FCC CFR47 PART 15 SUBPART C
INDUSTRY CANADA RSS-247 ISSUE 1

BLUETOOTH LOW ENERGY

CERTIFICATION TEST REPORT

FOR

Bluetooth/BLE, DTS b/g/n WATCH

MODEL NUMBER : SM-R732

FCC ID: A3LSMR732

IC ID: 649E-SMR732

REPORT NUMBER: 15K21505-E2

ISSUE DATE: AUG 26, 2015

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

Prepared by
UL Korea, Ltd. Suwon Laboratory
218 Maeyeong-ro, Yeongtong-gu,
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ACCREDITED
TL-637

Revision History

Rev.	Issue Date	Revisions	Revised By
--	08/26/15	Initial issue	SungGil Park

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: SAMSUNG ELECTRONICS CO., LTD.

EUT DESCRIPTION: Bluetooth/BLE and DTS b/g/n WATCH

MODEL NUMBER: SM-R732

SERIAL NUMBER: 1124D, 11251 (RADIATED); CF50031AE534941 (CONDUCTED)

DATE TESTED: AUG 07, 2015 - AUG 26, 2015

APPLICABLE STANDARDS

STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C	Pass
INDUSTRY CANADA RSS-247 Issue 1	Pass
INDUSTRY CANADA RSS-GEN Issue 4	Pass

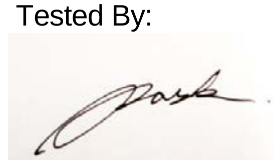
UL Korea, Ltd. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Korea, Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into 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.

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, and KDB 558074 D01 v03r03, ANSI C63.10-2009 for FCC and ANSI C63.10-2013 for IC, RSS-GEN Issue 4, and RSS-247 Issue 1.

ANSI C63.10-2009 Deviation
Radiated spurious emission above 1GHz EUT height is 1.5m not 0.8m.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 443-823, Korea. Line conducted emissions are measured only at the 218 address. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

218 Maeyeong-ro
☒ Chamber 1
☒ Chamber 2

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

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

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

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

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

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

4.3. MEASUREMENT UNCERTAINTY

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

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

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a Bluetooth/BLE and DTS b/g/n WATCH.

This test report addresses the DTS (BLE) operational mode.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum total conducted output power as follows:

Frequency Range [MHz]	Mode	Power Mode	Output Power [dBm]	Output Power [mW]
2402 - 2480	BLE	Peak	1.40	1.38
		Average	0.63	1.16

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an FPCB antenna, with a maximum gain of -6.29 dBi.

5.4. WORST-CASE CONFIGURATION AND MODE

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

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

5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Adapter	SAMSUNG	ETA0U60JBE	DK1G725HS/7-E	N/A
Wireless Charger	SAMSUNG	EP-OR720	N/A	N/A
Data Cable	SAMSUNG	ECB-DU6ABE	N/A	N/A

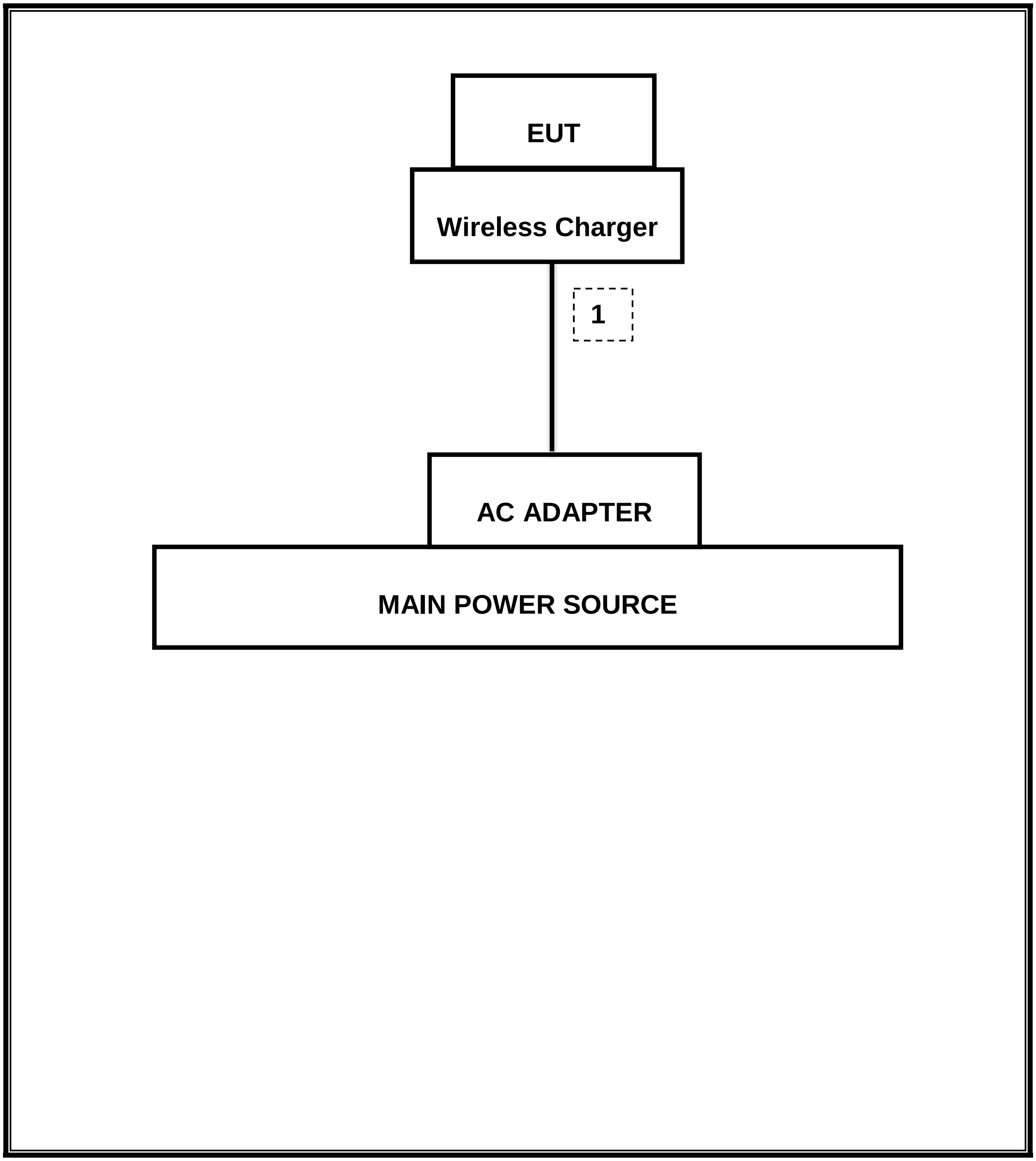
I/O CABLES

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

TEST SETUP

The EUT is a stand-alone unit during the tests. Test software exercised the radio card.

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	11-17-15
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	749	04-25-16
Antenna, Horn, 18 GHz	ETS	3115	00167211	09-20-15
Antenna, Horn, 18 GHz	ETS	3115	00161451	05-17-16
Antenna, Horn, 18 GHz	ETS	3117	00168724	06-17-16
Antenna, Horn, 18 GHz	ETS	3117	00168717	06-17-16
Antenna, Horn, 40 GHz	ETS	3116C	00166255	09-23-15
Antenna, Horn, 40 GHz	ETS	3116C-PA	00168841	09-29-15
Preamplifier, 1000 MHz	Sonoma	310N	341282	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 v03r03: Measurement Procedure §9.1.1 is used for peak power and §10.2 PKPSD 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

Please refer to BLE test report of FCC ID: A3LSMR720, IC ID: 649E-SMR720

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9. SUMMARY TABLE

The FCC ID: A3LSMR732 shares the same enclosure and circuit board as FCC ID: A3LSMR720. All components and PCB outline are same correctly between the two units. The exterior design and mechanic components different between these two units.

Test data for FCC ID: A3LSMR720 is being submitted for this application to cover BLE conducted test features.

FCC Part Section	RSS Section(s)	Test Description	Test Limit	Test Condition	Test Result	Worst Case
15.247 (a)(2)	RSS-247 5.2.1	Occupied Band width (6dB)	>500KHz	Conducted	Pass	714.6 kHz
2.1051, 15.247 (d)	RSS-247 5.5	Band Edge / Conducted Spurious Emission	-20dBc		Pass	-51.318 dBm
15.247	RSS-247 5.4.4	TX conducted output power	<30dBm		Pass	1.395 dBm (Peak)
15.247	RSS-247 5.2.2	PSD	<8dBm		Pass	-12.5 dBm (Peak)
15.207 (a)	RSS-GEN 8.8	AC Power Line conducted emissions	Section 10	Power Line conducted	Pass	39.07 dBuV (QP)
15.205, 15.209	RSS-GEN 8.9/7	Radiated Spurious Emission	< 40dBuV/m	Radiated	Pass	39.16 dBuV/m (AV)

10. ANTENNA PORT TEST RESULTS

10.1. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)
IC RSS-247 5.2.1

The minimum 6 dB bandwidth shall be at least 500 kHz.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

RESULTS

Please refer to BLE test report of FCC ID: A3LSMR720, IC ID: 649E-SMR720

10.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

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

RESULTS

Please refer to BLE test report of FCC ID: A3LSMR720, IC ID: 649E-SMR720

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10.3. OUTPUT POWER

LIMITS

FCC §15.247 (b)
IC RSS-247 5.4.4

The maximum antenna gain is less than or equal to 6 dBi, therefore the limit is 30 dBm.

TEST PROCEDURE

Peak power is measured using KDB558074 D01 DTS Meas Guidance v03r03 under section 9.1.1 utilizing spectrum analyze.

RESULTS

Please refer to BLE test report of FCC ID: A3LSMR720, IC ID: 649E-SMR720

10.4. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

Please refer to BLE test report of FCC ID: A3LSMR720, IC ID: 649E-SMR720

10.5. PSD

LIMITS

FCC §15.247
IC RSS-247 5.2.2

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 PKPSD (Peak PSD)” under KDB558074 D01 DTS Meas Guidance v03r03

RESULTS

Please refer to BLE test report of FCC ID: A3LSMR720, IC ID: 649E-SMR720

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10.6. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)
IC RSS-247 5.5

Output power was measured based on the use of a peak measurement, therefore the required attenuation is 20 dB.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

RESULTS

Please refer to DTS test report of FCC ID: A3LSMR720, IC ID: 649E-SMR720

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11. RADIATED TEST RESULTS

11.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209
IC RSS-GEN Clause 8.9 (Transmitter)
IC RSS-GEN Clause 7 (Receiver)

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. The EUT is configured in accordance with ANSI C63.4 - 2009. 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, then the video bandwidth is set to 1 MHz for peak measurements and add duty cycle factor for average measurements. Duty cycle factor = 10 log (1/x). For this sample: DCF = 10log(1/0.624)=2.05dB (Spectrum Analyzer round it up to 2.05dB)

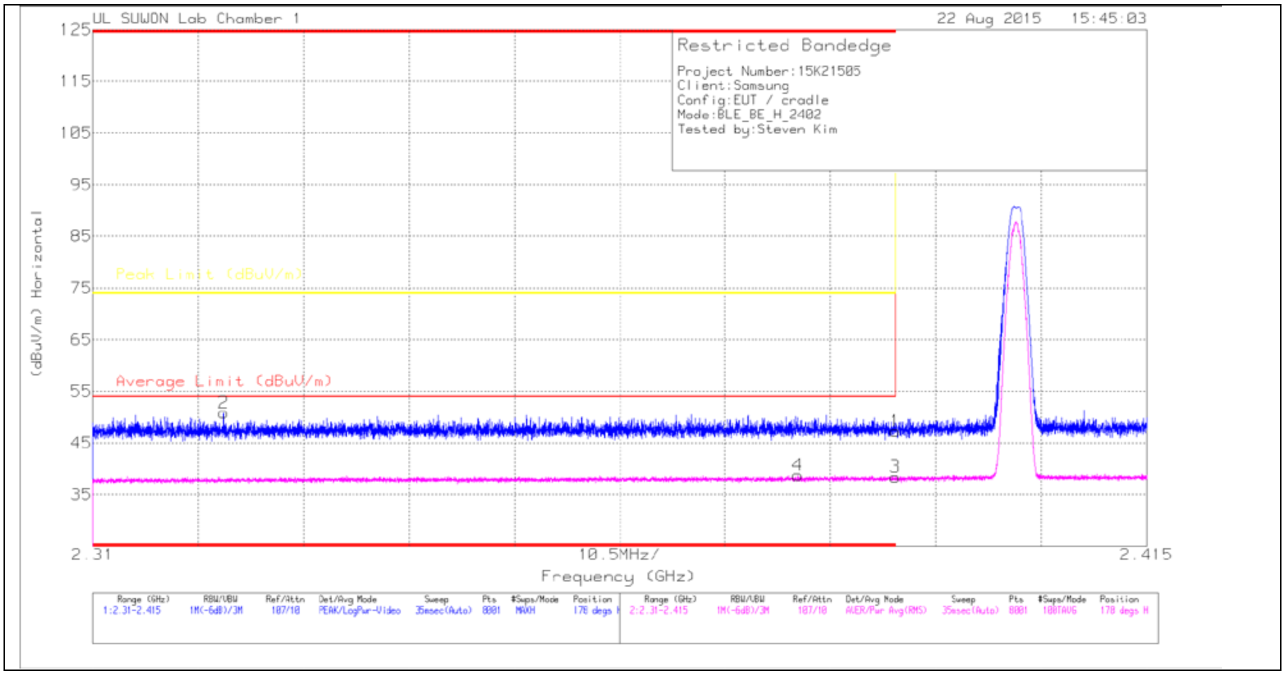
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

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

RESTRICTED BANDEDGE (LOW CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

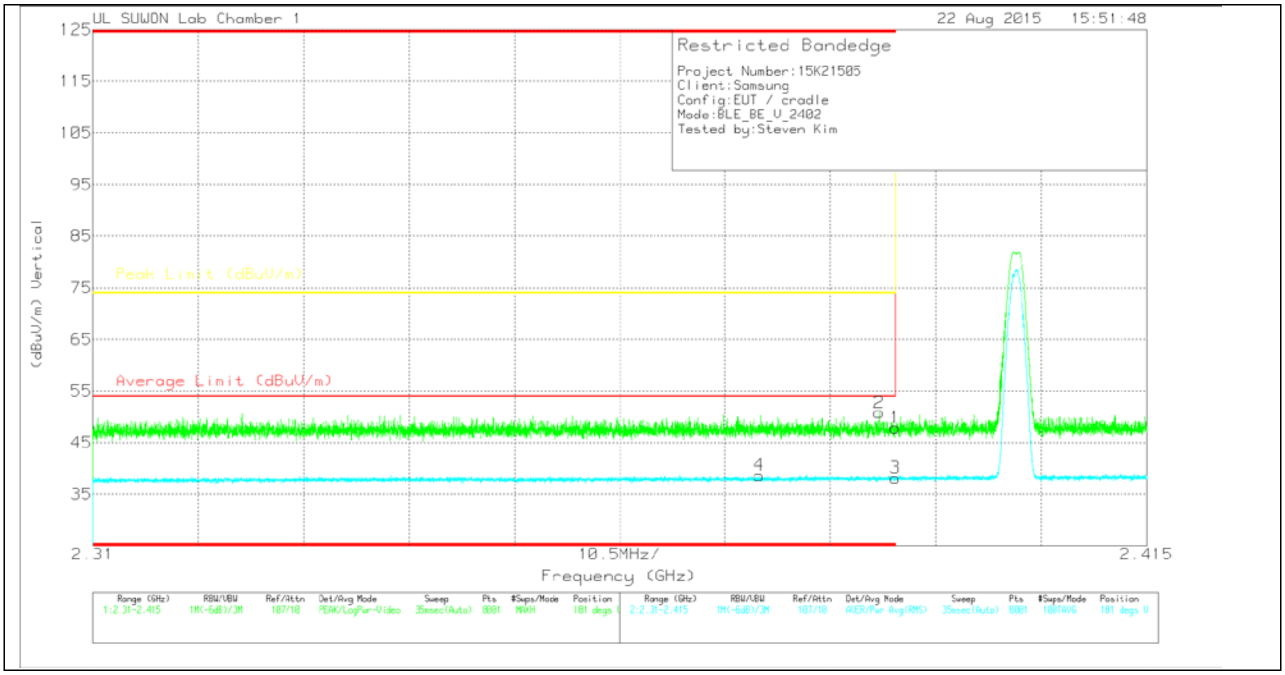
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_2_10 dB	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity	Marker
1	* 2.39	38.31	Pk	31.8	-22.8	47.31	-	-	74	-26.69	178	100	H	1
2	* 2.323	42.07	Pk	31.7	-22.9	50.87	-	-	74	-23.13	178	100	H	2
3	* 2.39	29.48	RMS	31.8	-22.8	38.48	54	-15.52	-	-	178	100	H	3
4	* 2.38	29.8	RMS	31.8	-22.8	38.8	54	-15.2	-	-	178	100	H	4

* - 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_10 dB	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity	Marker
1	* 2.39	38.89	Pk	31.8	-22.8	47.89	-	-	74	-26.11	181	191	V	1
2	* 2.388	41.83	Pk	31.8	-22.8	50.83	-	-	74	-23.17	181	191	V	2
3	* 2.39	29.23	RMS	31.8	-22.8	38.23	54	-15.77	-	-	181	191	V	3
4	* 2.376	29.72	RMS	31.8	-22.8	38.72	54	-15.28	-	-	181	191	V	4

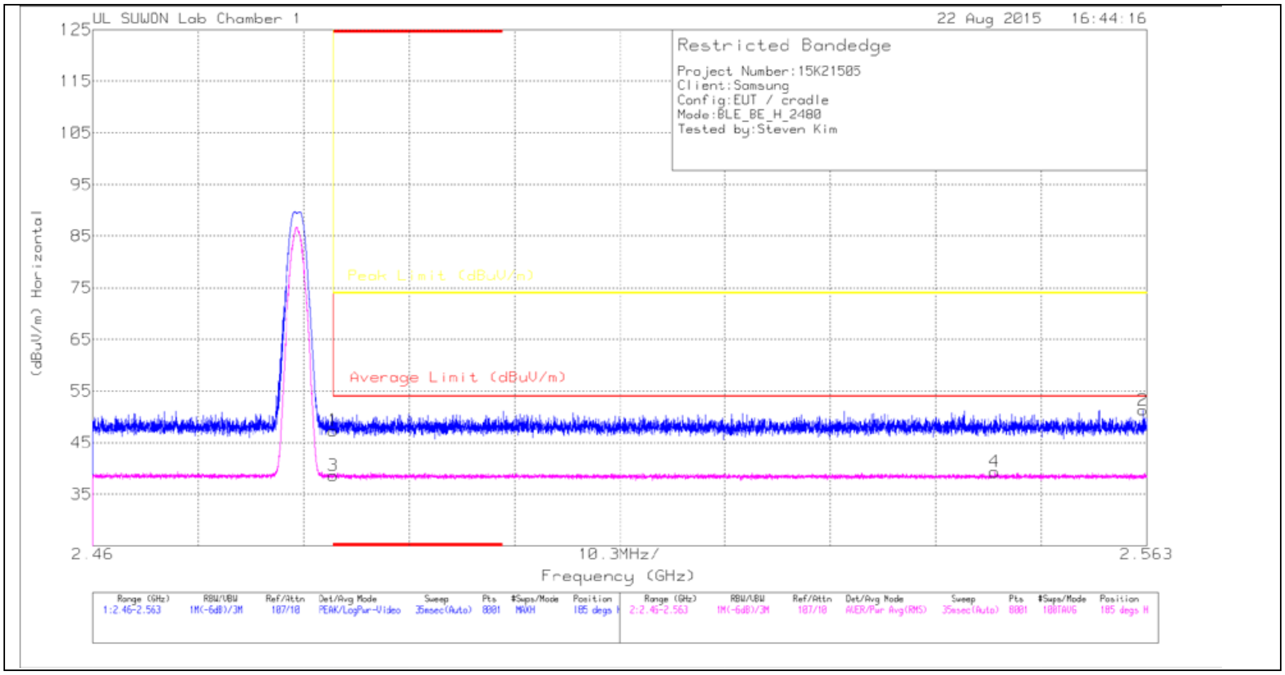
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

RMS - RMS detection

AUTHORIZED BANDEDGE (HIGH CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Trace Markers

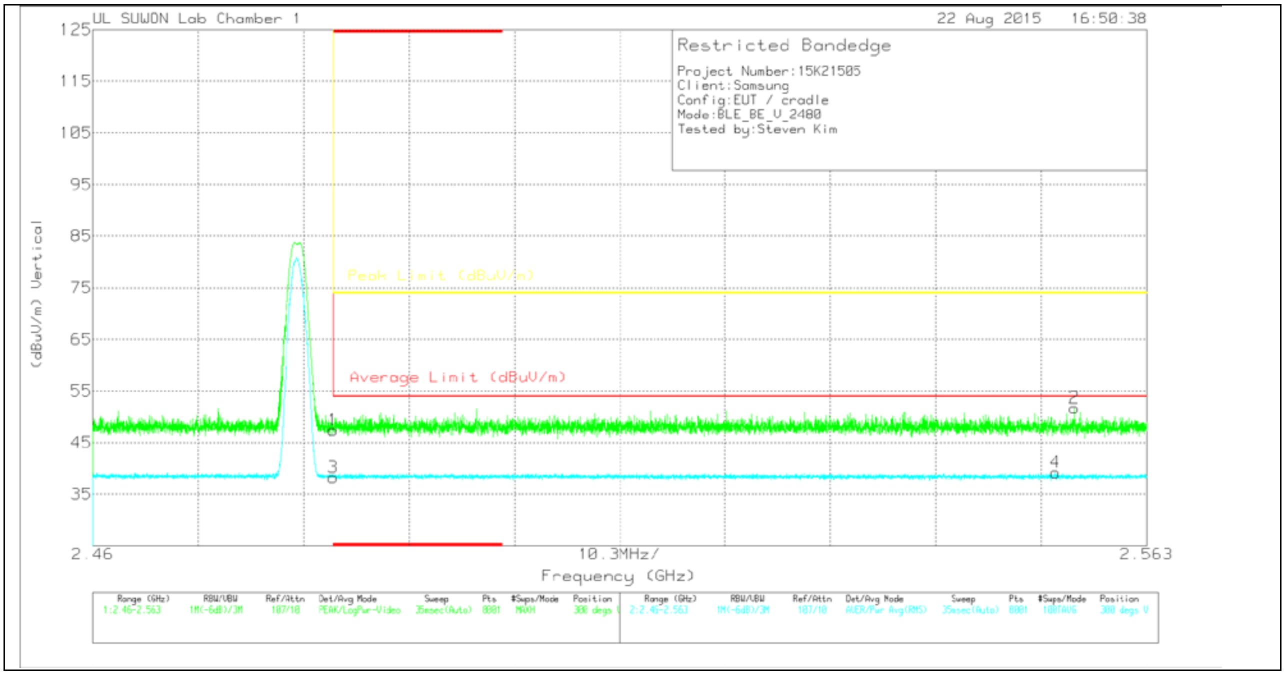
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_2_10 dB	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity	Marker
1	* 2.484	37.97	Pk	32	-22.6	47.37	-	-	74	-26.63	185	100	H	1
2	2.563	41.81	Pk	32	-22.5	51.31	-	-	74	-22.69	185	100	H	2
3	* 2.484	29.25	RMS	32	-22.6	38.65	54	-15.35	-	-	185	100	H	3
4	2.548	29.96	RMS	32	-22.6	39.36	54	-14.64	-	-	185	100	H	4

* - 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_10 dB	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity	Marker
1	* 2.484	38.01	Pk	32	-22.6	47.41	-	-	74	-26.59	300	278	V	1
2	2.556	42.35	Pk	32	-22.6	51.75	-	-	74	-22.25	300	278	V	2
3	* 2.484	28.92	RMS	32	-22.6	38.32	54	-15.68	-	-	300	278	V	3
4	2.554	29.84	RMS	32	-22.6	39.24	54	-14.76	-	-	300	278	V	4

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

Pk - Peak detector

RMS - RMS detection

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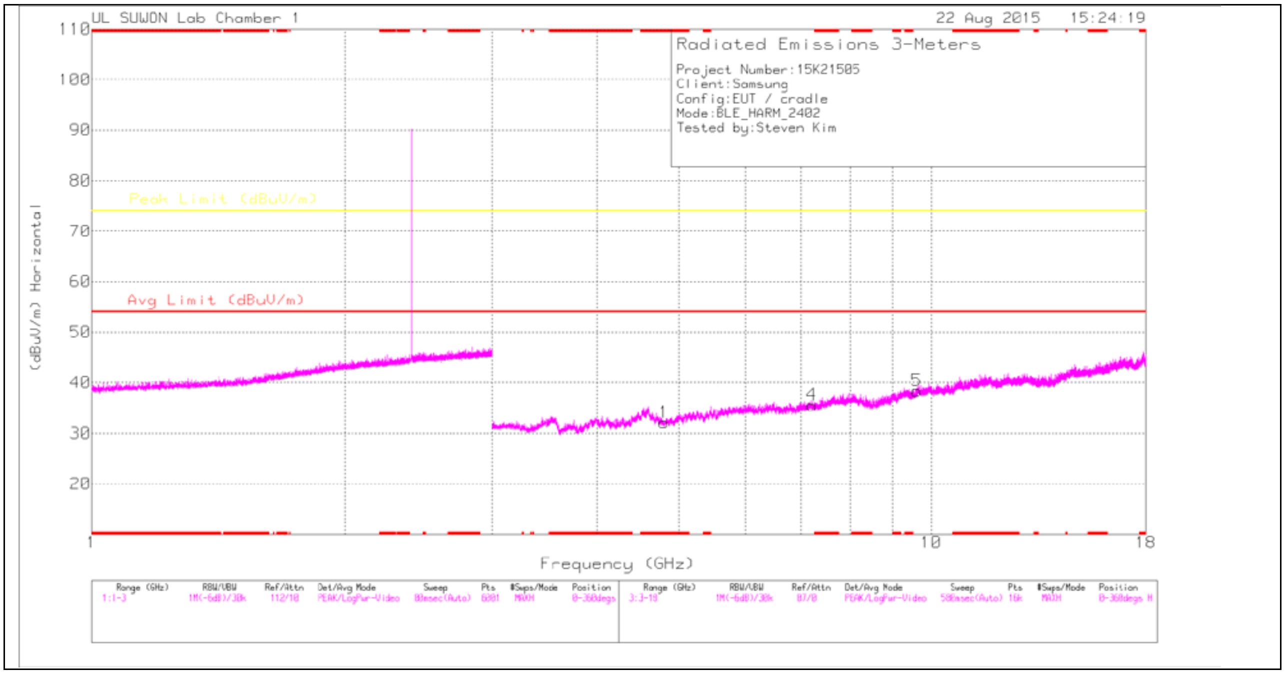
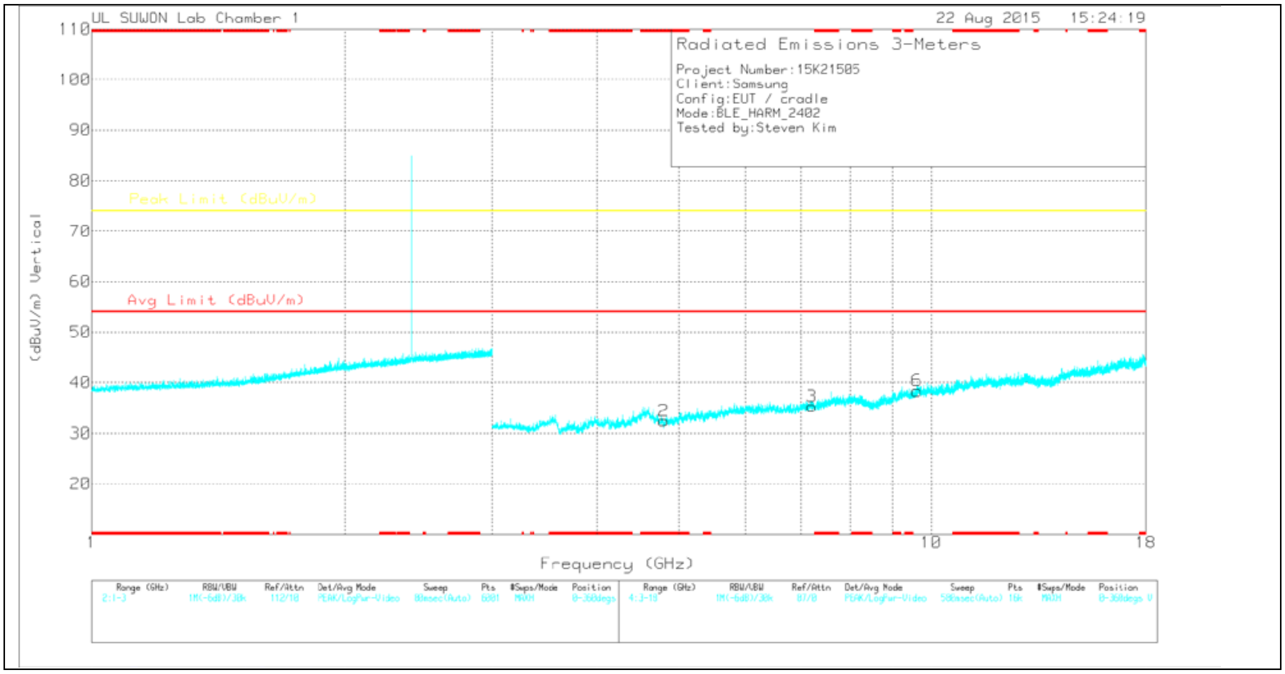
HARMONICS AND SPURIOUS EMISSIONS

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

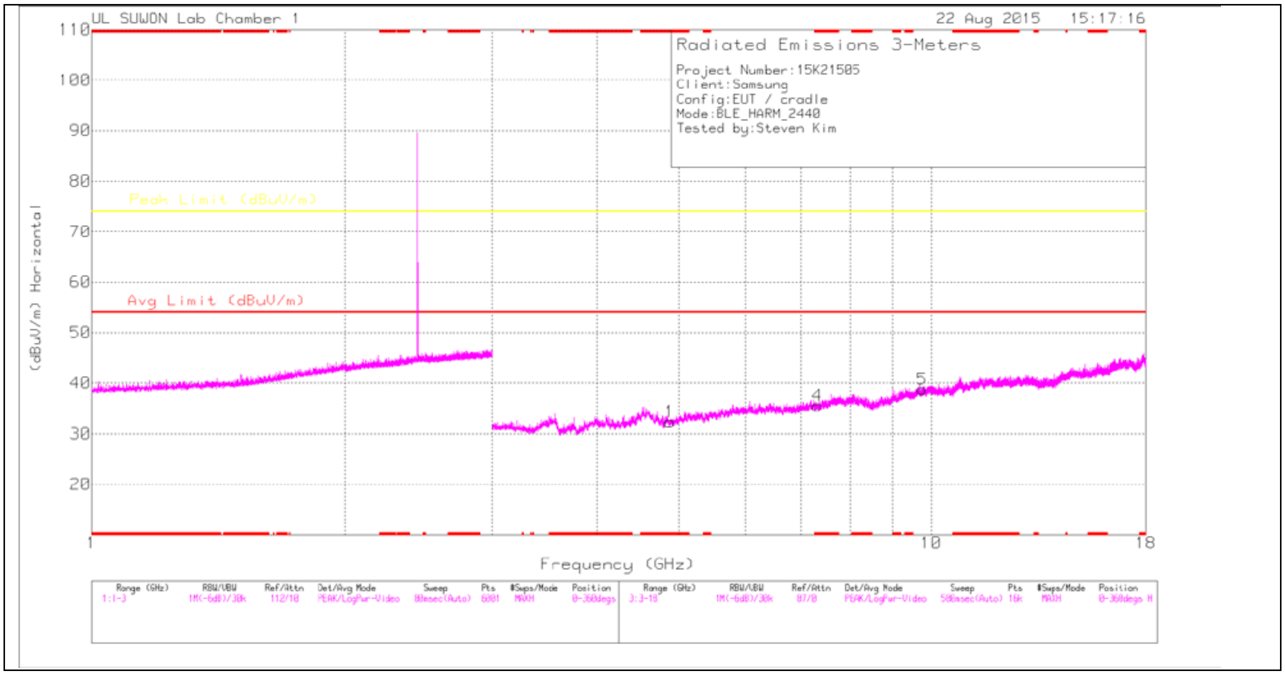
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168717)_150619	Path_3_3GHP	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity	Marker
1	* 4.806	27.92	PK	34	-29.8	32.12	-	-	74	-41.88	0-360	200	H	1
4	7.207	25.31	PK	35.7	-25.4	35.61	-	-	74	-38.39	0-360	200	H	4
5	9.607	22.38	PK	37	-21	38.38	-	-	74	-35.62	0-360	200	H	5
2	* 4.802	28.24	PK	34	-29.8	32.44	-	-	74	-41.56	0-360	100	V	2
3	7.205	25.01	PK	35.7	-25.4	35.31	-	-	74	-38.69	0-360	100	V	3
6	9.611	22.37	PK	37	-21	38.37	-	-	74	-35.63	0-360	200	V	6

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

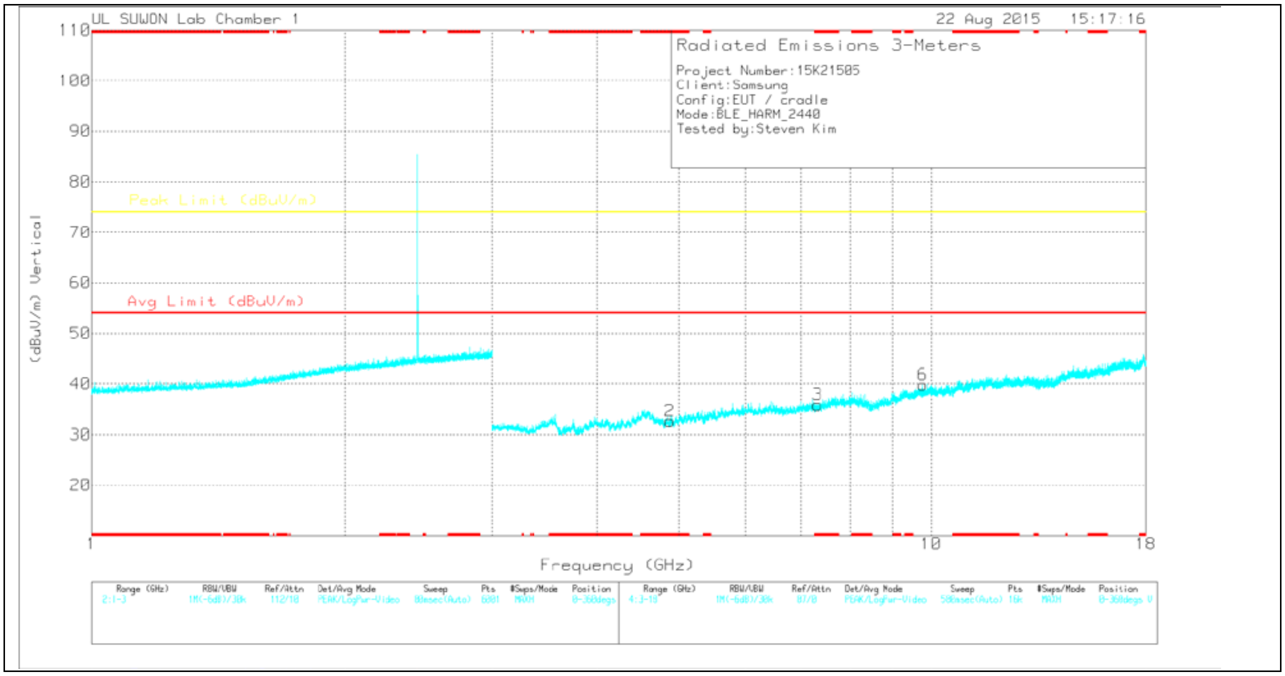
PK – Peak detector

Note: Only peak measurement was performed. Because peak measurement result of unwanted emission is less than average limt (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.

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MID CHANNEL DATA

Trace Markers

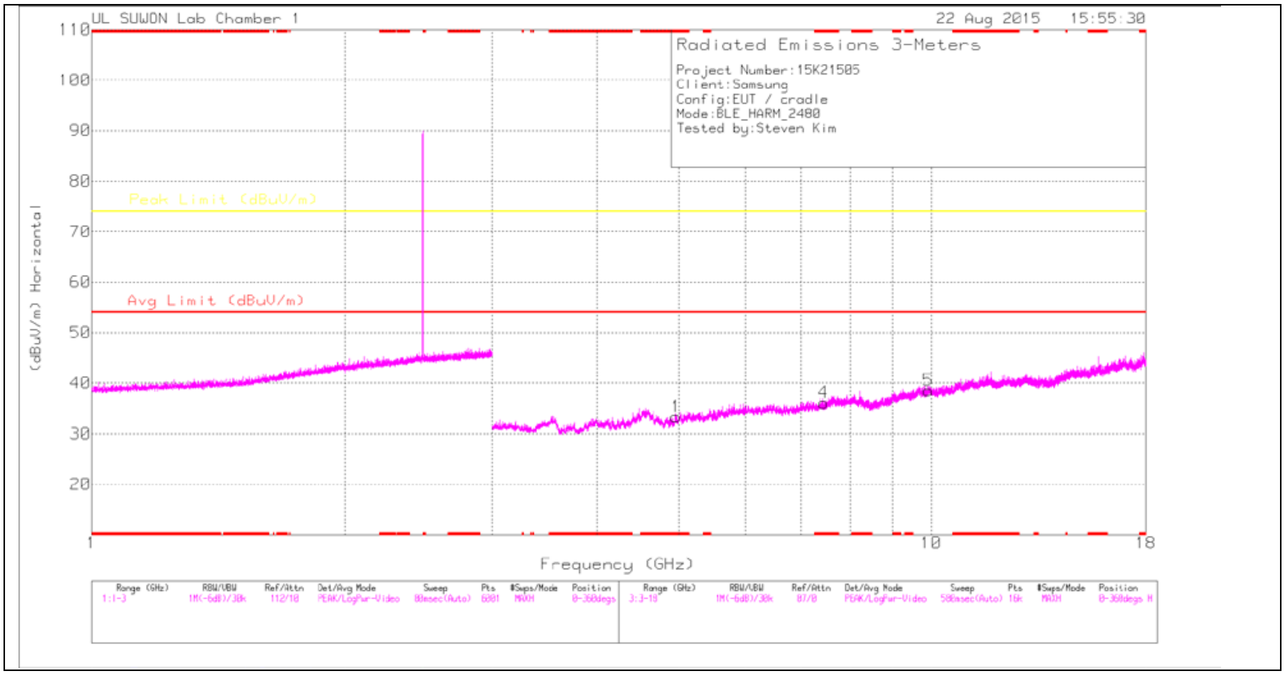
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117(00168724)_150619	Path_3	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.88	27.45	PK	34	-29.1	32.35	-	-	74	-41.65	0-360	100	H	1
4	* 7.318	25.35	PK	35.8	-25.6	35.55	-	-	74	-38.45	0-360	200	H	4
5	9.757	23.59	PK	37.2	-22	38.79	-	-	74	-35.21	0-360	100	H	5
2	* 4.882	27.76	PK	34	-29.1	32.66	-	-	74	-41.34	0-360	200	V	2
3	* 7.32	25.7	PK	35.8	-25.6	35.9	-	-	74	-38.1	0-360	200	V	3
6	9.766	24.74	PK	37.2	-22.1	39.84	-	-	74	-34.16	0-360	200	V	6

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

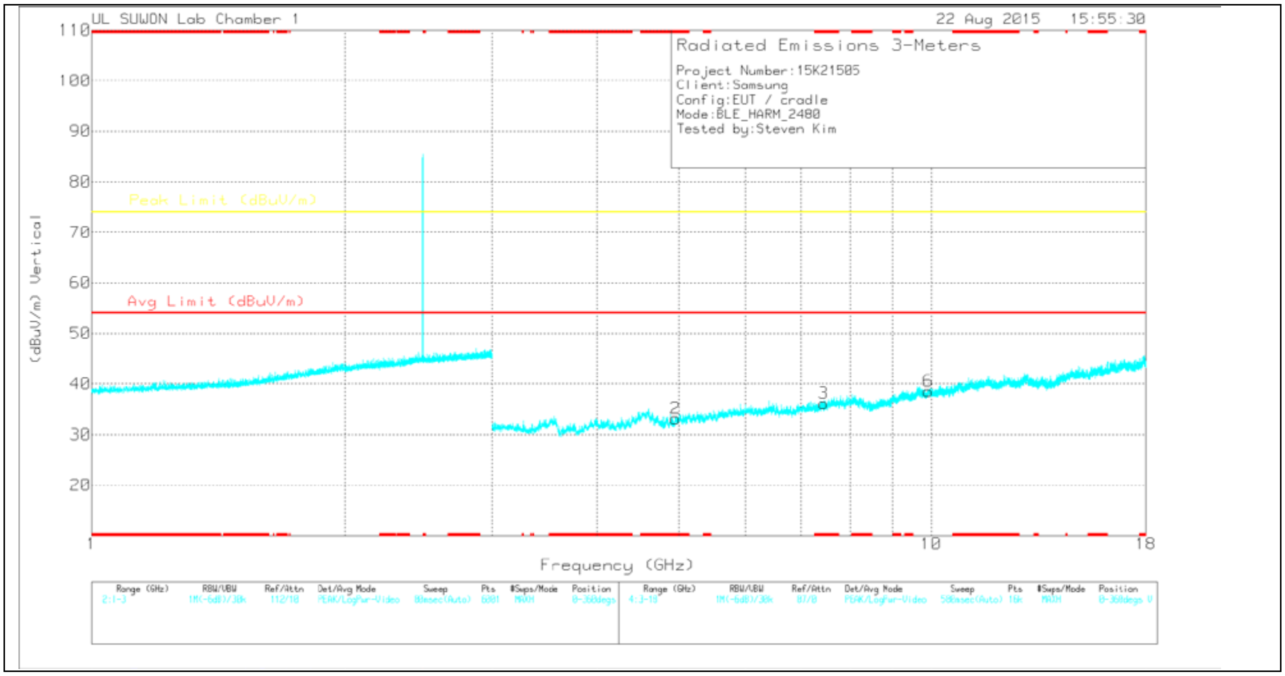
PK – Peak detector

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

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(00168724)_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	* 4.963	28.24	PK	34	-28.9	33.34	-	-	74	-40.66	0-360	200	H	1
4	* 7.438	25.14	PK	35.8	-24.8	36.14	-	-	74	-37.86	0-360	200	H	4
5	9.921	21.57	PK	37.4	-20.4	38.57	-	-	74	-35.43	0-360	200	H	5
2	* 4.958	28.05	PK	34	-28.9	33.15	-	-	74	-40.85	0-360	100	V	2
3	* 7.439	25.19	PK	35.8	-24.8	36.19	-	-	74	-37.81	0-360	200	V	3
6	9.919	21.55	PK	37.4	-20.4	38.55	-	-	74	-35.45	0-360	200	V	6

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

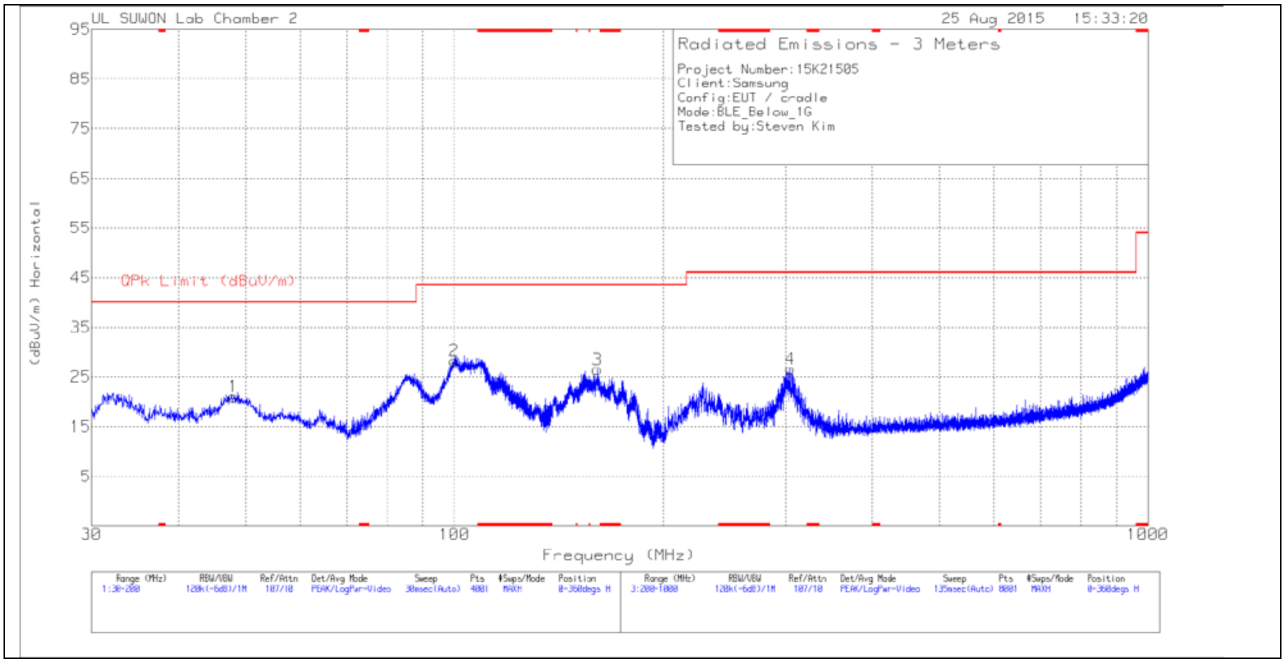
PK – Peak detector

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

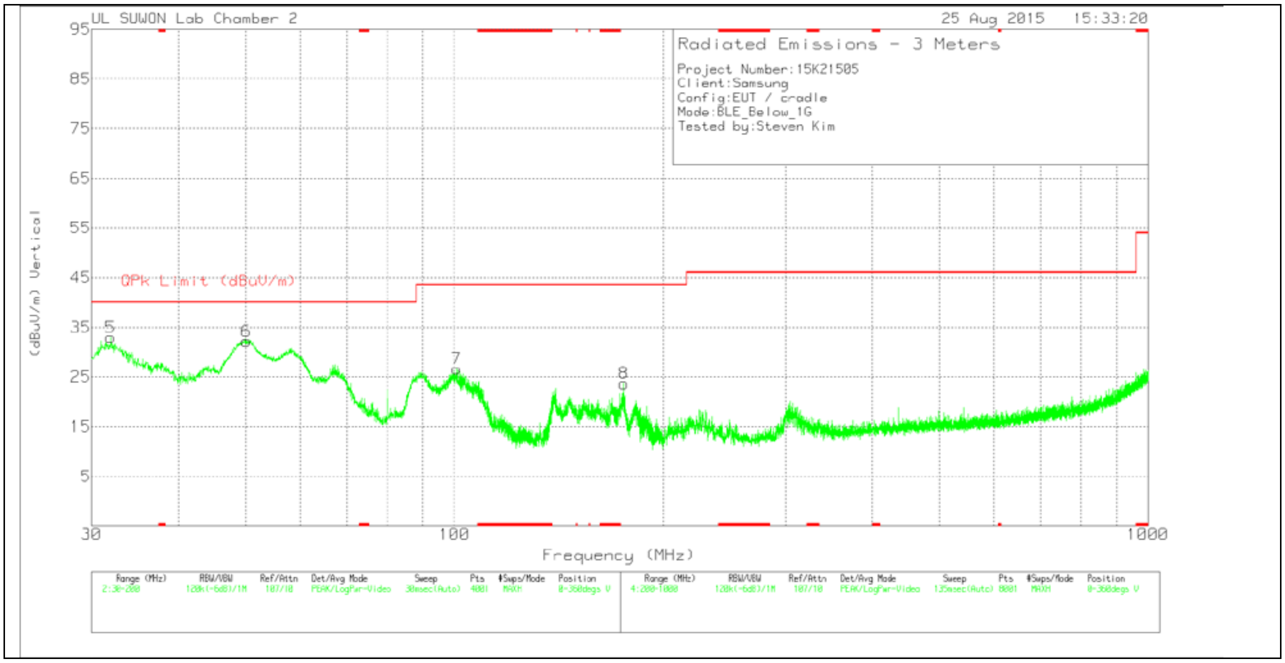
11.3. WORST-CASE BELOW 1 GHz

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

HORIZONTAL PLOT



VERTICAL PLOT



BELOW 1 GHz TABLE

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	VULB9163-749	Below_1G	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	48.0625	37.91	Pk	14	-30.8	21.11	40	-18.89	0-360	300	H
2	99.87	47.19	Pk	11.6	-30.5	28.29	43.52	-15.23	0-360	300	H
3	160.8575	48.33	Pk	8.6	-30.4	26.53	43.52	-16.99	0-360	200	H
5	31.955	53.33	Pk	10.4	-30.8	32.93	40	-7.07	0-360	100	V
6	50.145	48.76	Pk	14.1	-30.7	32.16	40	-7.84	0-360	100	V
7	100.8475	45.6	Pk	11.5	-30.5	26.6	43.52	-16.92	0-360	100	V
8	175.5625	44.76	Pk	9.3	-30.4	23.66	43.52	-19.86	0-360	200	V
4	305.1	43.18	Pk	13.5	-30	26.68	46.02	-19.34	0-360	100	H

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

Pk - Peak detector

12. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)
RSS-Gen 8.8

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

TEST PROCEDURE

ANSI C63.10 - 2009

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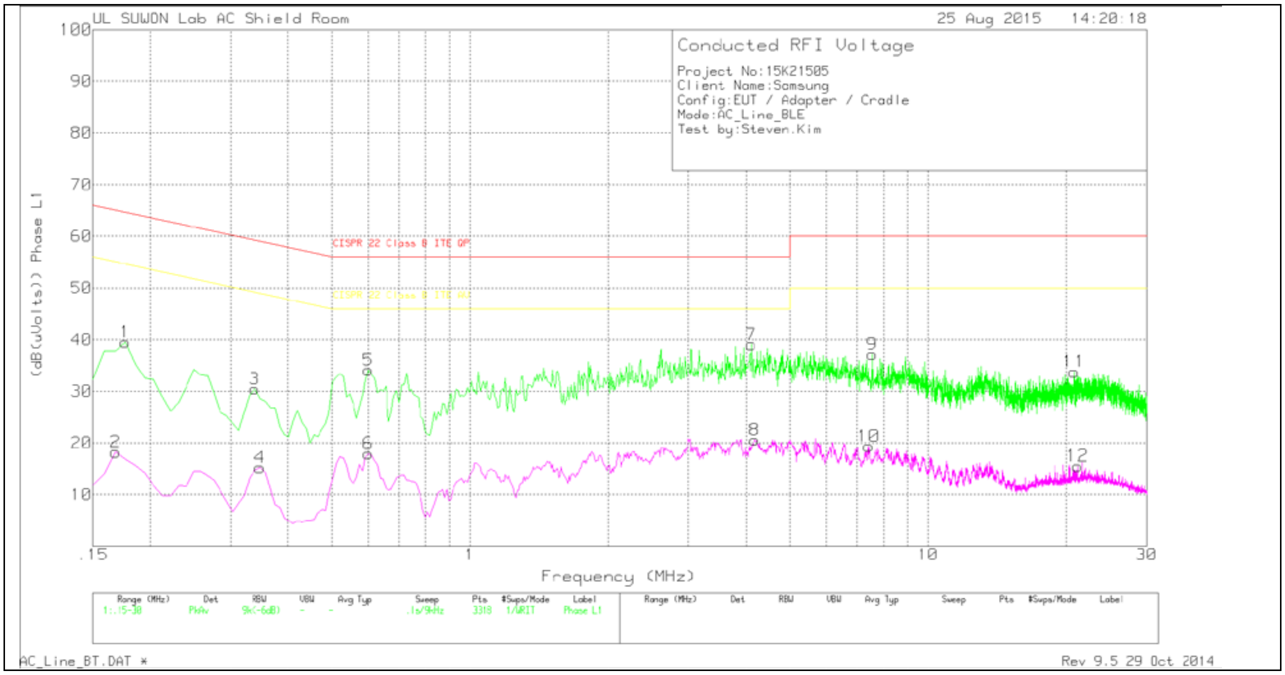
RESULTS

WORST EMISSIONS

LINE 1 PLOT



LINE 1 RESULTS

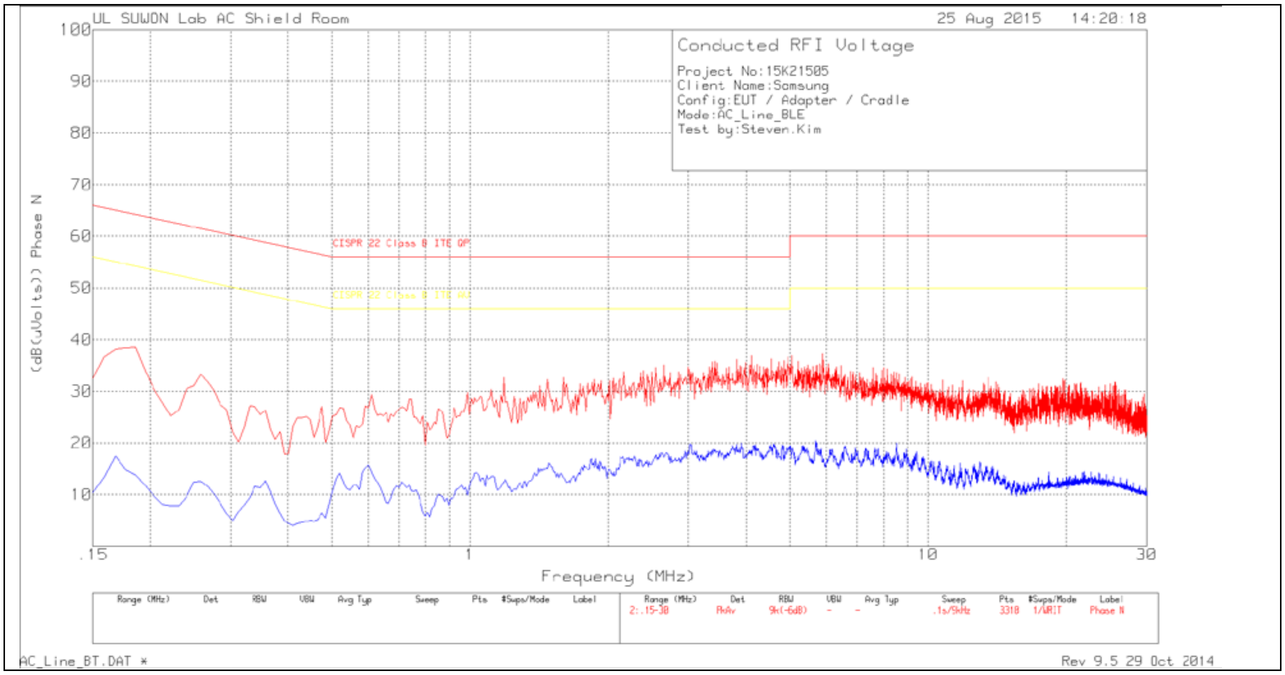
Phase L1 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	101837_with ex-cord_L1	CE Shield Room	Corrected Reading (dBuV)	CISPR 22 Class B ITE QP	Margin (dB)	CISPR 22 Class B ITE AV	Margin (dB)
1	.177	29.32	Pk	10.2	0	39.52	64.63	-25.11	-	-
2	.168	8.05	Av	10.2	0	18.25	-	-	55.06	-36.81
3	.339	20.46	Pk	10	0	30.46	59.23	-28.77	-	-
4	.348	5.24	Av	10	0	15.24	-	-	49.01	-33.77
5	.6	24	Pk	10.1	0	34.1	56	-21.9	-	-
6	.6	7.86	Av	10.1	0	17.96	-	-	46	-28.04
7	4.11	29.17	Pk	9.8	.1	39.07	56	-16.93	-	-
8	4.182	10.72	Av	9.8	.1	20.62	-	-	46	-25.38
9	7.557	27.15	Pk	9.9	.1	37.15	60	-22.85	-	-
10	7.422	9.4	Av	9.9	.1	19.4	-	-	50	-30.6
11	20.832	23.22	Pk	10.4	.2	33.82	60	-26.18	-	-
12	21.174	4.95	Av	10.4	.2	15.55	-	-	50	-34.45

Pk - Peak detector

Av - Average detection

LINE 2 PLOT



LINE 2 RESULTS

Phase N .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	101837_with ex-cord_N	CE Shield Room	Corrected Reading (dBuV)	CISPR 22 Class B ITE QP	Margin (dB)	CISPR 22 Class B ITE AV	Margin (dB)
1	.177	29.32	Pk	10.2	0	39.52	64.63	-25.11	-	-
2	.168	8.05	Av	10.2	0	18.25	-	-	55.06	-36.81
3	.339	20.46	Pk	10	0	30.46	59.23	-28.77	-	-
4	.348	5.24	Av	10	0	15.24	-	-	49.01	-33.77
5	.6	24	Pk	10.1	0	34.1	56	-21.9	-	-
6	.6	7.86	Av	10.1	0	17.96	-	-	46	-28.04
7	4.11	29.17	Pk	9.8	.1	39.07	56	-16.93	-	-
8	4.182	10.72	Av	9.8	.1	20.62	-	-	46	-25.38
9	7.557	27.15	Pk	9.9	.1	37.15	60	-22.85	-	-
10	7.422	9.4	Av	9.9	.1	19.4	-	-	50	-30.6
11	20.832	23.22	Pk	10.4	.2	33.82	60	-26.18	-	-
12	21.174	4.95	Av	10.4	.2	15.55	-	-	50	-34.45

Pk - Peak detector

Av - Average detection