FCC CFR47 PART 15 SUBPART C

DTS Wireless LAN

C2PC CERTIFICATION TEST REPORT

FOR

GSM Phone + BT/BLE, DTS b/g/n

MODEL NUMBER : SM-J105H, SM-J105H/DD, SM-J105H/DS, SM-J106H/DS

FCC ID: A3LSMJ105H

REPORT NUMBER: 15K23808-E1V2

ISSUE DATE: SEP 30, 2016

Prepared for

SAMSUNG ELECTRONICS CO., LTD.
129 SAMSUNG-RO, YEONGTONG-GU, SUWON-SI,
GYEONGGI-DO, 16677, KOREA

Prepared by

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ACCREDITED
TL-637

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	09/12/16	Initial issue	SungGil Park
V2	09/30/16	Revised report to address TCB's question	SungGil Park

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	SAMSUNG ELECTRONICS CO., LTD.
EUT DESCRIPTION:	GSM Phone + BT/BLE, DTS b/g/n
MODEL NUMBER:	SM-J105H, SM-J105H/DD, SM-J105H/DS, SM-J106H/DS
SERIAL NUMBER:	R31H80008PB (RADIATED); R31H80007AM (CONDUCTED)
DATE TESTED:	AUG 23, 2016 - SEP 12, 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:

SungGil Park
Suwon Lab Engineer
UL Korea, Ltd.

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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10-2013, 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

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4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

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

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

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

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

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4.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	2.32 dB
Radiated Disturbance, Below 1GHz	4.14 dB
Radiated Disturbance, Above 1 GHz	5.97 dB

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

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5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

This EUT is GSM Phone + BT/BLE, DTS b/g/n.
This test report addresses the DTS (WLAN) operational mode.

SM-J105H and SM-J105H/DS are same hardware, but for different number of SIM card slot.
SM-J105H has one slot. SM-J105H/DS is dual SIM version.
SM-J105H/DS and SM-J106H/DS are same hardware, but for different memory capacity and flash LED.
SM-J106H/DS was used for this C2PC test.

5.2. MAXIMUM OUTPUT POWER

Please refer to the DTS test report(15K22503-E1V2) of FCC ID: A3LSMJ105H

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an FPCB antennas, with a antenna's maximum gain of 0.4 dBi.

5.4. WORST-CASE CONFIGURATION AND MODE

Radiated emission below 1GHz and power line conducted emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

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

The fundamental of the EUT was investigated in three orthogonal orientations X, Y and Z it was determined that 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

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5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Charger	SAMSUNG	EP-TA60EBE	R37G6HL0KJ1SC3	N/A
Earphone	SAMSUNG	EHS61ASFWE	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.

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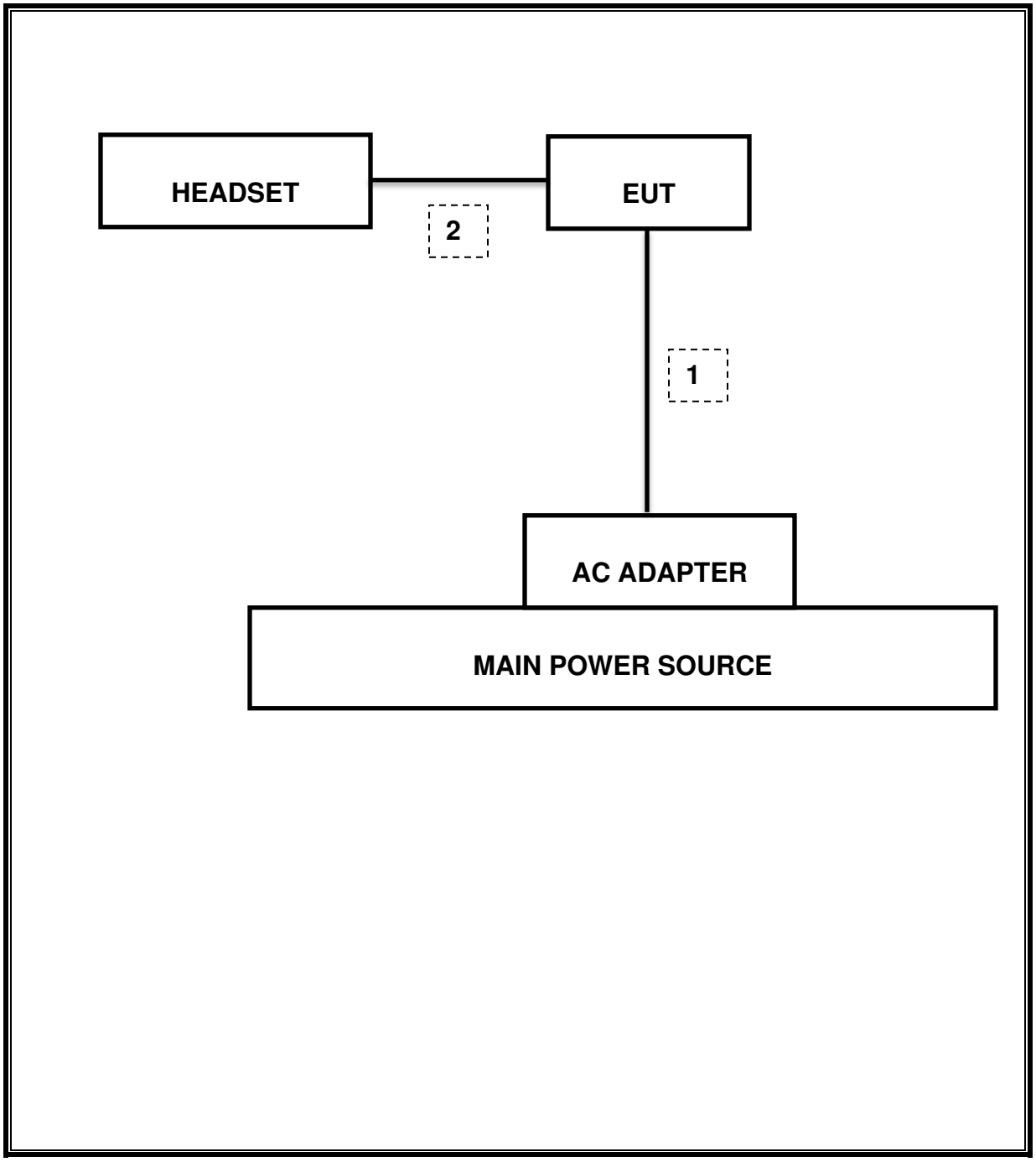
SETUP DIAGRAM FOR TESTS



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6. TEST AND MEASUREMENT EQUIPMENT

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

Test Equipment List				
Description	**Manufacturer**	**Model**	**S/N**	**Cal Due**
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	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	11-30-17
Antenna, Horn, 40 GHz	ETS	3116C-PA	00168841	12-15-17
Preamplifier, 1000 MHz	Sonoma	310N	341282	08-17-17
Preamplifier, 1000 MHz	Sonoma	310N	351741	08-16-17
Preamplifier	ETS	3115-PA	00167475	08-17-17
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1896138	08-16-17
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54170614	08-17-17
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54490312	08-16-17
Antenna, Loop, 9kHz-30MHz	R&S	HFH2-Z2	100418	11-25-17
Average Power Sensor	R&S	NRZ-Z91	102681	08-16-17
Average Power Sensor	Agilent / HP	U2000	MY54270007	08-17-17
EMI Test Receive, 40 GHz	R&S	ESU40	100439	08-17-17
EMI Test Receive, 40 GHz	R&S	ESU40	100457	08-16-17
EMI Test Receive, 3 GHz	R&S	ESR3	101832	08-16-17
Attenuator / Switch driver	HP	11713A	3748A04272	N/A
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	009	08-17-17
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	015	08-16-17
High Pass Filter 3GHz	Micro-Tronics	HPM17543	010	08-17-17
High Pass Filter 3GHz	Micro-Tronics	HPM17543	015	08-16-17
High Pass Filter 6GHz	Micro-Tronics	HPM17542	009	08-17-17
High Pass Filter 6GHz	Micro-Tronics	HPM17542	016	08-16-17
LISN	R&S	ENV-216	101836	08-16-17
LISN	R&S	ENV-216	101837	08-16-17
Attenuator	PASTERNACK	PE7087-10	A009	08-16-17

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7. MEASUREMENT METHODS

KDB 558074 D01 DTS Meas Guidance v03r05: 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.

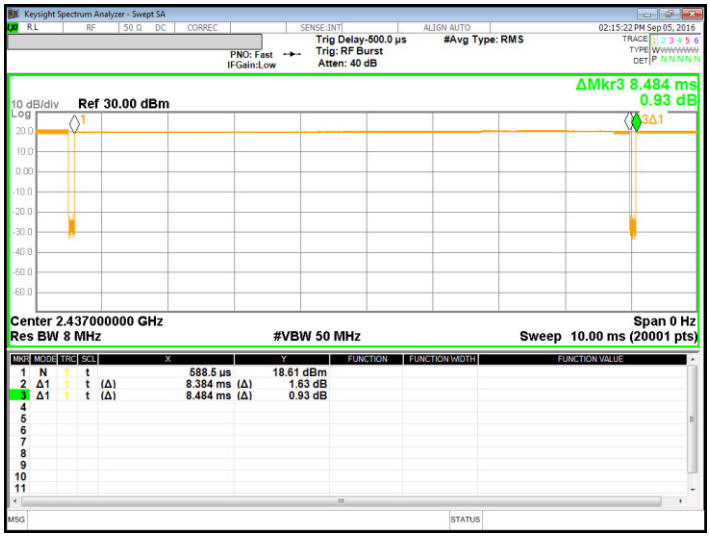
8. ON TIME, DUTY CYCLE

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	8.384	8.484	0.988	98.8%	0.00	0.010
802.11g	1.392	1.488	0.935	93.5%	0.29	0.718
802.11n HT20	1.173	1.269	0.924	92.4%	0.34	0.853



[802.11b]

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[802.11g]

[802.11n]

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9. SUMMARY TABLE

C2PC Reason: Please see SM-J106H/DS C2PC description for details.
: The only changes of this C2PC model are memory capacity and flash LED (minor circuitry for non-transmitter portions), so we tested only radiated items.
The other items, please refer to the DTS test report(15K22503-E2V1) of FCC ID: A3LSMJ105H

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

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10. RADIATED TEST RESULTS

10.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

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

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g. §§ 15.231 and 15.241.

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TEST PROCEDURE

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

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

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz for peak measurements and add duty cycle factor for average measurements. Duty cycle factor= 10log (1/x) For this sample B mode = 0dB (duty cycle >98%); G mode = 0.29dB; N mode = 0.34dB.

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

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

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

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

Formula for converting the filed strength from uV/m to dBuV/m is:
Limit (dBuV/m) = 20 log limit (uV/m)

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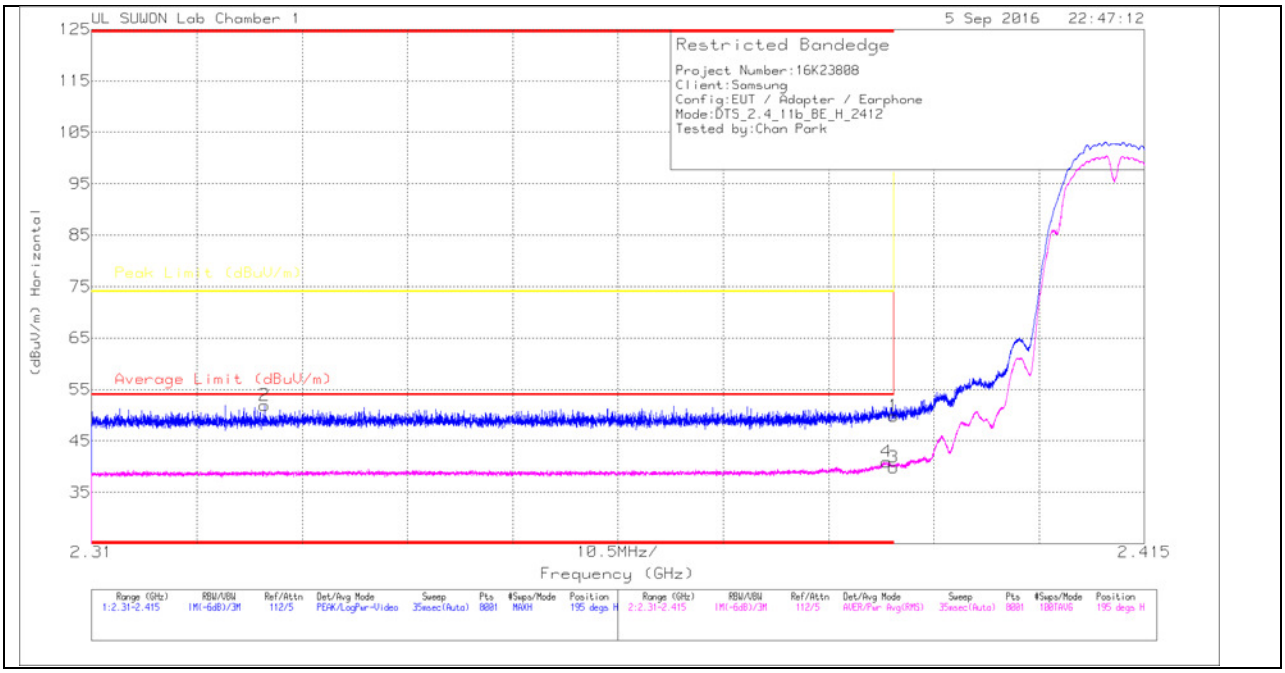
10.2. TRANSMITTER ABOVE 1 GHz

10.2.1. 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	47.04	Pk	31.8	-29	0	49.84	-	-	74	-24.16	195	111	H
2	* 2.327	49.22	Pk	31.7	-29	0	51.92	-	-	74	-22.08	195	111	H
3	* 2.39	37.06	RMS	31.8	-29	0	39.86	54	-14.14	-	-	195	111	H
4	* 2.389	38.14	RMS	31.8	-29	0	40.94	54	-13.06	-	-	195	111	H

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

Pk - Peak detector

RMS - RMS detection

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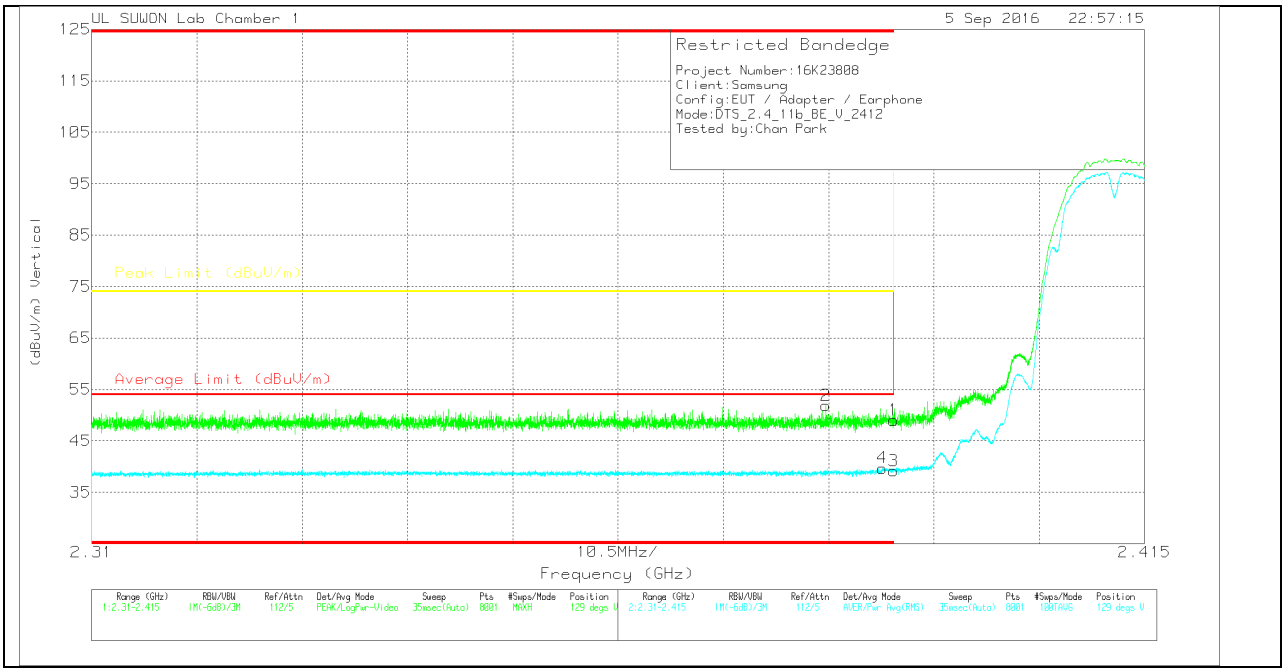
VERTICAL PEAK AND AVERAGE PLOT



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	46.22	Pk	31.8	-29	0	49.02	-	-	74	-24.98	129	299	V
2	* 2.383	49.07	Pk	31.8	-29	0	51.87	-	-	74	-22.13	129	299	V
3	* 2.39	36.38	RMS	31.8	-29	0	39.18	54	-14.82	-	-	129	299	V
4	* 2.389	36.92	RMS	31.8	-29	0	39.72	54	-14.28	-	-	129	299	V

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

Pk - Peak detector

RMS - RMS detection

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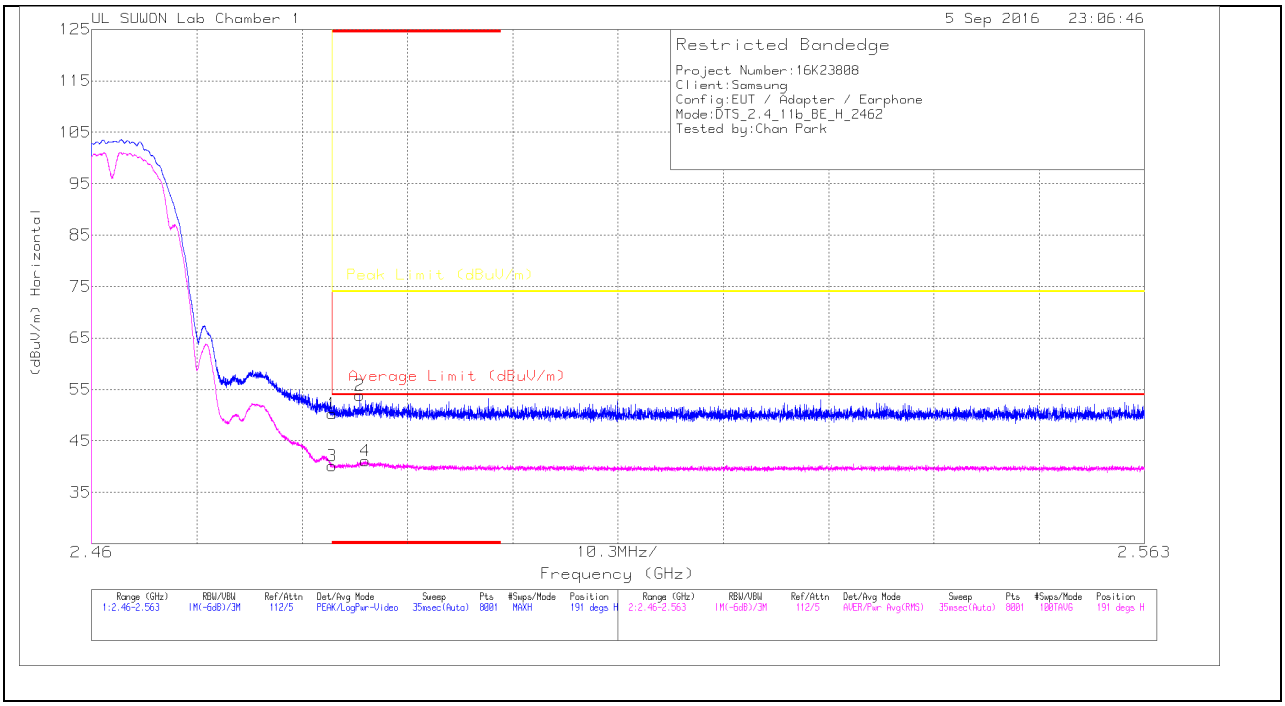
AUTHORIZED BANDEDGE (HIGH CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_2	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	46.61	Pk	32	-28.3	0	50.31	-	-	74	-23.69	191	291	H
2	* 2.486	50.1	Pk	32	-28.3	0	53.8	-	-	74	-20.2	191	291	H
3	* 2.484	36.45	RMS	32	-28.3	0	40.15	54	-13.85	-	-	191	291	H
4	* 2.487	37.45	RMS	32	-28.3	0	41.15	54	-12.85	-	-	191	291	H

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

Pk - Peak detector

RMS - RMS detection

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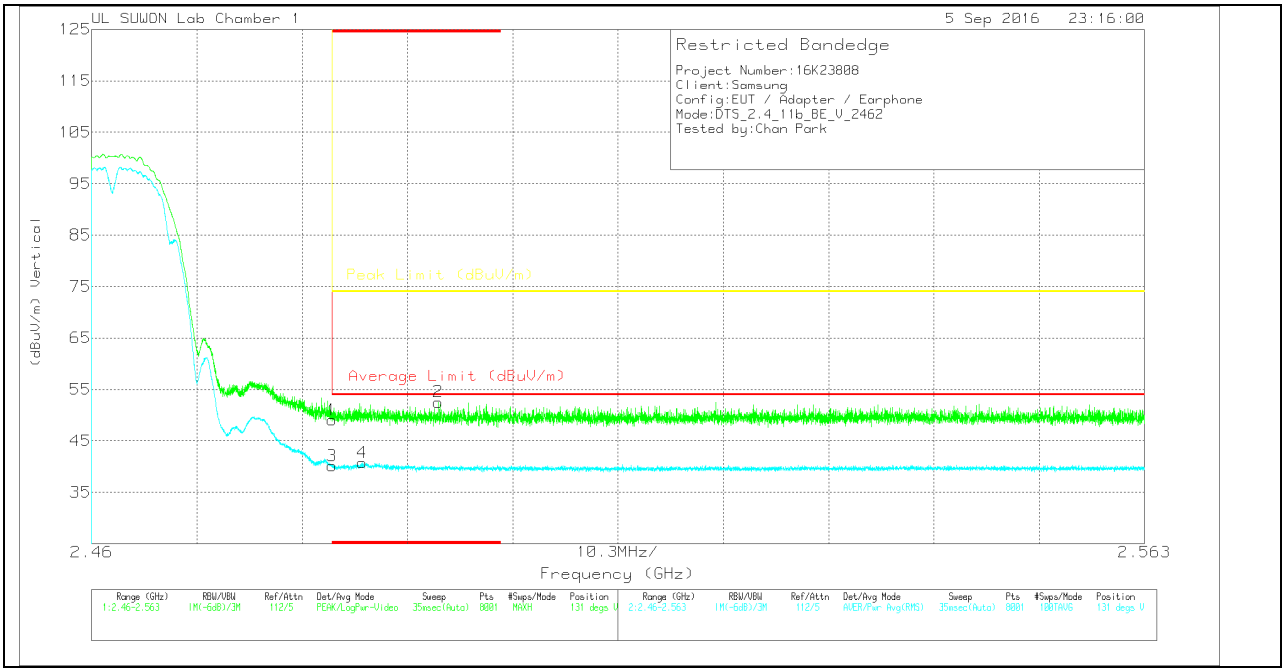
VERTICAL PEAK AND AVERAGE PLOT



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	45.34	Pk	32	-28.3	0	49.04	-	-	74	-24.96	131	240	V
2	* 2.494	48.85	Pk	32	-28.3	0	52.55	-	-	74	-21.45	131	240	V
3	* 2.484	36.41	RMS	32	-28.3	0	40.11	54	-13.89	-	-	131	240	V
4	* 2.486	37.07	RMS	32	-28.3	0	40.77	54	-13.23	-	-	131	240	V

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

Pk - Peak detector

RMS - RMS detection

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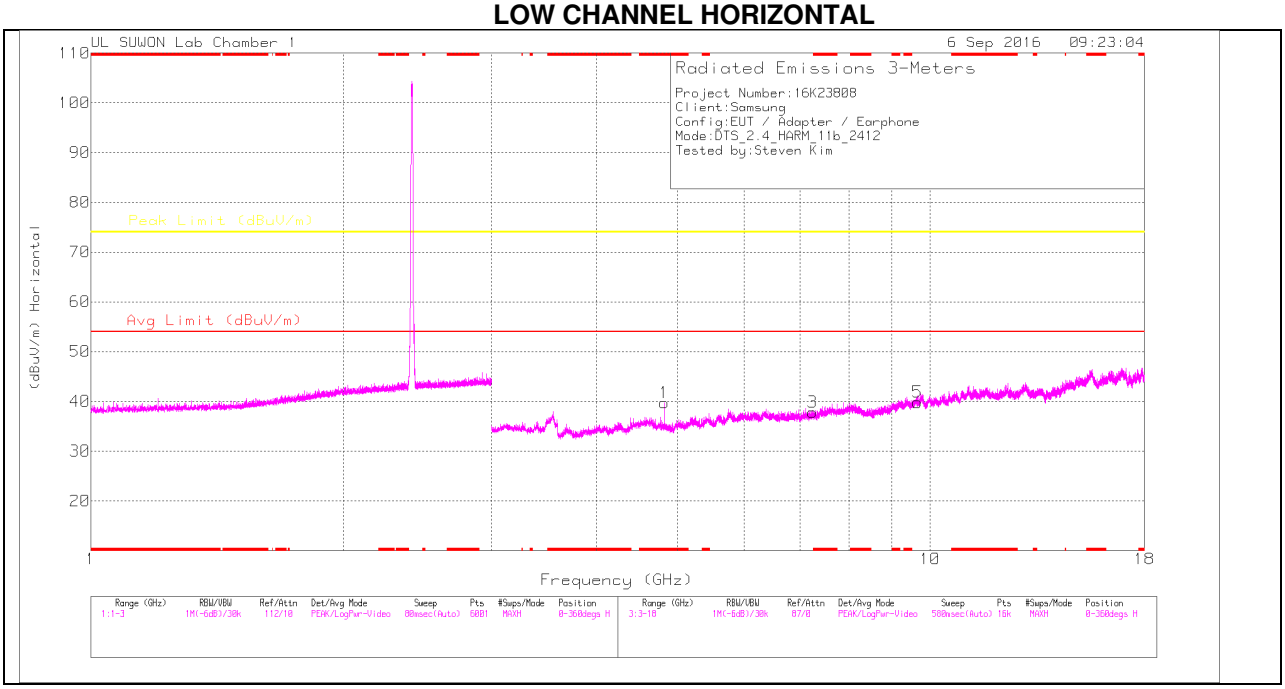
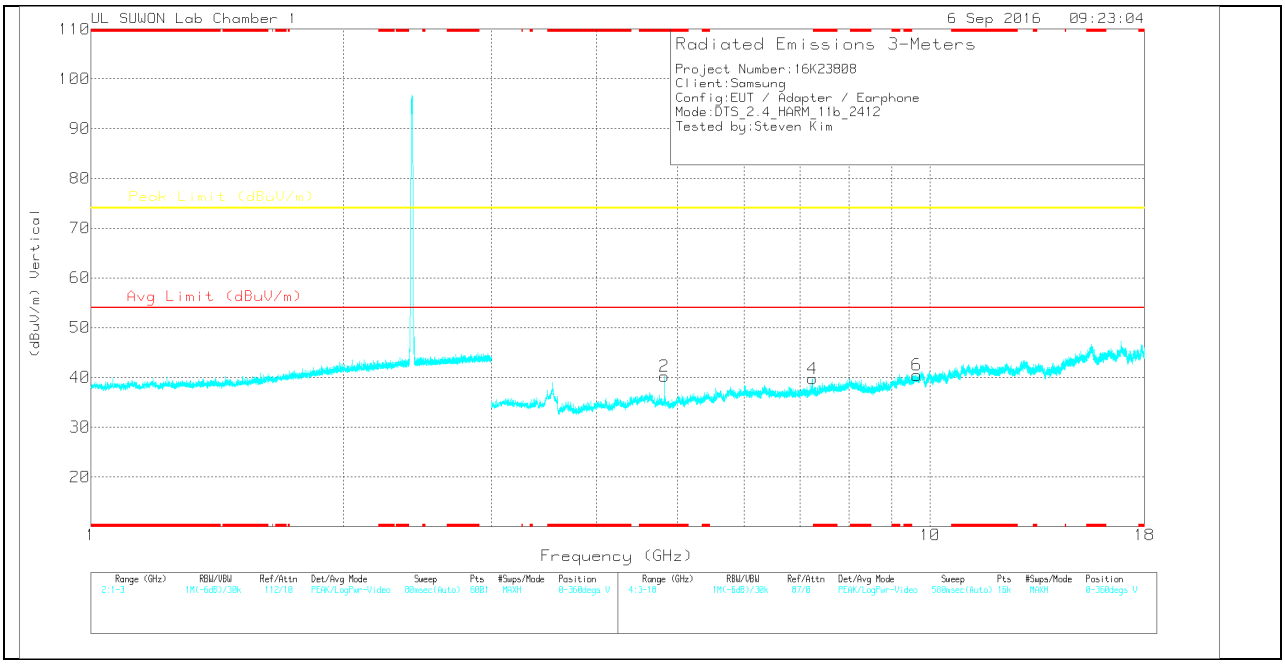
HARMONICS AND SPURIOUS EMISSIONS

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.

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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	39.5	PK	34	-33.8	0	39.7	-	-	74	-34.3	0-360	200	H
3	7.235	32.99	PK	35.7	-30.9	0	37.79	-	-	74	-36.21	0-360	100	H
5	9.65	30.1	PK	37.1	-27.4	0	39.8	-	-	74	-34.2	0-360	100	H
2	* 4.823	40.01	PK	34	-33.8	0	40.21	-	-	74	-33.79	0-360	200	V
4	7.237	34.91	PK	35.7	-30.9	0	39.71	-	-	74	-34.29	0-360	100	V
6	9.646	30.73	PK	37.1	-27.4	0	40.43	-	-	74	-33.57	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
* 4.824	49.04	PK2	34	-33.8	0	49.24	-	-	74	-24.76	38	295	H
* 4.824	40.51	MAv1	34	-33.8	0	40.71	54	-13.29	-	-	38	295	H
* 4.824	49.64	PK2	34	-33.8	0	49.84	-	-	74	-24.16	47	301	V
* 4.824	41.32	MAv1	34	-33.8	0	41.52	54	-12.48	-	-	47	301	V
7.236	46.31	PK2	35.7	-30.9	0	51.11	-	-	74	-22.89	16	100	V
7.239	44.2	PK2	35.7	-30.9	0	49	-	-	74	-25	3	291	H

* - 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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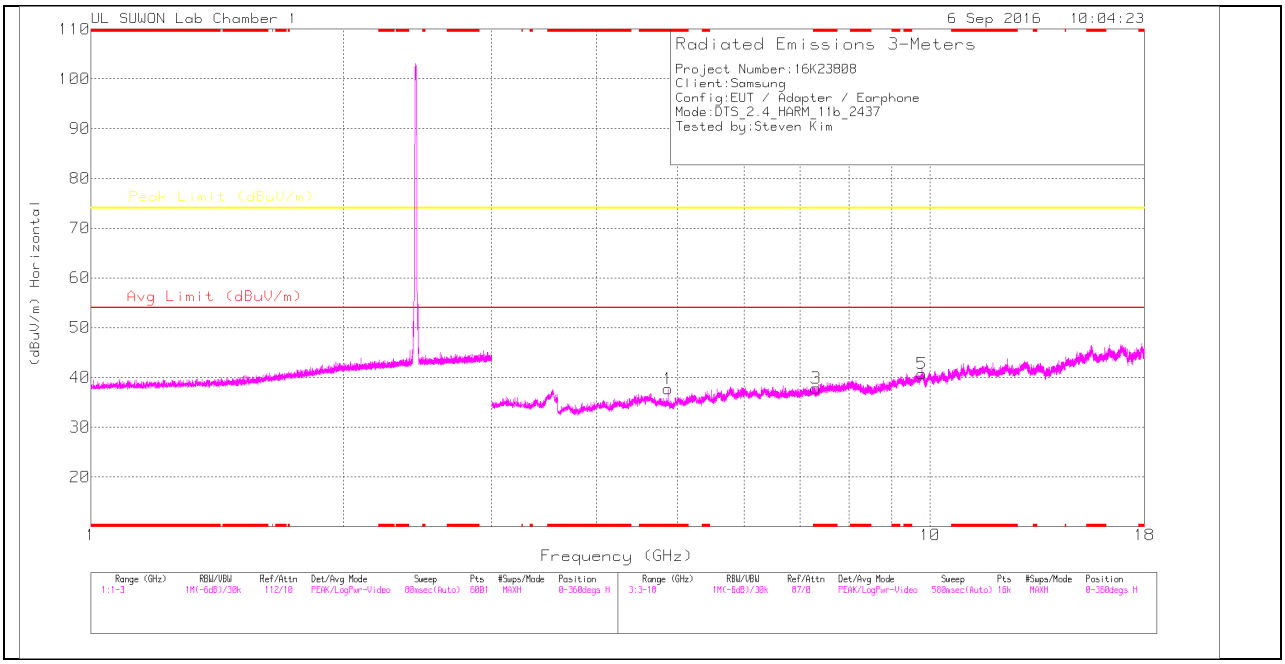
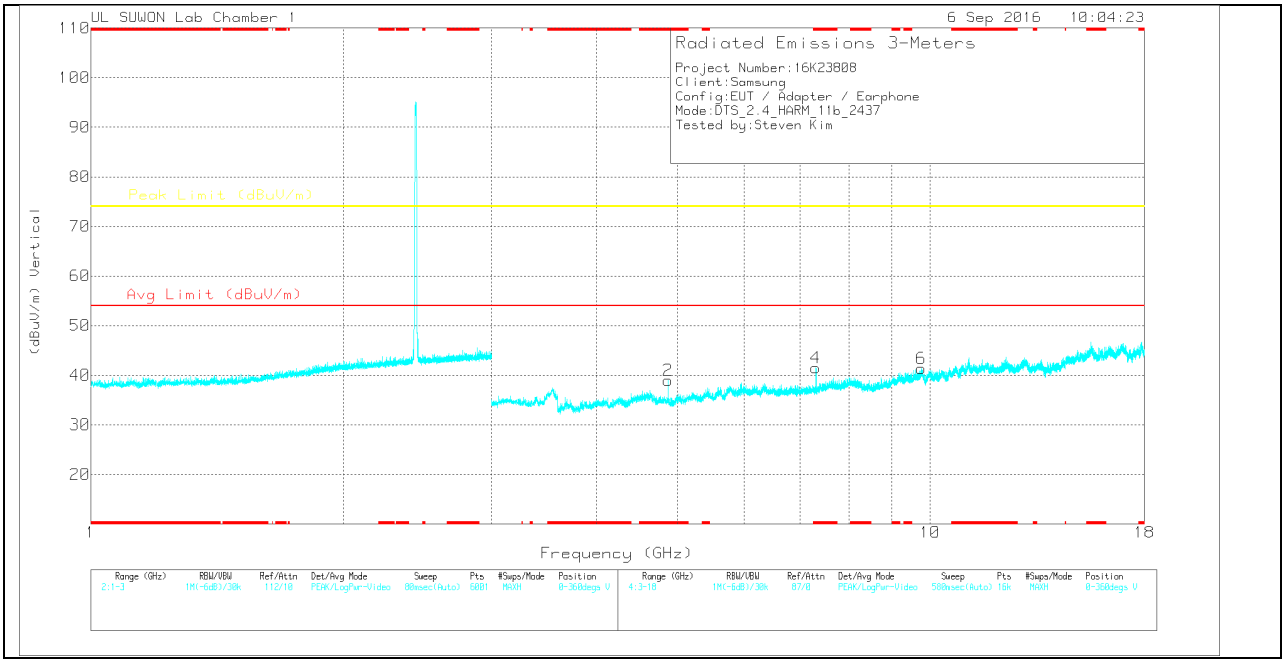
MID CHANNEL HORIZONTAL



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.

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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	* 4.873	37.71	PK	34	-34	0	37.71	-	-	74	-36.29	0-360	100	H
3	* 7.31	33	PK	35.7	-30.9	0	37.8	-	-	74	-36.2	0-360	200	H
5	9.766	30.01	PK	37.2	-26.5	0	40.71	-	-	74	-33.29	0-360	200	H
2	* 4.874	39	PK	34	-34	0	39	-	-	74	-35	0-360	100	V
4	* 7.309	36.72	PK	35.7	-30.9	0	41.52	-	-	74	-32.48	0-360	100	V
6	9.763	30.72	PK	37.2	-26.6	0	41.32	-	-	74	-32.68	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	50.24	PK2	34	-34	0	50.24	-	-	74	-23.76	34	296	H
* 4.874	41.92	MAv1	34	-34	0	41.92	54	-12.08	-	-	34	296	H
* 4.874	48.83	PK2	34	-34	0	48.83	-	-	74	-25.17	46	296	V
* 4.874	40.6	MAv1	34	-34	0	40.6	54	-13.4	-	-	46	296	V
* 7.31	46.17	PK2	35.7	-30.9	0	50.97	-	-	74	-23.03	13	104	V
* 7.31	36.33	MAv1	35.7	-30.9	0	41.13	54	-12.87	-	-	13	104	V
* 7.309	45.32	PK2	35.7	-30.9	0	50.12	-	-	74	-23.88	70	379	H
* 7.312	34.81	MAv1	35.7	-30.9	0	39.61	54	-14.39	-	-	70	379	H

* - 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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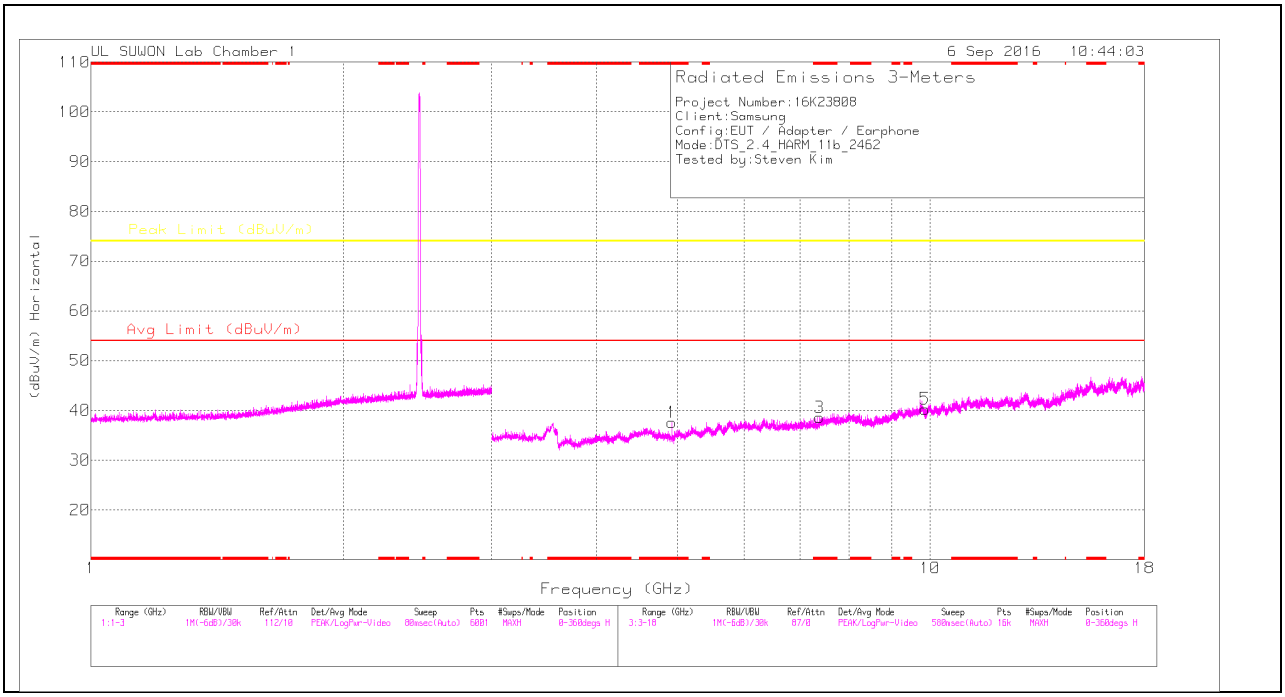
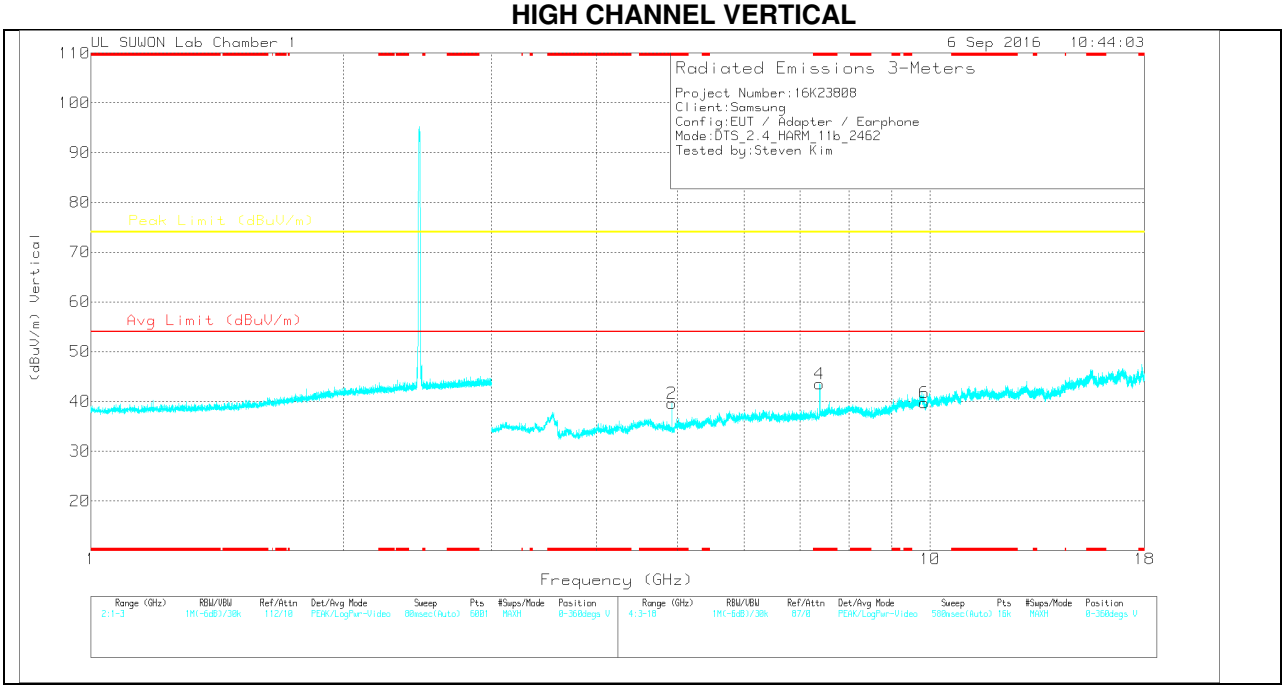
HIGH CHANNEL HORIZONTAL



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.

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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	37.53	PK	34	-34	0	37.53	-	-	74	-36.47	0-360	100	H
3	* 7.385	33.55	PK	35.8	-30.7	0	38.65	-	-	74	-35.35	0-360	200	H
5	9.851	30.7	PK	37.3	-27.7	0	40.3	-	-	74	-33.7	0-360	100	H
2	* 4.924	39.56	PK	34	-34	0	39.56	-	-	74	-34.44	0-360	100	V
4	* 7.385	38.4	PK	35.8	-30.7	0	43.5	-	-	74	-30.5	0-360	100	V
6	9.848	30.08	PK	37.3	-27.6	0	39.78	-	-	74	-34.22	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
* 4.924	49.61	PK2	34	-34	0	49.61	-	-	74	-24.39	44	320	H
* 4.924	41.75	MAv1	34	-34	0	41.75	54	-12.25	-	-	44	320	H
* 4.924	48.75	PK2	34	-34	0	48.75	-	-	74	-25.25	300	288	V
* 4.924	40.93	MAv1	34	-34	0	40.93	54	-13.07	-	-	300	288	V
* 7.385	47.97	PK2	35.8	-30.7	0	53.07	-	-	74	-20.93	24	100	V
* 7.387	39.06	MAv1	35.8	-30.7	0	44.16	54	-9.84	-	-	24	100	V
* 7.387	46.55	PK2	35.8	-30.7	0	51.65	-	-	74	-22.35	67	373	H
* 7.387	36.87	MAv1	35.8	-30.7	0	41.97	54	-12.03	-	-	67	373	H

* - 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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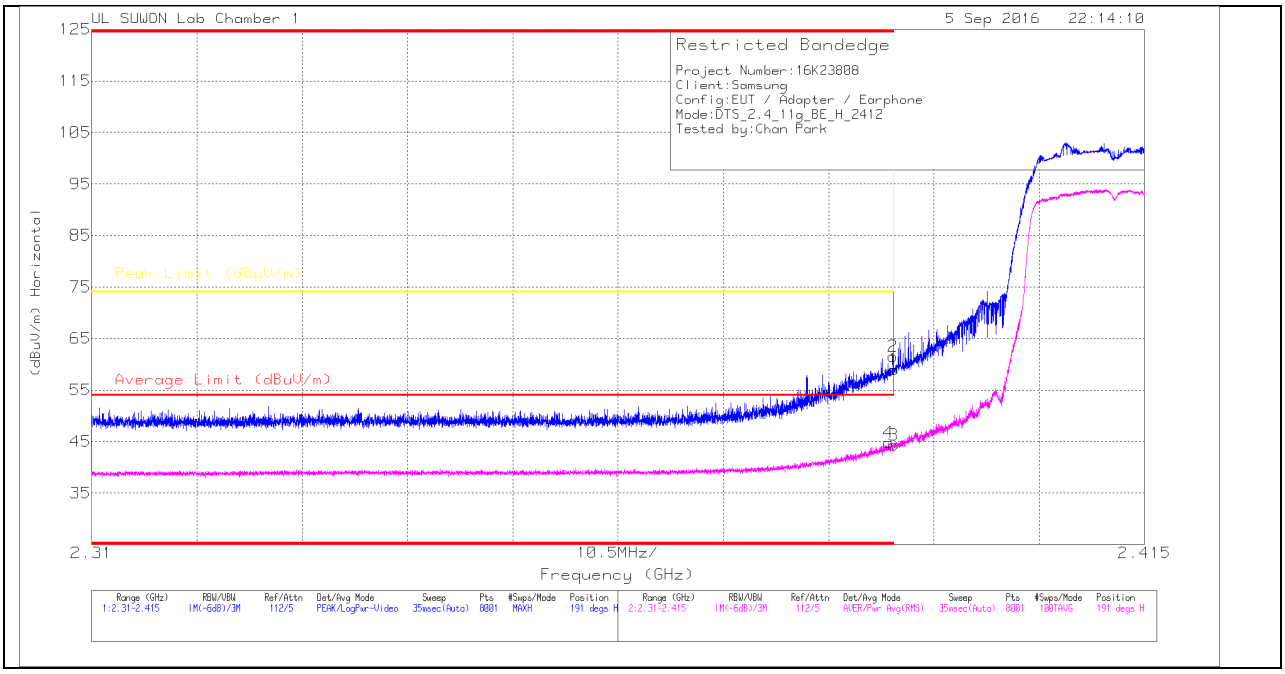
10.2.2. TX ABOVE 1 GHz 802.11g MODE IN THE 2.4 GHz BAND

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	56.17	Pk	31.8	-29	0	58.97	-	-	74	-15.03	191	109	H
2	* 2.39	58.73	Pk	31.8	-29	0	61.53	-	-	74	-12.47	191	109	H
3	* 2.39	41.22	RMS	31.8	-29	.29	44.31	54	-9.69	-	-	191	109	H
4	* 2.389	41.67	RMS	31.8	-29	.29	44.76	54	-9.24	-	-	191	109	H

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

Pk - Peak detector

RMS - RMS detection

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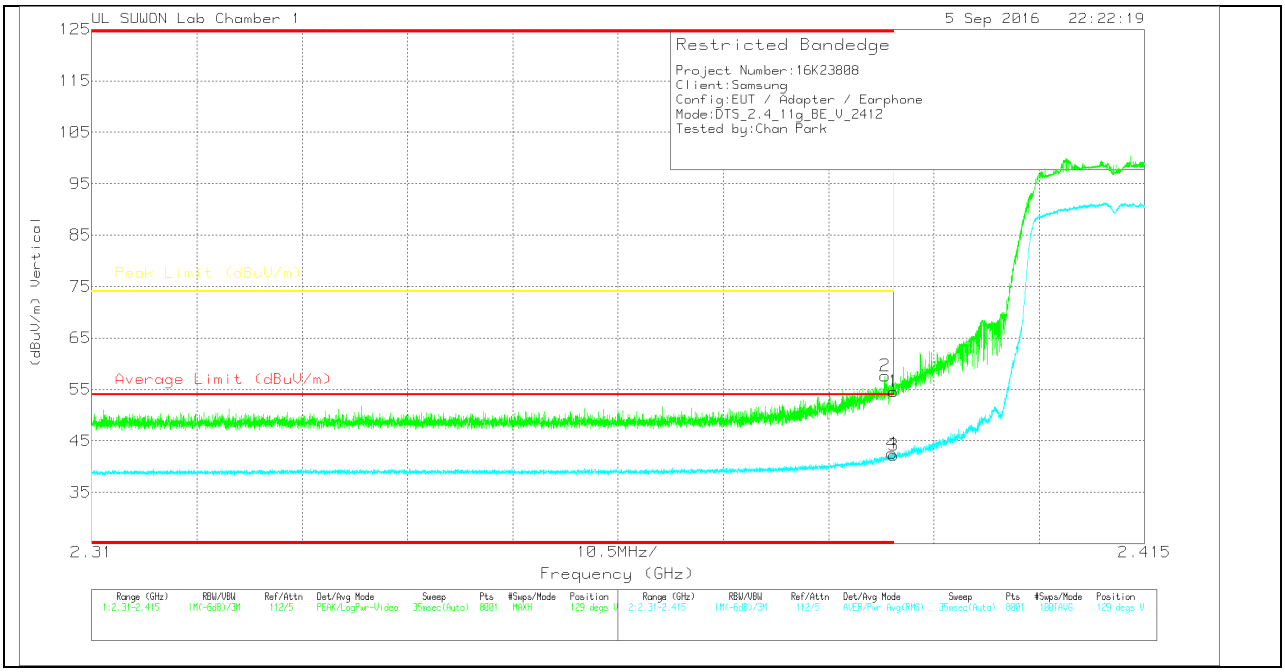
VERTICAL PEAK AND AVERAGE PLOT



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	51.82	Pk	31.8	-29	0	54.62	-	-	74	-19.38	129	302	V
2	* 2.389	54.87	Pk	31.8	-29	0	57.67	-	-	74	-16.33	129	302	V
3	* 2.39	39.11	RMS	31.8	-29	.29	42.2	54	-11.8	-	-	129	302	V
4	* 2.39	39.49	RMS	31.8	-29	.29	42.58	54	-11.42	-	-	129	302	V

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

Pk - Peak detector

RMS - RMS detection

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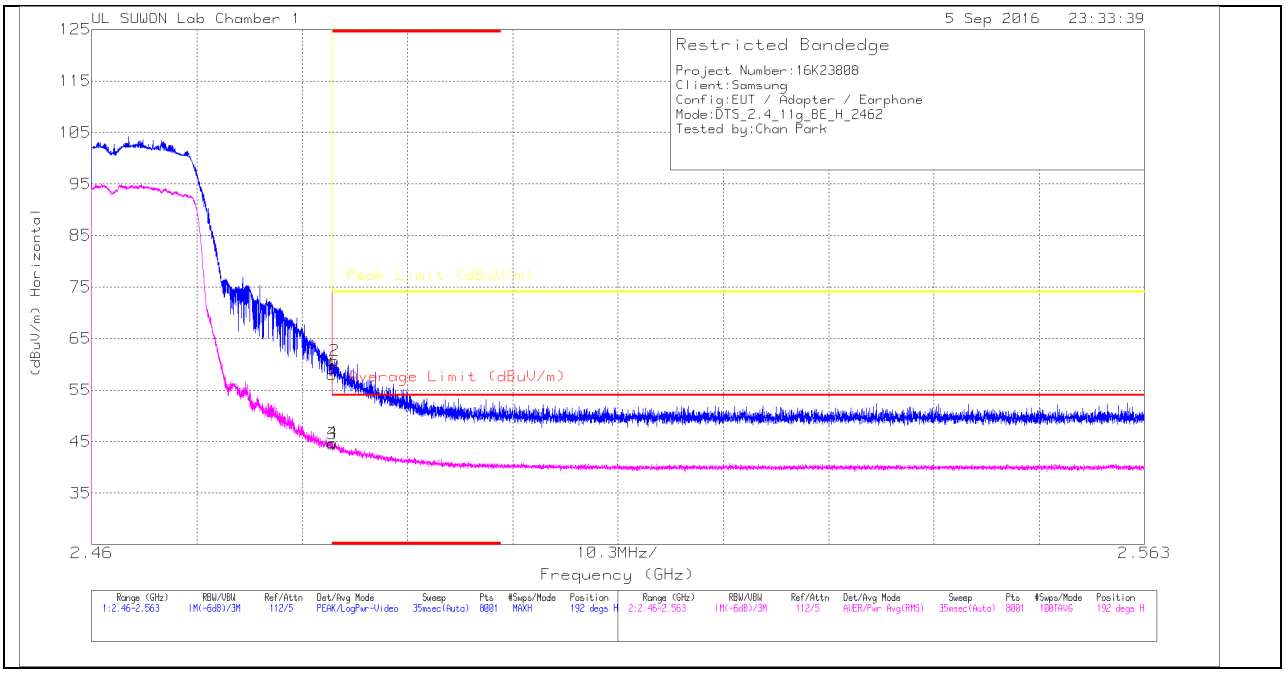
AUTHORIZED BANDEDGE (HIGH CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_2	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	54.33	Pk	32	-28.3	0	58.03	-	-	74	-15.97	192	102	H
2	* 2.484	56.97	Pk	32	-28.3	0	60.67	-	-	74	-13.33	192	102	H
3	* 2.484	40.53	RMS	32	-28.3	.29	44.52	54	-9.48	-	-	192	102	H
4	* 2.484	40.81	RMS	32	-28.3	.29	44.8	54	-9.2	-	-	192	102	H

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

Pk - Peak detector

RMS - RMS detection

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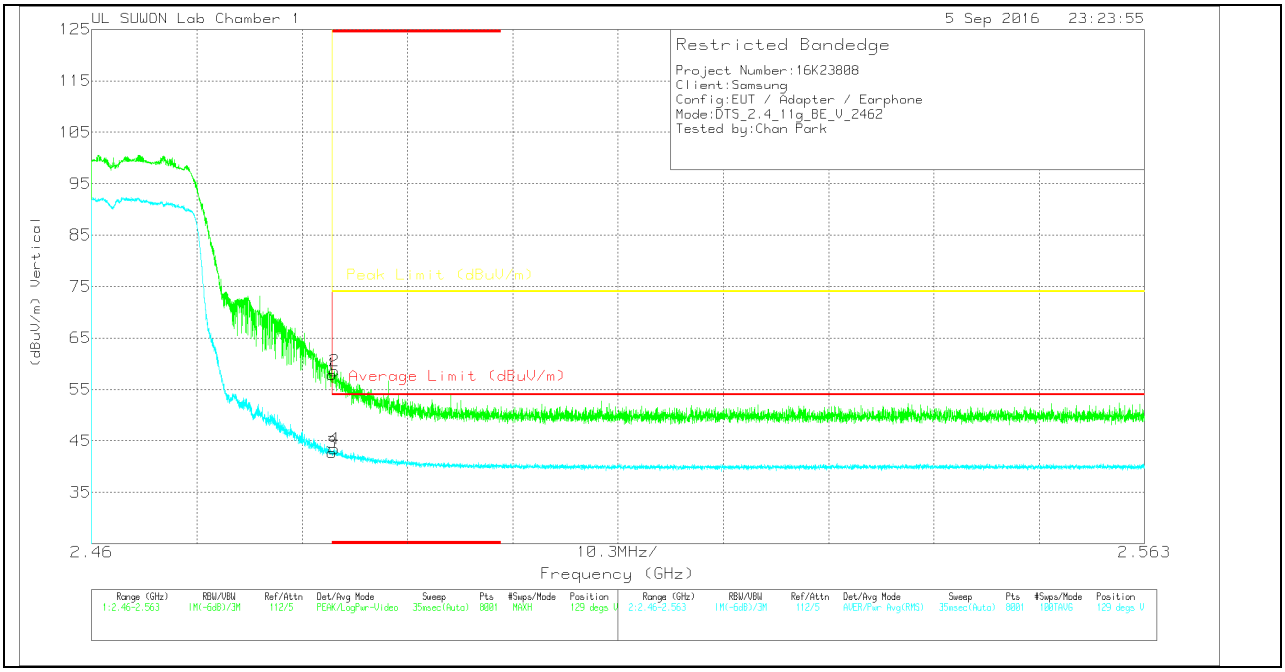
VERTICAL PEAK AND AVERAGE PLOT



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	54.23	Pk	32	-28.3	0	57.93	-	-	74	-16.07	129	238	V
2	* 2.484	54.91	Pk	32	-28.3	0	58.61	-	-	74	-15.39	129	238	V
3	* 2.484	38.7	RMS	32	-28.3	.29	42.69	54	-11.31	-	-	129	238	V
4	* 2.484	39.42	RMS	32	-28.3	.29	43.41	54	-10.59	-	-	129	238	V

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

Pk - Peak detector

RMS - RMS detection

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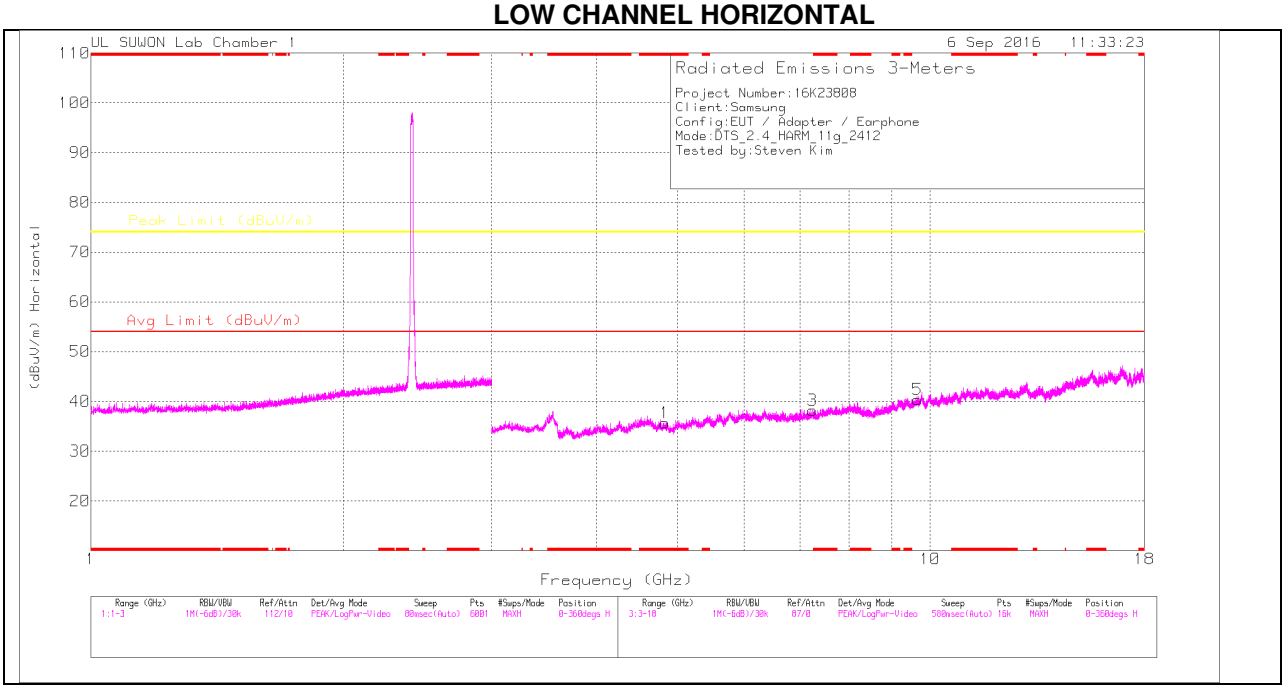
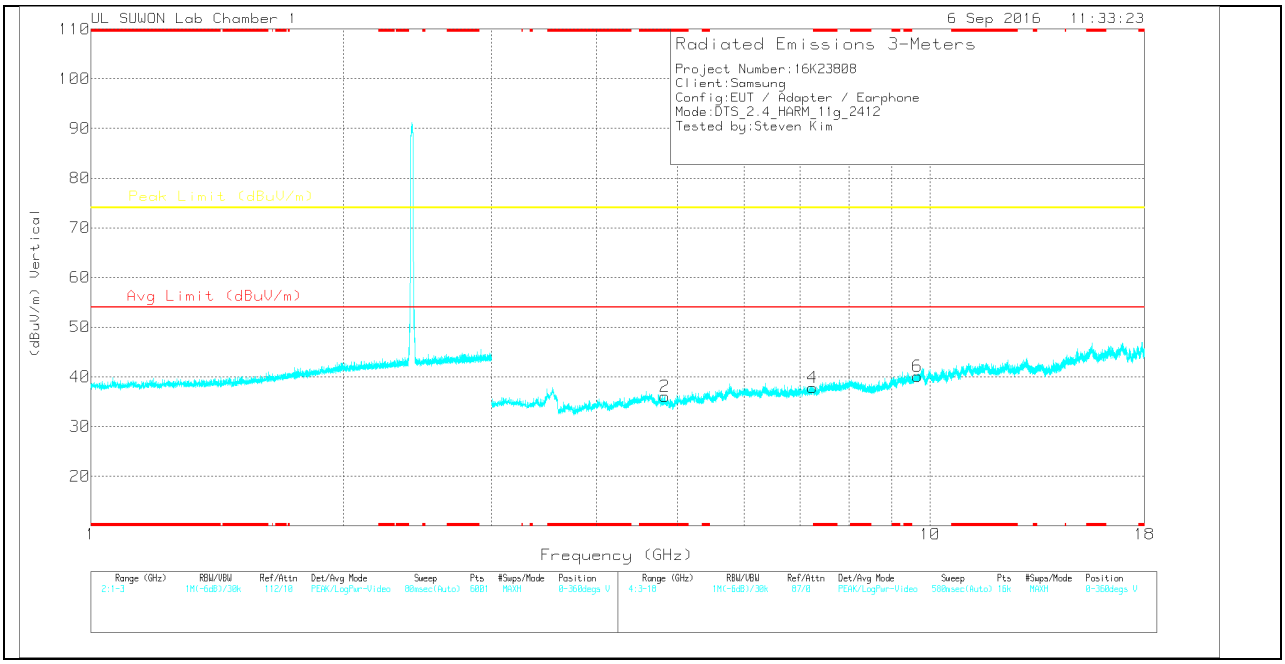
HARMONICS AND SPURIOUS EMISSIONS

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

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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	* 4.828	35.53	PK	34	-33.8	0	35.73	-	-	74	-38.27	0-360	100	H
3	7.24	33.44	PK	35.7	-30.9	0	38.24	-	-	74	-35.76	0-360	100	H
5	9.65	30.64	PK	37.1	-27.4	0	40.34	-	-	74	-33.66	0-360	100	H
2	* 4.831	35.81	PK	34	-33.8	0	36.01	-	-	74	-37.99	0-360	200	V
4	7.238	33.08	PK	35.7	-30.9	0	37.88	-	-	74	-36.12	0-360	200	V
6	9.648	30.36	PK	37.1	-27.4	0	40.06	-	-	74	-33.94	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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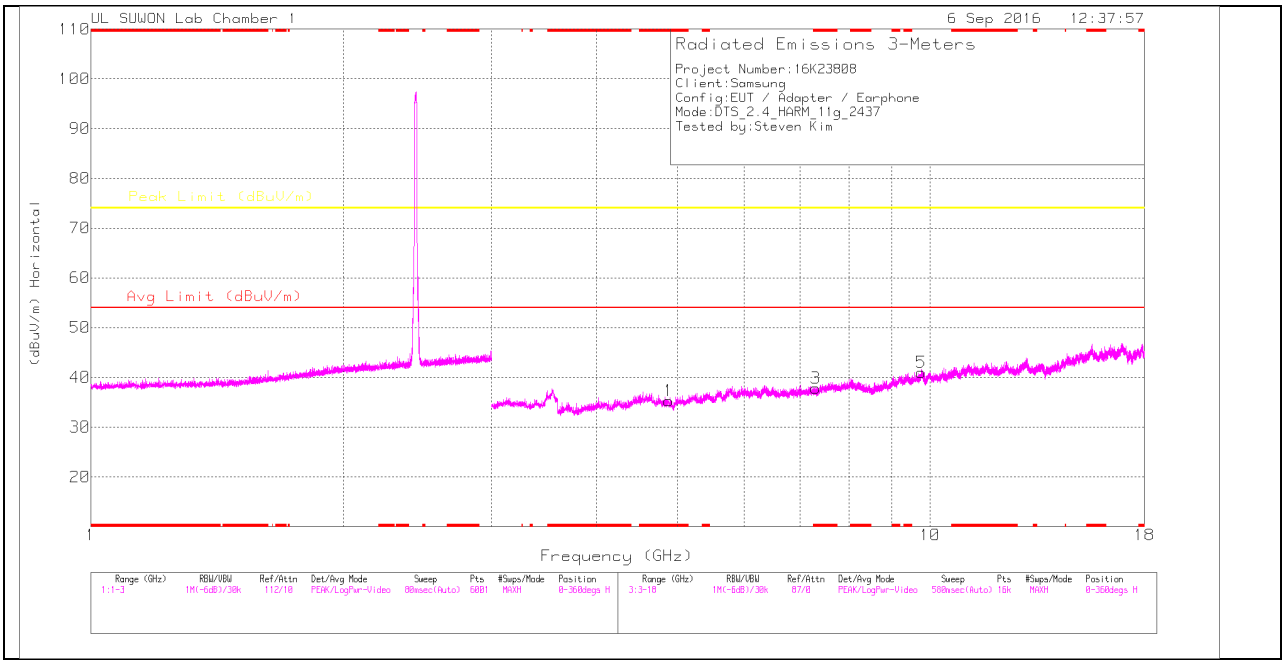
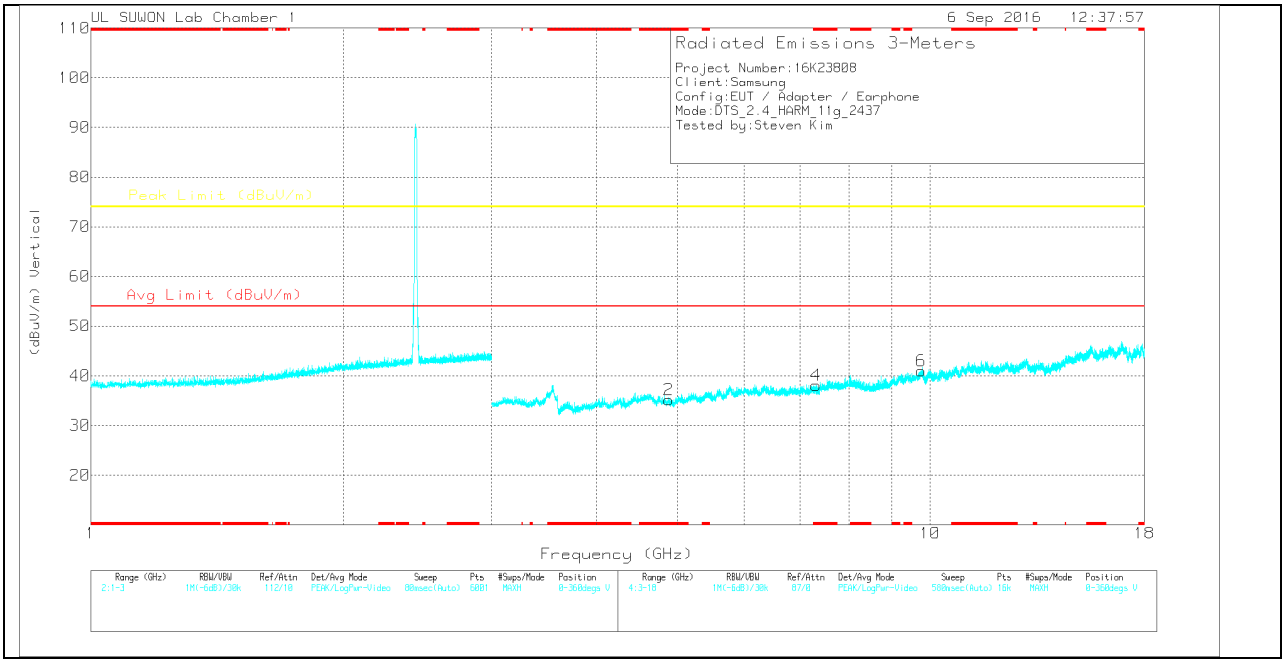
MID CHANNEL HORIZONTAL



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.

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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	* 4.88	35.26	PK	34	-34	0	35.26	-	-	74	-38.74	0-360	100	H
3	* 7.306	33.07	PK	35.7	-30.9	0	37.87	-	-	74	-36.13	0-360	100	H
5	9.751	30.6	PK	37.2	-26.8	0	41	-	-	74	-33	0-360	100	H
2	* 4.878	35.18	PK	34	-34	0	35.18	-	-	74	-38.82	0-360	100	V
4	* 7.31	33.28	PK	35.7	-30.9	0	38.08	-	-	74	-35.92	0-360	100	V
6	9.749	30.62	PK	37.2	-26.8	0	41.02	-	-	74	-32.98	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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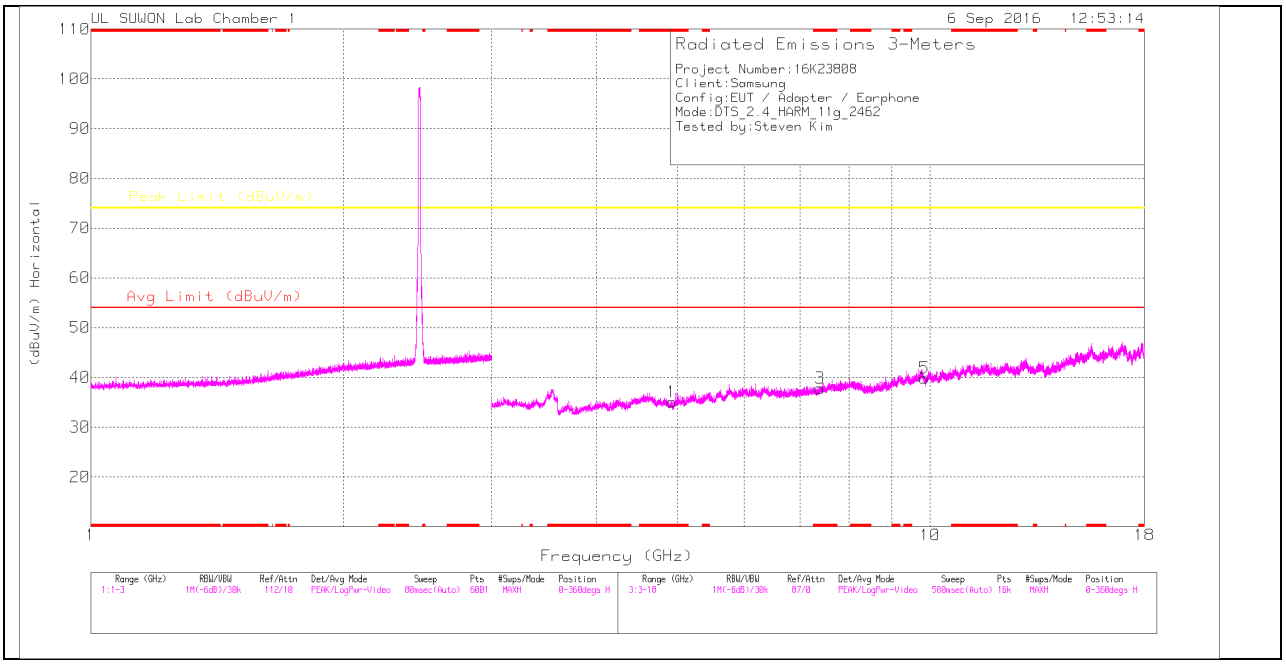
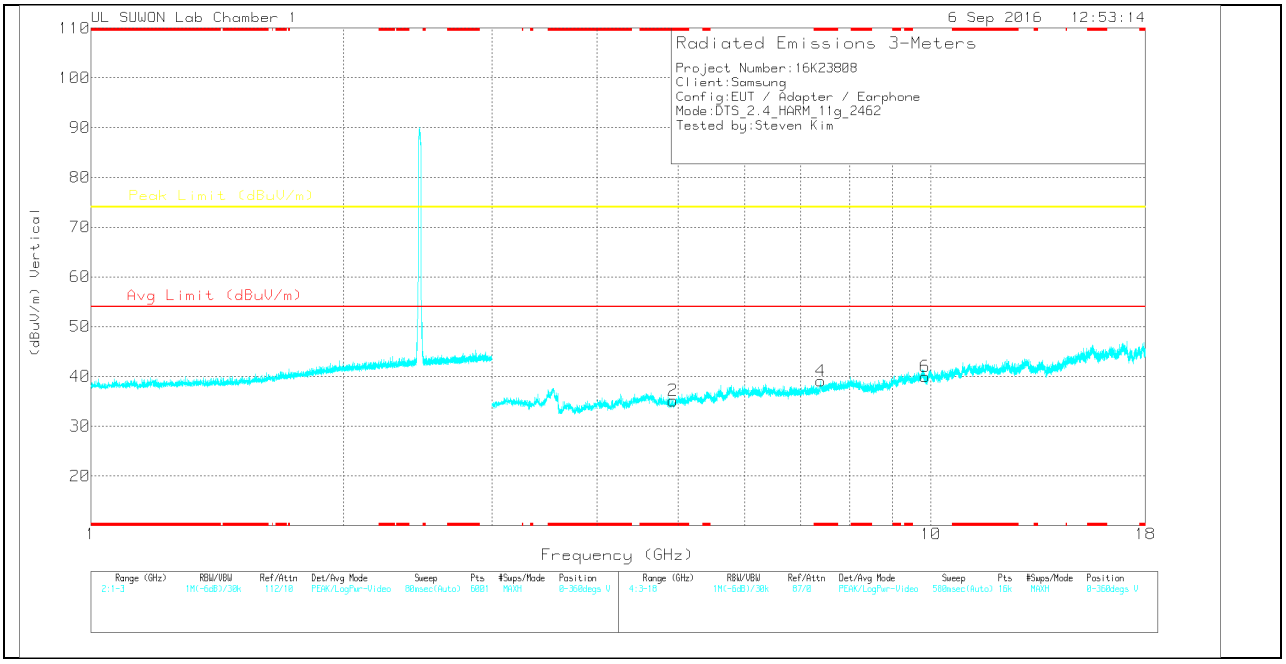
HIGH CHANNEL HORIZONTAL



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.

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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	* 4.926	35.05	PK	34	-34	0	35.05	-	-	74	-38.95	0-360	100	H
3	* 7.389	32.68	PK	35.8	-30.7	0	37.78	-	-	74	-36.22	0-360	200	H
5	9.846	30.21	PK	37.3	-27.6	0	39.91	-	-	74	-34.09	0-360	100	H
2	* 4.928	35.12	PK	34	-34	0	35.12	-	-	74	-38.88	0-360	200	V
4	* 7.387	33.95	PK	35.8	-30.7	0	39.05	-	-	74	-34.95	0-360	100	V
6	9.842	30.21	PK	37.3	-27.5	0	40.01	-	-	74	-33.99	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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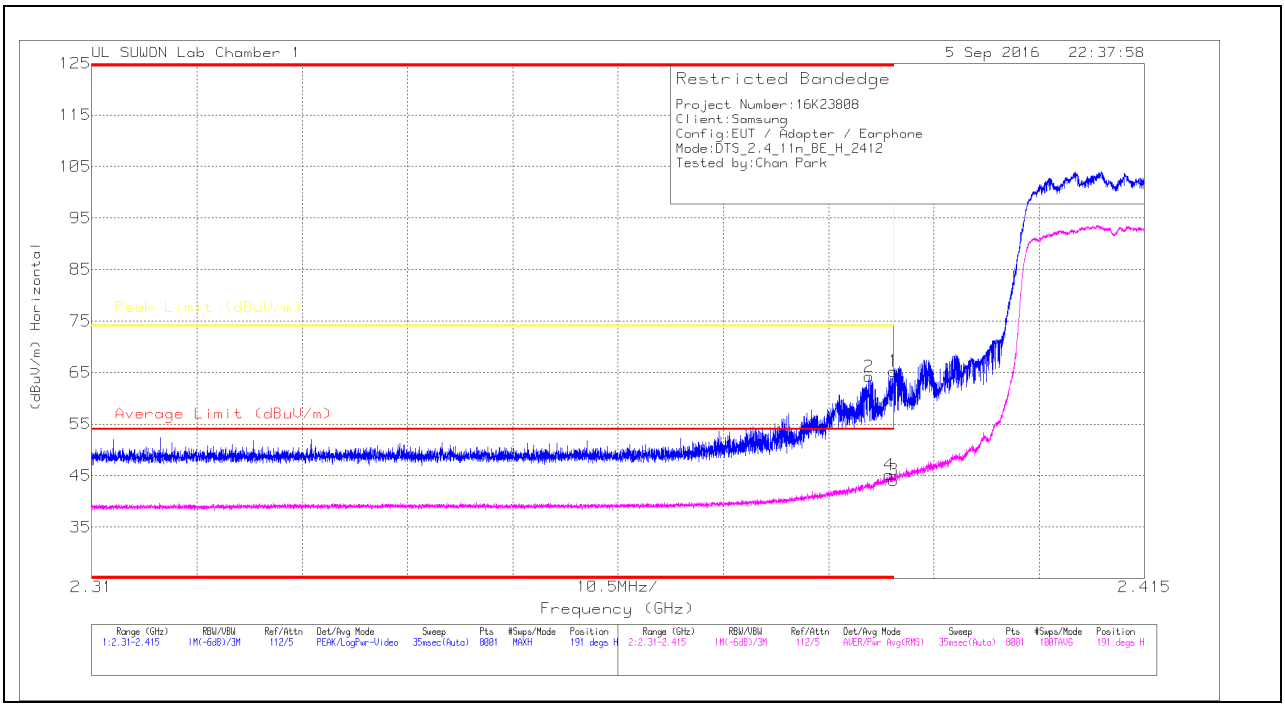
10.2.3. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 2.4 GHz BAND

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	62.44	Pk	31.8	-29	0	65.24	-	-	74	-8.76	191	107	H
2	* 2.388	61.41	Pk	31.8	-29	0	64.21	-	-	74	-9.79	191	107	H
3	* 2.39	40.98	RMS	31.8	-29	.34	44.12	54	-9.88	-	-	191	107	H
4	* 2.39	42.02	RMS	31.8	-29	.34	45.16	54	-8.84	-	-	191	107	H

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

Pk - Peak detector

RMS - RMS detection

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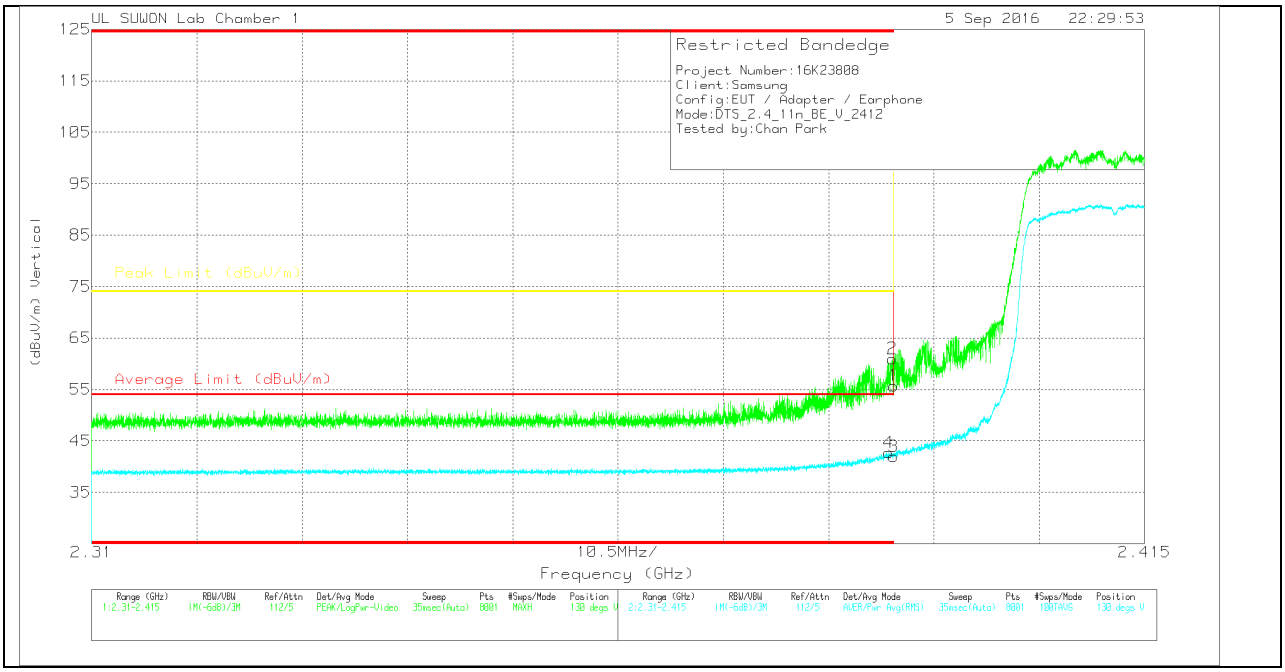
VERTICAL PEAK AND AVERAGE PLOT



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	52.93	Pk	31.8	-29	0	55.73	-	-	74	-18.27	130	302	V
2	* 2.39	58.17	Pk	31.8	-29	0	60.97	-	-	74	-13.03	130	302	V
3	* 2.39	38.85	RMS	31.8	-29	.34	41.99	54	-12.01	-	-	130	302	V
4	* 2.389	39.58	RMS	31.8	-29	.34	42.72	54	-11.28	-	-	130	302	V

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

Pk - Peak detector

RMS - RMS detection

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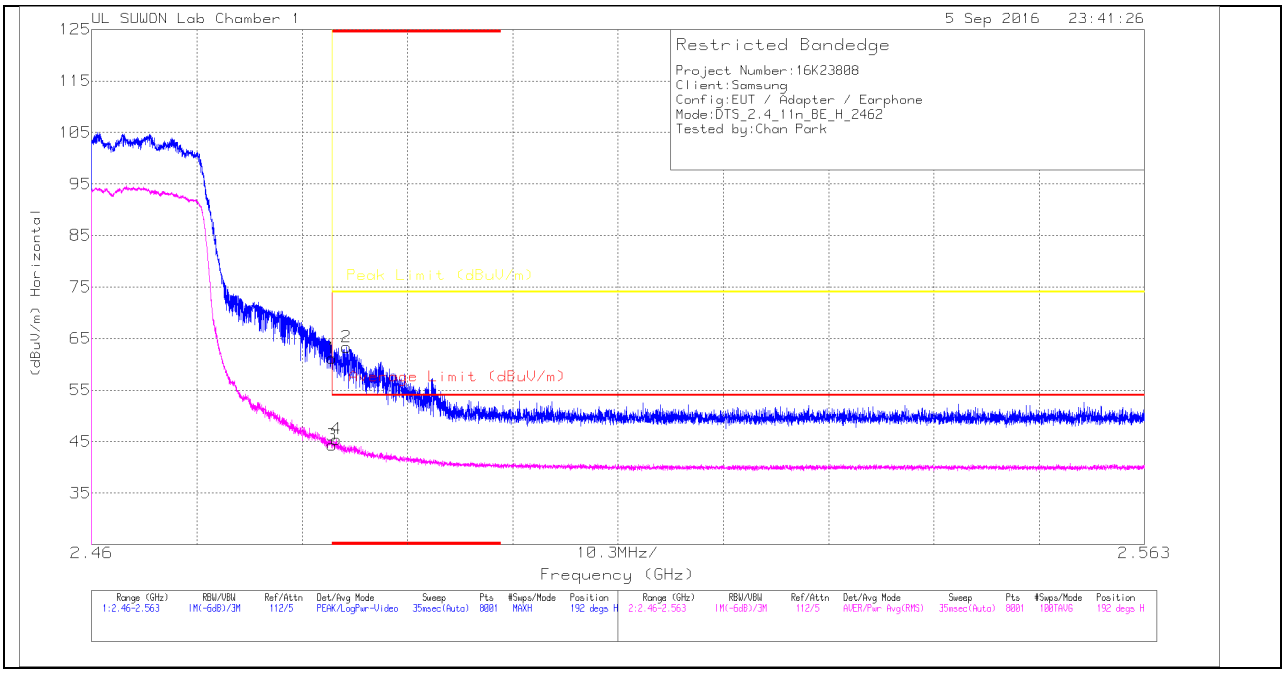
AUTHORIZED BANDEDGE (HIGH CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_2	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	57.45	Pk	32	-28.3	0	61.15	-	-	74	-12.85	192	291	H
2	* 2.485	59.62	Pk	32	-28.3	0	63.32	-	-	74	-10.68	192	291	H
3	* 2.484	40.24	RMS	32	-28.3	.34	44.28	54	-9.72	-	-	192	291	H
4	* 2.484	41.42	RMS	32	-28.3	.34	45.46	54	-8.54	-	-	192	291	H

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

Pk - Peak detector

RMS - RMS detection

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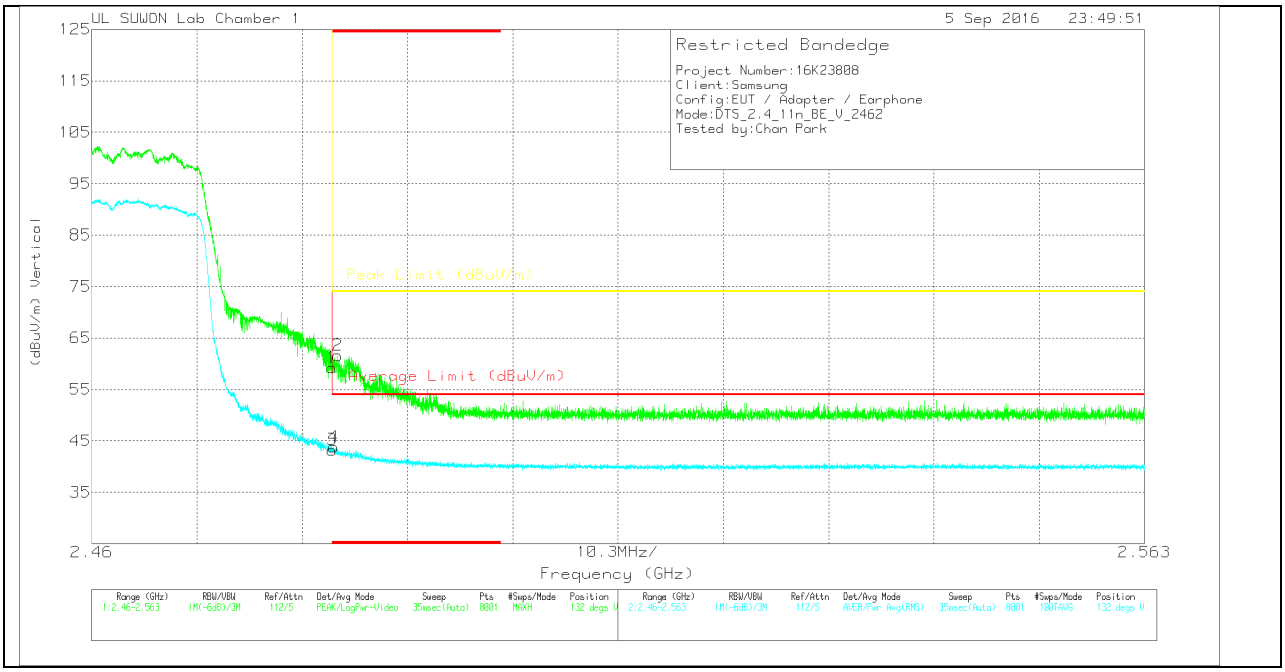
VERTICAL PEAK AND AVERAGE PLOT



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	55.56	Pk	32	-28.3	0	59.26	-	-	74	-14.74	132	241	V
2	* 2.484	57.9	Pk	32	-28.3	0	61.6	-	-	74	-12.4	132	241	V
3	* 2.484	39.22	RMS	32	-28.3	.34	43.26	54	-10.74	-	-	132	241	V
4	* 2.484	39.74	RMS	32	-28.3	.34	43.78	54	-10.22	-	-	132	241	V

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

Pk - Peak detector

RMS - RMS detection

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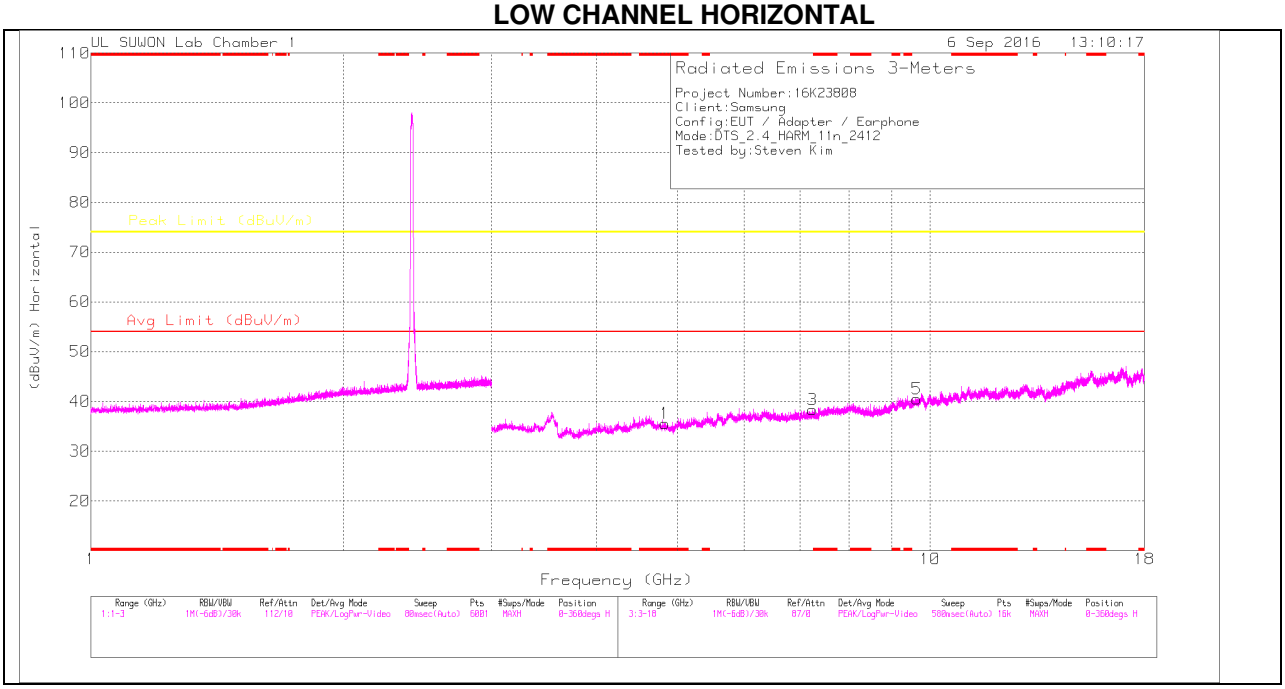
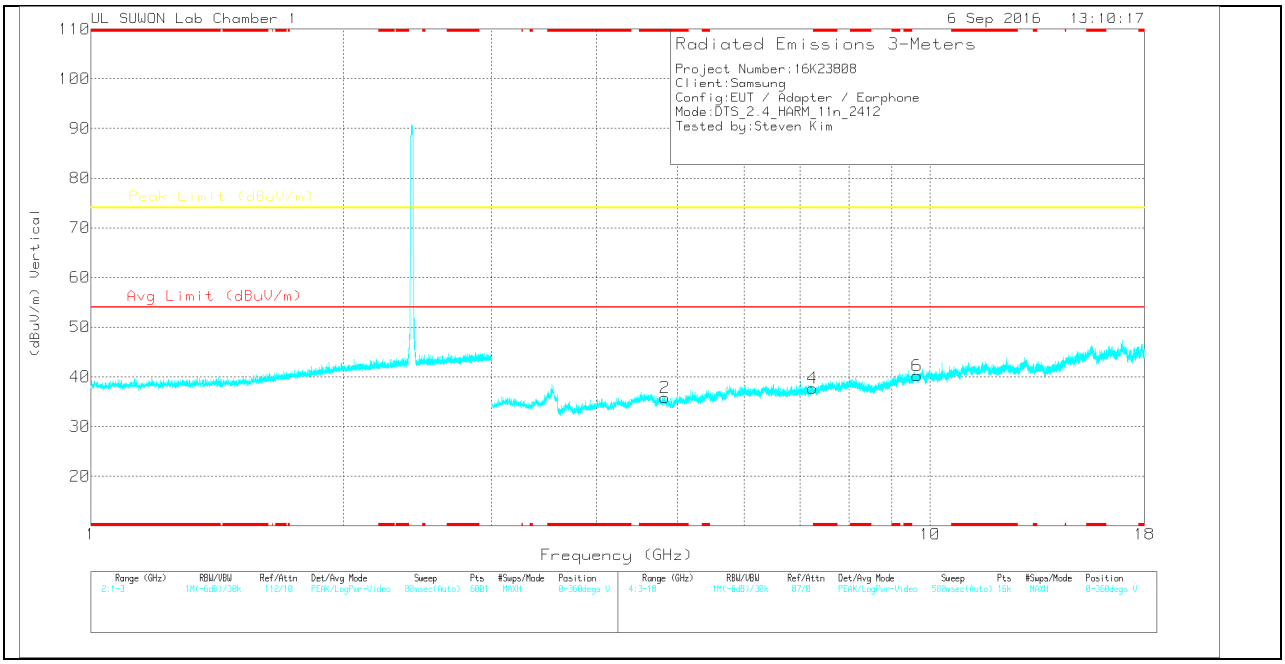
HARMONICS AND SPURIOUS EMISSIONS

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.

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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	* 4.832	35.41	PK	34	-33.8	0	35.61	-	-	74	-38.39	0-360	200	H
3	7.24	33.57	PK	35.7	-30.9	0	38.37	-	-	74	-35.63	0-360	100	H
5	9.644	30.81	PK	37.1	-27.4	0	40.51	-	-	74	-33.49	0-360	200	H
2	* 4.828	35.61	PK	34	-33.8	0	35.81	-	-	74	-38.19	0-360	100	V
4	7.235	32.93	PK	35.7	-30.9	0	37.73	-	-	74	-36.27	0-360	200	V
6	9.647	30.56	PK	37.1	-27.4	0	40.26	-	-	74	-33.74	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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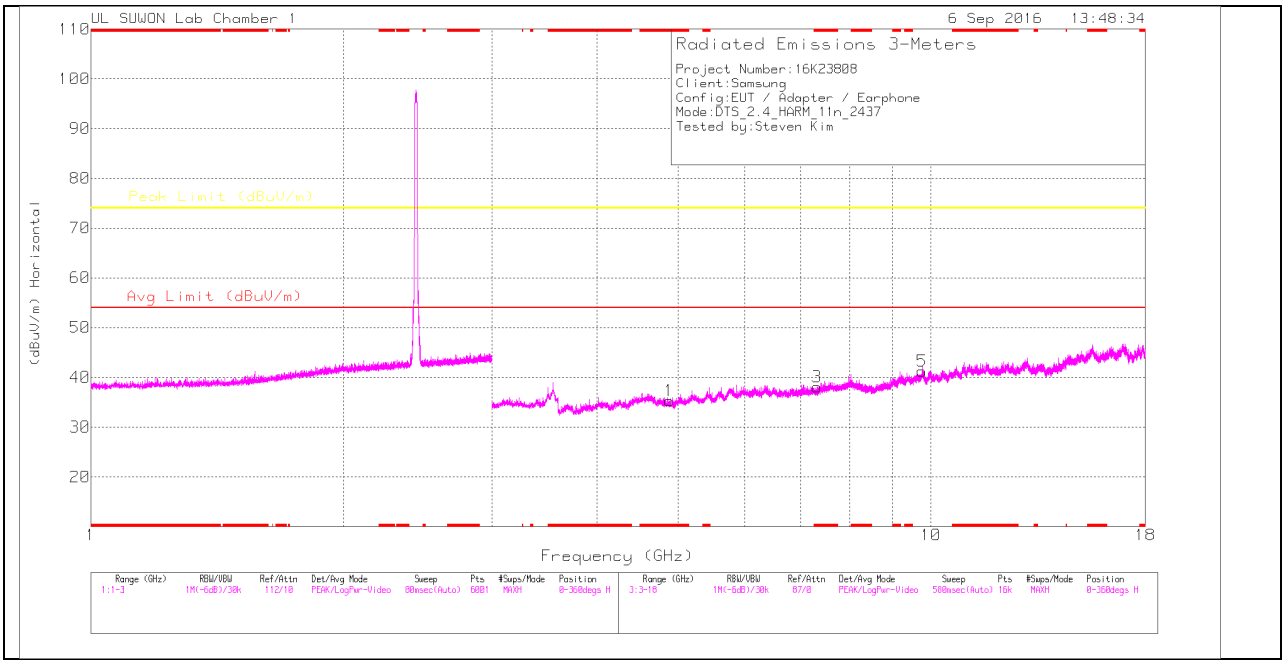
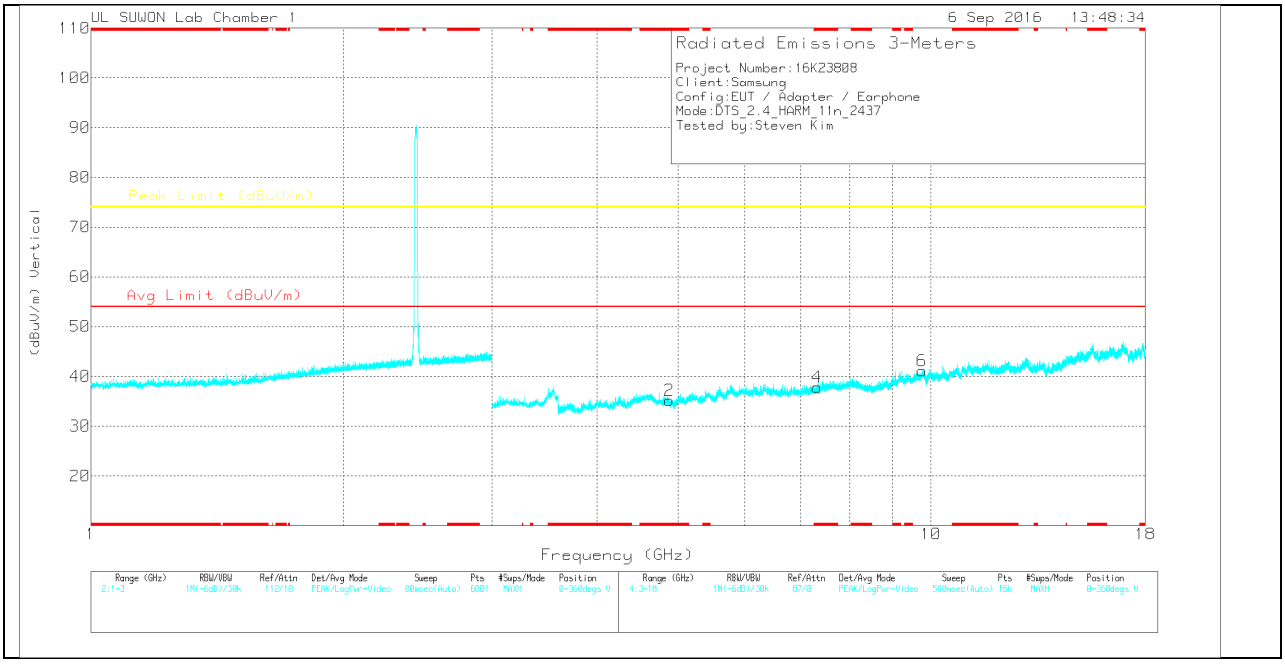
MID CHANNEL HORIZONTAL



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.

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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	* 4.877	35.35	PK	34	-34	0	35.35	-	-	74	-38.65	0-360	200	H
3	* 7.314	33.19	PK	35.8	-30.9	0	38.09	-	-	74	-35.91	0-360	200	H
5	9.764	30.61	PK	37.2	-26.6	0	41.21	-	-	74	-32.79	0-360	200	H
2	* 4.88	35.23	PK	34	-34	0	35.23	-	-	74	-38.77	0-360	200	V
4	* 7.316	32.88	PK	35.8	-30.9	0	37.78	-	-	74	-36.22	0-360	100	V
6	9.758	30.65	PK	37.2	-26.7	0	41.15	-	-	74	-32.85	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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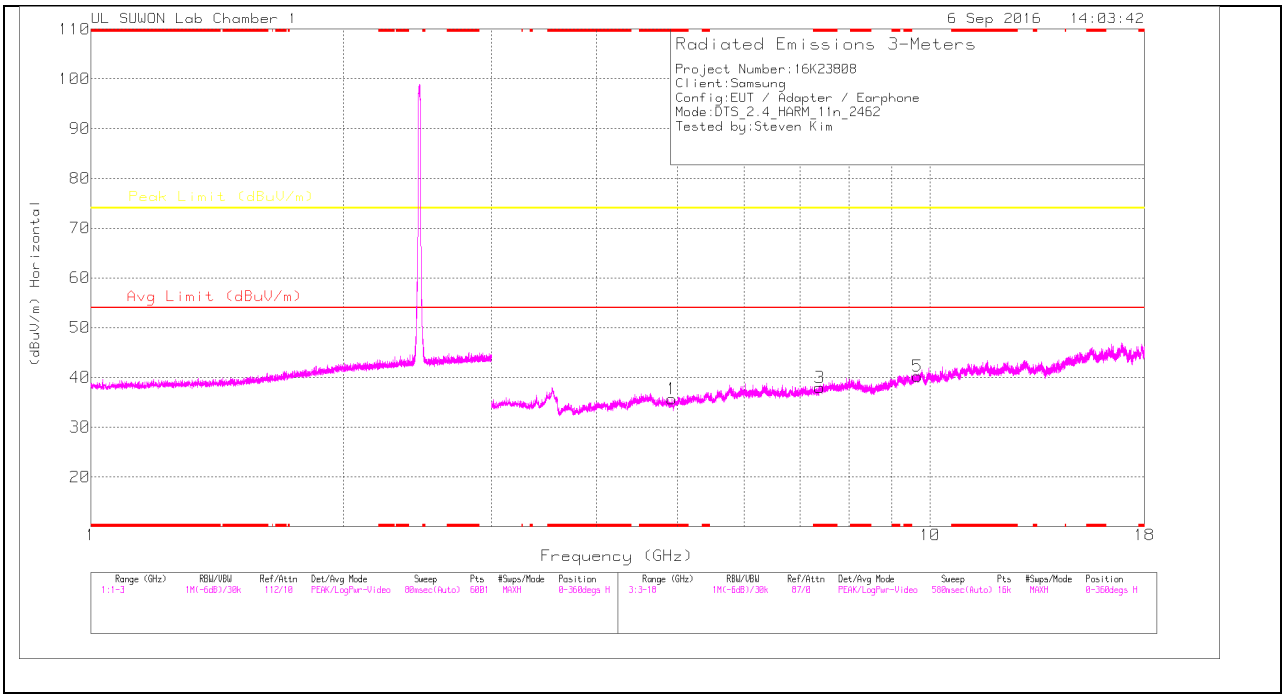
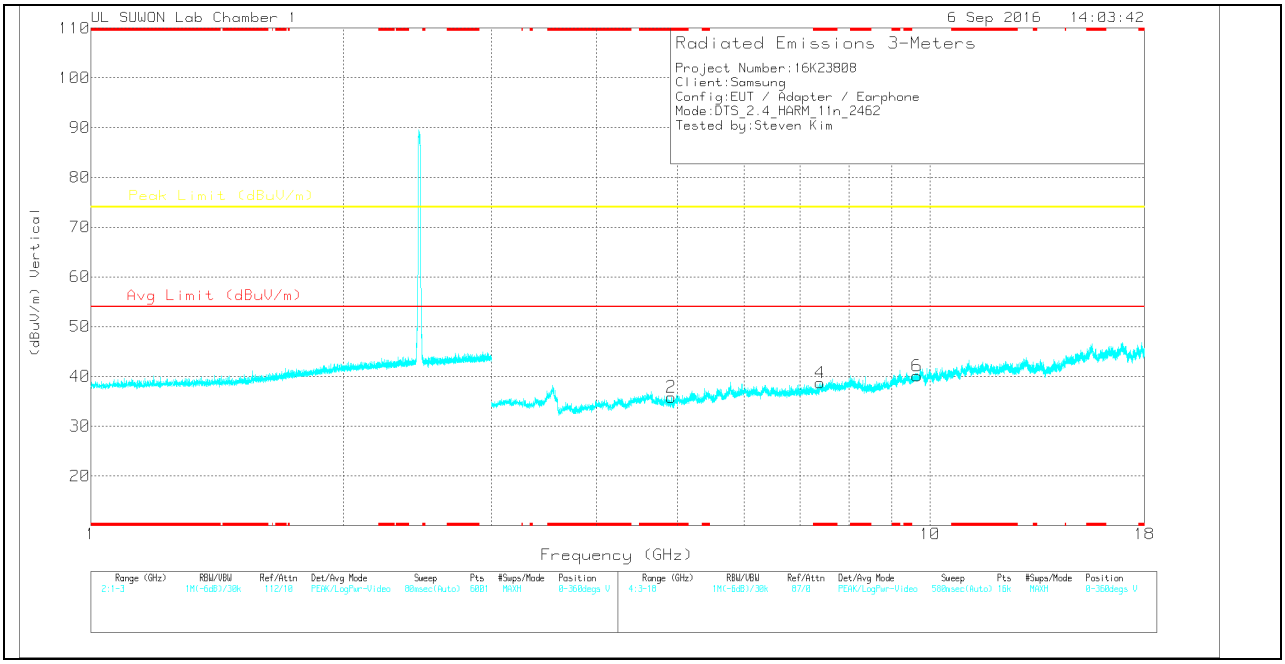
HIGH CHANNEL HORIZONTAL



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.

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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	* 4.923	35.71	PK	34	-34	0	35.71	-	-	74	-38.29	0-360	100	H
3	* 7.386	32.87	PK	35.8	-30.7	0	37.97	-	-	74	-36.03	0-360	200	H
5	9.649	30.54	PK	37.1	-27.4	0	40.24	-	-	74	-33.76	0-360	100	H
2	* 4.917	35.87	PK	34	-34	0	35.87	-	-	74	-38.13	0-360	100	V
4	* 7.388	33.58	PK	35.8	-30.7	0	38.68	-	-	74	-35.32	0-360	100	V
6	9.647	30.41	PK	37.1	-27.4	0	40.11	-	-	74	-33.89	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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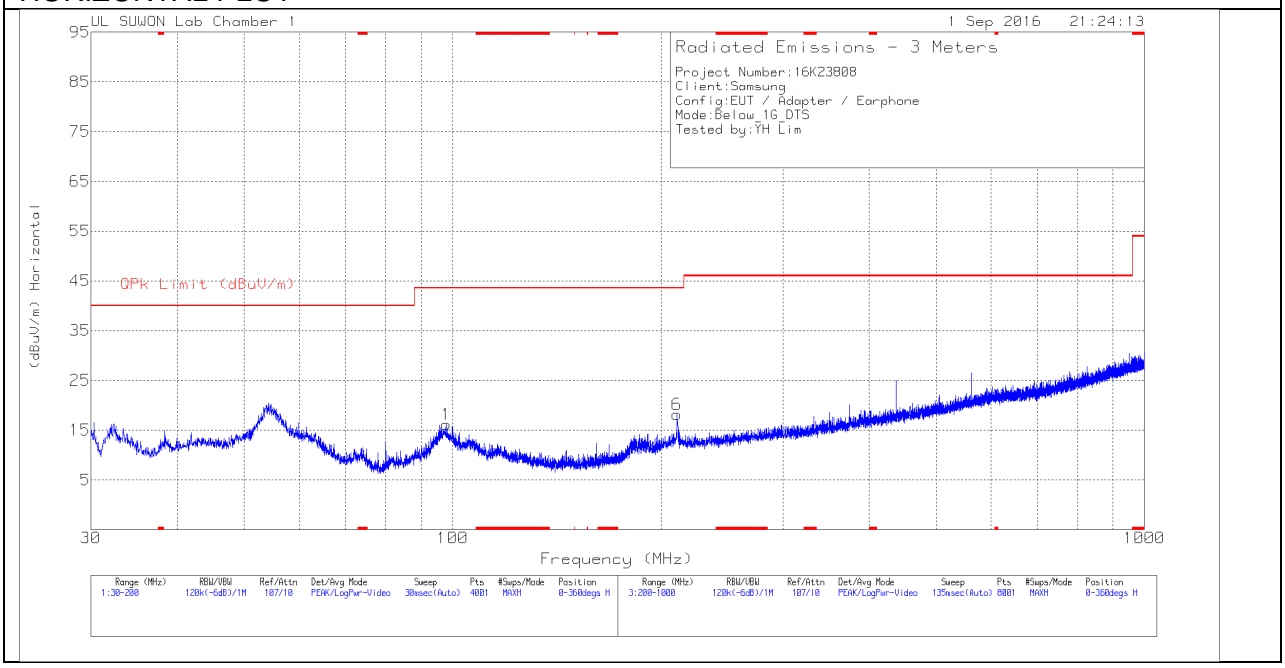
10.3. WORST-CASE BELOW 1 GHz

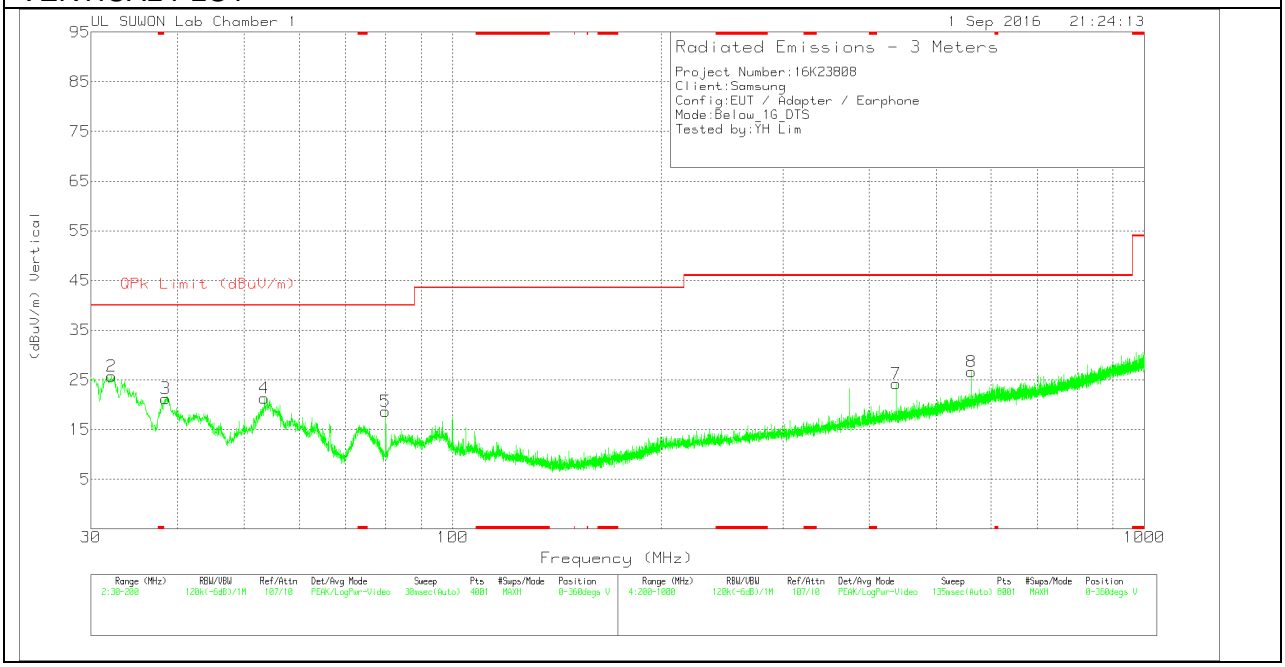
SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)

HORIZONTAL PLOT



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

VERTICAL PLOT



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Below 1G Data

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	97.8725	34.37	Pk	11.1	-29.3	16.17	43.52	-27.35	0-360	300	H
2	32.125	45.9	Pk	10.4	-30.5	25.8	40	-14.2	0-360	100	V
3	38.4575	39.85	Pk	11.8	-30.4	21.25	40	-18.75	0-360	100	V
4	53.46	37.91	Pk	13.4	-30	21.31	40	-18.69	0-360	100	V
5	79.98	41.31	Pk	6.9	-29.6	18.61	40	-21.39	0-360	100	V
6	211	34.63	Pk	11.6	-28.1	18.13	43.52	-25.39	0-360	100	H
7	437.5	34.7	Pk	16.1	-26.6	24.2	46.02	-21.82	0-360	100	V
8	562.6	34.23	Pk	18.4	-26	26.63	46.02	-19.39	0-360	100	V

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

Pk - Peak detector

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