

TEST REPORT

Report Number : 14523758-E18V2

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

Model : A2846 (Parent Model)
A3089, A3090, A3092 (Variant Models)

FCC ID : BCG-E8427A (Parent Model)
BCG-E8428A, BCG-E8429A, BCG-E8430A (Variant Models)

EUT Description : SMARTPHONE

Test Standard(s) : FCC PART 96.47

Date Of Issue:

July 07, 2023

Prepared by:

UL Verification Services Inc.
47173 Benicia Street
Fremont, CA 94538, U.S.A.
TEL: (510) 771-1000
FAX: (510) 661-0888



Revision History

| <u>Rev.</u> | <u>Issue Date</u> | <u>Revisions</u> | <u>Revised By</u> |
|-------------|-------------------|---------------------------|-------------------|
| V1 | 6/20/2023 | Initial Issue | Steven Tran |
| V2 | 7/7/2023 | Updated Section 1 and 5.1 | Steven Tran |

TABLE OF CONTENTS

| | |
|--|-----------|
| 1. ATTESTATION OF TEST RESULTS | 4 |
| 2. TEST METHODOLOGY | 5 |
| 3. FACILITIES AND ACCREDITATION | 5 |
| 4. DECISION RULES AND MEASUREMENT UNCERTAINTY | 6 |
| 4.1. METROLOGICAL TRACEABILITY | 6 |
| 4.2. DECISION RULES..... | 6 |
| 4.3. MEASUREMENT UNCERTAINTY..... | 6 |
| 4.4. MEASURING INSTRUMENT CALIBRATION | 7 |
| 5. EQUIPMENT UNDER TEST | 7 |
| 5.1. DESCRIPTION OF EUT | 7 |
| 5.2. DESCRIPTION OF TEST SETUP..... | 7 |
| 6. TEST AND MEASUREMENT EQUIPMENT | 9 |
| 7. END USER DEVICE ADDITIONAL REQUIREMENT | 10 |
| 7.1. TEST REQUIREMENT | 10 |
| 8. TEST PROCEDURE AND EUT CONFIGURATION..... | 10 |
| 8.1. END USER DEVICE CONFIGURATION 1..... | 11 |
| 8.2. END USER DEVICE CONFIGURATION 2..... | 13 |
| 9. SETUP PHOTOS..... | 15 |


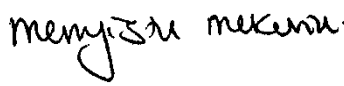

1. ATTESTATION OF TEST RESULTS

| | |
|----------------------------|--|
| Applicant Name and Address | APPLE INC. 1 APPLE PARK WAY CUPERTINO CA 95104, U.S.A. |
| Model | A2846 (Parent Model, Full Test) A3089, A3090, A3092 (Variant Models) |
| Brand | APPLE |
| FCC ID | BCG-E8427A (Parent Model) BCG-E8428A, BCG-E8429A, BCG-E8430A (Variant Models) |
| EUT Description | SMART PHONE |
| Serial Number | C57TX7VXYT |
| Sample Receipt Date | 04/13/2023 |
| Date Tested | 04/14/2023 |
| Applicable Standards | FCC Title 47 CFR PART 96.47 |
| 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: | Tested By: |
|  |  |  |
| Thu Chan Staff Engineer UL Verification Services Inc. | Mengistu Mekuria Staff Lab Engineer UL Verification Services Inc. | Steven Tran Project Engineer UL Verification Services Inc. |

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC Part 96.47, KDB 940660 D01 Part 96 CBRS Eqpt v03 and WINNF-TS-0122-v1.0.2.

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 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 | | | |
| <input type="checkbox"/> | Building 4: 47658 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} |
|---|------------------|
| 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. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The Apple iPhone is a smartphone with cellular GSM, GPRS, EGPRS, UMTS, LTE, 5G NR1, 5G NR2, IEEE 802.11a/b/g/n/ac/ax, Bluetooth (BT), Ultra-Wideband (UWB), GPS, NFC, 802.15.4ab-NB and MSS technologies. The rechargeable battery is not user accessible.

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.

Parent Model: A2846, FCC ID: BCG-E8427A

Variant Models: A3089, FCC ID: BCG-E8428A
 A3090, FCC ID: BCG-E8429A
 A3092, FCC ID: BCG-E8430A

5.2. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

| Support Equipment List | | | | |
|------------------------|--------------|--------------|---------------|--------|
| Description | Manufacturer | Model | Serial Number | FCC ID |
| Switch/AC/DC adapter | Trendnet | TEG-S51SFP/A | RA2C511100028 | - |
| Laptop AC/DC adapter | Lenovo | 20NYS1GL00 | MJOC6F8E | - |
| Laptop AC/DC adapter | HP | HSN-I12C | 5CG8491TSM | - |

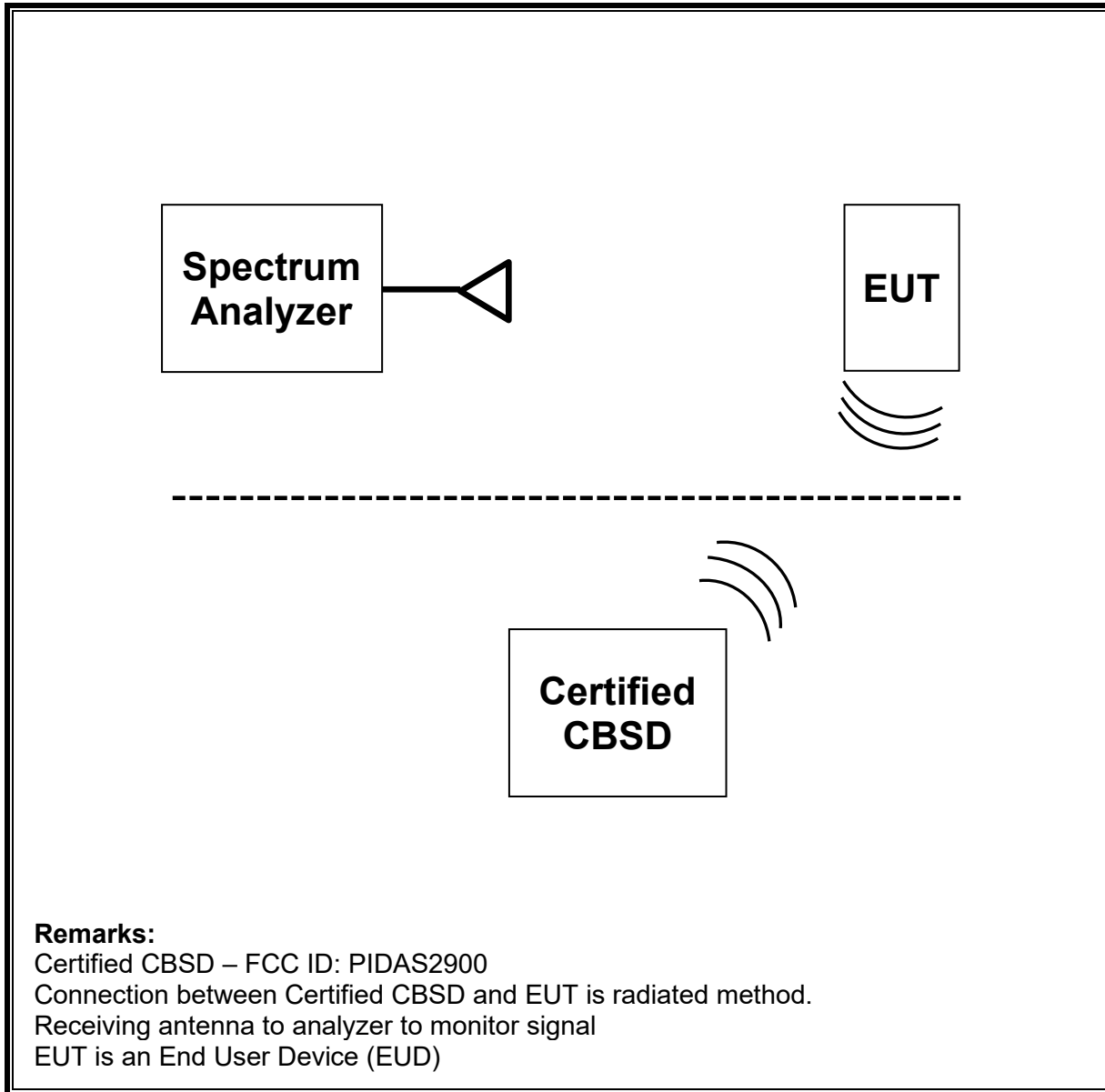
I/O CABLES

| I/O Cable List | | | | | | |
|----------------|---------|----------------------|----------------|-------------|------------------|---------|
| Cable No | Port | # of identical ports | Connector Type | Cable Type | Cable Length (m) | Remarks |
| 1 | AC | 1 | AC | Un-Shielded | 1 | N/A |
| 3 | RJ45 | 3 | Ethernet | Un-Shielded | 1 | N/A |
| 2 | RF Port | 2 | SMA | Shielded | 0.5 | N/A |

TEST SETUP

The standalone EUT connected to a certified CBSD and Spectrum Analyzer via air and an RF cable respectively.

SETUP DIAGRAM OF TEST SYSTEM



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 | ID Num | Cal Due |
| Spectrum Analyzer, PXA, 3Hz to 44GHz | Agilent (Keysight) Technologies | N9030A | 81188 | 01/31/2024 |
| Mount Antenna | Wilson Amplifiers | 301126 | - | - |
| Airspeed 2900 n48 CBSD Radio | Airspan Networks Inc. | AS29-N48-DSC1 | F3686B00EF84 | - |

7. END USER DEVICE ADDITIONAL REQUIREMENT

7.1. TEST REQUIREMENT

FCC Part 96.47

- (a) End User Devices may operate only if they can positively receive and decode an authorization signal transmitted by a CBSD, including the frequencies and power limits for their operation.
- (1) An End User Device must discontinue operations, change frequencies, or change its operational power level within 10 seconds of receiving instructions from its associated CBSD.

8. TEST PROCEDURE AND EUT CONFIGURATION

KDB 940660 D01 Part 96 CBRS v03, WINNF-TS-0122 V1.0.2

Additional requirements are required to End-User Device n48 device base on CBSD protocol. During the test, the EUT and its companion certified CBSD (FCC ID: PIDAS2900) device communicate with each other via air. Plots are captured and measurements are done over the air, in which the path loss is not accounted for the correction of the output power.

| Configuration | Frequency (MHz) | Power (dBm/MHz) | Bandwidth (MHz) |
|---------------|-----------------|-----------------|-----------------|
| 1 | 3560 | 17 | 20 |
| 2 | 3580 | 13 | 20 |

Configuration 1

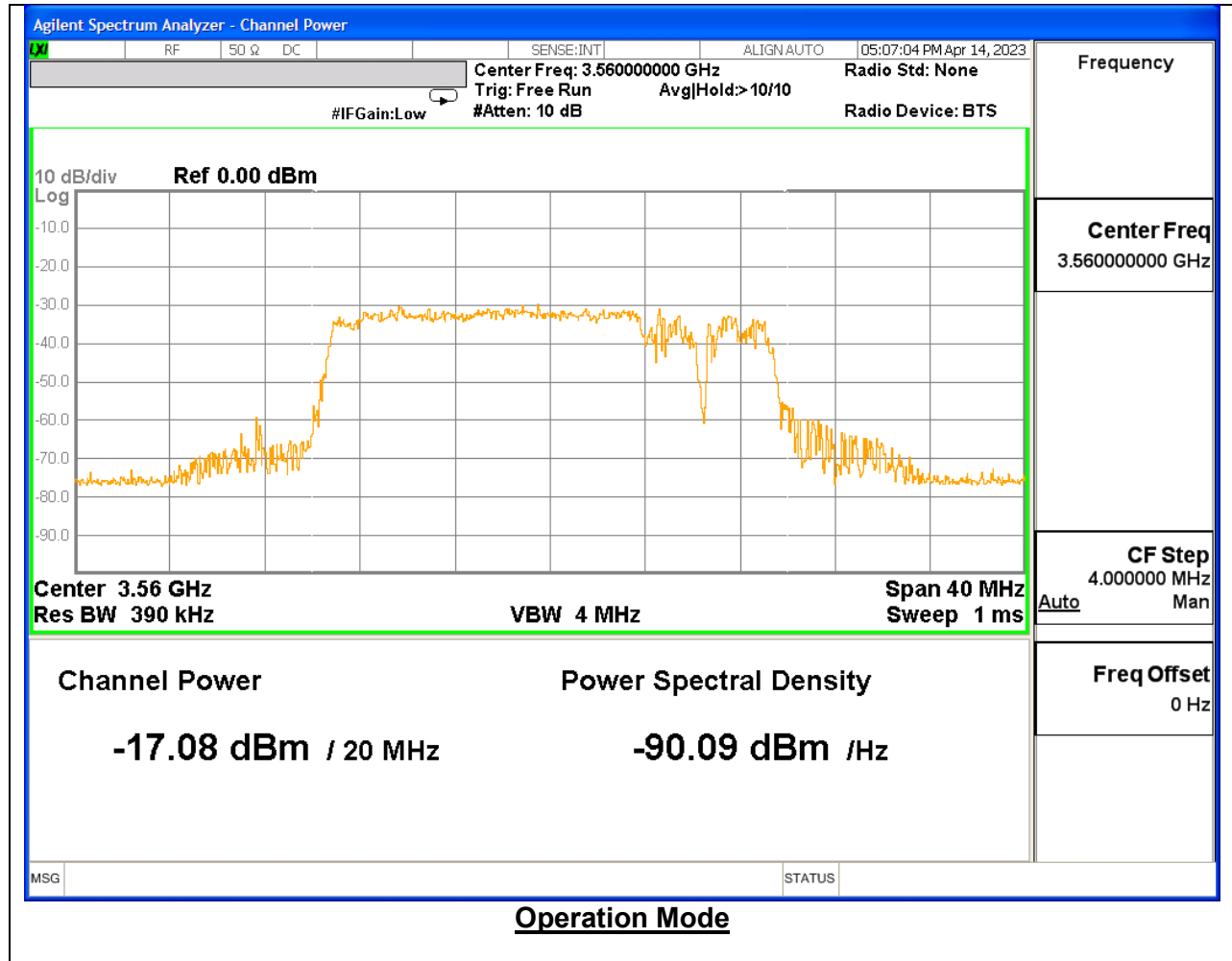
- a) Setup Airspeed 2900 with 3560MHz and power level 17 dBm/MHz
- b) Enable n48 service from Airspan admin control panel
- c) Check Transmitter Frequency and power
- d) Disable n48 service from Airspan admin control panel and check EUT stop transmission within 10s.

Configuration 2

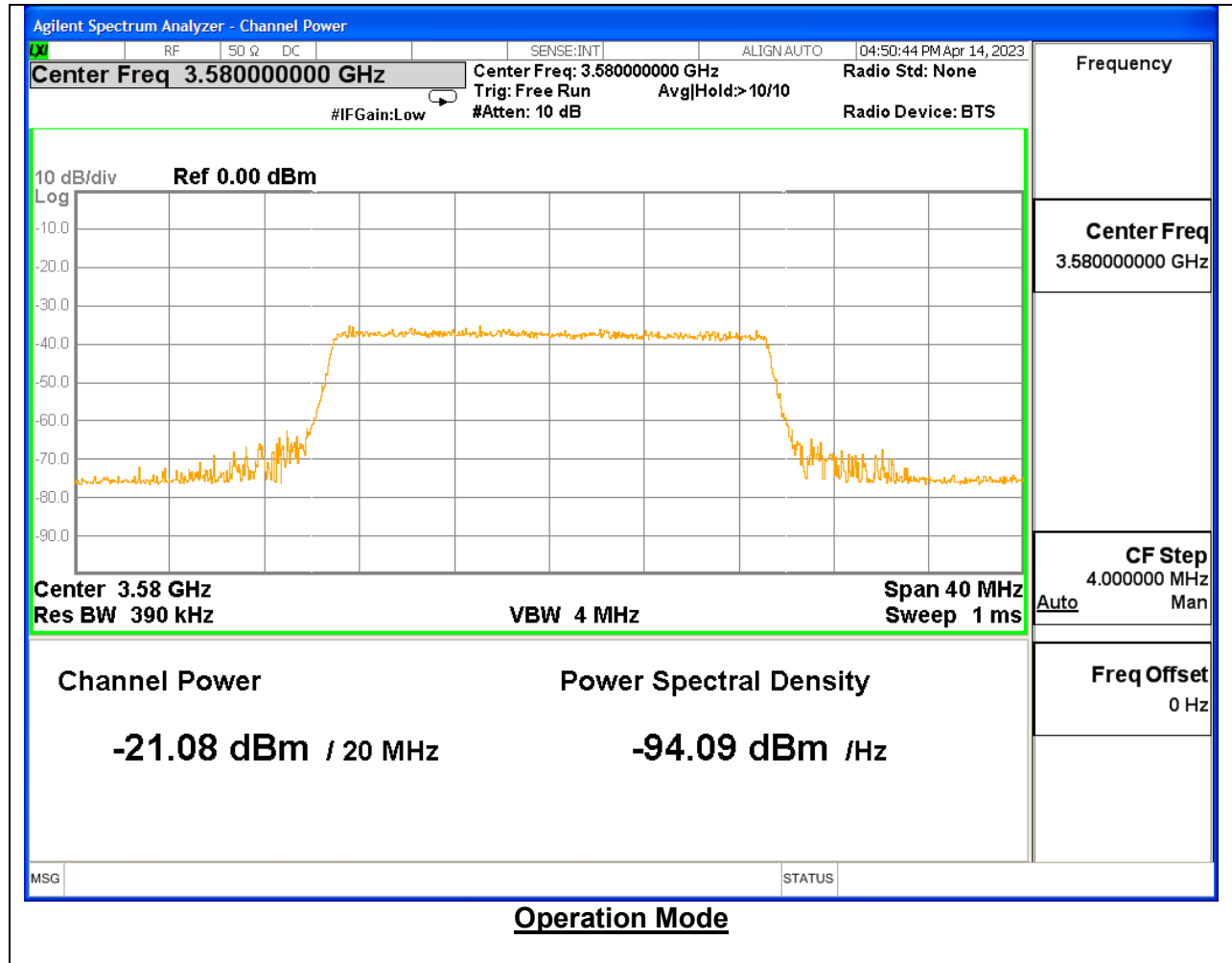
- a) Setup Airspeed 2900 with 3580MHz and power level 13 dBm/MHz
- b) Enable n48 service from Airspan admin control panel
- c) Check Transmitter Frequency and power
- d) Disable n48 service from Airspan admin control panel and check EUT stop transmission within 10s.

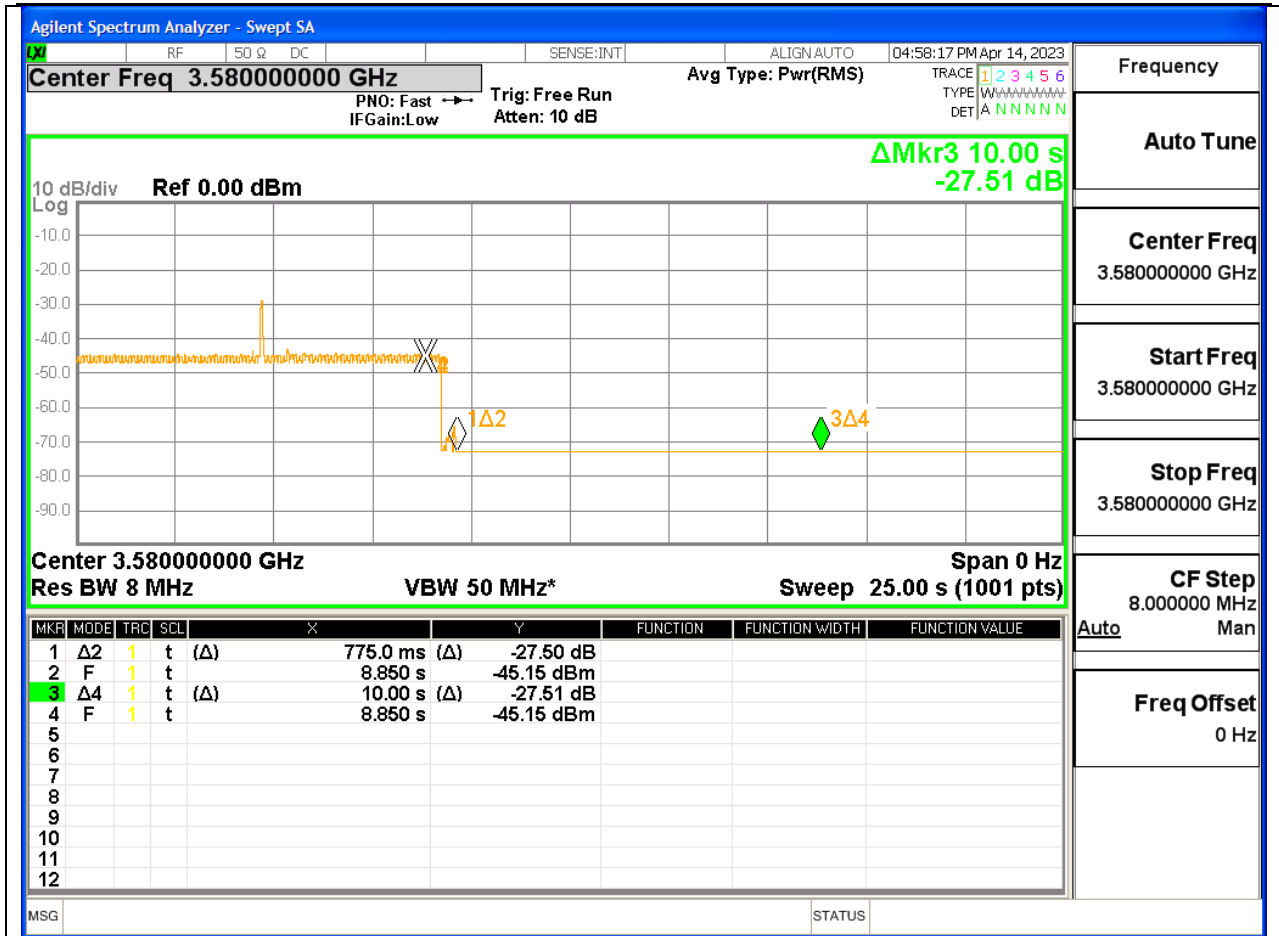
TEST RESULTS

8.1. END USER DEVICE CONFIGURATION 1 (3560MHz; MaxEIRP: 17 dBm/MHz)



8.2. END USER DEVICE CONFIGURATION 2 (3580MHz; MaxEIRP: 13 dBm/MHz)





Stop Operation Within 10 second Mode

NOTE:

Marker 1: Authorized CBSD sends a signal to stop n48 transmission.
 Marker 2: Time elapsed since signal to stop n48 transmission. EUD has stopped transmission.
 Marker 3-4 Delta: 10 seconds has elapsed since CBSD has sent a signal to stop n48 transmission to EUT.

9. SETUP PHOTOS

Please refer to 14523758-EP1V1 for setup photos

END OF REPORT