

FCC/IC TEST REPORT

Reference No. : GPWL2006001187EG

Applicant : Mobile Appliance, Inc.

Equipment Under Test (EUT) :

Product Name : UTR 2.0 Rear

Model Name : UTR 2.0 Rear

Alt. Model Name : Porsche Dashcam Rear,

Universal Traffic Recorder 2 Rear

FCC Authorization Type : Certificate of Conformity

Applied Standards : FCC Part 15 Subpart B, Class B,

ICES-003 Issue 6: 2019,

ANSI C 63.4:2014

FCC ID : WHBUTR2R

IC Certification : 22539-UTR2R

Date of Receipt : June 16, 2020

Date of Test : June 25, 2020

Date of Issue : July 24, 2020

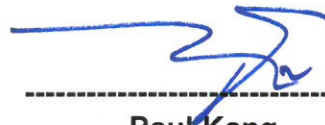
Test Results : Complied

Tested by :



Yongtae Yu

Reviewed by :



Paul Kang

This test report does not assure KOLAS accreditation.

1) The results of this test report are effective only to the items tested.

2) The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received.

Remarks :

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/terms_e-document.htm.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This Test Report cannot be reproduced, except in full

Contents

1. General Information.....	4
1.1 Client Information.....	4
1.2 Test Laboratory.....	4
1.3 General Information of E.U.T.	4
1.4 Operating Modes and Conditions.....	5
1.5 Auxiliary Equipments	5
1.6 Cable List.....	5
1.7 System Configurations.....	5
1.8 Test System Layout	5
1.9 Modifications	5
1.10 Applicable Standards for Testing	5
1.11 Summary of Test Results.....	5
2. Emission Test.....	6
2.1 Test Results.....	6
2.2 Test Method and Limits.....	6
2.2.1 Test Method.....	6
2.2.2 Test Limits	6
2.3 Radiated Emission	7
2.4.1 Test Equipments.....	7
2.3.2 Test Site	7
2.3.3 Environment Conditions and data.....	7
Appendix A : Radiated Emission	10



Revision History

Revision	Report Number	Description
0	F690501-RF-EMG000272	Initial
1		
2		



1. General Information

1.1 Client Information

Applicant : Mobile Appliance, Inc.
- Address of Applicant : 1701~1706, 401, Simin-daero, Dongan-gu, Anyang-si, Gyeonggi-do, Republic of Korea.

Manufacturer : Mobile Appliance, Inc.
- Address of Manufacturer : 1701~1706, 401, Simin-daero, Dongan-gu, Anyang-si, Gyeonggi-do, Republic of Korea.

1.2 Test Laboratory

Name and Address : SGS Korea Co., Ltd.
- Giheung 1 Laboratory : 35, Giheungdanji-ro 121beon-gil, Giheung-gu, Yongin-si, Gyeonggi-do, Republic of Korea
- Giheung 2 Laboratory : 23, Giheungdanji-ro 24beon-gil, Giheung-gu, Yongin-si, Gyeonggi-do, Republic of Korea
- Gunpo Laboratory : 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, 15807, Republic of Korea.

FCC Registration No. : KR0150
IC Registration No. : 7837B

Phone : + 82 31 428 5700
Fax : + 82 31 427 2370
e-mail : paul.kang@sgs.com

1.3 General Information of E.U.T.

Classification	Description
Product Name	UTR 2.0 Rear
Model Name	UTR 2.0 Rear
Alt. Model Name	Porsche Dashcam Rear, Universal Traffic Recorder 2 Rear
Model Differences	Porsche Dashcam Rear and Universal Traffic Recorder 2 Rear are no different from UTR 2.0 Rear except that they are added to manage model names by buyer.
Serial No.	None
EMI Classification	Class B
Test Voltage	12 Vd.c.
Rated Voltage	12 Vd.c.
Highest Internal Frequency	24 GHz

1.4 Operating Modes and Conditions

Operating Mode	Operating Condition
1) Live View & REC	Rear Live Video record to the SD card

1.5 Auxiliary Equipments

Description	Model	Serial No.	Manufacturer	FCC ID
Car Battery	-	-	-	
Mobile Phone	SHV-E330S	-	Samsung	
UTR 2.0	UTR 2.0	-	Mobile Appliance, Inc.	

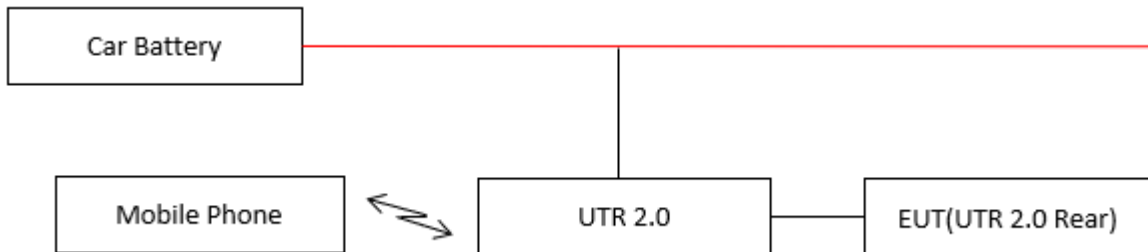
1.6 Cable List

Start		END		Cable Spec.		Used core
Name	I/O Port	Name	I/O Port	Length	Shield	
Car Battery	DC OUT	UTR 2.0	DC IN	0.8	Unshield	No.
UTR 2.0	-	EUT(UTR 2.0 Rear)	Aux	3.5	Unshield	No.

1.7 System Configurations

Description	Model	Serial No.	Manufacturer
UTR2.0(C)-REAR	-	-	-

1.8 Test System Layout



1.9 Modifications

There was no modified item during the test.

1.10 Applicable Standards for Testing

Standards	Status	Deviation
FCC Part 15 Subpart B, ICES-003 Issue 6: 2019	Applicable	No Deviation

1.11 Summary of Test Results

Test Item	Standards	Results
Radiated Emission	FCC Part 15 Subpart B Section 15.109, ICES-003 Issue 6: 2019, ANSI C 63.4:2014	Complied

Note : Test methods of all test items are performed according to the basic standards in this table.

EMISSION

2.1 Test Results

Test Items	Basic Standards	Test Results
Radiated Emission	FCC Part 15 Subpart B Section 15.109, ICES-003 Issue 6: 2019, ANSI C 63.4:2014	Complied

2.2 Test Method and Limits

2.2.1 Test Method

Test Items	Measuring Frequency Range	RBW	Measuring Distance
Radiated Emission	30 MHz ~ 1 GHz	120 kHz	10 m & 3 m
	Above 1 GHz	1 MHz	3 m

Note : 10 m method of radiated emission measurement is only applied to Class A equipment over the frequency range of 30 MHz ~ 1 GHz. Except this, 3 m method is applied to Class B equipment over the frequency range of 30 MHz ~ 1 GHz and Class A and Class B equipment above 1 GHz.

2.2.2 Test Limits

-Radiated Emission Limits below 1 GHz

Frequency Range	Limits(dB(μ V/m))	Class
	Quasi-peak	
30 MHz ~ 88 MHz	39.1	Class A (10m method)
88 MHz ~ 216 MHz	43.5	
216 MHz ~ 960 MHz	46.4	
960 MHz ~ 1 GHz	49.5	
30 MHz ~ 88 MHz	40.0	Class B (3m method)
88 MHz ~ 216 MHz	43.5	
216 MHz ~ 960 MHz	46.0	
960 MHz ~ 1 GHz	54.0	

-Radiated Emission Limits above 1 GHz (3m method)

Frequency Range	Limits(dB(μ V/m))		Class
	Average	Peak	
Above 1 GHz	59.5	79.5	Class A
Above 1 GHz	54.0	74.0	Class B

Note : The limits of class A equipment is extrapolated using an extrapolation factor of 20 dB/decade because it was measured at 3 m distance not 10 m distance.

2.3 Radiated Emission

The initial preliminary exploratory scans were performed at 3 m distance over the measuring frequency range(30 MHz to 40 GHz) using a max hold mode incorporating a Peak detector and using the software of EP5RE(Version Ver5.3.70 from TOYO). The final test data was measured using a Quasi-Peak detector below 1 GHz at 3 m distance and a Peak and Average detector above 1 GHz at 3 m distance. Measurements were made with the antenna positioned in both the horizontal and vertical planes of polarization. The antenna height was varied from 1 m to 4 m and the EUT was rotated 360° to find the maximum emitting point for each frequency.

2.4.1 Test Equipments

Description	Model No.	Manufacturer	S/N	Cal Due. Date
Horn Antenna (KOLAS)	HF906	R & S	100326	2021.02.14
Signal Conditioning Unit	SCU 18	R & S	10117	2021.06.10
Test Receiver	ESU26	R & S	100109	2021.02.18
Bilog Antenna	VULB9163	SCHWARZBECK	01126	2021.04.23
Amplifier	8447F	HP	2944A03909	2020.08.07
PREAMPLIFIER	TK-PA1840H	TESTEK	130016	2021.01.06
Horn Antenna	BBHA9170	SCHWARZBECK	540	2020.07.24
Test Receiver	ESW44	R & S	101767	2020.11.01
3m SEMI-ANECHOIC CHAMBER	-	SY CORPORATION	-	-

Note : The Bilog Antenna calibration period is 2 years, but the other equipment calibration period are 1 year.

2.3.2 Test Site

3m SEMI-ANECHOIC CHAMBER Gunpo Laboratory (Below 1 GHz, Above 1 GHz)

2.3.3 Environment Conditions and data

Radiated Emission Test

- Below 1 GHz

Temperature (Minimum 22.3, Maximum 24.7) °C ,
Humidity (Minimum 31.0, Maximum 31.0) % R.H.,
Atmospheric Pressure (Minimum 100.5, Maximum 100.5) kPa

Test Date : June 25, 2020

- Above 1 GHz

Temperature (Minimum 22.3, Maximum 24.7) °C ,
Humidity (Minimum 31.0, Maximum 31.0) % R.H.,
Atmospheric Pressure (Minimum 100.5, Maximum 100.5) kPa

Test Date : June 25, 2020

Radiated Emission Test Data

- Below 1 GHz (3 m method)

Freq. (MHz)	Reading (dB μ V)	Pol. (H/V)	A (°)	H (cm)	AF (dB/m)	CL (dB)	Amp. (dB)	F/S (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
396.01	34.00	H	2	195	21.52	2.28	28.06	29.74	46.00	16.26
396.01	39.70	V	345	100	21.52	2.28	28.06	35.44	46.00	10.56
423.40	29.60	H	1	100	22.00	2.41	28.29	25.72	46.00	20.28
478.53	31.50	V	3	100	22.57	2.67	28.67	28.07	46.00	17.93
830.90	33.80	V	185	205	27.14	3.72	28.38	36.28	46.00	9.72
831.03	31.80	H	96	195	27.14	3.72	28.38	34.28	46.00	11.72

Measurement Uncertainty (Horizontal) : 5.01 dB (The confidential level is about 95%, k=2)

Measurement Uncertainty (Vertical) : 5.38 dB (The confidential level is about 95%, k=2)

Note: • AF = Antenna Factor

• Pol.(H) = Horizontal

• Margin = Limit – F/S

• A : Angle

• CL = Cable Loss

• Pol.(V) = Vertical

• F/S = Level + AF + CL – Amp.

• H : Height

• F/S = Field Strength

• Amp. = Amplifier Gain

- Above 1 GHz (3 m method)

(1 GHz ~ 18 GHz)

Freq. (MHz)	Level (dB μ V)		Pol. (H/V)	A (°)	H (cm)	AF (dB)	CL (dB)	Amp. (dB)	CF (dB)	F/S (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
	Peak	C-AV										
1485.21	53.40	-	H	323	100	24.93	6.92	45.90	0.00	39.35	74.00	34.65
1485.21	-	37.90	H	323	100	24.93	6.92	45.90	0.00	23.85	54.00	30.15
2261.54	49.80	-	V	359	100	27.65	8.58	45.70	0.00	40.33	74.00	33.67
2261.54	-	41.70	V	359	100	27.65	8.58	45.70	0.00	32.23	54.00	21.77
6857.92	44.60	-	V	347	100	35.22	14.89	45.97	0.00	48.74	74.00	25.26
6857.92	-	36.40	V	347	100	35.22	14.89	45.97	0.00	40.54	54.00	13.46
11410.37	42.70	-	H	242	100	38.22	19.15	45.18	0.00	54.89	74.00	19.11
11410.37	-	34.60	H	242	100	38.22	19.15	45.18	0.00	46.79	54.00	7.21
16020.21	41.80	-	H	140	100	18.93	22.88	45.51	0.00	38.10	74.00	35.90
16020.21	-	33.90	H	140	100	18.93	22.88	45.51	0.00	30.20	54.00	23.80
17572.16	42.80	-	V	330	200	43.63	24.27	46.43	0.00	64.27	74.00	9.73
17572.16	-	24.40	V	330	200	43.63	24.27	46.43	0.00	45.87	54.00	8.13

(18 GHz ~ 30 GHz)

Freq. (MHz)	Level (dB μ V)		Pol. (H/V)	A (°)	H (cm)	AF (dB)	CL (dB)	Amp. (dB)	CF (dB)	F/S (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
	Peak	C-AV										
19790.50	57.70	-	H	21	100	38.26	2.38	50.10	0.00	48.24	74.00	25.76
19790.50	-	44.50	H	21	100	38.26	2.38	50.10	0.00	35.04	54.00	18.96
19823.00	56.80	-	V	250	100	38.26	2.41	50.10	0.00	47.37	74.00	26.63
19823.00	-	43.60	V	250	100	38.26	2.41	50.10	0.00	34.17	54.00	19.83
28539.00	59.20	-	H	271	100	40.52	8.56	49.50	0.00	58.78	74.00	15.22
28539.00	-	49.00	H	271	100	40.52	8.56	49.50	0.00	48.58	54.00	5.42
28704.50	58.60	-	V	113	100	40.58	8.86	49.50	0.00	58.54	74.00	15.46
28704.50	-	49.80	V	113	100	40.58	8.86	49.50	0.00	49.74	54.00	4.26
28994.50	58.80	-	H	154	100	40.70	9.39	49.50	0.00	59.39	74.00	14.61
28994.50	-	49.40	H	154	100	40.70	9.39	49.50	0.00	49.99	54.00	4.01
29222.50	58.90	-	V	94	100	40.70	8.43	49.50	0.00	58.53	74.00	15.47
29222.50	-	49.40	V	94	100	40.70	8.43	49.50	0.00	49.03	54.00	4.97

Note. We have also tested from 30 GHz to 40 GHz and found no emissions.

Measurement Uncertainty (Horizontal) : 5.33 dB (The confidential level is about 95%, $k=2$)

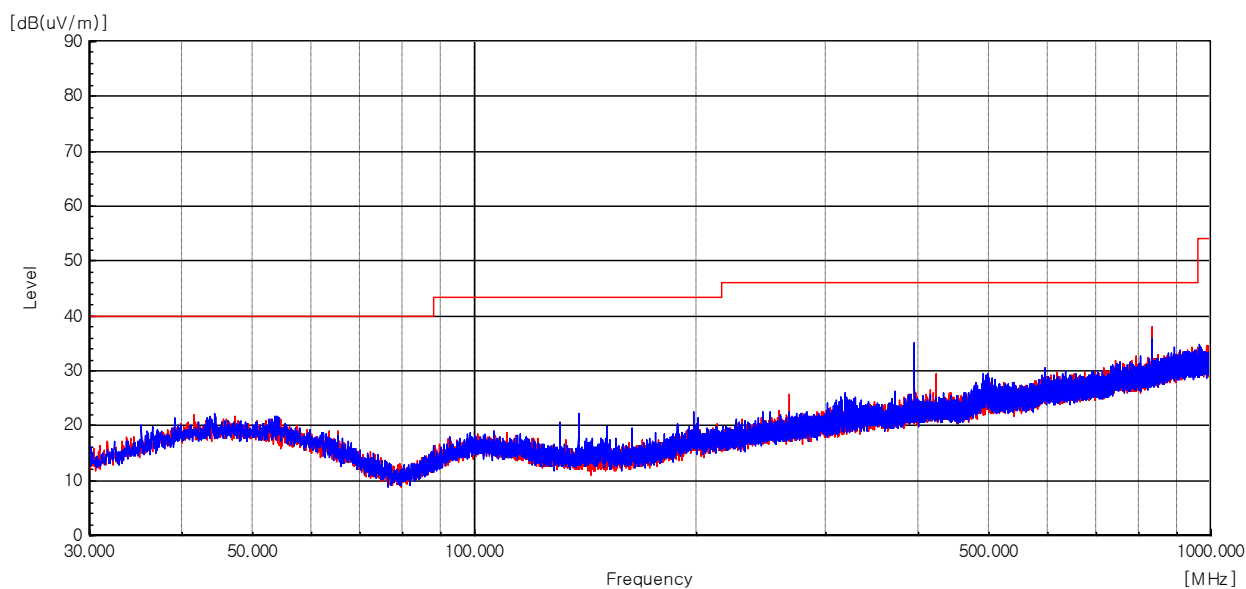
Measurement Uncertainty (Vertical) : 5.35 dB (The confidential level is about 95%, $k=2$)

Note: • AF = Antenna Factor
• Pol.(H) = Horizontal
• Margin = Limit – F/S
• A : Angle
• CL = Cable Loss
• Pol.(V) = Vertical
• F/S = Level + AF + CL – Amp.
• H : Height
• F/S = Field Strength
• Amp. = Amplifier Gain

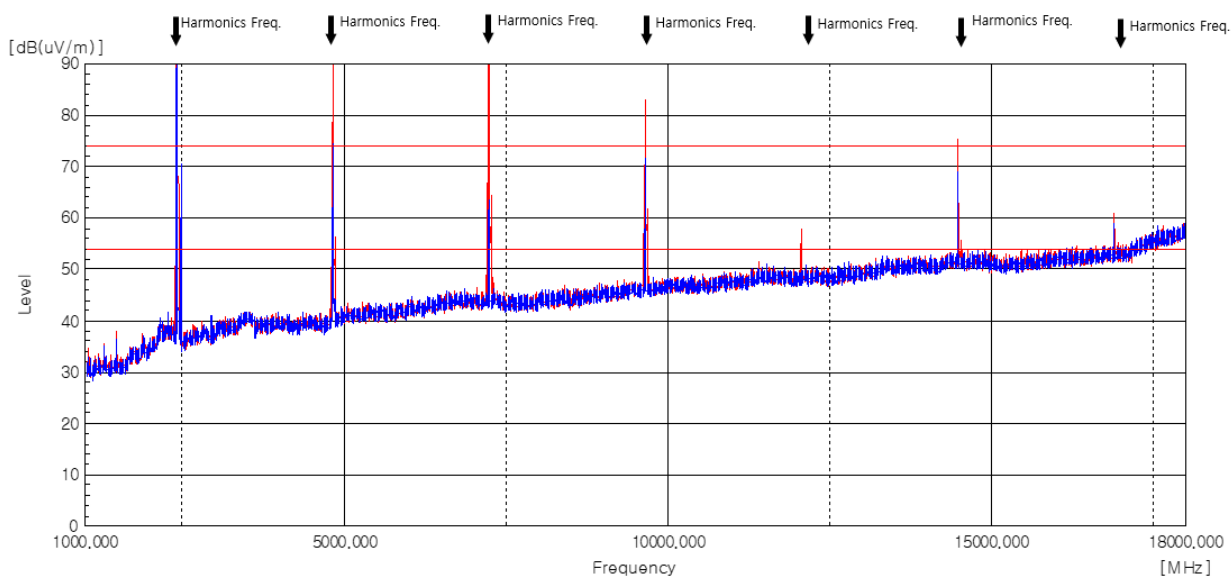
See Appendix A (Radiated Emission)

Appendix A : Radiated Emission

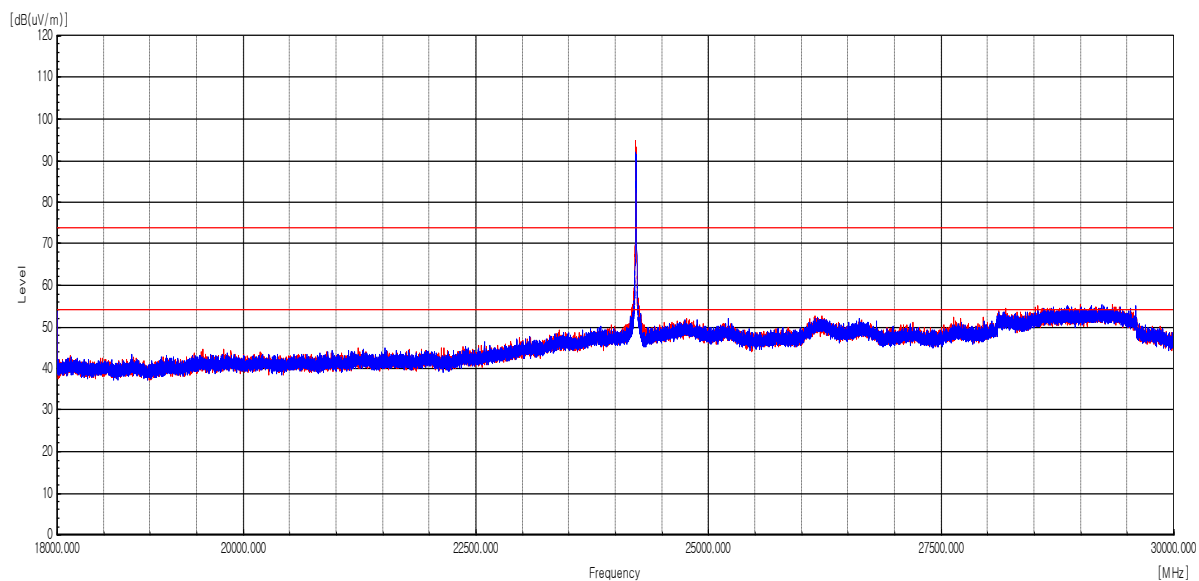
Below 1 GHz



Above 1 GHz (1 GHz ~ 18 GHz)



(18 GHz ~ 30 GHz)



- End of the Report -