

FCC MPE REPORT

FCC Certification

Applicant Name:
FRTEK CO., LTD.

Date of Issue:
April 04, 2019

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Report No.: HCT-RF-1904-FC001-R1

FCC ID: 2AFEG-700-850-21

APPLICANT: FRTEK CO., LTD.

Model: ROTECH7085FRT

EUT Type: INOVA ERU

The measurements shown in this report were made in accordance with the procedures specified in §2.947. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them.

HCT CO., LTD. Certifies that no party to this application has subject to a denial of Federal benefits that includes FCC benefits pursuant to section 5301 of the Anti-Drug Abuse Act of 1998,21 U.S. C.853(a)



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Version

| TEST REPORT NO. | DATE | DESCRIPTION |
|----------------------|----------------|----------------------------------------------------------------------------------------------------|
| HCT-RF-1904-FC001 | March 20, 2019 | - First Approval Report |
| HCT-RF-1904-FC001-R1 | April 04, 2019 | - Added explanation and results for Simultaneous Transmission Operations. - Revised the result. |
| | | |
| | | |

RF Exposure Statement

1. LIMITS

According to §1.1310 and §2.1091 RF exposure is calculated.

(B) Limits for General Population/Uncontrolled Exposures

| Frequency range (MHz) | Electric field Strength (V/m) | Magnetic field Strength (A/m) | Power density (mW/cm ²) | Averaging time (minutes) |
|-----------------------|-------------------------------|-------------------------------|-------------------------------------|--------------------------|
| 0.3 - 1.34..... | 614 | 1.63 | *(100) | 30 |
| 1.34 - 30..... | 824/f | 2.19/f | *(180/ f ²) | 30 |
| 30 - 300..... | 27.5 | 0.073 | 0.2 | 30 |
| 300 - 1500..... | | | f/1500 | 30 |
| 1500 - 100.000..... | | | 1.0 | 30 |

F = frequency in MHz

* = Plane-wave equivalent power density

2. MAXIMUM PERMISSIBLE EXPOSURE Prediction

Prediction of MPE limit at a given distance

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

S = Power density

P = power input to antenna

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the center of radiation of the antenna

Description of Equipment under Test

The EUT (FCC ID: 2AFEG-700-850-21) is installed in the host device and it can be simultaneous transmission with other transmitters (700MHz, 850MHz, 1.9GHz, 2.1GHz, 2.3GHz and 2.5GHz) in the host. **[Note 1]**

** The EUT information is declared by manufacturer and for more detailed features description please refers to the operational description.*

| FCC ID | Band | Operational Frequency (MHz) |
|-------------------|----------|-----------------------------|
| 2AFEG-700-850-21 | MBS | 728 ~ 756 |
| | Cellular | 862 ~ 894 |
| 2AFEG-1900-24 | PCS | 1 930 ~ 1 995 |
| 2AFEG-2100-24 | AWS | 2 110 ~ 2 180 |
| 2AFEG-23-25-21-24 | WCS | 2 350 ~ 2 360 |
| | BRS/EBS | 2 496 ~ 2 690 |

[Note 1]

For this application, we considered all simultaneous transmitter and antennas incorporated in a host device for MPE Calculation of Simultaneous Transmission Operations

MPE Calculation for Standalone Operations

- Lower 700 MHz (MBS)

| | | |
|-------------------------------------------------------------|--------|--------------------|
| Max Peak output Power at antenna input terminal | 22.00 | dBm |
| Max Peak output Power at antenna input terminal | 158.49 | mW |
| Prediction distance | 30.00 | cm |
| Prediction frequency | 730.50 | MHz |
| Antenna Gain(typical) | 3.000 | dBi |
| Antenna Gain(numeric) | 1.995 | - |
| Power density at prediction frequency(s) | 0.028 | mW/cm ² |
| MPE limit for uncontrolled exposure at prediction frequency | 0.487 | mW/cm ² |

- Upper 700 MHz (MBS)

| | | |
|-------------------------------------------------------------|--------|--------------------|
| Max Peak output Power at antenna input terminal | 22.00 | dBm |
| Max Peak output Power at antenna input terminal | 158.49 | mW |
| Prediction distance | 30.00 | cm |
| Prediction frequency | 748.50 | MHz |
| Antenna Gain(typical) | 3.000 | dBi |
| Antenna Gain(numeric) | 1.995 | - |
| Power density at prediction frequency(s) | 0.028 | mW/cm ² |
| MPE limit for uncontrolled exposure at prediction frequency | 0.499 | mW/cm ² |

- Cellular

| | | |
|-------------------------------------------------------------|--------|--------------------|
| Max Peak output Power at antenna input terminal | 22.00 | dBm |
| Max Peak output Power at antenna input terminal | 158.49 | mW |
| Prediction distance | 30.00 | cm |
| Prediction frequency | 870.25 | MHz |
| Antenna Gain(typical) | 3.000 | dBi |
| Antenna Gain(numeric) | 1.995 | - |
| Power density at prediction frequency(s) | 0.028 | mW/cm ² |
| MPE limit for uncontrolled exposure at prediction frequency | 0.580 | mW/cm ² |

MPE Calculation for Simultaneous Transmission Operations

| Band | MPE Ratio (Power density / Limit) | Sum of MPE Ratio | |
|----------|-----------------------------------|------------------|----|
| MBS | 0.057 | 0.495 | ≤1 |
| Cellular | 0.048 | | |
| PCS | 0.111 | | |
| AWS | 0.111 | | |
| WCS | 0.056 | | |
| BRS/EBS | 0.111 | | |

Note:

1. The result of each band was applied to the worst value.
2. MPE ratios are calculated as
$$[(\text{Power density}_1 / \text{MPE Limit}) + [(\text{Power density}_2 / \text{MPE Limit}) + \dots]] \leq 1$$