

**HYUNDAI CALIBRATION & CERTIFICATION TECH. CO., LTD.**



PRODUCT COMPLIANCE DIVISION  
SAN 136-1, AMI-RI , BUBAL-EUP, ICHEON-SI, KYOUNGKI-DO, 467-701, KOREA  
TEL : +82 31 639 8518 FAX : +82 31 639 8525 [www.hct.co.kr](http://www.hct.co.kr)

## VERIFICATION

**PANTECH&CURITEL COMMUNICATIONS, INC.**

110-1, ONGJEONG-RI, TONGJIN-EUP, GIMPO-SI,  
GYOUNGGI-DO, 415-865, KOREA

Date of Issue: October 17, 2006

Test Report No.: HCT-SAR06-1002

Test Site: HYUNDAI CALIBRATION & CERTIFICATION  
TECHNOLOGIES CO., LTD.

FRN: 0005866421

**MODEL :**

**PN-310**

Classification/ Standard(s):	FCC PART 15 CLASS B / CISPR 22 CLASS B
Equipment (EUT) Type:	Dual-Band Phone (CDMA/ PCS CDMA) - Prototype
Trade Name/Model(s):	PANTECH&CURITEL / PN-310
Port/ Connector(s)	DC Input Port / Ear Phone Port

The device bearing the trade name and model specified above, has been shown to comply with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.4-2003.(See Test Report if any modifications were made for compliance)

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

HYUNDAI C-Tech. certifies that no party to application has been denied the FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse of 1988,21 U.S.C.853(a).

**Report prepared by : Ki-Soo Kim**  
**Manager of Product Compliance Team**

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## 1. GENERAL INFORMATION

### 1.1 Product Description

The PANTECH&CURITEL. PN-310 Dual-Band (CDMA/ PCS CDMA) phone. Its basic purpose is used for communications. It transmits from CDMA(824.70~848.31), PCS CDMA(1851.25~1908.75)MHz and receives from CDMA(869.70~893.31), PCS CDMA(1931.25~1988.75)MHz. The RF power is rated at CDMA(0.305W), PCS CDMA(0.286W).

FCC ID	PP4PN-310
EUT Type	Dual-Band Phone (CDMA/PCS CDMA)- Prototype
Model	PN-310
TX Frequency	824.70 – 848.31 MHz (CDMA)/ 1851.25 – 1908.75 MHz (PCS CDMA)
RX Frequency	869.70 – 893.31 MHz (CDMA)/ 1931.25 – 1988.75 MHz (PCS CDMA)
FCC Classification	Licensed Portable Transmitter Held to Ear (PCE)
Max RF. Output Power	0.305 W ERP CDMA (24.9dBm) 0.286 W EIRP PCS CDMA (24.6 dBm)
Modulation	CDMA/ PCS CDMA

### 1.2 Related Submittal(s) / Grant(s)

ORIGINAL SUBMITTAL ONLY

### 1.3 Tested System Details

The Model names for all equipment, plus descriptions used in the tested system (including inserted cards) are:

DEVICE TYPE	MANUFACTURER	MODEL NUMBER	FCC ID / DoC	CONNECTED TO
Dual-Band Phone	PANTECH&CURITEL	PN-310	PP4PN-310	Adaptor/ P.C
Adaptor	PANTECH&CURITEL	PN-310	N/A	Dual-Band Phone

### 1.4 Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 -2003. Radiated testing was performed at an antenna to EUT distance of 3 meters.

### 1.5 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data are located at the 254-1, Maekok-Ri, Hobup-Myun, Ichon-Si, Kyoungki-Do, 467-701, KOREA. The site is constructed in conformance with the requirements of ANSI C63.4 and CISPR Publication 22. Detailed description of test facility was submitted to the Commission and accepted dated July 6, 2006(Registration Number: 90661)

## 2.SYSTEM TEST CONFIGURATION

### 2.1 Cable Description

The marked "(D)" means the Data Cable and "(P)" means the Power Cable.

	Power Cord Shielded (Y/N)	I/O Cable Shielded (Y/N)	Length (M)
CDMA PHONE	N/A	N/A	-
EAR PHONE	N/A	N	1.0(D)
Adapter	N	N/A	1.8(P)

### 2.2 Noise Suppression Parts on Cable.

	Ferrite Bead (Y/N)	Location	Metal Hood (Y/N)	Location
CDMA PHONE	N	N/A	N/A	Adapter END
EAR PHONE	N	N/A	Y	CDMA PHONE
Adapter	N	N/A	Y	CDMA PHONE

## **2.3 EUT exercise Software**

The EUT was tested on the charging battery during the radiated and conducted emission testing

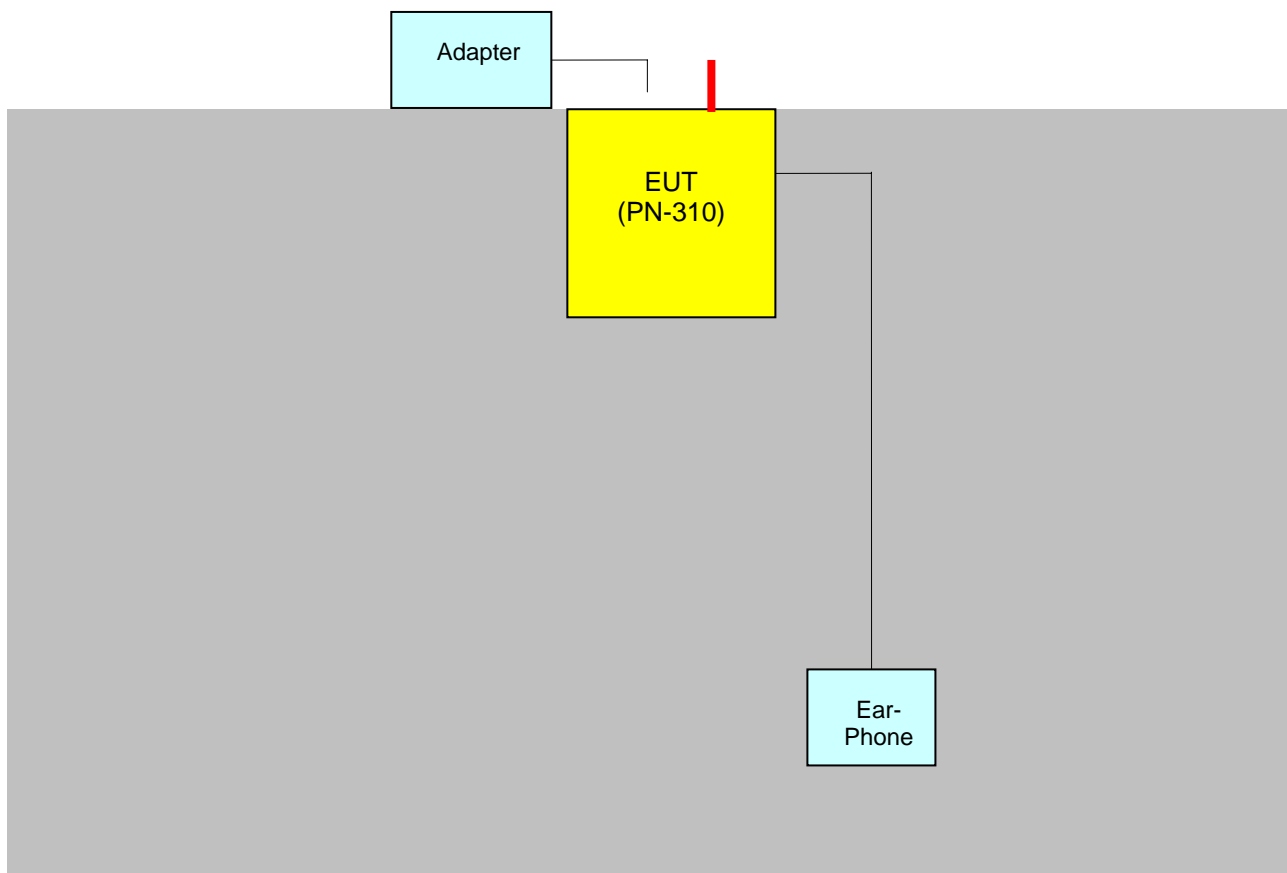
## **2.4 Equipment Modifications**

N/A

## 2.5 Configuration of Test system

Line Conducted Test : EUT was connected to LISN, all other supporting equipment were connected to another LISN. Preliminary Power line Conducted Emission tests were performed by using the procedure in ANSI C63.4 –2003 7.2.3 to determine the worse operating conditions.

Radiated Emission Test : Preliminary Radiated Emissions tests were conducted using the procedure in ANSI C63.4 /2003 8.3.1.1 to determine the worse pirating condition. Final Radiated Emission tests were conducted at 3 meter open area test site.



[Configuration of Tested System]

### 3. CONDUCTED AND RADIATED EMISSION TESTS SUMMARY

#### 3.1 Conducted Emissions Tests

The following table shows the highest levels of conducted emissions on both polarization of hot and neutral line.

```

=====
Humidity Level      : 32 %                      Temperature: 21.4 °C
Limit apply to     : CISPR 22 CLASS B
Result             : PASSED BY – 9.0 dB
Operating Condition : CHARGING BATTERY
Detector           : CISPR Quasi-Peak (6 dB Bandwidth: 9 KHz)
    
```

Power Line Conducted Emissions				FCC Class B	
Frequency (MHz)	Amplitude (dBuV)	Conductor	Result	Limit (dBuV)	Margin (dB)
0.1576	56.6	HOT	Quasi-Peak	66	-9.0
0.1676	42.5	HOT	Average	55	-12.5
0.565	45.0	NEUTRAL	Quasi-Peak	56	-11.0
0.565	32.5	NEUTRAL	Average	46	-13.5

Line Conducted Emissions Tabulated Data



Measured by : Keun-Ho Park / Engineer

Date :October 19, 2006



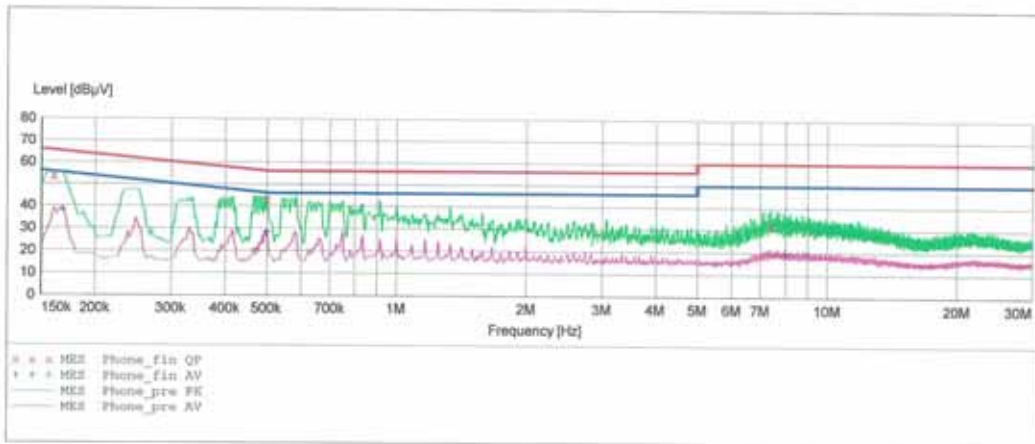
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**EMC TEST LAB.**

EUT: PN-310  
 Manufacturer: PANTECH@CURITEL  
 Operating Condition: Charging mode  
 Test Site: SHIELD ROOM  
 Operator: KEUN-HO PARK  
 Test Specification: CISPR 22 CLASS B  
 Comment: N

**SCAN TABLE: "CISPR 22 Voltage"**

Short Description:		CISPR 22 Voltage				
Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
150.1 kHz	500.0 kHz	2.5 kHz	MaxPeak	10.0 ms	9 kHz	None
500.0 kHz	5.0 MHz	5.0 kHz	Average	10.0 ms	9 kHz	None
5.0 MHz	30.0 MHz	5.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			



**MEASUREMENT RESULT: "Phone\_fin QP"**

10/19/2006 9:08AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.160100	53.60	10.1	66	11.9	---	---
0.500000	42.90	10.1	56	13.1	---	---
7.390000	31.90	10.3	60	28.1	---	---

**MEASUREMENT RESULT: "Phone\_fin AV"**

10/19/2006 9:08AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.167600	38.50	10.1	55	16.6	---	---
0.500000	28.60	10.1	46	17.4	---	---
7.990000	19.20	10.4	50	30.8	---	---

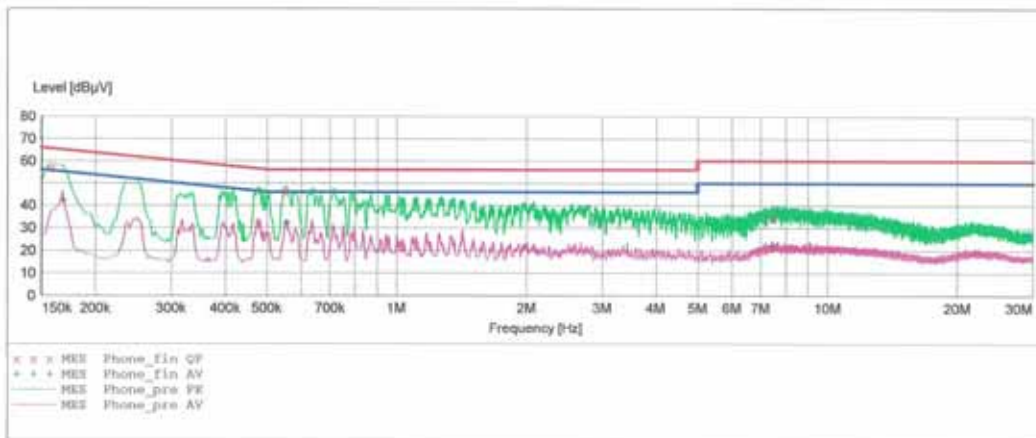
**HCT**

**EMC TEST LAB.**

EUT: PN-310  
 Manufacturer: PANTECH@CURITEL  
 Operating Condition: Charging mode  
 Test Site: SHIELD ROOM  
 Operator: KEUN-HO PARK  
 Test Specification: CISPR 22 CLASS B  
 Comment: H

**SCAN TABLE: "CISPR 22 Voltage"**

Short Description:			CISPR 22 Voltage			
Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
150.1 kHz	500.0 kHz	2.5 kHz	MaxPeak	10.0 ms	9 kHz	None
500.0 kHz	5.0 MHz	5.0 kHz	Average	10.0 ms	9 kHz	None
5.0 MHz	30.0 MHz	5.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			



**MEASUREMENT RESULT: "Phone\_fin QP"**

10/19/2006 9:05AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.157600	56.60	10.1	66	9.0	---	---
0.550000	46.20	10.1	56	9.8	---	---
7.485000	34.60	10.3	60	25.4	---	---

**MEASUREMENT RESULT: "Phone\_fin AV"**

10/19/2006 9:05AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.167600	42.50	10.1	55	12.5	---	---
0.555000	32.50	10.1	46	13.5	---	---
7.430000	22.50	10.3	50	27.5	---	---



### 3.3.1 Conducted Radiated Emission



### 3.3.2 Radiated Emission



## 4.1 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor.

The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CF$$

where FS = Field Strength

RA = Receiver Amplitude

AF = Antenna Factor

CF = Cable Attenuation Factor

Assume a receiver reading of 21.5 dBuV is obtained. The Antenna Factor of 7.4 and a Cable Factor of 1.1 is added. The 30 dBuV/m value was mathematically converted to its corresponding level in uV/m.

$$FS = 21.5 + 7.4 + 1.1 = 30 \text{ dBuV/m}$$

$$\text{Level in uV/m} = \text{Common Antilogarithm} [(30 \text{ dBuV/m})/20] = 31.6 \text{ uV/m}$$

## 5.1 Test Equipment

<u>Type</u>	<u>Manufacture</u>	<u>Model Number</u>	<u>CAL Due Date</u>
EMI Test Receiver	Rohde & Schwarz	ESI40	2006.11.16
EMI Test Receiver	Rohde & Schwarz	ESCI	2007.08.24
LISN	Rohde & Schwarz	ESH2-Z5	2007.04.26
LISN	EMCO	703125	2007.04.26
Loop Antenna	Rohde & Schwarz	HFH2-Z2	2006.12.20
TRILOG Antenna	Schwarzbeck	VULB 9160	2007.04.17
Antenna Position Tower	HD	MA240	N/A
Turn Table	EMCO	1050	N/A
Power Analyzer	Voltech	PM 3300	2007.03.22
Reference Network Impedance	Voltech	IEC 555	N/A
AC Power Source	PACIFIC	Magnetic Module	N/A
AC Power Source	PACIFIC	360-AMX	2006.11.25
Controller	HD GmbH	HD 100	N/A
SlideBar	HD GmbH	KMS 560	N/A
PULSE LIMITER	Rohde & Schwarz	ESH3-Z2	2006.11.16

## **6.1 Conclusion**

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The data collected shows that the PANTECH&CURITEL Dual-Band CDMA Phone. **FCC ID: PP4PN-310** Complies with §15.107 and §15.109 of the FCC Rules.