# RF Exposure Evaluation Report

| | |
|---|---|
| **Application No.:** | SZCR2407002876AT |
| **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 |
| **Equipment Under Test (EUT):** | |
| **EUT Name:** | Intergrated LCD System |
| **Model No.:** | 502xxxxx("X" = blank, A-Z or 0-9), 502TF ♣ |
| ♣ | 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:** | 2024-07-23 |
| **Date of Test:** | 2024-07-29 to 2024-08-09 |
| **Date of Issue:** | 2024-08-09 |
| **Test Result :** | **PASS*** |

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

Keny Xu
EMC Laboratory Manager



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# 1 Version

| Revision Record | | | | |
|---|---|---|---|---|
| **Version** | **Chapter** | **Date** | **Modifier** | **Remark** |
| 01 | | 2024-08-09 | | Original |
| | | | | |
| | | | | |

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|---|---|---|---|---|
| **Authorized for issue by:** | | | | |
| | | Edison Li<br>**Edison Li/Project Engineer** | | |
| | | Eric Fu<br>**Eric Fu/Reviewer** | | |



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# 2 Contents

# 3 General Information

## 3.1 General Description

| | |
|---|---|
| Power supply: | Medical AC Adapter<br>Model: EM11011M-190<br>Input: AC 100-240V, 2.0-1.0A, 50-60Hz<br>Output: DC 19.0V, 6.31A, 120.0W |
| 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 Technology: | Frequency Hopping Spread Spectrum(FHSS) |
| Modulation Type: | GFSK, π/4DQPSK, 8DPSK |
| Number of Channels: | 79 |
| Channel Spacing: | 1MHz |
| Antenna Type: | PIFA Antenna |
| Antenna Gain: | 2.0dBi |
| For Bluetooth LE mode | |
| Operation Frequency: | 2402MHz to 2480MHz |
| Bluetooth Version: | V5.2 |
| Channel Spacing: | 2MHz |
| Modulation Type: | GFSK |
| Number of Channels: | 40 |
| Data rate: | 1Mbps, 2Mbps |
| Antenna Type: | PIFA Antenna |
| Antenna Gain: | 2.0dBi |
| For 802.11b/g/n: | |
| Operation Frequency: | 802.11b/g/n/ax(HT20): 2412MHz to 2472MHz |

| | | | | |
|---|---|---|---|---|
| | 802.11n/ax(HT40): 2422MHz to 2462MHz | | | |
| Modulation Type: | 802.11b: DSSS(CCK, DQPSK, DBPSK)<br>802.11g/n: OFDM(QPSK, BPSK, 16QAM, 64QAM)<br>802.11ax: OFDMA(QPSK, BPSK, 16QAM, 64QAM, 256QAM, 1024QAM) | | | |
| Channel Numbers: | 802.11b/g, 802.11n/ax HT20: 13 Channels<br>802.11n/ax HT40: 9 Channels | | | |
| Antenna Type: | PIFA Antenna | | | |
| Antenna Gain: | Antenna1: 2.0dBi, Antenna2: 2.5dBi<br>Note: MIMO for 802.11n/ax. | | | |
| For 802.11a/n/ac/ax: U-NII-1, U-NII-2A, U-NII-2C, U-NII-3, U-NII-5, U-NII-6, U-NII-7, U-NII-8 | | | | |
| Operation Frequency: | Band | Mode | Frequency Range(MHz) | Number of channels |
| | UNII Band I | 802.11a/n/ac/ax(HT20) | 5180-5240 | 4 |
| | | 802.11n/ac/ax(HT40) | 5190-5230 | 2 |
| | | 802.11ac/ax(HT80) | 5210 | 1 |
| | UNII Band II-A | 802.11a/n/ac/ax(HT20) | 5260-5320 | 4 |
| | | 802.11n/ac/ax(HT40) | 5270-5310 | 2 |
| | | 802.11ac/ax(HT80) | 5290 | 1 |
| | | 802.11ac/ax(HT160) | 5250 | 1 |
| | UNII Band II-C | 802.11a/n/ac/ax(HT20) | 5500-5720 | 12 |
| | | 802.11n/ac/ax(HT40) | 5510-5710 | 6 |
| | | 802.11ac/ax(HT80) | 5530-5690 | 3 |
| | | 802.11ac/ax(HT160) | 5570 | 1 |
| | UNII Band III | 802.11a/n/ac/ax(HT20) | 5745-5825 | 5 |
| | | 802.11n/ac/ax(HT40) | 5755-5795 | 2 |
| | | 802.11ac/ax(HT80) | 5775 | 1 |
| | UNII Band 5 | 802.11a/n/ac/ax(HT20) | 5955-6415 | 24 |
| | | 802.11n/ac/ax(HT40) | 5965-6405 | 12 |
| | | 802.11ac/ax(HT80) | 5985-6385 | 6 |
| | | 802.11ac/ax(HT160) | 6025-6345 | 3 |
| | UNII Band 6 | 802.11a/n/ac/ax(HT20) | 6435-6515 | 5 |
| | | 802.11n/ac/ax(HT40) | 6445-6485 | 2 |
| | | 802.11ac/ax(HT80) | 6465-6545 | 2 |
| | | 802.11ac/ax(HT160) | 6505 | 1 |
| | UNII Band 7 | 802.11a/n/ac/ax(HT20) | 6535-6855 | 17 |
| | | 802.11n/ac/ax(HT40) | 6525-6845 | 9 |
| | | 802.11ac/ax(HT80) | 6625-6785 | 3 |
| | | 802.11ac/ax(HT160) | 6665 | 1 |
| | UNII Band 8 | 802.11a/n/ac/ax(HT20) | 6875-7115 | 13 |

| | | | | |
|---|---|---|---|---|
| | | 802.11n/ac/ax(HT40) | 6885-7085 | 6 |
| | | 802.11ac/ax(HT80) | 6865-7025 | 3 |
| | | 802.11ac/ax(HT160) | 6985 | 1 |
| Modulation Type: | 802.11a: OFDM(QPSK, BPSK, 16QAM, 64QAM)<br>802.11n: OFDM(QPSK, BPSK, 16QAM, 64QAM)<br>802.11ac: OFDM(QPSK, BPSK, 16QAM, 64QAM, 256QAM)<br>802.11ax: OFDMA(QPSK, BPSK, 16QAM, 64QAM, 256QAM, 1024QAM) | | | |
| DFS Function: | Slave without radar detection | | | |
| TPC Function: | Not support | | | |
| Antenna Type: | PIFA Antenna | | | |
| Antenna Gain: | Antenna1: 2.6dBi, Antenna2: 2.7dBi @5180MHz~5825MHz<br>Antenna1: 2.3dBi, Antenna2: 2.5dBi @5955MHz~7115MHz<br>Note: MIMO for 802.11n/ac/ax | | | |

Remark:The information in this section is provided by the applicant or manufacturer, SGS is not liable to the accuracy, suitability, reliability or/and integrity of the information.

**Declaration of EUT Family Grouping:**

Model No.: 502xxxxx(“X” = blank, A-Z or 0-9), 502TF

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

## 3.2 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, Nanshan District, Shenzhen, Guangdong, China. 518057.

Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.

## 3.3 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 (Member No. 1937)

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. Shenzhen EMC laboratory 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: CN1336

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

Designation Number: CN1336. Test Firm Registration Number: 787754.

- 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.

## 3.4 Deviation from Standards

None.

## 3.5 Abnormalities from Standard Conditions

None.

# 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 ($mW/cm^2$) | 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 |

F= Frequency in MHz

Friis Formula

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

Where

Pd = power density in $mW/cm^2$

Pout = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 3.1416

For Uncontrolled Environment, the MPE limit of 300MHz to 1500MHz is f/1500 $mW/cm^2$ , the MPE limit of 1500MHz to 100000MHz 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.

### 4.1.3 EUT RF Exposure Evaluation

## 1) Test Results

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

| Type | 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/cm$^2$) | Limit (mW/cm$^2$) | MPE Ratios | Result |
|---|---|---|---|---|---|---|---|---|---|
| BT | 2402 | 2.00 | 1.58 | 11.50 | 14.13 | 0.0045 | 1.0000 | 0.0045 | PASS |
| BLE | 2402 | 2.00 | 1.58 | 10.00 | 10.00 | 0.0032 | 1.0000 | 0.0032 | PASS |
| 2.4G | 2412 | 2.00 | 1.58 | 28.49 | 706.32 | 0.2227 | 1.0000 | 0.2227 | PASS |
| 5G | 5180 | 2.60 | 1.82 | 22.14 | 163.68 | 0.0593 | 1.0000 | 0.0593 | PASS |
| 5.8G | 5745 | 2.60 | 1.82 | 21.40 | 138.04 | 0.0500 | 1.0000 | 0.0500 | PASS |
| 6G | 5955 | 2.30 | 1.70 | 14.12 | 25.82 | 0.0087 | 1.0000 | 0.0087 | PASS |

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

| Type | 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/cm$^2$) | Limit (mW/cm$^2$) | MPE Ratios | Result |
|---|---|---|---|---|---|---|---|---|---|
| 2.4G | 2412 | 2.50 | 1.78 | 26.31 | 427.56 | 0.1513 | 1.0000 | 0.1513 | PASS |
| 5G | 5180 | 2.70 | 1.86 | 21.29 | 134.59 | 0.0499 | 1.0000 | 0.0499 | PASS |
| 5.8G | 5745 | 2.70 | 1.86 | 21.26 | 133.66 | 0.0495 | 1.0000 | 0.0495 | PASS |
| 6G | 5955 | 2.50 | 1.78 | 13.80 | 23.99 | 0.0085 | 1.0000 | 0.0085 | 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$^2$.

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)

= (0.2227/1) +(0.1513/1) = 0.3740 < 1

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

-End of Report-