



# PCTEST ENGINEERING LABORATORY, INC.

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## TEST REPORT CBSD-SAS Interoperability

**Applicant Name:**  
Netcomm Wireless Pty Ltd.  
18-20 Orion Road  
Lane Cove NSW 2066,  
Sydney Australia

**Date of Testing:**  
10/04/2021 – 10/11/2021  
**Test Site/Location:**  
PCTEST Lab. Columbia, MD, USA  
**Test Report Serial No.:**  
1M2109160108-03.XIA

<b>FCC ID:</b>	<b>XIA-CFW2132</b>
<b>APPLICANT:</b>	<b>NETCOMM WIRELESS Pty Ltd.</b>

**Application Type:** Class II Permissive Change  
**Model:** CFW-2132  
**EUT Type:** Outdoor LTE Router  
**Frequency Range:** 3550 – 3700 MHz  
**FCC Classification:** Citizens Band Category A and B Devices (CBD)  
**FCC Rule Part(s):** Part 96  
**Test Procedure(s):** KDB 940660 D01 v03, KDB 940660 D02 v01, WINNF-TS-0122-V1.0.0, CBRSA-TS-9001 V.1.0.0, [WINNF-19-IN-00033] CBRS CPE-CBSD as UUT Test Guidelines V1.0  
**Class II Permissive Change:** Adding WINNF C4 and C5 functionality  
**Original Grant Date:** 05/28/2020

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in the test procedures listed above. Test results reported herein relate only to the item(s) tested.

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.



Randy Ortanez  
President



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# 1.0 INTRODUCTION

## 1.1 Scope

Measurement and determination of compliance with the technical rules and regulations of the Federal Communications Commission.



## 1.2 PCTEST Test Location

These measurement tests were conducted at the PCTEST Engineering Laboratory, Inc. facility located at 7185 Oakland Mills Road, Columbia, MD 21046.

## 1.3 Test Facility / Accreditations

**Measurements were performed at PCTEST Engineering Lab located in Columbia, MD 21046, U.S.A.**

- PCTEST is OnGo Alliance Approved Test Lab
- PCTEST is a WinnForum Approved Test Lab
- PCTEST is an ISO 17025-2005 accredited test facility under the American Association for Laboratory Accreditation (A2LA) with Certificate number 2041.01 for CBRS Alliance Certification Test Plan and WinnForum Conformance and Performance Test Technical Standard.
- PCTEST is an ISO 17025-2005 accredited test facility under the American Association for Laboratory Accreditation (A2LA) with Certificate number 2041.01 for Specific Absorption Rate (SAR), Hearing Aid Compatibility (HAC) testing, where applicable, and Electromagnetic Compatibility (EMC) testing for FCC and Innovation, Science, and Economic Development Canada rules.
- PCTEST TCB is a Telecommunication Certification Body (TCB) accredited to ISO/IEC 17065-2012 by A2LA (Certificate number 2041.03) in all scopes of FCC Rules and ISED Standards (RSS).
- PCTEST facility is a registered (2451B) test laboratory with the site description on file with ISED.

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## 2.0 PRODUCT INFORMATION

### 2.1 Equipment Description

The Equipment Under Test (EUT) is the **Casa Systems, Outdoor LTE Router FCC ID: XIA-CFW2132**. The test data contained in this report pertains only to CBSD-SAS interoperability. The EUT is not a Domain Proxy.

**Test Device Serial Number(s):** 070499201200005  
**Test Device Hardware Version:** 1.0  
**Test Device Software Version:** 1.1.42.8  
**EUT SAS Client version:** 1.10

### 2.2 Device Capabilities

This device contains the following capabilities:

LTE Band 48

This device supports the following conditional features:

	Conditional Test Case Definitions	Supported
C1	Mandatory for UUT which supports multi-step registration message	<input checked="" type="checkbox"/>
C2	Mandatory for UUT which supports single-step registration with no CPI-signed data in the registration message. By definition, this is a subset of Category A devices which determine all registration information, including location, without CPI intervention.	<input type="checkbox"/>
C3	Mandatory for UUT which supports single-step registration containing CPI-signed data in the registration message.	<input checked="" type="checkbox"/>
C4	Mandatory for UUT which supports RECEIVED_POWER_WITHOUT_GRANT measurement report type.	<input checked="" type="checkbox"/>
C5	Mandatory for UUT which supports RECEIVED_POWER_WITH_GRANT measurement report type.	<input checked="" type="checkbox"/>
C6	Mandatory for UUT which supports parameter change being made at the UUT and prior to sending a deregistration	<input type="checkbox"/>



**Table 2-1. Conditional Features**

### 2.3 Test Configuration

Test configuration is setup per [WINNF-19-IN-00033] CBRS CPE-CBSD as UUT Test Guidelines Version V1.0. The EUT was connected to the SAS Test Harness developed by WINNF WG4-CBSD. The BTS-CBSD used is the Ruckus Q710 (FCC ID: S9GQ910US00). The latest version of the SAS Test Harness (V1.0.0.2) provided by CBRS Alliance was used for BTS-CBSD and CPE-CBSD. The SAS Test Harnesses are synchronized to UTC time.

### 2.4 Modifications

No modifications were made to EUT during testing.



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### 3.0 TEST EQUIPMENT CALIBRATION DATA

Test Equipment Calibration is traceable to the National Institute of Standards and Technology (NIST).



Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Dell	Latitude 5580	Test Harness Laptop	N/A	N/A	N/A	N/A

**Table 3-1 Annual Test Equipment Calibration Schedule**

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## 4.0 ENVIRONMENTAL CONDITIONS

The temperature is controlled within range of 15°C to 35°C. The relative humidity is controlled within range of 10% to 75%. The atmospheric pressure is monitored within the range 86-106kPa (860-1060mbar).

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## 5.0 EVALUATION PROCEDURE

The measurement procedure described in KDB 940660 D01 v01 and WINNF-TS-0122-V1.0.0 was used in the measurement of the EUT.

**Deviation from measurement procedure.....None**

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## 6.0 TEST SUMMARY

### 6.1 Summary



Company Name: Netcomm Wireless Pty Ltd.  
 FCC ID: XIA-CFW2132

**Table 6-1. Summary of Test Results**

FCC Part Section(s)	KDB940660 D01 Section 3.3 a)	Test Case Description	WinnForum Test Case	Test Result
96.39(c)(2)	8	Confirm that the device sends measurements data in response to the command from the SAS.	WINNF.FT.C.MES.1 WINNF.FT.C.MES.3 WINNF.FT.C.MES.4	Pass

**Notes:**



- Test cases denoted as "N/A" in the table above are not applicable to the EUT and are either Optional or Conditional per Section 6 of WINNF-TS-0122.
- Please see Appendices for test data.

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## 7.0 CONCLUSION



The data collected relate only to the item(s) tested and show that the **Casa Systems, Outdoor LTE Router FCC ID: XIA-CFW2132** has been tested to show compliance with Part 96 and KDB 940660 D01 v01.

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## APPENDIX A – TEST RESULT AND DATA



### A1 [WINNF.FT.C.MES.1] Registration Response contains measReportConfig

	Test Execution Steps	PASS	FAIL
1	Ensure the following conditions are met for test entry: <ul style="list-style-type: none"> <li>• UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness</li> </ul>	--	--
2	UUT sends a Registration Request message. Validate the Registration Request message is formatted correctly, including: <ul style="list-style-type: none"> <li>• userId is present and correct</li> <li>• fcclId is present and correct</li> <li>• cbsdSerialNumber is present and correct</li> <li>• measCapability = "RECEIVED_POWER_WITHOUT_GRANT"</li> </ul>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	SAS Test Harness sends a Registration Response message, with the following parameters: <ul style="list-style-type: none"> <li>• cbsdId = C = valid cbsdId for this UUT</li> <li>• measReportConfig= "RECEIVED_POWER_WITHOUT_GRANT"</li> <li>• responseCode = 0</li> </ul>	--	--
4	UUT sends a message: <ul style="list-style-type: none"> <li>• If message is type Spectrum Inquiry Request, go to step 5, or</li> <li>• If message is type Grant Request, go to step 7</li> </ul>	--	--
5	UUT sends message type Spectrum Inquiry Request. Verify message contains all required parameters properly formatted, and specifically: <ul style="list-style-type: none"> <li>• cbsdId = C</li> <li>• measReport is present, and is a properly formatted rcvdPowerMeasReport.</li> </ul>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
6	SAS Test Harness sends a Spectrum Inquiry Response, with the following parameters: <ul style="list-style-type: none"> <li>• cbsdId = C</li> <li>• availableChannel is an array of availableChannel objects</li> <li>• responseCode = 0</li> </ul>	--	--
7	UUT sends message type Grant Request message. Verify message contains all required parameters properly formatted, and specifically: <ul style="list-style-type: none"> <li>• cbsdId = C</li> <li>• measReport is present, and is a properly formatted rcvdPowerMeasReport.</li> </ul>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

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## A2 [WINNF.FT.C.MES.3] Grant Response contains measReportConfig

	Test Execution Steps	PASS	FAIL
1	Ensure the following conditions are met for test entry: <ul style="list-style-type: none"> <li>• UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness</li> <li>• UUT has successfully registered with SAS Test Harness, with cbsdId=C and measCapability = "RECEIVED_POWER_WITH_GRANT"</li> </ul>	--	--
2	UUT sends a Grant Request message. Verify Grant Request message contains all required parameters properly formatted, and specifically: <ul style="list-style-type: none"> <li>• cbsdId = C</li> <li>• operationParam is present and format is valid</li> </ul>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	SAS Test Harness sends a Grant Response message, with the following parameters: <ul style="list-style-type: none"> <li>• cbsdId = C</li> <li>• grantId = G = valid grant ID</li> <li>• grantExpireTime = UTC time in the future</li> <li>• heartbeatInterval = 60 seconds</li> <li>• measReportConfig= "RECEIVED_POWER_WITH_GRANT"</li> <li>• operationParam is set to valid operating parameters</li> <li>• channelType = "GAA"</li> <li>• responseCode = 0</li> </ul>	--	--
4	UUT sends a Heartbeat Request message. Verify message contains all required parameters properly formatted, and specifically: <ul style="list-style-type: none"> <li>• cbsdId = C</li> <li>• grantId = G</li> <li>• operationState = "GRANTED"</li> </ul>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5	If Heartbeat Request message (step 4) contains measReport object, then: <ul style="list-style-type: none"> <li>• verify measReport is properly formatted as object rcvdPowerMeasReport</li> <li>• end test, with PASS result</li> </ul> else, if Heartbeat Request message (step 4) does not contain measReport object, then: If number of Heartbeat Requests sent by UUT after Step 3 is = 5, then stop test with result of FAIL	<input checked="" type="checkbox"/>	<input type="checkbox"/>
6	SAS Test Harness sends a Heartbeat Response message, containing all required parameters properly formatted, and specifically: <ul style="list-style-type: none"> <li>• cbsdId = C</li> <li>• grantId = G</li> <li>• transmitExpireTime = current UTC time + 200 seconds</li> <li>• responseCode = 0</li> </ul> Go to Step 4, above	--	--



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### A3 [WINNF.FT.C.MES.4] Heartbeat Response contains measReportConfig

	Test Execution Steps	PASS	FAIL
1	Ensure the following conditions are met for test entry: <ul style="list-style-type: none"> <li>• UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness</li> <li>• UUT has successfully registered with SAS Test Harness, with cbsdId=C and measCapability = "RECEIVED_POWER_WITH_GRANT"</li> <li>• UUT has received a valid grant with grantId = G</li> <li>• UUT is in Grant State AUTHORIZED and is actively transmitting within the bounds of its grant.</li> <li>• Grant has heartbeatInterval = 60 seconds</li> </ul>	--	--
2	UUT sends a Heartbeat Request message. Verify Heartbeat Request message contains all required parameters properly formatted, and specifically: <ul style="list-style-type: none"> <li>• cbsdId = C</li> <li>• grantId = G</li> <li>• operationState = "AUTHORIZED"</li> </ul>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	SAS Test Harness sends a Heartbeat Response message, containing all required parameters properly formatted, and specifically: <ul style="list-style-type: none"> <li>• cbsdId = C</li> <li>• grantId = G</li> <li>• measReportConfig= "RECEIVED_POWER_WITH_GRANT"</li> <li>• responseCode = 0</li> </ul>	--	--
4	UUT sends a Heartbeat Request message. Verify message contains all required parameters properly formatted, and specifically: <ul style="list-style-type: none"> <li>• cbsdId = C</li> <li>• grantId = G</li> <li>• operationState = "AUTHORIZED"</li> </ul>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5	If Heartbeat Request message (step 4) contains measReport object, then: <ul style="list-style-type: none"> <li>• verify measReport is properly formatted as object rcvdPowerMeasReport</li> <li>• end test, with PASS result</li> </ul> else, if Heartbeat Request message (step 4) does not contain measReport object, then: <ul style="list-style-type: none"> <li>• If number of Heartbeat Requests sent by UUT after Step 3 is = 5, then stop test with result of FAIL</li> </ul>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
6	SAS Test Harness sends a Heartbeat Response message, containing all required parameters properly formatted, and specifically: <ul style="list-style-type: none"> <li>• cbsdId = C</li> <li>• grantId = G</li> <li>• responseCode = 0</li> </ul> Go to Step 4, above	--	--







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	Test Execution Steps	PASS	FAIL
1	Ensure the following conditions are met for test entry: <ul style="list-style-type: none"> <li>• UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness</li> <li>• UUT has successfully registered with SAS Test Harness, with cbsdId=C</li> <li>• UUT has received a valid grant with grantId = G</li> <li>• UUT is in Grant State AUTHORIZED and is actively transmitting within the bounds of its grant.</li> </ul> Invoke trigger to relinquish UUT Grant from the SAS Test Harness	--	--
2	UUT sends a Relinquishment Request message. Verify message contains all required parameters properly formatted, and specifically: <ul style="list-style-type: none"> <li>• cbsdId = C</li> <li>• grantId = G</li> </ul>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	SAS Test Harness shall approve the request with a Relinquishment Response message with parameters: <ul style="list-style-type: none"> <li>• cbsdId = C</li> <li>• grantId = G</li> <li>• responseCode = 0</li> </ul>	--	--
4	After completion of step 3, SAS Test Harness will not provide any additional positive response (responseCode=0) to further request messages from the UUT.	--	--
5	Monitor the RF output of the UUT from start of test until 60 seconds after Step 3 is complete. This is the end of the test. Verify: <ul style="list-style-type: none"> <li>• UUT shall stop RF transmission at any time between triggering the relinquishment and UUT sending the relinquishment request</li> </ul>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

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## APPENDIX B – TEST LOGS

Logs are available upon request

					
cmdSessio n_2021-10- 08T03.29.02 Z	cmdSessio n_2021-10- 11T19.16.06 Z	cmdSessio n_2021-10- 11T19.23.02 Z	WINNF.FT. C.MES.1_20 21-10-08T0 3.29.09Z	WINNF.FT. C.MES.3_20 21-10-11T1 9.16.13Z	WINNF.FT. C.MES.4_20 21-10-11T1 9.23.10Z

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