

# CERTIFICATION TEST REPORT

**Report Number. :** 4791163214-FR1V2

**Applicant :** SEGI LIMITED  
Unit J2, 4/F, Block 1, Kinho Industrial Building, 14-24 Au Pui Wan Street, Shatin, New Territories, Hongkong

**Model :** 2WG17R-SS

**FCC ID :** VA5REN500-2WLR  
**IC :** 7087A-2WREN500LR

**EUT Description :** Keyless Entry System

**Test Standard(s) :** FCC 47 CFR PART 15 SUBPART C  
INDUSTRY CANADA RSS-247 Issue 3  
INDUSTRY CANADA RSS-GEN Issue 5

**Date Of Issue:**  
2024-04-15

**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

## REPORT REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
V1	2024-04-02	Initial issue	Yeonghwan Hong
V2	2024-04-15	Updated to address TCB's question	Yeonghwan Hong

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# 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** SEGI LIMITED  
**EUT DESCRIPTION:** Keyless Entry System  
**MODEL:** 2WG17R-SS  
**SERIAL NUMBER:** Prototype (CONDUCTED)  
Prototype (RADIATED);  
**DATE TESTED:** 2024-01-24 ~ 2024-04-01;

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C	Complies
INDUSTRY CANADA RSS-247 Issue 3	Complies
INDUSTRY CANADA RSS-GEN Issue 5	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:

Tested By:



Seokhwan Hong  
Suwon Lab Engineer  
UL KOREA LTD.

Yeonghwan Hong  
Suwon Lab Engineer  
UL KOREA LTD.

## 2. TEST METHODOLOGY

1. FCC CFR 47 Part 2.
2. FCC CFR 47 Part 15.
3. IC RSS-247 Issue 2
4. IC RSS-GEN Issue 5
5. KDB 558074 D01 15.247 Meas Guidance v05r02.
6. ANSI C63.10-2013.

## 3. FACILITIES AND ACCREDITATION

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

218 Maeyeong-ro	
<input checked="" type="checkbox"/>	Chamber 1(3m semi-anechoic chamber)
<input checked="" type="checkbox"/>	Chamber 2(3m semi-anechoic chamber)
<input type="checkbox"/>	Chamber 3(3m semi-anechoic chamber)

Used ISED Test Site Reg.(company number): 2324L  
CAB Identifier: KR0161

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. DECISION RULES AND MEASUREMENT UNCERTAINTY

### 4.1. METROLOGICAL TRACEABILITY

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:

$$\begin{aligned} \text{Field Strength (dBuV/m)} &= \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \\ &\text{Cable Loss (dB)} - \text{Preamp Gain (dB)} \\ 28.9 \text{ dBuV/m} &= 36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} \end{aligned}$$

### 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	2.80 dB
Radiated Disturbance, 30 MHz to 1 GHz	3.92 dB
Radiated Disturbance, 1 GHz to 18 GHz	5.06 dB
Radiated Disturbance, 18 GHz to 40 GHz	6.02 dB

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

### 4.4. DECISION RULES

Decision rule for statement(s) of conformity is based on Procedure 2, Clause 4.4.3 in IEC Guide 115:2023

## 5. EQUIPMENT UNDER TEST

### 5.1. EUT DESCRIPTION

The EUT is Keyless Entry System.  
This test report addresses the DTS operational mode.

### 5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum total conducted output power as follows:

Frequency Range[MHz]	Modulation Type	Power Mode	Output Power [dBm]	Output Power [mW]
907 ~ 919	DSSS	Peak	19.309	85.29

### 5.3. DESCRIPTION OF AVAILABLE ANTENNAS

An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

**The internal antenna was Permanently attached.  
Therefore this E.U.T Complies with the requirement of §15.203.**

The radio utilizes an internal antenna, with a maximum gain of -7.30 dBi

### 5.4. WORST-CASE CONFIGURATION AND MODE

Radiated emission below 1GHz and power line conducted emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

Radiated emission above 1GHz was performed with the EUT set to transmit low/mid/high channels.

The fundamental of the EUT was investigated in three orthogonal orientations X, Y and Z it was determined that X orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in X orientation.

## 5.5. DESCRIPTION OF TEST SETUP

### SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
N/A	N/A	N/A	N/A	N/A

### I/O CABLE

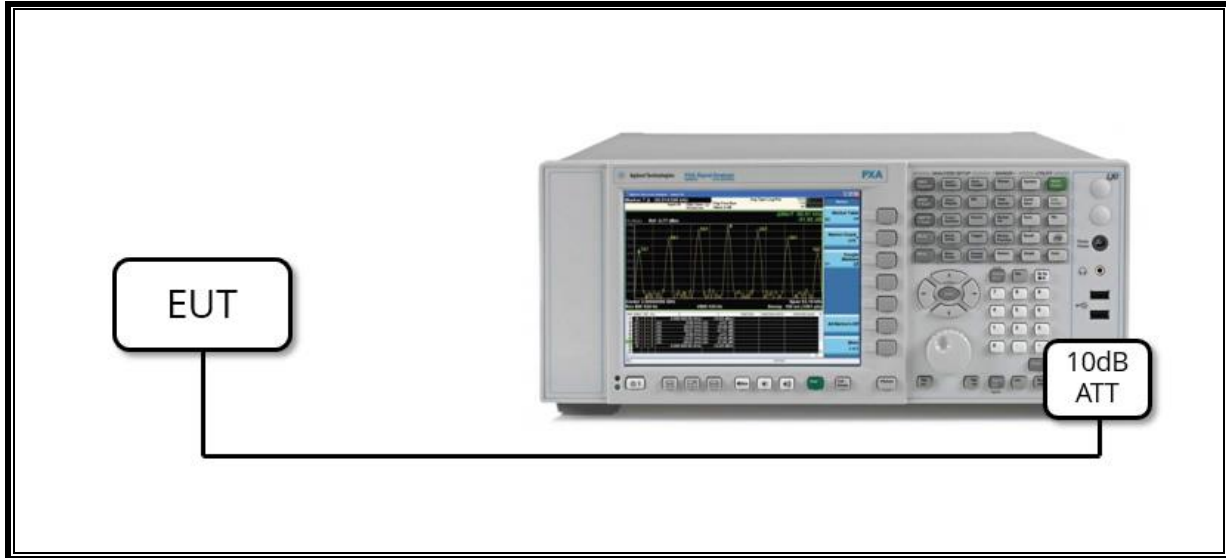
Cable No	Port	# of identical Ports	Connector Type	Cable Type	Cable Length (m)	Remarks
N/A	N/A	N/A	N/A	N/A	N/A	N/A

### TEST SETUP

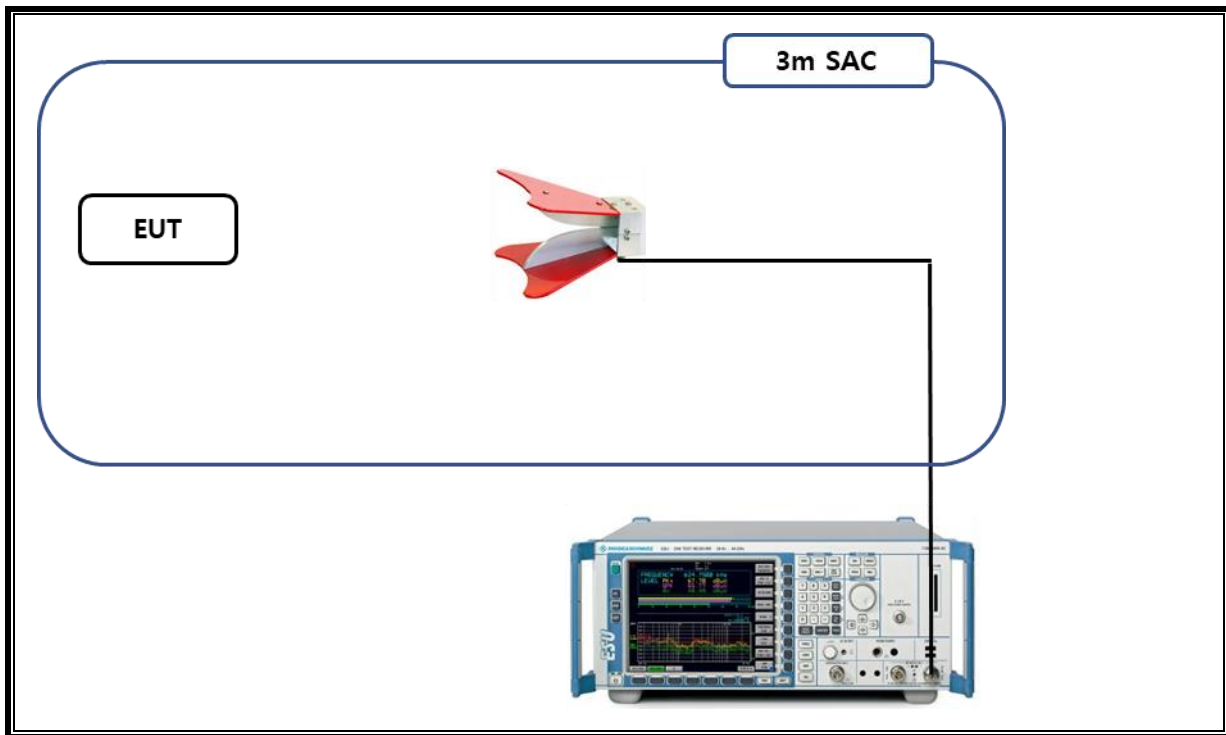
The EUT is a stand-alone unit during the tests.



**SETUP DIAGRAM FOR TESTS (CONDUCTED TEST SETUP)**



**SETUP DIAGRAM FOR TESTS (RADIATED TEST SETUP)**



## 6. MEASUREMENT METHOD

6 dB BW : KDB 558074 D01 v05r02, Section 8.2.

OUTPUT POWER : KDB 558074 D01 v05r02, Section 8.3.1.1

POWER SPECTRAL DENSITY : KDB 558074 D01 v05r02, Section 8.4.

Out-of-band Emissions (Conducted) : KDB 558074 D01 v05r02, Section 8.5.

Out-of-band Emissions in Non-restricted Bands: KDB 558074 D01 v05r02, Section 8.5.

Out-of-band Emissions in Restricted Bands : KDB 558074 D01 v05r02, Section 8.6.

AC Power Line Conducted Emission : ANSI C63.10-2013, Section 6.2

## 7. 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, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	750	2024-08-15
Antenna, Horn, 18 GHz	ETS	3117	00168717	2024-08-21
Antenna, Horn, 40 GHz	ETS	3116C	00166155	2024-08-02
Preamplifier	ETS	3116C-PA	00168841	2024-07-25
Preamplifier, 1000 MHz	Sonoma	310N	341282	2024-07-24
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	2029169	2024-07-24
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54170614	2024-07-25
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54490312	2024-07-24
Spectrum Analyzer, 44 GHz	KEYSIGHT	N9040B	MY60080268	2025-01-03
Average Power Sensor	Agilent / HP	U2000A	MY54270007	2024-07-23
Average Power Sensor	Agilent / HP	U2000A	MY54260010	2024-07-24
Attenuator	PASTERNAK	PE7087-10	A001	2024-07-23
Attenuator	PASTERNAK	PE7087-10	A008	2024-07-27
EMI Test Receive, 40 GHz	R&S	ESU40	100439	2024-07-23
EMI Test Receive, 40 GHz	R&S	ESU40	100457	2024-07-24
EMI Test Receive, 3 GHz	R&S	ESR3	101832	2024-07-23
High Pass Filter 1.2GHz	Micro-Tronics	HPM50108-02	G005	2024-07-23
High Pass Filter 1.2GHz	Micro-Tronics	HPM50108-02	G006	2024-07-23
High Pass Filter 2.8GHz	Micro-Tronics	HPM50111-02	010	2024-07-24
High Pass Filter 2.8GHz	Micro-Tronics	HPM50111-02	011	2024-07-24
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	009	2024-07-23
High Pass Filter 3GHz	Micro-Tronics	HPM17543	010	2024-07-23
High Pass Filter 6GHz	Micro-Tronics	HPS17542	021	2024-07-24
Antenna, Loop, 9kHz-30MHz	R&S	HFH2-Z2	100418	2025-09-06
UL Software				
Description	Manufacturer	Model	Version	
Radiated software	UL	UL EMC	Ver 9.5	
AC Line Conducted software	UL	UL EMC	Ver 9.5	

## 8. SUMMARY TABLE

FCC Part Section	IC Section	Test Description	Test Limit	Test Condition	Test Result
15.247 (a)(2)	RSS-247 5.2(a)	Occupied Band width (6dB)	> 500KHz	Conducted	PASS
2.1051, 15.247 (d)	RSS-247 5.5	Band Edge / Conducted Spurious Emission	-20dBc		PASS
15.247 (b)(3)	RSS-247 5.4(d)	TX conducted output power	< 30dBm		PASS
15.247 (e)	RSS-247 5.2(b)	PSD	< 8dBm		PASS
15.205, 15.209	RSS-GEN 8.9 & 8.10	Radiated Spurious Emission	< 54dBuV/m	Radiated	PASS
15.207 (a)	RSS-GEN 8.8	AC Power Line conducted emissions	Section 11	Power Line Conducted	N/A <sup>note1</sup>

Note1 : This EUT is only supplied by DC power (CR2325 battery\*2ea).

## 9. ANTENNA PORT TEST RESULTS

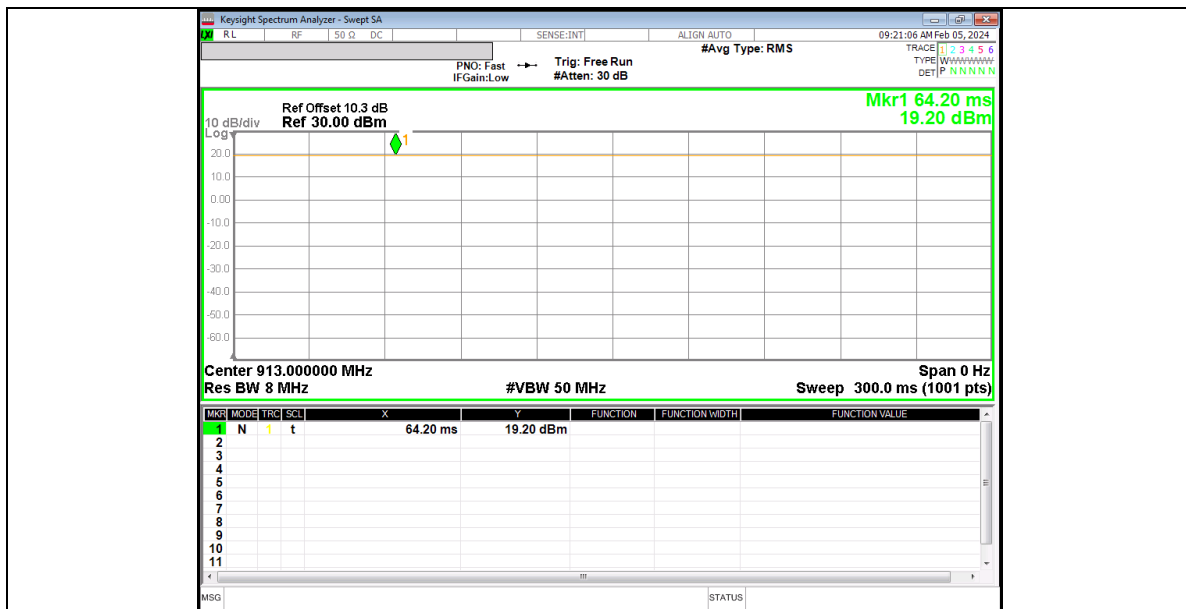
### 9.1. ON TIME AND DUTY CYCLE

#### LIMITS

None; for reporting purposes only.

Mode	T on [ms]	T period [ms]	Duty Cycle x [linear]	Duty Cycle [%]	Duty Cycle Correction Factor [dB]
DSSS	100	100	1.00	100.00	0.00

#### Duty Cycle Plot data



## 9.2. 99% BANDWIDTH

### LIMITS

None; for reporting purposes only.

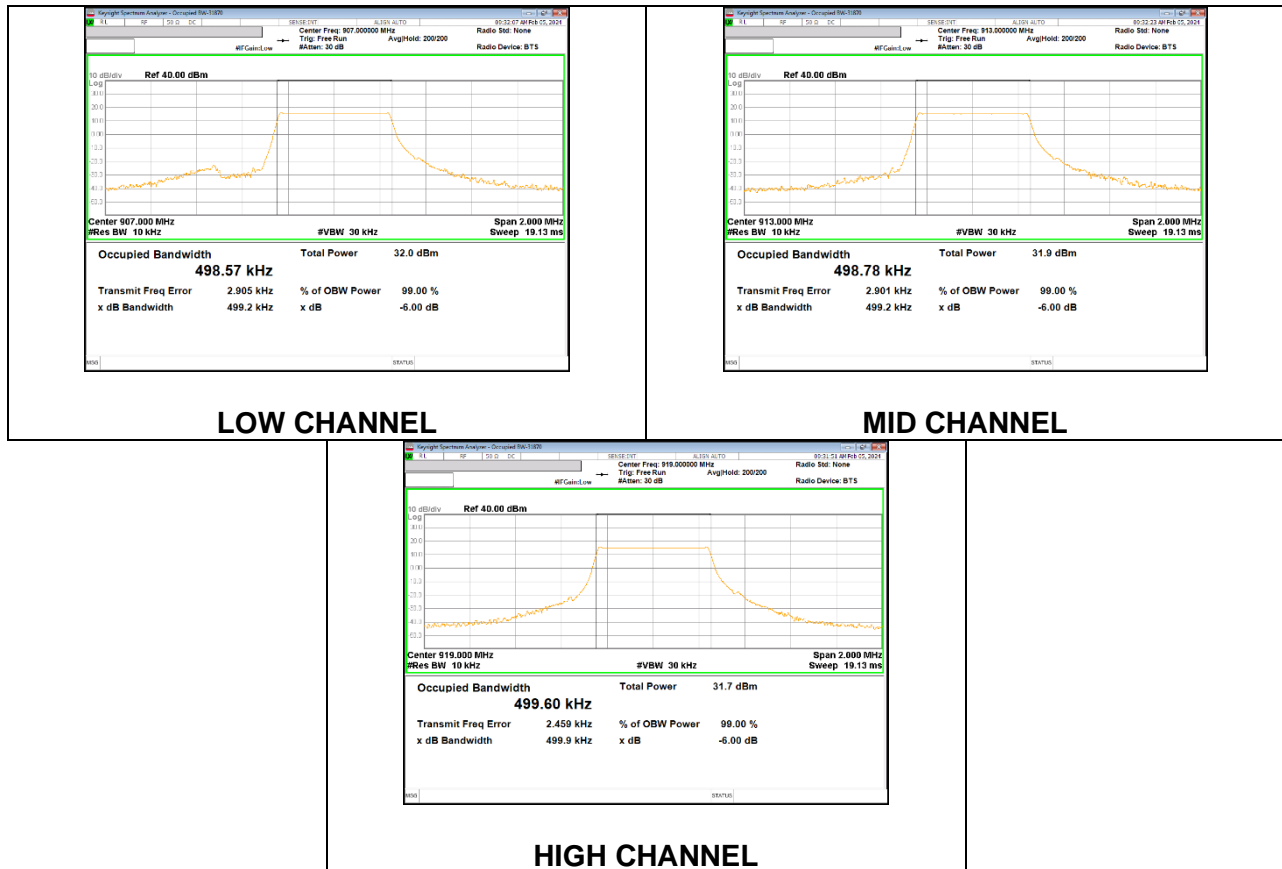
### TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth and to 1% of the span. The VBW is set to >= 3 times the RBW. The spectrum analyzer internal 99% bandwidth function is utilized.

### RESULTS

#### 99% BANDWIDTH data

Channel	Frequency [MHz]	99% Bandwidth [kHz]
Low	907	498.57
Mid	913	498.78
High	919	<b>499.60</b>
Worst		<b>499.60</b>



### 9.3. 6 dB BANDWIDTH

#### LIMITS

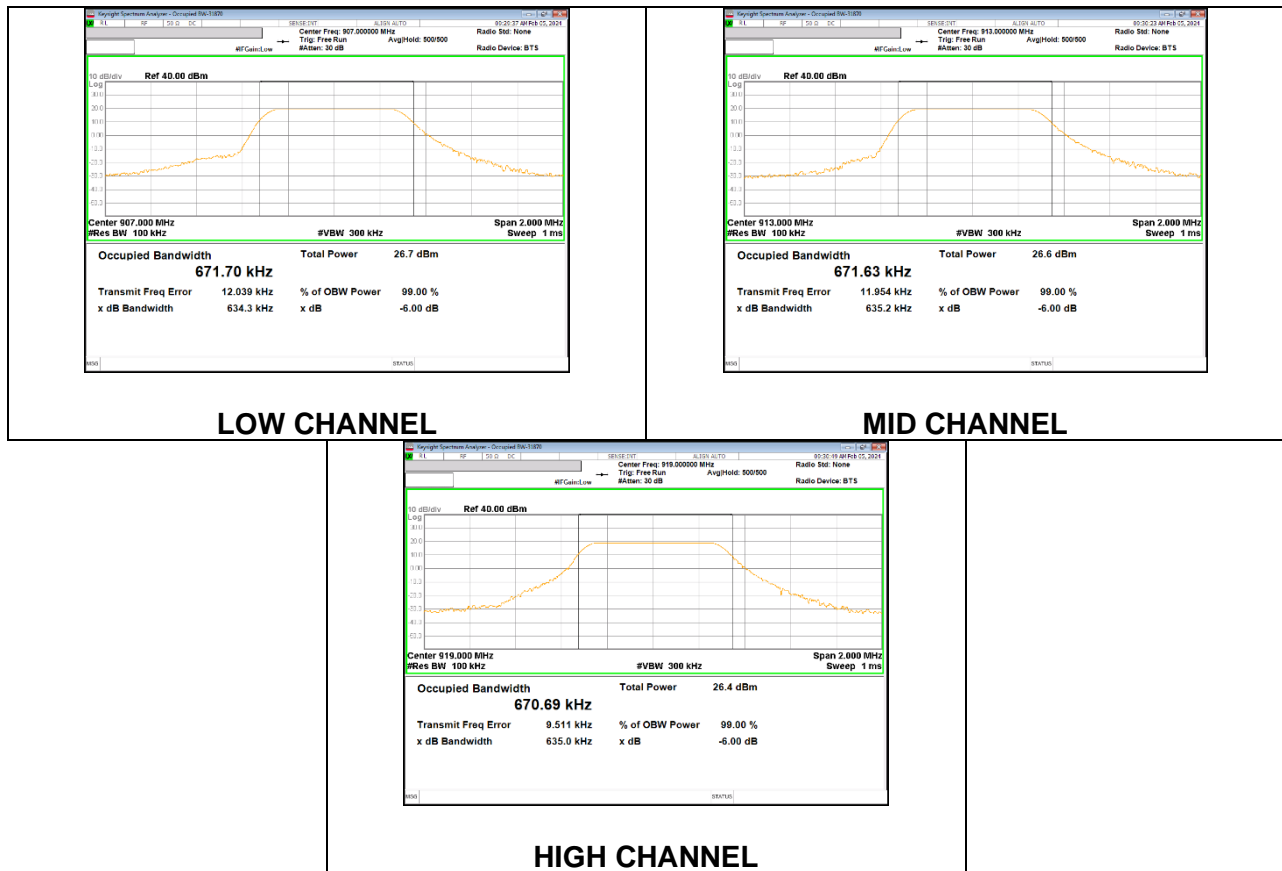
#### FCC §15.247 (a) (2)

IC RSS-247 5.2 (a)

The minimum 6 dB bandwidth shall be at least 500 kHz.

#### RESULTS 6dB Bandwidth data

Channel	Frequency [MHz]	6 dB Bandwidth [kHz]	Minumun Limit [kHz]
Low	907	634.3	500.0
Mid	913	<b>635.2</b>	500.0
High	919	635.0	500.0
Worst		<b>635.2</b>	634.3



## 9.4. PEAK OUTPUT POWER

### LIMITS

FCC §15.247 (b) (3)

IC RSS-247 5.4 (d)

The maximum antenna gain is less than or equal to 6 dBi, therefore the limit is 30 dBm.

### TEST PROCEDURE

Peak power is measured using ANSI C63.10(2013) under section 11.9.1.1 utilizing spectrum analyzer.

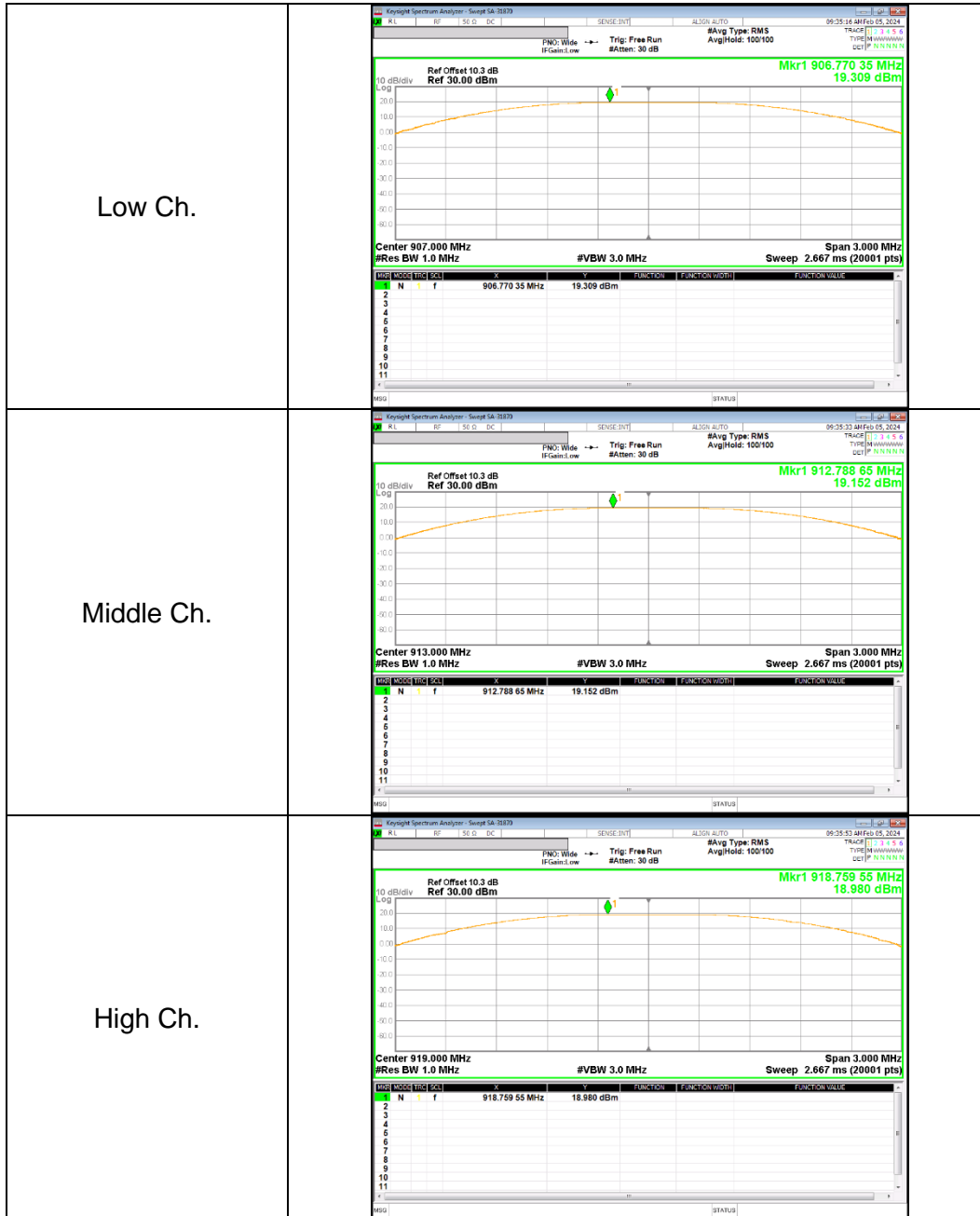
### RESULTS

#### PEAK OUTPUT POWER data

Channel	Frequency [MHz]	Peak Power [dBm]	Limit [dBm]	Margin [dB]
Low	907	19.31	30.00	-10.69
Mid	913	19.15	30.00	-10.85
High	919	18.98	30.00	-11.02
Worst		16.94	19.31	30.00



**PEAK OUTPUT POWER PLOTS**



## **9.5. POWER SPECTRAL DENSITY**

### **LIMITS**

FCC §15.247 (e)

IC RSS-247 (5.2) (b)

The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

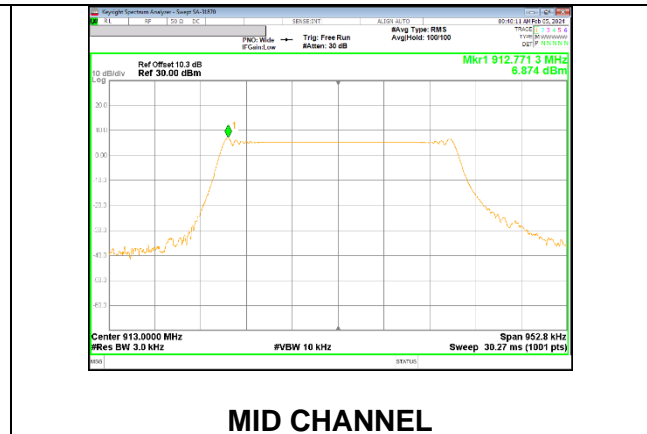
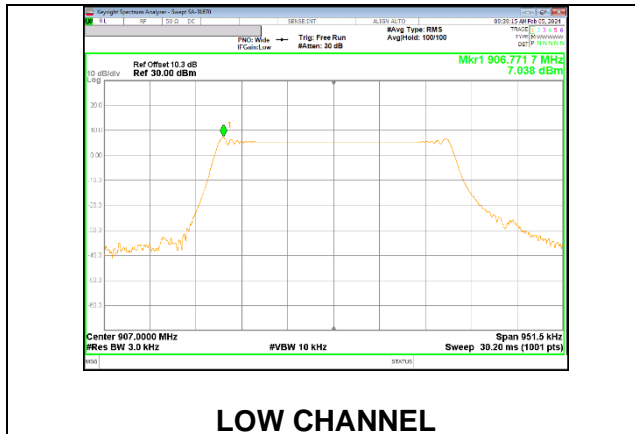
### **TEST PROCEDURE**

Power Spectral Density was measured using ANSI C63.10(2013) under section 11.10.2 utilizing spectrum analyzer.

### **RESULTS**

**PSD data**

Channel	Frequency [MHz]	PSD [dBm/3kHz]	Limit [dBm/3kHz]	Margin [dB]
Low	907	7.04	8.00	-0.96
Mid	913	6.87	8.00	-1.13
High	919	6.59	8.00	-1.41



## 9.6. CONDUCTED SPURIOUS EMISSIONS

### LIMITS

FCC §15.247 (d)

IC RSS-247 5.5

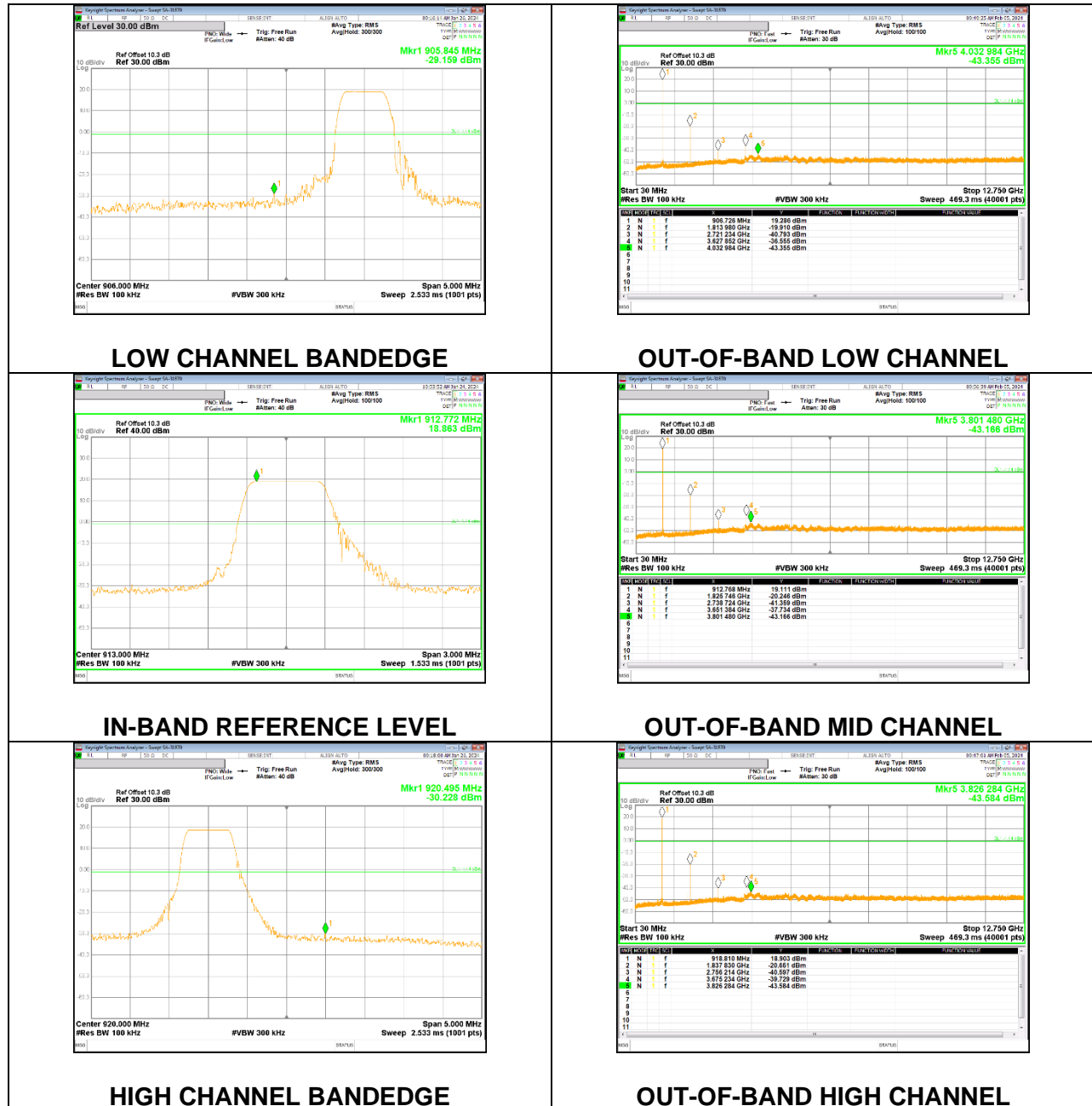
Output power was measured based on the use of a peak measurement, therefore the required attenuation is 20 dB.

### TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer with RBW = 100 kHz, VBW = 300 kHz, peak detector, and max hold. Measurements utilizing these settings are made of the in-band reference level, bandedge (where measurements to the general radiated limits will not be made) and out-of-band emissions.

### RESULTS

**CONDUCTED SPURIOUS EMISSIONS PLOTS**



## 10. RADIATED TEST RESULTS

### 10.1. LIMITS AND PROCEDURE

#### LIMITS

FCC §15.205 and §15.209  
 IC RSS-GEN 8.9 and 8.10

Limits for radiated disturbance of an intentional radiator		
Frequency range (MHz)	Limits (µV/m)	Measurement Distance (m)
0.009 – 0.490	2400 / F (kHz)	300
0.490 – 1.705	24000 / F (kHz)	30
1.705 – 30.0	30	30
30 – 88	100**	3
88 - 216	150**	3
216 – 960	200**	3
Above 960	500	3

\*\* Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g. §§ 15.231 and 15.241.

FCC Part 15.205 (a) : Only spurious emissions are permitted in any of the frequency bands listed below :

MHz	MHz	MHz	MHz	GHz	GHz
0.009 ~ 0.110	8.41425 ~ 8.41475	108 ~ 121.94	1300 ~ 1427	4.5 ~ 5.15	14.47 ~ 14.5
0.495 ~ 0.505	12.29 ~ 12.293	123 ~ 138	1435 ~ 1626.5	5.35 ~ 5.46	15.35 ~ 16.2
2.1735 ~ 2.1905	12.51975 ~ 12.52025	149.9 ~ 150.05	1645.5 ~ 1646.5	7.25 ~ 7.75	17.7 ~ 21.4
4.125 ~ 4.128	12.57675 ~ 12.57725	156.52475 ~	1660 ~ 1710	8.025 ~ 8.5	22.01 ~ 23.12
4.17725 ~ 4.17775	13.36 ~ 13.41	156.52525	1718.8 ~ 1722.2	9.0 ~ 9.2	23.6 ~ 24.0
4.20725 ~ 4.20775	16.42 ~ 16.423	156.7 ~ 156.9	2200 ~ 2300	9.3 ~ 9.5	31.2 ~ 31.8
6.215 ~ 6.218	16.69475 ~ 16.69525	162.0125 ~	2310 ~ 2390	10.6 ~ 12.7	36.43 ~ 36.5
6.26775 ~ 6.26825	16.80425 ~ 16.80475	167.17	2483.5 ~ 2500	13.25 ~ 13.4	Above 38.6
6.31175 ~ 6.31225	25.5 ~ 25.67	167.72 ~ 173.2	2655 ~ 2900		
8.291 ~ 8.294	37.5 ~ 38.25	240 ~ 285	3260 ~ 3267		
8.362 ~ 8.366	73 ~ 74.6	322 ~ 335.4	3332 ~ 3339		
8.37625 ~ 8.38675	74.8 ~ 75.2	399.90 ~ 410	3345.8 ~ 3358		
		608 ~ 614	3600 ~ 4400		
		960 ~ 1240			

▪ FCC Part 15.205(b) : The field strength of emissions appearing within these frequency bands shall not exceed the limits shown in §15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in §15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in §15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in §15.35 apply to these measurements.

## **TEST PROCEDURE**

The EUT is placed on a non-conducting table 80 cm above the ground plane for below 1GHz and 150 cm for above 1GHz. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.10. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz for peak measurements and add duty cycle factor for average measurements. (Restricted band-edge, Final detection of spurious harmonic emissions)

Duty cycle factor =  $10 \log (1/x)$ . But this EUT operated on a duty cycle of over 100% during test. Therefore, duty cycle factor is not applied.

Pre-scans to detect harmonic and spurious emissions, the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 30 kHz for peak measurements.

The spectrum from 1 GHz to 18 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the band (902 MHz ~ 928 MHz).  
(From 30MHz to 1GHz, test was performed with the EUT set to transmit at the channel with highest output power)

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

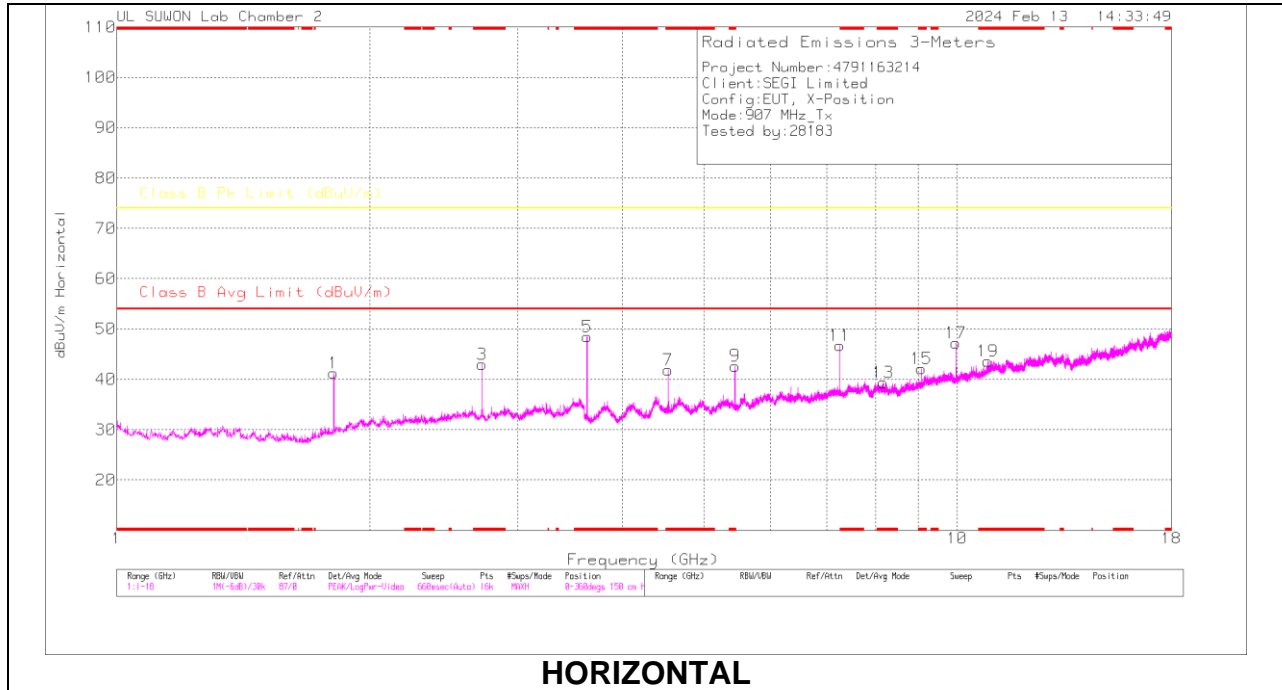
Note : Emission was pre-scanned from 9kHz to 30MHz; No emissions were detected which was at least 20dB below the specification limit (consider distance correction factor).  
Per FCC part 15.31(o), test results were not reported.

Although these tests were performed other than open field test site, adequate comparison measurements were confirmed against 30 m open area test site.  
Therefore, sufficient tests were made to demonstrate that the alternative site produces results that correlate with the one of tests made in an open field based on KDB 414788.

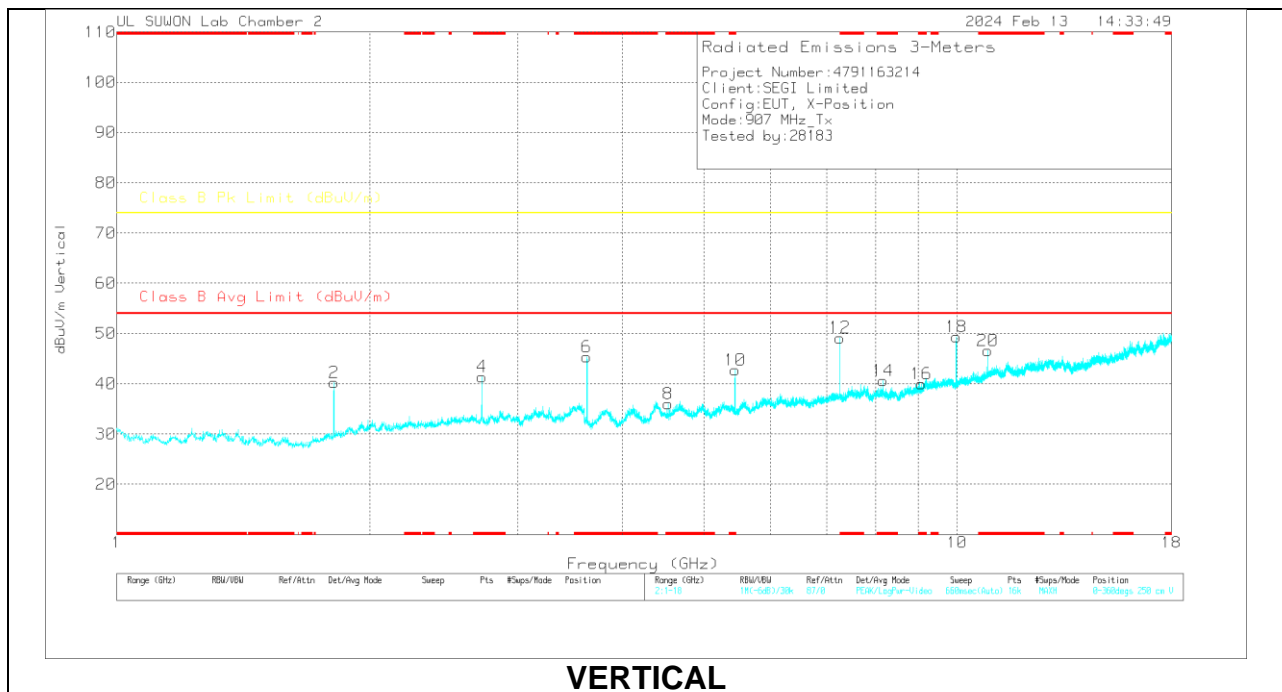
## 10.2. TRANSMITTER ABOVE 1 GHz

### HARMONICS AND SPURIOUS EMISSIONS

#### LOW CHANNEL RESULTS



**HORIZONTAL**



**VERTICAL**



**RADIATED EMISSIONS**

Meter	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168724	1-18GHz_Path Loss(dB)	1G HPPF(dB)	DC Corr (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	1.81276	40.68	PK	29.8	-30.1	.9	0	41.28	-	-	74	-32.72	0-360	100	H
2	1.81382	39.6	PK	29.8	-30.1	.9	0	40.2	-	-	74	-33.8	0-360	250	V
3	* 2.72008	38.87	PK	32.1	-28.9	.9	0	42.97	-	-	74	-31.03	0-360	150	H
4	* 2.72008	37.32	PK	32.1	-28.9	.9	0	41.42	-	-	74	-32.58	0-360	250	V
5	* 3.62846	43.27	PK	32.8	-28.3	.7	0	48.47	-	-	74	-26.53	0-360	100	H
6	* 3.6274	40.26	PK	32.8	-28.4	.7	0	45.34	-	-	74	-29.66	0-360	250	V
7	* 4.53366	34.71	PK	33.9	-27.4	.6	0	41.81	-	-	74	-32.19	0-360	100	H
8	* 4.53472	28.95	PK	33.9	-27.4	.6	0	36.05	-	-	74	-37.95	0-360	250	V
9	* 5.4431	34.37	PK	34.4	-26.7	.6	0	42.67	-	-	74	-31.33	0-360	100	H
10	* 5.4431	34.49	PK	34.4	-26.7	.6	0	42.79	-	-	74	-31.21	0-360	250	V
11	* 7.25561	35.14	PK	35.7	-24.9	.8	0	46.74	-	-	74	-27.26	0-360	100	H
12	* 7.25455	37.55	PK	35.7	-24.9	.8	0	49.15	-	-	74	-24.85	0-360	250	V
13	* 8.16293	26.27	PK	35.9	-23.5	.7	0	39.37	-	-	74	-34.63	0-360	100	H
14	* 8.16293	27.52	PK	35.9	-23.5	.7	0	40.62	-	-	74	-33.38	0-360	250	V
15	* 9.07131	27.04	PK	36.5	-22.2	.8	0	42.14	-	-	74	-31.86	0-360	100	H
16	* 9.06812	24.85	PK	36.5	-22.2	.8	0	39.95	-	-	74	-34.05	0-360	250	V
17	* 9.97544	30.41	PK	37.4	-21.4	.8	0	47.21	-	-	74	-26.79	0-360	100	H
18	* 9.97659	32.51	PK	37.4	-21.4	.8	0	49.31	-	-	74	-24.69	0-360	250	V
19	* 10.88555	25.04	PK	37.9	-20.1	.8	0	43.64	-	-	74	-30.36	0-360	100	H
20	* 10.88489	27.86	PK	37.9	-20	.8	0	46.56	-	-	74	-27.44	0-360	250	V

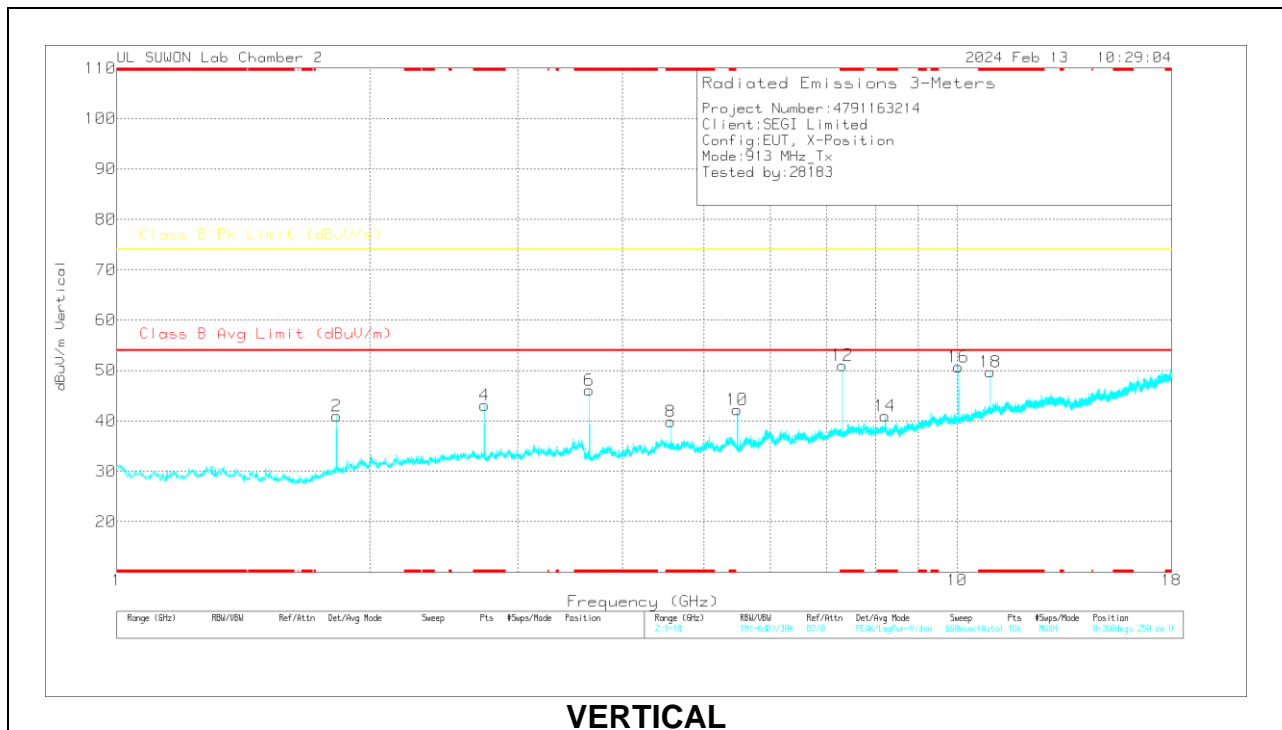
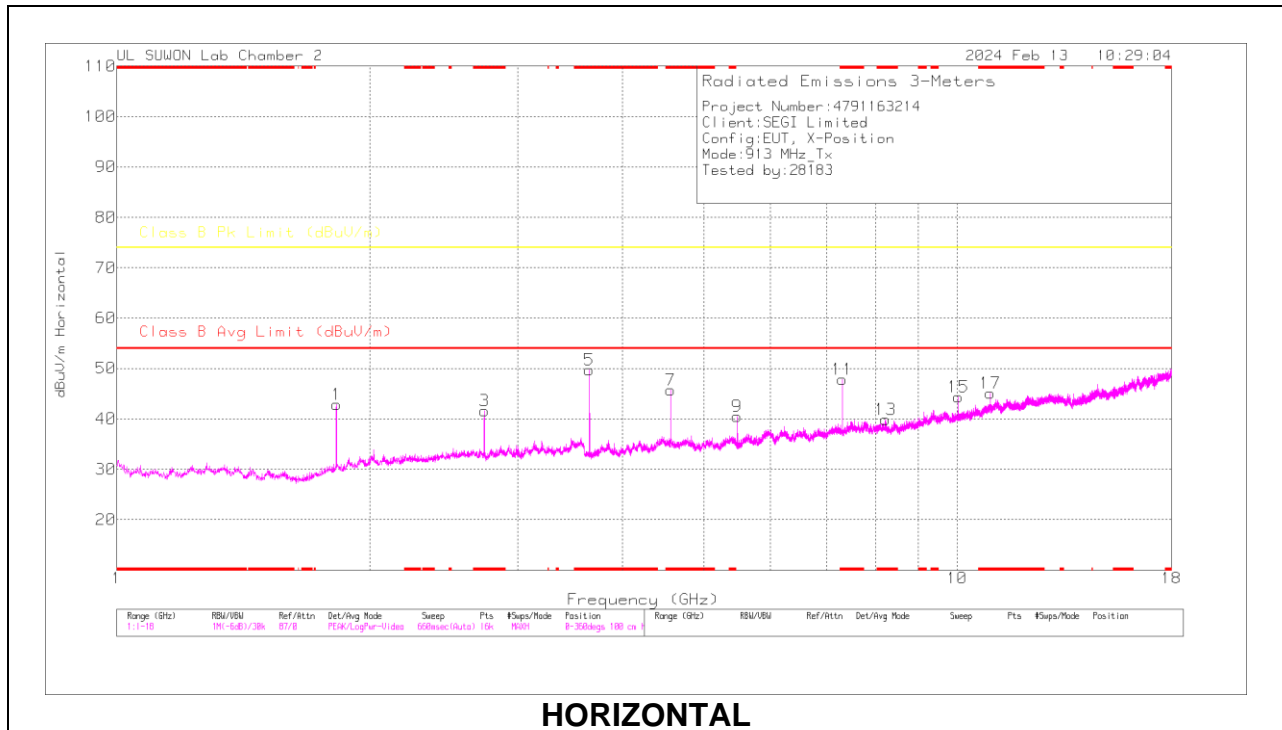
\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band  
 PK – Peak Detector

**Radiated Emissions**

Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168724	1-18GHz_Path Loss(dB)	1G HPPF(dB)	DC Corr (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
1.81369	44.65	PK2	29.8	-30.1	.9	0	45.25	-	-	74	-28.75	257	254	H
1.81387	31.66	MAV1	29.8	-30.1	.9	0	42.26	54	-11.74	-	-	257	254	H
* 2.72103	43.38	PK2	32.1	-28.9	.9	0	47.68	-	-	74	-26.32	268	221	H
* 2.72063	28.53	MAV1	32.1	-28.9	.9	10	42.63	54	-11.37	-	-	268	221	H
* 3.62818	45.85	PK2	32.8	-28.4	.7	0	50.95	-	-	74	-23.05	225	109	H
* 3.62726	32.69	MAV1	32.8	-28.4	.7	10	47.79	54	-6.21	-	-	225	109	H
* 5.44184	39.84	PK2	34.4	-26.7	.6	0	48.14	-	-	74	-25.86	214	128	H
* 5.44153	25.51	MAV1	34.4	-26.7	.6	10	43.81	54	-10.19	-	-	214	128	H
* 7.25606	42.46	PK2	35.7	-24.9	.8	0	54.06	-	-	74	-19.94	36	100	H
* 7.25627	26.62	MAV1	35.7	-24.9	.8	10	48.22	54	-5.78	-	-	36	100	H
9.97466	35.35	PK2	37.4	-21.4	.8	0	52.15	-	-	74	-21.85	45	222	H
9.97755	21.71	MAV1	37.4	-21.3	.8	10	48.61	54	-5.39	-	-	45	222	H
1.814	42.12	PK2	29.8	-30.1	.9	0	42.72	-	-	74	-31.28	339	109	V
1.814	29.27	MAV1	29.8	-30.1	.9	10	39.87	54	-14.13	-	-	339	109	V
* 2.72103	43.39	PK2	32.1	-28.9	.9	0	47.49	-	-	74	-26.51	15	309	V
* 2.72087	29.02	MAV1	32.1	-28.9	.9	10	43.12	54	-10.88	-	-	15	309	V
* 3.62698	44.74	PK2	32.8	-28.4	.7	0	49.64	-	-	74	-24.16	162	350	V
* 3.62789	32.02	MAV1	32.8	-28.4	.7	10	47.12	54	-6.88	-	-	162	350	V
* 5.4422	40.54	PK2	34.4	-26.7	.6	0	48.84	-	-	74	-25.16	176	101	V
* 5.44223	26.8	MAV1	34.4	-26.7	.6	10	45.1	54	-8.9	-	-	176	101	V
* 7.25588	44.25	PK2	35.7	-24.9	.8	0	55.85	-	-	74	-18.15	32	102	V
* 7.2562	27.8	MAV1	35.7	-24.9	.8	10	49.4	54	-4.6	-	-	32	102	V
9.97753	37.94	PK2	37.4	-21.3	.8	0	54.94	-	-	74	-19.16	89	363	V
9.9788	23.81	MAV1	37.4	-21.3	.8	10	50.71	54	-3.29	-	-	89	363	V

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band  
 PK2 - KDB558074 Method: Maximum Peak  
 MAV1 - KDB558074 Option 1 Maximum RMS Average

### MID CHANNEL RESULTS



**RADIATED EMISSIONS**

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168724	1-18GHz_Path Loss(dB)	1G HPF[dB]	DC Corr (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 (m)	Polarity
1	1.82551	42.18	PK	29.9	-30.1	.9	0	42.88	-	-	74	-31.12	0-360	100	H
2	1.82551	40.32	PK	29.9	-30.1	.9	0	41.02	-	-	74	-32.98	0-360	250	V
3	*2.73814	37.67	PK	32.1	-29	.8	0	41.57	-	-	74	-32.43	0-360	100	H
4	*2.73814	39.26	PK	32.1	-29	.8	0	43.16	-	-	74	-30.84	0-360	250	V
5	*3.65184	44.65	PK	32.8	-28.4	.7	0	49.75	-	-	74	-24.25	0-360	150	H
6	*3.6529	41	PK	32.8	-28.4	.7	0	46.1	-	-	74	-27.9	0-360	250	V
7	*4.56447	38.39	PK	34	-27.4	.7	0	45.69	-	-	74	-28.31	0-360	150	H
8	*4.56447	32.54	PK	34	-27.4	.7	0	39.84	-	-	74	-34.16	0-360	250	V
9	5.4771	32.12	PK	34.4	-26.6	.8	0	40.52	-	-	74	-33.48	0-360	100	H
10	5.47816	33.82	PK	34.4	-26.6	.8	0	42.22	-	-	74	-31.78	0-360	250	V
11	*7.30555	36.21	PK	35.7	-24.9	.8	0	47.81	-	-	74	-26.19	0-360	150	H
12	*7.30448	39.42	PK	35.7	-24.9	.8	0	51.02	-	-	74	-22.98	0-360	250	V
13	*8.21924	26.08	PK	35.9	-23.5	.8	0	39.28	-	-	74	-34.12	0-360	100	H
14	*8.21499	27.83	PK	35.9	-23.5	.8	0	41.03	-	-	74	-32.97	0-360	250	V
15	10.04025	27.32	PK	37.4	-21.2	.8	0	44.32	-	-	74	-29.68	0-360	150	H
16	10.04238	33.66	PK	37.4	-21.3	.9	0	50.66	-	-	74	-23.34	0-360	250	V
17	*10.95501	26.69	PK	37.9	-20.4	.9	0	45.09	-	-	74	-28.91	0-360	100	H
18	*10.95819	31.26	PK	37.9	-20.4	.9	0	49.66	-	-	74	-24.34	0-360	250	V

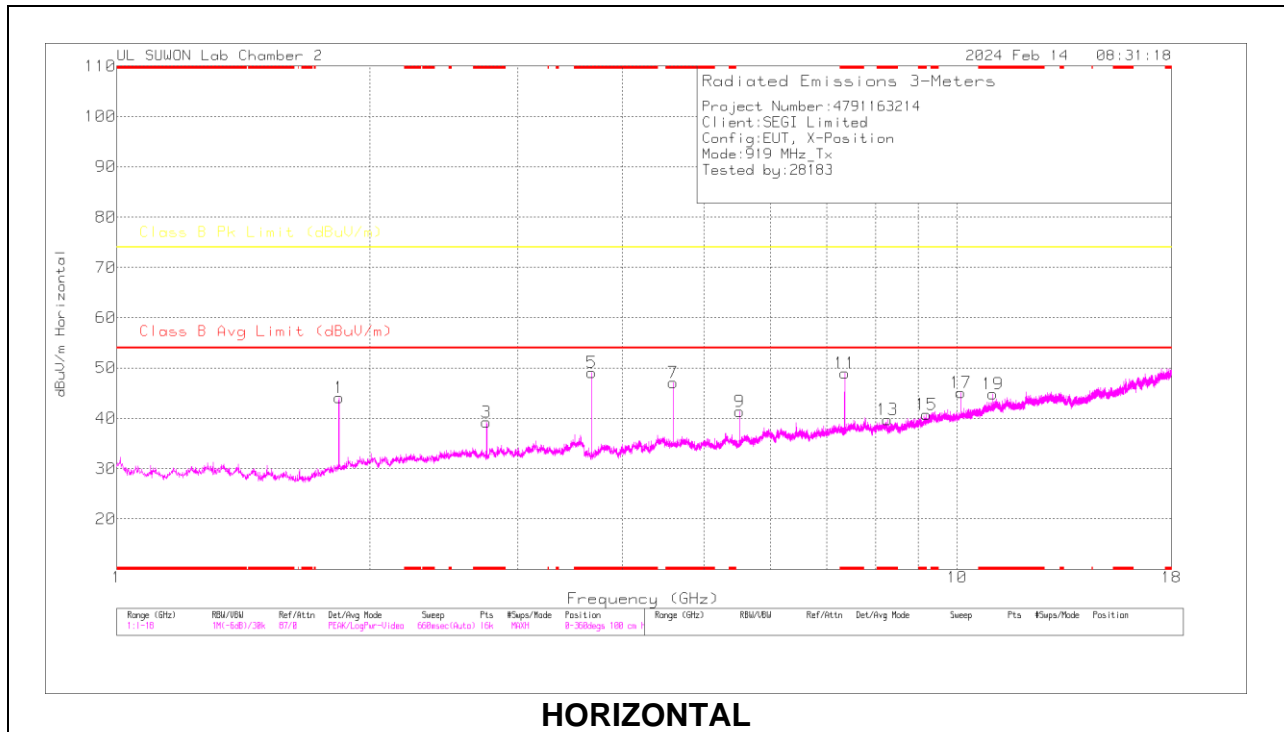
\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band  
 PK – Peak Detector

**Radiated Emissions**

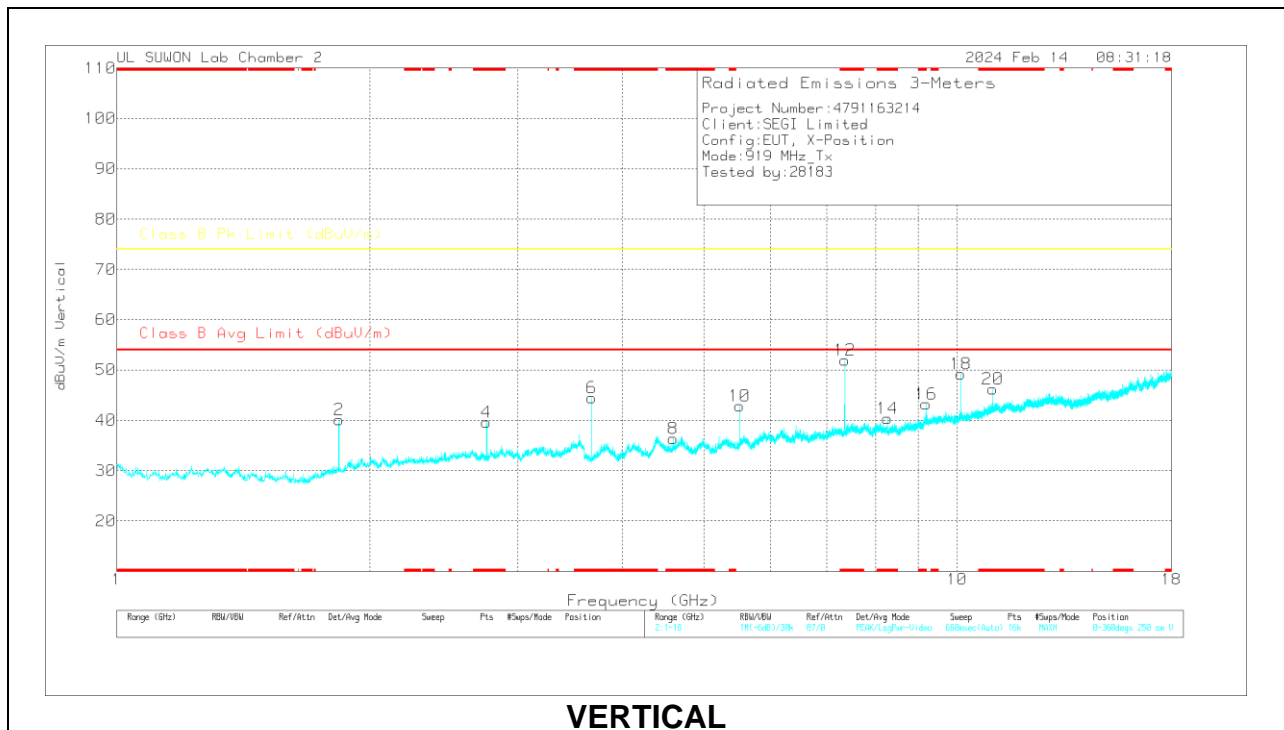
Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168724	1-18GHz_Path Loss(dB)	1G HPF[dB]	DC Corr (dB)	Corrected Reading (dBuV/m)	Class B Avg Limit (dBuV/m)	Av(CISPR)Margin (dB)	Class B Pk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (m)	Polarity
1.82543	47.18	PK2	29.9	-30.1	.9	0	47.88	-	-	74	-26.12	245	180	H
1.82587	34.6	MAV1	29.9	-30.1	.9	10	45.3	54	-8.7	-	-	245	160	H
*3.65212	47.01	PK2	32.8	-28.4	.7	0	52.11	-	-	74	-21.89	232	365	H
*3.65251	34.53	MAV1	32.8	-28.4	.7	10	49.63	54	-4.37	-	-	232	365	H
*4.56488	43.86	PK2	34	-27.4	.7	0	51.16	-	-	74	-22.84	217	158	H
*4.56514	29.31	MAV1	34	-27.4	.7	10	46.61	54	-7.39	-	-	217	158	H
*7.30295	44.43	PK2	35.7	-24.9	.8	0	56.03	-	-	74	-17.97	134	101	H
*7.30319	29.37	MAV1	35.7	-24.9	.8	10	50.87	54	-3.03	-	-	134	101	H
10.041	37.33	PK2	37.4	-21.3	.8	0	54.23	-	-	74	-19.77	42	102	H
10.04356	22.11	MAV1	37.4	-21.2	.9	10	49.21	54	-4.79	-	-	42	102	H
*10.95732	34.2	PK2	37.9	-20.4	.9	0	52.6	-	-	74	-21.4	182	100	H
*10.95734	21.44	MAV1	37.9	-20.4	.9	10	49.84	54	-4.16	-	-	182	100	H
1.82599	43.13	PK2	29.9	-30.1	.9	0	43.83	-	-	74	-30.17	0	101	V
1.82611	29.82	MAV1	29.9	-30.1	.9	10	40.52	54	-13.48	-	-	0	101	V
*3.65246	41.45	PK2	32.8	-28.4	.7	0	46.55	-	-	74	-27.45	349	119	V
*3.65219	27.71	MAV1	32.8	-28.4	.7	10	42.81	54	-11.19	-	-	349	119	V
*4.56588	37.3	PK2	34	-27.4	.7	0	44.6	-	-	74	-29.4	25	124	V
*4.5648	25.03	MAV1	34	-27.4	.7	10	42.33	54	-11.67	-	-	25	124	V
*7.30396	44.95	PK2	35.7	-24.9	.8	0	56.55	-	-	74	-17.45	37	106	V
*7.30351	29.77	MAV1	35.7	-24.9	.8	10	51.37	54	-2.63	-	-	37	106	V
10.04155	36.8	PK2	37.4	-21.3	.8	0	53.7	-	-	74	-20.3	122	356	V
10.04179	22.94	MAV1	37.4	-21.3	.8	10	49.84	54	-4.16	-	-	122	356	V
*10.95786	34.66	PK2	37.9	-20.4	.9	0	53.06	-	-	74	-20.94	134	138	V
*10.95619	21.78	MAV1	37.9	-20.3	.9	10	50.28	54	-3.72	-	-	134	138	V

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band  
 PK2 - KDB558074 Method: Maximum Peak  
 MAV1 - KDB558074 Option 1 Maximum RMS Average

### HIGH CHANNEL RESULTS



**HORIZONTAL**



**VERTICAL**

**RADIATED EMISSIONS**

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168724	1-18GHz_Path Loss(dB)	1G HPF[dB]	DC Corr (dB)	Corrected Reading (dBuV/m)	Class B Avg Limit (dBuV/m)	Av(CISPR)Margin (dB)	Class B Pt Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.83768	43.21	PK	30	-30	.9	0	44.11	-	-	74	-29.89	0-360	150	H
3	*2.7562	34.59	PK	32.1	-28.7	.8	0	39.19	-	-	74	-34.81	0-360	150	H
5	*3.67627	43.95	PK	32.8	-28.4	.7	0	49.05	-	-	74	-24.95	0-360	100	H
7	*4.59528	39.93	PK	34	-27.5	.7	0	47.13	-	-	74	-26.87	0-360	100	H
9	5.51534	32.94	PK	34.4	-26.5	.8	0	41.34	-	-	74	-32.66	0-360	100	H
11	*7.35017	37	PK	35.7	-24.5	.8	0	49	-	-	74	-25	0-360	100	H
13	*8.27024	36.3	PK	35.9	-23.4	.9	0	39.7	-	-	74	-34.3	0-360	100	H
15	*9.1903	25.09	PK	36.6	-22	1.1	0	40.79	-	-	74	-33.21	0-360	100	H
17	*10.11037	27.45	PK	37.4	-20.8	1	0	45.06	-	-	74	-28.95	0-360	100	H
19	*11.02938	26.39	PK	38	-20.5	1	0	44.89	-	-	74	-29.11	0-360	100	H
2	1.83826	39.16	PK	30	-30	.9	0	40.06	-	-	74	-33.94	0-360	250	V
4	*2.7562	35.45	PK	32.1	-28.7	.8	0	39.65	-	-	74	-34.35	0-360	250	V
6	*3.67521	39.41	PK	32.8	-28.4	.7	0	44.51	-	-	74	-29.49	0-360	250	V
8	*4.59526	29.17	PK	34	-27.5	.7	0	36.37	-	-	74	-37.63	0-360	250	V
10	5.51428	34.32	PK	34.4	-26.5	.6	0	42.82	-	-	74	-31.18	0-360	250	V
12	*7.35123	39.92	PK	35.7	-24.5	.8	0	51.92	-	-	74	-22.08	0-360	250	V
14	*8.27024	26.94	PK	35.9	-23.4	.9	0	40.34	-	-	74	-33.66	0-360	250	V
16	*9.18916	27.58	PK	36.6	-22.1	1.1	0	43.18	-	-	74	-30.82	0-360	250	V
18	10.10825	31.58	PK	37.4	-20.8	1	0	49.18	-	-	74	-24.82	0-360	250	V
20	*11.02938	27.74	PK	38	-20.5	1	0	46.24	-	-	74	-27.76	0-360	250	V

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

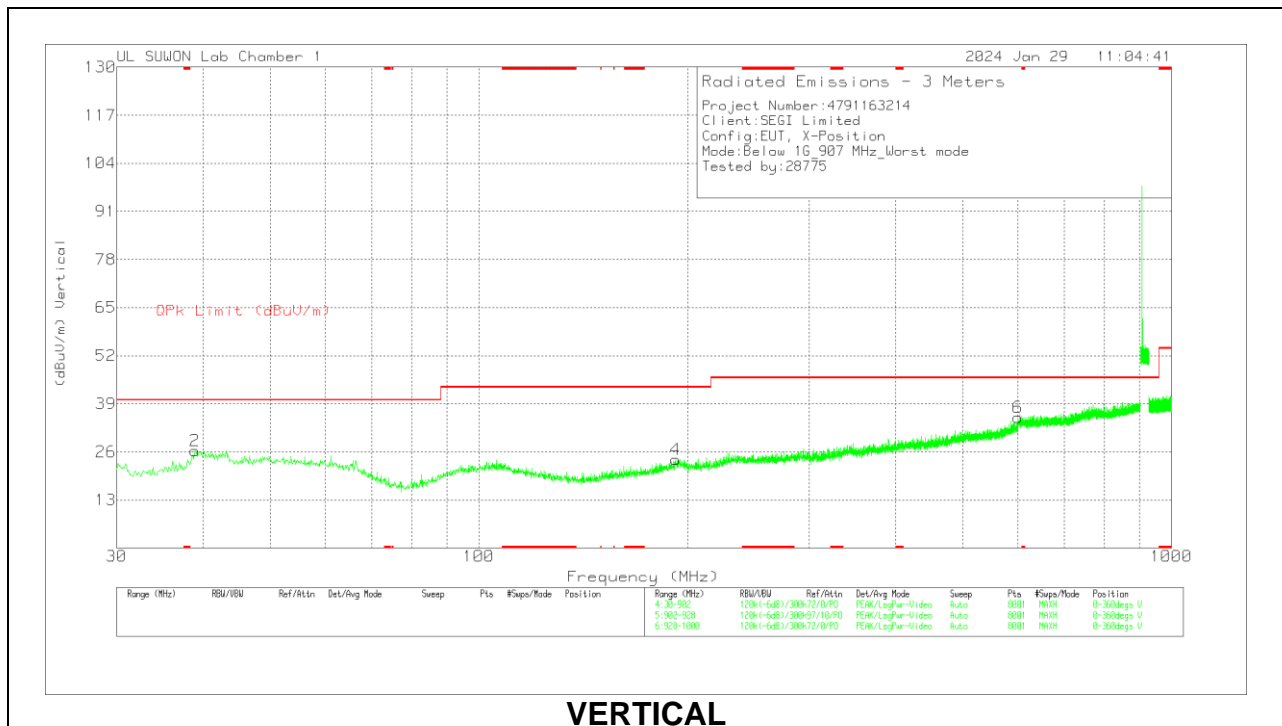
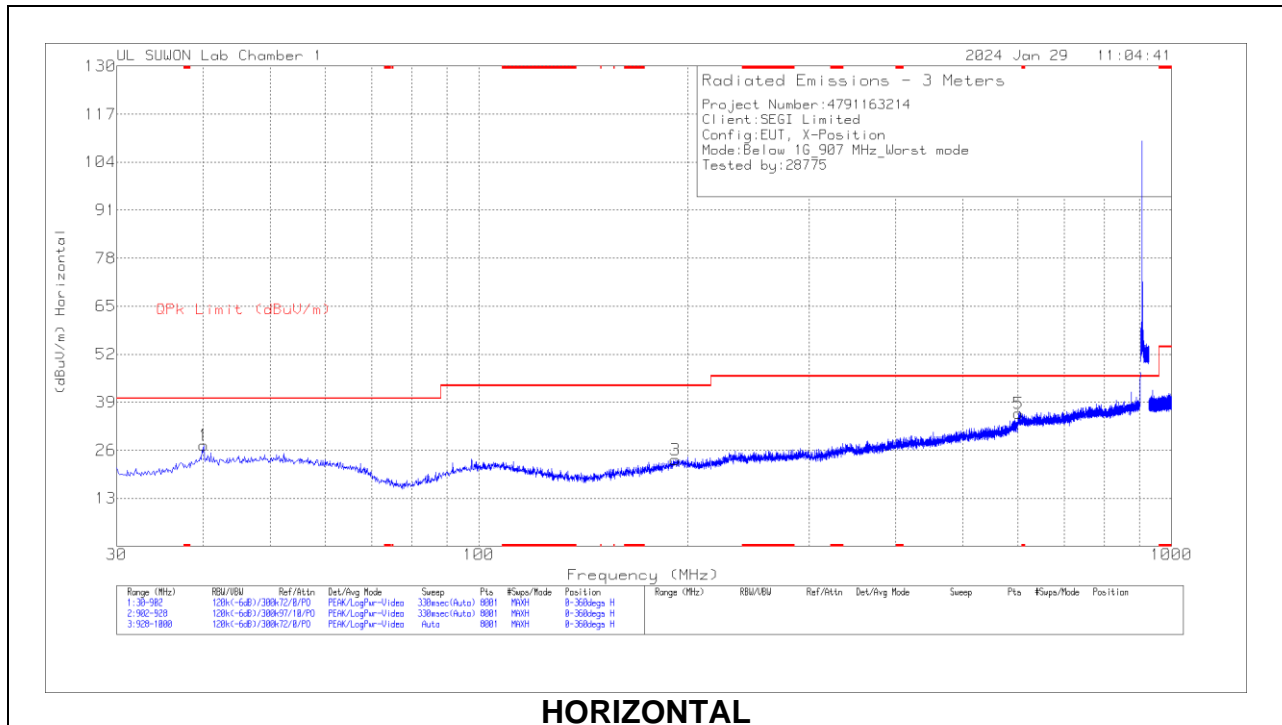
**Radiated Emissions**

Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168724	1-18GHz_Path Loss(dB)	1G HPF[dB]	DC Corr (dB)	Corrected Reading (dBuV/m)	Class B Avg Limit (dBuV/m)	Av(CISPR)Margin (dB)	Class B Pt Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1.83768	47.13	PK2	30	-30	.9	0	48.03	-	-	74	-25.97	250	296	H
1.83782	34.83	MAV1	30	-30	.9	10	45.73	54	-8.27	-	-	250	296	H
1.83784	42.9	PK2	30	-30	.9	0	43.8	-	-	74	-30.2	27	114	V
1.83782	30.33	MAV1	30	-30	.9	10	41.23	54	-12.77	-	-	27	114	V
*3.67604	46.13	PK2	32.8	-28.4	.7	0	51.23	-	-	74	-22.77	235	331	H
*3.67613	32.86	MAV1	32.8	-28.4	.7	10	47.96	54	-6.04	-	-	235	331	H
*3.6753	42.71	PK2	32.8	-28.4	.7	0	47.81	-	-	74	-26.19	163	344	V
*3.67669	31.42	MAV1	32.8	-28.5	.7	10	46.42	54	-7.58	-	-	163	344	V
*4.59503	43.79	PK2	34	-27.5	.7	0	50.99	-	-	74	-23.01	238	104	H
*4.59543	32.81	MAV1	34	-27.5	.7	10	50.01	54	-3.99	-	-	238	104	H
*7.3509	45.08	PK2	35.7	-24.5	.8	0	57.08	-	-	74	-16.94	131	100	H
*7.35212	30.51	MAV1	35.7	-24.6	.8	10	52.41	54	-1.59	-	-	131	100	H
*7.35184	44.42	PK2	35.7	-24.6	.8	0	56.32	-	-	74	-17.68	42	111	V
*7.35088	31.47	MAV1	35.7	-24.5	.8	10	53.47	54	-5.3	-	-	42	111	V
*9.18984	34.78	PK2	36.6	-22	1.1	0	50.48	-	-	74	-23.52	132	115	V
*9.18806	22.02	MAV1	36.6	-22.1	1.1	10	47.62	54	-6.38	-	-	132	115	V
10.11011	37.58	PK2	37.4	-20.8	1	0	55.18	-	-	74	-18.82	47	104	H
10.10794	23.09	MAV1	37.4	-20.8	1	10	50.69	54	-3.31	-	-	47	104	H
10.10898	38.18	PK2	37.4	-20.8	1	0	55.78	-	-	74	-18.22	151	100	V
10.10854	24.08	MAV1	37.4	-20.8	1	10	51.68	54	-2.32	-	-	151	100	V
*11.02793	34.76	PK2	38	-20.4	1	0	53.36	-	-	74	-20.64	267	116	H
*11.029	21.58	MAV1	38	-20.5	1	10	50.08	54	-3.92	-	-	267	116	H
*11.03023	32.94	PK2	38	-20.5	1	0	51.44	-	-	74	-22.56	85	318	V
*11.02743	21.14	MAV1	38	-20.5	1	10	49.64	54	-4.36	-	-	85	318	V

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band  
 PK2 - KDB558074 Method: Maximum Peak  
 MAV1 - KDB558074 Option 1 Maximum RMS Average

### 10.3. WORST CASE BELOW 1 GHZ

#### SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION)



## Below 1GHz Data

### Radiated Emissions

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	40.028	7.65	Pk	18.4	1.3	27.35	40	-12.65	0-360	100	H
3	192.192	3.84	Pk	16.7	2.9	23.44	43.52	-20.08	0-360	100	H
5	601.596	6.32	Pk	24.4	5.2	35.92	46.02	-10.1	0-360	100	H
2	38.938	6.81	Pk	18.2	1.3	26.31	40	-13.69	0-360	100	V
4	192.301	4.33	Pk	16.7	2.9	23.93	43.52	-19.59	0-360	200	V
6	600.07	5.76	Pk	24.4	5.2	35.36	46.02	-10.66	0-360	100	V

Pk - Peak detector

Note1: Only peak measurement was performed. Because peak measurement result of unwanted emission is less than Quasi-Peak limit.

## 11. AC POWER LINE CONDUCTED EMISSIONS

### LIMITS

FCC §15.207 (a)

IC RSS-GEN 8.8

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

<sup>\*</sup> Decreases with the logarithm of the frequency.

### RESULTS (Not applicable)

This EUT is only supplied by DC power (CR2325 battery\*2ea).

## END OF TEST REPORT