

RF Exposure Estimation

1. Introduction

Applicant:	Rollease Acmeda Inc
Address:	7th Floor / 750 East Main Street, Stamford, CT 06902, USA
Product:	Push Pro Remote
FCC ID:	2AGGZ003B9ACA57
Model No.:	MT02-0101-067013, MT02-0101-050013, MT02-0101-067014, MT02-0101-050014, MT02-0101-067018, MT02-0101-050018
Reference RF report #	709502405790-00B, 709502405790-00C

2. Limit and Guidelines on Exposure to Electromagnetic Fields

According to §15.247(e)(i) and §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

According to KDB 447498 D01 Mobile Portable RF Exposure v05r02, no SAR required if power is lower than the flowing threshold:

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})]$

$[\sqrt{f(\text{GHz})}] \leq 3.0$ for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where

- $f(\text{GHz})$ is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation²⁵
- The result is rounded to one decimal place for comparison
- 3.0 and 7.5 are referred to as the numeric thresholds in the step 2 below

The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz.

3. RF Exposure Evaluation

$$\text{EIRP} = p_t \times g_t = (E \times d)^2 / 30$$

where

p_t	is the transmitter output power in watts
g_t	is the numeric gain of the transmitting antenna (dimensionless)
E	is the electric field strength in V/m
d	is the measurement distance in meters (m)

transmitter output power for 433.92MHz Function

Field Strength (E _{Meas}):	78.70(dBuV/m)=0.0086V/m (f=433.92 MHz)
Measurement Distance(d _{Meas}):	3 (m)
Equivalent Isotropically Radiated Power(EIRP):	0.022188mW=-16.53dBm

433.92MHz: $[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$

Conducted Power + tune up tolerance = -16.53dBm+1dB=-15.53dBm= 0.028mW

Distance = 5 mm

f = 0.43392 GHz

$[0.028/5] \cdot \text{SQRT}(0.43392) = 0.0037$

$0.0037 \leq 3.0$

2.4G BLE: $[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$

Conducted Power + tune up tolerance = -0.23dBm+1dB=0.77dBm= 1.19mW

Distance = 5 mm

f = 2.402 GHz

$[1.19/5] \cdot \text{SQRT}(2.402) = 0.3688$

$0.3688 \leq 3.0$

According to KDB 447498 D04 v01 clause 2.2.3, This ratio is defined as $\text{SPLSR} = (\text{SAR1} + \text{SAR2})^{1.5}/R_i$, where SAR1 and SAR2 are the highest reported SAR or estimated SAR [Glossary] values for the two sources in the pair i, and R_i is their distance in millimeters.

When $\text{SPLSR} \leq 0.04$ (rounded to two decimal digits), for all antenna pairs in the configuration, then the device qualifies for 1-g SAR test exemption.

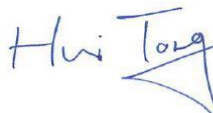
So, $\text{SPLSR} = (\text{SAR1} + \text{SAR2})^{1.5}/R_i = (0.0037 + 0.3688)^{1.5}/10 = 0.0227$ less than 0.04 and the device qualifies for 1-g SAR test exemption.

- TÜV SÜD Certification and Testing (China) Co., Ltd. Shanghai Branch

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Date: Sep.18, 2024

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