



FCC AND ISCED CERTIFICATION TEST REPORT

Applicant	:	HELLA GmbH & Co. KGaA
Address of Applicant	:	Rixbecker Strasse, 75, 59552 Lippstadt, Germany
Manufacturer	:	HELLA GmbH & Co. KGaA
Address of Manufacturer	:	Rixbecker Strasse, 75, 59552 Lippstadt, Germany
Equipment under Test	:	Smart Car Access Device
Model No.	:	FBD6
FCC ID	:	NBGFBD6
IC	:	2694A-FBD6
Test Standard(s)	:	FCC Rules and Regulations Part 15 Subpart F (15.519), RSS-220 Issue 1(March 2009) Amendment 1 (July 2018), ANSI C63.10:2013, RSS-Gen Issue 5, Apr. 2018, Amendment 2 (February 2021)
Report No.	:	DDT-RE24101724-2E06
Issue Date	:	2024/11/13
Issue By	:	Guangdong Dongdian Testing Service Co., Ltd.
Address of Laboratory	:	Unit 2, Building 1, No. 17, Zongbu 2nd Road, Songshan Lake Park, Dongguan, Guangdong, China, 523808

REPORT

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Test Report Declare

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Model No.	:	FBD6
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Test Standard Used:

FCC Rules and Regulations Part 15 Subpart F (15.519), RSS-220 Issue 1(March 2009)
Amendment 1 (July 2018)

Test procedure used:

ANSI C63.10:2013, KDB 393764 D01 v02, ANSI C63.10:2013, RSS-Gen Issue 5, Apr. 2018,
Amendment 2 (February 2021)

We Declare:

The equipment described above is tested by Guangdong Dongdian Testing Service Co., Ltd and in the configuration tested the equipment complied with the standards specified above. The test results are contained in this test report and Guangdong Dongdian Testing Service Co., Ltd is assumed of full responsibility for the accuracy and completeness of these tests.

After test and evaluation, our opinion is that the equipment provided for test compliance with the requirement of the above standards.

Report No.:	DDT-RE24101724-2E06		
Date of Receipt:	2024/10/29	Date of Test:	2024/10/29 - 2024/11/13

Prepared By:**Tiger Mo/Engineer****Approved By:****Damon Hu/EMC Manager**

Note: This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Guangdong Dongdian Testing Service Co., Ltd.

Revision History

Rev.	Revisions	Issue Date	Revised By
---	Initial issue	2024/11/13	

1. Summary of Test Results

The EUT have been tested according to the applicable standards as referenced below.		
Description of Test Item	Standard	Verdict
UBW (-10 dB) Bandwidth	FCC 15.503(a) 15.519(b), ANSI C63.10:2013	Pass
Cease of transmitter operation	15.519(a)(1), RSS 220 5.3.1(b) ANSI C63.10:2013	Pass
Transmitter radiated Emissions	15.519(c)(d), RSS 220 5.3.1(c),(b) ANSI C63.10:2013	Pass
Peak Emissions in a 50 MHz bandwidth	15.519(e), RSS 220 5.3.1(g) ANSI C63.10:2013	Pass
Power Line Conducted Emission	FCC 15.207, RSS-GEN Clause 8.8	Pass
Antenna Requirement	FCC 15.203, RSS-Gen Issue 5 clause 6.8 FCC 15.519(a)(2)	Pass

2. General Test Information

2.1. Description of EUT

EUT Name	: Smart Car Access Device
Model Number	: FBD6
EUT function description	: Please reference user manual of this device
Power Supply	: 12V DC from vehicle power supply system
Hardware Version	: 7.1
Software Version	: SXX
Operation frequency	: CH8: 7.22GHz – 7.738GHz, CH9: 7.73GHz – 8.25GHz
Number of Channel	: 2
Modulation	: Impulse radio

Note: EUT is the ab. of equipment under test.

Antenna information			
Antenna Type	Integrated PCB Antenna		
Max Antenna Gain	Ant1	2.8 dBi	Support:TxRx
	Ant2	6.1 dBi	Support:TxRx
	Ant3	5.0 dBi	Support:Rx

2.2. Accessories of EUT

Description of Accessories	Manufacturer	Model number	Description	Remark
N/A	N/A	N/A	N/A	N/A

2.3. Assistant equipment used for test

Assistant equipment	Manufacturer	Model number	EMC Compliance	SN
N/A	N/A	N/A	N/A	N/A

2.4. Block diagram of EUT configuration for test



2.5. Deviations of test standard

No Deviation

2.6. Test environment conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature range:	21-25°C
Humidity range:	40-75%

2.7. Test laboratory

Guangdong Dongdian Testing Service Co., Ltd.

Add.: Unit 2, Building 1, No. 17, Zongbu 2nd Road, Songshan Lake Park, Dongguan, Guangdong, China, 523808.

Tel.: +86-0769-38826678, <http://www.dgddt.com>, Email: ddt@dgddt.com.

CNAS Accreditation No. L6451; A2LA Accreditation Number: 3870.01

FCC Designation Number: CN1182, Test Firm Registration Number: 540522

Innovation, Science and Economic Development Canada Site Registration Number: 10288A

Conformity Assessment Body identifier: CN0048

VCCI facility registration number: C-20087, T-20088, R-20123, R-20155, G-20118

2.8. Measurement uncertainty

Test Item	Uncertainty
Bandwidth	1.1%
Peak Output Power (Conducted) (Spectrum analyzer)	0.86 dB (10 MHz $\leq$ f < 3.6 GHz);
	1.38 dB (3.6 GHz $\leq$ f < 8 GHz)
Peak Output Power (Conducted) (Power Sensor)	0.74 dB
Power Spectral Density	0.74 dB (10 MHz $\leq$ f < 3.6 GHz);
	1.38 dB (3.6 GHz $\leq$ f < 8 GHz)
Frequencies Stability	6.7×10^{-8} (Antenna couple method)
	5.5×10^{-8} (Conducted method)
Conducted spurious emissions	0.86 dB (10 MHz $\leq$ f < 3.6 GHz);
	1.40 dB (3.6 GHz $\leq$ f < 8 GHz)
	1.66 dB (8 GHz $\leq$ f < 22 GHz)
Uncertainty for radio frequency (RBW<20 kHz)	3×10^{-8}
Temperature	0.4°C
Humidity	2%
Uncertainty for Radiation Emission test (30 MHz-1 GHz)	4.70 dB (Antenna Polarize: V)
	4.84 dB (Antenna Polarize: H)
Uncertainty for Radiation Emission test (1 GHz-40 GHz)	4.10 dB (1-6 GHz)
	4.40 dB (6 GHz-18 GHz)
	3.54 dB (18 GHz-26 GHz)
	4.30 dB (26 GHz-40 GHz)
Uncertainty for Power line conduction emission test	3.32 dB (150 kHz-30 MHz)

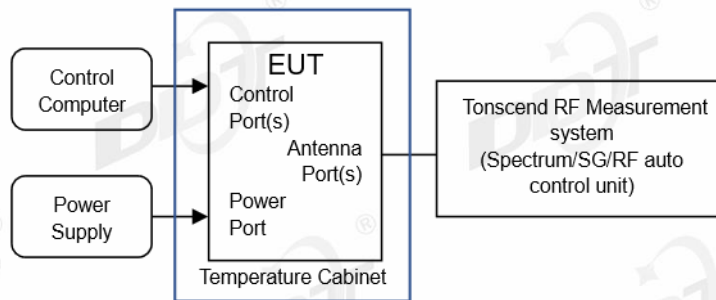
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

3. Equipment Used During Conductive Test

Equipment	Manufacturer	Model No.	Serial Number	Due Date
☑RF Connected Test (RF Measurement System 3#)				
SIGNAL ANALYZER	R&S	FSV40	101407	2025/07/08
Wideband Radio Communication Tester	R&S	CMW500	117491	2025/03/31
EXG Analog Signal Generator	KEYSIGHT	N5173B	MY62153058	2025/07/08
MXG Vector Signal Generator	Agilent	N5182A	MY48180912	2025/03/31
RF Control Unit	Tonscend	JS0806-2	20C8060230	2025/03/31
TEMP&HUMI Programmable Chamber	ZHIXIANG	ZXGDJS-150L	ZX170110-A	2025/04/22
Test Software	Tonscend	JS1120-3	Ver.3.2.22	N/A

4. UWB(-10 dB) Bandwidth

4.1. Block diagram of test setup



4.2. Limits

A UWB transmitter is defined as “an intentional radiator that, at any point in time, has a fractional bandwidth equal to or greater than 0.20 or has a UWB bandwidth equal to or great than 500 MHz, regardless of the fractional bandwidth.”

The upper boundary is designated f_H and the lower boundary is designated f_L . The frequency at which the highest radiated emission occurs is designated f_M .

The center frequency, f_C , equals $(f_H + f_L)/2$, and the fractional bandwidth equals $2(f_H - f_L)/(f_H + f_L)$

The UWB bandwidth of a device operating under the provisions of this section must be contained between 3100 MHz and 10,600 MHz.

4.3. Test procedure

(1) EUT set to test mode, connect EUT's antenna output to spectrum analyzer by RF cable.

(2) Set the spectrum analyzer as follows:

RBW:	1 MHz
VBW:	3 MHz
Detector Mode:	Peak
Sweep time:	auto
Trace mode	Max hold

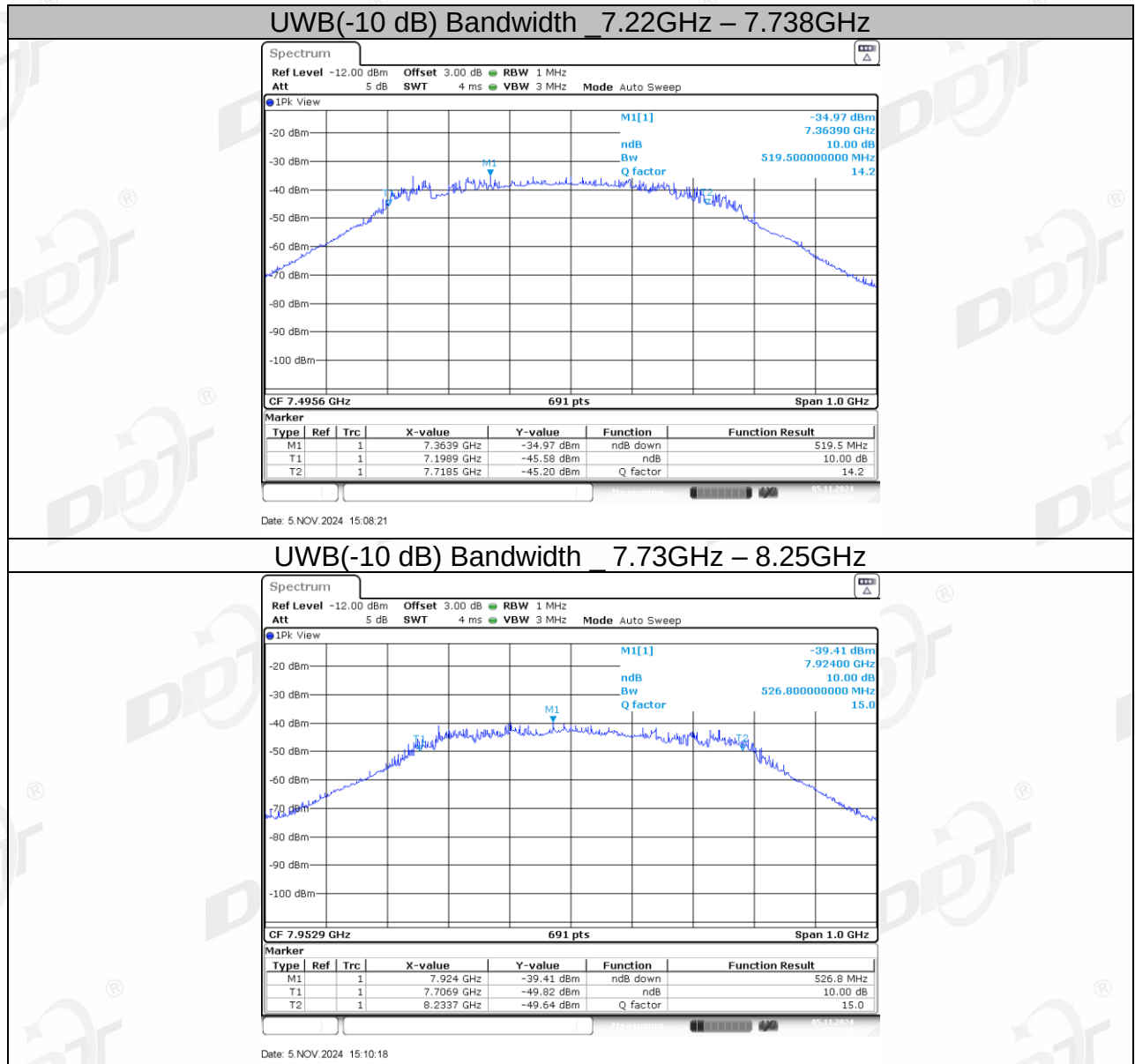
(3) Where the peak power falls by 10 dB relative to the level at f_M , searched the left and right edge in order to find f_H and f_L .

(4) Calculated fractional bandwidth.

4.4. Test result

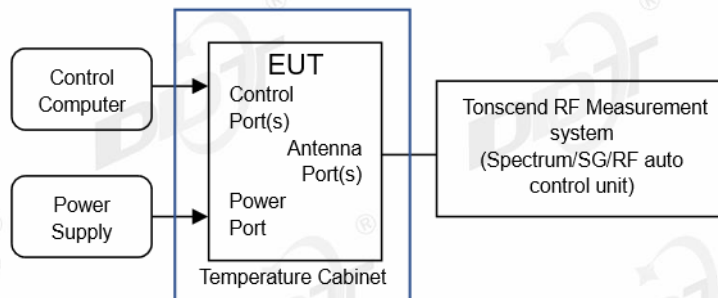
Mode	Freq. (GHz)	FL (GHz)	FH (GHz)	FM (GHz)	FC (GHz)	Measured Bandwidth (MHz)	Limit (MHz)	Conclusion
Tx mode	7.22 ~7.738	7.1989	7.7185	7.3639	7.4587	519	> 500	Pass
	7.73~8.25	7.7069	8.2337	7.924	7.9703	526	> 500	Pass

4.5. Original test data



5. Cease of transmitter operation

5.1. Block diagram of test setup



5.2. Limits

A UWB device operating under the provisions of this section shall transmit only when it is sending information to an associated receiver. 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. An acknowledgment of reception must continue to be received by the UWB intentional radiator at least every 10 seconds or the UWB device must cease transmitting.

5.3. Test procedure

- (1) Connect EUT's antenna output to spectrum analyzer by RF cable.
- (2) Set the spectrum analyzer as follows:

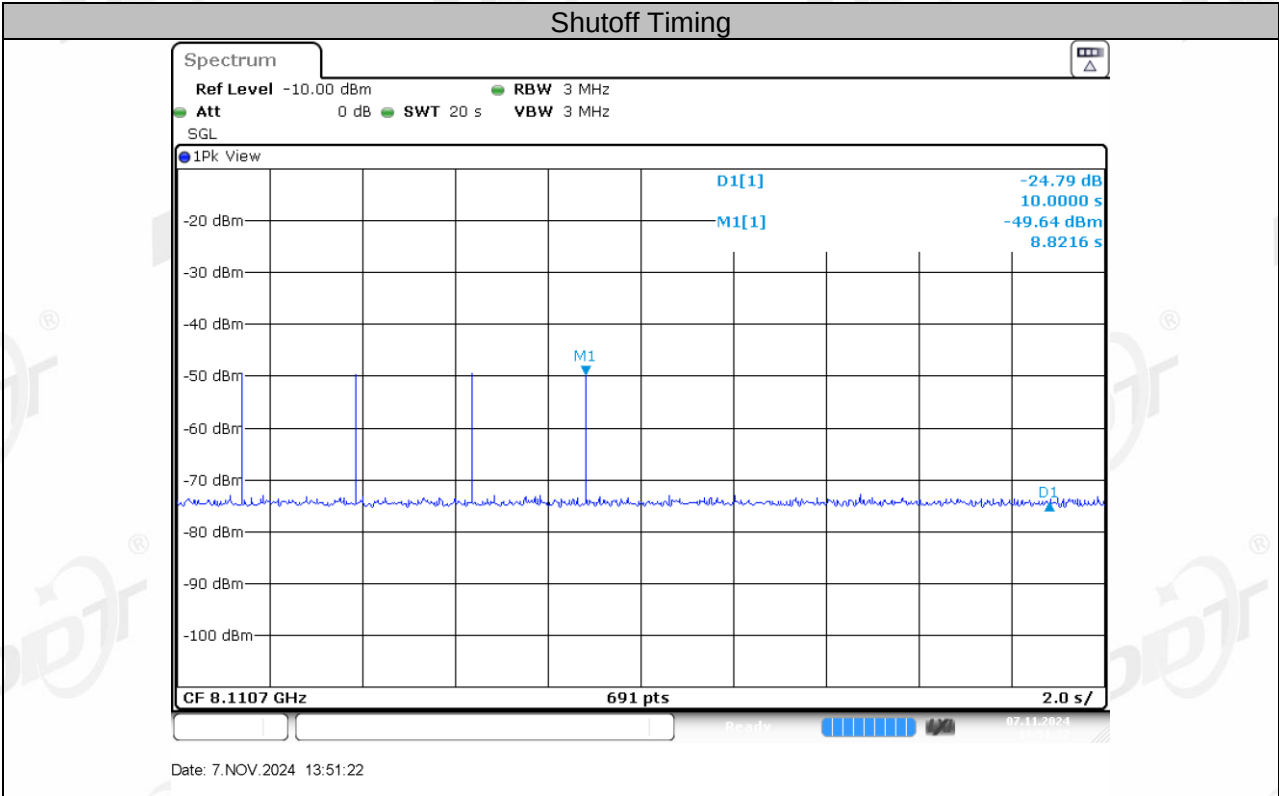
RBW:	3 MHz
VBW:	3 MHz
Span	Zero Span
Sweep time:	20 s

5.4. Test result

The UWB Tag is a real-location system, When UWB Tag not establish communication with UWB gateway UWB Tag cease transmission but only transmission periodic signals used for re-establishment of a communication link. so UWB Tag is satisfied the requirement for 47 CFR Part 15F Section 15.519(a)(1).

The EUT transmit a 165.9 μ s burst of location information every 107 ms to an associated receiver

5.5. original test data



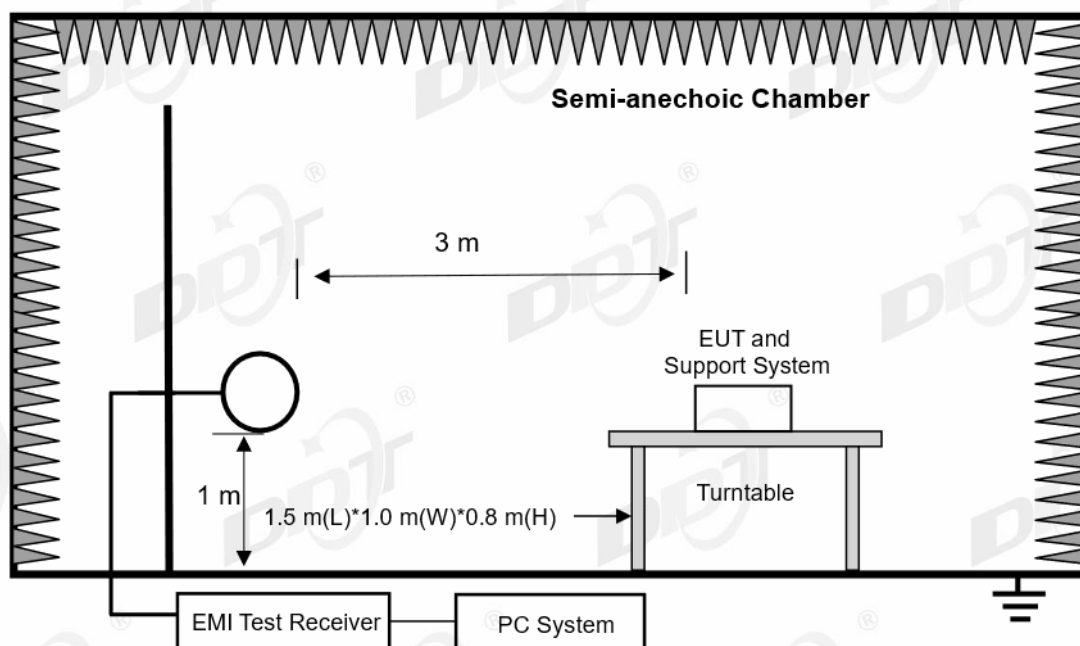
6. Radiated Spurious Emissions

6.1. Test equipment

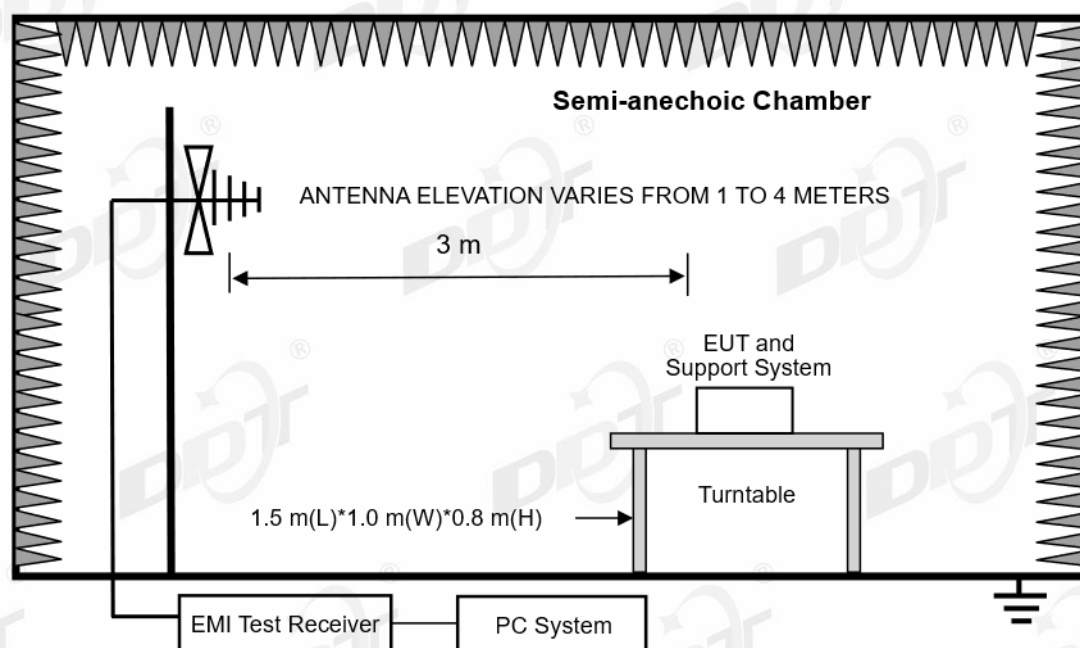
Equipment	Manufacturer	Model No.	Serial No.	Cal Due To
Micro-Tronics filters	REBES	BRM50716	DDT-ZC03240	/
RF cable	Yuhu Technology	ZT26S-SMAJ-SMAJ-1M	DDT-ZC02037	2025/03/31
RF Cable	N/A	W13.02 AP1-X2	DDT-ZC04023	2025/03/31
Pre-amplifier	COM-POWER	PAM-840A	DDT-ZC01693	2025/03/31
PSA Series Spectrum Analyzer	Agilent	E4447A	DDT-ZC00517	2025/03/31
RF cable	Yuhu Technology	JCTB810-NJ-NJ-9M	DDT-ZC02538	2025/03/31
Active Loop Antenna	Schwarzbeck	FMZB1519	DDT-ZC00524	2025/09/11
EMI TEST RECEIVER	R&S	ESU26	DDT-ZC01909	2025/03/31
RF cable	Zhongke Junchuang	JCT26S-NJ-NJ-1.5M	DDT-ZC02762	2025/03/31
High pass filter	Micro-Tronics	HPM50108	DDT-ZC00560	2025/04/22
Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	DDT-ZC00506	2025/04/26
Hochgewinn-Hornantenne	SCHWARZBECK	BBHA 9120 D	DDT-ZC02129	2025/09/18
High pass filter	Micro-Tronics	HPM50102	DDT-ZC00561	2025/04/22
Trilog Broadband Antenna	Schwarzbeck	VULB 9163	DDT-ZC02050	2025/07/11
High Pass filter	Xi'an Xingbo	XBLBQ-GTA67	DDT-ZC02179	2025/04/22
Pre-amplifier	COM-POWER	PAM-118A	DDT-ZC01293	2025/08/25
RF Cable	N/A	W24.02 HL-562	DDT-ZC04022	2025/03/31
Micro-Tronics filters	REBES	BRM50702	DDT-ZC03242	/

6.2. Block diagram of test setup

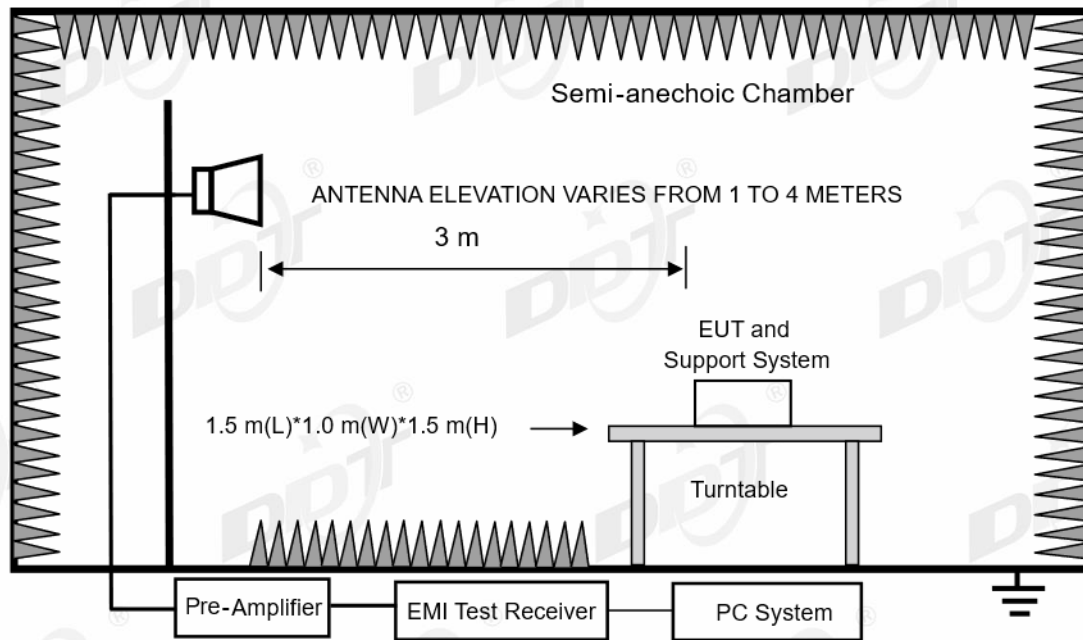
In 3 m Anechoic Chamber, test setup diagram for 9 kHz - 30 MHz:



In 3 m Anechoic Chamber, test setup diagram for 30 MHz – 1 GHz:



In 3 m Anechoic Chamber, test setup diagram for frequency above 1 GHz:



Note: For harmonic emissions test an appropriate high pass filter was inserted in the input port of AMP.

6.3. Limit

The radiated emissions at or below 960 MHz from a device operating under the provisions of this section shall not exceed the emission levels in §15.209.

Limits-Below 960 MHz

Frequency (MHz)	Distance Meters (m)	Field Strengths Limit	
		$\mu\text{V/m}$	$\text{dB}(\mu\text{V})/\text{m}$
0.009 ~ 0.490	300	$2400/F(\text{KHz})$	$67.6-20\log(F)$
0.490 ~ 1.705	30	$24000/F(\text{KHz})$	$87.6-20\log(F)$
1.705 ~ 30.0	30	30	29.54
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0

The radiated emissions above 960 MHz from a device operating under the provisions of this section shall not exceed the following average limits when measured using a resolution bandwidth of 1 MHz:

Limits- Above 960 MHz

Frequency (MHz)	EIRP in dBm	Distance Meters (m)	Field Strengths Limit ($\text{dB}(\mu\text{V})/\text{m}$)
960-1610	-75.3	3	19.9
1610-1990	-63.3	3	31.9
1990-3100	-61.3	3	33.9

3100-10600	-41.3	3	53.9
Above 10600	-61.3	3	33.9

In addition to the radiated emission limits specified in the table in paragraph (c) of this section, UWB transmitters operating under the provisions of this section shall not exceed the following average limits when measured using a resolution bandwidth of no less than 1 kHz:

Frequency (MHz)	EIRP in dBm	Distance Meters (m)	Field Strengths Limit(dB(μV)/m)
1164-1240	-85.3	3	19.9
1559-1610	-85.3	3	25.2

6.4. Test procedure

(1) EUT height should be 0.8 m for below 1 GHz at a semi-anechoic chamber while EUT height should be 1.5 m for above 1 GHz at full chamber or semi-anechoic chamber ground with absorbers.

(2) The antenna used as below table.

Test frequency range	Test antenna used	Measuring distance
9 kHz-30 MHz	Active Loop antenna	3 m
30 MHz-1 GHz	Trilog Broadband Antenna	3 m
1 GHz-18 GHz	Double Ridged Horn Antenna(1GHz-18GHz)	3 m
18 GHz-40 GHz	Horn Antenna(18GHz-40GHz)	1 m

According ANSI C63.10:2013 clause 6.4.4.2 and 6.5.3, for measurements below 30 MHz, the loop antenna was positioned with its plane vertical from the EUT and rotated about its vertical axis for maximum response at each azimuth position around the EUT. And the loop antenna also be positioned with its plane horizontal at the specified distance from the EUT. The center of the loop is 1 m above the ground. for measurement above 30 MHz, the Trilog Broadband Antenna or Horn Antenna was located 3 m from EUT, Measurements were made with the antenna positioned in both the horizontal and vertical planes of Polarization, and the measurement antenna was varied from 1 m to 4 m. in height above the reference ground plane to obtain the maximum signal strength.

(3) Below pre-scan procedure was first performed in order to find prominent frequency spectrum radiated emissions from 9 kHz to 40 GHz:

(a) Scanning the peak frequency spectrum with the antenna specified in step (3), and the EUT was rotated 360 degree, the antenna height was varied from 1 m to 4 m (Except loop antenna, it's fixed 1m above ground.)

(b) Change work frequency or channel of device if practicable.

(c) Change modulation type of device if practicable.

(d) Change power supply range from 85% to 115% of the rated supply voltage

(e) Rotated EUT though three orthogonal axes to determine the attitude of EUT arrangement produces highest emissions.

Spectrum frequency from 9 kHz to 40 GHz (tenth harmonic of fundamental frequency) was investigated.

(4) For final emissions measurements at each frequency of interest, the EUT was rotated and the antenna height was varied between 1 m and 4 m in order to maximize the emission. Measurements in both horizontal and vertical polarities were made and the data was recorded. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.10 2013 on Radiated Emission test.

(5) The emissions from 9 kHz to 1 GHz were measured based on CISPR QP detector except for the frequency bands 9-90 kHz, 110-490 kHz, for emissions from 9 kHz-90 kHz, 110 kHz-490 kHz and above 1 GHz were measured based on average detector.

(6) The emissions from 9 kHz to 1 GHz, QP or average values were measured with EMI receiver with below RBW

Frequency band	RBW
9 kHz-150 kHz	200 Hz
150 kHz-30 MHz	9 kHz
30 MHz-1 GHz	120 kHz

6.5. Test result

Pass. (See below detailed test result)

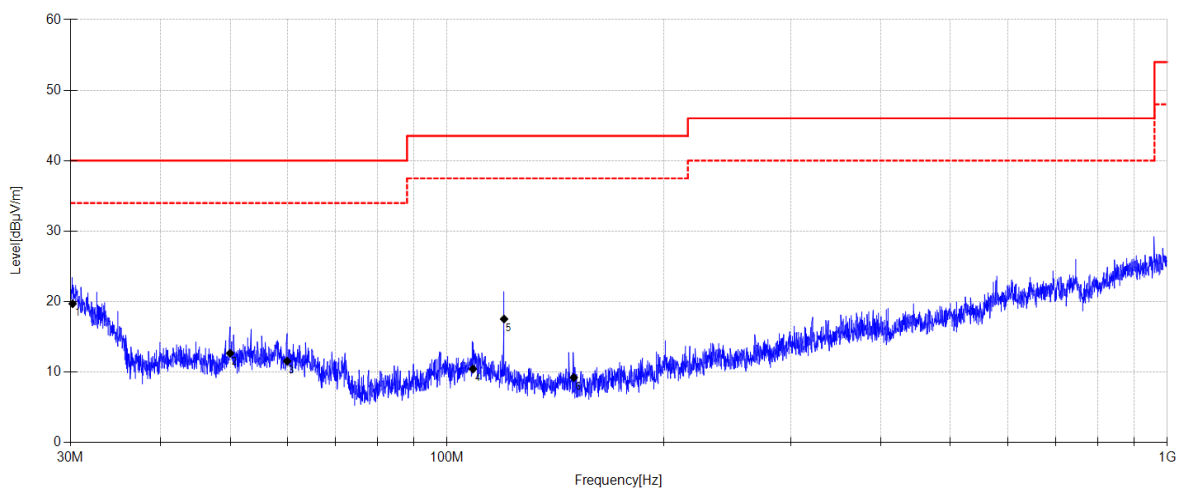
All the emissions except fundamental emission from 9 kHz to 40 GHz were comply with 15.209 & 15.519 limit.

Note: According exploratory test no any obvious emission was detected from 9 kHz to 30 MHz, 18GHz to 40GHz, so the final test was performed with frequency range from 30 MHz to 18 GHz and recorded in below.

Radiated Emission test

TR-4-E-009 Radiated Emission Test Result

Test Date: 2024-11-06 **Tested By:** Guoyuan Lin
EUT: Smart Car Access Device **Model Number:** FBD6
Test Mode: CH8 TX Mode **Power Supply:** DC 12V
Condition: Temp:21.9°C;Humi:51.0% **Test Site:** DDT 3# Chamber
File Path: d:\ts\2024 report data\Q24101724-2E\FCC Below 1G\20241106-013806_H
Memo: Sample NumberS24101724-001



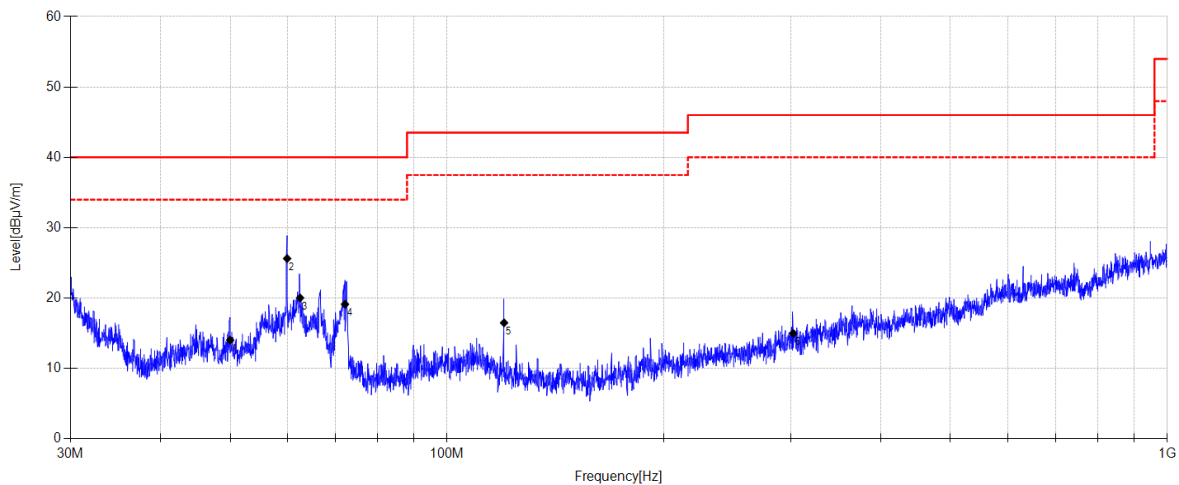
Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable Loss [dB]	Result [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	30.211	34.47	10.32	3.76	19.70	40.00	20.30	QP	Horizontal
2	49.981	24.6	12.99	3.88	12.67	40.00	27.33	QP	Horizontal
3	59.977	23.57	12.79	3.96	11.55	40.00	28.45	QP	Horizontal
4	108.619	22.92	11.83	4.27	10.45	43.50	33.05	QP	Horizontal
5	119.991	31.73	10.00	4.33	17.53	43.50	25.97	QP	Horizontal
6	149.963	25.05	8.12	4.49	9.23	43.50	34.27	QP	Horizontal

Note:

1. Result Level = Reading + Cable loss + Antenna Factor + AMP
2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.
3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Date: 2024-11-06
Tested By: Guoyuan Lin
EUT: Smart Car Access Device
Model Number: FBD6
Test Mode: CH8 TX Mode
Power Supply: DC 12V
Condition: Temp:21.9°C;Humi:51.0%
Test Site: DDT 3# Chamber
File Path: d:\ts\2024 report data\Q24101724-2E\FCC Below 1G\20241106-013825_V
Memo: Sample NumberS24101724-001



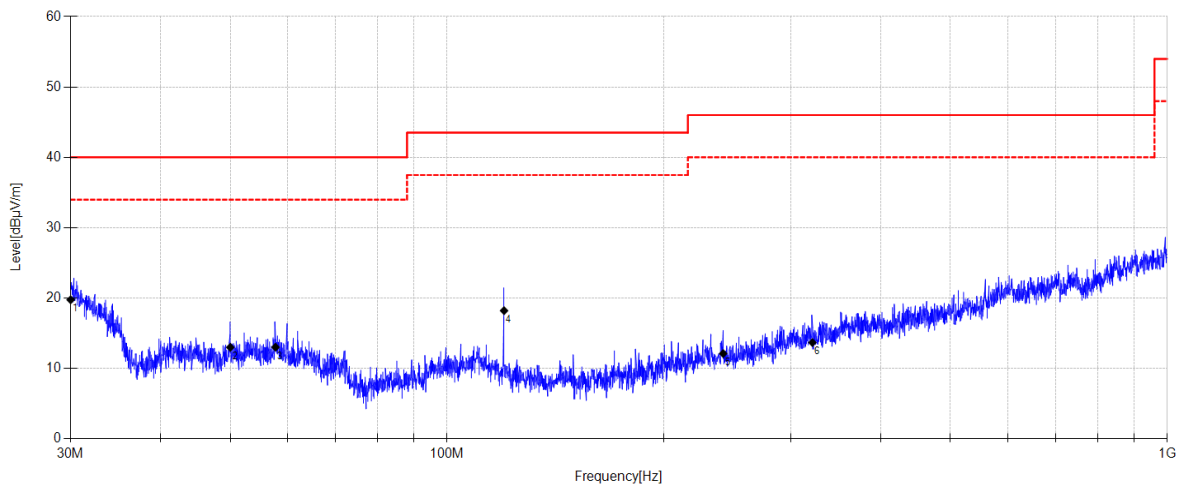
Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable Loss [dB]	Result [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	49.981	25.95	12.99	3.88	14.02	40.00	25.98	QP	Vertical
2	59.977	37.64	12.79	3.96	25.62	40.00	14.38	QP	Vertical
3	62.510	32.21	12.60	3.98	20.03	40.00	19.97	QP	Vertical
4	72.173	34.28	9.53	4.04	19.12	40.00	20.88	QP	Vertical
5	119.991	30.68	10.00	4.33	16.48	43.50	27.02	QP	Vertical
6	302.341	23.97	13.70	5.23	14.98	46.00	31.02	QP	Vertical

Note:

1. Result Level = Reading + Cable loss + Antenna Factor + AMP
2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.
3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Date: 2024-11-06
Tested By: Guoyuan Lin
EUT: Smart Car Access Device
Model Number: FBD6
Test Mode: CH9 TX Mode
Power Supply: DC 12V
Condition: Temp:21.9°C;Humi:51.0%
Test Site: DDT 3# Chamber
File Path: d:\ts\2024 report data\Q24101724-2E\FCC Below 1G\20241106-014531_H
Memo: Sample NumberS24101724-001



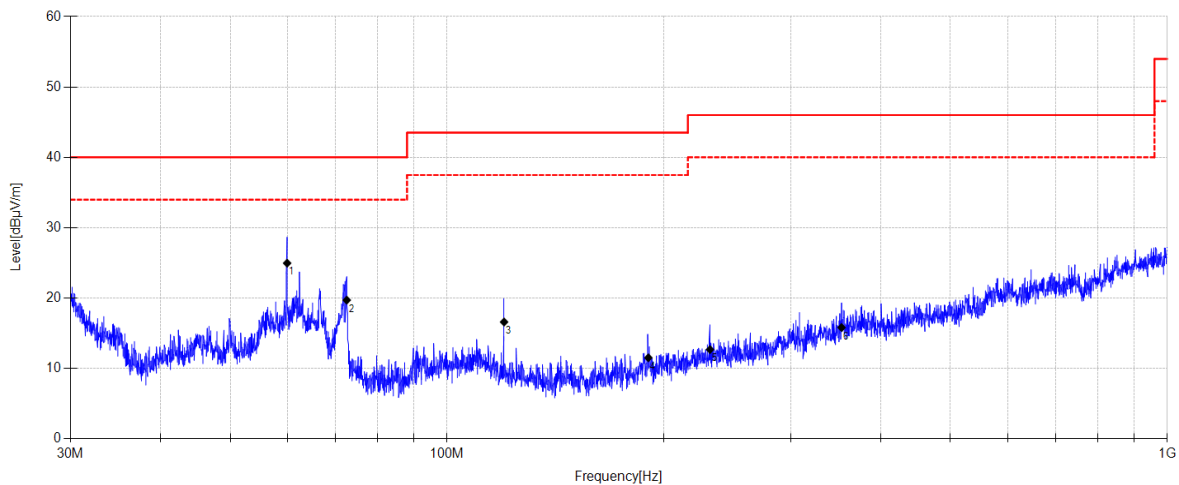
Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable Loss [dB]	Result [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	30.021	34.55	10.30	3.76	19.76	40.00	20.24	QP	Horizontal
2	50.016	24.93	12.99	3.88	13.00	40.00	27.00	QP	Horizontal
3	57.789	25.2	12.65	3.94	13.02	40.00	26.98	QP	Horizontal
4	119.991	32.41	10.00	4.33	18.21	43.50	25.29	QP	Horizontal
5	241.745	23.57	11.70	4.95	12.12	46.00	33.88	QP	Horizontal
6	321.584	22.57	13.84	5.31	13.68	46.00	32.32	QP	Horizontal

Note:

1. Result Level = Reading + Cable loss + Antenna Factor + AMP
2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.
3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Date: 2024-11-06
Tested By: Guoyuan Lin
EUT: Smart Car Access Device
Model Number: FBD6
Test Mode: CH9 TX Mode
Power Supply: DC 12V
Condition: Temp:21.9°C;Humi:51.0%
Test Site: DDT 3# Chamber
File Path: d:\ts\2024 report data\Q24101724-2E\FCC Below 1G\20241106-014550_V
Memo: Sample NumberS24101724-001



Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable Loss [dB]	Result [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	59.977	36.98	12.79	3.96	24.96	40.00	15.04	QP	Vertical
2	72.579	35.02	9.37	4.04	19.71	40.00	20.29	QP	Vertical
3	119.991	30.8	10.00	4.33	16.60	43.50	26.90	QP	Vertical
4	190.335	25.32	9.77	4.71	11.52	43.50	31.98	QP	Vertical
5	231.786	24.26	11.66	4.91	12.69	46.00	33.31	QP	Vertical
6	353.017	23.52	15.10	5.43	15.81	46.00	30.19	QP	Vertical

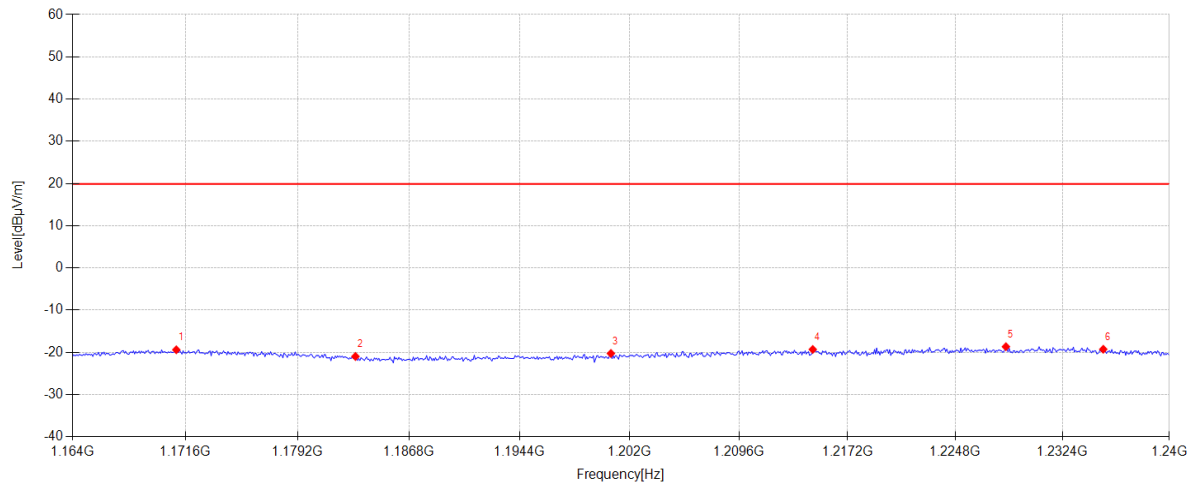
Note:

1. Result Level = Reading + Cable loss + Antenna Factor + AMP
2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.
3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Date: 2024-11-04 **Tested By:** Zhong Nan
EUT: Smart Car Access Device **Model Number:** FBD6
Test Mode: CH8 TX Mode **Power Supply:** DC 12V
Condition: Temp:21.9°C;Humi:51.0% **Test Site:** DDT 3# Chamber
File Path: d:\ts\2024 report data\Q24101724-2E\FCC ABOVE1G\74
Memo: Sample NumberS24101724-001 Power Setting:NA

Test Graph



Data List

NO .	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable loss [dB]	AMP [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	1170.992	5.77	24.84	2.55	-52.55	-19.39	19.90	39.29	AV	Vertical
2	1183.152	4.16	24.87	2.56	-52.56	-20.97	19.90	40.87	AV	Vertical
3	1200.708	4.87	24.90	2.57	-52.59	-20.25	19.90	40.15	AV	Vertical
4	1214.768	5.72	24.99	2.59	-52.61	-19.31	19.90	39.21	AV	Vertical
5	1228.372	6.30	25.07	2.60	-52.63	-18.66	19.90	38.56	AV	Vertical
6	1235.288	5.65	25.11	2.61	-52.64	-19.27	19.90	39.17	AV	Vertical

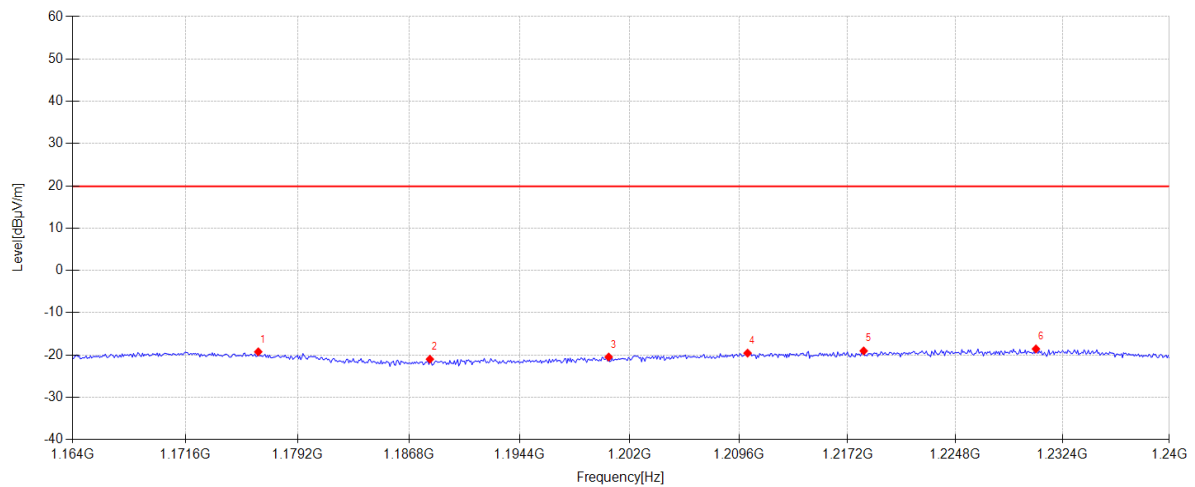
Note:

- Level = Reading + Cable loss + Antenna Factor + AMP
- If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Date: 2024-11-04 **Tested By:** Zhong Nan
EUT: Smart Car Access Device **Model Number:** FBD6
Test Mode: CH8 TX Mode **Power Supply:** DC 12V
Condition: Temp:21.9°C;Humi:51.0% **Test Site:** DDT 3# Chamber
File Path: d:\ts\2024 report data\Q24101724-2E\FCC ABOVE1G\75
Memo: Sample NumberS24101724-001 Power Setting:NA

Test Graph



Data List										
NO	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable loss [dB]	AMP [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	1176.540	5.91	24.85	2.55	-52.55	-19.24	19.90	39.14	AV	Horizontal
2	1188.244	4.14	24.88	2.56	-52.57	-20.99	19.90	40.89	AV	Horizontal
3	1200.556	4.65	24.90	2.57	-52.59	-20.47	19.90	40.37	AV	Horizontal
4	1210.208	5.51	24.96	2.58	-52.60	-19.55	19.90	39.45	AV	Horizontal
5	1218.340	5.99	25.01	2.59	-52.61	-19.02	19.90	38.92	AV	Horizontal
6	1230.500	6.39	25.08	2.60	-52.63	-18.56	19.90	38.46	AV	Horizontal

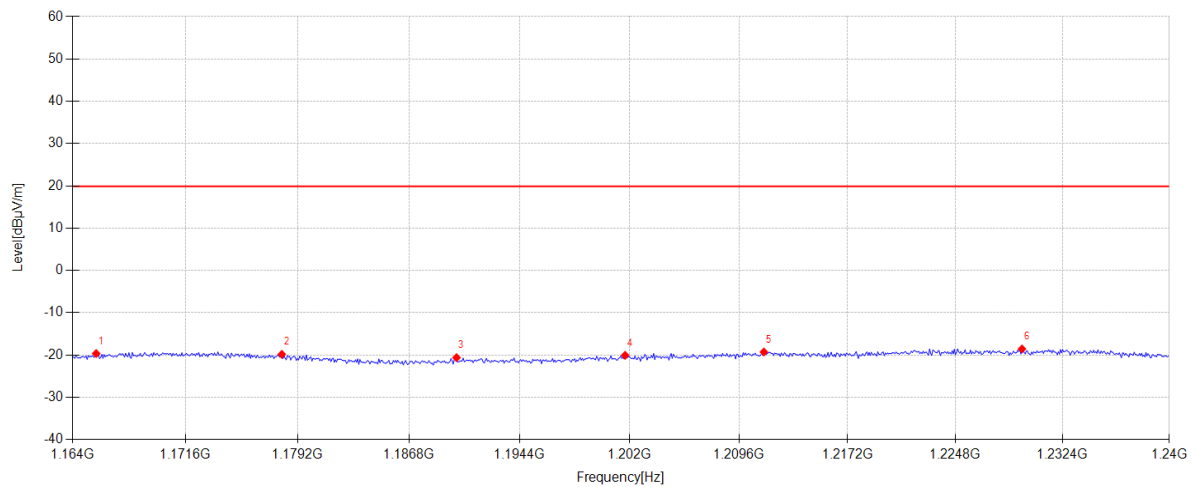
Note:

1. Level = Reading + Cable loss + Antenna Factor + AMP
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Date: 2024-11-04 **Tested By:** Zhong Nan
EUT: Smart Car Access Device **Model Number:** FBD6
Test Mode: CH9 TX Mode **Power Supply:** DC 12V
Condition: Temp:21.9°C;Humi:51.0% **Test Site:** DDT 3# Chamber
File Path: d:\ts\2024 report data\Q24101724-2E\FCC ABOVE1G\76
Memo: Sample NumberS24101724-001 Power Setting:NA

Test Graph



Data List										
NO	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable loss [dB]	AMP [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	1165.596	5.52	24.83	2.54	-52.54	-19.65	19.90	39.55	AV	Horizontal
2	1178.136	5.33	24.86	2.55	-52.56	-19.82	19.90	39.72	AV	Horizontal
3	1190.068	4.51	24.88	2.56	-52.57	-20.62	19.90	40.52	AV	Horizontal
4	1201.696	5.03	24.91	2.58	-52.59	-20.07	19.90	39.97	AV	Horizontal
5	1211.348	5.76	24.97	2.59	-52.60	-19.28	19.90	39.18	AV	Horizontal
6	1229.512	6.39	25.08	2.60	-52.63	-18.56	19.90	38.46	AV	Horizontal

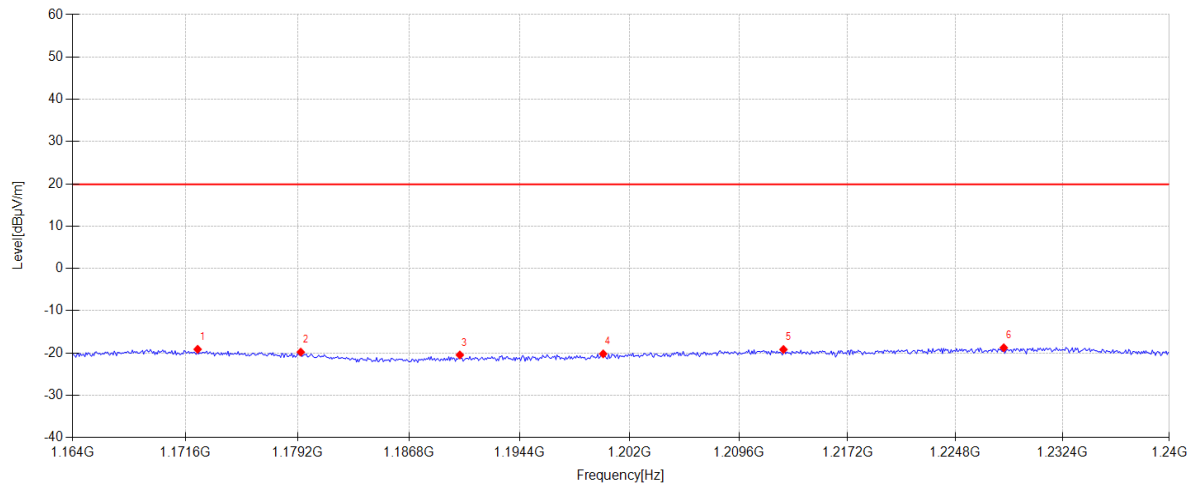
Note:

1. Level = Reading + Cable loss + Antenna Factor + AMP
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Date: 2024-11-04 **Tested By:** Zhong Nan
EUT: Smart Car Access Device **Model Number:** FBD6
Test Mode: CH9 TX Mode **Power Supply:** DC 12V
Condition: Temp:21.9°C;Humi:51.0% **Test Site:** DDT 3# Chamber
File Path: d:\ts\2024 report data\Q24101724-2E\FCC ABOVE1G\77
Memo: Sample NumberS24101724-001 Power Setting:NA

Test Graph



Data List										
NO	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable loss [dB]	AMP [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	1172.436	6.04	24.84	2.55	-52.55	-19.12	19.90	39.02	AV	Vertical
2	1179.428	5.36	24.86	2.55	-52.56	-19.79	19.90	39.69	AV	Vertical
3	1190.296	4.67	24.88	2.56	-52.57	-20.46	19.90	40.36	AV	Vertical
4	1200.176	4.92	24.90	2.57	-52.59	-20.20	19.90	40.10	AV	Vertical
5	1212.716	5.87	24.98	2.59	-52.61	-19.17	19.90	39.07	AV	Vertical
6	1228.220	6.20	25.07	2.60	-52.63	-18.76	19.90	38.66	AV	Vertical

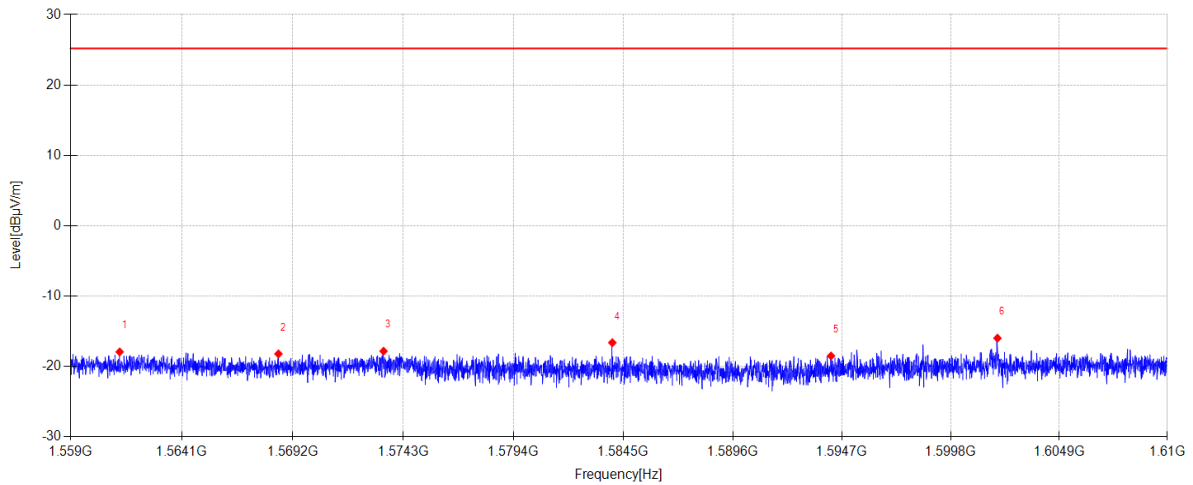
Note:

1. Level = Reading + Cable loss + Antenna Factor + AMP
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Date: 2024-11-04 **Tested By:** Zhong Nan
EUT: Smart Car Access Device **Model Number:** FBD6
Test Mode: CH8 TX Mode **Power Supply:** DC 12V
Condition: Temp:21.9°C;Humi:51.0% **Test Site:** DDT 3# Chamber
File Path: d:\ts\2024 report data\Q24101724-2E\FCC ABOVE1G\82
Memo: Sample NumberS24101724-001 Power Setting:NA

Test Graph



Data List

NO.	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable loss [dB]	AMP [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	1561.254	7.28	24.98	2.92	-53.11	-17.93	25.20	43.13	AV	Horizontal
2	1568.547	6.87	25.10	2.93	-53.12	-18.22	25.20	43.42	AV	Horizontal
3	1573.392	7.19	25.17	2.94	-53.13	-17.83	25.20	43.03	AV	Horizontal
4	1583.990	8.23	25.34	2.95	-53.14	-16.62	25.20	41.82	AV	Horizontal
5	1594.190	6.18	25.51	2.96	-53.16	-18.51	25.20	43.71	AV	Horizontal
6	1601.993	8.63	25.60	2.96	-53.17	-15.98	25.20	41.18	AV	Horizontal

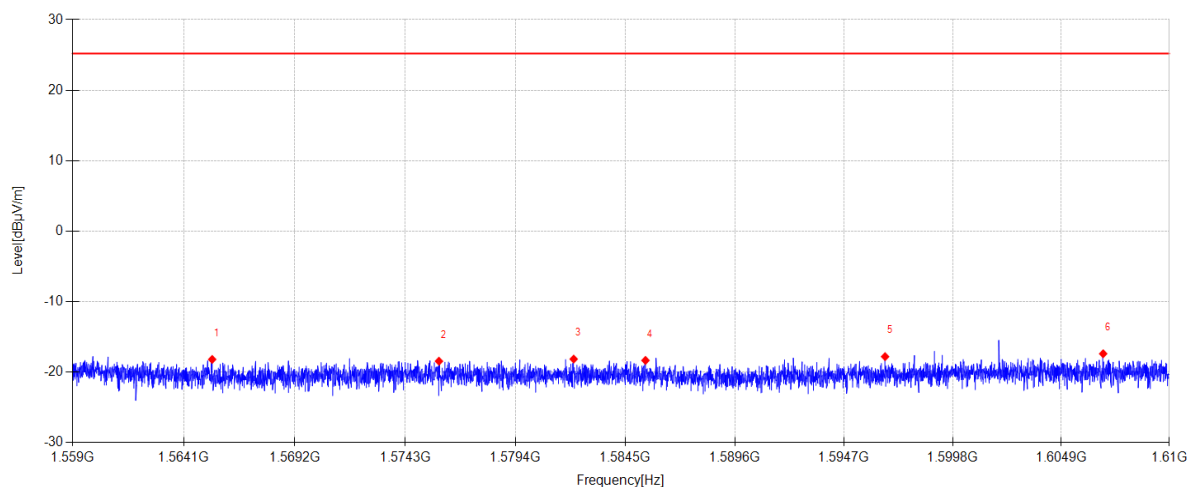
Note:

- Level = Reading + Cable loss + Antenna Factor + AMP
- If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Date: 2024-11-04 **Tested By:** Zhong Nan
EUT: Smart Car Access Device **Model Number:** FBD6
Test Mode: CH8 TX Mode **Power Supply:** DC 12V
Condition: Temp:21.9°C;Humi:51.0% **Test Site:** DDT 3# Chamber
File Path: d:\ts\2024 report data\Q24101724-2E\FCC ABOVE1G\83
Memo: Sample NumberS24101724-001 Power Setting:NA

Test Graph



Data List										
NO	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable loss [dB]	AMP [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	1565.406	6.93	25.05	2.93	-53.11	-18.20	25.20	43.40	AV	Horizontal
2	1575.861	6.53	25.21	2.94	-53.13	-18.45	25.20	43.65	AV	Horizontal
3	1582.103	6.74	25.31	2.94	-53.14	-18.15	25.20	43.35	AV	Horizontal
4	1585.438	6.48	25.37	2.95	-53.14	-18.34	25.20	43.54	AV	Horizontal
5	1596.628	6.85	25.55	2.96	-53.16	-17.80	25.20	43.00	AV	Horizontal
6	1606.879	7.20	25.61	2.97	-53.17	-17.39	25.20	42.59	AV	Horizontal

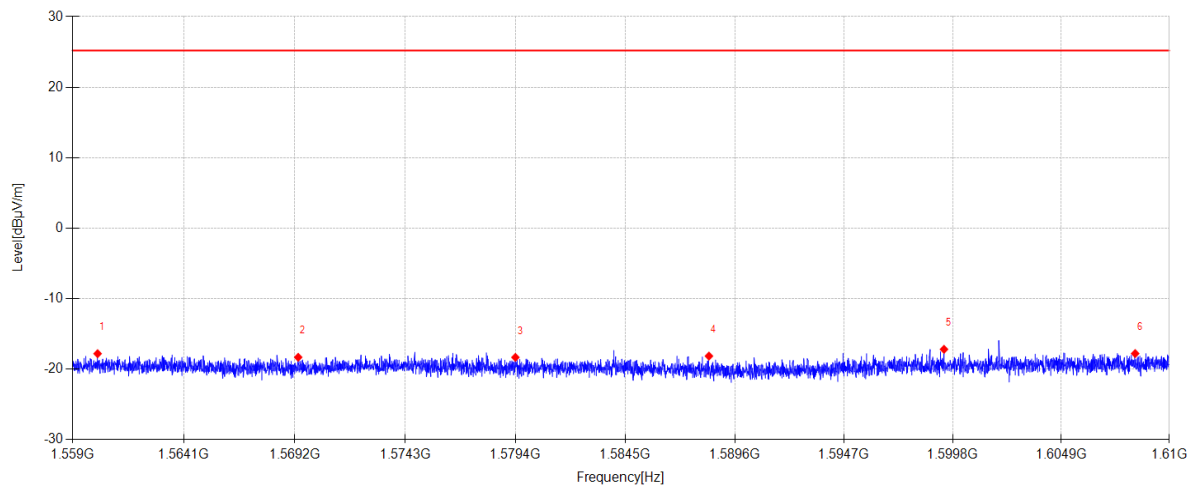
Note:

1. Level = Reading + Cable loss + Antenna Factor + AMP
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Date: 2024-11-04 **Tested By:** Zhong Nan
EUT: Smart Car Access Device **Model Number:** FBD6
Test Mode: CH9 TX Mode **Power Supply:** DC 12V
Condition: Temp:21.9°C;Humi:51.0% **Test Site:** DDT 3# Chamber
File Path: d:\ts\2024 report data\Q24101724-2E\FCC ABOVE1G\84
Memo: Sample NumberS24101724-001 Power Setting:NA

Test Graph



Data List										
NO	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable loss [dB]	AMP [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	1560.153	7.42	24.96	2.92	-53.11	-17.81	25.20	43.01	AV	Horizontal
2	1569.363	6.76	25.11	2.93	-53.12	-18.32	25.20	43.52	AV	Horizontal
3	1579.400	6.59	25.27	2.94	-53.13	-18.33	25.20	43.53	AV	Horizontal
4	1588.396	6.64	25.41	2.95	-53.15	-18.15	25.20	43.35	AV	Horizontal
5	1599.392	7.42	25.59	2.96	-53.16	-17.19	25.20	42.39	AV	Horizontal
6	1608.388	6.80	25.62	2.97	-53.18	-17.79	25.20	42.99	AV	Horizontal

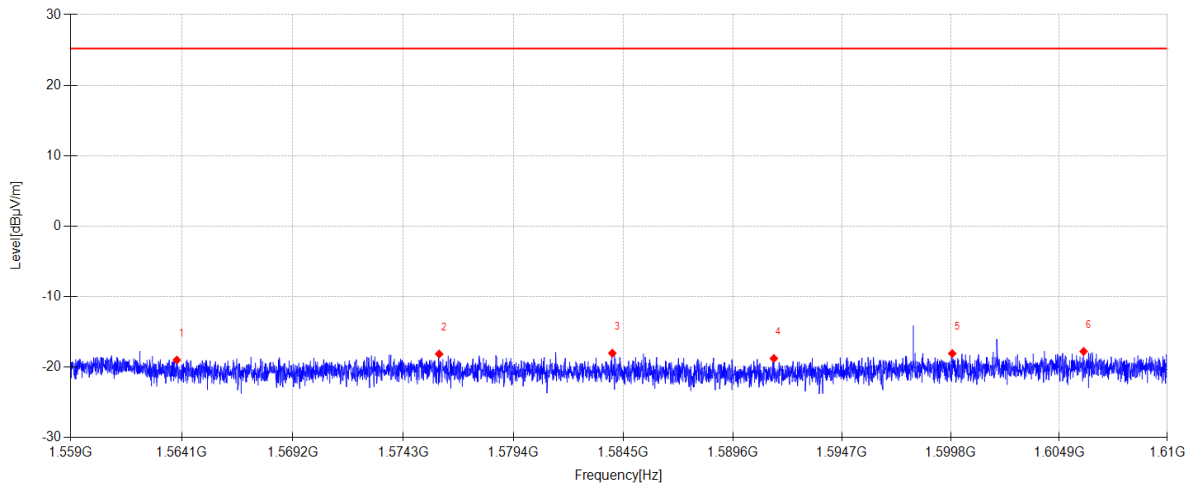
Note:

1. Level = Reading + Cable loss + Antenna Factor + AMP
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Date: 2024-11-04 **Tested By:** Zhong Nan
EUT: Smart Car Access Device **Model Number:** FBD6
Test Mode: CH9 TX Mode **Power Supply:** DC 12V
Condition: Temp:21.9°C;Humi:51.0% **Test Site:** DDT 3# Chamber
File Path: d:\ts\2024 report data\Q24101724-2E\FCC ABOVE1G\85
Memo: Sample NumberS24101724-001 Power Setting:NA

Test Graph



Data List										
NO	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable loss [dB]	AMP [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	1563.876	6.17	25.02	2.93	-53.11	-18.99	25.20	44.19	AV	Horizontal
2	1575.963	6.83	25.22	2.94	-53.13	-18.14	25.20	43.34	AV	Horizontal
3	1583.990	6.83	25.34	2.95	-53.14	-18.02	25.20	43.22	AV	Horizontal
4	1591.518	5.97	25.46	2.95	-53.15	-18.77	25.20	43.97	AV	Horizontal
5	1599.871	6.53	25.60	2.96	-53.16	-18.07	25.20	43.27	AV	Horizontal
6	1606.053	6.82	25.61	2.97	-53.17	-17.77	25.20	42.97	AV	Horizontal

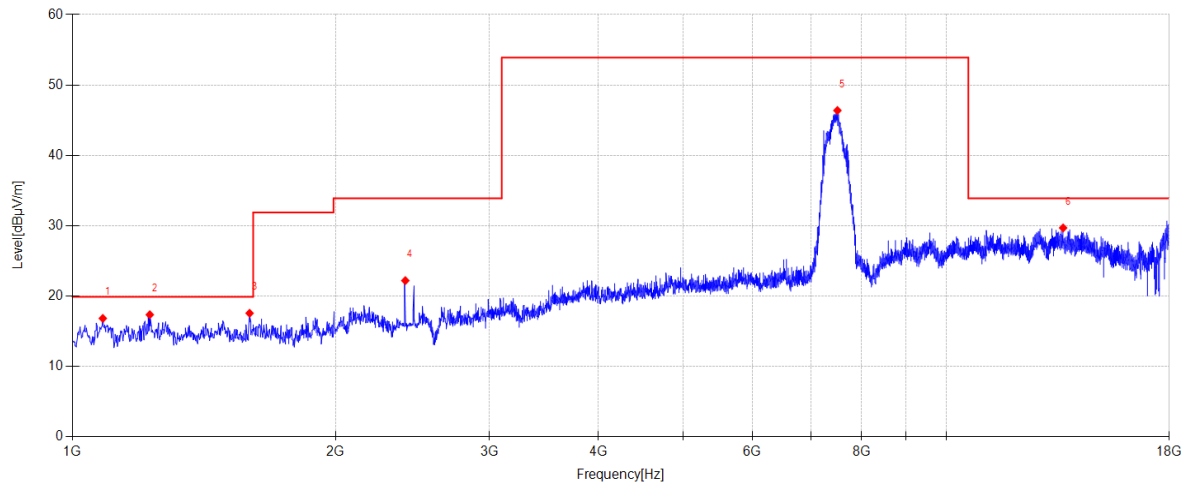
Note:

1. Level = Reading + Cable loss + Antenna Factor + AMP
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Date: 2024-11-04 **Tested By:** Zhong Nan
EUT: Smart Car Access Device **Model Number:** FBD6
Test Mode: CH8 TX Mode **Power Supply:** DC 12V
Condition: Temp:21.9°C;Humi:51.0% **Test Site:** DDT 3# Chamber
File Path: d:\ts\2024 report data\Q24101724-2E\FCC ABOVE1G\70
Memo: Sample NumberS24101724-001 Power Setting:NA

Test Graph



Data List

NO.	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable loss [dB]	AMP [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	1083.300	42.32	24.47	2.46	-52.42	16.83	19.90	3.07	AV	Horizontal
2	1226.100	42.32	25.06	2.60	-52.63	17.35	19.90	2.55	AV	Horizontal
3	1595.000	42.24	25.52	2.96	-53.16	17.56	19.90	2.34	AV	Horizontal
4	2404.200	45.56	27.31	3.58	-54.25	22.20	33.90	11.70	AV	Horizontal
5	7507.600	59.73	36.48	6.27	-56.10	46.38	53.90	7.52	AV	Horizontal
6	13608.900	36.22	40.40	8.43	-55.36	29.69	33.90	4.21	AV	Horizontal

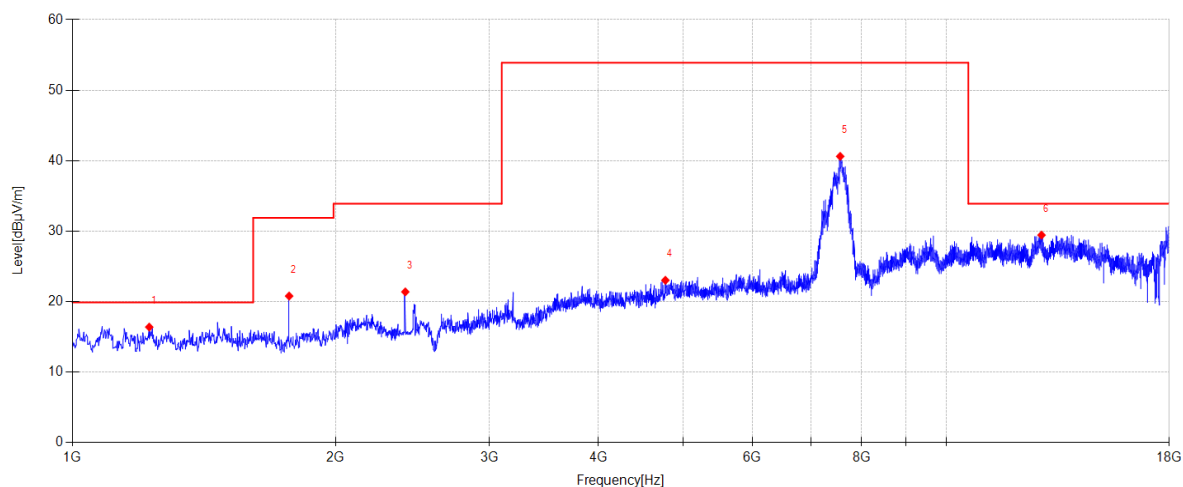
Note:

- Level = Reading + Cable loss + Antenna Factor + AMP
- If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Date: 2024-11-04 **Tested By:** Zhong Nan
EUT: Smart Car Access Device **Model Number:** FBD6
Test Mode: CH8 TX Mode **Power Supply:** DC 12V
Condition: Temp:21.9°C;Humi:51.0% **Test Site:** DDT 3# Chamber
File Path: d:\ts\2024 report data\Q24101724-2E\FCC ABOVE1G\71
Memo: Sample NumberS24101724-001 Power Setting:NA

Test Graph



Data List										
NO	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable loss [dB]	AMP [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	1224.400	41.36	25.05	2.60	-52.62	16.39	19.90	3.51	AV	Vertical
2	1770.100	45.77	25.30	3.13	-53.41	20.79	31.90	11.11	AV	Vertical
3	2404.200	44.75	27.31	3.58	-54.25	21.39	33.90	12.51	AV	Vertical
4	4770.600	40.80	32.38	5.03	-55.18	23.03	53.90	30.87	AV	Vertical
5	7562.000	53.94	36.42	6.30	-56.05	40.61	53.90	13.29	AV	Vertical
6	12855.800	36.63	39.86	8.34	-55.39	29.44	33.90	4.46	AV	Vertical

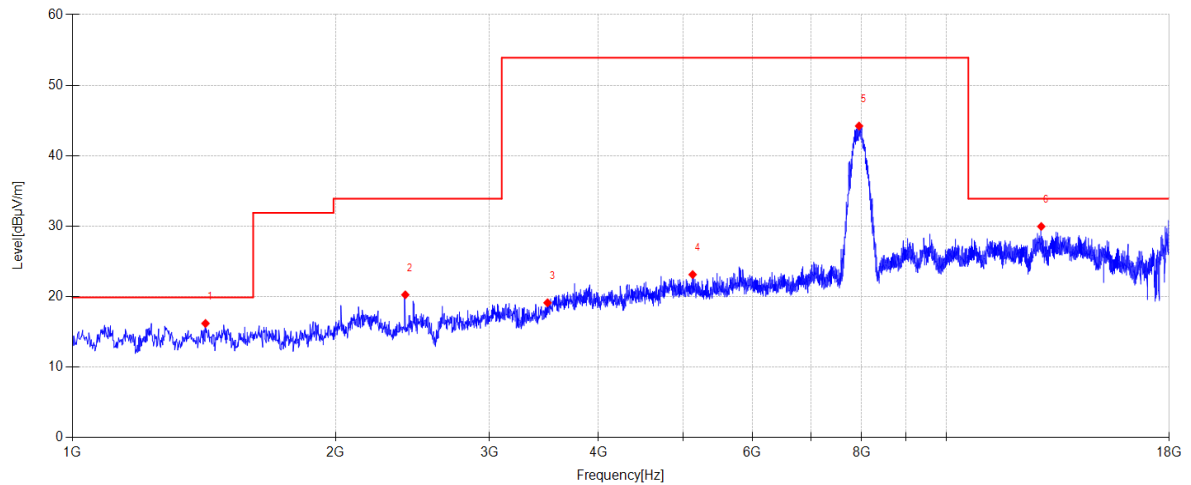
Note:

- Level = Reading + Cable loss + Antenna Factor + AMP
- If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Date: 2024-11-04 **Tested By:** Zhong Nan
EUT: Smart Car Access Device **Model Number:** FBD6
Test Mode: CH9 TX Mode **Power Supply:** DC 12V
Condition: Temp:21.9°C;Humi:51.0% **Test Site:** DDT 3# Chamber
File Path: d:\ts\2024 report data\Q24101724-2E\FCC ABOVE1G\72
Memo: Sample NumberS24101724-001 Power Setting:NA

Test Graph



Data List										
NO	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable loss [dB]	AMP [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	1419.900	41.13	25.18	2.79	-52.90	16.20	19.90	3.70	AV	Horizontal
2	2404.200	43.62	27.31	3.58	-54.25	20.26	33.90	13.64	AV	Horizontal
3	3497.300	40.17	29.87	4.21	-55.12	19.13	53.90	34.77	AV	Horizontal
4	5125.900	39.63	33.40	5.26	-55.16	23.13	53.90	30.77	AV	Horizontal
5	7947.900	56.26	37.10	6.56	-55.71	44.21	53.90	9.69	AV	Horizontal
6	12845.600	37.16	39.85	8.34	-55.39	29.96	33.90	3.94	AV	Horizontal

Note:

- Level = Reading + Cable loss + Antenna Factor + AMP
- If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Date:

2024-11-04

Tested By:

Zhong Nan

EUT:

Smart Car Access Device

Model Number:

FBD6

Test Mode:

CH9 TX Mode

Power Supply:

DC 12V

Condition:

Temp:21.9°C;Humi:51.0%

Test Site:

DDT 3# Chamber

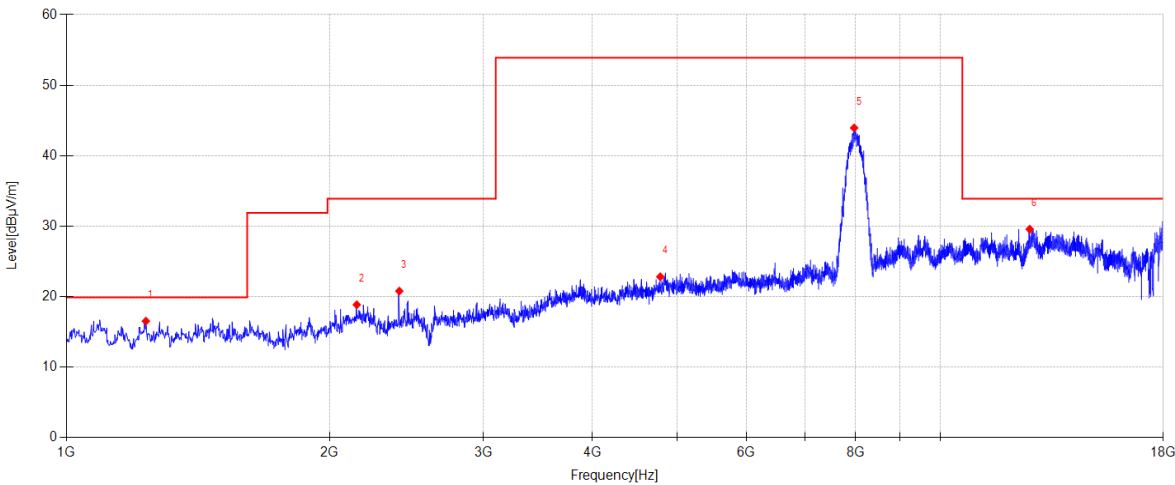
File Path:

d:\ts\2024 report data\Q24101724-2E\FCC ABOVE1G\73

Memo:

Sample NumberS24101724-001 Power Setting:NA

Test Graph



Data List										
NO	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable loss [dB]	AMP [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	1232.900	41.46	25.10	2.61	-52.64	16.53	19.90	3.37	AV	Vertical
2	2149.200	41.85	27.50	3.43	-53.93	18.85	33.90	15.05	AV	Vertical
3	2404.200	44.15	27.31	3.58	-54.25	20.79	33.90	13.11	AV	Vertical
4	4782.500	40.53	32.43	5.04	-55.18	22.82	53.90	31.08	AV	Vertical
5	7970.000	55.95	37.10	6.58	-55.69	43.94	53.90	9.96	AV	Vertical
6	12658.600	37.22	39.52	8.26	-55.43	29.57	33.90	4.33	AV	Vertical

Note:

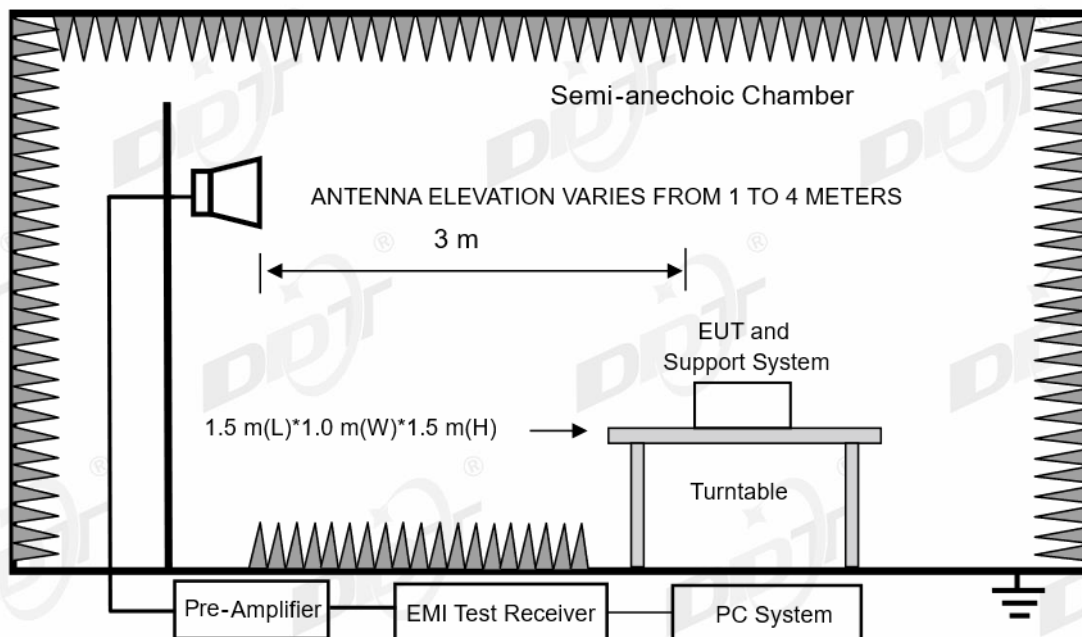
1. Level = Reading + Cable loss + Antenna Factor + AMP

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

7. Peak Emissions in a 50 MHz bandwidth

7.1. Block diagram of test setup



Note: For harmonic emissions test an appropriate high pass filter was inserted in the input port of AMP.

7.2. Limit

According to FCC Part 15.519(e):

There is a limit on the peak level of the emissions contained within a 50 MHz bandwidth centered on the frequency at which the highest radiated emission occurs, f_M. That limit is 0 dBm EIRP.

7.3. Test procedure

Same with clause 6.3 except the EUT should be in the receiving Mode.

- (1) EUT height should be 0.8 m for below 1 GHz at a semi-anechoic chamber while EUT height should be 1.5 m for above 1 GHz at full chamber or semi-anechoic chamber ground with absorbers.
- (2) Measurements were made with the antenna positioned in both the horizontal and vertical planes of Polarization, and the measurement antenna was varied from 1 m to 4 m. in height above the reference ground plane to obtain the maximum signal strength.
- (3) Below pre-scan procedure was first performed in order to find prominent frequency spectrum radiated emissions from 9 kHz to 40 GHz:
 - (a) Scanning the peak frequency spectrum with the antenna specified in step (3), and the EUT was rotated 360 degree, the antenna height was varied from 1 m to 4 m (Except loop antenna, it's fixed 1m above ground.)
 - (b) Change work frequency or channel of device if practicable.

- (c) Change modulation type of device if practicable.
 - (d) Change power supply range from 85% to 115% of the rated supply voltage
 - (e) Rotated EUT though three orthogonal axes to determine the attitude of EUT arrangement produces highest emissions.
- (4) For final emissions measurements at each frequency of interest, the EUT was rotated and the antenna height was varied between 1 m and 4 m in order to maximize the emission. Measurements in both horizontal and vertical polarities were made and the data was recorded. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.10 2013 on Radiated Emission test.

7.4. Test result

Channel (GHz)	Reading Level (dBμV/m)	EIRP (dBm/ MHz)	EIRP (dBm/ 50 MHz)	Limit (dBm/ 50 MHz)	Verdict
7.22 – 7.738	51.73	-43.57	-9.57	0	Pass
7.73 – 8.25	51.43	-43.87	-9.87	0	Pass

Note: 1. The correct factor of RBW 1 MHz to 50 MHz is $20\log(1\text{MHz}/ 50 \text{ MHz})=-34$

2. $E[\text{dB}\mu\text{V}/\text{m}] = \text{EIRP} [\text{dBm}]+95.3$, for $d=3$ meters.

d: The test distance

TR-4-E-009 Radiated Emission Test Result

Test Date:

2024-11-09

Tested By:

Zhong Nan

EUT:

Smart Car Access Device

Model Number:

FBD6

Test Mode:

CH8 TX Mode

Power Supply:

DC 12V

Condition:

Temp:21.9°C;Humi:51.0%

Test Site:

DDT 3# Chamber

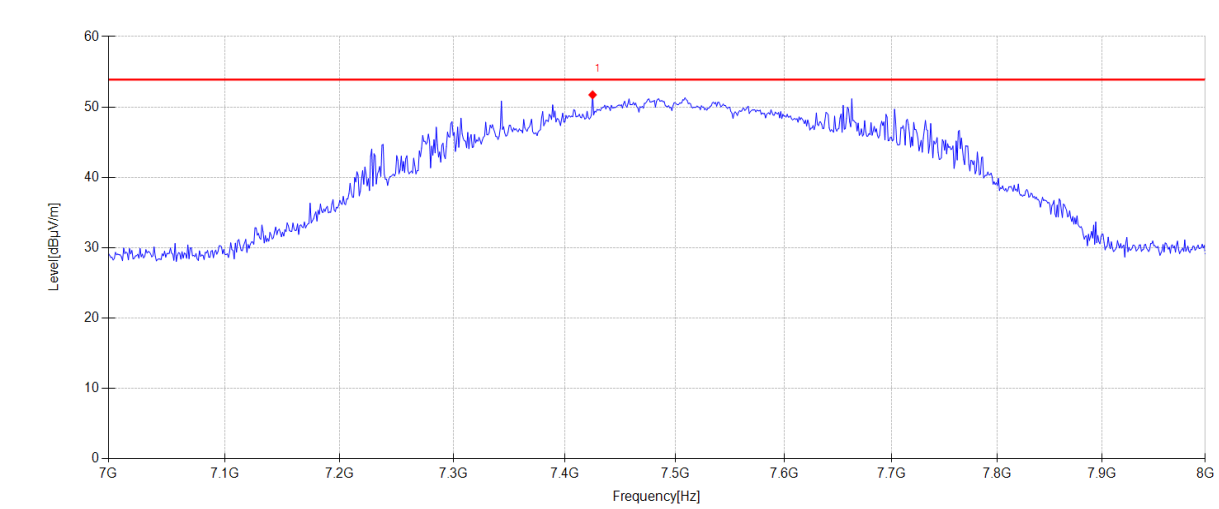
File Path:

d:\ts\2024 report data\Q24101724-2E\FCC ABOVE1G\100

Memo:

Sample NumberS24101724-001 Power Setting:NA

Test Graph



Data List										
NO.	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable loss [dB]	AMP [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	7425.000	65.05	36.65	6.21	-56.18	51.73	53.90	2.17	PK	Horizontal

Note:

1. Level = Reading + Cable loss + Antenna Factor + AMP

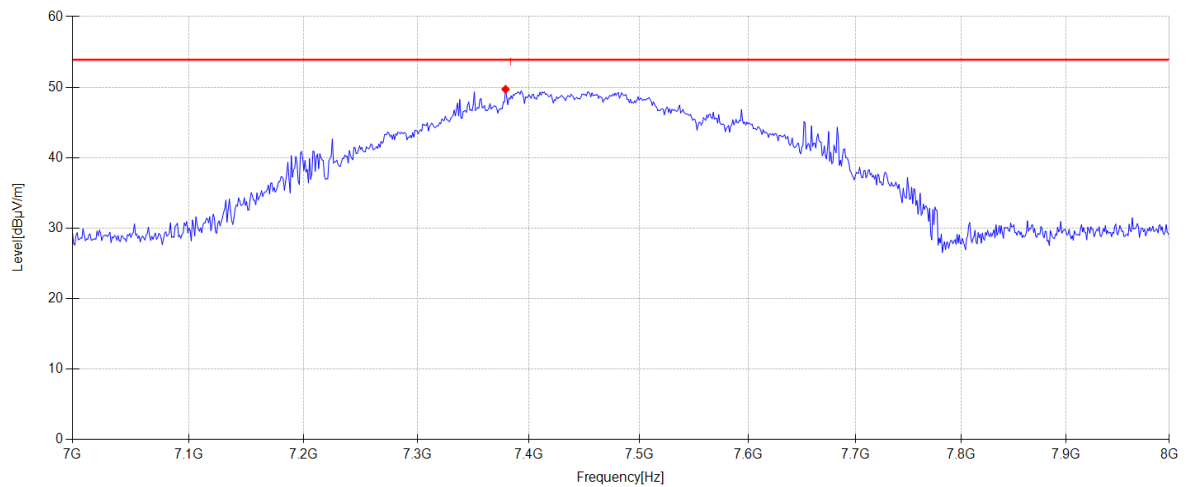
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Date: 2024-11-09 **Tested By:** Zhong Nan
EUT: Smart Car Access Device **Model Number:** FBD6
Test Mode: CH8 TX Mode **Power Supply:** DC 12V
Condition: Temp:21.9°C;Humi:51.0% **Test Site:** DDT 3# Chamber
File Path: d:\ts\2024 report data\Q24101724-2E\FCC ABOVE1G\101
Memo: Sample NumberS24101724-001 Power Setting:NA

Test Graph



Data List										
NO	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable loss [dB]	AMP [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	7379.000	63.01	36.74	6.18	-56.22	49.71	53.90	4.19	PK	Vertical

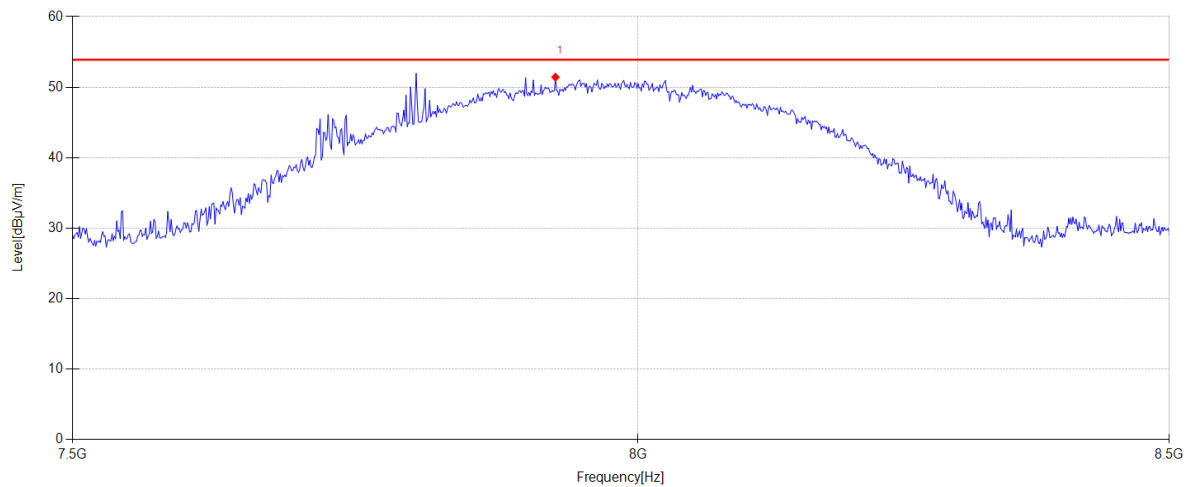
Note:

- Level = Reading + Cable loss + Antenna Factor + AMP
- If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Date: 2024-11-09 **Tested By:** Zhong Nan
EUT: Smart Car Access Device **Model Number:** FBD6
Test Mode: CH9 TX Mode **Power Supply:** DC 12V
Condition: Temp:21.9°C;Humi:51.0% **Test Site:** DDT 3# Chamber
File Path: d:\ts\2024 report data\Q24101724-2E\FCC ABOVE1G\102
Memo: Sample NumberS24101724-001 Power Setting:NA

Test Graph



Data List										
NO	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable loss [dB]	AMP [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	7925.000	63.56	37.05	6.55	-55.73	51.43	53.90	2.47	PK	Horizontal

Note:

1. Level = Reading + Cable loss + Antenna Factor + AMP
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

TR-4-E-009 Radiated Emission Test Result

Test Date:

2024-11-09

Tested By:

Zhong Nan

EUT:

Smart Car Access Device

Model Number:

FBD6

Test Mode:

CH9 TX Mode

Power Supply:

DC 12V

Condition:

Temp:21.9°C;Humi:51.0%

Test Site:

DDT 3# Chamber

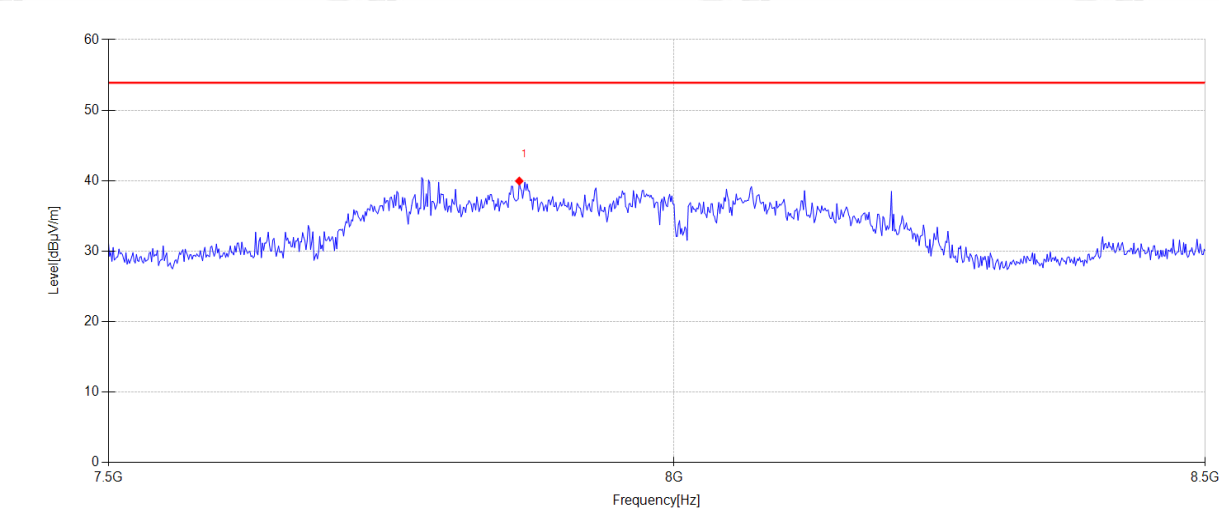
File Path:

d:\ts\2024 report data\Q24101724-2E\FCC ABOVE1G\103

Memo:

Sample NumberS24101724-001 Power Setting:NA

Test Graph



Data List										
NO	Freq. [MHz]	Reading [dBμV/m]	Antenna Factor [dB]	Cable loss [dB]	AMP [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Detector	Polarity
1	7860.000	52.32	36.92	6.50	-55.79	39.95	53.90	13.95	PK	Vertical

Note:

1. Level = Reading + Cable loss + Antenna Factor + AMP

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

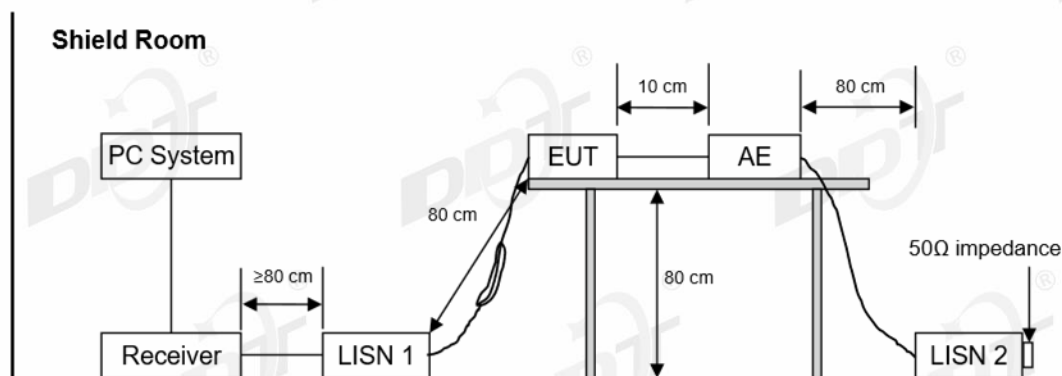
3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

8. Power Line Conducted Emission

8.1. Test equipment

Equipment	Manufacturer	Model No.	Serial No.	Cal Due To
Conducted Radiated Software	Audix	E3	DDT-ZC00562	/
RF Cable	Yuhu Technology	Z806-NJ-NJ-6 M	DDT-ZC02004	2025/07/08
Δ -shaped artificial power network	SCHWARZBECK	PVDC 8301	DDT-ZC03939	2025/03/31
Two Line V-Network	R&S	ENV216	DDT-ZC02056	2025/07/08
Pulse Limiter	SCHWARZBECK	VTSD 9561	DDT-ZC02128	2025/07/08
Two Line V-Network	R&S	ENV216	DDT-ZC02059	2025/07/08
EMI Test Receiver	R&S	ESCI/E3	DDT-ZC01297	2025/07/08
Three-phase artificial power network	SCHWARZBECK	NSLK 8163	DDT-ZC01572	2025/07/08

8.2. Block diagram of test setup



8.3. Power Line Conducted Emission Limits (Class B)

Frequency	Quasi-Peak Level dB(μ V)	Average Level dB(μ V)
150 kHz ~ 500 kHz	66 ~ 56*	56 ~ 46*
500 kHz ~ 5 MHz	56	46
5 MHz ~ 30 MHz	60	50

Note 1: * Decreasing linearly with logarithm of frequency.

Note 2: The lower limit shall apply at the transition frequencies.

8.4. Test procedure

The EUT and Support equipment, if needed, were put placed on a non-metallic table, 80cm above the ground plane.

All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.

All support equipment power received from a second LISN.

Emissions were measured on each current carrying line of the EUT using an EMI Test Receiver connected to the LISN powering the EUT.

The Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.

During the above scans, the emissions were maximized by cable manipulation.

After the preliminary scan, we found the test mode producing the highest emission level.

The EUT configuration and worse cable configuration of the above highest emission levels were recorded for reference of the final test.

EUT and support equipment were set up on the test bench as per the configuration with highest emission level in the preliminary test.

A scan was taken on both power lines, Neutral and Line, recording at least the six highest emissions.

Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit.

The test data of the worst-case condition(s) was recorded.

The bandwidth of test receiver is set at 9 kHz.

8.5. Test result

N/A

Measurements to demonstrate compliance with the conducted limits are not required for devices which only employ Battery power for operation and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines.

9. Antenna Requirements

9.1. Limit

For intentional device, according to FCC 47 CFR Section 15.203, 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. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For intentional device, according to RSS-Gen issue 5 section 6.8.

The applicant for equipment certification shall provide a list of all antenna types that may be used with the transmitter, where applicable (i.e. for transmitters with detachable antenna), indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna. The test report shall demonstrate the compliance of the transmitter with the limit for maximum equivalent isotropically radiated power (e.i.r.p.) specified in the applicable RSS, when the transmitter is equipped with any antenna type, selected from this list.

9.2. Result

The antenna used for this product as Antenna information described in section 2.1 of the report, and there is no other antenna than that furnished by the responsible party shall be used with the device.

10. Test Setup Photograph





11. Photos of the EUT

Please refer to DDT-Q24101724-1E appendix I

END OF REPORT