TEST REPORT

Report Number : 14523744-E30V2

Applicant	:	APPLE, INC. 1 APPLE PARK WAY CUPERTINO, CA. 95014, U.S.A.
Model	:	A3101 (Parent Model) A3102, A3104 (Variant Models)
FCC ID	:	BCG-E8436A (Parent Model) BCG-E8437A, BCG-E8438A (Variant Models)
EUT Description	:	SMARTPHONE
Test Standard(s)	:	FCC PART 96.47

Date Of Issue:
August 04, 2023

Prepared by:
UL Verification Services Inc.
47173 Benicia Street
Fremont, CA 94538, U.S.A.
TEL: (510) 771-1000
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ACCREDITED
CERT #0751.05

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	7/12/2023	Initial Issue	Steven Tran
V2	8/4/2023	Updated Section 4.3 and 8	Steven Tran

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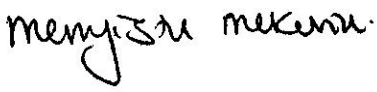
1. ATTESTATION OF TEST RESULTS

Applicant Name and Address	APPLE INC. 1 APPLE PARK WAY CUPERTINO CA 95104, U.S.A.
Model	A3101 (Parent Model, Full Test) A3102, A3104 (Variant Models)
Brand	APPLE
FCC ID	BCG-E8436A (Parent Model) BCG-E8437A, BCG-E8438A (Variant Models)
EUT Description	SMART PHONE
Serial Number	H19G2XG2G9
Sample Receipt Date	06/14/2023
Date Tested	06/15/2023
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
☐	Building 1: 47173 Benicia Street, Fremont, CA 94538, USA	US0104	2324A	550739
☒	Building 2: 47266 Benicia Street, Fremont, CA 94538, USA			
☐	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}
Conducted Antenna Port Emission Measurement	1.94 dB
Time Domain Measurements Using SA	3.39 %
Radio Frequency (Spectrum Analyzer)	141.16 Hz
Occupied Bandwidth	1.22%
Worst Case Radiated Disturbance, 1000 to 18000 MHz	4.73 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, 5GNR1, 5GNR2, IEEE 802.11a/b/g/n/ac/ax, Bluetooth (BT), Ultra-Wideband (UWB), GPS, NFC, NB UNII, 802.15.4, 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: A3101, FCC ID: BCG-E8436A

Variant Models: A3102, FCC ID: BCG-E8437A
A3104, FCC ID: BCG-E8438A

5.2. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Laptop and AC/DC adapter	Lenovo	20NYS1GL00	MJ0C6F8E	-

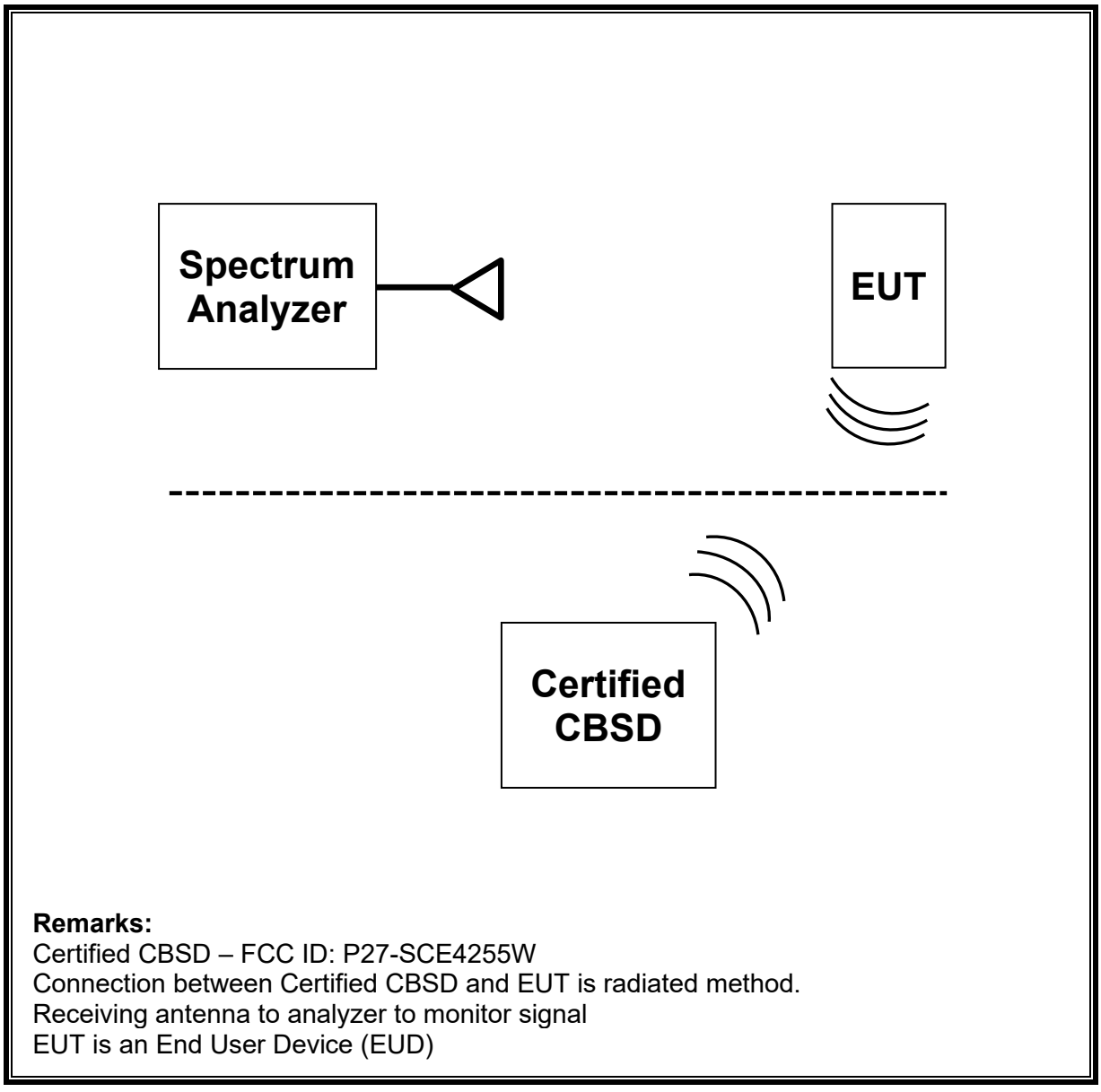
I/O CABLES

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



Remarks:
Certified CBSD – FCC ID: P27-SCE4255W
Connection between Certified CBSD and EUT is radiated method.
Receiving antenna to analyzer to monitor signal
EUT is an End User Device (EUD)

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	-	-
Mosolabs Englewood B48 LTE AP	Mosolabs	SCE4255W	2206CW6000010	-

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: P27-SCE4255W) 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	3670	15	20
2	3690	10	10

Configuration 1

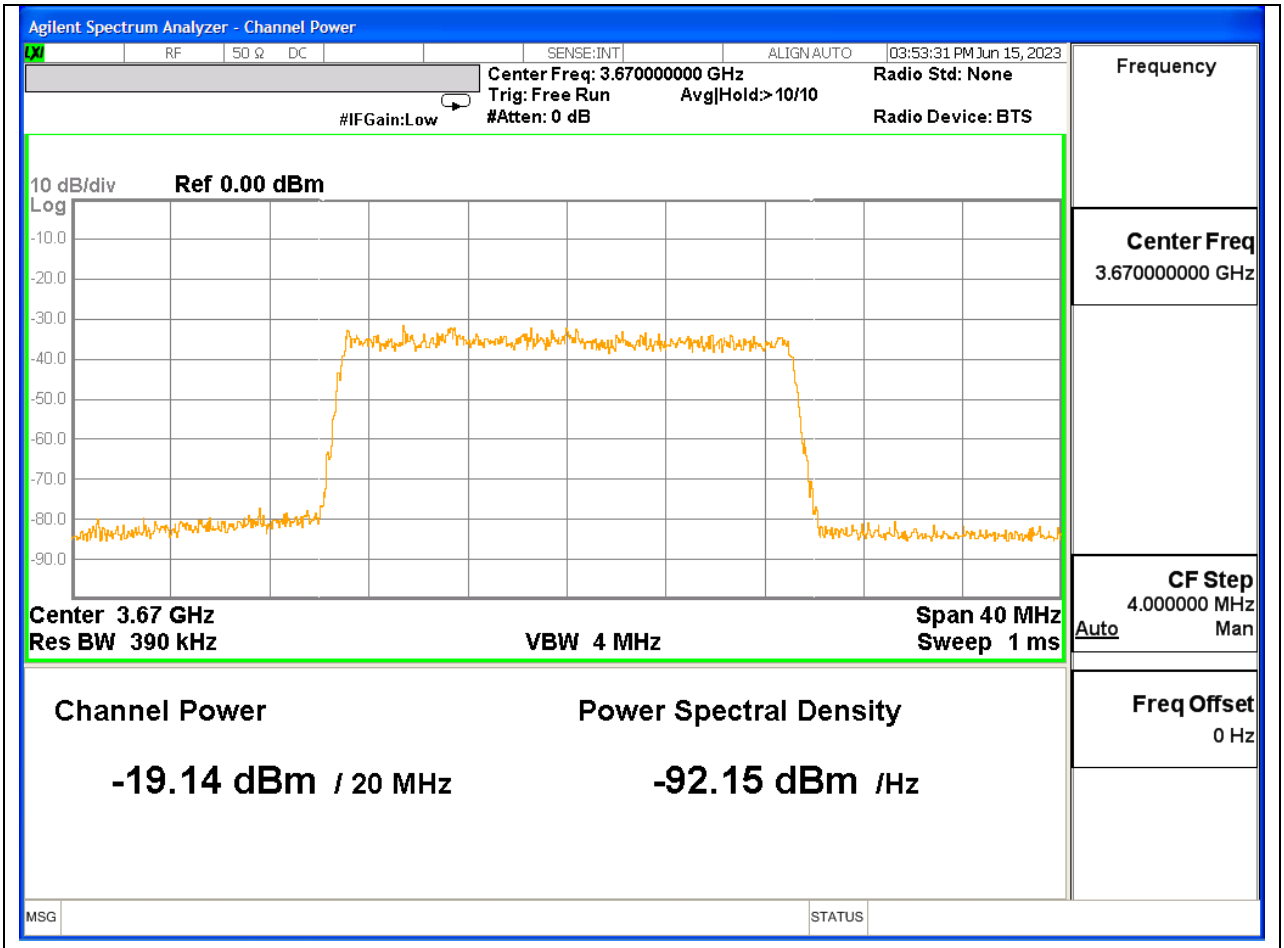
a) Setup CBSD with 3670MHz and power level 15 dBm/MHz
b) Enable B48 service from CBSD admin control panel
c) Check EUT Transmitter Frequency and power
d) Disable B48 service from CBSD admin control panel and check EUT stop transmission within 10s.

Configuration 2

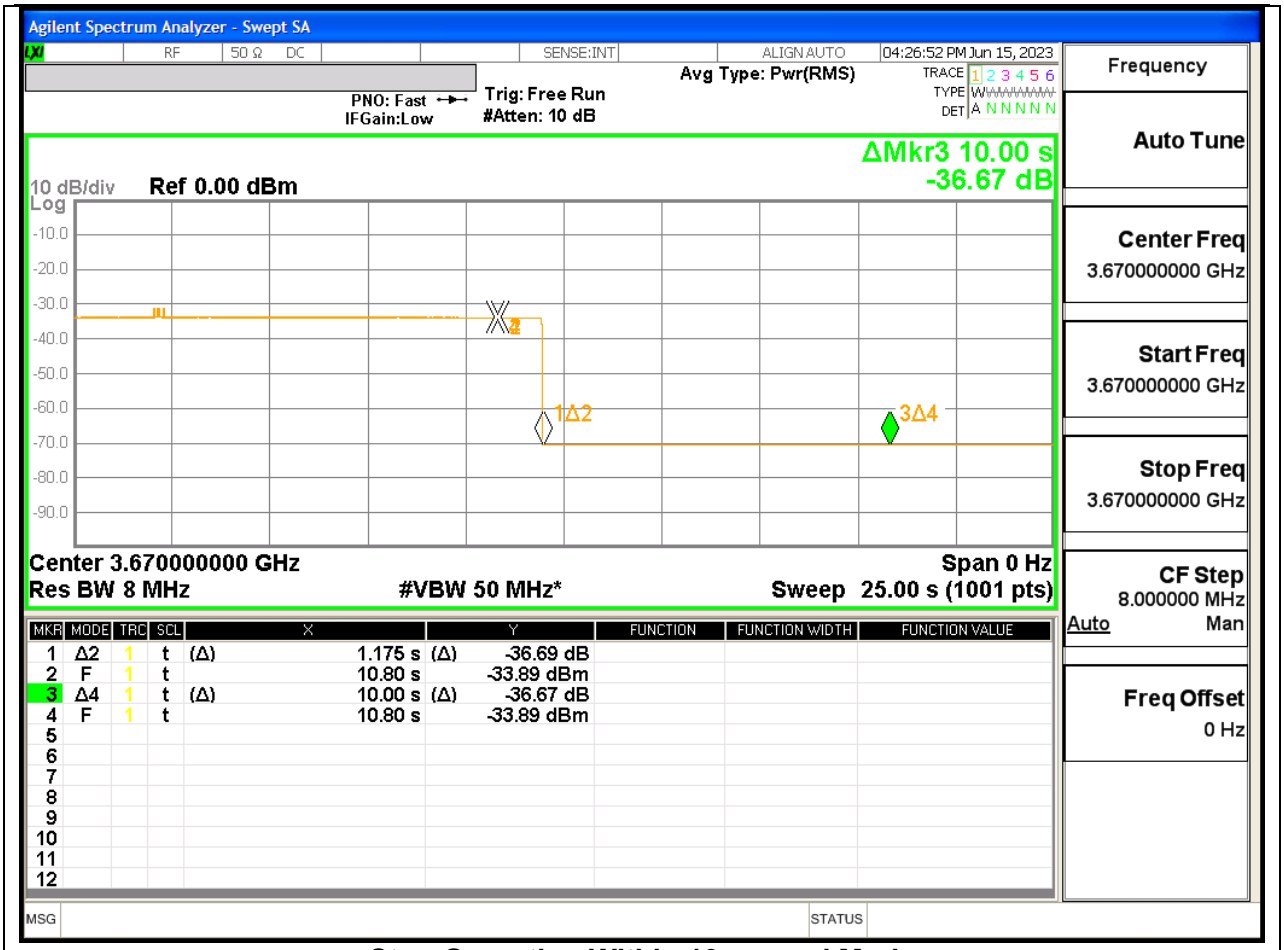
a) Setup CBSD with 3690MHz and power level 10 dBm/MHz
b) Enable B48 service from Airspan admin control panel
c) Check EUT Transmitter Frequency and power
d) Disable B48 service from CBSD admin control panel and check EUT stop transmission within 10s.

TEST RESULTS

8.1. END USER DEVICE CONFIGURATION 1 (3670MHz; MaxEIRP: 15 dBm/MHz)



Operation Mode

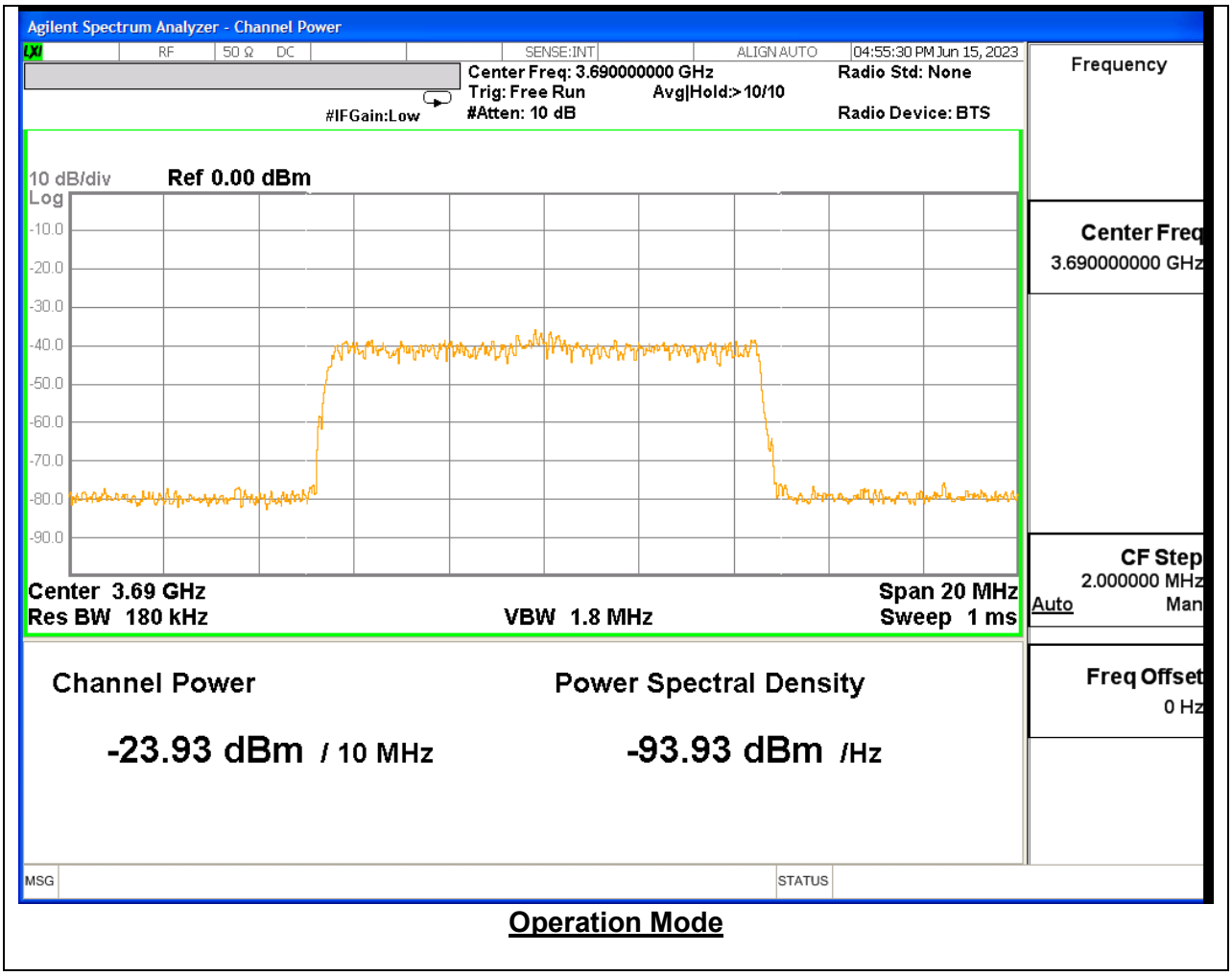


Stop Operation Within 10 second Mode

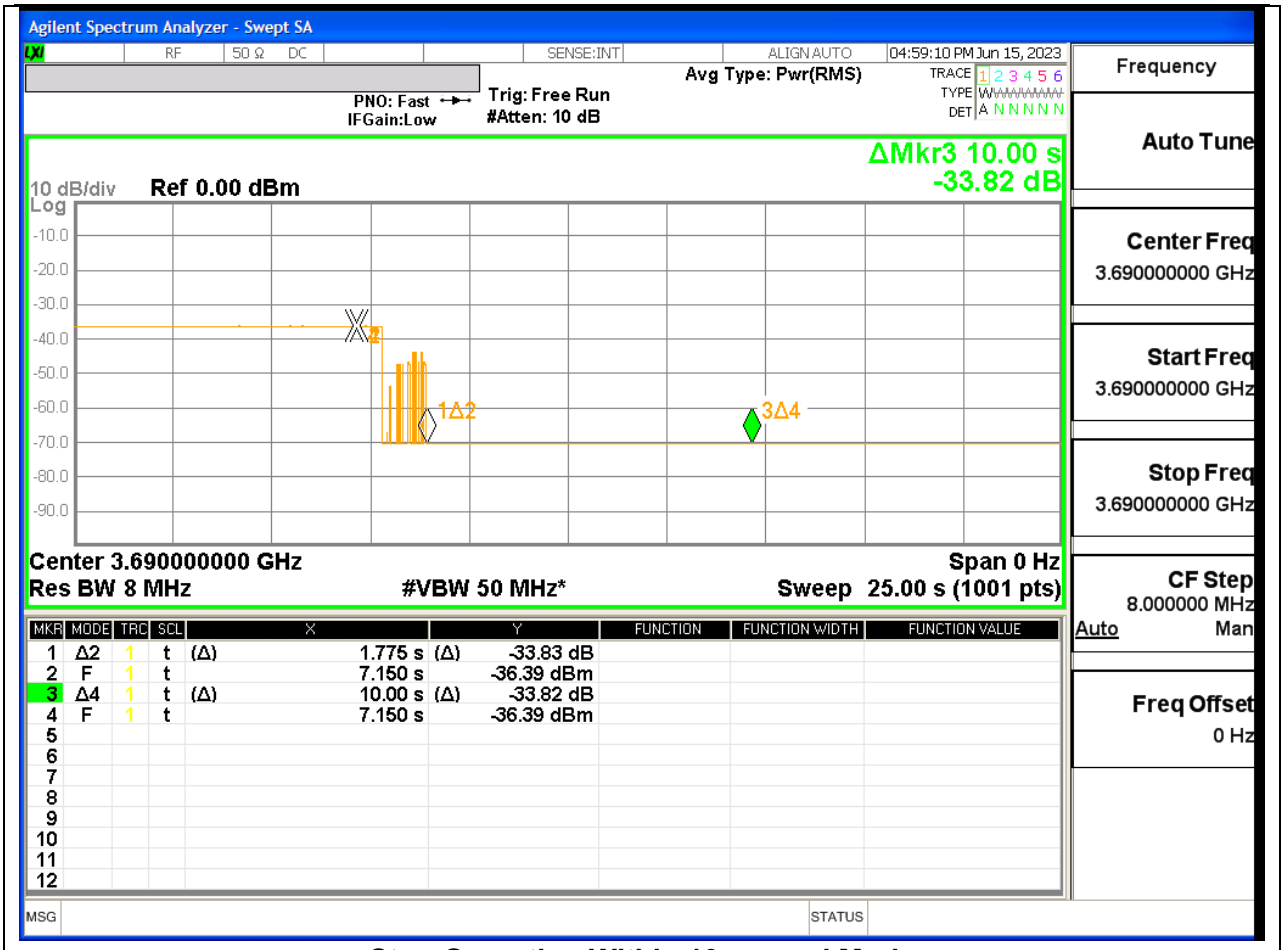
NOTE:

Marker 1: Authorized CBSD sends a signal to stop B48 transmission.
Marker 2: Time elapsed since signal to stop B48 transmission. EUD has stopped transmission.
Marker 3-4 Delta: 10 seconds has elapsed since CBSD has sent a signal to stop B48 transmission to EUT.

8.2. END USER DEVICE CONFIGURATION 2 (3690MHz; MaxEIRP: 10 dBm/MHz)



Operation Mode



Stop Operation Within 10 second Mode

NOTE:

Marker 1: Authorized CBSD sends a signal to stop B48 transmission.
Marker 2: Time elapsed since signal to stop B48 transmission. EUD has stopped transmission.
Marker 3-4 Delta: 10 seconds has elapsed since CBSD has sent a signal to stop B48 transmission to EUT.

9. SETUP PHOTOS

Please refer to 14523744-EP1V1 for setup photos

END OF REPORT

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