



## RF Exposure Evaluation Report

**Application No.:** SZEM2103002179CR  
**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:** Medical-Grade Integrated LCD System  
**Model No.:** 507T, 507XXX-XXX (X=blank, A~Z or 0~9) ♣  
♣ Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.  
**Trade Mark:** DT Research, Inc.  
**FCC ID:** YE3600-AX200NG  
47 CFR Part 1.1307  
**Standards:** 47 CFR Part 1.1310  
47 CFR Part 2.1091  
**Date of Receipt:** 2021-03-01  
**Date of Test:** 2021-03-02 to 2021-04-11  
**Date of Issue:** 2021-04-19

<b>Test Result :</b>	<b>PASS*</b>
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\* In the configuration tested, the EUT complied with the standards specified above.

Keny Xu

Keny Xu  
EMC Laboratory Manager


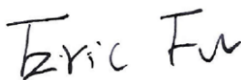


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## 2 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2021-04-19		Original

Authorized for issue by:				
				
		Edison Li/Project Engineer		
				
		Eric Fu/Reviewer		





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## 4 General Information

### 4.1 General Description of EUT

Power supply:	AC Adapter Model: EM11011M-190 Input: AC 100-240V, 2.0~1.0A, 50/60Hz Output: DC 19V, 6.31A, 120W
Cable(s):	DC cable:114cm with a ferrite core
Internal Source:	More than 108MHz
Sample Type:	Fixed device
Classification:	Uncontrolled Environment
For Bluetooth Classic:	
Operation Frequency:	2402MHz to 2480MHz
Bluetooth Version:	Bluetooth V5.0
Spectrum Spread Technology:	Frequency Hopping Spread Spectrum(FHSS)
Modulation Type:	GFSK, $\pi/4$ DQPSK, 8DPSK
Number of Channels:	79
Channel Spacing:	1MHz
Antenna Type:	PIFA Antenna
Antenna Gain:	3.5dBi
For Bluetooth LE:	
Operation Frequency:	2402MHz to 2480MHz
Bluetooth Version:	V5.0
Channel Spacing:	2MHz
Modulation Type:	GFSK
Number of Channels:	40
Antenna Type:	PIFA Antenna
Antenna Gain:	3.5dBi
For 802.11b/g/n:	
Operation Frequency:	802.11b/g/n/ax(HT20): 2412MHz to 2472MHz





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	802.11n/ax(HT40): 2422MHz to 2462MHz			
Modulation Type:	802.11b: DSSS (CCK, DQPSK, DBPSK) 802.11g: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11n/ax(HT20 and HT40): OFDM (BPSK, QPSK, 16QAM, 64QAM)			
Channel Numbers:	802.11b/g, 802.11n/ax HT20: 13 Channels 802.11n/ax HT40: 9 Channels			
Antenna Type:	PIFA Antenna			
Antenna Gain:	Antenna1: 3.6dBi, Antenna2: 3.5dBi Note: MIMO for 802.11n/ax.			
For 802.11a/n/ac/ax:				
Operation Frequency:	Band	Mode	Frequency Range(MHz)	Number of channels
	UNII Band I	IEEE 802.11a/n/ax(HT20)	5180-5240	4
		IEEE 802.11n/ax(HT40)	5190-5230	2
		IEEE 802.11ac/ax(HT80)	5210	1
		IEEE 802.11ac/ax(HT160)	5250	1
	UNII Band II-A	IEEE 802.11a/n/ax(HT20)	5260-5320	4
		IEEE 802.11n/ax(HT40)	5270-5310	2
		IEEE 802.11ac/ax(HT80)	5290	1
	UNII Band II-C	IEEE 802.11a/n/ax(HT20)	5500-5720	12
		IEEE 802.11n/ax(HT40)	5510-5710	6
		IEEE 802.11ac/ax(HT80)	5530-5690	3
		IEEE 802.11ac/ax(HT160)	5570	1
	UNII Band III	IEEE 802.11a/n/ax(HT20)	5745-5825	5
		IEEE 802.11n/ax(HT40)	5755-5795	2
		IEEE 802.11ac/ax(HT80)	5775	1
Modulation Type:	IEEE 802.11a: OFDM (BPSK, QPSK, 16QAM, 64QAM) IEEE 802.11n: OFDM (BPSK, QPSK, 16QAM, 64QAM) IEEE 802.11ac/ax: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)			
DFS Function:	Slave without radar detection			
TPC Function:	Not support			
Antenna Type:	PIFA Antenna			
Antenna Gain:	Antenna1: 3.5dBi, Antenna2: 3.3dBi Note: MIMO for 802.11n/ac/a/x			



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## 4.2 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

No. 1 Workshop, M-10, Middle section, Science & Technology Park, Shenzhen, Guangdong, China  
518057

Telephone: +86 (0) 755 2601 2053 Fax: +86 (0) 755 2671 0594

No tests were sub-contracted.

## 4.3 Test Facility

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

- **A2LA (Certificate No. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

- **VCCI**

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

- **FCC –Designation Number: CN1178**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1178. Test Firm Registration Number: 406779.

- **Innovation, Science and Economic Development Canada**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0006.

IC#: 4620C.

## 4.4 Deviation from Standards

None.

## 4.5 Abnormalities from Standard Conditions

None.

## 4.6 Other Information Requested by the Customer

None.



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## 5 RF Exposure Evaluation

### 5.1 RF Exposure Compliance Requirement

#### 5.1.1 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/cm <sup>2</sup> )	Averaging time (minutes)
<b>(A) Limits for Occupational/Controlled Exposures</b>				
0.3–3.0 .....	614	1.63	*(100)	6
3.0–30 .....	1842/f	4.89/f	*(900/f <sup>2</sup> )	6
30–300 .....	61.4	0.163	1.0	6
300–1500 .....	.....	.....	f/300	6
1500–100,000 .....	.....	.....	5	6
<b>(B) Limits for General Population/Uncontrolled Exposure</b>				
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:  $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot R^2)$

Where

$P_d$  = power density in mW/cm<sup>2</sup>

$P_{out}$  = output power to antenna in mW

G = gain of antenna in linear scale

$\pi$  = 3.1416

For Uncontrolled Environment, the MPE limit of 1500MHz to 100000MHz is 1.0 mW/cm<sup>2</sup>. 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.

#### 5.1.2 Test Procedure

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



### 5.1.3 EUT RF Exposure Evaluation

#### 1) Test Results

##### For Bluetooth Classic:

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

Antenna	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 = 20 cm (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )	MPE Ratios	Result
Ant2	3.5	2.24	11	12.59	0.0056	1.0000	0.0056	PASS

Note: Refer to report No. 181210-03.TR05 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.

##### For Bluetooth LE:

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

Antenna	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 = 20 cm (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )	MPE Ratios	Result
Ant2	3.5	2.24	10.5	11.22	0.0050	1.0000	0.0050	PASS

Note: Refer to report No. 181210-03.TR04 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.

##### For 2.4G WiFi:

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

Antenna	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 = 20 cm (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )	MPE Ratios	Result
Ant1	3.6	2.29	14.5	28.18	0.0128	1.0000	0.0128	PASS

Note: Refer to report No. 181210-03.TR04 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.







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**For 5G WiFi:**

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

Antenna	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 = 20 cm (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )	MPE Ratios	Result
Ant1	3.5	2.24	13.5	22.39	0.0100	1.0000	0.0100	PASS

Note: Refer to report No. 181210-03.TR01 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.

**For 2.4G WiFi MIMO:**

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

Antenna	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 = 20 cm (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )	MPE Ratios	Result
Ant1+2	6.61	4.58	17.27	53.33	0.0486	1.0000	0.0486	PASS

Note: Direectional Gain=  $G_{ANT} + 10 \cdot \log(N_{ANT}/N_{SS}) = 3.6 + 10 \cdot \log(2/1) = 6.61 \text{ dBi}$ .

**For 5G WiFi MIMO:**

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

Antenna	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 = 20 cm (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )	MPE Ratios	Result
Ant2	6.51	4.48	16.51	44.77	0.0399	1.0000	0.0399	PASS

Note: Direectional Gain=  $G_{ANT} + 10 \cdot \log(N_{ANT}/N_{SS}) = 3.5 + 10 \cdot \log(2/1) = 6.51 \text{ dBi}$ .

Note: The Bluetooth, 2.4G WiFi and 5G WiFi cannot synchronous transmission at the same time.

-End of Report-



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