HCT CO., LTD.

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EMI CERTIFICATION REPORT

Applicant:
SHARP CORPORATION
22-22 Nagaike-cho, Abeno-ku, Osaka 545-8522 Japan

Date of Issue: February 23, 2010
Test Report No.: HCTE1002FE23
Test Site: HCT CO., LTD.
HCT FRN: 0005-8664-21

FCC ID: **APYNAR0066**

Rule Part(s) / Standard(s)	: FCC PART 15 Subpart B / CISPR 22 Class B
Equipment (EUT) Type	: Slide Dual-band CDMA Phone with Bluetooth/WLAN
Trade Name / Model(s)	: SHARP CORPORATION / PB20ZU
Port / Connector(s)	: USB Data Port / Headset 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.

HCT certifies that no party to application has been denied the FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C 862.

Report prepared by
: Dong Sup Kim
Test Engineer of EMC Tech. Part

Approved by
: Kyoung Hee Yoon
Manager of EMC Tech. Part

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1. GENERAL INFORMATION

1.1 Product Description

Equipment Under Test (E.U.T) is **Slide Dual-band CDMA Phone with Bluetooth/WLAN, Model: PB20ZU** manufactured by **SHARP CORPORATION.** Its basic purpose is used for communications.

Model	PB20ZU
FCC ID	APYNAR0066
E.U.T Type	Slide Dual-band CDMA Phone with Bluetooth/WLAN
TX Frequency	824.70 ㎒ to 848.31 ㎒ (CDMA 835) 1 851.25 ㎒ to 1 908.75 ㎒ (CDMA 1 900)
RX Frequency	869.70 ㎒ to 893.31 ㎒ (CDMA 835) 1 931.25 ㎒ to 1 988.75 ㎒ (CDMA 1 900)

1.2 Related Submittal(s) / Grant(s)

Original submittal only.

1.3 Tested System Details

All equipment descriptions used in the tested system (including inserted cards) are:

Device Type	Manufacturer	Model Number/ Part Number	FCC ID / DoC	Connected To
Slide Dual-band CDMA Phone with Bluetooth/WLAN	Sharp	PB20ZU	APYNAR0066	Notebook PC
Notebook PC	DELL	E5500	DoC	E.U.T
Notebook PC adaptor	DELL	DA90PE1-00	-	Notebook PC
Mouse	Microsoft	Intellimouse optical USB and PS/2 compatible	DoC	Notebook PC
USB cable	-	-	-	E.U.T Notebook PC
Headset	-	-	-	E.U.T

1.4 Cable Description

Product Name	Port	Power Cord Shielded (Y/N)	I/O Cable Shielded (Y/N)	Length (M)
Slide Dual-band CDMA Phone with Bluetooth/WLAN	Headset jack	-	N	(D)1.2
	USB data	Y	Y	(P,D)1.5
Notebook PC	USB (Mouse)	-	Y	(D)1.8

* The marked "(D)" means the data cable and "(P)" means the power cable.

1.5 Noise Suppression Parts on Cable. (I/O cable)

Product Name	Port	Ferrite Bead (Y/N)	Location	Metal Hood (Y/N)	Location
Slide Dual-band CDMA Phone with Bluetooth/WLAN	Headset jack	N	-	Y	E.U.T End
	USB data	N	-	Y	Both End
Notebook PC	USB (Mouse)	Y	Notebook PC End	Y	Notebook PC End

1.6 Test Methodology

Both Conducted and Radiated testing was performed according to the procedures in ANSI C63.4/2003. Radiated testing was performed at an antenna to E.U.T distance of 3 m

1.7 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 June 10, 2009. (Registration Number: 90661)

1.8 Frequency Range of Radiated Measurements

An unintentional radiator, including a digital device, the spectrum shall be investigated from the lowest radio frequency signal generated or used in the device, without going below the lowest frequency for which a Radiated Emission limit is specified, up to the frequency shown in the following table

Highest frequency generated or used in the device or on which the device operates or tunes (㎒)	**Upper frequency of measurement range** (㎒)
Below 1.705	30
1.705 to 108	1 000
108 to 500	2 000
500 to 1 000	5 000
Above 1 000	5^{th} harmonic of the highest frequency or 40 ㎓, whichever is lower

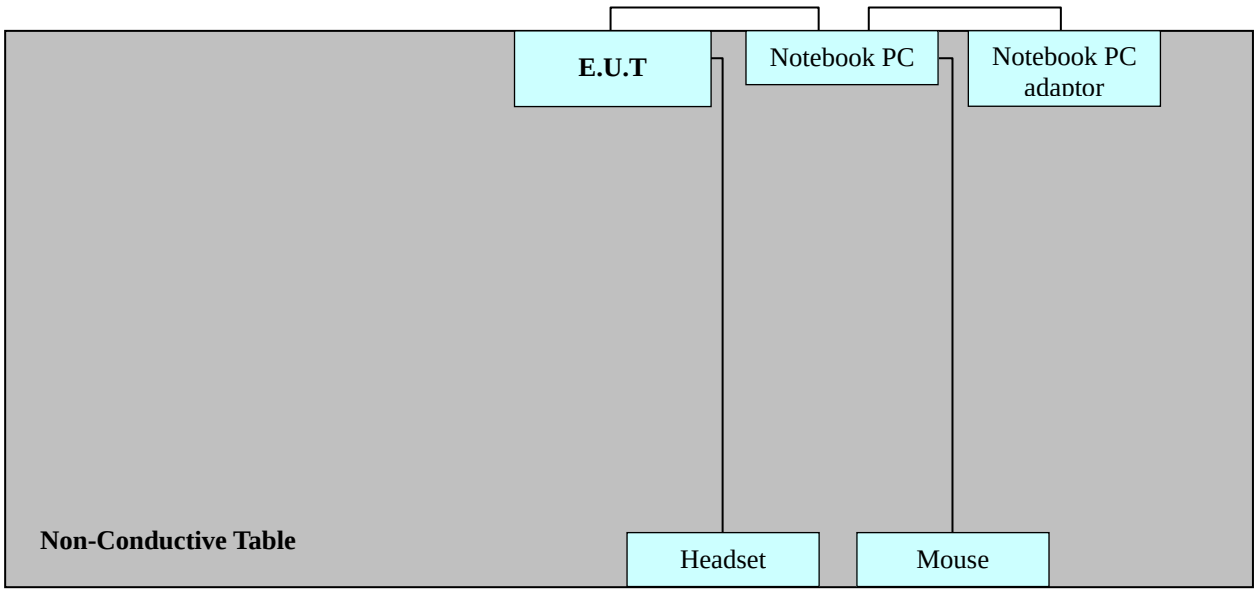
2. SYSTEM TEST CONFIGURATION

2.1 Configuration of Test System

Power Line Conducted test : E.U.T was connected to LISN, all other peripheral 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 worst operating conditions.

Radiated Emission test : Preliminary Radiated Emission tests were performed by using the procedure in ANSI C63.4/2003 8.3.1.1 to determine the worst operating condition. Final Radiated Emission tests were performed at 3 m open area test site.

[Configuration of Tested System]



Power Line: 110 VAC

3. PRELIMINARY TEST

3.1 Conducted Emission Test

■ Test E.U.T with Data Communication between E.U.T and laptop, after connecting all peripheral devices.

During preliminary tests, the following operating mode was investigated:

Operation Mode	The Worst Operating Condition
Data Communication	○

3. 2 Radiated Emission Test

■ Test E.U.T with Data Communication between E.U.T and laptop, after connecting all peripheral devices.

During preliminary tests, the following operating mode was investigated:

Operation Mode	The Worst Operating Condition
Data Communication	○

4. CONDUCTED AND RADIATED EMISSION TEST SUMMARY

4.1 Conducted Emission Test

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

Limit apply to	: CISPR 22 Class B
Result	: Passed by 7.4 ㏈
Operating condition	: Data Communication mode
Detector	: Quasi-Peak, Average (6 ㏈ Bandwidth: 9 ㎑)
Temperature	: 23.2 °C
Humidity level	: 34.9 %
Test date	: February 23, 2010

Power Line Conducted Emissions			CISPR 22 Class B		
Frequency (㎒)	**Amplitude** (㏈㎶)	**Conductor**	**Result**	**Limit** (㏈㎶)	**Margin** (㏈)
4.0800	38.6	NEUTRAL	Average	46.0	7.4
4.0960	43.9	NEUTRAL	Quasi-Peak	56.0	12.1
3.8560	37.7	HOT	Average	46.0	8.3
4.0080	43.1	HOT	Quasi-Peak	56.0	12.9

※ **NOTE:** Refer to page 10 to page 13 for details.

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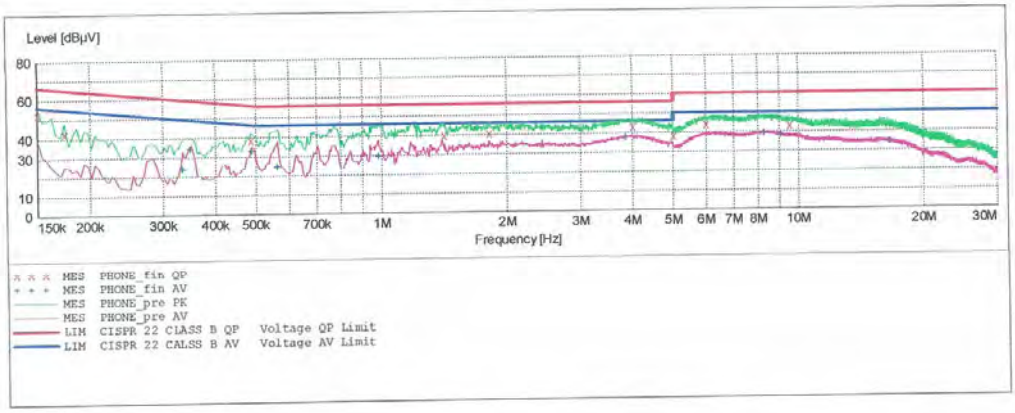
EUT: PB20ZU
Manufacturer: SHARP CORPORATION
Operating Condition: DATA COMMUNICATION
Test Site: SHIELD ROOM
Operator: DS-KIM
Test Specification: CISPR22 CLASS B
Comment: H

SCAN TABLE: "CISPR22 CLASS B"

Short Description: CISPR22 CLASS B

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
150.0 kHz	500.0 kHz	4.0 kHz	MaxPeak Average	10.0 ms	9 kHz	ESH3 (20100210)
500.0 kHz	5.0 MHz	4.0 kHz	MaxPeak Average	10.0 ms	9 kHz	ESH3 (20100210)
5.0 MHz	30.0 MHz	4.0 kHz	MaxPeak Average	10.0 ms	9 kHz	ESH3 (20100210)



MEASUREMENT RESULT: "PHONE_fin QP"

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Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.150001	52.50	10.1	66	13.5	---	---
0.174001	42.40	10.1	65	22.4	---	---
0.486001	38.50	10.1	56	17.7	---	---
1.412000	39.90	10.1	56	16.1	---	---
1.812000	40.60	10.1	56	15.4	---	---
4.008000	43.10	10.3	56	12.9	---	---
5.000000	38.20	10.4	56	17.8	---	---
5.992000	43.80	10.5	60	16.2	---	---
9.520000	43.10	10.8	60	16.9	---	---

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MEASUREMENT RESULT: "PHONE_fin AV"

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Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.334001	23.90	10.1	49	25.4	---	---
0.350001	34.20	10.1	49	14.7	---	---
0.490001	32.80	10.1	46	13.4	---	---
0.564000	24.80	10.1	46	21.2	---	---
0.984000	29.60	10.1	46	16.4	---	---
3.856000	37.70	10.3	46	8.3	---	---
8.296000	39.40	10.7	50	10.6	---	---
9.100000	38.60	10.7	50	11.4	---	---
16.632000	34.60	11.4	50	15.4	---	---

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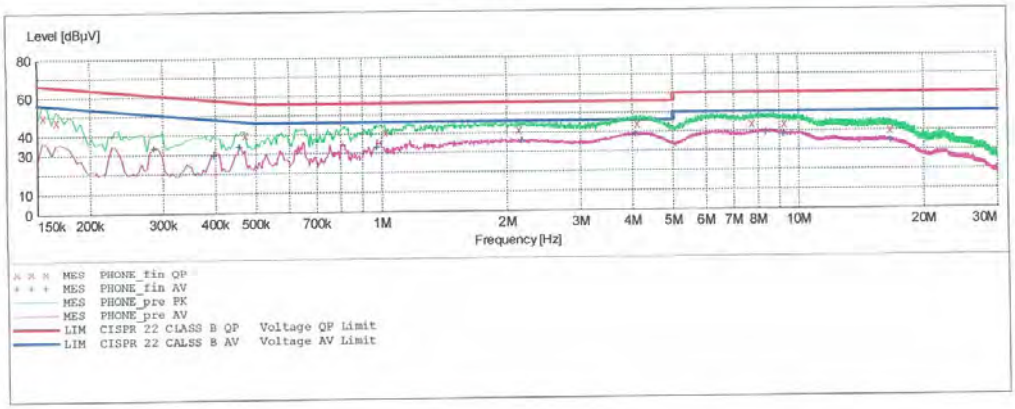
EUT:	PB20ZU
Manufacturer:	SHARP CORPORATION
Operating Condition:	DATA COMMUNICATION
Test Site:	SHIELD ROOM
Operator:	DS-KIM
Test Specification:	CISPR22 CLASS B
Comment:	N

SCAN TABLE: "CISPR22 CLASS B"

Short Description: CISPR22 CLASS B

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
150.0 kHz	500.0 kHz	4.0 kHz	MaxPeak Average	10.0 ms	9 kHz	ESH3 (20100210)
500.0 kHz	5.0 MHz	4.0 kHz	MaxPeak Average	10.0 ms	9 kHz	ESH3 (20100210)
5.0 MHz	30.0 MHz	4.0 kHz	MaxPeak Average	10.0 ms	9 kHz	ESH3 (20100210)



MEASUREMENT RESULT: "PHONE_fin QP"

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Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.154001	49.80	10.1	66	15.9	---	---
0.166001	47.50	10.1	65	17.6	---	---
0.470001	39.80	10.1	57	16.7	---	---
1.020000	40.60	10.1	56	15.4	---	---
2.132000	41.40	10.2	56	14.6	---	---
4.096000	43.90	10.4	56	12.1	---	---
7.716000	43.60	10.6	60	16.4	---	---
9.224000	43.30	10.7	60	16.7	---	---
16.556000	39.90	11.4	60	20.1	---	---

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MEASUREMENT RESULT: "PHONE_fin AV"

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Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.286001	33.10	10.0	51	17.5	---	---
0.398001	29.40	10.1	48	18.5	---	---
0.458001	33.60	10.1	47	13.1	---	---
0.976000	33.10	10.1	46	12.9	---	---
2.172000	35.70	10.2	46	10.3	---	---
4.080000	38.60	10.4	46	7.4	---	---
8.372000	39.10	10.7	50	10.9	---	---
9.244000	38.00	10.7	50	12.0	---	---
16.696000	34.30	11.4	50	15.7	---	---

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4.2 Radiated Emission Test

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

Limit apply to : FCC PART 15 Subpart B
Result : Passed by 8.2 dB
Operating condition : Data Communication mode
Detector : Quasi-Peak (6 dB Bandwidth: 120 ㎑)
Temperature : 14.0 °C
Humidity level : 31.8 %
Test date : February 23, 2010

Frequency	Reading	Ant. Factor	Cable Loss	Ant. POL	Total	Limit	Margin
㎒	dBμV	dB/m	dB	(H/V)	dBμV/m	dBμV/m	dB
39.1	8.3	12.0	0.7	H	21.0	40.0	19.0
53.2	10.9	12.4	0.7	V	24.0	40.0	16.0
72.0	13.2	9.8	0.9	V	23.9	40.0	16.1
90.3	15.0	8.2	1.0	H	24.2	43.5	19.3
343.3	18.1	13.9	1.9	V	33.9	46.0	12.1
358.8	21.5	14.3	2.0	H	37.8	46.0	8.2

5. 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 dBμV is obtained. The antenna factor of 7.4 dB/m and a cable factor of 1.1 dB are added. The 30 dBμV/m value is mathematically converted to its corresponding level in μV/m.

FS = 21.5 + 7.4 + 1.1 = 30 dBμV/m

[Radiated Emission Limits]

Frequency of Emission (㎒)	Field Strength	
	μV/m	dBμV/m
30 to 88	100	40.0
88 to 216	150	43.5
216 to 960	200	46.0
Above 960	500	54.0

6. TEST EQUIPMENT

	Type	Manufacturer	Model Number	Next CAL Date
Conducted Emission				
☒	EMI Test Receiver	Rohde & Schwarz	ESCI	2010.06.02
☒	LISN	Rohde & Schwarz	ESH3-Z5	2011.02.05
☒	LISN	Rohde & Schwarz	ENV216	2010.04.01
☒	Attenuator	Rohde & Schwarz	ESH3-Z2	2010.10.30
Radiated Emission				
☒	EMI Test Receiver	Rohde & Schwarz	ESI40	2010.10.30
☒	Trilog Antenna	Schwarzbeck	VULB9160	2010.12.18
☒	Antenna Master	HD	MA240	-
☒	Turn Table	EMCO	1060	-
☐	Communication Antenna	TDK	LPDA-0802	-
☐	Antenna Position Tower	HD	240/520/00	-
☐	Base Station	Rohde & Schwarz	CMU 200	2011.02.17
☒	Horn Antenna	Schwarzbeck	BBHA 9120D	2010.03.26
☒	RF-Amplifier	MITEQ	AMF-6D-00101800-35.20P.PS	2010.04.25
☐	Bluetooth Base Station	TESCOM	TC-3000A	2011.01.07

7. CONCLUSION

The data collected shows that the **SHARP CORPORATION, Model: PB20ZU, Slide Dual-band CDMA Phone with Bluetooth/WLAN. FCC ID: APYNAR0066** complies with §15.107 and §15.109 of the FCC rules.