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CBRS End User Device as UUT
Test Guidelines

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Version V1.0.0.00

13 November 2018

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TERMS, CONDITIONS & NOTICES

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1 # Contributors

2 The following individuals made significant contributions to this document:

3 Idan Raz (Airspan)

4

1 CBRS End User Device (EUD) as UUT Test Guidelines

2 1 Introduction

3 FCC Part 96 defines an End User Device (EUD) as limited in its maximum EiRP to
4 23dBm/10MHz and does not have any communication with the SAS.

5 Current FCC KDB document relating to EUD testing is 940660 D01 Part 96 CBRS Eqpt v01
6 (29-Jan-2018) [n.1].

7 This document provides guidelines for a proposed method of testing CBRS EUD as UUT in test
8 labs for FCC Part 96 certification.

9 **Note: the validity of this document for CBRS EUD as UUT is explicitly coupled with FCC**
10 **KDB document 940660 D01 Part 96 CBRS Eqpt v01 (29-Jan-2018) [n.1]. Future FCC**
11 **KDB documents providing updated information for CBRS EUD as UUT can cancel the**
12 **validity and necessity of this document**.

13 WInnForum SAS Test Harness is developed for test and certification purposes of CBSD/DP
14 UUT. The WInnForum SAS Test Harness is available for download from the GitHub repository
15 https://github.com/Wireless-Innovation-Forum/Citizens-Broadband-Radio-Service-Device

16 Note: It is recommended to check the GitHub repository as the Test Harness code may have
17 periodic updates to address reported items.

18 2 Scope

19 This document provides test guidelines for CBRS EUD as UUT following [n.1].

20 3 References

21 3.1 Normative references

22 The following referenced documents are necessary for the application of the present document.

23 [n.1]   FCC 940660 D01 Part 96 CBRS Eqpt v01 (29-Jan-2018)

24 [n.2]   WINNF-TS-0122 Version V1.0.0, "Conformance and Performance Test Technical
25   Specification; CBSD/DP as Unit Under Test (UUT)", 19 December 2017

26 [n.3]   WINNF-IN-0156 Version V1.0.0.1, "WInnForum SAS Test Harness CBSD UUT
27   Tutorial", 2 March 2018

28 [n.4]   WINNF-TS-0112 Version V1.5.0, "Requirements for Commercial Operation in the U.S.
29   3550-3700 MHz Citizens Broadband Radio Service Band", 1 May 2018

30 4 Definitions and abbreviations

31 4.1 Abbreviations

32 CBSD   Citizens Broadband Radio Service Device

1	CBRS	Citizens Broadband Radio Service
2	CFR	Code of Federal Regulation
3	CPI	Certified Professional Installer
4	DP	Domain Proxy
5	HTTP	Hypertext Transfer Protocol
6	HTTPS	HTTP over TLS
7	JSON	JavaScript Object Notation
8	SAS	Spectrum Access System
9	TLS	Transport Layer Security
10	EUD	End User Device

11 **4.2   Definitions**

12 *CBRS band*: The 3550-3700 MHz Citizens Broadband Radio Service band.

13 *CBSD Registration*: The procedure by which a CBSD indicates to a SAS its intention to operate.
14 Successful registration implies a validation by the SAS that the CBSD has been FCC certified
15 and confers on the CBSD the right to be authorized by the SAS to operate in accordance with a
16 Grant. During the registration process, each CBSD provides a fixed location, unique identifiers
17 (e.g., owner information, device information), *Group* membership, and radio-related capabilities.
18 A successful registration procedure concludes with the SAS providing a unique identifier for that
19 CBSD.

20 *CBSD User*: The registered entity that has operational responsibility for the CBSD.

21 *Channel*: the contiguous frequency range between lower and upper frequency limits.

22 *Citizens Broadband Radio Service Device (CBSD)*: Fixed Stations, or networks of such stations,
23 that operate on a Priority Access or General Authorized Access basis in the Citizens Broadband
24 Radio Service consistent with Title 47 CFR Part 96. For CBSDs which comprise multiple nodes
25 or networks of nodes, CBSD requirements apply to each node even if network management and
26 communication with the SAS is accomplished via a single network interface.

27 *Domain Proxy (DP)*: An entity engaging in communications with the SAS on behalf of multiple
28 individual CBSDs or networks of CBSDs. The Domain Proxy can also provide a translational
29 capability to interface legacy radio equipment in the 3650-3700 MHz band with a SAS to ensure
30 compliance with Part 96 rules.

31 *Spectrum Access System (SAS):* A system that authorizes and manages use of spectrum for the
32 Citizens Broadband Radio Service.

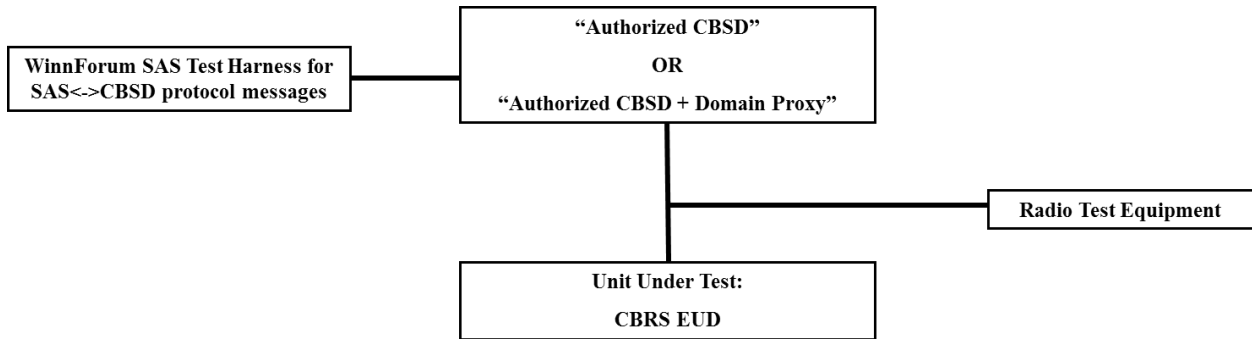33 **5   Test Lab Setup for CBRS EUD as UUT**

34 According to [n.1] "Applications for certification of End User Devices must identify and include
35 test results for operation with at least one authorized CBSD to show compliance with the
36 authorization and operation requirements".

1 An "authorized CBSD" is a CBSD or {CBSD + Domain Proxy} that has already obtained from
2 the FCC a formal FCC-ID compliant to FCC Part 96.

3 Available list of "authorized CBSD" can be found in
4 https://apps.fcc.gov/oetcf/eas/reports/GenericSearch.cfm (select "CBD-Citizens Band Category
5 A and B devices" to view the list of result)

6 The proposed test lab setup for EUD as UUT includes the following elements:

7   1. "authorized CBSD"

8   2. WInnForum SAS Test Harness as described in [n.3]

9   3. Radio test equipment required for RF measurements of EUD as UUT (out of the scope of
10   this document)

11

12 **Figure 1: Proposed Lab Test Setup for CBRS EUD as UUT**

13   6   Running Tests of WinnForum SAS Test Harness for CBRS EUD as UUT

14 According to [n.1] the following is required:

15   1. Confirm that the device will transmit only after it receives authorization from an
16   associated CBSD.

17   2. Confirm that the device discontinues operation, changes frequency, and changes its
18   operational power level within 10 s of receiving instructions from its associated CBSD.

19 The above is also stated in Requirement R0-DEV-13 in [n.4].

20 For EUD as UUT it is proposed to execute in the WinnForum SAS Test Harness test case
21 WINNF.FT.C.RLQ.1 as described in [n.2]. This should cover the following EUD requirements:

22   • "device will transmit only after it receives authorization from an associated CBSD"

23   • "device discontinues operation"

1   o   Test lab needs to verify EUD as UUT discontinued operation within 10 seconds
2   of "authorized CBSD" stopping its RF transmission

3   •   "device changes frequency"

4   o   The "authorized CBSD" in the test lab needs to transmit on a chosen frequency
5   and then change to a different frequency.

6   o   For EUD as UUT in the test lab, EUD changing to different frequency will be
7   allowed only after EUD discontinues operation.

8   For EUD as UUT it is proposed to execute in the WinnForum SAS Test Harness test case
9   WINNF.PT.C.HBT.1as described in [n.2]. This should cover the following EUD requirements:

10   •   "device change its operational power level"

11   o   The "authorized CBSD" in the test lab needs to transmit on different power levels
12   in order for EUD as UUT to change its operational power level.

13   o   Test lab may require additional Radio Test Equipment to simulate RF
14   environment changes for EUD as UUT to change its operational power level.

15   o   For EUD as UUT in the test lab, EUD changing its operational power level
16   following "authorized CBSD" changing its granted "maxEirp" from
17   WINNF.PT.C.HBT.1 will be allowed only after EUD discontinues operation.

18   Note: Test lab may propose additional test steps for EUD as UUT that can change its frequency
19   and/or operational power without discontinuing operation.