

Test Report No:
2440551R-RFUSV24S-A

TEST REPORT

FCC/ISED Rules & Regulations

Product Name	5G NR Module
Brand Name	Bigleaf
Model No.	FA990A28
FCC ID	2BEG9EDGE8005G
IC	31894-EDGE8005G
Applicant's Name / Address	Bigleaf Networks, Inc. 10565 SW Nimbus Ave Suite 110 Tigard, OR 97223 USA
Manufacturer's Name	Telit Communications S.p.A.
Test Method Requested, Standard	FCC CFR Title 47 Part 27 Subpart D RSS-195 Issue 2 (Apr. 2014) RSS-Gen Issue 5 + Amendment 2 (Feb. 2021) ANSI/TIA-603-E-2016 ANSI C63.26-2015
Verdict Summary	IN COMPLIANCE
Documented By April Chen	
Tested by Daniel Wu	
Approved By Will Chen	
Date of Receipt	2024/04/19
Date of Issue	2024/06/11
Report Version	V1.0

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Competences and Guarantees

DEKRA is a testing laboratory competent to carry out the tests described in this report.

In order to assure the traceability to other national and international laboratories, DEKRA has a calibration and maintenance program for its measurement equipment.

DEKRA guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated in the report and it is based on the knowledge and technical facilities available at DEKRA at the time of performance of the test.

DEKRA is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

The results presented in this Test Report apply only to the particular item under test established in this document.

IMPORTANT: No parts of this report may be reproduced or quoted out of context, in any form or by any means, except in full, without the previous written permission of DEKRA.

General Conditions

1. The test results relate only to the samples tested.
2. The test results shown in the test report are traceable to the national/international standard through the calibration report of the equipment and evaluated measurement uncertainty herein.
3. This report must not be used to claim product endorsement by TAF or any agency of the government.
4. The test report shall not be reproduced without the written approval of DEKRA Testing and Certification Co., Ltd.
5. Measurement uncertainties evaluated for each testing system and associated connections are given here to provide the system information for reference. Compliance determinations do not take into account measurement uncertainties for each testing system, but are based on the results of the compliance measurement.

Revision History

Version	Description	Issued Date
V1.0	Initial issue of report	2024/06/11

Summary of Test Result

Report Clause	Test Items	Band	Limit	Result (PASS/FAIL)
3	RF Output Power	LTE B30 5GNR n30	e.i.r.p < 250 mW within any 5 MHz bandwidth in average value	PASS
-	Occupied Bandwidth	LTE B30 5GNR n30	N/A	Note
-	Peak to Average Power Ratio	LTE B30 5GNR n30	≤ 13 dB	Note
4	Spurious Emission	LTE B30 5GNR n30	< -40 dBm	PASS
-	Conducted Band Edge	LTE B30 5GNR n30	< -40 dBm	Note
-	Frequency Stability	LTE B30 5GNR n30	± 2.5 ppm	Note

Note:

This report is to request the Class II Permissive Change for FCC ID: 2BEG9EDGE8005G and IC: 31894-EDGE8005G. The major change filed under this application is to add a new antenna and reduce the RF Output Power for LTE B30 and 5GNR n30. According to the major change, DEKRA tests RF Output Power and Radiated Spurious Emission, and other testing data refer to original module reports.

Comments and Explanations

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

Comments and Remarks

The product specification and testing instructions for the EUT declared in the report are provided by the manufacturer who will take all responsibilities for the accuracy.

1. General Information

1.1. EUT Description

Frequency Range	LTE Band 30	2305~2315 (Uplink) 2350~2360 (Downlink)
	5G NR n30	2305~2315 MHz (Uplink) 2350~2360 MHz (Downlink)
Bandwidth	LTE Band 30	5MHz / 10MHz
	5G NR n30	10 MHz (SCS 15kHz)
Type of Modulation	LTE Band 30	QPSK / 16QAM / 64QAM / 256QAM
	5G NR n30	pi/2 BPSK / QPSK / 16QAM / 64QAM / 256QAM

Antenna Information				
Item.	Brand Name	Model No.	Type	Gain (dBi)
1	TAOGLAS	TG.31.8113	Dipole	2.87 dBi for B30/n30

1.2. Testing Location Information

Site Description	Accredited by TAF
	Accredited Number: 3023

Test Laboratory	DEKRA Testing and Certification Co., Ltd.
	Linkou Laboratory
Address	No.5-22, Ruishukeng Linkou District, New Taipei City, 24451, Taiwan, R.O.C.
Performed Location	No. 26, Huaya 1st Rd., Guishan Dist., Taoyuan City 333411, Taiwan, R.O.C.
Phone Number	+886-3-275-7255
Fax Number	+886-3-327-8031

Ambient conditions in the laboratory:

Performed Item	Items	Required	Actual	Test Date
RF Output Power	Temperature (°C)	15~35 °C	22.3 °C	2024/05/09~2024/05/10
	Humidity (%RH)	20~75 %	57.5 %	
Radiated Emission	Temperature (°C)	15~35 °C	24.1 °C	2024/06/03
	Humidity (%RH)	20~75 %	60.8 %	

1.3. Measurement Uncertainty

Uncertainties have been calculated according to the DEKRA internal document with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2)).

Test Item	Uncertainty
RF Output Power	± 1.58 dB
Radiated Spurious Emissions	± 5.88dB for 30MHz~1GHz
	± 3.11dB for 1GHz~18GHz
	± 3.09dB for 18GHz~40GHz

1.4. List of Test Equipment

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
Universal Radio Communication Tester	Anritsu	MT8000A	6262134961	2023.05.30	2024.05.29
Universal Radio Communication Tester	Anritsu	MT8000A	6272478342	2023.08.04	2024.08.03
DC Power Supply	Keysight	E36234A	MY59001234	2023.11.09	2024.11.08
Bi-Log Antenna	SCHWARZBECK	VULB9168	9168-0675	2023.08.09	2025.08.08
Horn Antenna	Com-Power	AH-840	101101	2023.12.04	2025.12.03
Horn Antenna	RF SPIN	DRH18-E	210507A18ES	2024.05.15	2025.05.14
Pre-Amplifier	SGH	SGH0301-9	20211007-11	2024.01.10	2025.01.09
Pre-Amplifier	SGH	PRAMP118	20200701	2024.01.10	2025.01.09
Pre-Amplifier	EMCI	EMC05820SE	980310	2024.01.10	2025.01.09
Pre-Amplifier	EMCI	EMC184045SE	980369	2024.01.10	2025.01.09
Coaxial Cable	EMCI	EMC102-KM-KM-600	1160314	2024.01.10	2025.01.09
Coaxial Cable	EMCI	EMC102-KM-KM-7000	170242	2024.01.10	2025.01.09
Spectrum Analyzer	R&S	FSV3044	101114	2024.02.21	2025.02.20
Coaxial Cable	SGH	SGH18	2021005-1	2024.01.10	2025.01.09
Coaxial Cable	SGH	SGH18	202108-4	2024.01.10	2025.01.09
Coaxial Cable	SGH	HA800	GD20110223-1	2024.01.10	2025.01.09
Coaxial Cable	SGH	HA800	GD20110222-3	2024.01.10	2025.01.09

Note: Test Software Version: e3 230303 dekra V9.

2. Test Configuration of EUT

2.1. Test Condition

EUT Operational Condition	
Testing Voltage	AC 120V/60Hz for fixture and DC 3.3V for module

2.2. Measurement Configuration

Test Mode	Mode 1: LTE Band 30 Mode 2: 5GNR n30
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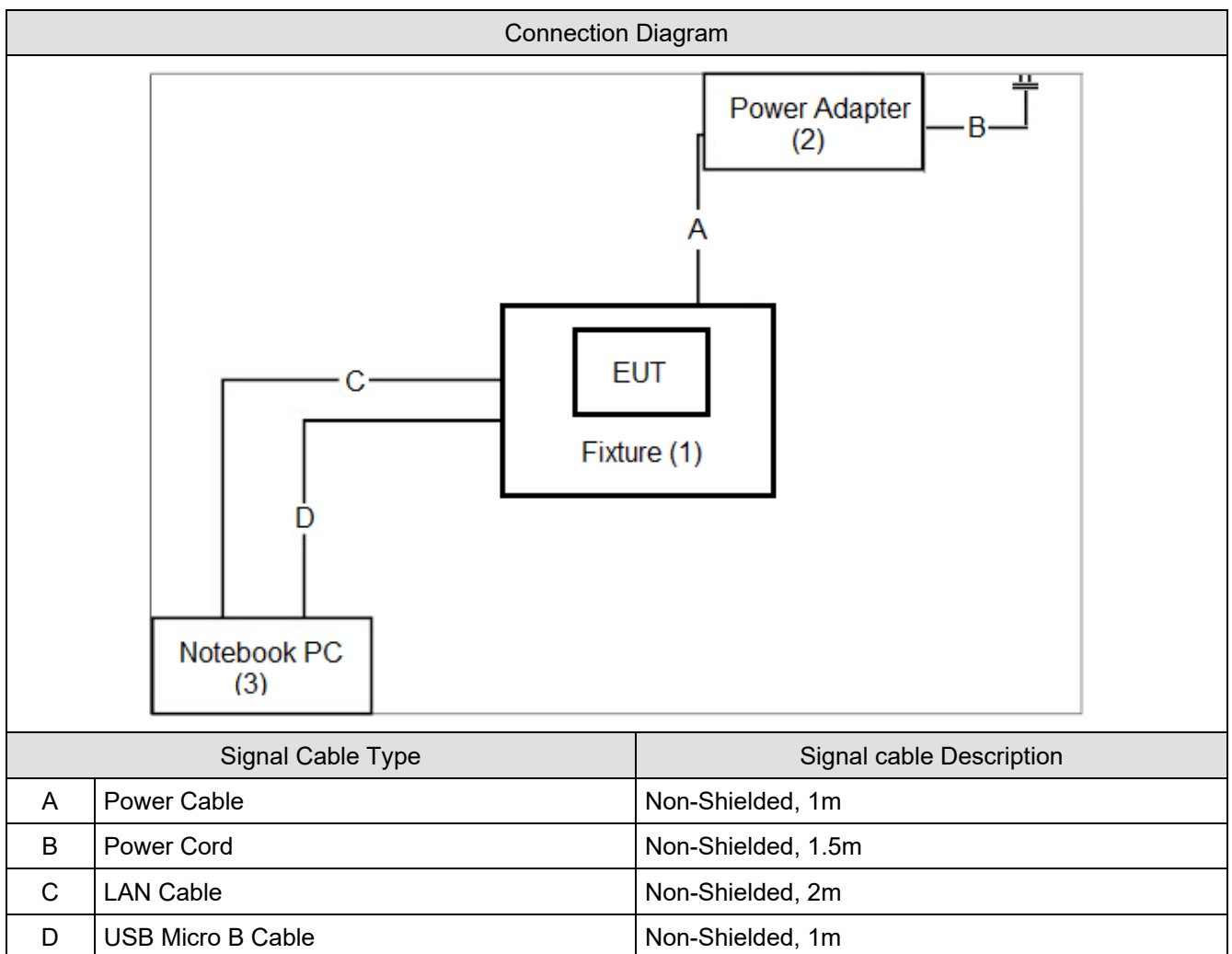
Note:

1. Determining compliance shall be based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
2. Regarding frequency band operation, the lowest, middle and highest frequency of channel were selected to perform the test, and the details were shown on this report.
3. The device was tested under all configurations, combinations, bandwidths, RB configurations and modulations, and the worst case was found in QPSK modulation for LTE B30 and PI/2 BPSK modulation for 5GNR n30, therefore the "Radiated Spurious Emission" test items perform QPSK modulation for LTE B30 and PI/2 BPSK modulation for 5GNR n30 in this report.
4. The EUT was performed at X axis, Y axis and Z axis positions for radiated spurious emission test. The worst case was found and the measurement will follow this same test configuration.

2.3. Tested System Details

	Product	Manufacturer	Model No.	Description
1	Fixture	N/A	N/A	N/A
2	Power Adapter	SWITCH MODE POWER	NBS60E120500M2	Input: 100-240V~, 50/60Hz, 1.5A Output: 60W, 12V, 5.0A
2	Notebook PC	DELL	Latitude 5501	S/N: 4H94P13

2.4. Configuration of Tested System

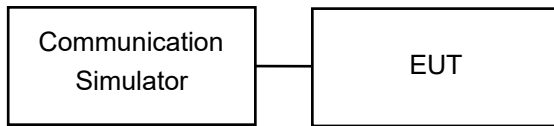


2.5. EUT Operating Procedures

1	Setup the EUT connect to the base station.
2	Setup the parameter (Band, Channel, Frequency).
3	The EUT will continue receive the signal from LTE and 5GNR function.
4	Repeat the above procedure (2) and (3).

3. RF Output Power

3.1. Test Setup



3.2. Test Procedure

The EUT makes a call to the communication simulator. The communication simulator station system controlled a EUT to export maximum conducted RF output power under transmission mode and specific channel frequency. The relevant equation for determining the ERP or EIRP from the conducted RF output power measured using the guidance provided above is:

$$\text{ERP or EIRP} = P_{\text{Meas}} + G_T - L_C$$

where:

ERP or EIRP = effective radiated power or equivalent isotropically radiated power, respectively (expressed in the same units as P_{Meas} , typically dBW or dBm);

P_{Meas} = measured transmitter output power or PSD, in dBm or dBW;

G_T = gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP);

L_C = signal attenuation in the connecting cable between the transmitter and antenna, in dB

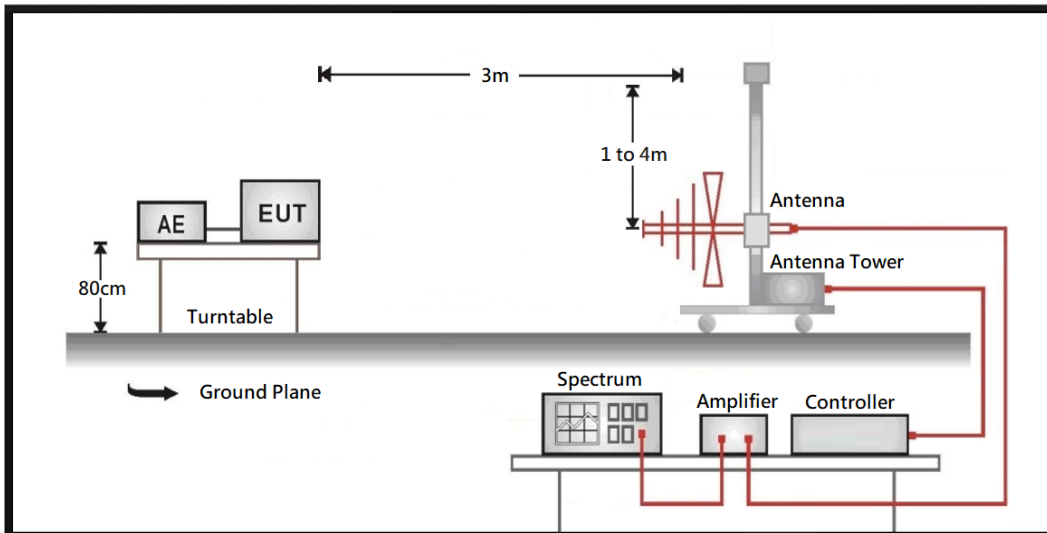
3.3. Test Result of RF Output Power

Refer as Appendix A

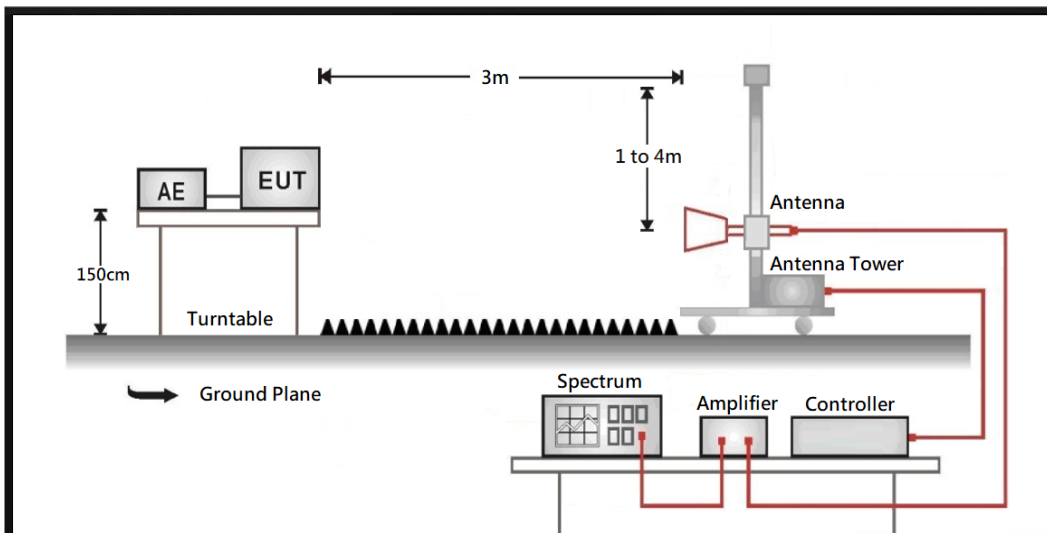
4. Spurious Emissions

4.1. Test Setup

Radiated Spurious Measurement: below 1GHz



Radiated Spurious Measurement: above 1GHz



4.2. Test Procedure

Radiated Spurious Measurement:

The EUT and its simulators are placed on a turn table which is 0.8 or 1.5 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations. The resolution bandwidth of the spectrum analyzer was set at 1 MHz, sufficient scans were taken to show the out of band Emission if any up to 10th harmonic. Taking the record of maximum spurious emission.

4.3. Test Result of Spurious Emission

Refer as Appendix B