



RF EXPOSURE REPORT

REPORT NO.: SA991206C18

MODEL NO.: MBR1400

FCC ID: UXX-MBR1400

ACCORDING: FCC Guidelines for Human Exposure
IEEE C95.1

APPLICANT: Cradlepoint, Inc.

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ISSUED BY: Bureau Veritas Consumer Products Services (H.K.)
Ltd., Taoyuan Branch

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
Original release	N/A	Dec. 24, 2010

1. RF EXPOSURE LIMIT

LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

FREQUENCY RANGE (MHz)	ELECTRIC FIELD STRENGTH (V/m)	MAGNETIC FIELD STRENGTH (A/m)	POWER DENSITY (mW/cm ²)	AVERAGE TIME (minutes)
LIMITS FOR GENERAL POPULATION / UNCONTROLLED EXPOSURE				
300-1500	F/1500	30
1500-100,000	1.0	30

F = Frequency in MHz

2. MPE CALCULATION FORMULA

$$P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot r^2)$$

where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

R = distance between observation point and center of the radiator in cm

3. CLASSIFICATION

The antenna of this product, under normal use condition, is at least 20cm away from the body of the user. So, this device is classified as **Mobile Device**.

4. CALCULATION RESULT OF MAXIMUM CONDUCTED POWER

For FCC ID: UXX-MBR1400

MODULATION MODE	FREQUENCY BAND (MHz)	MAX CONDUCTED POWER (dBm)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm ²)	LIMIT (mW/cm ²)
802.11b	2412-2462	25.3	9.77	20	0.640	1
802.11g	2412-2462	25.3	9.77	20	0.640	1
802.11n (20MHz)	2412-2462	26.1	5	20	0.256	1
802.11n (40MHz)	2422-2452	26.0	5	20	0.251	1
802.11a	5180-5240	12.2	9.77	20	0.031	1
802.11n (20MHz)	5180-5240	16.5	5	20	0.028	1
802.11n (40MHz)	5180-5240	16.7	5	20	0.029	1
802.11a	5745-5825	25.3	9.77	20	0.640	1
802.11n (20MHz)	5745-5825	25.5	5	20	0.223	1
802.11n (40MHz)	5745-5825	25.0	5	20	0.199	1

NOTE:

(802.11 b/g/a): Directional gain =5dBi+10log(3)=9.77dBi

**For FCC ID: N7NAC880E (3G dongle)
850 Band**

MODE	ERP(dBm)	EIRP(dBm)	SOURCE TIME AVERAGE POWER (dBm)	MPE	LIMIT
GPRS	28.8	30.95	27.95	0.12	0.55
EGPRS	26.8	28.95	25.95	0.08	0.55
WCDMA	25.9	28.05	25.05	0.06	0.55
HSDPA	26.0	28.15	25.15	0.07	0.55

1900 Band

MODE	EIRP(dBm)	SOURCE TIME AVERAGE POWER (dBm)	MPE	LIMIT
GPRS	29.3	26.3	0.08	1
EGPRS	27.0	24.0	0.05	1
WCDMA	27.1	24.1	0.05	1
HSDPA	27.6	24.6	0.06	1

**For FCC ID: QISE219 (Express Card)
1900 Band**

MODE	EIRP(dBm)	SOURCE TIME AVERAGE POWER (dBm)	MPE	LIMIT
GPRS	31.05	28.05	0.13	1
EGPRS	27.12	24.12	0.05	1

CONCLUSION:

The Product has 3 USB ports and 2 express slot to connect 3G device to support 3G function. Only 1 usb port and 1 express slot can work at the same time. Therefore, transmit simultaneously is evaluated for this product + 1 usb dongle + 1 express card.

The formula of calculated the MPE is:

$$CPD1 / LPD1 + CPD2 / LPD2 + \dots \text{etc.} < 1$$

CPD = Calculation power density

LPD = Limit of power density

1. WLAN 2.4GHz + 850 band of 3G dongle + 1900 band of Express card
= $0.640 / 1 + 0.12 / 0.55 + 0.13 / 1 = 0.988$
2. WLAN 2.4GHz + 1900 band of 3G dongle + 1900 band of Express card
= $0.640 / 1 + 0.08 / 1 + 0.13 / 1 = 0.850$
3. WLAN 5GHz + 850 band of 3G dongle + 1900 band of Express card
= $0.640 / 1 + 0.12 / 0.55 + 0.13 / 1 = 0.988$
4. WLAN 5GHz + 1900 band of 3G dongle + 1900 band of Express card
= $0.640 / 1 + 0.08 / 1 + 0.13 / 1 = 0.850$

Therefore, the maximum calculation of this situation is 0.988, which is less than the "1" limit.