# FCC RF EXPOSURE REPORT

KONG YUE ELECTRONICS & INFORMATION INDUSTRY LTD.

POS Terminal

Model Number: IM-78G

Additional Model: IM-78; IM-78C; IM-78T; IM-78F

FCC ID: WAGIM-78

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# Maximum Permissible Exposure

## 1、Applicable Standard

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 0.2m normally can be maintained between the user and the device.

### (a)、Limits for Occupational / Controlled Exposure

| Frequency Range (MHz) | Electric Field Strength E) (V/m) | Magnetic Field Strength (H) (A/m) | Power Density (S) (mW/cm2) | Averaging Times｜E｜2，｜H｜2 or S (minutes) |
|---|---|---|---|---|
| 0.3-3.0 | 614 | 1.63 | (100)* | 6 |
| 3.0-30 | 1842/f | 4.89/f | (900/f)* | 6 |
| 30-300 | 61.4 | 0.163 | 1.0 | 6 |
| 300-1500 | | | F/300 | 6 |
| 1500-10000 | | | 5 | 6 |

### (b)、Limits for General Population / Uncontrolled Exposure

| Frequency Range (MHz) | Electric Field Strength E) (V/m) | Magnetic Field Strength (H) (A/m) | Power Density (S) (mW/cm2) | Averaging Times｜E｜2，｜H｜2 or S (minutes) |
|---|---|---|---|---|
| 0.3-1.34 | 614 | 1.63 | (100)* | 30 |
| 1.34-30 | 824/f | 2.19/f | (180/f)* | 30 |
| 30-300 | 27.5 | 0.073 | 0.2 | 30 |
| 300-1500 | | | F/1500 | 30 |
| 1500-10000 | | | 1.o | 30 |

Note: f=frequency in MHz; *Plane-wave equivalent power density

## 2、MPE Calculation Method

$E$ (V/m) = $(30*P*G)^{0.5}/d$        Power Density: $Pd$ (W/m2) = $E^2/377$

E = Electric Field (V/m)

P = Peak RF output Power (W)

G = EUT Antenna numeric gain (numeric)

d = Separation distance between radiator and human body (m)

The formula can be changed to

$Pd = (30*P*G) / (377*d^2)$

From the peak EUT RF output power, the minimum mobile separation distance, d=0.2m, as well as the gain of the used antenna, the RF power density can be obtained

## 3、**Calculated Result and Limit**

| Model | Frequency (MHz) | Peak output power (dBm) | Peak output power (mW) | Antenna gain (dBi) | Antenna gain (Linear) | Target power (dBm) | Power Density (S) (mW/cm2) | Limited of Power Density (S) (mW/cm2) | Test Result |
|---|---|---|---|---|---|---|---|---|---|
| GFSK | 2402 | -4.232 | 0.377 | 0 | 1 | -5±1 | 0.00007920 | 1 | Compiles |
| | 2441 | -3.923 | 0.405 | 0 | 1 | -4±1 | 0.00009971 | 1 | Compiles |
| | 2480 | -3.582 | 0.438 | 0 | 1 | -4±1 | 0.00009971 | 1 | Compiles |
| 8-DPSK | 2402 | -3.099 | 0.490 | 0 | 1 | -4±1 | 0.00009971 | 1 | Compiles |
| | 2441 | -2.746 | 0.531 | 0 | 1 | -3±1 | 0.00012552 | 1 | Compiles |
| | 2480 | -2.271 | 0.593 | 0 | 1 | -3±1 | 0.00012552 | 1 | Compiles |
| BLE | 2402 | 4.600 | 2.884 | 0 | 1 | 4±1 | 0.00062911 | 1 | Compiles |
| | 2440 | 5.010 | 3.170 | 0 | 1 | 5±1 | 0.00079201 | 1 | Compiles |
| | 2480 | 5.370 | 3.443 | 0 | 1 | 5±1 | 0.00079201 | 1 | Compiles |
| IEEE 802.11 b | 2412 | 13.76 | 23.768 | 2 | 1.58 | 13±1 | 0.00792007 | 1 | Compiles |
| | 2442 | 14.23 | 26.485 | 2 | 1.58 | 14±1 | 0.00997078 | 1 | Compiles |
| | 2472 | 14.04 | 25.351 | 2 | 1.58 | 14±1 | 0.00997078 | 1 | Compiles |
| IEEE 802.11 g | 2412 | 12.69 | 18.578 | 2 | 1.58 | 12±1 | 0.00629114 | 1 | Compiles |
| | 2442 | 12.95 | 19.724 | 2 | 1.58 | 12±1 | 0.00629114 | 1 | Compiles |
| | 2472 | 13.30 | 21.380 | 2 | 1.58 | 13±1 | 0.00792007 | 1 | Compiles |
| IEEE 802.11 n HT 20 | 2412 | 11.65 | 14.622 | 2 | 1.58 | 11±1 | 0.00499723 | 1 | Compiles |
| | 2442 | 12.03 | 15.959 | 2 | 1.58 | 12±1 | 0.00629114 | 1 | Compiles |
| | 2472 | 11.68 | 14.723 | 2 | 1.58 | 12±1 | 0.00629114 | 1 | Compiles |

Max Target Power Density of the total from BT and Wi-Fi

| BT Max Target Power (dBm) | Wi-Fi Max Target Power (dBm) | Total Max Target Power (W) | Antenna gain | | Power Density (S) (mW /cm2) | Limited of Power Density (S) (mW /cm2) | Test Result |
|---|---|---|---|---|---|---|---|
| | | | (dBi) | (Linear) | | | |
| 5.370 | 14.23 | 0.144544 | 2 | 1.58 | 0.02875604 | 1 | Compiles |