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EMI CERTIFICATION REPORT

Applicant:

SHARP CORPORATION.
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545-8522 Japan

Date of Issue: February 14, 2011
Test Report No.: HCTE1102FE08

Test Site: HCT CO., LTD.
HCT FRN: 0005-8664-21

FCC ID:

APYNAR0074

Rule Part(s) : FCC PART 15 Subpart B Class B
Equipment Type : GSM/UMTS Phone with Bluetooth/WiFi
Manufacture : SHARP CORPORATION
Model : ADS1
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 subject to a denial of Federal benefits that includes FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C 862

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ATTACHMENT: TEST SETUP PHOTOGRAPHS

1. GENERAL INFORMATION

1.1 Product Description

Equipment Under Test (E.U.T) is **GSM/UMTS Phone with Bluetooth/WiFi, Model: ADS1** manufactured by **SHARP CORPORATION**. Its basic purpose is used for communications.

Model (s)	ADS1
FCC ID	APYNAR0074
E.U.T Type	GSM/UMTS Phone with Bluetooth/WiFi
TX Frequency	824.20 MHz to 848.80 MHz (GSM 850) 1 850.20 MHz to 1 909.80 MHz (GSM 1 900) 826.40 MHz to 846.60 MHz (WCDMA 850) 1 852.4 MHz to 1 907.6 MHz (WCDMA 1 900)
RX Frequency	869.20 MHz to 893.80 MHz (GSM 850) 1 930.20 MHz to 1 989.80 MHz (GSM 1 900) 871.40 MHz to 891.60 MHz (WCDMA 850) 1 932.4 MHz to 1 987.6 MHz (WCDMA 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/ Serial Number	FCC ID / DoC	Connected To
GSM/UMTS Phone with Bluetooth/WiFi	SHARP Corp.	ADS1	APYNAR0074	Notebook PC
Notebook PC	SAMSUNG	NT-R519 ZLA693AS900033M	DoC	E.U.T
Notebook PC adaptor	DELTA (JIANG SU)	ADP-60ZH D AD-6019R DA44-00242A	-	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
SD card(2 GB)	SANDISK	-	-	E.U.T

1.4 Cable Description

Product Name	Port	Power Cord Shielded (Y/N)	I/O Cable Shielded (Y/N)	Length (m)
GSM/UMTS Phone with Bluetooth/WiFi	Headset jack	-	N	(D)1.2
	USB data	Y	Y	(P,D)1.4
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
GSM/UMTS Phone with Bluetooth/WiFi	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 10 m semi anechoic chamber used to collect the radiated data is located at the 105-1, Jangam-Ri, Majang-Myeon, Icheon-Si, Kyoungki-Do, South Korea, and the conducted measurement facility used to measure the conducted data are located at San 136-1, Ami-Ri Bubal-Eup, Icheon-Si, Kyoungki-Do, 467-701, South Korea. Those measurement facilities are constructed in conformance with the requirements of ANSI C63.4.

Detailed description of test facilities was submitted to the Commission and accepted dated Sep. 03, 2010 (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 (MHz)	Upper frequency of measurement range (MHz)
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 GHz, whichever is lower

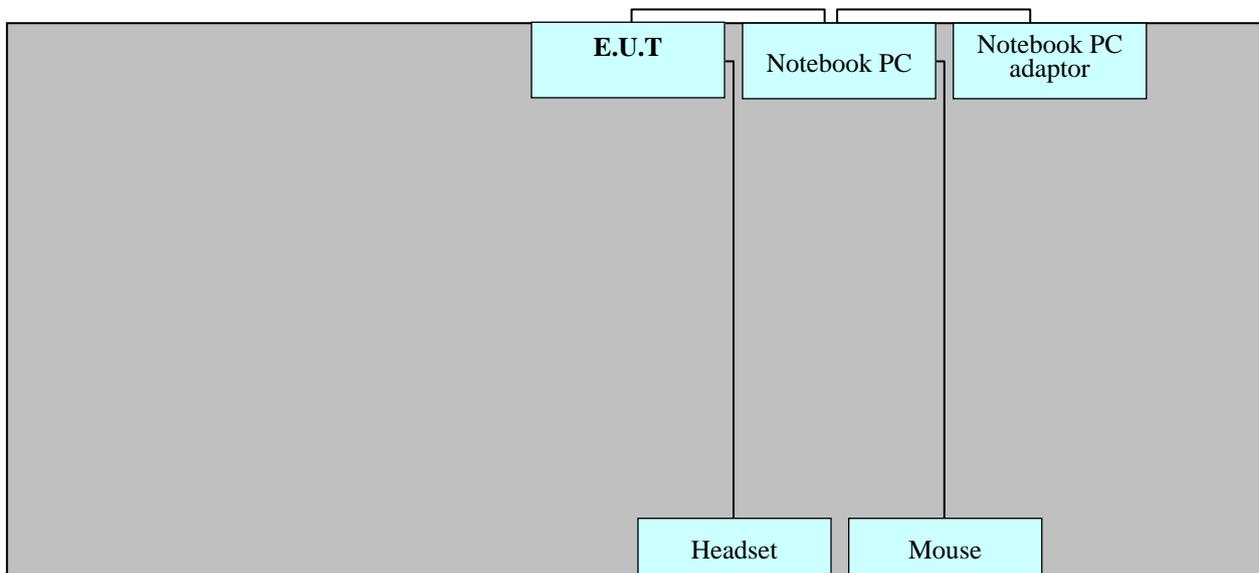
2. SYSTEM TEST CONFIGURATION

2.1 Configuration of Test System

Power Line Conducted test : E.U.T was connected to LISN via Notebook PC adaptor.
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 semi-anechoic chamber.

[Configuration of Tested System]



Non-Conductive Table

Power Line: 110 VAC

3. PRELIMINARY TEST

3.1 Conducted Emission Test

- Test E.U.T with Data Communication mode, after connecting all peripheral devices.

During preliminary tests, the following operating mode was investigated:

Operation Mode	The Worst Operating Condition
Data Communication	<input type="radio"/>

3. 2 Radiated Emission Test

- Test E.U.T with Data Communication mode, after connecting all peripheral devices.

During preliminary tests, the following operating mode was investigated:

Operation Mode	The Worst Operating Condition
Data Communication	<input type="radio"/>

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	: FCC PART 15 Subpart B
Detector	: Quasi-Peak, Average (6 dB Bandwidth: 9 kHz)
Temperature	: 25.1 °C
Humidity level	: 44.8 %
Test date	: February 14, 2011

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

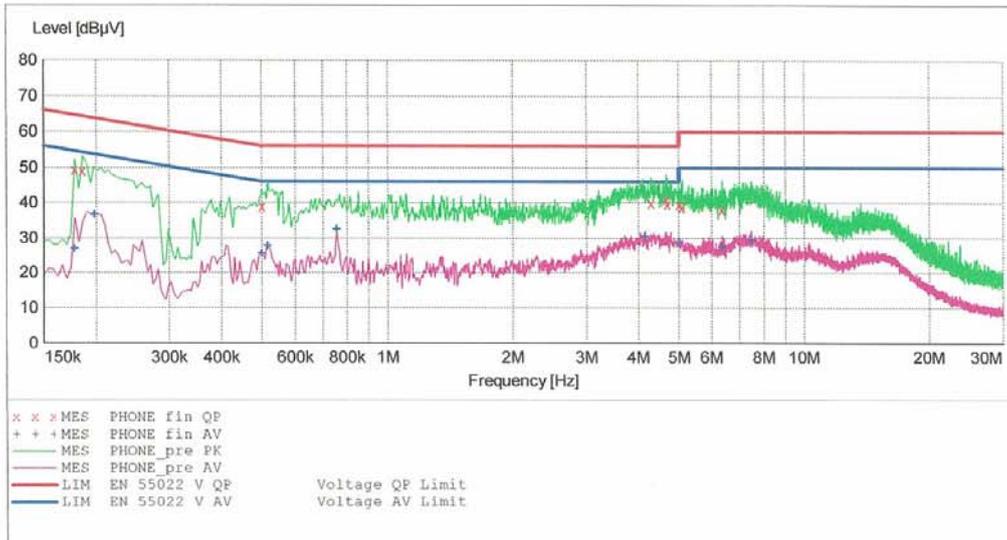
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EUT: ADS1
 Manufacturer: SHARP CORPORATION
 Operating Condition: DATA MODE
 Test Site: SHIELD ROOM
 Operator: DH-RYU
 Test Specification: FCC PART 15 CLASS B
 Comment: H

SCAN TABLE: "FCC PART 15 CLASS B"

Short Description:			FCC PART 15 CLASS B			
Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
150.0 kHz	500.0 kHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			
500.0 kHz	5.0 MHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			
5.0 MHz	30.0 MHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			



MEASUREMENT RESULT: "PHONE_fin QP"

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Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.178010	49.30	10.1	65	15.3	---	---
0.186010	49.00	10.1	64	15.2	---	---
0.500000	39.10	10.1	56	16.9	---	---
4.288000	40.10	10.4	56	15.9	---	---
4.672000	41.10	10.5	56	14.9	---	---
4.700000	39.70	10.5	56	16.3	---	---
5.000000	39.50	10.5	56	16.5	---	---
5.104000	38.90	10.5	60	21.1	---	---
6.356000	38.20	10.6	60	21.8	---	---

MEASUREMENT RESULT: "PHONE_fin AV"

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Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.178010	26.90	10.1	55	27.7	---	---
0.198010	36.60	10.1	54	17.1	---	---
0.500000	25.70	10.1	46	20.3	---	---
0.516000	27.70	10.1	46	18.3	---	---
0.756000	32.60	10.1	46	13.4	---	---
4.160000	30.50	10.4	46	15.5	---	---
5.000000	28.80	10.5	46	17.2	---	---
6.356000	27.50	10.6	50	22.5	---	---
7.464000	29.40	10.6	50	20.6	---	---

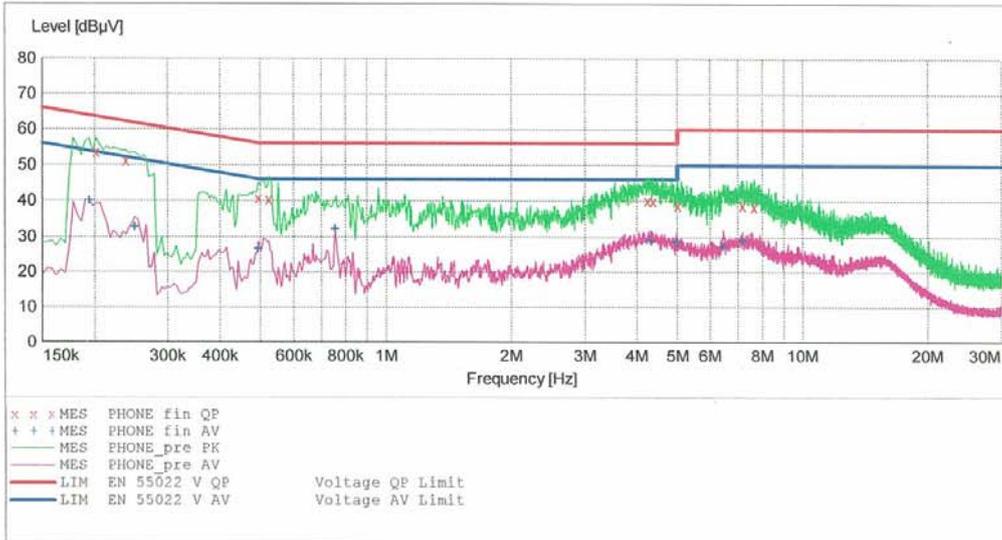
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EMC

EUT: ADS1
 Manufacturer: SHARP CORPORATION
 Operating Condition: DATA MODE
 Test Site: SHIELD ROOM
 Operator: DH-RYU
 Test Specification: FCC PART 15 CLASS B
 Comment: N

SCAN TABLE: "FCC PART 15 CLASS B"

Short Description:			FCC PART 15 CLASS B			
Start	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer
150.0 kHz	500.0 kHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			
500.0 kHz	5.0 MHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			
5.0 MHz	30.0 MHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			



MEASUREMENT RESULT: "PHONE_fin QP"

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Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.202010	53.60	10.1	64	9.9	---	---
0.238010	51.20	10.1	62	10.9	---	---
0.494010	40.80	10.1	56	15.3	---	---
0.524000	40.50	10.1	56	15.5	---	---
4.248000	40.20	10.4	56	15.8	---	---
4.392000	39.90	10.4	56	16.1	---	---
5.012000	38.90	10.5	60	21.1	---	---
7.184000	38.90	10.6	60	21.1	---	---
7.668000	38.50	10.7	60	21.5	---	---

MEASUREMENT RESULT: "PHONE_fin AV"

2/14/2011 11:18AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.194010	39.90	10.1	54	13.9	---	---
0.250010	32.70	10.1	52	19.1	---	---
0.494010	26.60	10.1	46	19.5	---	---
0.756000	32.30	10.1	46	13.7	---	---
4.316000	29.10	10.4	46	16.9	---	---
4.988000	28.60	10.5	46	17.4	---	---
5.000000	28.70	10.5	46	17.3	---	---
6.464000	27.30	10.6	50	22.7	---	---
7.188000	29.00	10.6	50	21.0	---	---

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
 Detector : Quasi-Peak (6 dB Bandwidth: 120 kHz)
 Temperature : 20.0 °C
 Humidity level : 33.5 %
 Test date : February 11, 2011

Frequency	Reading	Ant. Factor	Cable Loss	Ant. POL	Total	Limit	Margin
MHz	dB μ V	dB/m	dB	(H/V)	dB μ V/m	dB μ V/m	dB
37.6	7.6	11.9	0.8	V	20.3	40.0	19.7
67.1	8.6	10.9	1.0	V	20.5	40.0	19.5
73.6	9.3	9.7	1.1	H	20.1	40.0	19.9
127.9	11.7	11.9	1.4	V	25.0	43.5	18.5
172.0	16.3	12.4	1.7	H	30.4	43.5	13.1
466.9	9.8	16.9	2.8	H	29.5	46.0	16.5

※ **NOTE:**

1. For measurement above 1 GHz, noise level is more than 10 dB below the limit, specified in FCC Part 15.35

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

$$FS = 21.5 + 7.4 + 1.1 = 30 \text{ dB}\mu\text{V}/\text{m}$$

[Radiated Emission Limits]

Frequency of Emission (MHz)	Field Strength	
	μ V/m	dB μ V/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

<u>Type</u>	<u>Manufacturer</u>	<u>Model Number</u>	<u>Serial Number</u>	<u>Next CAL Date</u>
<u>Conducted Emission</u>				
<input checked="" type="checkbox"/> EMI Test Receiver	Rohde & Schwarz	ESCI	100033	2011.02.19
<input checked="" type="checkbox"/> LISN	Rohde & Schwarz	ESH3-Z5	100282	2012.02.01
<input type="checkbox"/> LISN	Rohde & Schwarz	ENV216	3560.6550.02	2011.04.05
<input checked="" type="checkbox"/> Attenuator	Rohde & Schwarz	ESH3-Z2	357.8810.52	2011.10.25
<u>Radiated Emission</u>				
<input type="checkbox"/> EMI Test Receiver	Rohde & Schwarz	ESI40	831564103	2011.10.29
<input checked="" type="checkbox"/> EMI Test Receiver	Rohde & Schwarz	ESU26	100241	2011.09.01
<input checked="" type="checkbox"/> Trilog Antenna	Schwarzbeck	VULB9160	3301	2012.09.13
<input checked="" type="checkbox"/> Antenna master	INNCO Systems	MA4000-EP	MA4000/283	-
<input checked="" type="checkbox"/> Turn Table	INNCO Systems	DT3000-3T	DT3000/69	-
<input checked="" type="checkbox"/> Communication Antenna	Schwarzbeck	USLP9142	9142-248	-
<input type="checkbox"/> RF-Amplifier	MITEQ	AMF-6D-0010 1800-35.20P.PS	-	2011.05.20

7. CONCLUSION

The data collected shows that the **SHARP CORPORATION, GSM/UMTS Phone with Bluetooth/WiFi, Model: ADS1, FCC ID: APYNAR0074** complies with §15.107 and §15.109 of the FCC rules.