



CERTIFICATION TEST REPORT

Report Number. : 4790136529-E2V2

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

Model : SM-N985F1/DS, SM-N985F1

FCC ID : A3LSMN985F1

EUT Description : GSM/WCDMA/LTE Phone + BT/BLE, DTS/UNII a/b/g/n/ac/ax, NFC,
WPT and UWB

Test Standard(s) : FCC 47 CFR PART 15 SUBPART B

Date Of Issue:

2021-11-19

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ACCREDITED

Testing Laboratory

TL-637

Revision History

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
V1	2021-11-12	Initial issue	Hyunsik Yun
V2	2021-11-19	Updated to address TCB's question	Hyunsik Yun

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: SAMSUNG ELECTRONICS CO., LTD.
EUT DESCRIPTION: GSM/WCDMA/LTE Phone + BT/BLE, DTS/UNII a/b/g/n/ac/ax, NFC, WPT and UWB
MODEL NUMBER: SM-N985F1/DS, SM-N985F1
SERIAL NUMBER: R38R900W1EB, R38R900W1GJ (RADIATED)
DATE TESTED: 2021-11-02 ~ 2021-11-12;

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 15B	Complies

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:



Seokhwan Hong
Suwon Lab Engineer
UL Korea, Ltd.

Tested By:



Hyunsik Yun
Suwon Lab Engineer
UL Korea, Ltd.

2. TEST METHODOLOGY

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

1. FCC CFR 47 Part 2.
2. FCC CFR 47 Part 15.
3. ANSI C63.4-2014

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea. Line conducted emissions are measured only at the 218 address. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

218 Maeyeong-ro	
<input checked="" type="checkbox"/>	Chamber 1
<input checked="" type="checkbox"/>	Chamber 2
<input type="checkbox"/>	Chamber 3

UL Korea, Ltd. is accredited by IAS, Laboratory Code TL-637. The full scope of accreditation can be viewed at <https://www.iasonline.org/wp-content/uploads/2017/05/TL-637-cert-New.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:

$EIRP = \text{PSA reading with EUT worst orientation (dBm)} + \text{Path loss (dB)} - \text{cable loss (between the SG and substitution antenna)} + \text{Substitution Antenna Factor (dBi)}$

$ERP = \text{PSA reading with EUT worst orientation (dBm)} + \text{Path loss (dB)} - \text{cable loss (between the SG and substitution antenna)}$

(Path loss = Signal generator output – PSA reading with substitution antenna)

4.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Radiated Disturbance, 30 MHz to 1 GHz	4.05 dB
Radiated Disturbance, 1 GHz to 18 GHz	5.78 dB

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

4.4. DECISION RULE

Decision rule for statement(s) of conformity is based on Procedure 2, Clause 4.4.3 in IEC Guide 115:2007.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a GSM/WCDMA/LTE Phone + BT/BLE, DTS/UNII a/b/g/n/ac/ax, NFC, WPT and UWB. This test report addresses the WWAN receiver mode.

This report covers the Samsung models SM-N985F1/DS, SM-N985F1.

These models are identical in hardware except SM-N985F1/DS is supported dual SIM tray and SM-N985F1 has single SIM tray.

All series model was same hardware thus, SM-N985F1/DS(Dual SIM tray) was set for final test.

5.2. TEST MODE

Mode	Description
GSM850	Communicating with Call simulator(CMW500)
	Communicating with Call simulator(CMW500) + Camera(Rear)
WCDMA BAND 5	Communicating with Call simulator(CMW500)
LTE BAND 12	Communicating with Call simulator(CMW500)
LTE BAND 13	Communicating with Call simulator(CMW500)
LTE BAND 26	Communicating with Call simulator(CMW500)

5.3. WORST-CASE ORIENTATION AND MODE

The fundamental and radiated spurious emission were investigated in three orthogonal orientations X and Y, it was determined that below orientation was worst-case orientation for each band.

Band	Worst Case		
	X	Y	Z
GSM 850	O	-	-
WCDMA B5	-	-	O
LTE B12	-	-	O
LTE B13	O	-	-
LTE B26	O	-	-

WCDMA Band5

WCDMA Band 5(Rx Frequency range: 871.4-891.6 MHz) is covered by GSM 850(Rx Frequency range: 869-894 MHz) due to same frequency range is higher than WCDMA Band5. Therefore, only Mid channel was checked.

LTE Band 5

LTE Band 5(Rx Frequency range: 869-894 MHz) is covered by LTE Band 26(Rx Frequency range: 859-894 MHz) due to overlapping frequency range, same limit and same channel bandwidth.

Note : The EUT is continuously communicated with the call box during the tests. Also attached with travel adapter for the worst case condition.

5.4. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Charger	SAMSUNG	EP-TA800	R37R38J4A28SE3	N/A
Data Cable	SAMSUNG	EP-DG980	N/A	N/A

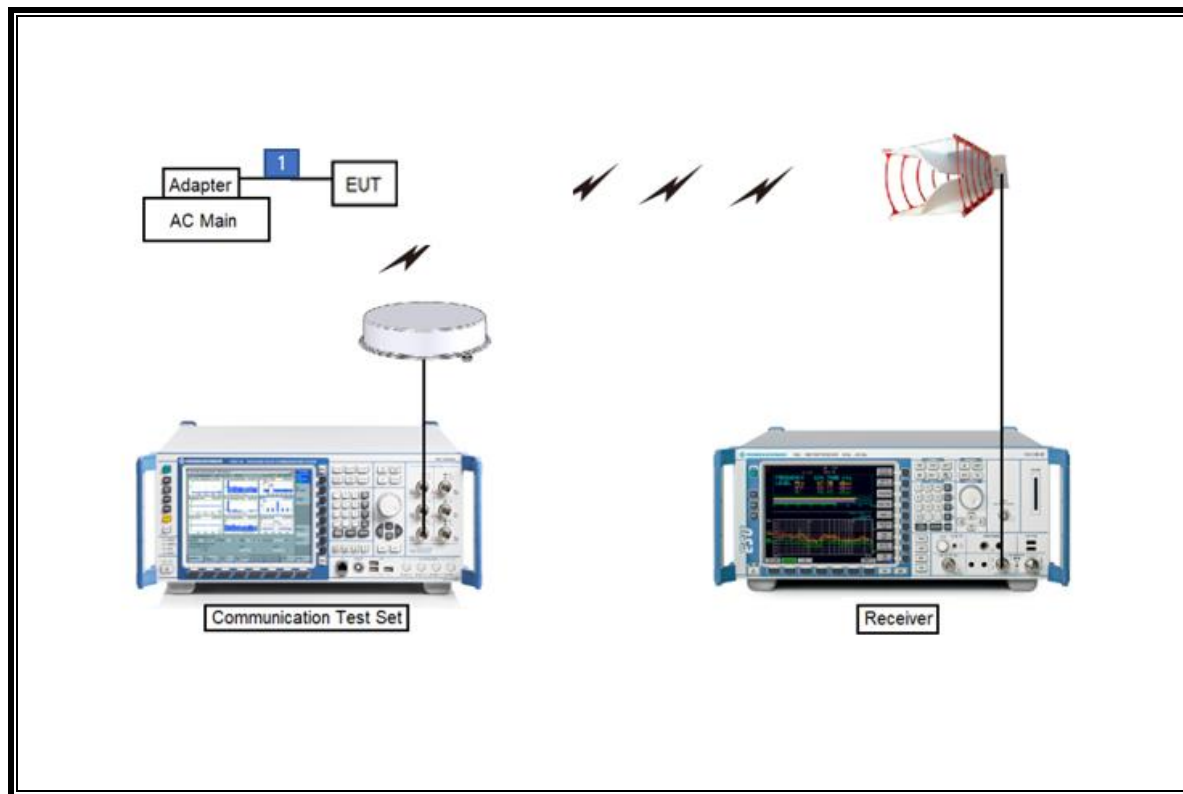
I/O CABLE

I/O Cable List						
Cable No.	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	DC Power	1	C Type	Shielded	1.0 m	N/A

TEST SETUP

The EUT is continuously communicated with the call box during the tests.

SETUP DIAGRAM FOR TESTS (RADIATED TEST SETUP)



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, Tuned Dipole 400~1000 MHz	ETS	3121D DB4	00164753	2023-02-08
Antenna, Horn, 40 GHz	ETS	3116C	00166155	2022-08-04
Antenna, Horn, 40 GHz	ETS	3116C	00168645	2023-10-13
Preamplifier	ETS	3116C-PA	00168841	2022-08-04
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	750	2022-08-19
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	845	2022-08-13
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	749	2022-08-13
Antenna, Horn, 18 GHz	ETS	3115	00167211	2022-07-27
Antenna, Horn, 18 GHz	ETS	3115	00161451	2022-08-15
Antenna, Horn, 18 GHz	ETS	3117	00168724	2022-07-27
Antenna, Horn, 18 GHz	ETS	3117	00168717	2022-08-15
Communications Test Set	R&S	CMW500	169796	2022-01-27
Preamplifier, 1000 MHz	Sonoma	310N	341282	2022-08-02
Preamplifier, 1000 MHz	Sonoma	310N	370599	2022-08-02
Preamplifier, 1000 MHz	Sonoma	310N	351741	2022-08-02
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1876511	2022-08-02
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	2029168	2022-08-02
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1896138	2022-08-02
EMI Test Receive, 40 GHz	R&S	ESU40	100439	2022-08-02
EMI Test Receive, 40 GHz	R&S	ESU40	100457	2022-08-02
Directional Antenna	Cobham	FPA3-0.8-6.0R/1329	80108-0004	N/A
Directional Antenna	Cobham	FPA3-0.8-6.0R/1329	110367-0003	N/A
High Pass Filter 1.2GHz	Micro-Tronics	HPM50108-02	G005	2022-08-03
High Pass Filter 1.2GHz	Micro-Tronics	HPM50108-02	G006	2022-08-02
High Pass Filter 2.8GHz	Micro-Tronics	HPM50111-02	010	2022-08-03
High Pass Filter 2.8GHz	Micro-Tronics	HPM50111-02	011	2022-08-02
High Pass Filter 4GHz	Micro-Tronics	HPM50118-02	G001	2022-08-03
High Pass Filter 4GHz	Micro-Tronics	HPM50118-02	G002	2022-08-02
Attenuator	PASTERNAK	PE7087-10	A009	2022-08-03
Attenuator	PASTERNAK	PE7087-10	A001	2022-08-03
Attenuator	PASTERNAK	PE7087-10	A008	2022-08-03
Attenuator	PASTERNAK	PE7004-10	2	2022-08-02
Attenuator	PASTERNAK	PE7395-10	A011	2022-08-03
EMI Test Receive, 3 GHz	R&S	ESR3	101832	2022-08-02
LISN	R&S	ENV-216	101836	2022-08-05
LISN	R&S	ENV-216	101837	2022-08-05
UXM 5G Wireless Test Platform	KEYSIGHT	E7515B	MY58120110	2022-01-13
UL Software				
Description	Manufacturer	Model	Version	
Radiated software	UL	UL EMC	Ver 9.5	
AC Line Conducted software	UL	UL EMC	Ver 9.5	

7. APPLICABLE LIMITS AND TEST RESULTS

7.1. RADIATED EMISSIONS

TEST PROCEDURE

ANSI C63.4-2014

LIMIT

§15.109 (a) Except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

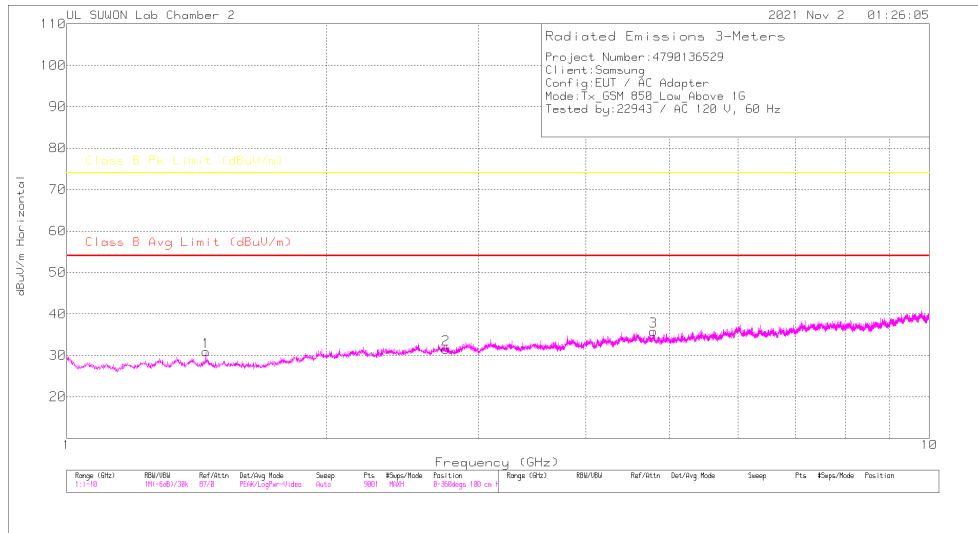
Limits for radiated disturbance of Class B ITE at measuring distance of 3 m	
Frequency range (MHz)	Quasi-peak limits (dB μ V/m)
30 to 88	40
88 to 216	43.5
216 to 960	46
Above 960 MHz	54

Note: The lower limit shall apply at the transition frequency.

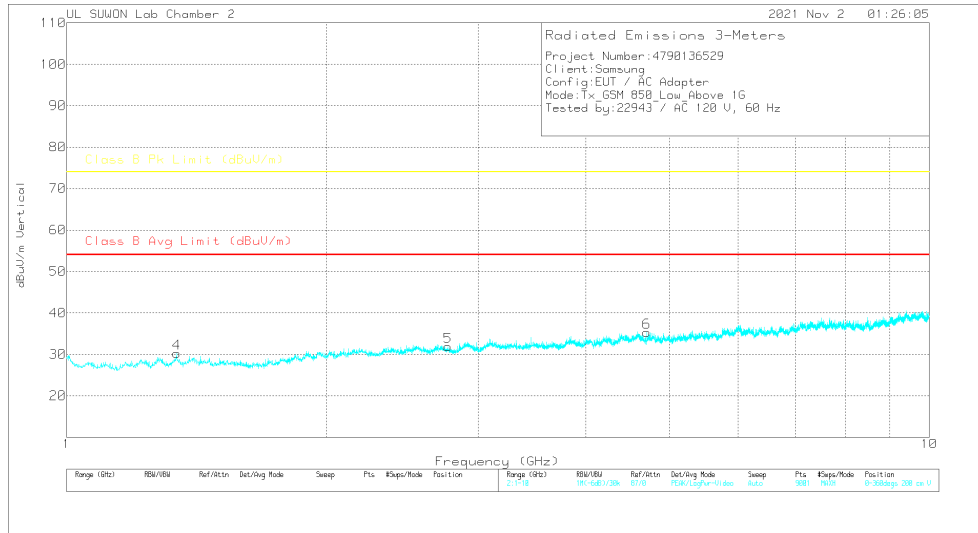
7.1.1. Above 1 GHz in the GSM850

LOW CHANNEL(869.2 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



DATA

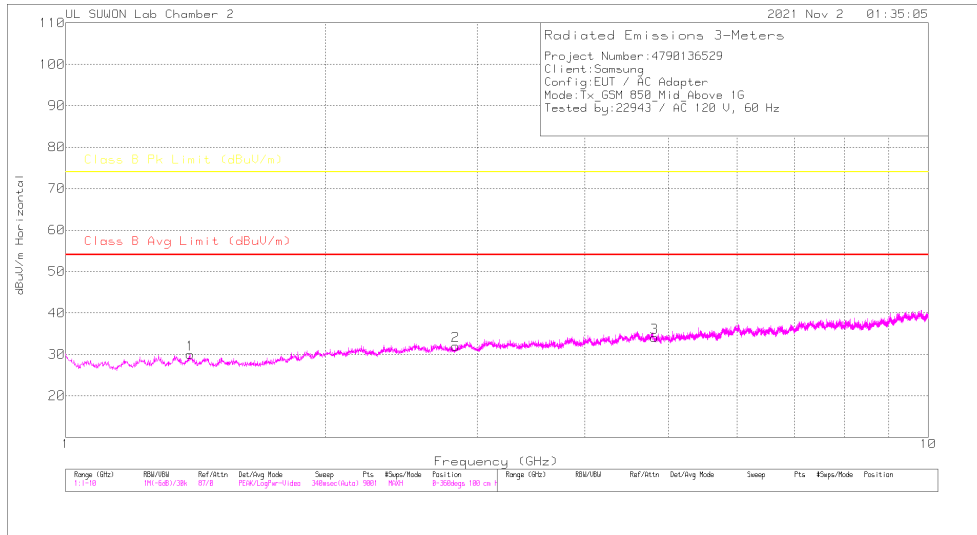
Trace Markers

Marker	Frequency (GHz)	Meas Reading (dBuV)	Det	3117_00168724	1-18GHz[dB]	1GHz_HP[dB]	Corrected Reading dBuV/m	Class B Avg Limit (dBuV/m)	Av(CISPR)Margin (dB)	Class B Pk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.45	32.53	PK	29.2	-31.7	.8	31.53	-	-	74	-43.17	0-360	100	H
2	2.753	28.83	PK	32.2	-30.1	.6	31.53	-	-	74	-42.47	0-360	100	H
3	4.792	29.41	PK	34.1	-28.2	.5	35.81	-	-	74	-38.19	0-360	100	H
4	1.341	31.64	PK	29.6	-31.8	.8	30.24	-	-	74	-43.76	0-360	200	V
5	2.767	28.94	PK	32.2	-29.9	.6	31.84	-	-	74	-42.16	0-360	200	V
6	4.704	29.81	PK	34.1	-29	.4	35.31	-	-	74	-38.69	0-360	200	V

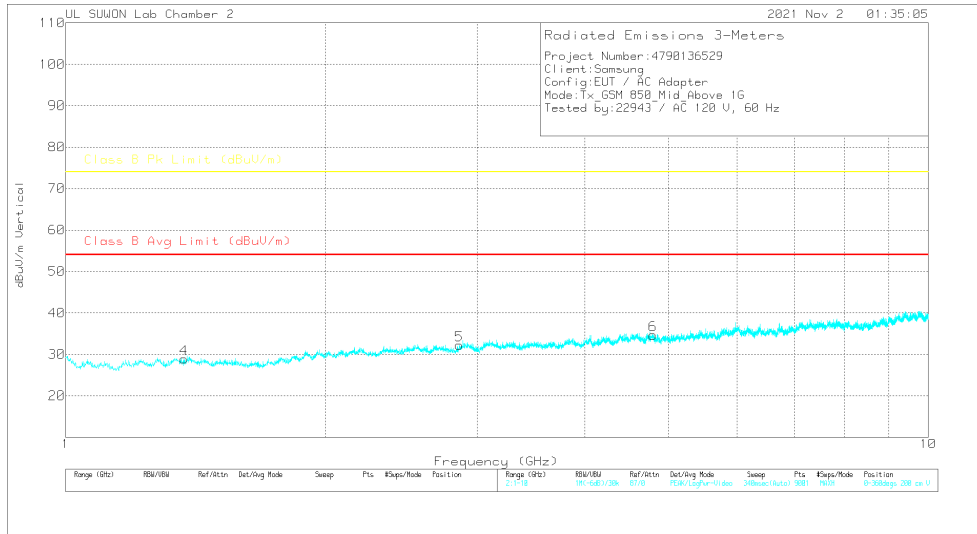
PK – Peak Detector

MID CHANNEL(881.6 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



DATA

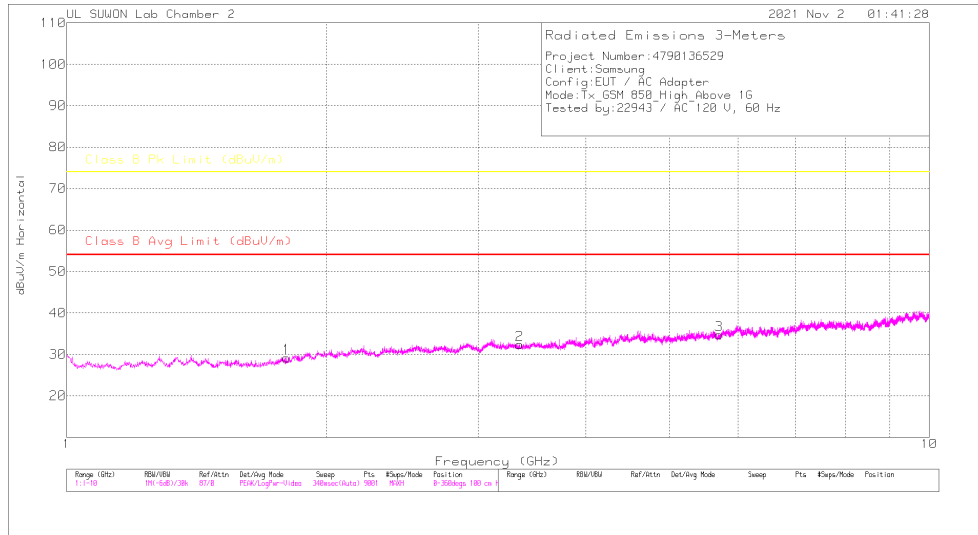
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBu)	Det	3117_00168724	1-18GHz(dB)	1GHz_HP(dB)	Corrected Reading (dBu/m)	Class B Avg Limit (dBu/m)	Av(CSPR)Margin (dB)	Class B Pk Limit (dBu/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.394	31.65	PK	29.4	-31.8	.8	30.05	-	-	74	-43.95	0-360	100	H
2	2.832	29.05	PK	32.2	-29.9	.7	32.05	-	-	74	-41.95	0-360	100	H
3	4.819	27.63	PK	34.1	-28.1	.5	34.13	-	-	74	-39.87	0-360	100	H
4	1.372	30.53	PK	29.5	-31.9	.8	28.93	-	-	74	-45.07	0-360	200	V
5	2.86	29.24	PK	32.2	-30	.8	32.24	-	-	74	-41.76	0-360	200	V
6	4.799	28.25	PK	34.1	-28.2	.5	34.65	-	-	74	-39.35	0-360	200	V

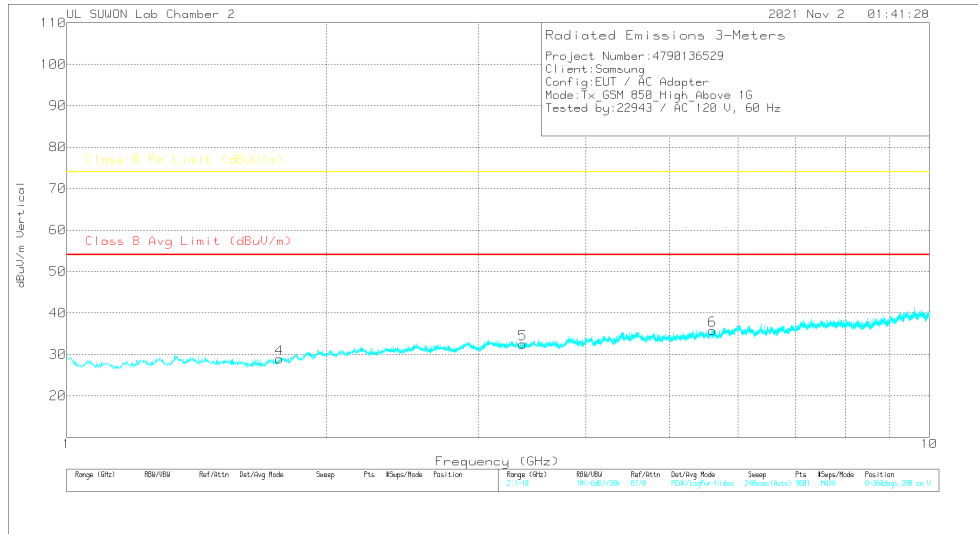
PK – Peak Detector

HIGH CHANNEL(893.8 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



DATA

Trace Markers

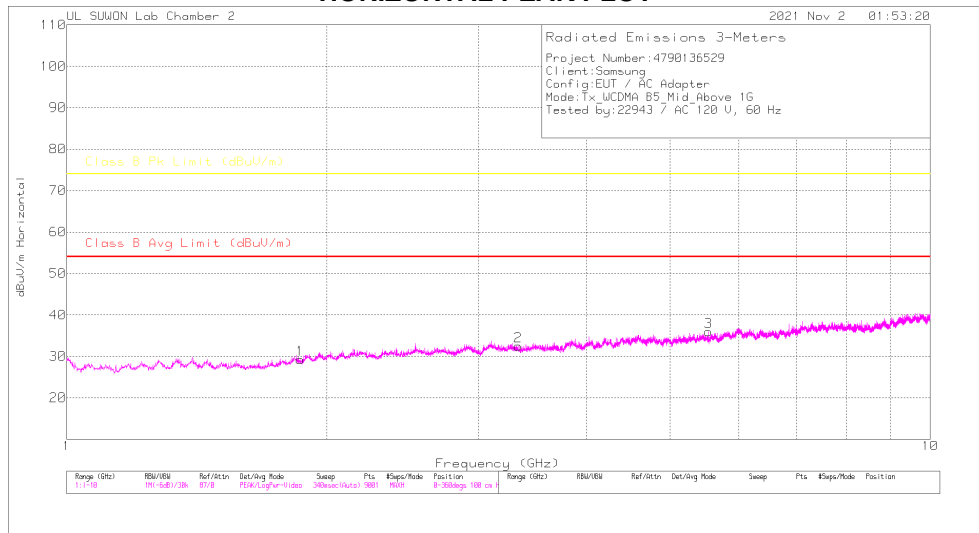
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168724	1-18GHz(dB)	1GHz_HP(dB)	Corrected Reading (dBuV/m)	Class B Avg Limit (dBuV/m)	Av(CISPR)Margin (dB)	Class B Pk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.798	30	PK		-29.8	-31.3	29.2	-	-	74	-44.8	0-360	100	H
2	3.351	28.9	PK		-29.9	-29.9	32.4	-	-	74	-41.6	0-360	100	H
3	5.709	27.36	PK		-27.8	-27.8	34.66	-	-	74	-39.34	0-360	100	H
4	1.763	30.07	PK		-29.4	-31.3	28.97	-	-	74	-45.13	0-360	200	V
5	3.379	28.73	PK		-29.6	-29.6	32.53	-	-	74	-41.47	0-360	200	V
6	5.604	28.66	PK		-29.9	-27.9	35.76	-	-	74	-38.24	0-360	200	V

PK – Peak Detector

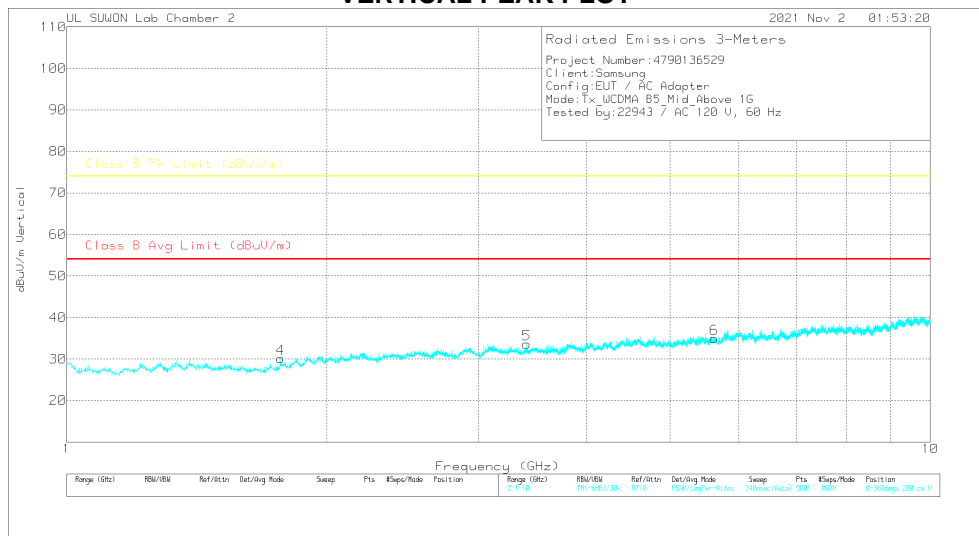
7.1.2. Above 1 GHz in the WCDMA Band 5

MID CHANNEL(881.6 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



DATA

Trace Markers

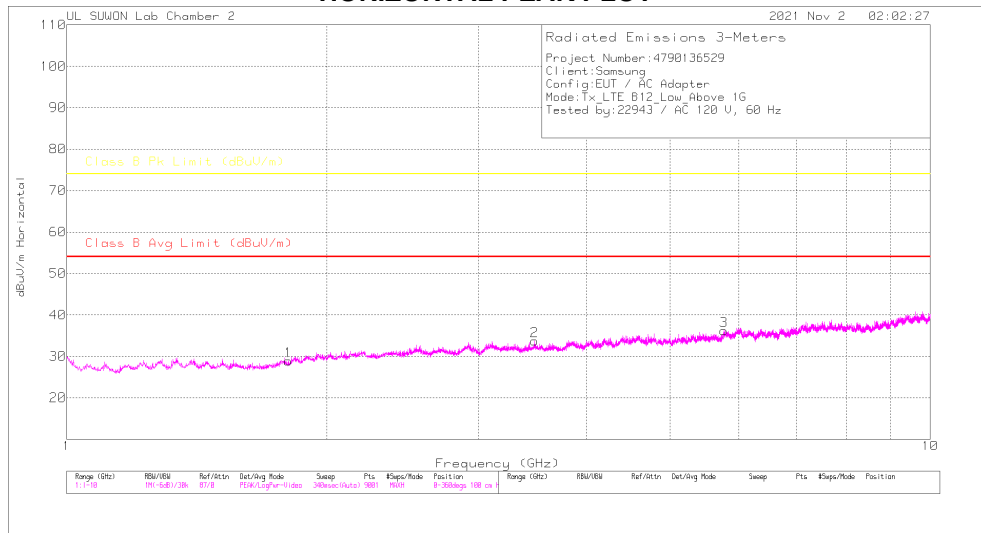
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168724	1-18GHz[dB]	1GHz_HP[dB]	Corrected Reading (dBuV/m)	Class B Avg Limit (dBuV/m)	Av(CISPR)Margin (dB)	Class B Pk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.864	29.47	PK	30.4	-31.2	.6	29.27	-	-	74	-44.73	0-360	100	H
2	3.332	29.04	PK	32.7	-30	.7	32.44	-	-	74	-41.56	0-360	100	H
3	5.538	28.77	PK	34.5	-27.8	.5	35.97	-	-	74	-38.03	0-360	100	H
4	1.769	31.36	PK	29.4	-31.3	.7	30.16	-	-	74	-43.84	0-360	200	V
5	3.409	29.74	PK	32.7	-29.4	.6	33.64	-	-	74	-40.36	0-360	200	V
6	5.621	27.9	PK	34.6	-28	.4	34.9	-	-	74	-39.1	0-360	200	V

PK – Peak Detector

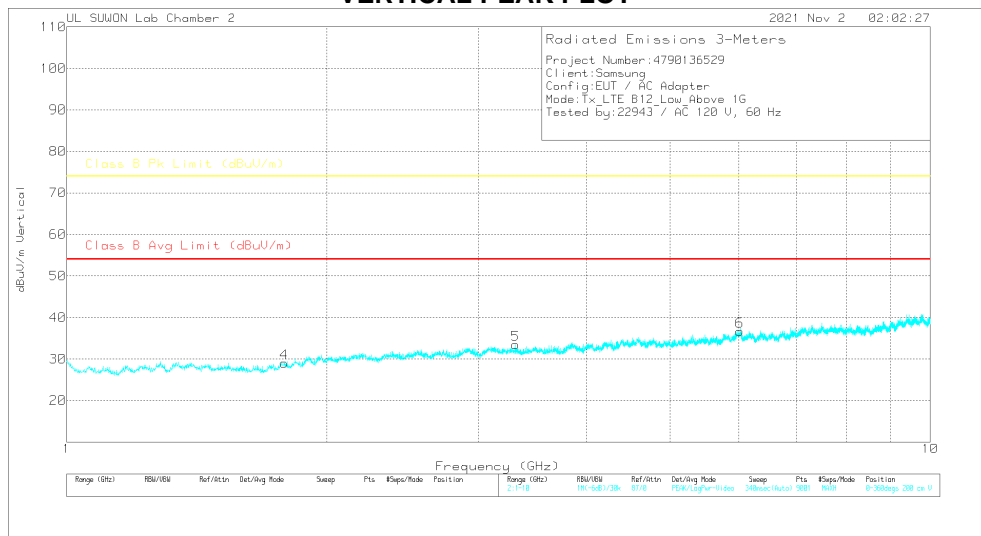
7.1.3. Above 1 GHz in the LTE Band 12

LOW CHANNEL(730.5 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



DATA

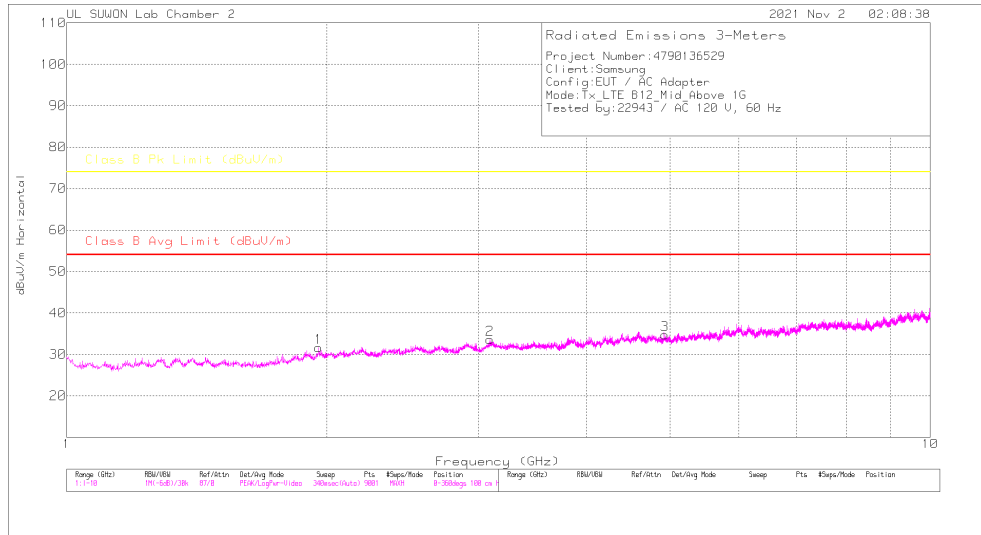
Trace Markers

Marker	Frequency (GHz)	Meas Reading (dBuV)	Det	s117_00168724	1-18GHz(dB)	1GHz_HPF(dB)	Corrected Reading (dBuV/m)	Class B Avg Limit (dBuV/m)	Av(CISPR)Margin (dB)	Class B Pk Limit (dBuV/m)	Margin (dB)	Acimuh (Degs)	Height (cm)	Polarity
1	1.806	29.56	PK		-31.3	.7	28.86	-	-	74	-45.14	0-360	100	H
2	3.481	29.46	PK		-29	.5	33.76	-	-	74	-40.24	0-360	100	H
3	5.769	28.15	PK		-27.3	.5	35.15	-	-	74	-37.85	0-360	100	H
4	1.785	30.07	PK		-31.3	.7	29.07	-	-	74	-44.93	0-360	200	V
5	3.312	30.09	PK		-30	.7	33.49	-	-	74	-40.51	0-360	200	V
6	6.016	28.47	PK		-27.5	.5	36.67	-	-	74	-37.33	0-360	200	V

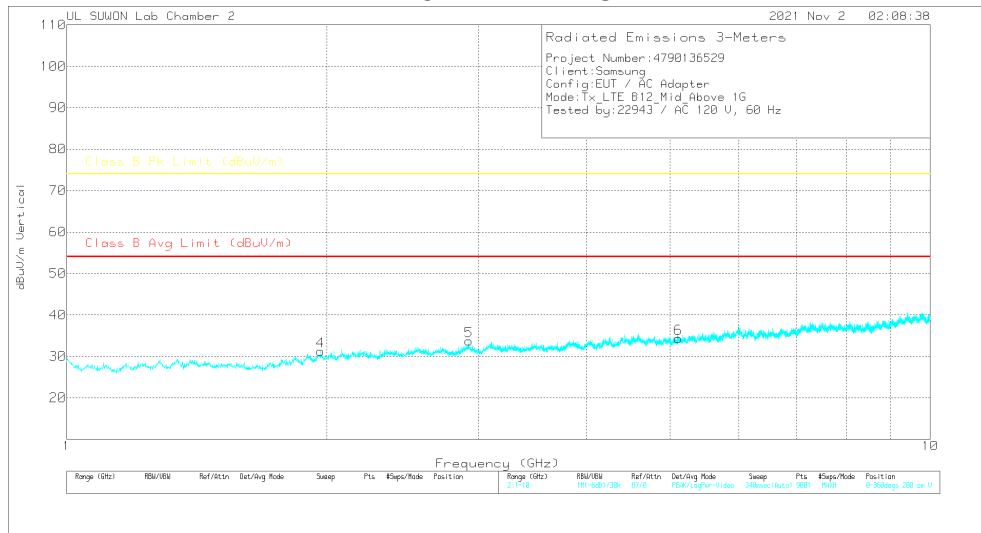
PK – Peak Detector

MID CHANNEL(737.5 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



DATA

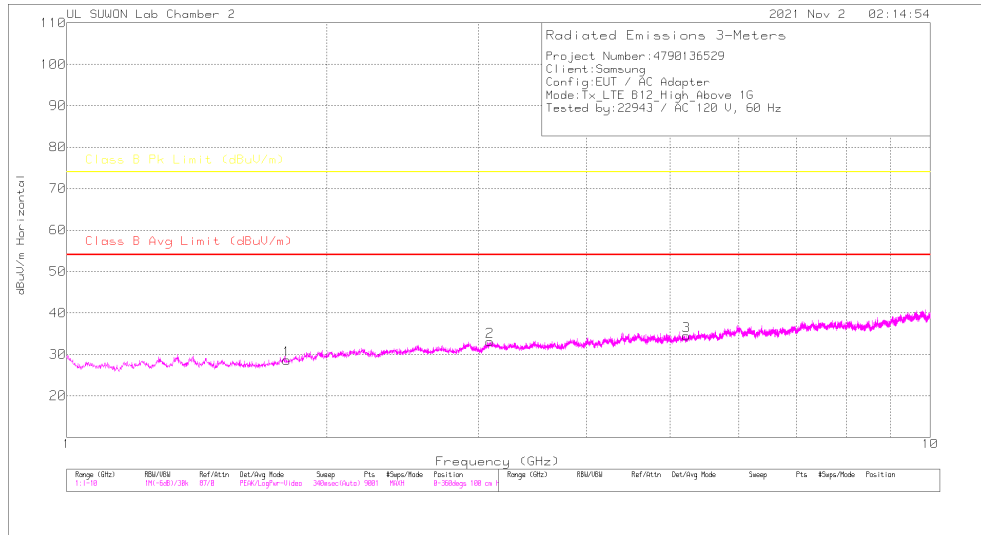
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168724	1-18GHz(dB)	1GHz_HP(dB)	Corrected Reading (dBuV/m)	Class B Avg Limit (dBuV/m)	Av(CSPR)Margin (dB)	Class B Pk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.958	31.05	PK	31	-31	.6	31.65	-	-	74	-42.35	0-360	100	H
2	3.09	29.98	PK	32.9	-29.9	.6	33.58	-	-	74	-40.42	0-360	100	H
3	4.927	28.62	PK	34.1	-28.4	.4	34.72	-	-	74	-39.28	0-360	100	H
4	1.969	30.52	PK	31.1	-31	.6	31.22	-	-	74	-42.78	0-360	200	V
5	2.921	30.6	PK	32.4	-30.1	.8	33.7	-	-	74	-40.3	0-360	200	V
6	5.106	27.59	PK	34.3	-28	.5	34.39	-	-	74	-39.61	0-360	200	V

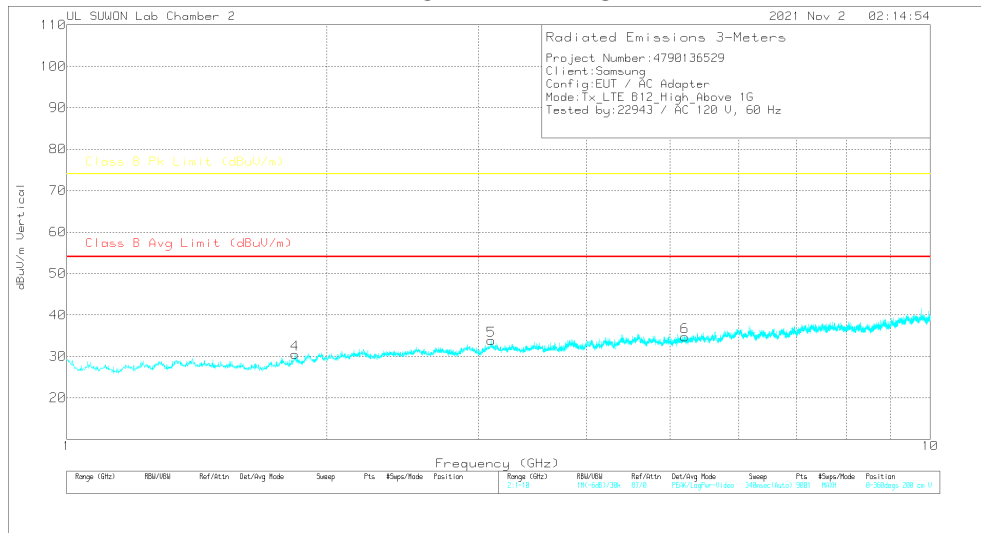
PK – Peak Detector

HIGH CHANNEL(744.5 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



DATA

Trace Markers

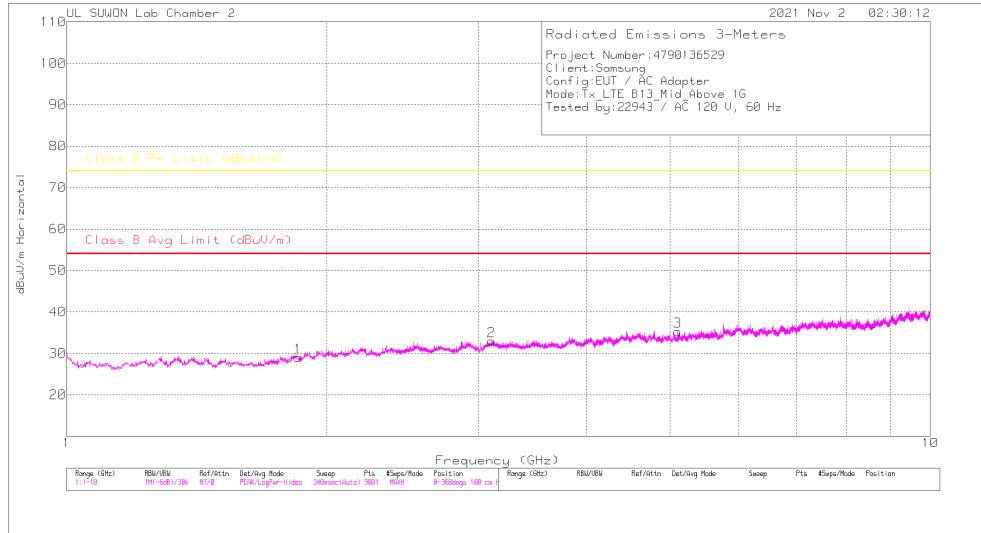
Marker	Frequency (GHz)	Meter Reading (dBu/m)	Det	3117_00168724	1-18GHz[dB]	1GHz_HP[dB]	Corrected Reading (dBu/m)	Class B Avg Limit (dBu/m)	Av(CSRR)Margin (dB)	Class B Pk Limit (dBu/m)	Margin (dB)	Altitude (Degs)	Height (cm)	Polarity
1	1.799	29.39	PK	29.8	-31.3	.7	28.59	-	-	74	-45.41	0-360	100	H
2	3.092	29.51	PK	32.9	-29.9	.6	33.11	-	-	74	-40.89	0-360	100	H
3	5.224	27.38	PK	34.5	-27.9	.5	34.48	-	-	74	-39.52	0-360	100	H
4	1.839	30.83	PK	30.2	-31.1	.6	30.53	-	-	74	-43.47	0-360	200	V
5	3.102	30.03	PK	32.9	-29.8	.7	33.83	-	-	74	-40.17	0-360	200	V
6	5.197	27.71	PK	34.4	-27.8	.4	34.71	-	-	74	-39.29	0-360	200	V

PK - Peak Detector

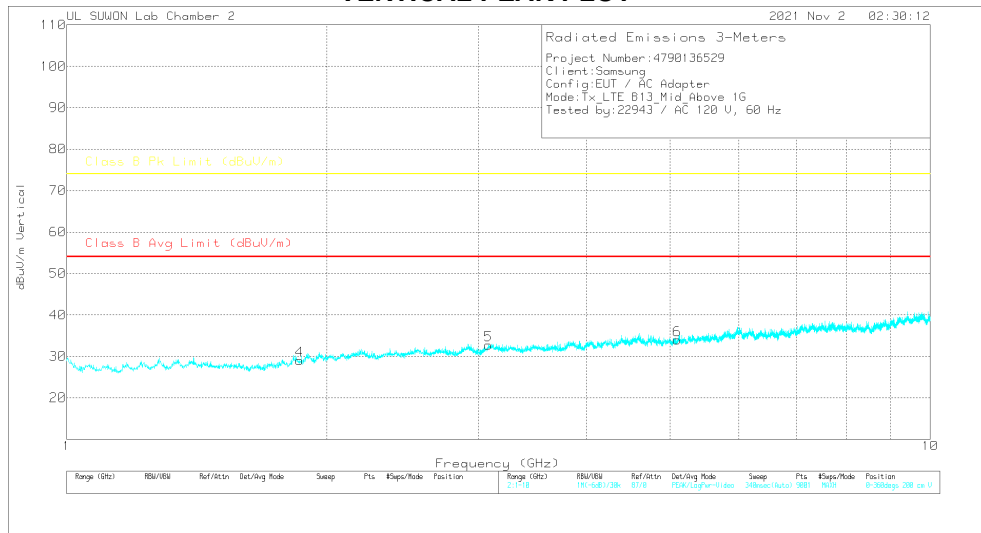
7.1.4. Above 1 GHz in the LTE Band 13

MID CHANNEL(751.0 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



DATA

Trace Markers

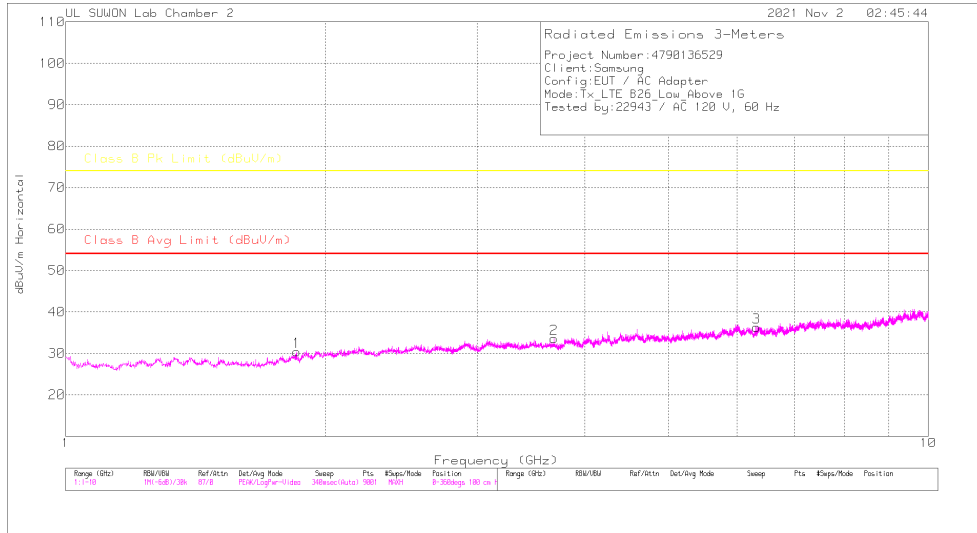
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168724	1-18GHz(dB)	1GHz_HP(dB)	Corrected Reading (dBuV/m)	Class B Avg Limit (dBuV/m)	Avg(CISPR)Margin (dB)	Class B Pk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.931	30.14	PK		-31.1	.7	30.64	-	-	74	-43.36	0-360	100	H
2	3.515	29.84	PK		-29.1	.5	34.04	-	-	74	-39.96	0-360	100	H
3	6.451	27.94	PK		-26.7	.4	37.04	-	-	74	-36.96	0-360	100	H
4	1.96	30.12	PK		-31	.6	30.72	-	-	74	-43.28	0-360	200	V
5	3.185	28.85	PK		-29.7	.7	32.85	-	-	74	-41.15	0-360	200	V
6	6.511	27.26	PK		-26.6	.5	36.56	-	-	74	-37.44	0-360	200	V

PK – Peak Detector

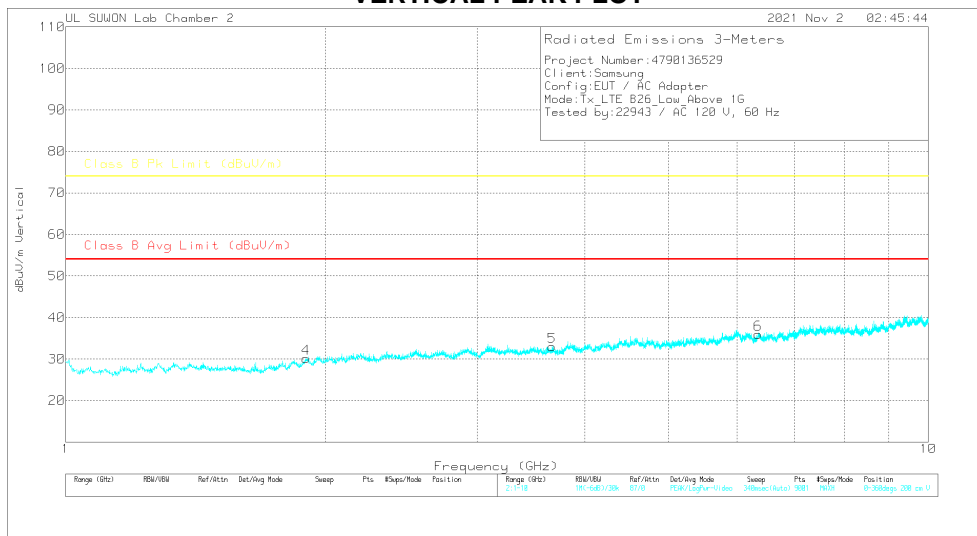
7.1.5. Above 1 GHz in the LTE Band 26

LOW CHANNEL(860.5 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



DATA

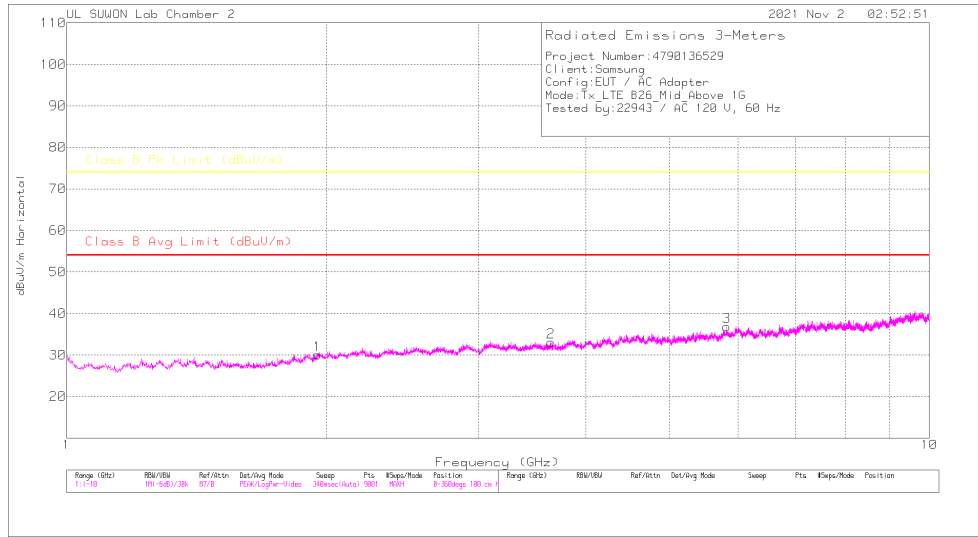
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168724	1-18GHz(dB)	1GHz_HP(dB)	Corrected Reading (dBuV/m)	Class B Avg Limit (dBuV/m)	Avg(CISPR)Margin (dB)	Class B Pk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.852	30.74	PK	30.3	-31.2	.6	30.44	-	-	74	-43.56	0-360	100	H
2	3.893	29.95	PK	33	-29.8	.5	33.65	-	-	74	-40.35	0-360	100	H
3	6.319	27.93	PK	35.3	-27.3	.4	36.33	-	-	74	-37.67	0-360	100	H
4	1.899	29.68	PK	30.7	-31	.7	30.08	-	-	74	-43.92	0-360	200	V
5	3.663	29.16	PK	32.9	-29.7	.6	32.96	-	-	74	-41.04	0-360	200	V
6	6.347	27.46	PK	35.3	-27.2	.4	35.96	-	-	74	-38.04	0-360	200	V

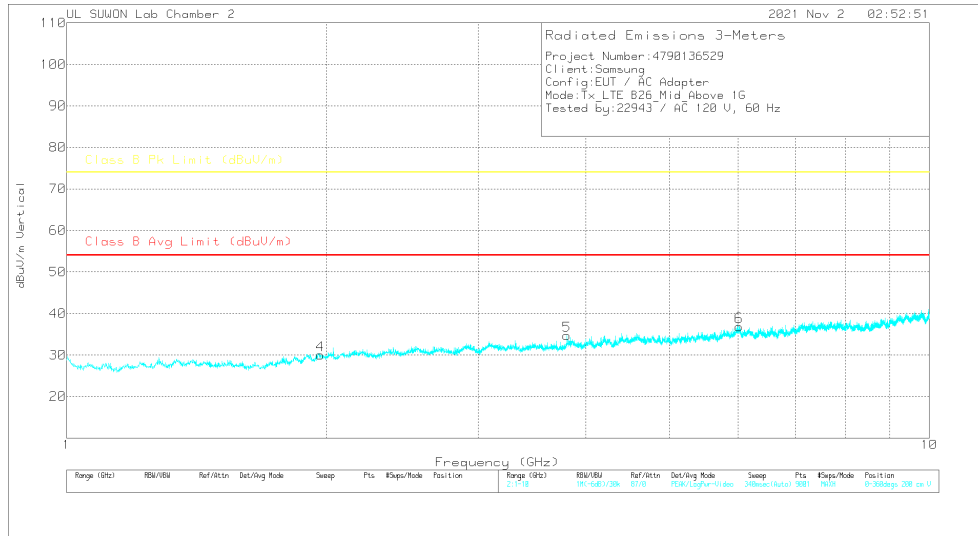
PK – Peak Detector

MID CHANNEL(876.5 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



DATA

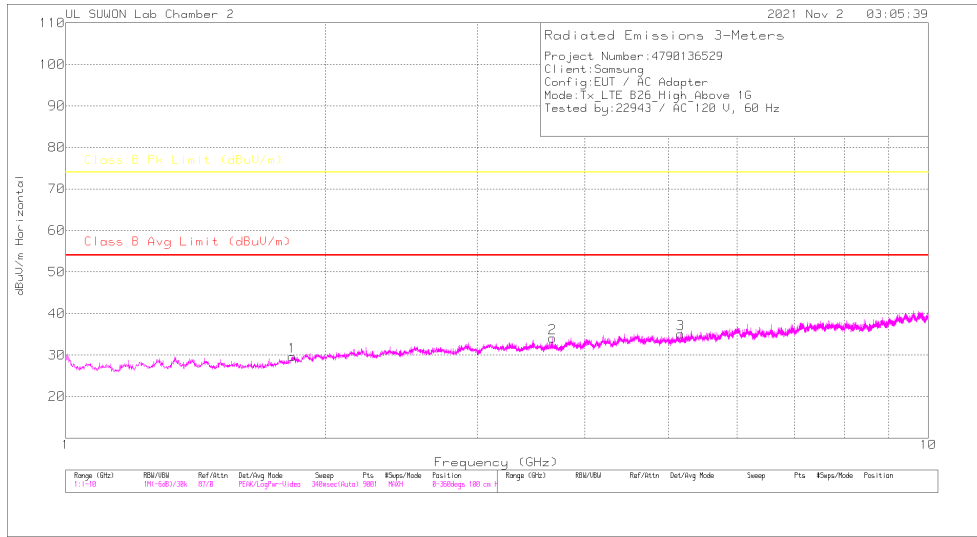
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168724	1-18GHz(dB)	1GHz_HP(dB)	Corrected Reading (dBuV/m)	Class B Avg Limit (dBuV/m)	Avr(CISPR)Margin (dB)	Class B Pk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.951	29.45	PK		-31.1	.7	30.05	-	-	74	-43.95	0-360	100	H
2	3.842	29.19	PK		-29.7	.7	33.09	-	-	74	-40.91	0-360	100	H
3	5.823	28.55	PK		-34.9	.5	36.85	-	-	74	-37.15	0-360	100	H
4	1.967	29.32	PK		-31.1	.6	30.02	-	-	74	-43.98	0-360	200	V
5	3.802	30.16	PK		-29.3	.5	34.66	-	-	74	-39.34	0-360	200	V
6	6.022	28.57	PK		-27.4	.5	36.87	-	-	74	-37.13	0-360	200	V

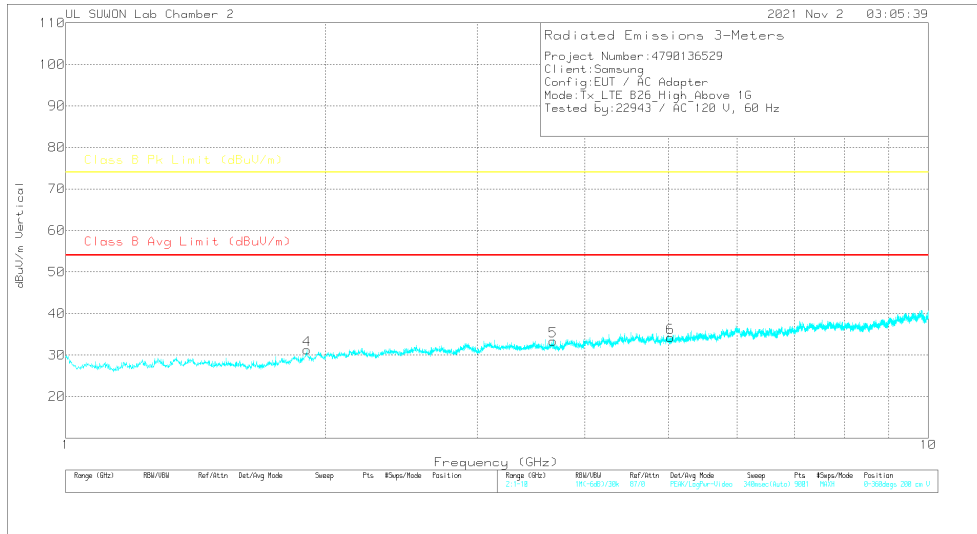
PK – Peak Detector

HIGH CHANNEL(892.5 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



DATA

Trace Markers

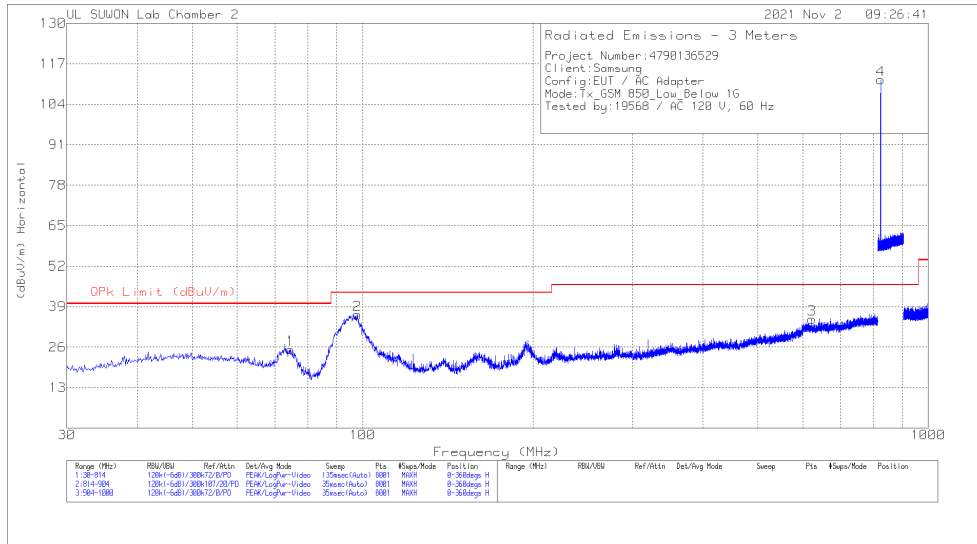
Marker	Frequency (GHz)	Meter Reading (dBu)	Det	3117_00168724	1-18GHz(dB)	1GHz_HP(dB)	Corrected Reading (dBu/m)	Class B Avg Limit (dBu/m)	Av(CSPR)Margin (dB)	Class B Pk Limit (dBu/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.83	30.12	PK	30.1	-31.2	.6	29.62	-	-	74	-44.38	0-360	100	H
2	3.666	30.28	PK	32.9	-29.7	.6	34.08	-	-	74	-39.92	0-360	100	H
3	5.162	28.18	PK	34.4	-27.9	.4	35.08	-	-	74	-38.92	0-360	100	H
4	1.904	30.78	PK	30.8	-31	.7	31.28	-	-	74	-42.72	0-360	200	V
5	3.671	29.57	PK	32.9	-29.7	.6	33.37	-	-	74	-40.63	0-360	200	V
6	5.023	27.89	PK	34.2	-28.3	.4	34.19	-	-	74	-39.81	0-360	200	V

PK – Peak Detector

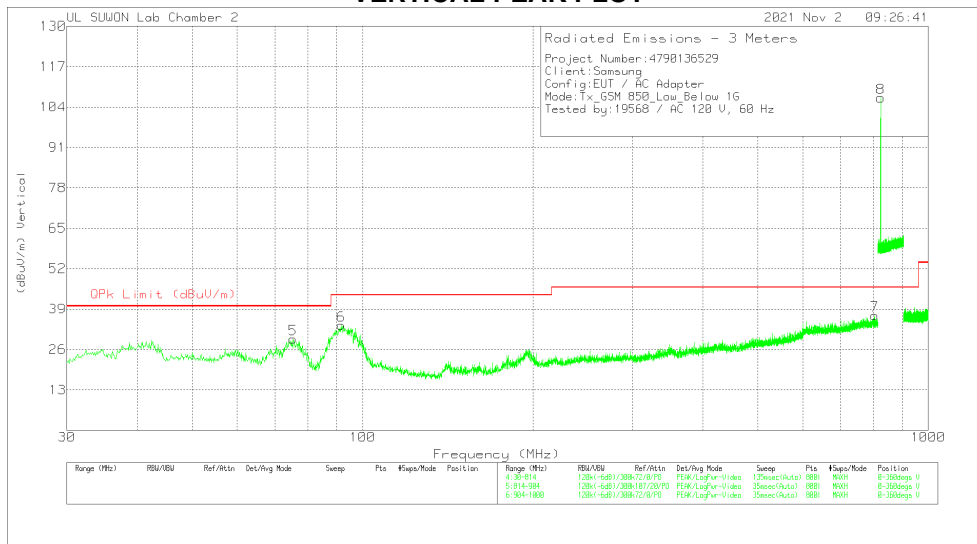
7.1.6. Below 1 GHz in the GSM850

LOW CHANNEL(869.2 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



DATA

Trace Markers

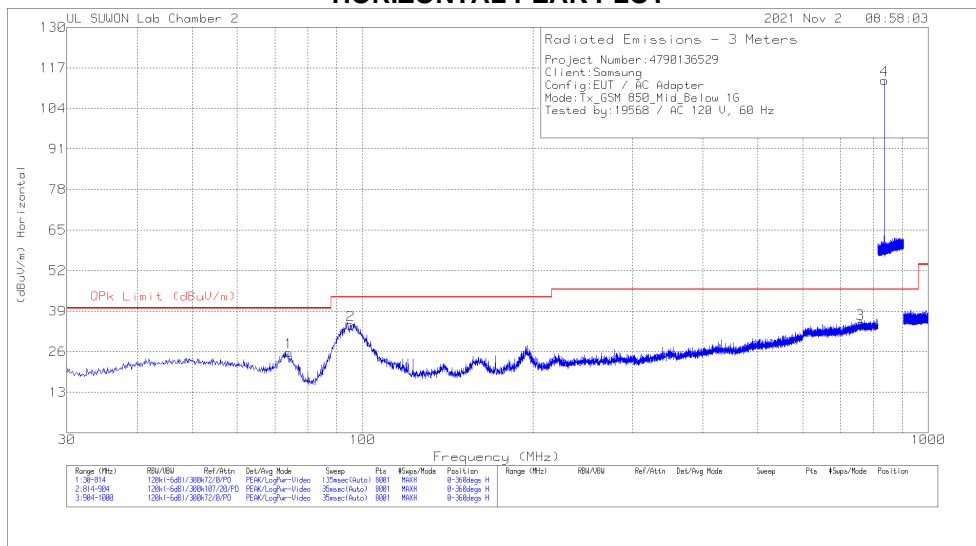
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	VULB9163_749	Below 1G_Bypass[dB]	Corrected Reading (dBuV/m)	QPK Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	74.59	10.85	Pk	13.4	1	25.25	40	-14.75	0-360	200	H
2	97.914	18.09	Pk	17.2	1.1	36.39	43.52	-7.13	0-360	100	H
3	622.9	7.15	Pk	25	2.8	34.95	46.02	-11.07	0-360	100	H
4	824.1588	81.91	Pk	26.7	3.2	111.81	46.02	65.79	0-360	200	H
5	75.374	15.27	Pk	13.1	1	29.37	40	-10.63	0-360	200	V
6	91.642	16.71	Pk	16	1.1	33.81	43.52	-9.71	0-360	200	V
7	804.396	7.06	Pk	26.7	3.2	36.96	46.02	-9.06	0-360	300	V
8	824.2488	77.1	Pk	26.7	3.2	107	46.02	60.98	0-360	100	V

Pk - Peak detector

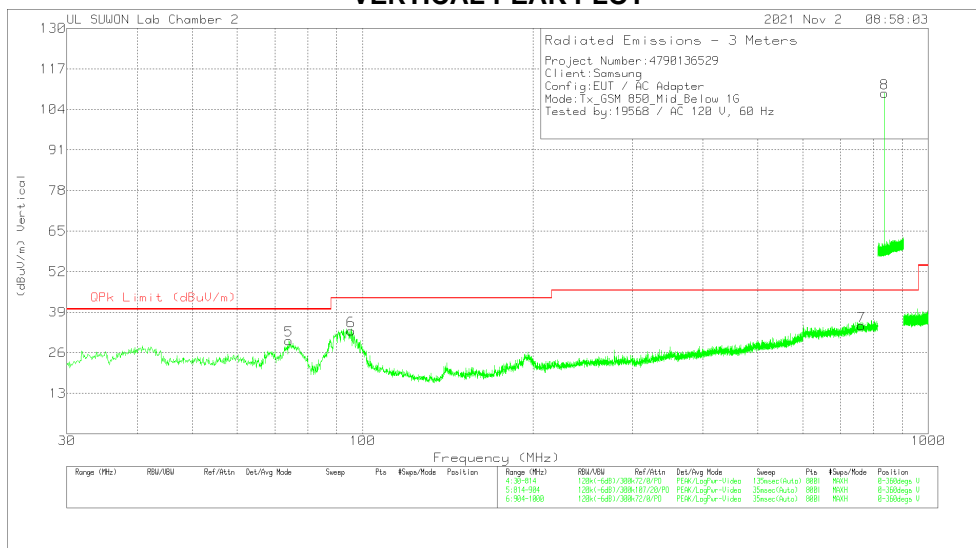
Note: Unwanted emissions captured from 824MHz to 849MHz and from 869MHz to 894MHz were the TX and RX signals generated from the call-simulator.

MID CHANNEL(881.6 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



DATA

Trace Markers

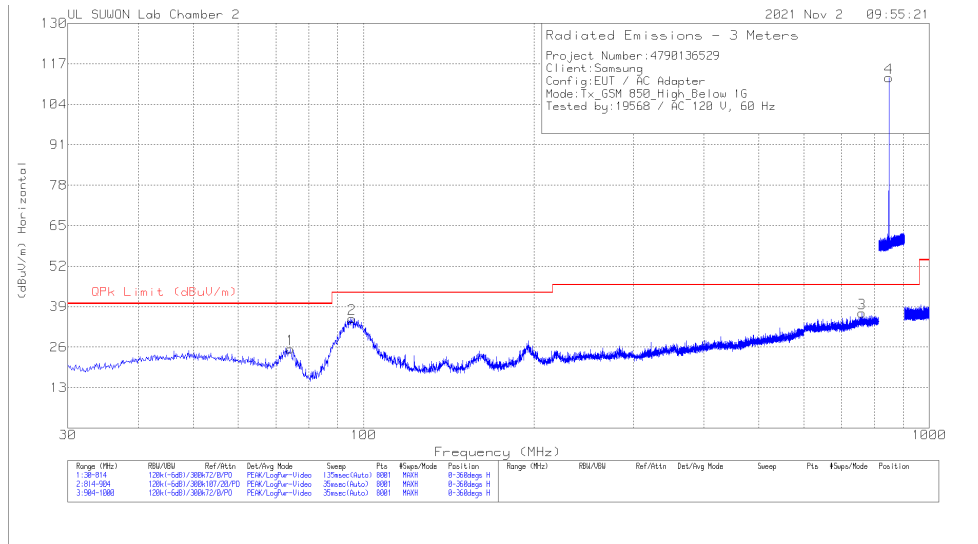
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	VULB9163_749	Below 1G_Bypass[dB]	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	74.1	11.21	Pk	13.6	1	25.81	40	-14.19	0-360	100	H
2	95.268	16.89	Pk	16.6	1.1	34.59	43.52	-8.93	0-360	100	H
3	759.12	5.28	Pk	26.6	3.1	34.98	46.02	-11.04	0-360	100	H
4	836.6013	82.84	Pk	26.9	3.3	113.04	46.02	67.02	0-360	200	H
5	74.1	15.33	Pk	13.6	1	29.93	40	-10.07	0-360	200	V
6	95.464	15.3	Pk	16.6	1.1	33	43.52	-10.52	0-360	200	V
7	762.452	4.9	Pk	26.6	3.1	34.6	46.02	-11.42	0-360	400	V
8	836.6125	79.01	Pk	26.9	3.3	109.21	46.02	63.19	0-360	100	V

Pk - Peak detector

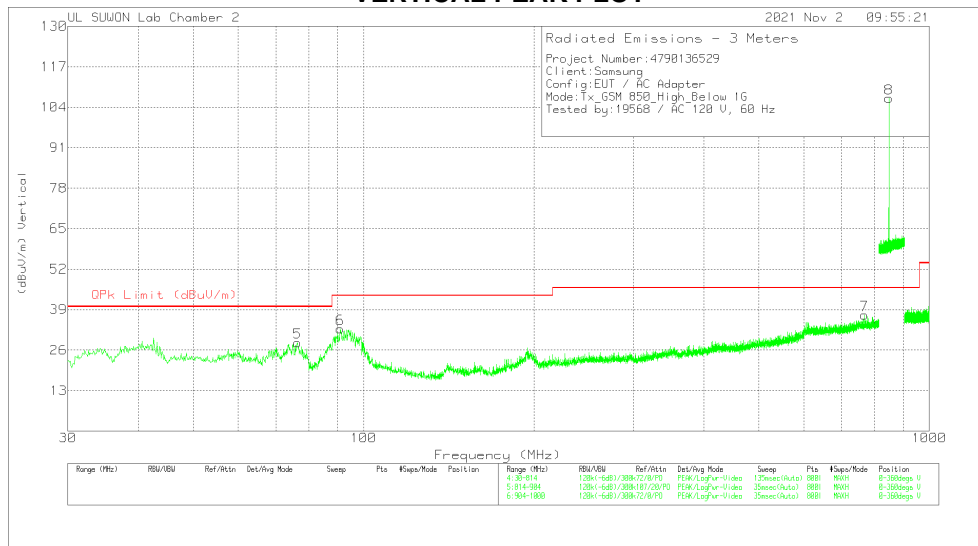
Note: Unwanted emissions captured from 824MHz to 849MHz and from 869MHz to 894MHz were the TX and RX signals generated from the call-simulator.

HIGH CHANNEL(893.8 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



DATA

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	VULB9163_749	Below 1G_Bypass[dB]	Corrected Reading (dBuV/m)	QPK Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	74.198	10.95	Pk	13.5	1	25.45	40	-14.55	0-360	200	H
2	95.366	17.47	Pk	16.6	1.1	35.17	43.52	-8.35	0-360	200	H
3	760.296	7.27	Pk	26.6	3.1	36.97	46.02	-9.05	0-360	300	H
4	848.7513	81.95	Pk	27.3	3.3	112.55	46.02	66.53	0-360	200	H
5	76.452	14.66	Pk	12.8	1	28.46	40	-11.54	0-360	200	V
6	90.956	15.86	Pk	15.9	1.1	32.86	43.52	-10.66	0-360	200	V
7	768.234	7.64	Pk	26.6	3.1	37.34	46.02	-8.68	0-360	400	V
8	848.7738	76.26	Pk	27.3	3.3	106.86	46.02	60.84	0-360	100	V

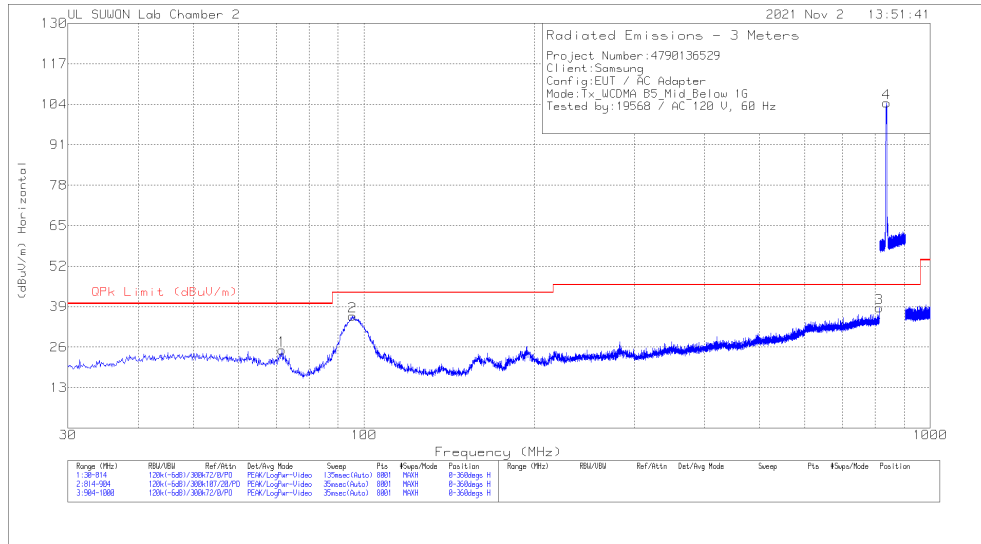
Pk - Peak detector

Note: Unwanted emissions captured from 824MHz to 849MHz and from 869MHz to 894MHz were the TX and RX signals generated from the call-simulator.

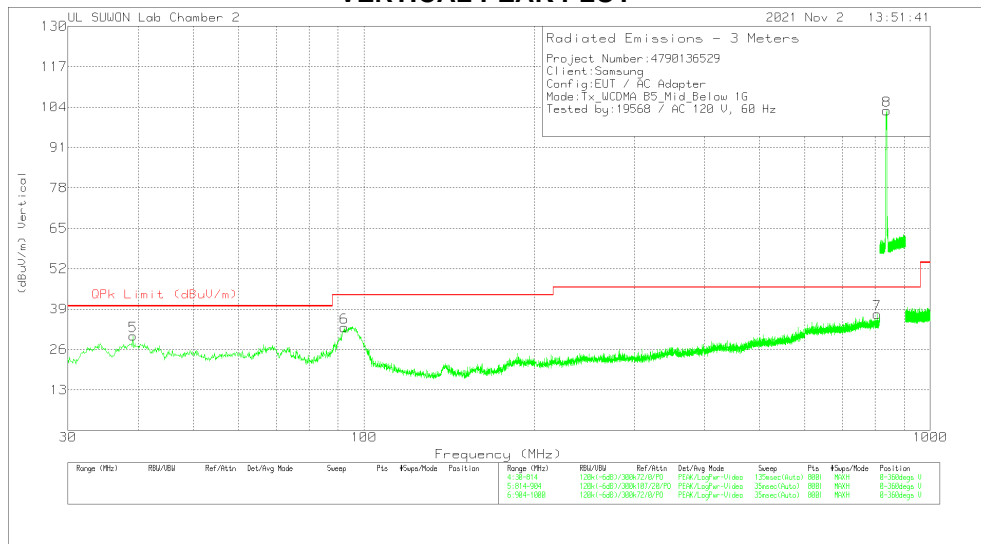
7.1.7. Below 1 GHz in the WCDMA Band 5

MID CHANNEL(881.6 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



DATA

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	VULB9163_749	Below 1G_Bypass[dB]	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	71.65	9.44	Pk	14.6	1	25.04	40	-14.96	0-360	100	H
2	95.464	18.23	Pk	16.6	1.1	35.93	43.52	-7.59	0-360	200	H
3	812.922	8.58	Pk	26.8	3.2	38.58	46.02	-7.44	0-360	100	H
4	837.8275	74.09	Pk	27	3.3	104.39	46.02	58.37	0-360	200	H
5	39.114	11.38	Pk	18.3	.7	30.38	40	-9.62	0-360	200	V
6	92.328	15.91	Pk	16.1	1.1	33.11	43.52	-10.41	0-360	200	V
7	806.748	7.49	Pk	26.7	3.2	37.39	46.02	-8.63	0-360	400	V
8	838.0075	72.57	Pk	27	3.3	102.87	46.02	56.85	0-360	100	V

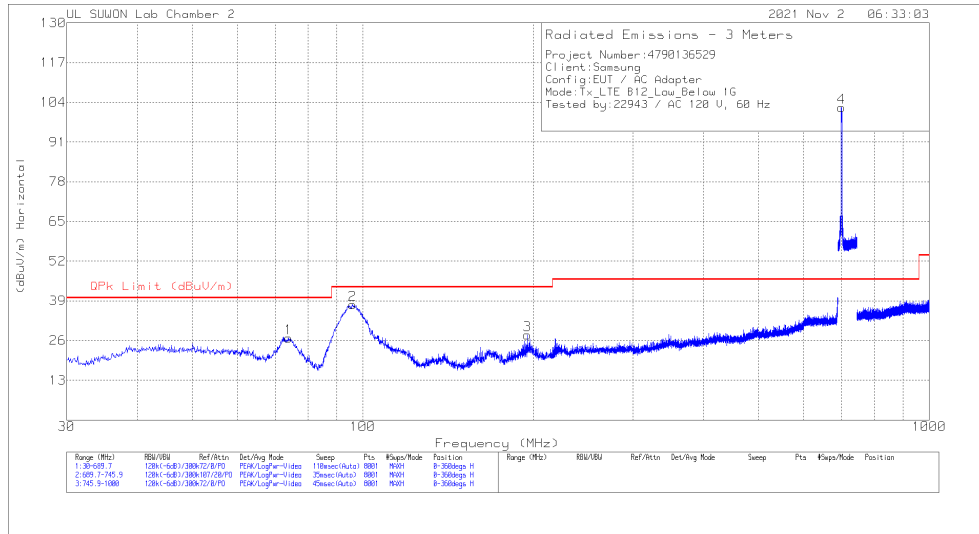
Pk - Peak detector

Note: Unwanted emissions captured from 824MHz to 849MHz and from 869MHz to 894MHz were the TX and RX signals generated from the call-simulator.

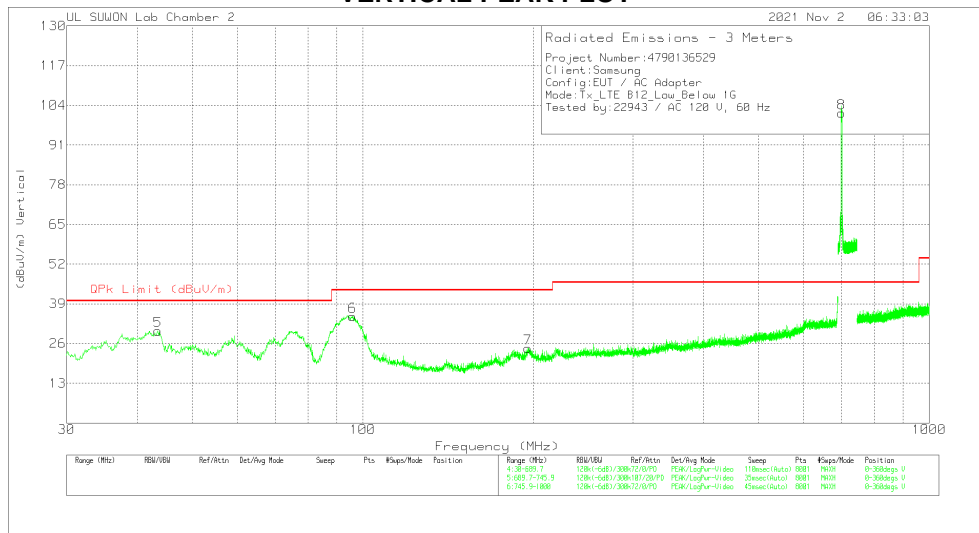
7.1.8. Below 1 GHz in the LTE Band 12

LOW CHANNEL(730.5 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



DATA

Trace Markers

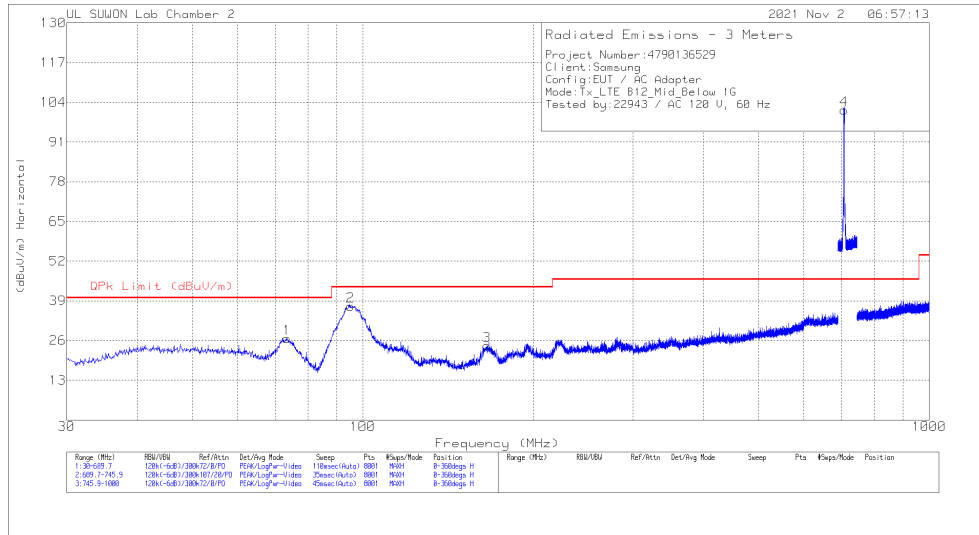
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	VULB9163_749	Below 1G_Bypass[dB]	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	73.9528	12.26	Pk	13.6	1	26.86	40	-13.14	0-360	200	H
2	95.8879	19.79	Pk	16.8	1.1	37.69	43.52	-5.83	0-360	200	H
3	195.0909	8.94	Pk	17.3	1.6	27.84	43.52	-15.68	0-360	100	H
4	700.645	73.84	Pk	25.4	3	102.24	46.02	56.22	0-360	200	H
5	43.4415	9.9	Pk	19.4	.8	30.1	40	-9.9	0-360	200	V
6	95.8879	17.02	Pk	16.8	1.1	34.92	43.52	-8.6	0-360	200	V
7	195.5857	5.46	Pk	17.4	1.6	24.46	43.52	-19.06	0-360	200	V
8	700.6379	73.04	Pk	25.4	3	101.44	46.02	55.42	0-360	100	V

Pk - Peak detector

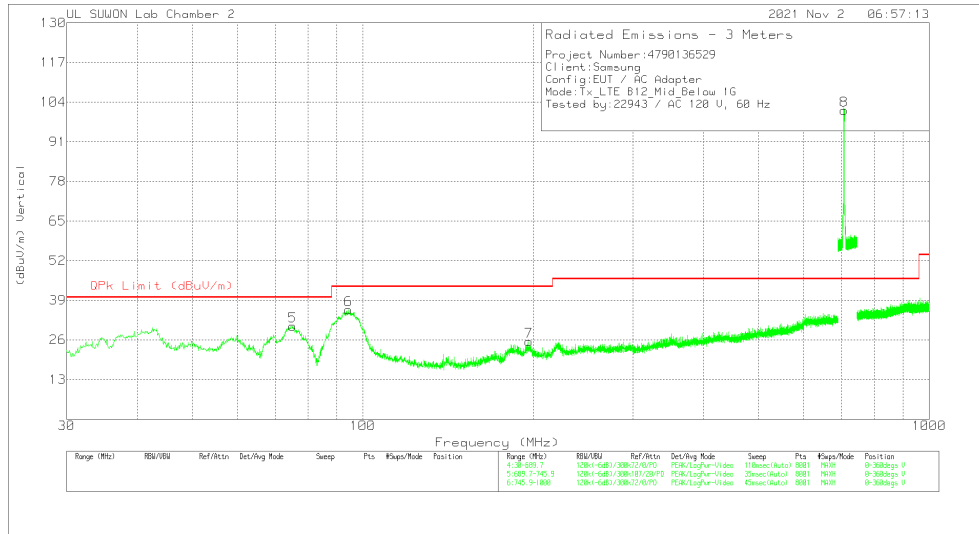
Note: Unwanted emissions captured from 699MHz to 716MHz and from 729MHz to 746MHz were the TX and RX signals generated from the call-simulator.

MID CHANNEL(737.5 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



DATA

Trace Markers

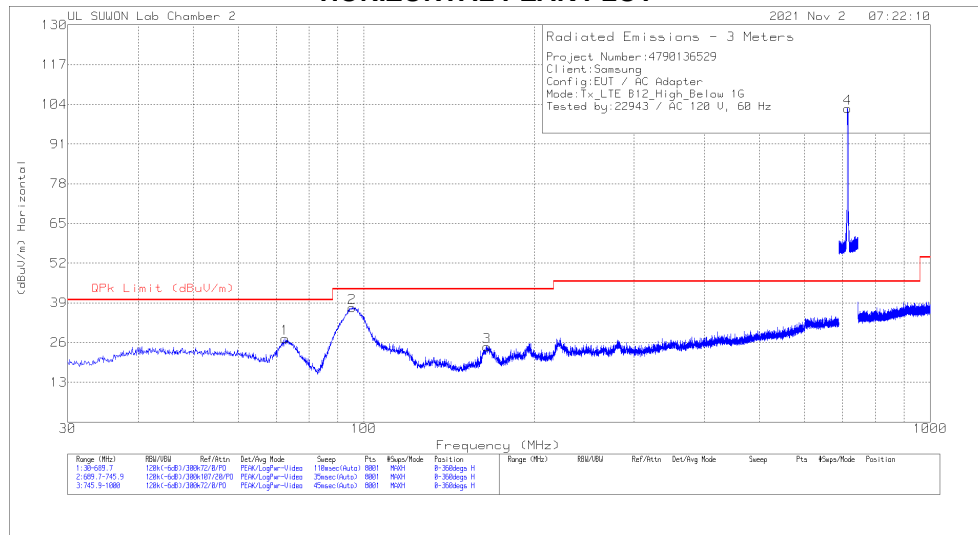
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	VULB9163_749	Below 1G_Bypass[dB]	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	73.458	11.82	Pk	13.8	1	26.62	40	-13.38	0-360	100	H
2	95.1458	19.65	Pk	16.5	1.1	37.25	43.52	-6.27	0-360	200	H
3	165.4867	8.37	Pk	14.4	1.5	24.27	43.52	-19.25	0-360	100	H
4	707.6419	72.83	Pk	25.6	3	101.43	46.02	55.41	0-360	200	H
5	75.1073	16.37	Pk	13.2	1	30.57	40	-9.43	0-360	200	V
6	94.3211	18.39	Pk	16.4	1.1	35.89	43.52	-7.63	0-360	200	V
7	196.4928	6.51	Pk	17.4	1.6	25.51	43.52	-18.01	0-360	200	V
8	707.5646	72.69	Pk	25.6	3	101.29	46.02	55.27	0-360	100	V

Pk - Peak detector

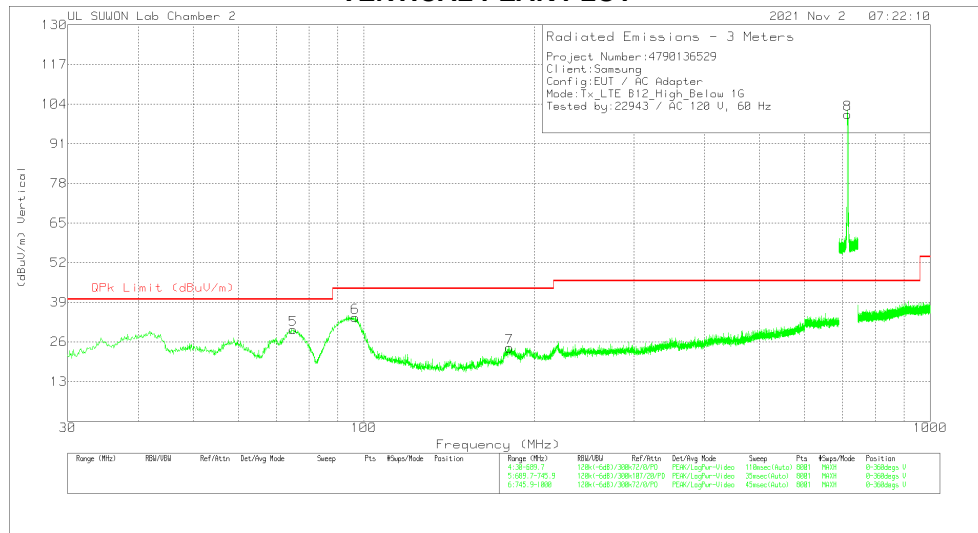
Note: Unwanted emissions captured from 699MHz to 716MHz and from 729MHz to 746MHz were the TX and RX signals generated from the call-simulator.

HIGH CHANNEL(744.5 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



DATA

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	VULB9163_749	Below 1G_Bypass[dB]	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	72.6334	12.05	Pk	14.2	1	27.25	40	-12.75	0-360	200	H
2	95.3932	19.77	Pk	16.6	1.1	37.47	43.52	-6.05	0-360	200	H
3	164.827	8.75	Pk	14.4	1.5	24.65	43.52	-18.87	0-360	100	H
4	714.5123	74.11	Pk	25.6	3	102.71	46.02	56.69	0-360	200	H
5	75.0248	15.81	Pk	13.2	1	30.01	40	-9.99	0-360	200	V
6	96.4652	16.06	Pk	16.9	1.1	34.06	43.52	-9.46	0-360	200	V
7	180.7424	7.15	Pk	15.4	1.5	24.05	43.52	-19.47	0-360	200	V
8	714.5685	72.03	Pk	25.6	3	100.63	46.02	54.61	0-360	100	V

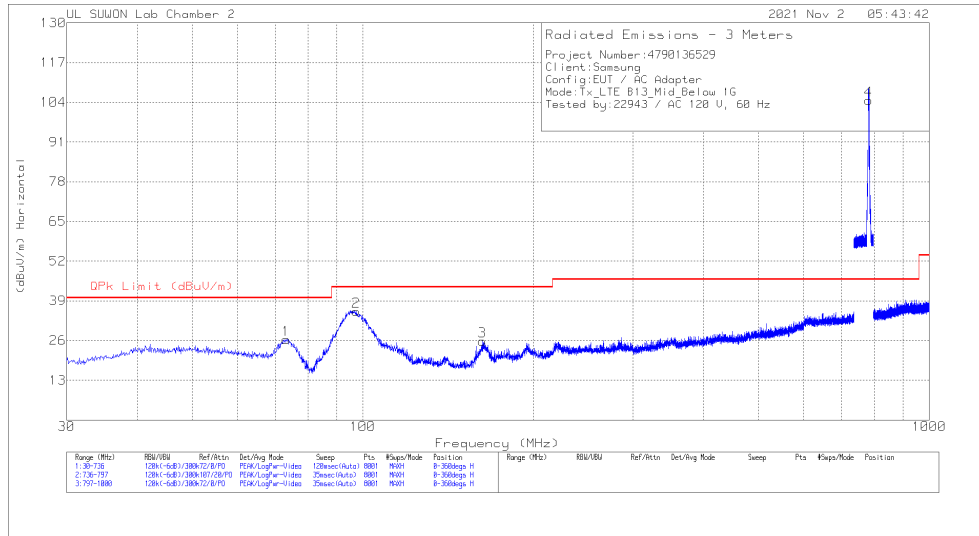
Pk - Peak detector

Note: Unwanted emissions captured from 699MHz to 716MHz and from 729MHz to 746MHz were the TX and RX signals generated from the call-simulator.

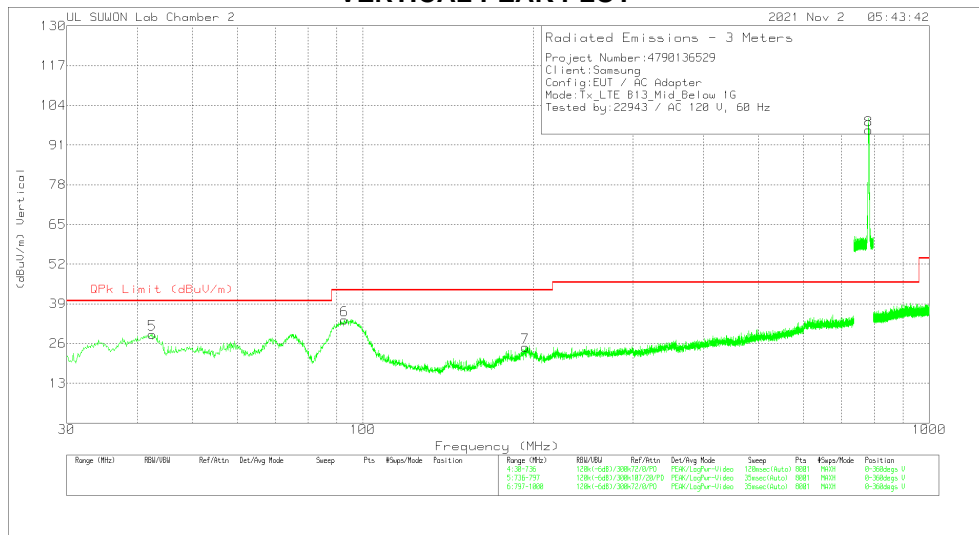
7.1.9. Below 1 GHz in the LTE Band 13

MID CHANNEL(751.0 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



DATA

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	VULB9163_749	Below 1G_Bypass[dB]	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	73.2425	11.46	Pk	13.9	1	26.36	40	-13.64	0-360	100	H
2	97.3348	17.43	Pk	17.1	1.1	35.63	43.52	-7.89	0-360	100	H
3	162.4633	10.05	Pk	14.3	1.4	25.75	43.52	-17.77	0-360	100	H
4	782.6955	74.99	Pk	26.5	3.2	104.69	46.02	58.67	0-360	200	H
5	42.4433	9.18	Pk	19.2	.7	29.08	40	-10.92	0-360	200	V
6	92.7458	16.47	Pk	16.1	1.1	33.67	43.52	-9.85	0-360	200	V
7	193.792	6.07	Pk	17.1	1.6	24.77	43.52	-18.75	0-360	200	V
8	782.0703	66.28	Pk	26.5	3.2	95.98	46.02	49.96	0-360	100	V

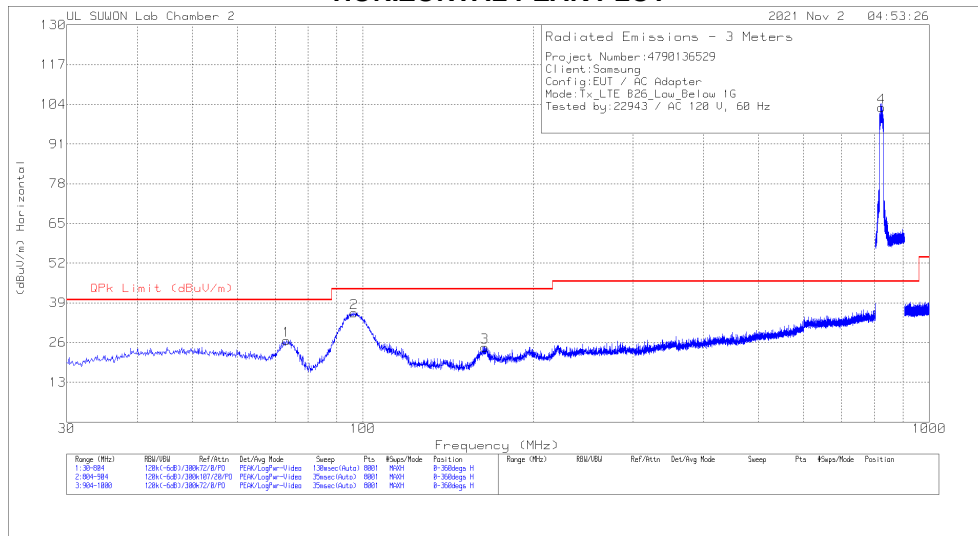
Pk - Peak detector

Note: Unwanted emissions captured from 777MHz to 787MHz and from 746MHz to 756MHz were the TX and RX signals generated from the call-simulator.

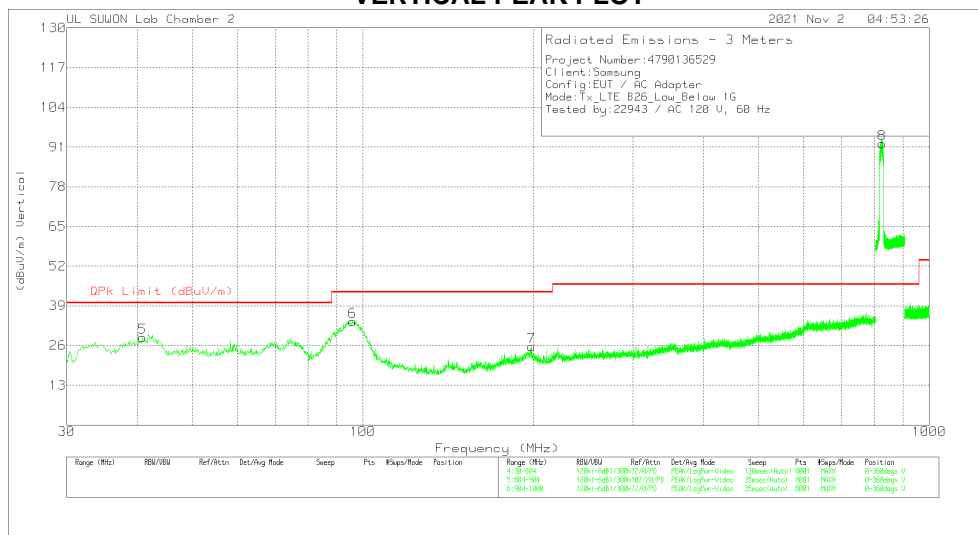
7.1.10. Below 1 GHz in the LTE Band 26

LOW CHANNEL (860.5 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



DATA

Trace Markers

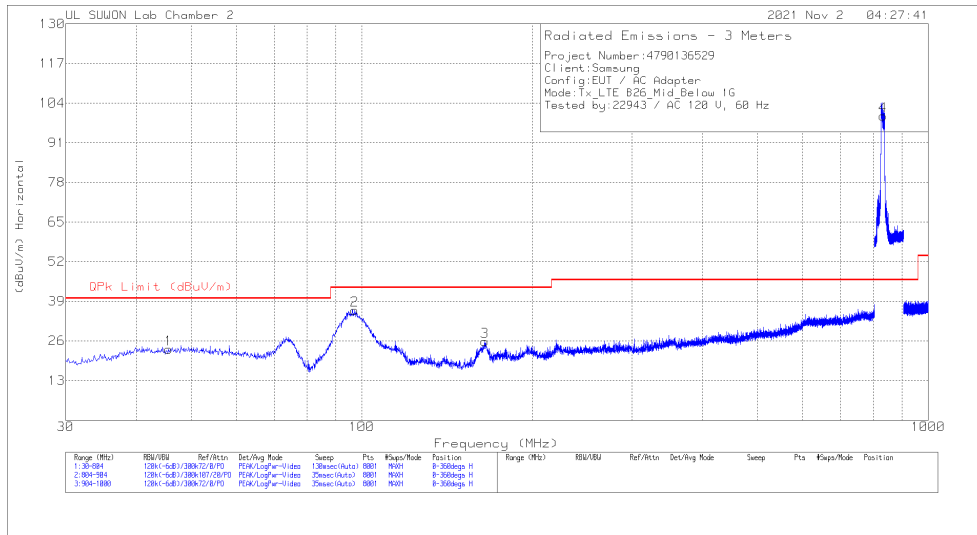
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	VULB9163_749	Below 1G_Bypass[dB]	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	73.2473	11.71	Pk	13.9	1	26.61	40	-13.39	0-360	200	H
2	96.4673	17.72	Pk	16.9	1.1	35.72	43.52	-7.8	0-360	200	H
3	164.289	8.6	Pk	14.4	1.5	24.5	43.52	-19.02	0-360	100	H
4	823.2625	73.11	Pk	26.7	3.2	103.01	46.02	56.99	0-360	200	H
5	40.836	9.07	Pk	18.9	.7	28.67	40	-11.33	0-360	200	V
6	95.8868	16.05	Pk	16.8	1.1	33.95	43.52	-9.57	0-360	200	V
7	198.345	6.62	Pk	17.4	1.6	25.62	43.52	-17.9	0-360	200	V
8	824.9	62.13	Pk	26.7	3.2	92.03	46.01	46.01	0-360	100	V

Pk - Peak detector

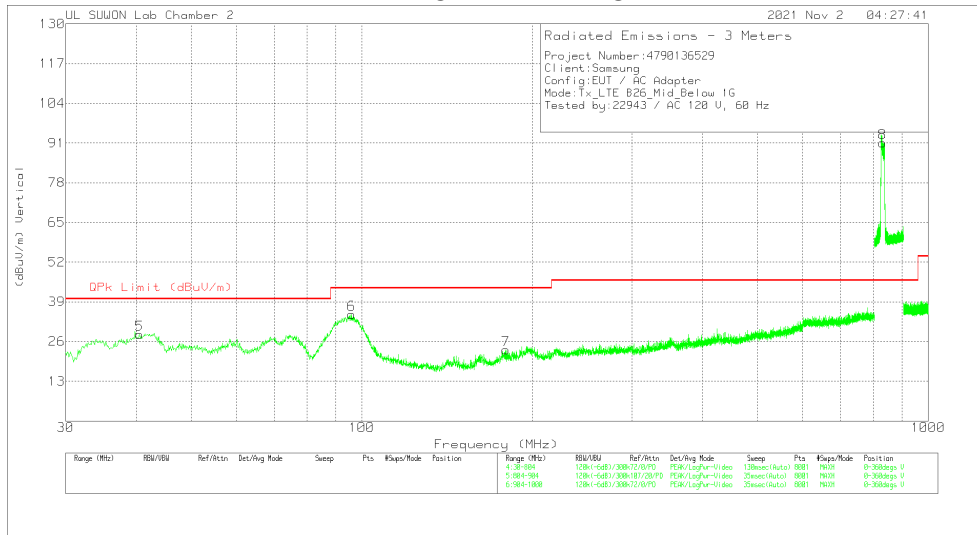
Note: Unwanted emissions captured from 814MHz to 849MHz and from 849MHz to 859MHz were the TX and RX signals generated from the call-simulator.

MID CHANNEL(876.5 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



DATA

Trace Markers

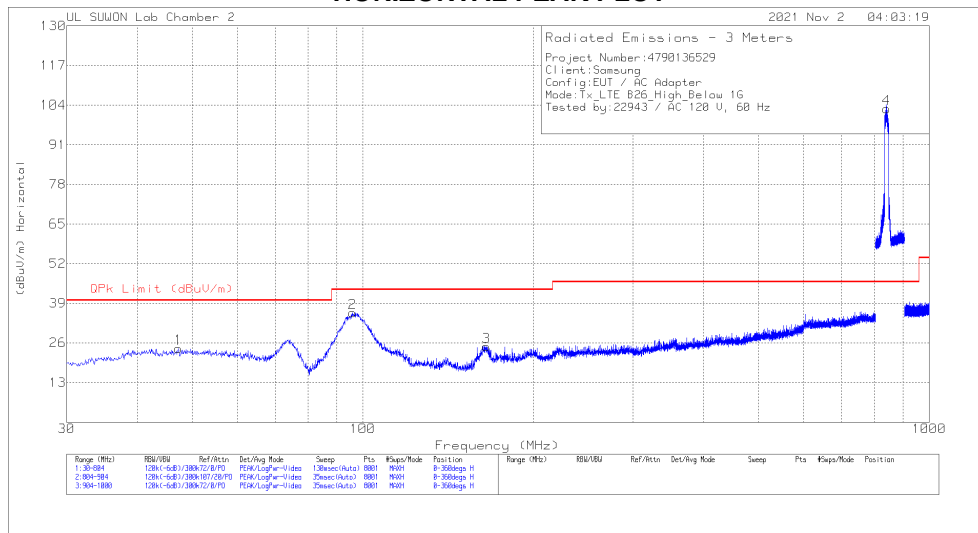
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	VULB9163_749	Below 1G_Bypass[dB]	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	45.5768	2.83	Pk	19.7	.8	23.33	40	-16.67	0-360	300	H
2	97.0478	17.96	Pk	17	1.1	36.06	43.52	-7.46	0-360	200	H
3	164.8695	9.9	Pk	14.4	1.5	25.8	43.52	-17.72	0-360	100	H
4	831.825	69.65	Pk	26.8	3.3	99.75	46.02	53.73	0-360	200	H
5	40.449	8.89	Pk	18.7	.7	28.29	40	-11.71	0-360	200	V
6	95.9835	16.96	Pk	16.8	1.1	34.86	43.52	-8.66	0-360	200	V
7	179.6723	6.49	Pk	15.3	1.5	23.29	43.52	-20.23	0-360	200	V
8	831.1375	60.96	Pk	26.8	3.3	91.06	46.02	45.04	0-360	100	V

Pk - Peak detector

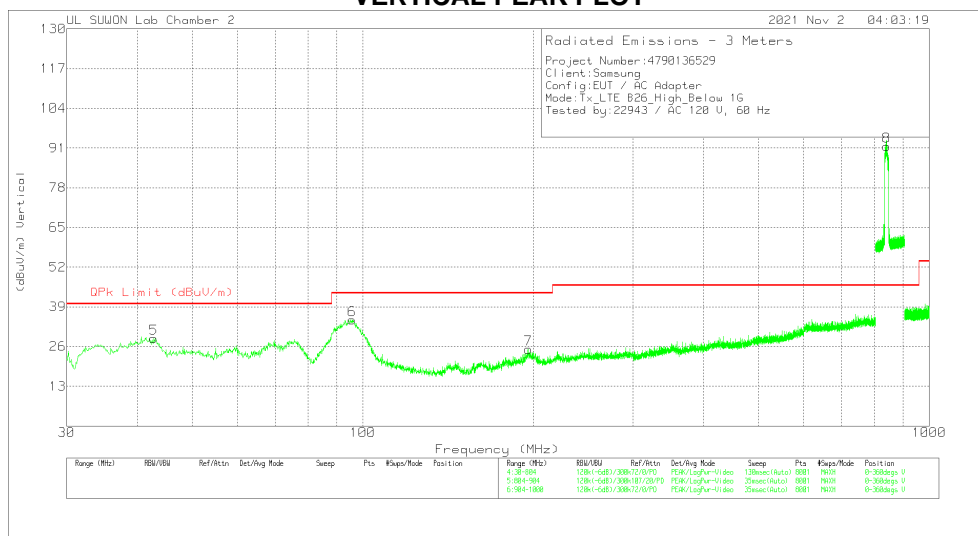
Note: Unwanted emissions captured from 814MHz to 849MHz and from 849MHz to 859MHz were the TX and RX signals generated from the call-simulator.

HIGH CHANNEL(892.5 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



DATA

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	VULB9163_749	Below 1G_Bypass[dB]	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	47.2215	3.61	Pk	19.8	.8	24.21	40	-15.79	0-360	200	H
2	95.9835	18.06	Pk	16.8	1.1	35.96	43.52	-7.56	0-360	200	H
3	165.1598	8.9	Pk	14.4	1.5	24.8	43.52	-18.72	0-360	100	H
4	840.7625	72.56	Pk	27	3.3	102.86	46.02	56.84	0-360	200	H
5	42.771	8.64	Pk	19.3	.8	28.74	40	-11.26	0-360	200	V
6	95.79	16.87	Pk	16.7	1.1	34.67	43.52	-8.85	0-360	200	V
7	196.023	6.14	Pk	17.4	1.6	25.14	43.52	-18.38	0-360	200	V
8	841.2	61.31	Pk	27	3.3	91.61	46.02	45.59	0-360	100	V

Pk - Peak detector

Note: Unwanted emissions captured from 814MHz to 849MHz and from 849MHz to 859MHz were the TX and RX signals generated from the call-simulator.

7.2. CONDUCTED EMISSIONS

TEST PROCEDURE

ANSI C63.4-2014

LIMIT

§15.107 (a) Except for Class A digital devices, for equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the band edges.

Frequency range (MHz)	Limits (dB μ V)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

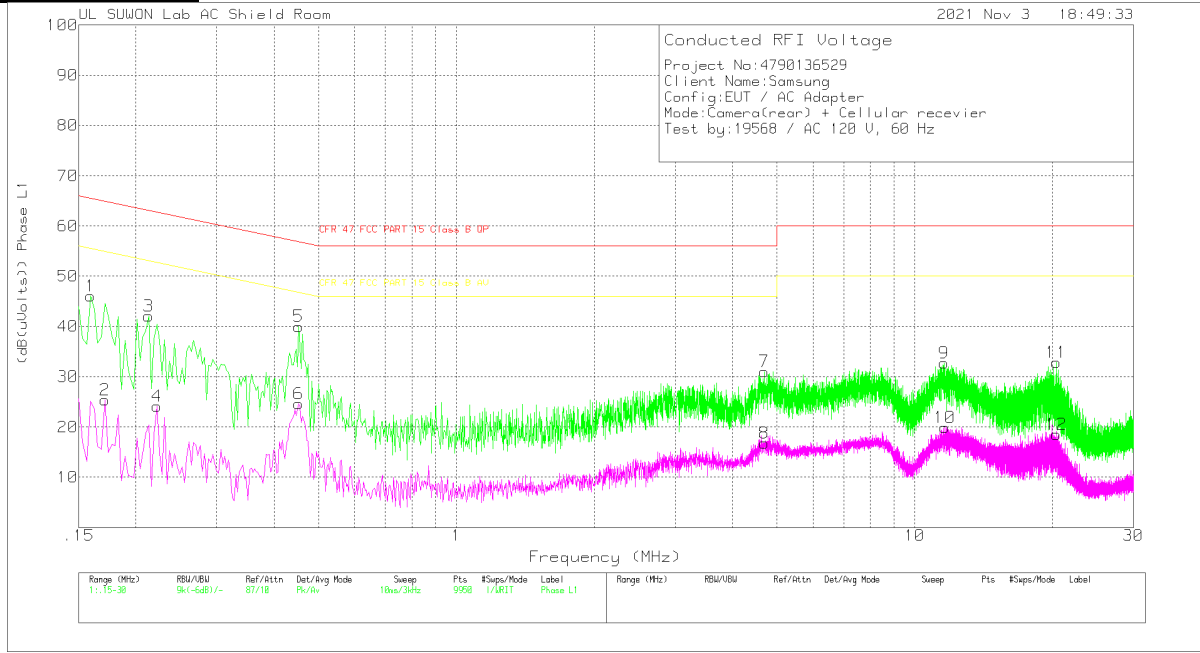
Notes:
 1. The lower limit shall apply at the transition frequencies
 2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

7.2.1 CONDUCTED EMISSIONS

6 WORST EMISSIONS(GSM850 + Rear camera on)

Line-L1 .15 – 30 MHz

LINE 1 RESULTS



Trace Markers

Range 1: Phase L1 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	101836_Wit h EX_L1[dB]	CABLELOS S(dB)	Corrected Reading (dB(uVolts))	CFR 47 FCC PART 15 Class B QP	Margin (dB)	CFR 47 FCC PART 15 Class B AV	Margin (dB)
1	.159	36.21	Pk	9.8	.1	46.11	65.52	-19.41	-	-
2	.171	15.19	Av	10	.2	25.39	-	-	54.91	-29.52
3	.213	32.03	Pk	9.8	.2	42.03	63.09	-21.06	-	-
4	.222	14.29	Av	9.7	.2	24.19	-	-	52.74	-28.55
5	.453	29.92	Pk	9.9	.2	40.02	56.82	-16.8	-	-
6	.453	14.5	Av	9.9	.2	24.6	-	-	46.82	-22.22
7	4.692	21.05	Pk	9.7	.3	31.05	56	-24.95	-	-
8	4.695	6.77	Av	9.7	.3	16.77	-	-	46	-29.23
9	11.592	22.54	Pk	9.9	.3	32.74	60	-27.26	-	-
10	11.637	9.7	Av	9.9	.3	19.9	-	-	50	-30.1
11	20.367	22.31	Pk	10.2	.4	32.91	60	-27.09	-	-
12	20.367	7.94	Av	10.2	.4	18.54	-	-	50	-31.46

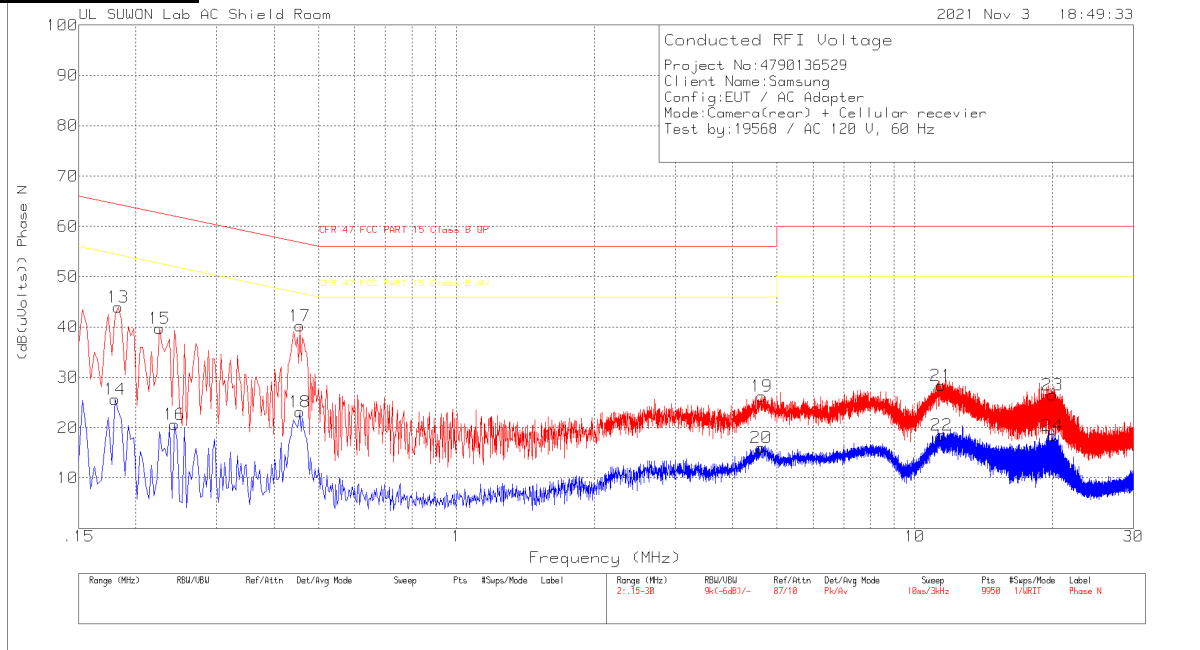
Pk - Peak detector

Av - Average detection

6 WORST EMISSIONS(GSM850 + Rear camera on)

Line-L2 .15 – 30 MHz

LINE 2 RESULTS



Trace Markers

Range 2: Phase N .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	101836_Wit h EX_N[dB]	CABLELOS S(dB)	Corrected Reading (dB(uVolts))	CFR 47 FCC PART 15 Class B QP	Margin (dB)	CFR 47 FCC PART 15 Class B AV	Margin (dB)
13	.183	33.83	Pk	9.9	.2	43.93	64.35	-20.42	-	-
14	.18	15.58	Av	9.9	.2	25.68	-	-	54.49	-28.81
15	.225	29.79	Pk	9.7	.2	39.69	62.63	-22.94	-	-
16	.243	10.82	Av	9.6	.2	20.62	-	-	51.99	-31.37
17	.456	30.16	Pk	9.9	.2	40.26	56.77	-16.51	-	-
18	.456	13.09	Av	9.9	.2	23.19	-	-	46.77	-23.58
19	4.632	16.26	Pk	9.7	.3	26.26	56	-29.74	-	-
20	4.62	6	Av	9.7	.3	16	-	-	46	-30
21	11.409	18.12	Pk	9.9	.3	28.32	60	-31.68	-	-
22	11.436	8.32	Av	9.9	.3	18.52	-	-	50	-31.48
23	20.007	15.82	Pk	10.3	.4	26.52	60	-33.48	-	-
24	19.998	7.84	Av	10.2	.4	18.44	-	-	50	-31.56

Pk - Peak detector
 Av - Average detection

END OF TEST REPORT