TEST REPORT

Report Number : 14982484-E4V1

Applicant	:	APPLE, INC 1 APPLE PARK WAY CUPERTINO, CA 95014, U.S.A.
Model	:	A3286, A3287, A3288
Brand	:	APPLE
FCC ID:		BCG-E8689A, BCG-8690A, BCG-8691A
EUT Description	:	SMARTPHONE
Test Standard(s)	:	FCC 47 CFR Part 2, Part 22, Part 27 and Part 96

Date Of Issue:
2024-08-28

Prepared by:
UL Verification Services Inc.
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ACCREDITED
CERT #0751.05

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	2024-08-28	Initial Review	--

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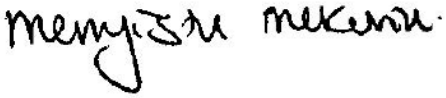
1. ATTESTATION OF TEST RESULTS

Applicant Name and Address	APPLE, INC 1 APPLE PARK WAY CUPERTINO, CA 95014, U.S.A.
Model	A3286, A3287, A3288
Brand	APPLE
FCC ID	BCG-E8689A, BCG-8690A, BCG-8691A
EUT Description	SMARTPHONE
Serial Number	Model (A2386): C07H5T000LS0000FGU (Conducted), P360XD2629 (Radiated) Model (A2387): C07H5R0011PS0000FGX (Conducted), FVHHWJYMHV (Radiated) Model (A2388): C07H5Q000DV0000FHD (Conducted), CDWYTJG6ML (Radiated)
Sample Receipt Date	2024-01-17
Date Tested	2024-01-17 TO 2024-06-30
Applicable Standards	FCC CFR 47 Part 2, Part 22, Part 27 and Part 96
Test Results	COMPLIES

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. All samples tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not taken into account unless noted otherwise.

This document may not be altered or revised in any way unless done so by UL Verification Services Inc.and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc.will constitute fraud and shall nullify the document.

Approved & Released By:	Prepared By:
	
Mengistu Mekuria Staff Laboratory Engineer UL Verification Services Inc.	Binod Sitaula Laboratory Engineer Associate UL Verification Services Inc.

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with the following:

- ANSI C63.26:2015
- FCC 47 CFR Part 2, Part 22, Part 27 and Part 96
- FCC KDB 971168 D01 v03r01: Power Meas License Digital Systems
- FCC KDB 971168 D02 v02r01: Misc Rev Approv License Devices
- FCC KDB 412172 D01 v01r01. Determining ERP and EIRP
- FCC KDB 484596 D01 v02r03: Referencing Test Data

3. FACILITIES AND ACCREDITATION

UL LLC is accredited by A2LA, certification #0751.05, for all testing performed within the scope of this report. Testing was performed at the locations noted below.

	Address	ISED CABID	ISED Company Number	FCC Registration
☒	Building 1: 47173 Benicia Street, Fremont, CA 94538, USA	US0104	2324A	550739
☒	Building 2: 47266 Benicia Street, Fremont, CA 94538, USA			
☐	Building 3: 843 Auburn Court, Fremont, CA 94538, USA			
☒	Building 4: 47658 Kato Rd, Fremont, CA 94538, USA			
☒	Building 5: 47670 Kato Rd, Fremont, CA 94538, USA			

4. DECISION RULES AND MEASUREMENT UNCERTAINTY

4.1. METROLOGICAL TRACEABILITY

All test and measuring equipment utilized to perform the tests documented in this report are calibrated on a regular basis, with a maximum time between calibrations of one year or the manufacturers' recommendation, whichever is less, and where applicable is traceable to recognized national standards.

4.2. DECISION RULES

The Decision Rule is based on Simple Acceptance in accordance with ISO Guide 98-4:2012 Clause 8.2. (Measurement uncertainty is not taken into account when stating conformity with a specified requirement.)

4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	U_{Lab}
Conducted Antenna Port Emission Measurement	1.940 db
Power Spectral Density	2.466 db
Time Domain Measurements Using SA	3.39 %
RF Power Measurement Direct Method Using Power Meter	0.450 db Peak 1.300 db Ave.
Radio Frequency (Spectrum Analyzer)	141.16 Hz
Occupied Bandwidth	1.22%
Worst Case Conducted Disturbance, 9KHz to 0.15 MHz	3.78 db
Worst Case Conducted Disturbance, 0.15 to 30 MHz	3.40 db
Worst Case Radiated Disturbance, 9KHz to 30 MHz	2.87 db
Worst Case Radiated Disturbance, 30 to 1000 MHz	6.01 db
Worst Case Radiated Disturbance, 1000 to 18000 MHz	4.73 db
Worst Case Radiated Disturbance, 18000 to 26000 MHz	4.51 db
Worst Case Radiated Disturbance, 26000 to 40000 MHz	5.29 db

Uncertainty figures are valid to a confidence level of 95%.

4.4. SAMPLE CALCULATION

RADIATED EMISSIONS

Where relevant, the following sample calculation is provided:
Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)
36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The Apple iPhone is a smartphone with cellular GSM, GPRS, EGPRS, WCDMA, LTE, 5GNR1, 5GNR2, IEEE 802.11a/b/g/n/ac/ax/be, Bluetooth (BT), Ultra-Wideband (UWB), Global Positioning System (GPS), Near-Field Communication (NFC), Narrow-Band (NB) UNII, 802.15.4, 802.15.4ab-Narrow Band (NB) and Mobile Satellite Service (MSS) technologies. The rechargeable battery is not user accessible. This device is not user-serviceable and requires special tools to disassemble.

Testing was performed on the parent model and is used to support the application for the parent and variants identified in this report based on the test plan submitted and approved via KDB inquiry by the FCC.

5.2. INTRODUCTION

This application for certification is leveraging the data reuse procedures from KDB 484596 D01 based on reference FCC ID: BCG-E8688A to cover variant model FCC ID: BCG-E8689A. The major difference between the parent/reference model and the variant model is the depopulation of some LTE and 5G NR Bands. All other circuitry and features are identical. The data reuse test plan was approved via manufacturer KDB inquiry.

5.3. MODEL DIFFERENCES

The manufacturer hereby declares the following for models A3081, A3286, A3287, and A3288.

These models are highly similar, with the only differences being listed on the table below:

Model	FCC ID	Model Changes
A3081	BCG-E8688A	Reference Model
A3286	BCG-E8689A	Variant model Removed FR2 from the reference model
A3287	BCG-E8690A	Variant model Removed FR2, LTE B11/14/21/29/71, and 5G NR n14/n71/n29 from the reference model
A3288	BCG-E8691A	Variant model Removed MSS, FR2, LTE B11/14/21/29/53/71, and 5G NR n14/n53/n71/n29 from the reference model

*Note:

They have the same PCB layout, design, common components, antennas, antenna locations and housing cases.

More specifically, their cellular modem, Wi-Fi, BT, NFC, WPT and UWB transmitters are identical, and removal of cellular bands is done by software and depopulation of band-specific components associated with the removed bands.

Spot check verification has been done on models A3286, A3287 and A3188 in accordance with the test plan approved via KDB inquiry. Comparison of the models, upper deviation is within 0.5dB range of antenna port data, and all tests are under ISED Technical Limits. The results documented for model A3081 may be applied as representative to models A3286, A3287, and A3288.

5.4. SPOT CHECK VERIFICATION RESULTS SUMMARY FOR A3286

A3286 Spot Check Results							
Technology	Worst Mode	Test Item	Measured Frequency (MHz)	Original Model: A3081 FCC ID: BCG-E8688A (dBm)	Sub Model: A3286 FCC ID: BCG-E8689A (dBm)	Delta (dB)	Remarks
LTE 5CA	QPSK @ 10MHz+10MHz BW	Cond Power	831.6/841.5	25.7	25.7	0.00	
LTE 7CA	QPSK @ 20MHz+20MHz BW	Cond Power	2525.1/2544.9	25.7	25.7	0.00	
LTE 41CA	QPSK @ 20MHz+20MHz BW	Cond Power	2583.1/2602.9	28.7	28.59	-0.11	
LTE 48CA	QPSK @ 20MHz+20MHz BW	Cond Power	3615.1/3634.9	25.0	25.0	0.00	

5.5. SPOT CHECK VERIFICATION RESULTS SUMMARY FOR A3287

A3287 Spot Check Results							
Technology	Worst Mode	Test Item	Measured Frequency (MHz)	Original Model: A3081 FCC ID: BCG-E8688A (dBm)	Sub Model: A3287 FCC ID: BCG-E8690A (dBm)	Delta (dB)	Remarks
LTE 5CA	QPSK @ 10MHz+10MHz BW	Cond Power	831.6/841.5	25.7	25.7	0.00	
LTE 7CA	QPSK @ 20MHz+20MHz BW	Cond Power	2525.1/2544.9	25.7	25.7	0.00	
LTE 41CA	QPSK @ 20MHz+20MHz BW	Cond Power	2583.1/2602.9	28.7	28.7	0.00	
LTE 48CA	QPSK @ 20MHz+20MHz BW	Cond Power	3615.1/3634.9	25.0	25	0.00	

5.6. SPOT CHECK VERIFICATION RESULTS SUMMARY FOR A3288

A3288 Spot Check Results							
Technology	Worst Mode	Test Item	Measured Frequency (MHz)	Original Model: A3081 FCC ID: BCG-E8688A (dBm)	Sub Model: A3288 FCC ID: BCG-E8691A (dBm)	Delta (dB)	Remarks
LTE 5CA	QPSK @ 10MHz+10MHz BW	Cond Power	831.6/841.5	25.7	25.49	-0.21	
LTE 7CA	QPSK @ 20MHz+20MHz BW	Cond Power	2525.1/2544.9	25.7	25.64	-0.06	
LTE 41CA	QPSK @ 20MHz+20MHz BW	Cond Power	2583.1/2602.9	28.7	28.68	-0.02	
LTE 48CA	QPSK @ 20MHz+20MHz BW	Cond Power	3615.1/3634.9	25.0	25	0.00	

5.7. REFERENCE DETAIL

Reference application that contains the reused reference data.

Reference FCC ID	Variant model FCC ID	Reference Test Report / Data Referencing Section	Equipment Class
BCG- E8688AA	BCG-E8689A BCG-E8690A BCG-E8691A	14982484-E20 / All Sections	PCE
		14982484-E14 / All Sections	CBE

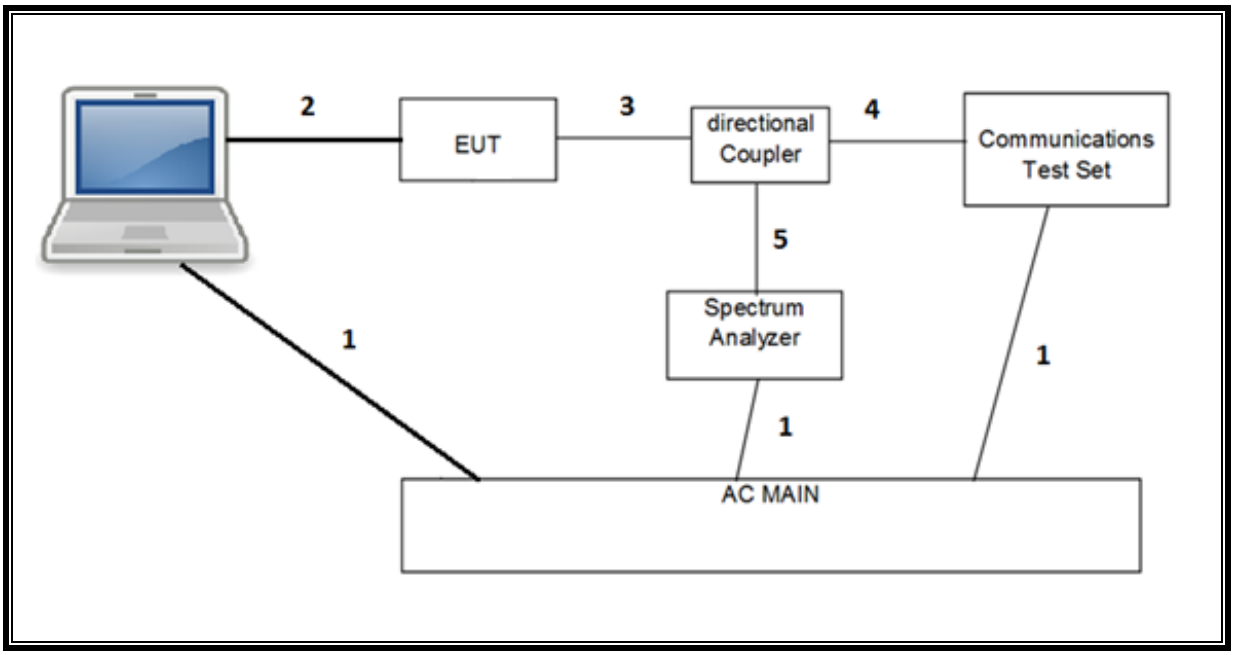
5.8. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was version 0.02.01.

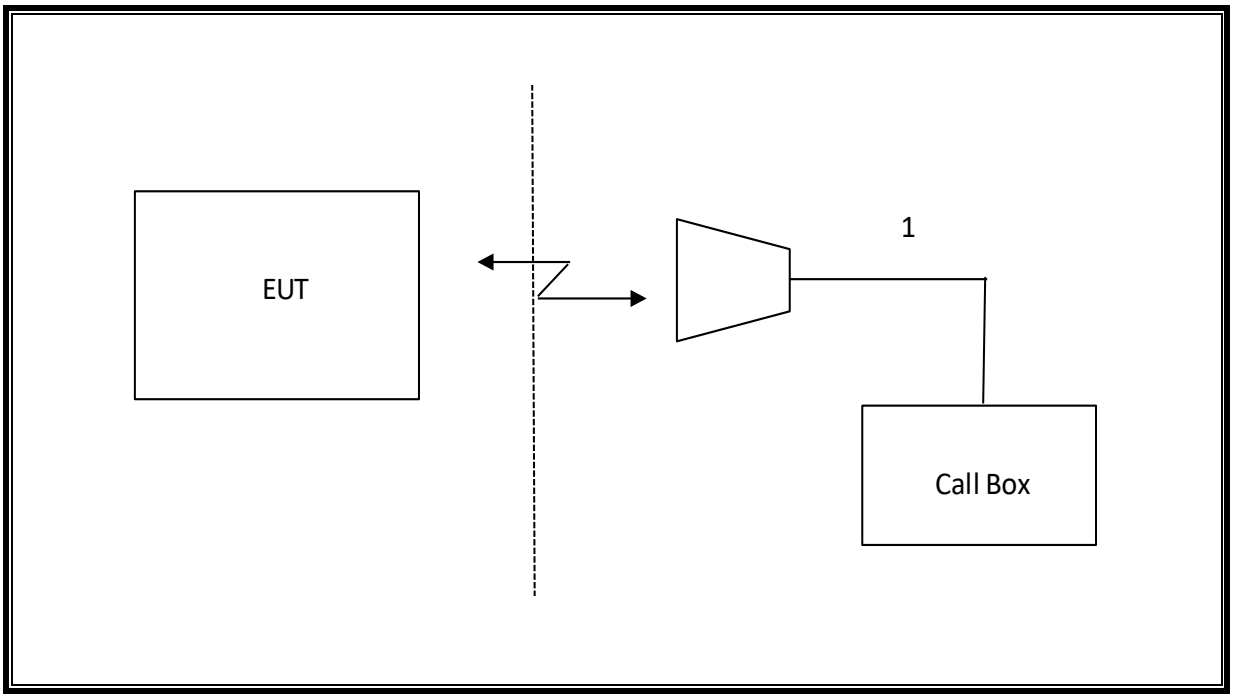
5.9. DESCRIPTION OF TEST SETUP

SUPPORT TEST EQUIPMENT						
Description		**Manufacturer**	**Model**	**Serial Number**		**FCC ID/ DoC**
Laptop		Apple	MacBook Pro	HRP082673		BCGA1708
AC/DC adapter		Apple	A1718	C4H64450HH3GN8RA6		--
I/O CABLES (RF CONDUCTED TEST)						
Cable No.	**Port**	**# of Identical Ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	AC	3	US 115V	Un-shielded	2.0	N/A
2	USB	1	DC	Un-shielded	1.0	N/A
3	RF In/Out	1	EUT	Un-shielded	0.6	N/A
4	RF In/Out	1	Communication Test Set	Un-shielded	1.2	N/A
5	RF In/Out	1	Barrel	N/A	N/A	N/A
I/O CABLES (RF RADIATED TEST)						
Cable No.	**Port**	**# of Identical Ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	RF In/Out	1	Antenna	Un-shielded	5.0	N/A

CONDUCTED SETUP



RADIATED SETUP



6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

TEST EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Asset**	**Cal Due**
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	80430	2024-08-31
Antenna, Horn 1-18GHz	ETS Lindgren	3117	79834	2024-06-30
Antenna, Broadband Hybrid, 30MHz to 3000MHz	SUNAR	JB3	222009	2024-10-31
RF Filter Box, 1-18GHz	UL-FR1	NA	217255	2024-10-31
RF Filter Box, 1-18GHz	UL-FR1	RATS 2	226781	2024-09-30
Amplifier, 10KHz to 1GHz, 32dB	Sonoma	310N	430250	2024-09-30
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	169936	2025-02-28
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	169935	2025-02-28
Wideband Communication Test Set, Call Box	R&S GmbH & Co. KG	CMW500	85943	2025-02-28
Directional Coupler	KRYTAR	152610	198816	2024-10-31
Directional Coupler	KRYTAR	152610	231664	2025-01-22
Power Meter, P-series single channel	Keysight	N1912A	90719	2025-01-31
Power Sensor, P - series, 50MHz to 18GHz, Wideband	Keysight	N1921A	81319	2025-01-31
Filter, HPF 1.2GHz	Micro-Tronics	HPM18129	204788	2024-09-30
Spectrum Analyzer, PXA, 2Hz to 44GHz	Keysight	N9030B	231739	2025-01-31
Spectrum Analyzer, PXA, 2Hz to 44GHz	Keysight	N9030B	245120	2025-02-28
Spectrum Analyzer, PXA, 3Hz to 44GHz	Keysight	N9030A	85212	2025-02-28
Wideband Communication Test Set, Call Box	R&S GmbH & Co. KG	CMW500	222793	2025-02-28
Wideband Communication Test Set, Call Box	R&S GmbH & Co. KG	CMW500	222797	2025-02-28
Transmitting Antenna, Horn Antenna	TEKBOX Digital Solutions	TBMA4	226709	C.N.R.
Antenna, Horn 18 to 26.5GHz	A.R.A.	MWH-1826/B	199659	2024-12-31
Amplifier 18-26.5GHz, +5Vdc, -54dBm P1dB	AMPLICAL	AMP18G26.5-60	234683	2024-03-29
DC Power Supply	GWINSTEK	GPS18500	N/A	C.N.R.
UL AUTOMATION SOFTWARE				
CLT Software	UL	UL RF	V2023.11.21.0	
Power Measurement Software	UL	UL RF	V2023.08.14.0	
Radiated test software	UL	UL RF	Ver 9.5 2023-05-01	

NOTES:

1. * Testing is completed before equipment expiration date.

Appendix A – Reference Test Report

Attached is the test report (14982484-E14, 14982484-E20) containing the reference data from the parent model as detailed in section 5.7.