

**Nemko Test Report No.:**

1L0042RUS1

**Applicant:**

Samsung Telecommunications America  
1130 Arapaho Road  
Richardson, Texas 75081

**Equipment Under Test:**

V4 Outdoor BTS

**FCC ID:**

NP8SCBS-419M

**In Accordance With:**

**FCC Part 24, Subpart E**  
Broadband PCS Base Station Transmitter

**Tested By:**

Nemko Dallas Inc.  
802 N. Kealy  
Lewisville, Texas 75057-3136



**Authorized By:**

Tom Tidwell, Wireless Group Manager

**Date:**

February, 2001

**Total Number of Pages:**

35

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EQUIPMENT: V4 Outdoor BTS

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**Section 1. Summary of Test Results**

Manufacturer: Samsung Telecommunications

Model No.: SCBS-319M

Serial No.: None

General: **All measurements are traceable to national standards.**

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with FCC Part 24, Subpart E.



New Submission



Production Unit



Class II Permissive Change



Pre-Production Unit

THIS TEST REPORT RELATES ONLY TO THE ITEM(S) TESTED.

THE FOLLOWING DEVIATIONS FROM, ADDITIONS TO, OR EXCLUSIONS FROM THE TEST SPECIFICATIONS HAVE BEEN MADE.

See " Summary of Test Data".



**NVLAP LAB CODE: 100426-0**

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This report applies only to the items tested.

EQUIPMENT: V4 Outdoor BTS

FCC ID: NP8SCBS-419M

REPORT NO.: 1L0042RUS1

**Summary Of Test Data**

NAME OF TEST	PARA. NO.	SPEC.	MEAS.	RESULT
RF Power Output	24.232	100W	18.2W	Complies
Occupied Bandwidth (CDMA)	24.238	Graph	Graph	Complies
Occupied Bandwidth (GSM)	24.238	N/A	N/A	N/A
Occupied Bandwidth (NADC)	24.238	N/A	N/A	N/A
Spurious Emissions at Antenna Terminals	24.238(a)	-13 dBm	> -13 dBm	Complies
Field Strength of Spurious Emissions	24.238(a)	-13 dBm E.R.P.	< -39 dBm	Complies
Frequency Stability	24.235	Must remain within the authorized band	Maximum freq. error -117 Hz	Complies

**Footnotes:**

1. The E.U.T. is CDMA only.

**Measurement uncertainty is expressed to a confidence level of 95%.**

## Section 2. General Equipment Specification

<b>Supply Voltage Input:</b>	+27 Vdc		
<b>Frequency Bands: TX</b>	<input checked="" type="checkbox"/>	Block A :	1930 – 1945 MHz
	<input checked="" type="checkbox"/>	Block D :	1945 – 1950 MHz
	<input checked="" type="checkbox"/>	Block B :	1950 – 1965 MHz
	<input checked="" type="checkbox"/>	Block E :	1965 – 1970 MHz
	<input checked="" type="checkbox"/>	Block F :	1970 – 1975 MHz
	<input checked="" type="checkbox"/>	Block C :	1975 – 1990 MHz
<b>Frequency Bands: RX</b>	<input checked="" type="checkbox"/>	Block A :	1850 – 1865 MHz
	<input checked="" type="checkbox"/>	Block B :	1865 – 1870 MHz
	<input checked="" type="checkbox"/>	Block C :	1870 – 1885 MHz
	<input checked="" type="checkbox"/>	Block D :	1885 – 1890 MHz
	<input checked="" type="checkbox"/>	Block E :	1890 – 1895 MHz
	<input checked="" type="checkbox"/>	Block F :	1895 – 1910 MHz
<b>Type of Modulation and Designator:</b>	<b>CDMA</b> (1M25G7W) <input checked="" type="checkbox"/>	<b>GSM</b> (200KGXW) <input type="checkbox"/>	<b>NADC</b> (40K0DXW) <input type="checkbox"/>
<b>Maximum No. of Carriers:</b>	3		
<b>Output Impedance:</b>	50 ohms		
<b>RF Output (Rated):</b>	Per channel:	20 W	
	Total:	60 W	
<b>Band Selection:</b>	<b>Software</b> <input checked="" type="checkbox"/>	<b>Duplexer</b> <input checked="" type="checkbox"/>	<b>Fullband</b> <input type="checkbox"/>

*EQUIPMENT:* V4 Outdoor BTS

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**Description of Modifications For Class II Permissive Change**

**Not Applicable**

### System Description

The V4 family of Base Station Transmitters consists of the following models:

SCBS-319L - V4 Indoor Base Station Transmitter which holds FCC ID. NP8SCBS-319L

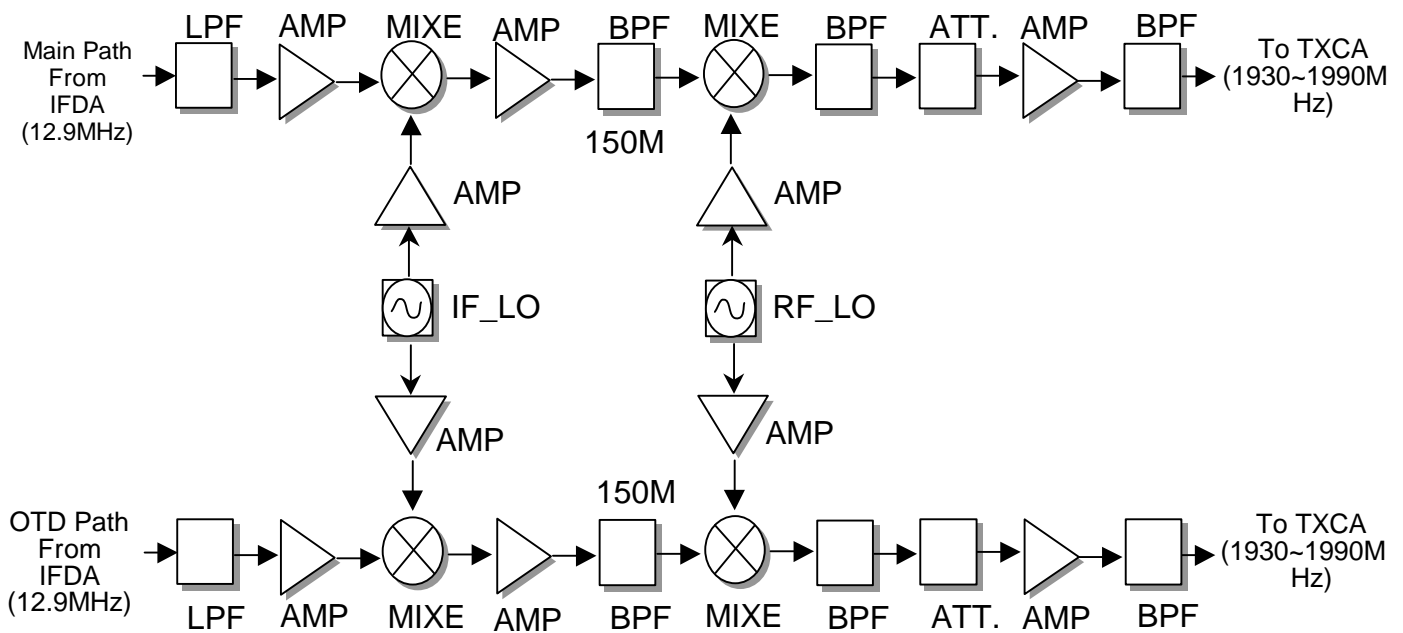
SCBS-319M - V4 Outdoor Base Station Transmitter. The FCC approval is applied for with this report.

These two units use the same modules but simply house them in different enclosures. The outdoor enclosure includes additional environmental control circuitry including cooling fans. Testing was repeated on the Outdoor unit (SCBS-319M) for frequency stability and field strength of spurious emissions. Testing for rf power output and antenna conducted spurious emissions was not repeated but the data for the indoor unit was repeated in this report as representative of both configurations.

The V4 BTS is a PCS band base station transceiver for use in CDMA wireless systems. The modulation used is QPSK and the access protocol is CDMA IS-98. The BTS can transmit up to 3 carriers with a nominal rf power output level of 20W/carrier. The maximum total rf output power is, therefore, 60 W.

The SCBS-419M is housed in an outdoor type enclosure and is connected to an antenna mounted on a permanent outdoor structure.

### System Diagram



EQUIPMENT: V4 Outdoor BTS

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**Section 3. RF Power Output**

NAME OF TEST: RF Power Output	PARA. NO.: 2.1046
TESTED BY: David Light	DATE: 12/14/00

**Test Results:** Complies.

**Measurement Data:**

Modulation Type	Measured Output Power (dBm)	External Cable Loss (dB)	Corrected Output Power (dBm)	Rated Output Power (dBm)	Measured/Rated Output Power (dB)
CDMA	+41.8	0.8	+42.6	+43.0	-0.4
GSM	N/A	N/A	N/A	N/A	N/A
NADC	N/A	N/A	N/A	N/A	N/A



EQUIPMENT: V4 Outdoor BTS

FCC ID: NP8SCBS-419M

REPORT NO.: 1L0042RUS1

### Test Data - RF Power Output

<b>Test Plot: RF POWER OUT</b>	
Page 1 of 1	
Job No.: 0L0471R	Date: 12/14/00
Specification: PART 24	Temperature(°C): 22
Tested By: David Light	Relative Humidity(%): 50
E.U.T.: INDOOR BTS	
Configuration: TRANSMIT ONE CDMA CHANNEL - FULL POWER - C BLOCK	
Serial Number: NONE	
Location: SAMSUNG (IN SITU)	RBW: 30 kHz
Detector Type: Rms	VBW: 300 kHz
<b>Test Equipment Used</b>	
Antenna: #N/A	Directional Coupler: #N/A
Pre-Amp: #N/A	Cable #1: #N/A
Filter: #N/A	Cable #2: #N/A
Receiver: 1036	Cable #3: #N/A
Attenuator #1: 1471	Cable #4: #N/A
Attenuator #2: #N/A	Mixer: #N/A
Additional equipment used: 1048 BIRD ATTENUATOR MODEL 1000-WA-FFN-30 (PROPERTY OF SAMSUNG)	
Measurement Uncertainty: #N/A	

Ref Lvl	50 dBm	Marker 1 [T1]	27.92 dBm	RBW	30 kHz	RF Att	10 dB
			1.98249110 GHz	VBW	300 kHz	Mixer	-10 dBm
				SWT	7 ms	Unit	dBm

50 dB Offset

▼1 [T1] 27.92 dBm

1.98249110 GHz LN

CH PWR 41.75 dBm SGL

CH BW 1.23000000 MHz

1 MAX

Paste Plot Here

1RM

TDF

Center 1.982508078 GHz 246 kHz

Span 2.46 MHz

Date: 14.DEC.2000 14:18:06

Notes:

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*EQUIPMENT:* [V4 Outdoor BTS](#)

*FCC ID:* NP8SCBS-419M

REPORT NO.: [1L0042RUS1](#)

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NAME OF TEST: Occupied Bandwidth (CDMA)	PARA. NO.: 2.1049
TESTED BY: David Light	DATE: 12/14/00

**Test Results:** Complies.

**Test Data:** See attached plot(s).

EQUIPMENT: V4 Outdoor BTS

FCC ID: NP8SCBS-419M

REPORT NO.: 1L0042RUS1

### Test Data - Occupied Bandwidth (CDMA)

<u>Test Plot: RF POWER OUT</u>	
Page 1 of 1	
Job No.: 0L0471R	Date: 12/14/00
Specification: PART 24	Temperature(°C): 22
Tested By: David Light	Relative Humidity(%) 50
E.U.T.: INDOOR BTS	
Configuration: TRANSMIT ONE CDMA CHANNEL - FULL POWER - C BLOCK	
Serial Number: NONE	
Location: SAMSUNG (IN SITU)	RBW: 30 kHz
Detector Type: Peak	VBW: 30 kHz
<b>Test Equipment Used</b>	
Antenna: #N/A	Directional Coupler: #N/A
Pre-Amp: #N/A	Cable #1: #N/A
Filter: #N/A	Cable #2: #N/A
Receiver: 1036	Cable #3: #N/A
Attenuator #1: 1471	Cable #4: #N/A
Attenuator #2: #N/A	Mixer: #N/A
Additional equipment used: 1048 BIRD ATTENUATOR MODEL 1000-WA-FFN-30 (PROPERTY OF SAMSUNG)	
Measurement Uncertainty: #N/A	

	Marker 1 [T1]	RBW 30 kHz	RF Att 10 dB
	15.21 dBm	VBW 30 kHz	Mixer -10 dBm
Ref Lvl 41.8 dBm	1.98184008 GHz	SWT 7 ms	Unit dBm

Center 1.982508078 GHz	246 kHz	Span 2.46 MHz
Date: 14.DEC.2000 14:21:35		

<b>Notes:</b>	
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EQUIPMENT: V4 Outdoor BTS

FCC ID: NP8SCBS-419M

REPORT NO.: 1L0042RUS1

NAME OF TEST: Occupied Bandwidth (GSM)	PARA. NO.: 2.1049
TESTED BY:	DATE:

Test Results:

Complies.

Test Data:

See attached reports.

Equipment Used:

**Not Applicable**

Measurement Uncertainty: +/- 1.6 dB

Temperature: °C

Relative Humidity: %

EQUIPMENT: V4 Outdoor BTS

FCC ID: NP8SCBS-419M

REPORT NO.: 1L0042RUS1

NAME OF TEST: Occupied Bandwidth (NADC)	PARA. NO.: 2.1049
TESTED BY:	DATE:

Test Results: Complies.

Test Data: See attached report

Equipment Used:

**Not Applicable**

Measurement Uncertainty: +/- 1.6 dB

Temperature: °C

Relative Humidity: %

*EQUIPMENT:* V4 Outdoor BTS

*FCC ID:* NP8SCBS-419M

REPORT NO.: 1L0042RUS1

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**Section 5. Spurious Emissions at Antenna Terminals**

NAME OF TEST: Spurious Emissions @ Antenna Terminals	PARA. NO.: 2.1051
TESTED BY: David Light	DATE: 12/14/00

**Test Results:** Complies.

**Test Data:**

See attached plots

EQUIPMENT: V4 Outdoor BTS

FCC ID: NP8SCBS-419M

REPORT NO.: 1L0042RUS1

Test Data - Spurious Emissions at Antenna Terminals

**Test Plot: ANTENNA PORT SPURIOUS**

Page 1 of 2

Job No.: 0L0471R Date: 12/14/00  
 Specification: PART 24 Temperature(°C): 22  
 Tested By: David Light Relative Humidity(%) 50  
 E.U.T.: INDOOR BTS  
 Configuration: TRANSMIT ONE CDMA CHANNEL - FULL POWER - C BLOCK  
 Serial Number: NONE  
 Location: SAMSUNG (IN SITU) RBW: 100 kHz < 1 GHz, 1 MHz > 1 GHz  
 Detector Type: Peak VBW: 100 kHz < 1 GHz, 1 MHz > 1 GHz

**Test Equipment Used**

Antenna: #N/A	Directional Coupler: #N/A
Pre-Amp: #N/A	Cable #1: #N/A
Filter: #N/A	Cable #2: #N/A
Receiver: 1036	Cable #3: #N/A
Attenuator #1: 1471	Cable #4: #N/A
Attenuator #2: #N/A	Mixer: #N/A

Additional equipment used: 1048 BIRD ATTENUATOR MODEL 1000-WA-FFN-30 (PROPERTY OF SAMSUNG)  
 Measurement Uncertainty: #N/A

Ref	Lvl	Marker 1 [11]	RBW	100 kHz	RF Att	10 dB
44.1	dBm	-28.49 dBm	VBW	100 kHz	Mixer	-10 dBm
		624.82965932 MHz	SWT	245 ms	Unit	dBm

Start 30 MHz 97 MHz/ Stop 1 GHz

Date: 14.DEC.2000 13:17:10

Notes:

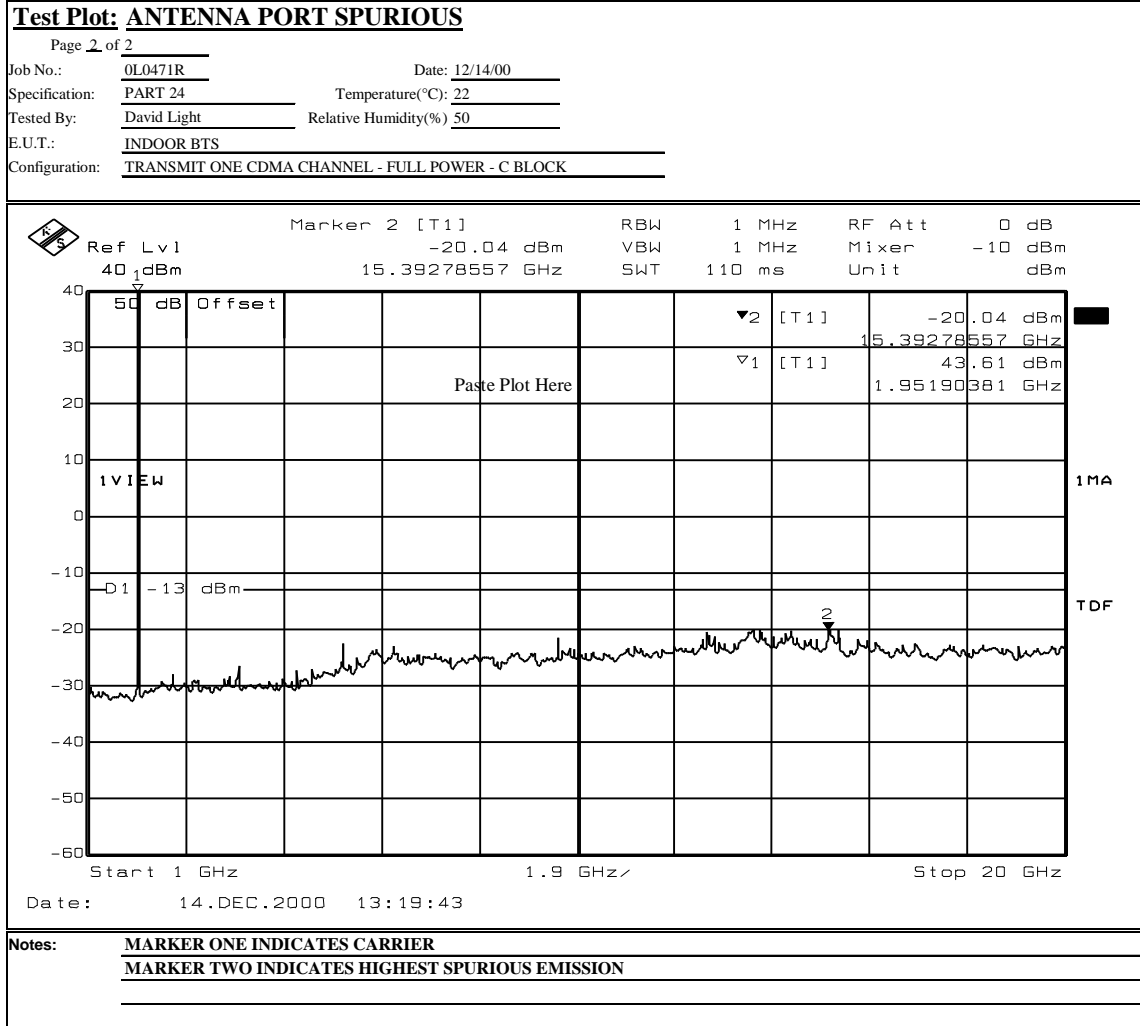
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EQUIPMENT: V4 Outdoor BTS

FCC ID: NP8SCBS-419M

REPORT NO.: 1L0042RUS1

### Test Data - Spurious Emissions at Antenna Terminals





EQUIPMENT: V4 Outdoor BTS

FCC ID: NP8SCBS-419M

REPORT NO.: 1L0042RUS1

### Test Data - Spurious Emissions at Antenna Terminals

**Test Plot: LOWER BANDEDGE**

Page 1 of 1

Job No.: 0L0471R Date: 12/14/00  
 Specification: PART 24 Temperature(°C): 22  
 Tested By: David Light Relative Humidity(%) 50  
 E.U.T.: INDOOR BTS  
 Configuration: TRANSMIT ONE CDMA CHANNEL - FULL POWER - CHANNEL 25  
 Serial Number: NONE  
 Location: SAMSUNG (IN SITU) RBW: 30 kHz  
 Detector Type: Peak VBW: 30 kHz

**Test Equipment Used**

Antenna: #N/A	Directional Coupler: #N/A
Pre-Amp: #N/A	Cable #1: #N/A
Filter: #N/A	Cable #2: #N/A
Receiver: 1036	Cable #3: #N/A
Attenuator #1: 1471	Cable #4: #N/A
Attenuator #2: #N/A	Mixer: #N/A

Additional equipment used: 1048 BIRD ATTENUATOR MODEL 1000-WA-FFN-30 (PROPERTY OF SAMSUNG)  
 Measurement Uncertainty: #N/A

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Ref Lvl  
41.8 dBm

30 dB Offset

1 VIEW

LBANDEGE

RBW	30 kHz	RF Att	10 dB
VBW	30 kHz	Mixer	-10 dBm
SWT	7 ms	Unit	dBm

Center 1.93 GHz 246 kHz / Span 2.46 MHz

Date: 14.DEC.2000 14:33:56

Notes:

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EQUIPMENT: V4 Outdoor BTS

FCC ID: NP8SCBS-419M

REPORT NO.: 1L0042RUS1

### Test Data - Spurious Emissions at Antenna Terminals

<b>Test Plot: UPPER BANDEDGE</b>	
Page 1 of 1	
Job No.: 0L0471R	Date: 12/14/00
Specification: PART 24	Temperature(°C): 22
Tested By: David Light	Relative Humidity(%) 50
E.U.T.: INDOOR BTS	
Configuration: TRANSMIT ONE CDMA CHANNEL - FULL POWER - CHANNEL 1175	
Serial Number: NONE	
Location: SAMSUNG (IN SITU)	RBW: 30 kHz
Detector Type: Peak	VBW: 30 kHz
<b>Test Equipment Used</b>	
Antenna: #N/A	Directional Coupler: #N/A
Pre-Amp: #N/A	Cable #1: #N/A
Filter: #N/A	Cable #2: #N/A
Receiver: 1036	Cable #3: #N/A
Attenuator #1: 1471	Cable #4: #N/A
Attenuator #2: #N/A	Mixer: #N/A
Additional equipment used: 1048 BIRD ATTENUATOR MODEL 1000-WA-FFN-30 (PROPERTY OF SAMSUNG)	
Measurement Uncertainty: #N/A	

	Ref Lvl 41.8 dBm	RBW 30 kHz VBW 30 kHz SWT 7 ms	RF Att 10 dB Mixer -10 dBm Unit dBm
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Center 1.99 GHz      246 kHz      Span 2.45 MHz

Date: 14.DEC.2000 14:41:49

<b>Notes:</b>	_____ _____ _____
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EQUIPMENT: V4 Outdoor BTS

FCC ID: NP8SCBS-419M

REPORT NO.: 1L0042RUS1

Test Data - Spurious Emissions at Antenna Terminals

**Test Plot: INTERMODULATION CHARACTERISTICS**

Page 1 of 1

Job No.: 0L0471R Date: 12/14/00  
 Specification: PART 24 Temperature(°C): 22  
 Tested By: David Light Relative Humidity(%) 50  
 E.U.T.: INDOOR BTS  
 Configuration: TRANSMIT TWO CDMA CHANNELS - FULL POWER - C BLOCK  
 Serial Number: NONE  
 Location: SAMSUNG (IN SITU) RBW: 30 kHz  
 Detector Type: Peak VBW: 30 kHz

**Test Equipment Used**

Antenna: #N/A Directional Coupler: #N/A  
 Pre-Amp: #N/A Cable #1: #N/A  
 Filter: #N/A Cable #2: #N/A  
 Receiver: 1036 Cable #3: #N/A  
 Attenuator #1: 1471 Cable #4: #N/A  
 Attenuator #2: #N/A Mixer: #N/A

Additional equipment used: 1048 BIRD ATTENUATOR MODEL 1000-WA-FFN-30 (PROPERTY OF SAMSUNG)  
 Measurement Uncertainty: #N/A

Ref Lvl 40 dBm  
 RBW 30 kHz RF Att 0 dB  
 VBW 30 kHz Mixer -10 dBm  
 SWT 54 ms Unit dBm

50 dB Offset  
 UBAN DEDG  
 1 VIEW  
 Paste Plot Here  
 IMA  
 TDF

Center 1.99 GHz 1.886225 MHz / Span 18.86225 MHz  
 Date: 14.DEC.2000 14:52:20

Notes:

*EQUIPMENT:* V4 Outdoor BTS

*FCC ID:* NP8SCBS-419M

REPORT NO.: 1L0042RUS1

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**Section 6. Field Strength of Spurious**

NAME OF TEST: Field Strength of Spurious Emissions	PARA. NO.: 2.1051
TESTED BY: David Light	DATE: 02/22/01

**Test Results:** Complies.

**Test Data:** See attached table.

EQUIPMENT: V4 Outdoor BTS

FCC ID: NP8SCBS-419M

REPORT NO.: 1L0042RUS1

**Test Data – Field Strength of Spurious Emissions**



Nemko Dallas, Inc.

Dallas Headquarters:  
802 N. Kealy  
Lewisville, TX 75057  
Tel: (972) 436-9600  
Fax: (972) 436-2667

<u>Field Strength of Spurious Emissions</u>										
Page <u>1</u> of <u>1</u>							Complete <u>X</u>			
Job No.:	1L0042R	Date:		2/22/01		Preliminary _____				
Specification:	PART 24	Temperature(°C):		<u>22</u>						
Tested By:	David Light	Relative Humidity(%):		<u>50</u>						
E.U.T.:	OUTDOOR BASE STATION									
Configuration:	TX CHANNEL 600 - FULL POWER									
Sample No:	_____									
Location:	AC 1	RBW:		1 MHz		Measurement				
Detector Type:	Peak	VBW:		1 MHz		Distance: <u>3</u> m				
<b>Test Equipment Used</b>										
Antenna:	993	Directional Coupler:		_____						
Pre-Amp:	_____	Cable #1:		1484						
Filter:	_____	Cable #2:		1485						
Receiver:	1036	Cable #3:		_____						
Attenuator #1:	_____	Cable #4:		_____						
Attenuator #2:	_____	Mixer:		_____						
Additional equipment used:	_____									
Measurement Uncertainty:	<u>+/-3.6 dB</u>									
Frequency (MHz)	Meter Reading (dBm)	Correction Factor (dB)		Pre-Amp Gain (dB)	Substitution Antenna Gain (dBd)		ERP (dBm)	ERP (mW)	Polarity	Comments
1960	-30.5	32.7		33.3	6.4		-24.8	0.003342	H	CARRIER
3920	-66.0	34.3		33.4	8.0		-57.1	0.000002	H	NOISE FLOOR
5880	-65.0	36.0		32	9.1		-51.9	0.000006	H	NF
7840	-64.0	39.8		33.4	9.4		-48.2	0.000015	H	NF
9800	-64.0	42.6		36.1	10.5		-47.0	0.000020	H	NF
11760	-64.0	46.0		36.6	11.0		-43.6	0.000044	H	NF
13720	-62.0	50.8		34.2	10.4		-35.0	0.000320	H	NF
1960	-31.7	29.9		33.3	6.4		-28.8	0.001318	V	CARRIER
3920	-66.0	40.4		33.4	8.0		-51.0	0.000008	V	NF
5880	-65.0	38.5		32	9.1		-49.4	0.000011	V	NF
7840	-64.0	40.4		33.4	9.4		-47.5	0.000018	V	NF
9800	-64.0	40.4		36.1	10.5		-49.2	0.000012	V	NF
11760	-64.0	42.5		36.6	11.0		-47.1	0.000020	V	NF
13720	-62.0	47.6		34.2	10.4		-38.2	0.000153	V	NF
Notes: SEARCHED SPECTRUM TO 10th HARMONIC OF CARRIER										
ONLY NOISE FLOOR READINGS WERE FOUND										

EQUIPMENT: V4 Outdoor BTS

FCC ID: NP8SCBS-419M

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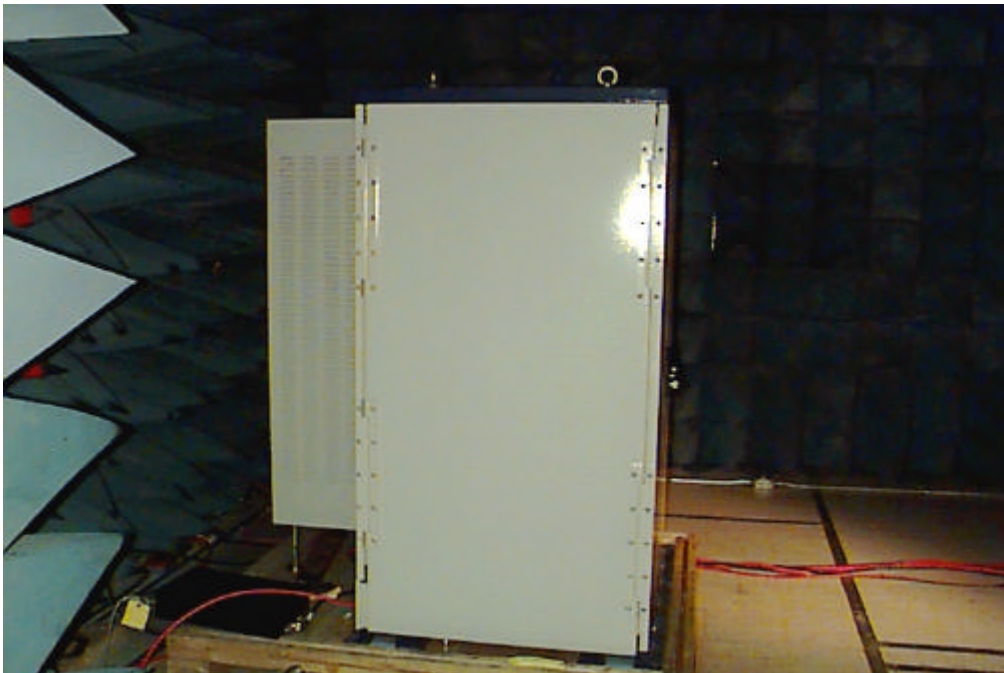
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**Photographs of Test Setup**

FRONT VIEW



REAR VIEW



*EQUIPMENT:* V4 Outdoor BTS

*FCC ID:* NP8SCBS-419M

REPORT NO.: 1L0042RUS1

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**Section 7. Frequency Stability**

NAME OF TEST: Frequency Stability	PARA. NO.: 2.1055
TESTED BY: David Light	DATE: 02/21/01

**Test Results:** Complies

**Measurement Data:** Standard Test Frequency: 1960 MHz  
Standard Test Voltage: 27 Vdc

EQUIPMENT: V4 Outdoor BTS

FCC ID: NP8SCBS-419M

REPORT NO.: 1L0042RUS1

**Test data - Frequency Stability**



Nemko Dallas, Inc.

Dallas Headquarters:  
802 N. Kealy  
Lewisville, TX 75057  
Tel: (972) 436-9600  
Fax: (972) 436-2667

Frequency Stability			
Client: <u>SAMSUNG</u>		W.O.# <u>1L0042R</u>	
EUT: <u>OUTDOOR PCS BASE STATION</u>		S/N: <u>NONE</u>	
Date: <u>21 FEB 2001</u>		Tech: <u>D. LIGHT</u>	
Test equipment: 1036-1469-1045		ETL equipment: 17-1108-1020-1225	
Temperature	Voltage	Rho	Frequency Error
20 °C	27 Vdc-Nominal	0.9916	0
20 °C	31 Vdc	0.9914	-10 Hz
20 °C	23 Vdc	0.9914	-20 Hz
10 °C	27 Vdc	0.9894	-80 Hz
0 °C	27 Vdc	0.9904	-70 Hz
-10 °C	27 Vdc	0.9903	-40 Hz
-20 °C	27 Vdc	0.9906	-50 Hz
30 °C	27 Vdc	0.9900	-80 Hz
40 °C	27 Vdc	0.9904	-80 Hz
50 °C	27 Vdc	0.9907	-117 Hz

Nemko test equipment:1036-1469-1045

ETL test equipment:

- 017 - Environmental Chamber - CNR
- 1020 - Controller - Cal'd 10/13/00
- 1108 - Thermometer - Cal'd 11/10/00
- 1225 - Chart recorder - Cal'd 2/2/01



EQUIPMENT: V4 Outdoor BTS

FCC ID: NP8SCBS-419M

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**Section 8. Test Equipment List**

Nemko ID	Description	Manufacturer	Serial Number	Calibration
		Model Number		Date
1036	SPECTRUM ANALYZER	ROHDE & SCHWARZ FSEK30	830844/006	06/14/99 2 Yr. Cycle
1471	10 dB Attenuator	MCL Inc. BW-S10W2 10db- 2WDC	NONE	CBU
1048	50 OHM LOAD	NARDA 27470	254	02/15/00
993	Horn antenna	A.H. Systems SAS-200/571	XXX	07/16/99 2 Yr. Cycle
1016	AMPLIFIER	HEWLETT PACKARD 8449A	2749A00159	05/24/00
1283	Spectrum analyzer display	Hewlett Packard 85662A	1811A00223	10/05/00
1483	Cable 4m	Storm PR90-010-144	N/A	05/23/00
	Temperature Chamber Controller	ETL	1020	10/13/00
	Chart Recorder	ETL	1225	8/30/00
	30 dB Power Attenuator	Bird 1000-WA-FFN-30	Property of Samsung	CBU

**Nemko Dallas**

FCC PART 24, SUBPART E  
BROADBAND PCS BASE STATION TRANSMITTER

*EQUIPMENT:* [V4 Outdoor BTS](#)

*FCC ID:* NP8SCBS-419M

REPORT NO.: [1L0042RUS1](#)

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## **ANNEX A - TEST DETAILS**

EQUIPMENT: V4 Outdoor BTS

FCC ID: NP8SCBS-419M

REPORT NO.: 1L0042RUS1

**NAME OF TEST: RF Power Output****PARA. NO.: 2.1046**

**Minimum Standard:** Para. No.24.232. Base stations are limited to 1640 watts peak E.I.R.P. with an antenna height up to 300 meters HAAT. In no case may the peak output power of a base station transmitter exceed 100 watts.

**Method Of Measurement:** CDMA Per ANSI/J-STD-014  
TDMA Per ANSI/J-STD-010

Detachable Antenna:

The peak power at antenna terminals is measured using an in-line peak power meter or a spectrum analyzer.

Integral Antenna:

If the antenna is not detachable from the circuit then the Peak Power Output is derived from the peak radiated field strength of the fundamental emission by using the plane wave relation  $GP/4\pi R^2 = E^2/120\pi$  and proceeding as follows:

$$P = \frac{E^2 R^2}{30G} = \frac{E^2 3^2}{30G}$$

where,

P = the equivalent isotropic radiated power in watts

E = the maximum measured field strength in V/m

R = the measurement range (3 meters)

G = the numeric gain of the transmit antenna in relation to an isotropic radiator

EQUIPMENT: V4 Outdoor BTS

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<b>NAME OF TEST: Occupied Bandwidth</b>	<b>PARA. NO.: 2.1049</b>
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**Minimum Standard:** Para. No. 24.238(b). 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 emissions are attenuated at least 26 dB.

**Method Of Measurement:**

CDMA Per ANSI/J-STD-014

Spectrum analyzer settings:  
RBW: 30 kHz  
VBW:  $\geq$  RBW  
Span: 5 MHz  
Sweep: Auto

GSM Per ANSI/J-STD-010

RBW: 3 kHz  
VBW:  $\geq$  RBW  
Span: 2 MHz  
Sweep: Auto

NADC Per IS-136

RBW: 1 kHz  
VBW:  $\geq$  RBW  
Span: 1 MHz  
Sweep: Auto

EQUIPMENT: V4 Outdoor BTS

FCC ID: NP8SCBS-419M

REPORT NO.: 1L0042RUS1

**NAME OF TEST: Spurious Emission at Antenna Terminals      PARA. NO.: 2.1051**

**Minimum Standard:**      Para. No.24.238(a). On any frequency outside a licensee’s frequency block, the power of any emission shall be attenuated below the transmitter power by at least 43 + 10 log (P) dB.

**Method Of Measurement:**

Spectrum analyzer settings:

CDMA Per ANSI/J-STD-014

RBW: 1 MHz (> 1 MHz from Band Edge)  
RBW: 30 kHz (< 1MHz from Band Edge)  
VBW: ≥ RBW  
Sweep: Auto  
Video Avg: 6 Sweeps

GSM Per ANSI/J-STD-010

RBW: 1 MHz (> 1 MHz from Band Edge)  
RBW: 3 kHz (< 1 MHz from Band Edge)  
VBW: ≥ RBW  
Sweep: Auto  
Video Avg: Disabled

NADC Per IS-136

RBW: 1 MHz (> 1 MHz from Band Edge)  
RBW: 1 kHz (< 1 MHz from Band Edge)  
VBW: ≥ RBW  
Sweep: Auto  
Video Avg: Disabled

To demonstrate compliance at band edges the frequency of the input signal is set to the lowest and highest assigned channel and the center frequency of the spectrum analyzer is set to the upper and lower edges of the appropriate frequency block.

*EQUIPMENT:* V4 Outdoor BTS

*FCC ID:* NP8SCBS-419M

REPORT NO.: 1L0042RUS1

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<b>NAME OF TEST: Field Strength of Spurious Radiation</b>	<b>PARA. NO.: 2.1053</b>
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**Minimum Standard:** Para. No.24.238(a). On any frequency outside a licensee’s frequency block, the power of any emission shall be attenuated below the transmitter power by at least  $43 + 10 \log (P)$  dB.

**Test Method:** TIA/EIA-603-1992, Section 2.2.12

The antenna substitution method was used to determine the equivalent radiated power at spurious frequencies. The spurious emissions were measured at a distance of 3 meters. The EUT was then replaced with a reference substitution antenna with a known gain referenced to a dipole. This antenna was fed with a signal at the spurious frequency. The level of the signal was adjusted to repeat the previously measured level. The resulting erp is the signal level fed to the reference antenna corrected for gain referenced to a dipole.

EQUIPMENT: V4 Outdoor BTS

FCC ID: NP8SCBS-419M

REPORT NO.: 1L0042RUS1

<b>NAME OF TEST: Frequency Stability</b>	<b>PARA. NO.: 2.1055</b>
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**Minimum Standard:** Para. No. 24.235. The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

**Method Of Measurement:** CDMA Per ANSI/J-STD-014  
 TDMA Per ANSI/J-STD-010  
 NADC Per IS-136

Frequency Stability With Voltage Variation

The E.U.T. is placed in an environmental chamber and allowed to stabilize at +20 degrees Celsius for at least 15 minutes. With the voltage input to the E.U.T. set to 85% S.T.V., the frequency is measured in 30 second intervals for a period of 5 minutes. This procedure is repeated at 100% S.T.V. and 115% S.T.V.

Frequency Stability With Temperature Variation

The input voltage to the E.U.T. is set to S.T.V. and the temperature of the environmental chamber is varied in 10 degree steps from -30 degrees C to +50 degrees C. The E.U.T. is allowed to stabilize at each temperature and the frequency is measured in 30 second intervals for a period of 5 minutes.

*EQUIPMENT:* [V4 Outdoor BTS](#)

*FCC ID:* NP8SCBS-419M

REPORT NO.: [1L0042RUS1](#)

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## **ANNEX B - TEST DIAGRAMS**



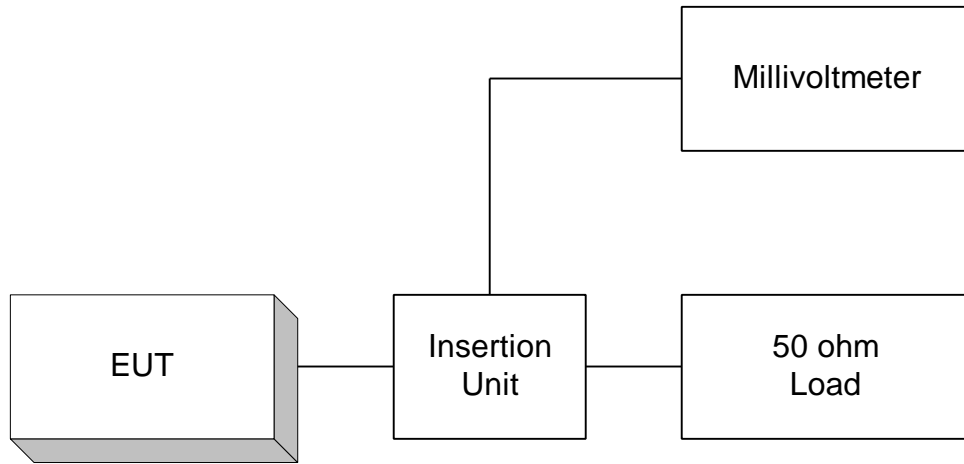
EQUIPMENT: V4 Outdoor BTS

FCC ID: NP8SCBS-419M

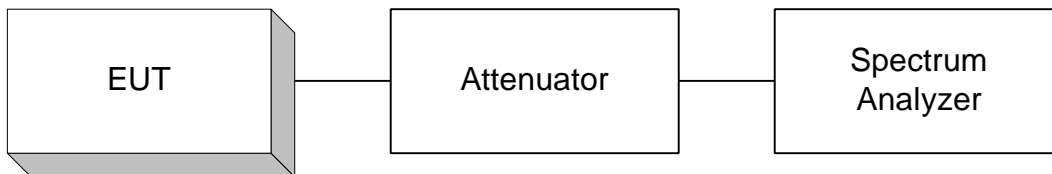
REPORT NO.: 1L0042RUS1

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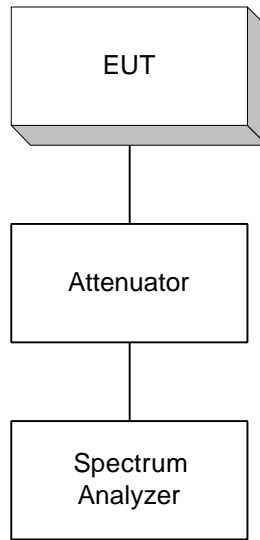
**Para. No. 2.985 - R.F. Power Output**



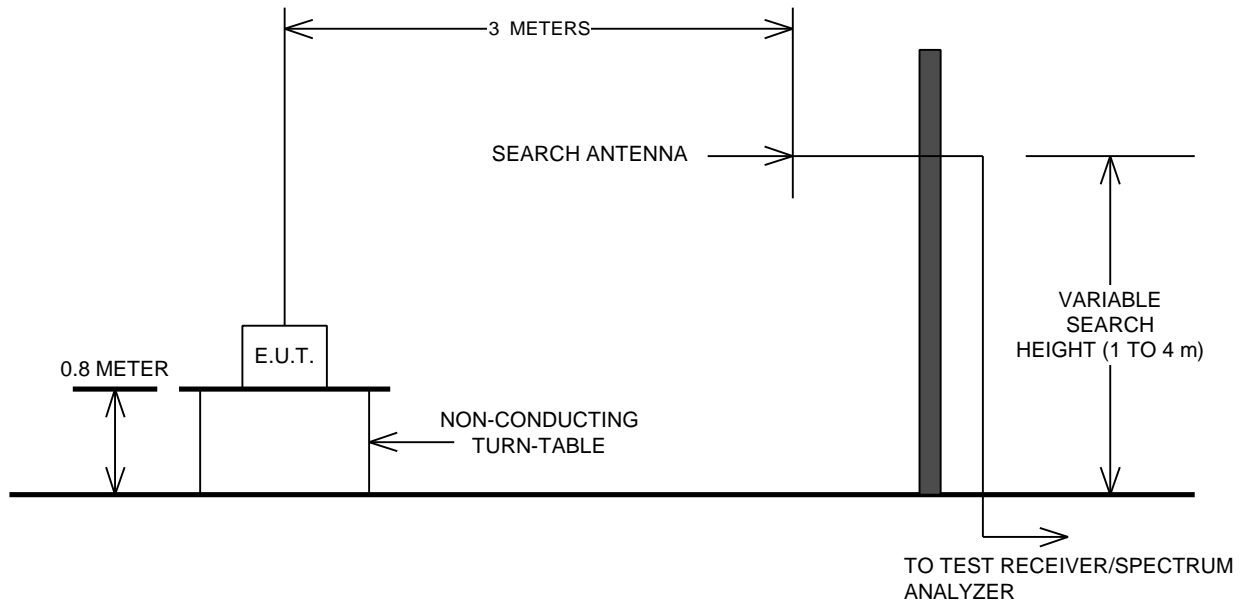
**Para. No. 2.989 - Occupied Bandwidth**



**Para. No. 2.991 Spurious Emissions at Antenna Terminals**



**Para. No. 2.993 - Field Strength of Spurious Radiation**



**Para. No. 2.995 - Frequency Stability**

