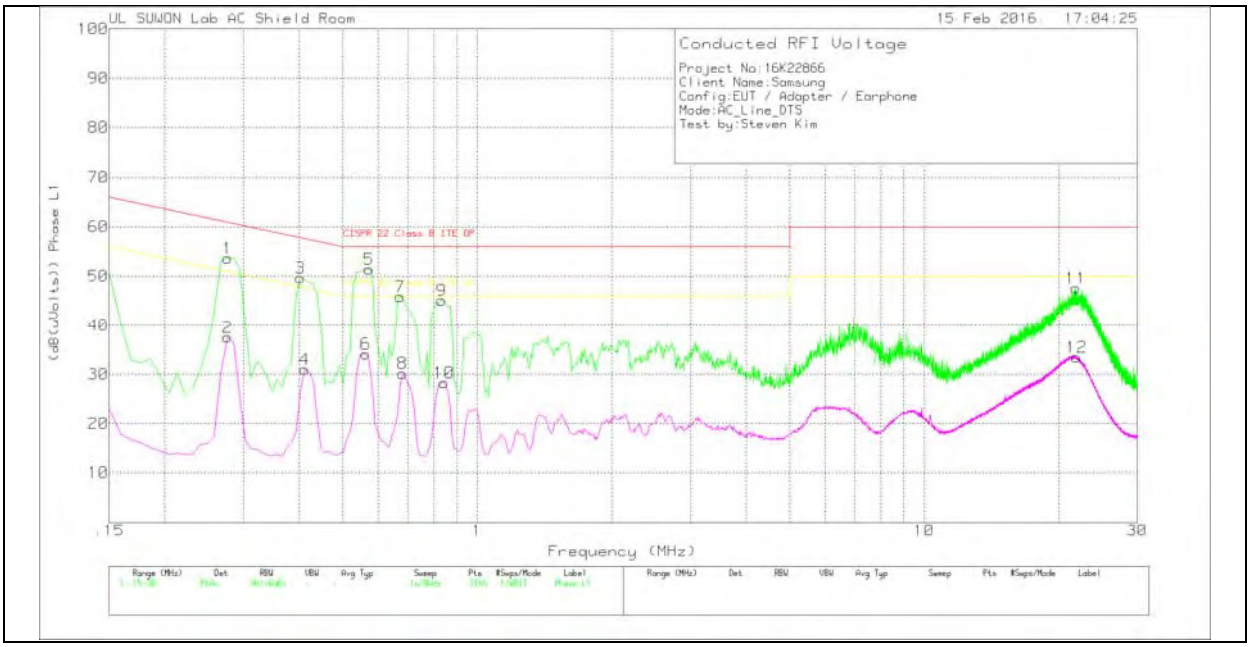
The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

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

RESULTS

6 WORST EMISSIONS

LINE 1 PLOT



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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 (dB(uVolts))	CISPR 22 Class B ITE QP	Margin (dB)	CISPR 22 Class B ITE AV	Margin (dB)
1	.276	43.9	Pk	9.8	0	53.7	60.94	-7.24	-	-
2	.276	27.74	Av	9.8	0	37.54	-	-	50.94	-13.4
3	.402	39.56	Pk	10.1	0	49.66	57.81	-8.15	-	-
4	.411	20.9	Av	10.1	0	31	-	-	47.63	-16.63
5	.573	41.29	Pk	10.1	0	51.39	56	-4.61	-	-
6	.564	24.07	Av	10.1	0	34.17	-	-	46	-11.83
7	.672	35.77	Pk	10.1	0	45.87	56	-10.13	-	-
8	.681	20.11	Av	10.1	0	30.21	-	-	46	-15.79
9	.834	35.1	Pk	10	0	45.1	56	-10.9	-	-
10	.843	18.33	Av	10	0	28.33	-	-	46	-17.67
11	21.867	36.93	Pk	10.5	.2	47.63	60	-12.37	-	-
12	21.957	22.81	Av	10.5	.2	33.51	-	-	50	-16.49

Pk - Peak detector

Av - Average detection

Quasi-Peak Emissions

Phase L1 .15 - 30MHz

Frequency (MHz)	Meter Reading (dBuV)	Det	101837_with 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)
.2742	36.32	Qp	9.8	0	46.12	60.99	-14.87	-	-
.4047	37.61	Qp	10.1	0	47.71	57.76	-10.05	-	-
.5775	25.71	Qp	10.1	0	35.81	56	-20.19	-	-

Qp – Quasi-Peak detector

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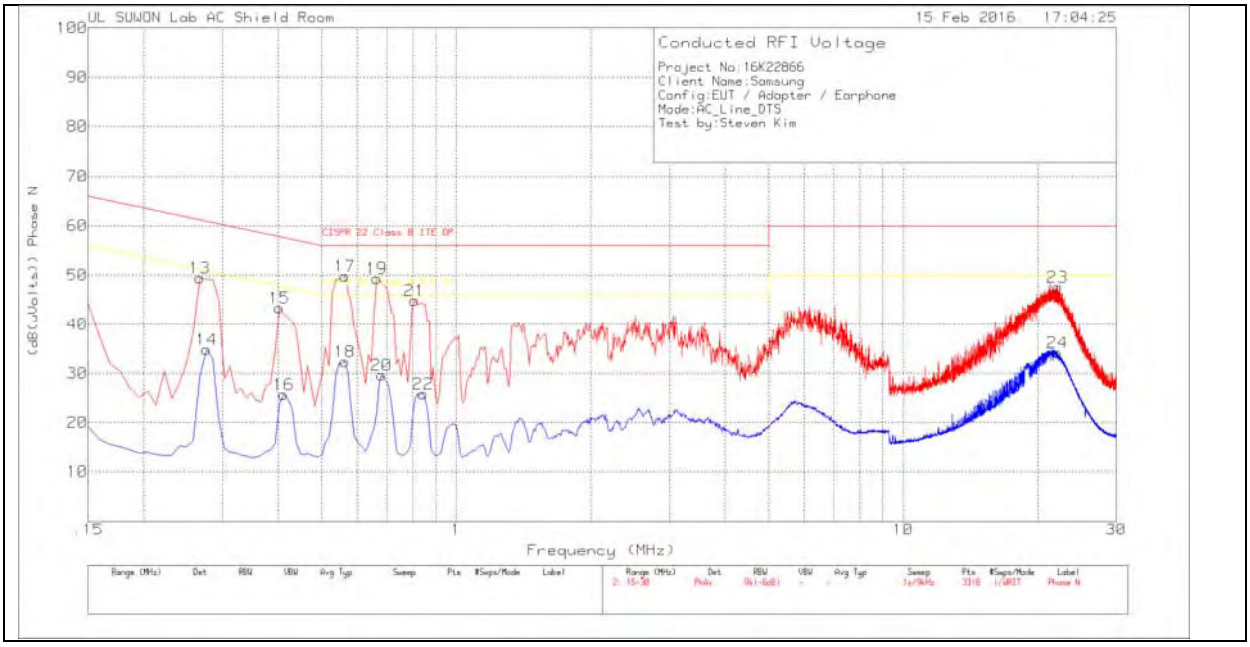
LINE 2 PLOT



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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 (dB(uVolts))	CISPR 22 Class B ITE QP	Margin (dB)	CISPR 22 Class B ITE AV	Margin (dB)
13	.267	39.62	Pk	9.8	0	49.42	61.21	-11.79	-	-
14	.276	25.04	Av	9.8	0	34.84	-	-	50.94	-16.1
15	.402	33.23	Pk	10.1	0	43.33	57.81	-14.48	-	-
16	.411	15.6	Av	10.1	0	25.7	-	-	47.63	-21.93
17	.564	39.76	Pk	10.1	0	49.86	56	-6.14	-	-
18	.564	22.25	Av	10.1	0	32.35	-	-	46	-13.65
19	.663	39.38	Pk	10	0	49.38	56	-6.62	-	-
20	.681	19.64	Av	10	0	29.64	-	-	46	-16.36
21	.807	34.84	Pk	10	0	44.84	56	-11.16	-	-
22	.843	15.97	Av	9.9	0	25.87	-	-	46	-20.13
23	22.164	36.71	Pk	10.7	.2	47.61	60	-12.39	-	-
24	22.128	23.33	Av	10.7	.2	34.23	-	-	50	-15.77

Pk - Peak detector

Av - Average detection

Quasi-Peak Emissions

Phase N .15 - 30MHz

Frequency (MHz)	Meter Reading (dBuV)	Det	101837_with 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)
.5685	29.37	Qp	10.1	0	39.47	56	-16.53	-	-
.6675	31.21	Qp	10	0	41.21	56	-14.79	-	-

Qp – Quasi-Peak detector

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