

## CERTIFICATE OF COMPLIANCE FCC PART 24(E) EIRP MEASUREMENTS

### Test Lab

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|                                |  |
|--------------------------------|--|
| <b>Test Procedure(s):</b>      | <b>ANSI/TIA/EIA-603-A-2001</b>                                 |
| <b>FCC Classification:</b>     | <b>Part 24 Licensed Portable Transmitter Held to Ear (PCE)</b> |
| <b>FCC Rule Part(s):</b>       | <b>§24(E), §2</b>  |
| <b>FCC ID:</b>                 | <b>ABLSP20</b>   |
| <b>Model(s):</b>               | <b>SH-P300 (#10)</b>   |
| <b>Equipment Type:</b>         | <b>Single-Mode PCS CDMA Phone</b>                              |
| <b>Tx Frequency Range:</b>     | <b>1851.25 - 1908.75 MHz</b>                                   |
| <b>Rx Frequency Range:</b>     | <b>1931.25 - 1988.75 MHz</b>                                   |
| <b>Max. EIRP Measured:</b>     | <b>0.158 Watts</b>   |
| <b>Conducted Power Tested:</b> | <b>22.7 dBm (1851.25 MHz)</b>                                  |
|                                | <b>22.3 dBm (1880.00 MHz)</b>                                  |
|                                | <b>22.5 dBm (1908.75 MHz)</b>                                  |
| <b>Antenna Type:</b>           | <b>Retractable</b>   |
| <b>Battery Type:</b>           | <b>3.7V Lithium-Ion (1000mAh)</b>                              |

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in §2.947.

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.

This test report shall not be reproduced partially, or in full, without the prior written approval of Celltech Research Inc. The results and statements contained in this report pertain only to the device(s) evaluated.



**Russell W. Pipe**  
**Senior Compliance Technologist**  
**Celltech Research Inc.**



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## FCC PART 24(E) EIRP MEASUREMENT REPORT

### 1.1 SCOPE

Measurement and determination of electromagnetic emissions (EME) from radio frequency devices for compliance with the technical rules and regulations of the Federal Communications Commission.

### 1.2 GENERAL INFORMATION - §2.1033(a)

|   |  |
|---|--|
| <p><b><u>APPLICANT</u></b></p> <p><b>HITACHI LTD.</b><br/>6 Kanda Surugadai 4 Chome<br/>Chiyoda-ku, Tokyo 101<br/>Japan</p> |  |
| <b>FCC ID</b>   | ABLSP20  |
| <b>Model(s)</b>   | SH-P300 (#10)  |
| <b>EUT Type</b>   | Single-Mode PCS CDMA Phone   |
| <b>Classification</b>   | Part 24 Licensed Portable Transmitter Held to Ear (PCE)                    |
| <b>Rule Part(s)</b>   | §24(E), §2   |
| <b>Test Procedure(s)</b>  | ANSI/TIA/EIA-603-A-2001  |
| <b>Max. EIRP Measured</b>   | 0.158 Watts  |
| <b>RF Conducted Output Power Tested</b>   | 22.7 dBm (1851.25 MHz)<br>22.3 dBm (1880.00 MHz)<br>22.5 dBm (1908.75 MHz) |
| <b>Tx Freq. Range</b>   | 1851.25 - 1908.75 MHz  |
| <b>Rx Freq. Range</b>   | 1931.25 - 1988.75 MHz  |
| <b>Modulation</b>   | PCS CDMA   |
| <b>Battery Type(s)</b>  | 3.7V Lithium-Ion (1000mAh)   |
| <b>Antenna Type</b>   | Retractable  |

## 2.1 MEASUREMENT PROCEDURES

### 2.2 RF OUTPUT POWER MEASUREMENT - §2.1046

The conducted power was measured with a Gigatronics 8650A Universal Power Meter using modulated average power mode. An offset was entered into the power meter to correct for the losses of the attenuator and cable installed before the sensor input. The transmitter terminal was coupled to the power meter and the EUT was placed into test mode using an Agilent E8285A base station simulator at a full data rate in the "always up" power control mode. All subsequent tests were performed using the same tune up procedures.

### 2.3 EFFECTIVE ISOTROPIC RADIATED POWER OUTPUT - §24.232(b)

EIRP Measurements by Substitution Method:

The EUT was placed into test mode using an Agilent E8285A base station simulator at a full rated power. The EUT was placed on a turntable 3-meters from the receive antenna. The field of maximum intensity was found by rotating the EUT approximately 360 degrees and changing the height of the receive antenna from 1 to 4 meters.

The field strength was recorded from a calibrated spectrum analyzer for each channel being tested. A horn antenna was substituted in place of the EUT. A CDMA signal with the same bandwidth as the EUT was generated, amplified, and fed through a directional coupler. The height and direction of the horn antenna was adjusted in order to give the field of maximum intensity. The power to the antenna was adjusted in order to give the same field strength reading as previously recorded for the EUT. The power at the coupler port was recorded at this point. The feed point for the antenna was then connected to a calibrated power meter and the power adjusted to read the same as the coupler port previously recorded, to account for any mismatch in impedance, which may occur at the horn antenna. The conducted power at the antenna feed point was recorded. The EIRP level was determined by adding the horn forward conducted power and the horn antenna gain in dB.

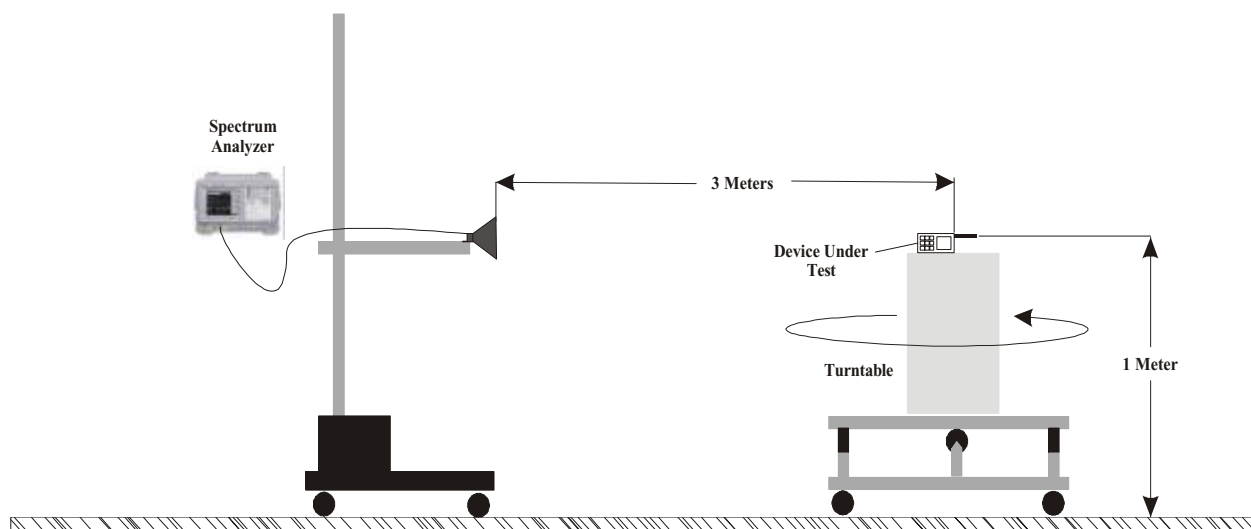


Figure 1. Radiated Measurement Test Setup Diagram

### 3.1 TEST DATA

### 3.2 EFFECTIVE ISOTROPIC RADIATED POWER OUTPUT - §24.232(b)

| Freq.<br>Tuned | EUT<br>Measured<br>Conducted<br>Power | Max. Field Strength<br>of EUT (dBm)<br>(Horizontal Polarization) |                     | Horn<br>Gain | Horn<br>Forward<br>Conducted<br>Power | EIRP of EUT<br>Horn Gain<br>+<br>Horn Forward<br>Conducted Power |         |
|----------------|---------------------------------------|--|---------------------|--------------|---------------------------------------|--|---------|
| (MHz)          | (dBm)                                 | Antenna<br>Retracted   | Antenna<br>Extended | (dBi)        | (dBm)                                 | (dBm)  | (Watts) |
| 1851.25        | 22.7                                  | -  | - 16.21             | 6.55         | 14.50                                 | 21.05  | 0.127   |
| 1880.00        | 22.3                                  | - 16.72  | - 16.05             | 6.58         | 15.41                                 | 21.99  | 0.158   |
| 1908.75        | 22.5                                  | -  | - 17.00             | 6.61         | 14.23                                 | 20.84  | 0.121   |

Notes:

1. Both horizontal and vertical antenna polarizations were investigated and the highest levels are reported.
2. Both retracted and extended antenna modes were investigated and the highest levels are reported.
3. EIRP measurements were performed using the standard battery, which is the only battery option for this phone.

## 4.1 TEST EQUIPMENT LIST

| <u>Type</u>                   | <u>Model</u>                     | <u>Calibration Due Date</u> | <u>Serial No.</u> |
|-------------------------------|----------------------------------|-----------------------------|-------------------|
| HP Signal Generator           | 8648D (9kHz-4.0GHz)              | Feb 2003                    | 3847A00611        |
| Rohde & Schwarz Signal Gen.   | SMR40 (10MHz-40GHz)              | Nov 2002                    | 835537/022        |
| Gigatronics Power Meter       | 8652A                            | Feb 2003                    | 1835272           |
| Gigatronics Power Sensor      | 80701A (0.05-18GHz)              | Feb 2003                    | 1833535           |
| Gigatronics Power Sensor      | 80701A (0.05-18GHz)              | March 2003                  | 1833542           |
| Amplifier Research Power Amp. | 5S1G4 (5W, 800MHz-4.2GHz)        | N/A                         | 26235             |
| Microwave System Amplifier    | HP 83017A (0.5-26.5GHz)          | N/A                         | 3123A00587        |
| Network Analyzer              | HP 8753E (30kHz-3GHz)            | Feb 2003                    | US38433013        |
| Audio Analyzer                | HP 8903B                         | Nov 2002                    | 3729A18691        |
| Modulation Analyzer           | HP 8901A                         | July 2003                   | 3749A07154        |
| Frequency Counter             | HP 53181A (3GHz)                 | May 2003                    | 3736A05175        |
| DC Power Supply               | HP E3611A                        | N/A                         | KR83015294        |
| CDMA Base Station Simulator   | Agilent E8285A                   | Feb. 2003                   | US40332926        |
| Multi-Device Controller       | EMCO 2090                        | N/A                         | 9912-1484         |
| Mini Mast                     | EMCO 2075                        | N/A                         | 0001-2277         |
| Turntable                     | EMCO 2080-1.2/1.5                | N/A                         | 0002-1002         |
| Double Ridged Horn Antenna    | ETS 3115 (1-18GHz)               | Nov 2002                    | 6267              |
| Double Ridged Horn Antenna    | ETS 3115 (1-18GHz)               | Nov 2002                    | 6276              |
| Horn Antenna                  | Chase BBHA 9120-A (0.7-4.8GHz)   | Nov 2002                    | 9120A-239         |
| Horn Antenna                  | Chase BBHA 9120-A (0.7-4.8GHz)   | Nov 2002                    | 9120A-240         |
| Roberts Dipoles               | Compliance Design (2 sets) 3121C | Nov 2002                    |                   |
| Spectrum Analyzer             | HP 8594E                         | Feb 2003                    | 3543A02721        |
| Spectrum Analyzer             | HP E4408B                        | Nov 2002                    | US39240170        |
| Shielded Screen Room          | Lindgren R.F. 18W-2/2-0          | N/A                         | 16297             |
| Environmental Chamber         | ESPEC ECT-2 (Temp./Humidity)     | Feb 2003                    | 0510154-B         |

## 5.1 CONCLUSION

The data in this measurement report shows that the Hitachi Ltd. Model: SH-P300 (#10) Single-Mode PCS CDMA Phone FCC ID: ABLSP20 complies with the FCC requirements specified in §24.232(b).

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## APPENDIX A - TEST SETUP PHOTOGRAPHS



## EIRP TEST SETUP PHOTOGRAPHS with Substitution Antenna



## EIRP TEST SETUP PHOTOGRAPHS

### Horizontal Polarization



**Antenna Retracted**



**Antenna Retracted**



**Antenna Extended**



**Antenna Extended**

## EIRP TEST SETUP PHOTOGRAPHS

### Vertical Polarization



**Antenna Retracted**



**Antenna Retracted**



**Antenna Extended**



**Antenna Extended**