FCC CFR47 CERTIFICATION

PART 22H and 24E

TEST REPORT

FOR

800MHZ CELLULAR (AMPS/CDMA/TDMA) / 1900MHZ PCS (EDGE/GSM/CDMA/TDMA)
IN BUILDING REPEATER RAU

MODEL: UNS-819RAU-1

FCC ID: NOOUNS-819RAU-1

REPORT NUMBER: 02U1315-1

ISSUE DATE: JUNE 06, 2002

Prepared for
LGC WIRELESS INC.
2540 JUNCTION AVENUE
SAN JOSE, CA 95134

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1. TEST RESULT CERTIFICATION

COMPANY NAME: LGC WIRELESS INC.
2540 JUNCTION AVENUE
SAN JOSE, CA 95134-1902

CONTACT PERSON: JOHN DORSEY / COMPLIANCE ENGINEER

TELEPHONE NO: (408) 952-2431

EUT DESCRIPTION: 800MHZ CELLULAR (AMPS/TDMA/CDMA) / 1900MHZ PCS (EDGE/GSM/CDMA/TDMA) IN BUILDING REPEATER RAU

MODEM NAME: UNS-819RAU-1

DATE TESTED: JUNE 06, 2002

TYPE OF EQUIPMENT	INTENTIONAL RADIATOR
EQUIPMENT TYPE	1850-1910 MHz paired with 1930-1990 MHz (24) , and 824 – 849MHz paired with 869 – 894MHz (22) Repeater.
MEASUREMENT PROCEDURE	ANSI 63.4 / 1992, TIA/EIA 603
PROCEDURE	CERTIFICATION
FCC RULE	CFR 47 PART 22 Subpart H and 24 Subpart E

Compliance Certification Services, Inc. tested the above equipment for compliance with the requirement set forth in CFR 47, PART 22 Subpart H-Cellular Radiotelephone Service and 24 Subpart E-Broadband PCS. The equipment in the configuration described in this report, shows the measured emission levels emanating from the equipment do not exceed the specified limit.

Note : This document reports conditions under which testing was conducted and results of tests performed. This document may not be altered or revised in any way unless done so by Compliance Certification Services and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Compliance Certification Services will constitute fraud and shall nullify the document.

Test By:

THU CHAN
SENIOR EMC ENGINEER
COMPLIANCE CERTIFICATION SERVICES

Released For CCS By:

STEVE CHENG
EMC DEPARTMENT MANAGER
COMPLIANCE CERTIFICATION SERVICES

2. EUT DESCRIPTION

This product is designed for offices, hotel rooms, small parking lots, garages or small buildings, helping to improve CDMA/PCS communications signal and coverage by extending the coverage of a base station.

Outdoor antenna receives from a PCS base station, then remote repeater amplifies the signal. After amplification, the signal is passed through to the indoor antennas. Conversely, signals from handsets are amplified and retransmitted to the base station.

3. TEST METHODOLOGY

Both conducted and radiated testing were performed according to the procedures documented on chapter 13 of ANSI C63.4 and FCC CFR 47 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055 and 2.1057.

4. TEST FACILITY

The open area test sites and conducted measurement facilities used to collect the radiated data are located at 561F Monterey Road, Morgan Hill, California, USA. The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

5. ACCREDITATION AND LISTING

The test facilities used to perform radiated and conducted emissions tests are accredited by National Voluntary Laboratory Accreditation Program for the specific scope of accreditation under Lab Code: 200065-0 to perform Electromagnetic Interference tests according to FCC PART 15 AND CISPR 22 requirements. No part of this report may be used to claim or imply product endorsement by NVLAP or any agency of the US Government. In addition, the test facilities are listed with Federal Communications Commission (reference no: 31040/SIT (1300B3) and 31040/SIT (1300F2))

6. MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

7. APPLICABLE RULES AND BRIEF TEST RESULT

§22.913 & 24.232- POWER LIMIT

22.913(a): Maximum ERP. The effective radiated power (ERP) of base station transmitters and cellular repeater must not exceed 500 Watts. The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

24.232(a): Maximum Peak output power for base station transmitters should not exceed 100 Watts conducted and 1640W EIRP if antenna height up to 300 meters for Base Station, 2W EIRP for Mobile / Portable.

Spec limit: As specified above.
Test result:

Modulation	*Max Output Power(dBm)*	*Max Output Power(mW)*
AMPS 800MHz	***10.04***	***10.09***
CDMA 800MHz	***17.06***	***50.82***
TDMA 800MHz	***10.05***	***10.12***
CDMA 1900MHz	***16.94***	***49.43***
EDGE 1900MHz	***10.86***	***12.19***
GSM 1900MHz	***10.88***	***12.25***
TDMA 1900MHz	***10.79***	***12.00***

TYPE OF EMISSION

(F9W) CDMA 800MHz, (F9W) CDMA 1900MHz, (DXW) TDMA 1900MHz

§22.355 & 24.235- FREQUENCY STABILITY

The frequency stability shall be sufficient to ensure that the fundamental emission stays within ±1.5 ppm

Spec limit: As stated above.
Test result: This measurement results shows that the EUT complies with the rule.

§22.917 & 24.238- EMISSION LIMITS

22.917(e): Out-of-band emissions. The mean power of emissions must be attenuated below the mean power of the un-modulated carrier (P) on any frequency twice or more than twice the fundamental frequency by:
at least 43 + 10 log P dB (-13dBm)

22.917(f): Mobile emissions in base frequency range. The mean power of any emissions appearing in the base station frequency range from cellular mobile transmitter operated must be attenuated to a level not to exceed –80dBm at the transmit antenna connector.

24.238(a): The magnitude of each spurious and harmonic emission that can be detected when the equipment is operated under conditions specified in the instruction manual and/or alignment procedure, shall not be less than 43+10 log (mean output power in watts) dBc below the mean power output outside a licensee's frequency block (-13dBm).

24.238(b) & (c);

(1) Compliance with the out-of-band emissions requirement is based on test being performed with 1MHz analyzer RES BW.

(2) At block edges, RES BW may be adjusted to a level at least as large as 1% of emission bandwidth. The emissions bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power. For the EUT this is at least:

AMPS:
0.01 * 40.00 KHz = 400 Hz. A RES BW of 1 KHz was used for measuring at the block edges.

CDMA:
0.01 * 1.455 MHz = 14.55 KHz. A RES BW of 30 KHz was used for measuring at the block edges.

TDMA:
0.01 * 33.38 KHz = 333.8 Hz. A RES BW of 1 KHz was used for measuring at the block edges.

EDGE:
0.01 * 357.5 KHz = 3.575 KHz. A RES BW of 10 KHz was used for measuring at the block edges.

GSM:
0.01 * 325.0 KHz = 3.250 KHz. A RES BW of 10 KHz was used for measuring at the block edges.

Spec limit: As stated above.
Test result: This measurement results shows that the EUT complies with the rule. Please refer to the plots section 9.6 Measurement Result Plots.

§2.1057- SPECTRUM RANGE TO BE INVESTIGATED

Lowest radio frequency signal generated in the equipment, without going below 9 kHz, up to at least the frequency shown below:

(1) If the equipment operates below 10 GHz: to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

(2) If the equipment operates at or above 10 GHz and below 30 GHz:
to the fifth harmonic of the highest fundamental frequency or to 100 GHz, whichever is lower.

(3) If the equipment operates at or above 30 GHz: to the fifth harmonic of the highest fundamental frequency or to 200 GHz, whichever is lower.

(b) Particular attention should be paid to harmonics and sub-harmonics of the carrier frequency as well as to those frequencies removed from the carrier by multiples of the oscillator frequency.
Radiation at the frequencies of multiplier stages should also be checked.

(c) The amplitude of spurious emissions, which are attenuated more than 20 dB below the permissible value, need not be reported.

(d) Unless otherwise specified, measurements above 40 GHz shall be performed using a minimum resolution bandwidth of 1 MHz.

Spec limit: Frequency investigation range from 15M to tenth harmonic (i.e. 20 GHz.).

§PART 15 RADIATED EMISSION

NOT APPLICABLE. The accompany digital port is designed for using in set up only, not for daily operation and after set up no cable will be attached to this port.

8. TEST SETUP, PROCEDURE AND RESULT

8.1. SECTION 2.1046: RF POWER OUTPUT

INSTRUMENTS LIST

EQUIPMENT	MANUFACTURE	MODEL NO.	CAL. DUE DATE
Signal Generator	Rohde & Schwarz	SMIQ 03	5/25/02
EMI Receiver	HP	8593EM	6/20/02

TEST SETUP

TEST PROCEDURE

The EUT was set to maximum output power (maximum gain). RF output power was measured with Spectrum Analyzer.

RESULT

Measured with Spectrum Analyzer. Set the power amplifier to the maximum output gain.

Test result:

Modulation	*Max Output Power(dBm)*	*Max Output Power(mW)*
AMPS 800MHz	***10.04***	***10.09***
CDMA 800MHz	***17.06***	***50.82***
TDMA 800MHz	***10.05***	***10.12***
CDMA 1900MHz	***16.94***	***49.43***
EDGE 1900MHz	***10.86***	***12.19***
GSM 1900MHz	***10.88***	***12.25***
TDMA 1900MHz	***10.79***	***12.00***

8.2. SECTION 2.1047: MODULATION CHARACTERISTICS

(NOT APPLICABLE TO THIS REPEATER, THE EUT DOESN'T HAVE A FREQUENCY TRANSLATOR OR MODULATOR INSIDE OF EUT. THE EUT IS AN AMPLIFIER TYPE REPEATER.)

8.3. SECTION 2.1049: OCCUPIED BANDWIDTH

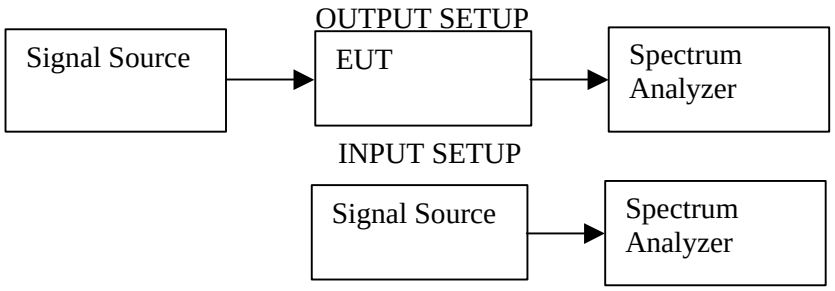
SECTION 2.1049(i)

Transmitters designed for other types of modulation – when modulated by an appropriate signal of sufficient amplitude to be representative of the type of service in which used. A description of the input signal should be supplied.

INSTRUMENTS LIST

EQUIPMENT	MANUFACTURE	MODEL NO.	CAL. DUE DATE
Signal Generator	Rohde & Schwarz	SMIQ 03	5/25/02
EMI Receiver	HP	8593EM	6/20/02

TEST SETUP



TEST PROCEDURE

The EUT's occupied bandwidth output plot is compared with the input source plot to check that no distortion is created when the input signal is amplified by the EUT. Identical bandwidths, spans and center frequencies are used for both plots. Reference levels and attenuation are adjusted.

RESULT

Plots of the input and output are included.

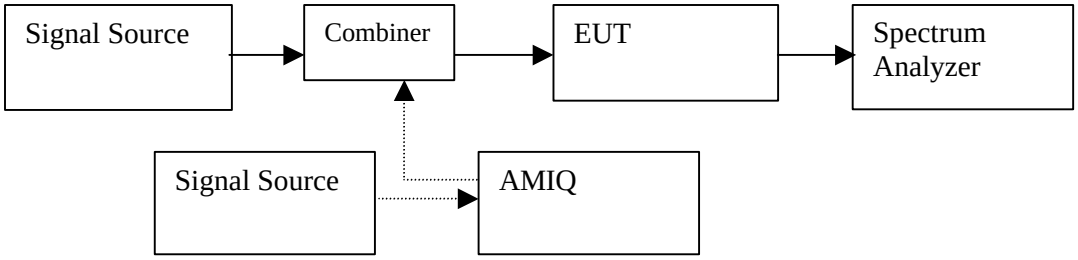
Please refer to the plots section 9.6 Measurement Result Plots.

8.4. SECTION 2.1051: SPURIOUS EMISSION AT ANTENNA TERMINAL

INSTRUMENTS LIST

EQUIPMENT	MANUFACTURE	MODEL NO.	CAL. DUE DATE
Signal Generator	Rohde & Schwarz	SMIQ 03	5/25/02
EMI Receiver	HP	8593EM	6/20/02
AMIQ	HP	E4432B-1E5-H9	7/28/02

TEST SETUP



TEST PROCEDURE

1) RF signal or three balanced signals (intermodulation measurement) were applied to the RF input. One set as close as possible to the bottom of the block edge and one set as close as possible to the top of the block edge. Set the RES BW to 1% of the emission bandwidth to show compliance with the –13dBm limit, in the 1 MHz bands immediately outside and adjacent to the top and bottom edges of the frequency block.

2) For the Out-of-Band measurements a 1 MHz RES BW was used to scan from 15 MHz to 10xfo of the fundamental carrier for all frequency block. A display line was placed at –13dBm to show compliance for spurious, harmonics, and intermodulation emissions.

3) 24.318(b) and also outside of which all emissions are attenuated at least 26 dB below the transmitter power.

4) 22.917(f); Mobile emissions in base frequency range. The mean power of any emissions appearing in the base station frequency range from cellular mobile transmitter operated must be attenuated to a level not to exceed –80dBm at the transmit antenna connector.

RESULT

Complies, ***Please refer to the plots section 9.6 Measurement Result Plots.***

8.5. SECTION 2.1053: FIELD STRENGTH OF SPURIOUS RADIATION

INSTRUMENTS LIST

EQUIPMENT	MANUFACTURE	MODEL NO.	CAL. DUE DATE
Spectrum Analyzer	HP	8593EM	6/20/02
Amplifier	MITEQ	NSP2600-44	4/26/03
Signal Generator	Rohde & Schwarz	SMIQ 03	5/25/02
Bicon Antenna	Eaton	94455-1	3/30/03
LP Antenna	EMCO	3146	3/30/03
Tune Dipole	Compliance Design	Robert	5/5/03
Tx Horn Antenna	EMCO	3115	1/31/03
Rx Horn Antenna	EMCO	3115	1/31/03
HPF	MICROLAB	FH-1800H	N/A
HPF	MICROLAB	FH-2400H	N/A
50 ohm terminator	SHX	TF-5	N/A

Detector Function Setting of Test Receiver

Frequency Range (MHz)	Detector Function	Resolution Bandwidth	Video Bandwidth
Above 1000	☒ Peak ☐ Average	☒ 1 MHz ☐ 1 MHz	☒ 1 MHz ☐ 10 Hz

TEST SETUP

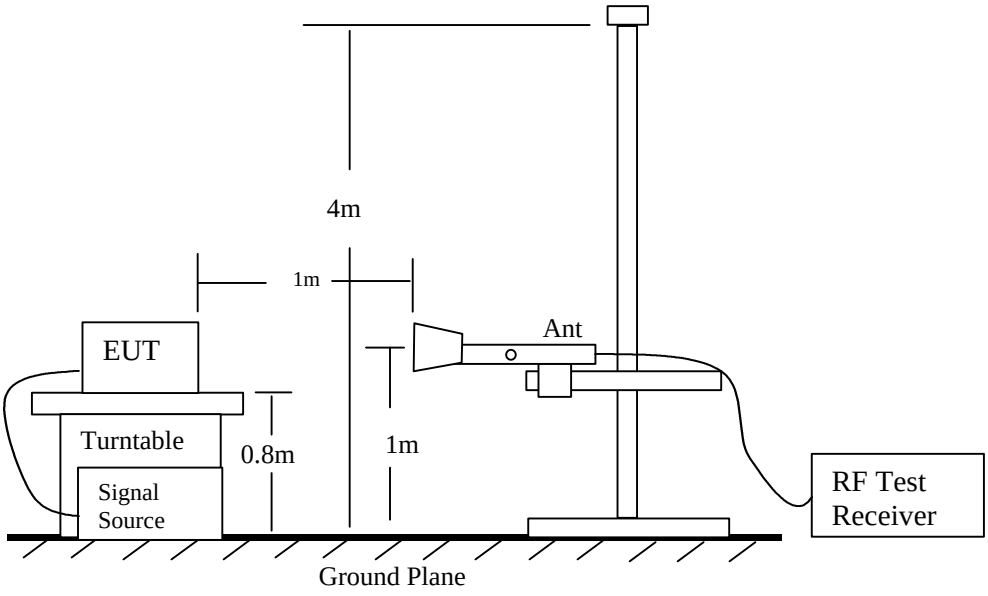


Fig 1: Radiated Emission Measurement

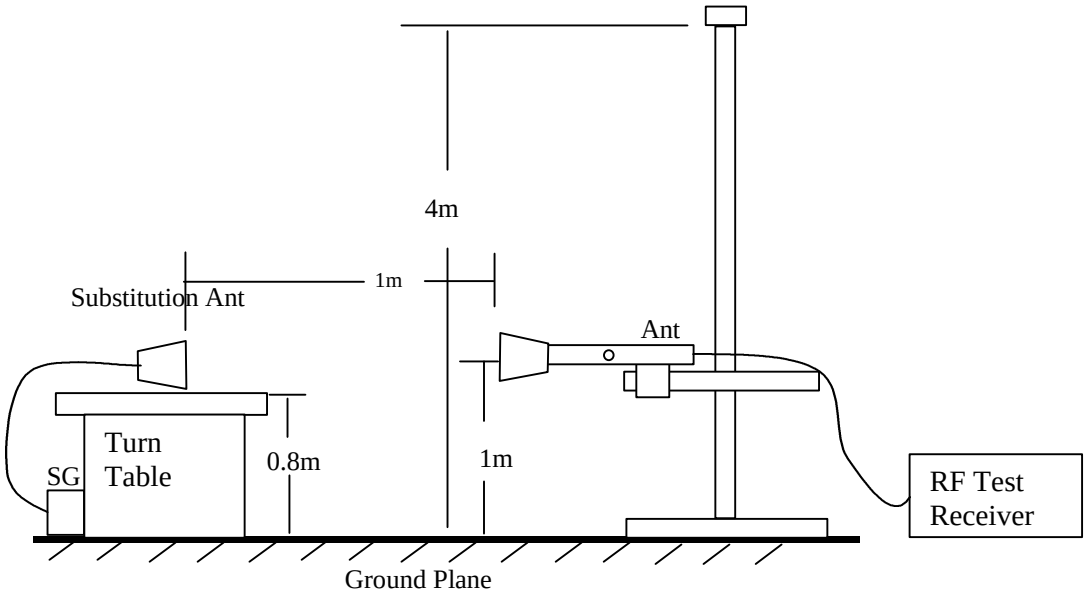


Fig 2: Radiated Emission – Substitution Method set-up

TEST PROCEDURE

1). On a test site, the EUT shall be placed on a turntable, and in the position closest to the normal use as declared by the user.
2). The test antenna shall be oriented initially for vertical polarization located 1m from the EUT to correspond to the frequency of the transmitter.
3). The output of the test antenna shall be connected to the measuring receiver and either a peak or average detector was used for the measurement as indicated on the report. The detector selection is based on how close the emission level was approaching the limit.
4). The transmitter shall be switched on, if possible, without the modulation and the measurement receiver shall be tuned to the frequency of the transmitter under test.
5). The test antenna shall be raised and lowered through the specified range of height until a maximum signal level is detected by the measuring receiver.
6). The transmitter shall than be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
7). The test antenna shall be raised and lowered again through the specified range of height until a maximum signal level is detected by the measuring receiver.
8). The maximum signal level detected by the measuring receiver shall be noted.
9). The transmitter shall be replaced by a substitution antenna.
10). The substitution antenna shall be oriented for vertical polarization.
11). The substitution antenna shall be connected to a calibrated signal generator.

12). If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
13). The test antenna shall be raised and lowered through the specified range of the height to ensure that the maximum signal is received.
14). The input signal to the substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuation setting of the measuring receiver.
15). The input level to the substitution antenna shall be recorded as power level in dBm, corrected for any change of input attenuator setting of the measuring receiver.
16). The measurement shall be repeated with the test antenna and the substitution antenna oriented for horizontal polarization.
17). The measure of the effective radiated power is the larger of the two levels recorded, at the input to the substitution antenna, corrected for the gain of the substitution antenna if necessary.

RESULT

No non-compliance noted, as shown below

6/4/02 **FCC Measurement**

Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: Thu Chan
Project #: 02U1315-1
Company: LGC Wireless Inc
EUT Descrip.: 800MHz Cellular
EUT M/N: UNS-819R-1
Test Target: FCC 22
Mode Oper: Downlink, Low / Mid / High

Frequency (GHz)	SA reading (dBuV)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Fundamental (Low, Mid, & High Channels):									
0.87	93.40	16.50	0.80	0.00	0.00	15.70	38.45	-22.75	V
0.88	95.60	18.00	0.80	0.00	0.00	17.20	38.45	-21.25	V
0.89	93.60	17.50	0.80	0.00	0.00	16.70	38.45	-21.75	V
0.87	87.30	13.00	0.80	0.00	0.00	12.20	38.45	-26.25	H
0.88	88.75	14.00	0.80	0.00	0.00	13.20	38.45	-25.25	H
0.89	87.50	13.00	0.80	0.00	0.00	12.20	38.45	-26.25	H
Spurious Emissions Lo Channel:									
1.74	48.00	-69.00	1.10	8.10	5.95	-64.15	-13.00	-51.15	V
2.61	43.00	-69.00	1.32	9.00	6.85	-63.47	-13.00	-50.47	V (Noise Floor)
3.48	43.00	-67.00	1.54	8.90	6.75	-61.79	-13.00	-48.79	V (Noise Floor)
4.35	43.00	-66.00	1.79	9.50	7.35	-60.44	-13.00	-47.44	V (Noise Floor)
5.22	43.00	-65.00	2.01	9.90	7.75	-59.26	-13.00	-46.26	V (Noise Floor)
6.09	43.00	-65.00	2.22	10.40	8.25	-58.97	-13.00	-45.97	V (Noise Floor)
6.96	43.00	-65.00	2.37	10.60	8.45	-58.92	-13.00	-45.92	V (Noise Floor)
7.83	44.00	-64.00	2.52	10.30	8.15	-58.37	-13.00	-45.37	V (Noise Floor)
8.70	45.00	-64.00	2.67	10.50	8.35	-58.32	-13.00	-45.32	V (Noise Floor)
1.74	46.50	-69.00	1.10	8.10	5.95	-64.15	-13.00	-51.15	H
2.61	43.00	-69.00	1.32	9.00	6.85	-63.47	-13.00	-50.47	H (Noise Floor)
3.48	43.00	-67.00	1.54	8.90	6.75	-61.79	-13.00	-48.79	H (Noise Floor)
4.35	43.00	-66.00	1.79	9.50	7.35	-60.44	-13.00	-47.44	H (Noise Floor)
5.22	43.00	-65.00	2.01	9.90	7.75	-59.26	-13.00	-46.26	H (Noise Floor)
6.09	43.00	-65.00	2.22	10.40	8.25	-58.97	-13.00	-45.97	H (Noise Floor)
6.96	43.00	-65.00	2.37	10.60	8.45	-58.92	-13.00	-45.92	H (Noise Floor)
7.83	44.00	-64.00	2.52	10.30	8.15	-58.37	-13.00	-45.37	H (Noise Floor)
8.70	45.00	-64.00	2.67	10.50	8.35	-58.32	-13.00	-45.32	H (Noise Floor)
Mid Channel									
1.76	49.00	-68.00	1.11	8.20	6.05	-63.06	-13.00	-50.06	V
1.76	47.00	-70.00	1.11	8.20	6.05	-65.06	-13.00	-52.06	H
2.64	43.00	-69.00	1.33	9.00	6.85	-63.48	-13.00	-50.48	V (Noise Floor)
3.53	43.00	-67.00	1.56	8.90	6.75	-61.81	-13.00	-48.81	V (Noise Floor)
High Channel									
1.79	48.00	-69.00	1.11	8.20	6.05	-64.06	-13.00	-51.06	V
1.79	46.50	-71.00	1.11	8.20	6.05	-66.06	-13.00	-53.06	H
2.68	43.00	-69.00	1.34	9.00	6.85	-63.49	-13.00	-50.49	V (Noise Floor)
3.57	43.00	-67.00	1.57	8.90	6.75	-61.82	-13.00	-48.82	V (Noise Floor)

Note: Completed scan from 30MHz to 10 GHz.

EPR = SG reading - CL + Gain (dBd)
Gain (dBd) = Gain (dBi) - 2.15
Margin = EPR - Limit

SA: Spectrum Analyzer, HP 8593EM, S/N: 3710A00205
SG: Signal Generator, HP 83732B, S/N: US34490599
TX Antenna: Dipole, Compliance Design, Roberts, S/N: 1:
Horn, EMCO 3115, S/N: 6717
CL: cable loss (5ft), FLEXCO
Pre-Amp: Miteq NSP2600 -44, S/N: 646456
RX Antenna: Bicon, Eston 94455-1, S/N: 1214
LP, EMCO 3146, S/N: 3163
Horn, EMCO 3115, S/N: 6739

6/4/02 **FCC Measurement**

Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: Thu Chan
Project #: 02U1315-1
Company: LGC Wireless Inc
EUT Descrip.: 800MHz Cellular
EUT M/N: UNS-819R-1
Test Target: FCC 22
Mode Oper: Uplink, Low / Mid / High

Frequency (GHz)	SA reading (dBuV)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Spurious Emissions									
Lo Channel:									
1.65	43.00	-72.00	1.10	8.10	5.95	-67.15	-13.00	-54.15	V
2.48	43.00	-69.00	1.32	9.00	6.85	-63.47	-13.00	-50.47	V (Noise Floor)
3.30	43.00	-67.00	1.54	8.90	6.75	-61.79	-13.00	-48.79	V (Noise Floor)
4.13	43.00	-66.00	1.79	9.50	7.35	-60.44	-13.00	-47.44	V (Noise Floor)
4.95	43.00	-65.00	2.01	9.90	7.75	-59.26	-13.00	-46.26	V (Noise Floor)
5.78	43.00	-65.00	2.22	10.40	8.25	-58.97	-13.00	-45.97	V (Noise Floor)
6.60	43.00	-65.00	2.37	10.60	8.45	-58.92	-13.00	-45.92	V (Noise Floor)
7.43	44.00	-64.00	2.52	10.30	8.15	-58.37	-13.00	-45.37	V (Noise Floor)
8.25	45.00	-64.00	2.67	10.50	8.35	-58.32	-13.00	-45.32	V (Noise Floor)
1.65	43.00	-72.00	1.10	8.10	5.95	-67.15	-13.00	-54.15	H
2.48	43.00	-69.00	1.32	9.00	6.85	-63.47	-13.00	-50.47	H (Noise Floor)
3.30	43.00	-67.00	1.54	8.90	6.75	-61.79	-13.00	-48.79	H (Noise Floor)
4.13	43.00	-66.00	1.79	9.50	7.35	-60.44	-13.00	-47.44	H (Noise Floor)
4.95	43.00	-65.00	2.01	9.90	7.75	-59.26	-13.00	-46.26	H (Noise Floor)
5.78	43.00	-65.00	2.22	10.40	8.25	-58.97	-13.00	-45.97	H (Noise Floor)
6.60	43.00	-65.00	2.37	10.60	8.45	-58.92	-13.00	-45.92	H (Noise Floor)
7.43	44.00	-64.00	2.52	10.30	8.15	-58.37	-13.00	-45.37	H (Noise Floor)
8.25	45.00	-64.00	2.67	10.50	8.35	-58.32	-13.00	-45.32	H (Noise Floor)
Mid Channel									
1.67	43.00	-72.00	1.11	8.20	6.05	-67.06	-13.00	-54.06	V
1.67	43.00	-72.00	1.11	8.20	6.05	-67.06	-13.00	-54.06	H
2.51	43.00	-69.00	1.33	9.00	6.85	-63.48	-13.00	-50.48	V (Noise Floor)
3.35	43.00	-67.00	1.56	8.90	6.75	-61.81	-13.00	-48.81	V (Noise Floor)
High Channel									
1.70	43.00	-72.00	1.11	8.20	6.05	-67.06	-13.00	-54.06	V
1.70	43.00	-72.00	1.11	8.20	6.05	-67.06	-13.00	-54.06	H
2.54	43.00	-69.00	1.34	9.00	6.85	-63.49	-13.00	-50.49	V (Noise Floor)
3.39	43.00	-67.00	1.57	8.90	6.75	-61.82	-13.00	-48.82	V (Noise Floor)

Note: Completed scan from 30MHz to 10 GHz.

EPR = SG reading - CL + Gain (dBd)
Gain (dBd) = Gain (dBi) - 2.15
Margin = EPR - Limit

SA: Spectrum Analyzer, HP 8593EM, S/N: 3710A00205
SG: Signal Generator, HP 83732B, S/N: US34490599
TX Antenna: Dipole, Compliance Design, Roberts, S/N: 1
Horn, EMCO 3115, S/N: 6717
CL: cable loss (5ft), FLEXCO
Pre-Amp: Miteq NSP2600 -44, S/N: 646456
RX Antenna: Bicon, Eston 94455-1, S/N: 1214
LP, EMCO 3146, S/N: 3163
Horn, EMCO 3115, S/N: 6739

6/4/02 **FCC Measurement**

Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: Thu Chan
Project #: 02U1315-1
Company: LGC Wireless Inc
EUT Descrip.: 1900MHz Cellular
EUT M/N: UNS-819R-1
Test Target: FCC 24
Mode Oper: Downlink, Low / Mid / High

Frequency (GHz)	SA reading (dBuV)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Fundamental (Low, Mid, & High Channels):									
1.931	93.00	11.50	1.20	8.20	0.00	18.50	33.00	-14.50	V
1.931	78.00	-2.00	1.20	8.20	0.00	5.00	33.00	-28.00	H
1.960	93.50	12.50	1.20	8.20	0.00	19.50	33.00	-13.50	V
1.960	78.00	-2.00	1.20	8.20	0.00	5.00	33.00	-28.00	H
1.989	93.65	12.50	1.20	8.20	0.00	19.50	33.00	-13.50	V
1.989	78.00	-2.00	1.20	8.20	0.00	5.00	33.00	-28.00	H
Spurious Emissions									
Lo Channel:									
3.86	55.00	-53.00	1.66	8.90	0.00	-45.76	-13.00	-32.76	V
5.79	43.00	-65.00	2.15	10.30	0.00	-56.85	-13.00	-43.85	V (Noise Floor)
7.73	45.00	-64.00	2.50	10.30	0.00	-56.20	-13.00	-43.20	V (Noise Floor)
9.66	45.00	-63.00	2.84	10.10	0.00	-55.74	-13.00	-42.74	V (Noise Floor)
11.59	45.00	-59.00	3.10	12.00	0.00	-50.10	-13.00	-37.10	V (Noise Floor)
13.52	48.00	-56.00	3.42	11.90	0.00	-47.52	-13.00	-34.52	V (Noise Floor)
15.45	48.00	-53.00	3.79	15.10	0.00	-41.69	-13.00	-28.69	V (Noise Floor)
17.38	50.00	-50.00	4.18	10.00	0.00	-44.18	-13.00	-31.18	V (Noise Floor)
3.86	49.00	-57.00	1.66	8.90	0.00	-49.76	-13.00	-36.76	H
5.79	43.00	-65.00	2.15	10.30	0.00	-56.85	-13.00	-43.85	H (Noise Floor)
7.73	45.00	-64.00	2.50	10.30	0.00	-56.20	-13.00	-43.20	H (Noise Floor)
9.66	45.00	-63.00	2.84	10.10	0.00	-55.74	-13.00	-42.74	H (Noise Floor)
11.59	45.00	-59.00	3.10	12.00	0.00	-50.10	-13.00	-37.10	H (Noise Floor)
13.52	47.00	-56.00	3.42	11.90	0.00	-47.52	-13.00	-34.52	H (Noise Floor)
15.45	48.00	-53.00	3.79	15.10	0.00	-41.69	-13.00	-28.69	H (Noise Floor)
17.38	49.00	-50.00	4.18	10.00	0.00	-44.18	-13.00	-31.18	H (Noise Floor)
Mid Channel									
3.92	54.00	-54.00	1.11	8.20	0.00	-46.91	-13.00	-33.91	V
3.92	48.00	-58.00	1.11	8.20	0.00	-50.91	-13.00	-37.91	H
5.88	43.00	-65.00	1.33	9.00	0.00	-57.33	-13.00	-44.33	V (Noise Floor)
7.84	45.00	-64.00	1.56	8.90	0.00	-56.66	-13.00	-43.66	V (Noise Floor)
High Channel									
3.98	48.00	-54.00	1.11	8.20	0.00	-46.91	-13.00	-33.91	V
3.98	46.50	-58.00	1.11	8.20	0.00	-50.91	-13.00	-37.91	H
5.97	43.00	-65.00	1.34	9.00	0.00	-57.34	-13.00	-44.34	V (Noise Floor)
7.96	43.00	-64.00	1.57	8.90	0.00	-56.67	-13.00	-43.67	V (Noise Floor)

Note: Completed scan from 30MHz to 20 GHz.

EIPR = SG reading - CL + Gain (dBi)
Margin = EIPR - Limit

SA: Spectrum Analyzer, HP 8593EM, S/N: 3710A00205
SG: Signal Generator, HP 83732B, S/N: US34490599
TX Antenna: Dipole, Compliance Design, Roberts, S/N: 116
Horn, EMCO 3115, S/N: 6717
CL: cable loss (5ft), FLEXCO
Pre-Amp: Miteq NSP2600 -44, S/N: 646456
RX Antenna: Bicon, Eston 94455-1, S/N: 1214
LP, EMCO 3146, S/N: 3163
Horn, EMCO 3115, S/N: 6739

6/4/02 **FCC Measurement**

Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: Thu Chan
Project #: 02U1315-1
Company: LGC Wireless Inc
EUT Descrip.: 1900MHz Cellular
EUT M/N: UNS-819R-1
Test Target: FCC 24
Mode Oper: Uplink, Low / Mid / High

Frequency (GHz)	SA reading (dBuV)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Spurious Emissions									
Lo Channel:									
3.70	43.00	-67.00	1.66	8.90	0.00	-59.76	-13.00	-46.76	V
5.55	43.00	-65.00	2.15	10.30	0.00	-56.85	-13.00	-43.85	V (Noise Floor)
7.41	45.00	-64.00	2.50	10.30	0.00	-56.20	-13.00	-43.20	V (Noise Floor)
9.26	45.00	-63.00	2.84	10.10	0.00	-55.74	-13.00	-42.74	V (Noise Floor)
11.11	45.00	-59.00	3.10	12.00	0.00	-50.10	-13.00	-37.10	V (Noise Floor)
12.96	48.00	-56.00	3.42	11.90	0.00	-47.52	-13.00	-34.52	V (Noise Floor)
14.81	48.00	-53.00	3.79	15.10	0.00	-41.69	-13.00	-28.69	V (Noise Floor)
16.66	50.00	-50.00	4.18	10.00	0.00	-44.18	-13.00	-31.18	V (Noise Floor)
3.70	43.00	-67.00	1.66	8.90	0.00	-59.76	-13.00	-46.76	H
5.55	43.00	-65.00	2.15	10.30	0.00	-56.85	-13.00	-43.85	H (Noise Floor)
7.41	45.00	-64.00	2.50	10.30	0.00	-56.20	-13.00	-43.20	H (Noise Floor)
9.26	45.00	-63.00	2.84	10.10	0.00	-55.74	-13.00	-42.74	H (Noise Floor)
11.11	45.00	-59.00	3.10	12.00	0.00	-50.10	-13.00	-37.10	H (Noise Floor)
12.96	47.00	-56.00	3.42	11.90	0.00	-47.52	-13.00	-34.52	H (Noise Floor)
14.81	48.00	-53.00	3.79	15.10	0.00	-41.69	-13.00	-28.69	H (Noise Floor)
16.66	49.00	-50.00	4.18	10.00	0.00	-44.18	-13.00	-31.18	H (Noise Floor)
Mid Channel									
3.76	43.00	-67.00	1.11	8.20	0.00	-59.91	-13.00	-46.91	V
3.76	43.00	-67.00	1.11	8.20	0.00	-59.91	-13.00	-46.91	H
5.64	43.00	-65.00	1.33	9.00	0.00	-57.33	-13.00	-44.33	V (Noise Floor)
7.52	45.00	-64.00	1.56	8.90	0.00	-56.66	-13.00	-43.66	V (Noise Floor)
High Channel									
3.82	43.00	-67.00	1.11	8.20	0.00	-59.91	-13.00	-46.91	V
3.82	43.00	-67.00	1.11	8.20	0.00	-59.91	-13.00	-46.91	H
5.73	43.00	-65.00	1.34	9.00	0.00	-57.34	-13.00	-44.34	V (Noise Floor)
7.64	45.00	-64.00	1.57	8.90	0.00	-56.67	-13.00	-43.67	V (Noise Floor)

Note: Completed scan from 30MHz to 20 GHz.

EIPR = SG reading - CL + Gain (dBd)
Margin = EIPR - Limit

SA: Spectrum Analyzer, HP 8593EM, S/N: 3710A00205
SG: Signal Generator, HP 83732B, S/N: US34490599
TX Antenna: Dipole, Compliance Design, Roberts, S/N: 116
Horn, EMCO 3115, S/N: 6717
CL: cable loss (5ft), FLEXCO
Pre-Amp: Miteq NSP2600 -44, S/N: 646456
RX Antenna: Bicon, Eston 94455-1, S/N: 1214
LP, EMCO 3146, S/N: 3163
Horn, EMCO 3115, S/N: 6739

8.6 SECTION 2.1055: FREQUENCY STABILITY

INSTRUMENTS LIST

EQUIPMENT	MANUFACTURE	MODEL NO.	CAL. DUE DATE
Signal Generator	Rohde & Schwarz	SMIQ 03	05/25/02
EMI Receiver	HP	8593EM	6/20/02
Environmental Chamber	Thermotron	SE 600-10-10	4/26/03

Detector Function Setting of Test Receiver

Frequency Range (MHz)	Detector Function	Resolution Bandwidth	Video Bandwidth
Above 1000	Peak	300 Hz	300 Hz

TEST SETUP

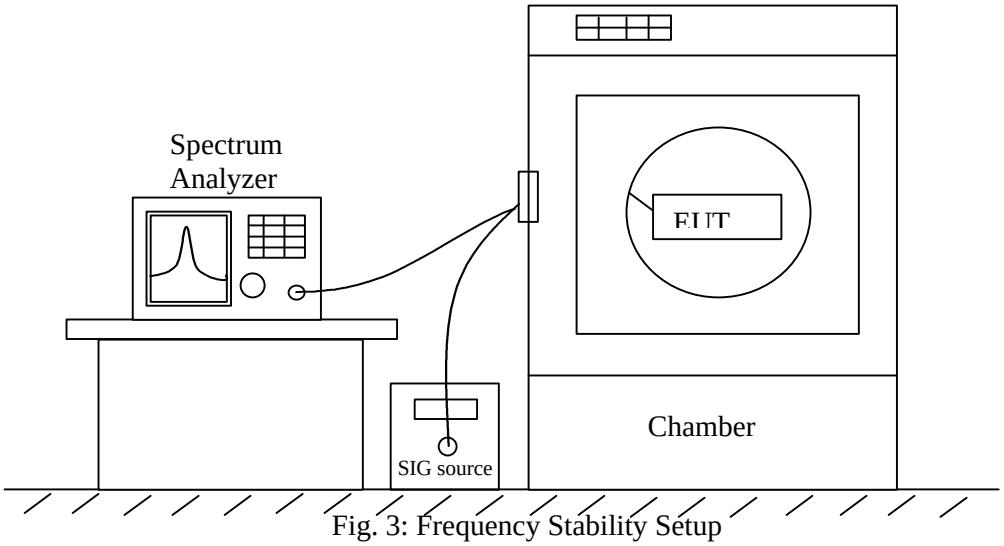


Fig. 3: Frequency Stability Setup

TEST PROCEDURE

- **Frequency stability versus environmental temperature**

1). Setup the configuration per figure 6 for frequencies measurement inside the environmental chamber. Set the temperature of the chamber to 25°C. Set SA Resolution Bandwidth low enough to obtain the desired frequency resolution and measure the EUT 25°C operating frequency as reference frequency.
2). Turn EUT off and set Chamber temperature to -30°C.
3). Allow sufficient time (approximately 20 to 30 minus after chamber reach the assigned temperature) for EUT to stabilize. Turn on EUT and measure the EUT operating frequency. Turn off EUT after the measurement.
4). Repeat step 3 with a 10°C increased per stage until the highest temperature of +50°C reached, record all measured frequencies on each temperature step.

- **Frequency stability versus AC input voltage**

1). Setup the configuration per figure 6 and set chamber temperature to 25°C. Use a variable AC power supply to power the EUT and set AC output voltage to EUT nominal input AC voltage. Set SA Resolution Bandwidth low enough to obtain the desired frequency resolution and measure the EUT 25°C operating frequency as reference frequency.
2). Slowly reduce the EUT input voltage to specified extreme voltage variation (±15%) and record the maximum frequency change.

RESULT

No non-compliance noted, as shown below because the EUT uses the same OSC in both receiver and transmitter LO circuit. As a result, the frequency does not shift in Frequency Stability Test.

Frequency stability versus environmental temperature

Reference Frequencies: Downlink @ 881.500036MHz Limit: ± 1.5 ppm (1322.25Hz)			
Environment Temperature (°C)	Power Supplied (Vac)	Frequency deviation measured with time elapse	
		Hz	Plot #
50	Fixed 115 Vac	+34	420
40	Fixed 115 Vac	+7	421
30	Fixed 115 Vac	+1	422
20	Fixed 115 Vac	0	423
10	Fixed 115 Vac	+1	424
0	Fixed 115 Vac	+17	425
-10	Fixed 115 Vac	+11	426
-20	Fixed 115 Vac	-2	427
-30	Fixed 115 Vac	-9	428

Reference Frequencies: Uplink @ 836.500031MHz Limit: ± 1.5 ppm (1254.75Hz)			
Environment Temperature (°C)	Power Supplied (Vac)	Frequency deviation measured with time elapse	
		Hz	Plot #
50	Fixed 115 Vac	+21	429
40	Fixed 115 Vac	+9	430
30	Fixed 115 Vac	+9	431
20	Fixed 115 Vac	0	432
10	Fixed 115 Vac	+6	433
0	Fixed 115 Vac	+6	434
-10	Fixed 115 Vac	0	435
-20	Fixed 115 Vac	-4	436
-30	Fixed 115 Vac	-1	437

Reference Frequencies: Downlink @ 1960.000074MHz Limit: ± 1.5 ppm (2940Hz)			
Environment Temperature (°C)	Power Supplied (Vac)	Frequency deviation measured with time elapse	
		Hz	Plot #
50	Fixed 115 Vac	+33	438
40	Fixed 115 Vac	+17	439
30	Fixed 115 Vac	+3	440
20	Fixed 115 Vac	0	441
10	Fixed 115 Vac	-1	442
0	Fixed 115 Vac	-7	443
-10	Fixed 115 Vac	-16	444
-20	Fixed 115 Vac	-21	445
-30	Fixed 115 Vac	-14	446

Reference Frequencies: Uplink @ 1880.000084MHz Limit: ± 1.5 ppm (2820Hz)			
Environment Temperature (°C)	Power Supplied (Vac)	Frequency deviation measured with time elapse	
		Hz	Plot #
50	Fixed 115 Vac	+36	447
40	Fixed 115 Vac	+16	448
30	Fixed 115 Vac	-4	449
20	Fixed 115 Vac	0	450
10	Fixed 115 Vac	+3	451
0	Fixed 115 Vac	-1	452
-10	Fixed 115 Vac	-10	453
-20	Fixed 115 Vac	-32	454
-30	Fixed 115 Vac	-11	455

Frequency stability versus AC input voltage

Reference Frequency: Downlink @ 881.500028MHz			
Environment Temperature (°C)	Power Supplied (Vac)	Frequency deviation measured with time elapse	
		MHz	Plot #
24	120	Same as reference readings above	456
24	138	Same as reference readings above	457
24	102	Same as reference readings above	458

Reference Frequency: Uplink @ 836.500008MHz			
Environment Temperature (°C)	Power Supplied (Vac)	Frequency deviation measured with time elapse	
		MHz	Plot #
24	115	Same as reference readings above	459
24	85	Same as reference readings above	460
24	132	Same as reference readings above	461

Reference Frequency: Downlink @ 1960.000010MHz			
Environment Temperature (°C)	Power Supplied (Vac)	Frequency deviation measured with time elapse	
		MHz	Plot #
24	120	Same as reference readings above	462
24	138	Same as reference readings above	463
24	102	Same as reference readings above	464

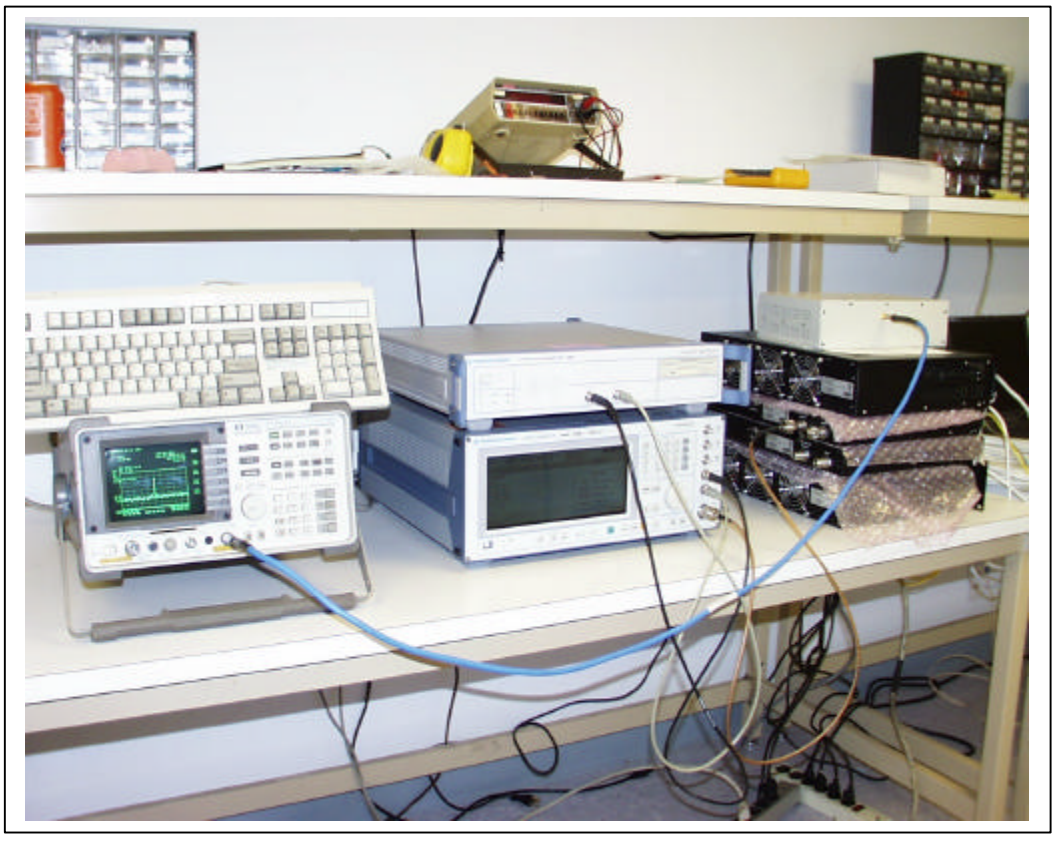
Reference Frequency: Uplink @ 1880.000020MHz			
Environment Temperature (°C)	Power Supplied (Vac)	Frequency deviation measured with time elapse	
		MHz	Plot #
24	115	Same as reference readings above	465
24	85	Same as reference readings above	466
24	132	Same as reference readings above	467

8.7 RADIATED EMISSION: part 15.209

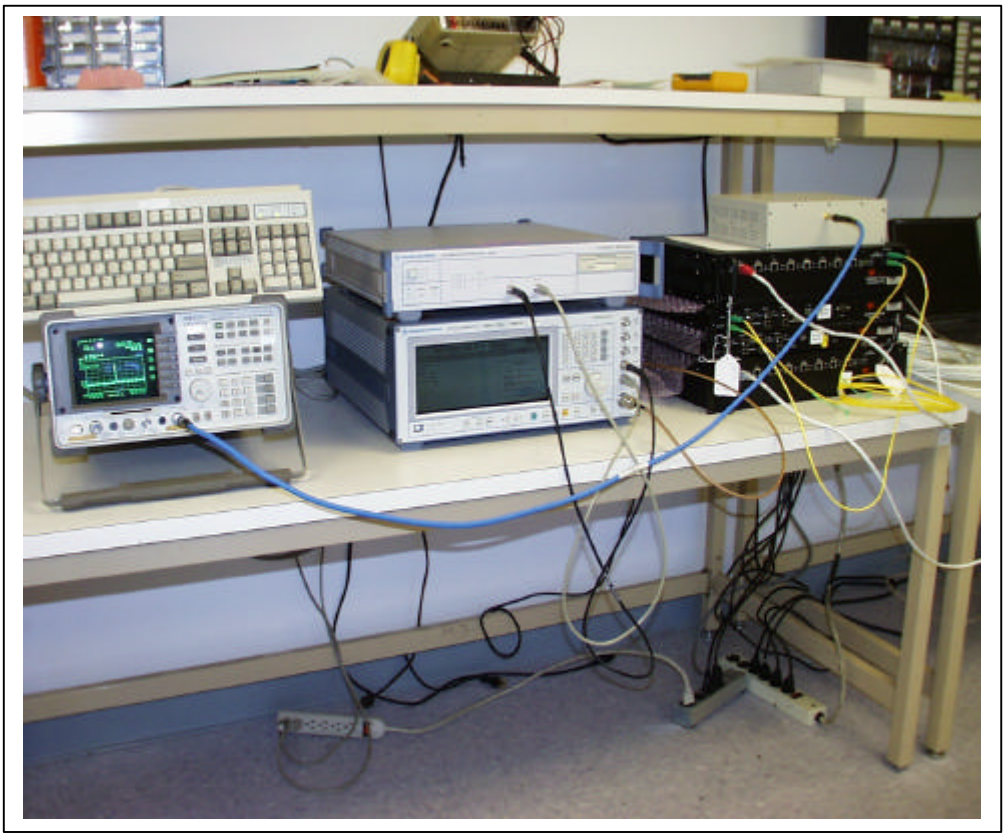
NOT APPLICABLE. The accompany digital port is designed for using in set up only, not for daily operation, and after the set up no cable will be attached to this port.

9. ATTACHMENT

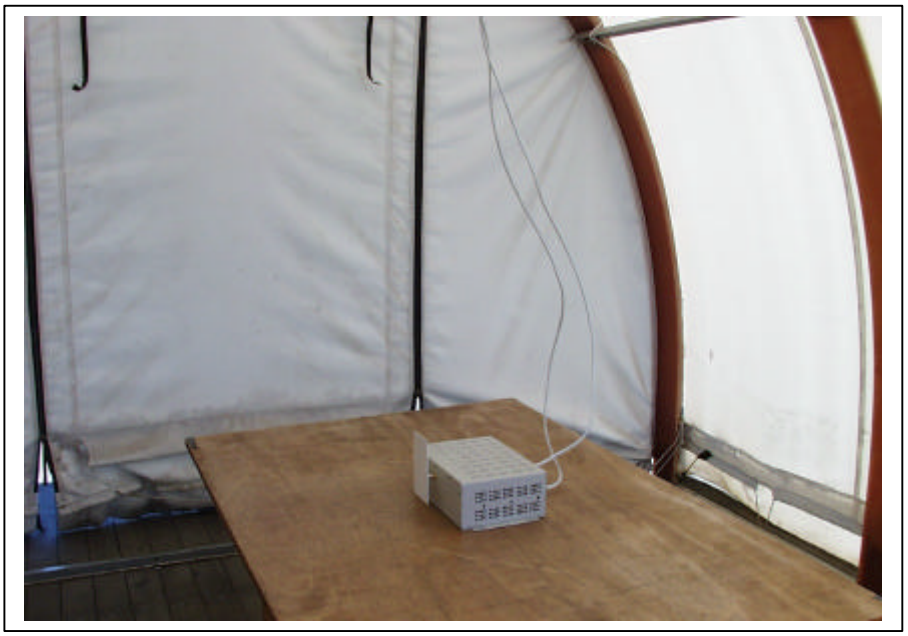
9.1. EUT SETUP PHOTOS



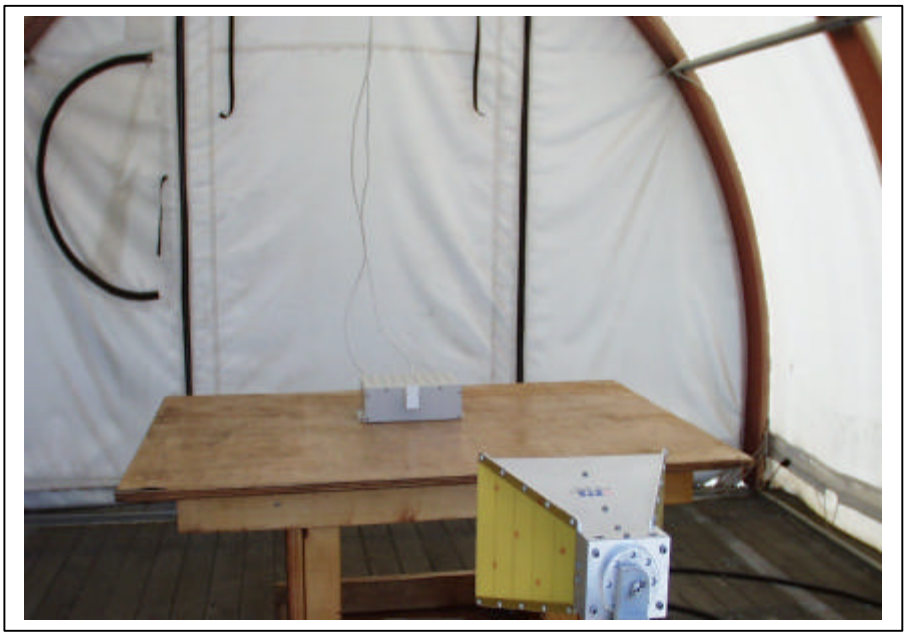
CONDUCTED MEASUREMENT



INTERMODULATED MEASUREMENT

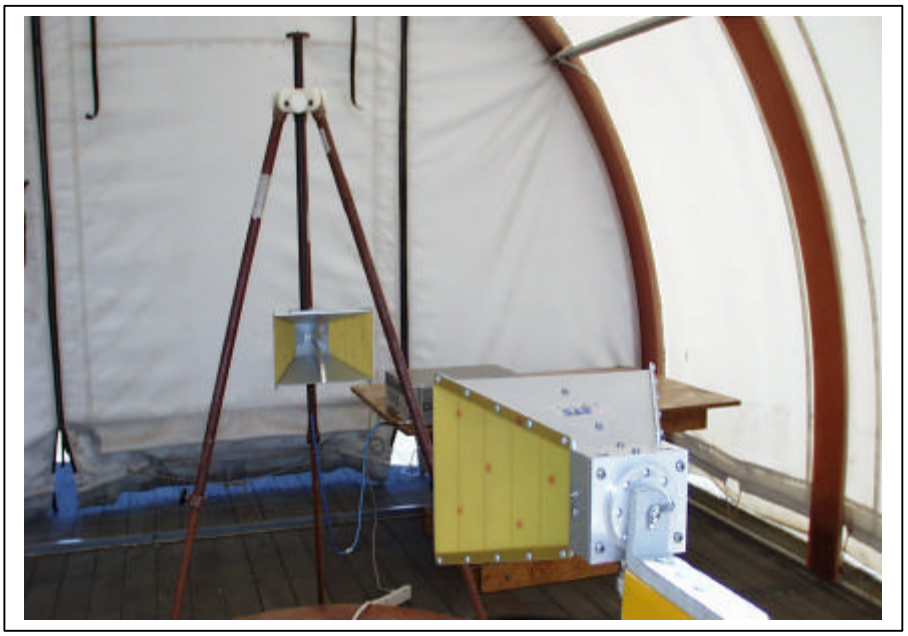


FUNDAMENTAL MEASUREMENTS (800MHz)

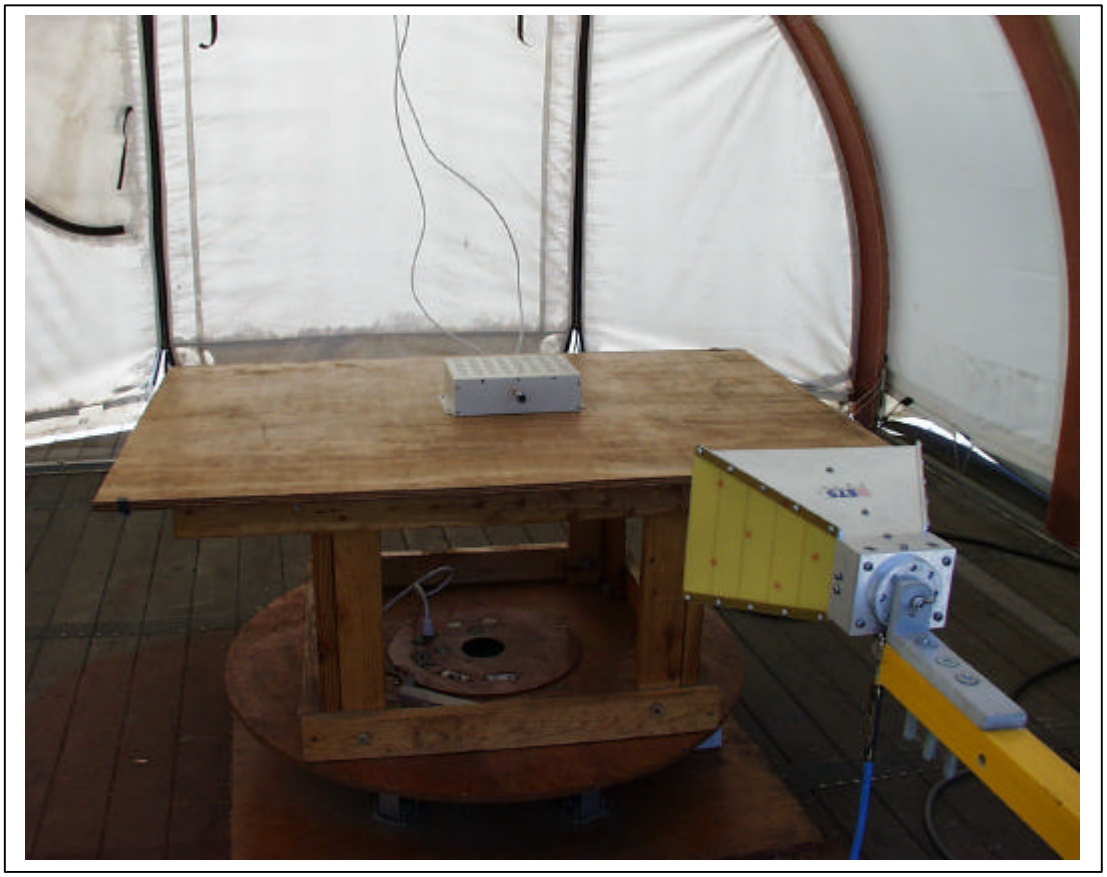


FUNDAMENTAL MEASUREMENTS (1900MHz)

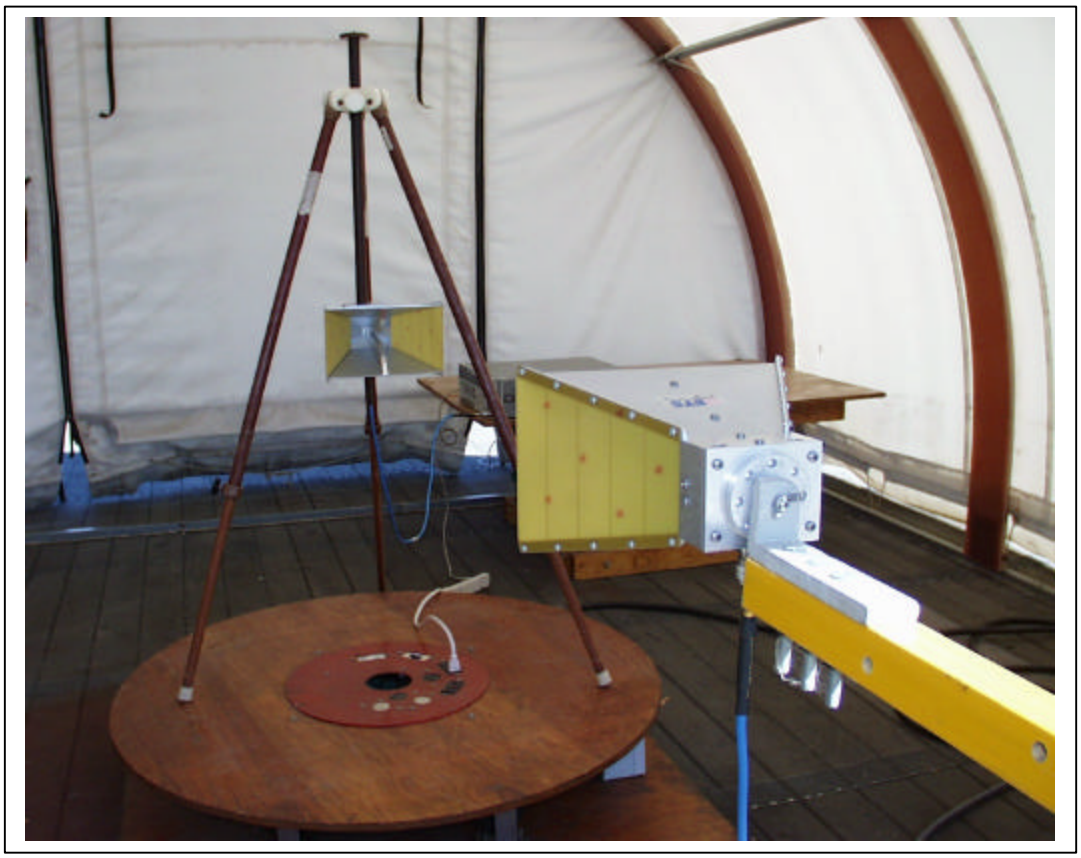
SUBSTITUTION MEASUREMENTS (800MHz)



SUBSTITUTION MEASUREMENTS (1900MHz)



HARMONIC & SPURIOUS MEASUREMENT



SUBSTITUTION METHOD

FREQUENCY VS. TEMPERATURE

FREQUENCY VS. VOLTAGE

9.2 MEASUREMENT RESULT PLOTS

RESULT

The following table indicates the plot number associated with the Input Bandwidth, Output Bandwidth, Block Edges, Intermodulation, Out-of-Band and Low, Mid, High Channels emission, mobile emissions in base frequency bands. All measurements are in peak detector mode.

800 MHz AMPS DOWNLINK BASE CHANNEL BLOCK A – B (869 – 894 MHz)		
Plot #	**Description**	**Frequency Range (MHz)**
1	Low Channel Output Power	869.1
2	Mid Channel Output Power	881.5
3	High Channel Output Power	893.9
4	Low Channel Input Bandwidth	869.1
5	Mid Channel Input Bandwidth	881.5
6	High Channel Input Bandwidth	893.9
7	Low Channel Output Bandwidth	869.1
8	Mid Channel Output Bandwidth	881.5
9	High Channel Output Bandwidth	893.9
10	Bottom Block Edge	868 to 870
11	Bottom Block Out-Of-Band	15 to 2900
12	Bottom Block Out-Of-Band	2900 to 10000
13	Mid Block Out-Of-Band	15 to 2900
14	Mid Block Out-Of-Band	2900 to 10000
15	Top Block Edge	893.9 to 894.1
16	Top Block Out-Of-Band	15 to 2900
17	Top Block Out-Of-Band	2900 to 10000

800 MHz AMPS DOWNLINK INTER-MODULATION BASE CHANNEL BLOCK A – B (869 – 894 MHz)		
Plot #	**Description**	**Frequency Range (MHz)**
18	Inter-modulation	Zoom In-Band
19	Inter-modulation	Zoom Out
20	Inter-modulation	Zoom Out
21	Inter-modulation Out-Of-Band	15 to 2900
22	Inter-modulation Out-Of-Band	2900 to 20000

800 MHz AMPS UPLINK MOBILE CHANNEL BLOCK A – B (824 – 849 MHz)		
Plot #	**Description**	**Frequency Range (MHz)**
23	Low Channel Output Power	824.1
24	Mid Channel Output Power	836.5
25	High Channel Output Power	848.9
26	Low Channel Input Bandwidth	824.1
27	Mid Channel Input Bandwidth	836.5
28	High Channel Input Bandwidth	848.9
29	Low Channel Output Bandwidth	824.1
30	Mid Channel Output Bandwidth	836.5
31	High Channel Output Bandwidth	848.9
32	Bottom Block Edge	823.9 to 824.1
33	Bottom Block Out-Of-Band	15 to 2900
34	Bottom Block Out-Of-Band	2900 to 10000
35	Mid Block Out-Of-Band	15 to 2900
36	Mid Block Out-Of-Band	2900 to 10000
37	Top Block Edge	848.9 to 849.1
38	Top Block Out-Of-Band	15 to 2900
39	Top Block Out-Of-Band	2900 to 10000

800 MHz AMPS UPLINK INTER-MODULATION MOBILE CHANNEL BLOCK A – B (824 – 849 MHz)		
Plot #	**Description**	**Frequency Range (MHz)**
40	Inter-modulation	Zoom In-Band
41	Inter-modulation	Zoom Out
42	Inter-modulation Out-Of-Band	15 to 2900
43	Inter-modulation Out-Of-Band	2900 to 20000

800 MHz CDMA DOWNLINK BASE CHANNEL BLOCK A – B (869 – 894 MHz)		
Plot #	**Description**	**Frequency Range (MHz)**
44	Low Channel Output Power	870.25
45	Mid Channel Output Power	881.5
46	High Channel Output Power	892.75
47	Low Channel Input Bandwidth	870.25
48	Mid Channel Input Bandwidth	881.5
49	High Channel Input Bandwidth	892.75
50	Low Channel Output Bandwidth	870.25
51	Mid Channek Output Bandwidth	881.5
52	High Channel Output Bandwidth	892.75
53	Bottom Block Edge	865.5 to 870.5
54	Bottom Block Out-Of-Band	15 to 2900
55	Bottom Block Out-Of-Band	2900 to 10000
56	Mid Block Out-Of-Band	15 to 2900
57	MId Block Out-Of-Band	2900 to 10000
58	Top Block Edge	822.5 to 895.5
59	Top Block Out-Of-Band	15 to 2900
60	Top Block Out-Of-Band	2900 to 10000

800 MHz CDMA DOWNLINK INTER-MODULATION BASE CHANNEL BLOCK A – B (869 – 894 MHz)		
Plot #	**Description**	**Frequency Range (MHz)**
61	Inter-modulation	Zoom In-Band
62	Inter-modulation	Zoom Out
63	Inter-modulation	Zoom Out
64	Inter-modulation Out-Of-Band	15 to 2900
65	Inter-modulation Out-Of-Band	2900 to 20000

800 MHz CDMA UPLINK MOBILE CHANNEL BLOCK A – B (824 – 849 MHz)		
Plot #	**Description**	**Frequency Range (MHz)**
66	Low Channel Output Power	825.25
67	Mid Channel Output Power	836.5
68	High Channel Output Power	847.75
69	Low Channel Input Bandwidth	825.25
70	Mid Channel Input Bandwidth	836.5
71	High Channel Input Bandwidth	847.75
72	Low Channel Output Bandwidth	825.25
73	Mid Channek Output Bandwidth	836.5
74	High Channel Output Bandwidth	847.75
75	Bottom Block Edge	820.525 to 825.525
76	Bottom Block Out-Of-Band	15 to 2900
77	Bottom Block Out-Of-Band	2900 to 10000
78	Mid Block Out-Of-Band	15 to 2900
79	MId Block Out-Of-Band	2900 to 10000
80	Top Block Edge	847.5 to 852.5
81	Top Block Out-Of-Band	15 to 2900
82	Top Block Out-Of-Band	2900 to 10000

800 MHz CDMA UPLINK INTER-MODULATION MOBILE CHANNEL BLOCK A – B (824 – 849 MHz)		
Plot #	**Description**	**Frequency Range (MHz)**
83	Inter-modulation	Zoom In-Band
84	Inter-modulation	Zoom Out
85	Inter-modulation Out-Of-Band	15 to 2900
86	Inter-modulation Out-Of-Band	2900 to 20000

800 MHz TDMA DOWNLINK BASE CHANNEL BLOCK A – B (869 – 894 MHz)		
Plot #	**Description**	**Frequency Range (MHz)**
87	Low Channel Output Power	869.1
88	Mid Channel Output Power	881.5
89	High Channel Output Power	893.9
90	Low Channel Input Bandwidth	869.1
91	Mid Channel Input Bandwidth	881.5
91	High Channel Input Bandwidth	893.9
93	Low Channel Output Bandwidth	869.1
94	Mid Channek Output Bandwidth	881.5
95	High Channel Output Bandwidth	893.9
96	Bottom Block Edge	868.9 to 869.1
97	Bottom Block Out-Of-Band	15 to 2900
98	Bottom Block Out-Of-Band	2900 to 10000
99	Mid Block Out-Of-Band	15 to 2900
100	MId Block Out-Of-Band	2900 to 10000
101	Top Block Edge	893.9 to 894.1
102	Top Block Out-Of-Band	15 to 2900
103	Top Block Out-Of-Band	2900 to 10000

800 MHz TDMA DOWNLINK INTER-MODULATION BASE CHANNEL BLOCK A – B (869 – 894 MHz)		
Plot #	**Description**	**Frequency Range (MHz)**
104	Inter-modulation	Zoom In-Band
105	Inter-modulation	Zoom Out
106	Inter-modulation	Zoom Out
107	Inter-modulation Out-Of-Band	15 to 2900
108	Inter-modulation Out-Of-Band	2900 to 20000

800 MHz TDMA UPLINK MOBILE CHANNEL BLOCK A – B (824 – 849 MHz)		
Plot #	**Description**	**Frequency Range (MHz)**
109	Low Channel Output Power	824.1
110	Mid Channel Output Power	836.5
111	High Channel Output Power	848.9
112	Low Channel Input Bandwidth	824.1
113	Mid Channel Input Bandwidth	836.5
114	High Channel Input Bandwidth	848.9
115	Low Channel Output Bandwidth	824.1
116	Mid Channek Output Bandwidth	836.5
117	High Channel Output Bandwidth	848.9
118	Bottom Block Edge	823.9 to 824.1
119	Bottom Block Out-Of-Band	15 to 2900
120	Bottom Block Out-Of-Band	2900 to 10000
121	Mid Block Out-Of-Band	15 to 2900
122	MId Block Out-Of-Band	2900 to 10000
123	Top Block Edge	848.9 to 849.1
124	Top Block Out-Of-Band	15 to 2900
125	Top Block Out-Of-Band	2900 to 10000

800 MHz TDMA UPLINK INTER-MODULATION MOBILE CHANNEL BLOCK A – B (824 – 849 MHz)		
Plot #	**Description**	**Frequency Range (MHz)**
126	Inter-modulation	Zoom In-Band
127	Inter-modulation	Zoom Out
128	Inter-modulation Out-Of-Band	15 to 2900
129	Inter-modulation Out-Of-Band	2900 to 20000

1900 MHz CDMA DOWNLINK BANDS A – F (1930 – 1990)		
Plot #	**Description**	**Frequency Range (MHz)**
130	Mid Channel Output Power (A – D)	1940
131	Mid Channel Output Power (D – B)	1950
132	Mid Channel Output Power (D – B)	1955
133	Mid Channel Output Power (B – E)	1960
134	Mid Channel Output Power (E – F)	1970
135	Mid Channel Output Power (F – C)	1980
136	Low Channel Output Power	1931.25
137	Low Channel Input Bandwidth	1931.25
138	Low Channel Output Bandwidth	1931.25
139	Low Channel Edge	1926.6 to 1931.6
140	Low Channel Out-Of-Band	15 to 2900
141	Low Channel Out-Of-Band	2900 to 20000
142	Low Channel Inter-modulation	Zoom In
143	Low Channel Inter-modulation	Zoom Out
144	Low Channel Inter-modulation Out-Of-Band	15 to 2900
145	Low Channel Inter-modulation Out-Of-Band	2900 to 20000
146	Mid Channel Output Power	1960
147	Mid Channel Input Bandwidth	1960
148	Mid Channel Output Bandwidth	1960
149	Mid Channel Out-Of-Band	15 to 2900
150	Mid Channel Out-Of-Band	2900 to 20000
151	Mid Channel Inter-modulation	Zoom In
152	Mid Channel Inter-modulation	Zoom Out
153	Mid Channel Inter-modulation Out-Of-Band	15 to 2900
154	Mid Channel Inter-modulation Out-Of-Band	2900 to 20000
155	High Channel Output Power	1988.75
156	High Channel Input Bandwidth	1988.75
157	High Channel Output Bandwidth	1988.75
158	High Channel Edge	1988.5 to 1993.5
159	High Channel Out-Of-Band	15 to 2900
160	High Channel Out-Of-Band	2900 to 20000
161	High Channel Inter-modulation	Zoom In
162	High Channel Inter-modulation	Zoom Out
163	High Channel Inter-modulation	Zoom Out
164	High Channel Inter-modulation Out-Of-Band	15 to 2900
165	High Channel Inter-modulation Out-Of-Band	2900 to 20000

1900 MHz CDMA UPLINK BANDS A – F (1850 – 1910)		
Plot #	**Description**	**Frequency Range (MHz)**
166	Mid Channel Output Power (A – D)	1860
167	Mid Channel Output Power (D – B)	1870
168	Mid Channel Output Power (D – B)	1875
169	Mid Channel Output Power (B – E)	1880
170	Mid Channel Output Power (E – F)	1890
171	Mid Channel Output Power (F – C)	1900
172	Low Channel Output Power	1851.25
173	Low Channel Input Bandwidth	1851.25
174	Low Channel Output Bandwidth	1851.25
175	Low Channel Edge	1846.5 to 1851.5
176	Low Channel Out-Of-Band	15 to 2900
177	Low Channel Out-Of-Band	2900 to 20000
178	Low Channel Inter-modulation	Zoom In
179	Low Channel Inter-modulation	Zoom Out
180	Low Channel Inter-modulation Out-Of-Band	15 to 2900
181	Low Channel Inter-modulation Out-Of-Band	2900 to 20000
182	Mid Channel Output Power	1880
183	Mid Channel Input Bandwidth	1880
184	Mid Channel Output Bandwidth	1880
185	Mid Channel Out-Of-Band	15 to 2900
186	Mid Channel Out-Of-Band	2900 to 20000
187	Mid Channel Inter-modulation	Zoom In
188	Mid Channel Inter-modulation	Zoom Out
189	Mid Channel Inter-modulation Out-Of-Band	15 to 2900
190	Mid Channel Inter-modulation Out-Of-Band	2900 to 20000
191	High Channel Output Power	1908.75
192	High Channel Input Bandwidth	1908.75
193	High Channel Output Bandwidth	1908.75
194	High Channel Edge	1907.5 to 1912.5
195	High Channel Out-Of-Band	15 to 2900
196	High Channel Out-Of-Band	2900 to 20000
197	High Channel Inter-modulation	Zoom In
198	High Channel Inter-modulation	Zoom Out
199	High Channel Inter-modulation Out-Of-Band	15 to 2900
200	High Channel Inter-modulation Out-Of-Band	2900 to 20000

1900 MHz EDGE DOWNLINK BANDS A – F (1930 – 1990)		
Plot #	**Description**	**Frequency Range (MHz)**
201	Mid Channel Output Power (A – D)	1940
202	Mid Channel Output Power (D – B)	1950
203	Mid Channel Output Power (D – B)	1955
204	Mid Channel Output Power (B – E)	1960
205	Mid Channel Output Power (E – F)	1970
206	Mid Channel Output Power (F – C)	1980
207	Low Channel Output Power	1930.5
208	Low Channel Input Bandwidth	1930.5
209	Low Channel Output Bandwidth	1930.5
210	Low Channel Edge	1925.6 to 1927.6
211	Low Channel Out-Of-Band	15 to 2900
212	Low Channel Out-Of-Band	2900 to 20000
213	Low Channel Inter-modulation	Zoom In
214	Low Channel Inter-modulation	Zoom Out
215	Low Channel Inter-modulation	Zoom Out
216	Low Channel Inter-modulation Out-Of-Band	15 to 2900
217	Low Channel Inter-modulation Out-Of-Band	2900 to 20000
218	Mid Channel Output Power	1960
219	Mid Channel Input Bandwidth	1960
220	Mid Channel Output Bandwidth	1960
221	Mid Channel Out-Of-Band	15 to 2900
222	Mid Channel Out-Of-Band	2900 to 20000
223	Mid Channel Inter-modulation	Zoom In
224	Mid Channel Inter-modulation	Zoom Out
225	Mid Channel Inter-modulation	Zoom Out
226	Mid Channel Inter-modulation Out-Of-Band	15 to 2900
227	Mid Channel Inter-modulation Out-Of-Band	2900 to 20000
228	High Channel Output Power	1989.5
229	High Channel Input Bandwidth	1989.5
230	High Channel Output Bandwidth	1989.5
231	High Channel Edge	1989.4 to 1991.4
232	High Channel Out-Of-Band	15 to 2900
233	High Channel Out-Of-Band	2900 to 20000
234	High Channel Inter-modulation	Zoom In
235	High Channel Inter-modulation	Zoom Out
236	High Channel Inter-modulation	Zoom Out
237	High Channel Inter-modulation Out-Of-Band	15 to 2900
238	High Channel Inter-modulation Out-Of-Band	2900 to 20000

1900 MHz EDGE UPLINK BANDS A – F (1850 – 1910)		
Plot #	**Description**	**Frequency Range (MHz)**
239	Mid Channel Output Power (A – D)	1860
240	Mid Channel Output Power (D – B)	1870
241	Mid Channel Output Power (D – B)	1875
242	Mid Channel Output Power (B – E)	1880
243	Mid Channel Output Power (E – F)	1890
244	Mid Channel Output Power (F – C)	1900
245	Low Channel Output Power	1850.5
246	Low Channel Input Bandwidth	1850.5
247	Low Channel Output Bandwidth	1850.5
248	Low Channel Edge	1848.5 to 1850.5
249	Low Channel Out-Of-Band	15 to 2900
250	Low Channel Out-Of-Band	2900 to 20000
251	Low Channel Inter-modulation	Zoom In
252	Low Channel Inter-modulation	Zoom Out
253	Low Channel Inter-modulation Out-Of-Band	15 to 2900
254	Low Channel Inter-modulation Out-Of-Band	2900 to 20000
255	Mid Channel Output Power	1880
256	Mid Channel Input Bandwidth	1880
257	Mid Channel Output Bandwidth	1880
258	Mid Channel Out-Of-Band	15 to 2900
259	Mid Channel Out-Of-Band	2900 to 20000
260	Mid Channel Inter-modulation	Zoom In
261	Mid Channel Inter-modulation	Zoom Out
262	Mid Channel Inter-modulation Out-Of-Band	15 to 2900
263	Mid Channel Inter-modulation Out-Of-Band	2900 to 20000
264	High Channel Output Power	1909.5
265	High Channel Input Bandwidth	1909.5
266	High Channel Output Bandwidth	1909.5
267	High Channel Edge	1909.5 to 1911.5
268	High Channel Out-Of-Band	15 to 2900
269	High Channel Out-Of-Band	2900 to 20000
270	High Channel Inter-modulation	Zoom In
271	High Channel Inter-modulation	Zoom Out
272	High Channel Inter-modulation Out-Of-Band	15 to 2900
273	High Channel Inter-modulation Out-Of-Band	15 to 2900
274	High Channel Inter-modulation Out-Of-Band	2900 to 20000

1900 MHz GSM DOWNLINK BANDS A – F (1930 – 1990)		
Plot #	**Description**	**Frequency Range (MHz)**
275	Mid Channel Output Power (A – D)	1940
276	Mid Channel Output Power (D – B)	1950
277	Mid Channel Output Power (D – B)	1955
278	Mid Channel Output Power (B – E)	1960
279	Mid Channel Output Power (E – F)	1970
280	Mid Channel Output Power (F – C)	1980
281	Low Channel Output Power	1930.5
282	Low Channel Input Bandwidth	1930.5
283	Low Channel Output Bandwidth	1930.5
284	Low Channel Edge	1928.5 to 1930.5
285	Low Channel Out-Of-Band	15 to 2900
286	Low Channel Out-Of-Band	2900 to 20000
287	Low Channel Inter-modulation	Zoom In
288	Low Channel Inter-modulation	Zoom Out
289	Low Channel Inter-modulation	Zoom Out
290	Low Channel Inter-modulation Out-Of-Band	15 to 2900
291	Low Channel Inter-modulation Out-Of-Band	2900 to 20000
292	Mid Channel Output Power	1960
293	Mid Channel Input Bandwidth	1960
294	Mid Channel Output Bandwidth	1960
295	Mid Channel Out-Of-Band	15 to 2900
296	Mid Channel Out-Of-Band	2900 to 20000
297	Mid Channel Inter-modulation	Zoom In
298	Mid Channel Inter-modulation	Zoom Out
299	Mid Channel Inter-modulation Out-Of-Band	15 to 2900
300	Mid Channel Inter-modulation Out-Of-Band	2900 to 20000
301	High Channel Output Power	1989.5
302	High Channel Bandwidth	1989.5
303	High Channel Output Bandwidth	1989.5
304	High Channel Edge	1989.4 to 1991.4
305	High Channel Out-Of-Band	15 to 2900
306	High Channel Out-Of-Band	2900 to 20000
307	High Channel Inter-modulation	Zoom In
308	High Channel Inter-modulation	Zoom Out
309	High Channel Inter-modulation	Zoom Out
310	High Channel Inter-modulation Out-Of-Band	15 to 2900
311	High Channel Inter-modulation Out-Of-Band	2900 to 20000

1900 MHz GSM UPLINK BANDS A – F (1850 – 1910)		
Plot #	**Description**	**Frequency Range (MHz)**
312	Mid Channel Output Power (A – D)	1860
313	Mid Channel Output Power (D – B)	1870
314	Mid Channel Output Power (D – B)	1875
315	Mid Channel Output Power (B – E)	1880
316	Mid Channel Output Power (E – F)	1890
317	Mid Channel Output Power (F – C)	1900
318	Low Channel Output Power	1850.5
319	Low Channel Input Bandwidth	1850.5
320	Low Channel Output Bandwidth	1850.5
321	Low Channel Edge	1848.5 to 1850.5
322	Low Channel Out-Of-Band	15 to 2900
323	Low Channel Out-Of-Band	2900 to 20000
324	Low Channel Inter-modulation	Zoom In
325	Low Channel Inter-modulation	Zoom Out
326	Low Channel Inter-modulation	15 to 2900
327	Low Channel Inter-modulation Out-Of-Band	2900 to 20000
328	Low Channel Inter-modulation Out-Of-Band	1880
329	Mid Channel Output Power	1880
330	Mid Channel Input Bandwidth	1880
331	Mid Channel Output Bandwidth	15 to 2900
332	Mid Channel Out-Of-Band	2900 to 20000
333	Mid Channel Out-Of-Band	Zoom In
334	Mid Channel Inter-modulation	Zoom Out
335	Mid Channel Inter-modulation	15 to 2900
336	Mid Channel Inter-modulation Out-Of-Band	2900 to 20000
337	Mid Channel Inter-modulation Out-Of-Band	1909.5
338	High Channel Output Power	1909.5
339	High Channel Bandwidth	1909.5
340	High Channel Output Bandwidth	1909.5 to 1911.5
341	High Channel Edge	15 to 2900
342	High Channel Out-Of-Band	2900 to 20000
343	High Channel Out-Of-Band	Zoom In
344	High Channel Inter-modulation	Zoom Out
345	High Channel Inter-modulation	15 to 2900
346	High Channel Inter-modulation	2900 to 20000

1900 MHz TDMA DOWNLINK BANDS A – F (1930 – 1990)		
Plot #	**Description**	**Frequency Range (MHz)**
347	Mid Channel Output Power (A – D)	1940
348	Mid Channel Output Power (D – B)	1950
349	Mid Channel Output Power (D – B)	1955
350	Mid Channel Output Power (B – E)	1960
351	Mid Channel Output Power (E – F)	1970
352	Mid Channel Output Power (F – C)	1980
353	Low Channel Output Power	1930.1
354	Low Channel Input Bandwidth	1930.1
355	Low Channel Output Bandwidth	1930.1
356	Low Channel Edge	1929.9 to 1930.1
357	Low Channel Out-Of-Band	15 to 2900
358	Low Channel Out-Of-Band	2900 to 20000
359	Low Channel Inter-modulation	Zoom In
360	Low Channel Inter-modulation	Zoom Out
361	Low Channel Inter-modulation	Zoom Out
362	Low Channel Inter-modulation Out-Of-Band	15 to 2900
363	Low Channel Inter-modulation Out-Of-Band	2900 to 20000
364	Mid Channel Output Power	1960
365	Mid Channel Input Bandwidth	1960
366	Mid Channel Output Bandwidth	1960
367	Mid Channel Out-Of-Band	15 to 2900
368	Mid Channel Out-Of-Band	2900 to 20000
369	Mid Channel Inter-modulation	Zoom In
370	Mid Channel Inter-modulation	Zoom Out
371	Mid Channel Inter-modulation Out-Of-Band	15 to 2900
372	Mid Channel Inter-modulation Out-Of-Band	2900 to 20000
373	High Channel Output Power	1989.9
374	High Channel Bandwidth	1989.9
375	High Channel Output Bandwidth	1989.9
376	High Channel Edge	1989.9 to 1990.1
377	High Channel Out-Of-Band	15 to 2900
378	High Channel Out-Of-Band	2900 to 20000
379	High Channel Inter-modulation	15 to 2900
380	High Channel Inter-modulation	2900 to 20000
381	High Channel Inter-modulation	Zoom In
382	High Channel Inter-modulation Out-Of-Band	Zoom Out
383	High Channel Inter-modulation Out-Of-Band	Zoom Out

1900 MHz TDMA UPLINK BANDS A – F (1850 – 1910)		
Plot #	**Description**	**Frequency Range (MHz)**
384	Mid Channel Output Power (A – D)	1860
385	Mid Channel Output Power (D – B)	1870
386	Mid Channel Output Power (D – B)	1875
387	Mid Channel Output Power (B – E)	1880
388	Mid Channel Output Power (E – F)	1890
389	Mid Channel Output Power (F – C)	1900
390	Low Channel Output Power	1850.1
391	Low Channel Input Bandwidth	1850.1
392	Low Channel Output Bandwidth	1850.1
393	Low Channel Edge	1849.9 to 1850.1
394	Low Channel Out-Of-Band	15 to 2900
395	Low Channel Out-Of-Band	2900 to 20000
396	Low Channel Inter-modulation	Zoom In
397	Low Channel Inter-modulation	Zoom Out
398	Low Channel Inter-modulation	15 to 2900
399	Low Channel Inter-modulation Out-Of-Band	2900 to 20000
400	Low Channel Inter-modulation Out-Of-Band	1880
401	Mid Channel Output Power	1880
402	Mid Channel Input Bandwidth	1880
403	Mid Channel Output Bandwidth	15 to 2900
404	Mid Channel Out-Of-Band	2900 to 20000
405	Mid Channel Out-Of-Band	Zoom In
406	Mid Channel Inter-modulation	Zoom Out
407	Mid Channel Inter-modulation	15 to 2900
408	Mid Channel Inter-modulation Out-Of-Band	2900 to 20000
409	Mid Channel Inter-modulation Out-Of-Band	1909.9
410	High Channel Output Power	1909.9
411	High Channel Bandwidth	1909.9
412	High Channel Output Bandwidth	1909.9 to 1910.1
413	High Channel Edge	15 to 2900
414	High Channel Out-Of-Band	2900 to 20000
415	High Channel Out-Of-Band	Zoom In
416	High Channel Inter-modulation	Zoom Out
417	High Channel Inter-modulation	15 to 2900
418	High Channel Inter-modulation	2900 to 20000

800MHz UPLINK MOBILE CHANNEL BLOCK A – B (824 – 849MHz)		
Plot #	**Description**	**Frequency Range (MHz)**
419	Mobile emissions in base frequency range	868 – 895 (RF input 836.5MHz)

END OF REPORT