



PCTEST ENGINEERING LABORATORY, INC.

6660-B Dobbin Road, Columbia, MD 21045 USA
Tel. 410.290.6652 / Fax 410.290.6554
http://www.pctestlab.com



CERTIFICATE OF COMPLIANCE FCC Part 24 & 22 Certification Class II Permissive Change

Applicant Name:
Samsung Electronics, Co. Ltd.
18600 Broadwick St.
Rancho Dominguez, CA 90220 USA

Date of Testing:
July 6-7, 2006
Test Site/Location:
PCTEST Lab, Columbia, MD, USA
Test Report Serial No.:
06062000526-W

FCC ID: A3LSGHZX20
APPLICANT: SAMSUNG ELECTRONICS, CO. LTD.

Application Type: Certification
FCC Classification: Licensed Transmitter Held to Ear (PCE)
FCC Rule Part(s): §24(E), §22(H); §2
EUT Type: Dual-Band Dual-Mode GSM/ EDGE/ WCDMA Phone with Bluetooth
Model(s): SGH-ZX20
Tx Frequency Range: 826.40 - 846.60 MHz (Cellular WCDMA) / 1852.4 - 1907.6 MHz (PCS WCDMA)
Max. RF Output Power: 0.194 W ERP WCDMA (22.873 dBm) /
0.199 W EIRP PCS WCDMA (22.951 dBm)

Max. SAR Measurement: 0.785 W/kg WCDMA850 Head SAR; 0.475 W/kg WCDMA850 Body SAR
1.36 W/kg WCDMA1900 Head SAR; 0.360 W/kg WCDMA1900 Body SAR

Emission Designator(s): 4M30F9W/ 4M23F9W
Test Device Serial No.: *identical prototype* [S/N: FD-091-E]
Class II Permissive Change: See Change Document.
Original Grant Date: April 12, 2006

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.

Grant Conditions: Power output listed is ERP for Part 22 and EIRP for Part 24. SAR compliance for body-worn operating configuration is based on a separation distance of 1.8 cm between the back of the unit and the body of the user. End-users must be informed of the body-worn operating requirements for satisfying RF exposure compliance. Belt clips or holsters may not contain metallic components.

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 Ortanez
President



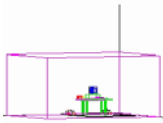
PCTEST™ PT. 22/24 TEST REPORT		FCC MEASUREMENT REPORT			Reviewed by: Quality Manager
Test Report S/N: 06062000526-W	Test Dates: July 6-7, 2006	EUT Type: Dual-Band Dual-Mode GSM/ EDGE/ WCDMA Phone with Bluetooth	FCC ID: A3LSGHZX20		Page 1 of 26

T A B L E O F C O N T E N T S

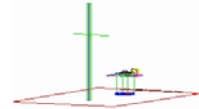
1.0	SCOPE	3
2.0	INTRODUCTION	4
2.1	TESTING FACILITY	4
2.2	MEASUREMENT PROCEDURE	4
3.0	INSERTS	5
4.0	DESCRIPTION OF TESTS	6
4.1	OCCUPIED BANDWIDTH EMISSION LIMITS	6
4.2	CELLULAR - BASE FREQUENCY BLOCKS	6
4.3	CELLULAR - MOBILE FREQUENCY BLOCKS	6
4.4	PCS - BASE FREQUENCY BLOCKS	7
4.5	PCS - MOBILE FREQUENCY BLOCKS	7
4.6	SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL	8
4.7	FREQUENCIES	8
4.8	RADIATED SPURIOUS AND HARMONIC EMISSIONS	8
4.9	FREQUENCY STABILITY / TEMPERATURE VARIATION	9
5.0	EFFECTIVE RADIATED POWER	11
5.1	EFFECTIVE RADIATED POWER OUTPUT DATA	11
6.0	EQUIVALENT ISOTROPIC RADIATED POWER	12
6.1	EQUIVALENT ISOTROPIC RADIATED POWER OUTPUT DATA	12
7.0	RADIATED MEASUREMENTS	13
8.1	CELLULAR WCDMA RADIATED MEASUREMENTS	13
8.2	PCS WCDMA RADIATED MEASUREMENTS	16
8.0	FREQUENCY STABILITY	19
8.1	FREQUENCY STABILITY (CELLULAR WCDMA)	19
8.2	FREQUENCY STABILITY (PCS WCDMA)	21
9.0	PLOT(S) OF EMISSIONS	23
10.0	TEST EQUIPMENT	24
11.0	SAMPLE CALCULATIONS	25
12.0	CONCLUSION	26
ATTACHMENT A: TEST PLOTS		
ATTACHMENT B: TEST SETUP PHOTOGRAPHS		
ATTACHMENT C: EXTERNAL PHOTOGRAPHS		
ATTACHMENT D: INTERNAL PHOTOGRAPHS		

PCTEST™ PT. 22/24 TEST REPORT		FCC MEASUREMENT REPORT		Reviewed by: Quality Manager
Test Report S/N: 06062000526-W	Test Dates: July 6-7, 2006	EUT Type: Dual-Band Dual-Mode GSM/ EDGE/ WCDMA Phone with Bluetooth	FCC ID: A3LSGHZX20	Page 2 of 26

1.0 SCOPE





Measurement and determination of electromagnetic emissions (EME) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission.



§2.1033 General Information

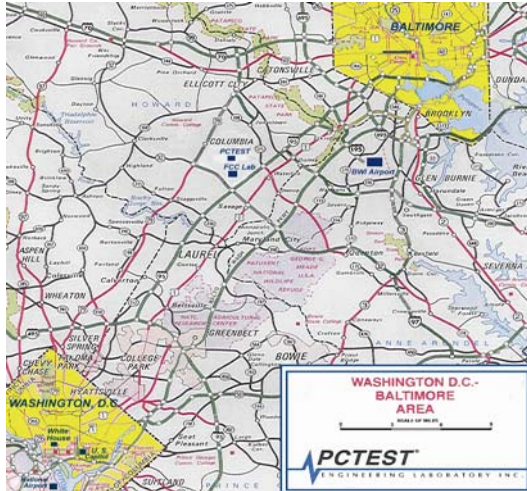
<p>Applicant Name: Samsung Electronics, Co. Ltd. Address: 18600 Broadwick St. Rancho Dominguez, CA 90220 USA</p>
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- FCC ID: A3LSGHZX20
- Quantity: Quantity production is planned
- Emission Designators: 4M18F9W/ 4M16F9W
- Tx Freq. Range: 826.40 - 846.60 MHz (Cellular WCDMA)/
1852.4 - 1907.6 MHz (PCS WCDMA)
- Max. Power Rating: 0.194 W ERP WCDMA ((22.873 dBm)) /
0.199 W EIRP PCS WCDMA (22.951 dBm)
- FCC Classification(s): PCS Licensed Portable Tx Held to Ear (PCE)
- Equipment (EUT) Type: Dual-Band Dual-Mode GSM/ EDGE/ WCDMA Phone with Bluetooth
- Modulation(s): WCDMA
- Frequency Tolerance: ± 0.00025 % (2.5 ppm)
- FCC Rule Part(s): § 24(E), §22(H)
- Dates of Tests: July 6-7, 2006
- Place of Tests: PCTEST Lab, Columbia, MD U.S.A.
- Test Report S/N: 06062000526-W
- *Deviation from measurement procedure – None*

PCTEST™ PT. 22/24 TEST REPORT		FCC MEASUREMENT REPORT		Reviewed by: Quality Manager
Test Report S/N: 06062000526-W	Test Dates: July 6-7, 2006	EUT Type: Dual-Band Dual-Mode GSM/ EDGE/ WCDMA Phone with Bluetooth	FCC ID: A3LSGHZX20	Page 3 of 26

2.0 INTRODUCTION

2.1 Testing Facility



These measurement tests were conducted at PCTEST Engineering Laboratory, Inc. facility in New Concept Business Park, Guilford Industrial Park, Columbia, Maryland. The site address is 6660-B Dobbin Road, Columbia, MD 21045. The test site is one of the highest points in the Columbia area with an elevation of 390 feet above mean sea level. The site coordinates are 39° 11'15" N latitude and 76° 49'38" W longitude. The facility is 1.5 miles North of the FCC laboratory, and the ambient signal and ambient signal strength are approximately equal to those of the FCC laboratory. There are no FM or TV transmitters within 15 miles of the site. The detailed description of the measurement facility was found to be in compliance with the requirements of § 2.948 according to ANSI C63.4 on October 19, 1992.

Figure 1. Map of the Greater Baltimore and Metropolitan Washington, D.C. area.

2.2 Measurement Procedure

The radiated spurious measurements were made outdoors at a 3-meter test range (see Figure2). The equipment under test is placed on a wooden turntable 3-meters from the receive antenna. The receive antenna height and turntable rotations were adjusted for the highest reading on the receive spectrum analyzer. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic antenna are taken into consideration.

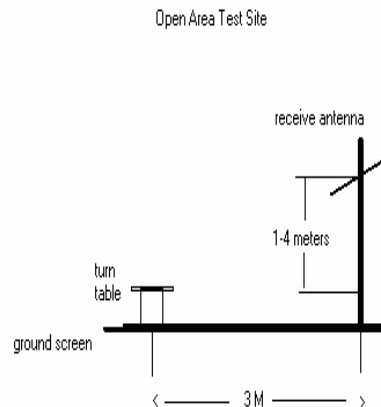




Figure 2. Diagram of 3-meter outdoor test range

PCTEST™ PT. 22/24 TEST REPORT		FCC MEASUREMENT REPORT		Reviewed by: Quality Manager
Test Report S/N: 06062000526-W	Test Dates: July 6-7, 2006	EUT Type: Dual-Band Dual-Mode GSM/ EDGE/ WCDMA Phone with Bluetooth	FCC ID: A3LSGHZX20	Page 4 of 26

3.0 INSERTS

Function of Active Devices (Confidential)

Block & Schematic Diagrams (Confidential)



Operating Instructions

Parts List & Tune-Up Procedure (Confidential)

Description of Freq. Stabilization Circuit (Confidential)

Description for Suppression of Spurious Radiation, for Limiting Modulation, and Harmonic Suppression Circuits (Confidential)

** These exhibits are not included*

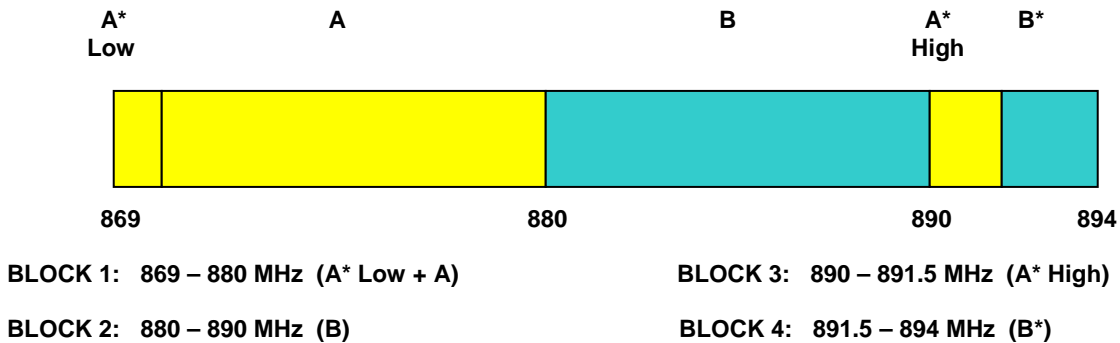
PCTEST™ PT. 22/24 TEST REPORT		FCC MEASUREMENT REPORT		Reviewed by: Quality Manager
Test Report S/N: 06062000526-W	Test Dates: July 6-7, 2006	EUT Type: Dual-Band Dual-Mode GSM/ EDGE/ WCDMA Phone with Bluetooth	FCC ID: A3LSGHZX20	Page 5 of 26

4.0 DESCRIPTION OF TESTS

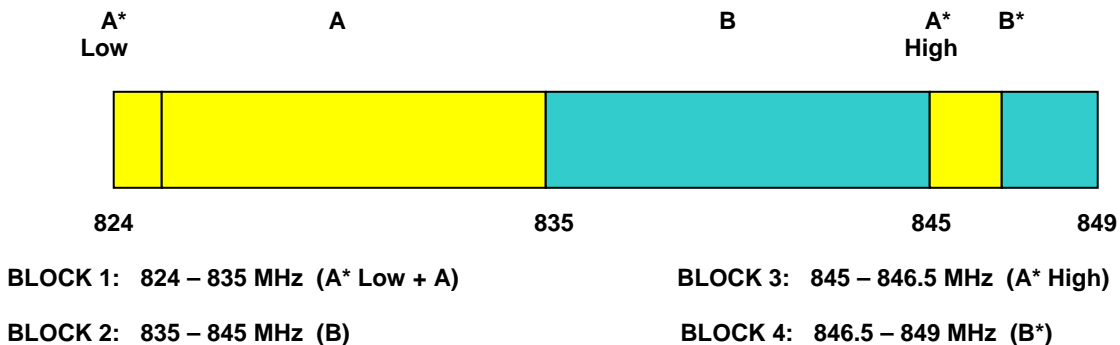
4.1 Occupied Bandwidth Emission Limits



- a. On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least $43 + 10 \log(P)$ dB.
- b. Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emission are attenuated at least 26 dB below the transmitter power.
- c. When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the licensee's frequency block edges, both upper and lower, as the design permits.
- d. The measurement of emission power can be expressed in peak or average values, provided they are expressed in the same parameters as the transmitter power.

4.2 Cellular - Base Frequency Blocks

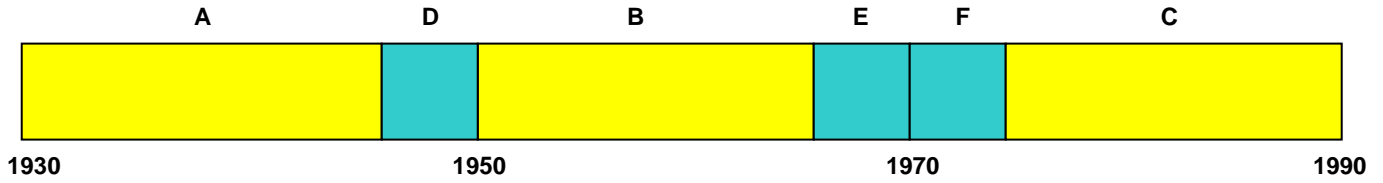


4.3 Cellular - Mobile Frequency Blocks



PCTEST™ PT. 22/24 TEST REPORT		FCC MEASUREMENT REPORT		Reviewed by: Quality Manager
Test Report S/N: 06062000526-W	Test Dates: July 6-7, 2006	EUT Type: Dual-Band Dual-Mode GSM/ EDGE/ WCDMA Phone with Bluetooth	FCC ID: A3LSGHZX20	Page 6 of 26

4.4 PCS - Base Frequency Blocks



BLOCK 1: 1930 – 1945 MHz (A)

BLOCK 4: 1965 – 1970 MHz (E)

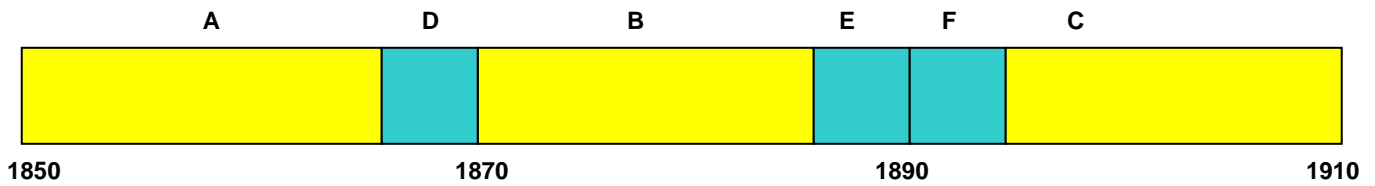
BLOCK 2: 1945 – 1950 MHz (D)

BLOCK 5: 1970 – 1975 MHz (F)

BLOCK 3: 1950 – 1965 MHz (B)

BLOCK 6: 1975 – 1990 MHz (C)

4.5 PCS - Mobile Frequency Blocks



BLOCK 1: 1850 – 1865 MHz (A)



BLOCK 4: 1885 – 1890 MHz (E)

BLOCK 2: 1865 – 1870 MHz (D)

BLOCK 5: 1890 – 1895 MHz (F)

BLOCK 3: 1870 – 1885 MHz (B)

BLOCK 6: 1895 – 1910 MHz (C)

PCTEST™ PT. 22/24 TEST REPORT		FCC MEASUREMENT REPORT		Reviewed by: Quality Manager
Test Report S/N: 06062000526-W	Test Dates: July 6-7, 2006	EUT Type: Dual-Band Dual-Mode GSM/ EDGE/ WCDMA Phone with Bluetooth	FCC ID: A3LSGHZX20	Page 7 of 26

4.6 Spurious and Harmonic Emissions at Antenna Terminal

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to 10 GHz. The transmitter is modulated with a 2500 Hz tone at a level of 16 dB greater than that required to provide 50% modulation.



At the input terminals of the spectrum analyzer, an isolator (RF circulator with one port terminated in 50 Ω) and an 870 MHz to 890 MHz band-pass filter is connected between the test transceiver (for conducted tests) or the receive antenna (for radiated tests) and the analyzer. The rejection of the band-pass filter to signals in the 825 – 845 MHz range is adequate to limit the transmit energy from the test transceiver which appears to a level which will allow the analyzer to measure signals less than –90 dBm. Calibration of the test receiver is performed in the 870 – 890 MHz range to insure accuracy to allow variation in the band-pass filter insertion loss to be calibrated.

4.7 Frequencies

At the input terminals of the spectrum analyzer, an isolator (RF pad) and a high-pass filter are connected between the test transceiver (for conducted tests) or the receive antenna (for radiated tests) and the analyzer. The high-pass filter (signals below 1.6 GHz) is to limit the fundamental frequency from interfering with the measurement of low-level spurious and harmonic emissions and to ensure that the preamplifier is not saturated.

4.8 Radiated Spurious and Harmonic Emissions

Radiation and harmonic emissions are measured outdoors at our 3-meter test range. The equipment under test is placed on a wooden turntable 3-meters from the receive antenna. The receive antenna height and turntable rotations were adjusted for the highest reading on the receive spectrum analyzer. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator with the level of the signal generator being adjusted to obtain the same receive spectrum analyzer reading. This level is recorded. For readings above 1 GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration. This device was tested under all R.C.s and S.O.s and the worst case is reported with RC3/SO55, with "All Up" power control bits.

PCTEST™ PT. 22/24 TEST REPORT		FCC MEASUREMENT REPORT		Reviewed by: Quality Manager
Test Report S/N: 06062000526-W	Test Dates: July 6-7, 2006	EUT Type: Dual-Band Dual-Mode GSM/ EDGE/ WCDMA Phone with Bluetooth	FCC ID: A3LSGHZX20	Page 8 of 26

4.9 Frequency Stability / Temperature Variation

The frequency stability of the transmitter is measured by:



- a.) **Temperature:** The temperature is varied from -30°C to +60°C using an environmental chamber.
- b.) **Primary Supply Voltage:** The primary supply voltage is varied from 85% to 115% of the voltage normally at the input to the device or at the power supply terminals if cables are not normally supplied.

Specification – The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within ± 0.00025 (± 2.5 ppm) of the center frequency.

Time Period and Procedure:

1. The carrier frequency of the transmitter and the individual oscillators is measured at room temperature (22°C to 25°C to provide a reference).
2. The equipment is subjected to an overnight “soak” at -30°C without any power applied.
3. After the overnight “soak” at -30°C (usually 14-16 hours), the equipment is turned on in a “standby” condition for one minute before applying power to the transmitter. Measurement of the carrier frequency of the transmitter and the individual oscillators is made within a three minute interval after applying power to the transmitter.
4. Frequency measurements are made at 10°C interval up to room temperature. At least a period of one and one half-hour is provided to allow stabilization of the equipment at each temperature level.
5. Again the transmitter carrier frequency and the individual oscillators is measured at room temperature to begin measurement of the upper temperature levels.
6. Frequency measurements are at 10 intervals starting at -30°C up to +50°C allowing at least two hours at each temperature for stabilization. In all measurements the frequency is measured within three minutes after re-applying power to the transmitter.
7. The artificial load is mounted external to the temperature chamber.

NOTE: The EUT is tested down to the battery endpoint.

PCTEST™ PT. 22/24 TEST REPORT		FCC MEASUREMENT REPORT			Reviewed by: Quality Manager
Test Report S/N: 06062000526-W	Test Dates: July 6-7, 2006	EUT Type: Dual-Band Dual-Mode GSM/ EDGE/ WCDMA Phone with Bluetooth	FCC ID: A3LSGHZX20	Page 9 of 26	

5.0 FCC 3G MEASUREMENT PROCEDURES – MAY 2006

The maximum output power is a measure of the maximum power the UE can transmit (i.e. the actual power as would be measured assuming no measurement error) in a bandwidth of at least $(1 + \alpha)$ times the chip rate of the radio access mode.



The default test configuration is to configure an established radio link between the UE and a communication test set using a 12.2 kbps RMC (reference measurement channel) configured in Test Loop Mode 1. Maximum output power is verified according to 3GPP TS 34.121 Section 5.2.

1. Configure TPC (Transmit Power Control) set to "All 1"s.
2. RMC and AMR connections at 12.2 kbps are measured under 3.4 kbps SRB (signaling radio bearer)
3. Measure the mean power of the UE in a bandwidth of at least $(1 + \alpha)$ times the chip rate of the radio access mode. The mean power shall be averaged over at least one timeslot.

Table 1
3GPP TS 34.121 Nominal Maximum Output Power

Operating Band	Power Class 3		Power Class 4	
	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)
Band II	+24	+1/-3	+21	+2/-2
Band V	+24	+1/-3	+21	+2/-2

		HSDPA Inactive		HSDPA Active	
UMTS	Channel	12.2 kbps RMC	12.2 kbps AMR	12.2 kbps RMC	12.2 kbps RMC
	4132	23.44	23.39	23.30	23.25
	4175	22.41	22.70	23.30	22.70
	4233	23.30	23.30	23.21	23.20
PCS	9262	23.48	23.50	23.40	23.45
	9400	23.60	23.60	23.50	23.55
	9538	23.37	23.56	23.33	23.50

PCTEST™ PT. 22/24 TEST REPORT		FCC MEASUREMENT REPORT		Reviewed by: Quality Manager
Test Report S/N: 06062000526-W	Test Dates: July 6-7, 2006	EUT Type: Dual-Band Dual-Mode GSM/ EDGE/ WCDMA Phone with Bluetooth	FCC ID: A3LSGHZX20	Page 10 of 26

6.0 EFFECTIVE RADIATED POWER

6.1 Effective Radiated Power Output Data

POWER: High (WCDMA Mode)

Freq. Tuned (MHz)	REF. LEVEL (dBm)	POL (H/V)	ERP (W)	ERP (dBm)	BATTERY
826.40	-18.400	H	0.194	22.873	Standard
836.40	-18.600	H	0.192	22.833	Standard
846.60	-18.900	H	0.185	22.683	Standard



Note: Standard batteries are the only options for this phone.

NOTES:

Effective Radiated Power Output Measurements by Substitution Method according to ANSI/TIA/EIA-603-A-2001, Aug. 15, 2001:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For WCDMA signals, a peak detector is used with RBW = VBW = 5 MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. The conducted power at the terminals of the dipole is measured. The ERP is recorded.

This device was tested under all AMR and RMO Modes and the worst case is reported with RMC 12.2 kbps.

PCTEST™ PT. 22/24 TEST REPORT		FCC MEASUREMENT REPORT		Reviewed by: Quality Manager
Test Report S/N: 06062000526-W	Test Dates: July 6-7, 2006	EUT Type: Dual-Band Dual-Mode GSM/ EDGE/ WCDMA Phone with Bluetooth	FCC ID: A3LSGHZX20	Page 11 of 26

7.0 EQUIVALENT ISOTROPIC RADIATED POWER

7.1 Equivalent Isotropic Radiated Power Output Data

Radiated measurements at 3 meters

Supply Voltage: 3.7 VDC
Modulation: PCS WCDMA

FREQ. (MHz)	REF. LEVEL (dBm)	POL (H/V)	Azimuth (o angle)	EIRP (dBm)	EIRP (W)	Battery
1852.40	-20.100	H	90	22.981	0.199	Standard
1880.00	-20.300	H	90	22.951	0.197	Standard
1907.60	-20.500	H	90	22.921	0.196	Standard



Note: Standard batteries are the only options for this phone.

NOTES:

Equivalent Isotropic Radiated Power Measurements by Substitution Method according to ANSI/TIA/EIA-603-A-2001, Aug. 15, 2001:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For WCDMA signals, a peak detector is used with RBW = VBW = 5 MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. The conducted power at the terminals of the dipole is measured. The ERP is recorded.

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PCTEST™ PT. 22/24 TEST REPORT		FCC MEASUREMENT REPORT		Reviewed by: Quality Manager
Test Report S/N: 06062000526-W	Test Dates: July 6-7, 2006	EUT Type: Dual-Band Dual-Mode GSM/ EDGE/ WCDMA Phone with Bluetooth	FCC ID: A3LSGHZX20	Page 12 of 26

8.0 RADIATED MEASUREMENTS

8.1 Cellular WCDMA Radiated Measurements

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 826.40 MHz
 CHANNEL: 4132 (Low)
 MEASURED OUTPUT POWER: 22.873 dBm = 0.194 W
 MODULATION SIGNAL: GSM (Internal)
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 35.88 dBc



FREQ. (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
1652.80	-51.08	6.10	-44.98	H	67.9
2479.20	-63.58	6.70	-56.88	H	79.8
3305.60	-89.58	6.80	-82.78	H	105.7
4132.00	-85.68	6.50	-79.18	H	102.1
4958.40	-84.38	7.00	-77.38	H	100.3

NOTES:

Radiated Spurious Emission Measurements by Substitution Method according to ANSI/TIA/EIA-603-A-2001, Aug. 15, 2001:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For WCDMA signals, a peak detector is used with RBW = VBW = 5 MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. The conducted power at the terminals of the dipole is measured. The ERP is recorded.

This device was tested under all AMR and RMO Modes and the worst case is reported with RMC 12.2 kbps.

PCTEST™ PT. 22/24 TEST REPORT		FCC MEASUREMENT REPORT		Reviewed by: Quality Manager
Test Report S/N: 06062000526-W	Test Dates: July 6-7, 2006	EUT Type: Dual-Band Dual-Mode GSM/ EDGE/ WCDMA Phone with Bluetooth	FCC ID: A3LSGHZX20	Page 13 of 26

8.1 Cellular WCDMA Radiated Measurements (Cont'd)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 835.00 MHz
 CHANNEL: 4175 (Mid)
 MEASURED OUTPUT POWER: 22.873 dBm = 0.194 W
 MODULATION SIGNAL: GSM (Internal)
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 35.87 dBc



FREQ. (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
1670.00	-52.48	6.10	-46.38	H	69.3
2505.00	-65.38	6.70	-58.68	H	81.6
3340.00	-89.48	6.80	-82.68	H	105.6
4175.00	-85.78	6.50	-79.28	H	102.2
5010.00	-83.78	7.00	-76.78	H	99.7

NOTES:

Radiated Spurious Emission Measurements by Substitution Method
 according to ANSI/TIA/EIA-603-A-2001, Aug. 15, 2001:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For WCDMA signals, a peak detector is used with RBW = VBW = 5 MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. The conducted power at the terminals of the dipole is measured. The ERP is recorded.

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PCTEST™ PT. 22/24 TEST REPORT		FCC MEASUREMENT REPORT		Reviewed by: Quality Manager
Test Report S/N: 06062000526-W	Test Dates: July 6-7, 2006	EUT Type: Dual-Band Dual-Mode GSM/ EDGE/ WCDMA Phone with Bluetooth	FCC ID: A3LSGHZX20	Page 14 of 26

8.1 Cellular WCDMA Radiated Measurements (Cont'd)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 846.60 MHz
 CHANNEL: 4233 (High)
 MEASURED OUTPUT POWER: 22.873 dBm = 0.194 W
 MODULATION SIGNAL: GSM (Internal)
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 35.87 dBc



FREQ. (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
1693.20	-51.88	6.10	-45.78	H	68.7
2539.80	-63.38	6.70	-56.68	H	79.6
3386.40	-89.08	6.80	-82.28	H	105.2
4233.00	-85.68	6.50	-79.18	H	102.1
5079.60	-83.98	7.00	-76.98	H	99.9

NOTES:

Radiated Spurious Emission Measurements by Substitution Method according to ANSI/TIA/EIA-603-A-2001, Aug. 15, 2001:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For WCDMA signals, a peak detector is used with RBW = VBW = 5 MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. The conducted power at the terminals of the dipole is measured. The ERP is recorded.

This device was tested under all AMR and RMO Modes and the worst case is reported with RMC 12.2 kbps.

PCTEST™ PT. 22/24 TEST REPORT		FCC MEASUREMENT REPORT		Reviewed by: Quality Manager
Test Report S/N: 06062000526-W	Test Dates: July 6-7, 2006	EUT Type: Dual-Band Dual-Mode GSM/ EDGE/ WCDMA Phone with Bluetooth	FCC ID: A3LSGHZX20	Page 15 of 26

8.2 PCS WCDMA Radiated Measurements

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 1852.40 MHz
 CHANNEL: 9262 (Low)
 MEASURED OUTPUT POWER: 22.981 dBm = 0.199 W
 MODULATION SIGNAL: GSM (Internal)
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 35.98 dBc



FREQ. (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
3704.80	-62.23	8.70	-53.53	H	76.5
5557.20	-83.23	9.70	-73.53	H	96.5
7409.60	-79.43	9.90	-69.53	H	92.5
9262.00	-77.43	11.40	-66.03	H	89.0
11114.40	-77.33	12.10	-65.23	H	88.2

NOTES:

Radiated Spurious Emission Measurements by Substitution Method according to ANSI/TIA/EIA-603-A-2001, Aug. 15, 2001:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For WCDMA signals, a peak detector is used with RBW = VBW = 5 MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. The conducted power at the terminals of the dipole is measured. The ERP is recorded.

This device was tested under all AMR and RMO Modes and the worst case is reported with RMC 12.2 kbps.

PCTEST™ PT. 22/24 TEST REPORT		FCC MEASUREMENT REPORT		Reviewed by: Quality Manager
Test Report S/N: 06062000526-W	Test Dates: July 6-7, 2006	EUT Type: Dual-Band Dual-Mode GSM/ EDGE/ WCDMA Phone with Bluetooth	FCC ID: A3LSGHZX20	Page 16 of 26

8.2 PCS WCDMA Radiated Measurements (Cont'd)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 1880.00 MHz
 CHANNEL: 9400 (Mid)
 MEASURED OUTPUT POWER: 22.981 dBm = 0.199 W
 MODULATION SIGNAL: GSM (Internal)
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 35.98 dBc



FREQ. (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
3760.00	-60.83	8.70	-52.13	H	75.1
5640.00	-83.03	9.70	-73.33	H	96.3
7520.00	-79.13	9.90	-69.23	H	92.2
9400.00	-77.23	11.40	-65.83	H	88.8
11280.00	-77.13	12.10	-65.03	H	88.0

NOTES:

Radiated Spurious Emission Measurements by Substitution Method according to ANSI/TIA/EIA-603-A-2001, Aug. 15, 2001:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For WCDMA signals, a peak detector is used with RBW = VBW = 5 MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. The conducted power at the terminals of the dipole is measured. The ERP is recorded.

This device was tested under all AMR and RMO Modes and the worst case is reported with RMC 12.2 kbps.

PCTEST™ PT. 22/24 TEST REPORT		FCC MEASUREMENT REPORT		Reviewed by: Quality Manager
Test Report S/N: 06062000526-W	Test Dates: July 6-7, 2006	EUT Type: Dual-Band Dual-Mode GSM/ EDGE/ WCDMA Phone with Bluetooth	FCC ID: A3LSGHZX20	Page 17 of 26

8.2 PCS WCDMA Radiated Measurements (Cont'd)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 1907.60 MHz
 CHANNEL: 9538 (High)
 MEASURED OUTPUT POWER: 22.981 dBm = 0.199 W
 MODULATION SIGNAL: GSM (Internal)
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 35.98 dBc



FREQ. (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
3815.20	-59.33	8.70	-50.63	H	73.6
5722.80	-82.83	9.70	-73.13	H	96.1
7630.40	-78.93	9.90	-69.03	H	92.0
9538.00	-76.93	11.40	-65.53	H	88.5
11445.60	-76.93	12.10	-64.83	H	87.8

NOTES:

Radiated Spurious Emission Measurements by Substitution Method according to ANSI/TIA/EIA-603-A-2001, Aug. 15, 2001:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For WCDMA signals, a peak detector is used with RBW = VBW = 5 MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. The conducted power at the terminals of the dipole is measured. The ERP is recorded.

This device was tested under all AMR and RMO Modes and the worst case is reported with RMC 12.2 kbps.



PCTEST™ PT. 22/24 TEST REPORT		FCC MEASUREMENT REPORT			Reviewed by: Quality Manager
Test Report S/N: 06062000526-W	Test Dates: July 6-7, 2006	EUT Type: Dual-Band Dual-Mode GSM/ EDGE/ WCDMA Phone with Bluetooth	FCC ID: A3LSGHZX20	Page 18 of 26	

9.0 FREQUENCY STABILITY

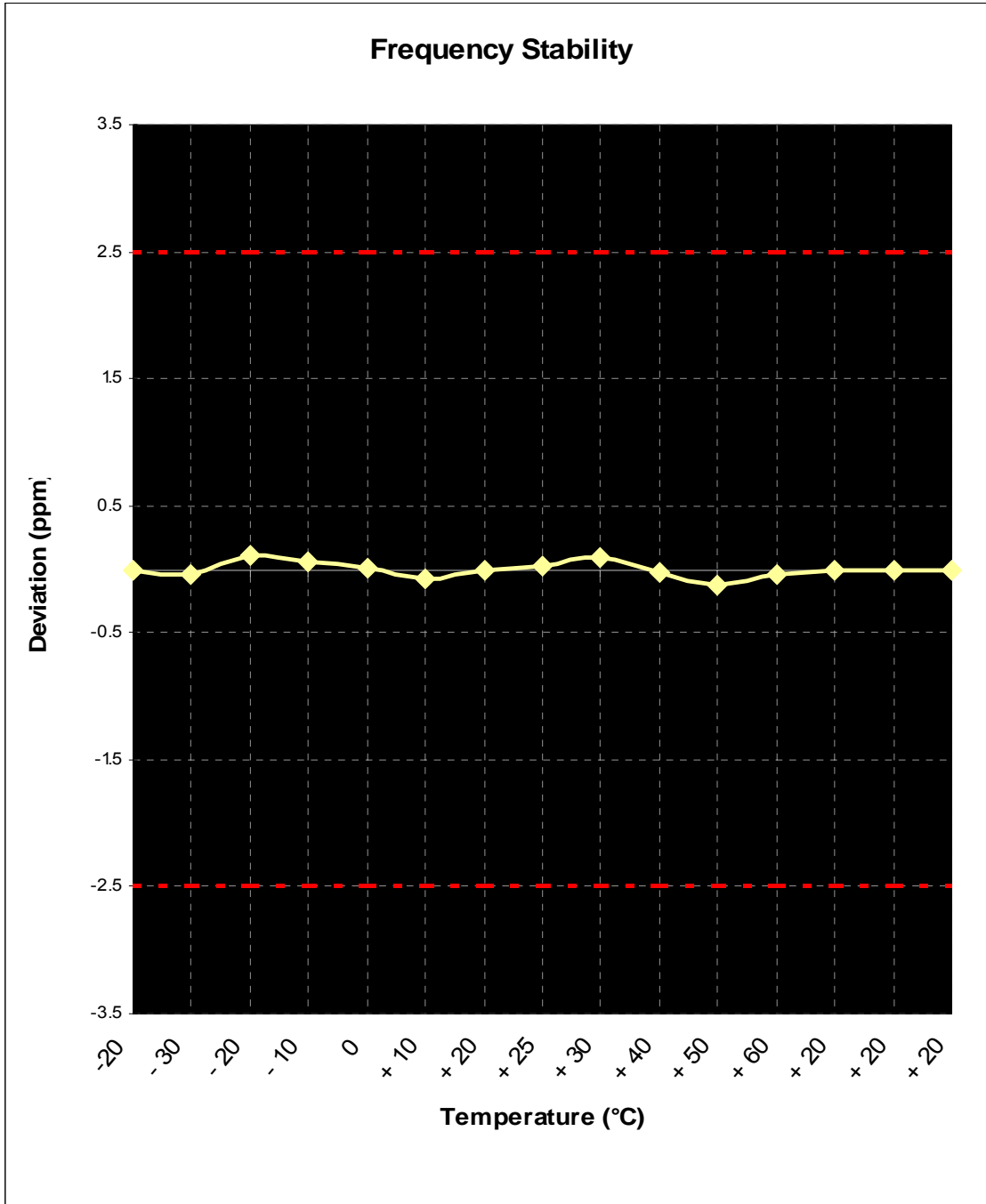
9.1 Frequency Stability (Cellular WCDMA)



OPERATING FREQUENCY: 836,520,009 Hz
 CHANNEL: 383
 REFERENCE VOLTAGE: 3.7 VDC
 DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQ. (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.70	+ 20 (Ref)	836,520,009	0.00	0.000000
100 %		- 30	836,520,042	-33.46	-0.000004
100 %		- 20	836,519,917	92.02	0.000011
100 %		- 10	836,519,959	50.19	0.000006
100 %		0	836,520,001	8.37	0.000001
100 %		+ 10	836,520,068	-58.56	-0.000007
100 %		+ 20	836,520,009	0.00	0.000000
100 %		+ 25	836,519,992	16.73	0.000002
100 %		+ 30	836,519,934	75.29	0.000009
100 %		+ 40	836,520,034	-25.10	-0.000003
100 %		+ 50	836,520,109	-100.38	-0.000012
100 %		+ 60	836,520,051	-41.83	-0.000005
85 %	3.17	+ 20	836,520,009	0.00	0.000000
115 %	4.26	+ 20	836,520,009	0.00	0.000000
BATT. ENDPOINT	3.01	+ 20	836,520,009	0.00	0.000000

PCTEST™ PT. 22/24 TEST REPORT		FCC MEASUREMENT REPORT			Reviewed by: Quality Manager
Test Report S/N: 06062000526-W	Test Dates: July 6-7, 2006	EUT Type: Dual-Band Dual-Mode GSM/ EDGE/ WCDMA Phone with Bluetooth	FCC ID: A3LSGHZX20	Page 19 of 26	

9.1 Frequency Stability (Cellular WCDMA) (Cont'd)



PCTEST™ PT. 22/24 TEST REPORT		FCC MEASUREMENT REPORT		 Reviewed by: Quality Manager
Test Report S/N: 06062000526-W	Test Dates: July 6-7, 2006	EUT Type: Dual-Band Dual-Mode GSM/ EDGE/ WCDMA Phone with Bluetooth	FCC ID: A3LSGHZX20	Page 20 of 26

9.2 Frequency Stability (PCS WCDMA)

8.4 FREQUENCY STABILITY (WCDMA PCS)



OPERATING FREQUENCY: 1,880,000,006 Hz

CHANNEL: 9400

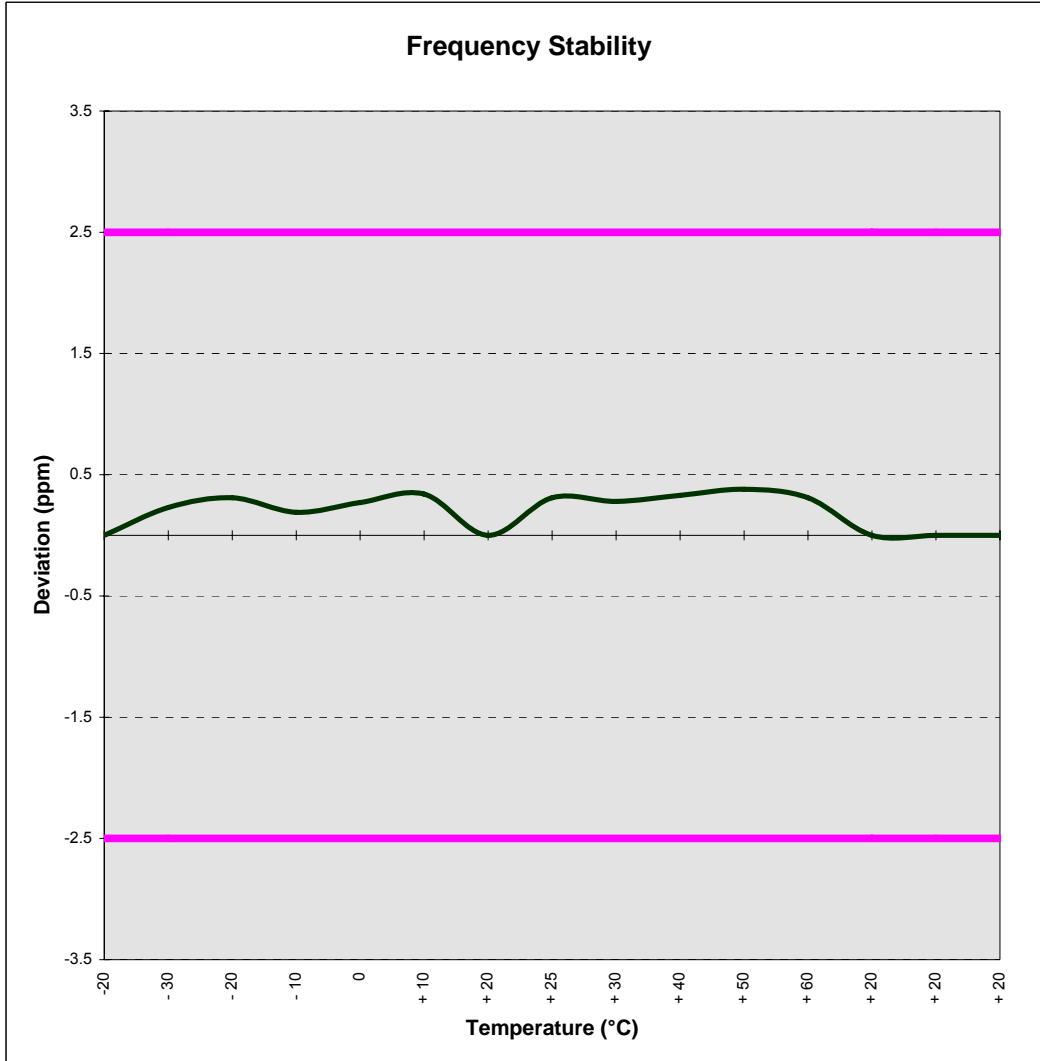
REFERENCE VOLTAGE: 3.7 VAC



DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQ. (Hz)	Deviation (%)
100 %	3.70	+ 20 (Ref)	1,880,000,006	0.000000
100 %		- 30	1,879,999,574	0.000023
100 %		- 20	1,879,999,423	0.000031
100 %		- 10	1,879,999,649	0.000019
100 %		0	1,879,999,498	0.000027
100 %		+ 10	1,879,999,367	0.000034
100 %		+ 20	1,880,000,006	0.000000
100 %		+ 25	1,879,999,423	0.000031
100 %		+ 30	1,879,999,480	0.000028
100 %		+ 40	1,879,999,386	0.000033
100 %		+ 50	1,879,999,292	0.000038
100 %		+ 60	1,879,999,423	0.000031
85 %	3.15	+ 20	1,880,000,006	0.000000
115 %	4.26	+ 20	1,880,000,006	0.000000
BATT. ENDPOINT	3.05	+ 20	1,880,000,006	0.000000

PCTEST™ PT. 22/24 TEST REPORT		FCC MEASUREMENT REPORT			Reviewed by: Quality Manager
Test Report S/N: 06062000526-W	Test Dates: July 6-7, 2006	EUT Type: Dual-Band Dual-Mode GSM/ EDGE/ WCDMA Phone with Bluetooth	FCC ID: A3LSGHZX20	Page 21 of 26	



9.2 Frequency Stability (PCS WCDMA) (Cont'd)



PCTEST™ PT. 22/24 TEST REPORT		FCC MEASUREMENT REPORT		Reviewed by: Quality Manager
Test Report S/N: 06062000526-W	Test Dates: July 6-7, 2006	EUT Type: Dual-Band Dual-Mode GSM/ EDGE/ WCDMA Phone with Bluetooth	FCC ID: A3LSGHZX20	Page 22 of 26



10.0 PLOT(S) OF EMISSIONS

(SEE ATTACHMENT A)

PCTEST™ PT. 22/24 TEST REPORT		FCC MEASUREMENT REPORT		Reviewed by: Quality Manager
Test Report S/N: 06062000526-W	Test Dates: July 6-7, 2006	EUT Type: Dual-Band Dual-Mode GSM/ EDGE/ WCDMA Phone with Bluetooth	FCC ID: A3LSGHZX20	Page 23 of 26

11.0 TEST EQUIPMENT

TYPE	MODEL	CAL DUE DATE S/N	
Signal Generator	Rohde & Schwarz (0.1-1000MHz)	9/11/2006	894215/012
Ailtech/Eaton Receiver	NM 37/57A-SL (30-1000MHz)	4/12/2007	0792-03271
Ailtech/Eaton Receiver	NM 37/57A (30-1000MHz)	3/11/2007	0805-03334
Ailtech/Eaton Receiver	NM 17/27A (0.1-32MHz)	9/17/2006	0608-03241
Ailtech/Eaton Adapter	CCA-7 CISPR/ANSI QP Adapter	3/11/2007	0194-04082
Harmonic/Flicker	Test System HP 6841A (IEC 555-2/3)	2/11/2007	3531A00115/ PCT468
Shielded Screen Room	RF Lindgren Model 26-2/2-0	6/19/2006	6710 (PCT270)
Shielded Semi-Anechoic Chamber	Ray Proof Model S81	4/17/2007	R2437 (PCT278)
Quasi-Peak Adapter	HP 85650A	8/9/2006	2043A00301
Microwave Spectrum Analyzer	HP 8566B (100Hz-22GHz)	8/15/2006	3638A08713
Microwave Spectrum Analyzer	HP 8566B (100Hz-22GHz)	4/17/2007	2542A11898
Spectrum Analyzer/Tracking Gen.	HP 8591A (100Hz-1.8GHz)	9/12/2006	3144A02458
Signal Generator	HP 8640B (500Hz-1GHz)	6/3/2006	2232A19558
Signal Generator	HP 8640B (500Hz-1GHz)	6/3/2006	1851A09816
Signal Generator	HP 8648D (9kHz-4GHz)	5/1/2007	3613A00315
Spectrum Analyzer	HP 8594A	11/2/2006	3051A00187
Spectrum Analyzer (2)	HP 8591A	10/15/2006	3034A01395, 3108A02053
Audio Analyzer	HP 8903B		3011A09025
Modulation Analyzer	HP 8901A		2432A03467
Power Meter	HP 437B		3125U24437
Power Sensor	HP 8482H (30mW-3W)		2237A02084
Broadband Amplifier (2)	HP 8447D		1145A00470, 1937A03348
Broadband Amplifier	HP 8447F		2443A03784
Network Analyzer	HP 8753E (30kHz-3GHz)		JP38020182
Attenuator	HP 8495A (0-70dB) DC-4GHz		
Horn Antenna	EMCO Model 3115 (1-18GHz)		9704-5182
Horn Antenna	EMCO Model 3115 (1-18GHz)		9205-3874
Horn Antenna	EMCO Model 3116 (18-40GHz)		9203-2178
Biconical Antenna (4)	Eaton 94455/Eaton 94455-1/Singer 94455-1/Compliance Design		1295, 1332, 0355
Log-Spiral Antenna (3)	Ailtech/Eaton 93490-1		0608, 1103, 1104
Roberts Dipoles	Compliance Design (1 set)		
Ailtech Dipoles	DM-105A (1 set)		33448-111
EMCO LISN (6)	3816/2		1079
Microwave Preamplifier 40dB	Gain HP 83017A (0.5-26.5GHz)		3123A00181
Microwave Cables	MicroCoax (1.0-26.5GHz)		
Gigatronics Universal Power Meter	8657A		1835256
Gigatronics Power Sensor	80701A (0.05-18GHz)		1833460
Amplifier Research	5S1G4 (5W, 800MHz-4.2GHz)		22322
Microwave Survey Meter	Holiday Model 1501 (2.450GHz)		80931
Digital Thermometer	Extech Instruments 421305		426966
Bi-Directional Coax Coupler	Narda 3020A (50-1000MHz)		
Environmental Chamber	Associated Systems Model 1025 (Temperature/Humidity)		PCT285

PCTEST™ PT. 22/24 TEST REPORT		FCC MEASUREMENT REPORT		Reviewed by: Quality Manager
Test Report S/N: 06062000526-W	Test Dates: July 6-7, 2006	EUT Type: Dual-Band Dual-Mode GSM/ EDGE/ WCDMA Phone with Bluetooth	FCC ID: A3LSGHZX20	Page 24 of 26

12.0 SAMPLE CALCULATIONS

Emission Designator



Emission Designator = 4M18F9W

CDMA BW = 4.18 MHz

F = Frequency Modulation



9 = Composite Digital Information

W = Combination (Audio/Data)
(measured at the 99.75% power bandwidth)

PCTEST™ PT. 22/24 TEST REPORT		FCC MEASUREMENT REPORT			Reviewed by: Quality Manager
Test Report S/N: 06062000526-W	Test Dates: July 6-7, 2006	EUT Type: Dual-Band Dual-Mode GSM/ EDGE/ WCDMA Phone with Bluetooth	FCC ID: A3LSGHZX20	Page 25 of 26	

13.0 CONCLUSION

The data collected shows that the Samsung Dual-Band Dual-Mode GSM/ EDGE/ WCDMA Phone with Bluetooth FCC ID: A3LSGHZX20 complies with all the requirements of Parts 2, 22, and 24 of the FCC rules.

PCTEST™ PT. 22/24 TEST REPORT		FCC MEASUREMENT REPORT		Reviewed by: Quality Manager
Test Report S/N: 06062000526-W	Test Dates: July 6-7, 2006	EUT Type: Dual-Band Dual-Mode GSM/ EDGE/ WCDMA Phone with Bluetooth	FCC ID: A3LSGHZX20	Page 26 of 26