



TEST REPORT

Report Number. : 13999462-E7V2

Applicant : APPLE, INC.
1 APPLE PARK WAY
CUPERTINO, CA 95014, U.S.A

Model : A2782

Brand : APPLE

FCC ID : BCG-E8064A

IC : 579C-E8064A

EUT Description : SMARTPHONE

Test Standard(s) : FCC CFR47 PART 22H, 24E, 27L, AND 90S
ISED RSS-132 ISSUE 3, RSS-133 ISSUE 6, AND RSS-139 ISSUE 3

Date Of Issue:
FEBRUARY 17, 2022

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Revision History

Rev.	Issue Date	Revisions	Revised By
V1	01/21/2020	Initial Review	Mengistu Mekuria
V2	02/17/2022	Updated EUT descriptions in Section 5.1 and 5.3	Mengistu Mekuria

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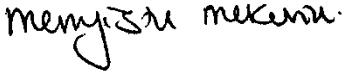
1. ATTESTATION OF TEST RESULTS

Applicant Name and Address	APPLE, INC. 1 APPLE PARK WAY CUPERTINO, CA 95014, U.S.A
Model	A2782
Brand	APPLE
FCC ID	BCG-E8064A
IC	579C-E8064A
EUT Description	SMARTPHONE
Serial Number	FG114720W9Q17XTCZ (Conducted) AND FD74J91DJL (Radiated)
Sample Receipt Date	OCTOBER 5, 2021
Date Tested	OCTOBER 5, 2021 to JANUARY 21, 2022
Applicable Standards	FCC CFR 47 Part 2, Part 22, Part 24, Part 27 and Part 90 ISED RSS-132 Issue 3, RSS-133 Issue 6, RSS-139 Issue 3.
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. This report must not be used by the client to claim product certification, approval, or endorsement by A2LA, NIST, any agency of the Federal Government, or any agency of the U.S. government.

Approved & Released By: 	Reviewed By: 	Prepared By: 
Mengistu Mekuria Staff Engineer UL Verification Services Inc.	John Thompson Test Engineer UL Verification Services Inc.	Tewodros Woldemichael 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 CFR 47 Part 2, Part 22, Part 24, Part 27 and Part 90
- [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
- ISED RSS-132 Issue 3, RSS-133 Issue 6, RSS-139 Issue 3.

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
<input type="checkbox"/>	Building 1: 47173 Benicia Street, Fremont, CA 94538, USA	US0104	2324A	550739
<input checked="" type="checkbox"/>	Building 2: 47266 Benicia Street, Fremont, CA 94538, USA	US0104	22541	550739
<input type="checkbox"/>	Building 4: 47658 Kato Rd, Fremont, CA 94538, USA	US0104	2324B	550739

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}
Worst Case Radiated Disturbance, 9KHz to 30 MHz	2.84 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
Occupied Channel Bandwidth	±1.22 %
Temperature	±2.26%
Supply voltages	±0.57 %
Time	±3.39 %

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)

$$36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} = 28.9 \text{ dBuV/m}$$

MAINS CONDUCTED EMISSIONS

Where relevant, the following sample calculation is provided:

Final Voltage (dBuV) = Measured Voltage (dBuV) + Cable Loss (dB) + Limiter Factor (dB) + LISN Insertion Loss.

$$36.5 \text{ dBuV} + 0 \text{ dB} + 10.1 \text{ dB} + 0 \text{ dB} = 46.6 \text{ dBuV}$$

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The Apple iPhone is a smartphone with multimedia functions (music, application support, and video), cellular GSM, GPRS, EGPRS, UMTS, LTE, 5G FR1, IEEE 802.11a/b/g/n/ac/ax, Bluetooth, GPS, and NFC. All models support at least one UICC based SIM. The second SIM is an UICC based e-SIM (electronic SIM) in some models. China model has 1 p-SIM (physical SIM) only. The device supports a built-in inductive charging receiver. The rechargeable battery is not user accessible.

5.2. INTRODUCTION

This application for certification is leveraging the data reuse procedures from KDB 484596 D01 based on reference FCC ID: BCG-E4082A/ IC: 579C-E4082A to cover variant model FCC ID: BCG-E8064A / IC: 579C-8064A. The major difference between the parent/reference model and the variant model is the de-population in the variant model 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 A2595 and A2782.

A2595 and A2782 are highly similar, with the only differences being listed on the table below:

Model	FCC ID	IC ID	Model Changes
A2595	BCG-E4082A	579C-E4082A	Main Reference Model
A2782	BCG-E8064A	579C-E8064A	B14/71 Removed and B11/21 Added

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

More specifically, their cellular modem, Wi-Fi, BT, and NFC transmitters are identical, and removal of LTE bands in some models is done by de-population of directly related components.

Spot check verification has been done on model A2782 in accordance with the test plan approved via KDB inquiry. Comparison of the models, upper deviation is within 3dB range and all tests are under FCC/ISED Technical Limits. The results documented for model A2595 may be applied as representative to model A2782.

5.4. SPOT CHECK VERIFICATION RESULTS SUMMARY

A2782 SPOT CHECK RESULTS							
Technology	Worst Mode	Test Item	Measured	Original Model: A2595	Sub Model: A2782	Delta (dB)	Remarks
			Frequency MHz	FCC ID : BCG-E4082A IC : 579C-E4082A (dBm)	FCC ID: BCG-E8064A IC : 579C-E8064A (dBm)		
GSM 850	GRPS 1 Slot	Cond Power	824-849	33.28	32.84	-0.44	
GSM 1900	GRPS 1 Slot	Cond Power	1850-1910	30.50	30.50	0	
WCDMA B5	REL 99	Cond Power	824-849	25.70	25.70	0	
WCDMA B2	HSDPA Sub 2	Cond Power	1852.4	25.70	25.70	0	
WCDMA B4	REL 99	Cond Power	1732.6	25.70	25.70	0	

5.5. REFERENCE DETAIL

Reference application that contains the reused reference data.

Equipment Class	Reference FCC ID / IC ID	Reference Application	Report Title/Section
PCE, TNE	BCG-E4082A/ 579C-E4082A	13911916 -E7	FCC_IC 2G/3G Report / All Sections

5.6. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was version 0.13.02.

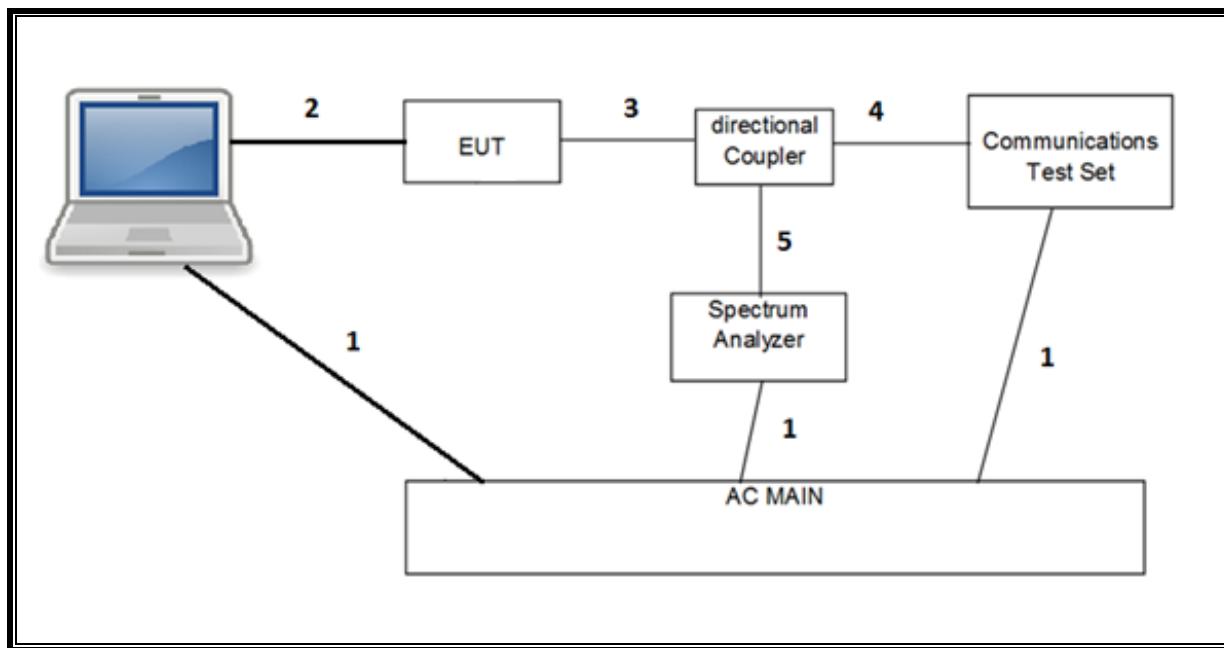
5.7. SPOT CHECK WORST-CASE CONFIGURATION AND MODE

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

5.8. DESCRIPTION OF TEST SETUP

SUPPORT TEST EQUIPMENT					
Description	Manufacturer	Model	Serial Number	FCC ID/ DoC	
Laptop	Apple	MacBook Pro	QDS-BRCM1069	A1398	
AC/DC adapter	Apple	B123	N/A	PA-1450-BA1	
I/O CABLES (RF CONDUCTED TEST)					
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length (m)
1	AC	3	US 115V	Un-shielded	2.0
2	USB	1	DC	Un-shielded	1.0
3	RF In/Out	1	EUT	Un-shielded	0.6
4	RF In/Out	1	Communication Test Set	Un-shielded	1.2
5	RF In/Out	1	Barrel	N/A	N/A

CONDUCTED 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
Spectrum Analyzer, PXA 3Hz to 44GHz	Keysight	N9030A	T907	07/22/2022
Spectrum Analyzer, PXA 3Hz to 50GHz	Keysight	N9030B	207995	05/27/2022
Spectrum Analyzer, PXA, 3Hz to 50GHz w/Ext. Mixer	Keysight	N9030A	T342	01/25/2022
Spectrum Analyzer, PSA 3Hz to 44GHz	Keysight	E4446A	T123	01/22/2022
Wideband Communication Test Set, Call Box	R&S GmbH & Co. KG	CMW500	T964	02/17/2022
Wireless Communication Test Set, Call Box	Agilent	E5515C	T211	04/03/2022
Directional Coupler	KRYTAR	152610	T1161	09/23/2022
Directional Coupler	KRYTAR	152610	T1536	09/23/2022
Directional Coupler	KRYTAR	152610	T1537	09/23/2022
Power Meter, P-series single channel	Keysight	N1912A	T1272	01/21/2022
Power Sensor, P - series, 50MHz to 18GHz, Wideband	Keysight	N1921A	T1224	01/28/2022
Spectrum Analyzer, PXA, 3Hz to 44GHz	Keysight	N9030A	T1210	01/22/2022
Wideband Communication Test Set, Call Box	R&S GmbH & Co. KG	CMW500	T979	02/22/2022
UL AUTOMATION SOFTWARE				
CLT Software	UL	UL RF	Ver 3.4, June 08 2021	
Power Measurement Software	UL	UL RF	Ver 3.1.4, May 20, 2021	

NOTES:

1. * Testing is completed before equipment expiration date.

Appendix A – Reference Test Report

Attached is the test report (13911916-E7) containing the reference data from the parent model as detailed in section 5.5.