


TEST REPORT

FCC ID..... :	NBGFS197R	
Test Report No..... :	TCT231226E010	
Date of issue..... :	Feb. 09, 2024	
Testing laboratory	SHENZHEN TONGCE TESTING LAB	
Testing location/ address:	TCT Testing Industrial Park Fuqiao 5th Industrial Zone, Fuhai Street, Bao'an District Shenzhen, Guangdong, 518103, People's Republic of China	
Applicant's name..... :	HELLA GmbH & Co. KGaA	
Address..... :	Rixbecker Strasse 75, Lippstadt D-59552, Germany	
Manufacturer's name ... :	HELLA GmbH & Co. KGaA	
Address..... :	Rixbecker Strasse 75, Lippstadt D-59552, Germany	
Factory's name	HELLA GmbH & Co. KGaA	
Address..... :	Römerstraße 66 59075 Hamm Germany	
Standard(s)	FCC CFR Title 47 Part 15 Subpart F	
Product Name..... :	Passive Entry-Passive Start Radio Identification Device	
Trade Mark	HELLA	
Model/Type reference..... :	FS197R	
Rating(s)	DC 3V	
Date of receipt of test item	Dec. 26, 2023	
Date (s) of performance of test..... :	Dec. 26, 2023 - Feb. 09, 2024	
Tested by (+signature) ... :	Brews Xu	
Check by (+signature).... :	Beryl Zhao	
Approved by (+signature):	Tomsin	

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1. General Product Information

1.1. EUT description

Product Name.....:	Passive Entry-Passive Start Radio Identification Device
Model/Type reference.....:	FS197R
Sample Number.....:	TCT231226E010-0101
Operation Frequency	6988.8MHz, 7488MHz
Modulation Technology	BPM-BPSK
Antenna Type.....:	PCB Integrated Monopole Antenna
Antenna Gain.....:	0dBi
Rating(s)	DC 3V

Note: The antenna gain listed in this report is provided by applicant, and the test laboratory is not responsible for this parameter.

1.2. Model(s) list

None.

1.3. Operation Frequency

Channel Number	Center frequencies
6	6988.8 MHz
8	7488 MHz

2. Test Result Summary

Requirement	CFR 47 Section	Result
Antenna requirement	§15.203 & §15.519(a)(2)	PASS
Conduction Emission	§15.207	N/A
UWB Bandwidth	§15.503(a) & §15.519(b) & §15.503(d)	PASS
Dwell Time	§15.519(a)(1)	PASS
Spurious Emission	§15.519(c)	PASS
EIRP	§15.519(e) & §15.521(g)	PASS

Note:

1. PASS: Test item meets the requirement.
2. Fail: Test item does not meet the requirement.
3. N/A: Test case does not apply to the test object.
4. The test result judgment is decided by the limit of test standard.

3. General Information

3.1. Test environment and mode

Operating Environment:	
Condition	Radiated Emission
Temperature:	25.0 °C
Humidity:	55 % RH
Atmospheric Pressure:	1010 mbar
Test Mode:	
Engineering mode:	Keep the EUT in transmitting by select channel and modulations
The sample was placed 0.8m & 1.5m for the measurement below & above 1GHz above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case(Z axis) are shown in Test Results of the following pages.	

3.2. Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Equipment	Model No.	Serial No.	FCC ID	Trade Name
/	/	/	/	/

Note:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.
3. For conducted measurements (Output Power, 6dB Emission Bandwidth, Power Spectral Density, Spurious Emissions), the antenna of EUT is connected to the test equipment via temporary antenna connector, the antenna connector is soldered on the antenna port of EUT, and the temporary antenna connector is listed in the Test Instruments.

4. Facilities and Accreditations

4.1. Facilities

The test facility is recognized, certified, or accredited by the following organizations:

- FCC - Registration No.: 645098

SHENZHEN TONGCE TESTING LAB

Designation Number: CN1205

The testing lab has been registered and fully described in a report with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files.

- IC - Registration No.: 10668A-1

SHENZHEN TONGCE TESTING LAB

CAB identifier: CN0031

The testing lab has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing.

4.2. Location

SHENZHEN TONGCE TESTING LAB

Address: TCT Testing Industrial Park, Fuqiao 5th Industrial Zone, Fuhai Street, Bao'an District, Shenzhen, Guangdong, 518103, People's Republic of China

TEL: +86-755-27673339

4.3. Measurement Uncertainty

The reported uncertainty of measurement $y \pm U$, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %.

No.	Item	MU
1	Conducted Emission	± 3.10 dB
2	RF power, conducted	± 0.12 dB
3	Spurious emissions, conducted	± 0.11 dB
4	Occupied Bandwidth	± 0.25 KHz
5	All emissions, radiated(<1 GHz)	± 4.56 dB
6	All emissions, radiated(1 GHz - 18 GHz)	± 4.22 dB
7	All emissions, radiated(18 GHz- 40 GHz)	± 4.36 dB

5. Test Results and Measurement Data

5.1. Antenna requirement

Standard requirement:

FCC Part15 C Section 15.203 & 15.519(a)(2)

15.203 requirement:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall 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, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

15.519(a)(2) requirement:

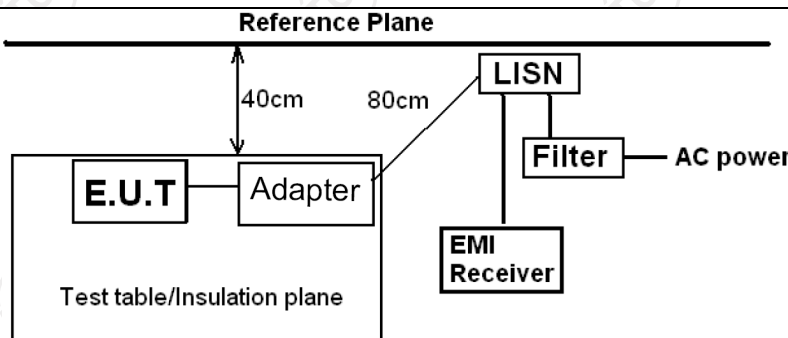
The use of antennas mounted on outdoor structures, e.g., antennas mounted on the outside of a building or on a telephone pole, or any fixed outdoors infrastructure is prohibited. Antennas may be mounted only on the hand held UWB device.

E.U.T Antenna:

The antenna is PCB Integrated Monopole Antenna which permanently attached, and the best case gain of the antenna is 0dBi.


5.2. Conducted Emission

5.2.1. Test Specification

Test Requirement:	FCC Part15 Section 15.207														
Test Method:	ANSI C63.10:2013														
Frequency Range:	150 kHz to 30 MHz														
Receiver setup:	RBW=9 kHz, VBW=30 kHz, Sweep time=auto														
Limits:	<table><tr><th rowspan="2">Frequency range (MHz)</th><th colspan="2">Limit (dBuV)</th></tr><tr><th>Quasi-peak</th><th>Average</th></tr><tr><td>0.15-0.5</td><td>66 to 56*</td><td>56 to 46*</td></tr><tr><td>0.5-5</td><td>56</td><td>46</td></tr><tr><td>5-30</td><td>60</td><td>50</td></tr></table>	Frequency range (MHz)	Limit (dBuV)		Quasi-peak	Average	0.15-0.5	66 to 56*	56 to 46*	0.5-5	56	46	5-30	60	50
Frequency range (MHz)	Limit (dBuV)														
	Quasi-peak	Average													
0.15-0.5	66 to 56*	56 to 46*													
0.5-5	56	46													
5-30	60	50													
Test Setup:	<div><p>Reference Plane</p><p>Remark: E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m</p></div>														
Test Mode:	N/A														
Test Procedure:	<div><div>1. The E.U.T is connected to an adapter through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment.</div><div>2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs).</div><div>3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement.</div></div>														
Test Result:	N/A; The product is powered by battery.														

5.3. UWB Bandwidth (10dB Bandwidth)

5.3.1. Test Specification

Test Requirement:	FCC Part 15F Section 15.503(a)
Test Method:	ANSI C63.10:2013
Limit:	UWB bandwidth $\geq 500\text{MHz}$; The UWB bandwidth of a device operating under the provisions of this section must be contained between 3100 MHz and 10,600 MHz.
Test Setup:	 <p style="text-align: center;">Spectrum Analyzer EUT</p>
Test Mode:	Refer to item 3.1
Test Procedure:	<ol style="list-style-type: none"> 1. Set to the maximum power setting and enable the EUT transmit continuously. 2. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 1MHz. Set the Video bandwidth (VBW) = 3MHz. In order to make an accurate measurement. The 10dB bandwidth must be greater than 500 MHz. 3. Measure and record the results in the test report.
Test Result:	PASS

5.3.2. Test Instruments

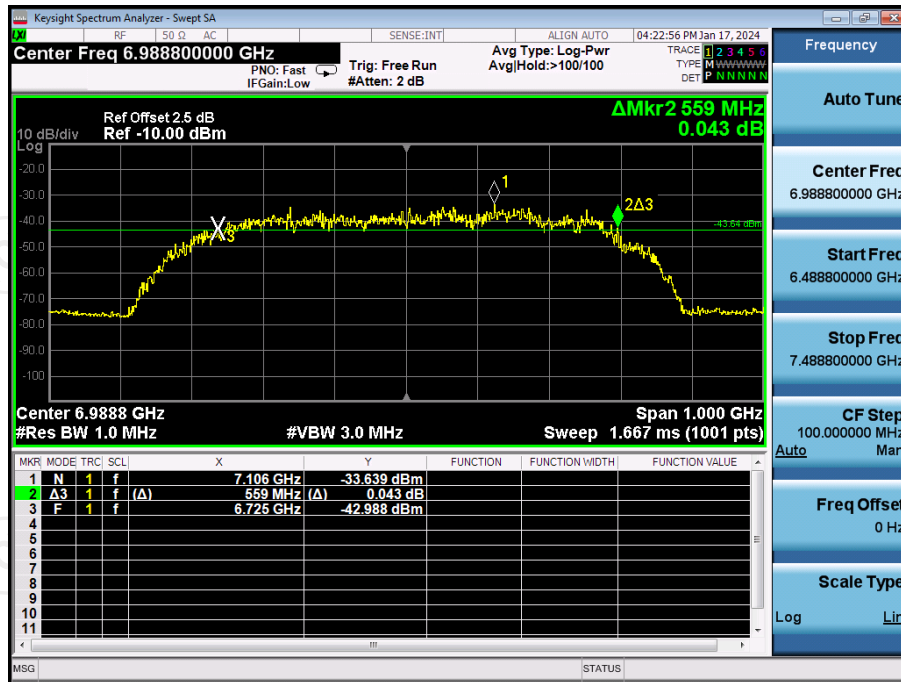
RF Test Room				
Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	R&S	FSQ40	200061	Jun. 29, 2024
RF cable (9kHz-40GHz)	TCT	RE-06	N/A	Jun. 29, 2024
Antenna Connector	TCT	RFC-01	N/A	Jun. 29, 2024

5.3.3. Test data

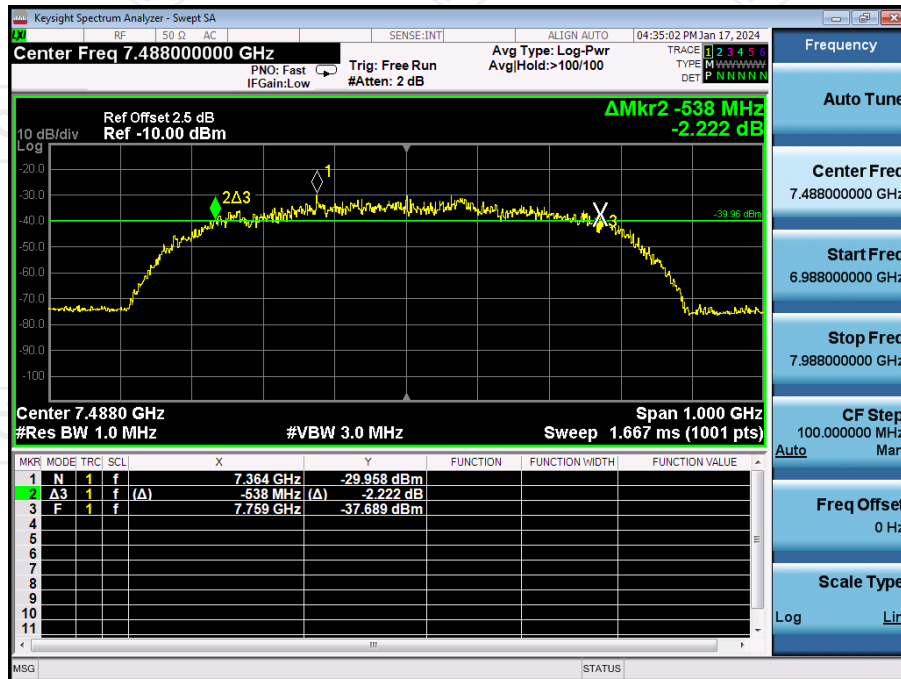
Test channel	FL (MHz)	FH (MHz)	Fm (MHz)	10dB Bandwidth (MHz)	Limit (MHz)	Result
6	6725	7284	7106	559	≥500	PASS
8	7221	7759	7364	538		

Test plots as follows:

Lowest channel




Highest channel



5.4. Dwell Time

5.4.1. Test Specification

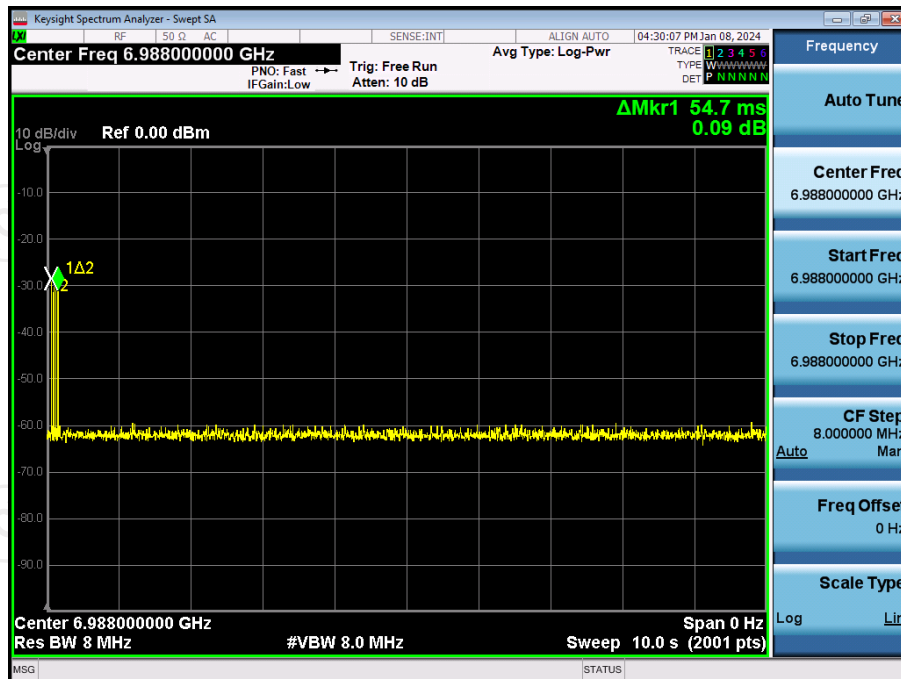
Test Requirement:	FCC Part15F Section 15.519(a)(1)
Test Method:	ANSI C63.10:2013
Limit:	The UWB intentional radiator shall cease transmission within 10 seconds unless it receives an acknowledgement from the associated receiver that its transmission is being received
Test Setup:	 <p style="text-align: center;">Spectrum Analyzer EUT</p>
Test Mode:	Refer to item 3.1
Test Procedure:	<ol style="list-style-type: none"> 1. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement. 2. Connect establishment EUT and receiver. 3. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW)= 1MHz. Video bandwidth VBW=1MHz. Sweep time=10s 4. Close the receiver. 5. Measure and record the results in the test report.
Test Result:	PASS

5.4.2. Test Instruments

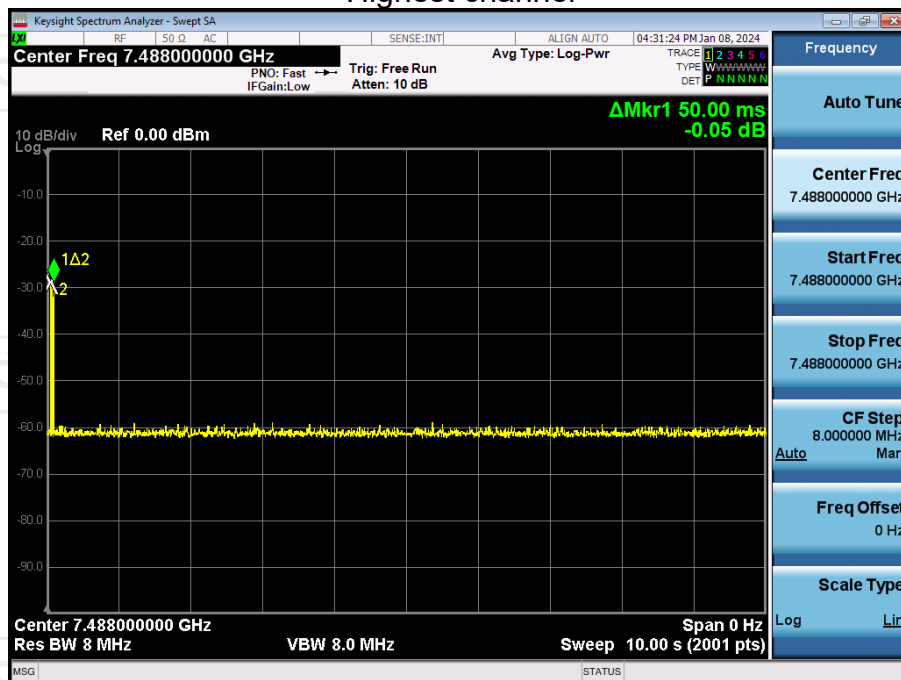
RF Test Room				
Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	R&S	FSQ40	200061	Jun. 29, 2024
RF cable (9kHz-26.5GHz)	TCT	RE-06	N/A	Jun. 29, 2024
Antenna Connector	TCT	RFC-01	N/A	Jun. 29, 2024

5.4.3. Test data

Lowest channel



Highest channel



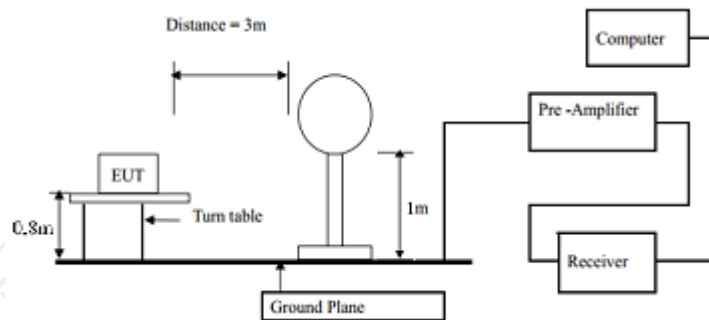
5.5. EIRP&Radiated Spurious Emission Measurement

5.5.1. Test Specification

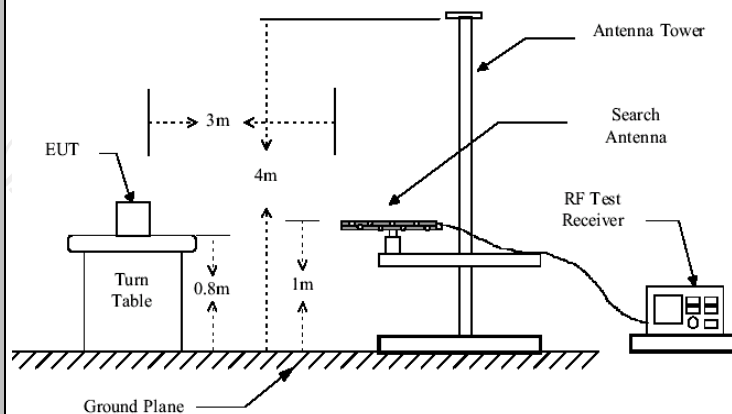
Test Requirement:	FCC Part15 F Section 15.519 (c)(d)/15.209			
Test Method:	ANSI C63.10: 2013			
Frequency Range:	9 kHz to 40 GHz			
Measurement Distance:	3 m			
Antenna Polarization:	Horizontal & Vertical			
Operation mode:	Refer to item 3.1			
Receiver Setup:	Frequency	Detector	RBW	VBW
	9kHz- 150kHz	Quasi-peak	200Hz	1kHz
	150kHz- 30MHz	Quasi-peak	9kHz	30kHz
	30MHz-1GHz	Quasi-peak	120KHz	300KHz
	Above 1GHz	Peak	1MHz	3MHz
Limit:	Remark			
	Quasi-peak Value			
	Quasi-peak Value			
	Quasi-peak Value			
	Peak Value			
	Average Value			
	Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)	
	0.009-0.490	2400/F(KHz)	300	
	0.490-1.705	24000/F(KHz)	30	
	1.705-30	30	30	
	30-88	100	3	
	88-216	150	3	
	216-960	200	3	
	960-1610	-75.3dBm (EIRP, RBW=1MHz)	3	
	1610-1990	-63.3 dBm (EIRP, RBW=1MHz)	3	
	1990-3100	-61.3 dBm (EIRP, RBW=1MHz)	3	
	3100MHz-10600MHz	-41.3 dBm (EIRP, RBW=1MHz)	3	
	3100MHz-10600MHz	0 dBm (EIRP, RBW=50MHz)	3	
	Above 10600MHz	-61.3 dBm (EIRP, RBW=1MHz)	3	
	1164MHz-1240MHz	-85.3dBm (EIRP, RBW=1kHz)	3	
	1559MHz-1610MHz	-85.3 dBm (EIRP, RBW=1kHz)	3	

Test setup:

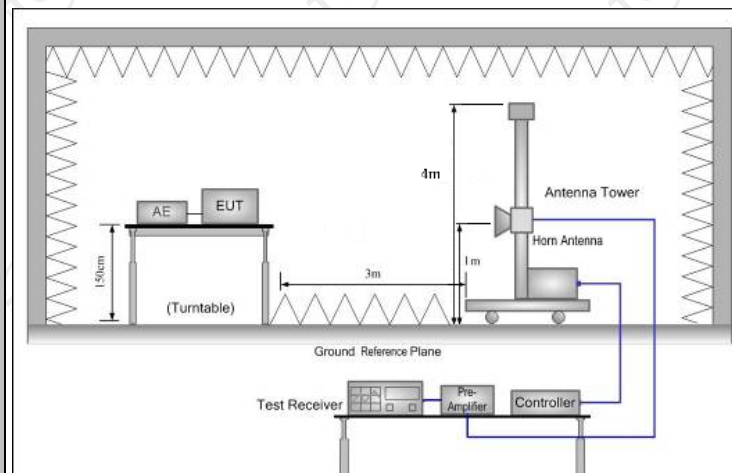
For radiated emissions below 30MHz



30MHz to 1GHz



Above 1GHz



Test Procedure:

1. For the radiated emission test below 1GHz:

The EUT was placed on a turntable with 0.8 meter above ground. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high PASS filter are used for the test in order to get better signal level.

For the radiated emission test above 1GHz:

	<p>Place the measurement antenna on a turntable with 1.5 meter above ground, which is away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.</p> <p>2. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level</p> <p>3. For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.</p>
Test mode:	Refer to section 4.1 for details
Test results:	PASS

Frequency	Limit		Detector	Measurement Distance
	EIRP (dBm)	Field Strength (dBuV/m)		
960MHz-1610MHz	-75.3 (RBW=1MHz)	20.00	RMS	3
1610MHz-1990MHz	-63.3 (RBW=1MHz)	32.00	RMS	3
1990MHz-3100MHz	-61.3 (RBW=1MHz)	34.00	RMS	3
3100MHz-10600MHz	-41.3 (RBW=1MHz)	54.00	RMS	3
3100MHz-10600MHz	0 (RBW=50MHz)	95.3	Peak	3
Above 10600MHz	-61.3 (RBW=1MHz)	34.00	RMS	3
1164MHz-1240MHz	-85.3 (RBW=1kHz)	10.00	RMS	3
1559MHz-1610MHz	-85.3 (RBW=1kHz)	10.00	RMS	3

Note: E (dBuV/m) = EIRP(dBm) + 95.3

5.5.2. Test Instruments

Radiated Emission Test Site (966)				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EMI Test Receiver	R&S	ESIB7	100197	Jun. 29, 2024
Spectrum Analyzer	R&S	FSV40-N	102188	Feb. 20, 2024
Pre-amplifier	SKET	LNPA_0118G-45	SK2021012102	Feb. 20, 2024
Pre-amplifier	SKET	LNPA_1840G-50	SK202109203500	Feb. 20, 2024
Pre-amplifier	HP	8447D	2727A05017	Jun. 27, 2024
Loop antenna	Schwarzbeck	FMZB1519B	00191	Jul. 02, 2024
Broadband Antenna	Schwarzbeck	VULB9163	340	Jul. 01, 2024
Horn Antenna	Schwarzbeck	BBHA 9120D	631	Jul. 01, 2024
Horn Antenna	Schwarzbeck	BBHA 9170	00956	Feb. 24, 2024
Coaxial cable	SKET	RC-18G-N-M	/	Feb. 24, 2024
Coaxial cable	SKET	RC_40G-K-M	/	Feb. 24, 2024
EMI Test Software	Shurple Technology	EZ-EMC	/	/

5.5.3. Test Data

Peak Power

Field Strength for fundamental @ RBW=1MHz				
Frequency (MHz)	Read Level (dBuV)	Factor (dB)	Level (dBuV/m)	Polarization
6988.8	46.88	-4.4	51.28	Horizontal
6988.8	43.15	-4.4	47.55	Vertical

Calculated Field Strength of fundamental @ RBW=50MHz						
Frequency (MHz)	Measured Field Strength of fundamental (FSM) (dBuV/m)	Calculated factor for RBW=10MHz to RBW=50MHz	Calculated Field Strength of fundamental (FSC) (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Polarization
6988.8	51.28	33.98	85.26	95.3	-10.04	Horizontal
6988.8	47.55	33.98	81.53	95.3	-13.77	Vertical
Note: $FS_C = FS_M + 20\log(50\text{MHz}/1\text{MHz}) = FS_M + 33.98$						

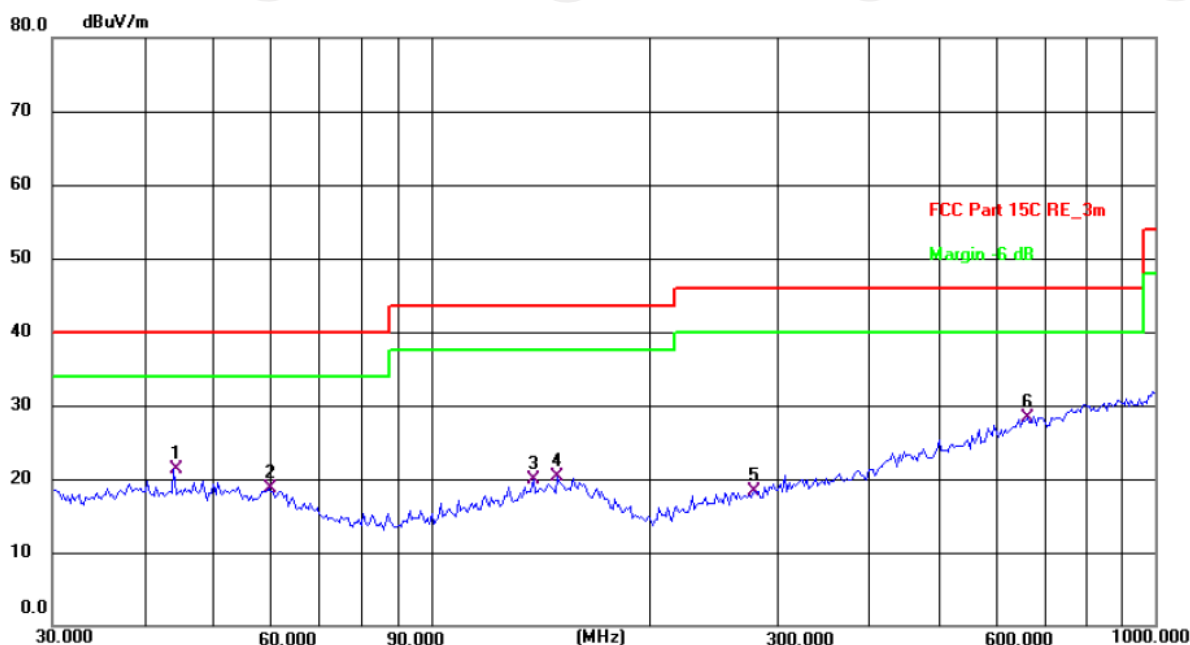
Field Strength for fundamental @ RBW=1MHz				
Frequency (MHz)	Read Level (dBuV)	Factor (dB)	Level (dBuV/m)	Polarization
7488	54.26	-0.32	54.58	Horizontal
7488	48.22	-0.32	48.54	Vertical

Calculated Field Strength of fundamental @ RBW=50MHz						
Frequency (MHz)	Measured Field Strength of fundamental (FSM) (dBuV/m)	Calculated factor for RBW=10MHz to RBW=50MHz	Calculated Field Strength of fundamental (FSC) (dBuV/m)	Limit (dBuV/m)	Over Limit(dB)	Polarization
7488	54.58	33.98	88.56	95.3	-6.74	Horizontal
7488	48.54	33.98	82.52	95.3	-12.78	Vertical
Note: $FS_C = FS_M + 20\log(50\text{MHz}/1\text{MHz}) = FS_M + 33.98$						

Spurious Emissions

Please refer to following diagram for individual
Below 1GHz

Horizontal:



Site: #1 3m Anechoic Chamber

Polarization: **Horizontal**

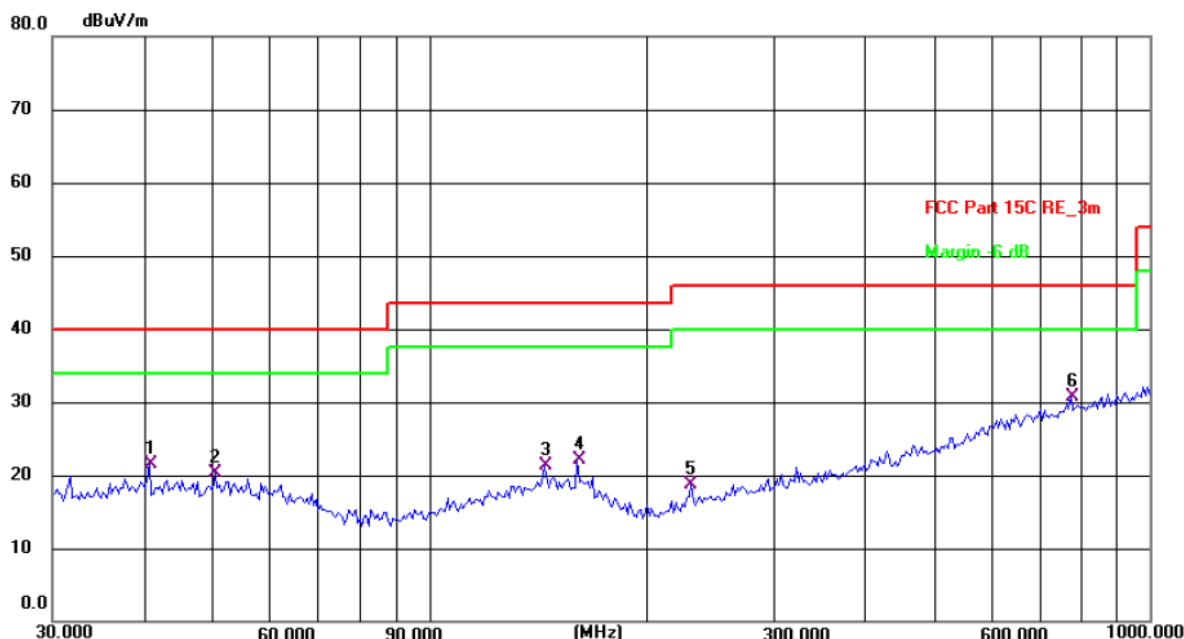
Temperature: 24.2(C) Humidity: 51 %

Limit: FCC Part 15C RE_3m

Power: DC 3 V

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	44.1202	7.42	13.83	21.25	40.00	-18.75	QP	P	
2	59.6493	5.63	12.98	18.61	40.00	-21.39	QP	P	
3	138.3873	6.13	13.74	19.87	43.50	-23.63	QP	P	
4	149.4857	5.80	14.46	20.26	43.50	-23.24	QP	P	
5	279.0436	5.12	13.28	18.40	46.00	-27.60	QP	P	
6 *	665.8034	6.42	21.80	28.22	46.00	-17.78	QP	P	

Vertical:



Site: #1 3m Anechoic Chamber

Polarization: **Vertical**

Temperature: 24.2(C)

Humidity: 51 %

Limit: FCC Part 15C RE_3m

Power: DC 3 V

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	40.8445	7.45	14.15	21.60	40.00	-18.40	QP	P	
2	50.4089	6.66	13.62	20.28	40.00	-19.72	QP	P	
3	144.3347	7.30	14.08	21.38	43.50	-22.12	QP	P	
4	160.3456	7.47	14.55	22.02	43.50	-21.48	QP	P	
5	230.9067	6.65	12.03	18.68	46.00	-27.32	QP	P	
6 *	776.8778	7.68	23.10	30.78	46.00	-15.22	QP	P	

Note: 1. The low frequency, which started from 9KHz~30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported

2. Measurements were conducted in all channels (high, low), and the worst case Mode (Highest channel) was submitted only.

3. Freq. = Emission frequency in MHz

Measurement (dBuV/m) = Reading level (dBuV) + Corr. Factor (dB)

Correction Factor = Antenna Factor + Cable loss - Pre-amplifier

Limit (dBuV/m) = Limit stated in standard

Margin (dB) = Measurement (dBuV/m) - Limits (dBuV/m)

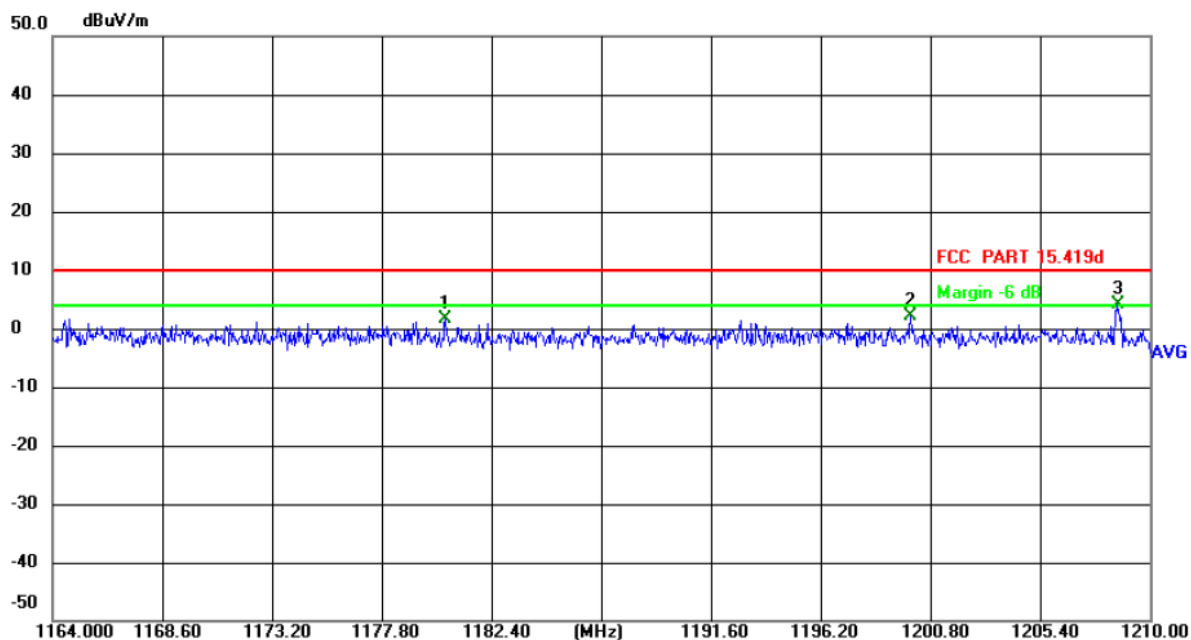
Any value more than 10dB below limit have not been specifically reported

* is meaning the worst frequency has been tested in the test frequency range

1164MHz-1240MHz & 1559MHz-1610MHz

CH6 6988.8MHz

Horizontal



Site: 3m Anechoic Chamber

Polarization: **Horizontal**

Temperature: 23.3(°C)

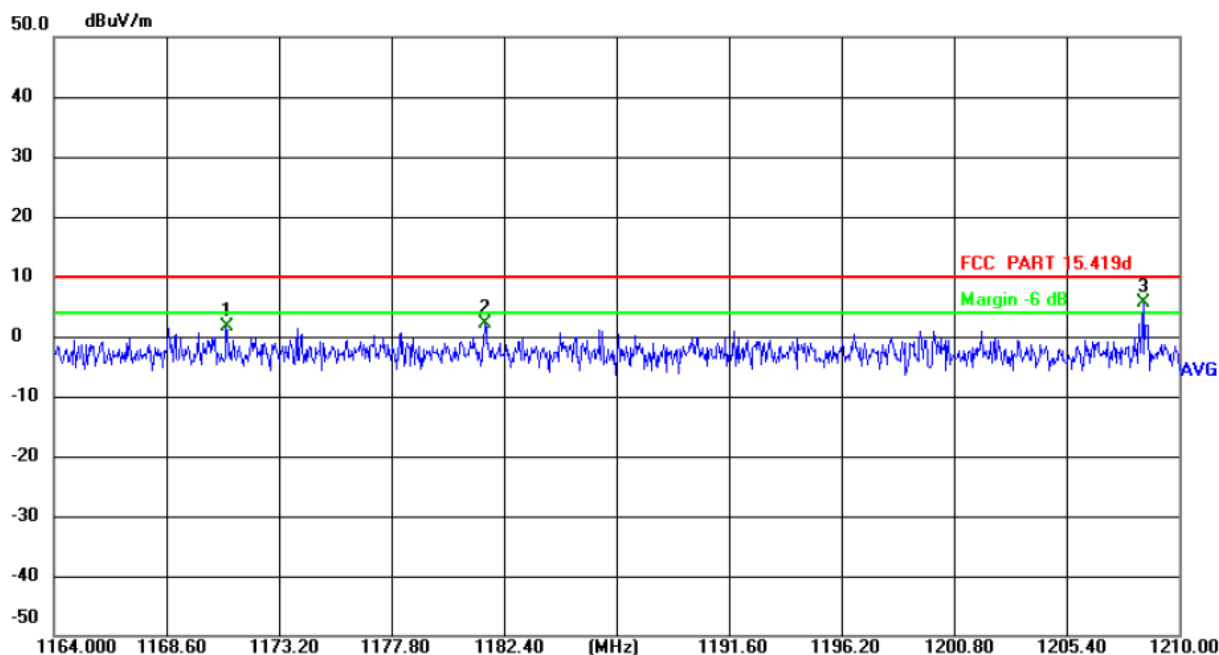
Humidity: 52 %

Limit: FCC PART 15.419d

Power: DC 3 V

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1 X	1180.468	14.62	-12.99	1.63	10.00	-8.37	Peak	P	
2 X	1199.989	15.12	-12.95	2.17	10.00	-7.83	Peak	P	
3 *	1208.626	17.96	-12.36	5.60	10.00	-4.40	Peak	P	

Vertical



Site: 3m Anechoic Chamber

Polarization: **Vertical**

Temperature: 23.3(°C)

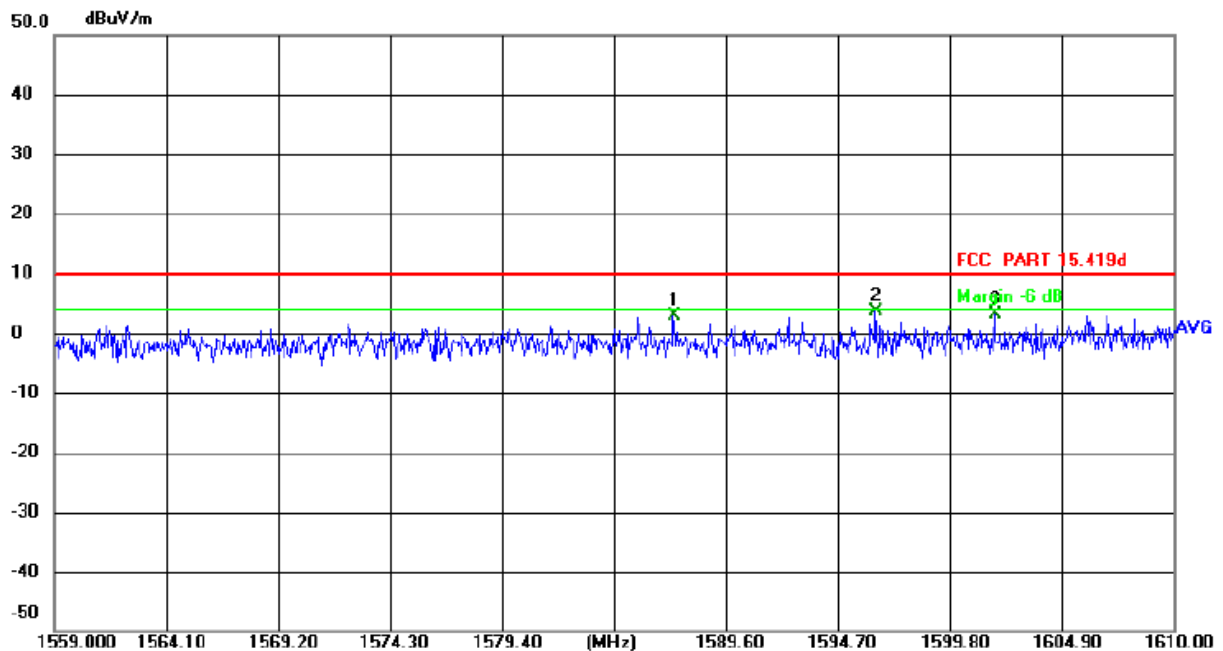
Humidity: 52 %

Limit: FCC PART 15.419d

Power: DC 3 V

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1 X	1171.067	14.63	-13.02	1.61	10.00	-8.39	Peak	P	
2 X	1181.658	15.00	-12.99	2.01	10.00	-7.99	Peak	P	
3 *	1208.628	18.64	-12.36	6.28	10.00	-3.72	Peak	P	

Horizontal



Site: 3m Anechoic Chamber

Polarization: **Horizontal**

Temperature: 23.3(°C)

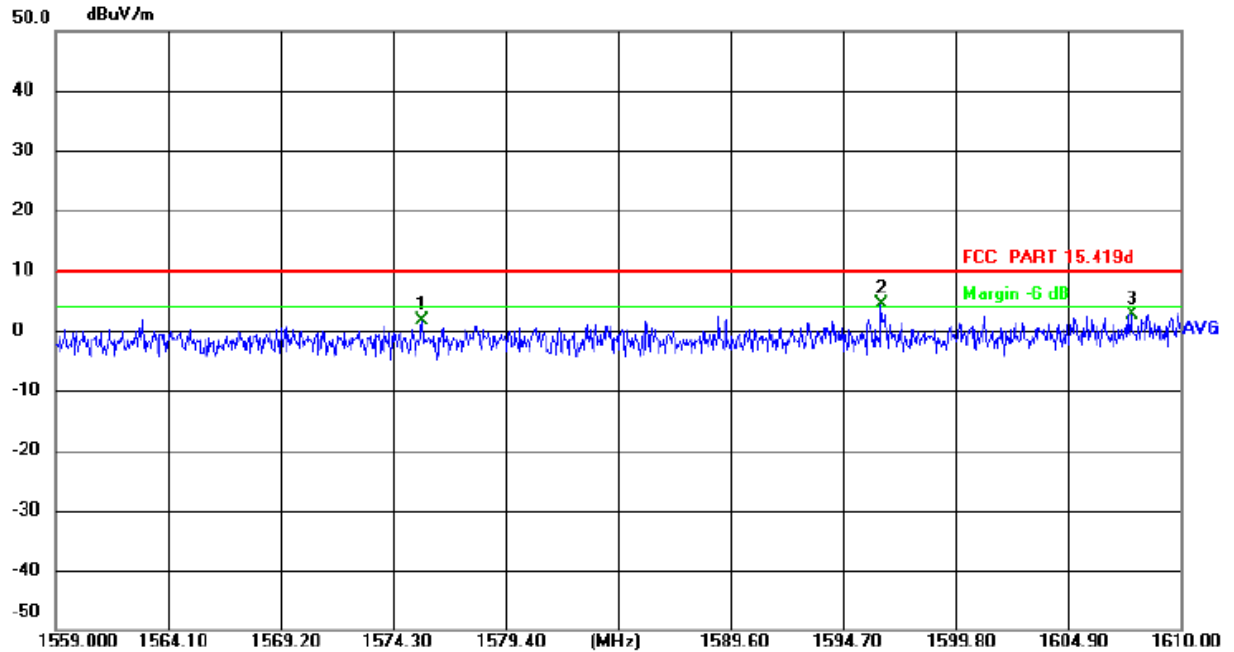
Humidity: 52 %

Limit: FCC PART 15.419d

Power: DC 3 V

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1 X	1587.248	15.63	-12.80	2.83	10.00	-7.17	Peak	P	
2 *	1596.378	15.22	-11.58	3.64	10.00	-6.36	Peak	P	
3 X	1601.859	14.72	-11.50	3.22	10.00	-6.78	Peak	P	

Vertical



Site: 3m Anechoic Chamber

Polarization: **Vertical**

Temperature: 23.3(°C)

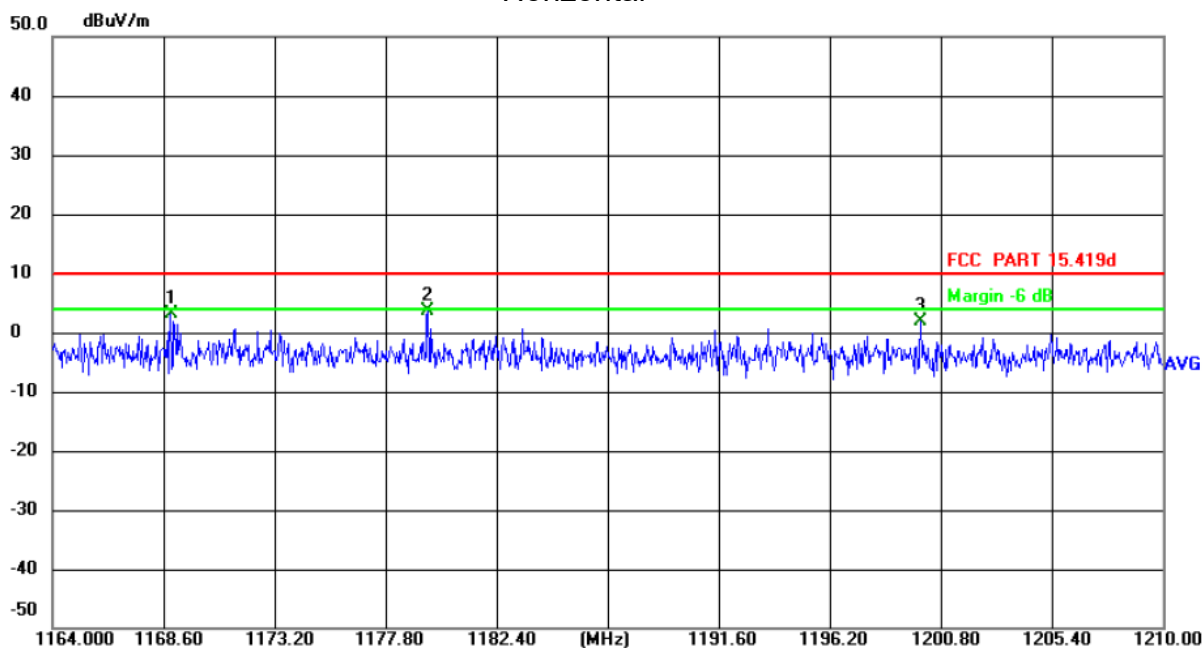
Humidity: 52 %

Limit: FCC PART 15.419d

Power: DC 3 V

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1 X	1575.651	14.88	-13.32	1.56	10.00	-8.44	Peak	P	
2 *	1596.376	15.27	-11.58	3.69	10.00	-6.31	Peak	P	
3 X	1607.769	13.44	-10.73	2.71	10.00	-7.29	Peak	P	

Horizontal



Site: 3m Anechoic Chamber

Polarization: **Horizontal**

Temperature: 23.3(°C)

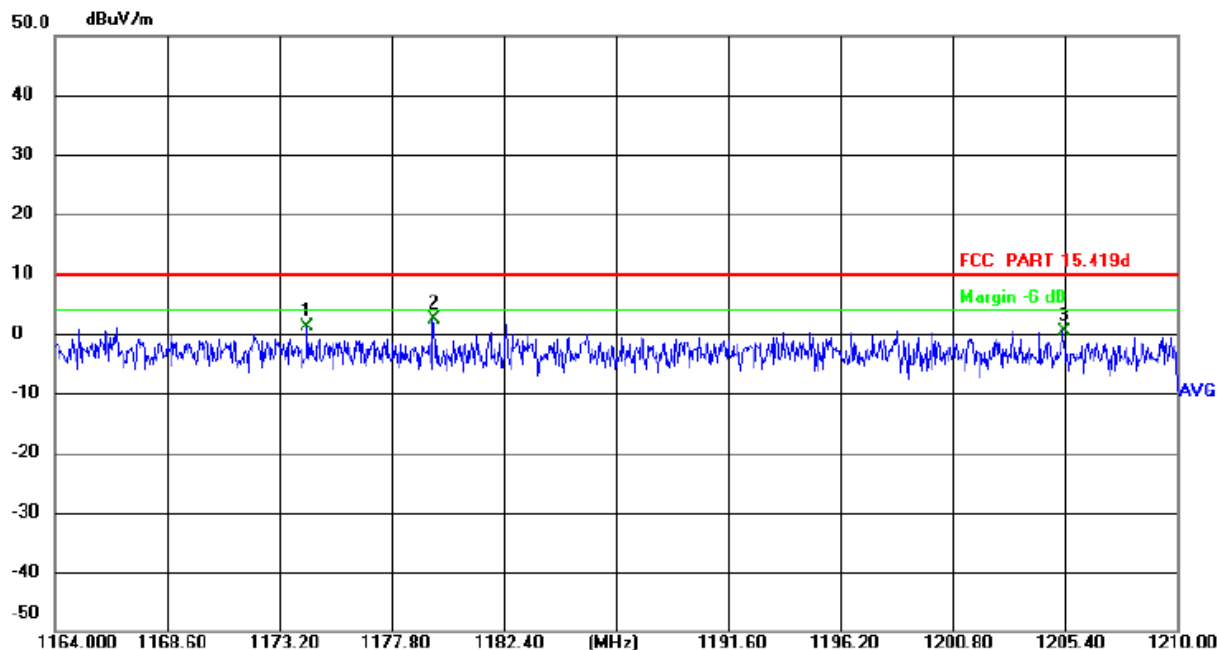
Humidity: 52 %

Limit: FCC PART 15.419d

Power: DC 3 V

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1 X	1168.882	16.13	-13.02	3.11	10.00	-6.89	Peak	P	
2 *	1179.558	16.85	-12.86	3.99	10.00	-6.01	Peak	P	
3 X	1199.989	14.55	-12.75	1.80	10.00	-8.20	Peak	P	

Vertical



Site: 3m Anechoic Chamber

Polarization: **Vertical**

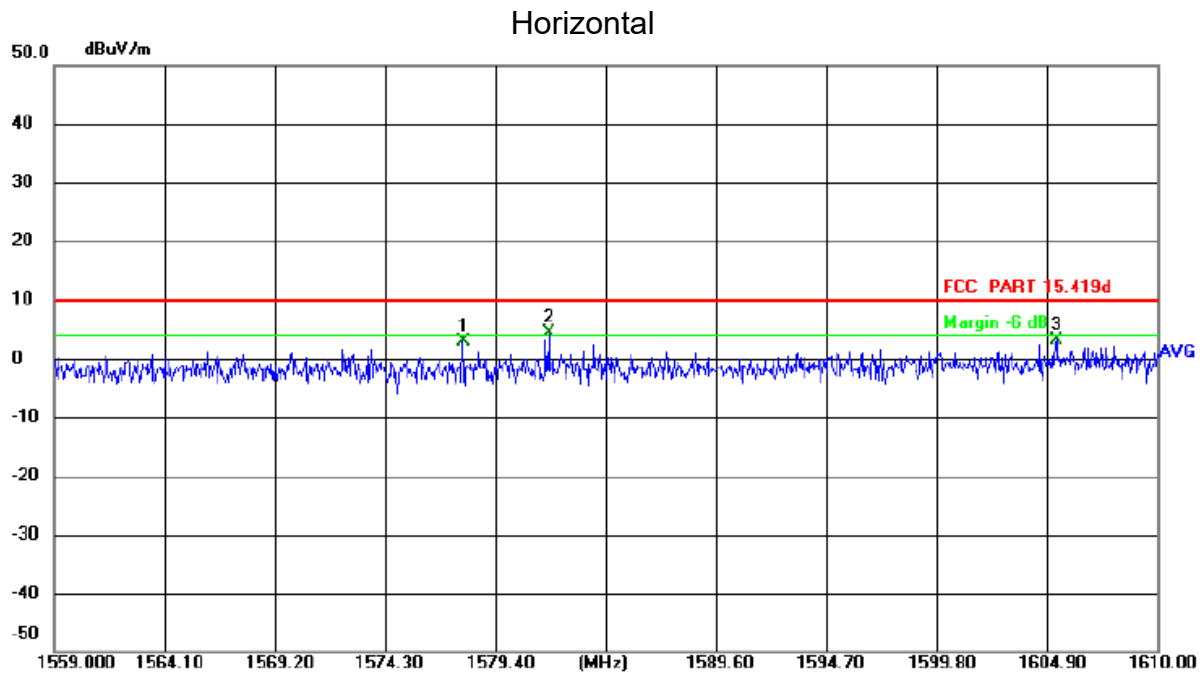
Temperature: 23.3(°C)

Humidity: 52 %

Limit: FCC PART 15.419d

Power:DC 3 V

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1 X	1174.361	14.24	-13.01	1.23	10.00	-8.77	Peak	P	
2 *	1179.561	17.08	-12.86	4.22	10.00	-5.78	Peak	P	
3 X	1205.331	13.25	-12.82	0.43	10.00	-9.57	Peak	P	



Site: 3m Anechoic Chamber

Polarization: **Horizontal**

Temperature: 23.3(°C)

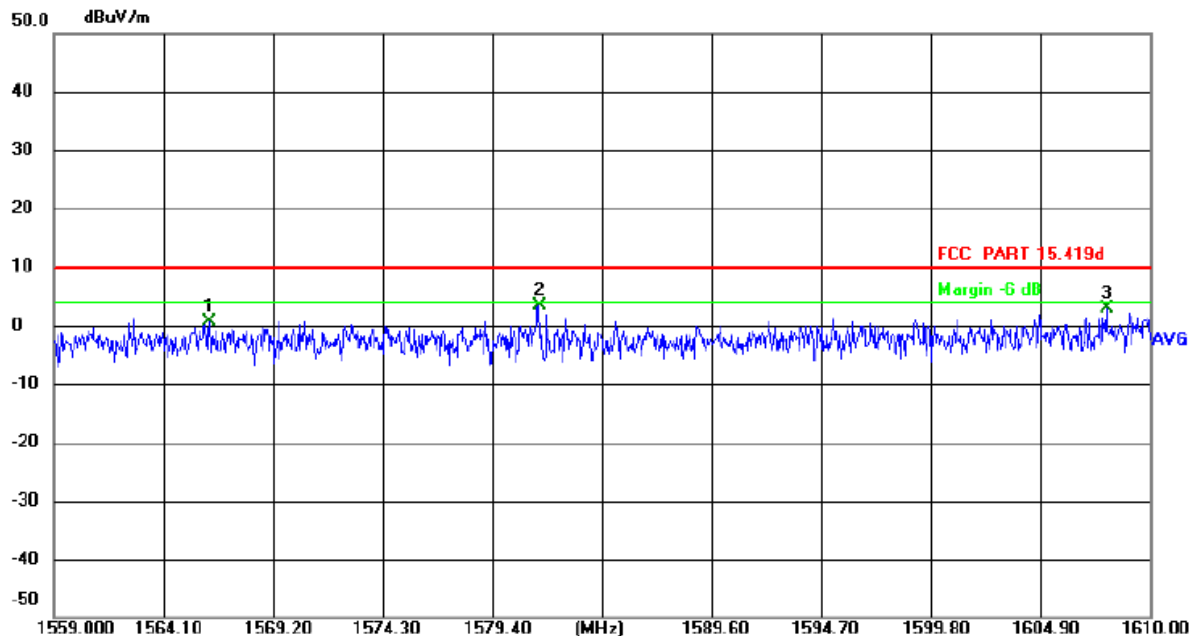
Humidity: 52 %

Limit: FCC PART 15.419d

Power: DC 3 V

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1 X	1577.883	15.85	-12.97	2.88	10.00	-7.12	Peak	P	
2 *	1581.736	16.85	-12.86	3.99	10.00	-6.01	Peak	P	
3 X	1605.308	14.59	-11.43	3.16	10.00	-6.84	Peak	P	

Vertical



Site: 3m Anechoic Chamber

Polarization: **Vertical**

Temperature: 23.3(°C)

Humidity: 52 %

Limit: FCC PART 15.419d

Power: DC 3 V

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1 X	1566.248	12.40	-11.72	0.68	10.00	-9.32	Peak	P	
2 *	1581.738	16.32	-11.63	4.69	10.00	-5.31	Peak	P	
3 X	1607.979	14.37	-11.52	2.85	10.00	-7.15	Peak	P	

Note:

1. Freq. = Emission frequency in MHz

Measurement (dBuV/m) = Reading level (dBuV) + Corr. Factor (dB)

Correction Factor = Antenna Factor + Cable loss - Pre-amplifier

Limit (dBuV/m) = Limit stated in standard

Margin (dB) = Measurement (dBuV/m) - Limits (dBuV/m)

Any value more than 10dB below limit have not been specifically reported

* is meaning the worst frequency has been tested in the test frequency range

Other emission Above 1GHz

CH6 6988.8MHz

960MHz ≤ f ≤ 3100MHz

Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBμV)	AV reading (dBμV)	Correction Factor (dB/m)	Emission Level		Peak limit (dBμV/m)	AV limit (dBμV/m)	Margin (dB)
					Peak (dBμV/m)	AV (dBμV/m)			
1063.27	H	19.63	---	-12.44	7.19	---	40	20	-12.81
2271.43	H	22.57	---	-10.05	12.52	---	54	34	-21.48
---	H	---	---	---	---	---	---	---	---
1063.27	V	18.76	---	-12.44	6.32	---	40	20	-13.68
2271.43	V	21.64	---	-10.05	11.59	---	54	34	-22.41
---	V	---	---	---	---	---	---	---	---

f > 3100MHz

Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBμV)	AV reading (dBμV)	Correction Factor (dB/m)	Emission Level		Peak limit (dBμV/m)	AV limit (dBμV/m)	Margin (dB)
					Peak (dBμV/m)	AV (dBμV/m)			
7251.63	H	26.42	---	2.11	28.53	---	74	54	-25.47
13256.74	H	20.36	---	10.42	30.78	---	54	34	-3.22
---	H	---	---	---	---	---	---	---	---
7251.63	V	27.03	---	2.11	29.14	---	74	54	-24.86
13256.74	V	20.58	---	10.42	31	---	54	34	-3.00
---	V	---	---	---	---	---	---	---	---

CH8 7488MHz

960MHz ≤ f ≤ 3100MHz

Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBμV)	AV reading (dBμV)	Correction Factor (dB/m)	Emission Level		Peak limit (dBμV/m)	AV limit (dBμV/m)	Margin (dB)
					Peak (dBμV/m)	AV (dBμV/m)			
1122.24	H	20.75	---	-12.58	8.17	---	40	20	-11.83
1969.87	H	22.96	---	-9.88	13.08	---	54	34	-20.92
---	H	---	---	---	---	---	---	---	---
1122.24	V	19.11	---	-12.58	6.53	---	40	20	-13.47
1969.87	V	21.37	---	-9.88	11.49	---	54	34	-22.51
---	V	---	---	---	---	---	---	---	---

f > 3100MHz

Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBμV)	AV reading (dBμV)	Correction Factor (dB/m)	Emission Level		Peak limit (dBμV/m)	AV limit (dBμV/m)	Margin (dB)
					Peak (dBμV/m)	AV (dBμV/m)			
7182.69	H	25.96	---	1.98	27.94	---	74	54	-26.06
12142.87	H	21.08	---	11.36	32.44	---	54	34	-1.56
---	H	---	---	---	---	---	---	---	---
7182.69	V	26.83	---	1.98	28.81	---	74	54	-25.19
12142.87	V	21.57	---	11.36	32.93	---	54	34	-1.07
---	V	---	---	---	---	---	---	---	---

Note:

- Emission Level=Peak Reading + Correction Factor; Correction Factor= Antenna Factor + Cable loss – Pre-amplifier
- Margin (dB) = Emission Level (Peak) (dBμV/m)-Average limit (dBμV/m)
- The emission levels of other frequencies are very lower than the limit and not show in test report.
- Data of measurement shown "—" in the above table mean that the reading of emissions is attenuated more than 20 dB below the limits or the field strength is too small to be measured.
- All the restriction bands are compliance with the limit of 15.209.

Appendix A: Photographs of Test Setup

Refer to the Appendix A

Appendix B: Photographs of EUT

Refer to the Appendix B

*******END OF REPORT*******