

## FCC 47 CFR MPE REPORT

Chunghsin Technology Group CO., LTD

55 inch DLED SMART TV

Model Number: E4SFT5517

FCC ID: 2AE2W-5517

|                          |                                                                     |
|--------------------------|---------------------------------------------------------------------|
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|                          |                                                                     |
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| Report Number:  | ESTE-R1801080    |
| Date of Test:   | Jan. 23~29, 2018 |
| Date of Report: | Jan. 30, 2018    |

## Maximum Permissible Exposure

### 1、Applicable Standard

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 limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 0.2m normally can be maintained between the user and the device.

#### (a)、Limits for Occupational / Controlled Exposure

| Frequency Range (MHz) | Electric Field Strength E) (V/m) | Magnetic Field Strength (H) (A/m) | Power Density (S) (mW/cm <sup>2</sup> ) | Averaging Times   E   2 ,   H   2 or S (minutes) |
|-----------------------|----------------------------------|-----------------------------------|-----------------------------------------|--------------------------------------------------|
| 0.3-3.0               | 614                              | 1.63                              | (100)*                                  | 6                                                |
| 3.0-30                | 1842/f                           | 4.89/f                            | (900/f)*                                | 6                                                |
| 30-300                | 61.4                             | 0.163                             | 1.0                                     | 6                                                |
| 300-1500              |                                  |                                   | F/300                                   | 6                                                |
| 1500-10000            |                                  |                                   | 5                                       | 6                                                |

#### (b)、Limits for General Population / Uncontrolled Exposure

| Frequency Range (MHz) | Electric Field Strength E) (V/m) | Magnetic Field Strength (H) (A/m) | Power Density (S) (mW/cm <sup>2</sup> ) | Averaging Times   E   2 ,   H   2 or S (minutes) |
|-----------------------|----------------------------------|-----------------------------------|-----------------------------------------|--------------------------------------------------|
| 0.3-1.34              | 614                              | 1.63                              | (100)*                                  | 30                                               |
| 1.34-30               | 824/f                            | 2.19/f                            | (180/f)*                                | 30                                               |
| 30-300                | 27.5                             | 0.073                             | 0.2                                     | 30                                               |
| 300-1500              |                                  |                                   | F/1500                                  | 30                                               |
| 1500-10000            |                                  |                                   | 1.0                                     | 30                                               |

Note: f=frequency in MHz; \*Plane-wave equivalent power density

### 2、MPE Calculation Method

$$E \text{ (V/m)} = (30 \cdot P \cdot G)^{0.5/d} \quad \text{Power Density: } Pd \text{ (W/m}^2\text{)} = E^2/377$$

E = Electric Field (V/m)

P = Peak RF output Power (W)

G = EUT Antenna numeric gain (numeric)

d = Separation distance between radiator and human body (m)

The formula can be changed to

$$Pd = (30 \cdot P \cdot G) / (377 \cdot d^2)$$

From the peak EUT RF output power, the minimum mobile separation distance, d=0.2m, as well as the gain of the used antenna, the RF power density can be obtained

**3、Conducted Power Result****3.1 Antenna 0**

| Mode                    | Frequency<br>(MHz) | Peak output power<br>(dBm) | Peak output power<br>(mW) | Target<br>power<br>( dBm ) | Antenna gain |          |
|-------------------------|--------------------|----------------------------|---------------------------|----------------------------|--------------|----------|
|                         |                    |                            |                           |                            | (dBi)        | (Linear) |
| IEEE<br>802.11b         | 2412               | 13.90                      | 24.547                    | $13 \pm 2$                 | 1.21         | 1.321    |
|                         | 2437               | 13.23                      | 21.038                    | $13 \pm 2$                 | 1.21         | 1.321    |
|                         | 2462               | 14.47                      | 27.990                    | $14 \pm 2$                 | 1.21         | 1.321    |
| IEEE<br>802.11g         | 2412               | 10.12                      | 10.280                    | $10 \pm 2$                 | 1.21         | 1.321    |
|                         | 2437               | 9.83                       | 9.616                     | $9 \pm 2$                  | 1.21         | 1.321    |
|                         | 2462               | 10.72                      | 11.803                    | $10 \pm 2$                 | 1.21         | 1.321    |
| IEEE<br>802.11n<br>HT20 | 2412               | 10.13                      | 10.304                    | $10 \pm 2$                 | 1.21         | 1.321    |
|                         | 2437               | 10.20                      | 10.471                    | $10 \pm 2$                 | 1.21         | 1.321    |
|                         | 2462               | 10.74                      | 11.858                    | $10 \pm 2$                 | 1.21         | 1.321    |
| IEEE<br>802.11n<br>HT40 | 2422               | 8.03                       | 6.353                     | $8 \pm 2$                  | 1.21         | 1.321    |
|                         | 2437               | 8.39                       | 6.902                     | $8 \pm 2$                  | 1.21         | 1.321    |
|                         | 2452               | 8.32                       | 6.792                     | $8 \pm 2$                  | 1.21         | 1.321    |

## 3.2 Antenna 1

| Mode                    | Frequency<br>(MHz) | Peak output power<br>(dBm) | Peak output power<br>(mW) | Target<br>power<br>( dBm ) | Antenna gain |          |
|-------------------------|--------------------|----------------------------|---------------------------|----------------------------|--------------|----------|
|                         |                    |                            |                           |                            | (dBi)        | (Linear) |
| IEEE<br>802.11b         | 2412               | 17.03                      | 50.466                    | $17 \pm 2$                 | 1.21         | 1.321    |
|                         | 2437               | 14.58                      | 28.708                    | $14 \pm 2$                 | 1.21         | 1.321    |
|                         | 2462               | 14.66                      | 29.242                    | $14 \pm 2$                 | 1.21         | 1.321    |
| IEEE<br>802.11g         | 2412               | 14.00                      | 25.119                    | $14 \pm 2$                 | 1.21         | 1.321    |
|                         | 2437               | 10.98                      | 12.531                    | $10 \pm 2$                 | 1.21         | 1.321    |
|                         | 2462               | 10.79                      | 11.995                    | $10 \pm 2$                 | 1.21         | 1.321    |
| IEEE<br>802.11n<br>HT20 | 2412               | 12.85                      | 19.275                    | $12 \pm 2$                 | 1.21         | 1.321    |
|                         | 2437               | 10.45                      | 11.092                    | $10 \pm 2$                 | 1.21         | 1.321    |
|                         | 2462               | 10.53                      | 11.298                    | $10 \pm 2$                 | 1.21         | 1.321    |
| IEEE<br>802.11n<br>HT40 | 2422               | 10.00                      | 10.000                    | $10 \pm 2$                 | 1.21         | 1.321    |
|                         | 2437               | 7.90                       | 6.166                     | $7 \pm 2$                  | 1.21         | 1.321    |
|                         | 2452               | 9.04                       | 8.017                     | $9 \pm 2$                  | 1.21         | 1.321    |

#### 4、Calculated Result and Limit

##### 4.1 Antenna 0

| Mode              | Target power (dBm) | Antenna gain |          | Power Density (S) (mW/cm <sup>2</sup> ) | Limited of Power Density (S) (mW/cm <sup>2</sup> ) | Test Result |
|-------------------|--------------------|--------------|----------|-----------------------------------------|----------------------------------------------------|-------------|
|                   |                    | (dBi)        | (Linear) |                                         |                                                    |             |
| IEEE 802.11b      | 16                 | 1.21         | 1.321    | <b>0.01046</b>                          | 1                                                  | Compiles    |
| IEEE 802.11g      | 12                 | 1.21         | 1.321    | <b>0.00417</b>                          | 1                                                  | Compiles    |
| IEEE 802.11n HT20 | 12                 | 1.21         | 1.321    | <b>0.00417</b>                          | 1                                                  | Compiles    |
| IEEE 802.11n HT40 | 10                 | 1.21         | 1.321    | <b>0.00263</b>                          | 1                                                  | Compiles    |

## 4.2 Antenna 1

| Mode              | Target power (dBm) | Antenna gain |          | Power Density (S) (mW/cm <sup>2</sup> ) | Limited of Power Density (S) (mW/cm <sup>2</sup> ) | Test Result |
|-------------------|--------------------|--------------|----------|-----------------------------------------|----------------------------------------------------|-------------|
|                   |                    | (dBi)        | (Linear) |                                         |                                                    |             |
| IEEE 802.11b      | 19                 | 1.21         | 1.321    | <b>0.02088</b>                          | 1                                                  | Compiles    |
| IEEE 802.11g      | 16                 | 1.21         | 1.321    | <b>0.01046</b>                          | 1                                                  | Compiles    |
| IEEE 802.11n HT20 | 14                 | 1.21         | 1.321    | <b>0.00660</b>                          | 1                                                  | Compiles    |
| IEEE 802.11n HT40 | 12                 | 1.21         | 1.321    | <b>0.00417</b>                          | 1                                                  | Compiles    |

## 4.3 Antenna 0+1

| Mode              | Power<br>Density<br>(S)<br>(mW<br>/cm <sup>2</sup> )<br>Antenna 0 | Power<br>Density<br>(S)<br>(mW<br>/cm <sup>2</sup> )<br>Antenna 1 | Power<br>Density<br>(S)<br>(mW<br>/cm <sup>2</sup> )<br>Total | Limited<br>of<br>Power<br>Density<br>(S)<br>(mW<br>/cm <sup>2</sup> ) | Test<br>Result |
|-------------------|-------------------------------------------------------------------|-------------------------------------------------------------------|---------------------------------------------------------------|-----------------------------------------------------------------------|----------------|
| IEEE 802.11n HT20 | 0.00417                                                           | 0.00660                                                           | <b>0.01077</b>                                                | 1                                                                     | Compiles       |
| IEEE 802.11n HT40 | 0.00263                                                           | 0.00417                                                           | <b>0.00680</b>                                                | 1                                                                     | Compiles       |