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CERTIFICATE OF COMPLIANCE (SAR EVALUATION)

SAMSUNG ELECTRONICS CO., LTD.
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Suwon City, Kyungki-Do 441-742, KOREA
Attn: Wallace Oh, Engineering Manager
Samsung Electronics America (QA Lab)

Dates of Tests: June 30 - July 11, 2000
Test Report S/N: SAR.200623295.A3L
Test Site: PCTEST Lab, Columbia MD U.S.A.

FCC ID

A3LSPHN200

APPLICANT

SAMSUNG Electronics Industries Co., Ltd.

EUT Type:	Dual-Band PCS/Cellular Phone (AMPS/CDMA)
Tx Frequency:	824.04 – 848.97 MHz (AMPS) / 1851.25 – 1908.75 MHz (PCS CDMA)
Rx Frequency:	869.04 – 893.97 MHz (AMPS) / 1931.25 – 1988.75 MHz (PCS CDMA)
Max. RF Output Power:	0.60W ERP AMPS (27.8 dBm) / 0.55W EIRP PCS CDMA (27.4 dBm)
Trade Name/Model(s):	SAMSUNG SPH-N200
FCC Classification:	Licensed Portable Transmitter Held to Ear (PCE)
Application Type:	Certification
Serial Number:	n/a (pre-production)
FCC Rule Part(s):	2.1093; ET Docket 96.326

This wireless portable device has been shown to be capable of compliance for localized specific absorption rate (SAR) for uncontrolled environment/general population exposure limits specified in ANSI/IEEE Std. C95.1-1992 and had been tested in accordance with the measurement procedures specified in ANSI/IEEE Std. C95.3-1992 (See Report).

Part 22 AMPS Mode -	Head Max. SAR: 1.1860 W/kg
	Body Max. SAR: 1.4610 W/kg
Part 24 PCS Mode -	Head Max. SAR: 1.3415 W/kg
	Body Max. SAR: 0.8347 W/kg

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.

NVLAP accreditation does not constitute any product endorsement by NVLAP or any agency of the United States Government.

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


Randy Ortañez
President & Chief Engineer

200623295.A3L



2) Transmitter

Waveform Quality : 0.944 or more

Open Loop Power Control Range

. -25dBm : -60.5dBm $\pm$ -41.5dBm

. -65dBm : -20.5dBm $\pm$ + 1.5dBm

. -104dBm : +15.0dBm $\pm$ +30.0dBm

Minimum Tx Power Control : below -50dBm

Closed Loop Power Control Range : $\pm$ 24dB

Maximum RF Output Power : 25.3dBm (+.2/-4)

Occupied Bandwidth : 1.23MHz

Conducted Spurious Emission @1.25 MHz : -42dBc/30kHz

3) Receiver

Rx Sensitivity and Dynamic Range : -104dBm, FER=0.5% or less

: -25dBm, FER=0.5% or less

Conducted Spurious Emission

. 1930 $\pm$ 1990MHz : < -81dBm

. 1850 $\pm$ 1910MHz : < -61dBm

. All Other Frequencies : < -47dBm

Single Tone Desensitization : lower than 1 %

Rx power = -101dBm

Tone power = -30dBm

Tone offset from carrier = $\pm$ 1.25 MHz

Intermodulation Spurious Response Attenuation : lower than 1 %

Rx power = -101dBm

Tone 1 power = -43dBm

Tone 2 power = -43dBm

Tone 1 : offset from carrier = $\pm$ 1.25 MHz

Tone 2 : offset from carrier = $\pm$ 2.05 MHz

2. 800MHz CELLULAR(AMPS)

1) General

Frequency Range

.Transmitter : 824 $\pm$ -849 MHz

.Receiver : 869 $\pm$ -894MHz

Channel Spacing : 30kHz

Number of Channels : 832

Duplex Spacing : 45MHz

Frequency Stability : ± 2.5 ppm(-30°C - 60°C , -22°F - 140°F)

Modulation/Demodulation

.Voice : PM

.Data : FM

Operating Temperature : -30°C - 60°C , -22°F - 140°F

Supply Voltage : 3.6V

2) Transmitter

RF output power : 26.8dBm (+.2/-4)

Carrier ON/OFF conditions

"ON" Condition : within ± 3 dB of specification output(in 2 ms)

"OFF" Condition : below -60dBm(in 2ms)

Compressor

Compression Rate : 2 : 1

Attack Time : 3ms

Recovery Time : 13.5ms

Reference Input : input power level for producing a nominal ± 2.9 kHz

: peak frequency deviation of transmitted carrier

Preamphasis : 6dB/OCT within 0.3 - 3 kHz

Maximum Frequency Deviation

F3 of G3 : ± 12 kHz

Supervisory Audio Tone : ± 2 kHz($\pm 10\%$)

Signaling Tone : ± 8 kHz($\pm 10\%$)

Wideband Data : ± 8 kHz($\pm 10\%$)

13.1 SAR TEST DATA SUMMARY

Ambient TEMPERATURE (°C) 22.0
Relative HUMIDITY (%) 47.0
Atmospheric PRESSURE (kPa) 94.0

Mixture Type: Brain

Dielectric Constant: 43.40

Conductivity: 0.90 S/m

Closest Distance (between E-Probe & Phone): 1.8 cm

13.2 Measurement Results (AMPS Head SAR)

FREQUENCY		Modulation	POWER (dBm)	Phantom Position	Antenna Position	SAR (W/kg)
MHz	Ch.					
824.04	991	AMPS	27.0	Left Ear	IN	1.1027
824.04	991	AMPS	27.0	Left Ear	OUT	0.6653
836.49	383	AMPS	27.0	Left Ear	IN	1.1667
836.49	383	AMPS	27.0	Left Ear	OUT	0.5233
848.97	799	AMPS	27.0	Left Ear	IN	1.1860
848.97	799	AMPS	27.0	Left Ear	OUT	0.9019
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population			Brain 1.6 W/kg (mW/g) averaged over 1 gram			

NOTES:

- The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration.
- All modes of operation were investigated and the worst-case are reported.
- Battery Type ☒ Standard ☐ Extended
Radiated measurements indicate that the extended-life battery produces a lower ERP, therefore the standard-life battery is used.
- Power Measured ☒ Conducted ☐ EIRP ☐ ERP
- SAR Measurement System ☐ SPEAG ☒ IDX
- SAR Configuration ☒ Head ☐ Body ☐ Hand


Randy Ortanez
President & Chief Engineer



Figure 14. Head SAR
Test Setup



SAMSUNG

PORTABLE CELLULAR
TELEPHONE
SPH-N200
User's Manual



SAMSUNG
ELECTRONICS

Draft version (2000.7.28)

Contents

Safety Precautions	5
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Your Phone	7
Unpacking	7
Phone Layout	8
Display	10
Backlight	12
Service Light	12

Getting Started	13
Installing Battery	13
Charging a Battery	13
Switching the Phone On/Off	17

Call Functions	20
Making a Call	20
Correcting the Number	21
Ending a Call	21
Emergency Dialing	22
Prepend Dialing	22
Redialing Last Number	23
Dialing from Phone Book Memory	23
Pause Dialing	25
Four-Digit Network Dialing	27
Four-Digit Dialing	28
Answering a Call	29
Caller ID Display	30
Viewing Missed Calls	31
In-Use Menu Options	32
Call Waiting	33
Call Forwarding	34
Three-Way Calling	35
Scratchpad Memory	36
Adjusting the Volume	36

Entering Text	37
Changing Text Input Mode	38
T9(English) Mode	39
Alpha Mode	42
Number Mode	44
Symbol Mode	44

Using the Menus	45
Accessing a Menu Functions by Scrolling	45
Accessing a Menu Functions by Using its Shortcut	46
Menu Map	47

Calls	50
Outgoing	50
Incoming	51
Missed	52
Erase History	53
Air Time	53

Phone Book	54
Find Name	54
Add New Entry	56
My Phone Number	58
Find Entry	58
Services	59

Messages	60
Voicemail	61
Page/Text	62
Browser Messages	63
Erase	63

Roaming	64
Set Mode	65
Call Guard	65

Calendar	66
Today	66
Month View	67
Jump To Date	69
To Do List	70
Countdown	71
Alarm Clock	72
World Clock	74
MiniBrowser	75
Launching the MiniBrowser	76
Exiting the MiniBrowser	77
Using the Soft Keys	77
Navigating the MiniBrowser	77
Entering Text, Numbers or Symbols	79
Using the Links	79
Initializing a Call from the MiniBrowser	80
Using Bookmarks	80
Setup/Tool	82
Sounds	82
Display	84
Data/Fax In	86
Security	87
Call Answer	90
Auto Answer	90
MiniBrowser	91
Language	91
Calculator	92
KeyGuard	93
Accessories	84
Using the Batteries	95
Safety Information	97
Glossary of Terms	101
Index	104
Quick Reference Card	109

FCC RF EXPOSURE INFORMATION

In August 1996 the Federal Communications Commission (FCC) of the United States with its action in Report and Order FCC 96-326 adopted an updated safety standard for human exposure to radio frequency electromagnetic energy emitted by FCC regulated transmitters. Those guidelines are consistent with the safety standard previously set by both U.S. and international standards bodies. The design of this phone complies with the FCC guidelines and these international standards.

Use only the supplied or an approved antenna. Unauthorized antennas, modifications, or attachments could impair call quality, damage the phone, or result in violation of FCC regulations.

Do not use the phone with a damaged antenna. If a damaged antenna comes into contact with the skin, a minor burn may result. Please contact your local dealer for replacement antenna.

Body-worn Operation

This device was tested for typical body-worn operations using a spacing of 2.5 cm between the phone and the body. To comply with FCC RF exposure requirements, a minimum separation distance of 2.5 cm must be maintained between the user's body and the phone, including the antenna, whether extended or retracted. The use of third-party belt-clips/ holsters with no metallic components that provide the minimum separation distance of 2.5 cm can be used to satisfy FCC RF exposure requirements. The use of non-tested accessories or other body-worn operations may not comply with FCC RF exposure requirements and should be avoided. Contact your local dealer for optional accessory items.

For more information about RF exposure, please visit the FCC web site at www.fcc.gov