TEST REPORT

Report Number : 14982437-E1V2

Applicant	:	APPLE, INC. 1 APPLE PARK WAY CUPERTINO, CA 95014, U.S.A
Model	:	A3292, A3293, A3294
Brand	:	APPLE
FCC ID	:	BCG-E8667A, BCG-E8668A, BCG-E8683A
IC	:	579C-E8667A, 579C-E8668A, 579C-E8683A
EUT Description	:	SMARTPHONE
Test Standard(s)	:	FCC 47 CFR PART 2, PART 22H, 24E, AND 27L ISED RSS-GEN ISSUE 5, RSS-132 ISSUE 4, RSS-133 ISSUE 6, AND RSS-139 ISSUE 4

Date Of Issue:
2024-08-27

Prepared by:
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ACCREDITED
CERT #0751.05

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	2024-07-22	Initial Review	--
V2	2024-08-27	Updated TCB Feedback Selection 5	Eric Ting

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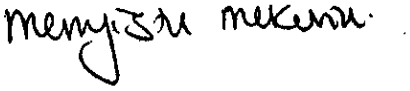
1. ATTESTATION OF TEST RESULTS

Applicant Name and Address	APPLE, INC. 1 APPLE PARK WAY CUPERTINO, CA 95014, U.S.A
Model	A3292, A3293, A3294
Brand	APPLE
FCC ID	BCG-E8667A, BCG-E8668A, BCG-E8683A
IC	579C-E8667A, 579C-E8668A, 579C-E8683A
EUT Description	SMARTPHONE
Serial Number	MODEL (A3292): C07H4D000DT0000FDT (CONDUCTED) and M2VVG03XC1 (RADIATED) MODEL (A3293): C07H470004Q0000FDY (CONDUCTED) and RVW4YN33X6 (RADIATED) MODEL (A3294) C07H4F001AC0000FE1 (CONDUCTED) and P7GFMKGP32 (RADIATED)
Sample Receipt Date	2023-11-09
Date Tested	2023-11-09 to 2024-07-02
Applicable Standards	FCC 47 CFR Part 2, Part 22, Part 24, and Part 27 ISED RSS-GEN ISSUE 5, RSS-132 Issue 4, RSS-133 Issue 6, RSS-139 Issue 4.
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:	Reviewed By:	Prepared By:
		
Mengistu Mekuria Staff Engineer UL Verification Services Inc.	Eric Ting Senior Test Engineer UL Verification Services Inc.	Andrew Le Senior Laboratory Technician 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 24, and Part 27.
- FCC KDB 971168 D01 v03r01: Power Meas License Digital Systems
- FCC KDB 971168 D02 v02r02: Misc Rev Approv License Devices
- FCC KDB 412172 D01 v01r01: Determining ERP and EIRP
- FCC KDB 484596 D01 v02r03: Referencing Test Data
- ISED RSS-GEN Issue 5, ISED RSS-132 Issue 4, RSS-133 Issue 6, RSS-139 Issue 4.

3. FACILITIES AND ACCREDITATION

UL Verification Services Inc 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
Power Spectral Density	2.466
Time Domain Measurements Using SA	3.39
RF Power Measurement Direct Method Using Power Meter	0.450 Peak; 1.300 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), WPT 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 and ISED Canada

5.2. INTRODUCTION

This application for certification is leveraging the data reuse procedures from KDB 484596 D01 based on reference FCC ID: BCG-E8666A / IC: 579C-E8666A to cover variant model FCC ID: BCG-E8667A / IC: 579C-E8667A and FCC ID BCG-E8668A / IC: 579C-E8668A and FCC ID BCG-E8683A / IC: 579C-E8683A. 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 A3083, A3292, A3293 and A3294.

These models are highly similar, with the only difference being the supported cellular bands.

Model	FCC ID	IC	Model Changes
A3083	BCG-E8666A	579C-E8666A	Reference Model
A3292	BCG-E8667A	579C-E8667A	Variant model Removed FR2 from the reference model
A3293	BCG-E8668A	579C-E8668A	Variant model Removed FR2, LTE B11/14/21/29/71, and 5G NR n14/n71/n29 from the reference model
A3294	BCG-E8683A	579C-E8683A	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 A3292, A3293 and A3294 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 A3083 may be applied as representative to models A3292, A3293 and A3294.

5.4. SPOT CHECK VERIFICATION RESULTS SUMMARY FOR A3292

A3292 SPOT CHECK RESULTS							
Technology	Worst Mode	Test Item	Measured Frequency MHz	Original Model: A3803 FCC ID : BCG-E8666A IC : 579C-E8666A (dBm)	Sub Model: A3292 FCC ID: BCG-E8667A IC : 579C-E8667A (dBm)	Delta (dB)	Remarks
GSM	GPRS 850	Cond Power	836.6	33.50	32.88	-0.62	
	GPRS 1900	Cond Power	1909.8	31.50	32.00	0.5	
WCDMA	REL99 B5	Cond Power	826.4	25.70	25.70	0.00	
	REL99 B2	Cond Power	1880	25.50	25.70	0.20	
	REL99 B4	Cond Power	1712.4	25.50	25.70	0.20	

5.5. SPOT CHECK VERIFICATION RESULTS SUMMARY FOR A3293

A3293 SPOT CHECK RESULTS							
Technology	Worst Mode	Test Item	Measured Frequency MHz	Original Model: A3803 FCC ID : BCG-E8666A IC : 579C-E8666A (dBm)	Sub Model: A3293 FCC ID: BCG-E8668A IC : 579C-E8668A (dBm)	Delta (dB)	Remarks
GSM	GPRS 850	Cond Power	836.6	33.50	33.09	-0.41	
	GPRS 1900	Cond Power	1909.8	31.50	31.56	0.06	
WCDMA	REL99 B5	Cond Power	826.4	25.70	25.70	0.00	
	REL99 B2	Cond Power	1880	25.50	25.70	0.20	
	REL99 B4	Cond Power	1712.4	25.50	25.70	0.20	

5.6. SPOT CHECK VERIFICATION RESULTS SUMMARY FOR A3294

A3294 SPOT CHECK RESULTS							
Technology	Worst Mode	Test Item	Measured Frequency MHz	Original Model: A3803 FCC ID : BCG-E8666A IC : 579C-E8666A (dBm)	Sub Model: A3294 FCC ID: BCG-E8683A IC : 579C-E8683A (dBm)	Delta (dB)	Remarks
GSM	GPRS 850	Cond Power	836.6	33.50	33.16	-0.34	
	GPRS 1900	Cond Power	1909.8	31.50	32	0.5	
WCDMA	REL99 B5	Cond Power	826.4	25.70	25.70	0.00	
	REL99 B2	Cond Power	1880	25.50	25.70	0.20	
	REL99 B4	Cond Power	1712.4	25.50	25.70	0.20	

5.7. REFERENCE DETAIL

Reference application that contains the reused reference data.

Reference FCC ID / IC Certification #	Equipment Class	Variant FCC ID/IC Certification #	Reference Test Report/Data Referencing Section
BCG- E8666A / 579C-E8666A	PCE	BCG-E8667A, 579C-E8667A	14982436-E17 Report / All Sections
	PCE	BCG-E8668A 579C-E8668A	14982436-E17 Report / All Sections
	PCE	BCG-E8683A 579C-E8683A	14982436-E17 Report / All Sections

5.8. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was version 0.02.01.

5.9. WORST-CASE CONFIGURATION AND MODE

The spot checks were performed on the worst-case configurations based on the parent model of reference report.

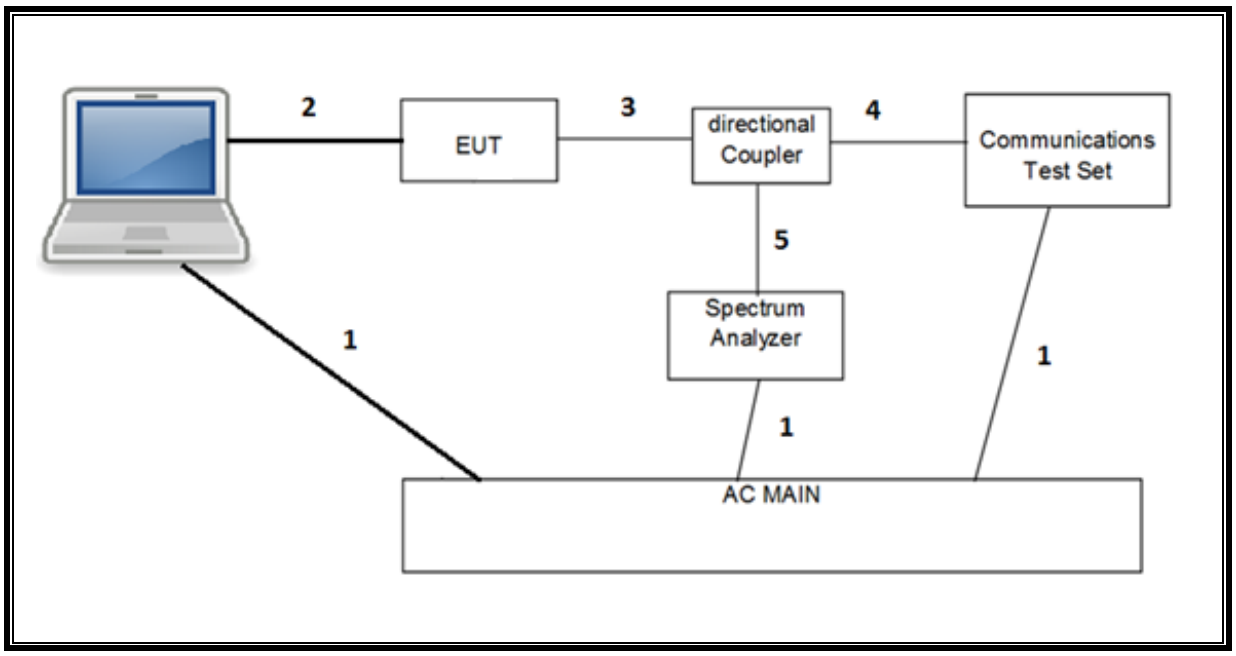
5.10. DESCRIPTION OF TEST SETUP

SUPPORT TEST EQUIPMENT					
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID/ DoC**	
Laptop	Apple	MacBook Pro	HRP082673	BCGA1708	
AC/DC adapter	Apple	A1718	C4H64450HH3GN8RA6	--	

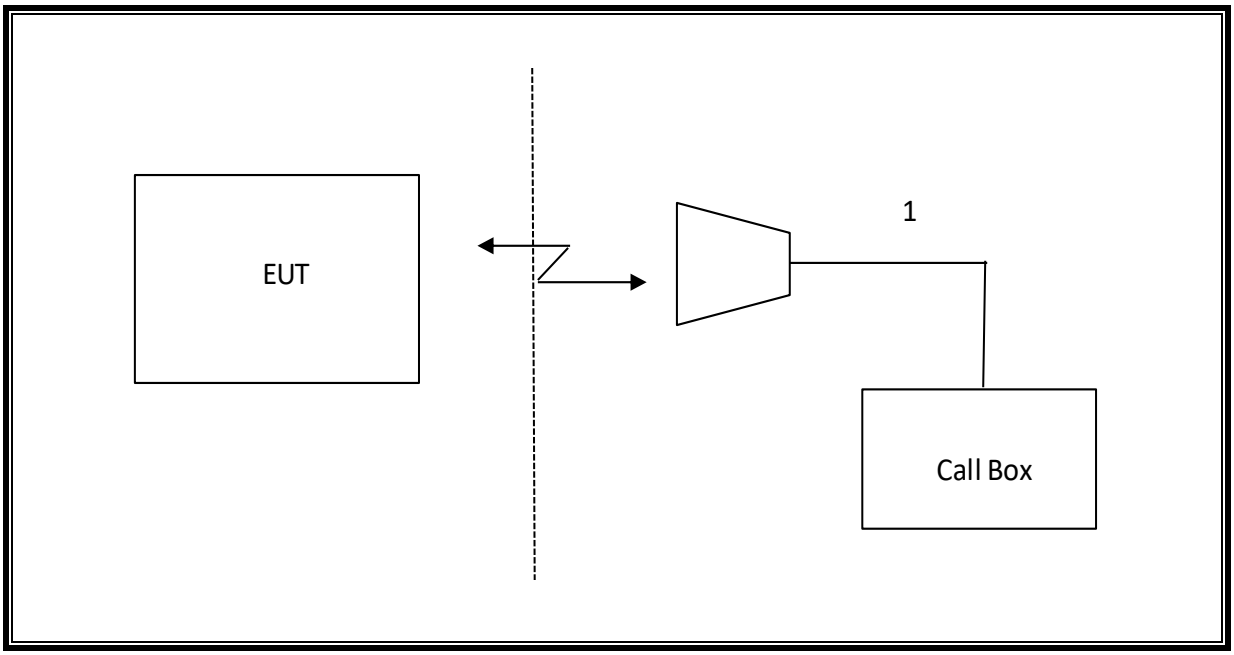
I/O CABLES (RF CONDUCTED TEST)						
Cable No.	**Port**	**# of Identical Ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	AC	3	US 115V	Un-shielded	2.0	N/A
2	USB	1	DC	Un-shielded	1.0	N/A
3	RF In/Out	1	EUT	Un-shielded	0.6	N/A
4	RF In/Out	1	Communication Test Set	Un-shielded	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 (14982436-E17) containing the reference data from the parent model as detailed in section 5.7.