RF Exposure Evaluation

For

Datecs Ltd.

EP-700

Test Model: EP-700

Additional Model No.: EP-700 MX

Prepared for	:	Datecs Ltd.
Address	:	115A Tzarigradsko Shosse, Fl.4 SOFIA 1784 Bulgaria
Prepared by	:	Shenzhen LCS Compliance Testing Laboratory Ltd.
Address	:	101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China
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Web	:	www.LCS-cert.com
Mail	:	webmaster@LCS-cert.com
Date of receipt of test sample	:	April 27, 2025
Number of tested samples	:	2
Sample No.	:	A250427137-1, A250427137-2
Serial number	:	Prototype
Date of Test	:	April 27, 2025 ~ May 14, 2025
Date of Report	:	May 15, 2025

RF Exposure Evaluation		
Report Reference No.	:	**LCSA04275083ED**
Date of Issue.....	:	May 15, 2025
Testing Laboratory Name	:	**Shenzhen LCS Compliance Testing Laboratory Ltd.**
Address.....	:	101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China
Testing Location/ Procedure.....	:	Full application of Harmonised standards ■ Partial application of Harmonised standards □ Other standard testing method □
Applicant's Name.....	:	**Datecs Ltd.**
Address.....	:	115A Tzarigradsko Shosse, Fl.4 SOFIA 1784 Bulgaria
Test Specification		
Standard	:	FCC KDB publication 447498 D01 General RF Exposure Guidance v06 FCC CFR 47 part1 1.1310 FCC CFR 47 part2 2.1091
Test Report Form No.	:	TRF-4-E-214 A/0
TRF Originator	:	Shenzhen LCS Compliance Testing Laboratory Ltd.
Master TRF	:	Dated 2011-03
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EUT Description.	:	**EP-700**
Trade Mark.....	:	Datecs
Test Model	:	EP-700
Ratings.....	:	Please Refer to Page 6
Result	:	**PASS**

Compiled by:	**Supervised by:**	**Approved by:**
Martin Lee	Jack Liu	Gavin Liang
Martin Lee/ Administrator	Jack Liu/ Technique principal	Gavin Liang/ Manager

RF Exposure Evaluation

Test Report No. : **LCSA04275083ED**	May 15, 2025 Date of issue

EUT.....	: EP-700
Test Model.....	: EP-700
Applicant.....	**: Datecs Ltd.**
Address.....	: 115A Tzarigradsko Shosse, Fl.4 SOFIA 1784 Bulgaria
Telephone.....	: /
Fax.....	: /
Manufacturer.....	**: Datecs Ltd.**
Address.....	: 115A Tzarigradsko Shosse, Fl.4 SOFIA 1784 Bulgaria
Telephone.....	: /
Fax.....	: /
Factory.....	**: Datecs Ltd.**
Address.....	: 115A Tzarigradsko Shosse, Fl.4 SOFIA 1784 Bulgaria
Telephone.....	: /
Fax.....	: /

Test Result:	**PASS**

The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

Revision History

Report Version	Issue Date	Revision Content	Revised By
000	May 15, 2025	Initial Issue	---

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Description **Page**

1. Product Information

EUT	:	EP-700
Test Model	:	EP-700
Additional Model No.	:	EP-700 MX
Model Declaration	:	PCB board, structure and internal of these model(s) are the same, So no additional models were tested
Ratings	:	Input:100-240V~,50/60Hz,1.5AMax Output:5V⎓0.5A, 24V⎓1A DC 3.7V by Rechargeable Li-ion Battery, 200mAh(for the RTC function of MCU)
Hardware Version	:	1.xx
Software Version	:	5.xx
Bluetooth:		
Frequency Range	:	2402MHz~2480MHz
Channel Number	:	79 channels for Bluetooth V4.2 (DSS) 40 channels for Bluetooth V4.2 (DTS)
Channel Spacing	:	1MHz for Bluetooth V4.2 (DSS) 2MHz for Bluetooth V4.2 (DTS)
Modulation Type	:	GFSK, π/4-DQPSK, 8-DPSK for Bluetooth V4.2 (DSS) GFSK for Bluetooth V4.2 (DTS)
Bluetooth Version	:	V4.2
Antenna Description	:	PCB Antenna, 3.4dBi(Max.)
WIFI (2.4G Band):		
Frequency Range	:	2412MHz~2462MHz
Channel Spacing	:	5MHz
Channel Number	:	11 Channels for 20MHz bandwidth (2412~2462MHz) 7 Channels for 40MHz bandwidth (2422~2452MHz)
Modulation Type	:	IEEE 802.11b: DSSS (CCK, DQPSK, DBPSK) IEEE 802.11g: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n: OFDM (64QAM, 16QAM, QPSK, BPSK)
Antenna Description	:	PCB Antenna, 3.4dBi(Max.)
Exposure category	:	General population/uncontrolled environment
EUT Type	:	Production Unit
Device Type	:	Mobile Device

Note: For a more detailed antenna description, please refer to the antenna specifications or the antenna report provided by the customer.

2. Evaluation Method

Systems operating under the provisions of FCC 47 CFR section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.
In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as mobile device whereby a distance of 0.2m normally can be maintained between the user and the device, and below RF Permissible Exposure limit shall comply with.
In accordance with KDB447498D01 for Simultaneous transmission MPE test exclusion applies when the sum of the MPE ratios for all simultaneous transmitting antennas incorporated in a host device, based on the calculated/estimated, numerically modelled or measured field strengths or power density, is ≤ 1.0. The MPE ratio of each antenna is determined at the minimum test separation distance required by the operating configurations and exposure conditions of the host device, according to the ratio of field strengths or power density to MPE limit, at the test frequency. Either the maximum peak or spatially averaged results from measurements or numerical simulations may be used to determine the MPE ratios. Spatial averaging does not apply when MPE is estimated using simple calculations based on far-field plane-wave equivalent conditions. The antenna installation and operating requirements for the host device must meet the minimum test separation distances required by all antennas, in both standalone and simultaneous transmission operations, to satisfy compliance.

3. Limit

3. 1 Refer Evaluation Method

ANSI C95.1–2019: IEEE Standard for Safety Levels with Respect to Human Exposure to Electric, Magnetic, and Electromagnetic Fields, 0 Hz to 300 GHz
FCC KDB publication 447498 D01 General 1 RF Exposure Guidance v06: Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies.
FCC CFR 47 part1 1.1310: Radiofrequency radiation exposure limits.
FCC CFR 47 part2 2.1091: Radiofrequency radiation exposure evaluation: mobile devices.

3. 2 Limit

Limits for Maximum Permissible Exposure (MPE)/Controlled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm^2)	Averaging Time (minute)
Limits for Occupational/Controlled Exposure				
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

Limits for Maximum Permissible Exposure (MPE)/Uncontrolled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm^2)	Averaging Time (minute)
Limits for Occupational/Uncontrolled Exposure				
0.3 – 3.0	614	1.63	(100) *	30
3.0 – 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

F=frequency in MHz
*=Plane-wave equivalent power density

4. MPE Calculation Method

Predication of MPE limit at a given distance
Equation from page 18 of OET Bulletin 65, Edition 97-01

$S=PG/4\pi R^2$

Where: S=power density
P=power input to antenna
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

5. Antenna Information

EUT can only use antennas certificated as follows provided by manufacturer;

Internal/ External Identification	Antenna type and antenna number	Operate frequency band	Maximum antenna gain	Notes
Internal	PCB Antenna	2400MHz ~ 2500MHz	3.4dBi	BT/ WIFI Antenna

6. Conducted Power

[BT]

Mode	Channel	Frequency (MHz)	Peak Conducted Output Power (dBm)
GFSK	0	2402	10.41
	39	2441	11.74
	78	2480	11.62
π/4DQPSK	0	2402	12.06
	39	2441	13.35
	78	2480	13.27
8DPSK	0	2402	12.53
	39	2441	13.54
	78	2480	13.48

[BLE 1M]

Mode	Channel	Frequency (MHz)	Peak Conducted Output Power (dBm)
BLE	0	2402	10.24
	19	2440	11.76
	39	2480	11.45

[2.4G WIFI]

Mode	Channel	Frequency (MHz)	Peak Conducted Output Power (dBm)
11B	1	2412	20.14
	6	2437	20.03
	11	2462	19.62
11G	1	2412	20.6
	6	2437	20.72
	11	2462	20
11N20 SISO	1	2412	20.56
	6	2437	20.57
	11	2462	19.95
11N40 SISO	3	2412	20.27
	6	2437	20.42
	9	2462	19.95

7. Manufacturing Tolerance

[BT]

GFSK (Peak)			
Channel	Channel 0	Channel 39	Channel 78
Target (dBm)	10.0	11.0	11.0
Tolerance ±(dB)	1.0	1.0	1.0
π/4-DQPSK (Peak)			
Channel	Channel 0	Channel 39	Channel 78
Target (dBm)	12.0	13.0	13.0
Tolerance ±(dB)	1.0	1.0	1.0
8DPSK (Peak)			

Channel	Channel 0	Channel 39	Channel 78
Target (dBm)	12.0	13.0	13.0
Tolerance ±(dB)	1.0	1.0	1.0

[BLE1M]

BT LE (Peak)			
Channel	Channel 0	Channel 19	Channel 39
Target (dBm)	10.0	11.0	11.0
Tolerance ±(dB)	1.0	1.0	1.0

[2.4G WIFI]

11B (Peak)			
Channel	Channel 1	Channel 6	Channel 11
Target (dBm)	20.0	20.0	19.0
Tolerance ±(dB)	1.0	1.0	1.0
11G (Peak)			
Channel	Channel 1	Channel 6	Channel 11
Target (dBm)	20.0	20.0	20.0
Tolerance ±(dB)	1.0	1.0	1.0
11N20 (Peak)			
Channel	Channel 1	Channel 6	Channel 11
Target (dBm)	20.0	20.0	19.0
Tolerance ±(dB)	1.0	1.0	1.0
11N40 (Peak)			
Channel	Channel 3	Channel 6	Channel 9
Target (dBm)	20.0	20.0	19.0
Tolerance ±(dB)	1.0	1.0	1.0

8. Measurement Results

8.1 Standalone MPE Evaluation

As declared by the Applicant, the EUT is a wireless device used in a fix application, at least 20 cm from any body part of the user or nearby persons; from the maximum EUT RF output power, the minimum separation distance, r =20cm, as well as the gain of the used antenna refer to antenna information, the RF power density can be obtained.

[BT]

Modulation Type	Output power		Antenna Gain (dBi)	Antenna Gain (linear)	MPE (mW/cm2)	MPE Limits (mW/cm2)
	dBm	mW				
GFSK	12.0	15.8489	3.4	2.1878	0.0069	1.0000
π/4-DQPSK	14.0	25.1189	3.4	2.1878	0.0109	1.0000
8-DPSK	14.0	25.1189	3.4	2.1878	0.0109	1.0000

[BLE1M]

Modulation Type	Output power		Antenna Gain (dBi)	Antenna Gain (linear)	MPE (mW/cm2)	MPE Limits (mW/cm2)
	dBm	mW				
GFSK	12.0	15.8489	3.4	2.1878	0.0069	1.0000

[2.4G WIFI]

Modulation Type	Output power		Antenna Gain (dBi)	Antenna Gain (linear)	MPE (mW/cm2)	MPE Limits (mW/cm2)
	dBm	mW				
IEEE 802.11b	21.0	125.8925	3.4	2.1878	0.0548	1.0000
IEEE 802.11g	21.0	125.8925	3.4	2.1878	0.0548	1.0000
IEEE 802.11n HT20	21.0	125.8925	3.4	2.1878	0.0548	1.0000
IEEE 802.11n HT40	21.0	125.8925	3.4	2.1878	0.0548	1.0000

Remark:
1. Output power including tune-up tolerance;
2. Output power was adjusted to duty cycle at 100% if measured duty cycle less than 98%;
3. MPE evaluate distance is 20cm from user manual provide by manufacturer.

8.2 Simultaneous Transmission MPE Evaluation

The EUT equipped with one WLAN/NBT (Model ESP32WROOM) and BT modular (Model: Datecs BT-402), two modulars share difference antenna. need consider simultaneous transmission for two modulars.
BT modular (Model: Datecs BT-402, FCC ID: YRW-BT402) MPE values refer to Modular Test Report Number: LCSA08134191EA.

Maximum MPE $Ratio_{ESP32WROOM}$	Maximum MPE $Ratio_{BT-402}$	Maximum MPE $Ratio_{ESP32WROOM}$ + Maximum MPE $Ratio_{BT-402}$	Limit	Results
0.0548	0.0013	0.0561	1.00	PASS

9. Conclusion

The measurement results comply with the FCC Limit per 47 CFR 2.1091 for the uncontrolled RF Exposure of mobile device.

10. Description of Test Facility

NVLAP Accreditation Code is 600167-0.
FCC Designation Number is CN5024.
CAB identifier is CN0071.
CNAS Registration Number is L4595.
Test Firm Registration Number: 254912.

11.Measurement Uncertainty

BT /BLE/2.4GWLAN:

Test Item		Frequency Range	Uncertainty	Note
Output power	:	1GHz-40GHz	±0.57dB	(1)

(1). This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

----------THE END OF REPORT----------