



RF EXPOSURE REPORT

REPORT NO.: SA110414D11

MODEL NO.: AVL-2000PLUS

FCC ID: RFHIRFR-300

APPLICANT: ICP Electronics, 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
SA110414D11	Original release	Sep. 15, 2011



1. CERTIFICATION

PRODUCT: EMBEDDED SYSTEM
BRAND NAME: iEi
MODEL NO.: AVL-2000PLUS
APPLICANT: ICP Electronics, Inc.
TEST ITEM: ENGINEERING SAMPLE
TESTED: May 16 ~ Jun. 15, 2011
STANDARDS: **FCC Part 2 (Section 2.1091)**
FCC OET Bulletin 65, Supplement C (01-01)
IEEE C95.1

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

PREPARED BY : Celia Chen , **DATE:** Sep. 15. 2011
(Celia Chen / Senior Specialist)

APPROVED BY : Ken Liu , **DATE:** Sep. 15. 2011
(Ken Liu / Manager)

2. 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

3. MPE CALCULATION FORMULA

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

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

4. 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**.

5. CALCULATION RESULT OF MAXIMUM POWER

FCC ID: RFHIRFR-300
FOR UHF (RFID):

MODE (MHz)	MAXIMUM RADIATED POWER (dBm)	DISTANCE (cm)	POWER DENSITY (mW/cm ²)	LIMIT (mW/cm ²)
915	-1.1	20	0.0002	0.61

FCC ID: XVX-AWMS0021MH
FOR BLUETOOTH:

FREQUENCY BAND (MHz)	MAXIMUM CONDUCTED POWER (dBm)	MAXIMUM ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm ²)	LIMIT (mW/cm ²)
2402-2480	14.5	2	20	0.0089	1.00

FCC ID: XVX-AWMS0021MH
FOR WLAN:

FREQUENCY BAND (MHz)	MAXIMUM CONDUCTED POWER (dBm)	MAXIMUM ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm ²)	LIMIT (mW/cm ²)
2412-2462	17.1	2	20	0.0162	1.00

FCC ID: N7NGOB12
FOR WWAN:

MODE	MAXIMUM CONDUCTED POWER (dBm)	SOUCE-TIME AVERAGE POWER(dBm)	ANTENNA GAIN (dBi)	MPE (mW/cm ²)	LIMIT (mW/cm ²)
GPRS 850	33.0	27	7	0.500	0.55
GPRS 1900	29.5	23.5	3.5	0.100	1.00

MODE	MAXIMUM CONDUCTED POWER (dBm)	ANTENNA GAIN (dBi)	MPE (mW/cm ²)	LIMIT (mW/cm ²)
CDMA 850	25.0	7	0.315	0.55
CDMA 1900	25.0	3.5	0.141	1.00
WCDMA 850	25.0	7	0.315	0.55
WCDMA 1900	25.0	3.5	0.141	1.00

CONCLUSION:

Both of the modules can transmit simultaneously, 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. UHF (RFID) + BLUETOOTH + WLAN + GPRS 850 =
 $0.0002/0.61 + 0.0089/1 + 0.0162/1 + 0.500/0.55 = 0.9345$
2. UHF (RFID) + BLUETOOTH + WLAN + GPRS 1900 =
 $0.0002/0.61 + 0.0089/1 + 0.0162/1 + 0.100/1 = 0.1254$
3. UHF (RFID) + BLUETOOTH + WLAN + CDMA 850 =
 $0.0002/0.61 + 0.0089/1 + 0.0162/1 + 0.315/0.55 = 0.5981$
4. UHF (RFID) + BLUETOOTH + WLAN + CDMA 1900 =
 $0.0002/0.61 + 0.0089/1 + 0.0162/1 + 0.141/1 = 0.1664$
5. UHF (RFID) + BLUETOOTH + WLAN + WCDMA 850 =
 $0.0002/0.61 + 0.0089/1 + 0.0162/1 + 0.315/0.55 = 0.5981$
6. UHF (RFID) + BLUETOOTH + WLAN + WCDMA 1900 =
 $0.0002/0.61 + 0.0089/1 + 0.0162/1 + 0.141/1 = 0.1664$

Therefore, the maximum calculation of this situation is 0.9345, which is less than the “1” limit.

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