MPE REPORT

Product Name	Embedded WiFi module
Manufacture	Hi-flying Electronics Technology Co.,Ltd.
Model	HF-A11x
Issued date	2012-03-21

Approved by _____ **Revised by** _____ **Performed by** _____

Director Manager Engineer

Test By

Company:	TA Technology (Shanghai) Co., Ltd.
Address:	No.145, Jintang Rd, Tangzhen Industry Park, Pudong Shanghai,China
Contact:	Yang Weizhong
Telephone:	+86-021-50791141/2/3
Fax:	+86-021-50791141/2/3-8000
Website:	http://www.ta-shanghai.com
E-mail:	yangweizhong@ta-shanghai.com

Maximum Permissible Exposure

Type of EUT: Embedded WiFi module
Manufacturer: Hi-flying Electronics Technology Co.,Ltd.
Model: HF-A11x
Maximum conducted output power (measured) and antenna Gain:

Band	Maximum average conducted output power (dBm)	Antenna Gain (dBi)
802.11b	15.65	0.8
802.11g	12.15	0.8
802.11n HT20	11.71	0.8
802.11n HT40	12.23	0.8

According to 1999/519/EC, limits for maximum permissible exposure (MPE) are as following:

Frequency range	E-field strength ($V\ m^{-1}$)	H-field strength ($A\ m^{-1}$)	B-field (μT)	Equivalent plane wave power density S_{eq} ($W\ m^{-2}$)
up to 1 Hz	—	3.2×10^4	4×10^4	—
1–8 Hz	10,000	$3.2 \times 10^4/f^2$	$4 \times 10^4/f^2$	—
8–25 Hz	10,000	$4{,}000/f$	$5{,}000/f$	—
0.025–0.8 kHz	$250/f$	$4/f$	$5/f$	—
0.8–3 kHz	$250/f$	5	6.25	—
3–150 kHz	87	5	6.25	—
0.15–1 MHz	87	$0.73/f$	$0.92/f$	—
1–10 MHz	$87/f^{1/2}$	$0.73/f$	$0.92/f$	—
10–400 MHz	28	0.073	0.092	2
400–2,000 MHz	$1.375f^{1/2}$	$0.0037f^{1/2}$	$0.0046f^{1/2}$	$f/200$
2–300 GHz	61	0.16	0.20	10

The maximum permissible exposure for 400~2000MHz is f/200, so

Band	The maximum permissible exposure
802.11b	**10 W/ m²**
802.11g	**10 W/ m²**
802.11n HT20	**10 W/ m²**
802.11n HT40	**10 W/m²**

The Transmitter is using external antennas that operate at 20 cm or more from nearby persons. The maximum permitted level is calculated using the general equation:

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

where: S = power density (in appropriate units, e.g. W/m^2)
P = power input to the antenna (in appropriate units, e.g., W)
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 (appropriate units, e.g., m)

802.11b: PG = 15.65dBm+(0.8dBi)=16.45dBm=44.16 mW=0.044 W
802.11g PG = 12.15dBm+(0.8dBi)=12.95dBm=19.72 mW=0.020 W
802.11n HT20 PG = 11.71dBm+(0.8dBi)=12.51dBm=17.82 mW=0.018 W
802.11n HT40 PG = 12.23dBm+(0.8dBi)=13.03dBm=20.09 mW=0.020 W
R = 0.2 m
Π = 3.1416

Solving for S, the power density at 20 cm is

Band	**Test Result (W/m^2)**	**Limit Value (W/m^2)**
802.11b	0.088	10
802.11g	0.040	10
802.11n HT20	0.036	10
802.11n HT40	0.040	10

So the limit is kept.

Note: For mobile or fixed location transmitters, minimum separation distance is 20cm, even if

calculations indicate MPE distance is less.