



FCC EMI TEST REPORT

Filing Type : Certification
FCC ID : ZPNUNIVERSALBSD
Equipment : Blind Spot Detection System
Brand Name : Cub
Model Name : VS-95A043、VS-95AXXX、VS-95AXXXX、VS-95AXXXXX、VS-95AXXXXXX、VS-95AXXX-X、VS-95AXXX-X、VS-95AXXXX-X、VS-95AXXXX-X、VS-95AXXX-XX、VS-95AXXXX-XX、VS-95AXXXX-XX、VS-95AXXX-XXXX、VS-95AXXX-XXXX、VS-95AXXXX-XXXX、VS-95AXXXX-XXXX、A001-XXX、A001-XXXX、A001-XXXXXX、A001-XXXXXX-XXX
(Refer to section 1.1 for more details)
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 Dec. 12, 2019, and testing was started from Mar. 17, 2020 and completed on Mar. 18, 2020. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications 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 report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Approved by: Sin Chang

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory
No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, 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 3.18 dB at 48.43 MHz
4	15.109	Radiated Emission above 1GHz	PASS	Under limit 22.61 dB at 1039.96 MHz

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:

None

Reviewed by: Sin Chang

Report Producer: Vicky Huang



1. General Description of Equipment under Test

Product Detail	
Equipment Name	Blind Spot Detection System
Model Name	VS-95A043、VS-95AXXX、VS-95AXXXX、VS-95AXXXXX、VS-95AXXXXXX、VS-95AXXXX-X、VS-95AXXXX-X、VS-95AXXXXX-X、VS-95AXXXXXX-X、VS-95AXXXX-XX、VS-95AXXXX-XX、VS-95AXXXXX-XX、VS-95AXXXXXX-XX、VS-95AXXXX-XXXX、VS-95AXXXX-XXXX、VS-95AXXXXX-XXXX、VS-95AXXXXXX-XXXX、A001-XXX、A001-XXXX、A001-XXXXXX、A001-XXXXXX-XXX
Brand Name	Cub
Power Supply	From DC power supply

1.1. Feature of Equipment under Test

1. The EUT's highest operating frequency is 76 GHz.
2. Accessories

Other
Car Charger set*1

3. Table for Multiple Listing

The model names in the following table are all refer to the identical product.

Model Name	Description
VS-95A043、VS-95AXXX、VS-95AXXXX、VS-95AXXXXX、VS-95AXXXX-X、VS-95AXXXX-X、VS-95AXXXXX-X、VS-95AXXXXX-X、VS-95AXXX-XX、VS-95AXXX-XX、VS-95AXXXXX-XX、VS-95AXXXXX-XX、VS-95AXXXX-XXXX、VS-95AXXXX-XXXX、VS-95AXXXXX-XXXX、VS-95AXXXXXX-XXXX、A001-XXX、A001-XXXX、A001-XXXXXX-XXX	All the models are identical, the difference model served as marketing strategy. (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.)

From the above models, model: VS-95A043 was selected as representative model for the test and its data was recorded in this report.

4. 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	
Test Mode	Description
1	Normal Link-EUT

Note: The EUT can only be used at X axis position.

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

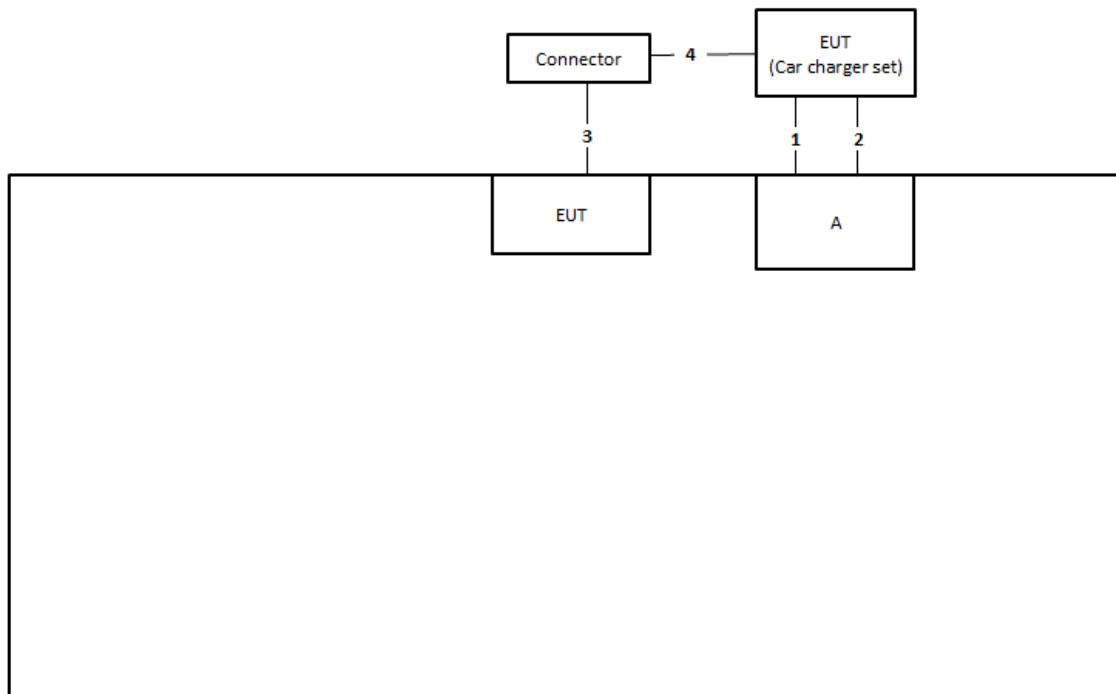
2.3. EUT Operation Condition

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	Crocodile clip cable	No	1.5m
2	Crocodile clip cable	No	1.5m
3	Power cable	No	0.5m
4	Car charger cable	No	7.3m



3. General Information of Test

3.1. Test Facility

EMI		
JHU BEI	ADD : No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C.	
TEL : 886-3-656-9065		FAX : 886-3-656-9085

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	03CH06-CB	Stim Sung	21~22.2	46~48	-	Mar. 17, 2020~Mar. 18, 2020	-
Radiated Emission above 1GHz	03CH06-CB	Stim Sung	21~22.2	46~48	-	Mar. 17, 2020~Mar. 18, 2020	-

3.3. Test Voltage

Power Type	Test Voltage
AC Power Supply	120 V / 60 Hz

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.

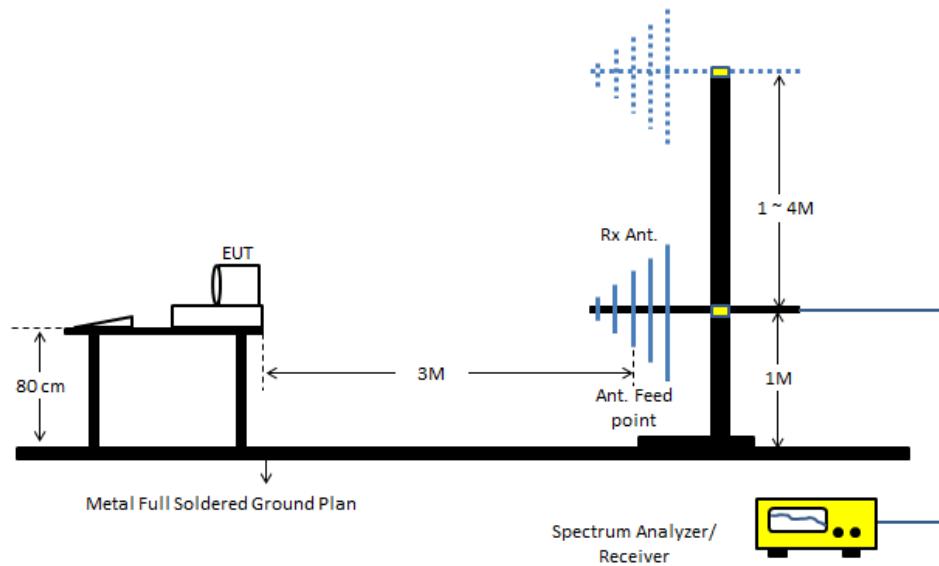
4.3. Measurement Results Calculation

The measured Level is calculated using:

- a. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
- b. Margin = - Limit + (Read Level + Antenna Factor + Cable Loss - Preamp Factor)

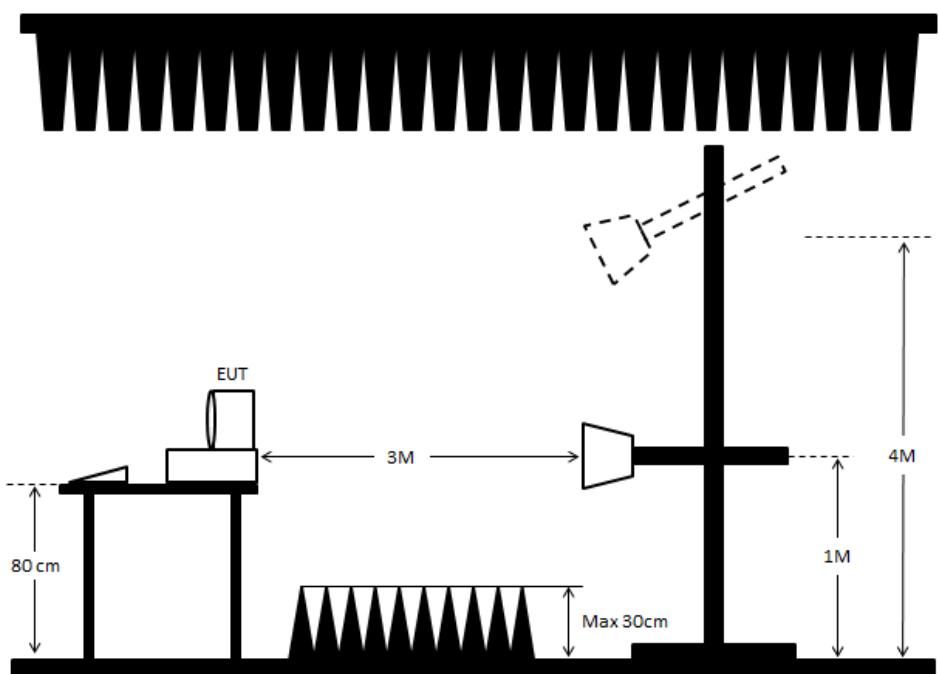
4.4. Typical Test Setup Layout of Radiated Emission

<Below 1 GHz>:



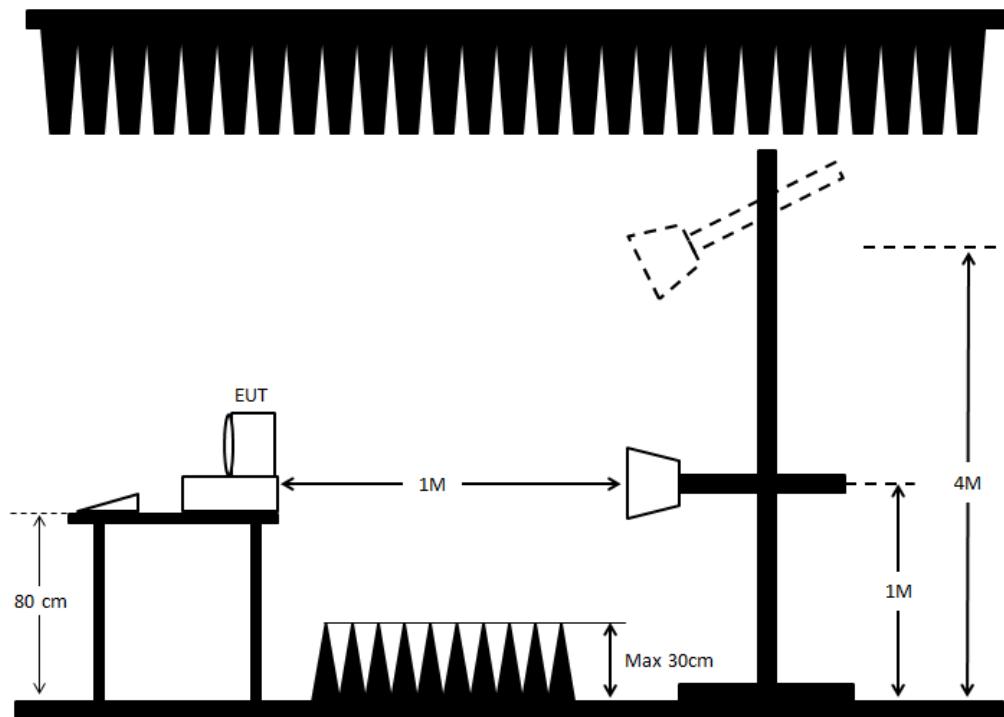
<Above 1 GHz>:

1,000~18,000 MHz





18,000~40,000 MHz





4.5. Test Result of Radiated Emission below 1 GHz

Refer as Appendix A

4.6. Test Result of Radiated Emission above 1 GHz

Refer as Appendix A



5. List of Measuring Equipment Used

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
Bilog Antenna with 6 dB attenuator	TESEQ & EMCI	CBL6112D & N-6-06	37878 & AT-N0606	20MHz ~ 2GHz	Aug. 03, 2019	Aug. 02, 2020	Radiation (03CH06-CB)
Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-1292	1GHz~18GHz	Jul. 17, 2019	Jul. 16, 2020	Radiation (03CH06-CB)
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170507	15GHz ~ 40GHz	Jun. 12, 2019	Jun. 11, 2020	Radiation (03CH06-CB)
Pre-Amplifier	Agilent	310N	187290	0.1MHz ~ 1GHz	May 07, 2019	May 06, 2020	Radiation (03CH06-CB)
Pre-Amplifier	Agilent	83017A	MY53270064	0.5GHz ~ 26.5GHz	May 08, 2019	May 07, 2020	Radiation (03CH06-CB)
Pre-Amplifier	MITEQ	TTA1840-35-HG	1864479	18GHz ~ 40GHz	Jul. 03, 2019	Jul. 02, 2020	Radiation (03CH06-CB)
Spectrum analyzer	R&S	FSP40	100080	9kHz~40GHz	Oct. 21, 2019	Oct. 20, 2020	Radiation (03CH06-CB)
EMI Test Receiver	R&S	ESCS	826547/017	9kHz ~ 2.75GHz	May 15, 2019	May 14, 2020	Radiation (03CH06-CB)
RF Cable-low	HUBER+SUHNER	RG402	Low Cable-05+24	30MHz~1GHz	Oct. 07, 2019	Oct. 06, 2020	Radiation (03CH06-CB)
RF Cable-high	HUBER+SUHNER	RG402	High Cable-05	1GHz~18GHz	Oct. 07, 2019	Oct. 06, 2020	Radiation (03CH06-CB)
RF Cable-high	HUBER+SUHNER	RG402	High Cable-05+24	1GHz~18GHz	Oct. 07, 2019	Oct. 06, 2020	Radiation (03CH06-CB)
RF Cable-high	Woken	RG402	High Cable-40G#1	18GHz ~ 40 GHz	Jul. 24, 2019	Jul. 23, 2020	Radiation (03CH06-CB)
RF Cable-high	Woken	RG402	High Cable-40G#2	18GHz ~ 40 GHz	Jul. 24, 2019	Jul. 23, 2020	Radiation (03CH06-CB)

※ Calibration Interval of instruments listed above is one year.



6. Uncertainty of Test Site

Test Items	Uncertainty	Remark
Radiated Emissions below 1GHz	4.3 dB	Confidence levels of 95%
Radiated Emissions 1GHz ~ 18GHz	4.3 dB	Confidence levels of 95%
Radiated Emissions 18GHz ~ 40GHz	5.1 dB	Confidence levels of 95%

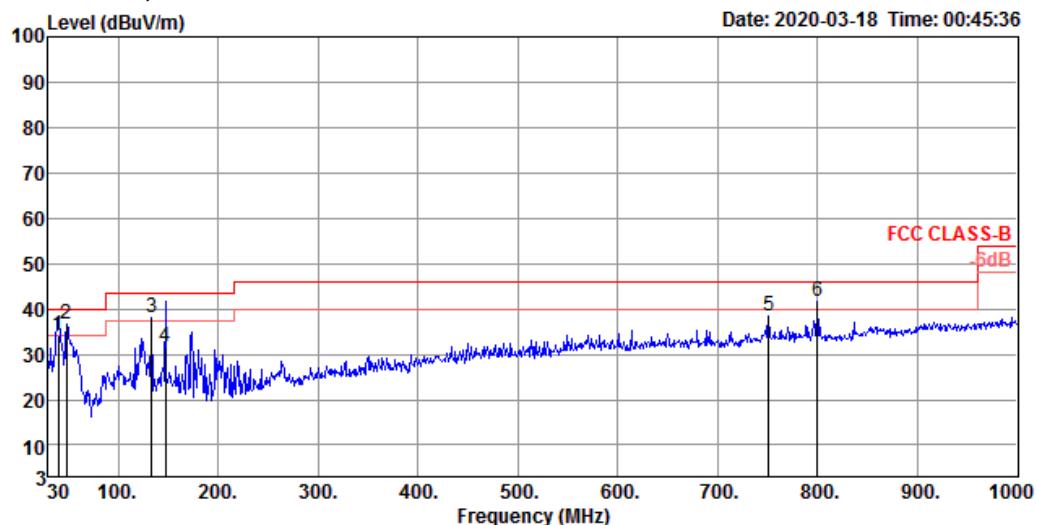


Radiated Emission below 1GHz Result

Appendix A.1

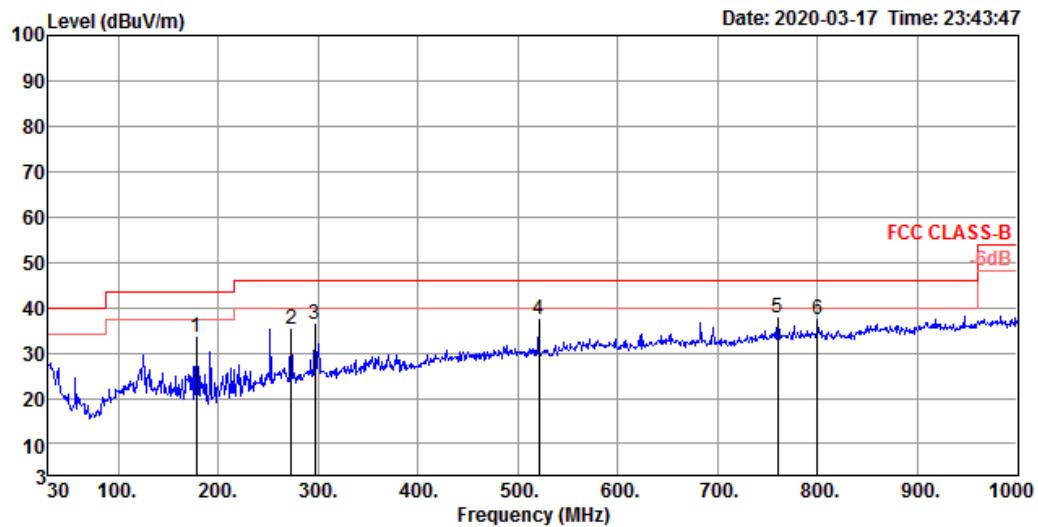
Test Mode	Mode 1	Frequency Range	30 MHz to 1,000 MHz
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Vertical 30 MHz to 1,000 MHz



Freq	Limit		Over Limit	Read Level	Cable		Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	Level	Line			Loss	dB						
1	39.70	34.01	40.00	-5.99	46.04	1.60	18.97	32.60	150	323	QP	VERTICAL
2	48.43	36.82	40.00	-3.18	53.22	1.47	14.85	32.72	125	86	Peak	VERTICAL
3	133.79	38.00	43.50	-5.50	50.53	2.37	17.56	32.46	100	348	Peak	VERTICAL
4	147.37	31.71	43.50	-11.79	45.09	2.48	16.60	32.46	100	348	QP	VERTICAL
5	750.71	38.45	46.00	-7.55	39.09	5.80	25.62	32.06	150	160	Peak	VERTICAL
6	800.18	41.60	46.00	-4.40	42.23	5.80	25.88	32.31	150	200	Peak	VERTICAL

Horizontal 30 MHz to 1,000 MHz



Freq	Limit		Over Limit	Read Level	Cable		Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	Line	dBuV/m			dB	dBuV						
MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m	dB	cm	deg		
1	178.41	33.39	43.50	-10.11	47.76	2.78	15.14	32.29	200	4	Peak	HORIZONTAL
2	273.47	35.32	46.00	-10.68	45.45	3.39	18.88	32.40	125	5	Peak	HORIZONTAL
3	296.75	36.37	46.00	-9.63	46.07	3.58	19.15	32.43	150	335	Peak	HORIZONTAL
4	520.82	37.51	46.00	-8.49	41.71	4.72	23.40	32.32	100	348	Peak	HORIZONTAL
5	760.41	37.87	46.00	-8.13	38.49	5.80	25.70	32.12	125	260	Peak	HORIZONTAL
6	800.18	37.36	46.00	-8.64	37.99	5.80	25.88	32.31	150	116	Peak	HORIZONTAL

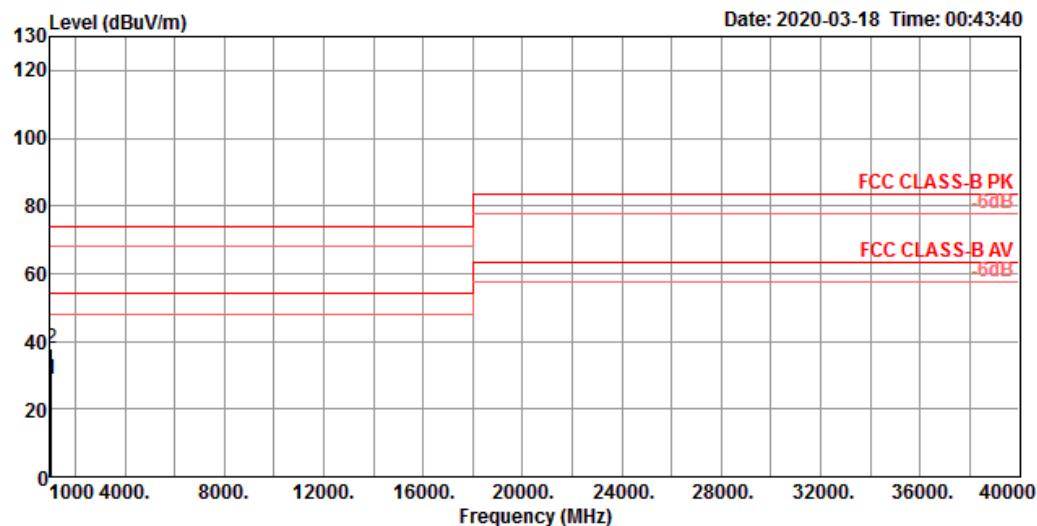


Radiated Emission above 1GHz Result

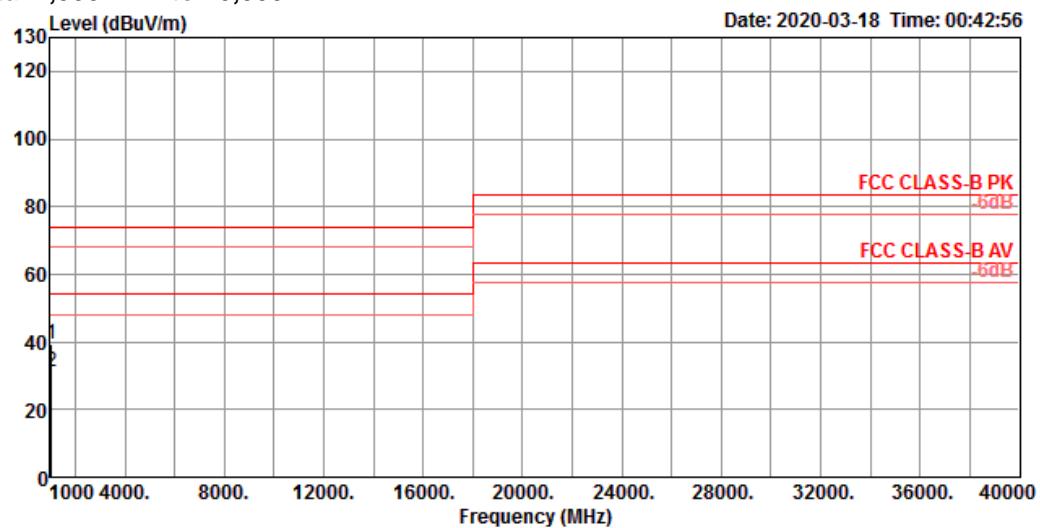
Appendix A.2

Test Mode	Mode 1	Frequency Range	1,000 MHz to 40,000 MHz
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Vertical 1,000 MHz to 40,000 MHz



Freq	Level	Limit		Over	Read	Cable	Antenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
		Line	Limit									
1	1039.95	28.74	54.00	-25.26	37.45	2.93	24.37	36.01	139	37	Average	VERTICAL
2	1040.05	37.81	74.00	-36.19	46.52	2.93	24.37	36.01	139	37	Peak	VERTICAL

**Horizontal 1,000 MHz to 40,000 MHz**

Freq	Level	Limit		Over	Read	Cable	Antenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
		Line	Limit									
MHz	dBuV/m	dBuV/m										
1	1039.51	39.39	74.00	-34.61	48.12	2.93	24.37	36.03	172	310	Peak	HORIZONTAL
2	1039.96	31.39	54.00	-22.61	40.10	2.93	24.37	36.01	172	310	Average	HORIZONTAL