



TEST REPORT

Application No.: SZCR2107022172AT
Applicant: Baicells Technologies Co., Ltd.
Address of Applicant: 9-10F,1stBldg., No.81BeiqingRoad, Haidian District, Beijing, China
Manufacturer: Baicells Technologies Co., Ltd.
Address of Manufacturer: 9-10F,1stBldg., No.81BeiqingRoad, Haidian District, Beijing, China
Equipment Under Test (EUT):
EUT Name: LTE Base Station
Model No.: pBS3101SE
Trade Mark: Baicells
FCC ID: 2AG32PBS3101SE
Standard(s) : CBRSA-TS-9001-V1.0.0
WINNF-TS-0122-V1.0
FCC 47 CFR Part 96
KDB 940660 D01
Date of Receipt: 2021-07-01
Date of Test: 2021-07-01 to 2021-07-15
Date of Issue: 2021-07-28

Test Result:	Pass*
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* In the configuration tested, the EUT complied with the standards specified above.

Keny Xu

Keny Xu
EMC Laboratory Manager





Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2021-07-28		Original

Authorized for issue by:			
			
		Calvin Weng /Project Engineer	
			
		Eric Fu /Reviewer	



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2 Test Summary

Item	Standard	Test Case ID	Result
UUT RF Transmit Power Measurement	WINNF-TS-0122-V1.0.0	WINNF.PT.C.HBT.1	Pass
SAS Version: 1.0.0.3			

The UUT is a CBSD with Domain Proxy. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

Test standards:

CBRSA-TS-9001-V1.0.0

CBRS Alliance Certification Test Plan

WINNF-TS-0122-V1.0.0

Test and Certification for Citizens Broadband Radio Service (CBRS); Conformance and Performance Test Technical Specification; CBSD/DP as Unit Under Test (UUT)

KDB 940660 D01 Part 96 CBRS Eqpt v03

The device pBS3101SE(FCC ID: 2AG32PBS3101SE) is based on the original device pBS3101S(FCC ID: 2AG32PBS3101S) to change the type of antenna and the antenna gain value, they have the same technical construction including circuit diagram, PCB Layout, electrical specification. So, in this test report we only do the "UUT RF Transmit Power Measurement" other test refer to original test report SZCR210502107001.

FCC ID	2AG32PBS3101S (Original)	2AG32PBS3101SE (New)
Model	pBS3101S	pBS3101SE
Category of CBRS	Category B	Category B
Type of Modulation	QPSK, 16QAM, 64QAM	QPSK, 16QAM, 64QAM
Bandwidth information	10MHz/20MHz	10MHz/20MHz
Type of antenna	Internal antenna	External antenna
Antenna gain	13dBi	17dBi



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4 General Information

4.1 Details of E.U.T.

Power supply:	Adapter Model NO.: G0566-480-100 Input: 100-240V~50/60Hz, 1.5A Output: 48.0V, 1.0A
Sample Type:	Fixed device
CBSD Class:	B
Transmitter Frequency Band:	LTE Band 48
Transmitter Frequency Range:	3550~3700MHz
Hardware Version:	A01
Software Version:	BaiBS_QRTB_2.7.3
Test sample:	SN1: 12020003952147B0033 SN2: 12020003952147B0014
Antenna Gain:	17dBi
Note: This is a BTS-CBSD communication with Domain Proxy. Domain Proxy information show as below: Model No. of Domain Proxy: LICA-1513A Software Version of Domain Proxy: BaiOMC_7.0.3	

4.2 Description of CBSD/DP Support Features

Condition	Feature Description	Supported
C1	Mandatory for UUT which supports multi-step registration message.	Y
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.	N
C3	Mandatory for UUT which supports single-step registration containing CPI-signed data in the registration message.	Y
C4	Mandatory for UUT which supports RECEIVED_POWER_WITHOUT_GRANT measurement report type.	Y
C5	Mandatory for UUT which supports RECEIVED_POWER_WITH_GRANT measurement report type.	Y
C6	Mandatory for UUT which supports parameter change being made at the UUT and prior to sending a deregistration.	N

Y: Supported

N: Not supported

4.3 Summary of Test Results

WINNF-TS-0122			
Classes	Test Case Items	Pass Items	Pass Rate (%)
FT (CBSD, DP/CBSD)	/	/	/
PT (CBSD, DP/CBSD)	1	1	100
Total	1	1	100

Note:

1. Functional Test (FT): Test to validate the conformance of the Protocols and functionalities implemented in the CBSD/DP UUT to the requirements developed by WinnForum and supporting FCC/DoD requirements.
2. Field/Performance Test (PT): Test to check the capability of the CBSD/DP UUT to support various traffic models and actual operations in the field.

4.4 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	$\pm 7.25 \times 10^{-8}$
2	RF conducted power	$\pm 0.75\text{dB}$
3	Temperature test	$\pm 1^\circ\text{C}$
4	Humidity test	$\pm 3\%$
5	Supply voltages	$\pm 1.5\%$
6	Time	$\pm 3\%$

4.5 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
CPE	SMAWAVE	USB Dongle	/
EPC	Lanner Electronics Inc.	LICA-1513A	LR202002004052
Router	TP-LINK	TL-R860+	1175379002425



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4.6 Test Location

All tests were performed at:

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 518057.

Tel: +86 755 2601 2053

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No tests were sub-contracted.



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5 Equipment List

Test Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Laptop (With SAS Test harness)	Lenovo	Pro-13API 2019	REF. No.SEA1800	/	/
Spectrum Analyzer	R&S	FSP	SEM004-06	2020-09-24	2021-09-23
Shield Room	SAEMC	MSR433	SEM001-11	2021-03-13	2024-03-12
Coaxial Cable	SGS	N/A	SEM031-01	2020-07-11	2021-07-10
				2021-07-11	2022-07-10
Attenuator	Weinschel Associates	WA41	SEM021-09	N/A	N/A
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-03	2020-09-27	2021-09-26



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6 Test Method and Environment

6.1 CBSD/DP Conformance and Performance

Test Requirement: CBRS CBSD Test Specification WINNF-TS-0122-V1.0.0
Test Method: CBRS CBSD Test Specification WINNF-TS-0122-V1.0.0
WINNF-IN-0156_WinnForum_SAS_Test_Harness_CBSD_UUT_Tutorial_v1_0_0_1

6.2 CBSD Test Procedure

- a. Connect the UUT to SAS Test Harness system and RF Test instruments via the DP interface and RF components. The highest level is set to test configuration.
- b. UUT shall be UTC time synchronized
- c. The frequency band is granted and set as UUT supported Modulation and Channels, transmitted power of the UUT according to it granted parameters from the SAS Test Harness.
- d. Each test case results were recorded and validated by SAS Test Harness system and RF instruments test cases was recorded test results from SAS Test Harness system.

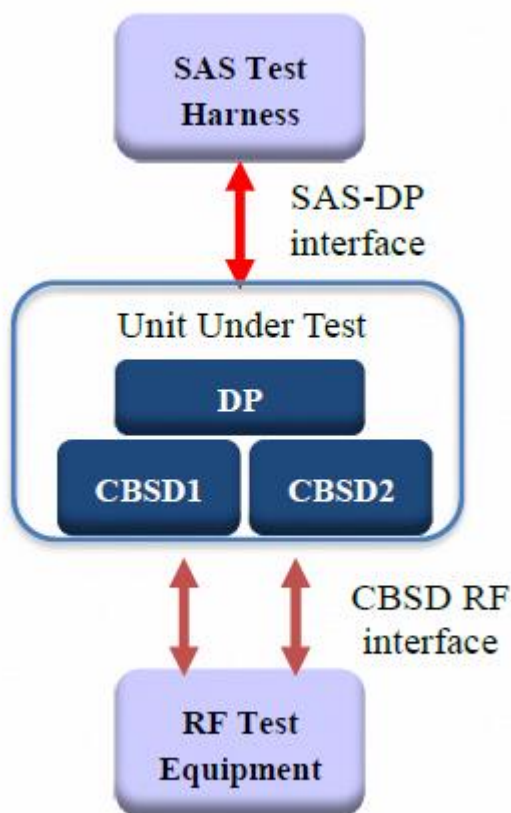


6.3 Test Environment

Test Harness Version: V1.0.0.3
Operating System: Microsoft Windows 10
TLS Version: 1.2
Python Version: 2.7.13
Environmental Conditions: 25deg. C, 65%RH
Input Power: 120Vac, 60Hz

6.4 Test Setup

- 1) DP is deployed on the network management, and the registration of DP to SAS is to register with SAS according to the granularity of CBSID;
- 2) The DP and the network element communicate messages according to the cell granularity, and each CBSID corresponds to a cell of an RRU which belongs to a base station.



DP/CBSD as UUT, BTS-CBSD communication with Domain Proxy

7 Test Data

7.1 CBSD RF Power Measurement

7.1.1 WINNF.PT.C.HBT.1

#	Test Execution Steps	Results	
1	<p>Ensure the following conditions are met for test entry:</p> <ul style="list-style-type: none"> UUT has successfully completed SAS Discovery and Authentication with the SAS Test Harness UUT has registered with the SAS, with CBSD ID = C UUT has a single valid grant G with parameters {lowFrequency = FL, highFrequency = FH, maxEirp = Pi}, with grant in AUTHORIZED state, and grantExpireTime set to a value far past the duration of this test case Note: in order for the UUT to request a grant with the parameters {lowFrequency, highFrequency, maxEirp}, the SAS Test Harness may need to provide appropriate guidance in the availableChannel object of the spectrumInquiry response message, and the operationParam object of the grant response message. Alternately, the UUT vendor may provide the ability to set those parameters on the UUT so that the UUT will request a grant with those parameters 	--	--
2	<p>UUT and SAS Test Harness perform a series of Heartbeat Request/Response cycles, which continues until the other test steps are complete. Messaging for each cycle is as follows:</p> <ul style="list-style-type: none"> UUT sends Heartbeat Request, including: <ul style="list-style-type: none"> cbsdId = C grantId = G SAS Test Harness responds with Heartbeat Response, including: <ul style="list-style-type: none"> cbsdId = C grantId = G transmitExpireTime = current UTC time + 200 seconds responseCode = 0 	--	--
3	<p>Tester performs power measurement on RF interface(s) of UUT, and verifies it complies with the maxEirp setting, Pi. The RF measurement method is out of scope of this document, but may include additional configuration of the UUT, as required, to fulfill the requirements of the power measurement method.</p> <ul style="list-style-type: none"> Note: it may be required for the vendor to provide a method or configuration to bring the UUT to a mode which is required by the measurement methodology. Any such mode is vendor-specific and depends upon UUT behavior and the measurement methodology. 	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail

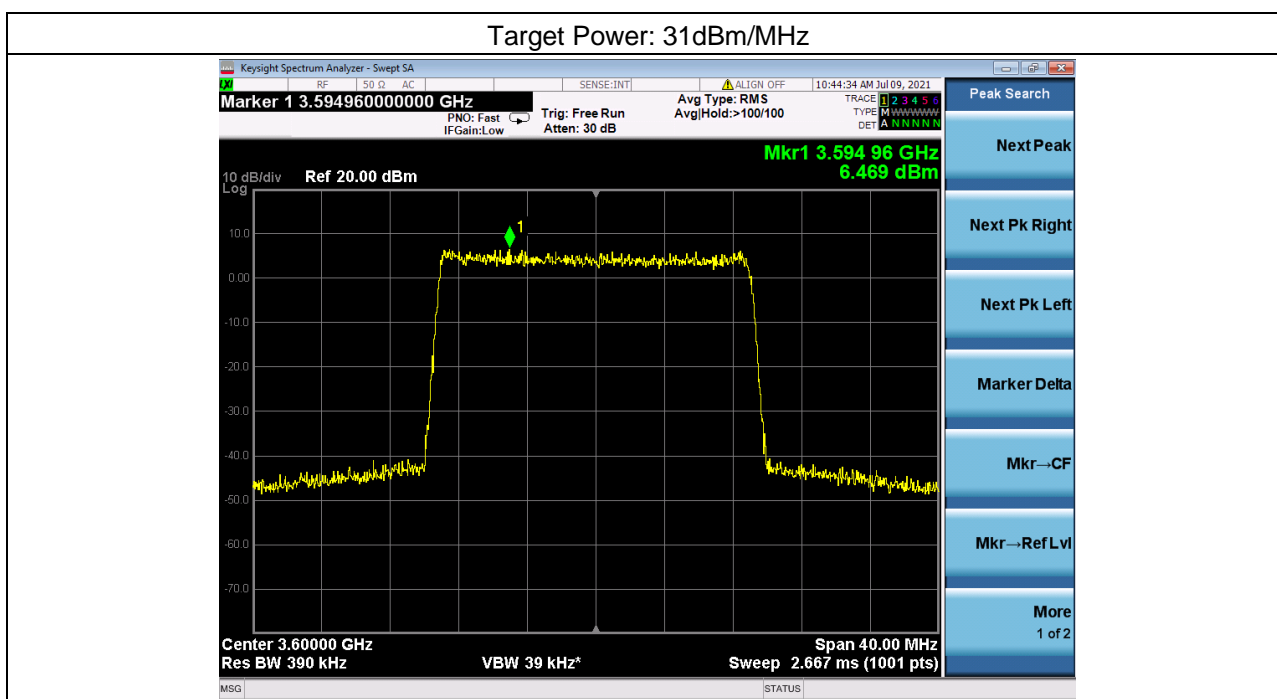
RF measurement plot for Test Case :

- Tester performs power measurement on RF interface(s) of UUT, and verifies it complies with the maxEirp setting, Pi. The RF measurement method is out of scope of this document, but may include additional configuration of the UUT, as required, to fulfill the requirements of the power measurement method.

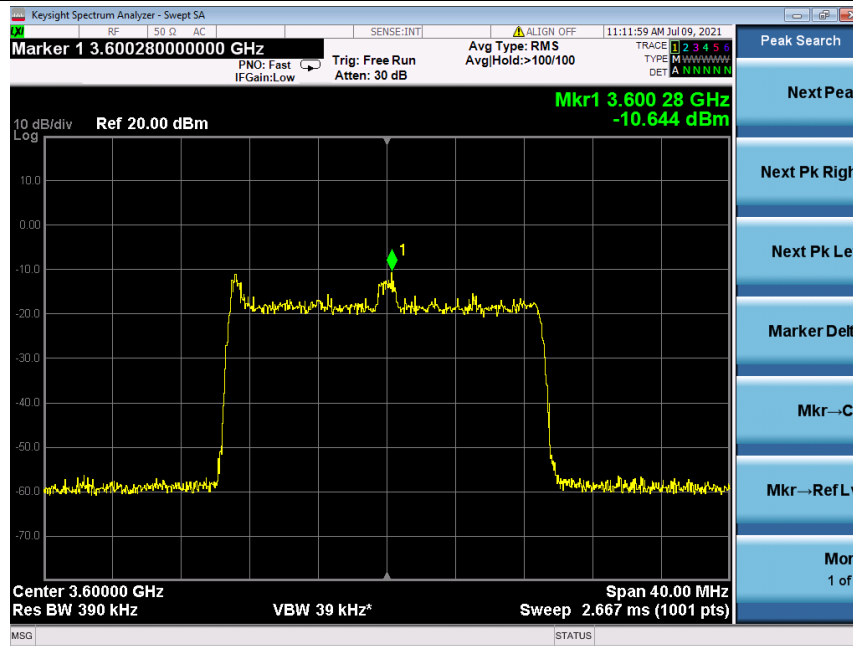
Freq. (MHz)	Conducted PSD (dBm/MHz)	Antenna Gain (dBi)	Array Gain (dB)	Splitter loss (dB)	EIRP PSD (dBm/MHz)	Limit (dBm/MHz)	Verdict
3600	6.469	17.0	3.01	4	30.479	31	Pass
3600	-10.644	17.0	3.01	4	13.366	15	Pass

Note:

- Array Gain=10log(n), n is the antenna number, for this CBSD the n=2
- EIRP PSD= Conducted PSD+ Antenna Gain+ Array Gain+ Splitter loss



Target Power: 15dBm/MHz



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8 Test Data Log

Test data log refer to log files (Log files appendix) except for securitytest cases which shows below.

9 Photographs

9.1 EUT Constructional Details (EUT Photos)

Please Refer to external and internal photos for details.

- End of the Report -



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