

SZCCS-TRF-01 Rev. A/0 Aug01,2022

Report No.: FYCR220900037305

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# **RF Exposure Evaluation Report**

**Application No.**: FYCR2209000373AT **Applicant:** DT Research, Inc.

Address of Applicant: 3RD FL NO 36 WUQUAN 7TH RD WUGU DISTRICT, NEW TAIPEI, Taiwan

**Manufacturer:** DT Research, Inc.

Address of Manufacturer: 2000 Concourse Drive, San Jose, CA 95131, USA

Factory: DT Research, Inc. Taiwan Branch

Address of Factory: 6F., No.36 Wuquan 7 th Rd., Wugu Dist. New Taipei City 248 Taiwan

Product Name: Integrated LCD System

Model No.: 502T, 502XXXXX (X is -, any alphanumeric or blank) ♣

Please refer to section 3.1 of this report which indicates which model was

actually tested and which were electrically identical.

Trade Mark: DT Research

FCC ID: YE3600-AX210NG

**Standards:** 47 CFR Part 1.1307, 47 CFR Part 1.1310, 47 CFR Part 2.1091

**Date of Receipt:** 2022-09-01

**Date of Test:** 2022-09-04 to 2022-09-30

**Date of Issue:** 2022-11-11

Test Result : PASS\*

\* In the configuration tested, the EUT complied with the standards specified above.

Winkey Wang
Winkey Wang
EMC Technical Manager



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#### 1 Version

	Revision Record									
Version	Version Chapter Date Modifie									
01		2022-11-11		Original						

Authorized for issue by:		
	Tree Zhan	
	Winkey Wang	
	Winkey Wang/Reviewer	



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### 3 General Information

### 3.1 General Description

Power supply:	Medical AC Adapter
	Model: EM11011M-190
	Input: AC 100-240V, 2.0-1.0A, 50-60Hz
	Output: DC 19.0V, 6.31A, 120.0W
	Rechargeable Lithium Battery
	Model: ACC-006-524N(3INR19/66)
	Rated Capacity: 2300mAh
	Voltage: 10.8VDC Watt-Hour:24.84Wh
Test Voltage:	AC 120V, 60Hz
	Note: Both nominal AC 120V, 60Hz and AC 240 V, 60Hz are required for
	testing in accordance with FCC KDB174176, this report only shows the
	results of the worst test result(AC 120V, 60Hz);
Cable(s):	DC cable:120cm with a ferrite core
Internal Source:	More than 108MHz
For Bluetooth Classic mode	
Operation Frequency:	2402MHz to 2480MHz
Bluetooth Version:	V5.2
Spectrum Spread	Frequency Hopping Spread Spectrum(FHSS)
Technology:	
Modulation Type:	GFSK, π/4DQPSK, 8DPSK
Number of Channels:	79
Channel Spacing:	1MHz
Antenna Type:	PIFA Antenna
Antenna Gain:	2.1dBi
For Bluetooth LE mode	
Operation Frequency:	2402MHz to 2480MHz
Bluetooth Version:	V5.2



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Channel Spacing:	2MHz							
Modulation Type:	GFSK							
Number of Channels:	40							
Data rate:	1Mbps, 2Mbps	1Mbps, 2Mbps						
Antenna Type:	PIFA Antenna	PIFA Antenna						
Antenna Gain:	2.1dBi	2.1dBi						
For 802.11b/g/n:								
Operation Frequency:		HT20): 2412MHz to 2472MH -0): 2422MHz to 2462MHz	łz					
Modulation Type:	802.11g/n: OFD	(CCK, DQPSK, DBPSK) M(QPSK, BPSK, 16QAM, 6 MA(QPSK, BPSK, 16QAM, 6	,	24QAM)				
Channel Numbers:		802.11b/g, 802.11n/ax HT20: 13 Channels 802.11n/ax HT40: 9 Channels						
Antenna Type:	PIFA Antenna	PIFA Antenna						
Antenna Gain:	Antenna1: 2.1dl	Antenna1: 2.1dBi, Antenna2: 1.9dBi						
	Note: MIMO for	Note: MIMO for 802.11n/ax.						
For 802.11a/n/ac/ax: U-NII-1	U-NII-2A, U-NII-	2C, U-NII-3		_				
Operation Frequency:	Band	Mode	Frequency Range(MHz)	Number of channels				
	UNII Band I	802.11a/n/ax(HT20)	5180-5240	4				
		802.11n/ax(HT40)	5190-5230	2				
		802.11ac/ax(HT80)	5210	1				
		802.11ac/ax(HT160)	5250	1				
	UNII Band II-A	802.11a/n/ax(HT20)	5260-5320	4				
		802.11n/ax(HT40)	5270-5310	2				
		802.11ac/ax(HT80)	5290	1				
	UNII Band II-C	802.11a/n/ax(HT20)	5500-5720	12				
		802.11n/ax(HT40)	5510-5710	6				



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		802.11ac/ax(HT80)	5530-5690	3			
		802.11ac/ax(HT160)	5570	1			
	UNII Band III	802.11a/n/ax(HT20)	5745-5865	7			
		802.11n/ax(HT40)	5755-5835	3			
		802.11ac/ax(HT80)	5775	1			
Modulation Type:	802.11a: OFDM	I(QPSK, BPSK, 16QAM, 64QA	AM)				
	802.11n: OFDM	802.11n: OFDM(QPSK, BPSK, 16QAM, 64QAM)					
	802.11ac: OFD	802.11ac: OFDM(QPSK, BPSK, 16QAM, 64QAM, 256QAM)					
	802.11ax: OFD	802.11ax: OFDMA(QPSK, BPSK, 16QAM, 64QAM, 256QAM, 1024QAM)					
DFS Function:	Slave without radar detection						
TPC Function:	Not support	Not support					
Antenna Type:	PIFA Antenna	PIFA Antenna					
Antenna Gain:	Antenna1: 3.2d	Antenna1: 3.2dBi, Antenna2: 3.1dBi					
	Note: MIMO for	Antenna1 and Antenna2.					

#### Remark:

Model No.: 502T, 502XXXXX (X is -, any alphanumeric or blank)

Only the model 502T was tested, since according to the declaration from the applicant, the electrical circuit design, layout, components used, internal wiring and functions were identical for all the above models, with only difference on model No..



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#### 3.2 Test Location

All tests were performed at:

Compliance Certification Services (Kunshan) Inc. Shenzhen branch.

Fuyong lab. Xinlong TechnoPark, Fengtang Road, Fuyong Subdistrict, Bao'an, Shenzhen, China

Tel: +86 755 8866 3988 Fax: +86 755 2671 0594

### 3.3 Test Facility

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

• A2LA (Certificate No. 6606.01)

Compliance Certification Services (Kunshan) Inc. Shenzhen branch is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 6606.01.

• FCC -Designation Number: CN1322

Compliance Certification Services (Kunshan) Inc. Shenzhen branch has been recognized as an accredited testing laboratory.

Designation Number: CN1322. Test Firm Registration Number: 718073

• Innovation, Science and Economic Development Canada

Compliance Certification Services (Kunshan) Inc. Shenzhen branch has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0129.

IC#: 28189.

#### 3.4 Deviation from Standards

None

#### 3.5 Abnormalities from Standard Conditions

None.

#### 3.6 Other Information Requested by the Customer

None.



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## 4 RF Exposure Evaluation

### 4.1 RF Exposure Compliance Requirement

#### **4.1.1 Limits**

According to FCC Part1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in part1.1307(b)

Table 1—Limits for Maximum Permissible Exposure (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm²)	Averaging time (minutes)	
(A) Lim	its for Occupational	/Controlled Exposur	es		
0.3–3.0 3.0–30 30–300 300–1500 1500–100,000	614 1842/f 61.4	1.63 4.89/f 0.163	*(100) *(900/f²) 1.0 f/300 5	6 6 6 6	
(B) Limits	for General Populati	on/Uncontrolled Exp	oosure		
0.3–1.34	614	1.63	*(100)	30	
1.34–30	824/f	2.19/f	*(180/f <sup>2</sup> )	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

Friis Formula

Friis transmission formula:  $Pd = (Pout*G)/(4*Pi*R^2)$ 

Where

Pd = power density in mW/cm<sup>2</sup>

Pout = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 3.1416

For Uncontrolled Environment, the MPE limit of 300 MHz to 1500 MHz is  $f/1500 \ mW/cm^2$ , the MPE limit of 1500 MHz to 100000 MHz is  $1.0 \ mW/cm^2$ . If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

#### 4.1.2 Test Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.



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#### 4.1.3 EUT RF Exposure Evaluation

#### 1) Test Results

The max tune-up tolerance power Into Antenna1 & RF Exposure Evaluation Distance:

Туре	Test Freq. (MHz)	Max Antenna Gain (dBi)	Max Antenna Gain (Numeric)	Max tune-up tolerance power (dBm)	Max tune-up Tolerance power to Antenna (mW)	Power Density at R=20cm (mW/cm²)	Limit (mW/cm²)	MPE Ratios	Result
BT	2402	2.1	1.62	11.5	14.13	0.0046	1.0000	0.0046	PASS
BLE	2402	2.1	1.62	10	10.00	0.0032	1.0000	0.0032	PASS
2.4G	2412	2.1	1.62	28.99	792.50	0.2557	1.0000	0.2557	PASS
5G	5180	3.2	2.09	23.96	248.89	0.1034	1.0000	0.1034	PASS
5.8G	5745	3.2	2.09	24.32	270.40	0.1124	1.0000	0.1124	PASS

The max tune-up tolerance power Into Antenna2 & RF Exposure Evaluation Distance:

Туре	Test Freq. (MHz)	Max Antenna Gain (dBi)	Max Antenna Gain (Numeric)	Max tune-up tolerance power (dBm)	Max tune-up Tolerance power to Antenna (mW)	Power Density at R=20cm (mW/cm²)	Limit (mW/cm²)	MPE Ratios	Result
2.4G	2412	1.9	1.55	28.99	792.50	0.2442	1.0000	0.2442	PASS
5G	5180	3.1	2.04	23.96	248.89	0.1011	1.0000	0.1011	PASS
5.8G	5745	3.1	2.04	24.32	270.40	0.1098	1.0000	0.1098	PASS

Note: Refer to report No. 200611-03 or EUT test Max Conducted Peak Output Power value.

The distancer (4th column) calculated from the Fries transmission formula is far greater than 20 cm separation requirement, the MPE limit of 1500MHz to 100000MHz is 1.0 mW/cm<sup>2</sup>.

The antenna1 and antenna2 can synchronous transmission at the same time.

The simultaneous transmission result between of antenna1 and antenna2:

The SAR Exclusion Threshold Level:

=CPD1 / LPD1 + CPD2 / LPD2

(CPD = Calculation power density, LPD = Limit of power density)

= (0.2557/1) + (0.2442/1) = 0.4999 < 1

Since the SAR Exclusion Threshold Level is well below the SAR low threshold level, so the EUT is considered to comply with SAR requirement without testing.

-End of Report-



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