

## FCC 47 CFR MPE REPORT

Parts Express International, Inc.

8-Source 8-Zone Distributed Whole House Audio System Amplifier;

Dayton Audio Division of Parts Express;

8-Source 8-Zone Distributed Audio Matrix Amplifier

Model Number: DAX88

FCC ID: 2AVBE-DAX88

|                          |                                                                     |
|--------------------------|---------------------------------------------------------------------|
| Prepared for:            | Parts Express International, Inc.                                   |
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|                          |                                                                     |
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|                 |                             |
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## Maximum Permissible Exposure

### 1. Applicable Standards

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.

#### 1.1. Limits for Maximum Permissible Exposure (MPE)

##### (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   <sup>2</sup> ,   H   <sup>2</sup> 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   <sup>2</sup> ,   H   <sup>2</sup> 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

## 1.2. MPE Calculation Method

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

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

$$Pd = \frac{30 \times P \times G}{377 \times d^2}$$

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

## 2. Conducted Power Result

| 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               | 14.74                      | 29.785                    | $14 \pm 1$               | 2            | 1.585    |
|                         | 2437               | 14.74                      | 29.785                    | $14 \pm 1$               | 2            | 1.585    |
|                         | 2462               | 14.49                      | 28.119                    | $14 \pm 1$               | 2            | 1.585    |
| IEEE<br>802.11g         | 2412               | 19.02                      | 79.799                    | $19 \pm 1$               | 2            | 1.585    |
|                         | 2437               | 18.98                      | 79.068                    | $18 \pm 1$               | 2            | 1.585    |
|                         | 2462               | 18.79                      | 75.683                    | $18 \pm 1$               | 2            | 1.585    |
| IEEE<br>802.11n<br>HT20 | 2412               | 17.27                      | 53.333                    | $17 \pm 1$               | 2            | 1.585    |
|                         | 2437               | 17.19                      | 52.360                    | $17 \pm 1$               | 2            | 1.585    |
|                         | 2462               | 17.05                      | 50.699                    | $17 \pm 1$               | 2            | 1.585    |
| IEEE<br>802.11n<br>HT40 | 2422               | 17.96                      | 62.517                    | $17 \pm 1$               | 2            | 1.585    |
|                         | 2437               | 17.97                      | 62.661                    | $17 \pm 1$               | 2            | 1.585    |
|                         | 2452               | 17.79                      | 60.117                    | $17 \pm 1$               | 2            | 1.585    |

## 3. Calculated Result and Limit

| Mode              | Target power<br>( dBm ) | Antenna gain |          | Power Density<br>(S)<br>(mW /cm2) | Limited of Power Density<br>(S)<br>(mW /cm2) | Test Result |
|-------------------|-------------------------|--------------|----------|-----------------------------------|----------------------------------------------|-------------|
|                   |                         | (dBi)        | (Linear) |                                   |                                              |             |
| 2.4G Band         |                         |              |          |                                   |                                              |             |
| IEEE 802.11b      | 15                      | 2            | 1.585    | <b>0.00997</b>                    | 1                                            | Compiles    |
| IEEE 802.11g      | 20                      | 2            | 1.585    | <b>0.03153</b>                    | 1                                            | Compiles    |
| IEEE 802.11n HT20 | 18                      | 2            | 1.585    | <b>0.01989</b>                    | 1                                            | Compiles    |
| IEEE 802.11n HT40 | 18                      | 2            | 1.585    | <b>0.01989</b>                    | 1                                            | Compiles    |

**End of Test Report**

