

Prüfbericht-Nr.: Test report no.:	CN24CMA8 002	Auftrags-Nr.: Order no.:	168516453	Seite 1 von 10 Page 1 of 10	
Kunden-Referenz-Nr.: Client reference no.:	N/A	Auftragsdatum: Order date:	2024-12-02		
Auftraggeber: Client:	LEEDARSON LIGHTING CO., LTD. Xingda Road, Xingtai Industrial Zone, Changtai County, Zhangzhou, Fujian, China				
Prüfgegenstand: Test item:	LED Smart Bulb				
Bezeichnung / Typ-Nr.: Identification / Type no.:	14aSA-C500ST-E1T_NA_2P, 14ySA-C500ST-E1T_NA_xP(Where "y" may be "a" to "z", which designates for different enclosure pattern design; "x and xx" may be "0" to "99", which designates for different package of style)				
Auftrags-Inhalt: Order content:	Test Report				
Prüfgrundlage: Test specification:	47 CFR FCC Part 2.1091 RSS-102 Issue 6				
Wareneingangsdatum: Date of sample receipt:	2024-12-06	Please refer to Photo Document			
Prüfmuster-Nr.: Test sample no.:	A003877474-001~004				
Prüfzeitraum: Testing period:	2024-12-06 - 2024-12-17				
Ort der Prüfung: Place of testing:	TÜV Rheinland (Shenzhen) Co., Ltd.				
Prüflaboratorium: Testing laboratory:	TÜV Rheinland (Shenzhen) Co., Ltd.				
Prüfergebnis*: Test result*:	Pass				
geprüft von: tested by:			genehmigt von: authorized by:		
Datum: Date:	2024-12-19	Signed by: Jonathan Li	Ausstellungsdatum: Issue date:	2024-12-19	Signed by: Bell Hu
Stellung / Position:	Sachverständige(r)/Expert		Stellung / Position:	Sachverständige(r)/Expert	
Sonstiges / Other:	FCC ID: 2AB2Q14AC500ST IC: 10256A-14AC500ST, HVIN: 14aSA-C500ST-E1T_NA				
Zustand des Prüfgegenstandes bei Anlieferung: Condition of the test item at delivery:	Prüfmuster vollständig und unbeschädigt Test item complete and undamaged				
* Legende:	P(ass) = entspricht o.g. Prüfgrundlage(n) F(ail) = entspricht nicht o.g. Prüfgrundlage(n) N/A = nicht anwendbar N/T = nicht getestet				
* Legend:	P(ass) = passed a.m. test specification(s) F(ail) = failed a.m. test specification(s) N/A = not applicable N/T = not tested				
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the above mentioned test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i>					

Prüfbericht-Nr.: CN24CMA8 002
Test report no.:

Seite 2 von 10
Page 2 of 10

Anmerkungen
Remarks

1	Alle eingesetzten Prüfmittel waren zum angegebenen Prüfzeitraum gemäß eines festgelegten Kalibrierungsprogramms unseres Prüfhauses kalibriert. Sie entsprechen den in den Prüfprogrammen hinterlegten Anforderungen. Die Rückverfolgbarkeit der eingesetzten Prüfmittel ist durch die Einhaltung der Regelungen unseres Managementsystems gegeben. Detaillierte Informationen bezüglich Prüfkonditionen, Prüfequipment und Messunsicherheiten sind im Prüflabor vorhanden und können auf Wunsch bereitgestellt werden. <i>The equipment used during the specified testing period was calibrated according to our test laboratory calibration program. The equipment fulfils the requirements included in the relevant standards. The traceability of the test equipment used is ensured by compliance with the regulations of our management system. Detailed information regarding test conditions, equipment and measurement uncertainty is available in the test laboratory and could be provided on request.</i>
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3	Prüfklausel mit der Note * wurden an qualifizierte Unterauftragnehmer vergeben und sind unter der jeweiligen Prüfklausel des Berichts beschrieben. Abweichungen von Prüfspezifikation(en) oder Kundenanforderungen sind in der jeweiligen Prüfklausel im Bericht aufgeführt. <i>Test clauses with remark of * are subcontracted to qualified subcontractors and described under the respective test clause in the report.</i> <i>Deviations of testing specification(s) or customer requirements are listed in specific test clause in the report.</i>
4	Die Entscheidungsregel für Konformitätserklärungen basierend auf numerischen Messergebnissen in diesem Prüfbericht basiert auf der "Null-Grenzwert-Regel" und der "Einfachen Akzeptanz" gemäß ILAC G8:2019 und IEC Guide 115:2021, es sei denn, in der auf Seite 1 dieses Berichts genannten angewandten Norm ist etwas anderes festgelegt oder vom Kunden gewünscht. Dies bedeutet, dass die Messunsicherheit nicht berücksichtigt wird und daher auch nicht im Prüfbericht angegeben wird. Zu weiteren Informationen bezüglich des Risikos durch diese Entscheidungsregel siehe ILAC G8:2019. <i>The decision rule for statements of conformity, based on numerical measurement results, in this test report is based on the "Zero Guard Band Rule" and "Simple Acceptance" in accordance with ILAC G8:2019 and IEC Guide 115:2021, unless otherwise specified in the applied standard mentioned on Page 1 of this report or requested by the customer. This means that measurement uncertainty is not taken in account and hence also not declared in the test report. For additional information to the resulting risk based of this decision rule please refer to ILAC G8:2019.</i>

Prüfbericht - Nr.: CN24CMA8 002
Test Report No.:

Seite 3 von 10
Page 3 of 10

Test Summary

3.1.1 RF Exposure Compliance

RESULT: Pass

Contents

1.	Test Sites	5
1.1	Test Facilities	5
1.2	Traceability	5
1.3	Calibration	5
1.4	Location of Original Data	5
1.5	Status of Facility Used for Testing	5
2.	General Product Information	6
2.1	Product Function and Intended Use	6
2.2	Rating and System Details	6
3.	Test Results	8
3.1	Transmitter Requirements & Test Suites	8
3.1.1	RF Exposure Compliance	8

1. Test Sites

1.1 Test Facilities

TÜV Rheinland (Shenzhen) Co., Ltd.

No. 362 Huanguan Road Middle, Longhua District, 518110, Shenzhen, P. R. China.

A2LA Certificate Number: 5162.01

FCC Registration No.: 694916

ISED wireless device testing laboratory: 25069

1.2 Traceability

All measurement equipment calibrations are traceable to NIST or where calibration is performed outside the United States, to equivalent nationally recognized standards organizations.

1.3 Calibration

Equipment requiring calibration is calibrated periodically by the manufacturer or according to manufacturer's specifications. Additionally all equipment is verified for proper performance on a regular basis using in house standards or comparisons.

1.4 Location of Original Data

The original copies of all test data taken during actual testing were attached at Appendixes of this report and delivered to the applicant. A copy has been retained in the TÜV Rheinland (Shenzhen) file for certification follow-up purposes.

1.5 Status of Facility Used for Testing

The TÜV Rheinland (Shenzhen) Co., Ltd. Test facility located at No. 362 Huanguan Road Middle, Longhua District, 518110, Shenzhen, P. R. China. is listed on the US Federal Communications Commission list of facilities approved to perform measurements.

2. General Product Information

2.1 Product Function and Intended Use

The EUT (Equipment Under Test) is a LED Smart Bulb which support BLE and 2.4GHz Wi-Fi wireless technogy.

For details refer to the User Manual, Technical Description and Circuit Diagram.

2.2 Rating and System Details

Table 1: Technical Specification of EUT

General Information of EUT	Value
Kind of Equipment	LED Smart Bulb
Type Designation	14aSA-C500ST-E1T_NA_2P, 14ySA-C500ST-E1T_NA_xP(Where "y" may be "a" to "z", which designates for different enclosure pattern design; "x and xx" may be "0" to "99", which designates for different package of style)
FCC ID:	2AB2Q14AC500ST
IC:	10256A-14AC500ST
HVIN:	14aSA-C500ST-E1T_NA
Operating Voltage	AC120V/60Hz
Testing Voltage	AC120V/60Hz
Technical Specification of Bluetooth	
Operating Frequency	2402-2480MHz
Type of Modulation	GFSK
Data Rate	1Mbps, 2Mbps
Channel Number	40 channels for Bluetooth BLE
Channel Separation	1MHz and 2MHz
Antenna Type	Integral Antenna
Antenna Number	1Tx1Rx
Antenna Gain	-1.74 dBi (Provided by the Client)
The type of wideband data transmission equipment	Non-FHSS for Bluetooth BLE
Technical Specification of 2.4GHz Wi-Fi	
Operating Frequency	2412 - 2462MHz for 802.11b/g/n(HT20) 2422 - 2452MHz for 802.11n(HT40)
Type of Modulation	DSSS(DBPSK/DQPSK/CCK) OFDM(BPSK/QPSK/16QAM/64QAM)
Data Rate	1/2/5.5/11 Mbps for 802.11b 6/9/12/18/24/36/48/54 Mbps for 802.11g MCS0 ~ MCS7 for 802.11n
Channel Number	11 channels for 802.11b/g/n(HT20) 7 channels for 802.11n(HT40)

Prüfbericht - Nr.: CN24CMA8 002
Test Report No.:

Seite 7 von 10
Page 7 of 10

Channel Separation	5 MHz
Antenna Type	Integral Antenna
Antenna Number	1Tx1Rx
Antenna Gain	-1.74 dBi (Provided by the Client)
The type of wideband data transmission equipment	DTS

3. Test Results

3.1 Transmitter Requirements & Test Suites

3.1.1 RF Exposure Compliance

RESULT:**Pass**

Test standard	:	RSS-102 Issue 5 47 CFR FCC Part 2.1091
Limit	:	Table 1 of 47 CFR FCC Part 1.1310 Section 6.6 of RSS-102 Issue 6

This device is mobile device, and the applicant declares that the minimum separation distance is greater than 20cm. Therefore MPE measurement or computational modelling should be used to determine compliance.

Antenna Gain: -1.74 dBi Bluetooth LE & 2.4GHz Wi-Fi.

3.1.1.1 RF Exposure Compliance Requirement for FCC

➤ **Radio Frequency Exposure Calculation Formula**

MPE Calculation is based on the conducted power, and considering maximum power and Antenna gain. The following formula is used to MPE evaluation.

$$S = \frac{PG}{4\pi R^2}$$

where: S = power density (in appropriate units, e.g. mW/cm²)
P = power input to the antenna (in appropriate units, e.g., mW)
G = power gain of the antenna in the direction of interest relative to an isotropic radiator
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

or:

$$S = \frac{EIRP}{4\pi R^2}$$

where: EIRP = equivalent (or effective) isotropically radiated power

➤ **Radio Frequency Exposure Limit**

According to ANSI/IEEE C95.1-1992, the criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio frequency (RF) radiation as specified in §1.1310.

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3-3.0	614	1.63	*(100)	6
3.0-30	1842/f	4.89/f	*(900/f ²)	6
30-300	61.4	0.163	1.0	6
300-1500			f/300	6
1500-100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f ²)	30
30-300	27.5	0.073	0.2	30
300-1500			f/1500	30
1500-100,000			1.0	30

Table 2: Test Results of RF Exposure Calculations for FCC, stand-alone mode

Operating Mode	Measured RF Output Power (dBm)	EIRP (dBm)	Distance (cm)	MPE P _d (mW/cm ²)	Limit (mW/cm ²)	Verdict
Bluetooth	13.35	11.61	20	0.0029	1.0	Pass
2.4G Wi-Fi	16.23	14.49	20	0.0056	1.0	Pass

➤ **Conclusion**

Therefore the maximum calculations result of above are meet the requirement of Radio Frequency Exposure (MPE) limit.

3.1.1.2 RSS-102 Exemption Limits for Routine Evaluation – RF Exposure Evaluation

RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm, except when the device operates as follows:

- at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $1.31 \times 10^{-2} f^{0.6834} \text{ W}$ (adjusted for tune-up tolerance), where f is in MHz;

In these cases, the information contained in the RF exposure technical brief may be limited to information that demonstrates how the e.i.r.p. was derived.

Table 3: Test Results of RF Exposure Calculations for ISED, Stand-alone mode

Operating Mode	Maximum EIRP (dBm)	Distance (cm)	Maximum EIRP (W)	Threshold power (W)	Verdict
Bluetooth	11.61	20	0.014	2.68	Pass
2.4G Wi-Fi	14.49	20	0.028	2.70	Pass

Note: The maximum EIRP lower than the threshold power in section 2.5.2, thus compliant.

Both e.i.r.p. for Bluetooth & Wi-Fi are less than the RF exposure evaluation exempted power. So RF exposure evaluation is not required.

➤ Conclusion

"RF Radiation Exposure Statement Caution: This Transmitter must be installed to provide a separation distance of at least 20 cm from all persons."