

Analysis Report

The Equipment Under Test (EUT), is a portable 2.4GHz Transceiver (Controller Unit) for a RC Drone. The sample supplied operated on 39 channels. The channels are shown in below table:

2420MHz	2421MHz	2422MHz	2423MHz
2424MHz	2425MHz	2426MHz	2427MHz
2428MHz	2429MHz	2430MHz	2431MHz
2433MHz	2434MHz	2435MHz	2436MHz
2437MHz	2438MHz	2439MHz	2440MHz
2441MHz	2442MHz	2443MHz	2444MHz
2445MHz	2446MHz	2447MHz	2449MHz
2450MHz	2451MHz	2452MHz	2453MHz
2454MHz	2455MHz	2456MHz	2457MHz
2458MHz	2459MHz	2460MHz	

The EUT is powered by 3 x 1.5V AAA batteries. After switching on the EUT, the drone emits light and fly with different directions based on the switches pressed in the controller.

Antenna Type: Internal integral antenna

Antenna Gain: 0dBi

Nominal rated field strength: 91.0dBμV/m at 3m (Peak)

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 peak field strength of production tolerance was 94.0dBμV/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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$$P_{th} \text{ (mW)} = \begin{cases} ERP_{20 \text{ cm}} (d/20 \text{ cm})^x & d \leq 20 \text{ cm} \\ ERP_{20 \text{ cm}} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases} \quad (\text{B. 2})$$

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:

$$EIRP = [(FS \cdot D)^2 \cdot 1000 / 30]$$

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

Since maximum peak 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.