



CERTIFICATION TEST REPORT

Report Number. : 4789633488-E1V2

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

Model : SM-G996B/DS, SM-G996B

FCC ID : A3LSMG996B

EUT Description : GSM/WCDMA/LTE/5G NR Phone + BT/BLE, DTS/UNII a/b/g/n/ac/ax,
UWB, WPT and NFC

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

Date Of Issue:

November 25, 2020

Prepared by:

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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	11/16/20	Initial issue	Hyunsik Yun
V2	11/25/20	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/5G NR Phone + BT/BLE, DTS/UNII a/b/g/n/ac/ax, UWB, WPT and NFC
MODEL NUMBER: SM-G996B/DS, SM-G996B
SERIAL NUMBER: 48a3c710441f7ece, 48a3c711d41f7ece, R3CN811PKVB (RADIATED)
DATE TESTED: OCT 23, 2020 – NOV 10, 2020;

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 15B	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:



Junwhan Lee
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	4.26 dB
Radiated Disturbance, 1 GHz to 18 GHz	5.90 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 1, Clause 4.4.2 in IEC Guide 115:2007.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a GSM/WCDMA/LTE/5G NR Phone + BT/BLE, DTS/UNII a/b/g/n/ac/ax, UWB, WPT and NFC. This test report addresses the WWAN receiver mode.

This report covers the Samsung models SM-G996B/DS and SM-G996B. These models are identical in hardware except SM-G996B has single SIM tray. With some pre-scan, model SM-G996B/DS was set for final test.

5.2. TEST MODE

Mode	Description
GSM850	Communicating with Call simulator(CMW500)
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)
5G NR BAND n5	Communicating with Call simulator(E7515B)

5.3. WORST-CASE ORIENTATION AND MODE

For GSM850 / WCDMA B5 / LTE B12 / LTE B13 / LTE B26 / 5G NR n5, EUT was investigated in three orthogonal orientations X, Y and Z it was determined that Z orientation was worst-case orientation.

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

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 maximum tune-up limit and same channel bandwidth.

LTE Band 17

LTE Band 17 (Rx Frequency range: 734-746 MHz) is covered by LTE Band 12 (Rx Frequency range: 729-746 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

5.4. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Charger	SAMSUNG	EP-TA800	R37N39603S8SE3	N/A
Data Cable	SAMSUNG	EP-DN980	N/A	N/A

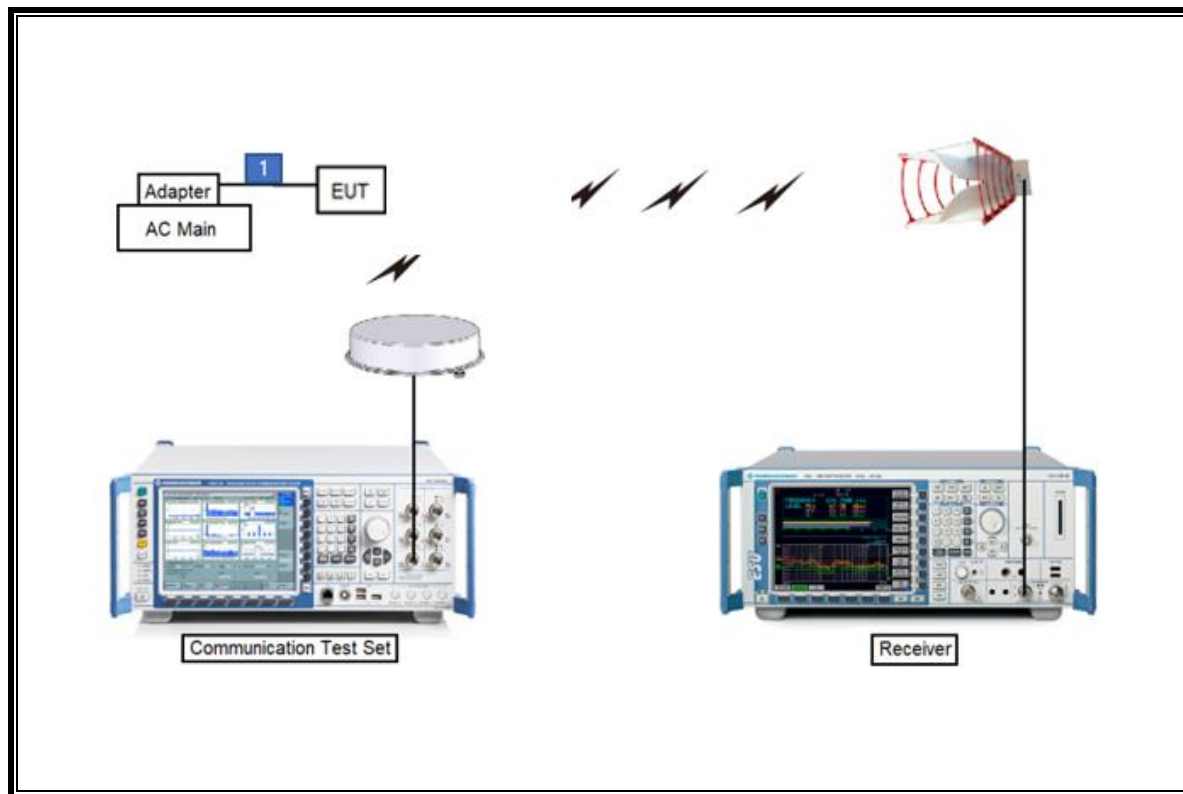
I/O CABLE

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	01-31-21
Antenna, Horn, 40 GHz	ETS	3116C	00166155	08-04-22
Preamplifier	ETS	3116C-PA	00168841	08-06-21
Antenna, Horn, 40 GHz	ETS	3116C	00168645	08-04-22
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	750	08-19-22
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	845	08-13-22
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	749	08-13-22
Antenna, Horn, 18 GHz	ETS	3115	00167211	07-27-22
Antenna, Horn, 18 GHz	ETS	3115	00161451	08-15-22
Antenna, Horn, 18 GHz	ETS	3117	00168724	07-27-22
Antenna, Horn, 18 GHz	ETS	3117	00168717	08-15-22
Communications Test Set	R&S	CMW500	115331	08-03-21
Preamplifier, 1000 MHz	Sonoma	310N	341282	08-03-21
Preamplifier, 1000 MHz	Sonoma	310N	370599	08-06-21
Preamplifier, 1000 MHz	Sonoma	310N	351741	08-03-21
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1876511	08-03-21
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	2029169	08-04-21
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1896138	08-03-21
EMI Test Receive, 40 GHz	R&S	ESU40	100439	08-03-21
EMI Test Receive, 40 GHz	R&S	ESU40	100457	08-03-21
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	08-05-21
High Pass Filter 1.2GHz	Micro-Tronics	HPM50108-02	G006	08-05-21
High Pass Filter 2.8GHz	Micro-Tronics	HPM50111-02	010	08-05-21
High Pass Filter 2.8GHz	Micro-Tronics	HPM50111-02	011	08-05-21
High Pass Filter 4GHz	Micro-Tronics	HPM50118-02	G001	08-05-21
High Pass Filter 4GHz	Micro-Tronics	HPM50118-02	G002	08-05-21
Attenuator	PASTERNAK	PE7087-10	A009	08-05-21
Attenuator	PASTERNAK	PE7087-10	A001	08-03-21
Attenuator	PASTERNAK	PE7087-10	A008	08-03-21
Attenuator	PASTERNAK	PE7004-10	2	08-04-21
Attenuator	PASTERNAK	PE7395-10	A011	08-05-21
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

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:

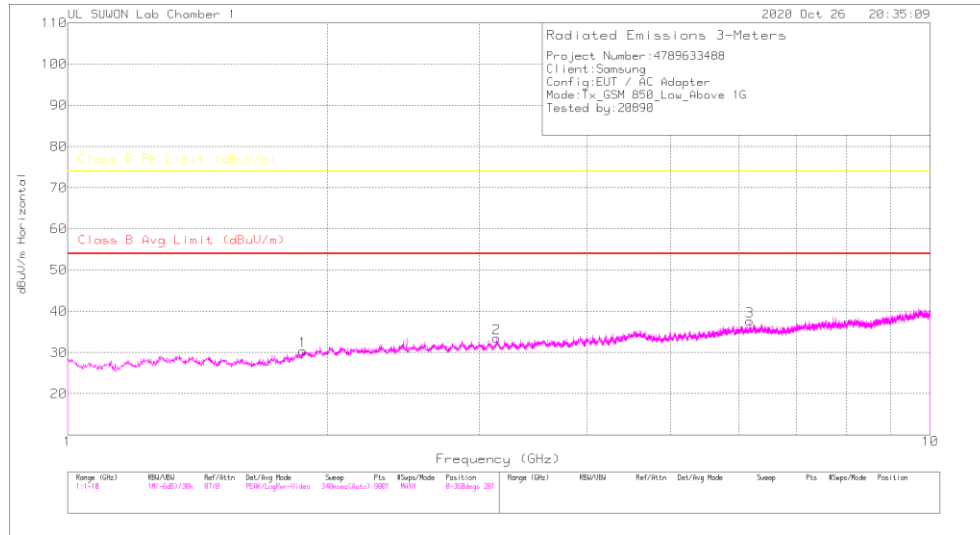
Limits for radiated disturbance of Class B ITE at measuring distance of 3 m	
Frequency range (MHz)	Quasi-peak limits (dB μ V/m)
30 to 88	40
88 to 216	43.5
216 to 960	46
Above 960 MHz	54

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

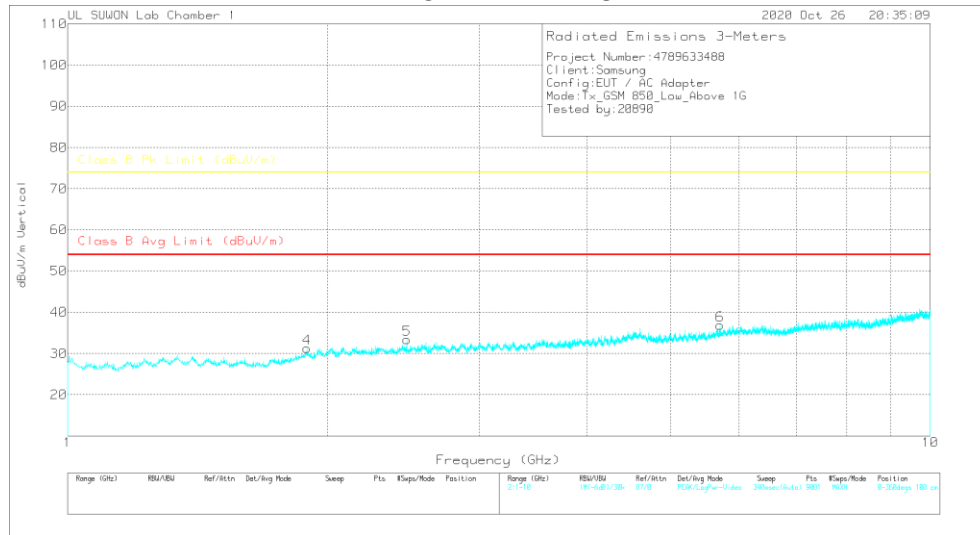
7.1. Above 1 GHz in the GSM850

LOW CHANNEL(869.2 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



DATA

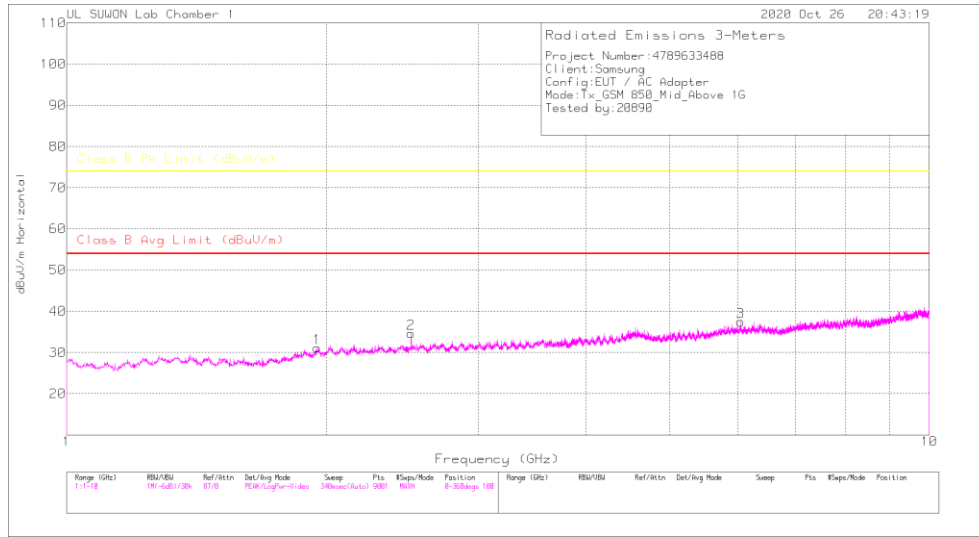
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168717	1-18GHz(dB)	1GHz_HPF	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	1.873	36.49	PK	30.4	-36.2	.7	30.39	-	-	74	-43.61	0-360	201	H
2	3.144	34.14	PK	32.7	-34	.7	33.54	-	-	74	-40.46	0-360	201	H
3	6.175	31.98	PK	35.4	-30.1	.4	37.68	-	-	74	-36.32	0-360	100	H
4	1.894	36.13	PK	30.6	-36.2	.7	31.23	-	-	74	-42.77	0-360	201	V
5	2.472	35.89	PK	31.9	-35.1	.7	33.39	-	-	74	-40.61	0-360	100	V
6	5.708	32.47	PK	34.9	-31	.5	36.87	-	-	74	-37.13	0-360	201	V

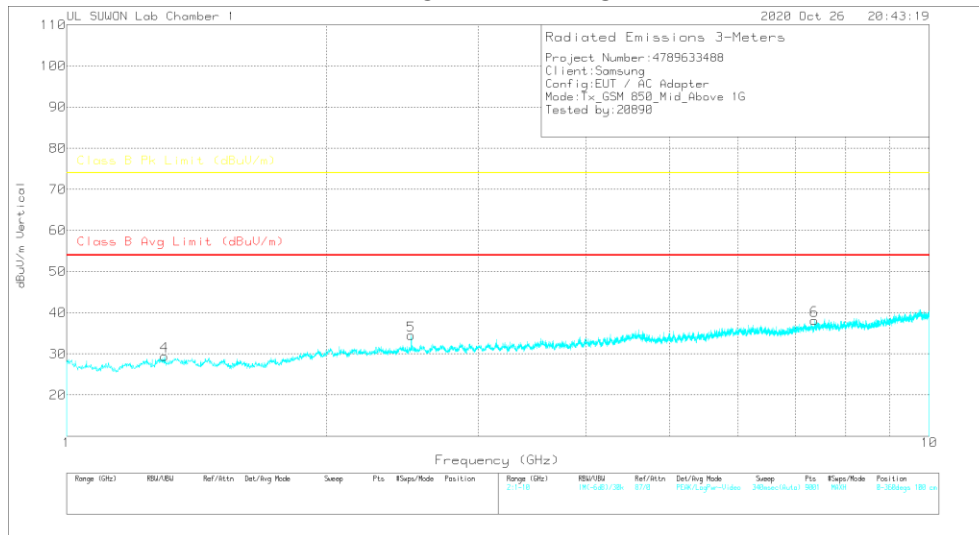
PK-Peak Detector

MID CHANNEL(881.6 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



DATA

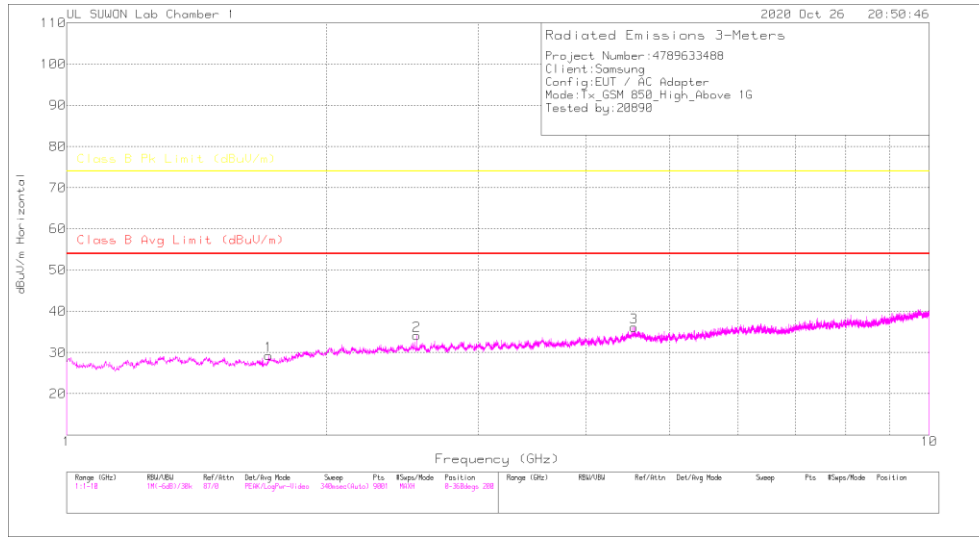
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBu)	Det	3117_00168717	1-18GHz(dB)	1GHz_HPF	Corrected Reading dBu/m	Class B Avg Limit (dBu/m)	Avi(CSPR)Margin (dB)	Class B Pk Limit (dBu/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.951	35.53	PK	31.1	-36	.5	31.13	-	-	74	-42.87	0-360	100	H
2	2.509	37.1	PK	32	-35	.5	34.6	-	-	74	-39.4	0-360	100	H
3	6.045	32.34	PK	35.3	-30.7	.5	37.44	-	-	74	-36.56	0-360	100	H
4	1.299	36.66	PK	29.4	-37.3	.7	29.46	-	-	74	-44.54	0-360	100	V
5	2.509	36.99	PK	32	-35	.5	34.49	-	-	74	-39.51	0-360	100	V
6	7.364	29.88	PK	35.6	-28	.5	38.16	-	-	74	-35.82	0-360	200	V

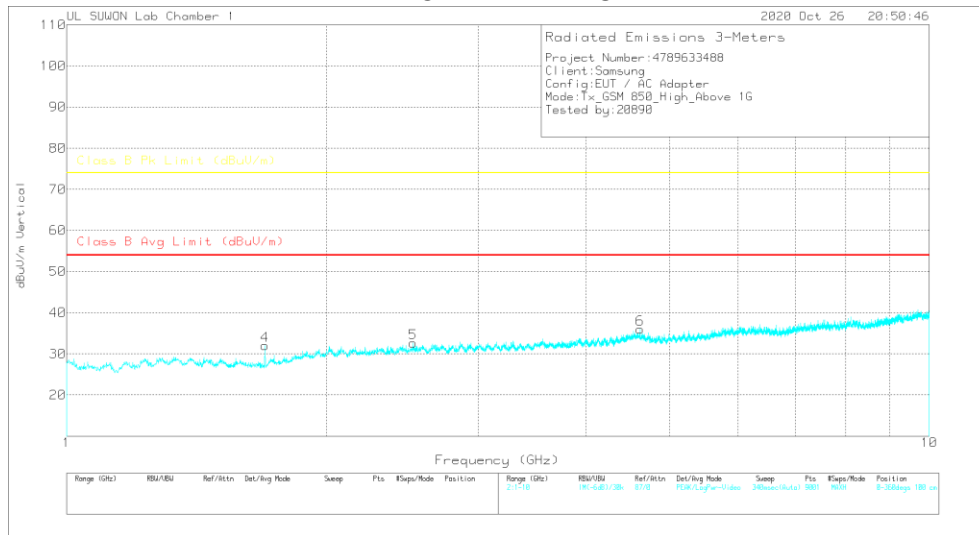
PK – Peak Detector

HIGH CHANNEL(893.8 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBu)	Det	3117_00168717	1-18GHz(dB)	1GHz_HPF	Corrected Reading (dBu/m)	Class B Avg Limit (dBu/m)	Av(CISPR)Margin (dB)	Class B Pk Limit (dBu/m)	Margin (dB)	Altitude (Degs)	Height (cm)	Polarity
1	1.715	36.21	PK		-36.4	.8	29.31	-	-	74	-44.69	0-360	200	H
2	2.546	36.24	PK		-34.8	.7	34.14	-	-	74	-39.86	0-360	100	H
3	4.5495	33.75	PK		-32.2	.4	36.15	-	-	74	-37.85	0-360	200	H
4	1.697	39.32	PK		-36.5	.6	32.02	-	-	74	-41.98	0-360	100	V
5	2.522	34.85	PK		-34.8	.6	32.65	-	-	74	-41.35	0-360	200	V
6	4.62	33.63	PK		-32.2	.4	36.03	-	-	74	-37.97	0-360	200	V

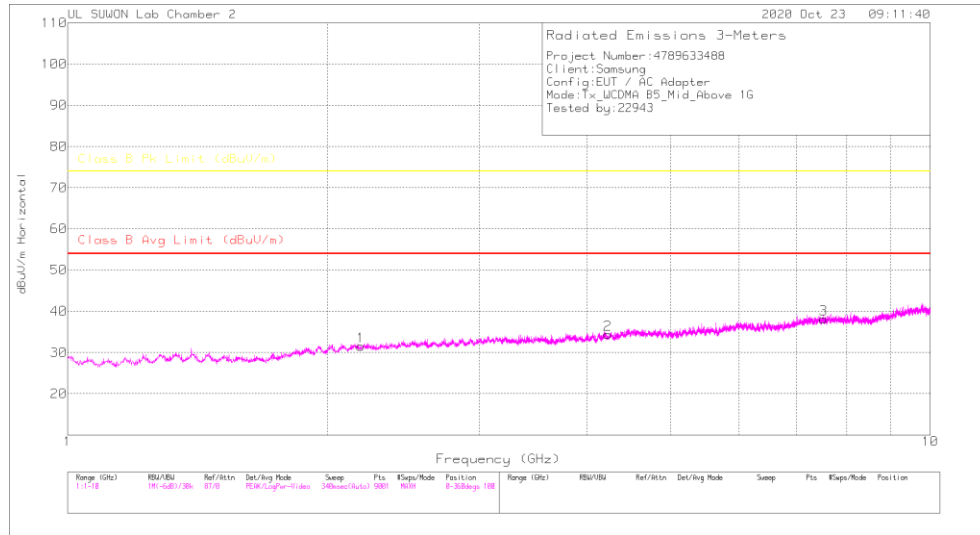
PK – Peak Detector

Note: Unwanted emissions on the harmonic frequency were generated from the call-simulator with the TX and RX signals.

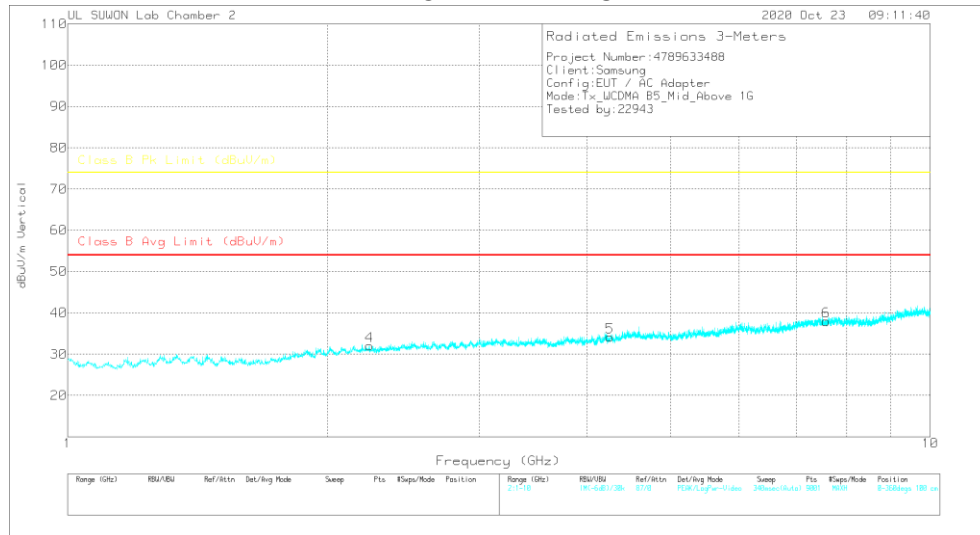
7.2. Above 1 GHz in the WCDMA Band 5

MID CHANNEL(881.6 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



DATA

Trace Markers

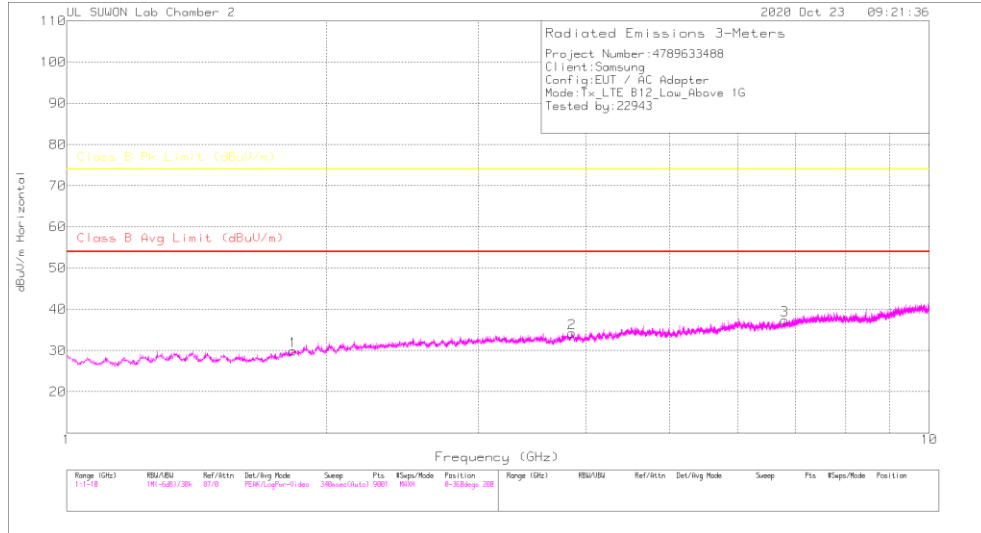
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168724	1-18GHz[dB]	1GHz_HP[dB]	Corrected Reading dBuV/m	Class B Avg Limit (dBuV/m)	Av(CISPR)Margin (dB)	Class B Pk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	2.186	29.67	PK	31.7	-30.5	.7	31.57	-	-	74	-42.43	0-360	200	H
2	4.231	28.58	PK	33.4	-28.1	.5	34.38	-	-	74	-39.62	0-360	100	H
3	7.522	26.17	PK	36	-24.6	.6	38.17	-	-	74	-35.83	0-360	200	H
4	2.238	30.33	PK	31.7	-30.7	.7	32.03	-	-	74	-41.97	0-360	100	V
5	4.254	28.6	PK	33.4	-28.4	.5	34.1	-	-	74	-39.9	0-360	100	V
6	7.573	26.04	PK	36	-24.7	.6	37.94	-	-	74	-36.06	0-360	200	V

PK – Peak Detector

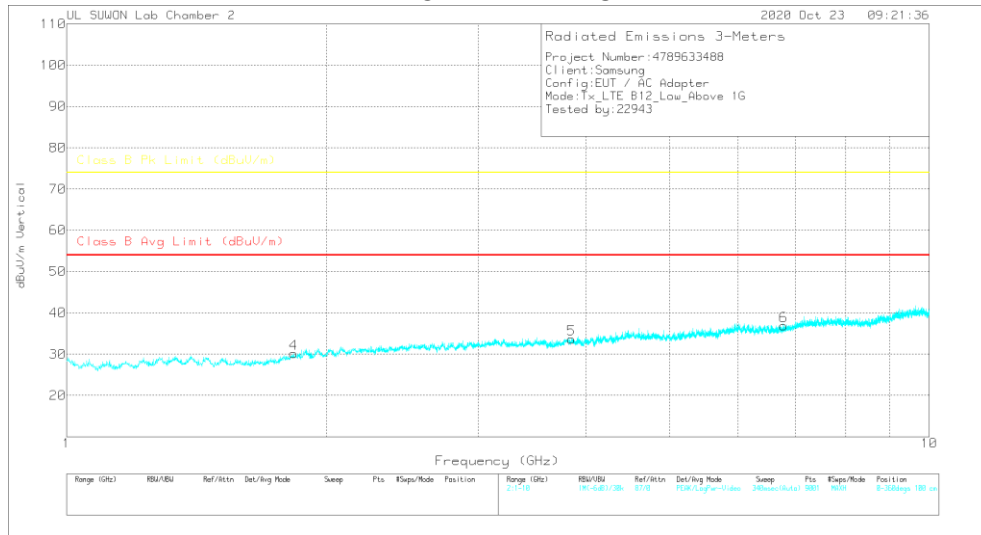
7.3. Above 1 GHz in the LTE Band 12

LOW CHANNEL(730.5 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



DATA

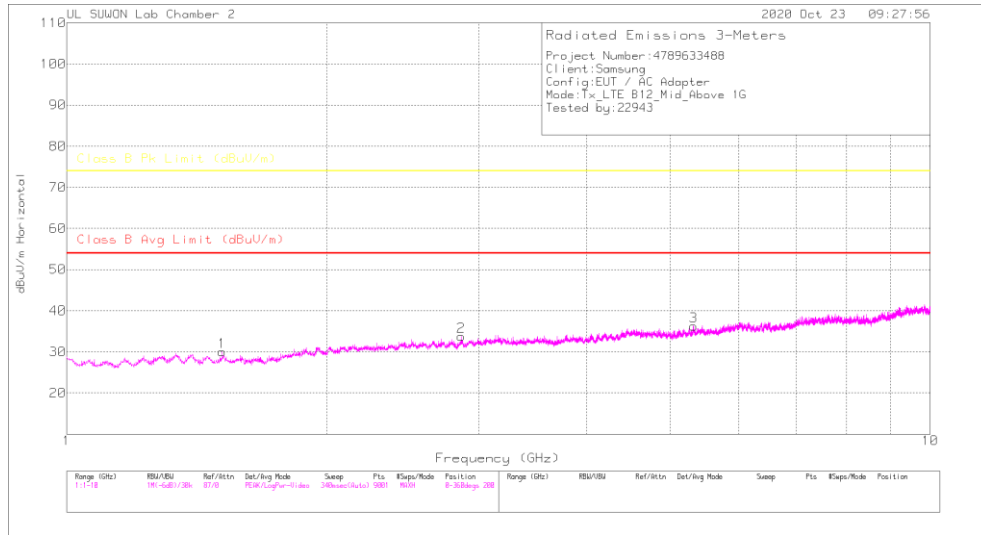
Trace Markers

Marker	Frequency (GHz)	Marker 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	1.83	30.07	PK	30.1	-31	.7	29.87	-	-	74	-44.13	0-360	200	H
2	3.854	29.3	PK	33.4	-28.9	.5	34.3	-	-	74	-39.7	0-360	100	H
3	6.794	26.62	PK	35.7	-25.4	.5	37.42	-	-	74	-36.58	0-360	200	H
4	1.832	30.4	PK	30.1	-31.1	.7	30.1	-	-	74	-43.9	0-360	200	V
5	3.848	28.73	PK	33.4	-29	.5	33.63	-	-	74	-40.37	0-360	100	V
6	6.779	26.18	PK	35.6	-25.4	.5	36.88	-	-	74	-37.12	0-360	200	V

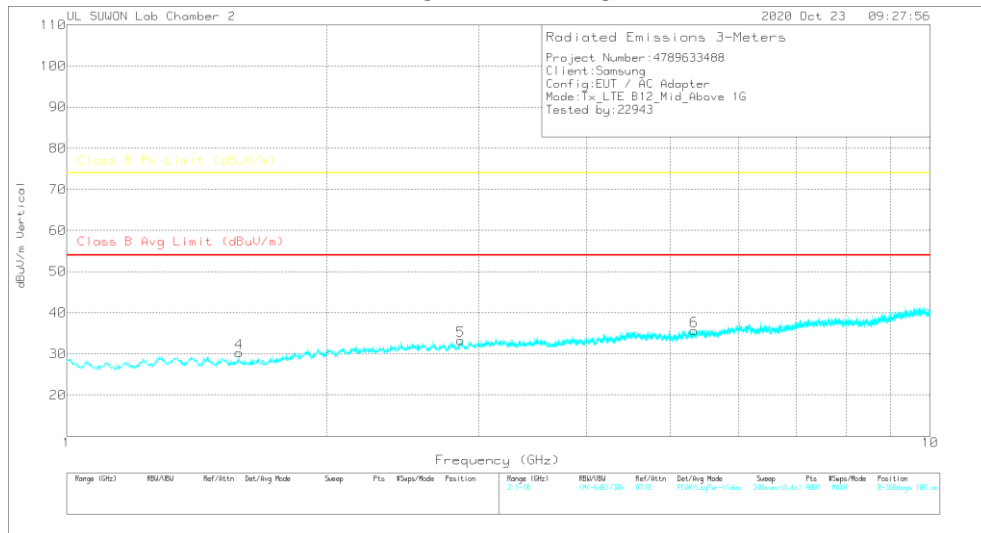
PK – Peak Detector

MID CHANNEL(737.5 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



DATA

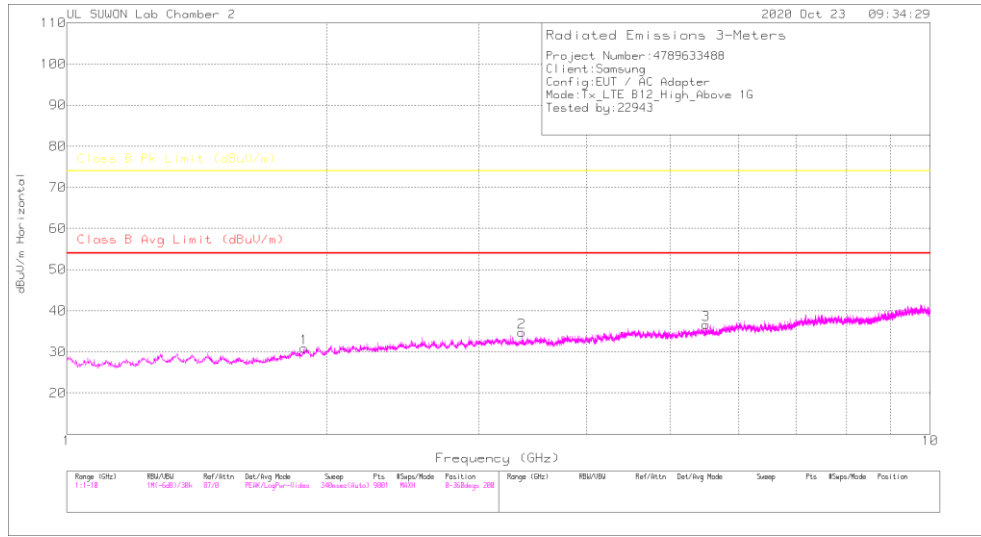
Trace Markers

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(CISPR)Margin (dB)	Class B Pk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.514	31.67	PK	-29	-31.5	.8	29.97	-	-	74	-44.03	0-360	100	H
2	2.865	30.81	PK	-32.2	-29.9	.7	33.81	-	-	74	-40.19	0-360	100	H
3	5.32	29.47	PK	-34.5	-28.2	.5	36.27	-	-	74	-37.73	0-360	100	H
4	1.583	32.39	PK	-28.6	-31.5	.8	30.29	-	-	74	-43.71	0-360	100	V
5	2.86	30.12	PK	-32.2	-29.8	.7	33.22	-	-	74	-40.78	0-360	100	V
6	5.327	28.81	PK	-34.5	-28.2	.5	35.61	-	-	74	-38.39	0-360	200	V

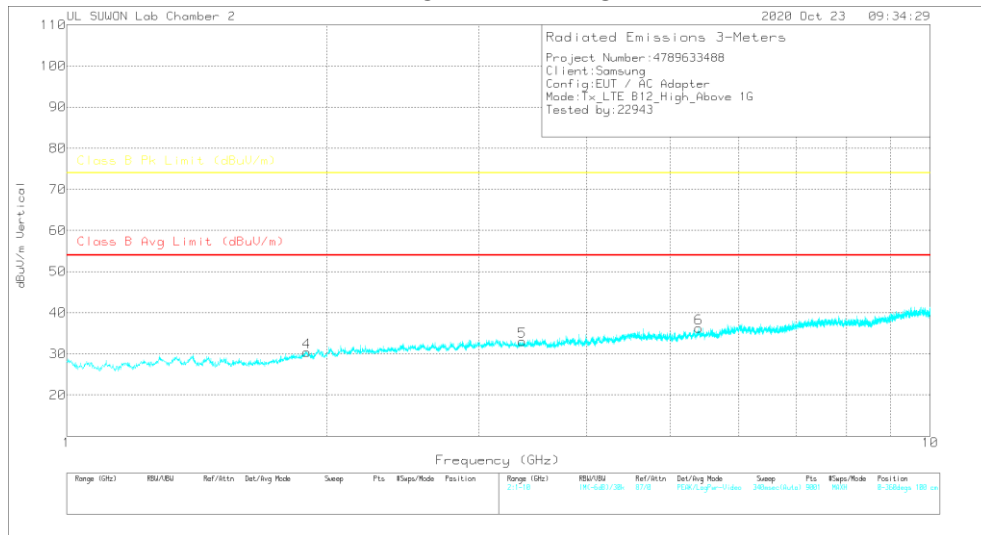
PK – Peak Detector

HIGH CHANNEL(744.5 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



DATA

Trace Markers

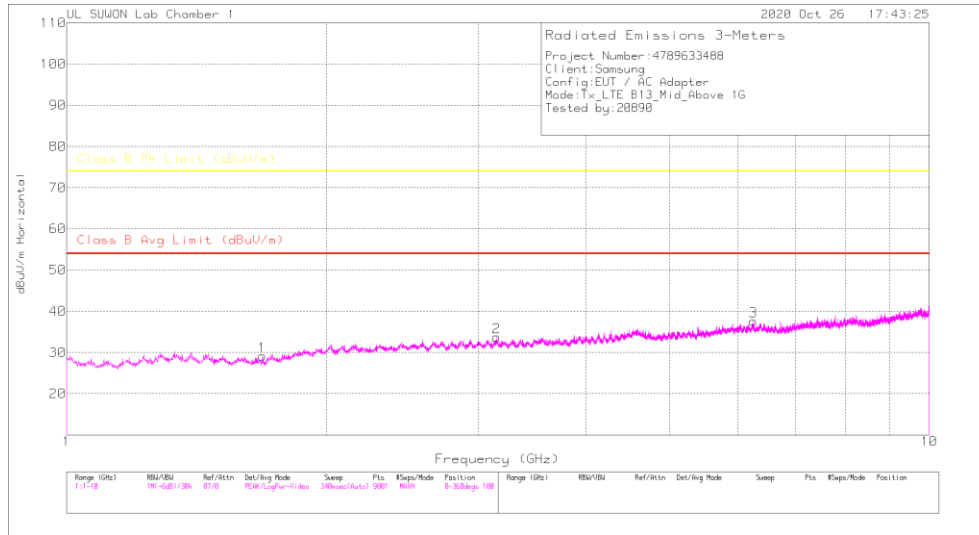
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168724	1-18GHz[dB]	1GHz_HP[dB]	Corrected Reading dBuV/m	Class B Avg Limit (dBuV/m)	Av(CISPR)Margin (dB)	Class B Pk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.884	30.56	PK		-31	.7	30.86	-	-	74	-43.14	0-360	100	H
2	3.365	30.92	PK		-29.6	.7	34.72	-	-	74	-39.28	0-360	200	H
3	5.5	28.97	PK		-27.4	.5	36.57	-	-	74	-37.43	0-360	100	H
4	1.896	29.93	PK		-30.9	.7	30.43	-	-	74	-43.57	0-360	200	V
5	3.368	29.15	PK		-29.5	.7	33.05	-	-	74	-40.95	0-360	200	V
6	5.392	29.11	PK		-27.8	.5	36.31	-	-	74	-37.69	0-360	100	V

PK – Peak Detector

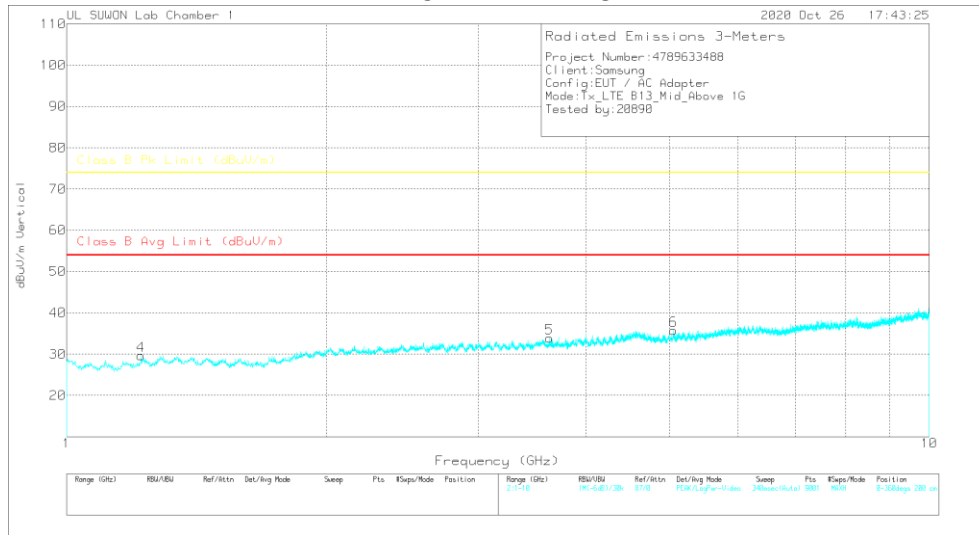
7.4. Above 1 GHz in the LTE Band 13

MID CHANNEL(751.0 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



DATA

Trace Markers

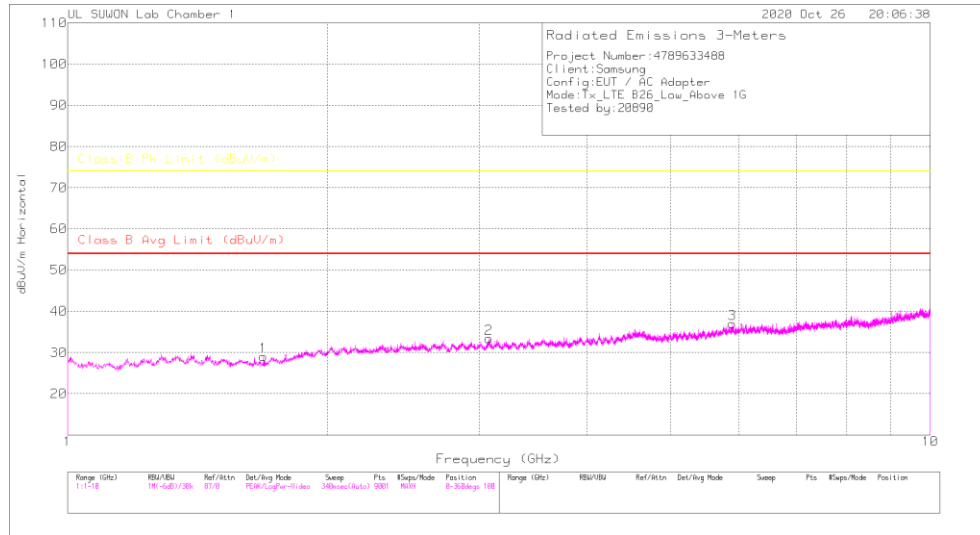
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168717	1-18GHz(dB)	1GHz_HPF	Corrected Reading dBuV/m	Class B Avg Limit (dBuV/m)	Av(CISPR)Margin (dB)	Class B Pk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.687	36.6	PK	28.5	-36.5	.5	29.1	-	-	74	-44.9	0-360	100	H
2	3.153	34.53	PK	32.7	-34.1	.6	33.73	-	-	74	-40.27	0-360	200	H
3	6.258	31.69	PK	35.5	-30.1	.5	37.59	-	-	74	-36.41	0-360	100	H
4	1.22	37.63	PK	28.7	-37.5	.8	29.63	-	-	74	-44.37	0-360	200	V
5	3.628	33.63	PK	33.1	-33.4	.5	33.83	-	-	74	-40.17	0-360	100	V
6	5.052	32.89	PK	34.2	-31.7	.4	35.79	-	-	74	-38.21	0-360	200	V

PK – Peak Detector

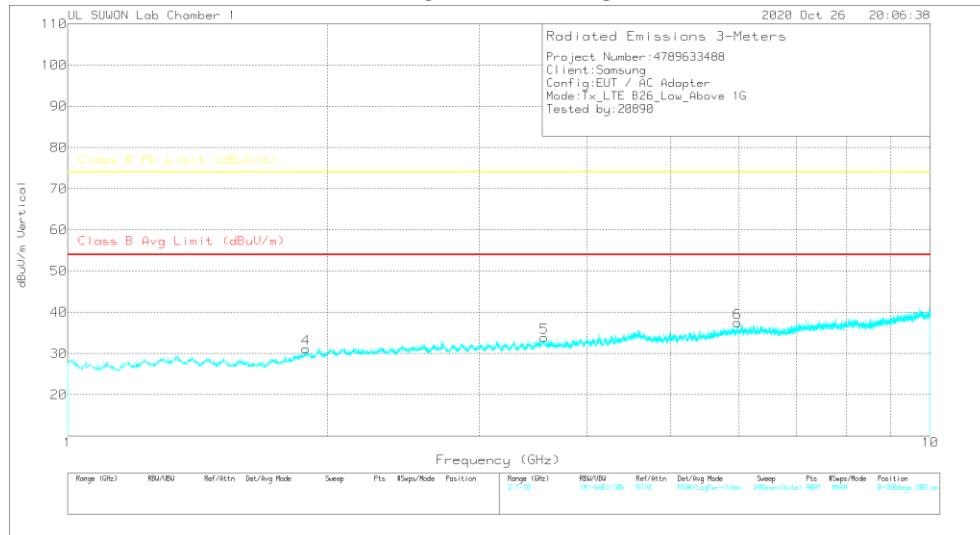
7.5. Above 1 GHz in the LTE Band 26

LOW CHANNEL(860.5 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



DATA

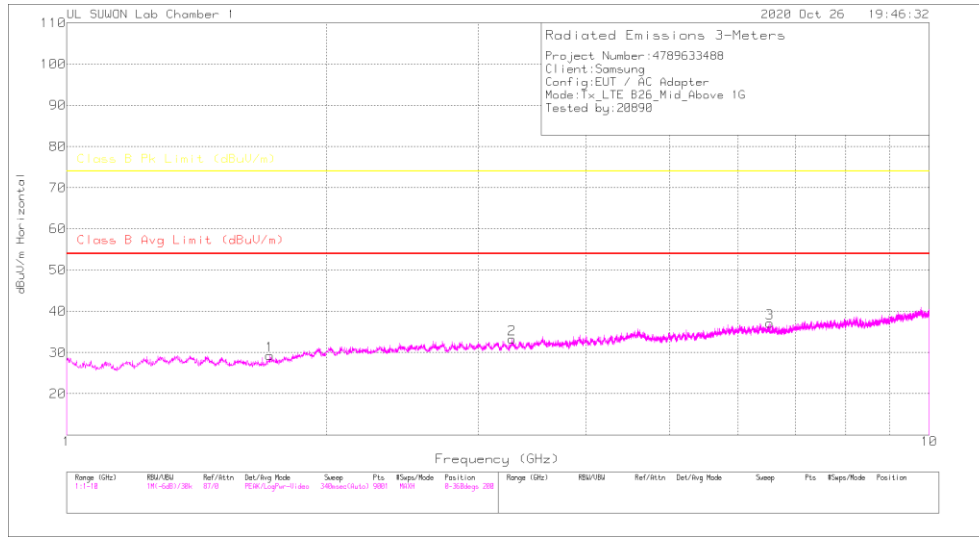
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168717	1-18GHz(dB)	1GHz_HPF	Corrected Reading dBuV/m	Class B Avg Limit (dBu/m)	Av(CISPR)Margin (dB)	Class B Pk Limit (dBu/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.687	36.56	PK	28.5	-36.5	.5	29.06	-	-	74	-44.94	0-360	100	H
2	3.078	34.43	PK	32.5	-34.1	.6	33.43	-	-	74	-40.57	0-360	100	H
3	5.896	32.28	PK	35.1	-30.9	.5	36.98	-	-	74	-37.02	0-360	200	H
4	1.89	35.95	PK	30.6	-36.1	.7	31.15	-	-	74	-42.85	0-360	100	V
5	3.568	33.84	PK	33	-33.5	.5	33.84	-	-	74	-40.16	0-360	100	V
6	5.981	32.71	PK	36.2	-30.8	.4	37.51	-	-	74	-36.49	0-360	100	V

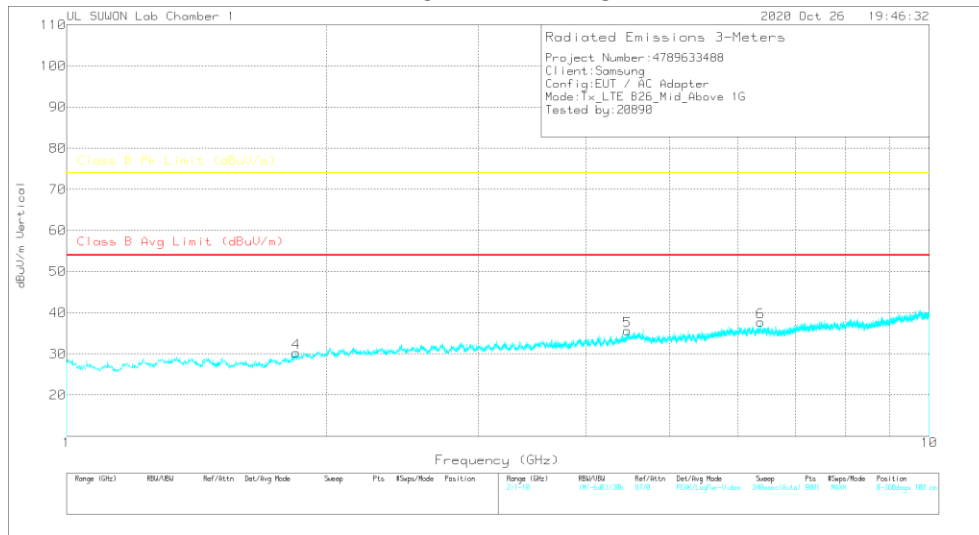
Pk - Peak detector

MID CHANNEL(876.5 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



DATA

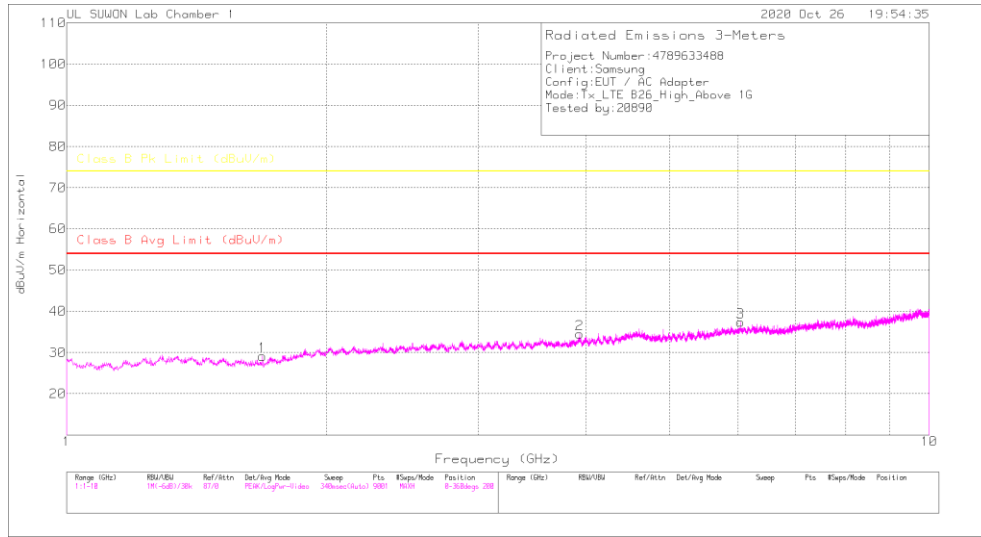
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBu)	Det	3117_00168717	1-18GHz(dB)	1GHz_HPF	Corrected Reading dBu/m	Class B Avg Limit (dBu/m)	Avi(CSPR)Margin (dB)	Class B Pk Limit (dBu/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.72	36.03	PK	28.8	-36.4	.8	29.23	-	-	74	-44.77	0-360	100	H
2	3.284	33.84	PK	32.6	-33.9	.7	33.24	-	-	74	-40.76	0-360	200	H
3	6.53	30.77	PK	35.4	-29.5	.4	37.07	-	-	74	-36.93	0-360	100	H
4	1.846	35.76	PK	30.1	-36.2	.6	30.26	-	-	74	-43.74	0-360	100	V
5	4.464	33.22	PK	34.1	-32.1	.4	35.62	-	-	74	-38.38	0-360	100	V
6	6.371	31.54	PK	35.5	-29.8	.5	37.74	-	-	74	-36.26	0-360	100	V

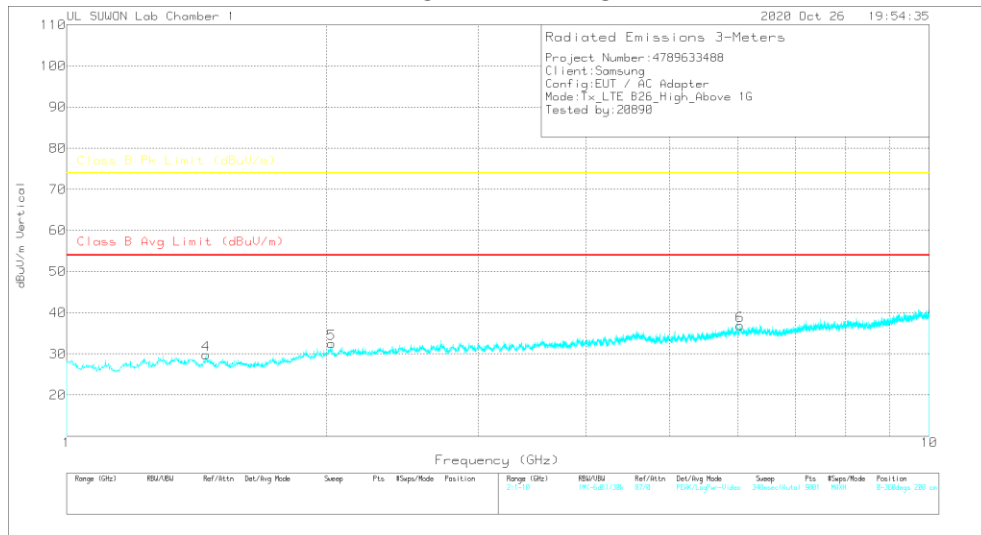
PK – Peak Detector

HIGH CHANNEL(892.5 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



DATA

Trace Markers

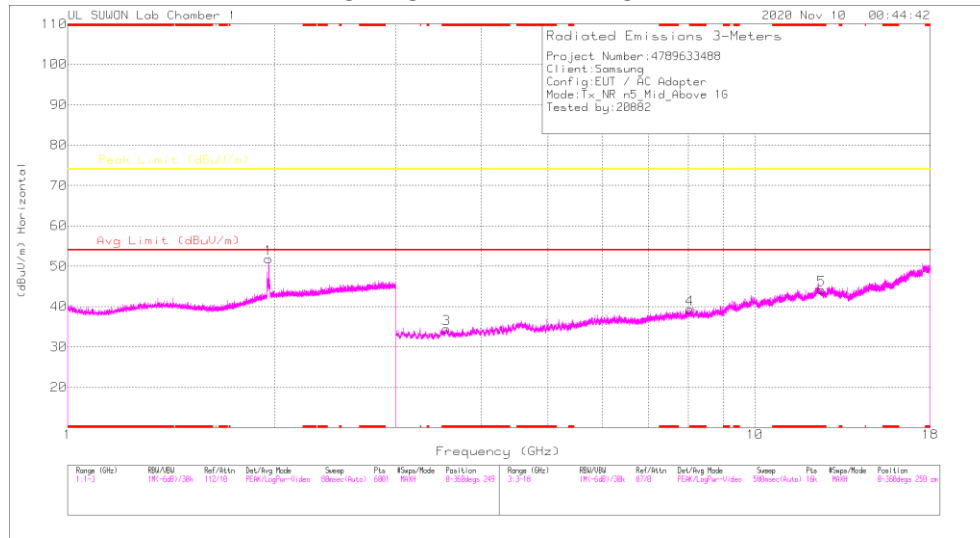
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168717	1-18GHz(dB)	1GHz_HPF	Corrected Reading dBuV/m	Class B Avg Limit (dBuV/m)	Avi(DSPR)Margin (dB)	Class B Pk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.687	36.59	PK	28.5	-36.5	.5	29.09	-	-	74	-44.91	0-360	100	H
2	3.332	33.46	PK	33.4	-32.9	.5	34.46	-	-	74	-39.54	0-360	200	H
3	6.046	32.16	PK	35.3	-30.6	.5	37.36	-	-	74	-36.64	0-360	100	H
4	1.45	36.87	PK	29.2	-37	.7	29.77	-	-	74	-44.23	0-360	100	V
5	2.029	36.34	PK	31.5	-35.9	.6	32.54	-	-	74	-41.46	0-360	200	V
6	6.037	31.68	PK	35.3	-30.6	.5	36.88	-	-	74	-37.12	0-360	100	V

PK – Peak Detector

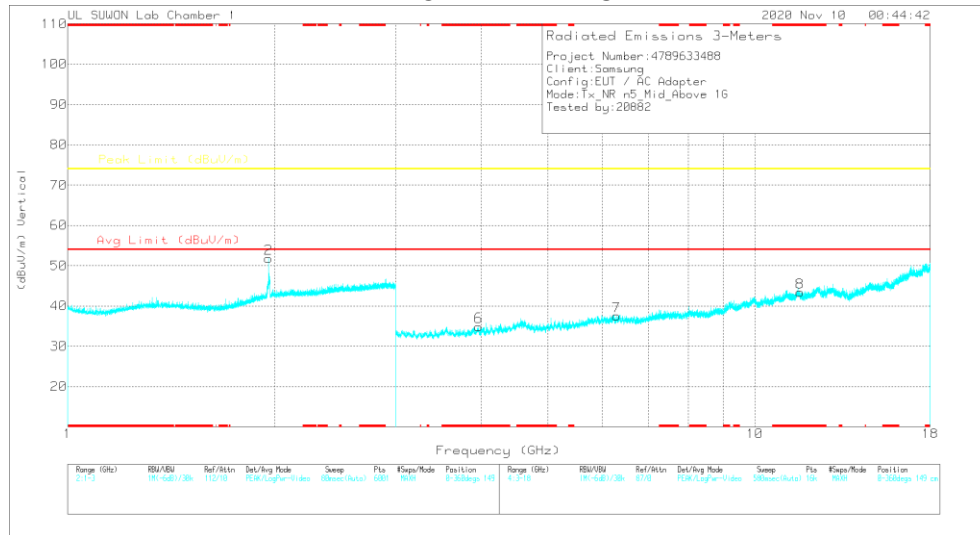
7.6. Above 1 GHz in the 5G NR Band 5

MID CHANNEL(881.5MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168717	10dB_ATT[dB]	1GHz_HP[dB]	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.96	46.19	PK	31.2	-26.2	.6	51.79	-	-	74	-22.21	0-360	150	H
2	1.98033	46.22	PK	31.2	-26.2	.6	51.82	-	-	74	-22.18	0-360	149	V

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168717	3GHz_HP[dB]	1GHz_HP[dB]	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3	* 3.55965	33.16	PK	33	-32.3	.6	34.46	-	-	74	-39.54	0-360	149	H
4	* 8.04156	28.39	PK	36.1	-25.8	.6	39.29	-	-	74	-34.71	0-360	250	H
5	* 12.49628	26.2	PK	38.9	-22	1.1	44.2	-	-	74	-29.8	0-360	149	H
6	* 3.96088	33.31	PK	33.4	-32.3	.5	34.91	-	-	74	-39.09	0-360	149	V
7	6.29511	30.35	PK	35.5	-28.8	.5	37.55	-	-	74	-36.45	0-360	250	V
8	* 11.64508	26.04	PK	38.3	-21.8	.8	43.34	-	-	74	-30.66	0-360	250	V

PK – Peak Detector

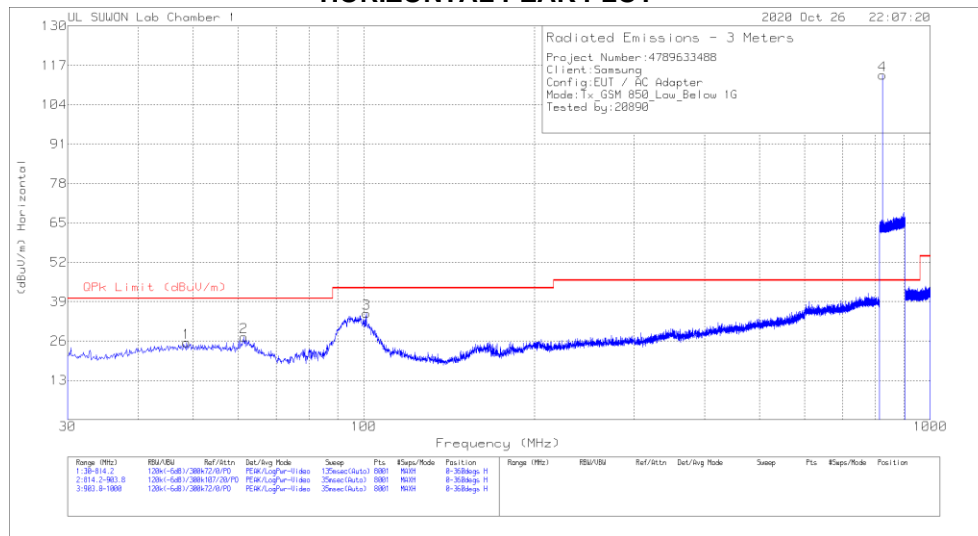
Note1: Unwanted emissions on the harmonic frequency were generated from the call-simulator with the TX and RX signals.

Note2: The signal of marker 1&2 is the LTE signal of the EN-DC combination.

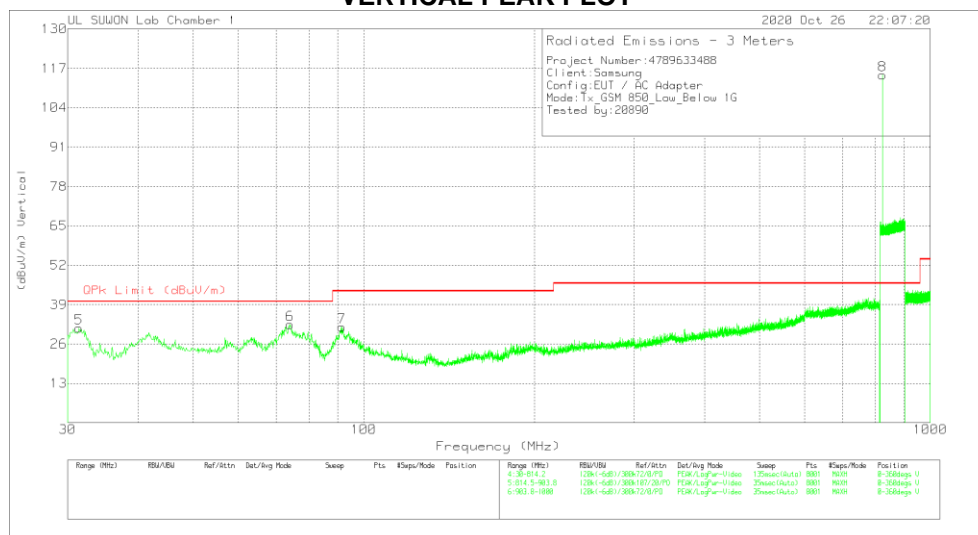
7.7. Below 1 GHz in the GSM850

LOW CHANNEL(869.2 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



DATA

Trace Markers

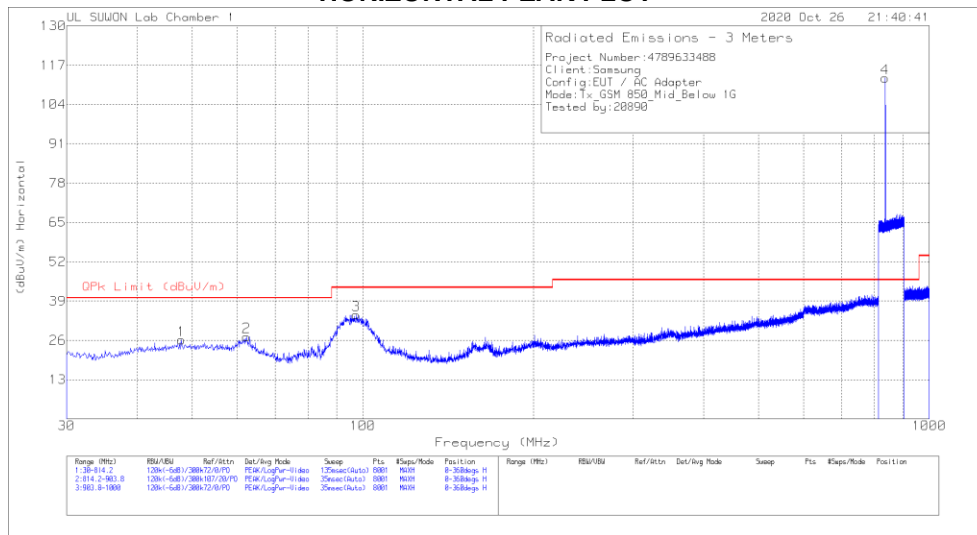
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	VULB9163_750	Below_1G_Bypass [dB]	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	48.6248	3.85	Pk	19.8	1.9	25.55	40	-14.45	0-360	400	H
2	61.466	7.03	Pk	18.3	2	27.33	40	-12.67	0-360	400	H
3	100.9701	14.75	Pk	17.7	2.7	35.15	43.52	-8.37	0-360	300	H
4	824.168	79.06	Pk	27.1	7.6	113.76	46.02	67.74	0-360	200	H
5	31.3724	13.97	Pk	15.7	1.6	31.27	40	-8.73	0-360	100	V
6	74.0132	16.4	Pk	13.7	2.3	32.4	40	-7.6	0-360	100	V
7	91.3637	13.04	Pk	16	2.5	31.54	43.52	-11.98	0-360	100	V
8	824.2006	80.06	Pk	27.1	7.6	114.76	46.02	68.74	0-360	100	V

Pk - Peak detector

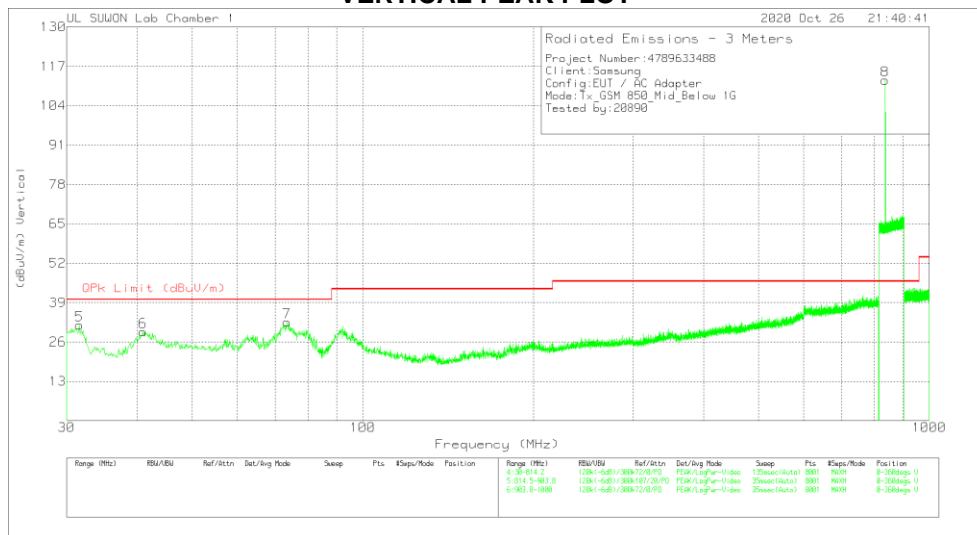
Note: Unwanted emissions captured from 824MHz to 849MHz and from 869MHz to 894MHz were the TX and RX signals generated from the call-simulator.

MID CHANNEL(881.6 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



DATA

Trace Markers

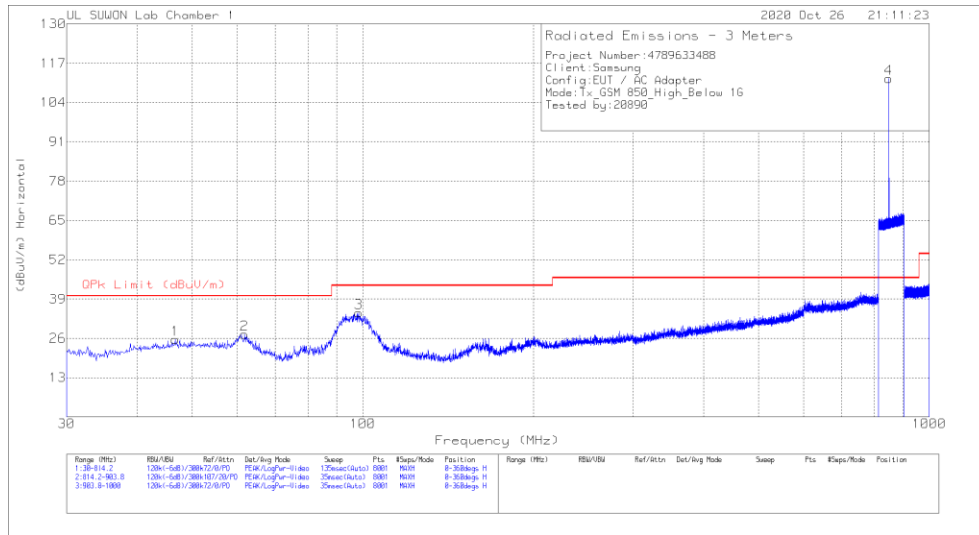
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	VULB9163_750	Below_1G_Bypass [dB]	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	47.8406	4.35	Pk	19.9	1.9	26.15	40	-13.85	0-360	200	H
2	62.3483	7.16	Pk	18	2.1	27.26	40	-12.74	0-360	300	H
3	97.3432	14.72	Pk	17.2	2.5	34.42	43.52	-9.1	0-360	300	H
4	836.5328	78.09	Pk	27.1	7.6	112.79	46.02	66.77	0-360	100	H
5	31.5684	14.57	Pk	15.6	1.4	31.57	40	-8.43	0-360	100	V
6	40.8808	8.61	Pk	18.9	1.8	29.31	40	-10.69	0-360	100	V
7	73.4251	16.37	Pk	14	2.2	32.57	40	-7.43	0-360	100	V
8	836.6027	77.74	Pk	27.1	7.6	112.44	46.02	66.42	0-360	200	V

Pk - Peak detector

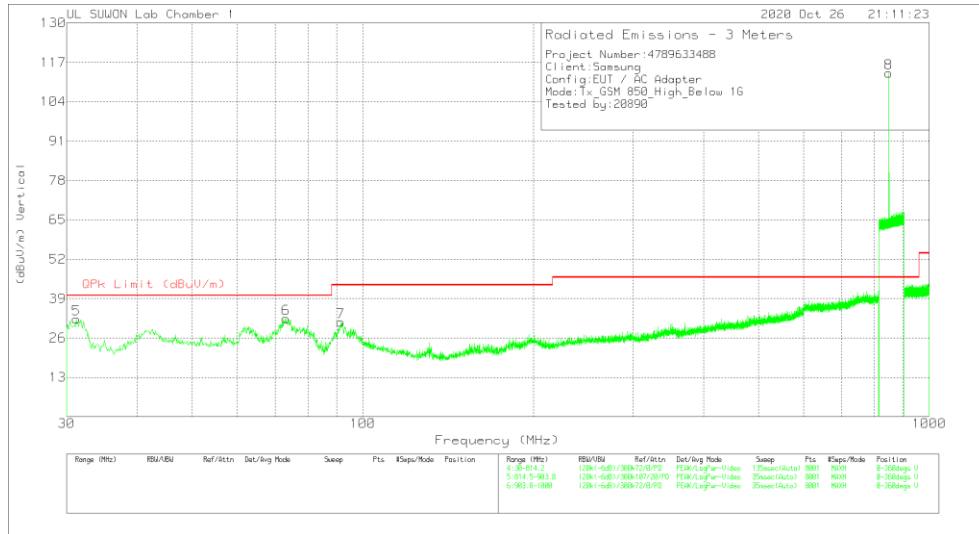
Note: Unwanted emissions captured from 824MHz to 849MHz and from 869MHz to 894MHz were the TX and RX signals generated from the call-simulator.

HIGH CHANNEL(893.8 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



DATA

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	VULB9163_750	Below_1G_Bypass [dB]	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	46.6643	3.8	Pk	19.9	1.9	25.6	40	-14.4	0-360	400	H
2	61.8581	7.32	Pk	18.1	2	27.42	40	-12.58	0-360	400	H
3	98.3234	14.56	Pk	17.3	2.6	34.46	43.52	-9.06	0-360	300	H
4	848.7408	76.88	Pk	27.4	7.7	111.98	46.02	65.96	0-360	100	H
5	31.1763	15.37	Pk	15.7	1.2	32.27	40	-7.73	0-360	100	V
6	73.131	16.02	Pk	14.1	2.3	32.42	40	-7.58	0-360	100	V
7	91.4617	12.8	Pk	16	2.5	31.3	43.52	-12.22	0-360	100	V
8	848.8039	78.37	Pk	27.4	7.6	113.37	46.02	67.35	0-360	100	V

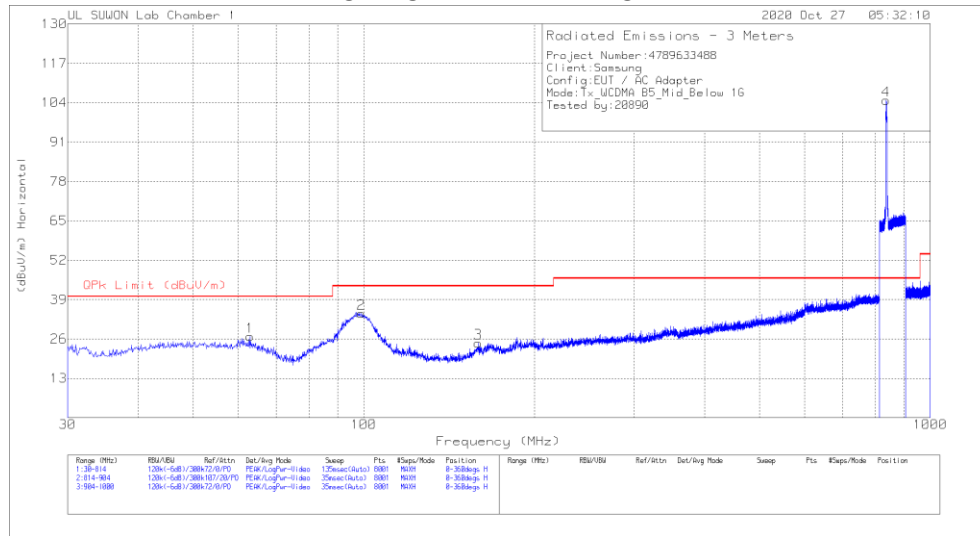
Pk - Peak detector

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

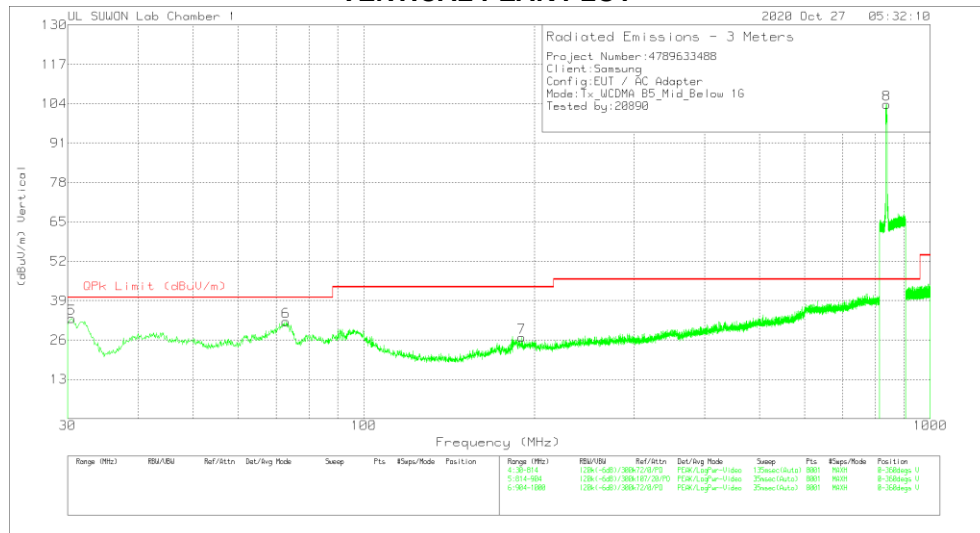
7.8. Below 1 GHz in the WCDMA Band 5

MID CHANNEL(881.6 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



DATA

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	VULB9163_750	Below_1G_Bypass [dB]	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	62.928	6.97	Pk	17.8	2	26.77	40	-13.23	0-360	400	H
2	98.894	14.44	Pk	17.4	2.7	34.54	43.52	-8.98	0-360	300	H
3	159.262	7.22	Pk	14.2	3.3	24.72	43.52	-18.8	0-360	200	H
4	835.7125	70.22	Pk	27	7.6	104.82	46.02	58.8	0-360	100	H
5	30.49	15.81	Pk	15.9	1.4	33.11	40	-6.89	0-360	100	V
6	72.924	15.63	Pk	14.2	2.2	32.03	40	-7.97	0-360	100	V
7	189.936	6.8	Pk	16.5	3.6	26.9	43.52	-16.62	0-360	100	V
8	838.1425	69.08	Pk	27.1	7.6	103.78	46.02	57.76	0-360	100	V

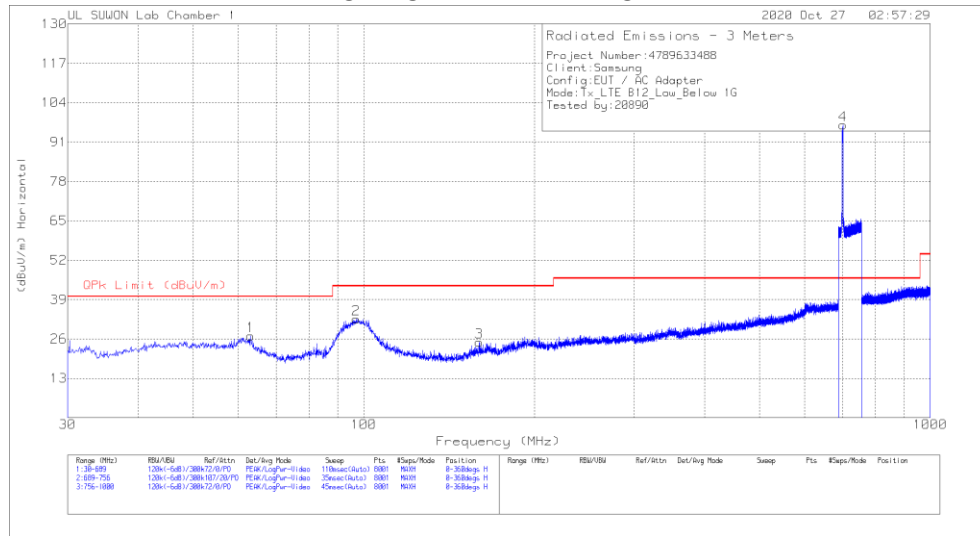
Pk - Peak detector

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

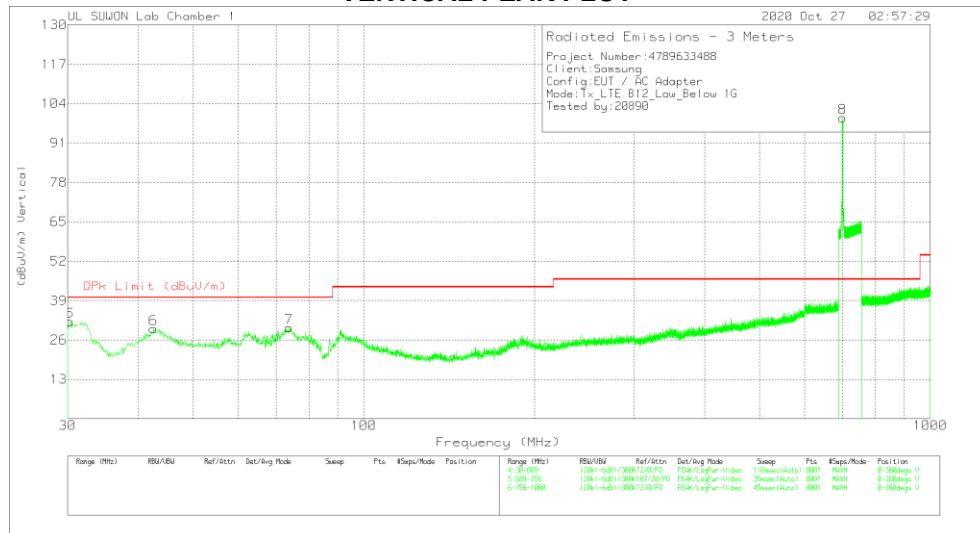
7.9. Below 1 GHz in the LTE Band 12

LOW CHANNEL(730.5 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



DATA

Trace Markers

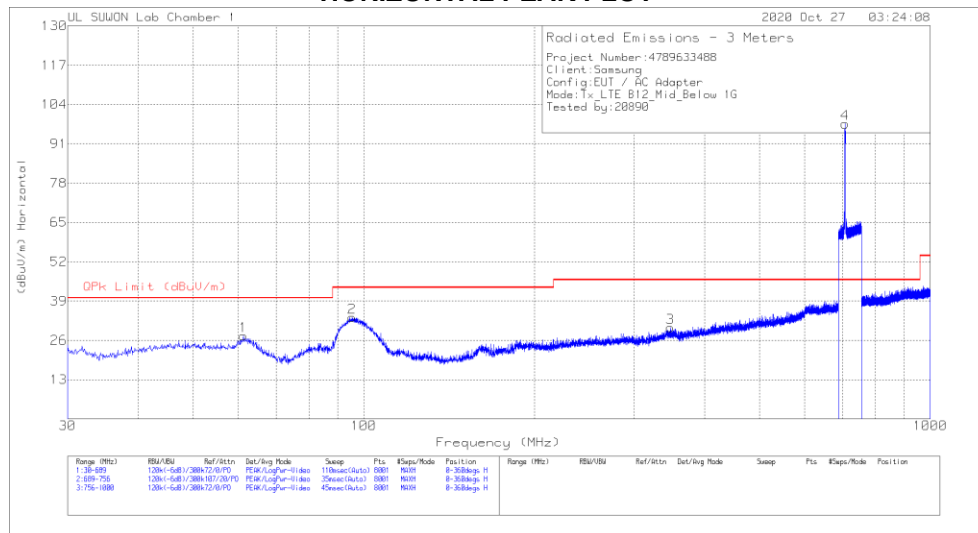
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	VULB9163_750	Below_1G_Bypass [dB]	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	63.1148	7.09	Pk	17.8	2.2	27.09	40	-12.91	0-360	400	H
2	96.8885	12.87	Pk	17.1	2.7	32.67	43.52	-10.85	0-360	300	H
3	159.9054	7.2	Pk	14.3	3.4	24.9	43.52	-18.62	0-360	200	H
4	701.0684	64.18	Pk	25.6	6.9	96.68	46.02	50.66	0-360	100	H
5	30.3295	14.57	Pk	15.9	1.6	32.07	40	-7.93	0-360	100	V
6	42.521	8.69	Pk	19.2	1.8	29.69	40	-10.31	0-360	100	V
7	73.8235	14.02	Pk	13.8	2.2	30.02	40	-9.98	0-360	100	V
8	700.5324	66.87	Pk	25.6	6.9	99.37	46.02	53.35	0-360	100	V

Pk - Peak detector

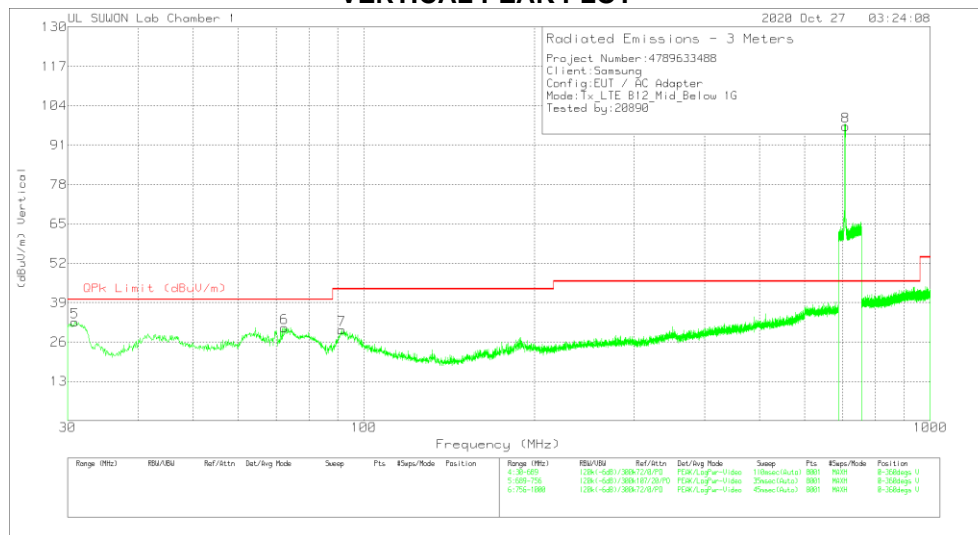
Note: Unwanted emissions captured from 699MHz to 716MHz and from 729MHz to 746MHz were the TX and RX signals generated from the call-simulator.

MID CHANNEL(737.5 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



DATA

Trace Markers

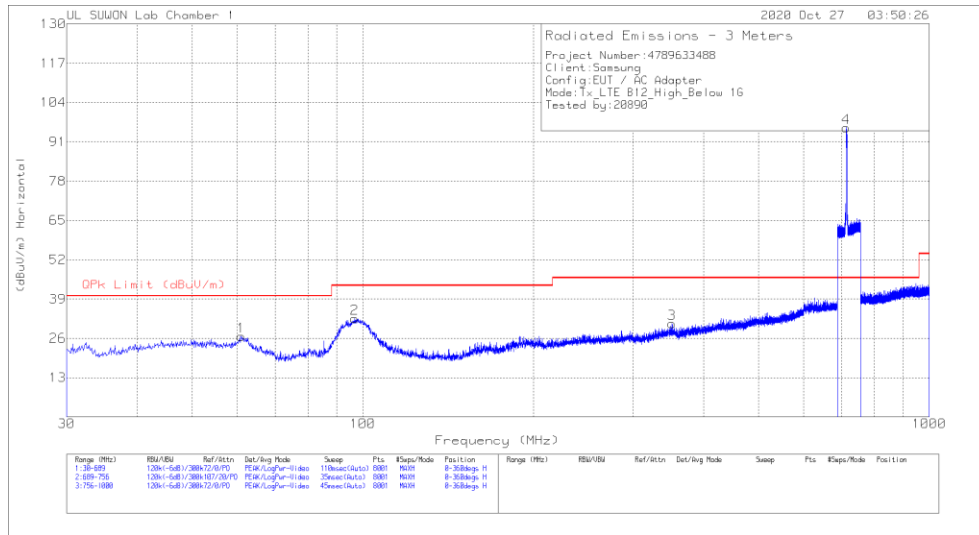
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	VULB9163_750	Below_1G_Bypass [dB]	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	61.3025	7.26	Pk	18.3	2	27.56	40	-12.44	0-360	400	H
2	95.4058	14.07	Pk	16.7	2.8	33.57	43.52	-9.95	0-360	300	H
3	347.5556	4.5	Pk	20.9	4.9	30.3	46.02	-15.72	0-360	400	H
4	706.9476	65	Pk	25.6	7	97.6	46.02	51.58	0-360	100	H
5	30.9061	15.61	Pk	15.7	1.3	32.61	40	-7.39	0-360	100	V
6	72.4231	14.08	Pk	14.4	2.2	30.68	40	-9.32	0-360	100	V
7	91.3694	11.52	Pk	16	2.5	30.02	43.52	-13.5	0-360	100	V
8	708.4049	64.45	Pk	25.7	7	97.15	46.02	51.13	0-360	100	V

Pk - Peak detector

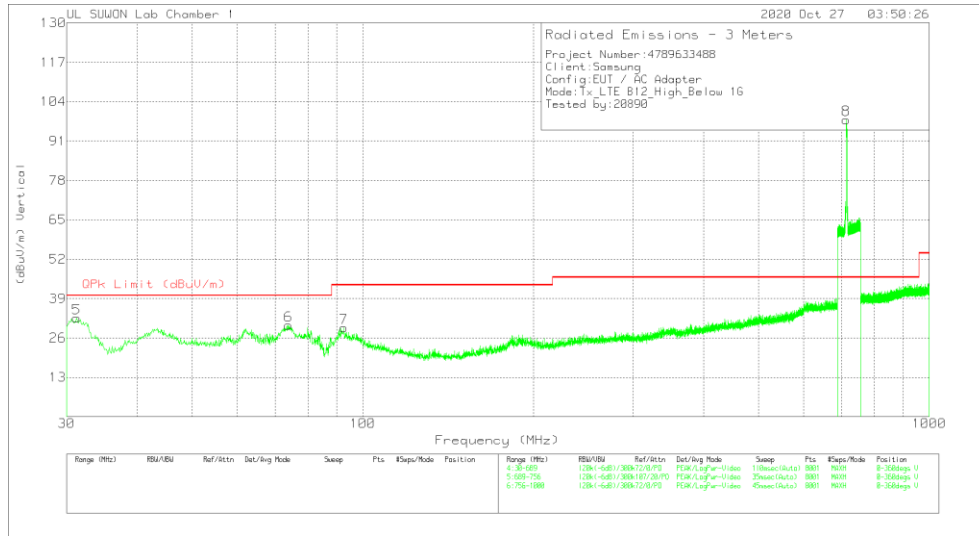
Note: Unwanted emissions captured from 699MHz to 716MHz and from 729MHz to 746MHz were the TX and RX signals generated from the call-simulator.

HIGH CHANNEL(744.5 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



DATA

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	VULB9163_750	Below_1G_Bypass [dB]	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	60.973	6.22	Pk	18.4	2.1	26.72	40	-13.28	0-360	400	H
2	96.7238	12.99	Pk	17	2.6	32.59	43.52	-10.93	0-360	300	H
3	351.6744	4.84	Pk	21	5	30.84	46.02	-15.18	0-360	100	H
4	713.6393	62.91	Pk	25.7	7.1	95.71	46.02	49.69	0-360	100	H
5	31.2356	15.49	Pk	15.7	1.4	32.59	40	-7.41	0-360	100	V
6	73.9059	14.27	Pk	13.7	2.2	30.17	40	-9.83	0-360	100	V
7	92.605	10.76	Pk	16.2	2.4	29.36	43.52	-14.16	0-360	100	V
8	713.8654	65.4	Pk	25.7	7	98.1	46.02	52.08	0-360	100	V

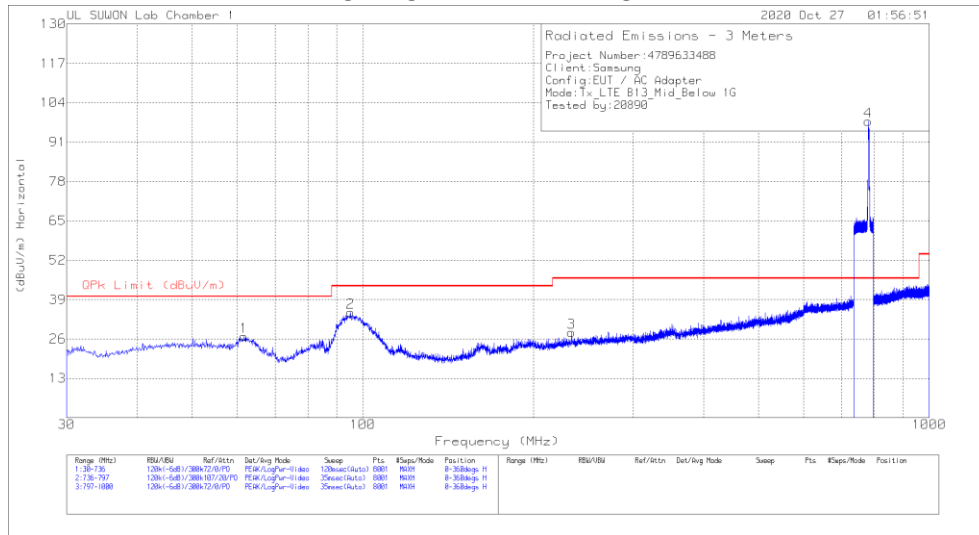
Pk - Peak detector

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

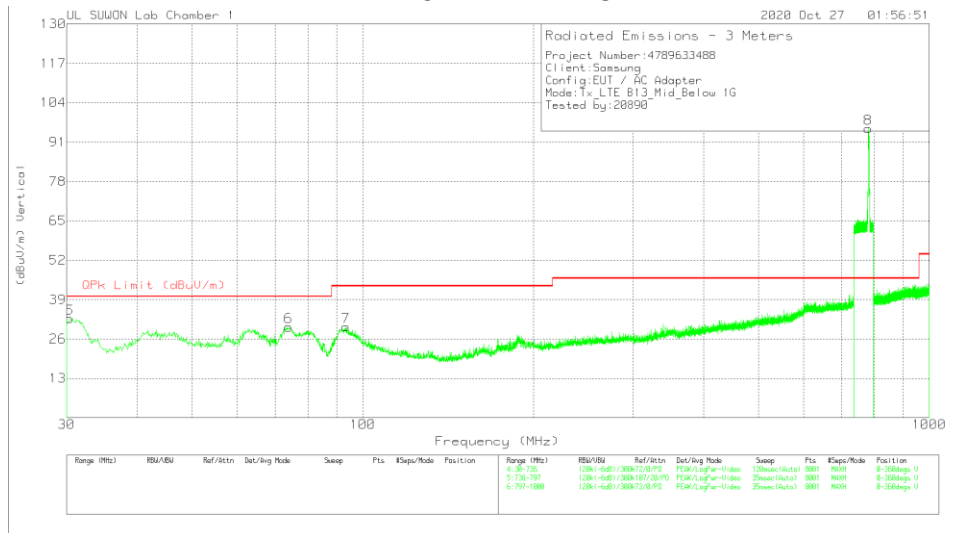
7.10. Below 1 GHz in the LTE Band 13

MID CHANNEL(751.0 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



DATA

Trace Markers

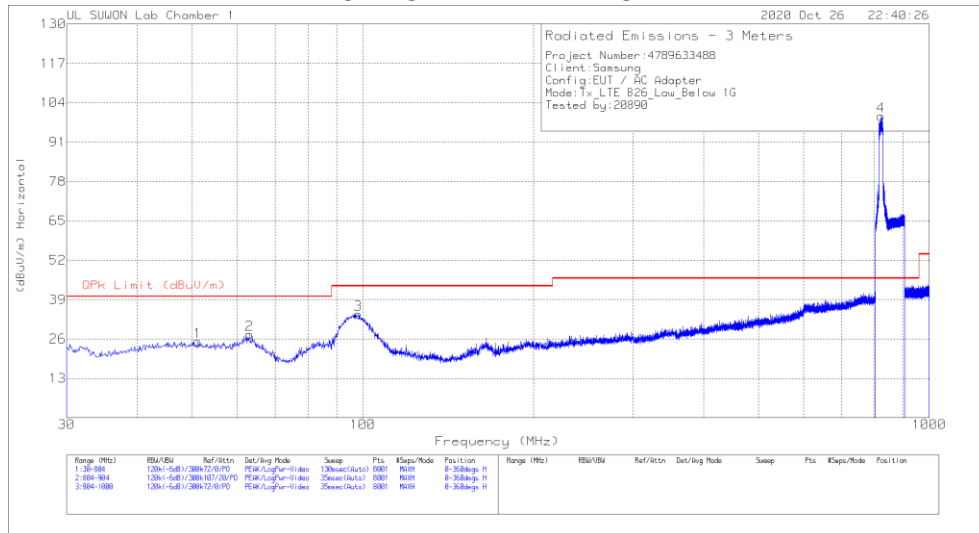
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	VULB9163_750	Below_1G_Bypass [dB]	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	61.6818	6.61	Pk	18.2	2.1	26.91	40	-13.09	0-360	400	H
2	95.0403	15.53	Pk	16.6	2.7	34.83	43.52	-8.69	0-360	300	H
3	233.681	6.21	Pk	17.8	4.2	28.21	46.02	-17.81	0-360	200	H
4	780.0039	63.77	Pk	26.7	7.3	97.77	46.02	51.75	0-360	100	H
5	30.353	15.27	Pk	15.9	1.6	32.77	40	-7.23	0-360	100	V
6	73.9485	14.08	Pk	13.7	2.2	29.98	40	-10.02	0-360	100	V
7	93.4518	11.23	Pk	16.3	2.6	30.13	43.52	-13.39	0-360	100	V
8	779.8895	61.5	Pk	26.7	7.3	95.5	46.02	49.48	0-360	100	V

Pk - Peak detector

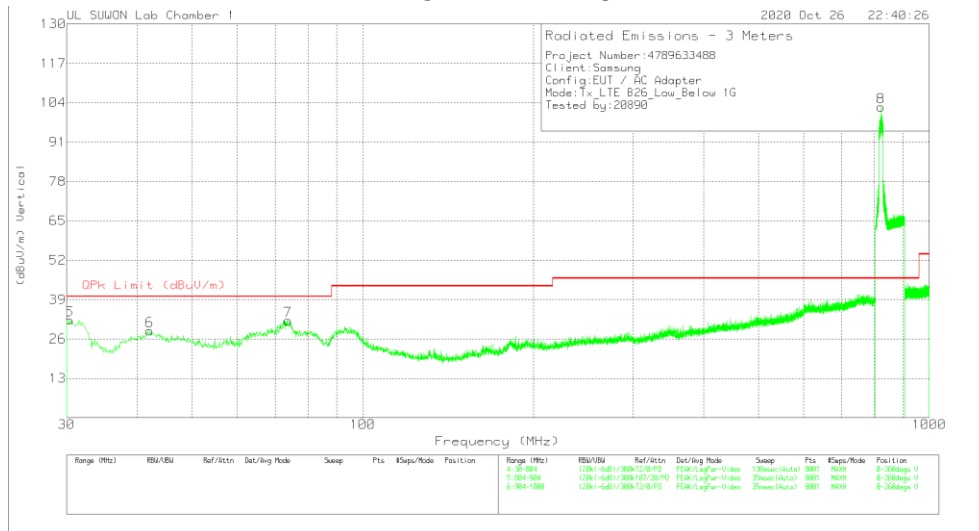
7.11. Below 1 GHz in the LTE Band 26

LOW CHANNEL(860.5 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



DATA

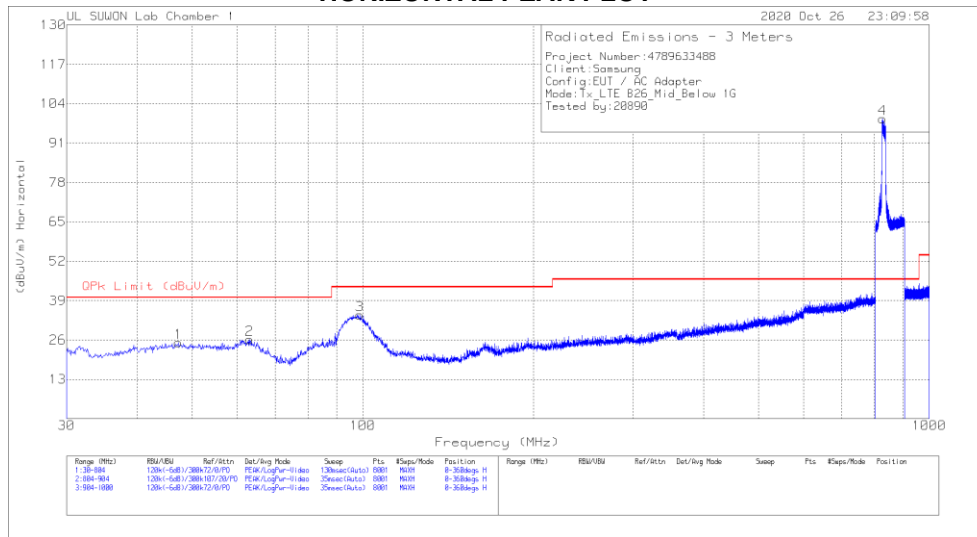
Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	VULB9163_750	Below_1G_Bypass [dB]	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	51.0915	3.29	Pk	19.8	2.1	25.19	40	-14.81	0-360	100	H
2	63.0885	7.54	Pk	17.8	2.2	27.54	40	-12.46	0-360	400	H
3	98.2088	14.14	Pk	17.3	2.7	34.14	43.52	-9.38	0-360	300	H
4	821.45	64.93	Pk	27.1	7.5	99.53	46.02	53.51	0-360	100	H
5	30.387	14.6	Pk	15.9	1.7	32.2	40	-7.8	0-360	100	V
6	41.997	7.87	Pk	19.1	1.8	28.77	40	-11.23	0-360	100	V
7	73.731	16.17	Pk	13.8	2.2	32.17	40	-7.83	0-360	100	V
8	822.6875	67.92	Pk	27.1	7.6	102.62	46.02	56.6	0-360	100	V

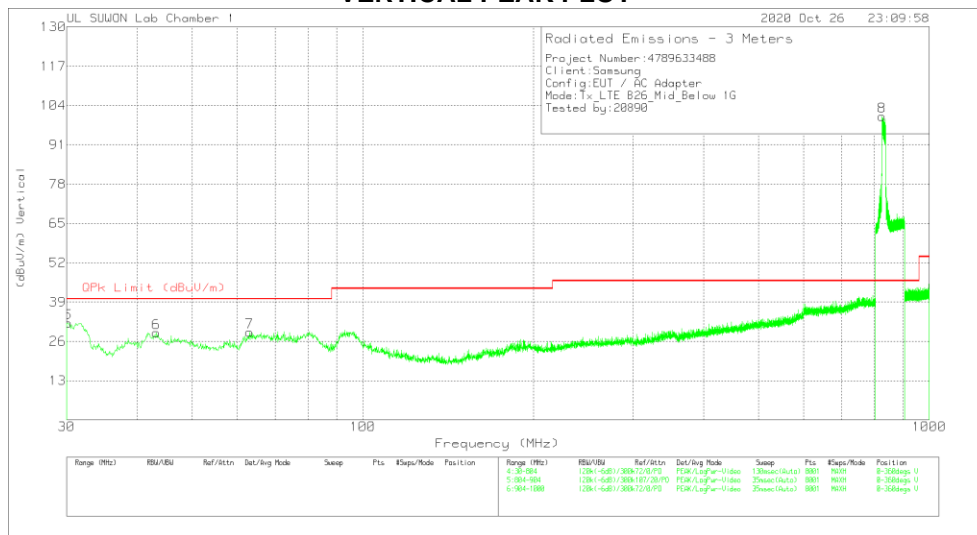
Pk - Peak detector

MID CHANNEL(876.5 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



DATA

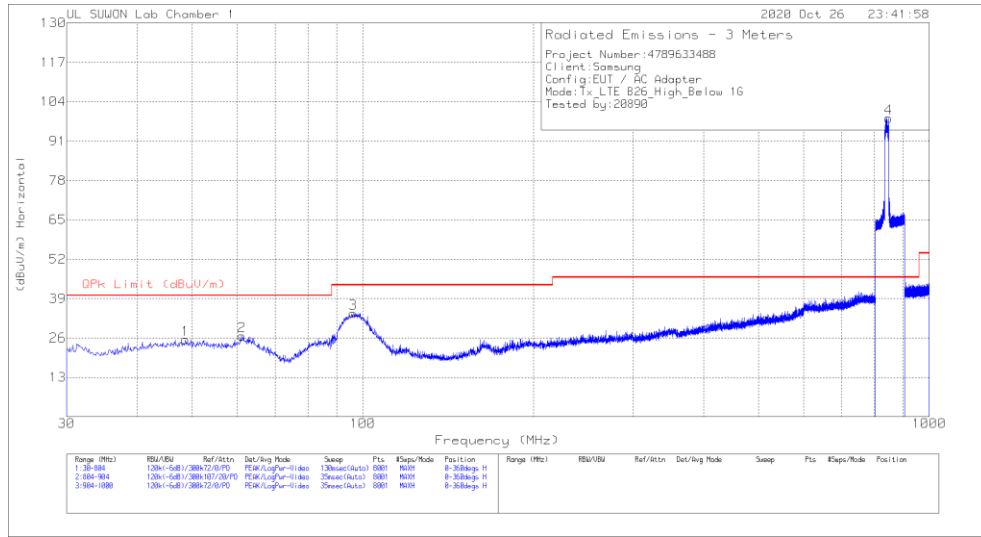
Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	VULB9163_750	Below_1G_Bypass [dB]	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	47.2215	3.28	Pk	19.9	1.9	25.08	40	-14.92	0-360	400	H
2	63.0885	6.15	Pk	17.8	2.2	26.15	40	-13.85	0-360	300	H
3	98.7893	14.26	PK	17.4	2.7	34.36	43.52	-9.16	0-360	300	H
4	827.1375	64.4	Pk	27.1	7.5	99	46.02	52.98	0-360	200	H
5	30.1935	14.66	Pk	15.9	1.5	32.06	40	-7.94	0-360	100	V
6	43.158	7.73	Pk	19.3	1.9	28.93	40	-11.07	0-360	100	V
7	63.0885	9.08	Pk	17.8	2.2	29.08	40	-10.92	0-360	100	V
8	824.9125	65.79	PK	27.1	7.5	100.39	46.02	54.37	0-360	100	V

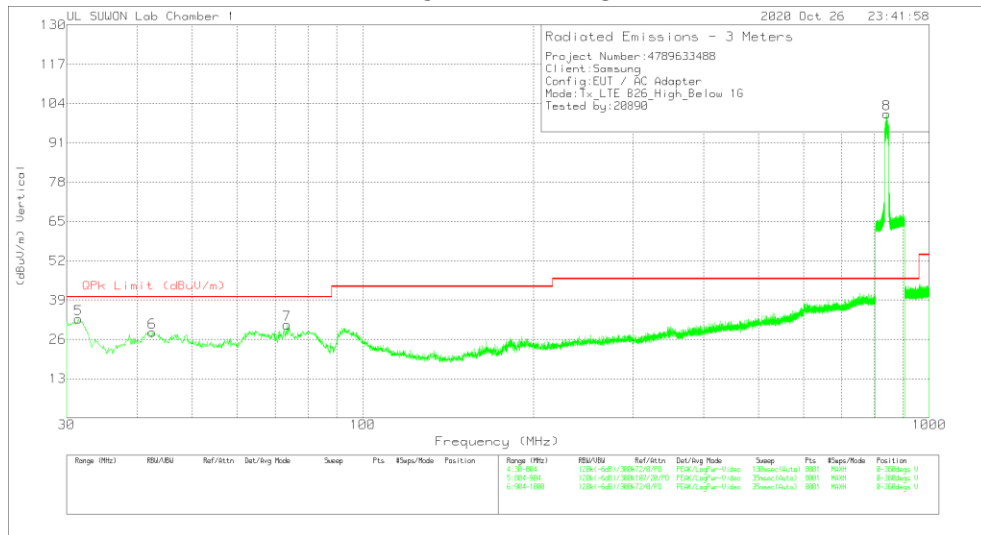
Pk - Peak detector

HIGH CHANNEL(892.5 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



DATA

Trace Markers

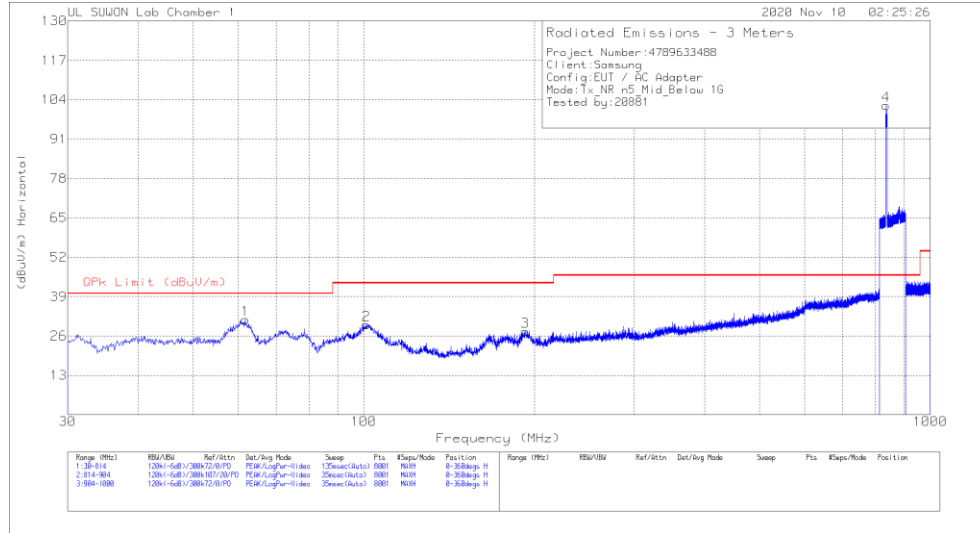
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	VULB9163_750	Below_1G_Bypass [dB]	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	48.6728	3.61	Pk	19.8	2	25.41	40	-14.59	0-360	400	H
2	61.1535	6.25	Pk	18.4	2	26.65	40	-13.35	0-360	300	H
3	96.0803	14.73	PK	16.8	2.6	34.13	43.52	-9.39	0-360	300	H
4	847.5625	63.51	Pk	27.4	7.6	98.51	46.02	52.49	0-360	200	H
5	31.4513	15.55	Pk	15.7	1.5	32.75	40	-7.25	0-360	100	V
6	42.4808	7.35	Pk	19.2	1.8	28.35	40	-11.65	0-360	200	V
7	73.5375	14.73	Pk	13.9	2.2	30.83	40	-9.17	0-360	100	V
8	841.5375	65.67	Pk	27.2	7.7	100.57	46.02	54.55	0-360	100	V

Pk - Peak detector

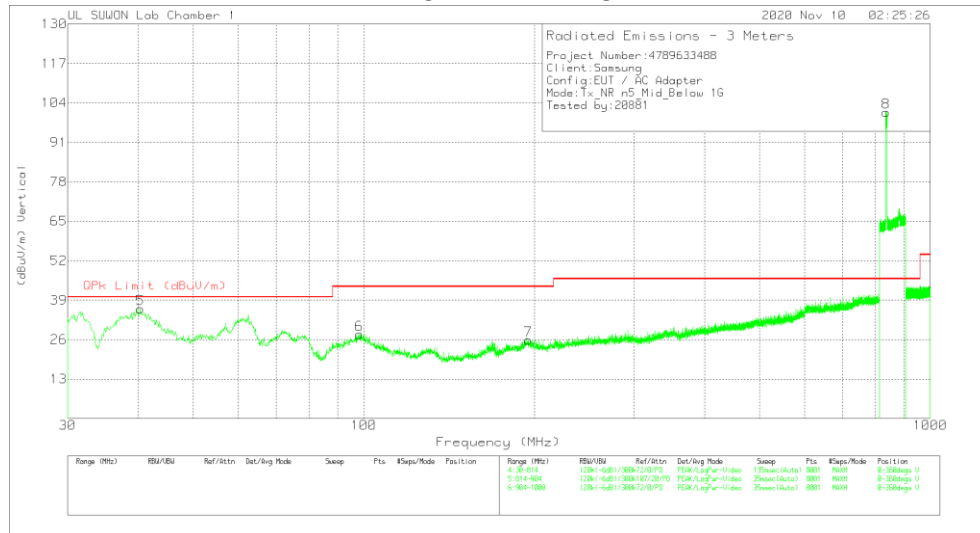
7.12. Below 1 GHz in the 5G NR Band 5

MID CHANNEL(881.6MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



DATA

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	VULB9163_750	Below_1G_Bypass [dB]	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	61.752	11.23	Pk	18.2	2	31.43	40	-8.57	0-360	400	H
2	101.148	9.21	Pk	17.7	2.8	29.71	43.52	-13.81	0-360	300	H
3	192.778	6.87	Pk	17	3.7	27.57	43.52	-15.95	0-360	100	H
4	835.51	67.44	Pk	27	7.7	102.14	46.02	56.12	0-360	300	H
5	40.29	15.59	Pk	18.8	1.7	36.09	40	-3.91	0-360	100	V
6	98.208	7.75	Pk	17.3	2.7	27.75	43.52	-15.77	0-360	100	V
7	195.032	4.67	Pk	17.4	3.7	25.77	43.52	-17.75	0-360	200	V
8	836.6013	66.24	Pk	27.1	7.6	100.94	46.02	54.92	0-360	100	V

Pk - Peak detector

Radiated Emissions

Frequency (MHz)	Meter Reading (dBuV)	Det	VULB9163_750	Below_1G_Bypass [dB]	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
40.29	10.88	Qp	18.8	1.7	31.38	40	-8.62	330	102	V

Qp - Quasi-Peak detector

END OF TEST REPORT