



# TEST REPORT

**Report Number:** 13584004-E8V3

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

**Model :** A2636, A2638, A2639, A2640

**Brand :** APPLE

**FCC ID :** BCG-E4002A, BCG-E4033A, AND BCG-E4034A

**EUT Description :** SMARTPHONE

**Test Standard(s) :** FCC CFR47 PART 2, 22H, 24E, 27, 90S, 90R, AND 96

**Date Of Issue:**  
AUGUST 11, 2021

**Prepared by:**  
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Revision History

| <u>Rev.</u> | <u>Issue Date</u> | <u>Revisions</u>   | <u>Revised By</u> |
|-------------|-------------------|--|-------------------|
| V1          | 8/6/2021          | Initial Review   | Sintia Andean     |
| V2          | 8/10/2021         | Updated Section 5 according to TCB Feedback. Removed reference to setup photos, as that is covered by referenced report in appendix A. | John Thompson     |
| V3          | 8/11/2021         | Updated Section 1, 5.2,5.4-5.6 and 6, according to TCB Feedback.   | Lieu Nguyen       |

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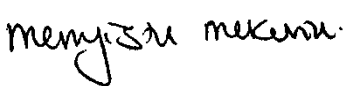


# 1. ATTESTATION OF TEST RESULTS

|                            |  |
|----------------------------|--|
| Applicant Name and Address | APPLE, INC<br>1 APPLE PARK WAY<br>CUPERTINO, CA 95014, U.S.A.  |
| Model                      | A2636, A2638, A2639, A2640   |
| Brand                      | APPLE  |
| FCC ID                     | BCG-E4002A, BCG-E4033A, BCG-E4034A   |
| EUT Description            | SMARTPHONE   |
| Serial Number              | MODEL A2636: C071264002P0G4J5 (CONDUCTED) AND GJ44HYV9D5 (RADIATED)<br>MODEL A2638: C07126500AU0X3VV4 (CONDUCTED) AND VL7NGJX4CM (RADIATED)<br>MODEL A2640: C07112700NL0X3X2 (CONDUCTED) AND CN7HJ63H41 (RADIATED) |
| Sample Receipt Date        | MAY 17, 2021   |
| Date Tested                | JUNE 08, 2021 to AUGUST 05, 2021   |
| Applicable Standards       | FCC CFR47 PART 2, 22H, 24E, 27, 90S, 90R, AND 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. 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:<br><br> | Reviewed By:<br><br> | Prepared By:<br><br> |
| Mengistu Mekuria<br>Lead Test Engineer<br>UL Verification Services Inc.  | Sintia Andrian<br>Laboratory Engineer<br>UL Verification Services Inc.                                  | Tony Li<br>Test Engineer<br>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, Part 90, 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

## 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 |
|-------------------------------------|--|------------|---------------------|------------------|
| <input checked="" type="checkbox"/> | Building 1: 47173 Benicia Street, Fremont, CA 94538, USA | US0104     | 2324A               | 208313           |
| <input checked="" type="checkbox"/> | Building 2: 47266 Benicia Street, Fremont, CA 94538, USA | US0104     | 22541               | 208313           |
| <input checked="" type="checkbox"/> | Building 4: 47658 Kato Rd, Fremont, CA 94538, USA        | US0104     | 2324B               | 208313           |

## 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 <sub>Lab</sub> |
|---|------------------|
| 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          |
| 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 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 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 dBuV + 0 dB + 10.1 dB + 0 dB = 46.6 dBuV

## 5. INTRODUCTION OF TEST DATA REUSE

### 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, CDMA, IEEE 802.11 a/b/g/n/ac/ax, Bluetooth, Ultra-Wideband, GPS, and NFC. All models support at least one UICC based SIM. The second SIM is either an UICC based p-SIM (physical SIM) or e-SIM (electronic SIM). The device supports a built-in inductive charging transmitter and 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-E4000A to cover variant model FCC ID: BCG-E4002A, FCC ID: BCG-E4033A, and FCC ID: BCG-E4034A. The major difference between the parent/reference model and the variant model is the depopulation in the variant model of the mmWave transmitter, and 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 A2483, A2636, A2638, A2639, and A2640.

A2483, A2636, A2638, A2639, and A2640 are highly similar, with the only differences being listed on the table below.

| Model  | FCC ID     | Model Changes          |
|--------|------------|------------------------|
| A2483  | BCG-E4000A | Main Reference Model   |
| A2636  | BCG-E4002A | FR2 removed            |
| A2638  | BCG-E4033A | FR2 and B14/71 removed |
| A2639* | BCG-E4034A | FR2 and B14/71 removed |
| A2640  | BCG-E4034A | FR2 and B14/71 removed |

\*Note: Model only support (pSIM + pSIM) instead of (pSIM + eSIM). A2639 is electrically identical to A2640.

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 A2636, A2638, A2639, and A2640 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 A2483 may be applied as representative to models A2636, A2638, A2639, and A2640.

### 5.4. SPOT CHECK VERIFICATION RESULTS SUMMARY FOR A2636

| A2636 SPOT CHECK RESULTS |                   |            |                 |                          |                          |            |             |
|--------------------------|-------------------|------------|-----------------|--------------------------|--------------------------|------------|-------------|
| Technology               | Worst Mode        | Test Item  | Measured        | Original Model: A2483    | Sub Model: A2636         | Delta (dB) | Remarks     |
|                          |                   |            | Frequency (MHz) | FCC ID: BCG-E4000A (dBm) | FCC ID: BCG-E4002A (dBm) |            |             |
| 5G NR BAND N5            | BPSK @ 20 MHz BW  | Cond Power | 824-849         | 25.7                     | 25.7                     | 0          | Noise Floor |
|                          | QPSK @ highest BW | RSE        |                 | -55.94                   | -56.04                   | -0.1       |             |
| LTE BAND 7               | QPSK @ 20 MHz BW  | Cond Power | 2500-2570       | 25.7                     | 25.7                     | 0          | Noise Floor |
|                          | QPSK @ highest BW | RSE        |                 | -50.7                    | -51.01                   | -0.31      |             |
| 5G NR BAND N7            | QPSK @ 20 MHz BW  | Cond Power | 2500-2570       | 25.7                     | 25.7                     | 0          |             |
| LTE BAND 12              | QPSK @ 10 MHz BW  | Cond Power | 699-716         | 25.7                     | 25.7                     | 0          |             |
| 5G NR BAND N12           | BPSK @ 15 MHz BW  | Cond Power | 699-716         | 25.7                     | 25.7                     | 0          |             |
| LTE BAND 13              | QPSK @ 10 MHz BW  | Cond Power | 777-787         | 25.7                     | 25.7                     | 0          |             |
| LTE BAND 14              | QPSK @ 10 MHz BW  | Cond Power | 788-798         | 25.7                     | 25.7                     | 0          |             |
| LTE BAND 17              | QPSK @ 10 MHz BW  | Cond Power | 704-716         | 25.7                     | 25.7                     | 0          |             |
| LTE BAND 25              | QPSK @ 20 MHz BW  | Cond Power | 1850-1915       | 25.7                     | 25.7                     | 0          | Noise Floor |
|                          | QPSK @ highest BW | RSE        |                 | -51.73                   | -52.24                   | -0.51      |             |
| 5G NR BAND N25           | QPSK @ 20 MHz BW  | Cond Power | 1850-1915       | 25.7                     | 25.7                     | 0          |             |
| LTE BAND 26 (90S)        | QPSK @10 MHz BW   | Cond Power | 814-824         | 25.7                     | 25.7                     | 0          |             |
| LTE BAND 26 (Part 22)    | QPSK @10 MHz BW   | Cond Power | 824-849         | 25.7                     | 25.7                     | 0          |             |
| LTE BAND 30              | QPSK @ 10 MHz BW  | Cond Power | 2305-2315       | 25.7                     | 25.7                     | 0          |             |
| 5G NR BAND N30           | BPSK @ 5 MHz BW   | Cond Power | 2305-2315       | 25.7                     | 25.7                     | 0          |             |
| LTE BAND 41              | QPSK @ 20 MHz BW  | Cond Power | 2496-2690       | 27.5                     | 27.5                     | 0          |             |
| 5G NR BAND N41           | BPSK @ 100 MHz BW | Cond Power | 2496-2690       | 27.7                     | 27.7                     | 0          |             |
| LTE BAND 48              | QPSK @ 20 MHz BW  | Cond Power | 3550-3700       | 25.6                     | 25.6                     | 0          | Noise Floor |
|                          | QPSK @ highest BW | RSE        |                 | -47.98                   | -60.88                   | -12.9      |             |
| LTE BAND 66              | QPSK @ 20 MHz BW  | Cond Power | 1710-1780       | 25.7                     | 25.7                     | 0          |             |
| 5G NR BAND N66           | BPSK @ 20 MHz BW  | Cond Power | 1710-1780       | 25.7                     | 25.7                     | 0          |             |
| LTE BAND 71              | QPSK @ 20 MHz BW  | Cond Power | 663-698         | 25.7                     | 25.7                     | 0          |             |
| 5G NR BAND N71           | BPSK @ 10 MHz BW  | Cond Power | 663-698         | 25.7                     | 25.7                     | 0          |             |
| 5G NR BAND N77           | BPSK @ 100 MHz BW | Cond Power | 3450-3550       | 27.7                     | 27.7                     | 0          |             |
| 5G NR BAND N77           | BPSK @ 100 MHz BW | Cond Power | 3700-3980       | 27.7                     | 27.7                     | 0          |             |



### 5.5. SPOT CHECK VERIFICATION RESULTS SUMMARY FOR A2638

| A2638 SPOT CHECK RESULTS |                   |            |                 |                          |                          |            |             |
|--------------------------|-------------------|------------|-----------------|--------------------------|--------------------------|------------|-------------|
| Technology               | Worst Mode        | Test Item  | Measured        | Original Model: A2483    | Sub Model: A2638         | Delta (dB) | Remarks     |
|                          |                   |            | Frequency (MHz) | FCC ID: BCG-E4000A (dBm) | FCC ID: BCG-E4033A (dBm) |            |             |
| 5G NR BAND N5            | BPSK @ 20 MHz BW  | Cond Power | 824-849         | 25.7                     | 25.7                     | 0          |             |
|                          | QPSK @ highest BW | RSE        |                 | -55.94                   | -56.5                    | -0.56      | Noise Floor |
| LTE BAND 7               | QPSK @ 20 MHz BW  | Cond Power | 2500-2570       | 25.7                     | 25.7                     | 0          |             |
|                          | QPSK @ highest BW | RSE        |                 | -50.7                    | -51.59                   | -0.89      | Noise Floor |
| 5G NR BAND N7            | QPSK @ 20 MHz BW  | Cond Power | 2500-2570       | 25.7                     | 25.7                     | 0          |             |
| LTE BAND 12              | QPSK @ 10 MHz BW  | Cond Power | 699-716         | 25.7                     | 25.7                     | 0          |             |
| 5G NR BAND N12           | BPSK @ 15 MHz BW  | Cond Power | 699-716         | 25.7                     | 25.7                     | 0          |             |
| LTE BAND 13              | QPSK @ 10 MHz BW  | Cond Power | 777-787         | 25.7                     | 25.7                     | 0          |             |
| LTE BAND 17              | QPSK @ 10 MHz BW  | Cond Power | 704-716         | 25.7                     | 25.7                     | 0          |             |
| LTE BAND 25              | QPSK @ 20 MHz BW  | Cond Power | 1850-1915       | 25.7                     | 25.7                     | 0          |             |
|                          | QPSK @ highest BW | RSE        |                 | -51.73                   | -51.9                    | -0.17      | Noise Floor |
| 5G NR BAND N25           | QPSK @ 20 MHz BW  | Cond Power | 1850-1915       | 25.7                     | 25.7                     | 0          |             |
| LTE BAND 26 (90S)        | QPSK @ 10 MHz BW  | Cond Power | 814-824         | 25.7                     | 25.7                     | 0          |             |
| LTE BAND 26 (Part 22)    | QPSK @ 10 MHz BW  | Cond Power | 824-849         | 25.7                     | 25.7                     | 0          |             |
| LTE BAND 30              | QPSK @ 10 MHz BW  | Cond Power | 2305-2315       | 25.7                     | 25.7                     | 0          |             |
| 5G NR BAND N30           | BPSK @ 5 MHz BW   | Cond Power | 2305-2315       | 25.7                     | 25.7                     | 0          |             |
| LTE BAND 41              | QPSK @ 20 MHz BW  | Cond Power | 2496-2690       | 27.5                     | 27.5                     | 0          |             |
| 5G NR BAND N41           | BPSK @ 100 MHz BW | Cond Power | 2496-2690       | 27.7                     | 27.7                     | 0          |             |
| LTE BAND 48              | QPSK @ 20 MHz BW  | Cond Power | 3550-3700       | 25.6                     | 25.6                     | 0          |             |
|                          | QPSK @ highest BW | RSE        |                 | -47.98                   | -60.43                   | -12.45     | Noise Floor |
| LTE BAND 66              | QPSK @ 20 MHz BW  | Cond Power | 1710-1780       | 25.7                     | 25.7                     | 0          |             |
| 5G NR BAND N66           | BPSK @ 20 MHz BW  | Cond Power | 1710-1780       | 25.7                     | 25.7                     | 0          |             |
| 5G NR BAND N77           | BPSK @ 100 MHz BW | Cond Power | 3450-3550       | 27.7                     | 27.7                     | 0          |             |
| 5G NR BAND N77           | BPSK @ 100 MHz BW | Cond Power | 3700-3980       | 27.7                     | 27.7                     | 0          |             |

## 5.6. SPOT CHECK VERIFICATION RESULTS SUMMARY FOR A2639 AND A2640

| A2639 AND A2640 SPOT CHECK RESULTS |                   |            |                 |                          |                            |            |             |
|------------------------------------|-------------------|------------|-----------------|--------------------------|----------------------------|------------|-------------|
| Technology                         | Worst Mode        | Test Item  | Measured        | Original Model: A2483    | Sub Model: A2639 and A2640 | Delta (dB) | Remarks     |
|                                    |                   |            | Frequency (MHz) | FCC ID: BCG-E4000A (dBm) | FCC ID: BCG-E4034A (dBm)   |            |             |
| 5G NR BAND N5                      | BPSK @ 20 MHz BW  | Cond Power | 824-849         | 25.7                     | 25.7                       | 0          | Noise Floor |
|                                    | QPSK @ highest BW | RSE        |                 | -55.94                   | -55.64                     | 0.3        |             |
| LTE BAND 7                         | QPSK @ 20 MHz BW  | Cond Power | 2500-2570       | 25.7                     | 25.7                       | 0          | Noise Floor |
|                                    | QPSK @ highest BW | RSE        |                 | -50.7                    | -51.61                     | -0.91      |             |
| 5G NR BAND N7                      | QPSK @ 20 MHz BW  | Cond Power | 2500-2570       | 25.7                     | 25.7                       | 0          |             |
| LTE BAND 12                        | QPSK @ 10 MHz BW  | Cond Power | 699-716         | 25.7                     | 25.7                       | 0          |             |
| 5G NR BAND N12                     | BPSK @ 15 MHz BW  | Cond Power | 699-716         | 25.7                     | 25.7                       | 0          |             |
| LTE BAND 13                        | QPSK @ 10 MHz BW  | Cond Power | 777-787         | 25.7                     | 25.7                       | 0          |             |
| LTE BAND 17                        | QPSK @ 10 MHz BW  | Cond Power | 704-716         | 25.7                     | 25.7                       | 0          |             |
| LTE BAND 25                        | QPSK @ 20 MHz BW  | Cond Power | 1850-1915       | 25.7                     | 25.7                       | 0          | Noise Floor |
|                                    | QPSK @ highest BW | RSE        |                 | -51.73                   | -51.84                     | -0.11      |             |
| 5G NR BAND N25                     | QPSK @ 20 MHz BW  | Cond Power | 1850-1915       | 25.7                     | 25.7                       | 0          |             |
| LTE BAND 26 (90S)                  | QPSK @ 10 MHz BW  | Cond Power | 814-824         | 25.7                     | 25.7                       | 0          |             |
| LTE BAND 26 (Part 22)              | QPSK @ 10 MHz BW  | Cond Power | 824-849         | 25.7                     | 25.7                       | 0          |             |
| LTE BAND 30                        | QPSK @ 10 MHz BW  | Cond Power | 2305-2315       | 25.7                     | 25.7                       | 0          |             |
| 5G NR BAND N30                     | BPSK @ 5 MHz BW   | Cond Power | 2305-2315       | 25.7                     | 25.7                       | 0          |             |
| LTE BAND 41                        | QPSK @ 20 MHz BW  | Cond Power | 2496-2690       | 27.5                     | 27.5                       | 0          |             |
| 5G NR BAND N41                     | BPSK @ 100 MHz BW | Cond Power | 2496-2690       | 27.7                     | 27.7                       | 0          |             |
| LTE BAND 48                        | QPSK @ 20 MHz BW  | Cond Power | 3550-3700       | 25.6                     | 25.6                       | 0          | Noise Floor |
|                                    | QPSK @ highest BW | RSE        |                 | -47.98                   | -49.01                     | -1.03      |             |
| LTE BAND 66                        | QPSK @ 20 MHz BW  | Cond Power | 1710-1780       | 25.7                     | 25.7                       | 0          |             |
| 5G NR BAND N66                     | BPSK @ 20 MHz BW  | Cond Power | 1710-1780       | 25.7                     | 25.7                       | 0          |             |
| 5G NR BAND N77                     | BPSK @ 100 MHz BW | Cond Power | 3450-3550       | 27.7                     | 27.7                       | 0          |             |
| 5G NR BAND N77                     | BPSK @ 100 MHz BW | Cond Power | 3700-3980       | 27.7                     | 27.7                       | 0          |             |

### 5.7. REFERENCE DETAIL

Reference application that contains the reused reference data.

| Equipment Class | Reference FCC ID | Reference Application | Variant model FCC ID | Report Title/Section   |
|-----------------|------------------|-----------------------|----------------------|--|
| PCE, CBE, TNE   | BCG-E4000A       | 13571601-E8           | BCG-E4002A           | FCC LTE Report/ All Sections                                     |
| PCE, CBE, TNE   | BCG-E4000A       | 13571601-E8           | BCG-E4033A           | FCC LTE Report/ All Sections except LTE/5GnR Band 14/71 sections |
| PCE, CBE, TNE   | BCG-E4000A       | 13571601-E8           | BCG-E4034A           | FCC LTE Report/ All Sections except LTE/5GnR Band 14/71 sections |

## **5.8. SOFTWARE AND FIRMWARE**

The EUT firmware installed during testing was version 0.21.02-1

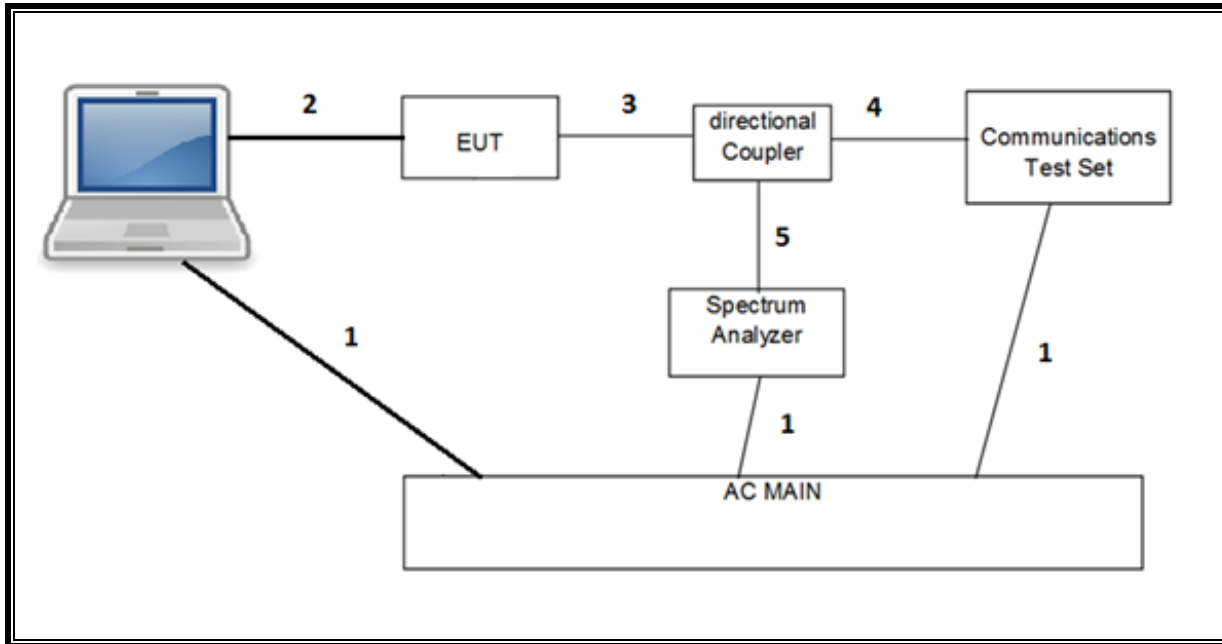
## **5.9. SPOT CHECK WORST-CASE CONFIGURATION AND MODE**

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

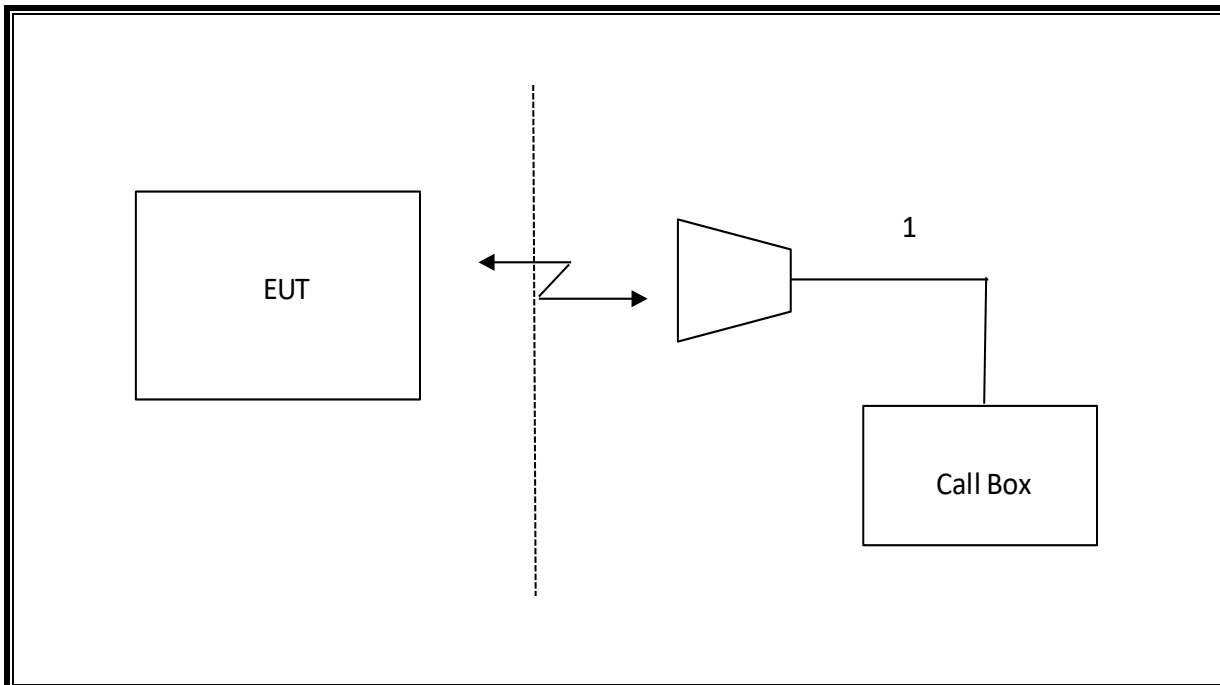
### 5.10. DESCRIPTION OF TEST SETUP

| SUPPORT TEST EQUIPMENT         |              |                      |                        |             |                  |         |
|--------------------------------|--------------|----------------------|------------------------|-------------|------------------|---------|
| Description                    | Manufacturer | Model                | Serial Number          | FCC ID/ DoC |                  |         |
| Laptop                         | A1398        | C02PM012G3QD         | QDS-BRCM1069           | A1398       |                  |         |
| AC/DC adapter                  | PA-1450-BA1  | 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) | 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              | PRE0213972           | 12/03/2021 |
| Antenna, Horn 1-18GHz                        | ETS Lindgren              | 3117              | PRE0213833           | 02/16/2022 |
| Antenna, Broadband Hybrid, 30MHz to 2000MHz  | Sunol Sciences Corp.      | JB3               | T407                 | 06/22/2022 |
| Amplifier 1-18GHz, 45dB Min                  | AMPLICAL                  | AMP0.1G18-47-20   | 172123               | 01/23/2022 |
| RF Device, Active, Amplifier                 | AMPLICAL                  | AMP0.1G18-47-20   | 206055               | 05/13/2022 |
| *Amplifier, 9KHz to 1GHz, 32dB               | SONOMA INSTRUMENT         | 310               | PRE0180176           | 07/14/2021 |
| *Filter, BRF 2495 to 2690MHz                 | Micro-Tronics             | BRM50709-02       | T1790                | 06/23/2021 |
| Filter, 2.7 to 18GHz High Pass               | Micro-Tronics             | H2G518G6          | 198714               | 04/22/2022 |
| *Filter, Highpass 1.2GHz                     | Micro-Tronics             | HPM50108          | T1737                | 6/23/2021  |
| *Filter, BRF 3400 to 3800MHz                 | Micro-Tronics             | BRM50711-02       | T1792                | 6/23/2021  |
| Directional Coupler                          | KRYTAR                    | 152610            | T1161                | 09/16/2021 |
| EMI TEST RECEIVER                            | Rohde & Schwarz           | ESW44             | 201497               | 02/25/2022 |
| EMI TEST RECEIVER                            | Rohde & Schwarz           | ESW44             | 201499               | 02/26/2022 |
| Antenna, Horn 1-12GHz                        | L3 Narda                  | PNR 1-12-440EM-NF | PRE0181256           | 03/11/2022 |
| Wideband Communication Test Set, Call Box    | R&S GmbH & Co. KG         | CMW500            | T703                 | 02/20/2022 |
| Wideband Communication Test Set, Call Box    | R&S GmbH & Co. KG         | CMW500            | T972                 | 02/20/2022 |
| Power Meter, P-series single channel         | Keysight                  | N1912A            | T1245                | 01/21/2022 |
| Power Sensor                                 | Keysight                  | N1921A            | T1225                | 01/28/2022 |
| Amplifier, 26 - 40GHz                        | Miteq                     | TTA2640-35-HG     | T1864                | 04/19/2022 |
| Amplifier, 1 to 26.5GHz, 23.5dB Gain minimum | Keysight Technologies Inc | 8449B             | T404                 | 04/19/2022 |
| Antenna, Horn 18 to 26.5GHz                  | ARA                       | MWH-1826/B        | T447                 | 09/24/2021 |
| Antenna, Horn 26.5GHz to 40GHz               | ARA                       | MWH-2640          | T90                  | 05/03/2022 |
| Antenna, Active Loop 9KHz to 30MHz           | ETS Lindgren              | 6502              | T1616                | 12/02/2021 |
| UL AUTOMATION SOFTWARE                       |                           |                   |                      |            |
| CLT Software                                 | UL                        | UL RF             | Ver 3.2.5, 4/13/2021 |            |
| Power Measurement Software                   | UL                        | UL RF             | Ver 3.1.2 5/17/2021  |            |
| Radiated test software                       | UL                        | UL RF             | Ver 9.5, 4/14/2021   |            |

### NOTES:

\* Testing is completed before equipment expiration date.

## Appendix A – Reference Test Report

Attached is the test report (13571601-E8) containing the reference data from the parent model as detailed in section 5.7.