CERTIFICATION TEST REPORT

Report Number. : 4789468331-E1V2

Applicant	:	SAMSUNG ELECTRONICS CO., LTD. 129 SAMSUNG-RO, YEONGTONG-GU, SUWON-SI, GYEONGGI-DO, 16677, KOREA
Model	:	SM-N986B/DS, SM-N986B
FCC ID	:	A3LSMN986B
EUT Description	:	GSM/WCDMA/LTE 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:
June 29, 2020

Prepared by:
UL Korea, Ltd.
26th floor, 152, Teheran-ro, Gangnam-gu Seoul, 06236, Korea

Suwon Test Site: UL Korea, Ltd. Suwon Laboratory
218 Maeyeong-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 16675, Korea
TEL: (031) 337-9902
FAX: (031) 213-5433

IAS ACCREDITED
Testing Laboratory
TL-637

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	06/19/20	Initial issue	Hyunsik Yun
V2	06/29/20	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 Phone + BT/BLE, DTS/UNII a/b/g/n/ac/ax, UWB, WPT and NFC
MODEL NUMBER:	SM-N986B/DS, SM-N986B
SERIAL NUMBER:	R3CN40FXVPH, R3CN40FXTKX (RADIATED)
DATE TESTED:	MAY 11, 2020 – MAY 22, 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.

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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
☒ Chamber 1
☒ Chamber 2
☐ 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.

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4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

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

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

EIRP = PSA reading with EUT worst orientation (dBm) + Path loss (dB) – cable loss(between the SG and substitution antenna) + Substitution Antenna Factor (dBi)

ERP = PSA reading with EUT worst orientation (dBm) + Path loss (dB) – 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	3.49 dB
Radiated Disturbance, 1 GHz to 18 GHz	5.82 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.

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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, UWB, WPT and NFC. This test report addresses the WWAN operational mode.

This report covers the Samsung models SM-N986B/DS and SM-N986B.
These models are identical in hardware except SM-N986B has single SIM tray.
With some pre-scan, model SM-N986B/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)

5.3. WORST-CASE ORIENTATION AND MODE

For GSM850 / LTE B12 / LTE B13, EUT was investigated in three orthogonal orientations X, Y and Z it was determined that Z orientation was worst-case orientation.

For WCDMA B5 / LTE B26, EUT was investigated in three orthogonal orientations X, Y and Z it was determined that X 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.

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5.4. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Charger	SAMSUNG	EP-TA800	R37N39301T8SE3	N/A
Data Cable	SAMSUNG	EP-DG980	N/A	N/A

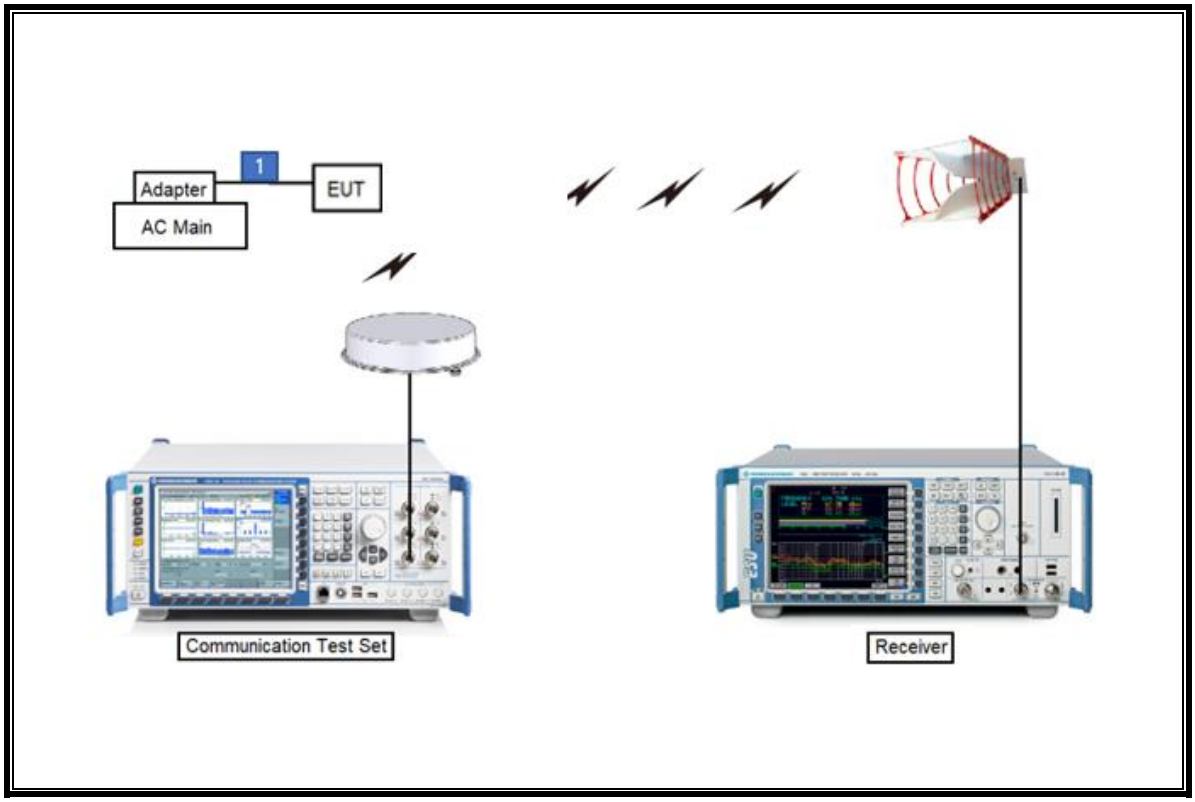
I/O CABLE

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	1.1m	N/A

TEST SETUP

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

SETUP DIAGRAM FOR TESTS (RADIATED TEST SETUP)



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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, Tuned Dipole 400~1000 MHz	ETS	3121D DB4	00164753	01-31-21
Antenna, Horn, 40 GHz	ETS	3116C	00166155	08-13-20
Preamplifier	ETS	3116C-PA	00168841	08-08-20
Antenna, Horn, 40 GHz	ETS	3116C	00168645	10-02-21
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	750	08-04-20
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	845	08-04-20
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	749	08-04-20
Antenna, Horn, 18 GHz	ETS	3115	00167211	08-04-20
Antenna, Horn, 18 GHz	ETS	3115	00161451	08-04-20
Antenna, Horn, 18 GHz	ETS	3117	00168724	08-04-20
Antenna, Horn, 18 GHz	ETS	3117	00205959	08-04-20
Antenna, Horn, 18 GHz	ETS	3117	00168717	08-04-20
Communications Test Set	R&S	CMW500	115331	08-05-20
UXM 5G Wireless Test Platform	KEYSIGHT	E7515B	MY58010202	02-05-21
Preamplifier, 1000 MHz	Sonoma	310N	341282	08-05-20
Preamplifier, 1000 MHz	Sonoma	310N	370599	08-05-20
Preamplifier, 1000 MHz	Sonoma	310N	351741	08-05-20
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1876511	08-06-20
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	2029169	08-06-20
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1896138	08-06-20
EMI Test Receive, 40 GHz	R&S	ESU40	100439	08-06-20
EMI Test Receive, 40 GHz	R&S	ESU40	100457	08-06-20
EMI Test Receive, 44 GHz	R&S	ESW40	101590	08-05-20
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	08-05-20
High Pass Filter 1.2GHz	Micro-Tronics	HPM50108-02	G006	08-05-20
High Pass Filter 2.8GHz	Micro-Tronics	HPM50111-02	010	08-05-20
High Pass Filter 2.8GHz	Micro-Tronics	HPM50111-02	011	08-05-20
High Pass Filter 4GHz	Micro-Tronics	HPM50118-02	G001	08-05-20
High Pass Filter 4GHz	Micro-Tronics	HPM50118-02	G002	08-05-20
Attenuator	PASTERNACK	PE7087-10	A009	08-08-20
Attenuator	PASTERNACK	PE7087-10	A001	08-08-20
Attenuator	PASTERNACK	PE7087-10	A008	08-08-20
Attenuator	PASTERNACK	PE7087-10	2	08-08-20
Attenuator	PASTERNACK	PE7395-10	A011	08-08-20
UL Software				
Description	**Manufacturer**	**Model**	**Version**	
Radiated software	UL	UL EMC	Ver 9.5	

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7. APPLICABLE LIMIYS 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 (dBµV/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.	

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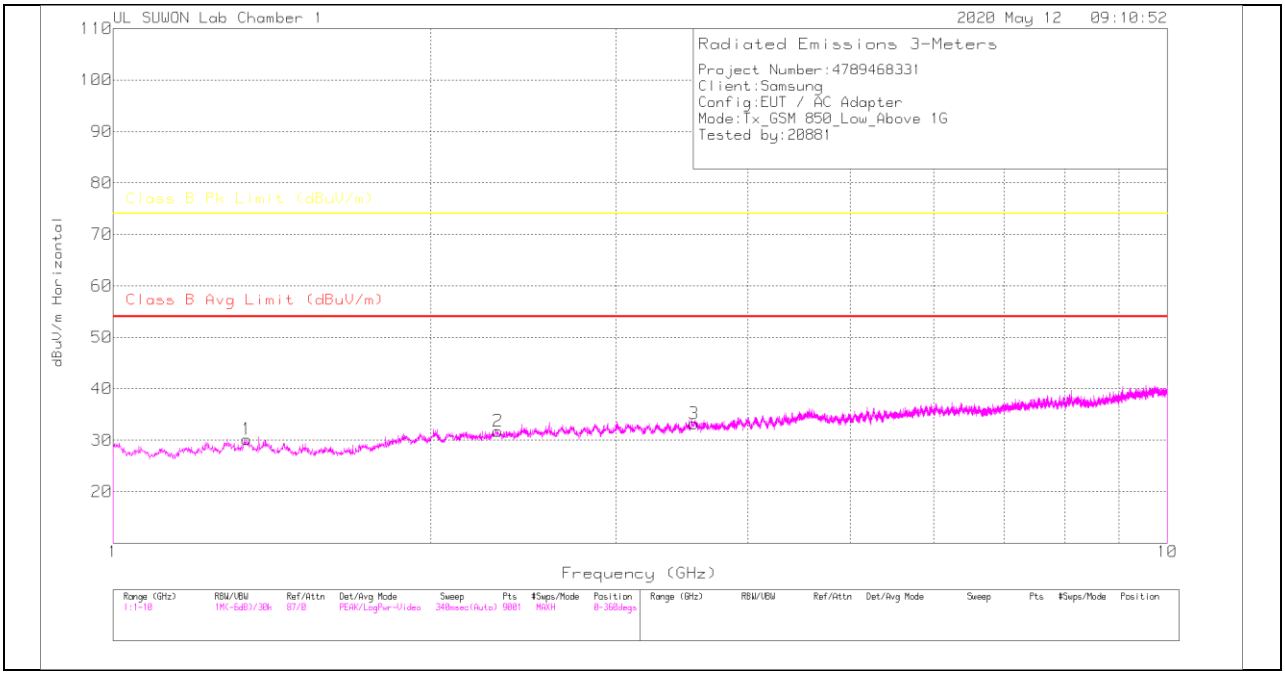
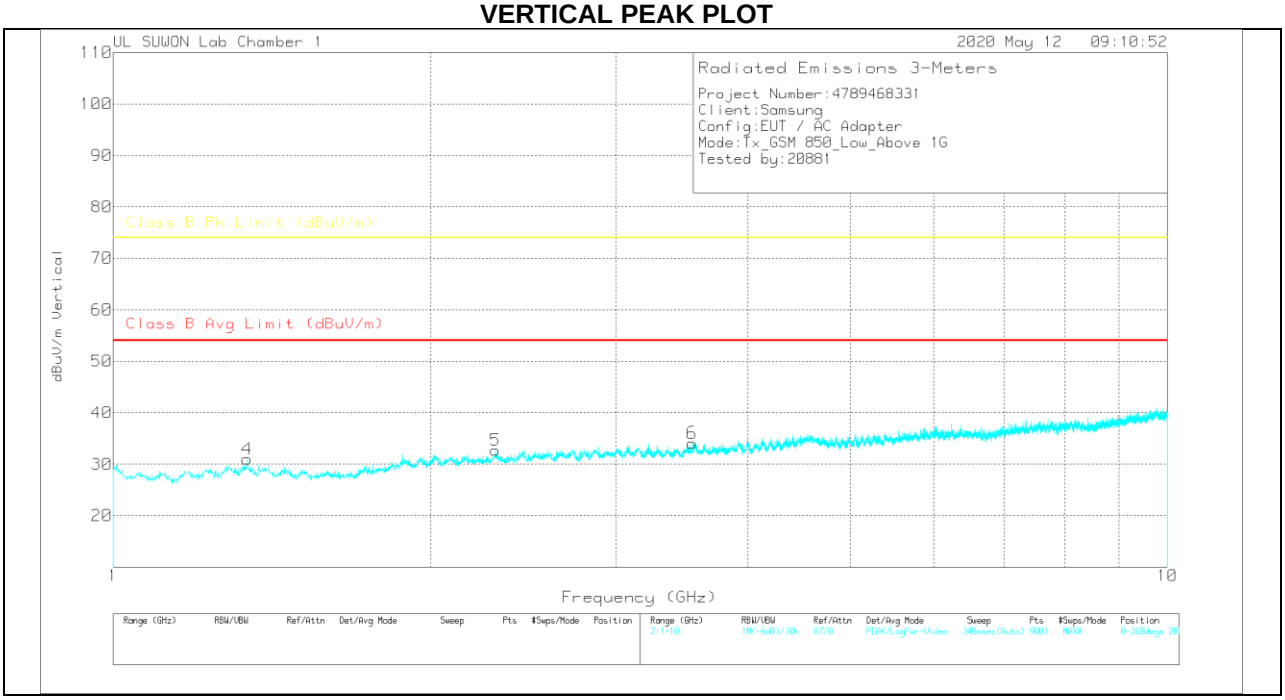
7.1. Above 1 GHz in the GSM850

LOW CHANNEL(869.2 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



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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	1.339	36.99	PK	29.6	-37.1	.7	30.19	-	-	74	-43.81	0-360	200	H
2	2.318	34.86	PK	31.5	-35.4	.8	31.76	-	-	74	-42.24	0-360	100	H
3	3.555	32.92	PK	33	-33.3	.6	33.22	-	-	74	-40.78	0-360	200	H
4	1.34	37.78	PK	29.6	-37.1	.7	30.98	-	-	74	-43.02	0-360	100	V
5	2.305	35.71	PK	31.5	-35.4	.9	32.71	-	-	74	-41.29	0-360	100	V
6	3.54	33.88	PK	33	-33.4	.6	34.08	-	-	74	-39.92	0-360	100	V

PK – Peak Detector

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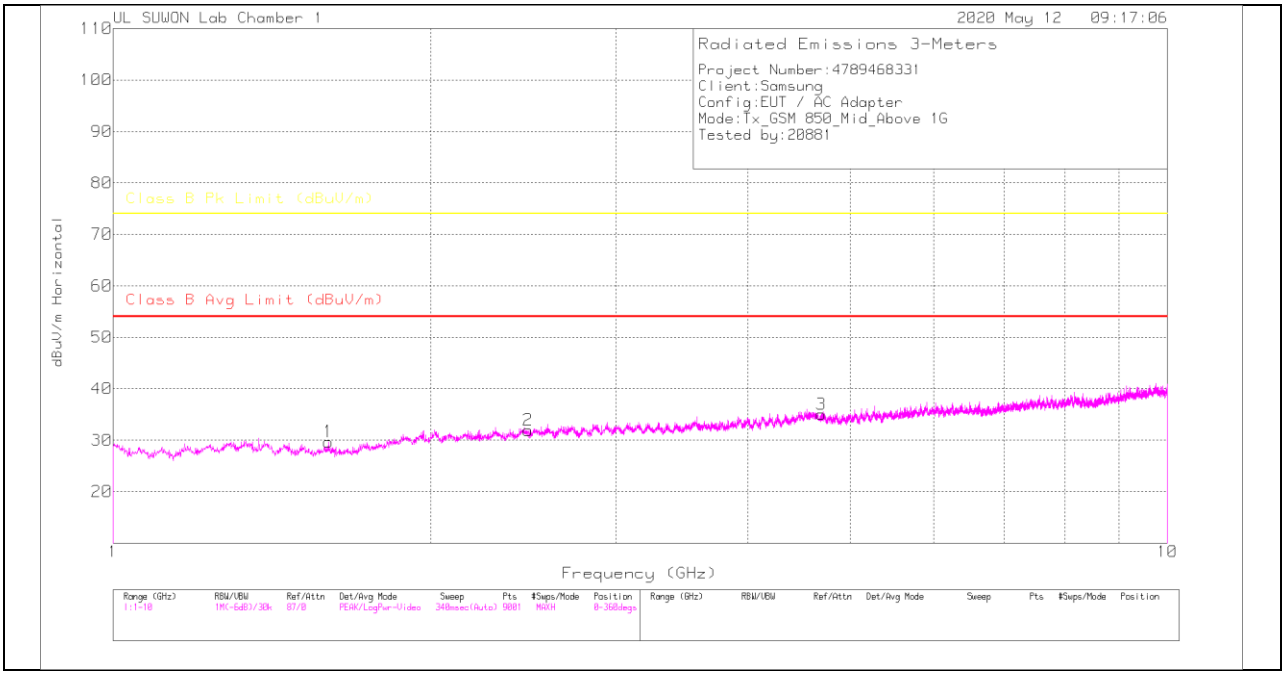
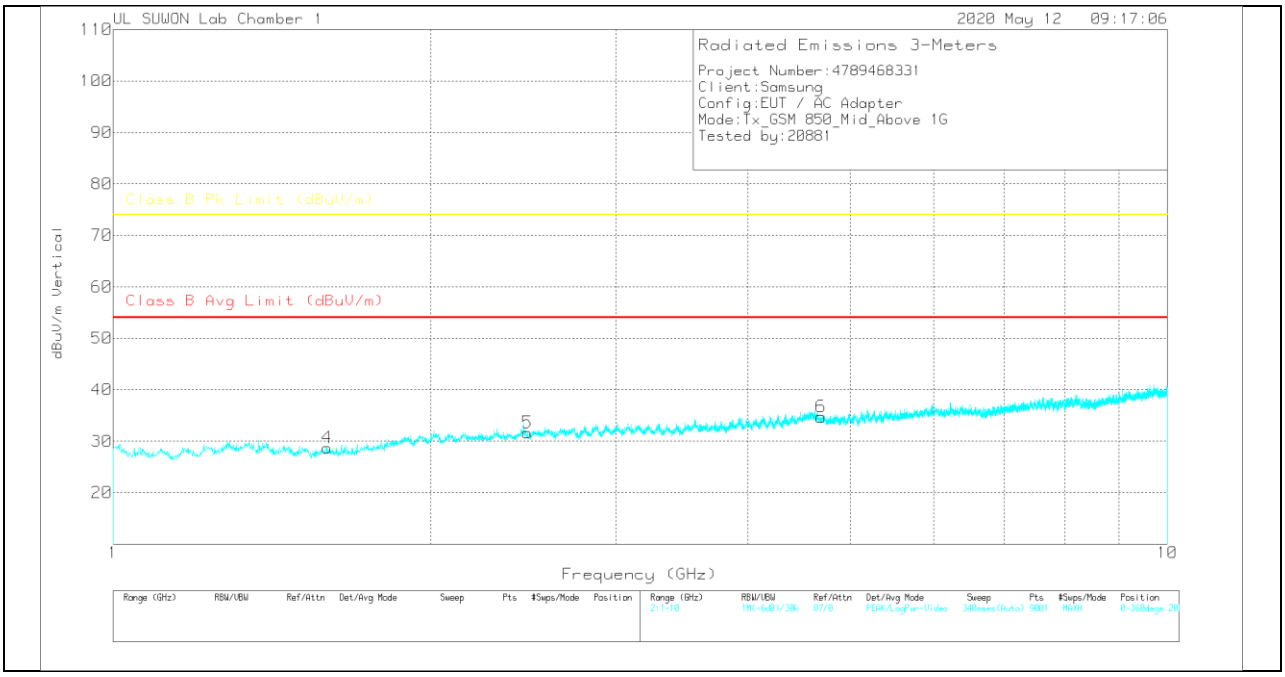
MID CHANNEL(881.6 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



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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	1.6	37.1	PK	28.3	-36.5	.8	29.7	-	-	74	-44.3	0-360	100	H
2	2.476	34.24	PK	31.9	-34.9	.7	31.94	-	-	74	-42.06	0-360	200	H
3	4.694	32.62	PK	34.2	-32.2	.4	35.02	-	-	74	-38.98	0-360	100	H
4	1.596	36.23	PK	28.3	-36.6	.8	28.73	-	-	74	-45.27	0-360	200	V
5	2.472	34.04	PK	31.9	-35	.7	31.64	-	-	74	-42.36	0-360	100	V
6	4.693	32.34	PK	34.2	-32.2	.4	34.74	-	-	74	-39.26	0-360	100	V

PK – Peak Detector

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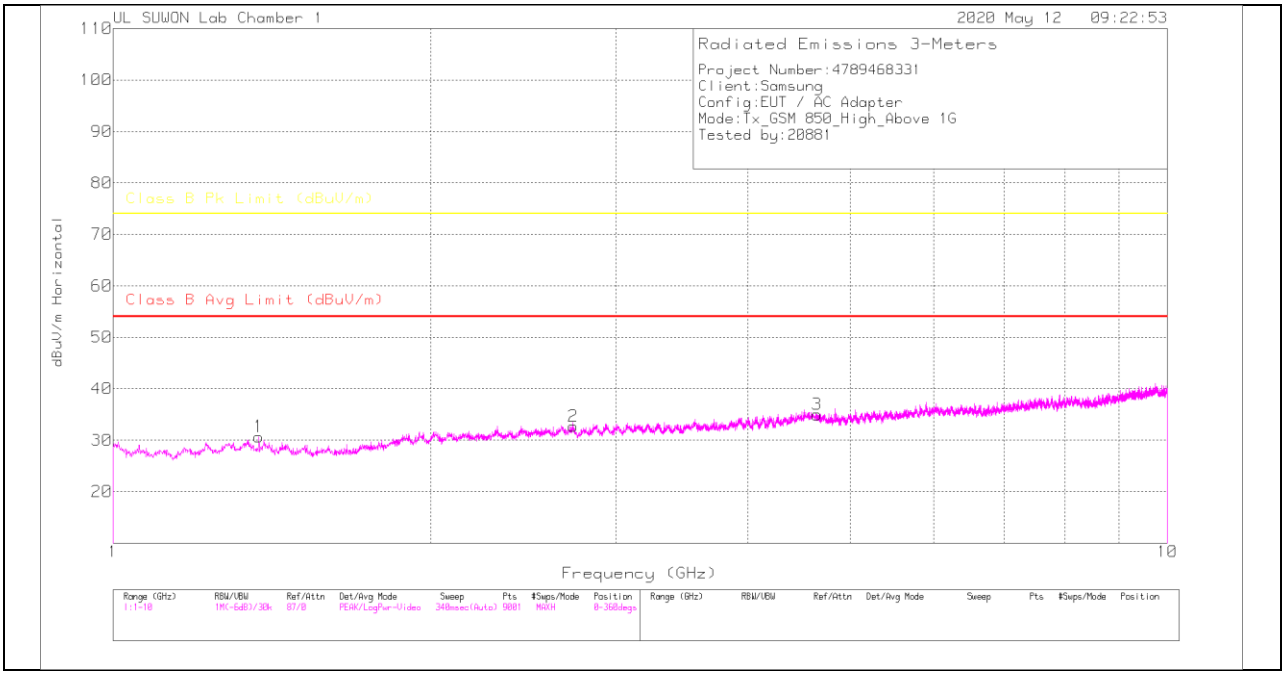
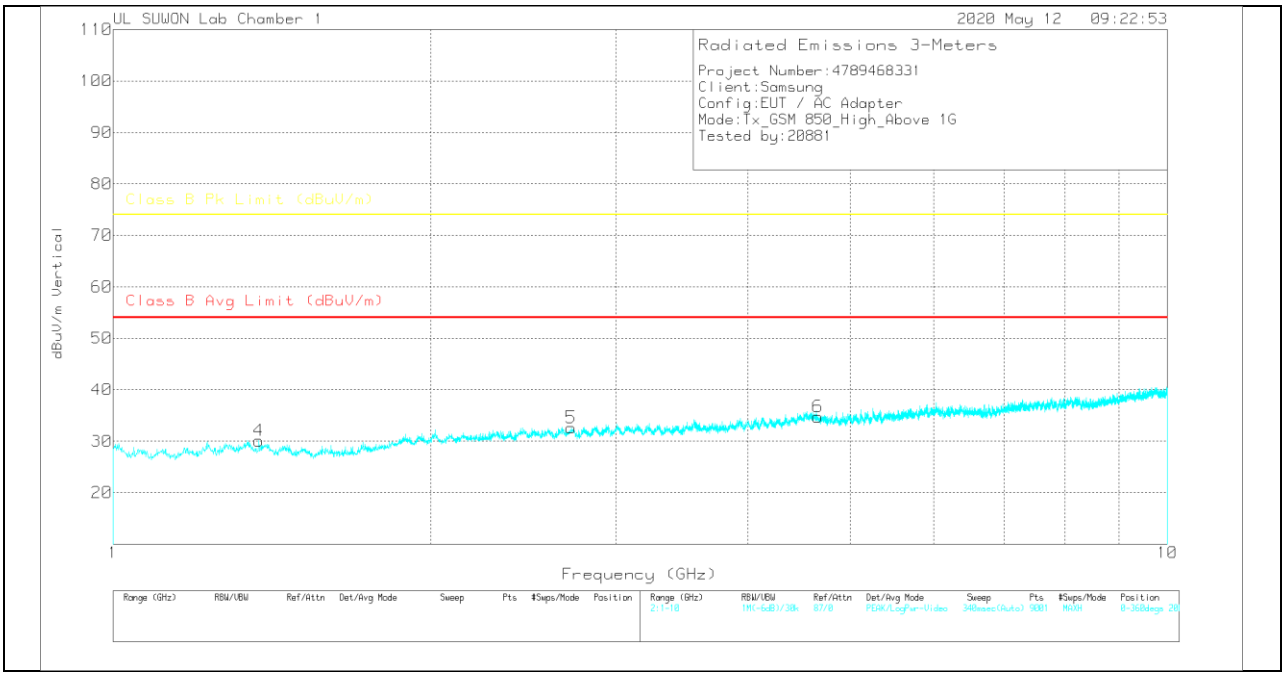
HIGH CHANNEL(893.8 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



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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	1.375	37.48	PK	29.5	-37	.7	30.68	-	-	74	-43.32	0-360	100	H
2	2.733	34.4	PK	32.1	-34.5	.7	32.7	-	-	74	-41.3	0-360	100	H
3	4.653	32.59	PK	34.2	-32.2	.4	34.99	-	-	74	-39.01	0-360	100	H
4	1.375	36.9	PK	29.5	-37	.7	30.1	-	-	74	-43.9	0-360	200	V
5	2.719	34.3	PK	32.1	-34.6	.8	32.6	-	-	74	-41.4	0-360	100	V
6	4.661	32.46	PK	34.2	-32.3	.4	34.76	-	-	74	-39.24	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.

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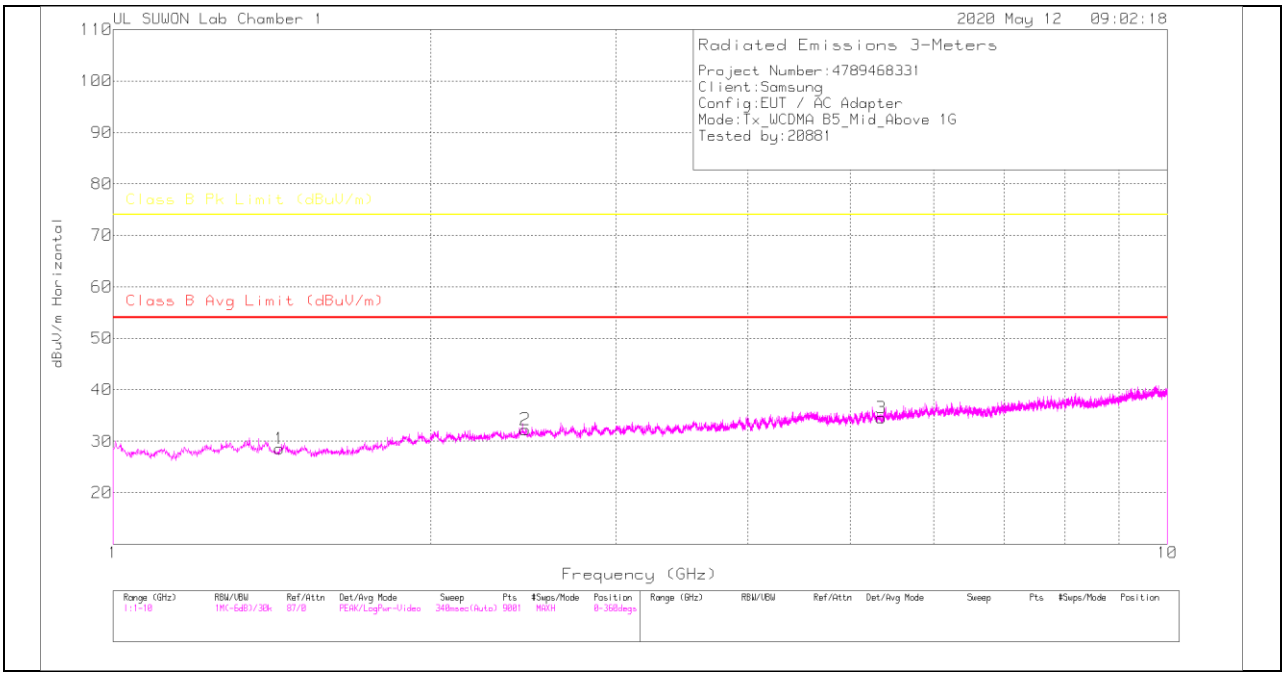
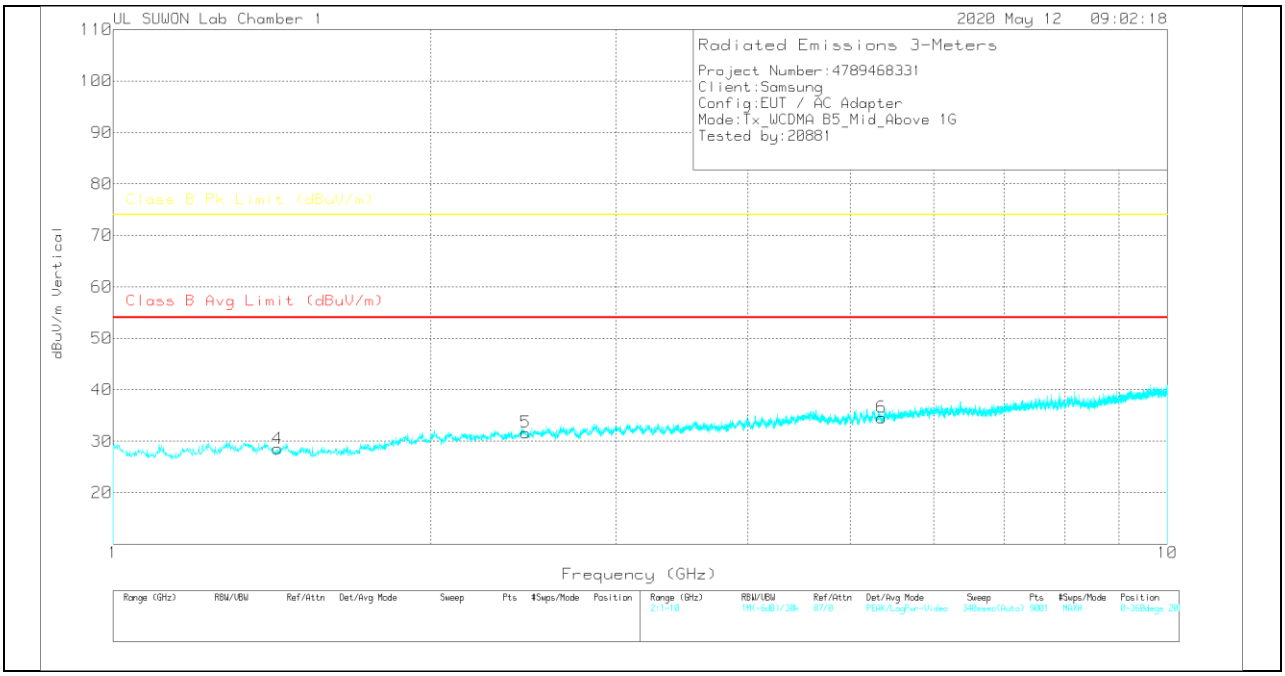
7.2. Above 1 GHz in the WCDMA Band 5

MID CHANNEL(881.6 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



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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	1.438	35.85	PK	29	-36.9	.6	28.55	-	-	74	-45.45	0-360	100	H
2	2.46	34.44	PK	31.9	-34.9	.8	32.24	-	-	74	-41.76	0-360	100	H
3	5.353	30.92	PK	34.7	-31.5	.4	34.52	-	-	74	-39.48	0-360	200	H
4	1.432	35.84	PK	29.1	-37	.6	28.54	-	-	74	-45.46	0-360	200	V
5	2.4625	33.98	PK	31.9	-35	.8	31.68	-	-	74	-42.32	0-360	100	V
6	5.359	31.01	PK	34.7	-31.5	.4	34.61	-	-	74	-39.39	0-360	100	V

PK – Peak Detector

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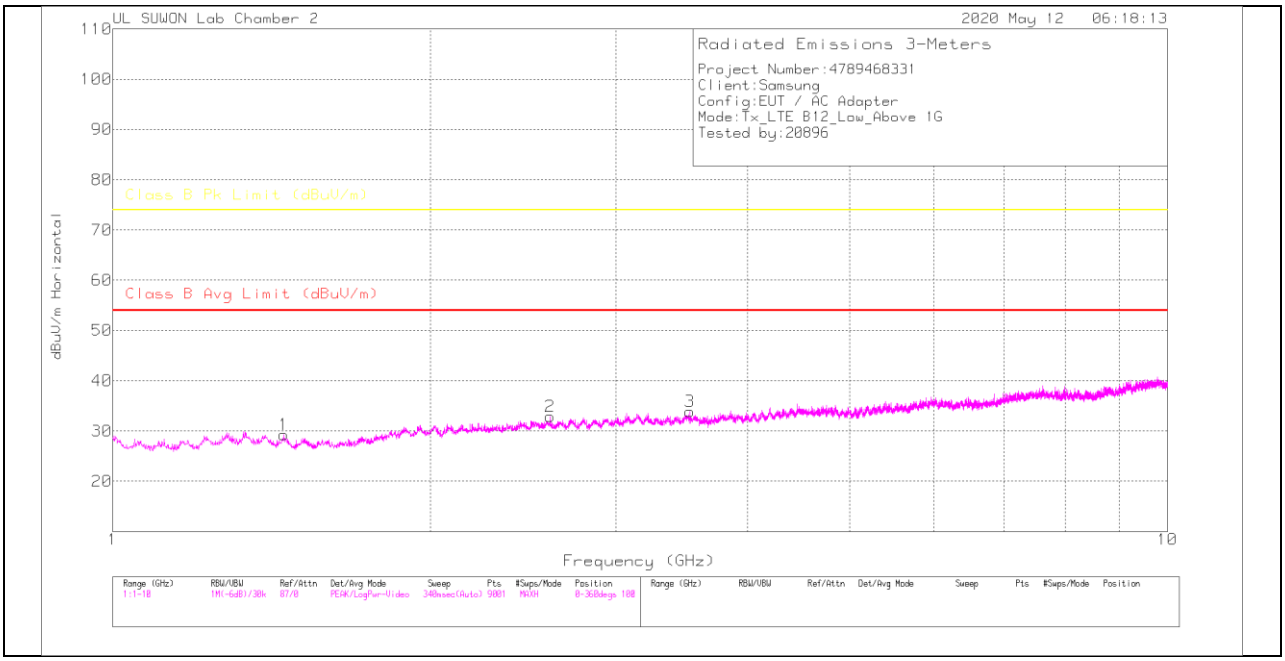
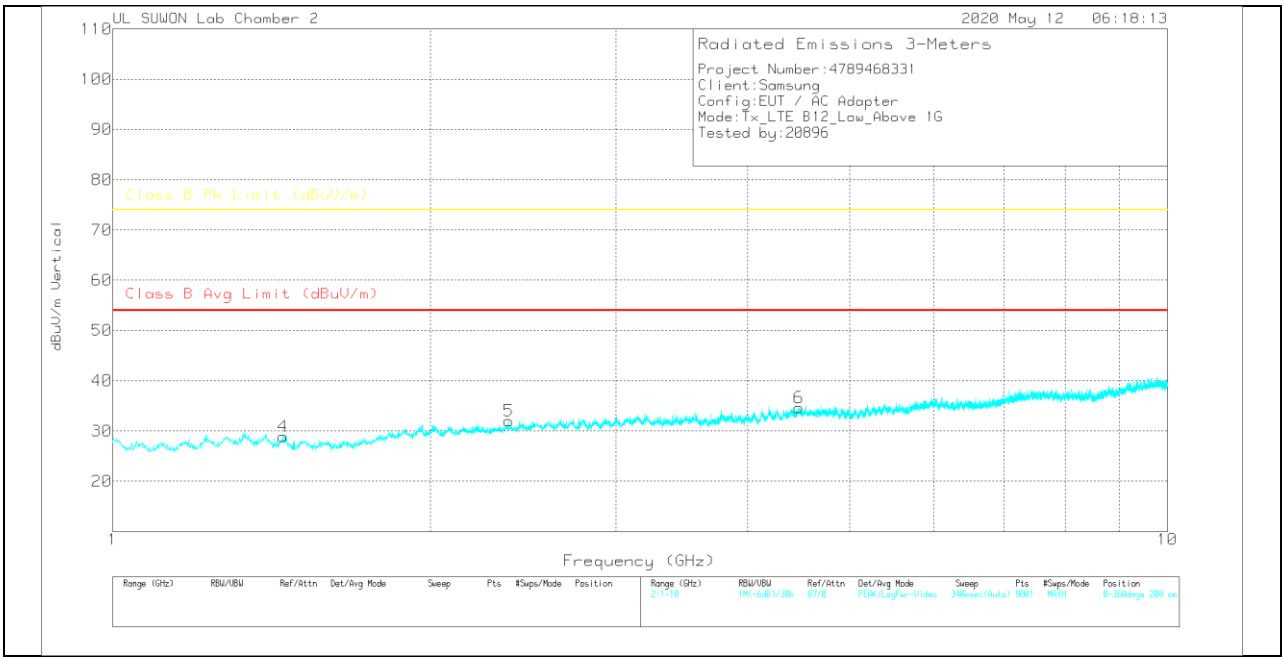
7.3. Above 1 GHz in the LTE Band 12

LOW CHANNEL(730.5 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



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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	1.452	31.16	PK	29	-31.6	.7	29.26	-	-	74	-44.74	0-360	100	H
2	2.6	30.31	PK	32.1	-30.2	.7	32.91	-	-	74	-41.09	0-360	100	H
3	3.527	29.61	PK	32.7	-29	.6	33.91	-	-	74	-40.09	0-360	100	H
4	1.451	30.75	PK	29	-31.6	.7	28.85	-	-	74	-45.15	0-360	200	V
5	2.374	30.36	PK	31.6	-30.6	.7	32.06	-	-	74	-41.94	0-360	200	V
6	4.471	28.6	PK	33.8	-28.3	.5	34.6	-	-	74	-39.4	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.

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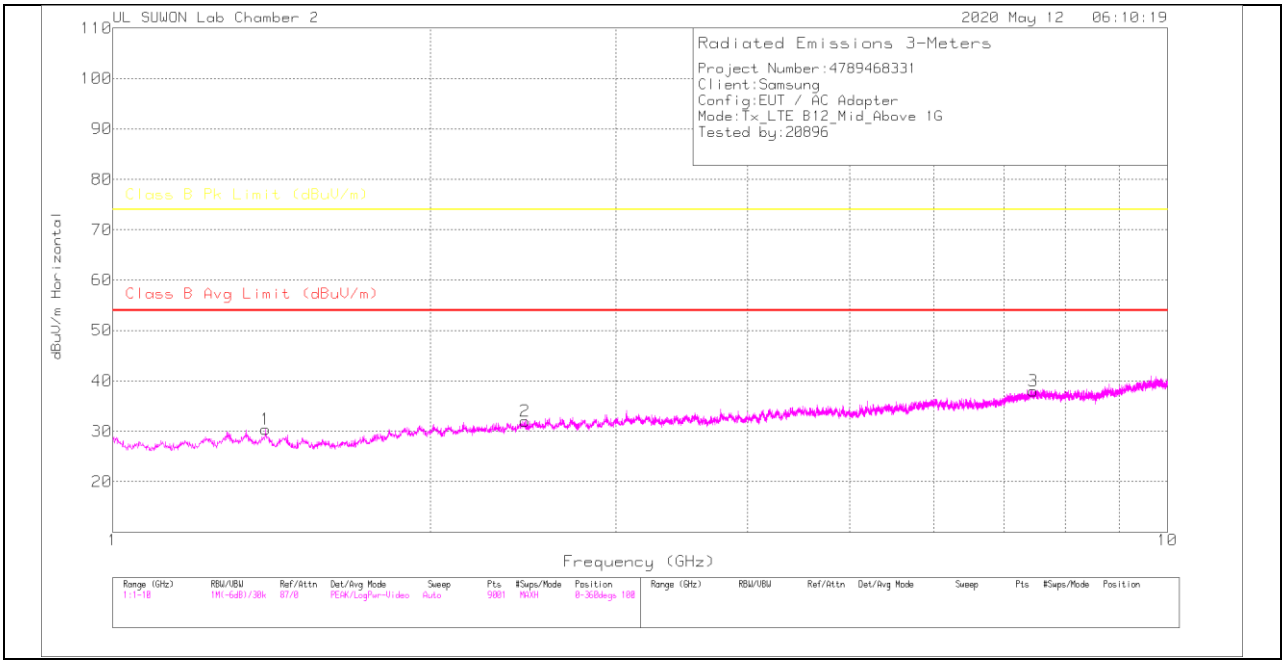
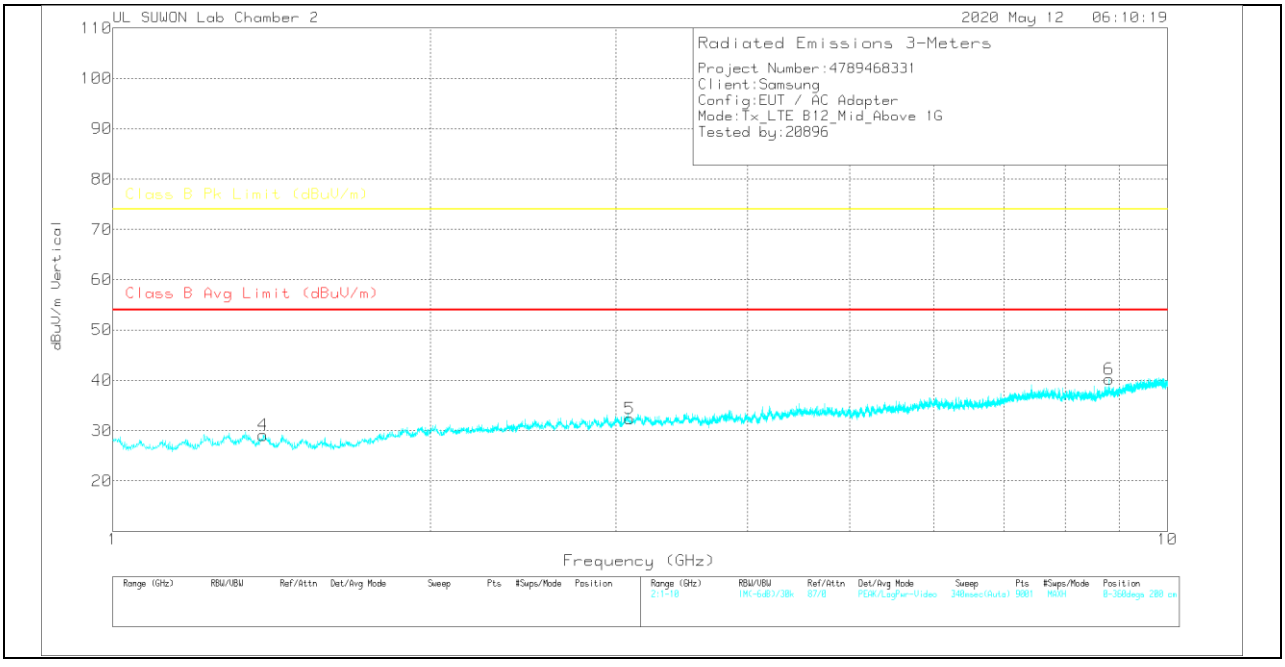
MID CHANNEL(737.5 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



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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	1.397	31.96	PK	29.4	-31.7	.7	30.36	-	-	74	-43.64	0-360	100	H
2	2.459	29.76	PK	31.8	-30.2	.7	32.06	-	-	74	-41.94	0-360	100	H
3	7.463	26.15	PK	36.2	-24.9	.6	38.05	-	-	74	-35.95	0-360	200	H
4	1.389	30.69	PK	29.5	-31.8	.7	29.09	-	-	74	-44.91	0-360	100	V
5	3.09	28.83	PK	32.7	-29.8	.7	32.43	-	-	74	-41.57	0-360	200	V
6	8.803	26.38	PK	36.3	-23.1	.7	40.28	-	-	74	-33.72	0-360	100	V

PK – Peak Detector

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

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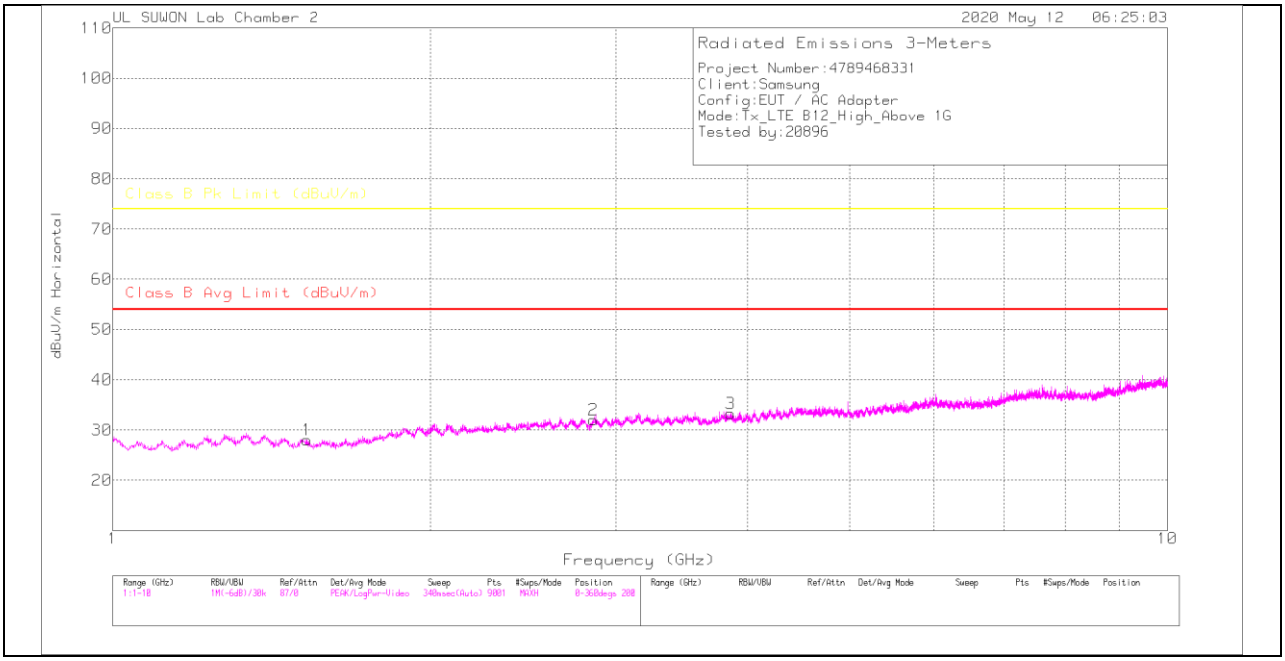
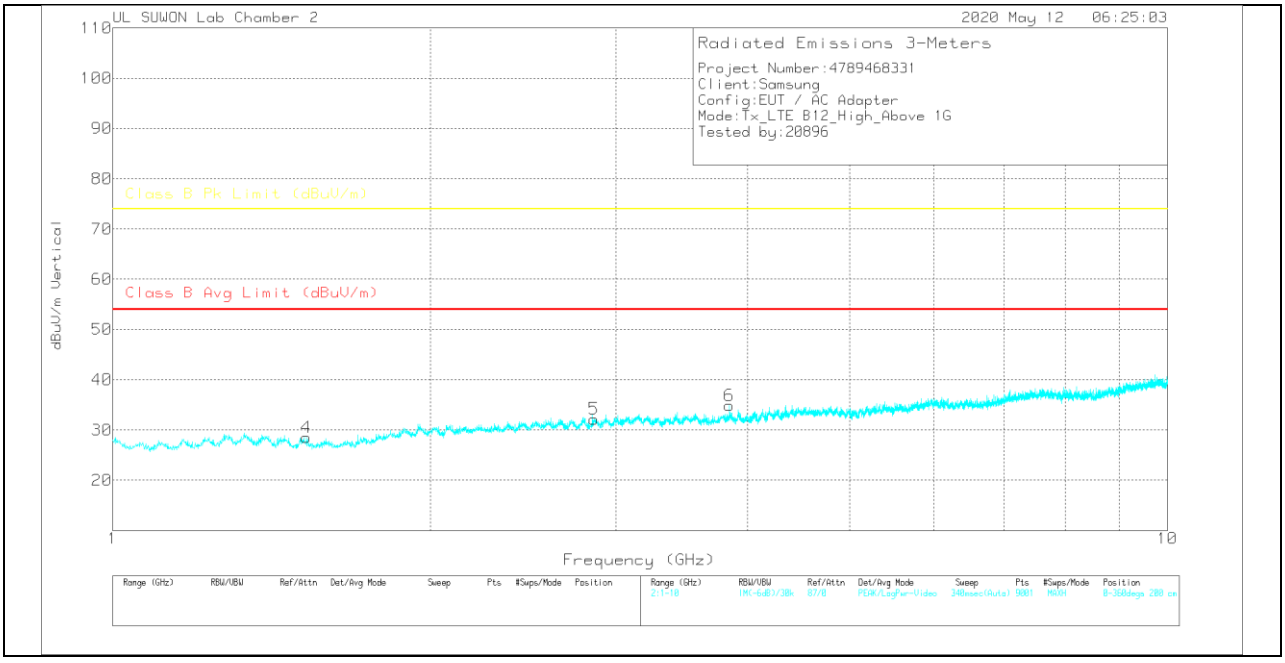
HIGH CHANNEL(744.5 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



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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	1.528	30.23	PK	28.5	-31.4	.7	28.03	-	-	74	-45.97	0-360	100	H
2	2.855	28.86	PK	32.1	-29.8	.8	31.96	-	-	74	-42.04	0-360	200	H
3	3.852	28.31	PK	33.3	-28.9	.5	33.21	-	-	74	-40.79	0-360	200	H
4	1.526	30.65	PK	28.5	-31.4	.8	28.55	-	-	74	-45.45	0-360	200	V
5	2.858	29.1	PK	32.1	-29.8	.8	32.2	-	-	74	-41.8	0-360	200	V
6	3.843	29.94	PK	33.3	-28.9	.5	34.84	-	-	74	-39.16	0-360	100	V

PK – Peak Detector

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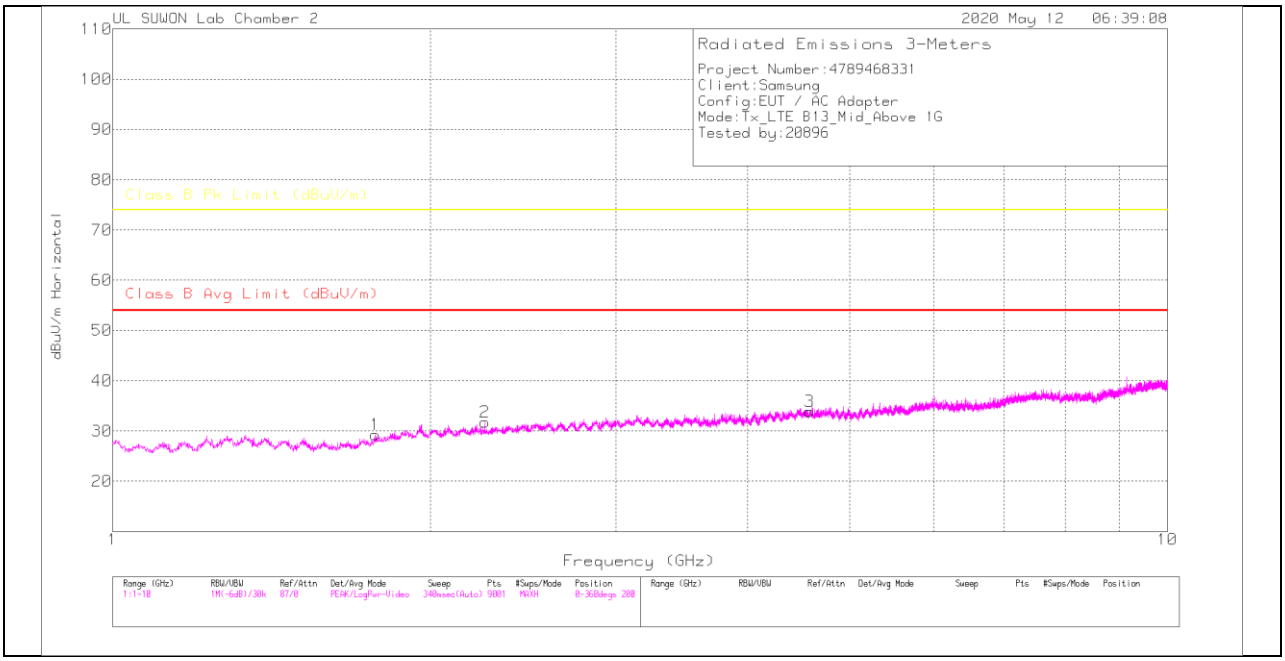
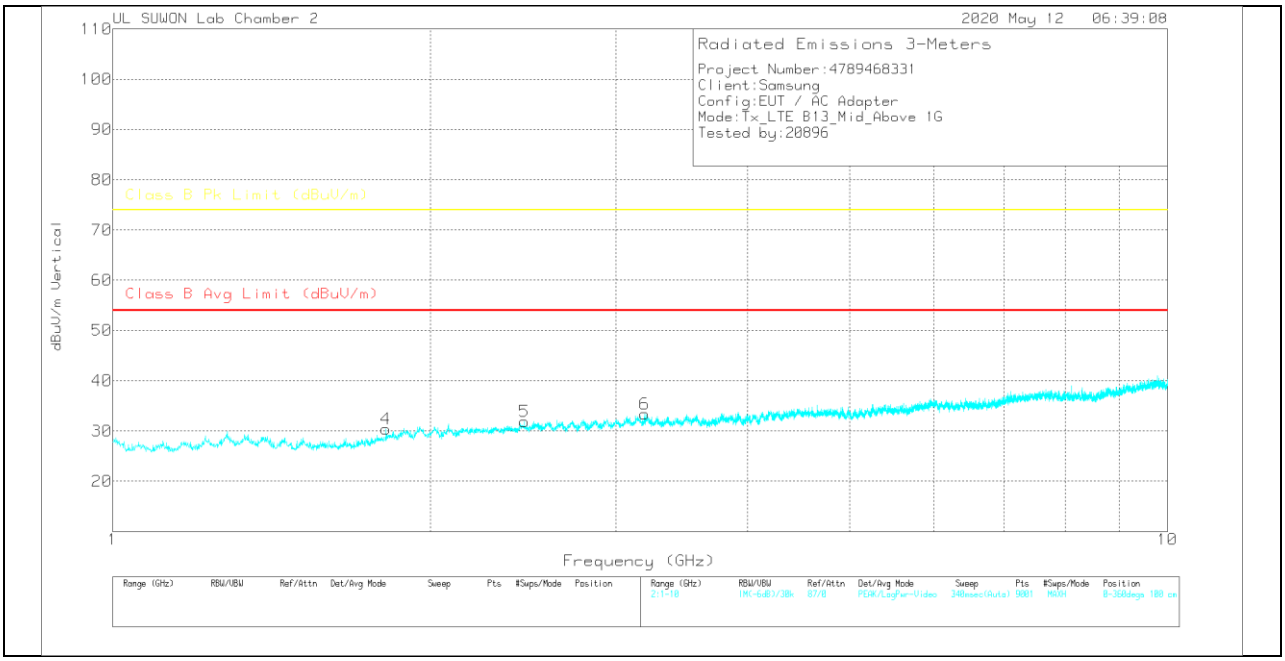
7.4. Above 1 GHz in the LTE Band 13

MID CHANNEL(751.0 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



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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	1.774	30.34	PK	29.4	-31.2	.7	29.24	-	-	74	-44.76	0-360	100	H
2	2.254	30.29	PK	31.4	-30.6	.7	31.79	-	-	74	-42.21	0-360	200	H
3	4.577	28.14	PK	33.9	-28.7	.5	33.84	-	-	74	-40.16	0-360	200	H
4	1.816	30.85	PK	30	-31.1	.7	30.45	-	-	74	-43.55	0-360	200	V
5	2.456	29.49	PK	31.8	-30.1	.7	31.89	-	-	74	-42.11	0-360	100	V
6	3.195	29.28	PK	32.9	-29.5	.7	33.38	-	-	74	-40.62	0-360	200	V

PK – Peak Dector

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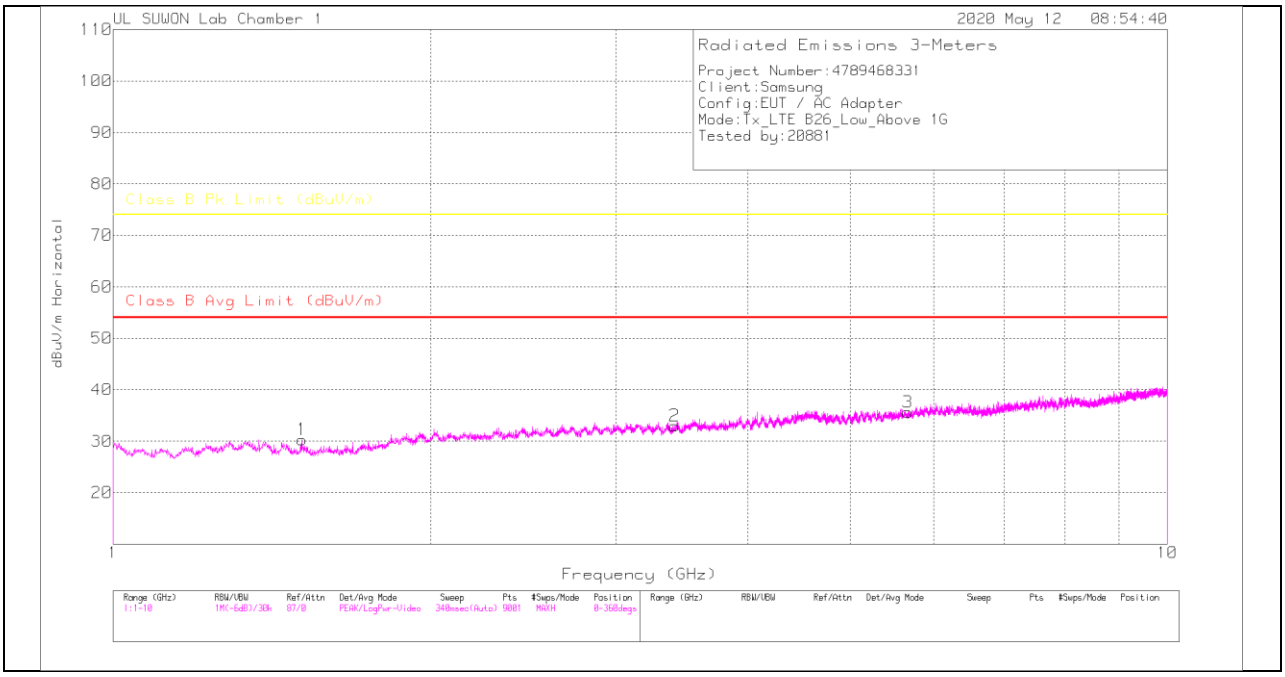
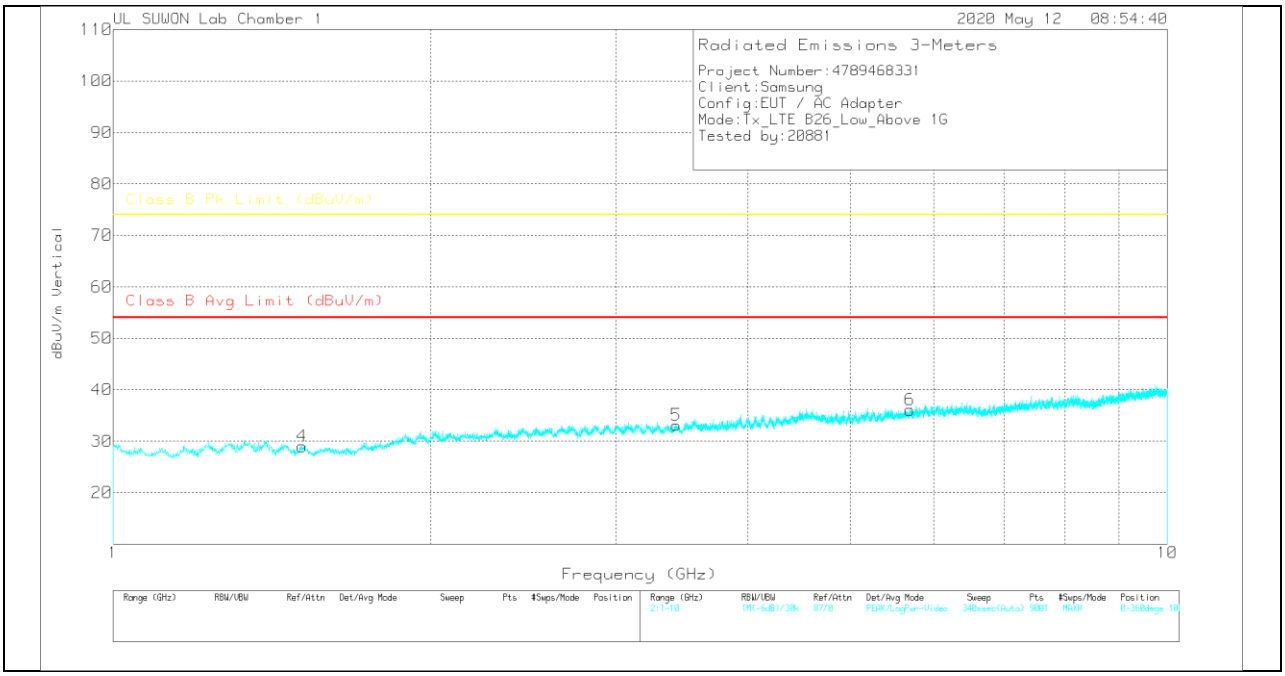
7.5. Above 1 GHz in the LTE Band 26

LOW CHANNEL(860.5 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



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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	1.51	37.59	PK	28.6	-36.6	.7	30.29	-	-	74	-43.71	0-360	200	H
2	3.409	33.07	PK	32.7	-33.5	.7	32.97	-	-	74	-41.03	0-360	100	H
3	5.671	31.72	PK	34.7	-31.3	.5	35.62	-	-	74	-38.38	0-360	100	H
4	1.511	36.4	PK	28.5	-36.6	.7	29	-	-	74	-45	0-360	200	V
5	3.422	33.39	PK	32.7	-33.6	.6	33.09	-	-	74	-40.91	0-360	200	V
6	5.698	32	PK	34.8	-31.2	.5	36.1	-	-	74	-37.9	0-360	200	V

PK – Peak Detector

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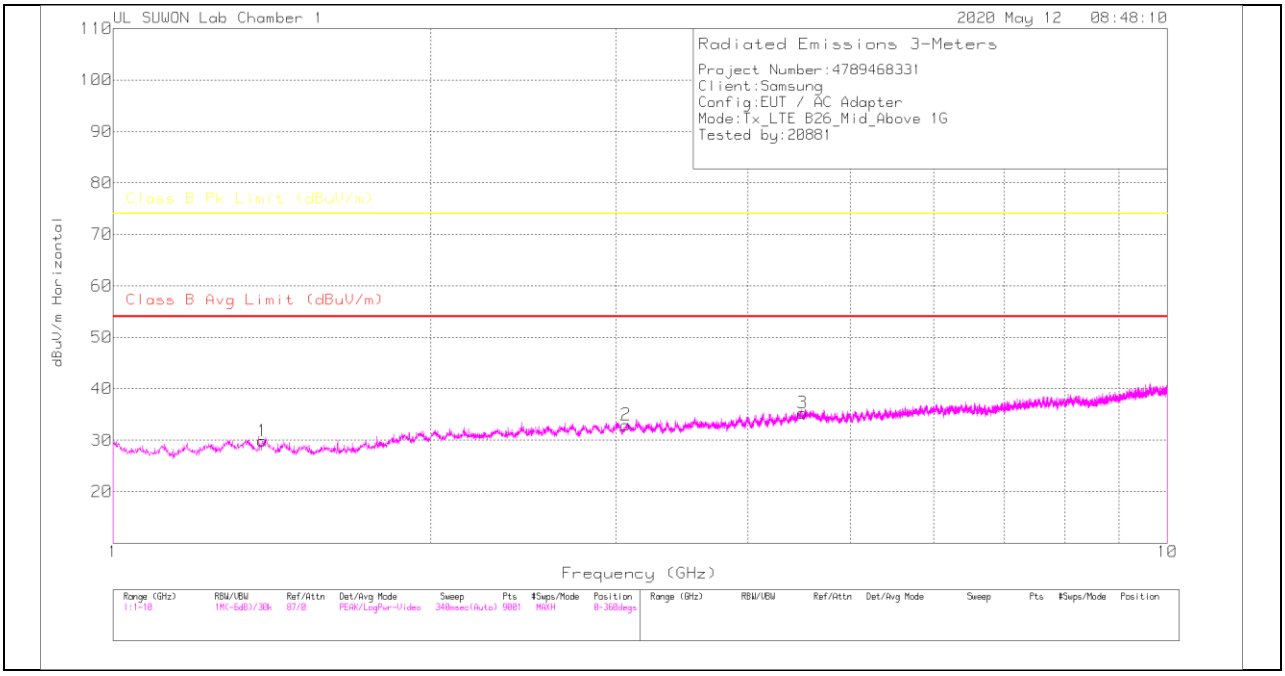
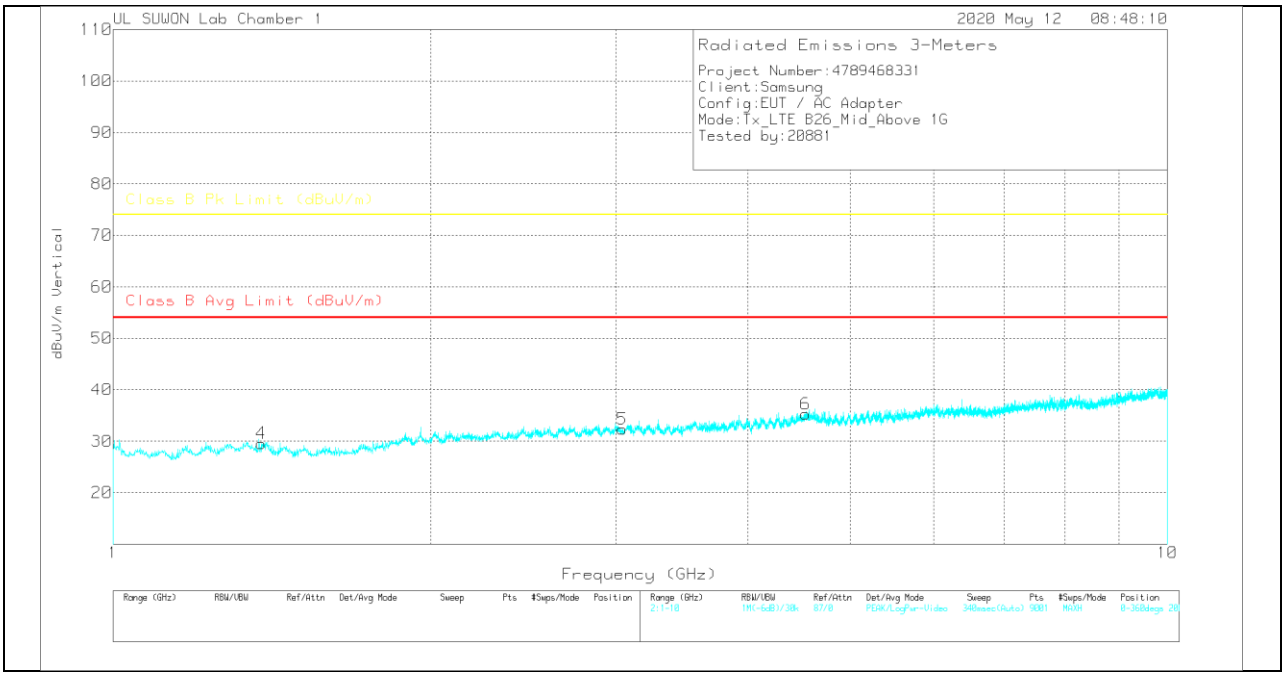
MID CHANNEL(876.5 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



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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	1.385	36.98	PK	29.4	-37.1	.6	29.88	-	-	74	-44.12	0-360	200	H
2	3.065	33.61	PK	32.6	-33.8	.6	33.01	-	-	74	-40.99	0-360	100	H
3	4.506	33.02	PK	34.2	-32.3	.4	35.32	-	-	74	-38.68	0-360	200	H
4	1.382	36.56	PK	29.4	-37.1	.7	29.56	-	-	74	-44.44	0-360	200	V
5	3.041	33.23	PK	32.6	-34.1	.6	32.33	-	-	74	-41.67	0-360	200	V
6	4.539	32.86	PK	34.2	-32.2	.4	35.26	-	-	74	-38.74	0-360	200	V

PK – Peak Detector

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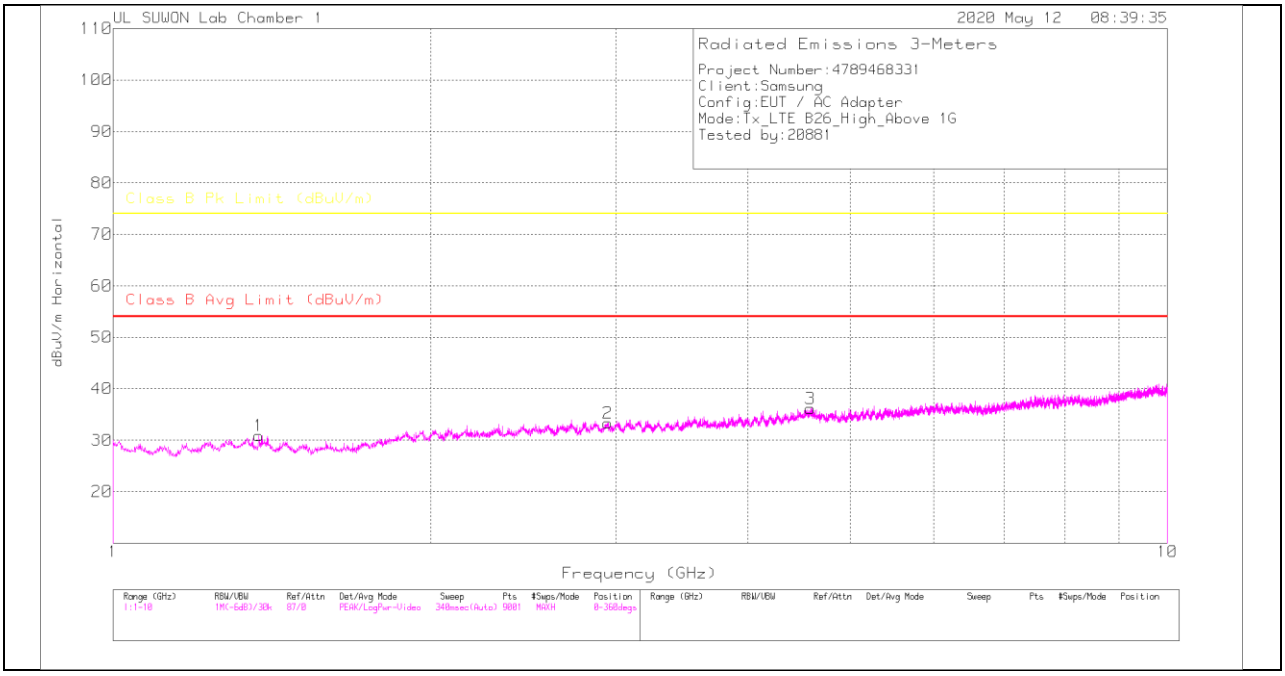
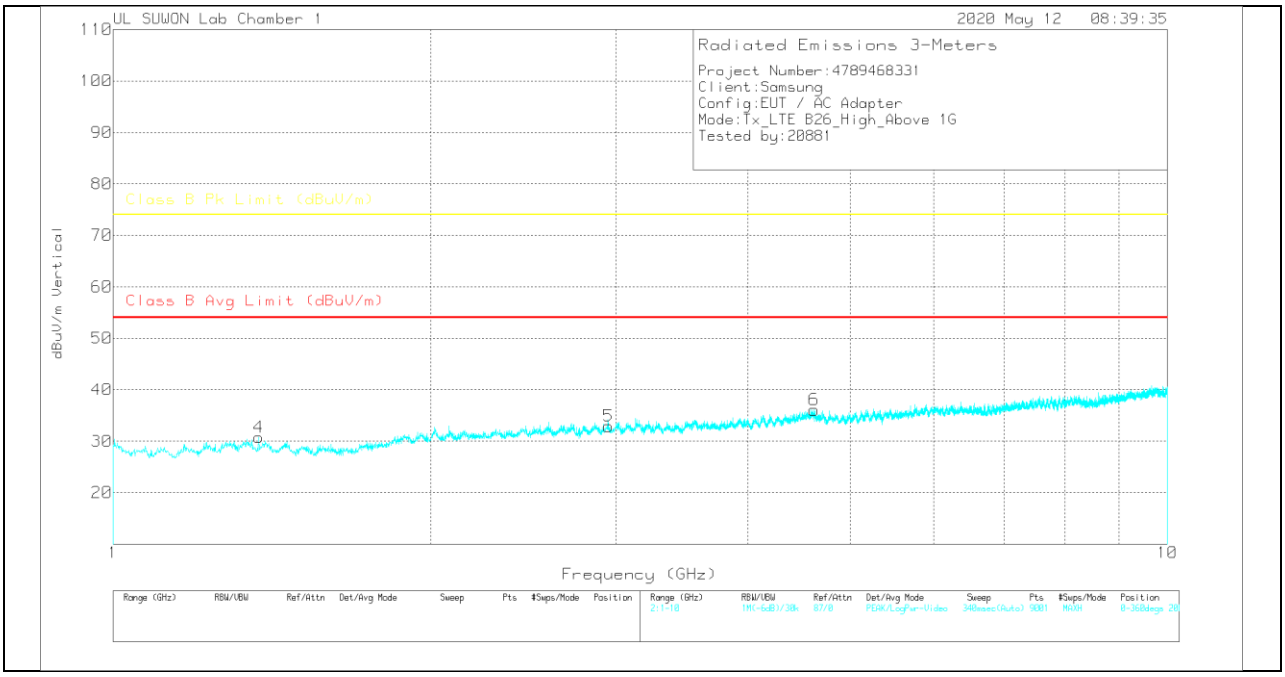
HIGH CHANNEL(892.5 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



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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	1.375	37.66	PK	29.5	-37	.7	30.86	-	-	74	-43.14	0-360	200	H
2	2.946	34.6	PK	32.4	-34.3	.6	33.3	-	-	74	-40.7	0-360	100	H
3	4.585	33.73	PK	34.2	-32.2	.4	36.13	-	-	74	-37.87	0-360	100	H
4	1.374	37.66	PK	29.5	-37.1	.7	30.76	-	-	74	-43.24	0-360	200	V
5	2.949	34.11	PK	32.4	-34.2	.6	32.91	-	-	74	-41.09	0-360	100	V
6	4.623	33.79	PK	34.2	-32.3	.4	36.09	-	-	74	-37.91	0-360	200	V

PK – Peak Detector

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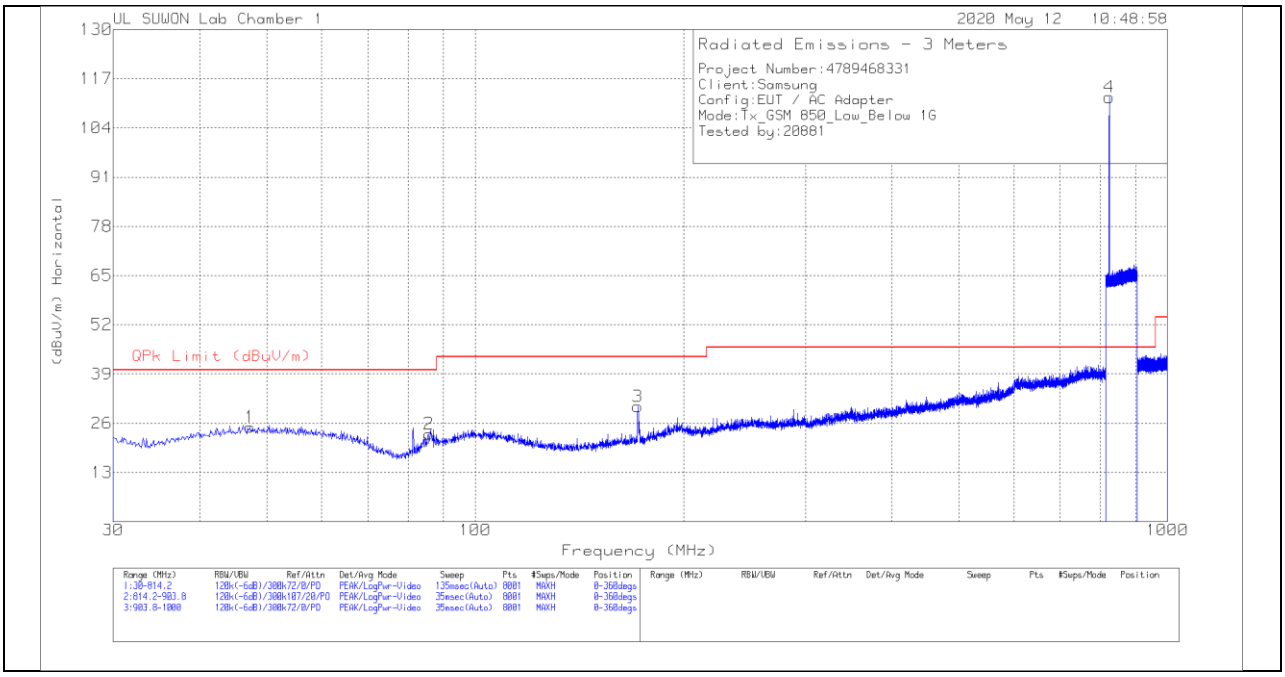
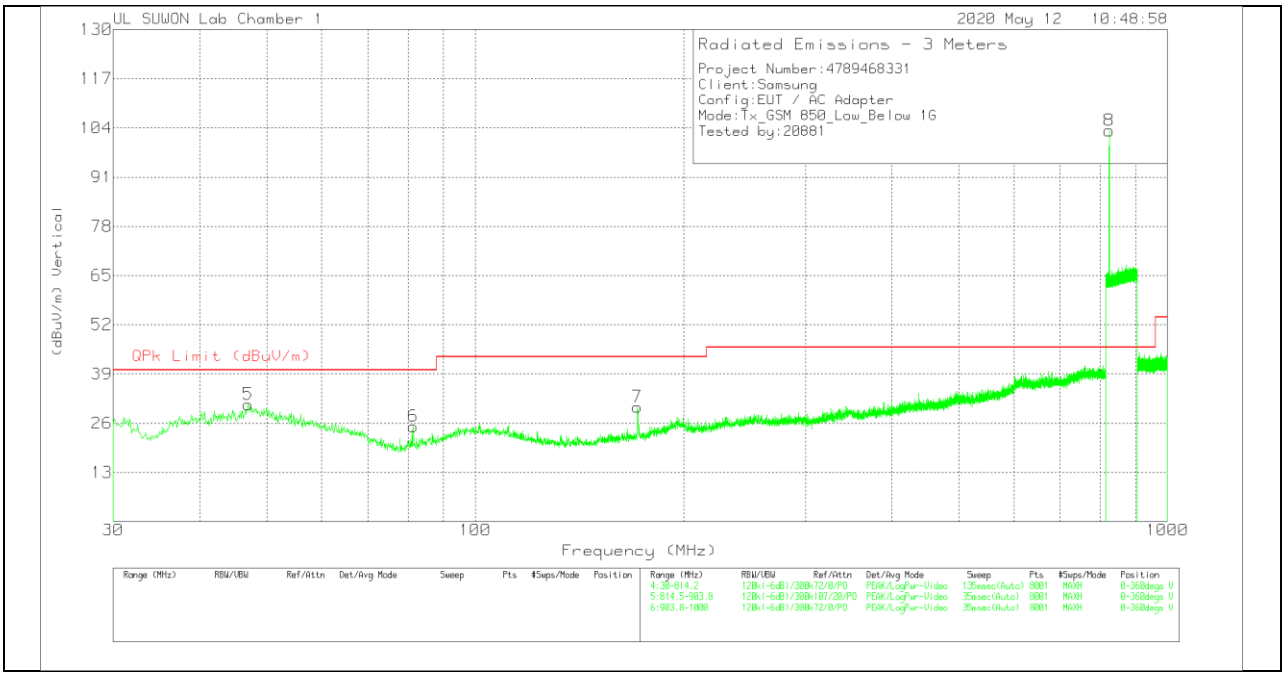
7.6. Below 1 GHz in the GSM850

LOW CHANNEL(869.2 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



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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	47.2524	3.23	Pk	19.8	1.9	24.93	40	-15.07	0-360	300	H
2	85.7762	6.62	Pk	14	2.5	23.12	40	-16.88	0-360	400	H
3	171.7442	11.97	Pk	14.9	3.5	30.37	43.52	-13.15	0-360	100	H
4	824.1288	77.55	Pk	27	7.6	112.15	**46.02**	**66.13**	0-360	100	H
5	46.9583	7.87	Pk	19.8	3.3	30.97	40	-9.03	0-360	200	V
6	81.3651	8.56	Pk	12.8	3.8	25.16	40	-14.84	0-360	100	V
7	171.6461	10.76	Pk	14.9	4.6	30.26	43.52	-13.26	0-360	200	V
8	824.2006	68.71	Pk	27	7.6	103.31	**46.02**	**57.29**	0-360	200	V

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

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_15B(04)
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

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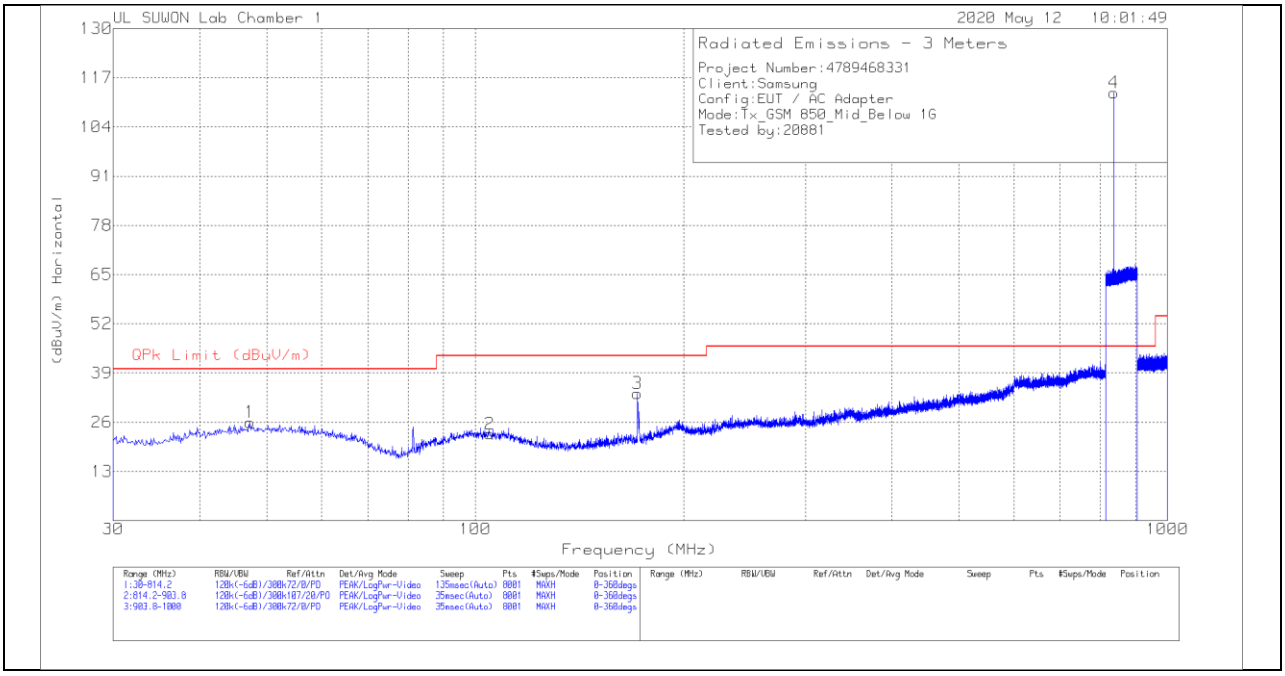
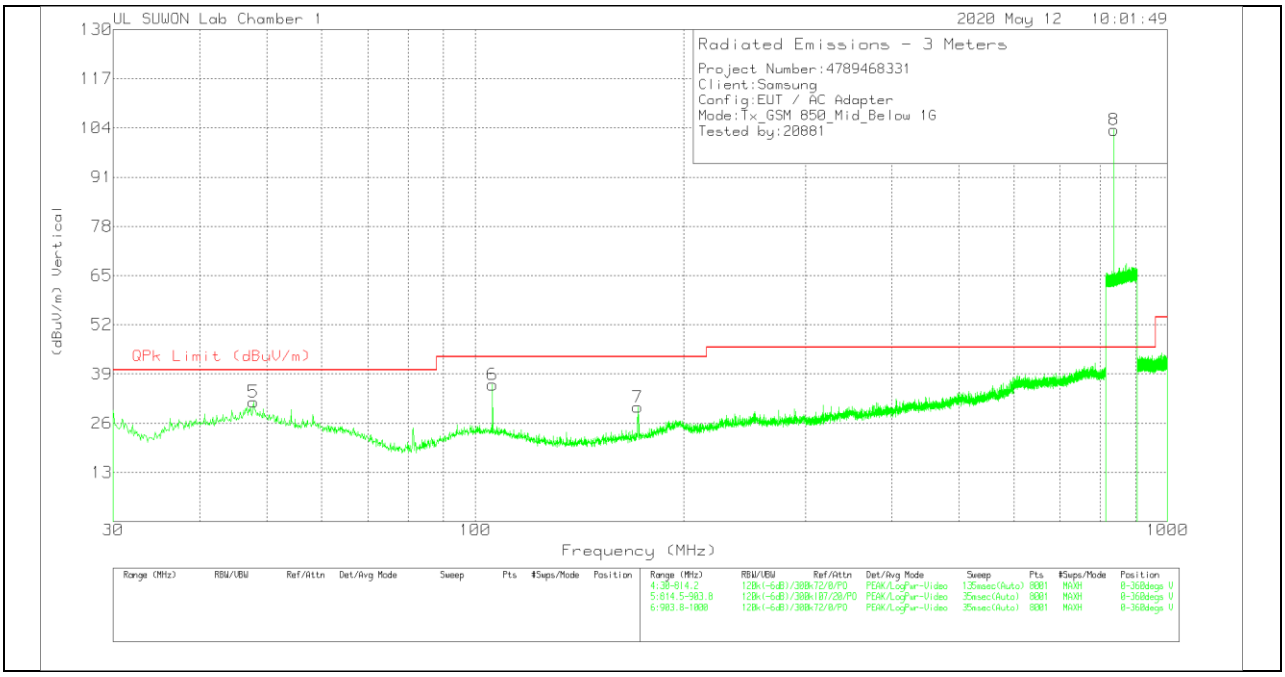
MID CHANNEL(881.6 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



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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	47.2524	4.28	Pk	19.8	1.9	25.98	40	-14.02	0-360	100	H
2	104.9891	2.32	Pk	17.8	2.8	22.92	43.52	-20.6	0-360	400	H
3	171.6461	15.18	Pk	14.9	3.5	33.58	43.52	-9.94	0-360	200	H
4	836.5888	78.17	Pk	27.2	7.7	113.07	**46.02**	**67.05**	0-360	100	H
5	47.8406	8.48	Pk	19.8	3.3	31.58	40	-8.42	0-360	100	V
6	105.9694	14.46	Pk	17.8	3.9	36.16	43.52	-7.36	0-360	100	V
7	171.7442	10.74	Pk	14.9	4.6	30.24	43.52	-13.28	0-360	100	V
8	836.6586	68.6	Pk	27.2	7.7	103.5	**46.02**	**57.48**	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.

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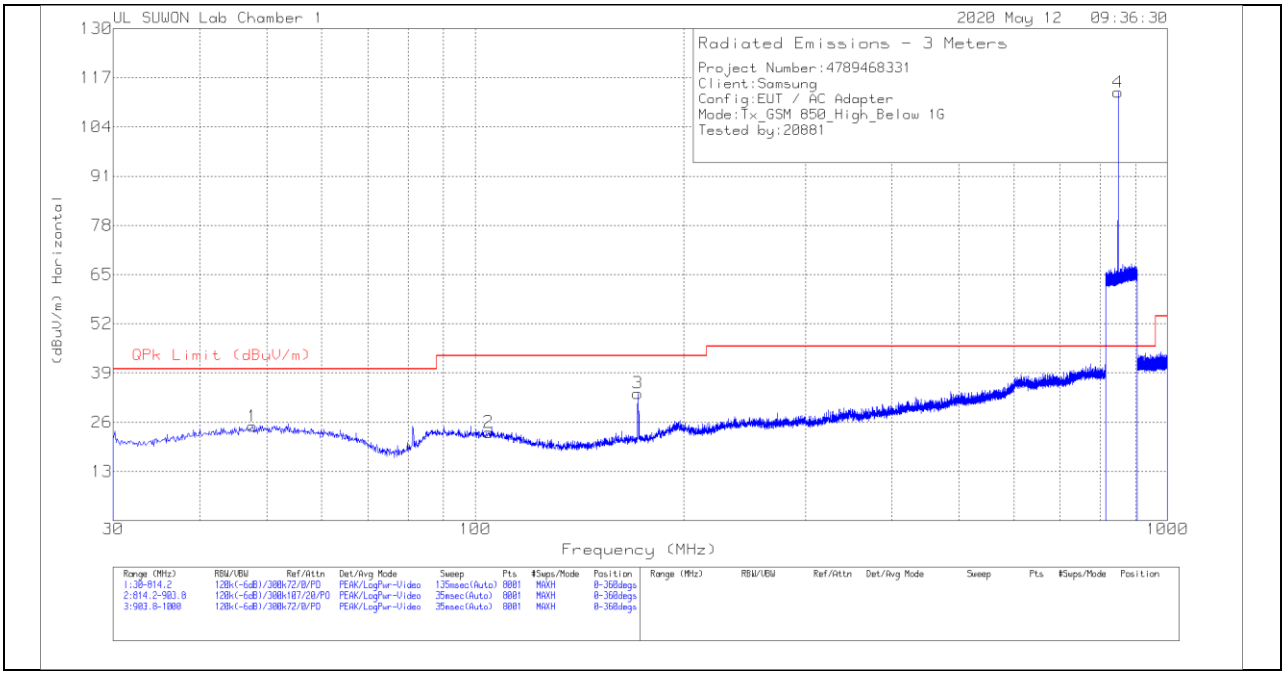
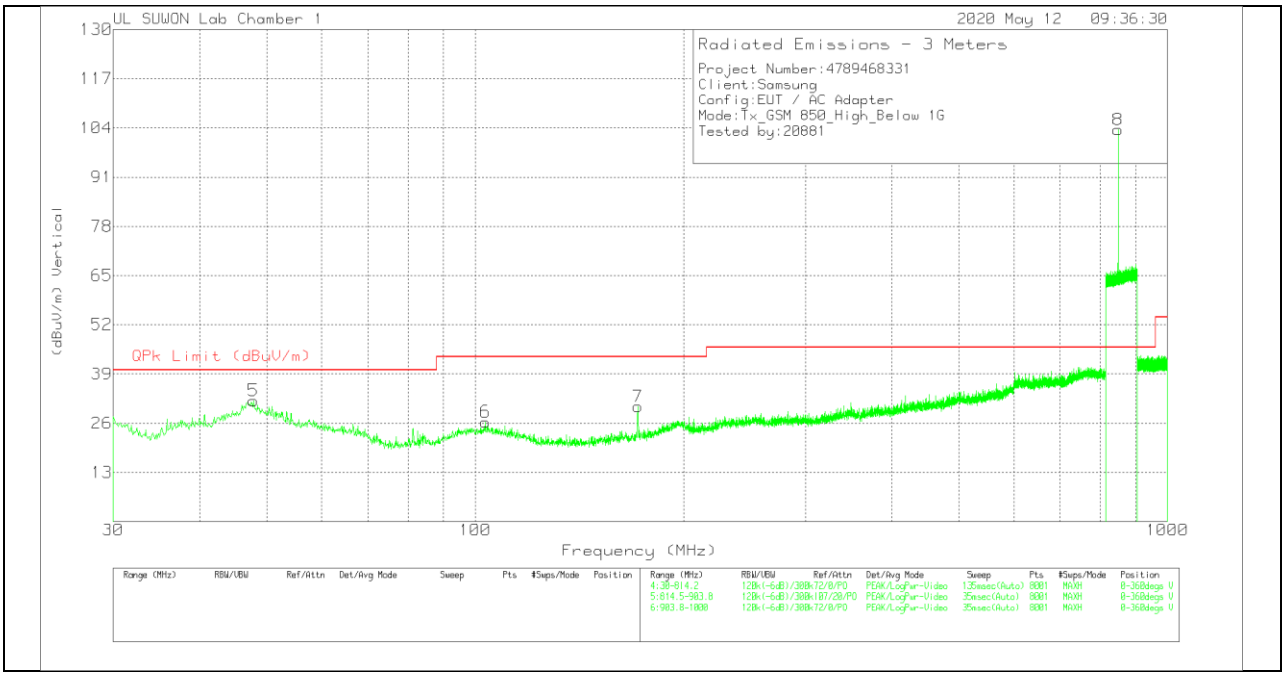
HIGH CHANNEL(893.8 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



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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	47.6445	3.2	Pk	19.8	1.9	24.9	40	-15.1	0-360	100	H
2	104.597	2.59	Pk	17.9	2.8	23.29	43.52	-20.23	0-360	400	H
3	171.7442	15.25	Pk	14.9	3.5	33.65	43.52	-9.87	0-360	200	H
4	848.8304	77.89	Pk	27.5	7.8	113.19	**46.02**	**67.17**	0-360	100	H
5	47.8406	8.81	Pk	19.8	3.3	31.91	40	-8.09	0-360	100	V
6	103.4207	4.5	Pk	17.9	3.9	26.3	43.52	-17.22	0-360	100	V
7	171.9402	10.9	Pk	14.9	4.6	30.4	43.52	-13.12	0-360	100	V
8	848.8039	68.22	Pk	27.5	7.8	103.52	**46.02**	**57.5**	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.

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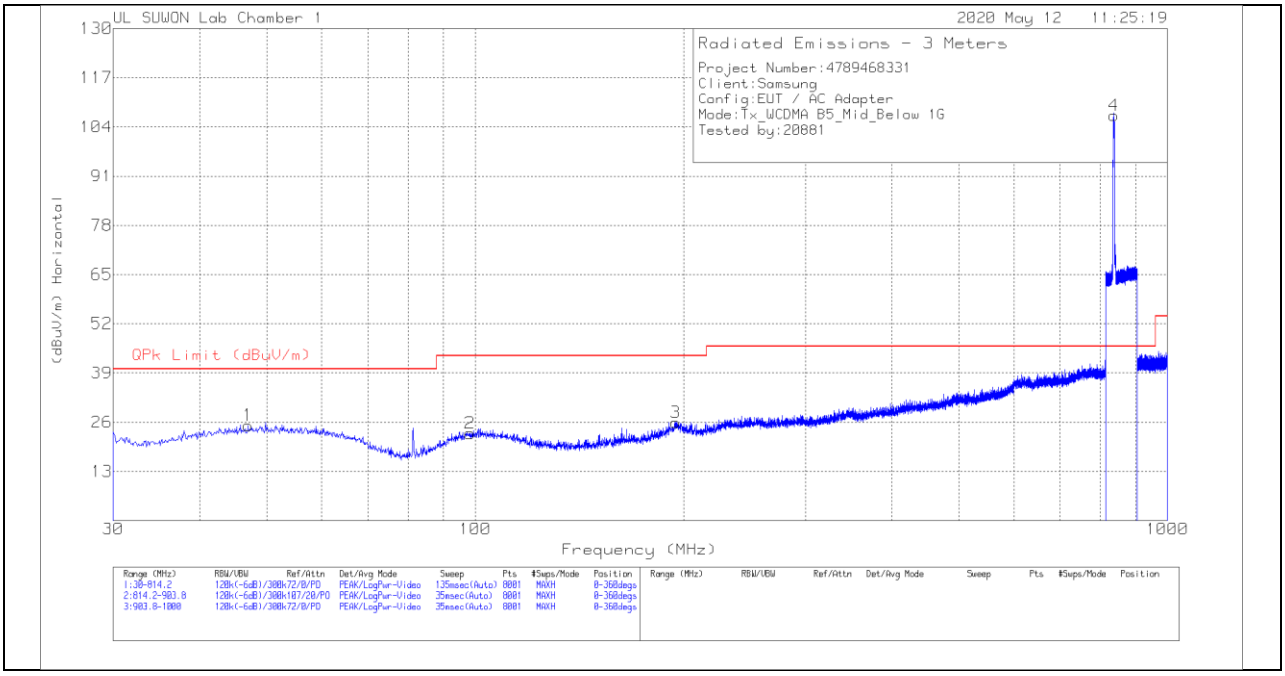
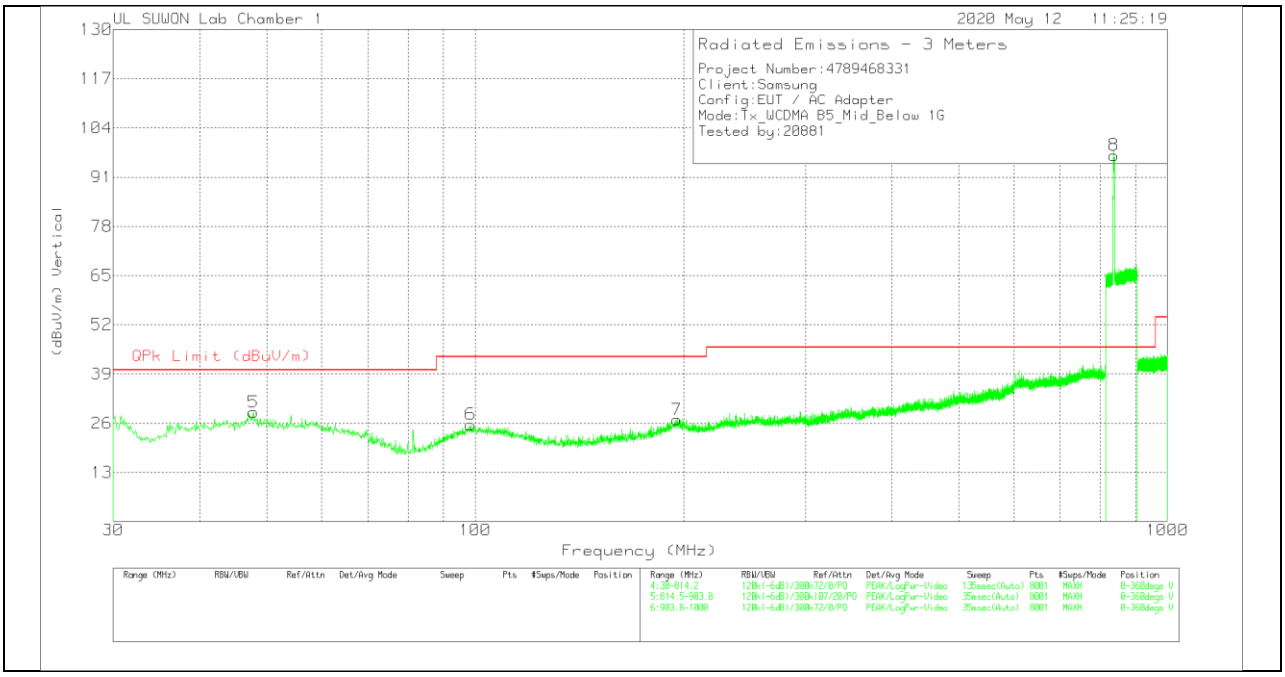
7.7. Below 1 GHz in the WCDMA Band 5

MID CHANNEL(881.6 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



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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	46.9583	3.41	Pk	19.8	1.9	25.11	40	-14.89	0-360	300	H
2	98.3234	2.53	Pk	17.8	2.7	23.03	43.52	-20.49	0-360	200	H
3	194.8781	4.21	Pk	18	3.7	25.91	43.52	-17.61	0-360	300	H
4	837.1936	72.14	Pk	27.2	7.7	107.04	**46.02**	**61.02**	0-360	100	H
5	47.8406	5.78	Pk	19.8	3.3	28.88	40	-11.12	0-360	100	V
6	98.5195	3.96	Pk	17.8	3.9	25.66	43.52	-17.86	0-360	200	V
7	195.6623	4.2	Pk	18.1	4.6	26.9	43.52	-16.62	0-360	100	V
8	837.3507	61.89	Pk	27.2	7.7	96.79	**46.02**	**50.77**	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.

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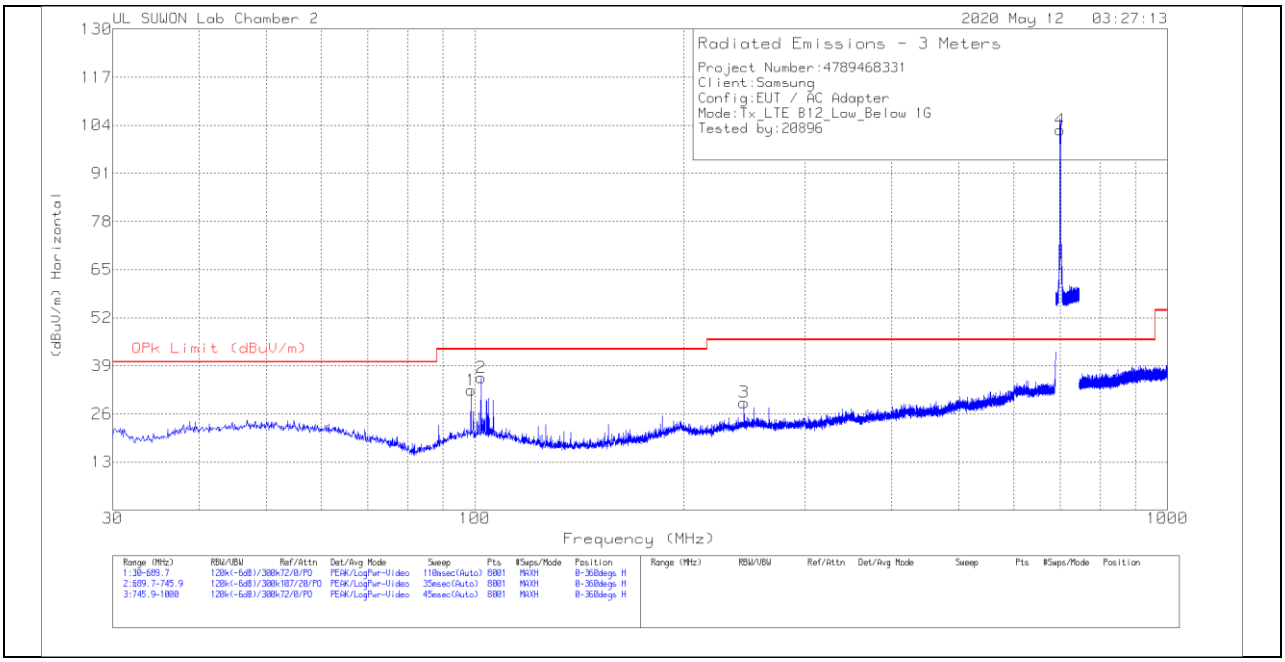
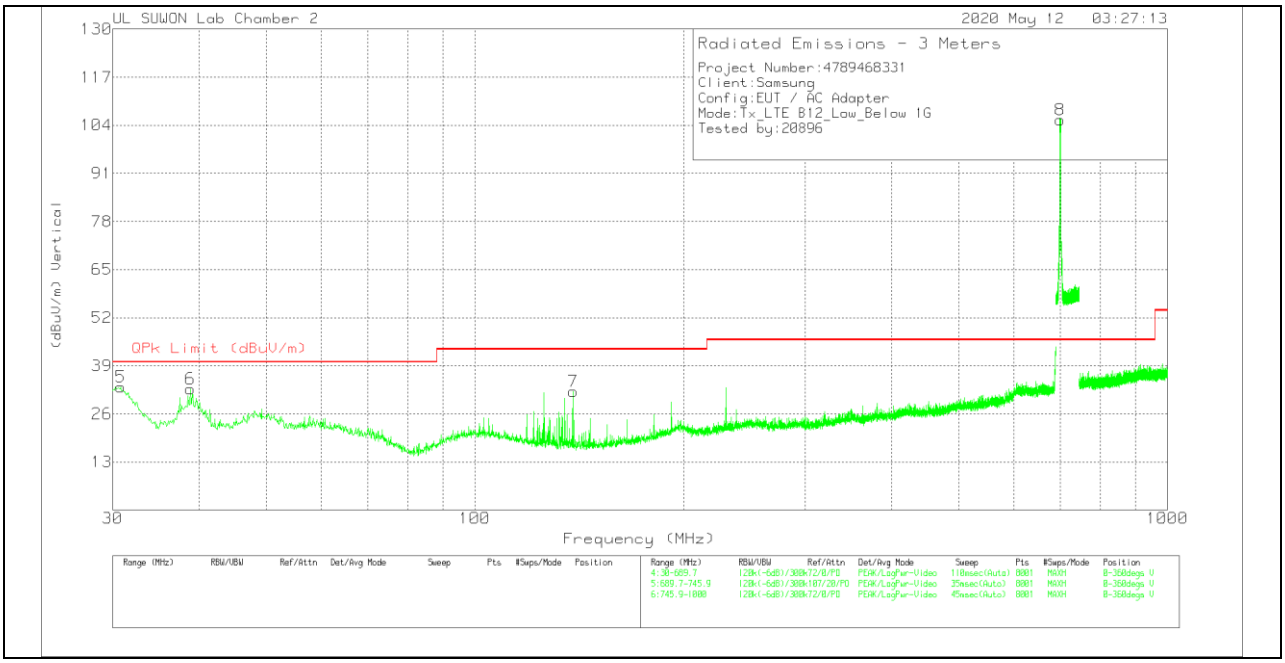
7.8. Below 1 GHz in the LTE Band 12

LOW CHANNEL(730.5 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



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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	98.6917	13.63	Pk	17.7	1.1	32.43	43.52	-11.09	0-360	300	H
2	102.0727	16.88	Pk	17.8	1.1	35.78	43.52	-7.74	0-360	300	H
3	244.7337	8.53	Pk	18.8	1.8	29.13	46.02	-16.89	0-360	100	H
4	700.2726	74.2	Pk	25.6	3	102.8	**46.02**	**56.78**	0-360	100	H
5	30.8246	17.05	Pk	15.6	.6	33.25	40	-6.75	0-360	100	V
6	38.8235	13.8	Pk	18.3	.7	32.8	40	-7.2	0-360	100	V
7	138.8512	16.72	Pk	14.1	1.3	32.12	43.52	-11.4	0-360	100	V
8	700.5817	76.95	Pk	25.6	3	105.55	**46.02**	**59.53**	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.

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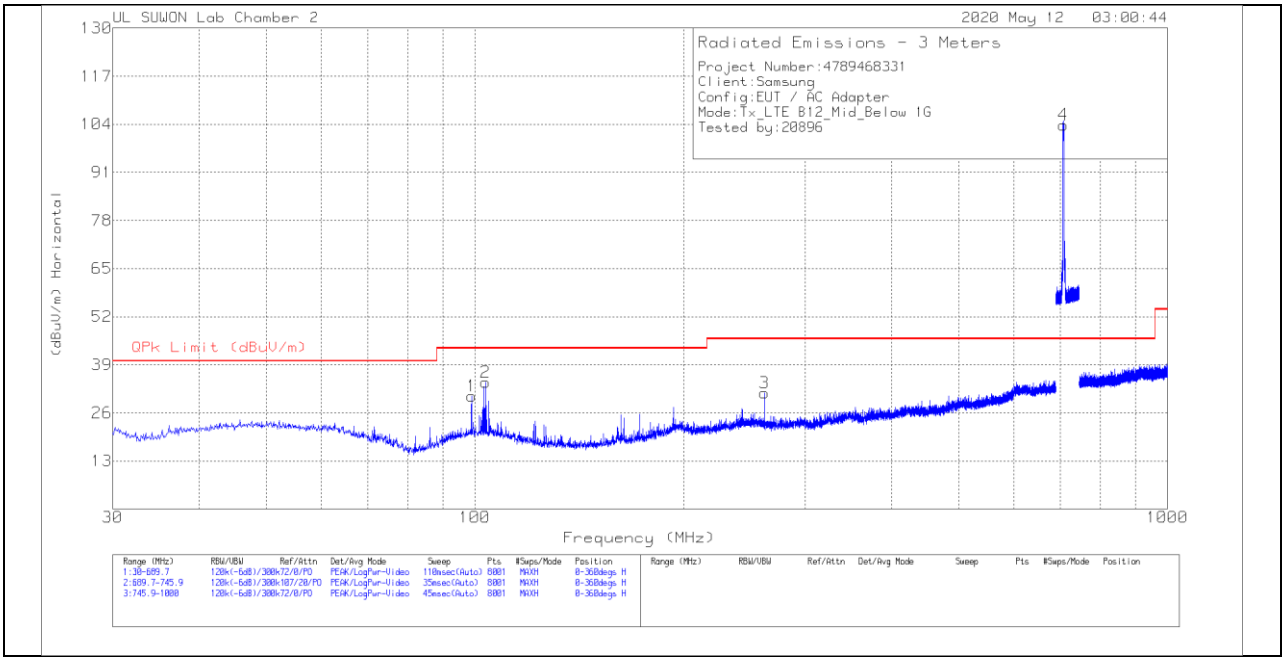
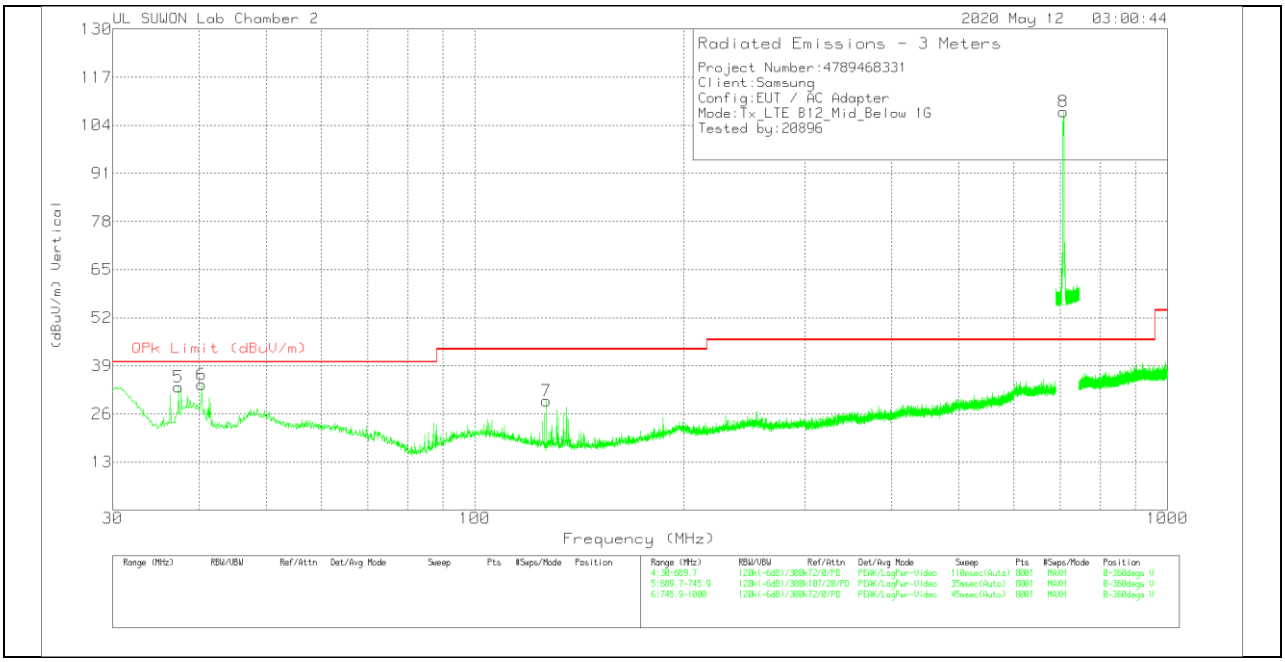
MID CHANNEL(737.5 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



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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	98.9391	11.82	Pk	17.7	1.1	30.62	43.52	-12.9	0-360	300	H
2	103.557	15.53	Pk	17.7	1.1	34.33	43.52	-9.19	0-360	300	H
3	261.886	10.99	Pk	18.7	1.8	31.49	46.02	-14.53	0-360	100	H
4	707.3398	75.36	Pk	25.5	3	103.86	**46.02**	**57.84**	0-360	100	H
5	37.3392	14.91	Pk	17.6	.7	33.21	40	-6.79	0-360	100	V
6	40.3079	14.51	Pk	18.8	.7	34.01	40	-5.99	0-360	100	V
7	126.8116	13.76	Pk	14.5	1.3	29.56	43.52	-13.96	0-360	100	V
8	707.9299	79.25	Pk	25.5	3	107.75	**46.02**	**61.73**	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.

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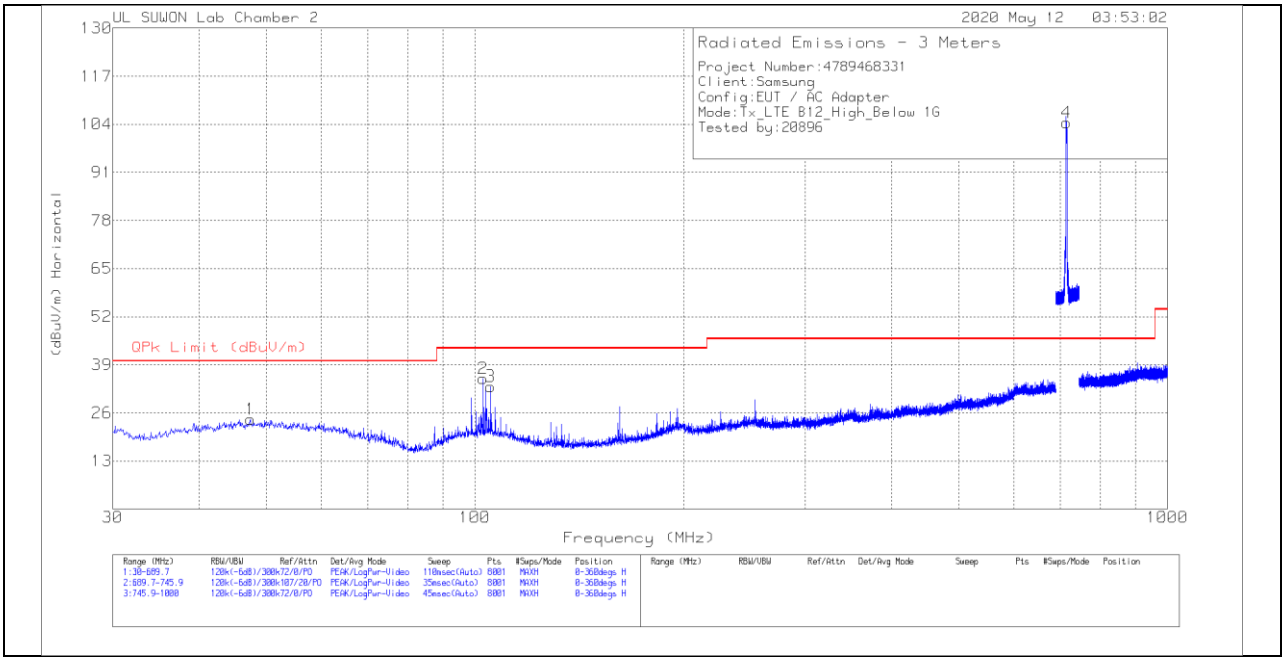
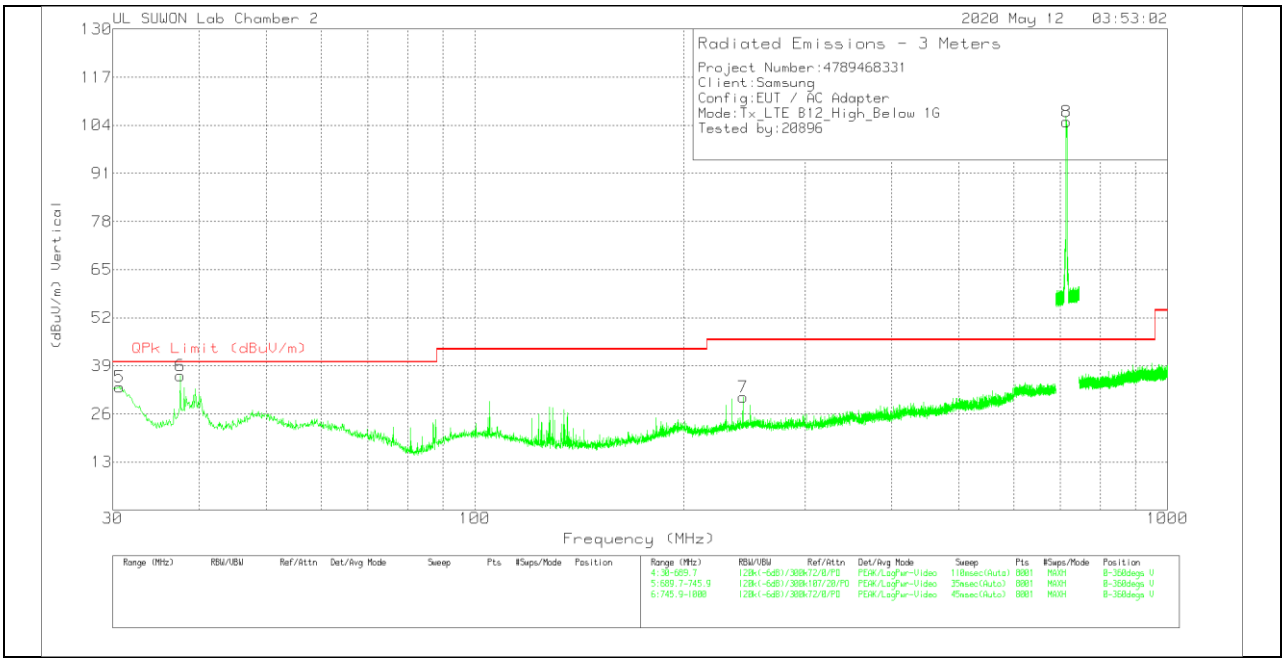
HIGH CHANNEL(744.5 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



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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	47.3997	3.68	Pk	19.8	.8	24.28	40	-15.72	0-360	200	H
2	102.8148	16.46	Pk	17.8	1.1	35.36	43.52	-8.16	0-360	300	H
3	105.3712	14.39	Pk	17.6	1.2	33.19	43.52	-10.33	0-360	300	H
4	714.4421	75.91	Pk	25.6	3	104.51	**46.02**	**58.49**	0-360	100	H
5	30.6597	17.04	Pk	15.7	.6	33.34	40	-6.66	0-360	100	V
6	37.5866	17.88	Pk	17.7	.7	36.28	40	-3.72	0-360	100	V
7	243.7441	10	Pk	18.7	1.8	30.5	46.02	-15.52	0-360	300	V
8	714.4561	76.36	Pk	25.6	3	104.96	**46.02**	**58.94**	0-360	100	V

Pk - Peak detector

Radiated Emissions

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
37.5866	7.17	Qp	17.7	.7	25.57	40	-14.43	169	112	V

Qp - Quasi-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.

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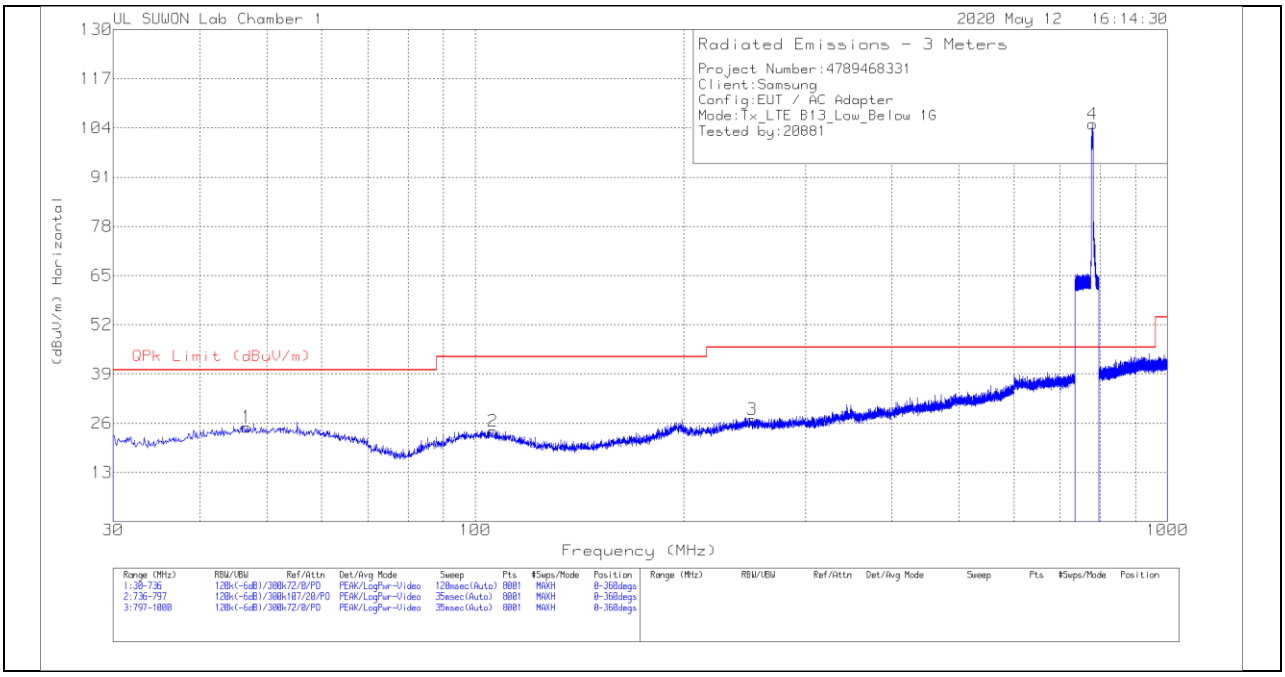
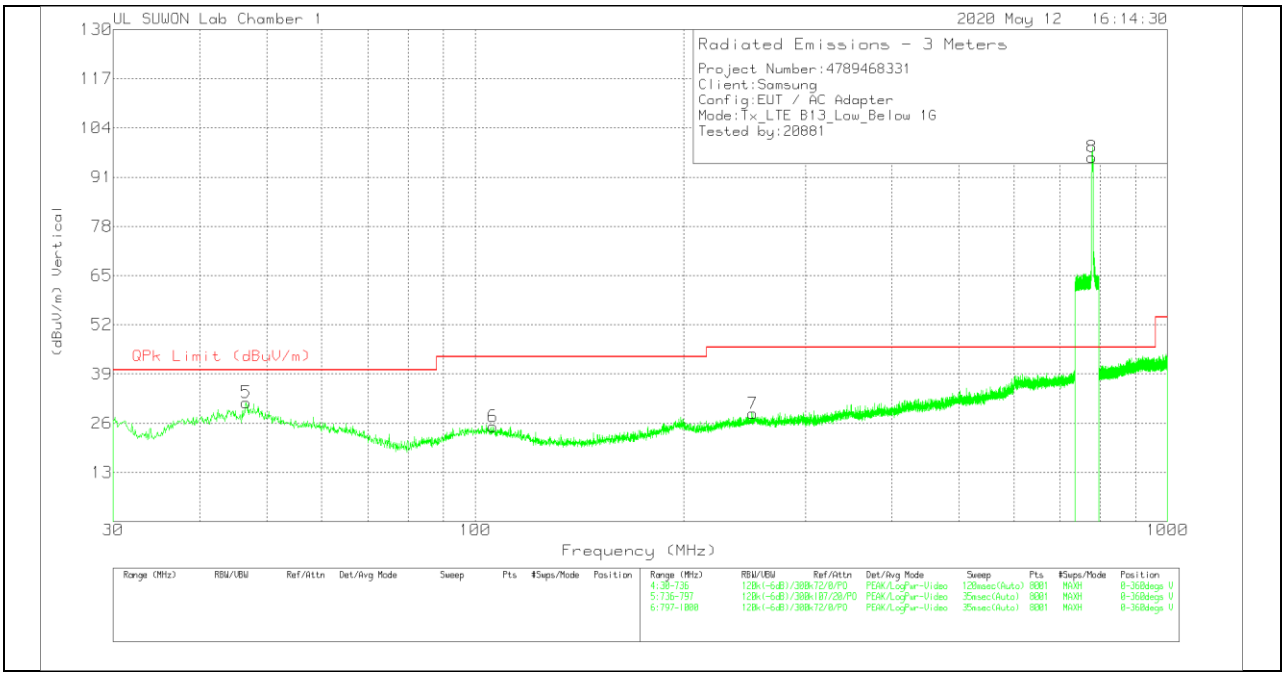
7.9. Below 1 GHz in the LTE Band 13

MID CHANNEL(751.0 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



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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	46.7675	3.28	Pk	19.8	1.9	24.98	40	-15.02	0-360	400	H
2	106.0715	3.29	Pk	17.8	2.8	23.89	43.52	-19.63	0-360	200	H
3	251.4193	3.68	Pk	19.1	4.2	26.98	46.02	-19.04	0-360	300	H
4	779.8056	70.83	Pk	26.8	7.4	105.03	**46.02**	**59.01**	0-360	100	H
5	46.6793	8.46	Pk	19.7	3.3	31.46	40	-8.54	0-360	100	V
6	106.1598	3.5	Pk	17.7	3.9	25.1	43.52	-18.42	0-360	100	V
7	251.7723	4.37	Pk	19.1	5.1	28.57	46.02	-17.45	0-360	300	V
8	778.7153	62.12	Pk	26.8	7.4	96.32	**46.02**	**50.3**	0-360	200	V

Pk - Peak detector

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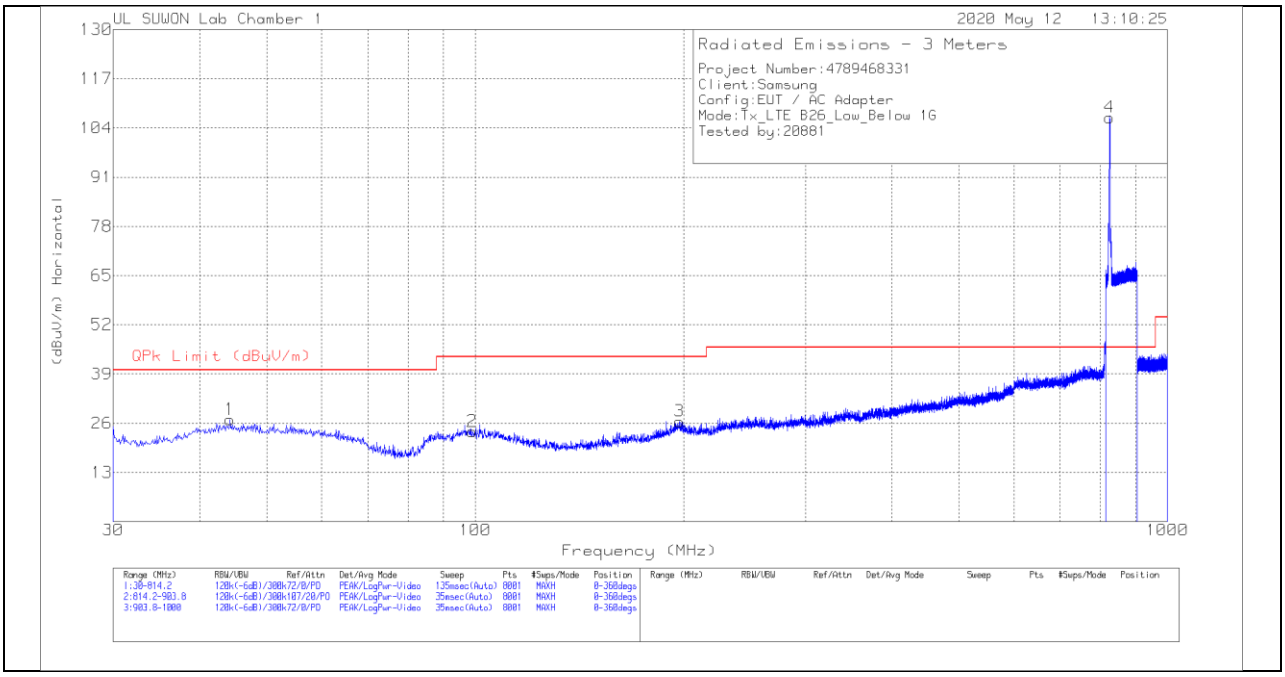
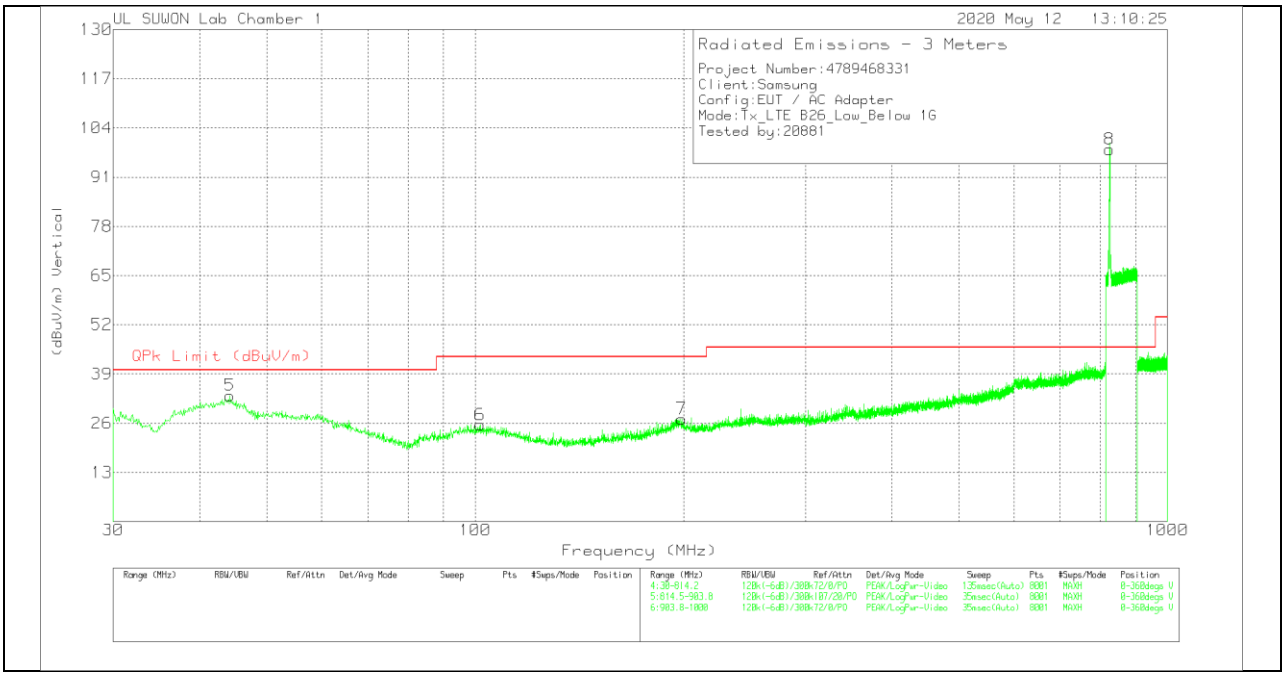
7.10. Below 1 GHz in the LTE Band 26

LOW CHANNEL(860.5 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



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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	44.2136	5.54	Pk	19.6	1.8	26.94	40	-13.06	0-360	300	H
2	99.1076	3.3	Pk	17.8	2.7	23.8	43.52	-19.72	0-360	200	H
3	197.4267	4.59	Pk	18.1	3.8	26.49	43.52	-17.03	0-360	300	H
4	825.456	72.18	Pk	27	7.6	106.78	**46.02**	**60.76**	0-360	100	H
5	44.2136	10.51	Pk	19.6	3.2	33.31	40	-6.69	0-360	100	V
6	101.6563	3.77	Pk	17.9	3.9	25.57	43.52	-17.95	0-360	200	V
7	198.7991	4.51	Pk	17.9	4.7	27.11	43.52	-16.41	0-360	300	V
8	825.0044	63.73	Pk	27	7.6	98.33	**46.02**	**52.31**	0-360	200	V

Pk - Peak detector

Note: Unwanted emissions captured from 814MHz to 849MHz and from 859MHz to 894MHz were the TX and RX signals generated from the call-simulator.

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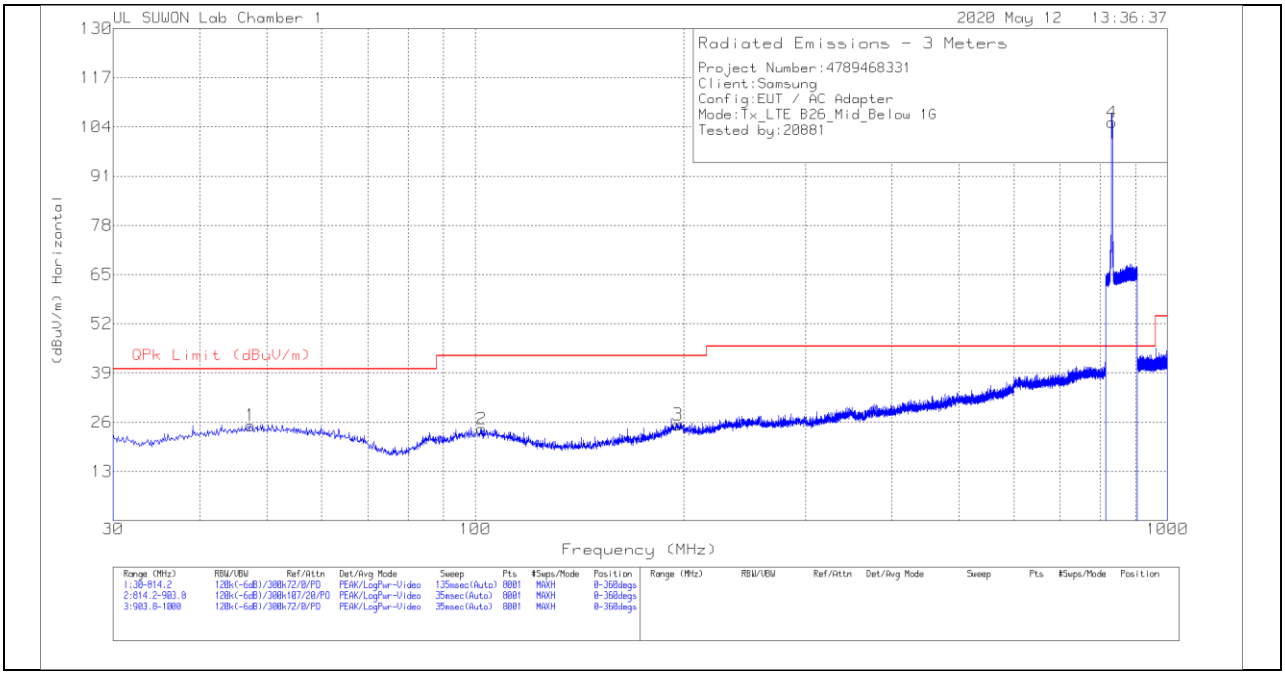
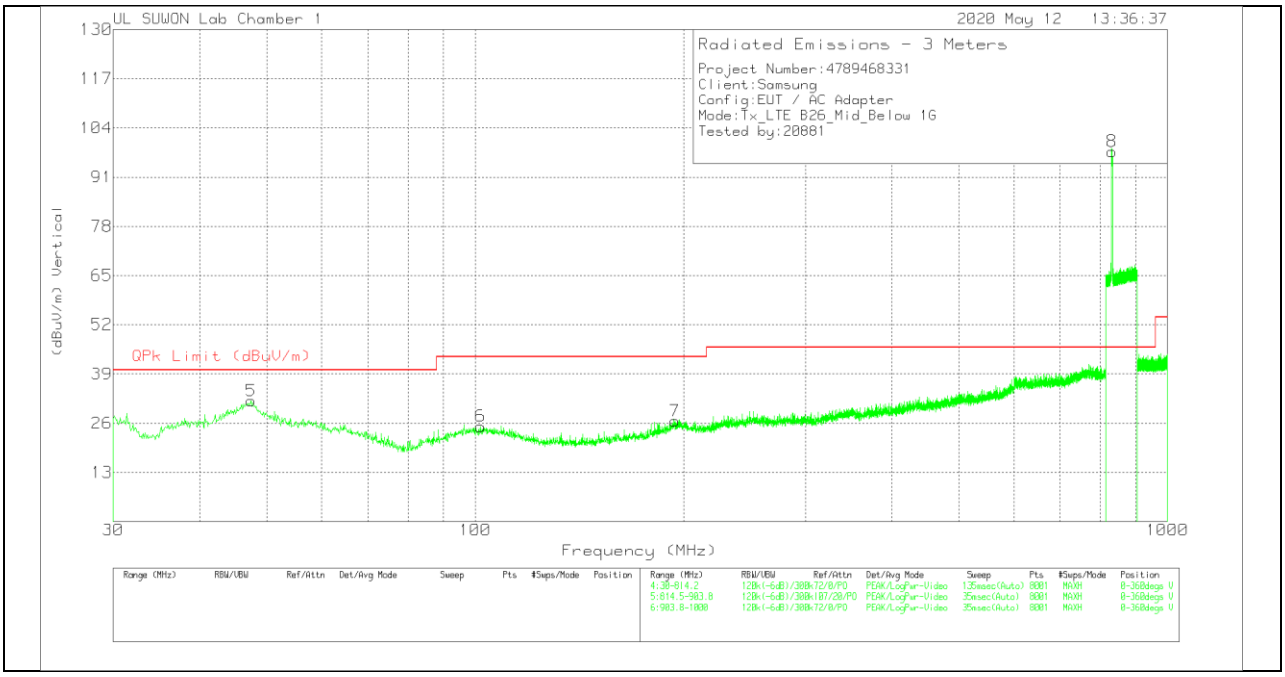
MID CHANNEL(876.5 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



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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	47.3504	3.41	Pk	19.8	1.9	25.11	40	-14.89	0-360	100	H
2	102.2444	3.65	Pk	17.9	2.7	24.25	43.52	-19.27	0-360	400	H
3	196.2504	3.39	Pk	18.2	3.7	25.29	43.52	-18.23	0-360	300	H
4	831.9408	70.3	Pk	27.2	7.7	105.2	**46.02**	**59.18**	0-360	100	H
5	47.4485	8.78	Pk	19.8	3.3	31.88	40	-8.12	0-360	100	V
6	101.8523	3.36	Pk	17.9	3.9	25.16	43.52	-18.36	0-360	200	V
7	194.2899	3.95	Pk	17.9	4.7	26.55	43.52	-16.97	0-360	300	V
8	831.5236	62.86	Pk	27.2	7.7	97.76	**46.02**	**51.74**	0-360	200	V

Pk - Peak detector

Note: Unwanted emissions captured from 814MHz to 849MHz and from 859MHz to 894MHz were the TX and RX signals generated from the call-simulator.

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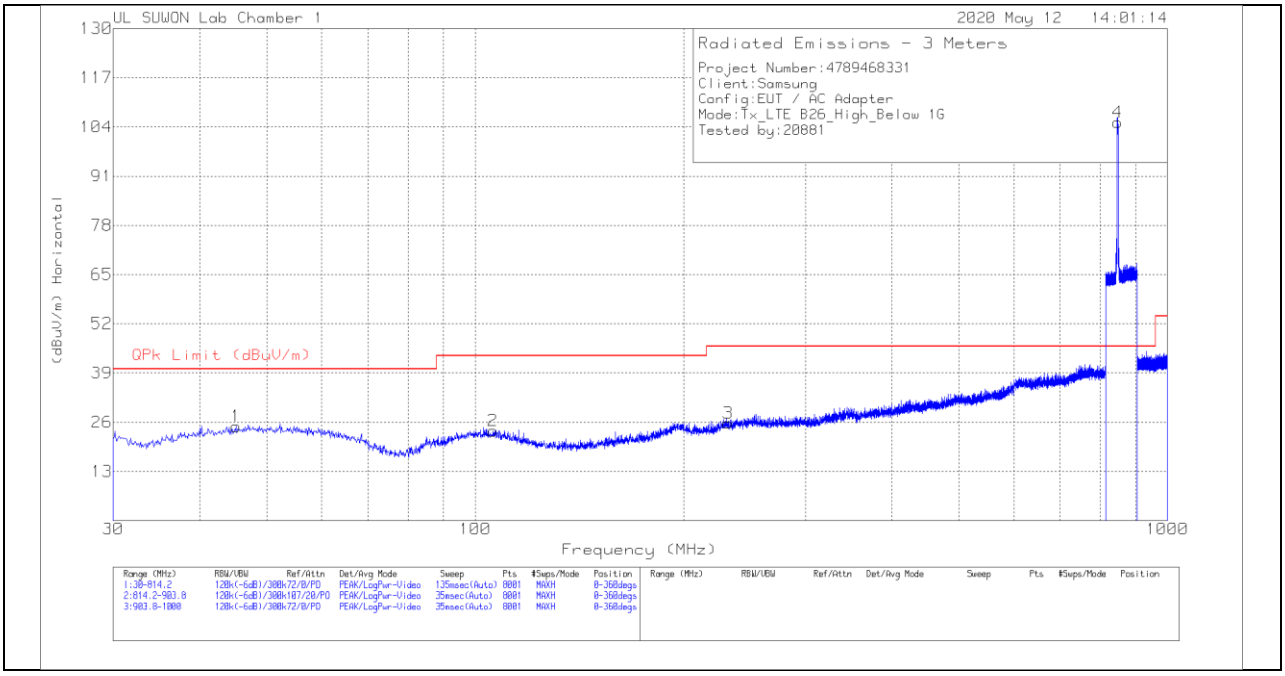
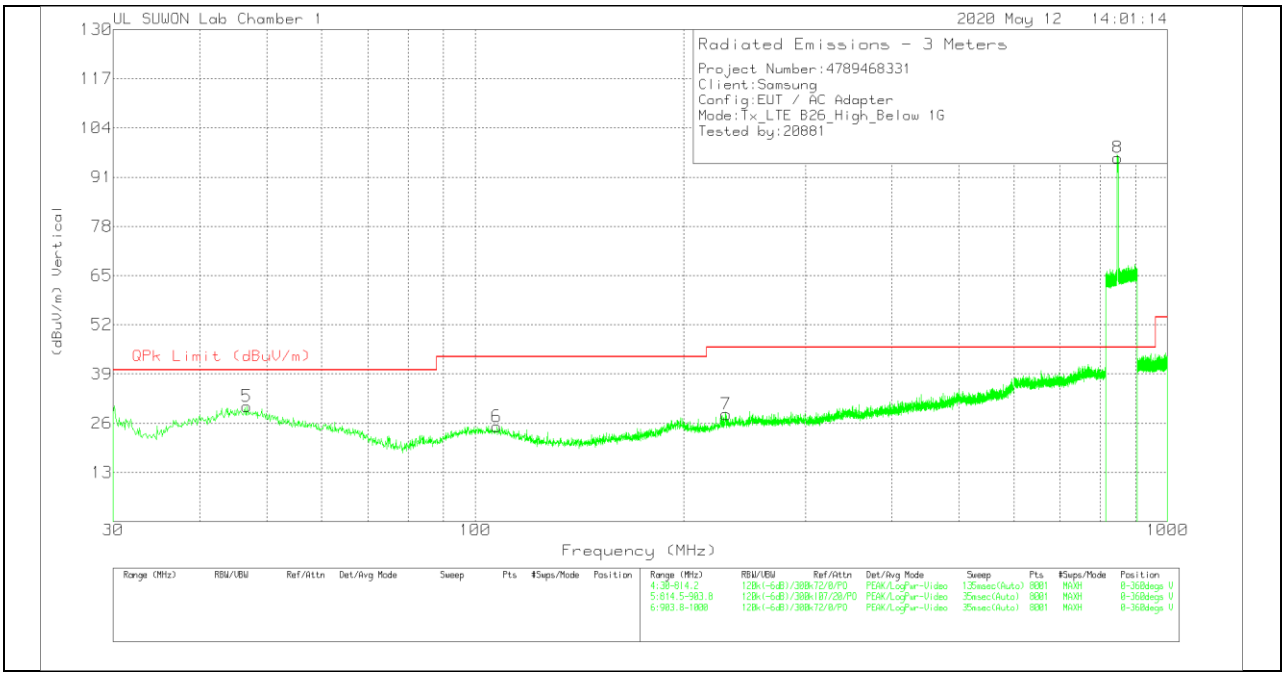
HIGH CHANNEL(892.5 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



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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	45.1939	3.46	Pk	19.6	1.8	24.86	40	-15.14	0-360	200	H
2	106.1654	3.18	Pk	17.7	2.8	23.68	43.52	-19.84	0-360	300	H
3	231.9315	3.32	Pk	18.3	4.1	25.72	46.02	-20.3	0-360	300	H
4	847.296	69.97	Pk	27.4	7.8	105.17	**46.02**	**59.15**	0-360	100	H
5	46.7623	7.32	Pk	19.8	3.3	30.42	40	-9.58	0-360	100	V
6	107.4398	3.61	Pk	17.6	3.9	25.11	43.52	-18.41	0-360	400	V
7	230.4611	5.24	Pk	18.3	4.8	28.34	46.02	-17.68	0-360	400	V
8	848.3239	60.85	Pk	27.5	7.8	96.15	**46.02**	**50.13**	0-360	100	V

Pk - Peak detector

Note: Unwanted emissions captured from 814MHz to 849MHz and from 859MHz to 894MHz were the TX and RX signals generated from the call-simulator.

END OF TEST REPORT

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