



EMI TEST REPORT

Filing Type : Certification
FCC ID : ZPNB122037TIRVBSD
Equipment : BSD 77GHz Trailer RV System
Brand Name : Cub
Model Name : B122-037、A009-010、A009-026、B122-037XXX-XX、
B122-037XXX-XXX、A009-010XXX-XX、A009-010XXX-XXX、
A009-026XXX-XX、A009-026XXX-XXX、A009-XXX-XX、
A009-XXX-XXX (Please refer to section 1.1 of the test report for
detailed information.)
Applicant : CUB ELECPARTS INC
No.6, Lane 546, Sec. 6, Changlu Road, Fuhsin Township, Changhua
County, Taiwan 506
Manufacturer : CUB ELECPARTS INC
No.6, Lane 546, Sec. 6, Changlu Road, Fuhsin Township, Changhua
County, Taiwan 506
Standard : 47 CFR FCC Rules and Regulations Part 15 Subpart B Class B
Digital Device

The product was received on May 28, 2021, and testing was started from Jul. 07, 2021 and completed on Jul. 07, 2021. We, Sporton International Inc. Hsinchu Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.4-2014 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. Hsinchu Laboratory, the test report shall not be reproduced except in full.


Approved by: Sin Chang

Sportun International Inc. Hsinchu Laboratory
No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.)



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History of this test report



Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
-	15.107	AC Power Port Conducted Emission	N/A	Note
4	15.109	Radiated Emission below 1GHz	PASS	Under limit 5.04 dB at 32.91 MHz
4	15.109	Radiated Emission above 1GHz	PASS	Under limit 4.19 dB at 28.79954 GHz

Note: It was supplied power by DC-Powered (vehicle battery) for EUT; it's not necessary to apply to AC Power-line Conducted Emissions test.

Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

Reviewed by: Sin Chang

Report Producer: Wendy Pan



1. General Description of Equipment under Test

Product Detail	
Equipment Name	BSD 77GHz Trailer RV System
Model Name	B122-037、A009-010、A009-026、B122-037XXX-XX、B122-037XXX-XXX、A009-010XXX-XX、A009-010XXX-XXX、A009-026XXX-XX、A009-026XXX-XXX、A009-XXX-XX、A009-XXX-XXX (Please refer to section 1.1 of the test report for detailed information.)
Brand Name	Cub
Power Supply	From DC power supply (12V)

1.1. Feature of Equipment under Test

1. The EUT's highest operating frequency is 77GHz.
2. Accessories

Item	Equipment Name	Brand	Model
1	Radar Holder Cover1	Cub	21-006204-01
2	Radar Holder Cover2	Cub	21-005961-01
3	Cable1	Cub	25-360206-11
4	Controller A	Cub	A009-010NA1-A0
5	Controller B	Cub	C001-020NA1-A0
6	Info Cable_1	Cub	25-360240-01
7	Info Cable_2	Cub	25-360240-11
8	Info Cable_3	Cub	25-360240-21
9	Info Cable_coloured thread	Cub	25-300555-01
10	Indicator	Cub	C200-012NA1-A0

Note: 1.The difference between Radar Holder Cover1 & Radar Holder Cover2 is only opening directions, there is only Radar Holder Cover1 tested and recorded in this report.
2.The difference among Info Cable_1 ~ Info Cable_3 is only length, there is only Info Cable_1 tested and recorded in this report.



3. Test Configuration

Configuration	Description
1	Radar Holder Cover + Controller + Cable1 + Info Cable_coloured thread
2	Radar Holder Cover + Controller + Cable1 + Info Cable 1 + Indicator

4. Table for Multiple Listing

EUT No.	Model Name	Description
1	B122-037	
-	A009-010	
-	A009-026	
-	B122-037XXX-XX, B122-037XXX-XXX, A009-010XXX-XX, A009-010XXX-XXX, A009-026XXX-XX, A009-026XXX-XXX, A009-XXX-XX and A009-XXX-XXX (Where X may be any alpha character "a"-“z”, "A"-“Z”, or numeric character "0"-“9”, or -, (,), or blank or combination of alpha and numeric characters.)	All the models are identical, the difference model name for difference as marketing strategy.

Note 1: From the above model B122-037 was selected as representative model for the test and its data was recorded in this report.

Note 2: The above information was declared by manufacturer.

- For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

1.2. Modification of EUT

Please refer to the technical specifications of EUT.



2. Test Configuration of Equipment under Test

2.1. Test Mode

The following table is a list of the test modes shown in this test report.

Radiated Emissions Below 1GHz						
Test Mode	Configuration	Radar Holder	Controller	Cable 1	Info Cable_coloured thread	Info Cable 1 + Indicator
1	Config. 1	Cover 1	A	●	●	-
2	Config. 1	Cover 1	B	●	●	-
Mode 1 has been evaluated to be the worst case between Mode 1~2, thus measurement for Mode 3 will follow this same test mode.						
3	Config. 2	Cover 1	A	●	-	●
Mode 3 generated the worst test result, so it was recorded in this report.						

Radiated Emissions Above 1GHz						
Test Mode	Configuration	Radar Holder	Controller	Cable 1	Info Cable_coloured thread	Info Cable 1 + Indicator
1	Config. 1	Cover 1	A	●	●	-
2	Config. 1	Cover 1	B	●	●	-
Mode 1 has been evaluated to be the worst case between Mode 1~2, thus measurement for Mode 3 will follow this same test mode.						
3	Config. 2	Cover 1	A	●	-	●
Mode 3 generated the worst test result, so it was recorded in this report.						



2.2. 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.

No.	Support Unit	Brand	Model	FCC ID
A	Power Supply	Advanced	LPS-305	N/A
B	Blind Spot Indicator set	Cub	25-360240-01	N/A
C	Controller A	Cub	A009-010NA1-A0	N/A

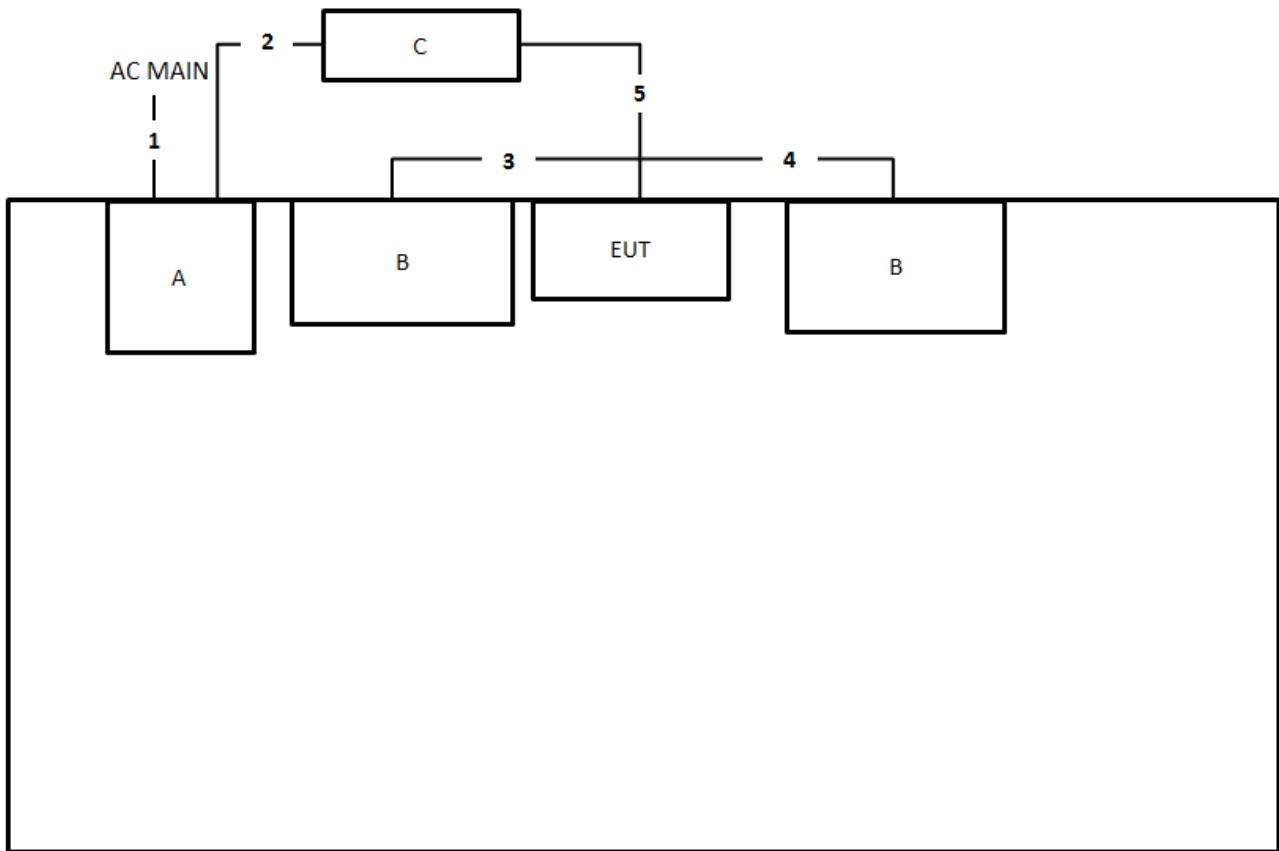
2.3. EUT Operation Condition

The EUT transmits RF signal continuously.

No test software was used during testing.

2.4. Connection Diagram of Test System

2.4.1. Radiation Emissions Test Configuration



Item	Connection	Shielded	Length
1	Power cable	No	1.5m
2	Info Cable_1	No	9.2m
3	Indicator cable	No	3.5m
4	Indicator cable	No	2.3m
5	Cable 1	No	4.3m



3. General Information of Test

3.1. Test Facility

EMI					
Test Lab. : Sporton International Inc. Hsinchu Laboratory					
Hsinchu (TAF: 3787)	ADD: No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan	(R.O.C.)	TEL: 886-3-656-9065	FAX: 886-3-656-9085	
				Test site Designation No. TW3787 with FCC.	
				Conformity Assessment Body Identifier (CABID) TW3787 with ISED.	

3.2. Test Environment

Test Items	Test Site No.	Test Engineer	Test Environment			Test Date	Remark
			Temp (°C)	Humidity (%)	Pressure (kPa)		
Radiated Emission below 1GHz	03CH05-CB	Eason Chen	24.7-26.4	54-55	-	Jul. 07, 2021	-
Radiated Emission above 1GHz	03CH05-CB	Eason Chen	24.7-26.4	54-55	-	Jul. 07, 2021	-

3.3. Test Voltage

Power Type	Test Voltage
DC Power Supply	12V

3.4. Standard for Methods of Measurement

ANSI C63.4-2014

3.5. Frequency Range Investigated

Test Items	Frequency Range
Radiated emission test	30 MHz to 40,000 MHz

3.6. Test Distance

Test Items	Test Distance
Radiated emission test below 1 GHz (30 MHz to 1,000 MHz)	3 m
Radiated emission test above 1 GHz (1,000 MHz to 18,000 MHz)	3 m
Radiated emission test above 1 GHz (18,000 MHz to 40,000 MHz)	1 m



4. Test of Radiated Emission

4.1. Limit

Radiated Emission below 1 GHz test at 3 m:

Frequency (MHz)	QP (dBuV/m)
30~88	40
88~216	43.5
216~960	46
Above 960	54

Radiated Emission 1~18 GHz test at 3 m:

Frequency (MHz)	PK (dBuV/m)	AV (dBuV/m)
1,000 to 18,000	74	54

Radiated Emission 18~40 GHz test at 1 m:

Frequency (MHz)	PK (dBuV/m)	AV (dBuV/m)
18,000 to 40,000	83.54	63.54

4.2. Test Procedures

- a. The EUT was placed on a rotatable table top 0.8 meter above ground.
- b. The EUT was set 3m (below 1GHz) / 3m (1GHz-18GHz) / 1m (18GHz-40GHz) meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
- c. The table was rotated 360 degrees to determine the position of the highest radiation.
- d. The antenna height is varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna are set to make the measurement.
- e. For each suspected emission the EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turn table (from 0 degree to 360 degrees) to find the maximum reading.
- f. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.
- g. If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method and reported.
- h. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.



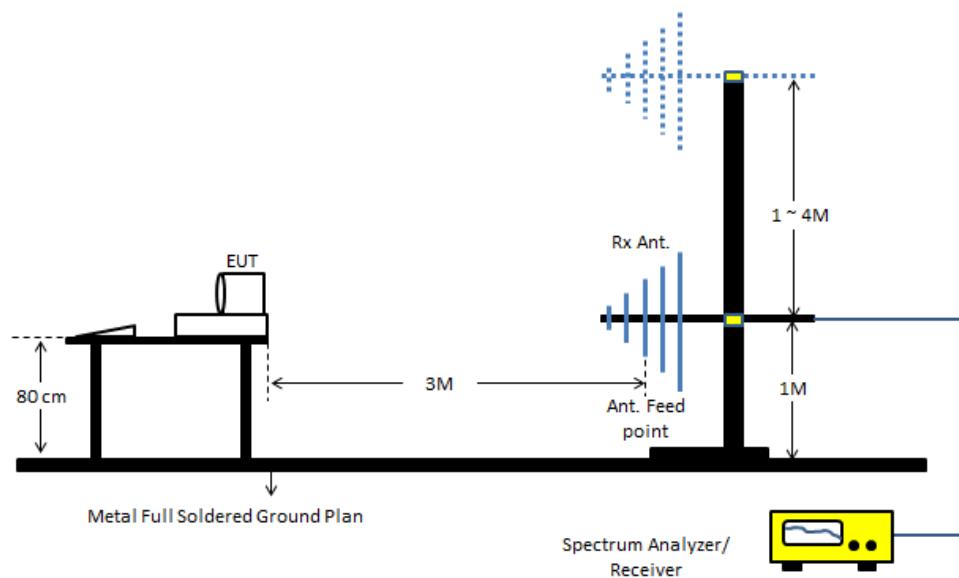
4.3. Measurement Results Calculation

The measured Level is calculated using:

- a. Corrected Reading: Antenna factor (AF) + Cable loss (CL) + Read level (Raw) - Preamp factor (PA) = Level
- b. Margin = -Limit + Level

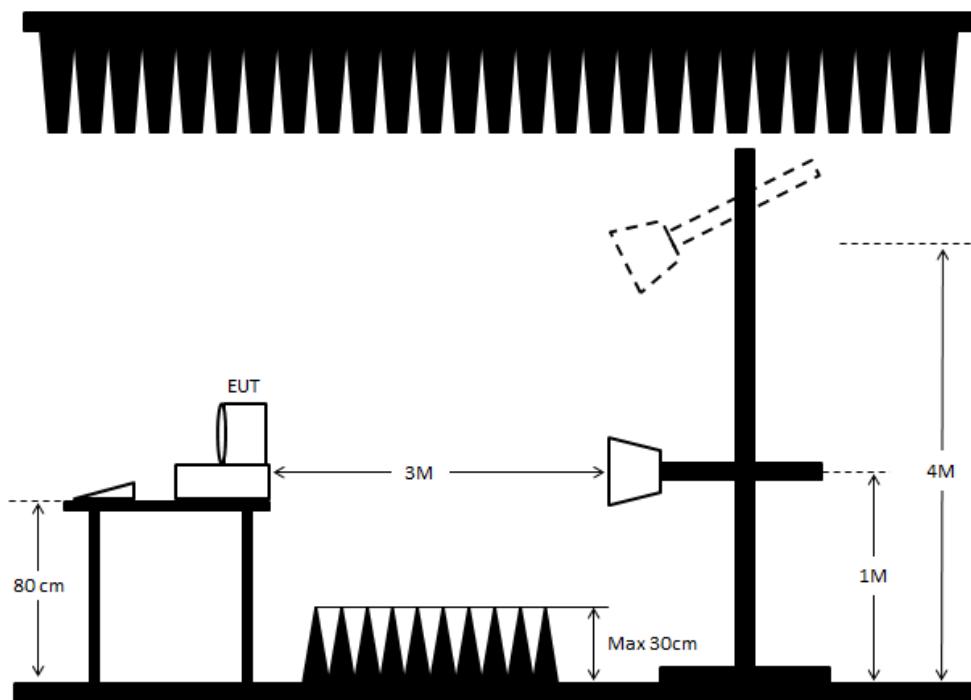
4.4. Typical Test Setup Layout of Radiated Emission

<Below 1 GHz>:

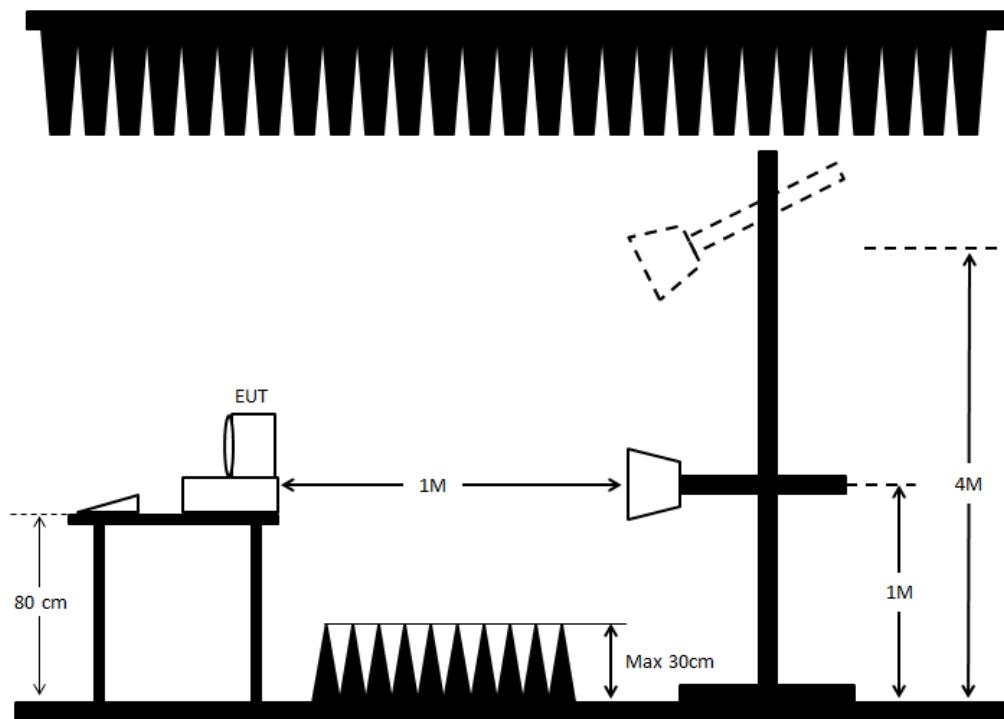


<Above 1 GHz>:

1,000~18,000 MHz



18,000~40,000 MHz



4.5. Test Result of Radiated Emission

Refer as Appendix A



5. List of Measuring Equipment Used

Instrument	Brand	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
3m Semi Anechoic Chamber NSA	TDK	SAC-3M	03CH05-CB	30 MHz ~ 1 GHz	Aug. 10, 2020	Aug. 09, 2021	Radiation (03CH05-CB)
3m Semi Anechoic Chamber VSWR	TDK	SAC-3M	03CH05-CB	1GHz ~18GHz 3m	Nov. 08, 2020	Nov. 07, 2021	Radiation (03CH05-CB)
Bilog Antenna with 6dB Attenuator	TESEQ & EMCI	CBL 6112D & N-6-06	35236 & AT-N0610	30MHz ~ 2GHz	Mar. 26, 2021	Mar. 25, 2022	Radiation (03CH05-CB)
Horn Antenna	SCHWARZBECK	BBHA9120D	BBHA 9120 D-1291	1GHz~18GHz	Sep. 05, 2020	Sep. 04, 2021	Radiation (03CH05-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Jul. 21, 2020	Jul. 20, 2021	Radiation (03CH05-CB)
Pre-Amplifier	EMCI	EMC330N	980331	20MHz ~ 3GHz	Apr. 27, 2021	Apr. 26, 2022	Radiation (03CH05-CB)
Pre-Amplifier	EMCI	EMC12630SE	980287	1GHz – 26.5GHz	Jul. 02, 2021	Jul. 01, 2022	Radiation (03CH05-CB)
Pre-Amplifier	MITEQ	TTA1840-35-H G	1864479	18GHz ~ 40GHz	Jul. 08, 2020	Jul. 07, 2021	Radiation (03CH05-CB)
Spectrum Analyzer	R&S	FSP40	100304	9kHz ~ 40GHz	Nov. 10, 2020	Nov. 09, 2021	Radiation (03CH05-CB)
EMI Test Receiver	R&S	ESCS	826547/017	9kHz ~ 2.75GHz	Jun. 21, 2021	Jun. 20, 2022	Radiation (03CH05-CB)
RF Cable-low	Woken	RG402	Low Cable-04+23	30MHz~1GHz	Oct. 05, 2020	Oct. 04, 2021	Radiation (03CH05-CB)
RF Cable-high	Woken	RG402	High Cable-28	1GHz~18GHz	Oct. 05, 2020	Oct. 04, 2021	Radiation (03CH05-CB)
RF Cable-high	Woken	RG402	High Cable-04+28	1GHz~18GHz	Oct. 05, 2020	Oct. 04, 2021	Radiation (03CH05-CB)
RF Cable-high	Woken	RG402	High Cable-40G#1	18GHz ~ 40 GHz	Jul. 16, 2020	Jul. 15, 2021	Radiation (03CH05-CB)
RF Cable-high	Woken	RG402	High Cable-40G#2	18GHz ~ 40 GHz	Jul. 16, 2020	Jul. 15, 2021	Radiation (03CH05-CB)
Test Software	SPORTON	SENSE	V5.10	-	N.C.R.	N.C.R.	Radiation (03CH05-CB)

※ Calibration Interval of instruments listed above is one year.

※ N.C.R. means Non-Calibration required.

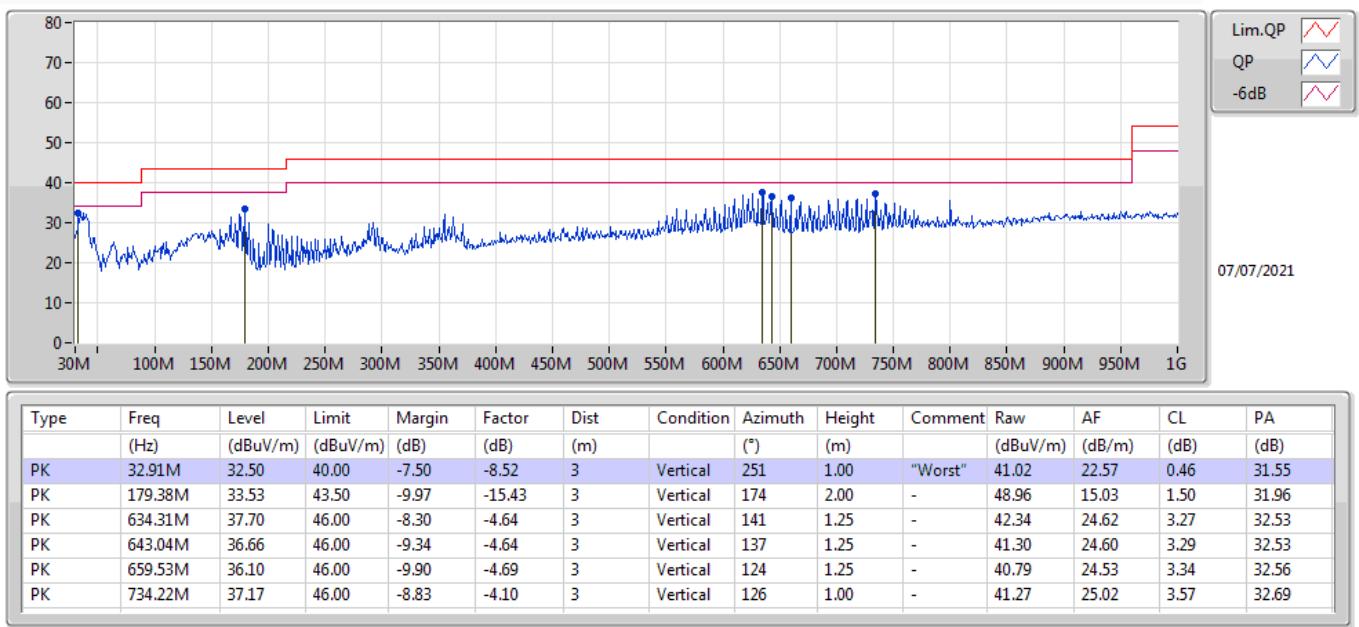


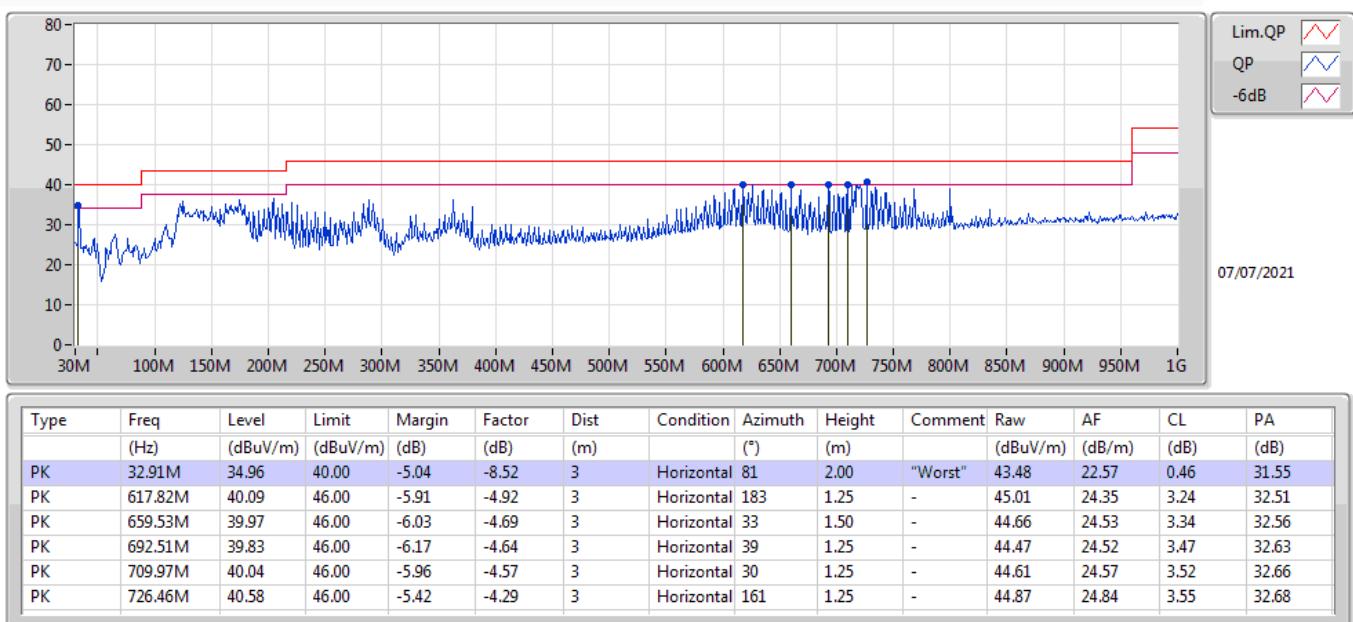
6. Uncertainty of Test Site

Test Items	Uncertainty	Remark
Radiated Emissions below 1GHz	5.5 dB	Confidence levels of 95%
Radiated Emissions 1GHz ~ 18GHz	4.7 dB	Confidence levels of 95%
Radiated Emissions 18GHz ~ 40GHz	4.2 dB	Confidence levels of 95%

**Summary**

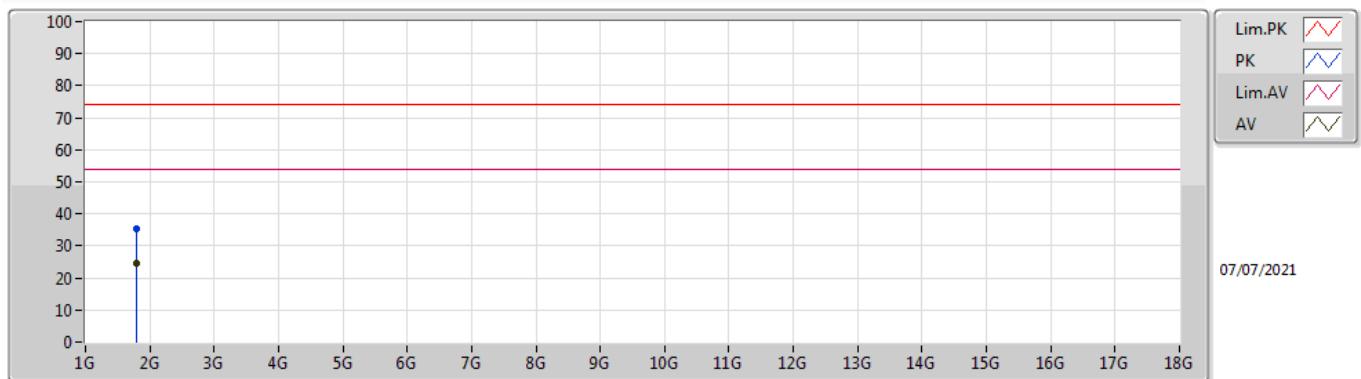
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Condition
Mode 3	Pass	PK	32.91M	34.96	40.00	-5.04	Horizontal

Mode 3


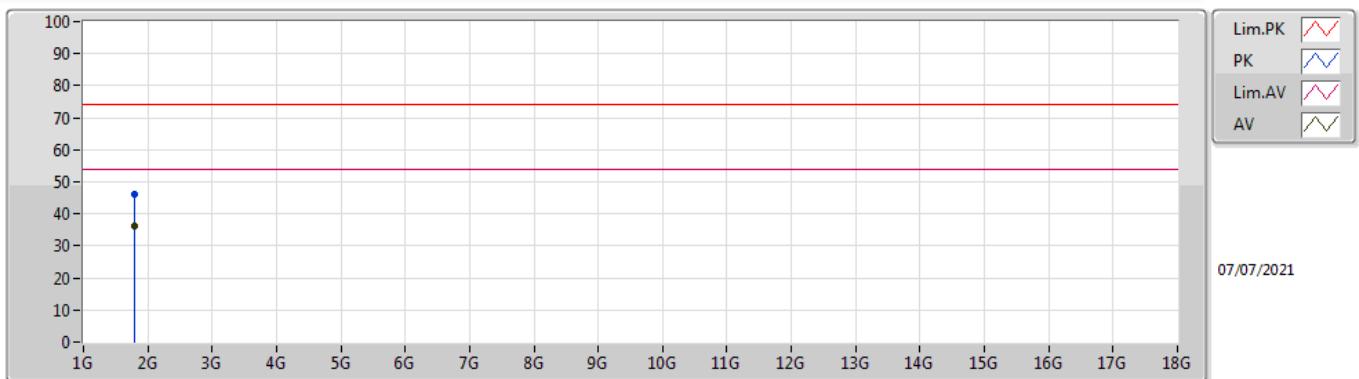
Mode 3


**Summary**

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Condition
Mode 3	Pass	AV	1.80002G	36.26	54.00	-17.74	Horizontal

Mode 3


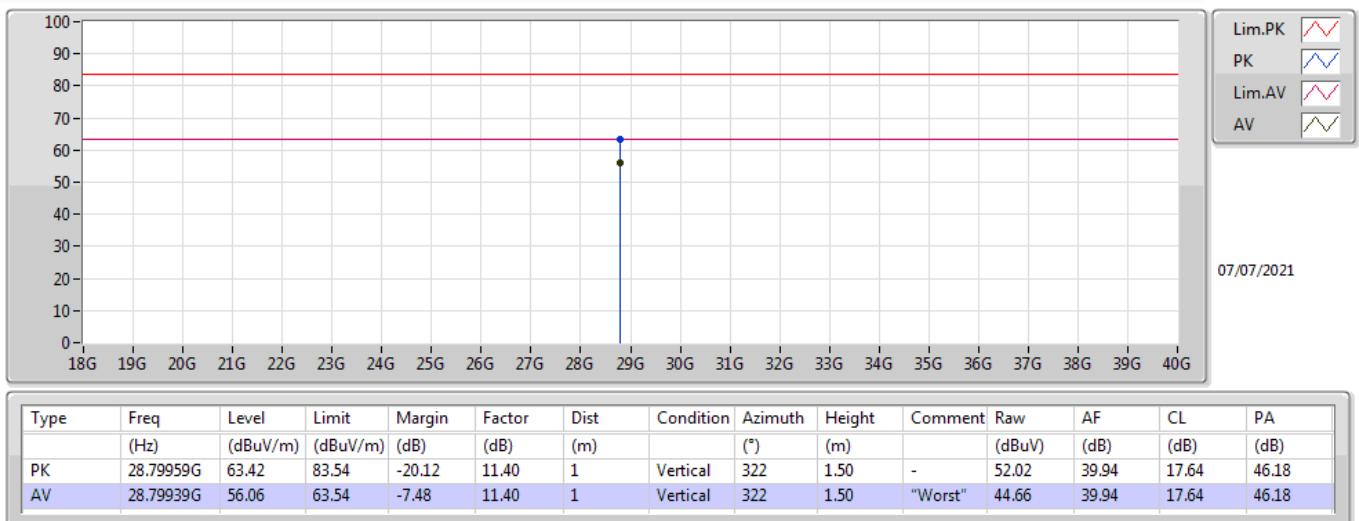
Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
PK	1.79992G	35.30	74.00	-38.70	-7.77	3	Vertical	185	1.31	-	43.07	25.10	3.60	36.47
AV	1.80001G	24.65	54.00	-29.35	-7.77	3	Vertical	185	1.31	"Worst"	32.42	25.10	3.60	36.47

Mode 3


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
PK	1.79997G	46.04	74.00	-27.96	-7.77	3	Horizontal	357	1.74	-	53.81	25.10	3.60	36.47
AV	1.80002G	36.26	54.00	-17.74	-7.77	3	Horizontal	357	1.74	"Worst"	44.03	25.10	3.60	36.47

**Summary**

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Condition
Mode 3	Pass	AV	28.79954G	59.35	63.54	-4.19	Horizontal

Mode 3


Mode 3
