



CERTIFICATION TEST REPORT

Report Number. : 4790360891-E1V2

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

Model : SM-A137F/DSN

FCC ID : A3LSMA137F

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

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

Date Of Issue:
2022-04-25

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ACCREDITED

Testing Laboratory

TL-637

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	2022-04-22	Initial issue	Yeonhee Lim
V2	2022-04-25	Updated to address TCB's question	Yeonhee Lim

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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 and NFC
MODEL NUMBER: SM-A137F/DSN
SERIAL NUMBER: R38T4001ZCM (RADIATED)
DATE TESTED: 2022-04-12 ~ 2022-04-18;

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:



Yeonhee Lim
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	
☐	Chamber 1(3m semi-anechoic chamber)
☒	Chamber 2(3m semi-anechoic chamber)
☐	Chamber 3(3m semi-anechoic chamber)
☐	Chamber 4(3m Full-anechoic chamber)
☐	Chamber 5(3m Full-anechoic chamber)

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:

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

(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
Conducted Disturbance, 0.15 to 30 MHz	3.02 dB
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 and NFC. This test report addresses the WWAN operational mode.

5.2. TEST MODE

Mode	Description
GSM850	Communicating with Call simulator(CMW500)
WCDMA BAND 5	Communicating with Call simulator(CMW500)
LTE BAND 5	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 B5		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 and maximum tune-up limit is higher than WCDMA Band5. Therefore, only Mid channel was checked.

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

Conducted Emission Test

The worst-case scenario for all measurements is based on the average conducted output power measurement investigation results. The worst-case scenario was GSM 850.

5.4. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacture	Model	Serial Number	FCC ID
Charger	SAMSUNG	EP-TA800	R37MANQ1E72SE3	N/A
Data Cable	SAMSUNG	EP-DN980	GH39-02115A BWE	N/A
Earphone	SAMSUNG	GH59-15055A	EHS64AVFWE	N/A

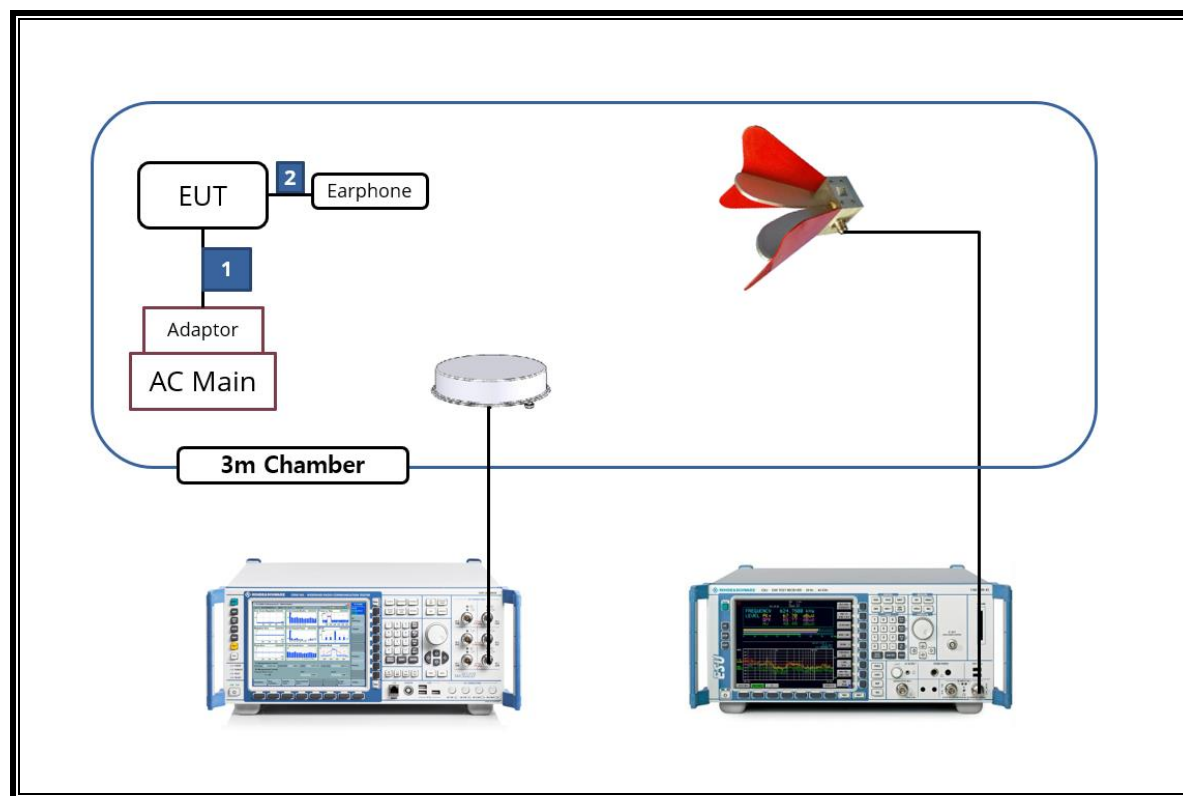
I/O CABLE

I/O Cable List						
Cable No.	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	DC Power	1	C to C Type	Shielded	1.0 m	N/A
2	Audio	2	Mini-jack	Unshielded	0.7 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
Directional Antenna	Cobham	FPA3-0.8-6.0R/1329	110367-0003	N/A
Directional Antenna	Cobham	FPA3-0.8-6.0R/1329	80108-0004	N/A
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	2023-01-07
DC Power Supply	Agilent / HP	E3640A	MY54226395	2022-08-02
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
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54170614	2022-08-04
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54490312	2022-08-04
EMI Test Receive, 40 GHz	R&S	ESU40	100439	2022-08-02
EMI Test Receive, 40 GHz	R&S	ESU40	100457	2022-08-02
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
Temperature Chamber	ESPEC	SH-642	93001109	2022-08-02
Power Splitter	MINI-CIRCUITS	WA1534	UL003	2023-01-11
Power Splitter	MINI-CIRCUITS	WA1534	UL004	2023-01-11
UL Software				
Description	Manufacturer	Model	Version	
Antenna port test software	UL	CLT	Ver 3.4	
Radiated software	UL	UL EMC	Ver 9.5	

7. APPLICABLE LIMITS AND TEST RESULTS

7.1. RADIATED EMISSIONS

TEST PROCEDURE

ANSI C63.4-2014

LIMIT

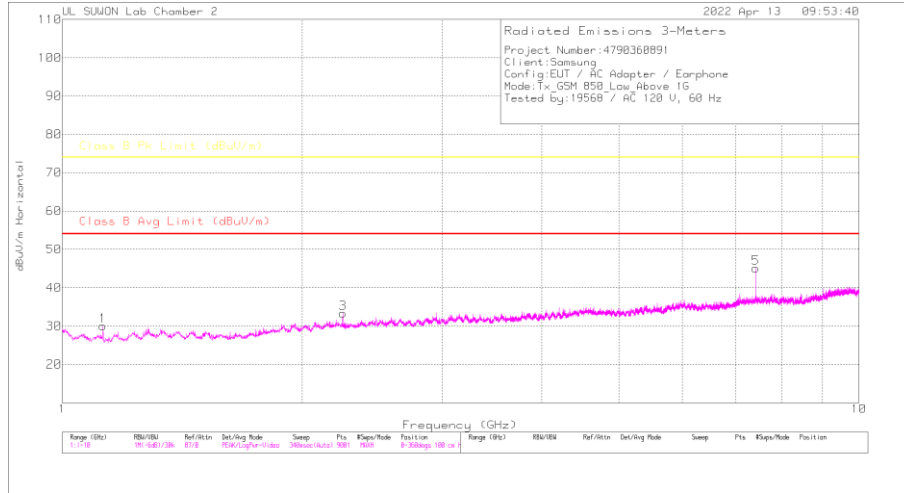
§15.109 (a) Except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

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.	

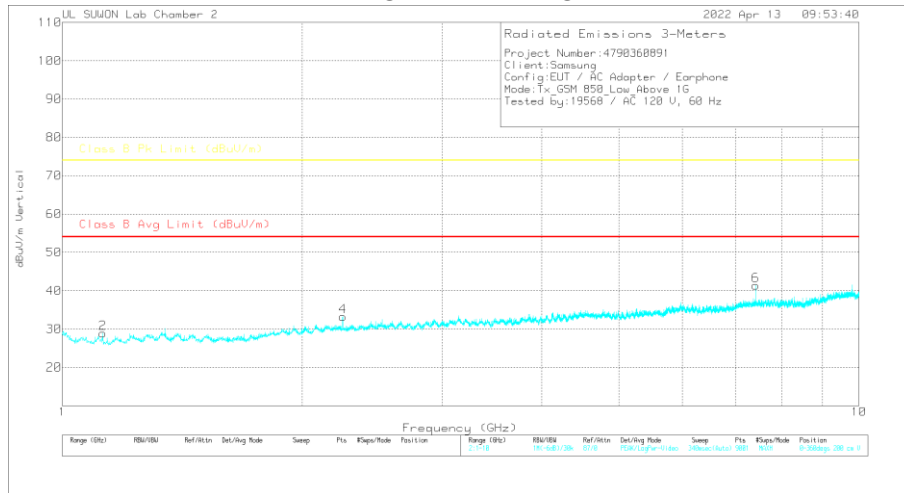
7.1.1. Above 1 GHz in the GSM850

LOW CHANNEL(869.2 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT

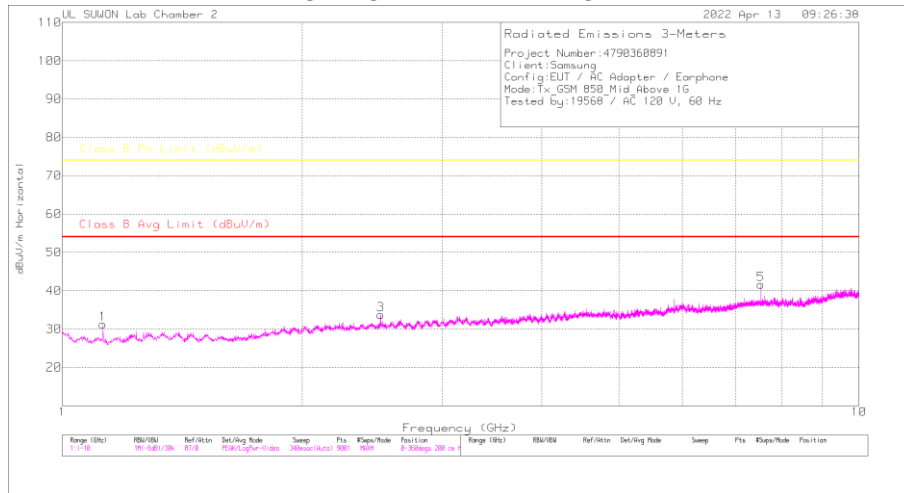
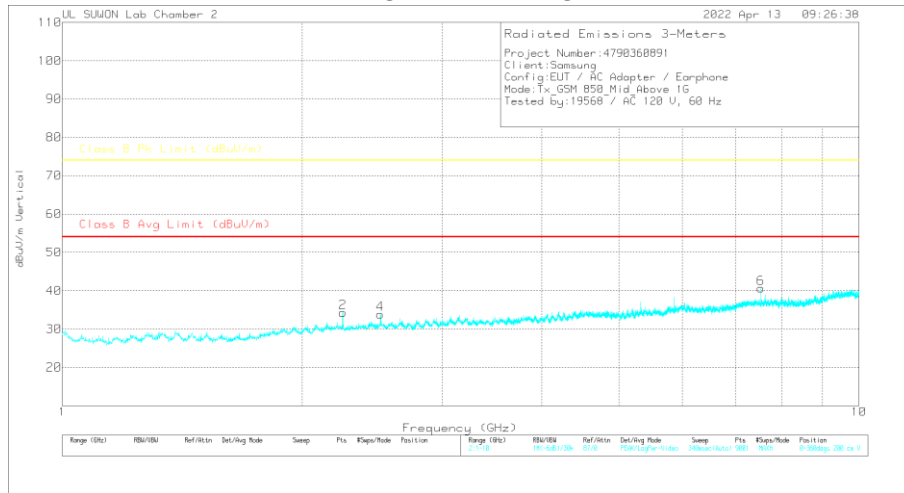


DATA

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	3117_0016872 4	1-18GHz[dB]	1GHz_HPI[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
1.125	37.47	Pk	28	-32.2	1.2	34.47	-	-	74	-39.53	0	100	H
1.125	25.81	Ca	28	-32.2	1.2	22.81	54	-31.19	-	-	0	100	H
1.124	38.22	Pk	28	-32.2	1.2	35.22	-	-	74	-38.78	0	100	V
1.124	25.65	Ca	28	-32.2	1.2	22.65	54	-31.35	-	-	0	100	V
2.25	36.56	Pk	31.7	-30.7	.6	38.16	-	-	74	-35.84	0	100	H
2.25	25.06	Ca	31.7	-30.7	.6	26.66	54	-27.34	-	-	0	100	H
2.25	36.81	Pk	31.7	-30.7	.6	38.41	-	-	74	-35.59	0	100	V
2.25	24.86	Ca	31.7	-30.7	.6	26.46	54	-27.54	-	-	0	100	V
7.418	39.64	Pk	36.1	-25.3	.4	50.84	-	-	74	-23.16	205	150	H
7.418	24.25	Ca	36.1	-25.3	.4	35.45	54	-18.55	-	-	205	150	H
7.418	38.22	Pk	36.1	-25.3	.4	49.42	-	-	74	-24.58	24	157	V
7.418	23.49	Ca	36.1	-25.3	.4	34.69	54	-19.31	-	-	24	157	V

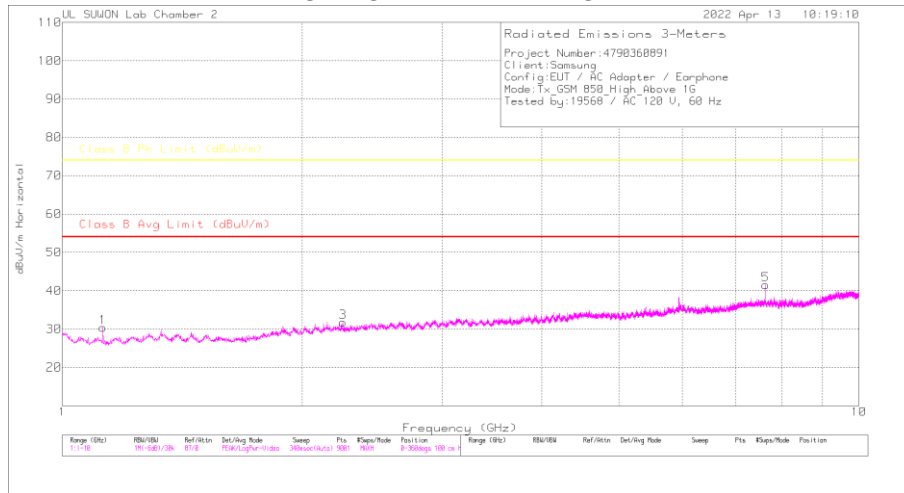
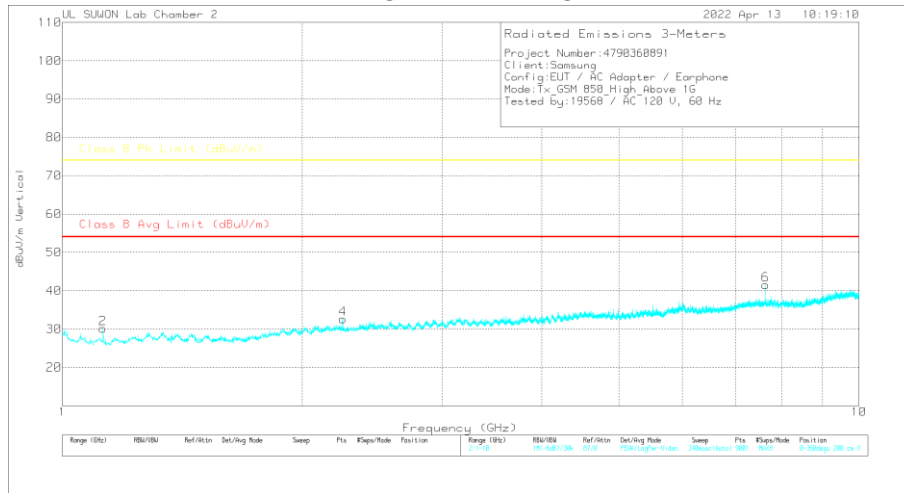
Pk - Peak detector
Ca - CISPR average detection

MID CHANNEL(881.6 MHz)**HORIZONTAL PEAK PLOT****VERTICAL PEAK PLOT****DATA****Radiated Emissions**

Frequency (GHz)	Meter Reading (dBuV)	Det	3117_0016872_4	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
1.124	37.47	Pk	28	-32.2	1.2	34.47	-	-	74	-39.53	0	100	H
1.124	25.73	Ca	28	-32.2	1.2	22.73	54	-31.27	-	-	0	100	H
2.25	36.91	Pk	31.7	-30.7	.6	38.51	-	-	74	-35.49	0	100	V
2.25	25.14	Ca	31.7	-30.7	.6	26.74	54	-27.26	-	-	0	100	V
2.51	36.49	Pk	32.1	-30.2	.8	39.19	-	-	74	-34.81	0	100	H
2.51	24.33	Ca	32.1	-30.2	.8	27.03	54	-26.97	-	-	0	100	H
2.509	35.65	Pk	32.1	-30.3	.8	38.25	-	-	74	-35.75	0	100	V
2.509	24.24	Ca	32.1	-30.3	.8	26.84	54	-27.16	-	-	0	100	V
7.53	40.99	Pk	36	-25.1	.4	52.29	-	-	74	-21.71	222	182	H
7.53	24.03	Ca	36	-25.1	.4	35.33	54	-18.67	-	-	222	182	H
7.53	36.57	Pk	36	-25.1	.4	47.87	-	-	74	-26.13	160	177	V
7.53	22.75	Ca	36	-25.1	.4	34.05	54	-19.95	-	-	160	177	V

Pk - Peak detector

Ca - CISPR average detection

HIGH CHANNEL(893.8 MHz)**HORIZONTAL PEAK PLOT****VERTICAL PEAK PLOT****DATA****Radiated Emissions**

Frequency (GHz)	Meter Reading (dBuV)	Det	3117_0016872_4	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
1.124	37.15	Pk	28	-32.2	1.2	34.15	-	-	74	-39.85	360	100	H
1.124	25.57	Ca	28	-32.2	1.2	22.57	54	-31.43	-	-	360	100	H
1.125	38.38	Pk	28	-32.2	1.2	35.38	-	-	74	-38.62	360	100	V
1.125	25.94	Ca	28	-32.2	1.2	22.94	54	-31.06	-	-	360	100	V
2.25	36.95	Pk	31.7	-30.7	.6	38.55	-	-	74	-35.45	360	100	H
2.25	24.98	Ca	31.7	-30.7	.6	26.58	54	-27.42	-	-	360	100	H
2.25	37.07	Pk	31.7	-30.7	.6	38.67	-	-	74	-35.33	360	100	V
2.25	24.98	Ca	31.7	-30.7	.6	26.58	54	-27.42	-	-	360	100	V
7.64	38.89	Pk	35.9	-25.1	.4	50.09	-	-	74	-23.91	226	174	H
7.64	22.95	Ca	35.9	-25.1	.4	34.15	54	-19.85	-	-	226	174	H
7.639	36.3	Pk	35.9	-25.1	.4	47.5	-	-	74	-26.5	182	199	V
7.639	22.6	Ca	35.9	-25.1	.4	33.8	54	-20.2	-	-	182	199	V

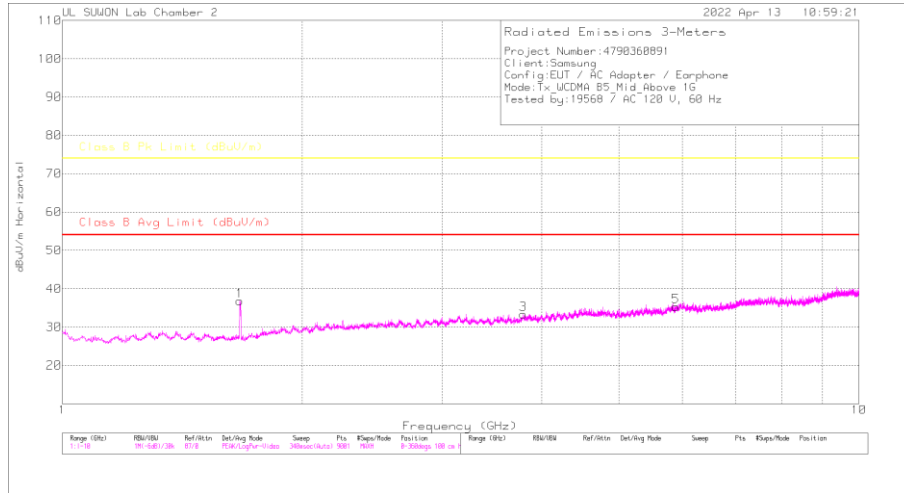
Pk - Peak detector

Ca - CISPR average detection

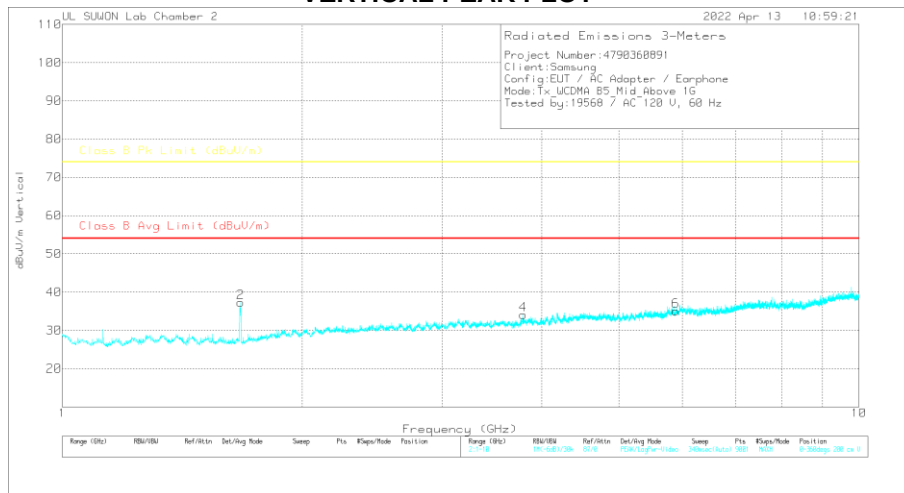
7.1.2. Above 1 GHz in the WCDMA Band 5

MID CHANNEL(881.6 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



DATA

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	3117_0016872 4	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
1.671	39.06	Pk	28.6	-31.4	.8	37.06	-	-	74	-36.94	0	100	H
1.671	27.2	Ca	28.6	-31.4	.8	25.2	54	-28.8	-	-	0	100	H
1.674	36.61	Pk	28.6	-31.4	.8	34.61	-	-	74	-39.39	0	100	V
1.674	25.06	Ca	28.6	-31.4	.8	23.06	54	-30.94	-	-	0	100	V
3.792	37.08	Pk	33.3	-29.3	.5	41.58	-	-	74	-32.42	0	100	H
3.792	24.26	Ca	33.3	-29.3	.5	28.76	54	-25.24	-	-	0	100	H
3.791	36.33	Pk	33.3	-29.3	.5	40.83	-	-	74	-33.17	0	100	V
3.791	24.3	Ca	33.3	-29.3	.5	28.8	54	-25.2	-	-	0	100	V
5.889	34.94	Pk	35	-27.4	.4	42.94	-	-	74	-31.06	0	100	H
5.889	23.36	Ca	35	-27.4	.4	31.36	54	-22.64	-	-	0	100	H
5.891	35.25	Pk	35	-27.4	.4	43.25	-	-	74	-30.75	0	100	V
5.891	23.49	Ca	35	-27.4	.4	31.49	54	-22.51	-	-	0	100	V

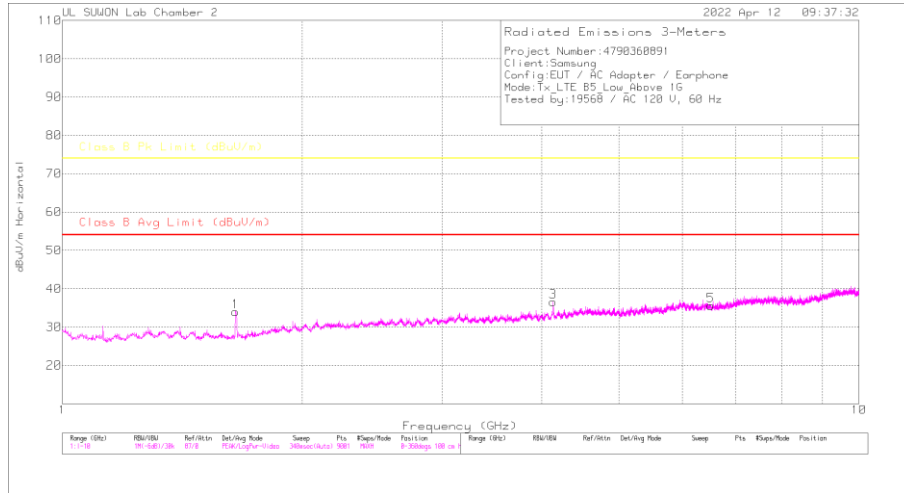
PK - Peak detector

Ca - CISPR average detection

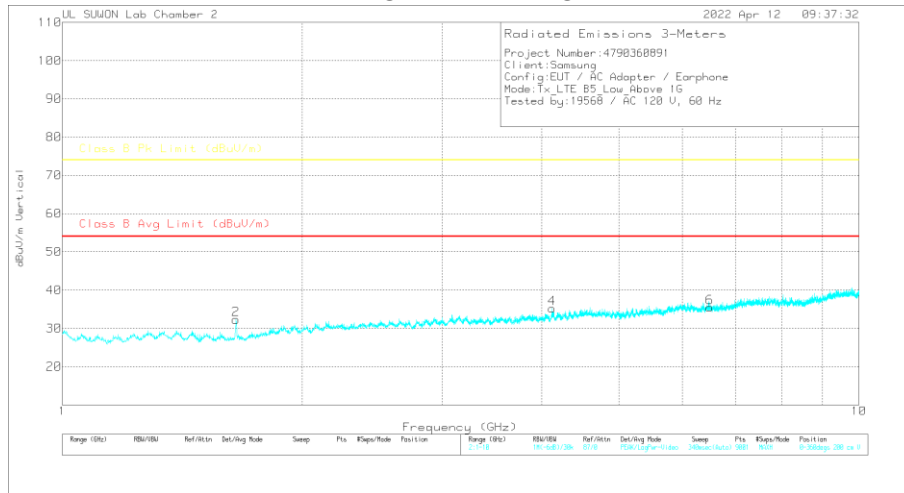
7.1.3. Above 1 GHz in the LTE Band 5

LOW CHANNEL(871.5 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



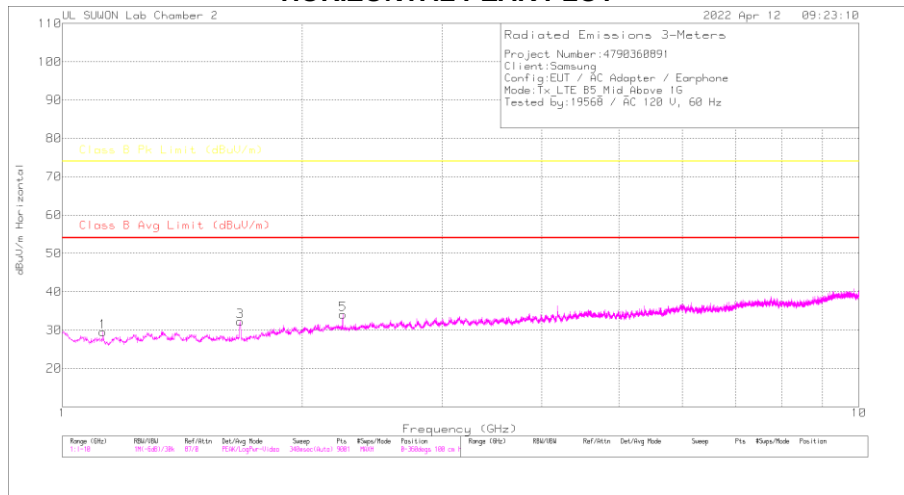
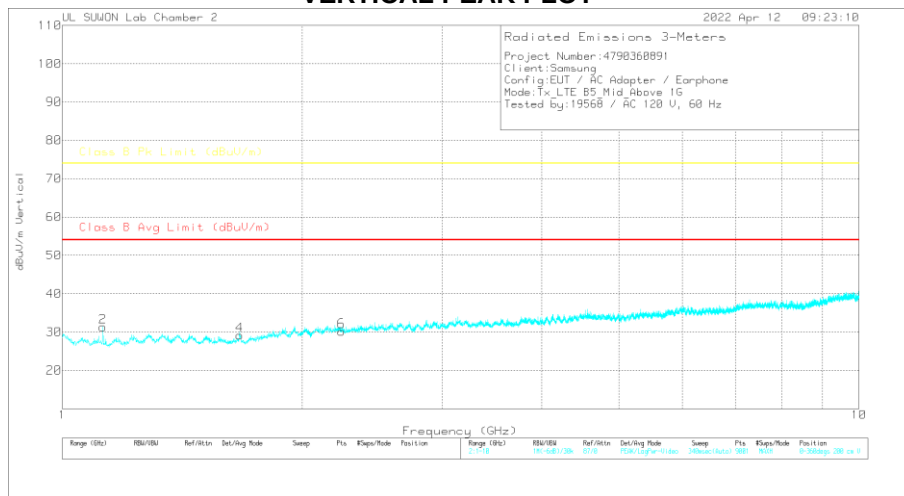
DATA

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	3117_0016872 4	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
1.65	39.04	Pk	28.6	-31.4	.8	37.04	-	-	74	-36.96	360	100	H
1.65	26.19	Ca	28.6	-31.4	.8	24.19	54	-29.81	-	-	360	100	H
1.653	39.47	Pk	28.6	-31.4	.8	37.47	-	-	74	-36.53	360	100	V
1.653	27.45	Ca	28.6	-31.4	.8	25.45	54	-28.55	-	-	360	100	V
4.134	36.44	Pk	33.4	-28.5	.5	41.84	-	-	74	-32.16	360	100	H
4.134	24.44	Ca	33.4	-28.5	.5	29.84	54	-24.16	-	-	360	100	H
4.123	36.94	Pk	33.4	-28.6	.5	42.24	-	-	74	-31.76	360	100	V
4.123	24.48	Ca	33.4	-28.6	.5	29.78	54	-24.22	-	-	360	100	V
6.516	35.08	Pk	35.4	-26.6	.5	44.38	-	-	74	-29.62	360	100	H
6.516	22.58	Ca	35.4	-26.6	.5	31.88	54	-22.12	-	-	360	100	H
6.498	36.58	Pk	35.4	-26.6	.5	45.88	-	-	74	-28.12	360	100	V
6.498	22.79	Ca	35.4	-26.6	.5	32.09	54	-21.91	-	-	360	100	V

Pk - Peak detector

Ca - CISPR average detection

MID CHANNEL(881.5 MHz)**HORIZONTAL PEAK PLOT****VERTICAL PEAK PLOT****DATA****Radiated Emissions**

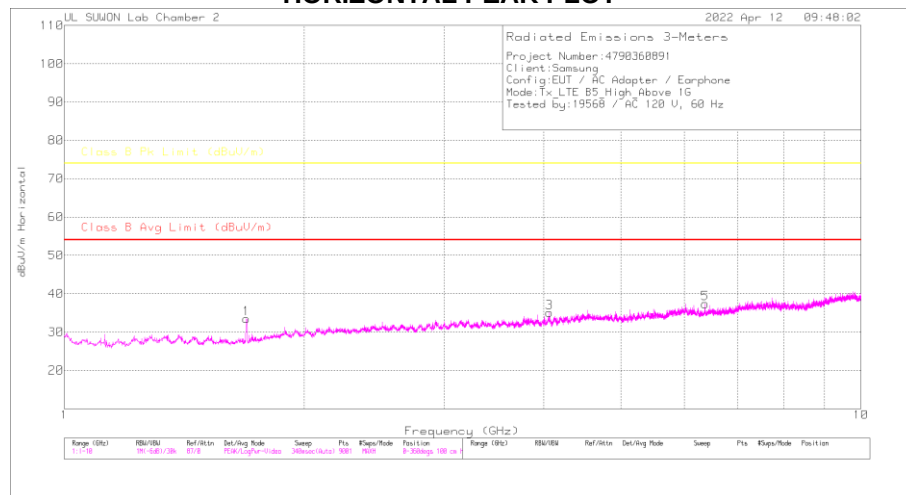
Frequency (GHz)	Meter Reading (dBuV)	Det	3117_0016872 4	1-18GHz[dB]	1GHz_HP[dB]	Corrected Reading dBuV/m	Class B Avg Limit (dBuV/m)	Av(CISPR)Margin (dB)	Class B Pk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1.125	38.49	Pk	28	-32.2	1.2	35.49	-	-	74	-38.51	360	100	H
1.125	25.96	Ca	28	-32.2	1.2	22.96	54	-31.04	-	-	360	100	H
1.672	38.22	Pk	28.6	-31.4	.8	36.22	-	-	74	-37.78	360	100	H
1.672	26.61	Ca	28.6	-31.4	.8	24.61	54	-29.39	-	-	360	100	H
2.25	37.44	Pk	31.7	-30.7	.6	39.04	-	-	74	-34.96	360	100	H
2.25	25.36	Ca	31.7	-30.7	.6	26.96	54	-27.04	-	-	360	100	H
1.125	38.52	Pk	28	-32.2	1.2	35.52	-	-	74	-38.48	360	100	V
1.125	26.01	Ca	28	-32.2	1.2	23.01	54	-30.99	-	-	360	100	V
1.671	37.65	Pk	28.6	-31.4	.8	35.65	-	-	74	-38.35	360	100	V
1.671	25.78	Ca	28.6	-31.4	.8	23.78	54	-30.22	-	-	360	100	V
2.241	36.48	Pk	31.7	-30.8	.7	38.08	-	-	74	-35.92	360	100	V
2.241	24.72	Ca	31.7	-30.8	.7	26.32	54	-27.68	-	-	360	100	V

Pk - Peak detector

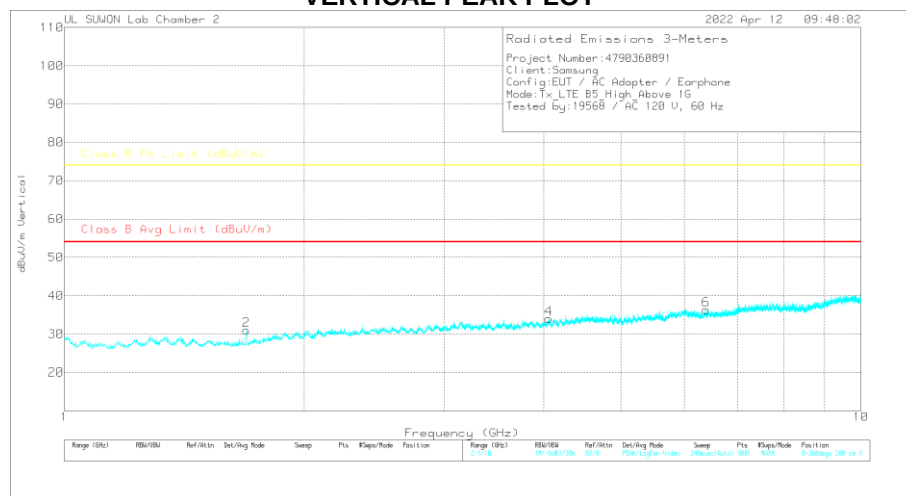
Ca - CISPR average detection

HIGH CHANNEL(891.5 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



DATA

Radiated Emissions

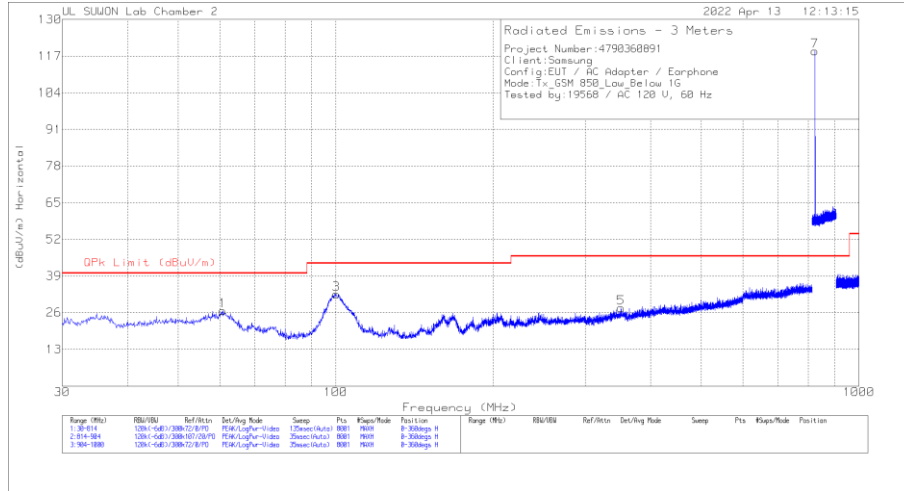
Frequency (GHz)	Meter Reading (dBuV)	Det	3117_0016872.4	1-18GHz[dB]	1GHz_HP[dB]	Corrected Reading dBuV/m	Class B Avg Limit (dBuV/m)	Av[CISPR]Margin (dB)	Class B Pk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1.693	39	Pk	28.7	-31.3	.8	37.2	-	-	74	-36.8	360	100	H
1.693	26.45	Ca	28.7	-31.3	.8	24.65	54	-29.35	-	-	360	100	H
1.694	38.38	Pk	28.7	-31.3	.8	36.58	-	-	74	-37.42	360	100	V
1.694	26.7	Ca	28.7	-31.3	.8	24.9	54	-29.1	-	-	360	100	V
4.064	36.76	Pk	33.5	-28.9	.6	41.96	-	-	74	-32.04	360	100	H
4.064	24.58	Ca	33.5	-28.9	.6	29.78	54	-24.22	-	-	360	100	H
4.056	36.28	Pk	33.5	-29	.6	41.38	-	-	74	-32.62	360	100	V
4.056	24.51	Ca	33.5	-29	.6	29.61	54	-24.39	-	-	360	100	V
6.377	35.8	Pk	35.4	-27	.4	44.6	-	-	74	-29.4	360	100	H
6.377	23.46	Ca	35.4	-27	.4	32.26	54	-21.74	-	-	360	100	H
6.39	35.53	Pk	35.4	-26.9	.4	44.43	-	-	74	-29.57	360	100	V
6.39	23.25	Ca	35.4	-26.9	.4	32.15	54	-21.85	-	-	360	100	V

Pk - Peak detector
Ca - CISPR average detection

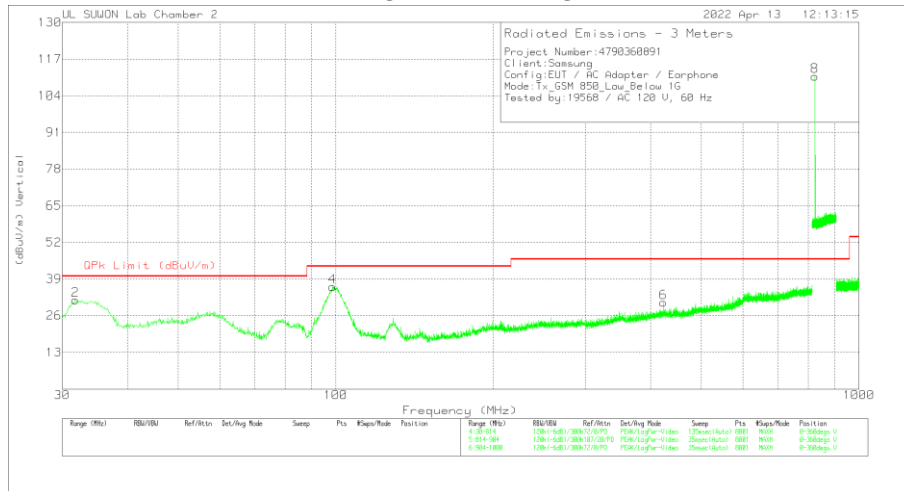
7.1.4. Below 1 GHz in the GSM850

LOW CHANNEL(869.2 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



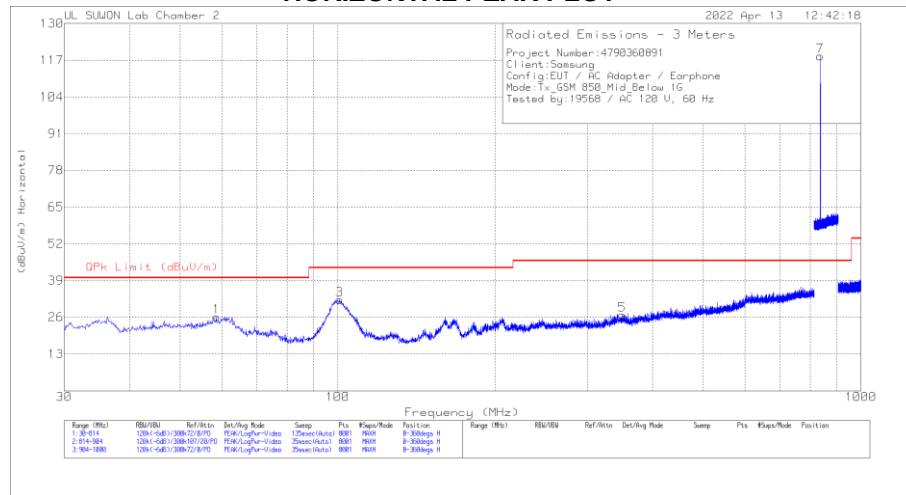
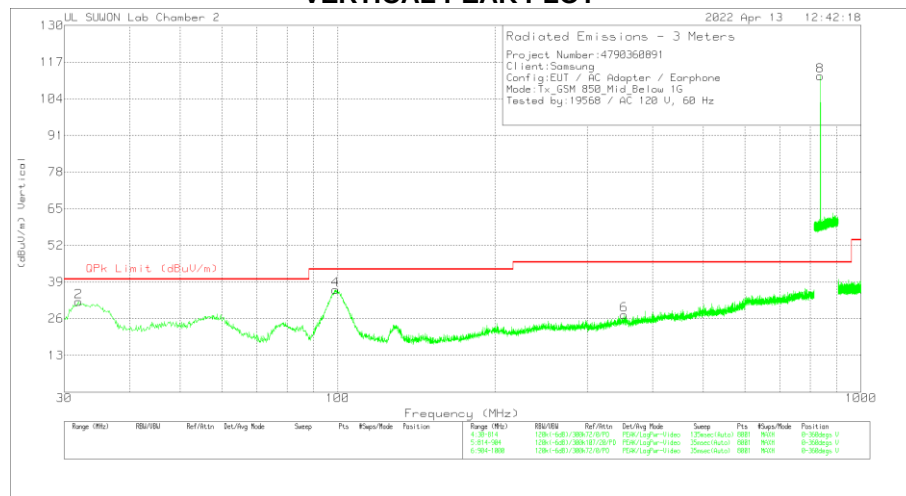
DATA

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	60.772	7.52	Pk	18.3	.9	26.72	40	-13.28	0-360	300	H
3	100.168	14.09	Pk	17.4	1.1	32.59	43.52	-10.93	0-360	200	H
5	350.95	4.54	Pk	21	2.1	27.64	46.02	-18.38	0-360	100	H
7	824.2038	88.94	Pk	26.7	3.2	118.84	46.02	72.82	0-360	200	H
2	31.764	15.45	Pk	15.4	.7	31.55	40	-8.45	0-360	200	V
4	98.6	17.9	Pk	17.3	1.1	36.3	43.52	-7.22	0-360	200	V
6	423.176	6.21	Pk	22.1	2.3	30.61	46.02	-15.41	0-360	400	V
8	824.215	81.06	Pk	26.7	3.2	110.96	46.02	64.94	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**

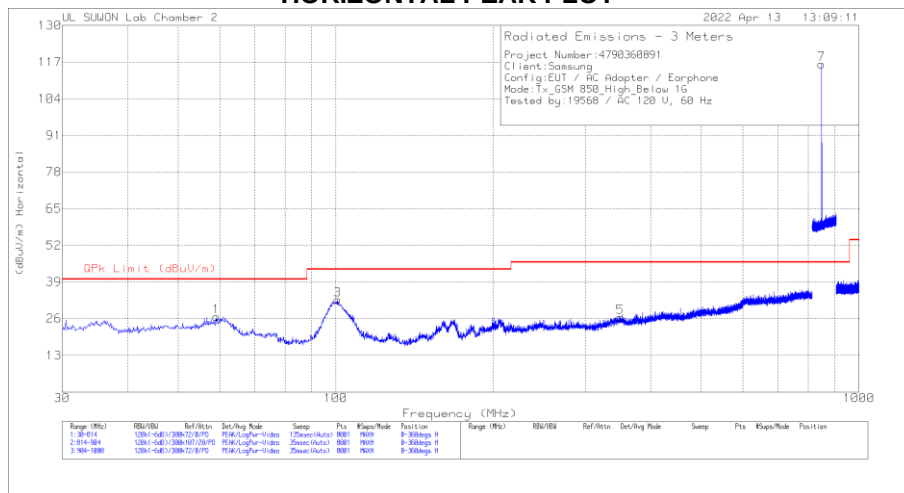
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	VULB9163_749	Below 1G_Bypass[dB]	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	58.616	6.43	Pk	18.8	.9	26.13	40	-13.87	0-360	200	H
3	100.756	13.55	Pk	17.5	1.1	32.15	43.52	-11.37	0-360	200	H
5	350.166	3.65	Pk	21	2.1	26.75	46.02	-19.27	0-360	100	H
7	836.5788	88.31	Pk	26.9	3.3	118.51	46.02	72.49	0-360	200	H
2	31.96	15.89	Pk	15.4	.7	31.99	40	-8.01	0-360	200	V
4	98.894	17.78	Pk	17.3	1.1	36.18	43.52	-7.34	0-360	200	V
6	353.008	4.16	Pk	21	2.1	27.26	46.02	-18.76	0-360	400	V
8	836.6013	81.82	Pk	26.9	3.3	112.02	46.02	66	0-360	100	V

Pk - Peak detector

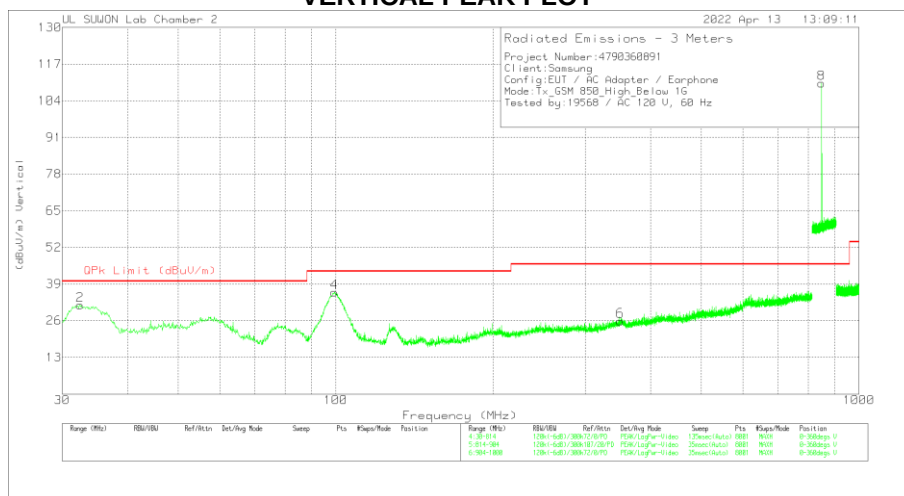
Note: Unwanted emissions captured from 824MHz to 849MHz and from 869MHz to 894MHz were the TX and RX signals generated from the call-simulator.

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	59.204	6.98	Pk	18.7	.9	26.58	40	-13.42	0-360	300	H
3	100.756	14.04	Pk	17.5	1.1	32.64	43.52	-10.88	0-360	200	H
5	349.578	3.31	Pk	21	2.1	26.41	46.02	-19.61	0-360	200	H
7	848.8525	85.61	Pk	27.3	3.3	116.21	46.02	70.19	0-360	200	H
2	32.45	15.37	Pk	15.5	.7	31.57	40	-8.43	0-360	200	V
4	99.384	17.71	Pk	17.3	1.1	36.11	43.52	-7.41	0-360	200	V
6	350.068	2.79	Pk	21	2.1	25.89	46.02	-20.13	0-360	200	V
8	848.83	79.59	Pk	27.3	3.3	110.19	46.02	64.17	0-360	100	V

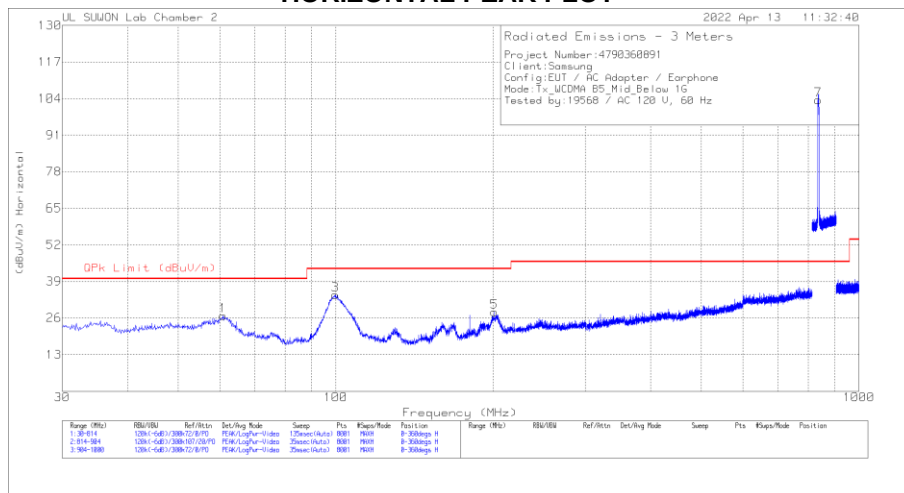
Pk - Peak detector

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

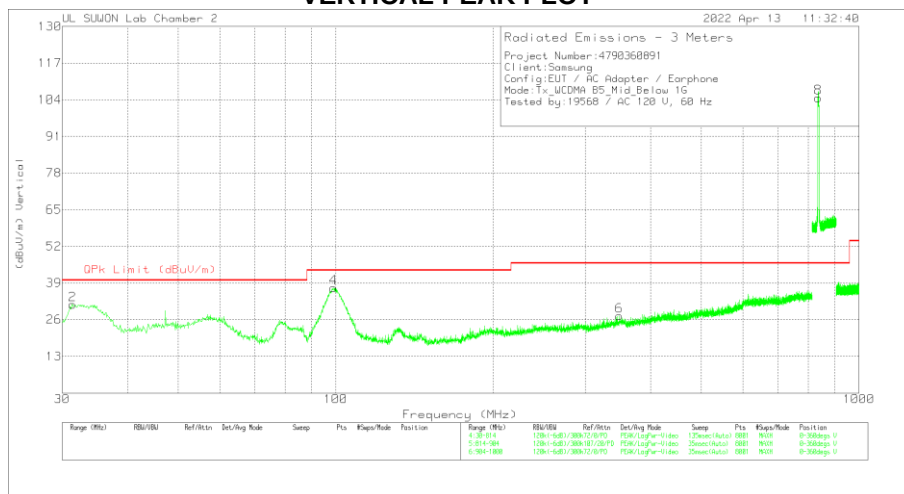
7.1.5. Below 1 GHz in the WCDMA Band 5

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	60.87	7.56	Pk	18.3	.9	26.76	40	-13.24	0-360	300	H
3	99.874	15.71	Pk	17.4	1.1	34.21	43.52	-9.31	0-360	200	H
5	200.912	9.43	Pk	17.1	1.6	28.13	43.52	-15.39	0-360	100	H
7	836.7025	73.24	Pk	26.9	3.3	103.44	46.02	57.42	0-360	200	H
2	31.372	15.35	Pk	15.4	.6	31.35	40	-8.65	0-360	200	V
4	98.992	18.92	Pk	17.3	1.1	37.32	43.52	-6.2	0-360	200	V
6	348.598	4.39	Pk	20.9	2.1	27.39	46.02	-18.63	0-360	400	V
8	836.6688	74.54	PK	26.9	3.3	104.74	46.02	58.72	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
98.992	16.18	Qp	17.3	1.1	34.58	43.52	-8.94	235	100	V

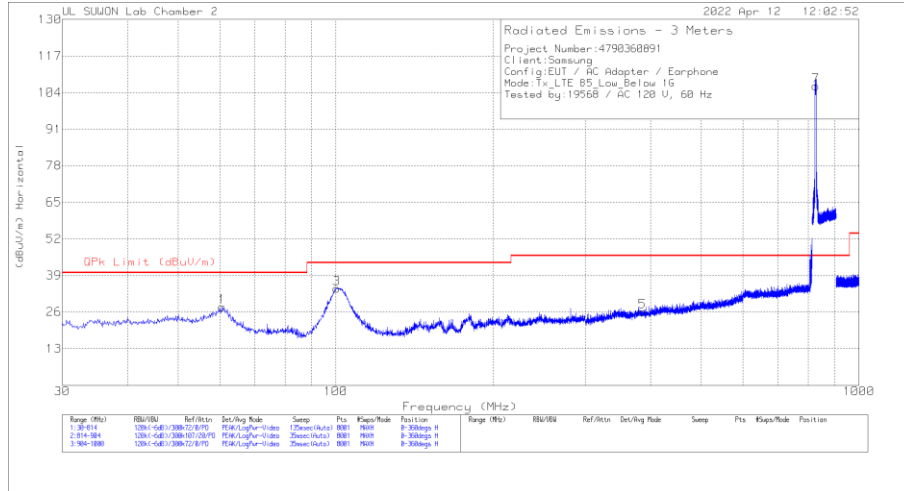
Qp - Quasi-Peak detector

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

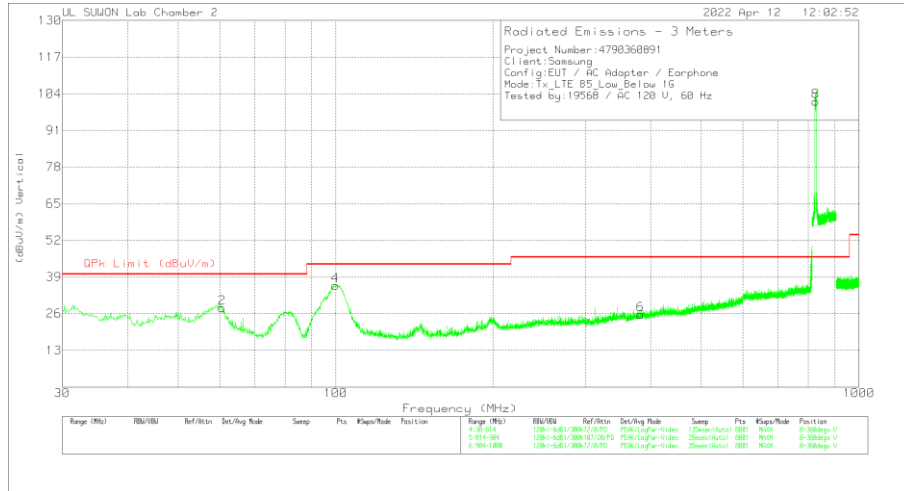
7.1.6. Below 1 GHz in the LTE Band 5

LOW CHANNEL(871.5 MHz)

HORIZONTAL PEAK PLOT



VERTICAL PEAK PLOT



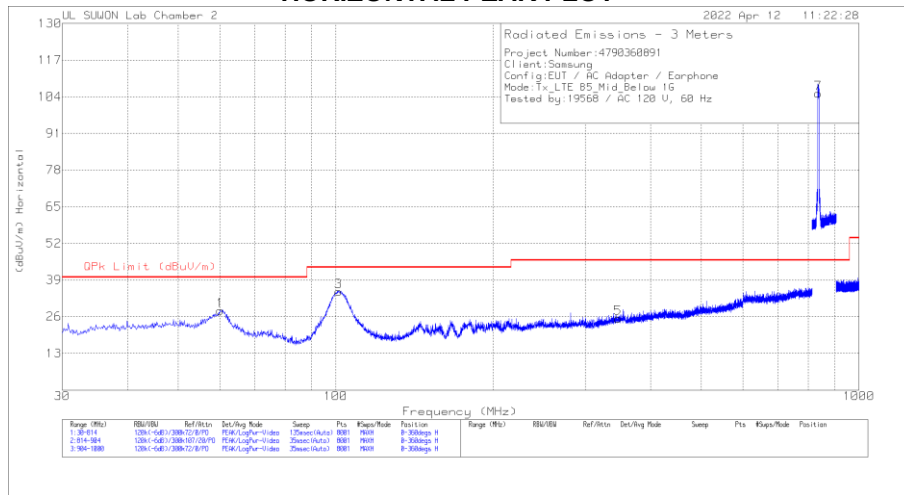
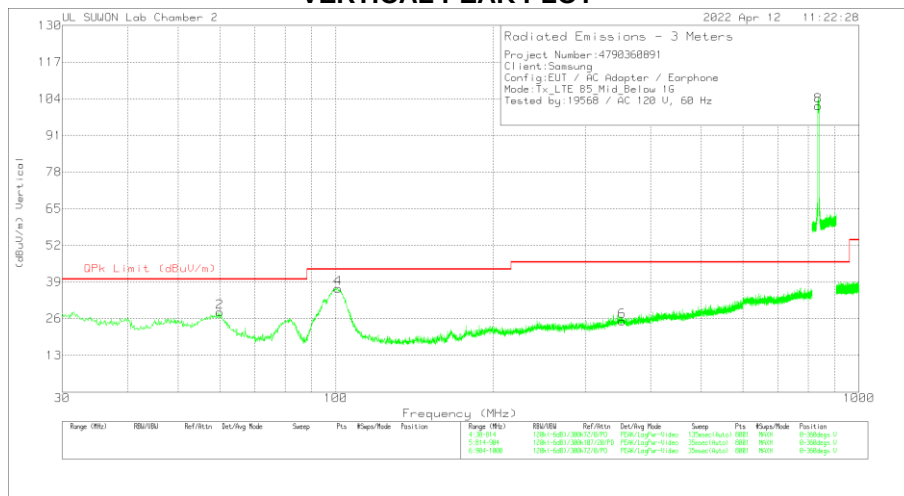
DATA

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	60.674	8.53	Pk	18.4	.9	27.83	40	-12.17	0-360	300	H
3	100.364	15.88	Pk	17.4	1.1	34.38	43.52	-9.14	0-360	100	H
5	385.936	2.77	Pk	21.1	2.2	26.07	46.02	-19.95	0-360	100	H
7	826.5438	76.44	Pk	26.7	3.2	106.34	46.02	60.32	0-360	200	H
2	60.674	8.63	Pk	18.4	.9	27.93	40	-12.07	0-360	400	V
4	99.874	17.47	Pk	17.4	1.1	35.97	43.52	-7.55	0-360	200	V
6	382.8	2.29	Pk	21.1	2.2	25.59	46.02	-20.43	0-360	300	V
8	826.5663	71.35	Pk	26.7	3.2	101.25	46.02	55.23	0-360	100	V

Pk - Peak detector

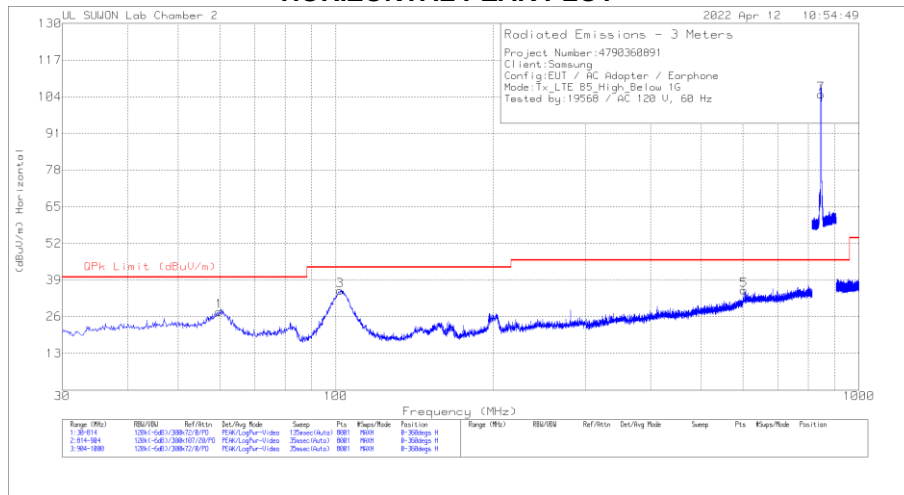
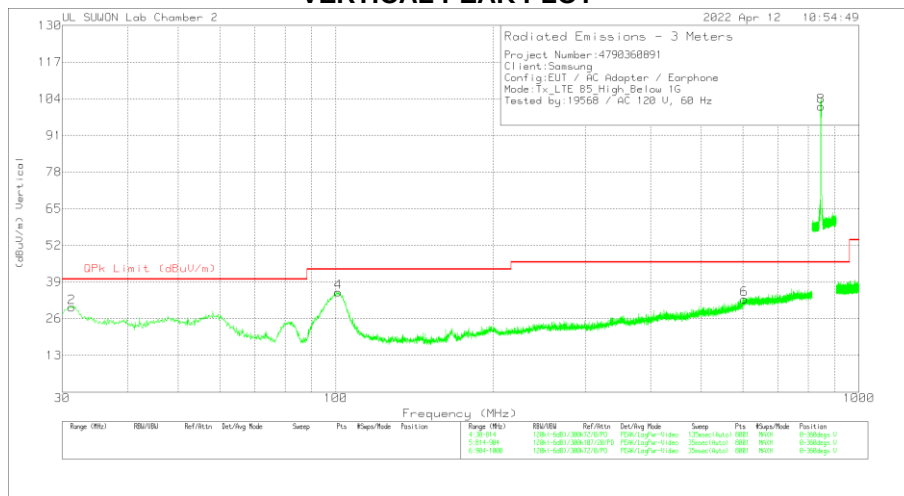
Note: Unwanted emissions captured from 814MHz to 849MHz and from 849MHz to 859MHz were the TX and RX signals generated from the call-simulator.

MID CHANNEL(881.5 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	60.184	8.8	PK	18.5	.9	28.2	40	-11.8	0-360	300	H
3	101.344	16.24	PK	17.5	1.1	34.84	43.52	-8.68	0-360	200	H
5	346.148	2.49	PK	20.8	2.1	25.39	46.02	-20.63	0-360	300	H
7	836.5675	74.97	PK	26.9	3.3	105.17	46.02	59.15	0-360	200	H
2	59.988	8.92	PK	18.5	.9	28.32	40	-11.68	0-360	400	V
4	100.952	18.09	PK	17.5	1.1	36.69	43.52	-6.83	0-360	200	V
6	352.714	2	PK	21	2.1	25.1	46.02	-20.92	0-360	400	V
8	836.545	71.26	PK	26.9	3.3	101.46	46.02	55.44	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(891.5 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	59.89	8.38	Pk	18.5	.9	27.78	40	-12.22	0-360	300	H
3	101.932	16.58	Pk	17.5	1.1	35.18	43.52	-8.34	0-360	200	H
5	602.908	7.48	PK	25.1	2.8	35.38	46.02	-10.64	0-360	100	H
7	846.5688	74.31	PK	27.2	3.3	104.81	46.02	58.79	0-360	100	H
2	31.274	14.04	PK	15.4	.6	30.04	40	-9.96	0-360	200	V
4	101.05	16.79	PK	17.5	1.1	35.39	43.52	-8.13	0-360	200	V
6	604.084	5.04	PK	25.1	2.8	32.94	46.02	-13.08	0-360	200	V
8	846.5688	70.72	PK	27.2	3.3	101.22	46.02	55.2	0-360	200	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

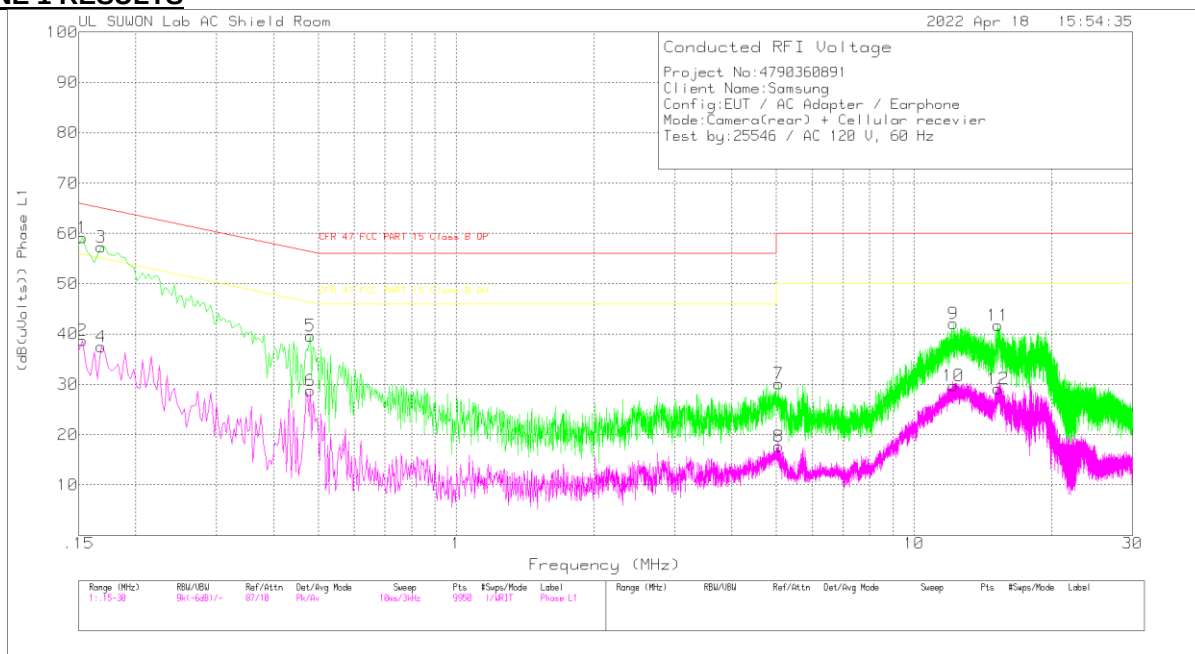
Notes:
1. The lower limit shall apply at the transition frequencies
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

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_With 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	.153	49.22	Pk	9.8	.1	59.12	65.84	-6.72	-	-
2	.153	28.85	Av	9.8	.1	38.75	-	-	55.84	-17.09
3	.168	47.21	Pk	10	.1	57.31	65.06	-7.75	-	-
4	.168	27.34	Av	10	.1	37.44	-	-	55.06	-17.62
5	.48	29.55	Pk	9.9	.2	39.65	56.34	-16.69	-	-
6	.48	18.67	Av	9.9	.2	28.77	-	-	46.34	-17.57
7	5.064	20.15	Pk	9.7	.3	30.15	60	-29.85	-	-
8	5.064	7.68	Av	9.7	.3	17.68	-	-	50	-32.32
9	12.204	31.88	Pk	9.9	.3	42.08	60	-17.92	-	-
10	12.204	19.51	Av	9.9	.3	29.71	-	-	50	-20.29
11	15.267	31.25	Pk	10	.4	41.65	60	-18.35	-	-
12	15.267	18.72	Av	10	.4	29.12	-	-	50	-20.88

Pk - Peak detector

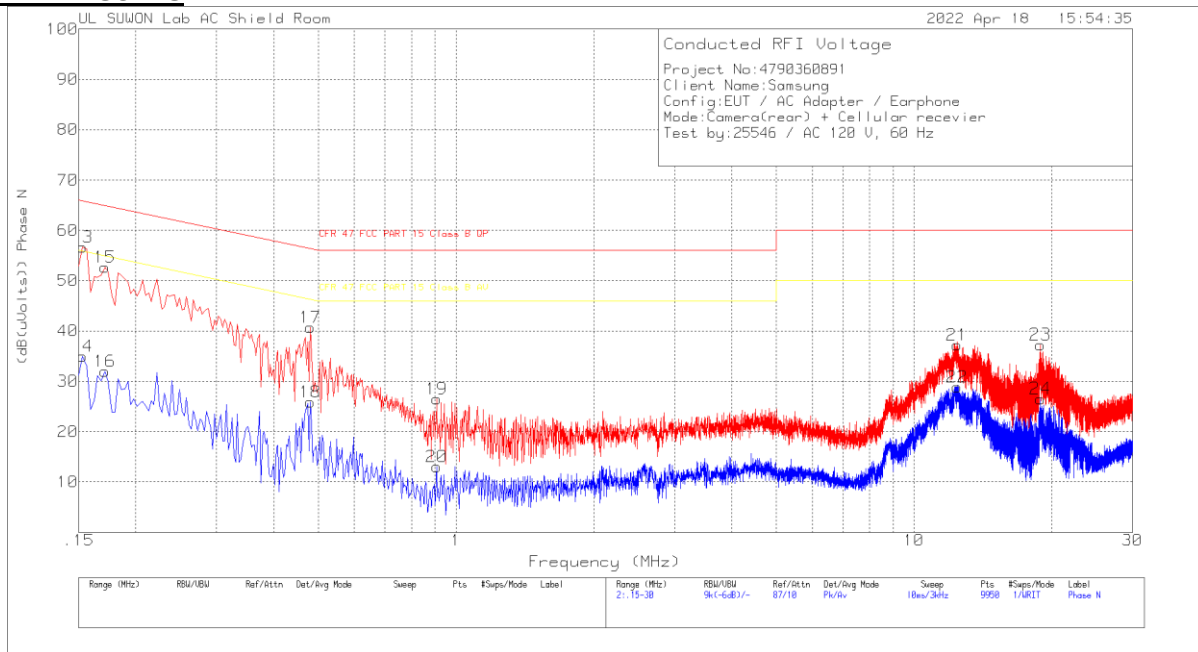
Av - Average detection

Quasi-Peak Emissions

Range 1: Phase L1 .15 - 30MHz

Frequency (MHz)	Meter Reading (dBuV)	Det	101836_With 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)
.15225	41.56	Qp	9.7	.1	51.36	65.88	-14.52	-	-
.16725	39.69	Qp	9.9	.1	49.69	65.1	-15.41	-	-

Qp - Quasi-Peak detector

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_With 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	.153	46.8	Pk	9.8	.1	56.7	65.84	-9.14	-	-
14	.153	25.02	Av	9.8	.1	34.92	-	-	55.84	-20.92
15	.171	42.47	Pk	10	.2	52.67	64.91	-12.24	-	-
16	.171	21.73	Av	10	.2	31.93	-	-	54.91	-22.98
17	.48	30.65	Pk	9.9	.2	40.75	56.34	-15.59	-	-
18	.48	15.82	Av	9.9	.2	25.92	-	-	46.34	-20.42
19	.909	16.44	Pk	9.8	.3	26.54	56	-29.46	-	-
20	.909	2.92	Av	9.8	.3	13.02	-	-	46	-32.98
21	12.417	26.94	Pk	10	.3	37.24	60	-22.76	-	-
22	12.417	18.56	Av	10	.3	28.86	-	-	50	-21.14
23	18.903	26.68	Pk	10.2	.4	37.28	60	-22.72	-	-
24	18.9	15.96	Av	10.2	.4	26.56	-	-	50	-23.44

Pk - Peak detector

Av - Average detection

Quasi-Peak Emissions**Range 2: Phase N .15 - 30MHz**

Frequency (MHz)	Meter Reading (dBuV)	Det	101836_With 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)
.15375	40.97	Qp	9.8	.1	50.87	65.79	-14.92	-	-

Qp - Quasi-Peak detector

END OF TEST REPORT