

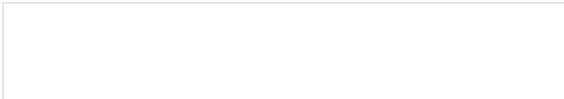
Maximum Permissible Exposure (MPE) & Exposure evaluation

Report identification number: 1-1328/20-01-06-A

| Certification numbers and labeling requirements | |
|---|-----------|
| FCC ID | 2AYEK-GWX |
| ISED number | 26767-GWX |
| HVIN (Hardware Version Identification Number) | GWX |
| PMN (Product Marketing Name) | GWX |
| FVIN (Firmware Version Identification Number) | -/- |
| HMN (Host Marketing Name) | -/- |

This test report is electronically signed and valid without handwritten signature. For verification of the electronic signatures, the public keys can be requested at the testing laboratory.

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EUT technologies:

| Technologies: | Power Average Conducted [dBm] | Radiated average output power [dBm] | Max. Power for RF Exposure [dBm] ISED EIRP | Max. Power for RF Exposure [dBm] FCC ERP |
|--------------------------|-------------------------------|-------------------------------------|--|--|
| | Measured Value | Measured Value | | |
| GSM 850 MHz | 32.2 | 31.0 (ERP) 33.15 (EIRP) | 30.15* | 28.0* |
| GSM 1900 | 29.7 | 30.8 (ERP) 32.95 (EIRP) | 29.95* | 27.8* |
| UMTS 1880 MHz | 22.8 | 25.45 (ERP) 27.6 (EIRP) | 27.6 | 25.45 |
| UMTS 1700 MHz | 23.1 | 25.75 (ERP) 27.9 (EIRP) | 27.9 | 25.75 |
| UMTS 850 MHz | 23.0 | 25.3 (ERP) 27.45 (EIRP) | 27.45 | 25.3 |
| LTE FDD 2 1900 MHz | 22.6 | 24.05 (ERP) 26.2 (EIRP) | 26.2 | 24.05 |
| LTE FDD 4 1750 MHz | 23.10 | 21.85 (ERP) 24.0 (EIRP) | 24.0 | 21.85 |
| LTE FDD 5 850 MHz | 23.30 | 22.5 (ERP) 24.65 (EIRP) | 24.65 | 22.5 |
| LTE FDD 12 700 MHz | 23.20 | 21.1 (ERP) 23.25 (EIRP) | 23.25 | 21.1 |
| LTE FDD 13 700 MHz | 22.90 | 21.5 (ERP) 23.65 (EIRP) | 23.65 | 21.5 |
| LTE FDD 25 1900 MHz | 23.40 | 23.05 (ERP) 25.2 (EIRP) | 25.2 | 23.05 |
| LTE FDD 26 850 MHz | 23.10 | 21.8 (ERP) 23.95 (EIRP) | 23.95 | 21.8 |
| LTE FDD 41 2600 MHz | 23.20 | 21.45 (ERP) 23.7 (EIRP) | 23.7 | 21.45 |
| SRD proprietary 2450 MHz | 3.2 | 5.85 (ERP) 8.0 (EIRP) | 8.0 | 5.85 |
| RFID 13.56 MHz | 22.65 (calculated value) | -58.67 | 22.65 | 22.65 |

*The values are corrected by 3 dB as the worst case is when 4 from 8 time slots are active at the same time which leads to a duty cycle of 50%.

RFID:

| Technologies: | Max. declared cond. AVG Power | Max. measured EIRP @ 10m ¹⁾ | Antenna gain |
|------------------|----------------------------------|---|-----------------|
| NFC 13.56 MHz | 22.65 dBm | 22.5 dB μ V (Peak, w/o TAG) = -62.27 dBm 26.1 dB μ V (Peak, w/ TAG) = -58.67 dBm | < 0 dBi |

NOTE:

The measured PEAK EIRP @10m proofs that the EUT antenna gain is far below 0dBi and that considering the max. declared output power of 22.65dBm (=184mW) is by far larger than the EIRP. Thus for it is correct to use the conducted value as the worst case base for the RF exposure calculation.

Declared output power is taken from the max data according NFC Datasheet NT3H2111_2211 (NXP Semiconductors):

I_{max} = 40 mA

V_{max} = 4.6 V

P_{max} = 184 mW

Declared minimum safety distances: 20 cm**Collocation overview:**

| Technology | Active scenario: |
|-------------|------------------|
| Cellular | x |
| SRD 2.4 GHz | x |
| RFID 13.56 | x |

Prediction of MPE limit at given distance (KDB 447498 D01 General RF Exposure Guidance v06)

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = PG / 4\pi R^2$$

where: S = Power density

P = Power input to the antenna

G = Antenna gain

R = Distance to the center of radiation of the antenna

PG = Output Power including antenna gain

The table below is excerpted from Table 1B of 47 CFR 1.1310 titled "Limits for Maximum Permissible Exposure (MPE), Limits for General Population/Uncontrolled Exposure"

| Frequency Range (MHz) | Power Density (mW/cm ²) | Averaging Time (minutes) |
|-----------------------|-------------------------------------|--------------------------|
| 300 -1500 | f/1500 | 30 |
| 1500 - 100000 | 1.0 | 30 |

where f = Frequency (MHz)

Prediction: worst case

| | | | |
|---|---------------|--------|--------------------|
| Technologies: | GSM | SRD | |
| Frequency (MHz) | 850 | 2450 | |
| Declared max power | 28.0 | 5.9 | dBm |
| Distance | 20.0 | 20.0 | cm |
| Power limit uncontrolled exposure | N/A | N/A | mW |
| Power Density limit uncontrolled exposure | 0.5670 | 1.0000 | mW/cm ² |
| Calculated Power: | N/A | N/A | mW |
| Calculated Power density: | 0.1256 | 0.0008 | mW/cm ² |
| Calculated percentage of Limit: | 22.15% | 0.08% | |
| Collocation: | | | |
| Sum: | 22.23% | | |

The calculated power density limit for uncontrolled exposure for GSM850 is 0.567 mW/cm².

As per 447498 D01 General RF Exposure Guidance v06 Page 31, Appendix C the SAR test exclusion threshold for 13.56 MHz at 5 cm is 443 mW. The value is extrapolated from 474 mW for 10 MHz and 308 mW for 50 MHz.

The 22.7 dBm (184 mW) RFID output power value is 41.55% of 443 mW, which is the SAR test exclusion limit.

The sum of exclusion limits is 22.23% + 41.55% = 63.78%

This prediction demonstrates the following:

The power density levels for FCC at a distance of 20 cm are below the maximum levels allowed by regulations.

Conclusion: RF exposure evaluation is not required.

Prediction of MPE limit at given distance - ISED

RSS-102, general limitations for E- and H- Field

Reference levels for general public (uncontrolled environment) exposure to time-varying electric and magnetic fields

| According to: RSS 102-ISSUE 05 | | |
|--------------------------------|---|----------------------------|
| Frequency Range (MHz) | Power density (W/m ²) | Reference Period (minutes) |
| 0.003-10 | -- | Instantaneous* |
| 0.1-10 | -- | 6** |
| 1.1-10 | -- | 6** |
| 10-20 | 2 | 6 |
| 20-48 | $8.944 / f^{0.5}$ | 6 |
| 48-300 | 1.291 | 6 |
| 300-6000 | $0.02619 \times f^{0.6834}$ | 6 |
| 6000-15000 | 10 | 6 |
| 15000-150000 | 10 | $616000 / f^{1.2}$ |
| 150000-300000 | $6.67 \times 10^{-5} \times f$ | $616000 / f^{1.2}$ |

Note: f is frequency in MHz.
 * Based on nerve stimulation (NS).
 ** Based on specific absorption rate (SAR).

NOTE:

The calculated limit for 850MHz is 2.63W/m²

The calculated limit for 2450MHz is 5.42W/m²

The calculated limit for RFID 13.56 MHz is 2W/m².

Prediction: worst case

| | | GSM / UMTS / LTE | SRD proprietary | RFID | |
|----|--|------------------|-----------------|---------|------------------|
| R | Frequency | 850 | 2450 | 13.56 | MHz |
| R | Distance | 20 | 20 | 20 | cm |
| PG | Maximum EIRP | 30.15 | 8 | 22.65 | dBm |
| PG | Maximum EIRP | 1035.1 | 6.3 | 184.1 | mW |
| S | Power density | 2.1 | 0.01255 | 0.36621 | W/m ² |
| | Exclusion Limit from above: | 2.63 | 5.42 | 2.00 | W/m ² |
| | Calculated percentage of Limit: | 78.30% | 0.23% | 18.31% | |
| | Scenario 1: GSM / UMTS / LTE + SRD + RFID Calculated percentage of Limit: | 96.84% | | | |

Conclusion: RF exposure evaluation is not required.