KTL Test Report:	8L0265E
Applicant:	Samsung Telecommunications America, Inc. 1130 Arapaho Road Richardson, Tx 75081
Equipment Under Test: (E.U.T.)	Outdoor Mini-BTS
FCC ID:	NP817-4WODMINI
In Accordance With:	**FCC Part 24, Subpart E** Broadband PCS Base Station
Tested By:	KTL Dallas Inc. 802 North Kealy Lewisville, TX 75057-3136
Authorized By:	_____ Tom Tidwell, RF Group Manager
Date:	_____
Total Number of Pages:	

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Section 1. Summary of Test Results

Manufacturer: Samsung Telecommunication America, Inc.

Model No.: Outdoor Mini-BTS

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

P	C	B

Equipment Code

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: 100351-0

TESTED BY: _____ DATE: _____
Ron Gaytan, Technician

Summary Of Test Data

NAME OF TEST	PARA. NO.	SPEC.	MEAS.	RESULT
RF Power Output	24.232	100W	17.4 W	Complies
Occupied Bandwidth (CDMA)	24.238	Plots	Plots	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	-15 dBm	Complies
Field Strength of Spurious Emissions	24.238(a)	-13 dBm E.I.R.P.	-26.3 dBm E.I.R.P.	Complies
Frequency Stability	24.235	± 0.05 ppm	-0.00356 ppm	Complies

Note: Waveform Quality was measured under voltage and temperature extremes in order to characterize the modulation characteristics as per FCC Part 2.1047 This data is reported with Frequency Stability data.

Footnotes For N/A's: The E.U.T. is a CDMA only base station transmitter.

Test Conditions:

LAB: Temperature: 24 °C
Humidity: 52 %

OATS: Temperature: 22 °C
Humidity: 41 %

Section 2. General Equipment Specification

Supply Voltage Input: **27 VAC**

Frequency Range(s): **Blocks A,D,B,E,C & F**

A	1931.250-1943.750
D	1946.250-1948.750
B	1951.250-1963.750
E	1966.250-1968.750
F	1971.250-1973.750
C	1976.250-1988.750

Type of Modulation and Designator:

CDMA (F9W)	**GSM (GXW)**	**NADC (DXW)**
☒	☐	☐

Emission & Bandwidth Designator: **1M25F9W**

Output Impedance: **50 ohm**

RF Output (Rated): **17.4 Watts (+42.4 dBm)**

Band Selection:

Software	**Duplexer Change**	**Fullband Coverage**
☒	☐	☒

Description of Modifications For Class II Permissive Change

Not Applicable

Modifications Made During Testing

Not Applicable

System Description

The E.U.T. is a base station transmitter that operates in the PCS 1900 frequency blocks. The access method is CDMA and the air interface is designed to the IEC IS-95 standard.. Output power of the transmitter is rated as 17.4 watts. Multiple sectors can be configured with one CDMA channel per sector.

The system is intended to operate on the valid CDMA frequency assignments defined in J-STD-008 and listed below.

Block Designator	Valid CDMA Frequency Assignments	CDMA Channel Number	Personal Station Frequency(MHz)	**Base Station Frequency(MHz)**
A	Not Valid	0-24	1850.000-1851.200	1930.000-1931.200
	Valid	25-275	1851.250-1863.75	1931.250-1943.750
	Cond. Valid	276-299	1863.800-1864.950	1943.800-1944.950
D	Cond. Valid	300-324	1865.000-1866.200	1945.000-1946.200
	Valid	325-375	1866.250-1868.750	1946.250-1948.750
	Cond. Valid	376-399	1868.800-1869.950	1948.800-1949.950
B	Cond. Valid	400-424	1870.000-1871.200	1950.000-1951.200
	Valid	425-675	1871.250-1883.750	1951.250-1963.750
	Cond. Valid	676-699	1883.800-1884.950	1963.800-1964.950
E	Cond. Valid	700-724	1885.000-1886.200	1965.000-1966.200
	Valid	725-775	1886.250-1888.750	1966.250-1968.750
	Cond. Valid	776-799	1888.800-1889.950	1968.800-1969.950
F	Cond. Valid	800-824	1890.000-1891.200	1970.000-1971.200
	Valid	825-875	1891.250-1893.750	1971.250-1973.750
	Cond. Valid	876-899	1893.800-1894.950	1973.800-1974.950
C	Cond. Valid	900-924	1895.000-1896.200	1975.000-1976.200
	Valid	925-1175	1896.250-1908.750	1976.250-1988.750
	Not Valid	1176-1199	1908.800-1909.950	1988.800-1989.950

Section 3. RF Power Output

NAME OF TEST: RF Power Output	PARA. NO.: 2.1046
TESTED BY: Ron Gaytan	DATE: 1/25/99

Test Results: Complies.

Measurement Data:

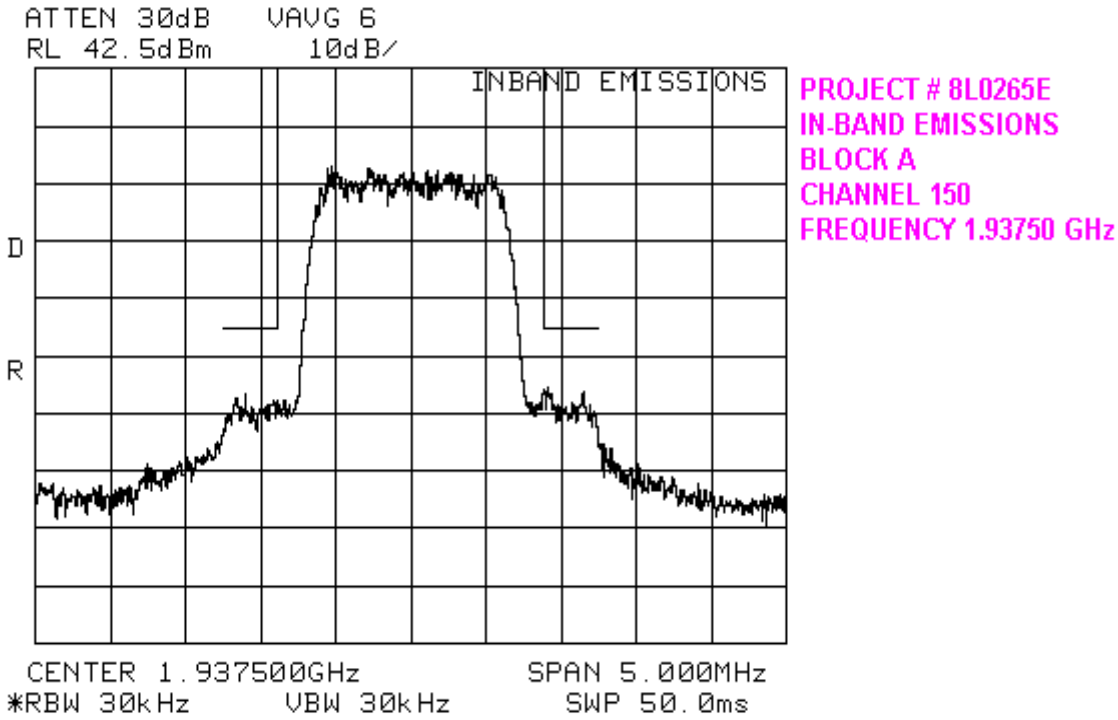
Modulation Type	Measured Output Power (dBm)	Rated Output Power (dBm)
CDMA	42.4	42.4
GSM	N/A	N/A
NADC	N/A	N/A

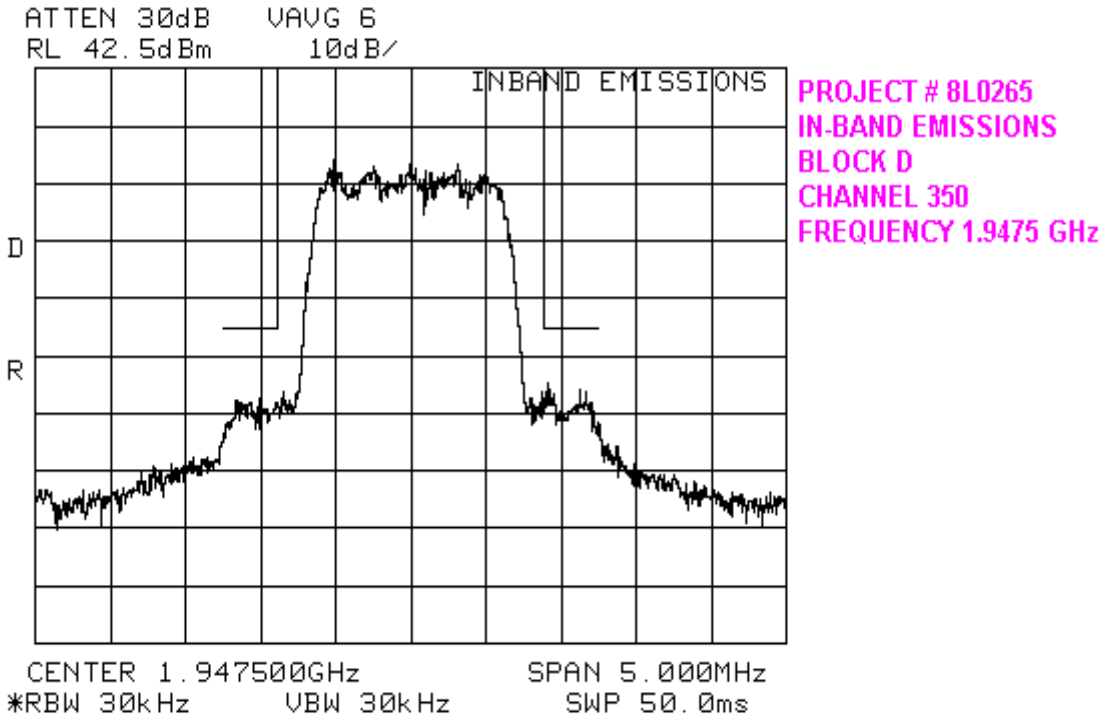
Section 4. Occupied Bandwidth

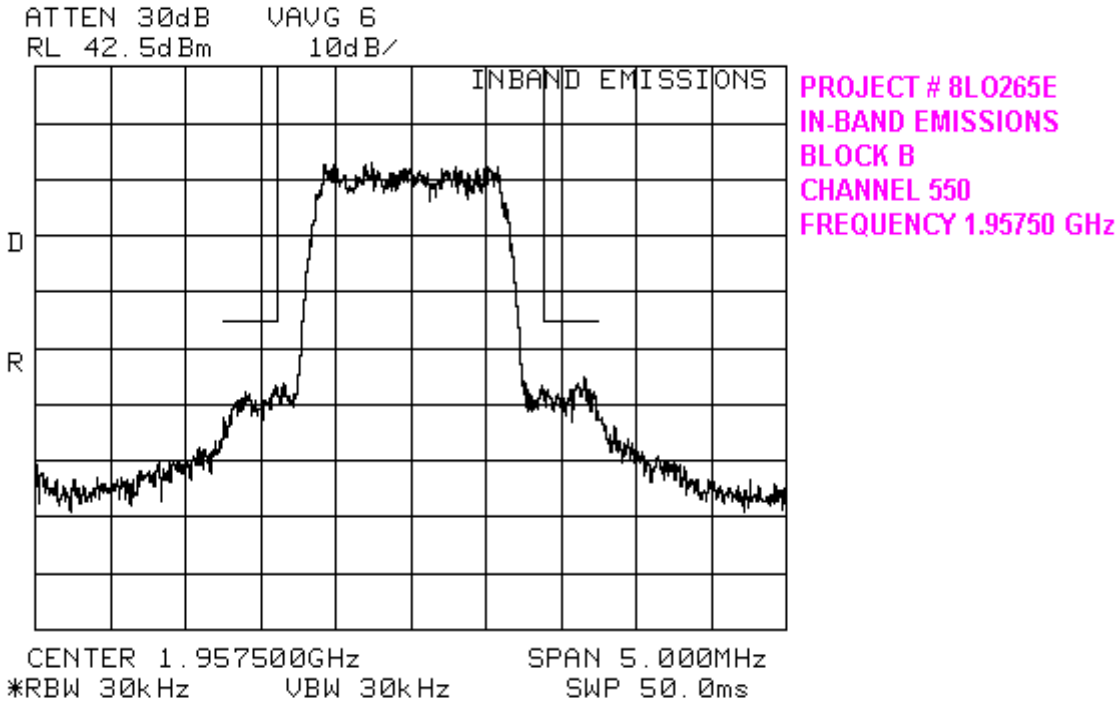
NAME OF TEST: Occupied Bandwidth (CDMA)	PARA. NO.: 2.1049
TESTED BY: Ron Gaytan	DATE: 1/26/99

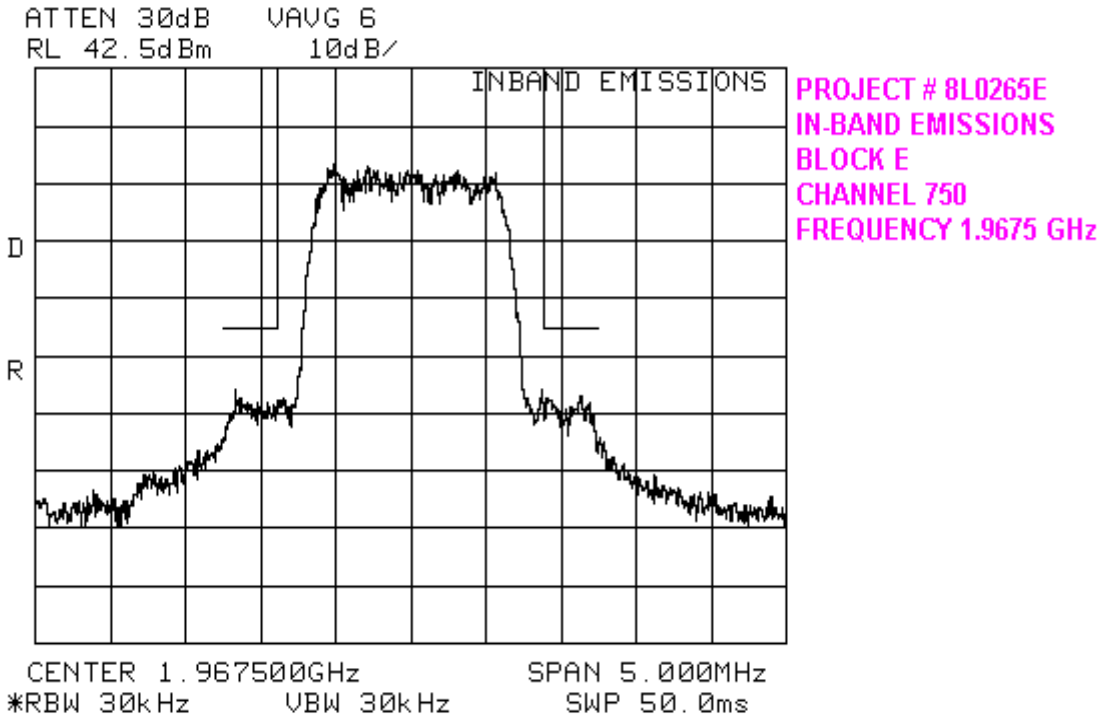
Test Results: Complies.

Test Data: See attached graph(s).


ATTEN 30dB
VAVG 6
RL 42.5dBm
10dB/
INBAND EMISSIONS
D
R
CENTER 1.937500GHz
SPAN 5.000MHz
*RBW 30kHz
VBW 30kHz
SWP 50.0ms
PROJECT # 8L0265E
IN-BAND EMISSIONS
BLOCK A
CHANNEL 150
FREQUENCY 1.93750 GHz


ATTEN 30dB
VAVG 6
RL 42.5dBm
10dB/
INBAND EMISSIONS
D
R
CENTER 1.947500GHz
SPAN 5.000MHz
*RBW 30kHz
VBW 30kHz
SWP 50.0ms
PROJECT # 8L0265
IN-BAND EMISSIONS
BLOCK D
CHANNEL 350
FREQUENCY 1.9475 GHz


ATTEN 30dB
VAVG 6
RL 42.5dBm
10dB/
INBAND EMISSIONS
D
R
CENTER 1.957500GHz
SPAN 5.000MHz
*RBW 30kHz
VBW 30kHz
SWP 50.0ms
PROJECT # 8L0265E
IN-BAND EMISSIONS
BLOCK B
CHANNEL 550
FREQUENCY 1.95750 GHz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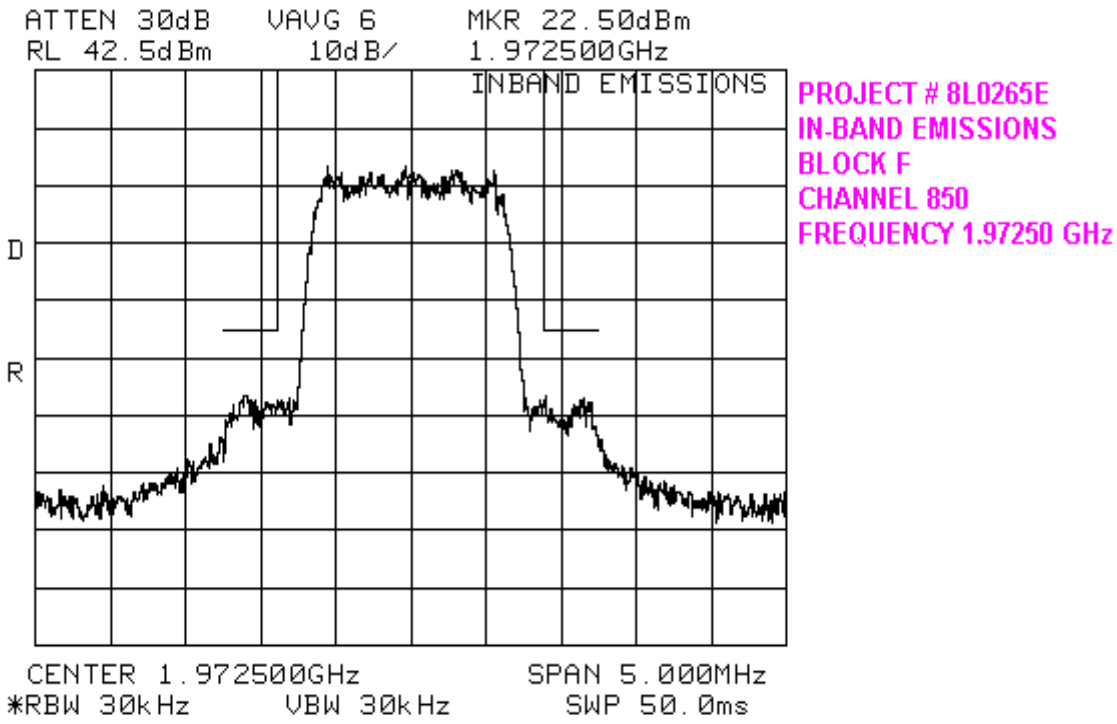
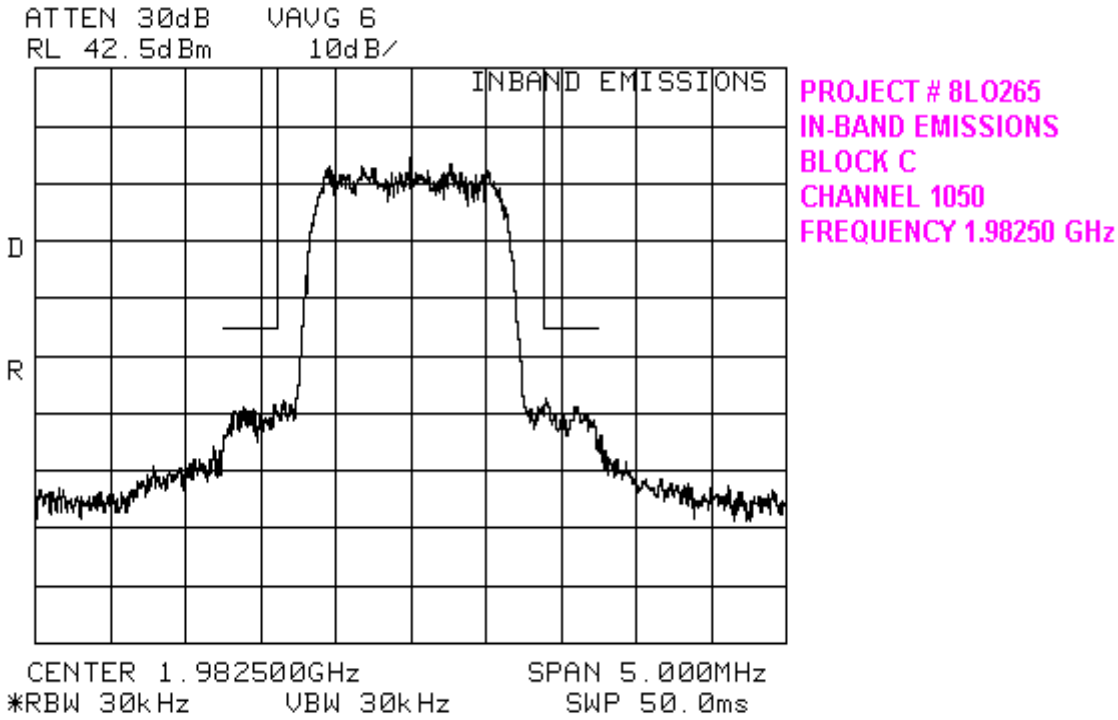
VAVG 6
RL 42.5dBm
10dB/
INBAND EMISSIONS
D
R
CENTER 1.967500GHz
SPAN 5.000MHz
*RBW 30kHz
VBW 30kHz
SWP 50.0ms
PROJECT # 8L0265E
IN-BAND EMISSIONS
BLOCK E
CHANNEL 750
FREQUENCY 1.9675 GHz


ATTEN 30dB
RL 42.5dBm
VAVG 6
10dB/
MKR 22.50dBm
1.972500GHz
INBAND EMISSIONS
D
R
CENTER 1.972500GHz
SPAN 5.000MHz
*RBW 30kHz
VBW 30kHz
SWP 50.0ms
PROJECT # 8L0265E
IN-BAND EMISSIONS
BLOCK F
CHANNEL 850
FREQUENCY 1.97250 GHz


ATTEN 30dB
VAVG 6
RL 42.5dBm
10dB/
INBAND EMISSIONS
D
R
CENTER 1.982500GHz
SPAN 5.000MHz
*RBW 30kHz
VBW 30kHz
SWP 50.0ms
PROJECT # 8L0265
IN-BAND EMISSIONS
BLOCK C
CHANNEL 1050
FREQUENCY 1.98250 GHz

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

Test Results: Complies/Does Not Comply.

Test Data: See attached graph(s).

Not Applicable

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

Test Results: Complies/Does Not Comply.

Test Data: See attached graph(s).

Not Applicable

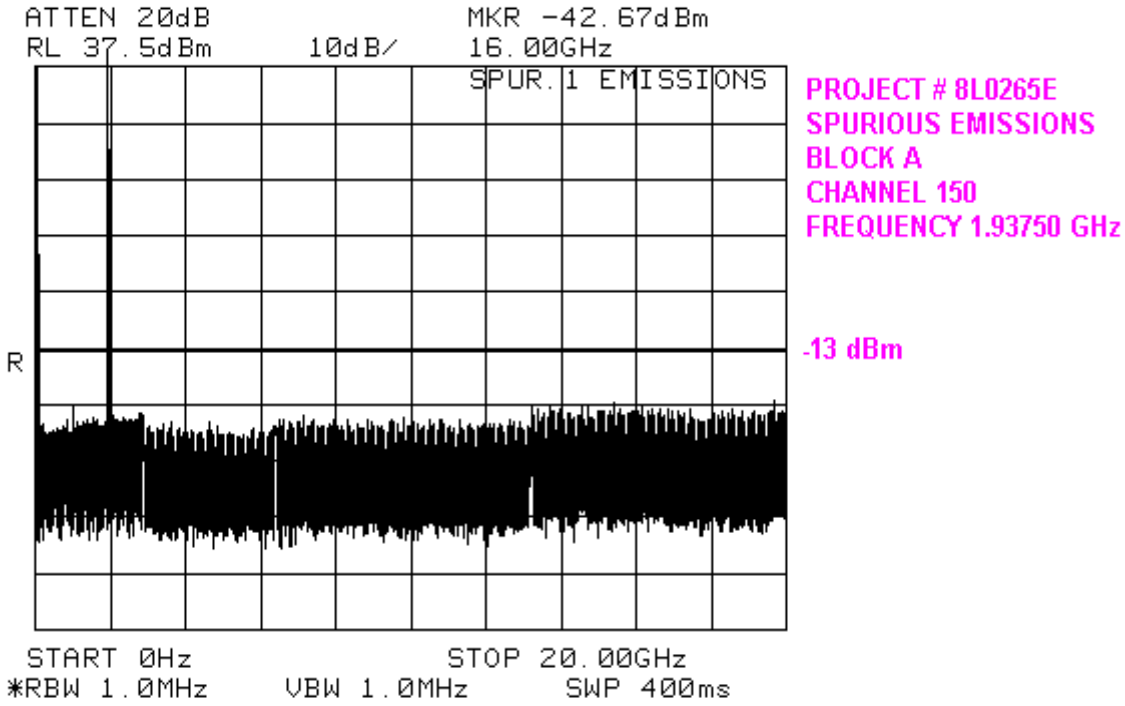
Section 5. Spurious Emissions at Antenna Terminals

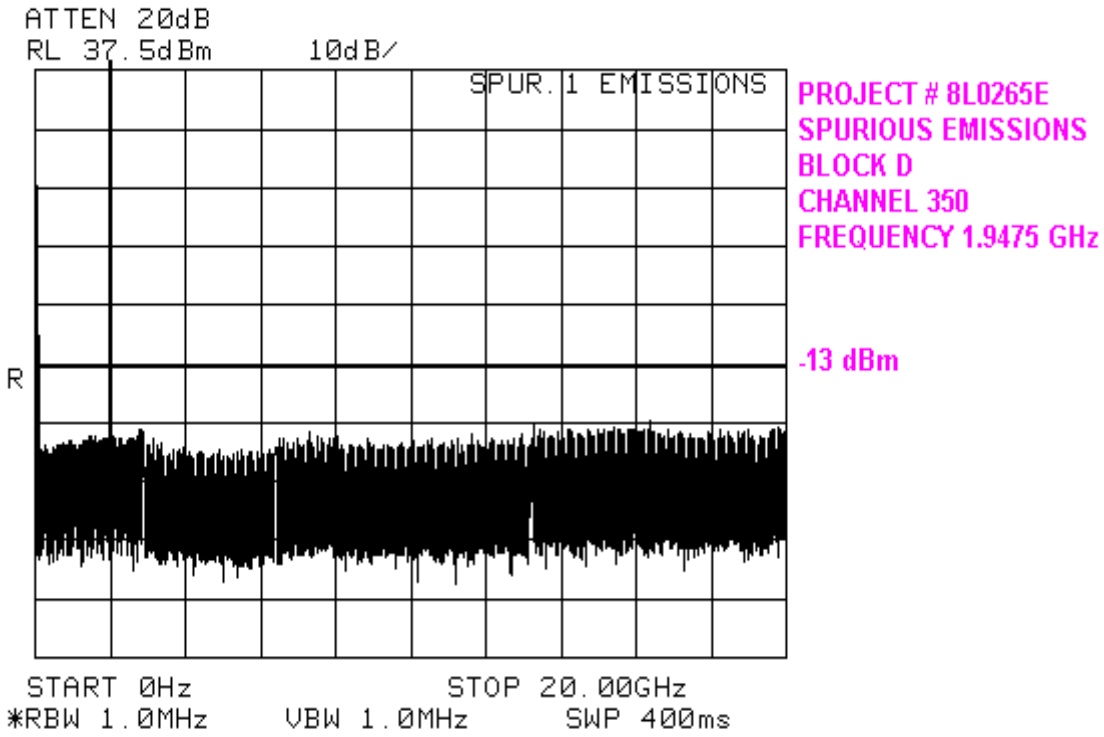
NAME OF TEST: Spurious Emissions @ Antenna Terminals	PARA. NO.: 2.1051
TESTED BY: Ron Gaytan	DATE: 1/26/99 & 1/27/99

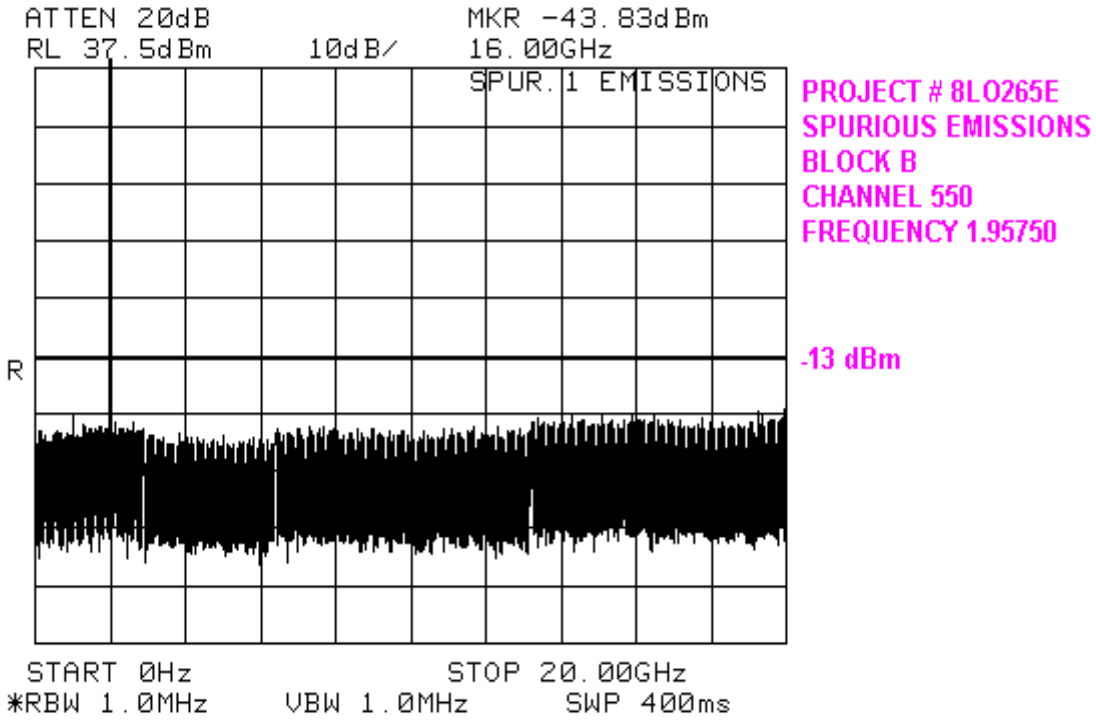
Test Results: Complies.

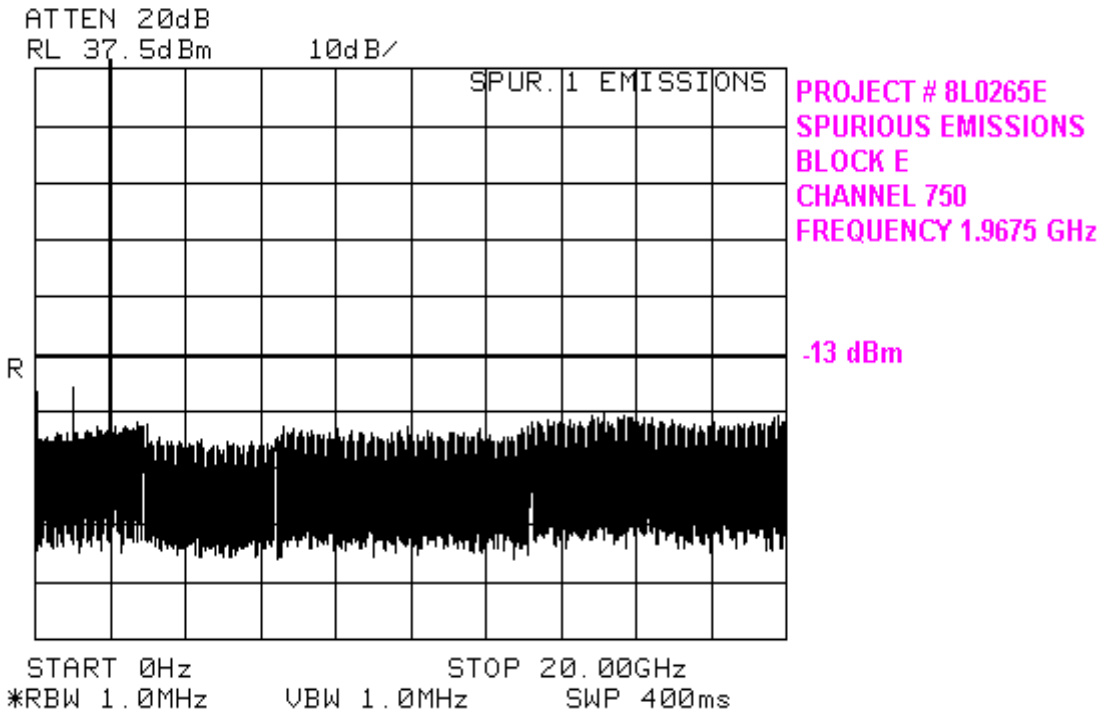
Test Data:

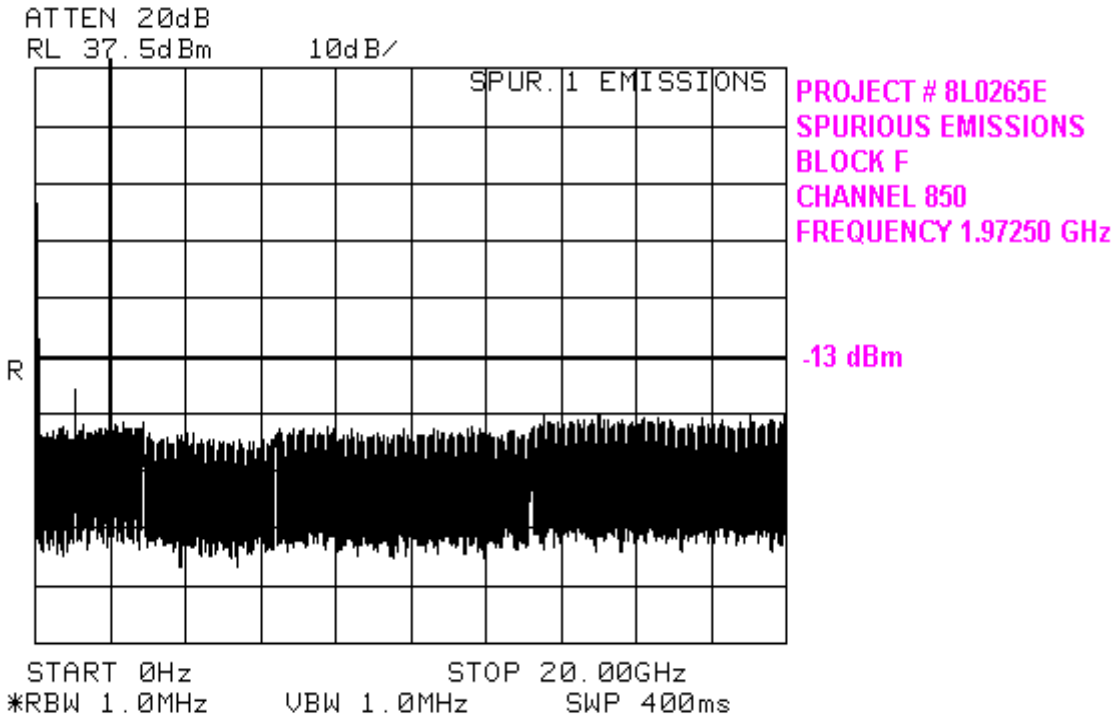
NAME OF TEST	WORST-CASE SURIOUS LEVEL(dBm)
0 to 20 GHz Spurious	-17
Lower Band Edge	-15
Upper Band Edge	-19

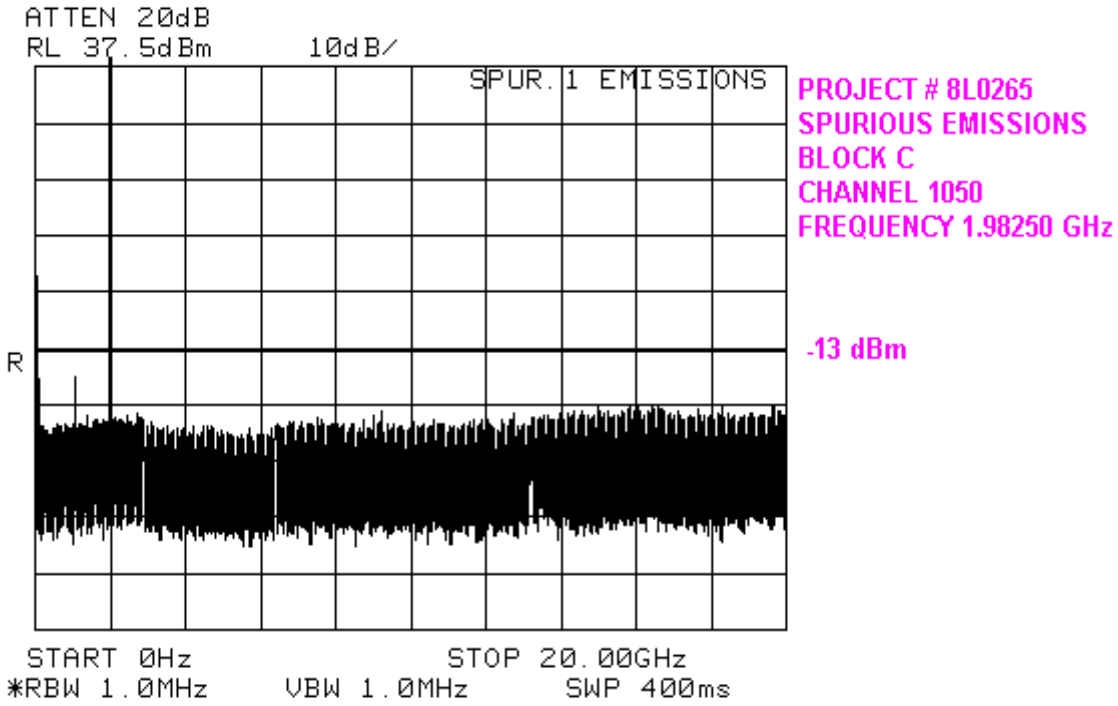

ATTEN 20dB
RL 37.5dBm
10dB/
MKR -42.67dBm
16.00GHz
SPUR.1 EMISSIONS
R
START 0Hz
STOP 20.00GHz
*RBW 1.0MHz
VBW 1.0MHz
SWP 400ms
PROJECT # 8L0265E
SPURIOUS EMISSIONS
BLOCK A
CHANNEL 150
FREQUENCY 1.93750 GHz
-13 dBm

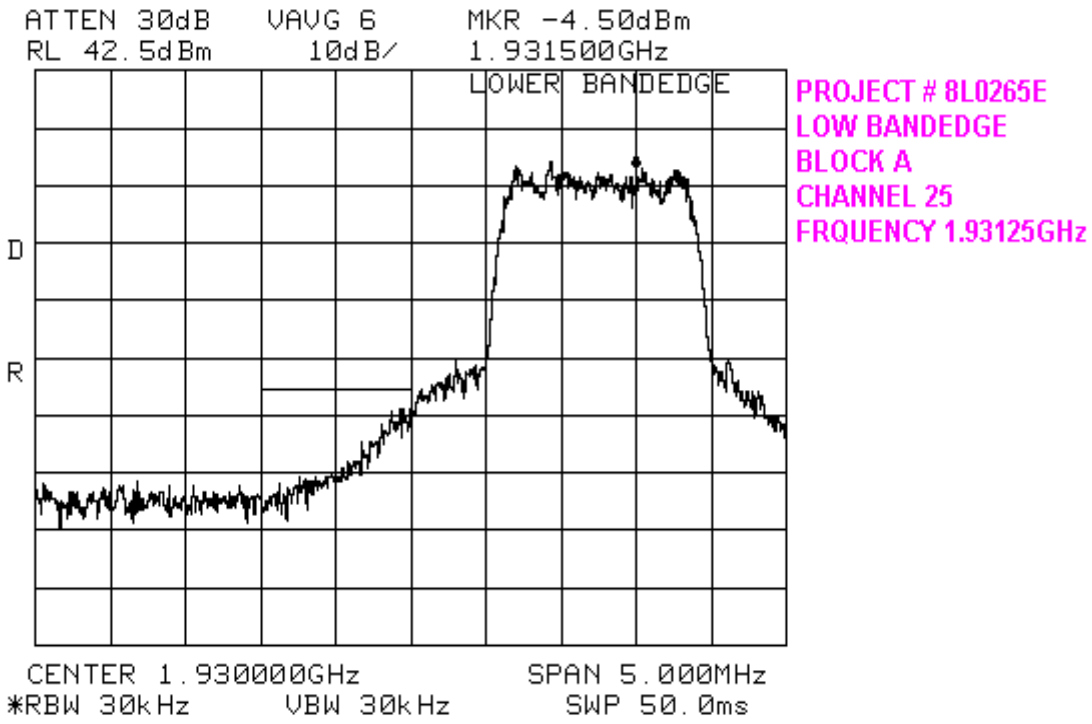

ATTEN 20dB
RL 37.5dBm
10dB/
SPUR.1 EMISSIONS
PROJECT # 8L0265E
SPURIOUS EMISSIONS
BLOCK D
CHANNEL 350
FREQUENCY 1.9475 GHz
-13 dBm
R
START 0Hz
STOP 20.00GHz
*RBW 1.0MHz
VBW 1.0MHz
SWP 400ms

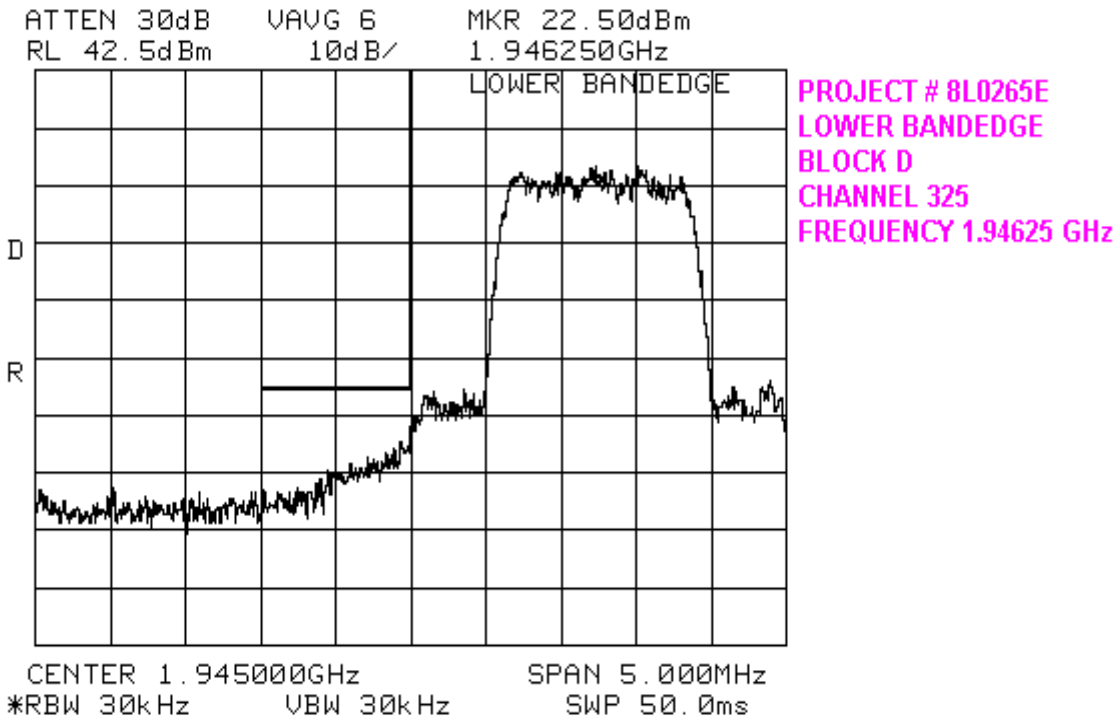

ATTEN 20dB
RL 37.5dBm
10dB/
MKR -43.83dBm
16.00GHz
SPUR.1 EMISSIONS
PROJECT # 8LO265E
SPURIOUS EMISSIONS
BLOCK B
CHANNEL 550
FREQUENCY 1.95750
R
-13 dBm
START 0Hz
STOP 20.00GHz
*RBW 1.0MHz
VBW 1.0MHz
SWP 400ms

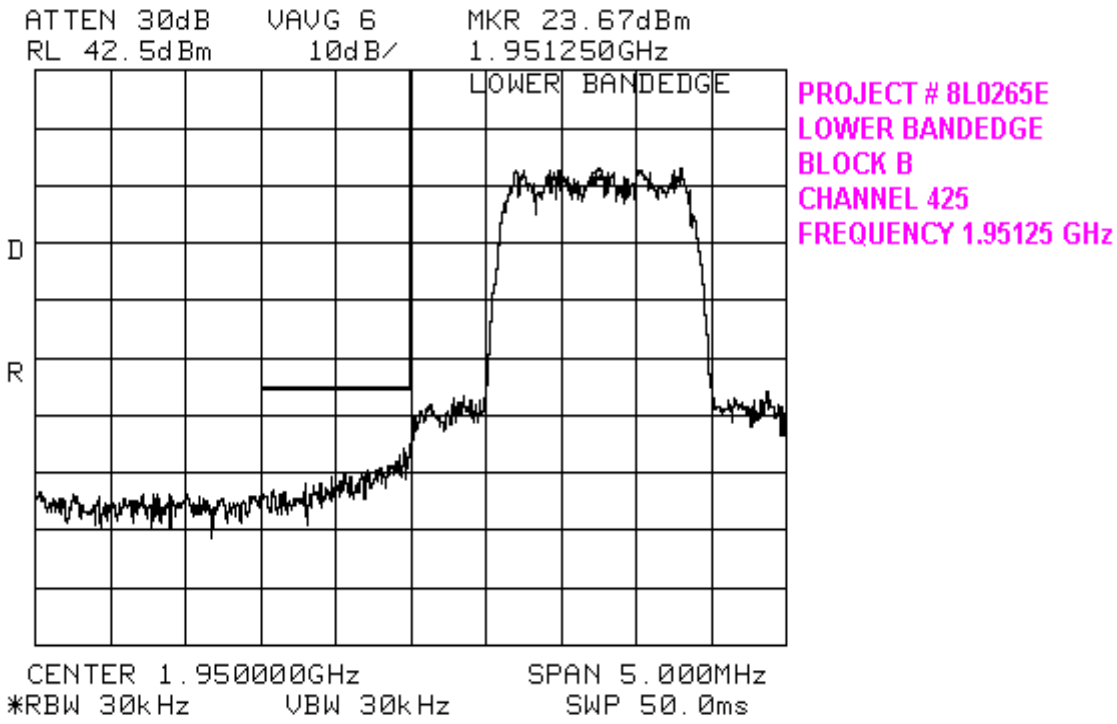

ATTEN 20dB
RL 37.5dBm
10dB/
SPUR.1 EMISSIONS
PROJECT # 8L0265E
SPURIOUS EMISSIONS
BLOCK E
CHANNEL 750
FREQUENCY 1.9675 GHz
-13 dBm
R
START 0Hz
STOP 20.00GHz
*RBW 1.0MHz
VBW 1.0MHz
SWP 400ms

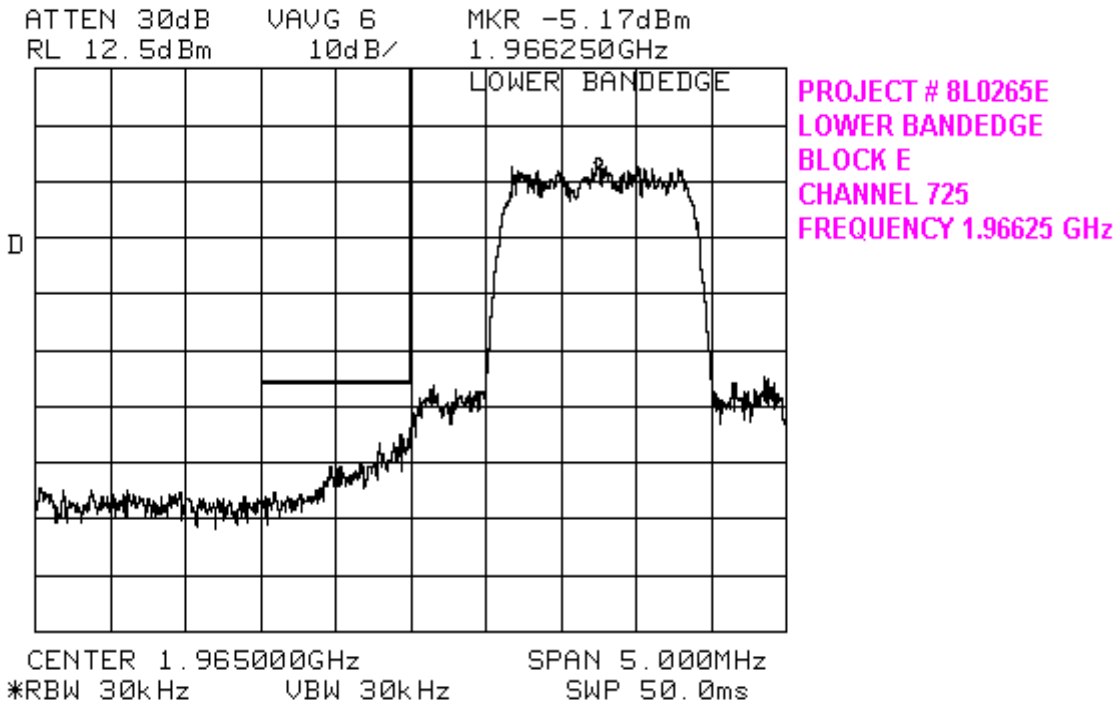

ATTEN 20dB
RL 37.5dBm
10dB/
SPUR.1 EMISSIONS
PROJECT # 8L0265E
SPURIOUS EMISSIONS
BLOCK F
CHANNEL 850
FREQUENCY 1.97250 GHz
-13 dBm
R
START 0Hz
STOP 20.00GHz
*RBW 1.0MHz
VBW 1.0MHz
SWP 400ms


ATTEN 20dB
RL 37.5dBm
10dB/
SPUR.1 EMISSIONS
PROJECT # 8L0265
SPURIOUS EMISSIONS
BLOCK C
CHANNEL 1050
FREQUENCY 1.98250 GHz
-13 dBm
R
START 0Hz
STOP 20.00GHz
*RBW 1.0MHz
VBW 1.0MHz
SWP 400ms

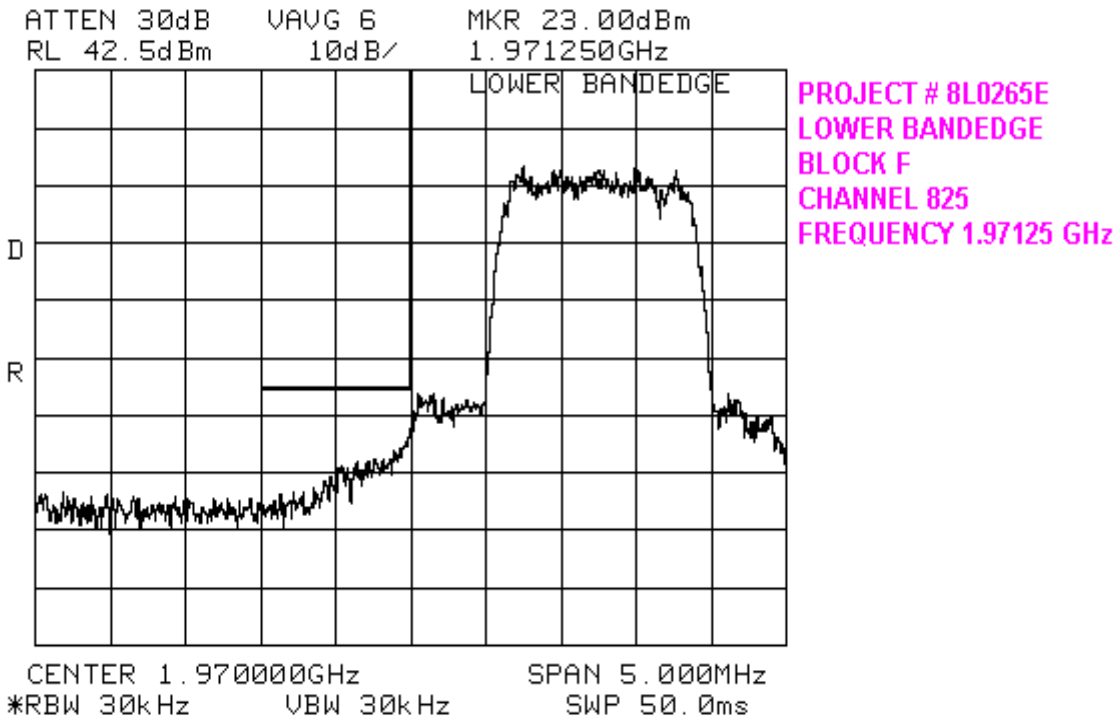

ATTEN 30dB
RL 42.5dBm
VAVG 6
10dB/
MKR -4.50dBm
1.931500GHz
LOWER BANDEDGE
D
R
CENTER 1.930000GHz
SPAN 5.000MHz
*RBW 30kHz
VBW 30kHz
SWP 50.0ms
PROJECT # 8L0265E
LOW BANDEDGE
BLOCK A
CHANNEL 25
FRQUENCY 1.93125GHz

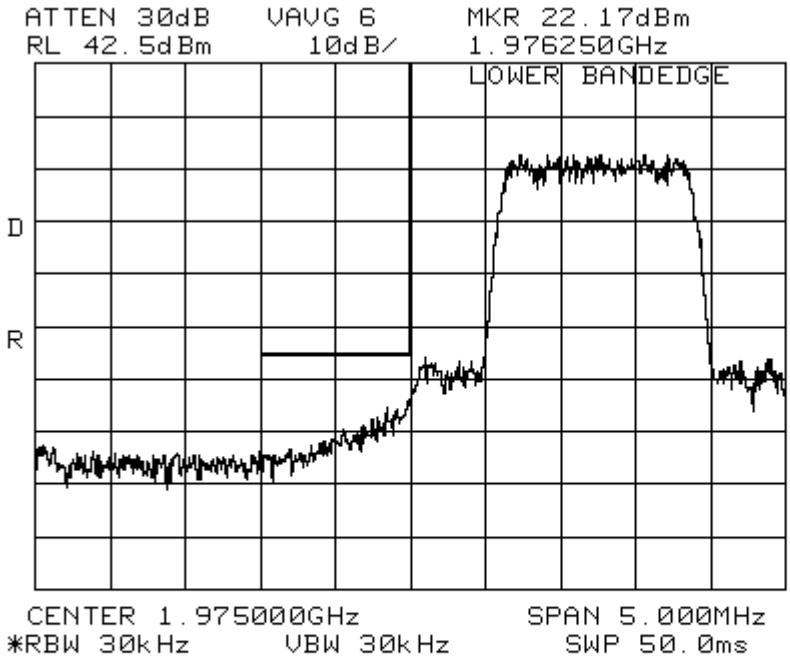

ATTEN 30dB
RL 42.5dBm
VAVG 6
10dB/
MKR 22.50dBm
1.946250GHz
LOWER BANDEDGE
D
R
CENTER 1.945000GHz
SPAN 5.000MHz
*RBW 30kHz
VBW 30kHz
SWP 50.0ms
PROJECT # 8L0265E
LOWER BANDEDGE
BLOCK D
CHANNEL 325
FREQUENCY 1.94625 GHz


ATTEN 30dB
RL 42.5dBm
VAVG 6
10dB/
MKR 23.67dBm
1.951250GHz
LOWER BANDEDGE
D
R
CENTER 1.950000GHz
SPAN 5.000MHz
*RBW 30kHz
VBW 30kHz
SWP 50.0ms
PROJECT # 8L0265E
LOWER BANDEDGE
BLOCK B
CHANNEL 425
FREQUENCY 1.95125 GHz

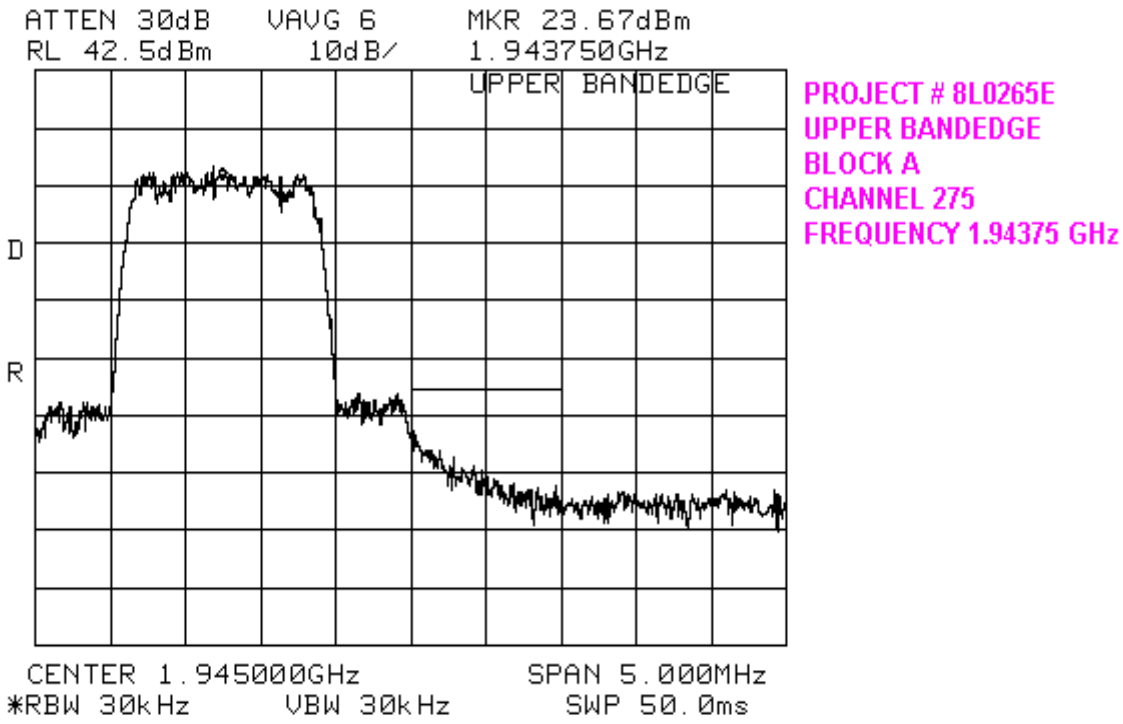


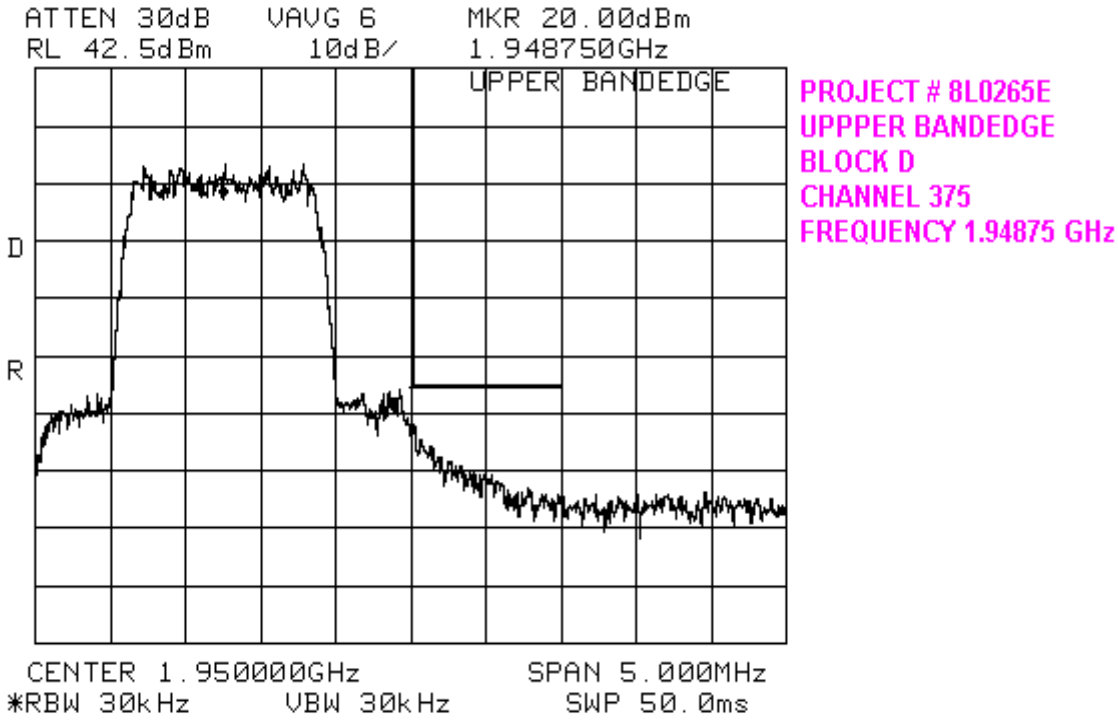
Reference level should be read as 42.5 dBm due to external attenuation of 30dB not compensated for in the above plot.

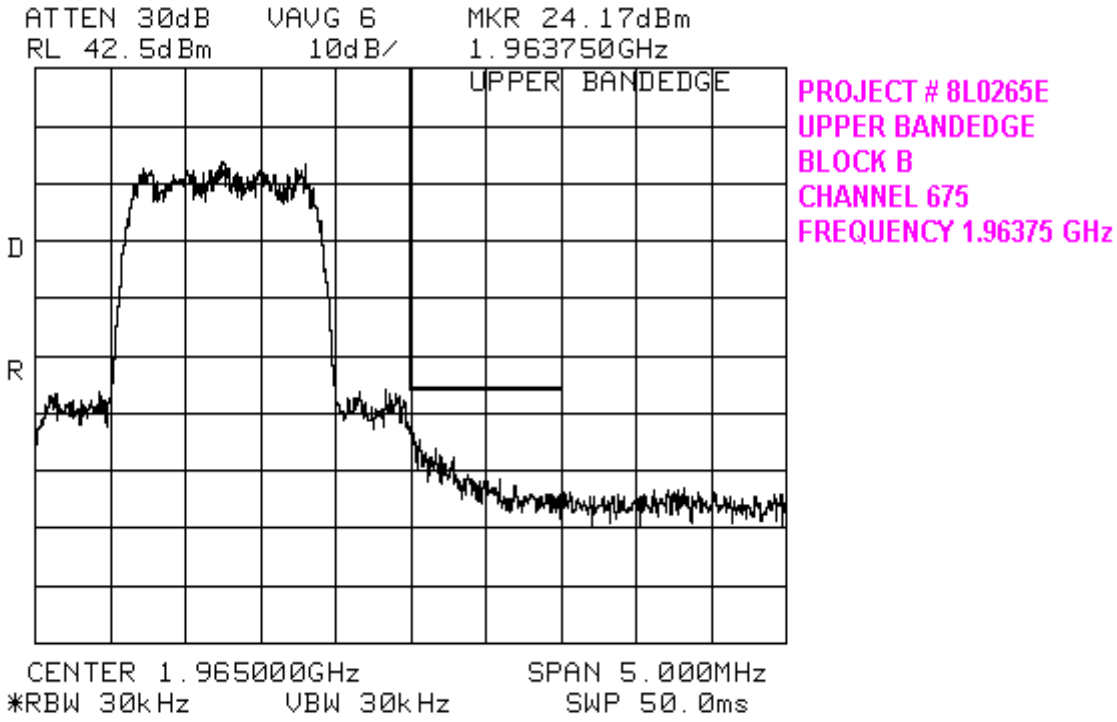

ATTEN 30dB
RL 42.5dBm
VAVG 6
10dB/
MKR 23.00dBm
1.971250GHz
LOWER BANDEDGE
D
R
CENTER 1.970000GHz
SPAN 5.000MHz
*RBW 30kHz
VBW 30kHz
SWP 50.0ms
PROJECT # 8L0265E
LOWER BANDEDGE
BLOCK F
CHANNEL 825
FREQUENCY 1.97125 GHz

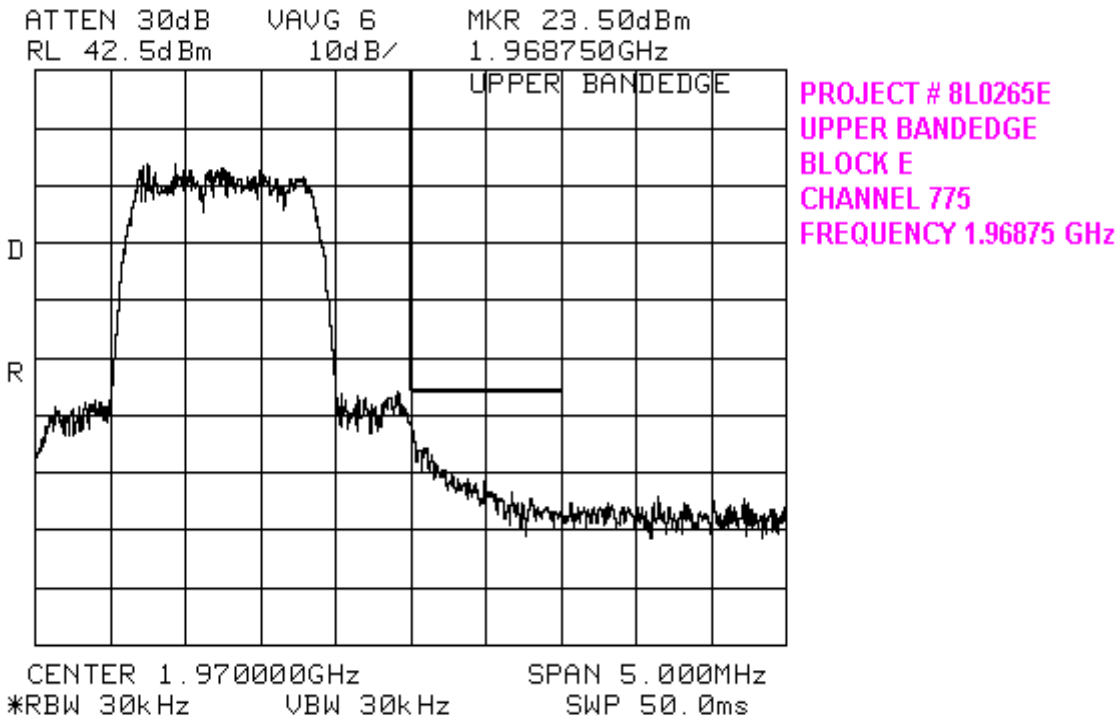


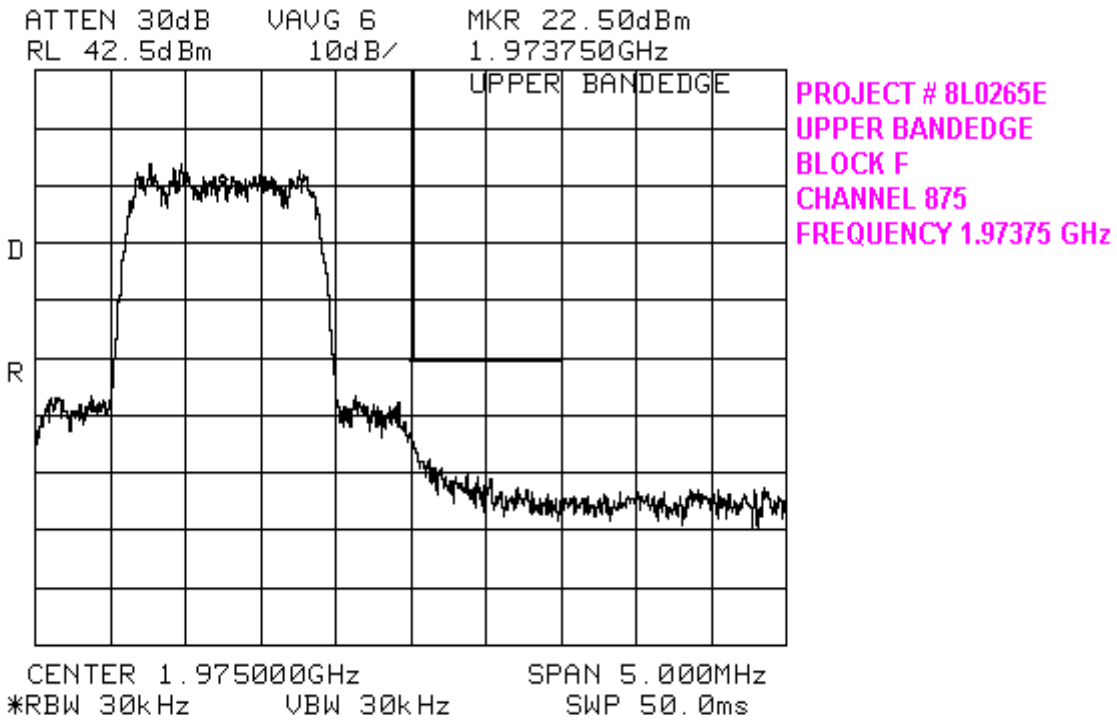
PROJECT # 8LO265
LOWER BANDEDGE
BLOCK C
CHANNEL 925
FREQUENCY 1.97625 GHz

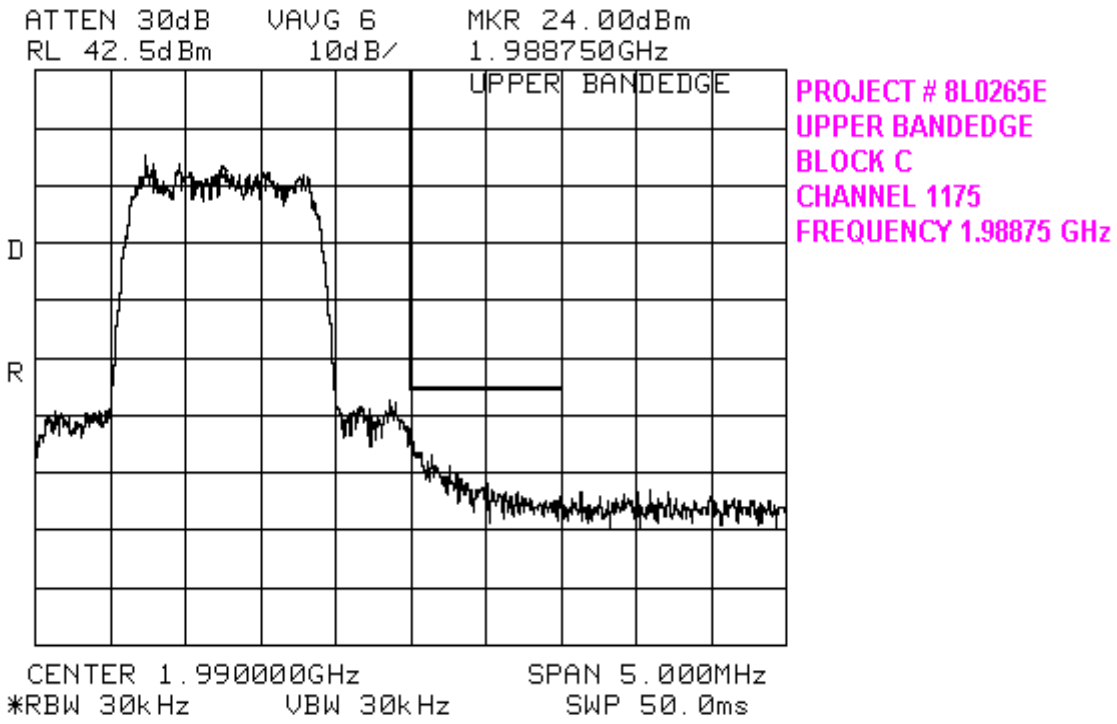

ATTEN 30dB
VAVG 6
MKR 23.67dBm
RL 42.5dBm
10dB/
1.943750GHz
UPPER BANDEDGE
D
R
CENTER 1.945000GHz
SPAN 5.000MHz
*RBW 30kHz
VBW 30kHz
SWP 50.0ms
PROJECT # 8L0265E
UPPER BANDEDGE
BLOCK A
CHANNEL 275
FREQUENCY 1.94375 GHz


ATTEN 30dB
RL 42.5dBm
VAVG 6
10dB/
MKR 20.00dBm
1.948750GHz
UPPER BANDEDGE
D
R
CENTER 1.950000GHz
*RBW 30kHz
VBW 30kHz
SPAN 5.000MHz
SWP 50.0ms
PROJECT # 8L0265E
UPPPER BANDEDGE
BLOCK D
CHANNEL 375
FREQUENCY 1.94875 GHz


ATTEN 30dB
RL 42.5dBm
VAVG 6
10dB/
MKR 24.17dBm
1.963750GHz
UPPER BANDEDGE
D
R
CENTER 1.965000GHz
*RBW 30kHz
VBW 30kHz
SPAN 5.000MHz
SWP 50.0ms
PROJECT # 8L0265E
UPPER BANDEDGE
BLOCK B
CHANNEL 675
FREQUENCY 1.96375 GHz


ATTEN 30dB
RL 42.5dBm
VAVG 6
10dB/
MKR 23.50dBm
1.968750GHz
UPPER BANDEDGE
PROJECT # 8L0265E
UPPER BANDEDGE
BLOCK E
CHANNEL 775
FREQUENCY 1.96875 GHz
D
R
CENTER 1.970000GHz
SPAN 5.000MHz
*RBW 30kHz
VBW 30kHz
SWP 50.0ms

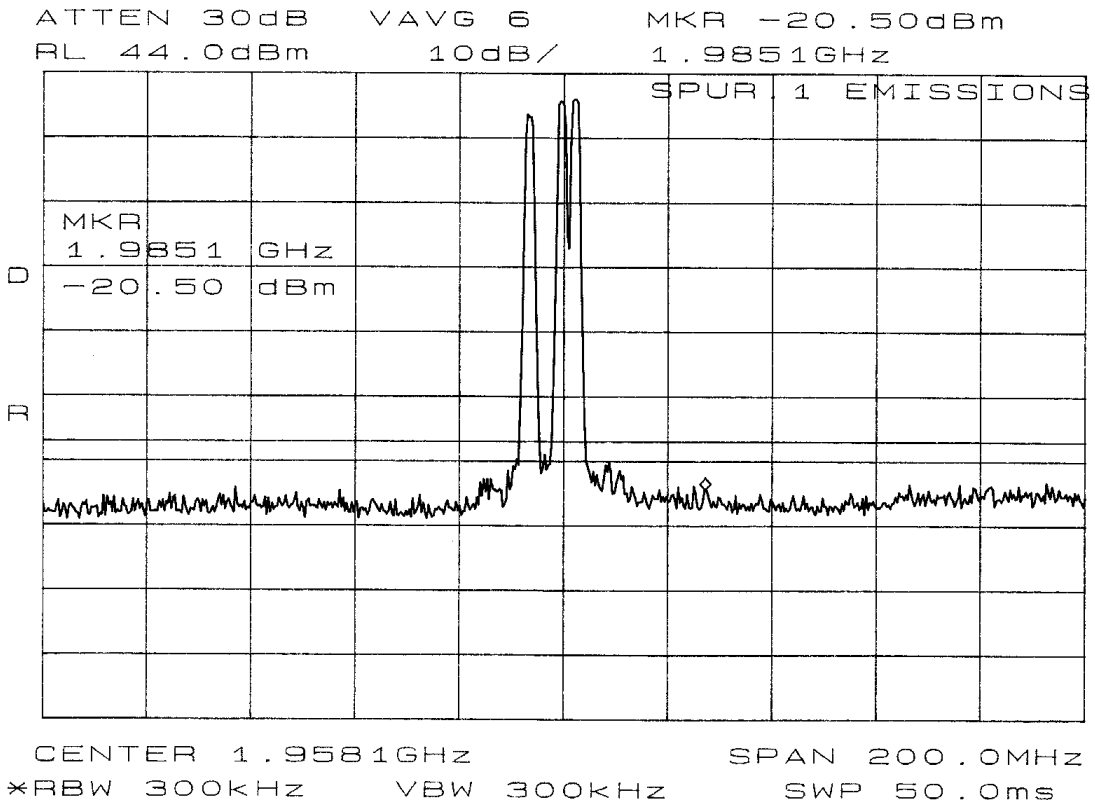

ATTEN 30dB
RL 42.5dBm
VAVG 6
10dB/
MKR 22.50dBm
1.973750GHz
UPPER BANDEDGE
D
R
CENTER 1.975000GHz
*RBW 30kHz
VBW 30kHz
SPAN 5.000MHz
SWP 50.0ms
PROJECT # 8L0265E
UPPER BANDEDGE
BLOCK F
CHANNEL 875
FREQUENCY 1.97375 GHz


ATTEN 30dB
RL 42.5dBm
VAVG 6
10dB/
MKR 24.00dBm
1.988750GHz
UPPER BANDEDGE
D
R
CENTER 1.990000GHz
*RBW 30kHz
VBW 30kHz
SPAN 5.000MHz
SWP 50.0ms
PROJECT # 8L0265E
UPPER BANDEDGE
BLOCK C
CHANNEL 1175
FREQUENCY 1.98875 GHz

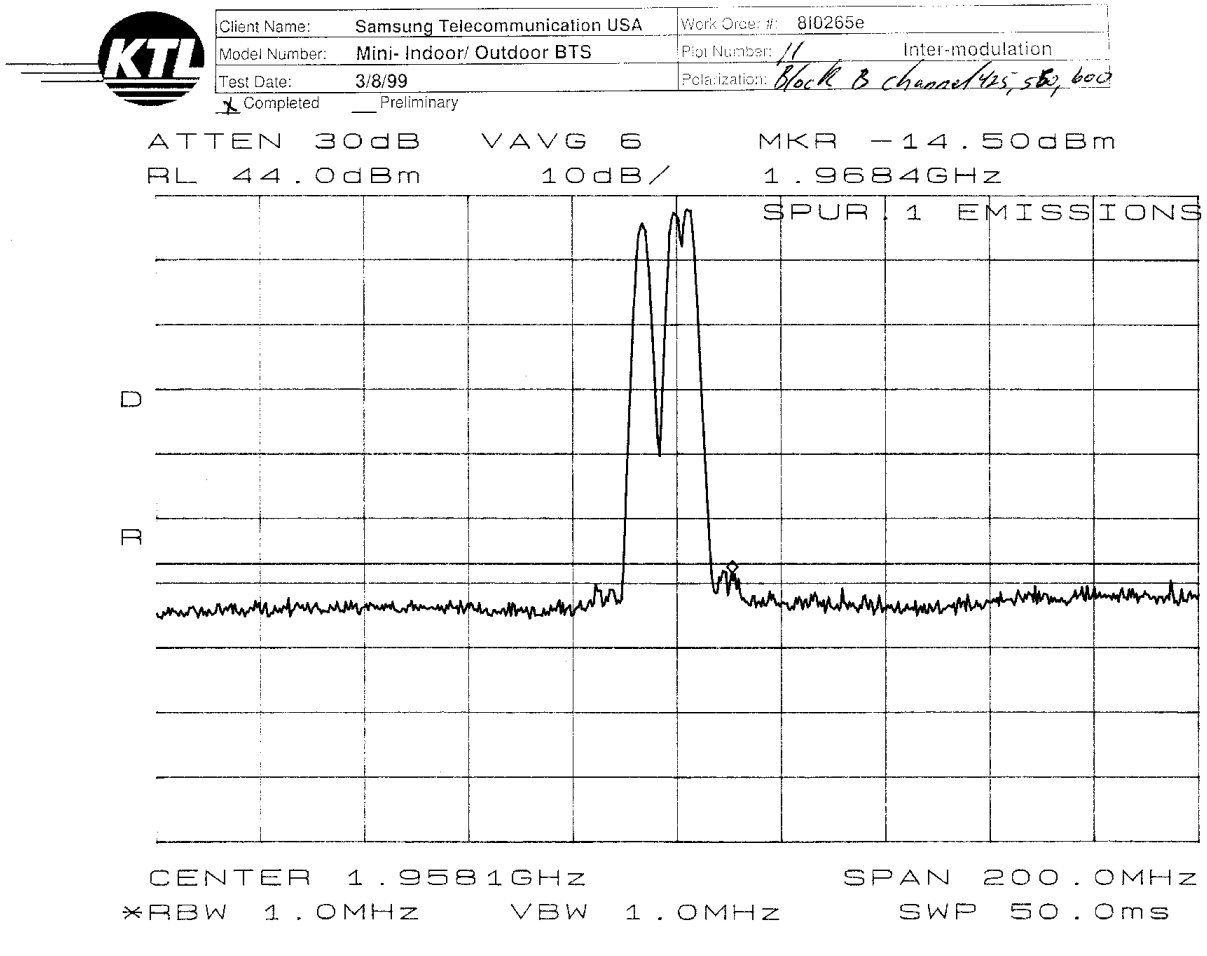
Inter- Modulation Data

Client Name:	Samsung Telecommunication USA	Work Order #:	8l0265e
Model Number:	Mini- Indoor/ Outdoor BTS	Plot Number:	10 Inter-modulation
Test Date:	3/8/99	Polarization:	Block B channel 465,550,600

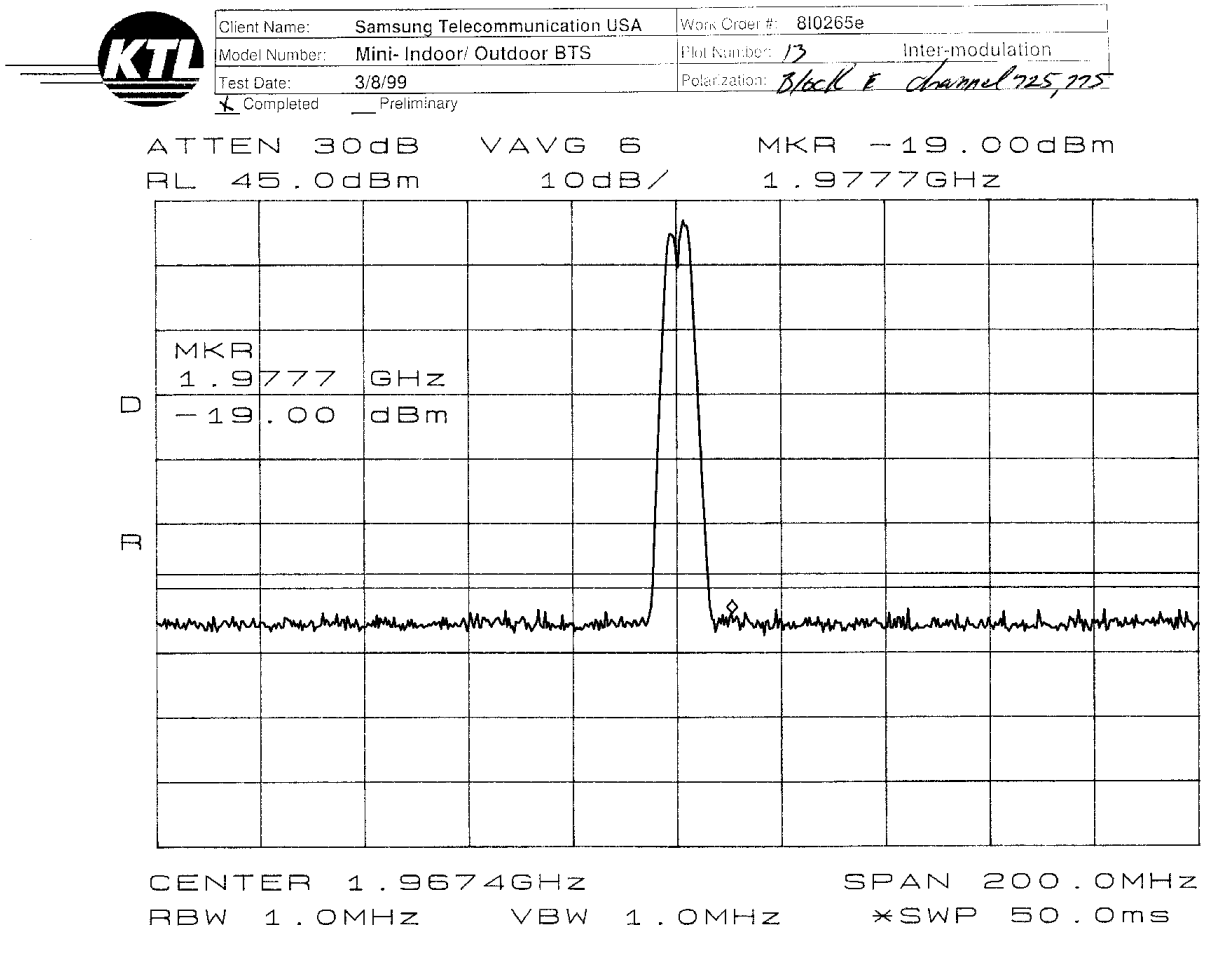
X Completed ___ Preliminary



Inter- Modulation Data



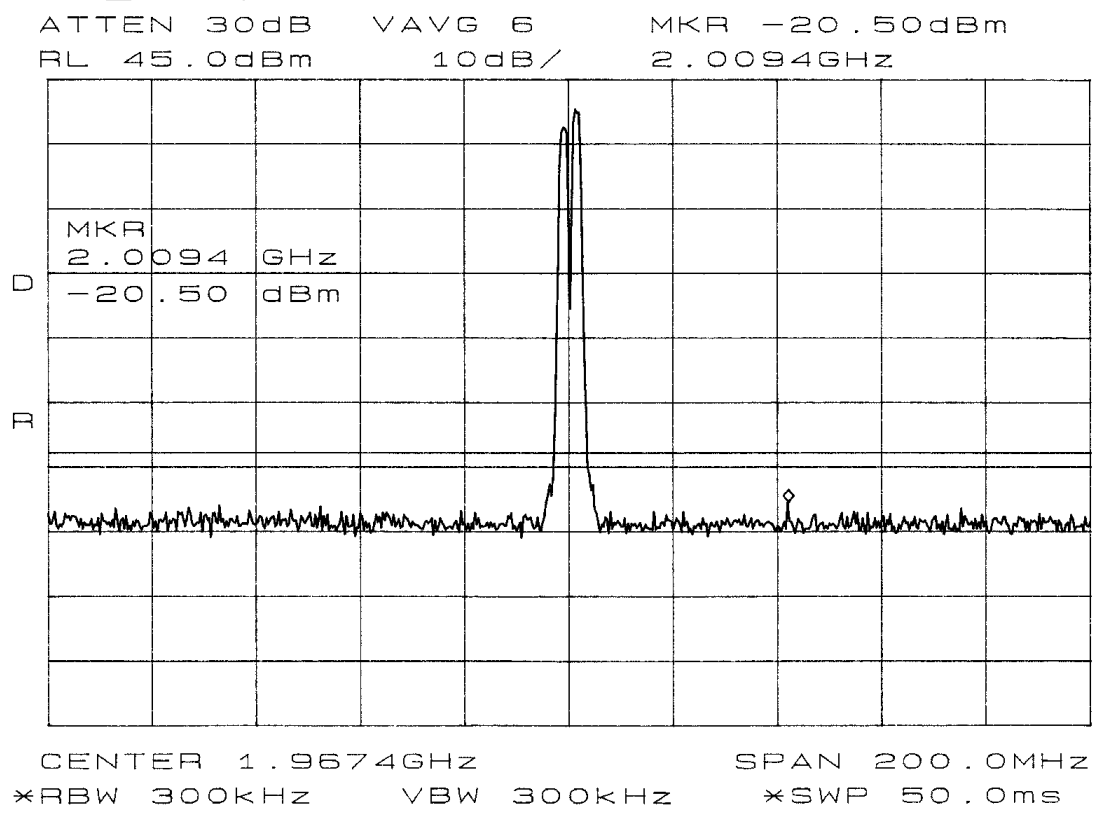
Inter- Modulation Data



Inter- Modulation Data

Client Name:	Samsung Telecommunication USA	Work Order #:	8l0265e
Model Number:	Mini- Indoor/ Outdoor BTS	Plot Number:	14 Inter-modulation
Test Date:	3/8/99	Polarization:	Block E Channel 725, 775

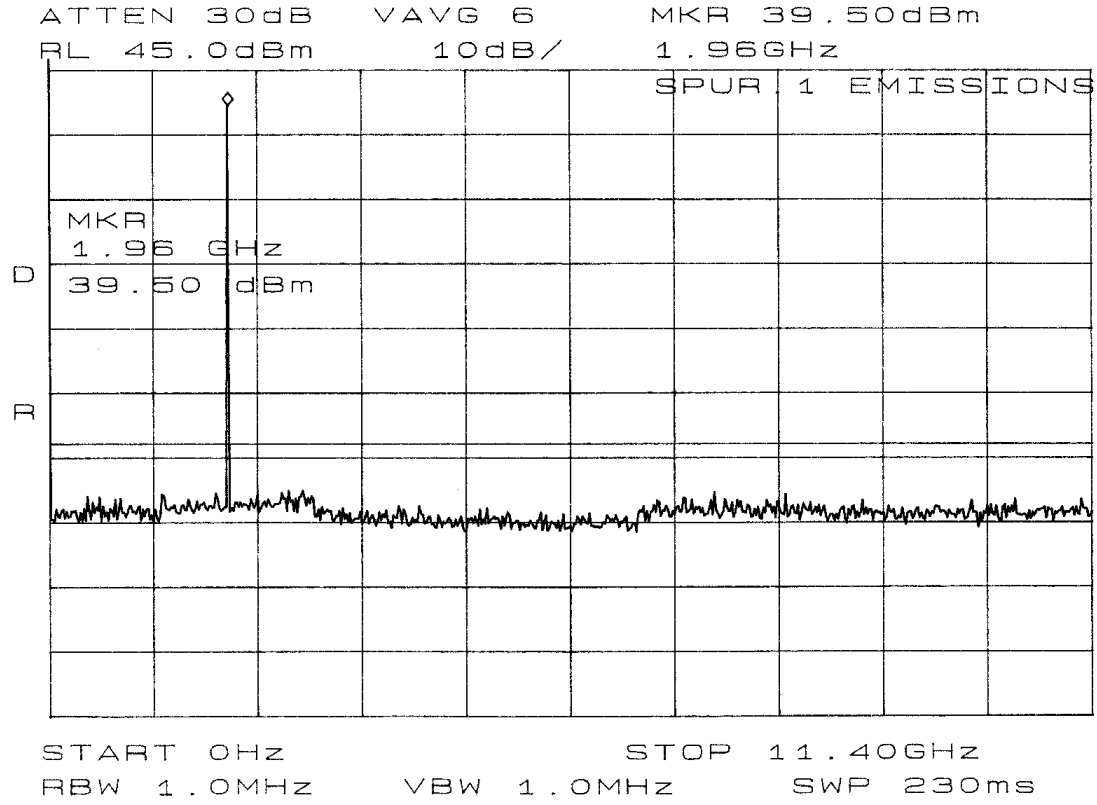
X Completed ___ Preliminary



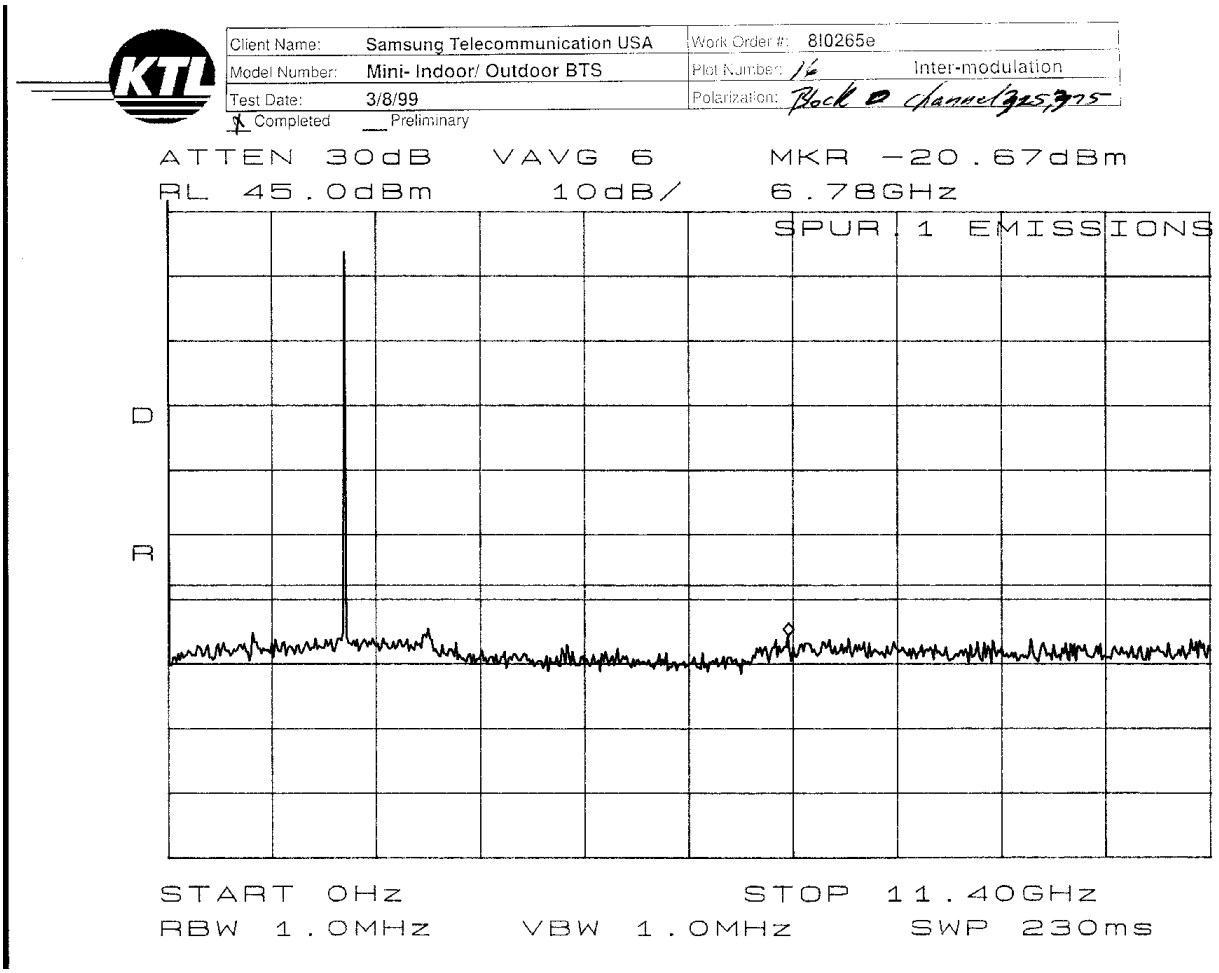
Inter- Modulation Data

Client Name:	Samsung Telecommunication USA	Work Orde: #:	8l0265e
Model Number:	Mini- Indoor/ Outdoor BTS	Plot Number: 15	Inter-modulation
Test Date:	3/8/99	Polarization:	Block E channel 725,775

☒ Completed ☐ Preliminary



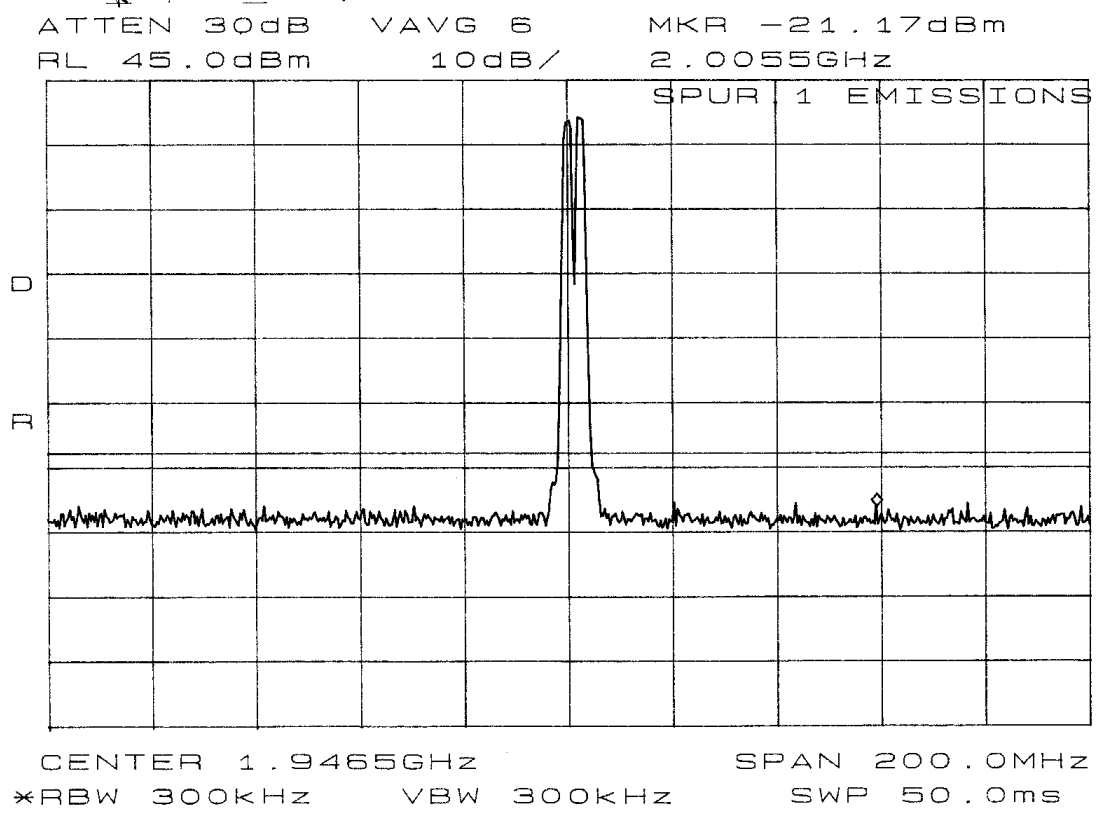
Inter- Modulation Data



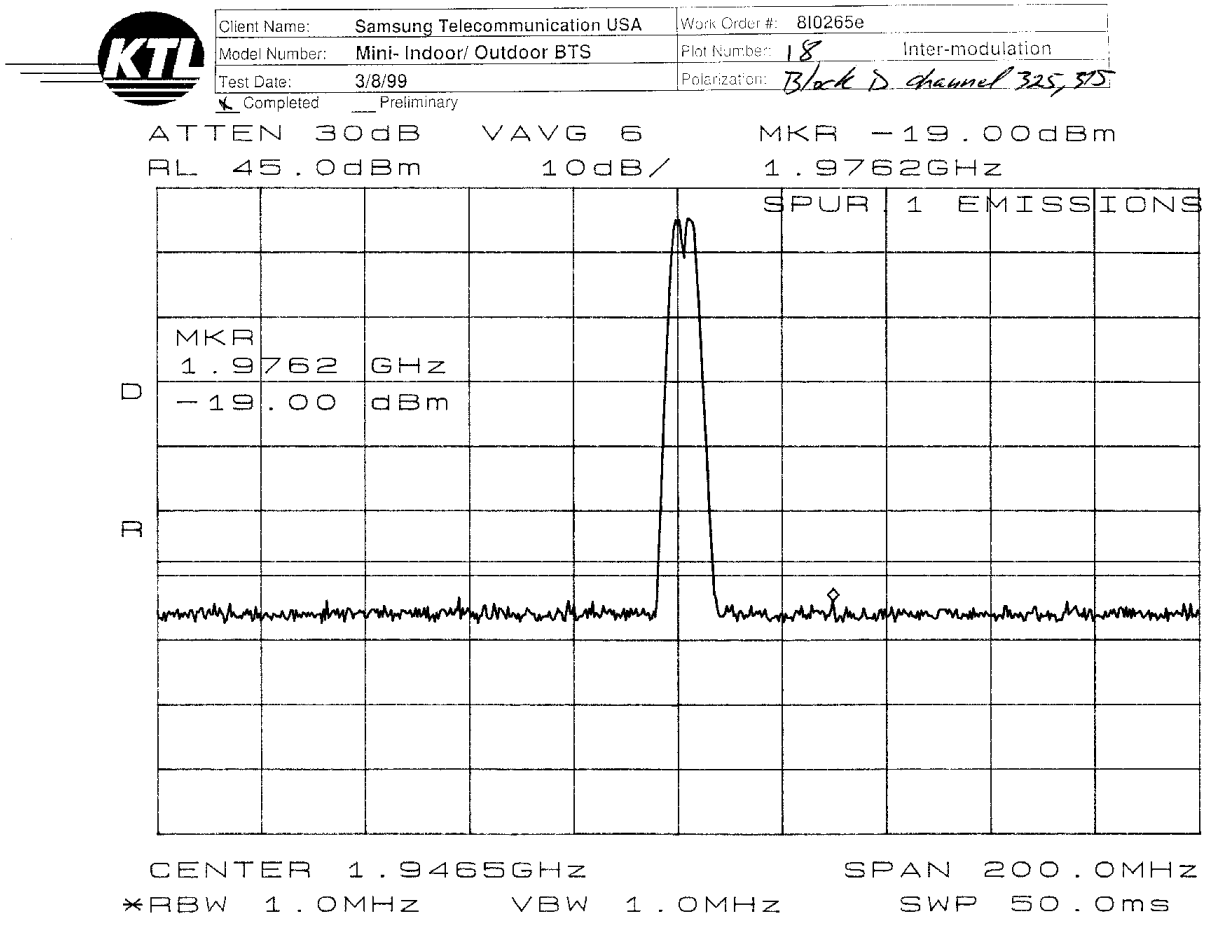
Inter- Modulation Data

Client Name:	Samsung Telecommunication USA	Work Order #:	8l0265e
Model Number:	Mini- Indoor/ Outdoor BTS	Plot Number:	17 Inter-modulation
Test Date:	3/8/99	Polarization:	Block D channel 325, 375

X Completed ___ Preliminary



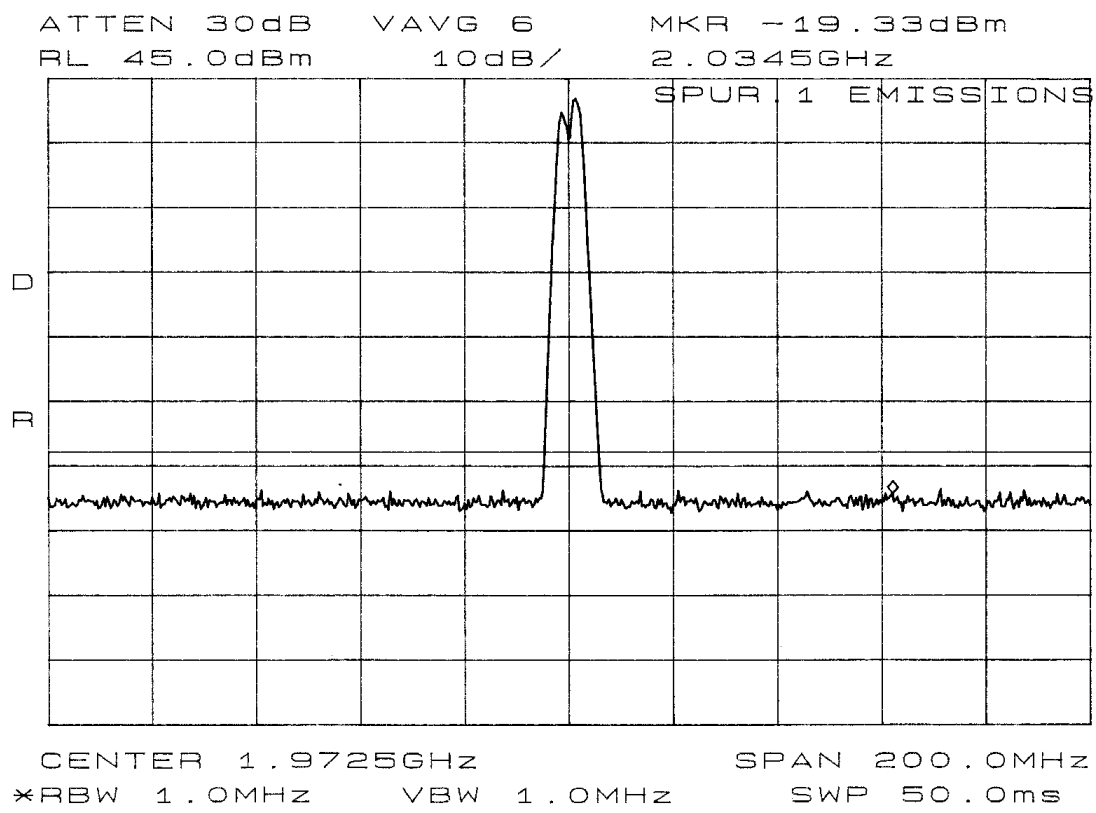
Inter- Modulation Data



Inter- Modulation Data

Client Name:	Samsung Telecommunication USA	Work Order #:	8l0265e
Model Number:	Mini- Indoor/ Outdoor BTS	Plot Number:	19 Inter-modulation
Test Date:	3/8/99	Polarization:	Block F Channel 825, 875

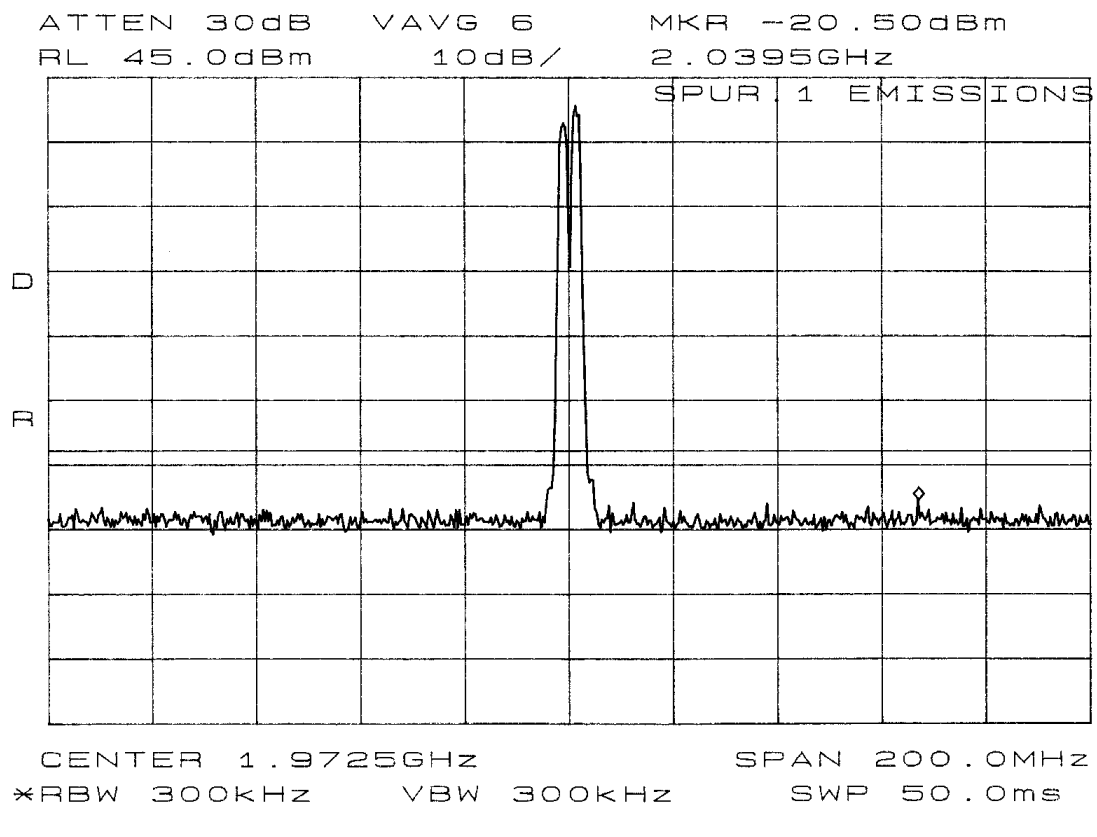
X Completed ___ Preliminary



Inter- Modulation Data

Client Name:	Samsung Telecommunication USA	Work Order #:	8l0265e
Model Number:	Mini- Indoor/ Outdoor BTS	Plot Number:	22 Inter-modulation
Test Date:	3/8/99	Polarization:	Block F Channel 825, 975

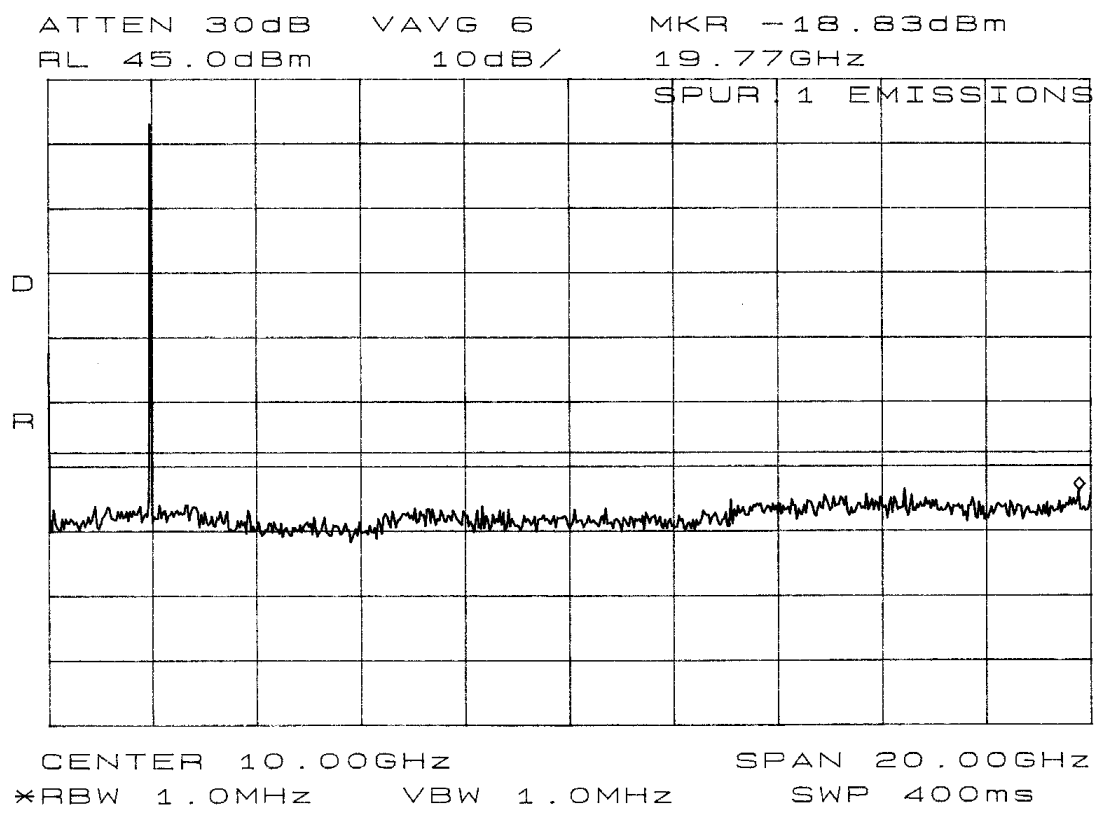
X Completed ___ Preliminary



Inter- Modulation Data

Client Name:	Samsung Telecommunication USA	Work Order #:	8l0265e
Model Number:	Mini- Indoor/ Outdoor BTS	Plot Number:	21 Inter-modulation
Test Date:	3/8/99	Polarization:	Block E Channel 823, 875

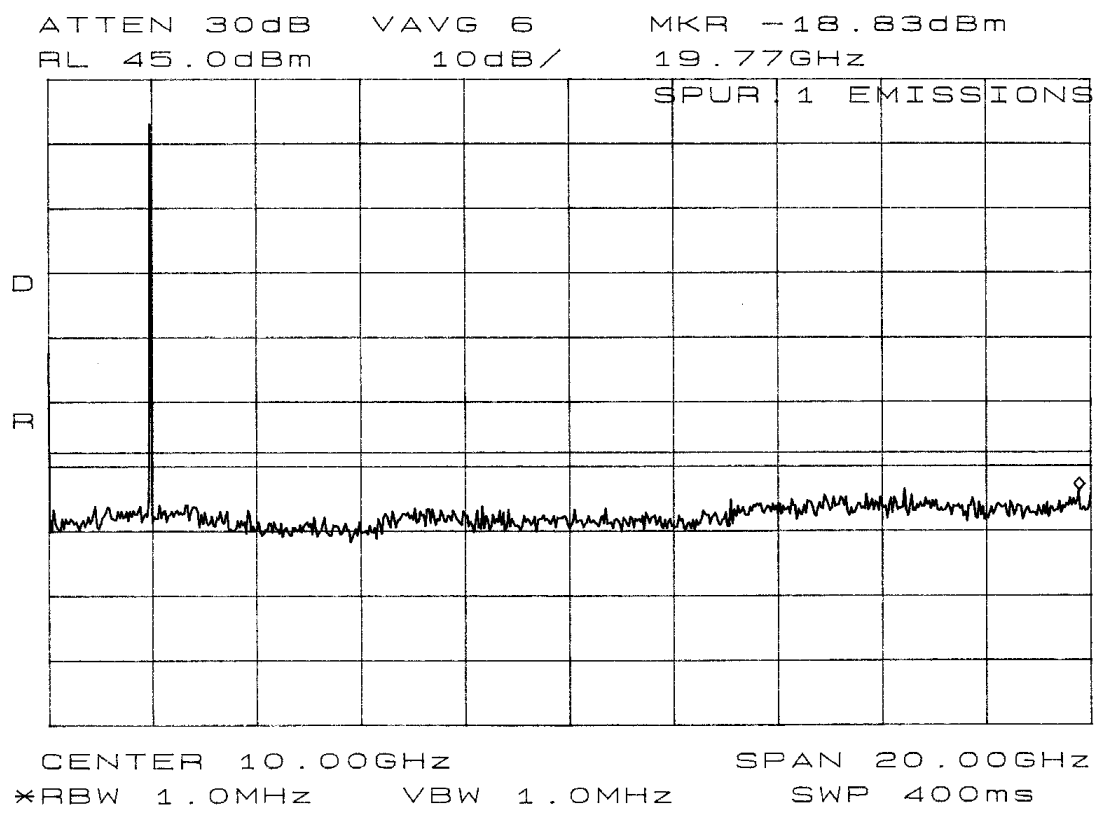
X Completed ___ Preliminary



Inter- Modulation Data

Client Name:	Samsung Telecommunication USA	Work Order #:	8l0265e
Model Number:	Mini- Indoor/ Outdoor BTS	Plot Number:	21 Inter-modulation
Test Date:	3/8/99	Polarization:	Block E Channel 823, 875

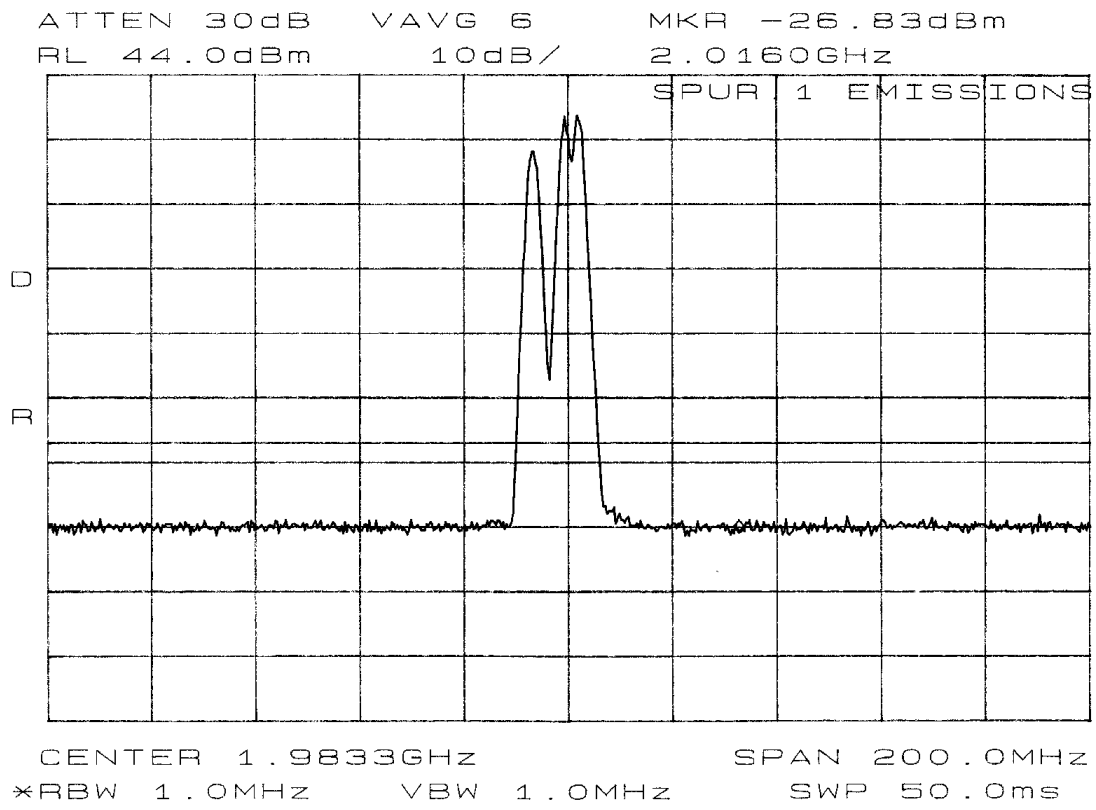
X Completed ___ Preliminary



Inter- Modulation Data

Client Name:	Samsung Telecommunication USA	Work Order #:	8I0265e
Model Number:	Mini- Indoor/ Outdoor BTS	Plot Number:	4 Inter-modulation
Test Date:	3/8/99	Polarization:	Block C Channel 925, 1050, 1190

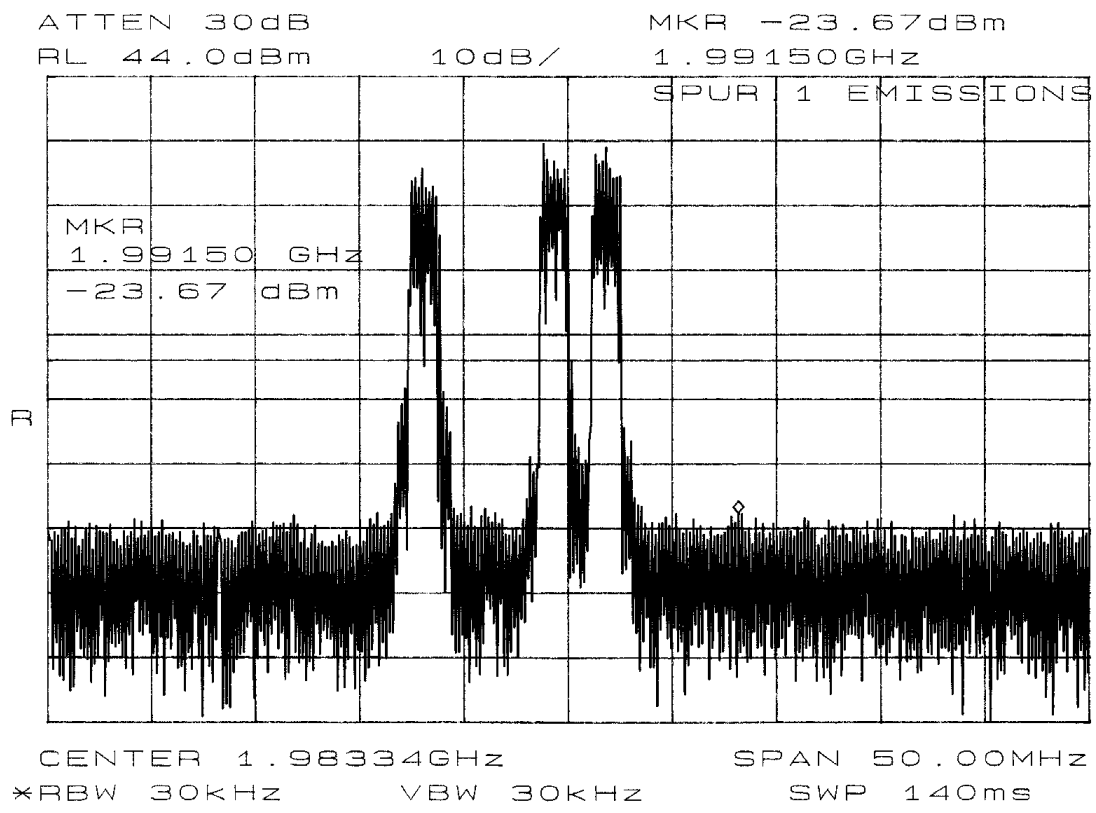
X Completed ___ Preliminary



Inter- Modulation Data

Client Name:	Samsung Telecommunication USA	Work Order #:	8I0265e
Model Number:	Mini- Indoor/ Outdoor BTS	Plot Number:	1 Inter-modulation
Test Date:	3/8/99	Polarization:	4A Block C channel 925, 950, 1100

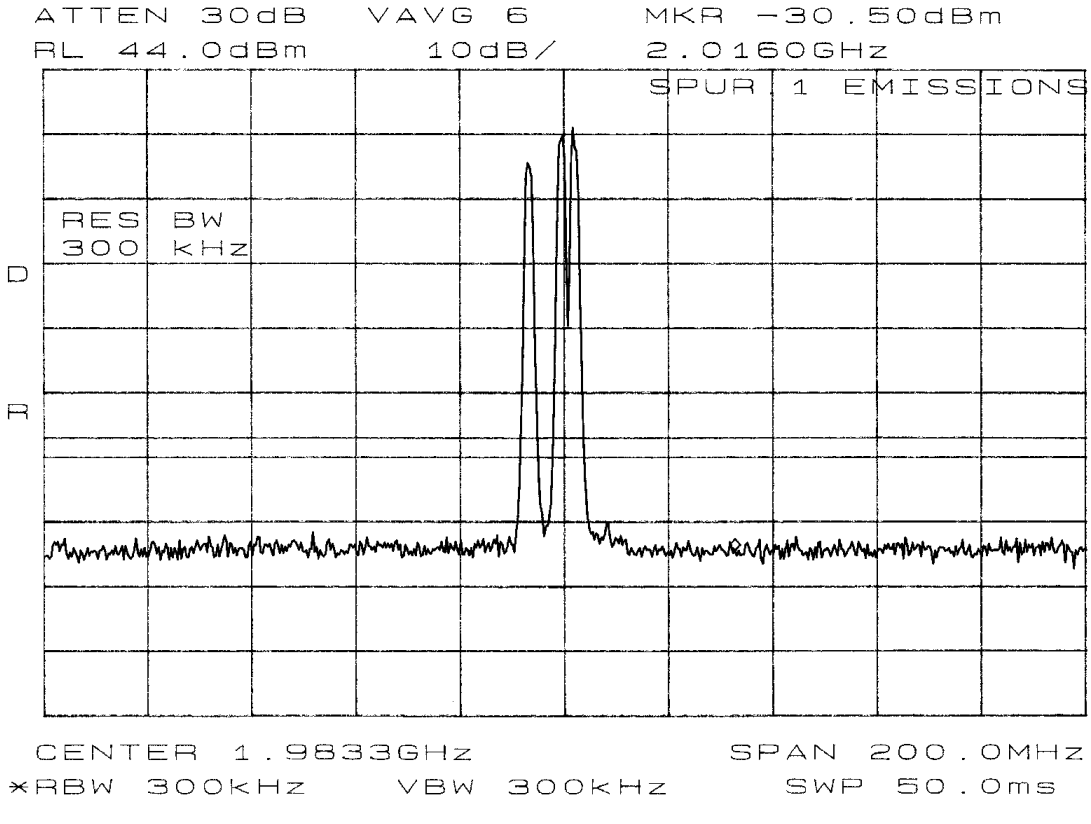
X Completed ___ Preliminary



Inter- Modulation Data

Client Name:	Samsung Telecommunication USA	Work Order #:	8I0265e
Model Number:	Mini- Indoor/ Outdoor BTS	Plot Number: 5	Inter-modulation
Test Date:	3/8/99	Polarization:	Block C channel 925, 1050, 1120

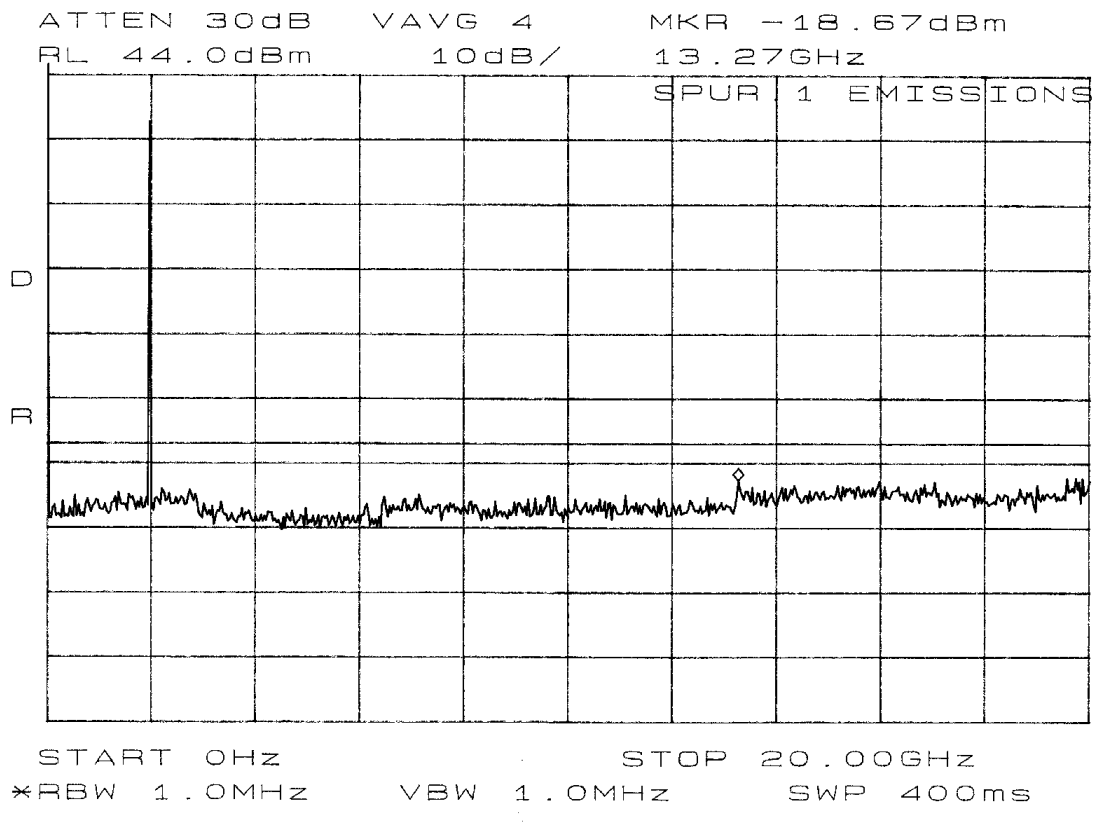
X Completed ___ Preliminary



Inter- Modulation Data

Client Name:	Samsung Telecommunication USA	Work Order #:	8I0265e
Model Number:	Mini- Indoor/ Outdoor BTS	Plot Number:	6 Inter-modulation
Test Date:	3/8/99	Polarization:	Block C channel 925, 1050, 1100

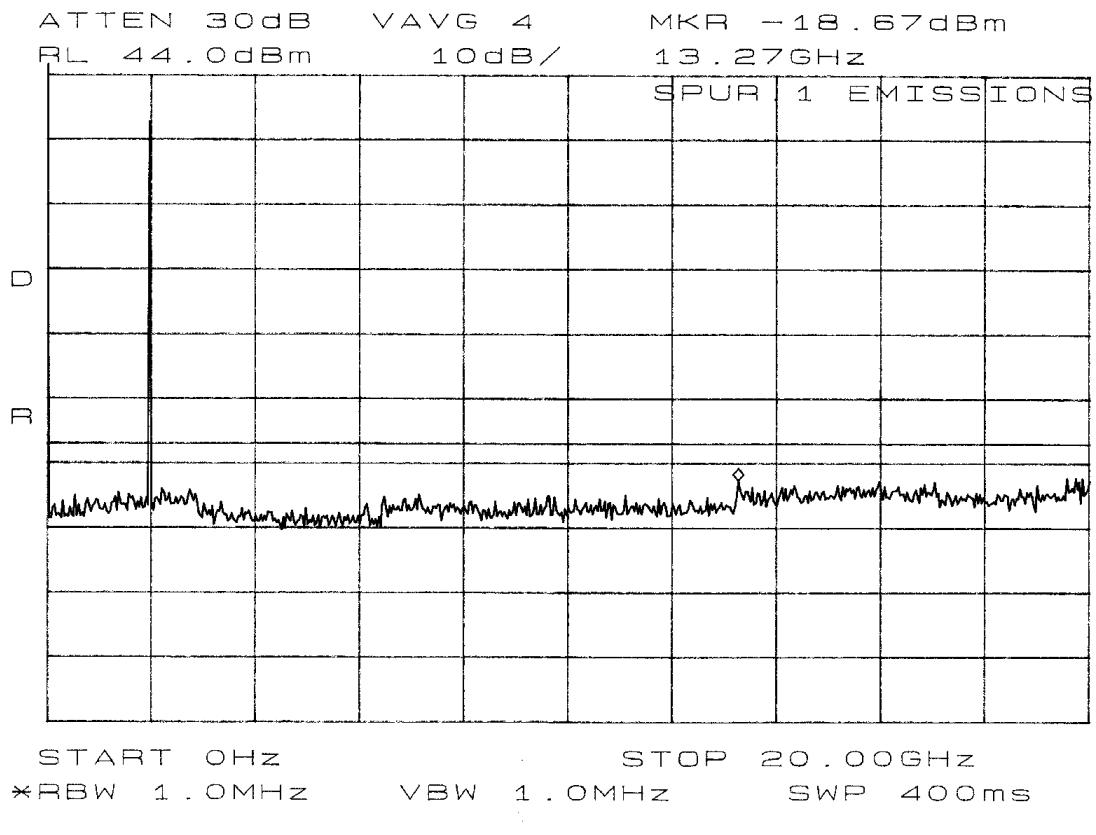
+ Completed __ Preliminary



Inter- Modulation Data

Client Name:	Samsung Telecommunication USA	Work Order #:	8I0265e
Model Number:	Mini- Indoor/ Outdoor BTS	Plot Number:	6 Inter-modulation
Test Date:	3/8/99	Polarization:	Block C channel 925, 1050, 1100

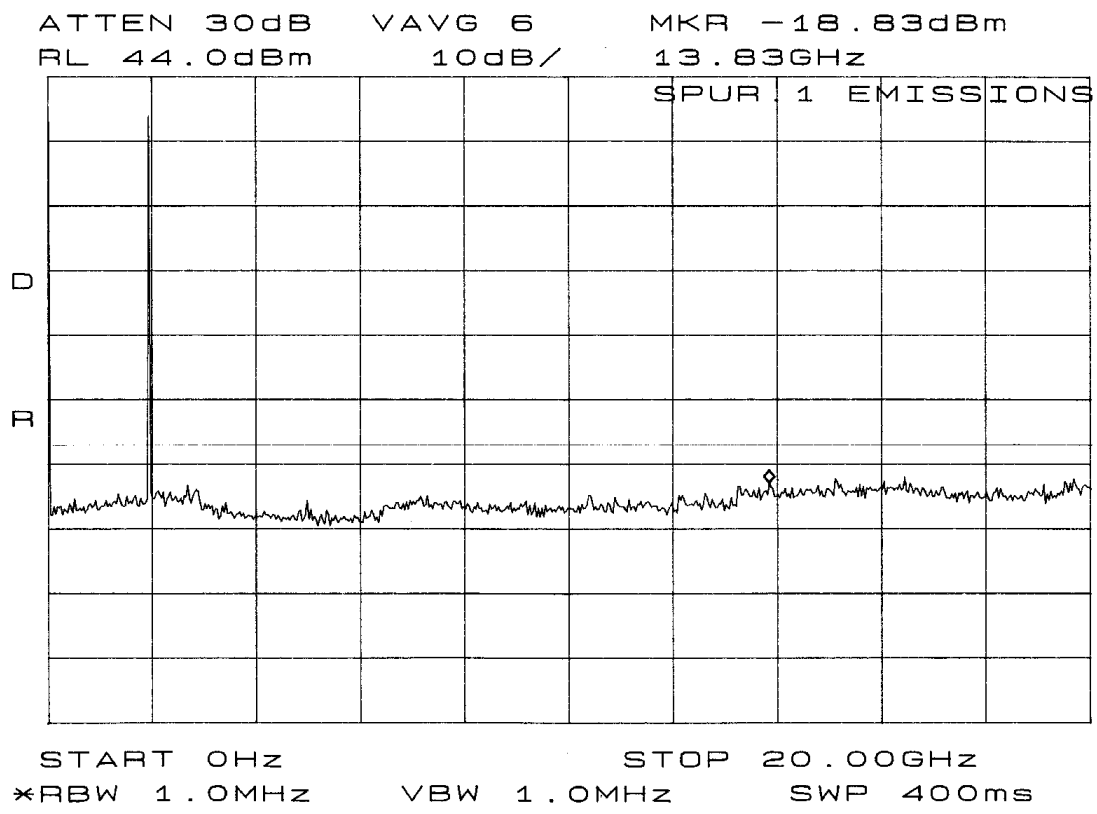
X Completed ___ Preliminary



Inter- Modulation Data

Client Name:	Samsung Telecommunication USA	Work Order #:	8I0265e
Model Number:	Mini- Indoor/ Outdoor BTS	Plot Number:	7 Inter-modulation
Test Date:	3/8/99	Polarization:	Blade A channel 25, 150, 200

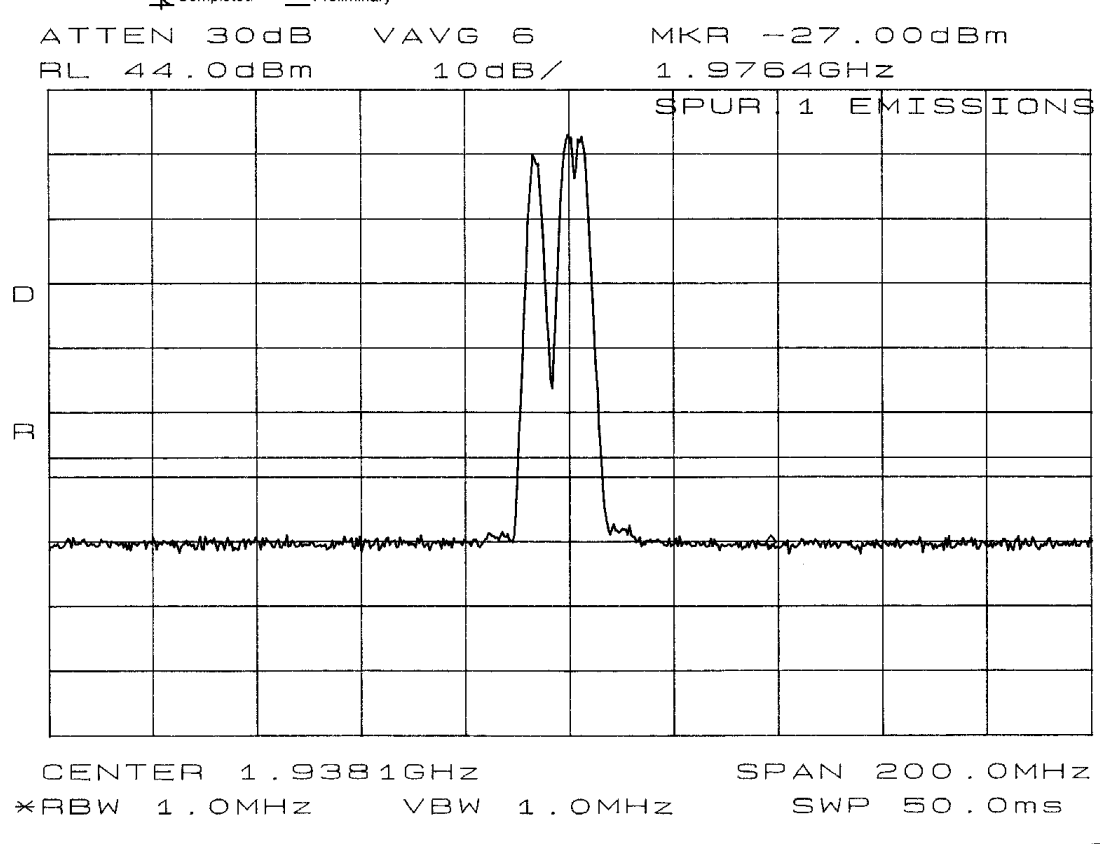
X Completed ___ Preliminary



Inter- Modulation Data

Client Name:	Samsung Telecommunication USA	Work Order #:	8I0265e
Model Number:	Mini- Indoor/ Outdoor BTS	Plot Number:	8 Inter-modulation
Test Date:	3/8/99	Polarization:	Block A Channel 25, 150, 200

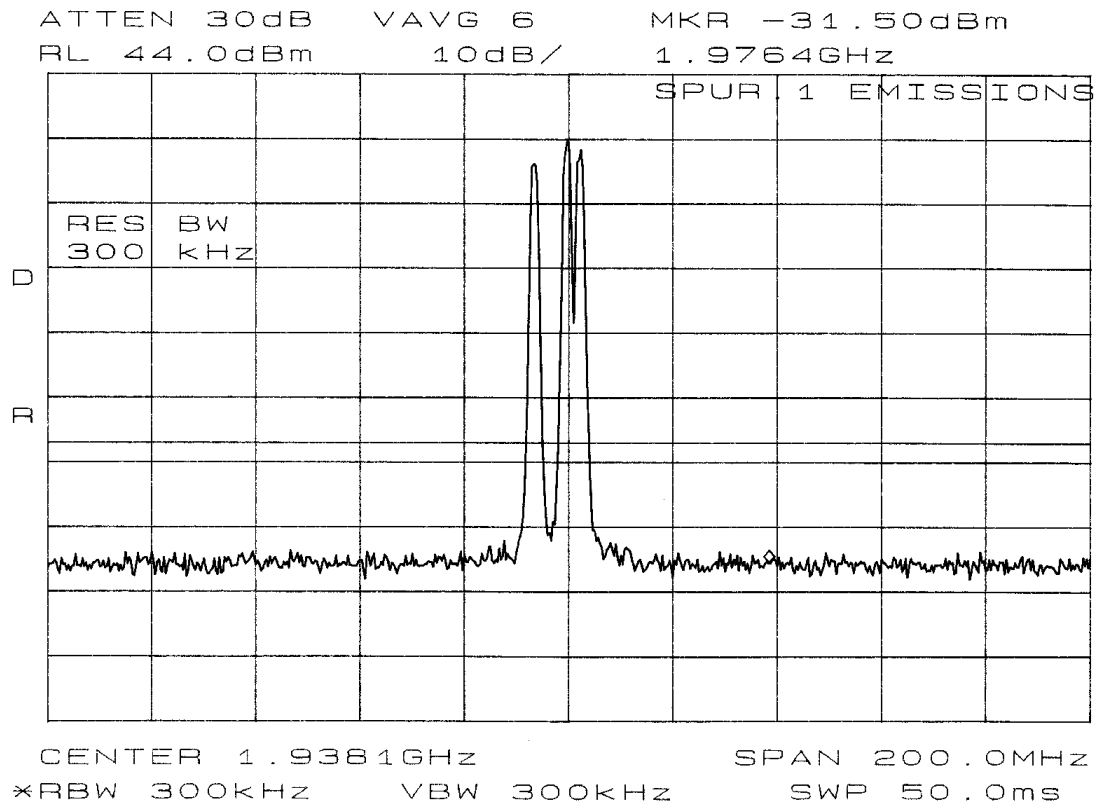
X Completed ___ Preliminary



Inter- Modulation Data

Client Name:	Samsung Telecommunication USA	Work Order #:	8I0265e
Model Number:	Mini- Indoor/ Outdoor BTS	Plot Number:	9 Inter-modulation
Test Date:	3/8/99	Polarization:	Block A Channel 25, 150, 200

X Completed ___ Preliminary



NAME OF TEST: Field Strength of Spurious	PARA. NO.: 2.1053
TESTED BY:	DATE:

Test Results: Complies.
The maximum field strength is 69 dBµV/m @ 3m.

Test Data:

Test Data-Radiated Microwave Emissions MW-1

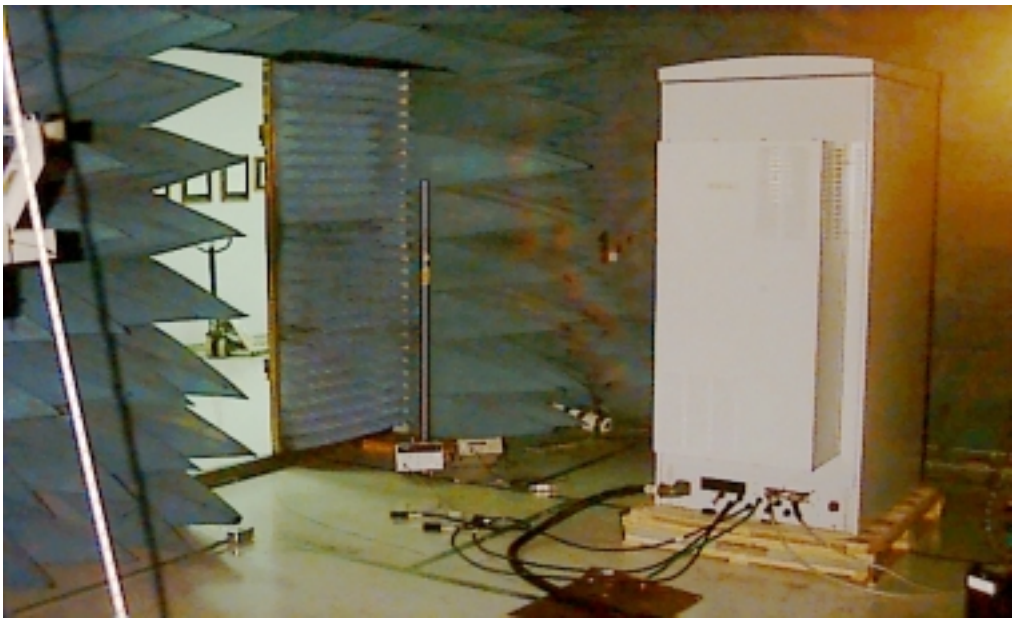
Freq. (GHz)	Meter Reading (dBm)	Antenna Factor (dB)	Cable Loss (dB)	RF Gain (dB)	Conver. Factor	Corrected Reading (dBuV/m)	Spec. Limit (dBuV/m)	Pol.	Comments:
1.816	-42	27.3	3.4	30.9	107	65	82.3	H	
3.614	-60	31.2	5.4	31.7	107	52	82.3	H	
3.632	-60	31.2	5.4	31.7	107	52	82.3	H	
5.462	-72	35.6	6.5	30	107	47	82.3	H	
9.035	-70	37.9	9.0	33	107	51	82.3	H	
1.815	-38	27.3	3.4	30.9	107	69	82.3	V	
3.619	-60	31.2	5.4	31.7	107	52	82.3	V	
3.632	-58	31.2	5.4	31.7	107	54	82.3	V	
5.462	-68	35.6	6.5	30	107	51	82.3	V	
9.038	-72	37.9	9.0	33	107	49	82.3	V	
									Scanned from 1-20GHz

Test Data - Radiated Emissions RE-1

Emission Frequency (MHz)	Ant. Pol. (H/V)	Det. Atten. (dB)	Meter Reading (dBuV)	Antenna Factor (dB)	Path Loss (dB)	RF Gain (dB)	Corrected Reading (dBuV/m)	Spec. Limit (dBuV/m)	CR/SL Delta (dB)	Pass Fail Marginal	Notes
53.3	V	0.0	52.0	10.2	2.2	27.5	36.8	74.0	-37.2	Pass	REFER TO Q.P.
53.3	V	0.0	49.3	10.2	2.2	27.5	34.1	74.0	-39.9	Pass	Q.P
59.0	V	0.0	58.8	9.6	2.2	27.5	43.1	74.0	-30.9	Pass	REFER TO Q.P.
59.0	V	0.0	57.5	9.6	2.2	27.5	41.8	74.0	-32.2	Pass	Q.P.
66.0	V	0.0	56.0	9.4	2.2	27.5	40.1	74.0	-33.9	Pass	REFER TO Q.P.
66.0	V	0.0	54.9	9.4	2.2	27.5	39.0	74.0	-35.0	Pass	Q.P.
69.7	V	0.0	57.0	9.3	2.2	27.5	41.0	74.0	-33.0	Pass	REFER TO Q.P.
69.7	V	0.0	55.6	9.3	2.2	27.5	39.6	74.0	-34.4	Pass	Q.P.
78.7	V	0.0	55.0	8.5	2.4	27.0	38.9	74.0	-35.1	Pass	REFER TO Q.P.
78.7	V	0.0	53.0	8.5	2.4	27.0	36.9	74.0	-37.1	Pass	Q.P.
108.4	V	0.0	42.0	10.5	3.0	27.0	28.5	74.0	-45.5	Pass	
113.7	V	0.0	40.0	10.7	3.0	27.0	26.8	74.0	-47.2	Pass	
118.0	V	0.0	48.7	11.0	3.0	27.0	35.7	74.0	-38.3	Pass	
128.3	V	0.0	53.5	11.8	3.4	27.1	41.6	74.0	-32.4	Pass	REFER TO Q.P.
128.3	V	0.0	52.6	11.8	3.4	27.1	40.7	74.0	-33.3	Pass	Q.P.
138.6	V	0.0	58.0	12.3	3.4	27.1	46.6	74.0	-27.4	Pass	REFER TO Q.P.
138.6	V	0.0	57.0	12.3	3.4	27.1	45.6	74.0	-28.4	Pass	Q.P.
148.5	V	0.0	60.0	13.1	3.4	27.1	49.4	74.0	-24.6	Pass	REFER TO Q.P.
148.5	V	0.0	59.3	13.1	3.4	27.1	48.7	74.0	-25.3	Pass	Q.P.
178.2	V	0.0	49.0	14.1	4.7	27.1	40.7	74.0	-33.3	Pass	REFER TO Q.P.
178.2	V	0.0	48.0	14.1	4.7	27.1	39.7	74.0	-34.3	Pass	Q.P.
198.0	V	0.0	45.0	15.0	4.7	27.1	37.6	74.0	-36.4	Pass	
287.9	V	0.0	39.0	17.3	5.3	27.2	34.4	74.0	-39.6	Pass	
53.3	H	0.0	39.0	10.2	2.2	27.5	23.8	74.0	-50.2	Pass	
59.0	H	0.0	50.0	9.7	2.2	27.5	34.4	74.0	-39.6	Pass	Q.P.
59.4	H	0.0	50.0	9.6	2.2	27.5	34.3	74.0	-39.7	Pass	Q.P.
66.0	H	0.0	45.5	9.4	2.2	27.5	29.6	74.0	-44.4	Pass	Q.P.
69.7	H	0.0	45.5	9.3	2.2	27.5	29.5	74.0	-44.5	Pass	Q.P.
78.8	H	0.0	48.2	8.5	2.4	27.0	32.1	74.0	-41.9	Pass	Q.P.
79.2	H	0.0	44.1	8.4	2.4	27.0	27.9	74.0	-46.1	Pass	Q.P.
118.0	H	0.0	35.3	11.0	3.0	27.0	22.3	74.0	-51.7	Pass	Q.P.
128.4	H	0.0	41.1	11.8	3.4	27.1	29.2	74.0	-44.8	Pass	Q.P.
135.7	H	0.0	44.5	12.2	3.4	27.1	33.0	74.0	-41.0	Pass	Q.P.
138.6	H	0.0	46.5	12.3	3.4	27.1	35.1	74.0	-38.9	Pass	Q.P.
148.5	H	0.0	49.8	13.1	3.4	27.1	39.2	74.0	-34.8	Pass	Q.P.
157.3	H	0.0	43.0	13.3	3.4	27.1	32.6	74.0	-41.4	Pass	Q.P.
158.4	H	0.0	42.3	13.3	3.4	27.1	31.9	74.0	-42.1	Pass	Q.P.
177.0	H	0.0	32.1	13.8	4.7	27.1	23.5	74.0	-50.5	Pass	Q.P.
178.2	H	0.0	41.3	14.1	4.7	27.1	33.0	74.0	-41.0	Pass	Q.P.
198.0	H	0.0	41.0	15.0	4.7	27.1	33.6	74.0	-40.4	Pass	Q.P.
216.2	H	0.0	37.2	15.1	4.7	27.2	29.8	74.0	-44.2	Pass	Q.P.
218.0	H	0.0	36.6	15.1	4.7	27.2	29.2	74.0	-44.8	Pass	Q.P.
231.0	H	0.0	30.8	15.5	4.7	27.2	23.8	74.0	-50.2	Pass	Q.P.
259.1	H	0.0	34.2	18.1	5.3	27.2	30.4	74.0	-43.6	Pass	Q.P.
288.0	H	0.0	36.8	17.2	5.3	27.2	32.1	74.0	-41.9	Pass	Q.P.
360.0	V	0.0	37.0	4.4	5.9	27.3	20.0	74.0	-54.0	Pass	
594.0	V	0.0	34.0	5.5	8.0	27.9	19.6	74.0	-54.4	Pass	
799.8	V	0.0	48.0	12.0	10.0	28.2	41.8	74.0	-32.2	Pass	AMBIENT
				12.0							
360.0	H	0.0	38.7		5.9	27.3	17.3	74.0	-56.7	Pass	
495.0	H	0.0	29.0	18.9	7.0	27.8	27.1	74.0	-46.9	Pass	
799.8	H	0.0	50.0	21.0	10.0	28.2	52.8	74.0	-21.2	Pass	AMBIENT
											Scanned from 30-1000MHz

Photographs of Test Setup

FRONT VIEW



Note: Photo on D oats is unavailable, However the preliminary Microwave setup was an identical test configuration.

BICONICAL ANTENNA VIEW

HORN ANTENNA VIEW

Section 7. Frequency Stability

NAME OF TEST: Frequency Stability	PARA. NO.: 24.235
TESTED BY: Ron Gaytan	DATE: February 17, 1999

Test Results: Complies

Measurement Data: Standard Test Frequency: 1967.5 MHz
Standard Test Voltage: 27 VAC

See attached tables.

Frequency Stability (OUTDOOR)

Nominal

VOLTAGE	FREQUENCY TOLERANCE(Hz)	TIME REF .(µSec.)	RHO	POWER (dBm)
27 VDC	2.5	.33	.97	42.4

VOLTAGE VARIATION

VOLTAGE	FREQUENCY TOLERANCE (Hz)	TIME REF. (µSec.)	RHO	POWER (dBm)
85% S.T.V. (22.95 VDC)	6.0	.33	.97	42.4
100% S.T.V. (27.0 VDC)	2.5	.33	.97	42.4
115% S.T.V. (31.05 VDC)	**Unable to take Measurements**			
91% S.T.V (29.4 VDC)	-3	**.5**	**.97**	42.4

Note: Transmitter shuts down at 29.7 VDC as measured at Transmitter

TEMPERATURE VARIATION

TEMPERATURE (°C)	FREQUENCY TOLERANCE (Hz)	TIME REF. (µSec.)	RHO	POWER (dBm)
-30	-3.0	.5	.97	42.4
-20	-5.0	.29	.97	42.4
-10	-7.0	.34	.97	42.4
0	-5.0	.33	.97	42.4
10	-3.3	.32	.97	42.4
30	-3	.32	.97	42.4
40	2.6	.32	.97	42.4
50	3.0	.32	.97	42.4

Section 8. Test Equipment List

The listing below indicates the test equipment utilized for the test (s). Calibration interval on all items is typically 12 months from the calibration date shown.

KTL(ICC) ID	Nomenclature	Manufacturer Model Number	Serial Number	Calibration Date
C5D	D O.A.T.S. Cable Set			12/14/98
CF01	Storm Cable (7.7 meters)			04/28/98
CF30	Storm Cable (1.0 meter)	Semi Flex		01/13/99
151	Receiver (20-1000 MHz)	Rohde & Schwarz ESVS 30	843710/0001	04/01/99
156	Digital Power Meter	Hewlett Packard 436A	2512A22082	02/09/99
183	Limiter	Fischer FCC-450B-1.2	NSN	02/27/98
200	Log-Periodic Antenna (300 MHz - 1.8 GHz)	A.H. Systems SAS-200/510	121	01/25/99
228	Antenna-Biconical	ICC BCON-30300		11/17/98
243	Dipole Antenna	A.H. Systems TDS-200/335	151	03/09/99
494	Horn Antenna	A.H. Systems SAS-200/571	162	08/13/98
934	Horn Antenna (18-26.5 GHz)	EMCO 3160-09	9705-1079	CNR
946	27dB Gaing Preamp	ICC 27dB LNA	946	04/09/98
960	Power Sensor	Hewlett Packard 8482H	1926A01090	02/16/99
G1017B	Attenuator	Narda 776B-20	None	08/14/98
G1018	Attenuator	Narda 10 dB	776B-10	10/27/98
EM2200	Amplifier	Hewlett Packard 8449A	2749A00159	05/22/98

Test Equipment List (Continued):

The listing below indicates the test equipment utilized for the test (s). Calibration interval on all items is typically 12 months from the calibration date shown.

KTL(ICC) ID	Nomenclature	Manufacturer Model Number	Serial Number	Calibration Date
G2624	Spectrum Analyzer	Hewlett Packard 8563E	3551A04428	10/05/98
ETL # 017	Temperature Chamber	Thermotron		CNR
ETL # 1020	Temperature Controller	Micristar		10/14/99
ETL # 1107	Temperature Recorder	Honeywell		05/18/99
		LAB #3 OPEN AREA (INDOOR)		
		SITE D O.A.T.S. (OPEN AREA TEST SITE) 30 Meter Site		
	Turntable Flush Mounted, Metal Covered, 12 Foot	A.H. Systems (Automated)		CNR
	Antenna Mast, 5 Meter	ICC (Automated)		CNR

ANNEX A

TEST METHODOLOGIES

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

NAME OF TEST: Occupied Bandwidth	**PARA. NO.: 2.1049**

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: ≥ RBW
Span: 5 MHz
Sweep: Auto

GSM Per ANSI/J-STD-010

RBW: 3 kHz
VBW: ≥ RBW
Span: 2 MHz
Sweep: Auto

NADC Per IS-136

RBW: 1 kHz
VBW: ≥ RBW
Span: 1 MHz
Sweep: Auto

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: 3 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.

NAME OF TEST: Field Strength of Spurious Radiation PARA. NO.: 2.1053

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.

Calculation Of Field Strength Limit

An example of attenuation requirement of 43 + 10 Log P is equivalent to -13 dBm (5×10^{-5} Watts) at the antenna terminal. We determine the field strength limit by using the plane wave relation.

$GP/4\pi R^2 = E^2/120\pi$

For emissions ≤ 1 GHz:

G = 1.64 (Dipole Gain)
P = 10^{-5} Watts (Maximum spurious output power)
R = 3m (Measurement Distance)

$$E = \frac{\sqrt{30GP}}{R}$$

$$\mathrm{E} = \frac{\sqrt{30 \times 1.64 \times 5 \times 10^{-5}}}{3} = 0.016533 \text{ V / m} = 84.4 \text{ dB}\mu\text{V / m}$$

For emissions > 1 GHz:

G = 1 (Isotropic Gain)
P = 1×10^{-5} Watts (Maximum spurious output power)
R = 3m (Measurement Distance)

$$E = 84.4 - 20Log\sqrt{1.64} = 82.3 dB\mu V \ / \ m@3m$$

NAME OF TEST: Frequency Stability	**PARA. NO.: 2.1055**

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.

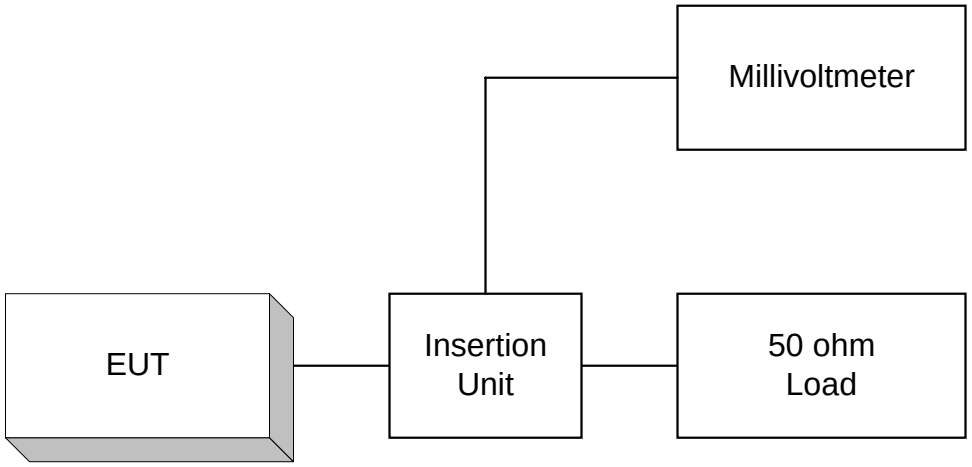
Frequency Stability With Temperature Variation

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.

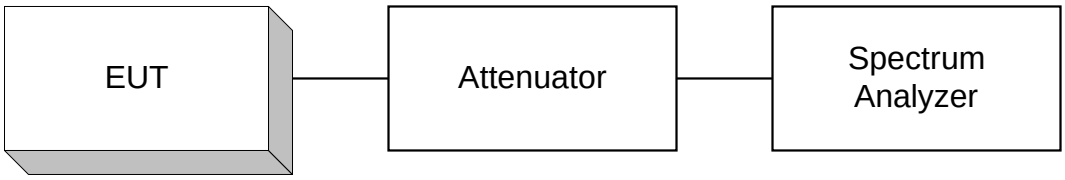
ANNEX B

TEST DIAGRAMS

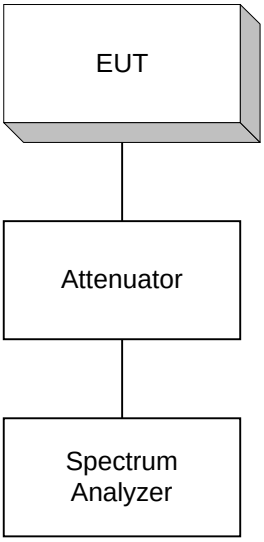
Para. No. 2.1046 - R.F. Power Output



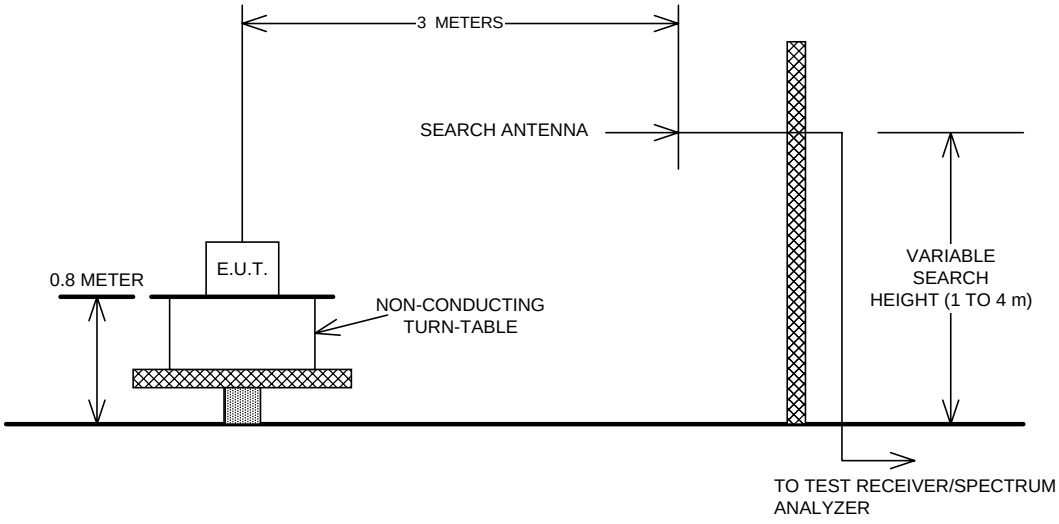
Para. No. 2.1049 - Occupied Bandwidth



Para. No. 2.1051 Spurious Emissions at Antenna Terminals



Para. No. 2.1053 - Field Strength of Spurious Radiation



Para. No. 2.1055 - Frequency Stability