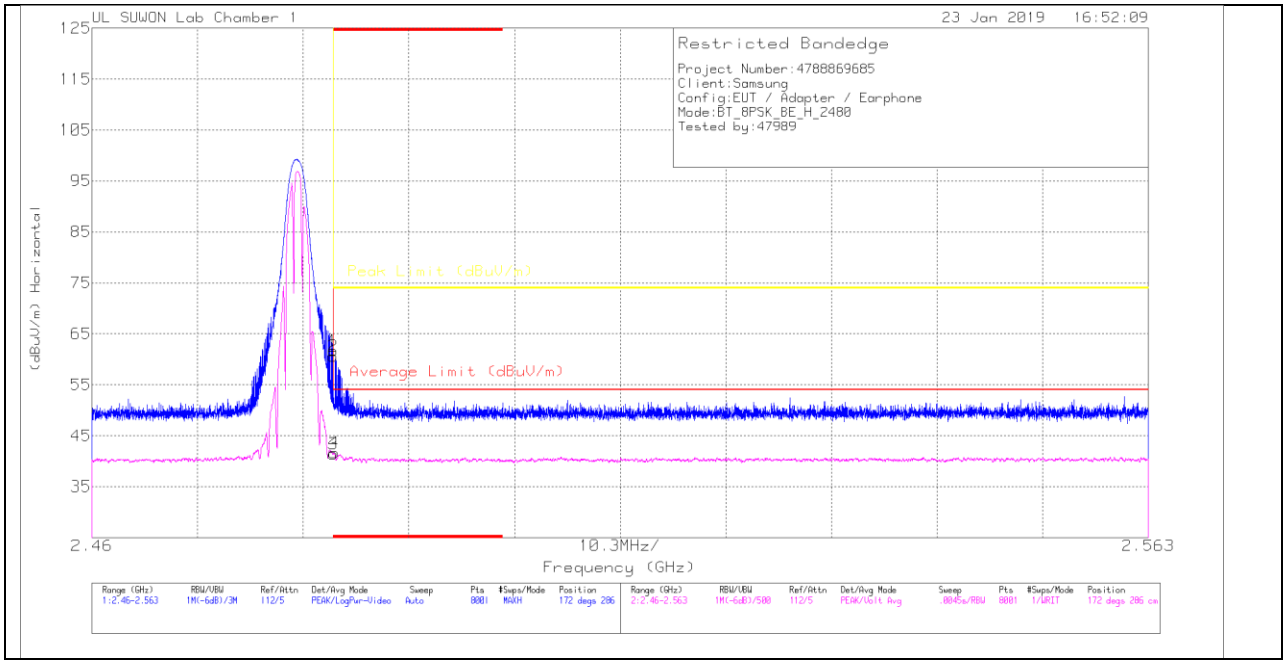
AUTHORIZED BANDEDGE (HIGH CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

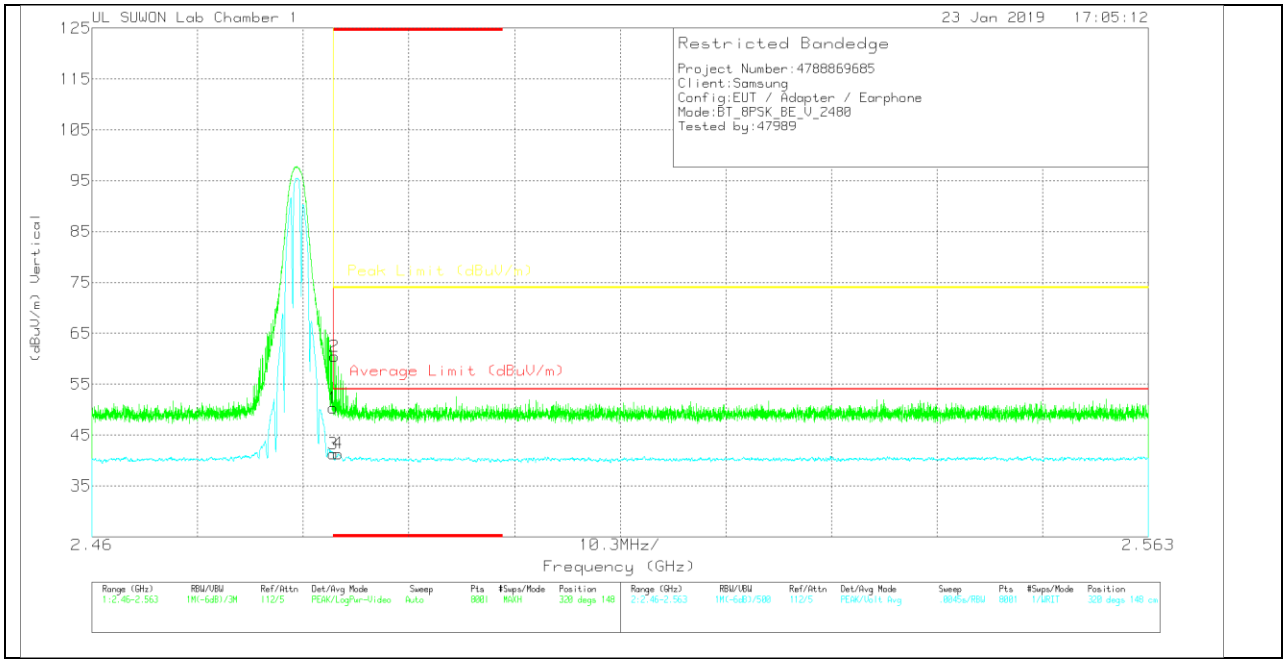
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168717	10dB[dB]	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	55.06	Pk	31.9	-25.3	0	61.66	-	-	74	-12.34	172	286	H
2	* 2.484	53.96	Pk	31.9	-25.3	0	60.56	-	-	74	-13.44	172	286	H
3	* 2.484	33.69	VA1T	31.9	-25.3	0	40.29	54	-13.71	-	-	172	286	H
4	* 2.484	33.94	VA1T	31.9	-25.3	0	40.54	54	-13.46	-	-	172	286	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Trace Markers

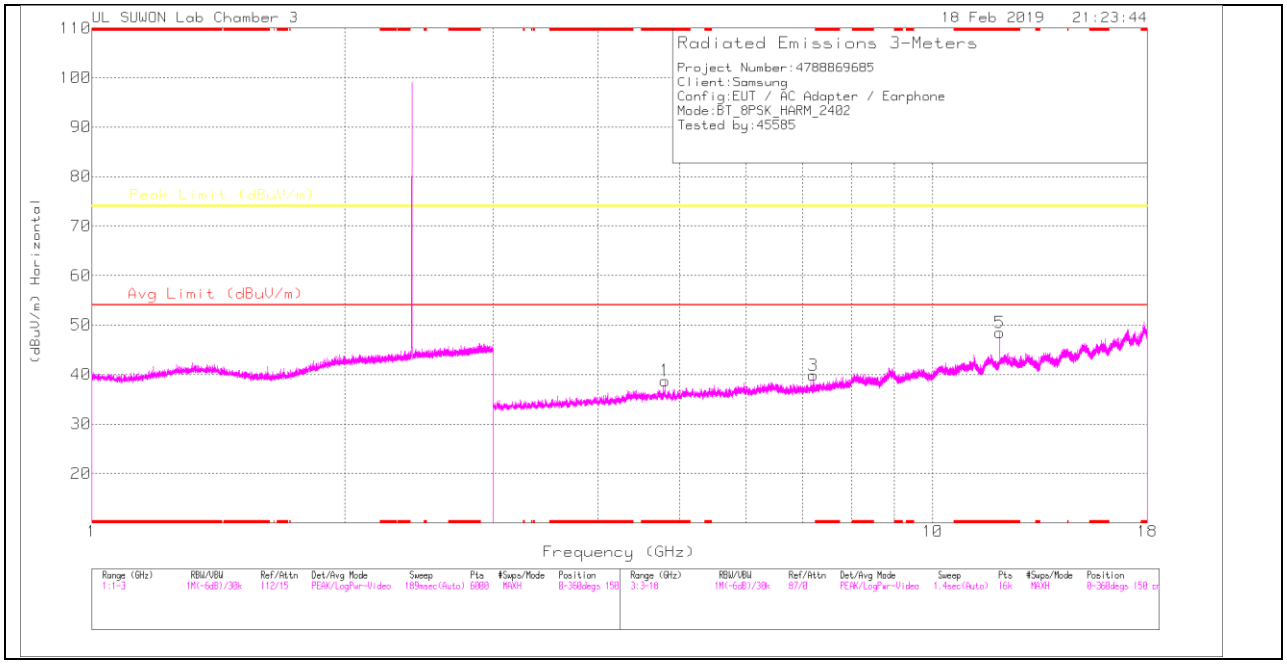
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168717	10dB[dB]	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	43.68	Pk	31.9	-25.3	0	50.28	-	-	74	-23.72	320	148	V
2	* 2.484	53.92	Pk	31.9	-25.3	0	60.52	-	-	74	-13.48	320	148	V
3	* 2.484	33.56	VA1T	31.9	-25.3	0	40.16	54	-13.84	-	-	320	148	V
4	* 2.484	33.61	VA1T	31.9	-25.3	0	40.21	54	-13.79	-	-	320	148	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

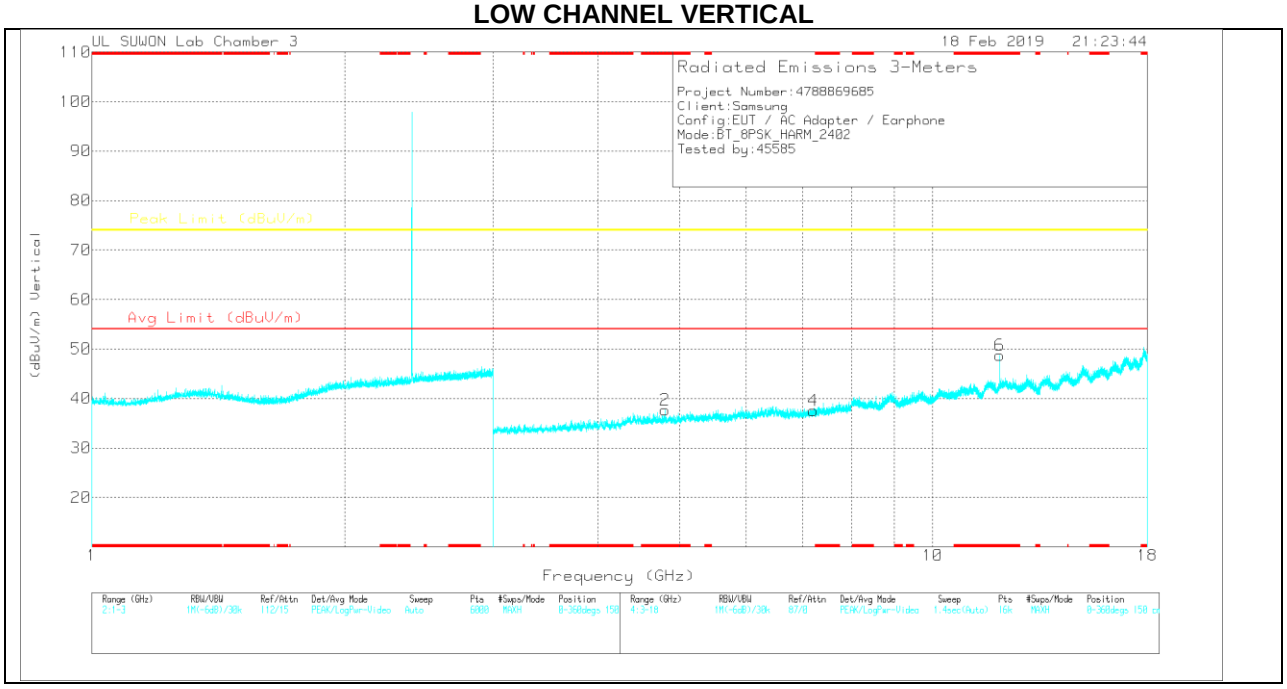
UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_15C
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL



LOW CHANNEL VERTICAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

LOW CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00205959	3GHz_HP[dB]	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.804	32.96	PK	34.2	-28.4	38.76	-	-	74	-35.24	0-360	250	H
3	7.205	28.26	PK	35.8	-24.2	39.86	-	-	74	-34.14	0-360	150	H
5	* 12.01	29.54	PK	39	-20.1	48.44	-	-	74	-25.56	0-360	250	H
2	* 4.804	31.85	PK	34.2	-28.4	37.65	-	-	74	-36.35	0-360	150	V
4	7.205	25.91	PK	35.8	-24.2	37.51	-	-	74	-36.49	0-360	250	V
6	* 12.01	29.83	PK	39	-20.1	48.73	-	-	74	-25.27	0-360	250	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Peak - Peak Detector

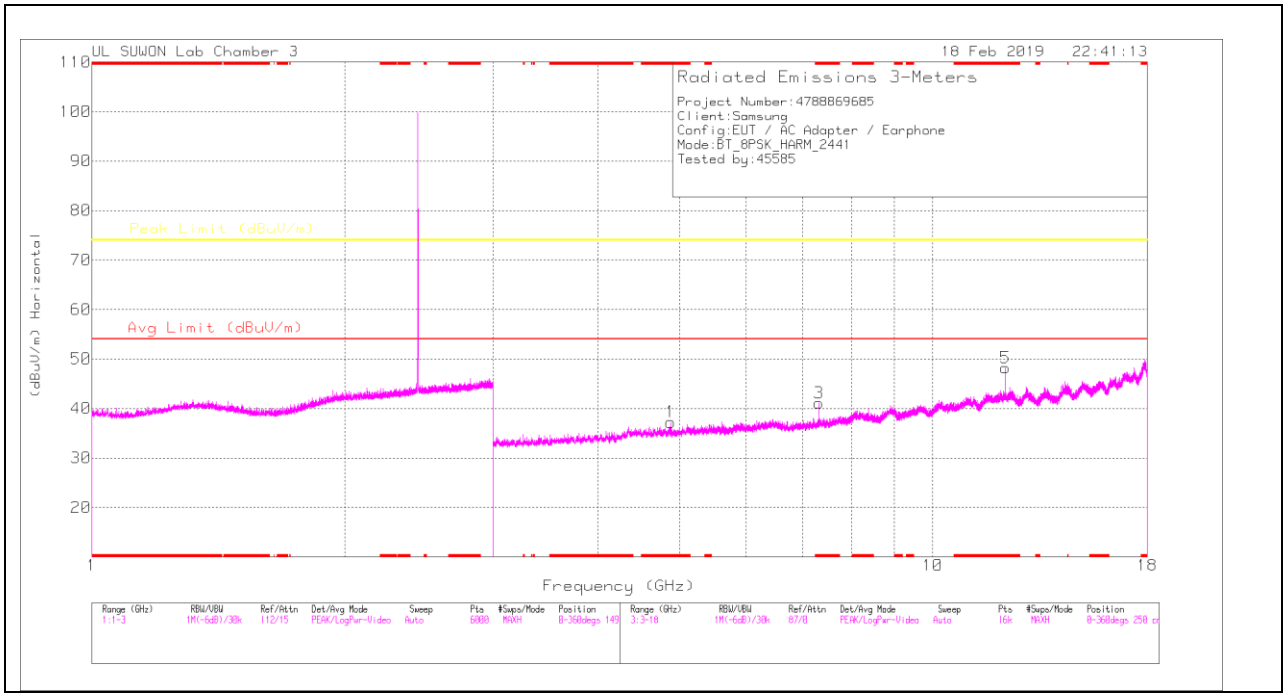
Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00205959	3GHz_HP[dB]	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.804	41.78	PKFH	34.2	-28.4	47.58	-	-	74	-26.42	196	149	H
* 4.804	30.86	VA1T	34.2	-28.4	36.66	54	-17.34	-	-	196	149	H
* 4.804	40.66	PKFH	34.2	-28.4	46.46	-	-	74	-27.54	218	170	V
* 4.804	30.14	VA1T	34.2	-28.4	35.94	54	-18.06	-	-	218	170	V
7.206	38.5	PKFH	35.8	-24.2	50.1	-	-	74	-23.9	122	100	V
7.206	21.06	VA1T	35.8	-24.2	32.66	-	-	-	-	122	100	V
7.206	38.42	PKFH	35.8	-24.2	50.02	-	-	74	-23.98	182	105	H
7.206	21.16	VA1T	35.8	-24.2	32.76	-	-	-	-	182	104	H
* 12.011	39.57	PKFH	39	-20.1	58.47	-	-	74	-15.53	251	244	H
* 12.01	27.3	VA1T	39	-20.1	46.2	54	-7.8	-	-	251	244	H
* 12.009	37.03	PKFH	39	-20.1	55.93	-	-	74	-18.07	89	149	V
* 12.01	24.38	VA1T	39	-20.1	43.28	54	-10.72	-	-	89	149	V

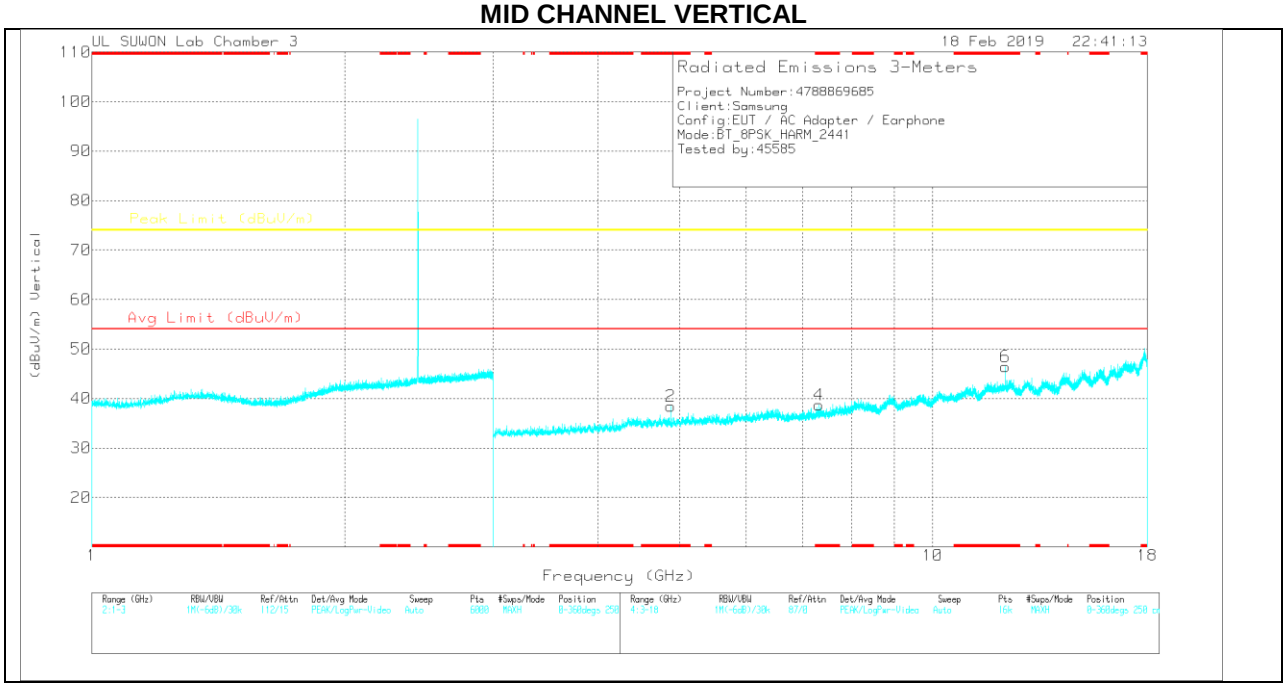
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PKFH - FHSS: RB=100k/1MHz VB=3 x RB, Peak
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_15C
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

MID CHANNEL HORIZONTAL



MID CHANNEL VERTICAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_15C
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

MID CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00205959	3GHz_HP[dB]	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.882	32.24	PK	34.2	-29.2	37.24	-	-	74	-36.76	0-360	150	H
3	* 7.323	28.87	PK	35.8	-23.6	41.07	-	-	74	-32.93	0-360	150	H
5	* 12.206	28.96	PK	39	-19.7	48.26	-	-	74	-25.74	0-360	150	H
2	* 4.882	33.43	PK	34.2	-29.2	38.43	-	-	74	-35.57	0-360	150	V
4	* 7.323	26.5	PK	35.8	-23.6	38.7	-	-	74	-35.3	0-360	150	V
6	* 12.205	27.29	PK	39	-19.8	46.49	-	-	74	-27.51	0-360	250	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PK – Peak Detector

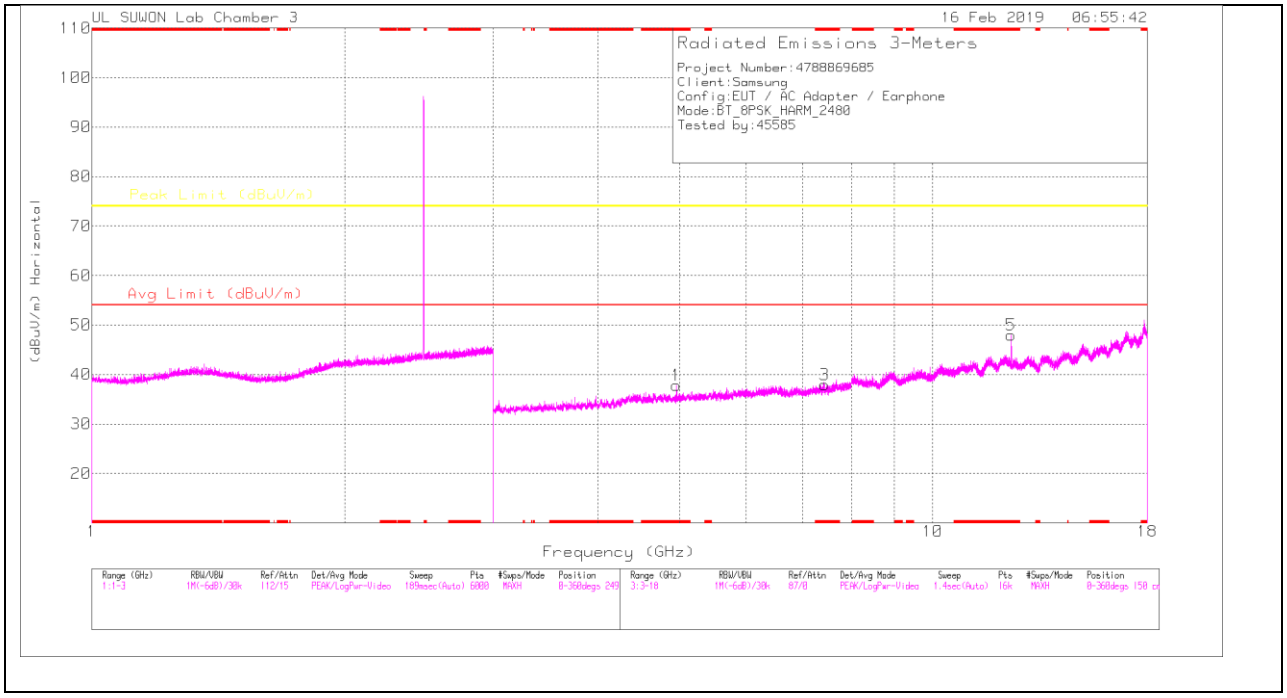
Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00205959	3GHz_HP[dB]	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.882	41.6	PKFH	34.2	-29.2	46.6	-	-	74	-27.4	132	100	H
* 4.882	31.02	VA1T	34.2	-29.2	36.02	54	-17.98	-	-	132	100	H
* 4.882	40.95	PKFH	34.2	-29.2	45.95	-	-	74	-28.05	216	148	V
* 4.882	30.56	VA1T	34.2	-29.2	35.56	54	-18.44	-	-	216	148	V
* 7.323	36.39	PKFH	35.8	-23.6	48.59	-	-	74	-25.41	143	386	V
* 7.323	24.46	VA1T	35.8	-23.6	36.66	54	-17.34	-	-	143	386	V
* 7.323	38.73	PKFH	35.8	-23.6	50.93	-	-	74	-23.07	187	104	H
* 7.323	28.57	VA1T	35.8	-23.6	40.77	54	-13.23	-	-	187	104	H
* 12.206	40.95	PKFH	39	-19.8	60.15	-	-	74	-13.85	193	100	H
* 12.205	27.96	VA1T	39	-19.8	47.16	54	-6.84	-	-	193	100	H
* 12.206	38.23	PKFH	39	-19.8	57.43	-	-	74	-16.57	191	241	V
* 12.205	25.09	VA1T	39	-19.8	44.29	54	-9.71	-	-	191	241	V

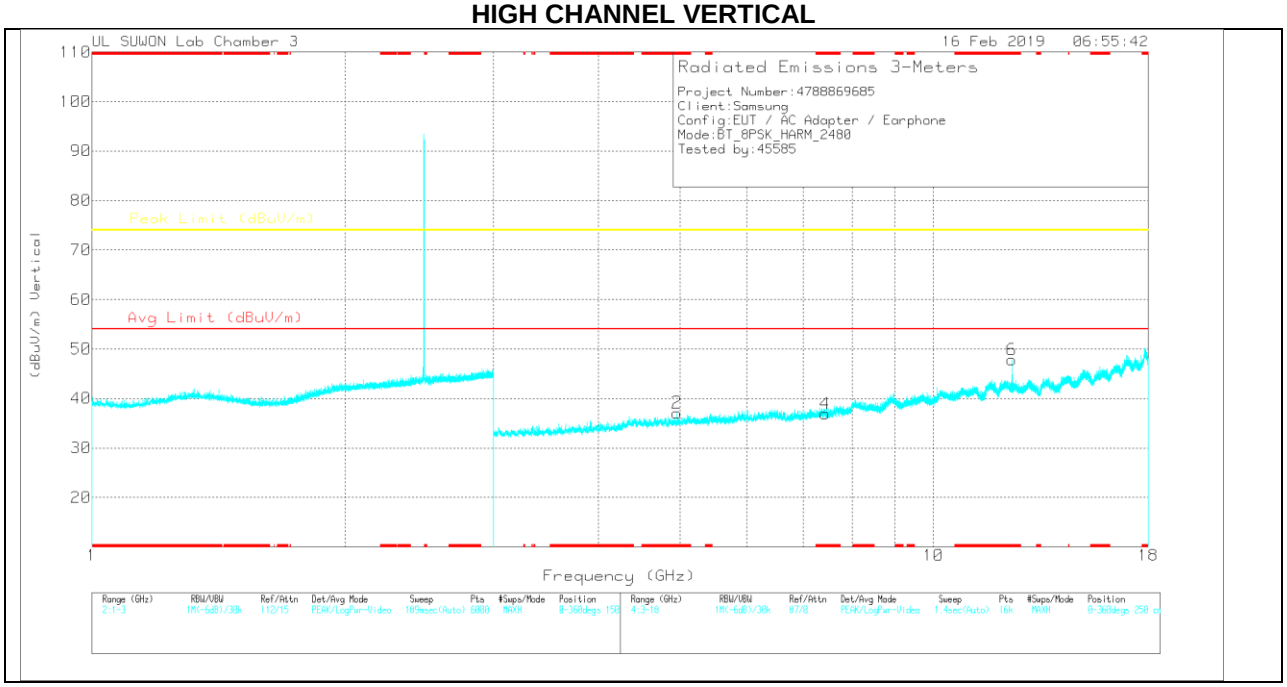
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PKFH - FHSS: RB=100k/1MHz VB=3 x RB, Peak
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_15C
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

HIGH CHANNEL HORIZONTAL



HIGH CHANNEL VERTICAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_15C
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

HIGH CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00205959	3GHz_HP[dB]	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.959	32.56	PK	34.2	-28.9	37.86	-	-	74	-36.14	0-360	150	H
3	* 7.439	25.53	PK	35.8	-23.4	37.93	-	-	74	-36.07	0-360	150	H
5	* 12.401	29.31	PK	38.8	-20.2	47.91	-	-	74	-26.09	0-360	150	H
2	* 4.959	31.81	PK	34.2	-28.9	37.11	-	-	74	-36.89	0-360	150	V
4	* 7.441	24.56	PK	35.8	-23.4	36.96	-	-	74	-37.04	0-360	150	V
6	* 12.4	29.12	PK	38.9	-20.2	47.82	-	-	74	-26.18	0-360	250	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PK – Peak Detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00205959	3GHz_HP[dB]	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.96	40.99	PKFH	34.2	-28.9	46.29	-	-	74	-27.71	199	128	H
* 4.96	30.4	VA1T	34.2	-28.9	35.7	54	-18.3	-	-	199	128	H
* 4.96	40.54	PKFH	34.2	-28.9	45.84	-	-	74	-28.16	200	142	V
* 4.96	31.23	VA1T	34.2	-28.9	36.53	54	-17.47	-	-	200	142	V
* 12.4	38.98	PKFH	38.8	-20.2	57.58	-	-	74	-16.42	94	100	V
* 12.4	27.49	VA1T	38.8	-20.2	46.09	54	-7.91	-	-	94	100	V
* 12.4	43.66	PKFH	38.9	-20.2	62.36	-	-	74	-11.64	182	100	H
* 12.4	32.97	VA1T	38.8	-20.2	51.57	54	-2.43	-	-	182	100	H

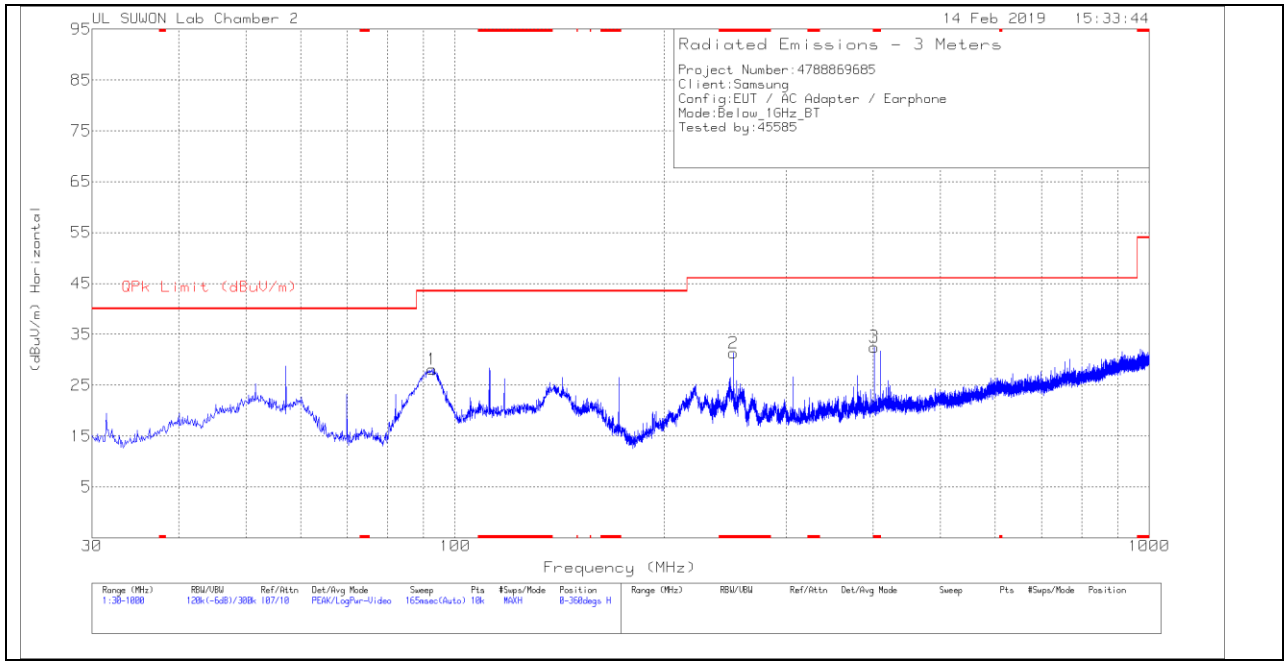
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PKFH - FHSS: RB=100k/1MHz VB=3 x RB, Peak
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_15C
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

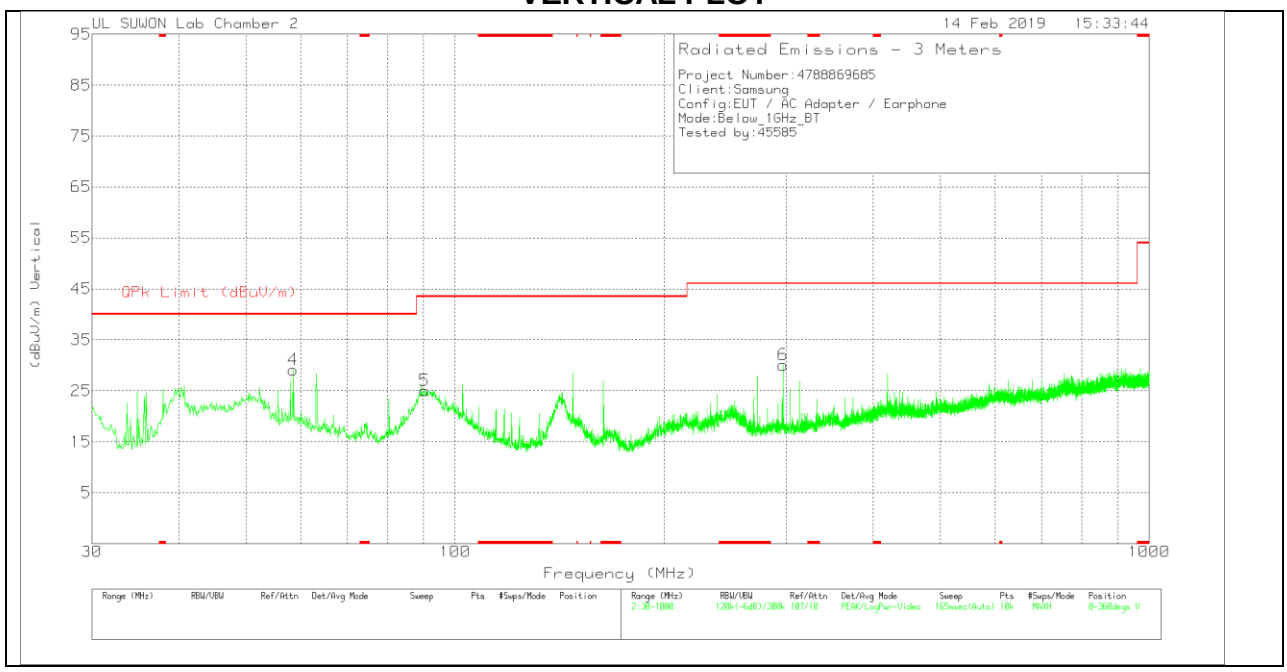
11.2. WORST-CASE BELOW 1 GHz

GFSK SPURIOUS EMISSIONS 30 TO 1000 MHz

HORIZONTAL PLOT



VERTICAL PLOT



UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

BELOW 1 GHz TABLE

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	VULB9163_749	Below_1G[dB]	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	92.662	43.07	Pk	16.6	-31.5	28.17	43.52	-15.35	0-360	200	H
2	* 251.645	42.8	Pk	19.1	-30.6	31.3	46.02	-14.72	0-360	100	H
3	* 401.801	41.41	Pk	21.3	-30.2	32.51	46.02	-13.51	0-360	300	H
4	58.421	42	Pk	18.8	-31.7	29.1	40	-10.9	0-360	100	V
5	90.431	40.78	Pk	15.8	-31.5	25.08	43.52	-18.44	0-360	100	V
6	296.653	41.34	Pk	19.2	-30.5	30.04	46.02	-15.98	0-360	100	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_15C
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

12. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

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

* Decreases with the logarithm of the frequency.

TEST PROCEDURE

The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.10.

The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

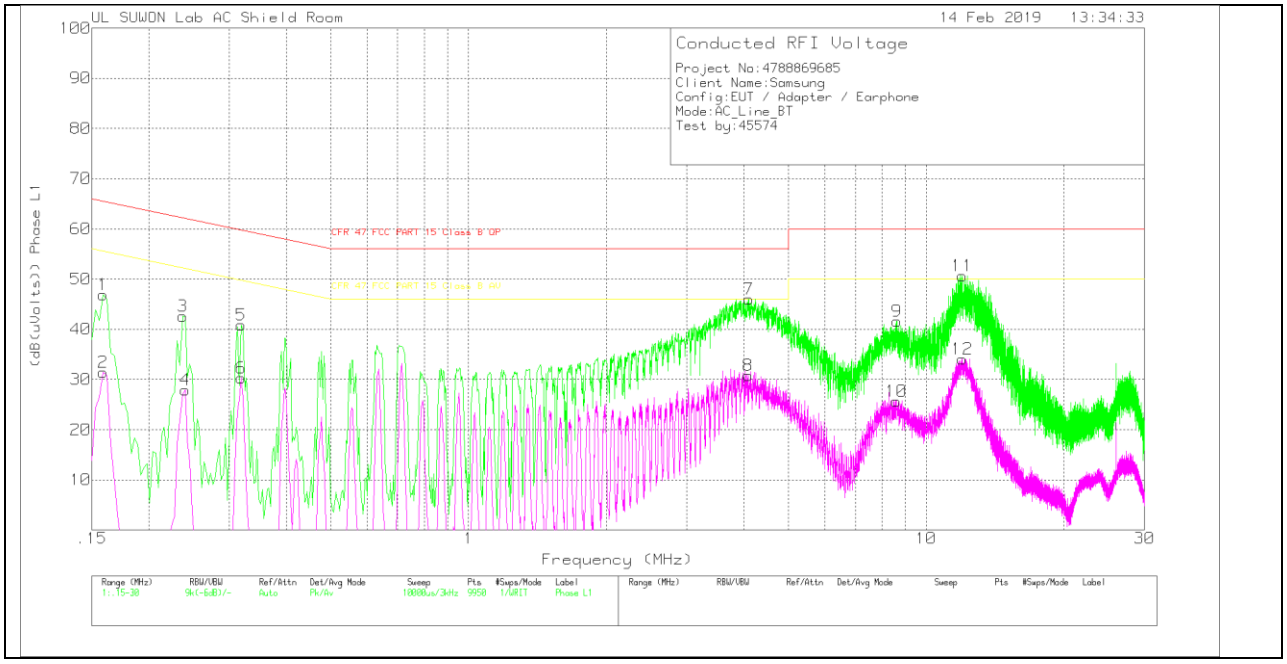
Line conducted data is recorded for both NEUTRAL and HOT lines.

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_15C
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

RESULTS

WORST EMISSIONS

LINE 1 PLOT



UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_15C
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

LINE 1 RESULTS

Trace Markers

Range 1: Phase L1 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	ENV216_101836_With ex-cord_L1	CABLELOSS(dB)	Corrected Reading (dB(uVolts))	CFR 47 FCC PART 15 Class B QP	Margin (dB)	CFR 47 FCC PART 15 Class B AV	Margin (dB)
1	.159	36.93	Pk	9.9	.1	46.93	65.52	-18.59	-	-
2	.159	21.41	Av	9.9	.1	31.41	-	-	55.52	-24.11
3	.237	32.68	Pk	9.7	.2	42.58	62.2	-19.62	-	-
4	.24	17.99	Av	9.7	.2	27.89	-	-	52.1	-24.21
5	.318	30.83	Pk	9.8	.2	40.83	59.76	-18.93	-	-
6	.318	20.26	Av	9.8	.2	30.26	-	-	49.76	-19.5
7	4.098	35.87	Pk	9.8	.3	45.97	56	-10.03	-	-
8	4.089	20.73	Av	9.8	.3	30.83	-	-	46	-15.17
9	8.628	31.45	Pk	9.9	.3	41.65	60	-18.35	-	-
10	8.607	15.5	Av	9.9	.3	25.7	-	-	50	-24.3
11	11.988	40.2	Pk	10.1	.3	50.6	60	-9.4	-	-
12	11.988	23.65	Av	10.1	.3	34.05	-	-	50	-15.95

Pk - Peak detector
Av - Average detection

Quasi-Peak Emissions

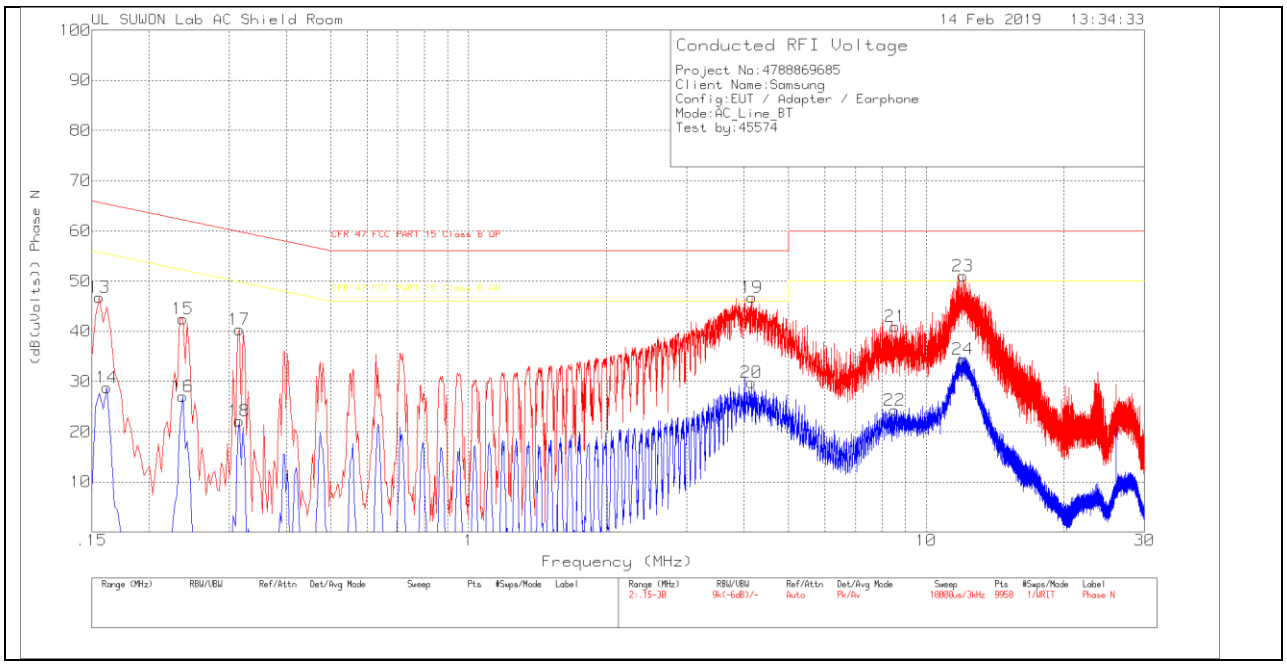
Range 1: Phase L1 .15 - 30MHz

Frequency (MHz)	Meter Reading (dBuV)	Det	ENV216_101836_With ex-cord_L1	CABLELOSS(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)
4.09725	30.9	Qp	9.8	.3	41	56	-15	-	-
11.9888	32.55	Qp	10.1	.3	42.95	60	-17.05	-	-

Qp - Quasi-Peak detector

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_15C
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

LINE 2 PLOT



UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_15C
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.

LINE 2 RESULTS

Trace Markers

Range 2: Phase N .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	ENV216_101836_With ex-cord_N	CABLELOSS(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	.156	36.81	Pk	9.8	.1	46.71	65.67	-18.96	-	-
14	.162	18.75	Av	9.9	.1	28.75	-	-	55.36	-26.61
15	.237	32.61	Pk	9.7	.2	42.51	62.2	-19.69	-	-
16	.237	17.18	Av	9.7	.2	27.08	-	-	52.2	-25.12
17	.315	30.32	Pk	9.8	.2	40.32	59.84	-19.52	-	-
18	.315	12.14	Av	9.8	.2	22.14	-	-	49.84	-27.7
19	4.161	36.68	Pk	9.8	.3	46.78	56	-9.22	-	-
20	4.143	19.72	Av	9.8	.3	29.82	-	-	46	-16.18
21	8.565	30.73	Pk	9.9	.3	40.93	60	-19.07	-	-
22	8.523	14.05	Av	9.9	.3	24.25	-	-	50	-25.75
23	12.03	40.59	Pk	10.1	.3	50.99	60	-9.01	-	-
24	12.036	24.05	Av	10.1	.3	34.45	-	-	50	-15.55

Pk - Peak detector
Av - Average detection

Quasi-Peak Emissions

Range 2: Phase N .15 - 30MHz

Frequency (MHz)	Meter Reading (dBuV)	Det	ENV216_101836_With ex-cord_N	CABLELOSS(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)
4.16175	30.42	Qp	9.8	.3	40.52	56	-15.48	-	-
12.0308	32.16	Qp	10.1	.3	42.56	60	-17.44	-	-

Qp - Quasi-Peak detector

UL Korea, Ltd. Suwon Laboratory FORM ID: FCC_15C
218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433
UL Korea, Ltd. Confidential
This report shall not be reproduced except in full, without the written approval of UL Korea, Ltd.