

Analysis Report

The Equipment Under Test (EUT), is a portable 2.4GHz Transceiver (Car Unit) for a RC Car. The sample supplied operated on 49 channels, normally at 2410 – 2473MHz. The channels are shown in below table.

| | | | | |
|------|------|------|------|------|
| 2410 | 2411 | 2412 | 2413 | 2414 |
| 2415 | 2416 | 2417 | 2418 | 2419 |
| 2420 | 2421 | 2422 | 2423 | 2424 |
| 2428 | 2431 | 2433 | 2434 | 2435 |
| 2436 | 2437 | 2438 | 2439 | 2440 |
| 2441 | 2442 | 2443 | 2444 | 2445 |
| 2446 | 2447 | 2452 | 2456 | 2459 |
| 2460 | 2461 | 2462 | 2463 | 2464 |
| 2465 | 2466 | 2467 | 2468 | 2469 |
| 2470 | 2471 | 2472 | 2473 | |

The EUT is powered by 1 x 3.7V Lithium-ion battery. After switching on the EUT, light and sound will be emitted from the car. The car will be moved forward or backward and turned left and right based on the switches pressed in the controller. The volume of the sound can be lowered or muted based on the switches pressed in the controller. The car will undergo a series of movement automatically based on the switches pressed in the controller. The sequence which the switches are pressed in the controller can be recorded and the car will be allowed to move correspondingly based on the switches pressed in the controller. There is an ultrasonic function which allow the car to emit smoke based on the switches pressed in the controller. Light at the back of the car will be turned on during the smoke emission.

Antenna Type: Internal integral antenna

Antenna Gain: 0dBi

Nominal rated field strength: 60.8dB μ V/m at 3m

Maximum allowed field strength of production tolerance: +/- 3dB

According to the KDB 447498 D04 Interim General RF Exposure Guidance v01

Based on the Maximum allowed average field strength of production tolerance was 63.8dB μ V/m at 3m.

Thus, it below calculated field strength according to minimum SAR exclusion threshold level as follows:

For mobile devices that are not exempt per Table B.1 [Table 1 of § 1.1307(b)(1)(i)(C)] at distances from 20 cm to 40 cm and in 0.3 GHz to 6 GHz, evaluation of compliance with the exposure limits in § 1.1310 is necessary if the ERP of the device is greater than $ERP_{20\text{cm}}$ in Formula (B.1) [repeated from § 2.1091(c)(1) and § 1.1307(b)(1)(i)(B)].

$$P_{\text{th}} \text{ (mW)} = ERP_{20\text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases} \quad (\text{B. 1})$$

If the ERP is not easily obtained, then the available maximum time-averaged power may be used (i.e., without consideration of ERP only if the physical dimensions of the radiating structure(s) do not exceed the electrical length of $\lambda/4$ or if the antenna gain is less than that of a half-wave dipole.

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$$P_{\text{th}} \text{ (mW)} = \begin{cases} ERP_{20\text{ cm}}(d/20\text{ cm})^x & d \leq 20\text{ cm} \\ ERP_{20\text{ cm}} & 20\text{ cm} < d \leq 40\text{ cm} \end{cases} \quad (\text{B. 2})$$

where

$$x = -\log_{10} \left(\frac{60}{ERP_{20\text{ cm}} \sqrt{f}} \right)$$

and f is in GHz, d is the separation distance (cm), and $ERP_{20\text{cm}}$ is per Formula (B.1). The example values shown in Table B.2 are for illustration only.

Table B.2—Example Power Thresholds (mW)

| Frequency (MHz) | Distance (mm) | | | | | | | | | |
|-----------------|---------------|----|----|-----|-----|-----|-----|-----|-----|-----|
| | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |
| 300 | 39 | 65 | 88 | 110 | 129 | 148 | 166 | 184 | 201 | 217 |
| 450 | 22 | 44 | 67 | 89 | 112 | 135 | 158 | 180 | 203 | 226 |
| 835 | 9 | 25 | 44 | 66 | 90 | 116 | 145 | 175 | 207 | 240 |
| 1900 | 3 | 12 | 26 | 44 | 66 | 92 | 122 | 157 | 195 | 236 |
| 2450 | 3 | 10 | 22 | 38 | 59 | 83 | 111 | 143 | 179 | 219 |
| 3600 | 2 | 8 | 18 | 32 | 49 | 71 | 96 | 125 | 158 | 195 |
| 5800 | 1 | 6 | 14 | 25 | 40 | 58 | 80 | 106 | 136 | 169 |

The worst case of SAR Exclusion Threshold Level at 2.48GHz with distance 5mm:
= 2.717mW

According to the KDB 412172 D01:
EIRP = [(FS*D) ^2*1000 / 30]

Calculated Field Strength for 2.717mW is 99.6dBuV/m @3m

Since maximum average field strength plus production tolerance $\leq 99.6\text{dBuV/m @3m}$ and antenna gain is $\geq 0.0\text{dBi}$, it is concluded that maximum Conducted Power and Field Strength are well below the SAR Exclusion threshold level, so the EUT is considered to comply with SAR requirement without testing.