

HYUNDAI CALIBRATION & CERTIFICATION TECH. CO., LTD.



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VERIFICATION

PANTECH&CURITEL COMMUNICATIONS, INC.

8F, PEERES BLDG, 222, CHUNGJEONGNO 3-GA,
SEODAEMUN-GU, 120-708, KOREA

FRN: 0006278469

Date of Issue: April 5, 2006

Test Report No.: HCT-SAR06-0405

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

FRN: 0005866421

MODEL

:

PN-320

Classification/ Standard(s): FCC PART 15 CLASS B / CISPR 22 CLASS B

Equipment (EUT) Type: Dual-Mode Phone (CDMA/ PCS CDMA)- Prototype

Trade Name/Model(s): PANTECH&CURITEL / PN-320

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 COMMUNICATIONS, INC. PN-320 Dual-mode CDMA Phone (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 (0.343W), PCS CDMA (0.331W).

FCC ID	PP4PN-320
EUT Type	Dual-Mode Phone (CDMA/ PCS CDMA)- Prototype
Model	PN-320
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	0.343 W ERP CDMA (25.4 dBm) 0.331 EIRP PCS CDMA (25.2 dBm)
Modulation	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- Mode CDMA Phone	PANTECH&CURITEL COMMUNICATIONS, INC.	PN-320	PP4PN-320	Adaptor/ P.C
Adaptor	AUDIOVOX	CNR4	N/A	CDMA Phone
Head-Set	PANTECH&CURITEL COMMUNICATIONS, INC.	-	N/A	EUT
Notebook P.C	TOSHIBA	PSA50K-04007	DoC	N/A
Adapter	TOSHIBA	ADP-60RH A	DoC	Notebook P.C
MOUSE	H.P	M-S48a	DoC	P.C
PRINTER	H/P	C4569A	DoC	P.C

1.4 Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4/1992. 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 23, 2003(Registration Number: 90661)

2.SYSTEM TEST CONFIGURATION

2.1 Justification

The device was configured for testing in a typical fashion (as a customer would normally use it). During the tests, the following components and I/O cards inside the E.U.T were used.

DEVICE TYPE	MANUFACTURE	MODEL/PART NUMBER
MAIN BOARD	PANTECH&CURITEL COMMUNICATIONS, INC.	PN-320

2.2 EUT exercise Software

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

2.3 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)
EUT	N/A	Y	1.5(D)
Charger	N	N/A	1.5(P)
Notebook PC	N	N/A	1.8(P)
Adaptor	N	N/A	1.8(P)
Head-Set	N/A	N	1.5(D)
MOUSE	N/A	Y	1.8(D)
PRINTER	N	Y	1.8(P), 1.8(D)

2.4 Noise Suppression Parts on Cable

	Ferrite Bead (Y/N)	Location	Metal Hood (Y/N)	Location
EUT	Y	P.C END	Y	PC END
Charger	N	N/A	N	EUT END
Adaptor	Y	Adaptor END	Y	PC END
Head-Set	N	N/A	N	P.C END
MOUSE	N	N/A	Y	P.C END
PRINTER	N	N/A	Y	P.C END

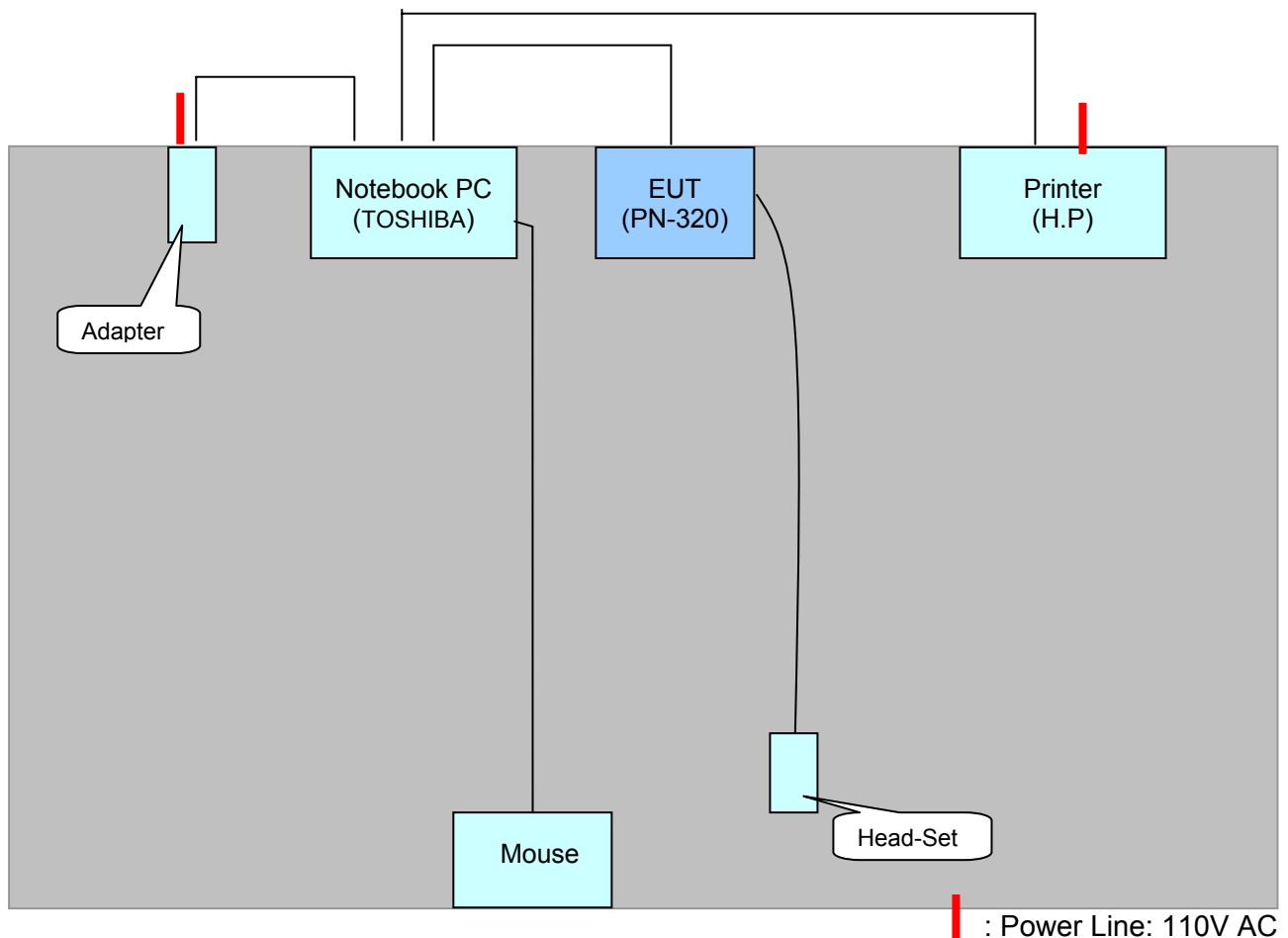
2.5 Equipment Modifications

N/A

2.6 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 perating 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

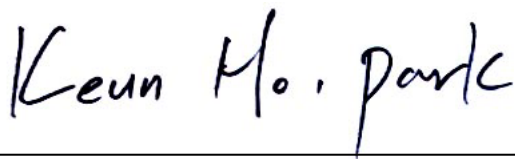
The following table shows the highest levels of conducted emissions on both polarization of hot and neutral line.

=====

Humidity Level	: 38 %	Temperature:	18.9 °C
Limit apply to	: CISPR 22 CLASS B		
Result	: PASSED BY – 13.3 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)
0.760	38.9	HOT	Quasi-Peak	56	-17.1
0.760	31.7	HOT	Average	46	-14.3
0.353	45.6	NEUTRAL	Quasi-Peak	59	-13.3
0.645	28.0	NEUTRAL	Average	46	-18.0

Line Conducted Emissions Tabulated Data



Measured by : Keun-Ho Park / Engineer

Date : April 02, 2006

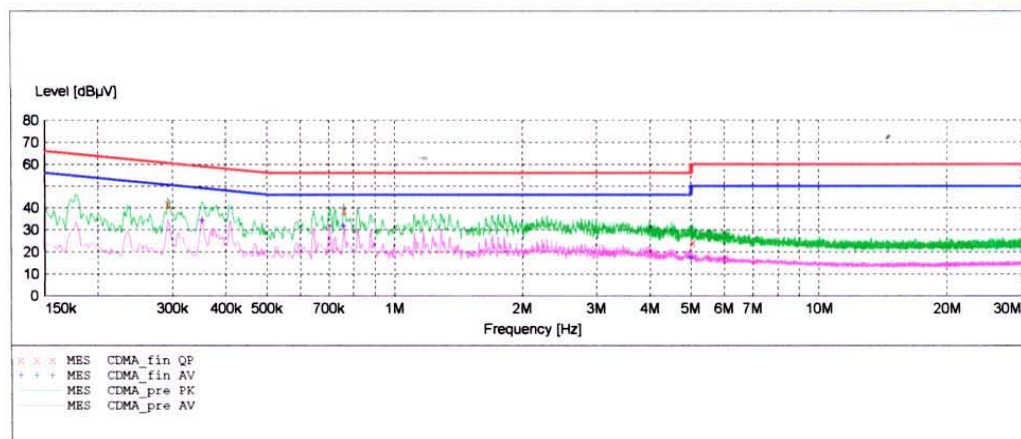
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EMC TEST LAB

EUT: PN-320
Manufacturer: CURITEL
Operating Condition: NORMAL
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	
			Average				
500.0 kHz	5.0 MHz	5.0 kHz	MaxPeak	10.0 ms	9 kHz	None	
			Average				
5.0 MHz	30.0 MHz	5.0 kHz	MaxPeak	10.0 ms	9 kHz	None	
			Average				



MEASUREMENT RESULT: "CDMA_fin QP"

4/2/2006 2:52PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.292600	41.70	10.1	61	18.8	---	---
0.760000	38.90	10.2	56	17.1	---	---
5.050000	24.30	10.3	60	35.7	---	---

MEASUREMENT RESULT: "CDMA_fin AV"

4/2/2006 2:52PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.352600	34.20	10.1	49	14.7	---	---
0.760000	31.70	10.2	46	14.3	---	---
5.000000	17.40	10.3	46	28.6	---	---

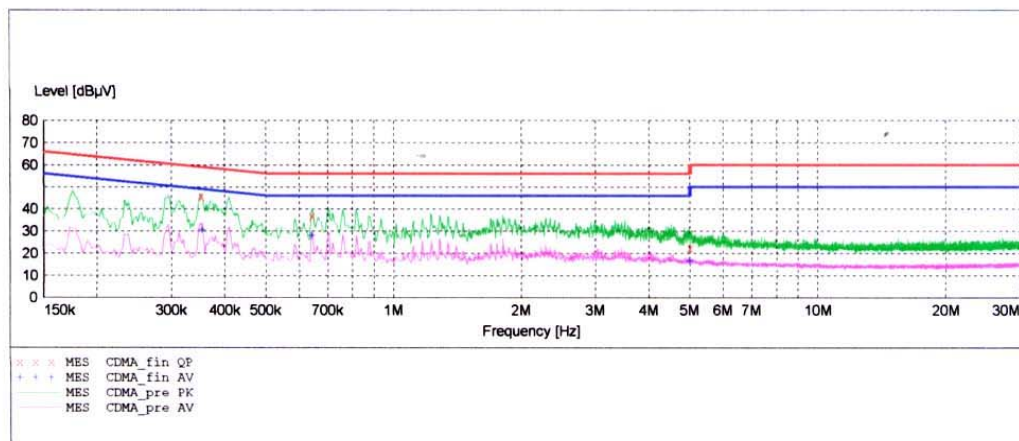
HCT

EMC TEST LAB

EUT: PN-320
 Manufacturer: CURITEL
 Operating Condition: NORMAL
 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	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer	
Frequency	Frequency	Width					
150.1 kHz	500.0 kHz	2.5 kHz	MaxPeak	10.0 ms	9 kHz	None	
			Average				
500.0 kHz	5.0 MHz	5.0 kHz	MaxPeak	10.0 ms	9 kHz	None	
			Average				
5.0 MHz	30.0 MHz	5.0 kHz	MaxPeak	10.0 ms	9 kHz	None	
			Average				



MEASUREMENT RESULT: "CDMA_fin QP"

4/2/2006 2:57PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.352600	45.60	10.1	59	13.3	---	---
0.645000	37.00	10.2	56	19.0	---	---
5.000000	22.60	10.3	56	33.4	---	---

MEASUREMENT RESULT: "CDMA_fin AV"

4/2/2006 2:57PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.355100	30.70	10.1	49	18.1	---	---
0.645000	28.00	10.2	46	18.0	---	---
5.000000	16.60	10.3	46	29.4	---	---

3.2 Radiated Emissions Tests

The following table shows the highest levels of Radiated Emissions on both polarization of horizontal and vertical.

=====

Humidity Level : 38 % Temperature: 18.9 °C
Limit apply to : FCC PART 15 CLASS B
Result : PASSED BY -6.4 dB
Operating Condition : Charging Battery
Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 KHz)

Frequency MHz	Reading dBuV	Ant. Factor dB	Cable Loss dB	ANT POL (H/V)	Total dBuV/m	Limit dBuV/m	Margin dB
93.60	24.2	9.2	2.2	V	35.6	43.5	-7.9
97.00	23.5	9.7	2.2	V	35.4	43.5	-8.1
269.40	15.8	17.9	3.8	V	37.5	46	-8.5
335.80	19.0	16.4	4.2	V	39.6	46	-6.4
389.60	17.1	16.8	4.5	V	38.5	46	-7.5
412.10	15.6	17.3	4.7	V	37.6	46	-8.4
452.60	14.8	18.4	4.9	V	38.1	46	-7.9
217.60	18.0	16.8	3.3	H	38.1	46	-7.9
326.60	17.8	16.3	4.2	H	38.3	46	-7.7
421.50	15.9	17.6	4.7	H	38.2	46	-7.8
456.30	14.1	18.5	4.9	H	37.5	46	-8.5
502.10	14.3	19.2	5.1	H	38.6	46	-7.4



Measured by : Keun-Ho Park / Engineer

Date : April 02, 2006

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

Type	Manufacture	Model Number	CAL Date
EMI Test Receiver	Rohde & Schwarz	ESI40	2005.11.16
EMI Test Receiver	Rohde & Schwarz	ESVS30	2005.07.16
LISN	Rohde & Schwarz	ESH2-Z5	2005.07.28
LISN	EMCO	ESH3-Z5	2005.07.28
Attenuator	Rohde & Schwarz	ESH3-Z2	2005.11.16
Amplifier	Hewlett-Packard	8447E	2005.08.23
TRILOG Antenna	Schwarzbeck	9160	2006.04.06
Antenna Position Tower	EMCO	1051-12	N/A
Turn Table	EMCO	1060-06	N/A
Power Analyzer	Voltech	PM 3300	2006.02.15
Reference Network Impedance	Voltech	IEC 555	N/A
AC Power Source	PACIFIC	Magnetic Module	N/A
AC Power Source	PACIFIC	360-AMX	2005.11.25
Controller	HD GmbH	HD 100	N/A
SlideBar	HD GmbH	KMS 560	N/A

6.1 Conclusion

The data collected shows that the PANTECH&CURITEL COMMUNICATIONS, INC. Dual- Mode CDMA Phone. FCC ID: PP4PN-320. Complies with §15.107 and §15.109 of the FCC Rules.