FCC RF Exposure / MPE Evaluation

1. Applicant & Equipment Details

- Applicant: Universal Electronics, Inc.
- Product: 345 MHz Transmitter
- FCC ID: MG3-CS412 / IC: 2575A-CS412
- Model Number: CS-412
- Device Type: Low-power unlicensed transmitter OOK modulated packets
- Evaluation Type: MPE (Maximum Permissible Exposure) Assessment
- Date: 7/9/2025

2. Applicable Standards

This demonstrates compliance with the following FCC requirements:

- 47 CFR §1.1310 – RF exposure limits
- 47 CFR §2.1091 – Mobile and unlicensed devices
- FCC OET Bulletin 65, Edition 97-01
- KDB 447498 D01 General RF Exposure Guidance v06

3. RF Exposure Limits

For general population/uncontrolled exposure, the limit for 345 MHz is:

MPE Limit = f (MHz) / 1500 = 345 / 1500 = 0.23 mW/cm^2

4. Transmitter Specifications

Parameter	Value
Operating Frequency	345 MHz
Conducted Output Power (Provided by the manufacturer)	14 dBm (25.1 mW)
Antenna Gain	–17.8 dBi
EIRP (Calculated)	–3.8 dBm (0.42 mW)
Separation Distance	20 cm
Duty Cycle	100% (worst case)

The antenna is 1mm diameter copper clad solid core wire, that is 39 mm in length with two 90 degree bends at each end where the resulting bend results in an approximate 4.8mm leg on each end of the antenna and an approximate 28.6mm run.

*See attachments for additional dimensions of antenna element

5. Power Density Calculation

$S = EIRP / (4 \pi r^2) = 0.42 \text{ mW} / (4 \pi (20 \text{ cm})^2)$
$= 0.42 / 5026.55 \approx 8.29 \times 10^{-5} \text{ mW/cm}^2$

6. Compliance Statement

The calculated power density at 20 cm is:

- $S = 0.000083 \text{ mW/cm}^2$
- Limit = 0.23 mW/cm^2

Since $0.000083 \text{ mW/cm}^2 \ll 0.23 \text{ mW/cm}^2$, this device complies with the FCC's RF exposure limits for general population/uncontrolled exposure.

All measurements were performed radiated and therefore additional antenna gain documentation is not required.

7. Conclusion

This device meets the FCC RF exposure requirements specified in 47 CFR §1.1310 for general population/uncontrolled exposure. No further SAR evaluation is required under KDB 447498 D01 Section 4.3.

8. Prepared By

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7/9/2025