

RF Exposure evaluation

Product Name : Laptop
Brand Name : N/A
Model : T141J
Series Model : T141A, T151J, T151A, T160J, T173A, T173J
FCC ID : 2BOHB-T141J
Applicant : **Shenzhen Jiufang Yingtong Technology Co., Ltd.**
Address : Room 201, Building A, Zhengchangda Digital Technology Park,
Jian'an Road, Zhancheng Community, Fuhai Street, Bao'an
District, Shenzhen, China
Manufacturer : **Shenzhen Jiufang Yingtong Technology Co., Ltd.**
Address : Room 201, Building A, Zhengchangda Digital Technology Park,
Jian'an Road, Zhancheng Community, Fuhai Street, Bao'an
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Standard(s) : 47CFR §1.1310, 47CFR §2.1093
KDB447498 D01 General RF Exposure Guidance v06
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Note: This device has been tested and found to comply with the standard(s) listed, this 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. This report shall not be reproduced except in full, without the written approval of Guangdong Asia Hongke Test Technology Limited. If there is a need to alter or revise this document, the right belongs to Guangdong Asia Hongke Test Technology Limited, and it should give a prior written notice of the revision document. This test report must not be used by the client to claim product endorsement.

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Report Revise Record

Report Version	Issued Date	Notes
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1 GENERAL INFORMATION

1.1 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Normal Temperature:	25°C
Relative Humidity:	55 %
Air Pressure:	101 kPa

1.2 General Description of EUT

Product Name:	Laptop			
Model/Type reference:	T141J			
Serial Model:	T141A, T151J, T151A, T160J, T173A, T173J			
Model difference:	All models except model name and appearance color, The internal structure is the same as the circuit.			
Power Supply:	Input: 12.0V==3.0A DC 7.6V 5000mAh 38Wh Rechargeable Li-ion battery			
Adapter Information:	Model: JHD-AP036Z-120300BA-A Input:AC 100-240V~50/60Hz 1.2A Output: 12.0V==3.0A 36W			
Adapter information	N/A			
Hardware version.:	N/A			
Sample(s) Status:	AiTSZ-250316009-1(Normal sample) AiTSZ-250316009-2(Engineer sample)			
2.4G WIFI:				
Supported type:	802.11b/802.11g /802.11n(HT20)/802.11n(HT40)			
Modulation:	802.11b(DSSS):CCK,DQPSK,DBPSK 802.11g(OFDM):BPSK,QPSK,16-QAM,64-QAM 802.11n(OFDM):BPSK,QPSK,16-QAM,64-QAM			
Operation frequency:	802.11b/802.11g/802.11n(H20): 2412MHz~2462MHz 802.11n(H40): 2422MHz~2452MHz			
Channel number:	802.11b/802.11g/802.11n(H20): 11 802.11n(H40): 7			
Channel separation:	5MHz			
Antenna type:	PIFA antenna			
Antenna gain:	1.57dBi			
5G WIFI:				
Supported type:	20MHz system	40MHz system	80MHz system	160MHz system
	802.11a 802.11n 802.11ac	802.11n 802.11ac	802.11ac	N/A

Operation frequency:	5180-5240MHz 5745-5825MHz	5190-5230MHz 5755-5795MHz	5210MHz 5775MHz	N/A
Modulation:	OFDM	OFDM	OFDM	N/A
Channel number:	9	4	2	N/A
Channel separation:	20MHz	40MHz	80MHz	N/A
Antenna type:	PIFA antenna			
Antenna gain:	1.19dBi			
Bluetooth :				
Supported type:	Bluetooth BR/EDR			
Modulation:	GFSK, $\pi/4$ DQPSK, 8DPSK			
Operation frequency:	2402MHz~2480MHz			
Channel number:	79			
Channel separation:	1MHz			
Antenna type:	PIFA antenna			
Antenna gain:	1.65dBi			
Bluetooth LE:				
Supported type:	Bluetooth LE			
Modulation:	GFSK			
Operation frequency:	2402MHz~2480MHz			
Channel number:	40			
Channel separation:	2MHz			
Antenna type:	PIFA antenna			
Antenna gain:	1.65dBi			

1.3 Test Facility

Test Laboratory:

Guangdong Asia Hongke Test Technology Limited

B1/F, Building 11, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

The test facility is recognized, certified or accredited by the following organizations:

FCC-Registration No.: 251906 Designation Number: CN1376

Guangdong Asia Hongke Test Technology Limited has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files.

IC —Registration No.: 31737 CAB identifier: CN0165

The 3m Semi-anechoic chamber of Guangdong Asia Hongke Test Technology Limited has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 31737

A2LA-Lab Cert. No.: 7133.01

Guangdong Asia Hongke Test Technology Limited has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

1.4 Measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report according to CISPR 16 - 4 "Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements" and is documented in the Guangdong Asia Hongke Test Technology Limited's quality system according to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Asia Hongke laboratory is reported:

Test	Measurement Uncertainty	Notes
Power Line Conducted Emission	150KHz~30MHz ± 1.20 dB	(1)
Radiated Emission	9KHz~30Hz ± 3.10 dB	(1)
Radiated Emission	9KHz~1GHz ± 3.75 dB	(1)
Radiated Emission	1GHz~18GHz ± 3.88 dB	(1)
Radiated Emission	18GHz~40GHz ± 3.88 dB	(1)
RF power, conducted	30MHz~6GHz ± 0.16 dB	(1)
RF power density, conducted	± 0.24 dB	(1)
Spurious emissions, conducted	± 0.21 dB	(1)
Temperature	$\pm 1^{\circ}\text{C}$	(1)
Humidity	$\pm 3\%$	(1)
DC and low frequency voltages	$\pm 1.5\%$	(1)
Time	$\pm 2\%$	(1)
Duty cycle	$\pm 2\%$	(1)
Bandwidth	$\pm 1.5 \times 10^{-6}$	(1)

The report uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty Multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95%.

2 Method of measurement

2.1 Applicable Standard

According to §1.1307(b)(1), systems operating under the provisions of this 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.

According to §1.1310 and §2.1093 RF exposure is calculated.

FCC KDB447498 D01 General RF Exposure Guidance v06: Mobile and Portable Device, RF Exposure, Equipment Authorization Procedures

2.2 Evaluation Method and Limit

According to KDB447498 D01 General RF Exposure Guidance v06 Section 4.3.1 Standalone SAR test exclusion considerations: "Unless specifically required by the published RF exposure KDB procedures, standalone 1-g head or body and 10-g extremity SAR evaluation for general population exposure conditions, by measurement or numerical simulation, is not required when the corresponding SAR Test Exclusion Threshold condition, listed below, is satisfied. These test exclusion conditions are based on source-based time-averaged maximum conducted output power of the RF channel requiring evaluation, adjusted for tune-up tolerance, and the minimum test separation distance required for the exposure conditions. The minimum test separation distance is determined by the smallest distance from the antenna and radiating structures or outer surface of the device, according to the host form factor, exposure conditions and platform requirements, to any part of the body or extremity of a user or bystander (see 5) of section 4.1). To qualify for SAR test exclusion, the test separation distances applied must be fully explained and justified by the operating configurations and exposure conditions of the transmitter and applicable host platform requirements, typically in the SAR measurement or SAR analysis report, according to the required published RF exposure KDB procedures. When no other RF exposure testing or reporting is required, a statement of justification and compliance must be included in the equipment approval, in lieu of the SAR report, to qualify for the SAR test exclusion. When required, the device specific conditions described in the other published RF exposure KDB procedures must be satisfied before applying these SAR test exclusion provisions; for example, handheld PTT two-way radios, handsets, laptops & tablets etc."

$$\left[\frac{(\text{max. power of channel, including tune-up tolerance, mW})}{(\text{min. test separation distance, mm})} \right] \cdot [\sqrt{f} \text{ (GHz)}] \leq 3.0 \text{ for 1-g SAR and } \leq 7.5 \text{ for 10-g extremity SAR, where:}$$

- f (GHz) is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison
- 3.0 and 7.5 are referred to as the numeric thresholds in the step 2 below

The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm according to f) in section 4.1 is applied to determine SAR test exclusion.

When one of the following test exclusion conditions is satisfied for all combinations of simultaneous transmission configurations, further equipment approval is not required to incorporate transmitter modules in host devices that operate in the mixed mobile and portable host platform exposure conditions. The grantee is responsible for documenting this according to Class I permissive change requirements. Antennas that qualify for standalone SAR test exclusion must apply the estimated standalone SAR to determine simultaneous transmission test exclusion.

The $[\sum \text{ of (the highest measured or estimated SAR for each standalone antenna configuration, adjusted for maximum tune-up tolerance) / 1.6 W/kg}] + [\sum \text{ of MPE ratios}] \leq 1.0$.

The SAR to peak location separation ratios of all simultaneously transmitting antenna pairs operating in portable device exposure conditions are all ≤ 0.04 , and the $[\sum \text{ of MPE ratios}] \leq 1.0$.

2.3 Manufacturing Tolerance

Bluetooth

GFSK (Peak)			
Channel	Channel 0	Channel 39	Channel 78
Target (dBm)	5.0	5.0	5.0
Tolerance \pm (dB)	1.0	1.0	1.0
π /4DQPSK (Peak)			
Channel	Channel 0	Channel 39	Channel 78
Target (dBm)	5.0	5.0	5.0
Tolerance \pm (dB)	1.0	1.0	1.0
8-DPSK (Peak)			
Channel	Channel 0	Channel 39	Channel 78
Target (dBm)	5.0	5.0	5.0
Tolerance \pm (dB)	1.0	1.0	1.0
BLE 1Mbps GFSK			
Channel	Channel 0	Channel 19	Channel 39
Target (dBm)	2.0	2.0	2.0
Tolerance \pm (dB)	1.0	1.0	1.0

2.4GHz WLAN

IEEE 802.11b (Peak)			
Channel	Channel 01	Channel 06	Channel 11
Target (dBm)	7.0	7.0	7.0
Tolerance \pm (dB)	1.0	1.0	1.0
IEEE 802.11g (Peak)			
Channel	Channel 01	Channel 06	Channel 11
Target (dBm)	7.0	7.0	7.0
Tolerance \pm (dB)	1.0	1.0	1.0
IEEE 802.11n(HT20) (Peak)			
Channel	Channel 01	Channel 06	Channel 11
Target (dBm)	7.0	7.0	7.0
Tolerance \pm (dB)	1.0	1.0	1.0
IEEE 802.11n(HT40) (Peak)			
Channel	Channel 03	Channel 06	Channel 09
Target (dBm)	7.0	7.0	7.0
Tolerance \pm (dB)	1.0	1.0	1.0

5GHz WLAN

5GHz WLAN Band 1				5GHz WLAN Band 4		
IEEE 802.11a (Average)						
Frequency (MHz)	5180	5200	5240	5745	5785	5825
Target (dBm)	5.0	5.0	5.0	4.0	4.0	4.0
Tolerance ± (dB)	1.0	1.0	1.0	1.0	1.0	1.0
IEEE 802.11n HT20 (Average)				IEEE 802.11n HT20 (Average)		
Frequency (MHz)	5180	5200	5240	5745	5785	5825
Target (dBm)	5.0	5.0	5.0	4.0	5.0	4.0
Tolerance ± (dB)	1.0	1.0	1.0	1.0	1.0	1.0
IEEE 802.11ac VHT20 (Average)				IEEE 802.11ac VHT20 (Average)		
Frequency (MHz)	5180	5200	5240	5745	5785	5825

Target (dBm)	3.0	.0	3.0	3.0	.0	3.0
Tolerance \pm (dB)	1.0	1.0	1.0	1.0	1.0	1.0
<i>IEEE 802.11n HT40 (Average)</i>				<i>IEEE 802.11n HT40 (Average)</i>		
Frequency (MHz)	5190	5230	5755	5795		
Target (dBm)	4.0	4.0	4.0	4.0		
Tolerance \pm (dB)	1.0	1.0	1.0	1.0		
<i>IEEE 802.11ac VHT40 (Average)</i>				<i>IEEE 802.11ac VHT40 (Average)</i>		
Frequency (MHz)	5190	5230	5755	5795		
Target (dBm)	4.0	4.0	4.0	4.0		
Tolerance \pm (dB)	1.0	1.0	1.0	1.0		
<i>IEEE 802.11ac VHT80 (Average)</i>				<i>IEEE 802.11ac VHT80 (Average)</i>		
Frequency (MHz)	5210			5775		
Target (dBm)	4.0			4.0		
Tolerance \pm (dB)	1.0			1.0		

2.4 Evaluation Result

Standalone Evaluation Results

Mode	Test Frequency (MHz)	Minimum Separation Distance (mm)	Output Power with tune up (dBm)	Output Power (mW)	calculated value	exclusion thresholds	Estimated SAR (W/Kg)
BT	2480.00	5.0	6.0	3.981	1.3	3	0.167
BLE	2480.00	5.0	3.0	1.995	0.6	3	0.084
WIFI 2.4G	2437.00	5.0	8.0	6.310	1.9	3	0.263
WIFI 5G B1	5190.00	5.0	6.0	3.981	1.8	3	0.242
WIFI 5G B4	5785.00	5.0	6.0	3.981	1.9	3	0.255

The EUT equipped with two antennas, the main antenna for 2.4G WIFI and the aux antenna for 5G wifi and BT, 2.4Wifi and BT can transmit simultaneously, according to KDB 447498 if the sum of SAR for individual transmitters is less than SAR limit, the simultaneously transmit can be exempt.

$$\text{SUM}_{\text{SAR}} = \text{WIFI 2.4G Estimated SAR} + \text{BT Estimated SAR} = 0.263 + 0.167 = 0.430 \text{ W/Kg} < 1.6$$

2.5 Conclusion

The measurement results comply with the FCC Limit per 47 CFR 2.1093 for the uncontrolled RF Exposure and SAR Exclusion Threshold per KDB 447498 v06

***** End of Report *****