Analysis Report

The Equipment Under Test (EUT), is a portable 2.4GHz Transceiver (Controller 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 2 x 1.5V AA batteries. 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: 72.7dBμV/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 75.7dBμV/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_{20cm} in Formula (B.1) [repeated from § 2.1091(c)(1) and § 1.1307(b)(1)(i)(B)].

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

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

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_{20cm} is per Formula (B.1). The example values shown in Table B.2 are for illustration only.

Table B.2—Example Power Thresholds (mW)

		Distance (mm)								
		5	10	15	20	25	30	35	40	45	50
Frequency (MHz)	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 < = 99.6dBuV/m @3m and antenna gain is > = 0.0dBi, 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.