

RF EXPOSURE REPORT

REPORT NO.: SA110617D07

MODEL NO.: PCG-4121DL, PCG-4121EL

FCC ID: AK8PCG4121DL

APPLICANT: SONY Corporation

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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
SA110617D07	Original release	Jul. 22, 2011

1. CERTIFICATION

PRODUCT: Personal Computer

BRAND NAME: SONY

MODEL NO.: PCG-4121DL, PCG-4121EL

APPLICANT: SONY Corporation

TESTED: Jun. 24 ~ 30, 2011

TEST SAMPLE: ENGINEERING SAMPLE

STANDARDS: FCC Part 2 (Section 2.1091)

FCC OET Bulletin 65, Supplement C (01-01)

IEEE C95.1

The above equipment (Model: PCG-4121DL) 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.

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(Annie Chang / Senior Specialist)

APPROVED BY : Ken Liu , DATE: Jul. 22, 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 CONDUCTED POWER

FOR WLAN:

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	17.0	0.59	20	0.0114	1.00
802.11g	2412-2462	20.4	0.59	20	0.0250	1.00
802.11n (20MHz)	2412-2462	21.6	0.59	20	0.0329	1.00
802.11n (40MHz)	2422-2452	20.7	0.59	20	0.0268	1.00
802.11a	5180-5240	15.3	0.80	20	0.0081	1.00
802.11n (20MHz)	5180-5240	14.3	0.80	20	0.0064	1.00
802.11n (40MHz)	5190-5230	14.4	0.80	20	0.0066	1.00
802.11a	5260-5320	15.0	0.80	20	0.0076	1.00
802.11n (20MHz)	5260-5320	14.3	0.80	20	0.0064	1.00
802.11n (40MHz)	5270-5310	14.1	0.80	20	0.0061	1.00
802.11a	5500-5700	14.4	0.80	20	0.0066	1.00
802.11n (20MHz)	5500-5700	14.2	0.80	20	0.0063	1.00
802.11n (40MHz)	5510-5670	12.6	0.80	20	0.0044	1.00
802.11a	5745-5825	18.6	-1.04	20	0.0173	1.00
802.11n (20MHz)	5745-5825	18.6	-1.04	20	0.0173	1.00
802.11n (40MHz)	5755-5795	19.2	-1.04	20	0.0199	1.00

FOR BLUETOOTH:

FREQUENCY BAND (MHz)	MAX POWER (dBm)	MAXIMUM ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm ²)	LIMIT (mW/cm ²)
2402-2480	6.5	0.59	20	0.0010	1.00

FOR WWAN:

MODE	MAX RADIATED POWER (dBm)	SOURCE-TIME AVERAGE POWER(dBm)	MPE (mW/cm ²)	LIMIT (mW/cm ²)
GPRS 850	29.2	23.2	0.042	0.55
EGPRS 850	23.0	17.0	0.010	0.55
GPRS 1900	29.6	23.6	0.046	1.00
EGPRS 1900	25.5	19.5	0.018	1.00

MODE	MAX RADIATED POWER (dBm)	MPE (mW/cm ²)	LIMIT (mW/cm ²)
CDMA 850	22.4	0.035	0.55
CDMA 1900	23.8	0.048	1.00
WCDMA 850	21.0	0.025	0.55
WCDMA 1900	26.6	0.091	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. WLAN(2.4G)+Bluetooth+GPRS 850 = $0.0329 / 1 + 0.0010 / 1 + 0.042 / 0.55 = 0.1103$
2. WLAN(2.4G)+Bluetooth+EGPRS 850 = $0.0329 / 1 + 0.0010 / 1 + 0.010 / 0.55 = 0.0521$
3. WLAN(2.4G)+Bluetooth+GPRS 1900 = $0.0329 / 1 + 0.0010 / 1 + 0.046 / 1.00 = 0.0799$
4. WLAN(2.4G)+Bluetooth+EGPRS 1900 = $0.0329 / 1 + 0.0010 / 1 + 0.018 / 1.00 = 0.0519$
5. WLAN(2.4G)+Bluetooth+CDMA 850 = $0.0329 / 1 + 0.0010 / 1 + 0.035 / 0.55 = 0.0975$
6. WLAN(2.4G)+Bluetooth+CDMA 1900 = $0.0329 / 1 + 0.0010 / 1 + 0.048 / 1.00 = 0.0819$
7. WLAN(2.4G)+Bluetooth+WCDMA 850 = $0.0329 / 1 + 0.0010 / 1 + 0.025 / 0.55 = 0.0794$
8. WLAN(2.4G)+Bluetooth+WCDMA 1900 = $0.0329 / 1 + 0.0010 / 1 + 0.091 / 1.00 = 0.1249$
9. WLAN(5.0G)+Bluetooth+GPRS 850 = $0.0199 / 1 + 0.0010 / 1 + 0.042 / 0.55 = 0.0973$
10. WLAN(5.0G)+Bluetooth+EGPRS 850 = $0.0199 / 1 + 0.0010 / 1 + 0.010 / 0.55 = 0.0391$
11. WLAN(5.0G)+Bluetooth+GPRS 1900 = $0.0199 / 1 + 0.0010 / 1 + 0.046 / 1.00 = 0.0669$
12. WLAN(5.0G)+Bluetooth+EGPRS 1900 = $0.0199 / 1 + 0.0010 / 1 + 0.018 / 1.00 = 0.0389$
13. WLAN(5.0G)+Bluetooth+CDMA 850 = $0.0199 / 1 + 0.0010 / 1 + 0.035 / 0.55 = 0.0845$
14. WLAN(5.0G)+Bluetooth+CDMA 1900 = $0.0199 / 1 + 0.0010 / 1 + 0.048 / 1.00 = 0.0689$
15. WLAN(5.0G)+Bluetooth+WCDMA 850 = $0.0199 / 1 + 0.0010 / 1 + 0.025 / 0.55 = 0.0664$
16. WLAN(5.0G)+Bluetooth+WCDMA 1900 = $0.0199 / 1 + 0.0010 / 1 + 0.091 / 1.00 = 0.1119$

Therefore, the maximum calculation of this situation is 0.1249, which is less than the "1" limit.