TEST REPORT



CTK Co., Ltd. (Ho-dong), 113, Yejik-ro, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea Tel: +82-31-339-9970 Fax: +82-31-624-9501

Report No.: CTK-2024-00803 Page (1) / (26) Pages

1. Applicant

- Name : Haier US Appliance Solutions, Inc.
- Address : Appliance Park AP5-2N-65, Louisville, Kentucky, KY 40225, United States
- Date of Receipt : 2024-03-08

2. Manufacturer

- Name : Haier US Appliance Solutions, Inc.
- Address : Appliance Park AP5-2N-65, Louisville, Kentucky, KY 40225, United States
- 3. Use of Report : For FCC Conformance / ISED Conformance
- 4. Test Sample / Model: Android Board for GEA Wall Oven / CBA-L80
- 5. Date of Test : 2024-03-14 to 2024-03-15
- 6. Test Standard (method) used : FCC 47 CFR part 15 subpart C 15.247,

FCC 47 CFR part 15 subpart E 15.407

ISED RSS-247 & RSS-Gen

- **7. Testing Environment:** Temp.: (23 ± 1) °C, Humidity: (31 ± 3) % R.H.
- 8. Test Results : Compliance
- 9. Location of Test : 🛛 Permanent Testing Lab 🛛 🗌 On Site Testing

(Address : (Unhak-Dong) 5, Dongbu-ro 221beon-gil, Cheoin-gu, Yong-in-si, Gyeonggi-do, Korea)

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This report cannot be reproduced or copied without the written consent of CTK.

Approval	Tested by Ji-Hye, Kim: (Signature)	Technical Manager Won-Jae, Hwang: (Signature)
Remark. Th	is report is not related to KOLAS acc	creditation and relevant regulation.
		CTK Co., Ltd.



Report No.: CTK-2024-00803 Page (2) / (26) Pages

REPORT REVISION HISTORY

Date	Revision	Page No
2024-03-22	Issued (CTK-2024-00803)	all

This report shall not be reproduced except in full, without the written approval of CTK Co., Ltd. This document may be altered or revised by CTK Co., Ltd. personnel only, and shall be noted in the revision section of the document. Any alteration of this document not carried out by CTK Co., Ltd. will constitute fraud and shall nullify the document.



Report No.: CTK-2024-00803 Page (3) / (26) Pages

CONTENTS

1. General Product Description
1.1 Applicant Information 4
1.2 Product Information 4
1.3 Peripheral Devices
1.4 Model Differences
2. Accreditations
2.1 Laboratory Accreditations and Listings6
2.2 Calibration Details of Equipment Used for Measurement
3. Test Specifications
3.1 Standards7
3.2 Mode of operation during the test
3.3 Introduction
3.4 Differences
3.5 Maximum Measurement Uncertainty9
3.6 Test Software
4. Technical Characteristic Test 10
4.1 Radiated Emission 10
4.2 AC Conducted Emissions
APPENDIX A – Test Equipment Used For Tests



Report No.: CTK-2024-00803 Page (4) / (26) Pages

1. General Product Description

1.1 Applicant Information

Company	Haier US Appliance Solutions, Inc.
Contact Point	Appliance Park AP5-2N-65, Louisville, Kentucky, KY 40225, United States
Contact Person	Name : Park, Hansung E-mail : hansung.park@geappliances.com Tel : +82-31-8094-6732 Fax : +82-31-8094-6888

1.2 Product Information

FCC ID	ZKJ-CBA-L80			
ISED	10229A-CBAL80			
Product Description	Android Board for C	GEA Wall O	ven	
Model name	CBA-L80			
Variant Model name	-			
	Bluetooth Classic, Bluetooth LE	2 402 MHz - 2 480 MHz		
	WLAN 2.4GHz	2 412 MH 2 422 MH	2 412 MHz – 2 462 MHz (20MHz_BW) 2 422 MHz – 2 452 MHz (40MHz_BW)	
	WLAN 5GHz	UNII 1	5 180 MHz – 5 240 MHz (20 MHz_BW) 5 190 MHz – 5 230 MHz (40 MHz_BW) 5 210 MHz (80 MHz_BW)	
Operating Frequency		UNII 2A	5 260 MHz – 5 320 MHz (20 MHz_BW) 5 270 MHz – 5 310 MHz (40 MHz_BW) 5 290 MHz (80 MHz_BW)	
		UNII 2C	5 500 MHz – 5 720 MHz (20 MHz_BW) 5 510 MHz – 5 710 MHz (40 MHz_BW) 5 530 MHz – 5 690 MHz (80 MHz BW)	
		UNII 3	5 745 MHz – 5 825 MHz (20 MHz_BW) 5 755 MHz – 5 795 MHz (40 MHz_BW) 5 775 MHz (80 MHz)	
RF Output Power	Refer to original report			
	Antenna type : Chip Antenna			
Antenna Specification	Bluetooth Classic, Bluetooth LE	Peak Gain : 3.52 dBi		
	WLAN 2.4GHz	Peak Gain : 4.02 dBi (ANT1), 3.52 dBi (ANT2)		
	WLAN 5GHz Peak Gain : 2.69 dBi (ANT1), 2.74 dBi (ANT2)			
Power Source	DC 5 V			
Hardware Rev	v5.3			
Software Rev	V1.6.0.19			



1.3 Peripheral Devices

Device	Manufacturer	Model No.	Serial No.
Note Computer	HP	15-bs563TU	CND7253R6N
AC/DC Adapter	HP	HSTNN-CA40	-

1.4 Model Differences

Not applicable



Report No.: CTK-2024-00803 Page (6) / (26) Pages

2. Accreditations

2.1 Laboratory Accreditations and Listings

Country	Agency	Registration Number
USA	FCC	805871
CANADA	ISED	CN : 8737A CAB ID : KR0025
KOREA	NRRA	KR0025

2.2 Calibration Details of Equipment Used for Measurement

Test equipment and test accessories are calibrated on regular basis. The maximum time between calibrations is one year or what is recommended by the manufacturer, whichever is less. All test equipment calibrations are traceable to the Korea Research Institute of Standards and Science (KRISS), therefore, all test data recorded in this report is traceable to KRISS.



3. Test Specifications

3.1 Standards

FCC Part Section(s)	Requirement(s)	Status (Note 5)	Test Condition
15.209	Radiated Emissions (30 MHz ~ 1 GHz)	С	Radiated
15.207	AC Conducted Emission	С	Line Conducted
Note 1: C=Complies NC=Not Complies NT=Not Tested NA=Not Applicable			
Note 2: The data in this test report are traceable to the national or international standards.			
Note 3: The sample was tested according to the following specification: FCC Part 15.247, FCC Part 15.407			
<u>Note 4</u> : The tests were performed according to the method of measurements prescribed in KDB No.558074, KDB No.789033, ANSI C63.10-2013			
Note 5: etc. : The conformity assessment of except for this item was confirmed by the other report. (Test Report No.CTK-2022-01658, No.CTK-2022-01659, No.CTK-2022-01660 and No.CTK-2022-01661 issued on 2022-06-23 by CTK Co Ltd.)			

sued on 2022-06-23 by CTK Co., Ltd)
------------------------------------	---

ISED Part Section(s)	Requirement(s)	Status (Note 5)	Test Condition	
RSS-Gen 6.13	Radiated Emissions (30 MHz ~ 1 GHz)	С	Dedicted	
RSS-Gen 5	Receiver Spurious Emissions (30 MHz ~ 1 GHz)	С	Radiated	
RSS-Gen 8.8	AC Conducted Emission	С	Line Conducted	
Note 1: C=Complies NC=Not Complies NT=Not Tested NA=Not Applicable				
Note 2: The data in this test report are traceable to the national or international standards.				
Note 3: The sample was tested according to the following specification: RSS-247, RSS-GEN				
Note 4: The tests were performed according to the method of measurements prescribed in ANSI C63.10-2013				
Note 5: etc. : The conformity assessment of except for this item was confirmed by the other report. (Test Report No.CTK-2022-01658, No.CTK-2022-01659, No.CTK-2022-01660 and No.CTK-2022-01662 issued on 2022-06-23 by CTK Co., Ltd)				



Report No.: CTK-2024-00803 Page (8) / (26) Pages

3.2 Mode of operation during the test

The EUT is operated in a manner representative of the typical of the equipments. During at testing, system components were manipulated within the confines of typical usage to maximize each emission. All modulation modes were tests. The results are only attached worst cases.

Test Frequency	
Bluetooth Classic - 8-DPSK	
2 441 MHz	
Bluetooth LE - 1Mbps	
2 440 MHz	
WLAN 2.4GHz - 802.11n20	
2 412 MHz	
WLAN 5GHz - 802.11ac20	
5 320 MHz	

3.3 Introduction

The before change and the after changing PCB has identical antenna, SW implementation for Wi-Fi. Based on their similarity, the FCC Part 15C (equipment class: DSS, DTS), Part 15E (equipment class: NII) test data issued data of CBA-L80 references the test data of existing report.

The applicant takes full responsibility that the test data as referenced in this report represent compliance for this FCC ID (FCC ID: ZKJ-CBA-L80) and IC Cert.No(IC : 10229A-CBAL80).



3.4 Differences

There are some minor changes to improve power stability, and there is no change in the operating voltage level.

- 1) Changed PCB stack-up to reinforce power for MPU and DDR memory.
- 2) Modified Artwork related to the power for MPU and DDR memory.

Except for the mentioned changes, has identical PCB layout, antenna, SW implementation for Wi-Fi/BT. Especially, the same Wi-Fi/BT module is also used for the new version HW.

Except for the mentioned changes, the device remains electrically, Software Configuration and mechanically identical to the originally certified device and no changes have been made.

3.5 Maximum Measurement Uncertainty

The value of the measurement uncertainty for the measurement of each parameter. Coverage factor k = 2, Confidence levels of 95 %

Description	Uncertainty
Radiated Emissions (f \leq 1 GHz)	3.88 dB (C.L.: Approx. 95 %, k = 2)
Line Conducted Emission	2.08 dB (C.L.: Approx. 95 %, k = 2)

3.6 Test Software

Radiated Test	ES10 Ver. 2022.04.000
Line Conducted Test	EMC32 Ver. 10.50.00



Report No.: CTK-2024-00803 Page (10) / (26) Pages

4. Technical Characteristic Test

4.1 Radiated Emission

Test Location

 \square 10 m SAC (test distance : \square 10 m, \square 3 m) \square 3 m SAC (test distance : 3 m)

Test Procedures

KDB 558074 - Section 8.5, 8.6 ANSI C63.10-2013 - Section 11.11, 11.12 RSS-Gen - Section 6.13

- In the frequency range of 9 kHz to 30 MHz, magnetic field is measured with Loop Antenna. The Test Antenna is positioned with its plane vertical at 1m distance from the EUT. The center of the Loop Test Antenna is 1m above the ground. During the measurement the Loop Test Antenna rotates about its vertical axis for maximum response at each azimuth about the EUT.
- 2) In the frequency rage above 30 MHz, Bi-Log Test Antenna(30 MHz to 1 GHz) and Horn Test Antenna(above 1 GHz) are used. Test Antenna is 3m away from the EUT. Test Antenna height is carried from 1m to 4m above the ground to determine the maximum value of the field strength. The emissions levels at both horizontal and vertical polarizations should be tested.

Test Settings:

Frequency Range = 30 MHz ~ 1 GHz

a) RBW = 100 kHz for f < 1 GHz

- b) VBW \geq RBW
- c) Detector = CISPR Quasi-peak

d) Sweep time = auto couple



Limit :

FCC Part 15 § 15.209 (a) Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table :

Except when the requirements applicable to a given device state otherwise, emissions from licence-exempt transmitters shall comply with the field strength limits shown in Table 2 Additionally, the level of any transmitter emission shall not exceed the level of the transmitter's fundamental emission.

Frequency(MHz)	Field Strength uV/m@3m	Field Strength dBuV/m@3m	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**	40	3
88-216	150**	43.5	3
216-960	200**	46	3
Above 960	500	54	3

Table 2. General Field Strength Limits for Licence-Exempt Transmitters

** Except as provided in 15.209(g).fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72MHz, 76-88MHz, 174-216MHz, 470-806MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g.15.231 and 15.241.



Report No.: CTK-2024-00803 Page (12) / (26) Pages





Report No.: CTK-2024-00803 Page (13) / (26) Pages

Test results

1) 30 MHz to 1 GHz

Test mode : Transmitter (simultaneous transmissions WLAN 2.4GHz + DSS)

The requirements are: \square Complies

60 <FCC B 3m> Limit (QP) <BT + WLAN2,4GHz> Scan(H, PK) Scan(V. PK) 50 Suspected Item(H, PK Suspected Item(V, PK) 40 Level [dB (µV/m) 30 20 10 0 100 500 30 50 1000 Frequency[MHz] Spectrum Selection No. Frequency Pol Reading c.f Result Limit Margin Height Angle PK PK QP QP-PK [dB(1/m)] $[dB(\mu V/m)]$ $[dB(\mu V/m)]$ [MHz] [dB(µV)] [dB] [cm] [deg] 1 247.183 Н 44.2 -11.5 32.7 46.0 13.3 200.2 357.4 357.4 2 247.862 Н 42.8 -11.4 31.4 46.0 14.6 200.2 3 270.075 42.7 -10.7 32.0 46.0 14.0 100.0 359.7 н 4 405.002 Н 38.6 -6.9 31.7 46.0 14.3 100.0 13.1 5 665.156 v 35.0 -1.3 33.7 46.0 12.3 100.0 357.2 6 666.514 -1.3 н 33.5 32.2 46.0 13.8 300.0 0.9

Test Data

- The unwanted emission was measured in the following position: EUT stand-up position(Z axis), lie-down position(X,Y axis). The worst emission was found in lie-down position(X axis) and the worst case was recorded.
- 2. Result = Reading + c.f(Correction factor)
- 3. Correction factor = Antenna factor + Cable loss + 6 dB attenuator Amp Gain
- 4. This data is the Peak(PK) value.



Report No.: CTK-2024-00803 Page (14) / (26) Pages

Test mode : Transmitter (simultaneous transmissions WLAN 5GHz + DSS)

The requirements are: Complies

Test Data



- The unwanted emission was measured in the following position: EUT stand-up position(Z axis), lie-down position(X,Y axis). The worst emission was found in lie-down position(X axis) and the worst case was recorded.
- 2. Result = Reading + c.f(Correction factor)
- 3. Correction factor = Antenna factor + Cable loss + 6 dB attenuator Amp Gain
- 4. This data is the Peak(PK) value.



Report No.: CTK-2024-00803 Page (15) / (26) Pages

Test mode : Transmitter, Bluetooth Classic (Worst Case)

The requirements are: Complies

Test Data



- The unwanted emission was measured in the following position: EUT stand-up position(Z axis), lie-down position(X,Y axis). The worst emission was found in lie-down position(X axis) and the worst case was recorded.
- 2. Result = Reading + c.f(Correction factor)
- 3. Correction factor = Antenna factor + Cable loss + 6 dB attenuator Amp Gain



Report No.: CTK-2024-00803 Page (16) / (26) Pages

Test mode : Receiver, Bluetooth Classic (Worst Case)

The requirements are:

Test Data



- The unwanted emission was measured in the following position: EUT stand-up position(Z axis), lie-down position(X,Y axis). The worst emission was found in lie-down position(X axis) and the worst case was recorded.
- 2. Result = Reading + c.f(Correction factor)
- 3. Correction factor = Antenna factor + Cable loss + 6 dB attenuator Amp Gain



Report No.: CTK-2024-00803 Page (17) / (26) Pages

Test mode : Transmitter, Bluetooth LE (Worst Case)

The requirements are: Complies

Test Data



- The unwanted emission was measured in the following position: EUT stand-up position(Z axis), lie-down position(X,Y axis). The worst emission was found in lie-down position(X axis) and the worst case was recorded.
- 2. Result = Reading + c.f(Correction factor)
- 3. Correction factor = Antenna factor + Cable loss + 6 dB attenuator Amp Gain



Report No.: CTK-2024-00803 Page (18) / (26) Pages



The requirements are: Complies

Test Data



- The unwanted emission was measured in the following position: EUT stand-up position(Z axis), lie-down position(X,Y axis). The worst emission was found in lie-down position(X axis) and the worst case was recorded.
- 2. Result = Reading + c.f(Correction factor)
- 3. Correction factor = Antenna factor + Cable loss + 6 dB attenuator Amp Gain



Report No.: CTK-2024-00803 Page (19) / (26) Pages

Test mode : Transmitter, WLAN 2.4GHz (Worst Case)

The requirements are: Complies

Test Data



- The unwanted emission was measured in the following position: EUT stand-up position(Z axis), lie-down position(X,Y axis). The worst emission was found in lie-down position(X axis) and the worst case was recorded.
- 2. Result = Reading + c.f(Correction factor)
- 3. Correction factor = Antenna factor + Cable loss + 6 dB attenuator Amp Gain
- 4. This data is the Peak(PK) value.



Report No.: CTK-2024-00803 Page (20) / (26) Pages

Test mode : Receiver, WLAN 2.4GHz (Worst Case)

The requirements are:

Test Data



- The unwanted emission was measured in the following position: EUT stand-up position(Z axis), lie-down position(X,Y axis). The worst emission was found in lie-down position(X axis) and the worst case was recorded.
- 2. Result = Reading + c.f(Correction factor)
- 3. Correction factor = Antenna factor + Cable loss + 6 dB attenuator Amp Gain
- 4. This data is the Peak(PK) value.



Report No.: CTK-2024-00803 Page (21) / (26) Pages

Test mode : Transmitter, WLAN 5GHz (Worst Case)

The requirements are: Complies

Test Data



- The unwanted emission was measured in the following position: EUT stand-up position(Z axis), lie-down position(X,Y axis). The worst emission was found in lie-down position(X axis) and the worst case was recorded.
- 2. Result = Reading + c.f(Correction factor)
- 3. Correction factor = Antenna factor + Cable loss + 6 dB attenuator Amp Gain
- 4. This data is the Peak(PK) value.



Report No.: CTK-2024-00803 Page (22) / (26) Pages



The requirements are: Complies

Test Data



- 1. The unwanted emission was measured in the following position: EUT stand-up position(Z axis), lie-down position(X,Y axis). The worst emission was found in lie-down position(X axis) and the worst case was recorded.
- 2. Result = Reading + c.f(Correction factor)
- 3. Correction factor = Antenna factor + Cable loss + 6 dB attenuator Amp Gain
- 4. This data is the Peak(PK) value.



4.2 AC Conducted Emissions

Frequency Range of Measurement

150 kHz to 30 MHz

Instrument Settings

IF Band Width: 9 kHz

Test Procedures

ANSI C63.10-2013 - Section 6.2 RSS-Gen - Section 8.8

The EUT was placed on a non-metallic table 0.8m above the metallic, grounded floor and 0.4m from the reference ground plane wall. The distance to other metallic surfaces was at least 0.8m.

Amplitude measurements were performed with a quasi-peak detector and an average detector.

Limit

- 15.207(a)

	Conducted Limit (dBuV)				
	Quasi-peak	Average**			
0.15 ~ 0.5	66 to 56*	56 to 46*			
0.5 ~ 5	56	46			
5 ~ 30	60	50			

* The level decreases linearly with the logarithm of the frequency.

** A linear average detector is required.

Test Results

The requirements are: \square Complies



Report No.: CTK-2024-00803 Page (24) / (26) Pages

Test Data



Final Result

Frequency	QuasiPeak	CAverage	Limit	Margin	Meas. Time	Bandwidth	Line	Filter	Corr.
(MHz)	(dBµV)	(dBµV)	(dBµV)	(dB)	(ms)	(kHz)			(dB)
0.159000	52.13		65.52	13.38	15000.0	9.000	L1	ON	9.9
0.163500		33.05	55.28	22.23	15000.0	9.000	L1	ON	9.9
0.190500	47.90		64.02	16.12	15000.0	9.000	L1	ON	9.9
0.231000		26.48	52.41	25.93	15000.0	9.000	L1	ON	9.7
0.235500	43.20		62.25	19.06	15000.0	9.000	L1	ON	9.7
0.289500	37.62		60.54	22.92	15000.0	9.000	L1	ON	9.7
0.379500	31.55		58.29	26.74	15000.0	9.000	L1	ON	9.8
2.580000		21.26	46.00	24.74	15000.0	9.000	L1	ON	9.6
3.183000		20.23	46.00	25.77	15000.0	9.000	L1	ON	9.6
3.637500		21.01	46.00	24.99	15000.0	9.000	L1	ON	9.6
3.646500	29.98		56.00	26.02	15000.0	9.000	L1	ON	9.6
26.623500		29.49	50.00	20.51	15000.0	9.000	L1	ON	9.9



Report No.: CTK-2024-00803 Page (25) / (26) Pages

[NEUTRAL]



Final Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.163500		32.98	55.28	22.31	15000.0	9.000	N	ON	9.9
0.163500	51.62		65.28	13.67	15000.0	9.000	N	ON	9.9
0.190500	47.97		64.02	16.05	15000.0	9.000	N	ON	9.9
0.208500		29.22	53.27	24.04	15000.0	9.000	N	ON	9.8
0.231000		26.62	52.41	25.79	15000.0	9.000	N	ON	9.7
0.231000	44.85		62.41	17.56	15000.0	9.000	N	ON	9.7
0.289500	38.25		60.54	22.29	15000.0	9.000	N	ON	9.7
0.384000	31.78		58.19	26.41	15000.0	9.000	N	ON	9.8
0.433500	28.58		57.19	28.61	15000.0	9.000	N	ON	9.8
0.550500		20.68	46.00	25.32	15000.0	9.000	N	ON	9.8
9.267000		21.62	50.00	28.38	15000.0	9.000	N	ON	9.9
26.623500		27.24	50.00	22.76	15000.0	9.000	N	ON	10.0



Report No.: CTK-2024-00803 Page (26) / (26) Pages

APPENDIX A – Test Equipment Used For Tests

	Name of Equipment	Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date
1	EMI TEST RECEIVER	Rohde & Schwarz	ESW44	102039	2023-05-03	2024-05-03
2	BILOG ANTENNA	TESEQ	CBL6111D	60654	2023-08-21	2025-08-21
3	6dB Attenuator	NONE	6dB	190557	2023-09-25	2024-09-25
4	6dB Attenuator	PASTERNACK	PE7AP006-06	L20210504000023	2023-08-04	2024-08-04
5	AMPLIFIER	SONOMA INSTRUMENT	310N	411011	2023-08-04	2024-08-04
6	EMI Test Receiver	Rohde & Schwarz	ESR3	102826	2023-05-03	2024-05-03
7	LISN	Rohde & Schwarz	ENV216	102698	2023-05-03	2024-05-03

	Cable	Manufacturer	Model No.	Serial No.	Check Date
1	RF Cable (Line Conducted)	Canare Corporation	L-5D2W	N/A	2023-03-05
2	RF Cable (9 kHz - 30 MHz Radiated)	Canare Corporation	L-5D2W	N/A	2023-03-05
3	RF Cable (30 MHz - 1 GHz Radiated)	Canare Corporation	L-5D2W	N/A	2023-03-05
4	RF Cable (9 kHz - 1 GHz Radiated)	HUBER+SUHNER	SUCOFLEX 104	MY27558/4	2023-03-05

-END-