

TEST REPORT

Applicant Name: Astera LED Technology GmbH
Address: Schatzbogen 60 81829 Munich Germany
Report Number: 2401Z64580E-RF-07B

Test Standard (s)

Item 19 of Article 2 Paragraph 1

Sample Description

Product Type: QuikSpot
Model No.: AST-QUKSP
Multiple Model(s) No.: N/A
Trade Mark: Astera
Date Received: 2024/11/13
Issue Date: 2025/04/08

Test Result:

Pass▲

▲ In the configuration tested, the EUT complied with the standards above.

Prepared and Checked By:

Ekko Wu

Ekko Wu
RF Engineer

Approved By:

Nancy Wang

Nancy Wang
RF Supervisor

Note: The information marked # is provided by the applicant, the laboratory is not responsible for its authenticity and this information can affect the validity of the result in the test report. Customer model name, addresses, names, trademarks etc. are included.

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Bay Area Compliance Laboratories Corp. (Shenzhen)

5F(B-West) , 6F, 7F, the 3rd Phase of Wan Li Industrial Building D, Shihua Rd, FuTian Free Trade Zone, Shenzhen, China

Tel: +86-755-33320018 Fax: +86-755-33320008 www.baclcorp.com.cn

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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	2401Z64580E-RF-07B	Original Report	2025/04/08

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Product		QuikSpot
Tested Model		AST-QUKSP
Multiple Model(s)		N/A
Radio Type		BLE
Technical Parameters	Modulation Type	GFSK
	Data Rate	1Mbps
	Frequency Range	2402-2480MHz
	Rated Output Power	2.5 mW for BLE 1M
	Antenna Gain [#]	-5.25 dBi (It is provided by the applicant)
Nominal Power Supply		DC 18V from battery or AC100V~240V, 60/50Hz
Sample serial number		2TZJ-2 (Assigned by BACL, Shenzhen)
Sample/EUT Status		Good condition
Adapter Information		N/A

Objective

The objective of the manufacturer is to demonstrate compliance with Radio Law of Japan item 19 of Article 2 Paragraph 1, rules and limits for this device including:

Test Method

MIC Notice No.88 Appendix No.43

Measurement Uncertainty

Item	Expanded Measurement uncertainty
Frequency error	56.6Hz(k=2, 95% level of confidence)
Occupied Channel Bandwidth	109.2kHz(k=2, 95% level of confidence)
RF output power, conducted	0.86dB(k=2, 95% level of confidence)
Unwanted Emission, conducted	1.60dB(k=2, 95% level of confidence)
Duty Cycle	±1%
Temperature	±1°C
Supply voltages	±0.4%
Humidity	±1%

Note: The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located on the 5F(B-West) , 6F, 7F, the 3rd Phase of Wan Li Industrial Building D, Shihua Rd, FuTian Free Trade Zone, Shenzhen, China.

Each test item follows test standards and with no deviation.

EUT TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in a testing mode by some software.

For BLE 1M mode, 40 channels are provided for testing:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	20	2442
1	2404	21	2444
...	...	...	...
...	...	...	...
...	...	...	...
18	2438	38	2478
19	2440	39	2480

EUT was tested with channel 0, 19 and 39.

The EUT has a power manage chip: LM5176PWPR, the fluctuation of power supply to the RF circuit of EUT (excluding power source) is equal to or less than +/- 1%. Exempt extremely high and low supply voltage condition tests, EUT only operated in normal voltage to test all regulations.

EUT Exercise Software

Software “AsteraserialLogInstaller.msi”[#] was used and the power level set is Default[#]. The power level was provided by applicant.

Equipment Modifications

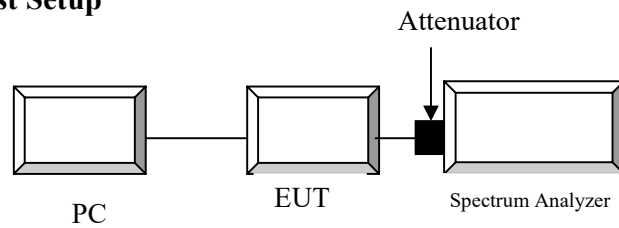
No modification was made to the EUT tested.

Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
DELL	PC	DESKTOP-1630AQ3	Unknown

External I/O Cable

Cable Description	Length (m)	From/Port	To
Un-shielding Detachable USB Cable	0.5	EUT	PC

Configuration of Test Setup

SUMMARY OF TEST RESULTS

MIC Notice No.88 Appendix No.43 Article 2, Paragraph 1, Item 19	Description of Test	Result	Remark
1	Frequency Error	-	See Note 2
2	Occupied Bandwidth	-	See Note 2
3	Transmitter Spurious Emission and Unwanted Emission Intensity	-	See Note 2
4	Antenna Output Power and Output Power Tolerance	Compliant	-
5	Receiver Spurious Emission and Unwanted Emission Intensity	-	See Note 2
6	Transmission Antenna Gain	Not Applicable	-
7	Carrier sense capability	Not Applicable**	-
8	Transmission Radiation Angle Width	Not Applicable	-
9	Frequency Hopping Dwell Time	Not Applicable*	-
10	Interference Prevention Function	-	See Note 2
11	Construction Protection Confirmation	-	See Note 2

Note 1:

Not Applicable* -Testing is only required for FHSS system devices.

Not Applicable**-The OBW of EUT is less than 26 MHz.

Not Applicable - This test item was not required for the output power less than 12.14 dBm (E.I.R.P)

Note 2:

1: The manufacturer declared the BLE module installed in EUT is identical to the certified module Model ESP32-WROVER-E.

2: The test data are referred to the module report RSHD200401002-24C.

3: The BACL is responsible for all the information provided in this report, except when information is provided by the customer as identified in this report.

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date	Calibration Authority	Calibration Method
Rohde & Schwarz	Spectrum Analyzer	FSU26	200982	2024/09/20	2025/09/19	BACL Cal	c)
WEINSCHL	3dB Attenuator	Unknown	F-03-EM220	2024/06/27	2025/06/26	BACL	d)

Note: Calibration Method

a) Calibration conducted by the National Institute of Information and Communications Technology (NICT) or a designated calibration agency under Article 102-18 paragraph (1)

b) Correction conducted pursuant to the provisions of Article 135 or Article 144 of the Measurement Law (Law No. 51 of 1992) ~Japan Calibration Service System~

c) Calibration conducted in foreign countries, which shall be equivalent to the calibration conducted by the NICT or a designated calibration agency under Article 102-18 paragraph (1)

d) Calibration conducted by using other equipment that listed above from a) to c)

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

ANTENNA OUTPUT POWER AND ANTENNA POWER TOLERANCE

Limit

Antenna power:

- ≤ 10 mW/MHz (OFDM, DSSS from 2400-2483.5 MHz)
- ≤ 10 mW (other from 2400-2483.5 MHz)

The Output Power Tolerance must be within +20%, -80%.

E.i.r.p:

- ≤ 12.14 dBm/MHz (OFDM (20MHz system), DSSS form 2400-2483.5MHz)
- ≤ 9.13 dBm/MHz (OFDM(40MHz system) from 2400-2483.5MHz)
- ≤ 12.14 dBm (other from 2400-2483.5MHz)

Test Procedure

For FHSS UUT:

Connect the UUT to the spectrum analyzer and use the following settings:

- Frequency to measure
- RBW : 3MHz
- VBW : 3MHz
- Span: Wide enough to cover the complete power envelope of the signal of the UUT.
- Detector: Average (see note).
- Trace Mode: Max Hold.

For OFDM, DSSS UUT:

Step 1:

Connect the UUT to the spectrum analyzer and use the following settings:

- Centre Frequency: The centre frequency of the channel under test.
- RBW: 1 MHz.
- VBW: 1 MHz.
- Span: Wide enough to cover the complete power envelope of the signal of the UUT.
- Detector: Peak.
- Trace Mode: Max Hold.

Step 2:

When the trace is complete, find the peak value of the power envelope and record the frequency.

Step 3:

Make the following changes to the settings of the spectrum analyzer:

- Measurement Mode: Time Domain Power
- Centre Frequency: Equal to the frequency recorded in step 2.
- Span: Zero Span.
- Resolution BW: 3 MHz.
- Video BW: 3 MHz.
- Sweep Mode: Single.
- Detector: RMS.
- Trace Mode: Clear Write.

For other UUT:

Make the following changes to the settings of the spectrum analyser:

- Centre Frequency: The centre frequency of the channel under test.
- Span: 5MHz.
- RBW: 3 MHz.
- VBW: 10 MHz.
- Detector: Peak
- Trace Mode: Max Hold.

NOTE: The detector mode "Average" is often referred to as "RMS Average" or "Sample" but do not use Video Average.

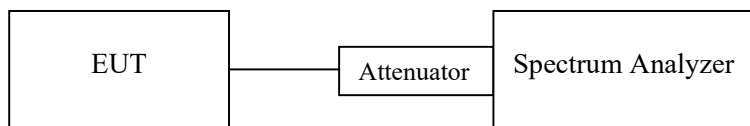
When the trace is complete, use the time domain power function of the analyzer measure the mean power average across one pulse on period, this level is recorded as D.

D shall be recorded in the test report.

The maximum PD, which is e.i.r.p. PSD (spectral density power) or power, is calculated from the above measured value D, and the applicable antenna assembly gain "G" in dBi, according to the formula below. If more than one antenna assembly is intended for this power setting, the gain of the antenna assembly with the highest gain shall be used.

$$PD = D + G$$

Test Setup Block diagram



Test Data**Environmental Conditions**

Temperature:	26.3 °C
Relative Humidity:	55 %
ATM Pressure:	101.1 kPa

The testing was performed by Rainbow Zhu on 2025-04-08.

Test Result: Compliant

Test Mode: Transmitting

Test Condition: NV

Mode	Antenna gain (dBi)	Declared power (mW)
BLE 1M	-5.25	2.5

Mode	Channel	Conducted power(dBm)	Antenna output power(mW)		Antenna output tolerance(%)		EIRP (dBm)		Verdict
			Result	Limit	Result	Limit	Result	Limit	
BLE 1M	Low	2.75	1.884	≤ 10	-24.64	-80~+20	-2.50	≤ 12.14	Pass
	Middle	3.10	2.042	≤ 10	-18.32	-80~+20	-2.15	≤ 12.14	Pass
	High	3.31	2.143	≤ 10	-14.28	-80~+20	-1.94	≤ 12.14	Pass

Note:

Antenna Output power(mW) = $10^{\{\text{Conducted power(dBm)} / 10\}}$

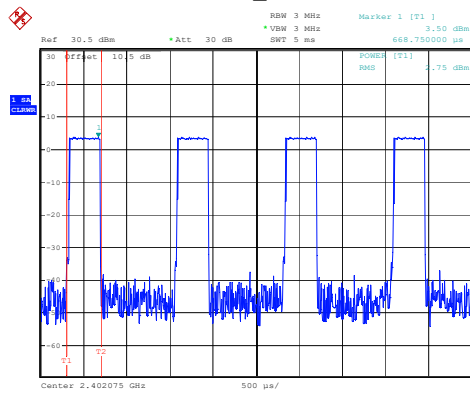
Antenna Output Power Tolerance(%) = (Antenna Output power - Declared Power) / Declared Power * 100%

Antenna output power(dBm) = $10 * \log_{10}\{\text{Antenna Output Power(mW)}\}$

EIRP(dBm) = Antenna output power(dBm) + Antenna gain.

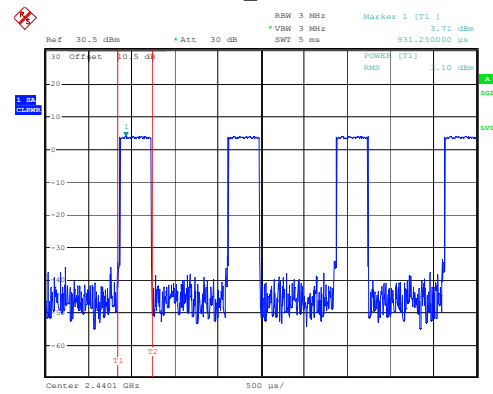
Test Condition: NV

BLE 1M_Low Channel



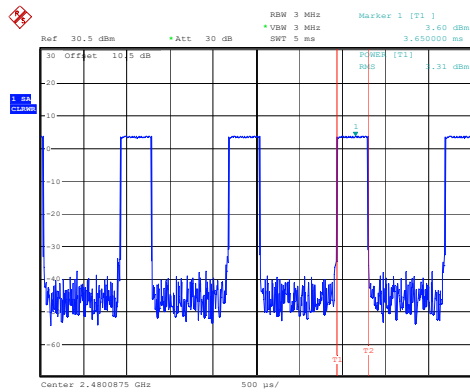
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BLE 1M_Middle Channel



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Date: 8.APR.2025 18:12:17

BLE 1M_High Channel



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Date: 8.APR.2025 18:09:26

EUT PHOTOGRAPHS

Please refer to the attachment 2401Z64580E-RF External photo and 2401Z64580E-RF Internal photo.

TEST SETUP PHOTOGRAPHS

Please refer to the attachment 2401Z64580E-RFA Test Setup photo.

******END OF REPORT******