Nemko Test Report:	5L0126RUS1Rev1
Applicant:	Siemens Subscriber Networks, Inc. 4849 Alpha Rd. Dallas, Texas 75244
Equipment Under Test: **(E.U.T.)**	SpeedStream 6520EX / 6515EX
In Accordance With:	**FCC Part 15, Subpart C, 15.247** Spread Spectrum Transmitters
Tested By:	Nemko Dallas Inc. 802 N. Kealy Lewisville, Texas 75057-3136
Authorized By:	 Tom Tidwell, Frontline Manager
Date:	10 June 2005

Table of Contents

Section 1. Summary of Test Results

Manufacturer: Siemens Subsciber Networks, Inc.

Model No.: SpeedStream 6520EX (Model Tested)
SpeedStream 6515EX

Serial No.: MAE:00:0B:23:FE:6D:99

REMARKS:

This report contains the test results for the Siemens Subscribers Networks Model Speedstream 6520/ Speedstream 6515. An external power adapter provided power.

Model No's:	Part No's:
Speedstream 6520EX	060-R651-AXX
Speedstream 6515EX	060-R551-AXX

Small black box with SpeedStream written in black on the top front bezel. Back part of modem has DSL, USB, Ethernet ports 4-1, Power connection, Antenna and on/off push switch

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 Part 15, Subpart C, Paragraph 15.247 for Direct Sequence Spread Spectrum devices. Radiated tests were conducted is accordance with ANSI C63.4-1992. Radiated emissions are made on an open area test site. A description of the test facility is on file with the FCC.

☒ New Submission ☐ Production Unit

☐ Class II Permissive Change ☒ Pre-Production Unit

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

THE FOLLOWING DEVIATIONS FROM, ADDITIONS TO, OR EXCLUSIONS FROM THE TEST SPECIFICATIONS HAVE BEEN MADE. NONE
See " Summary of Test Data".

NVLAP LAB CODE: 100426-0

Summary Of Test Data

NAME OF TEST	PARA. NO.	RESULT
Powerline Conducted Emissions	15.207(a)	Complies
Minimum 6 dB Bandwidth	15.247(a)(2)	Complies
Maximum Peak Power Output	15.247(b)(1)	Complies
Spurious Emissions (Antenna Conducted)	15.247(c)	Complies
Spurious Emissions (Restricted Bands)	15.247(c)	Complies
Peak Power Spectral Density	15.247(d)	Complies

Footnotes:

Section 2. Equipment Under Test (E.U.T.)

General Equipment Information

Frequency Band: 2412 to 2462 MHz

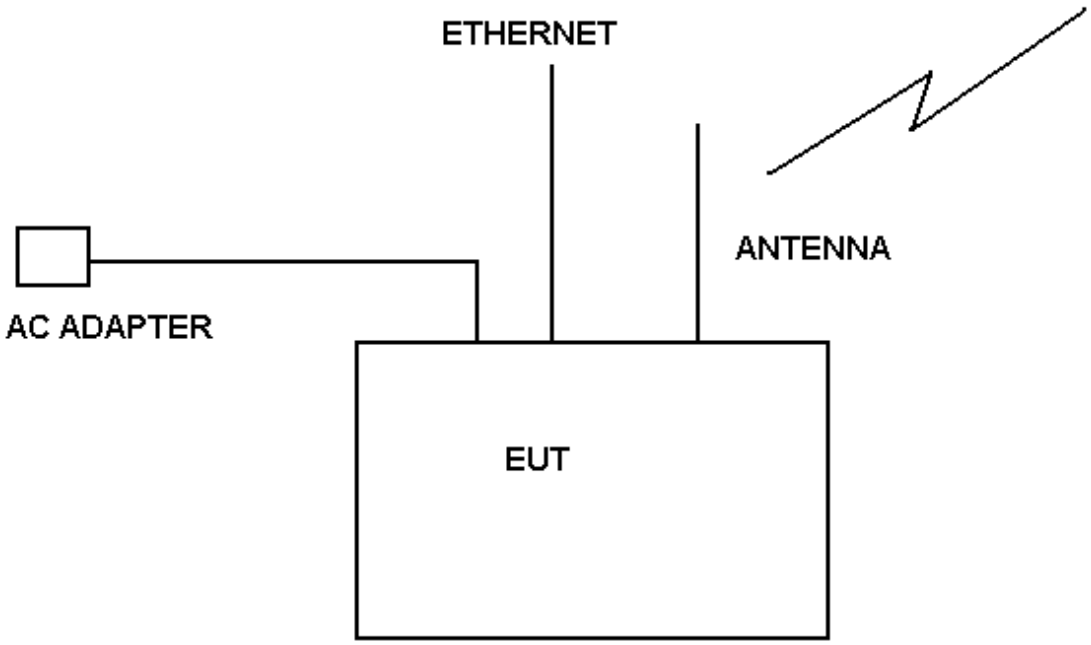
Channel Spacing: 5 MHz

User Frequency Adjustment: Software controlled

Description of EUT

The device is a DSL/wireless 802.11b/g modem.

System Diagram



Section 3. Powerline Conducted Emissions

NAME OF TEST: Powerline Conducted Emissions	PARA. NO.: 15.207(a)
TESTED BY: Kevin Rose	DATE: 03/16/05

Test Results: Complies.

Measurement Data: See attached plots.

Measurement Uncertainty: +/- 1.7 dB

Generic Description	Manufacturer	Model No.	Serial #
AC Adapter (WallWart)Domestic	Ten Pao	S024AU1200150	7

Test Data – Powerline Conducted Emissions

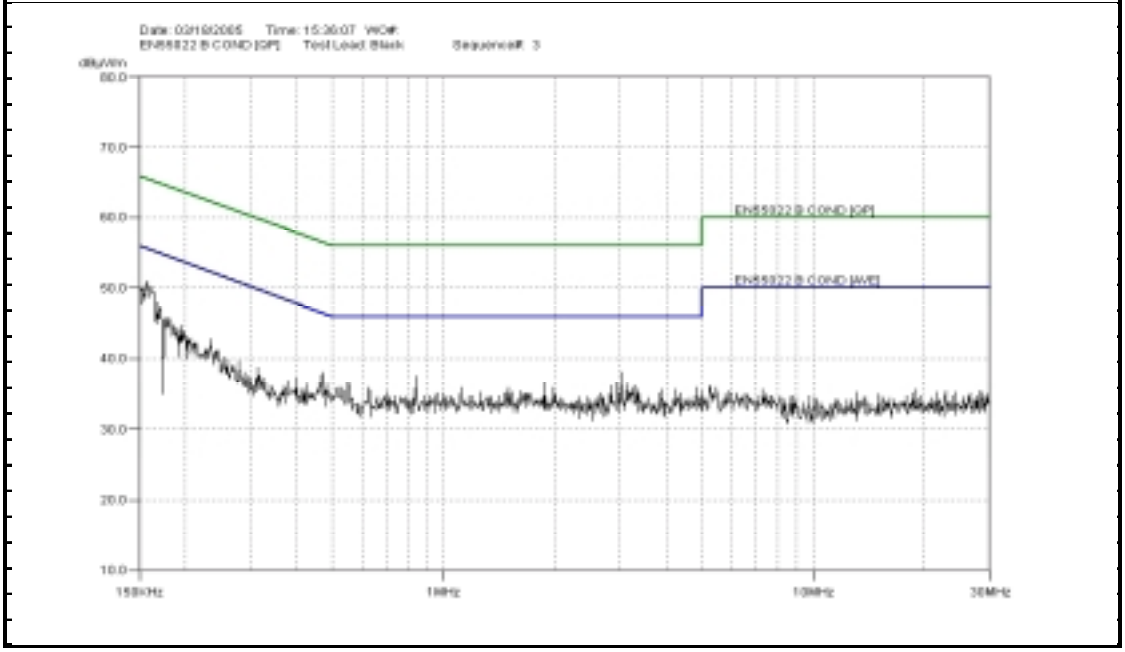
NEMKO Dallas, Inc.

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

Conducted Emissions
Powerline Voltage Measurement

Complete	x			Job # : 5l0126E	Test # : CEPV-01
Preliminary				Page 1	of 2
Client Name :	Siemens				
EUT Name :	Compact Wireless Gateway				
EUT Model # :	SpeedStream 6520EX / 6515EX Annex A				
EUT Part # :	060-R651-AXX / 060-R551-AXX				
EUT Serial # :	MAE:00:0B:23:FE:6D:99				
EUT Config. :	CHANNEL 6 MAX TRANSMIT				
Specification :	PART 15.247			Reference :	PART 15 SUB B CLASS B
Transducer # :	545	Temp. (deg. C) :	23	Date :	03/18/05
HP Filter # :	958	Humidity (%) :	56	Time :	15:00
Cable 1 # :	1113	EUT Voltage :	120VAC	Staff :	Kevin Rose
Cable 2 # :	1019	EUT Frequency :	60Hz	Location :	Lab 2
Detector 1 # :	716	Peak Bandwidth:	10kHz	Photo ID:	5L0126ECEPV-01
Detector 2 # :	1464	QP Bandwidth	9kHz		
Limiter # :	674	Avg. Bandwidth	9kHz		

Meas. Freq. (MHz)	EUT Test Point	Detector Type (P,QP, A)	Limit Type (QP, A)	Meter Reading (dBuV)	Path Loss (dB)	Transducer Factor (dB)	Corrected Reading (dBuV)	Spec.limit (dBuV) Q.P.	Spec.limit (dBuV) Avg.	CR/SL Diff. (dB)	Pass Fail Unc.	Comment



..\EMCShare\AUTOMATE\DATASHTS\CEP_Voltage Rev C.xls Document Control #EMC DS EM COND VOLT

NEMKO Dallas, Inc.

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

Conducted Emissions

Powerline Voltage Measurement

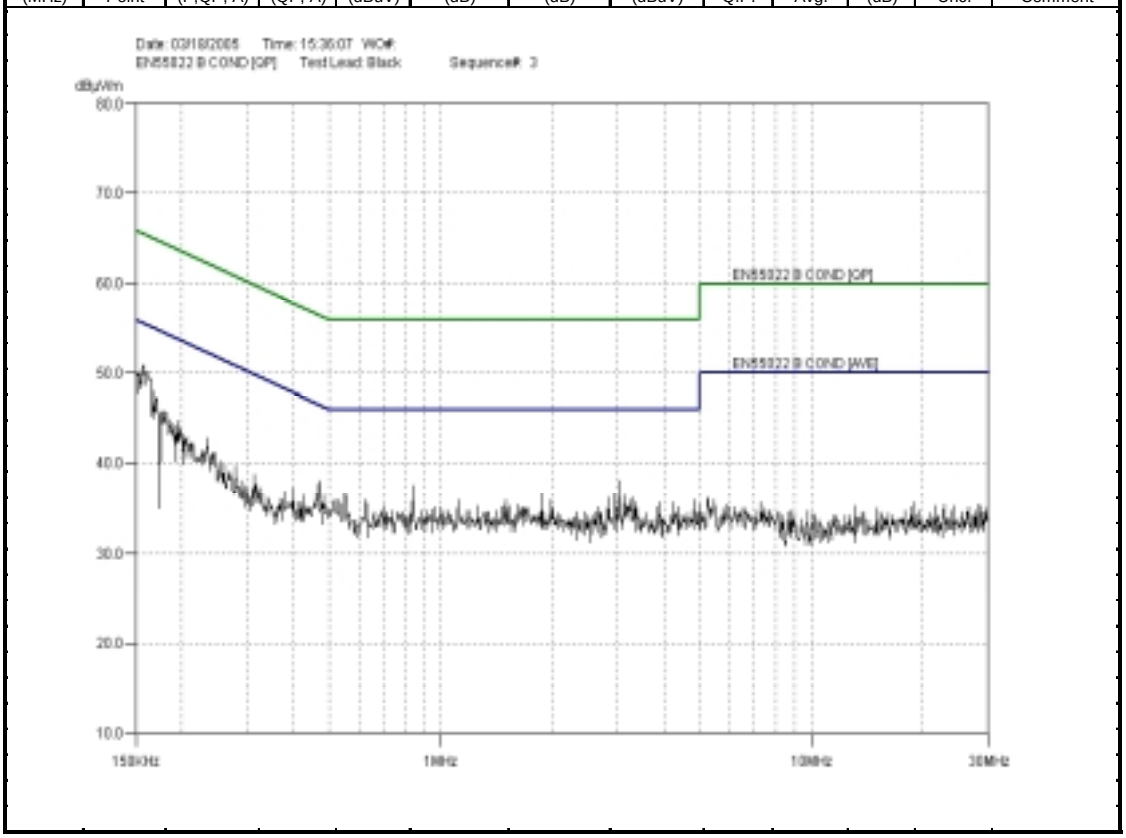
Complete x
Preliminary

Job # : 5l0126E Test # : CEPV-01
Page 2 of 2

Client Name : Siemens
EUT Name : Compact Wireless Gateway
EUT Model # : SpeedStream 6520EX / 6515EX Annex A
EUT Part # : 060-R651-AXX / 060-R551-AXX
EUT Serial # : MAE:00:0B:23:FE:6D:99
EUT Config. : CHANNEL 6 MAX TRANSMIT

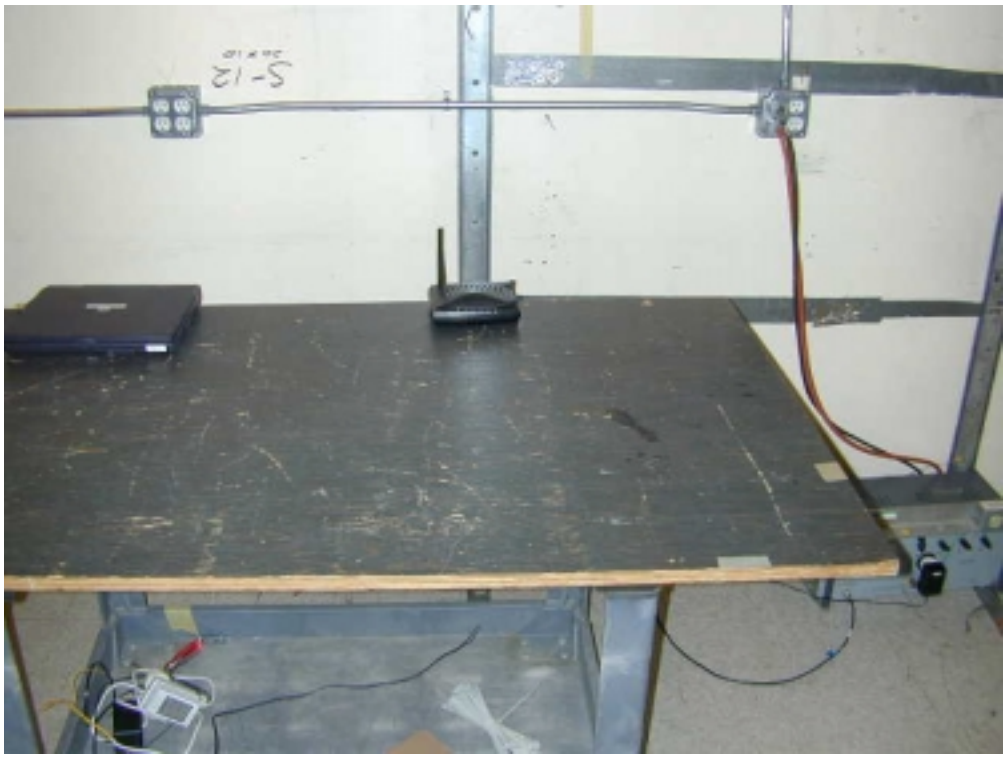
Specification : PART 15.247 Reference : PART 15 SUB B CLASS B

Meas. Freq. (MHz)	EUT Test Point	Detector Type (P,QP, A)	Limit Type (QP, A)	Meter Reading (dBuV)	Path Loss (dB)	Transducer Factor (dB)	Corrected Reading (dBuV)	Spec.limit (dBuV) Q.P.	Spec.limit (dBuV) Avg.	CR/SL Diff. (dB)	Pass Fail Unc.	Comment



..\EMCShare\AUTOMATE\DATASHTS\CEP_Voltage Rev C.xls Document Control #EMC DS EM COND VOLT

Photos – Powerline Conducted Emissions



Section 4. Minimum 6 dB Bandwidth

NAME OF TEST: Minimum 6 dB Bandwidth	PARA. NO.: 15.247(a)(2)
TESTED BY: Kevin Rose	DATE: 03/15/05

Test Results: Complies.

Measurement Data: See 6 dB BW plot

Measured 6 dB bandwidth: 16.6 MHz Max

Channel Separation: 5 MHz

Test Data – Occupied Bandwidth

Nemko Dallas, Inc.

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

Data Plot **Occupied Bandwidth**

Page 1 of 6

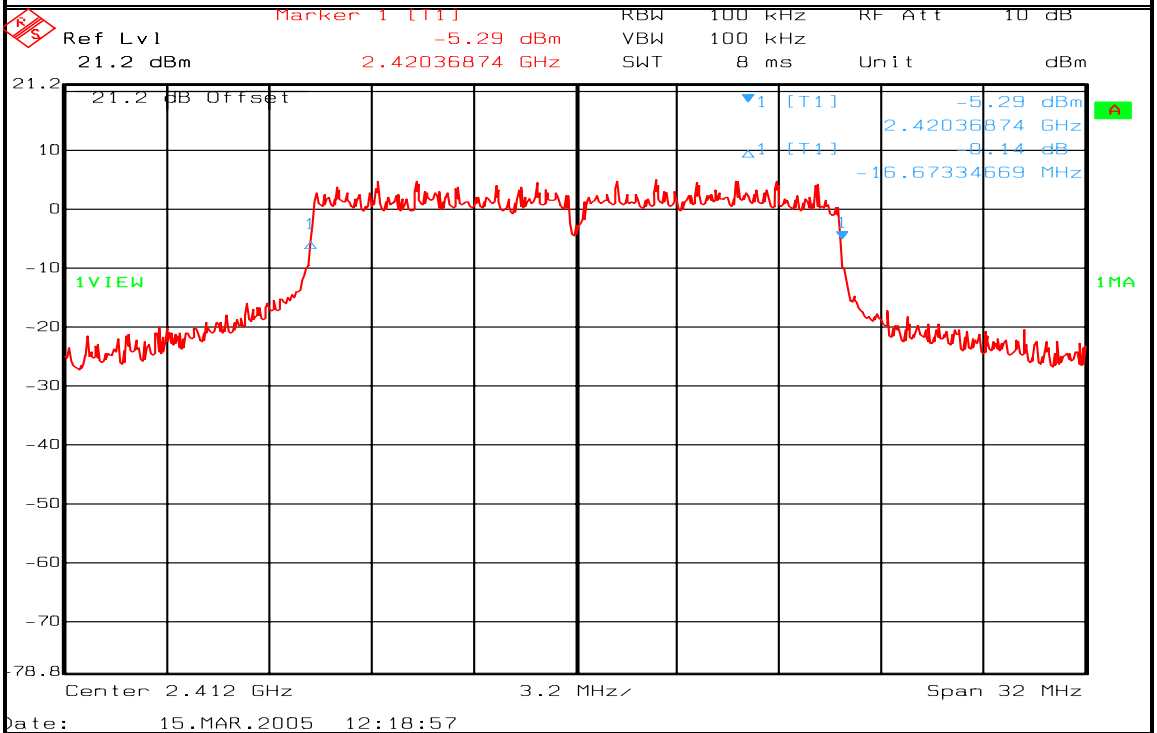
Job No.:	5L0126R	Date:	3/15/2005	Complete	X
Specification:	15.247	Temperature(°C):	21	Preliminary:	
Tested By:	Kevin Rose	Relative Humidity(%)	42		
E.U.T.:	SS 6520EX/6515EX				
Configuration:	TX				
Sample Number:	1				
Location:	Lab 2	RBW:	100 kHz	Measurement	
Detector Type:	Peak	VBW:	100 kHz	Distance:	NA m

Test Equipment Used

Antenna:		Directional Coupler:	
Pre-Amp:		Cable #1:	1081
Filter:		Cable #2:	
Receiver:	1036	Cable #3:	
Attenuator #1	1472	Cable #4:	
Attenuator #2:		Mixer:	

Additional equipment used:

Measurement Uncertainty: +/-1.7 dB



Notes: **CHANNEL 1 - 54 Mbs**

Test Data – Occupied Bandwidth

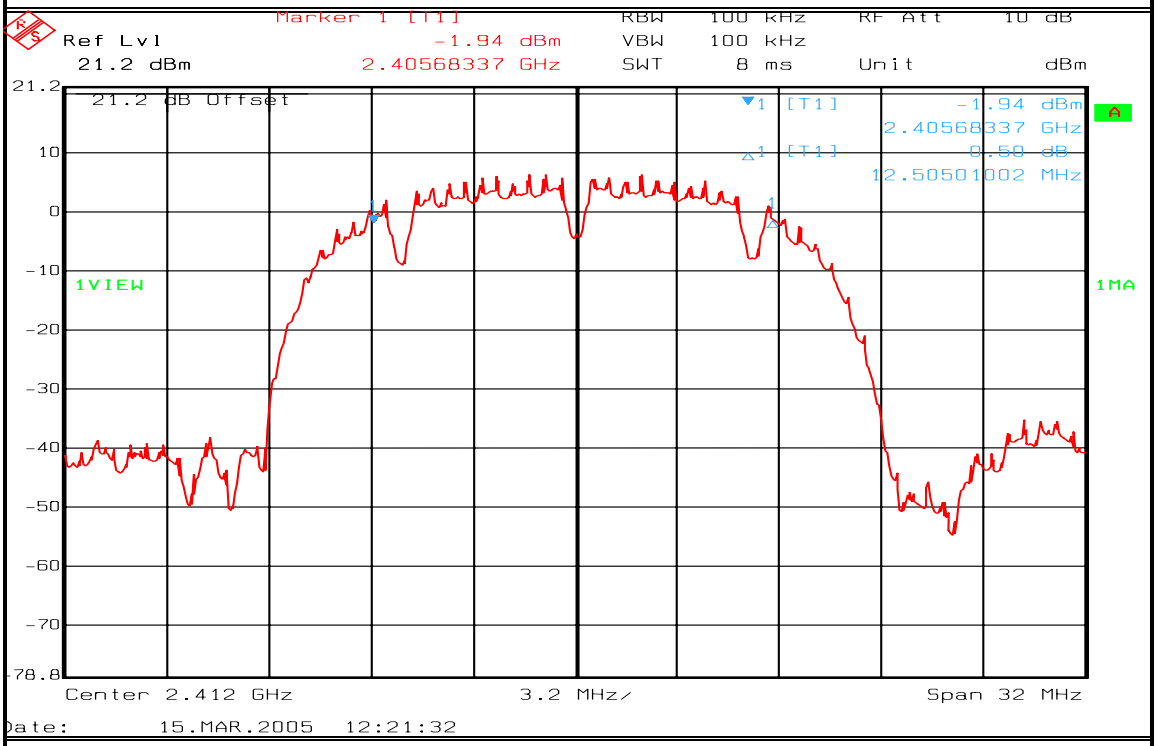
Nemko Dallas, Inc.

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

Data Plot **Occupied Bandwidth**

Page 2 of 6

Job No.:	5L0126R	Date:	3/15/2005
Specification:	15.2	Temperature(°C):	21
Tested By:	Kevin Rose	Relative Humidity(%)	42
E.U.T.:	SS 6520EX/6515EX		
Configuration:	TX		



Notes: **CHANNEL 1**
1 Mbs

Test Data – Occupied Bandwidth

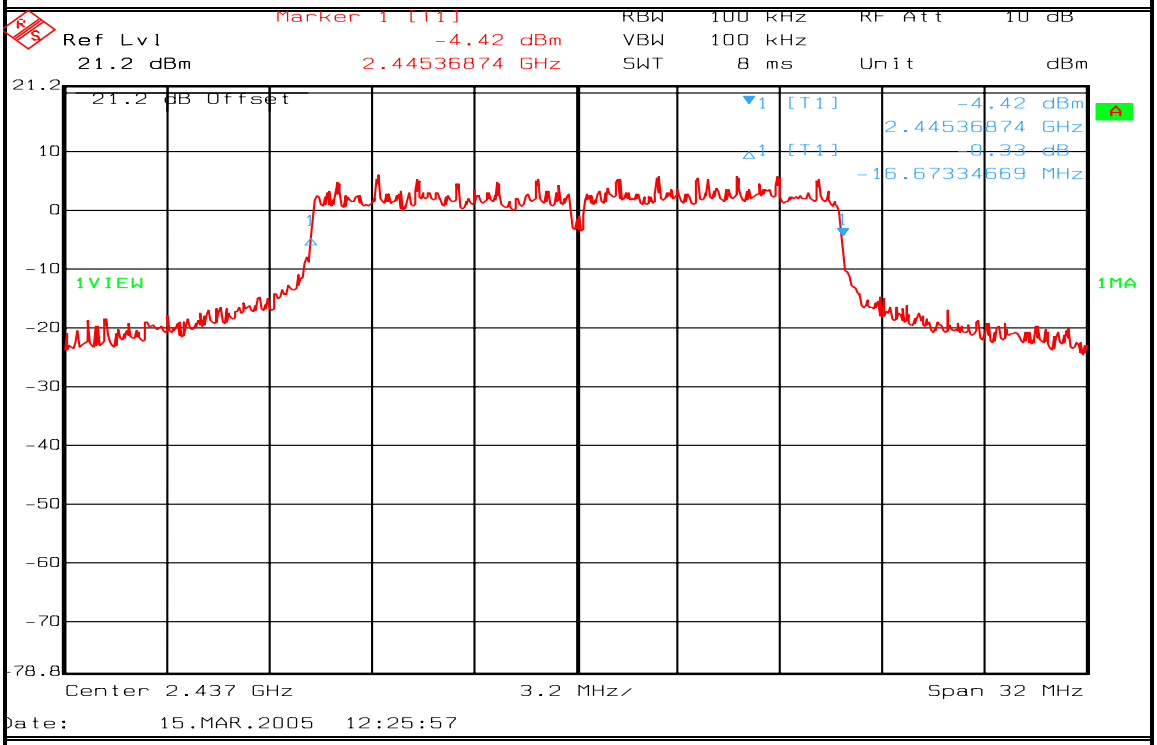
Nemko Dallas, Inc.

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

Data Plot **Occupied Bandwidth**

Page 3 of 6

Job No.:	5L0126R	Date:	3/15/2005
Specification:	15.2	Temperature(°C):	21
Tested By:	Kevin Rose	Relative Humidity(%)	42
E.U.T.:	SS 6520EX/6515EX		
Configuration:	TX		



Notes: **CHANNEL 6**
54 Mbs

Test Data – Occupied Bandwidth

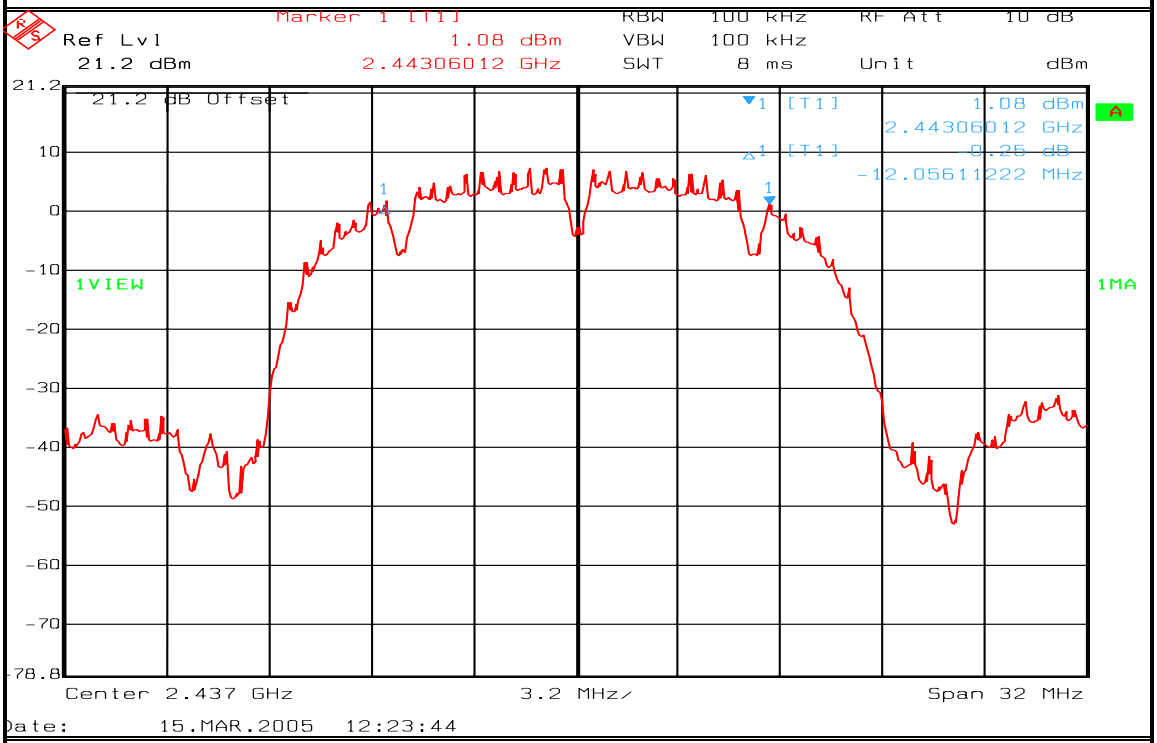
Nemko Dallas, Inc.

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

Data Plot **Occupied Bandwidth**

Page 4 of 6

Job No.:	5L0126R	Date:	3/15/2005
Specification:	15.2	Temperature(°C):	21
Tested By:	Kevin Rose	Relative Humidity(%)	42
E.U.T.:	SS 6520EX/6515EX		
Configuration:	TX		



Notes: **CHANNEL 6**
1 Mbs

Test Data – Occupied Bandwidth

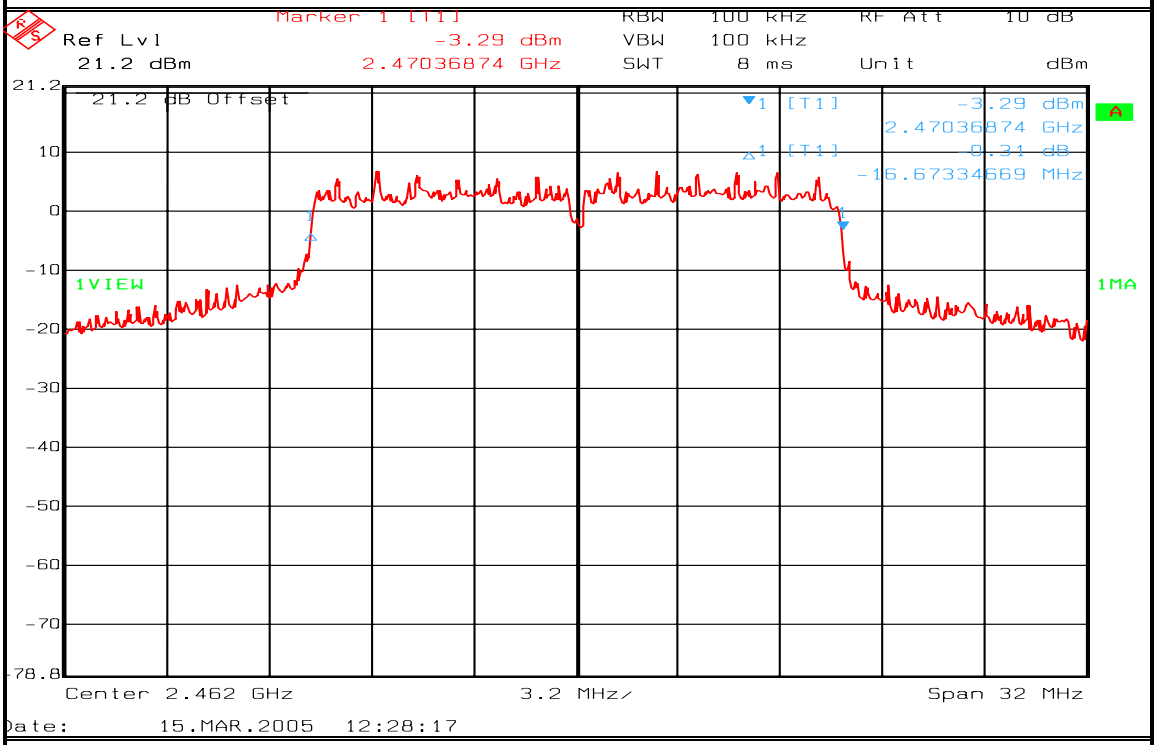
Nemko Dallas, Inc.

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

Data Plot **Occupied Bandwidth**

Page 5 of 6

Job No.:	5L0126R	Date:	3/15/2005
Specification:	15.2	Temperature(°C):	21
Tested By:	Kevin Rose	Relative Humidity(%)	42
E.U.T.:	SS 6520EX/6515EX		
Configuration:	TX		



Notes: **CHANNEL 11**
54 Mbs

Test Data – Occupied Bandwidth

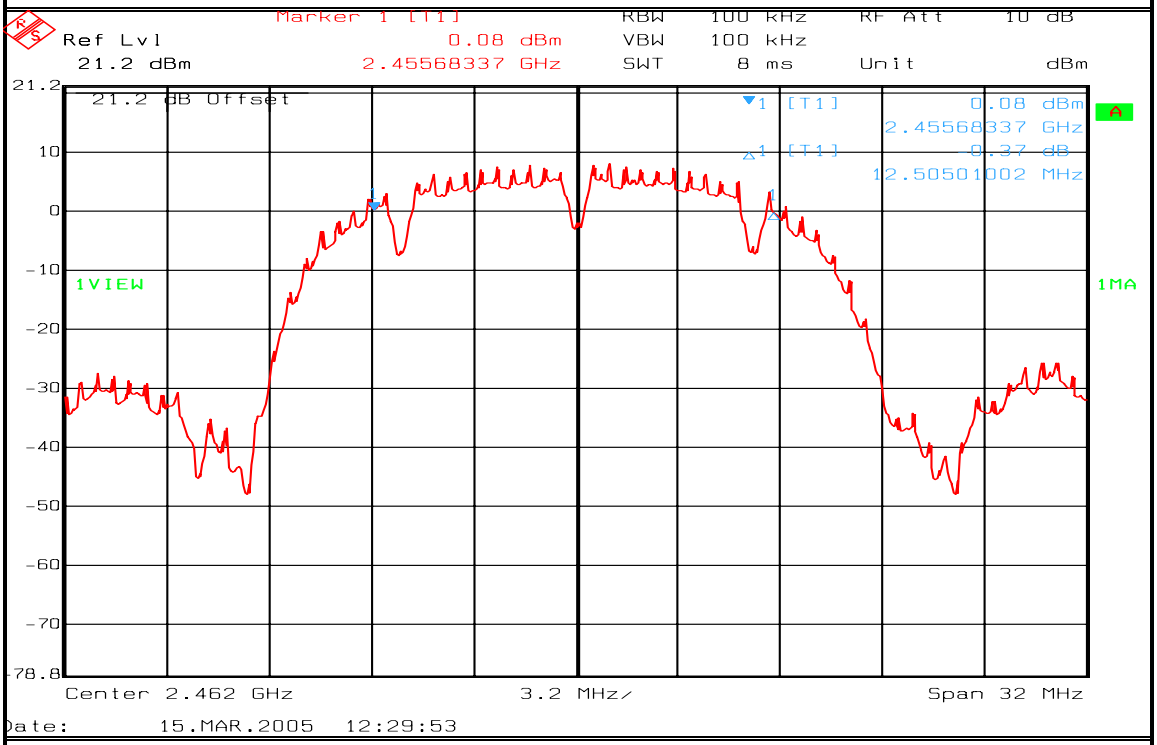
Nemko Dallas, Inc.

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

Data Plot **Occupied Bandwidth**

Page 6 of 6

Job No.:	5L0126R	Date:	3/15/2005
Specification:	15.2	Temperature(°C):	21
Tested By:	Kevin Rose	Relative Humidity(%)	42
E.U.T.:	SS 6520EX/6515EX		
Configuration:	TX		



Notes: **CHANNEL 11**
1 Mbs

Section 5. Maximum Peak Output Power

NAME OF TEST: Maximum Peak Output power	PARA. NO.: 15.247(b)(1)
TESTED BY: Kevin Rose	DATE: 03/15/05

Test Results: Complies.

Measurement Data:

Antennas: Monopole

Frequency (MHz)	Data Rate (Bps)	Antenna Gain (dBi)	Peak Power (dBm)	Peak Power (W)	EIRP (dBm)
2412	1	2.5	27.12	.515	29.6
2437	1	2.5	27.50	.562	30.0
2462	1	2.5	28.01	.633	30.5
2412	54	2.5	29.38	.867	31.9
2437	54	2.5	29.38	.867	31.9
2462	54	2.5	29.26	.843	31.8

Note: The AC supply to the device was varied from 102 Vac to 138 Vac will rf output power was monitored. There was no variation of rf output power noted.

Equipment Used: 1029-1081-1474

Measurement Uncertainty: +/- 0.7 dB

Temperature: 21 °C

Relative Humidity: 42 %

Section 6. Spurious Emissions (conducted)

NAME OF TEST: Spurious Emissions (conducted)	PARA. NO.: 15.247(c)
TESTED BY: Kevin Rose	DATE: 03/15/05

Test Results: Complies.

Measurement Data: See attached plots.

Test Data – Spurious Emissions at Antenna Terminals

Nemko Dallas, Inc.

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

Data Plot — **Spurious Emissions at Antenna Terminals**

Page 1 of 6

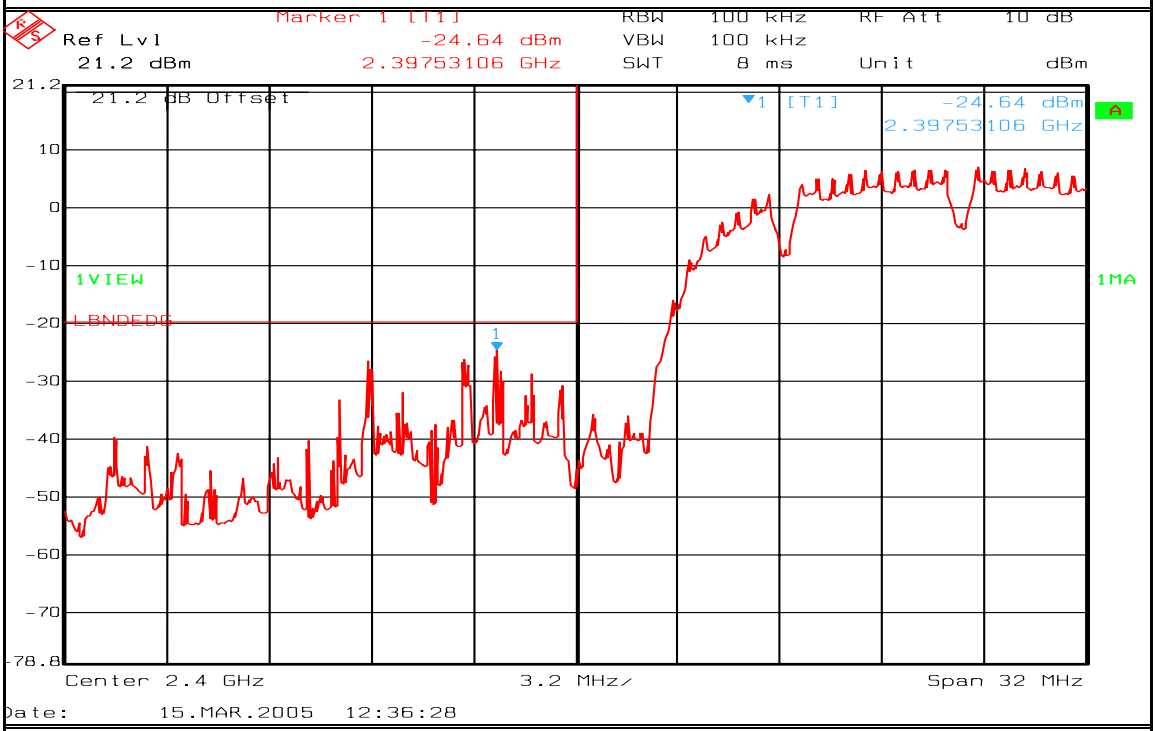
Job No.:	5L0126R	Date:	3/15/2005	Complete	X
Specification:	15.247	Temperature(°C):	21	Preliminary:	
Tested By:	Kevin Rose	Relative Humidity(%)	42		
E.U.T.:	SS 6520EX/6515EX				
Configuration:	TX				
Sample Number:	1				
Location:	Lab 2	RBW:	100 kHz	Measurement	
Detector Type:	Peak	VBW:	100 kHz	Distance:	NA m

Test Equipment Used

Antenna:		Directional Coupler:	
Pre-Amp:		Cable #1:	1081
Filter:		Cable #2:	
Receiver:	1036	Cable #3:	
Attenuator #1	1472	Cable #4:	
Attenuator #2:		Mixer:	

Additional equipment used:

Measurement Uncertainty: +/-1.7 dB



Notes: **CHANNEL 1**
1 Mbs
Lower band edge

Test Data – Spurious Emissions at Antenna Terminals

Nemko

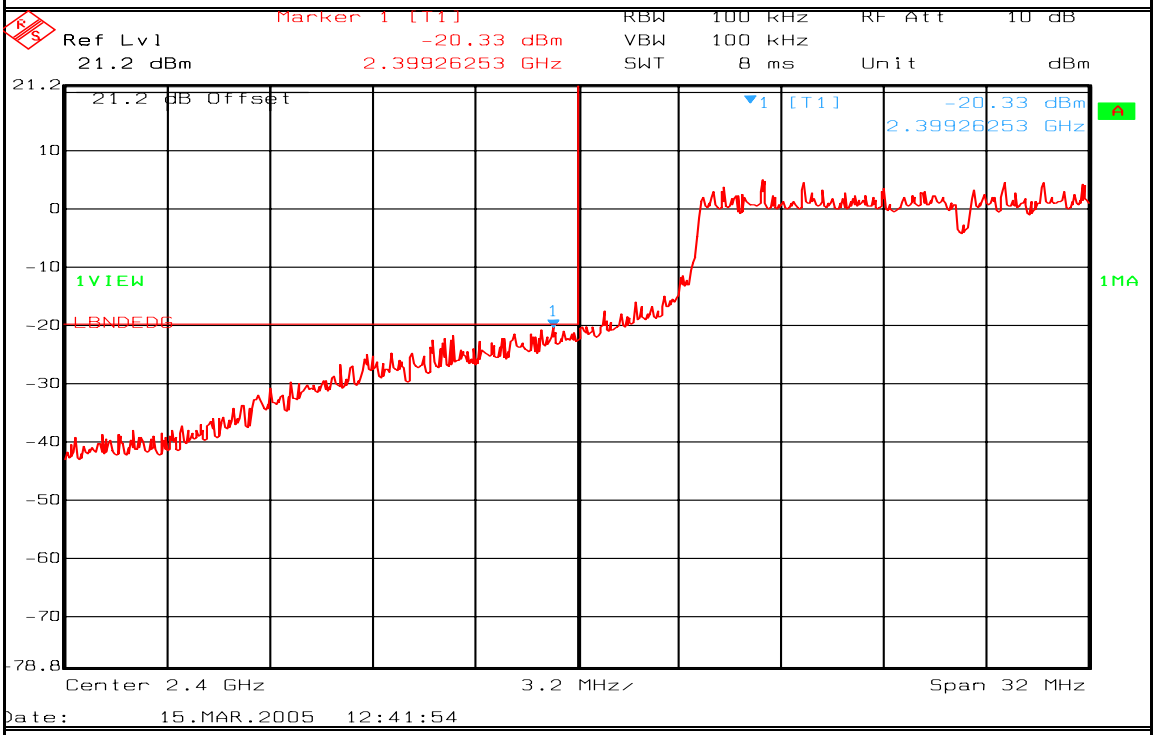
Dallas Headquarters:
802 N. Kealy
Lewisville, TX 75057
Tel: (972) 436-9600
Fax: (972) 436-2667

Nemko Dallas, Inc.

Data Plot **Spurious Emissions at Antenna Terminals**

Page 2 of 6

Job No.:	5L0126R	Date:	3/15/2005
Specification:	15.247	Temperature(°C):	21
Tested By:	Kevin Rose	Relative Humidity(%)	42
E.U.T.:	SS 6520EX/6515EX		
Configuration:	TX		



Notes: **CHANNEL 1**
54 Mbs
Lower band edge

Test Data – Spurious Emissions at Antenna Terminals

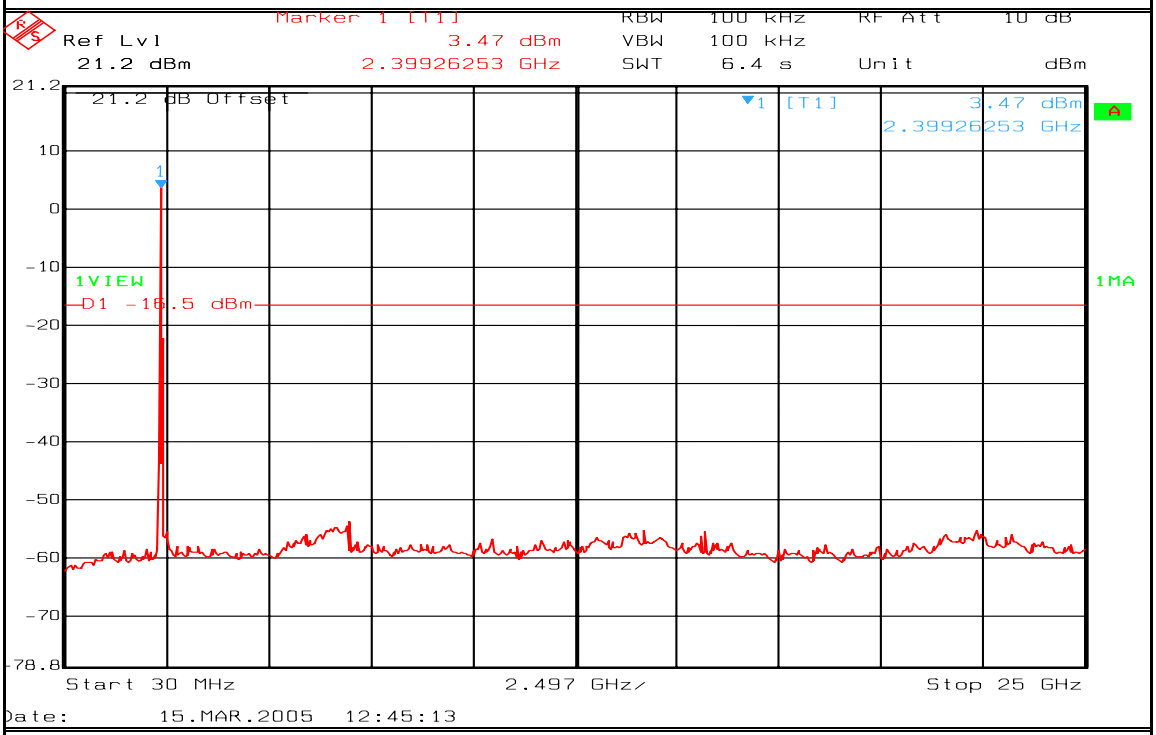
Nemko Dallas, Inc.

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

Data Plot **Spurious Emissions at Antenna Terminals**

Page 3 of 6

Job No.:	5L0126R	Date:	3/15/2005
Specification:	15.247	Temperature(°C):	21
Tested By:	Kevin Rose	Relative Humidity(%)	42
E.U.T.:	SS 6520EX/6515EX		
Configuration:	TX		



Notes: **CHANNEL 1**
54 Mbs

Test Data – Spurious Emissions at Antenna Terminals

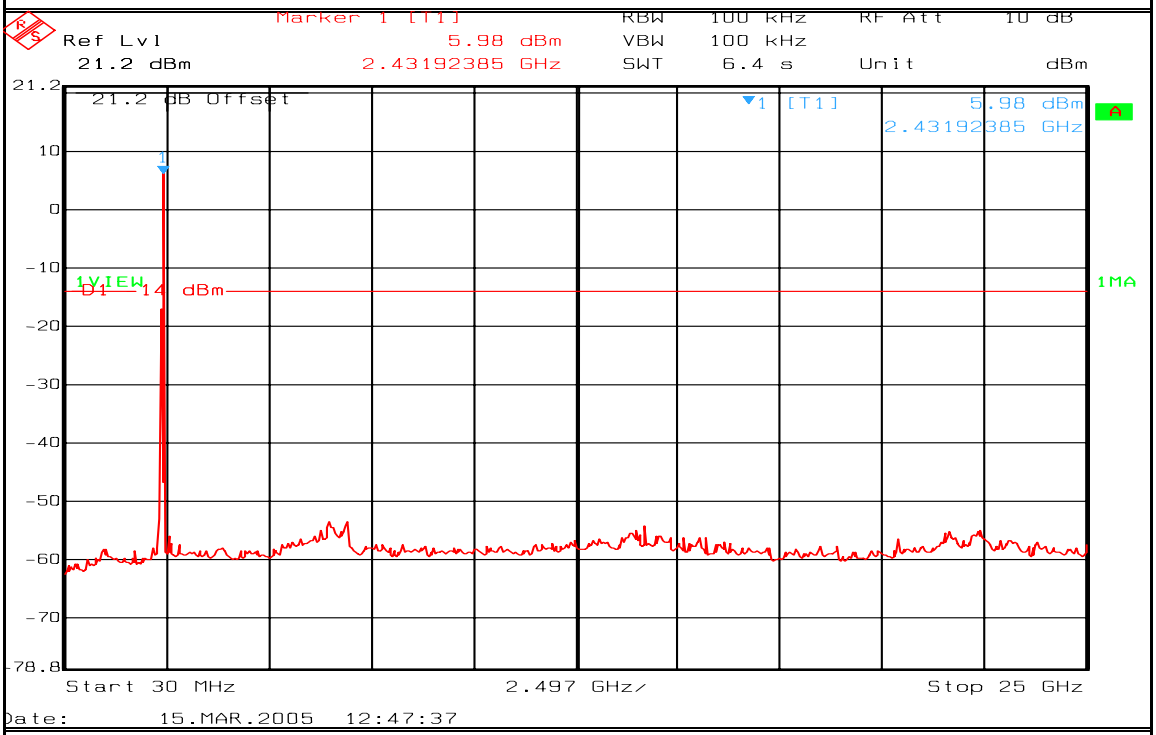
Nemko Dallas, Inc.

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

Data Plot **Spurious Emissions at Antenna Terminals**

Page 4 of 6

Job No.:	5L0126R	Date:	3/15/2005
Specification:	15.247	Temperature(°C):	21
Tested By:	Kevin Rose	Relative Humidity(%)	42
E.U.T.:	SS 6520EX/6515EX		
Configuration:	TX		



Notes: **CHANNEL 6**
54 Mbs

Test Data – Spurious Emissions at Antenna Terminals

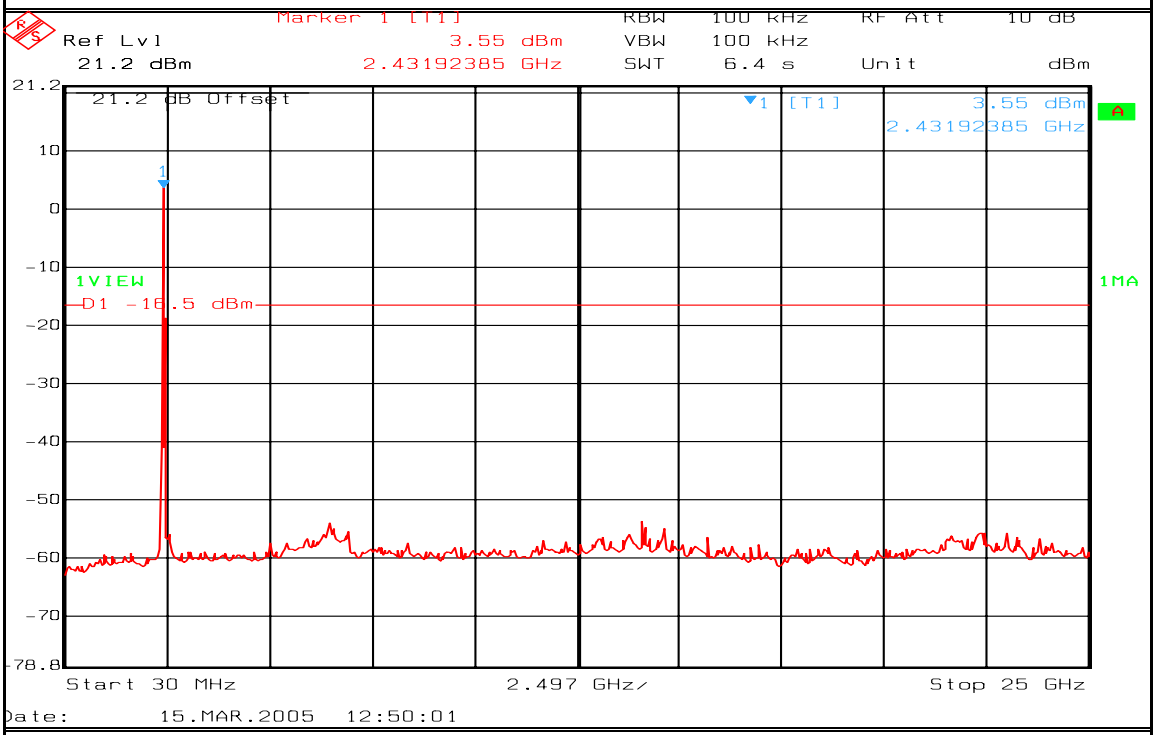
Nemko Dallas, Inc.

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

Data Plot **Spurious Emissions at Antenna Terminals**

Page 5 of 6

Job No.:	5L0126R	Date:	3/15/2005
Specification:	15.247	Temperature(°C):	21
Tested By:	Kevin Rose	Relative Humidity(%)	42
E.U.T.:	SS 6520EX/6515EX		
Configuration:	TX		



Notes: **CHANNEL 11**
54 Mbs

Section 7. Spurious Emissions (Restricted Bands)

NAME OF TEST: Spurious Emissions (Restricted Bands)	PARA. NO.: 15.247 (c)
TESTED BY: Kevin Rose	DATE: 03/15/05

Test Results: Complies.

Measurement Data: See attached table.

Test Data – Radiated Emissions

Nemko

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

Nemko Dallas,

Radiated Emissions

Page 1 of 1

Job No.: 5L0126R Date: 3/15/2005
Specification: 15.247 Temperature(°C): 21
Tested By: Kevin Rose Relative Humidity(%) 42
E.U.T.: SS 6520EX/6515EX
Configuration: TX
Sample Number: 1
Location: AC 3 RBW: 1 MHz Pk / 1 MHz Avg.
Detector Type: Peak VBW: 1 MHz Pk / 10 Hz Avg

Test Equipment Used

Antenna: 1304 Directional Coupler: #N/A
Pre-Amp: #N/A Cable #1: 1484
Filter: #N/A Cable #2: 1485
Receiver: 1036 Cable #3: 1081
Attenuator #1 #N/A Cable #4: #N/A
Attenuator #2: #N/A Mixer: #N/A
Measurement Uncertainty: +/- 3.6 dB

Frequency (GHz)	Meter Reading (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Pre-Amp Gain (dB)	Corrected Reading (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Detector /
2.4835	41.7	28.2	3.1	0.0	73.0	74	54	Peak - / Vertical
2.4835	20.3	28.2	3.1	0.0	51.6	74	54	Average - / Vertical
2.4835	40.5	28.2	3.1	0.0	71.8	74	54	Peak - / Horizontal
2.4835	21.4	28.2	3.1	0.0	52.7	74	54	Average - NF / Horizontal

Notes: The spectrum was searched to 25 GHz
measurement
The device was tested at 2.412, 2.437 and 2.462 MHz and no emissions were found above the
Data presented is to demonstrate upper bandedge compliance on

Setup Photos

Section 8. Peak Power Spectral Density

NAME OF TEST: Peak Power Spectral Density	PARA. NO.: 15.247(d)
TESTED BY: Kevin Rose	DATE: 03/16/05

Test Results: Complies.

Measurement Data: See attached plots.

Test Data – Spectral Density

Nemko Dallas, Inc.

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

Data Plot **Spurious Emissions at Antenna Terminals**

Page 1 of 6

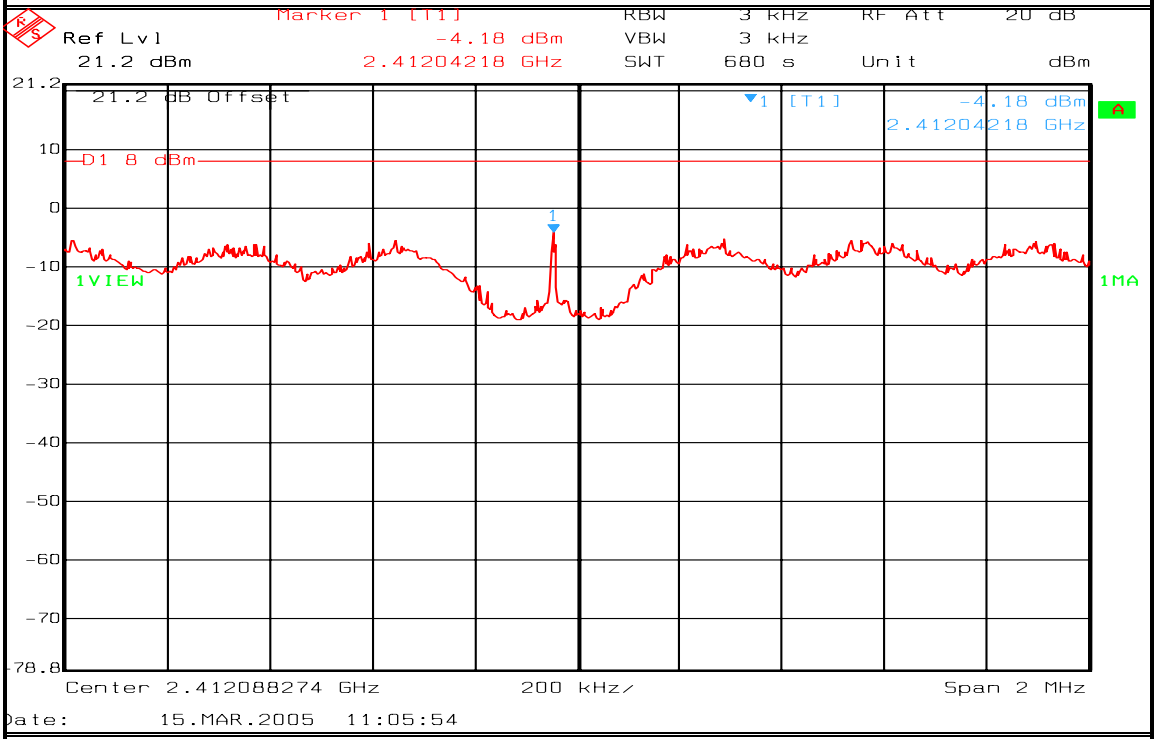
Job No.:	5L0126R	Date:	3/15/2005	Complete	X
Specification:	PART 15.247(d)	Temperature(°C):	21	Preliminary:	
Tested By:	Kevin Rose	Relative Humidity(%)	42		
E.U.T.:	SS 6520EX/6515EX				
Configuration:	TRANSMITTING				
Sample Number:	1				
Location:	Lab 2	RBW:	Refer to plots		
Detector Type:	Peak	VBW:	Refer to plots		

Test Equipment Used

Antenna:		Directional Coupler:	
Pre-Amp:		Cable #1:	1081
Filter:		Cable #2:	
Receiver:	1036	Cable #3:	
Attenuator #1	1472	Cable #4:	
Attenuator #2:		Mixer:	

Additional equipment used:

Measurement Uncertainty: +/-1.7 dB



Notes: **channel 1 54Mbs**

Test Data – Spectral Density

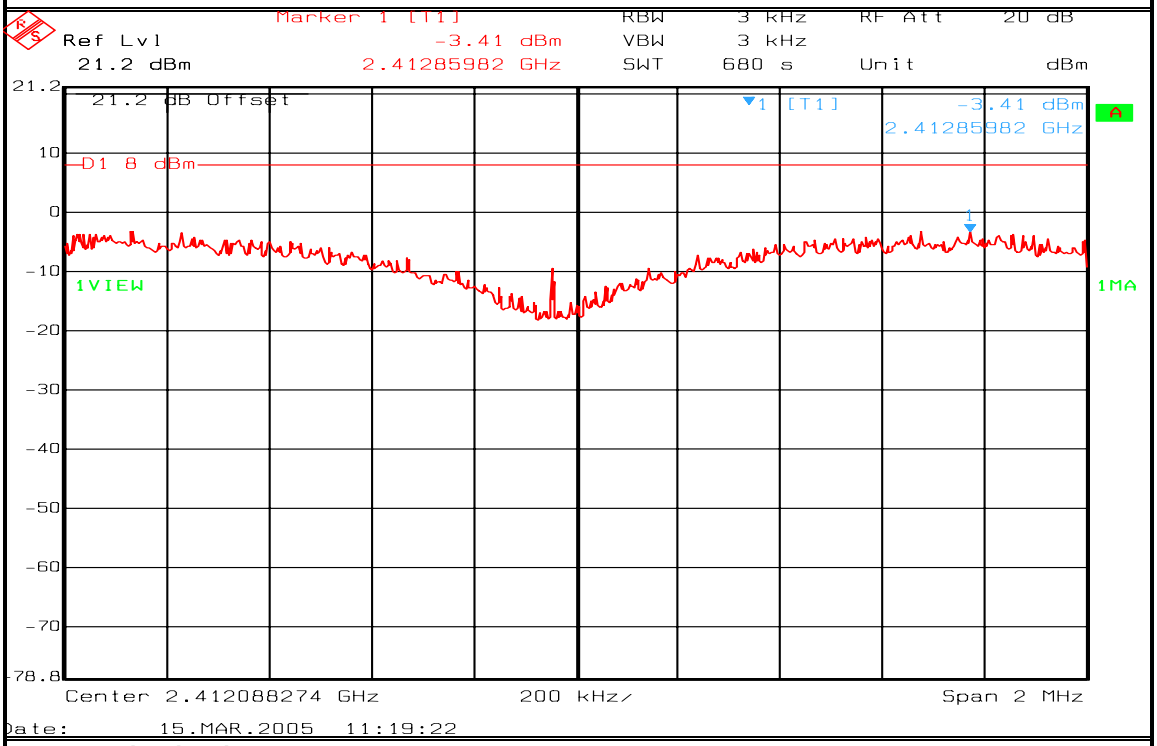
Nemko Dallas, Inc.

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

Data Plot **Spurious Emissions at Antenna Terminals**

Page 2 of 6

Job No.:	5L0126R	Date:	3/15/2005
	PART		
Specification:	15.247(d)	Temperature(°C):	21
Tested By:	Kevin Rose	Relative Humidity(%)	42
E.U.T.:	SS 6520EX/6515EX		
Configuration:	TRANSMITTING		



Notes: **channel 1 1Mbs**

Test Data – Spectral Density

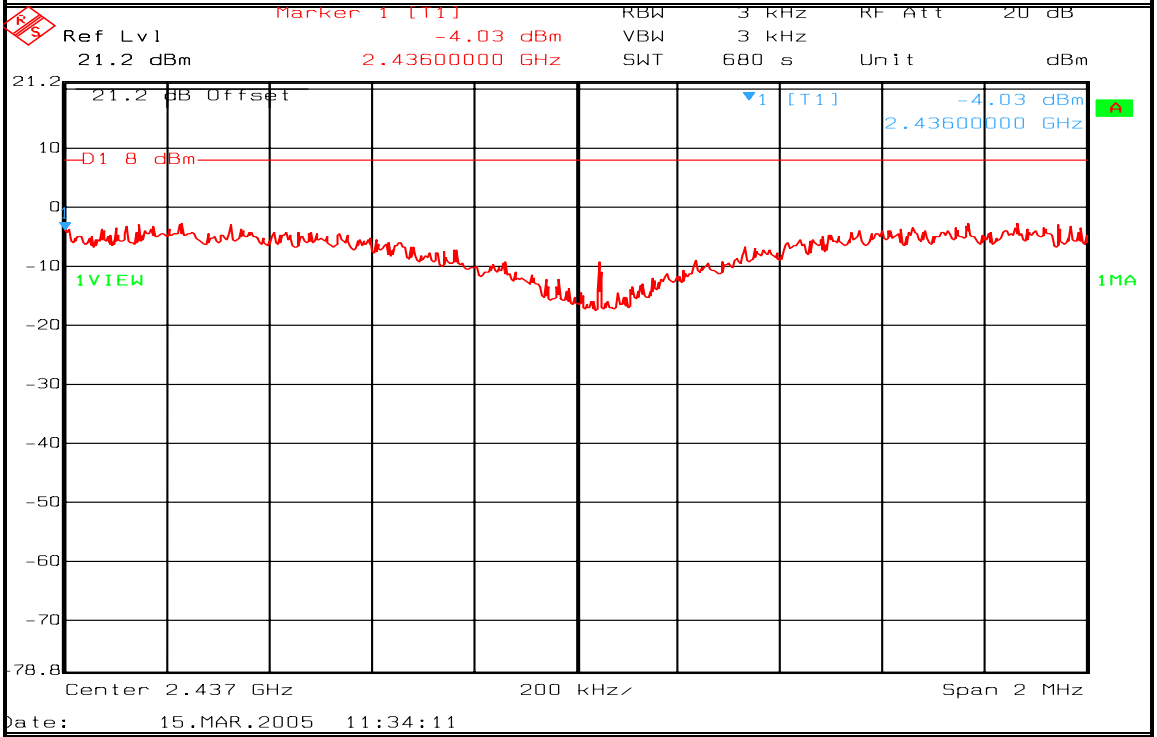
Nemko Dallas, Inc.

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

Data Plot **Spurious Emissions at Antenna Terminals**

Page 3 of 6

Job No.:	5L0126R PART	Date:	3/15/2005
Specification:	15.247(d)	Temperature(°C):	21
Tested By:	Kevin Rose	Relative Humidity(%)	42
E.U.T.:	SS 6520EX/6515EX		
Configuration:	TRANSMITTING		



Notes: **channel 6 1Mbs**

Test Data – Spectral Density

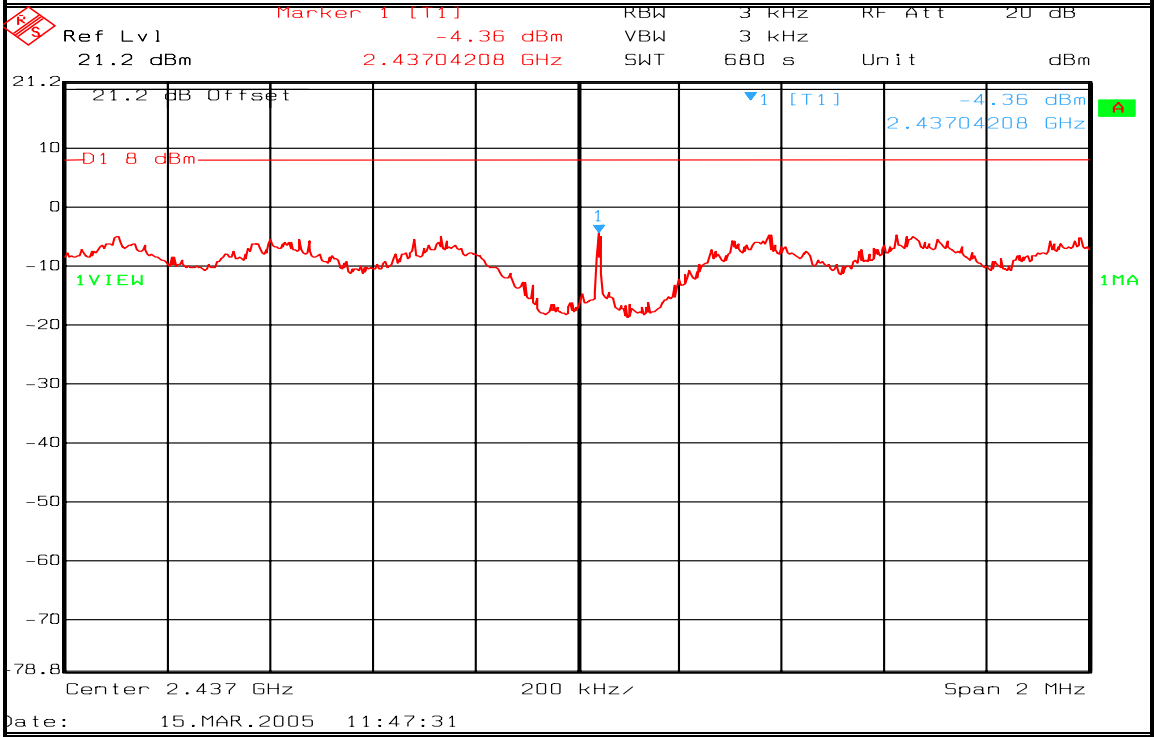
Nemko Dallas, Inc.

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

Data Plot **Spurious Emissions at Antenna Terminals**

Page 4 of 6

Job No.:	5L0126R PART	Date:	3/15/2005
Specification:	15.247(d)	Temperature(°C):	21
Tested By:	Kevin Rose	Relative Humidity(%)	42
E.U.T.:	SS 6520EX/6515EX		
Configuration:	TRANSMITTING		



Notes: **channel 6 54Mbs**

Test Data – Spectral Density

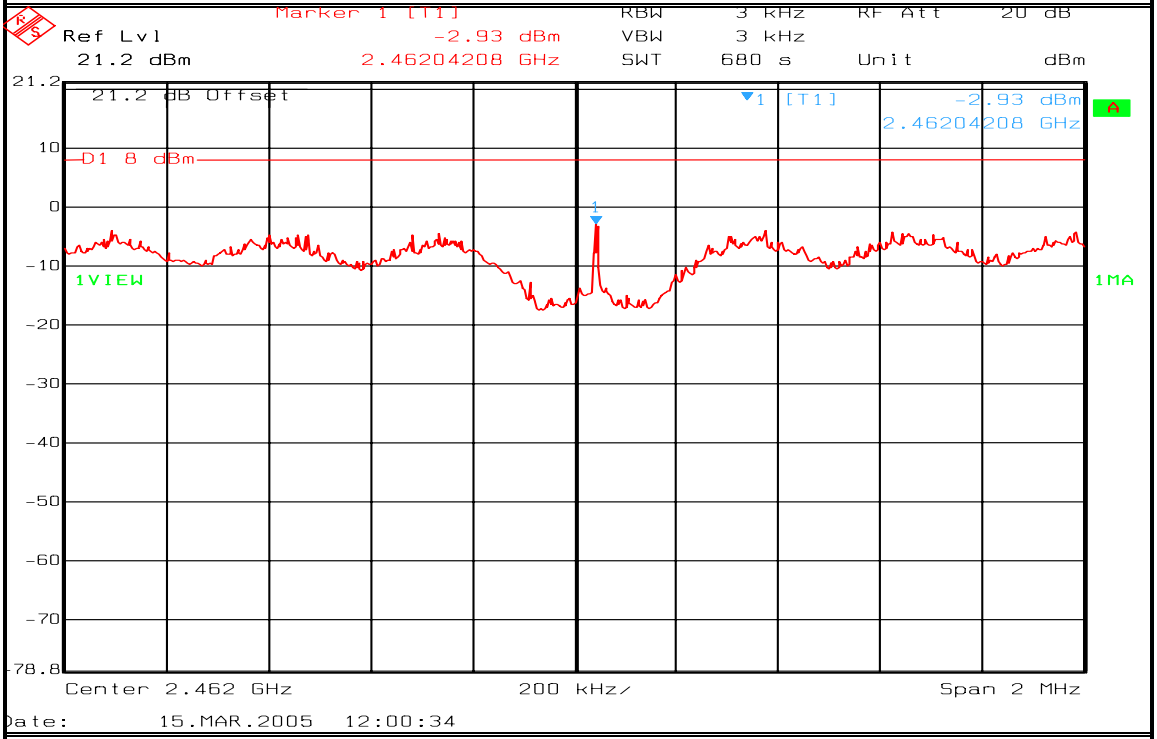
Nemko Dallas, Inc.

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

Data Plot **Spurious Emissions at Antenna Terminals**

Page 5 of 6

Job No.:	5L0126R	Date:	3/15/2005
	PART		
Specification:	15.247(d)	Temperature(°C):	21
Tested By:	Kevin Rose	Relative Humidity(%)	42
E.U.T.:	SS 6520EX/6515EX		
Configuration:	TRANSMITTING		



Notes: **channel 11 54Mbs**

Test Data – Spectral Density

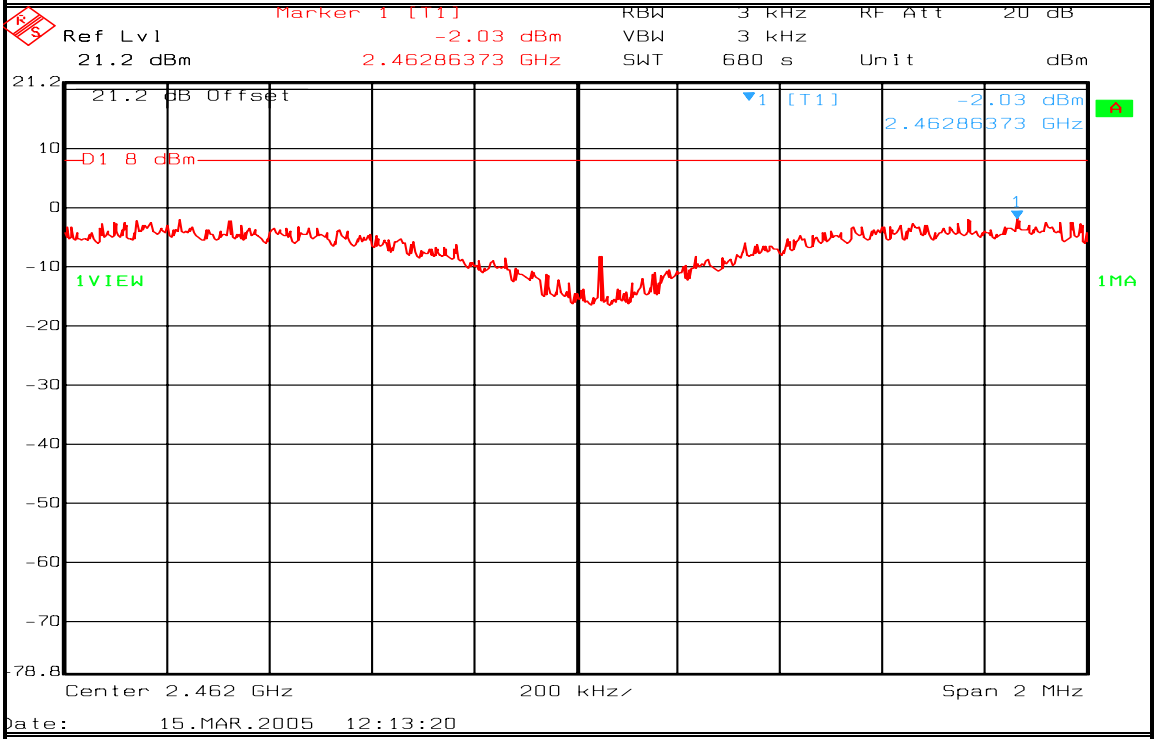
Nemko Dallas, Inc.

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

Data Plot **Spurious Emissions at Antenna Terminals**

Page 6 of 6

Job No.:	5L0126R	Date:	3/15/2005
	PART		
Specification:	15.247(d)	Temperature(°C):	21
Tested By:	Kevin Rose	Relative Humidity(%)	42
E.U.T.:	SS 6520EX/6515EX		
Configuration:	TRANSMITTING		



Notes: **channel 11 1Mbs**

Section 9. Test Equipment List

Nemko ID	Description	Manufacturer Model Number	Serial Number	Calibration Date	Calibration Due
1484	Cable 2.0-18.0 Ghz	Storm PR90-010-072	N/A	08/26/04	08/26/05
1485	Cable 2.0-18.0 Ghz	Storm PR90-010-216	N/A	08/02/04	08/02/05
1081	CABLE 2m	Astrolab 32027-2-29094-72TC	N/A	08/26/04	08/26/05
1036	SPECTRUM ANALYZER	ROHDE & SCHWARZ FSEK30	830844/006	03/22/04	03/23/06
1472	20db Attenuator DC 18 Ghz	Omni Spectra 20600-20db	NONE	CBU	N/A
1304	HORN ANTENNA	ELECTRO METRICS RGA-60	6151	09/22/03	09/22/05
545	LISN	Schwarz Beck 8120	8120350	09/17/04	09/17/05
958	#N/A	#N/A #N/A	#N/A	#N/A	#N/A
1113	CABLE, 1m	KTL RG223	N/A	06/09/04	06/09/05
1019	CABLE, 9.5m	KTL RG223	N/A	07/27/04	07/27/05
1464	Spectrum analyzer	Hewlett Packard 8563E	3551A04428	07/30/04	07/31/06
716	Receiver cal extension	Polorad ESH2	879342/005	02/02/04	08/01/05
674	LIMITER	HP 11947A	3107A02200	CBU	CBU
1016	Pre-Amp	HEWLETT PACKARD 8449A	2749A00159	11/12/04	11/12/05
1480	Bilog Antenna	Schaffner-Chase CBL6111C	2572	CalNotReq	N/A
1029	PEAK POWER METER	HP 8900D	3303U0012	12/23/04	12/22/05
1081	CABLE 2m	Astrolab 32027-2-29094-72TC	N/A	08/26/04	08/26/05
1474	20db Attenuator DC 18 Ghz	MCL Inc. BW-S20W2	NONE	CBU	N/A

ANNEX A - TEST DETAILS

NAME OF TEST: Powerline Conducted Emissions	PARA. NO.: 15.207(a)

Minimum Standard: The R.F. that is conducted back onto the AC power line on any frequency within the band 0.15 to 30 MHz shall not exceed 250µV (48 dBµV) across 50 ohms.

NAME OF TEST: Minimum 6 dB bandwidth	PARA. NO.: 15.247(a)(2)

Minimum Standard: The minimum 6 dB bandwidth shall be at least 500 kHz

NAME OF TEST: Maximum Peak Output Power	PARA. NO.: 15.247(b)(1)

Minimum Standard: The maximum peak output power shall not exceed 1 watt.

If transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Systems operating in the 2400-2483.5 MHz band that are used exclusively for fixed, point to point operation may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum peak output power is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceed 6 dBi.

Systems operating in the 5725 – 5850 MHz band that are used exclusively for fixed, point-to-point operation may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter peak output power.

Direct Measurement Method For Detachable Antennas:
If the antenna is detachable, a peak power meter is used to measure the power output with the transmitter operating into a 50 ohm load. The dBi gain of the antenna(s) employed shall be reported.

Calculation Of EIRP For 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

The RBW of the spectrum analyzer shall be set to a value greater than the measured 6 dB occupied bandwidth of the E.U.T.

Number of channels tested:

Tuning range	Number of channels tested	Channel location in band
1 MHz or less	1	middle
1 to 10 MHz	2	top and bottom
more than 10 MHz	3	top, middle, bottom

NAME OF TEST: Spurious Emissions(conducted) PARA. NO.: 15.247(c)

Minimum Standard: In any 100kHz bandwidth outside the frequency band in which the transmitter is operating, emissions shall be at least 20 dB below the fundamental emission or shall not exceed the following field strength limits. Emissions falling in the restricted bands of 15.205 shall not exceed the following field strength limits:

Frequency (MHz)	Field Strength (μV/m @ 3m)	Field Strength (dB @ 3m)
30 - 88	100	40.0
88 - 216	150	43.5
216 - 960	200	46.0
Above 960	500	54.0

THE SPECTRUM IS SEARCHED TO THE 10th HARMONIC OF THE HIGHEST FREQUENCY GENERATED IN THE EUT.

Method Of Measurement:

30 MHz - 10th harmonic plot
RBW: 100 kHz
VBW: 300 kHz
Sweep: Auto
Display line: -20 dBc

Lower Band Edge
RBW: At least 1% of span/div.
VBW: >RBW
Span: As necessary to display any spurious at band edge.
Sweep: Auto
Center Frequency: 902 MHz, 2400 MHz, or 5725 MHz
Marker: Peak of fundamental emission
Marker Δ: Peak of highest spurious level below center frequency.

Upper Band Edge
RBW: At least 1% of span/div.
VBW: >RBW
Span: As necessary to display any spurious at band edge.
Sweep: Auto
Center Frequency: 928 MHz, 2483.5 MHz, or 5850 MHz
Marker: Peak of fundamental emission
Marker Δ: Peak of highest spurious level above center frequency.

Number of channels tested:

Tuning range	Number of channels tested	Channel location in band
1 MHz or less	1	middle
1 to 10 MHz	2	top and bottom
more than 10 MHz	3	top, middle, bottom

NAME OF TEST: Radiated Spurious Emissions	PARA. NO.: 15.247(c)

Minimum Standard: In any 100kHz bandwidth outside the frequency band in which the transmitter is operating, emissions shall be at least 20 dB below the fundamental emission or shall not exceed the following field strength limits:

Emissions falling in the restricted bands of 15.205 shall not exceed the following field strength limits:

Frequency (MHz)	Field Strength (µV/m @ 3m)	Field Strength (dB @ 3m)
30 - 88	100	40.0
88 - 216	150	43.5
216 - 960	200	46.0
Above 960	500	54.0

THE SPECTRUM WAS SEARCHED TO THE 10th HARMONIC

15.205 Restricted Bands

MHz	MHz	MHz	GHz
0.09-0.11	16.42-16.423	399.9-410	4.5-5.25
0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.125-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2655-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	Above 38.6
13.36-13.41	1718		

Number of channels tested:

Tuning range	Number of channels tested	Channel location in band
1 MHz or less	1	middle
1 to 10 MHz	2	top and bottom
more than 10 MHz	3	top, middle, bottom

NAME OF TEST: Transmitter Power Density	PARA. NO.: 15.247(d)

Minimum Standard: The transmitted power density averaged over any 1 second interval shall not be greater than +8 dBm in any 3 kHz bandwidth.

Method Of Measurement: The spectrum analyzer is set as follows:

RBW: 3 kHz
VBW: >3 kHz
Span: => measured 6 dB bandwidth
Sweep: Span(kHz)/3 (i.e. for a span of 1.5 MHz the sweep rate is 1500/3 = 500 sec.
LOG dB/div.: 2 dB

Note: For devices with spectrum line spacing =< 3 kHz, the RBW of the analyzer is reduced until the spectral lines are resolved. The measurement data is normalized to 3 kHz by summing the power of all the individual spectral lines within a 3 kHz band in linear power units.

For Devices With Integral Antenna:

For devices with non-detachable antennas, the received field strength is peaked and the spectrum analyzer is set as above. The peak emission level is then measured and converted to a field strength by adding the appropriate antenna factor and cable loss. This field strength is then converted to an equivalent isotropic radiated power using the same method as described for Peak Power output.

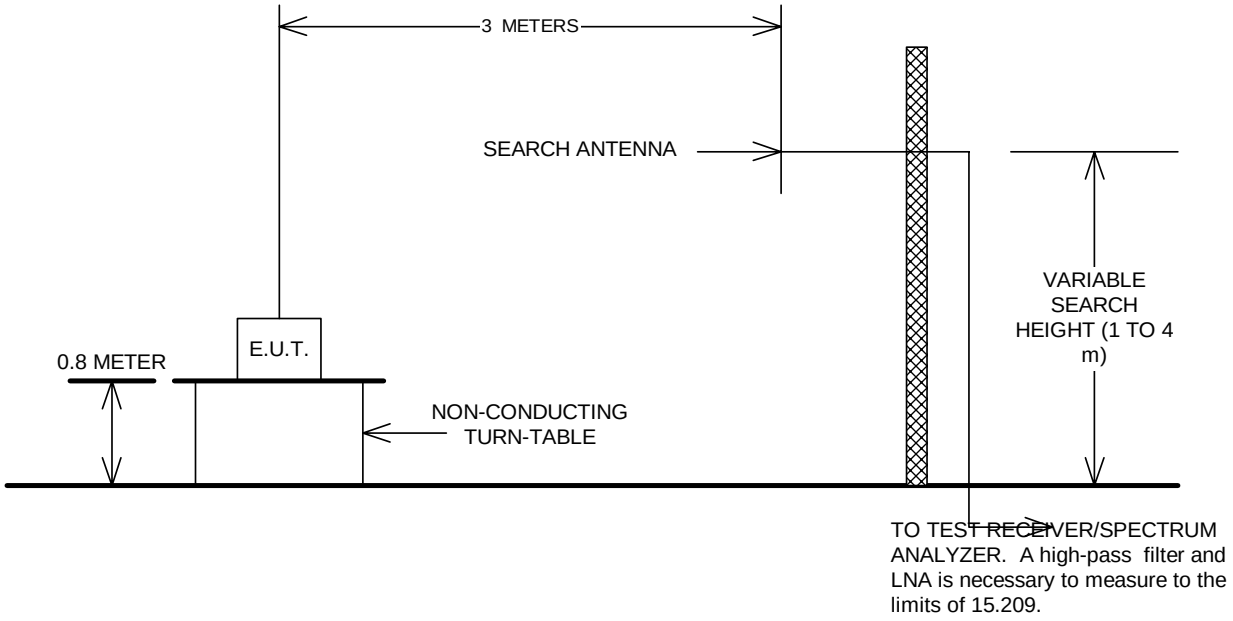
Number of channels tested:

Tuning Range	Number Of Channels Tested	Channel Location In Band
1 MHz or Less	1	Middle
1 to 10 MHz	2	Top And Bottom
More Than 10 MHz	3	Top, Middle, Bottom

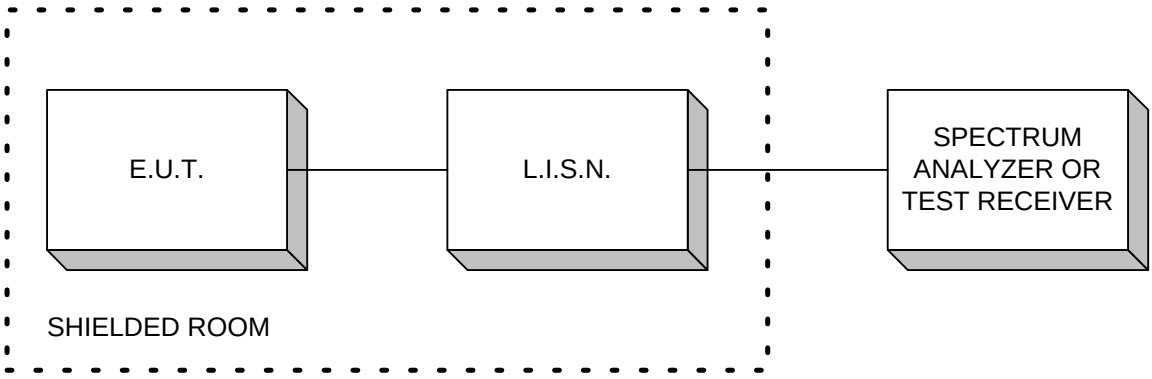
.

ANNEX B - TEST DIAGRAMS

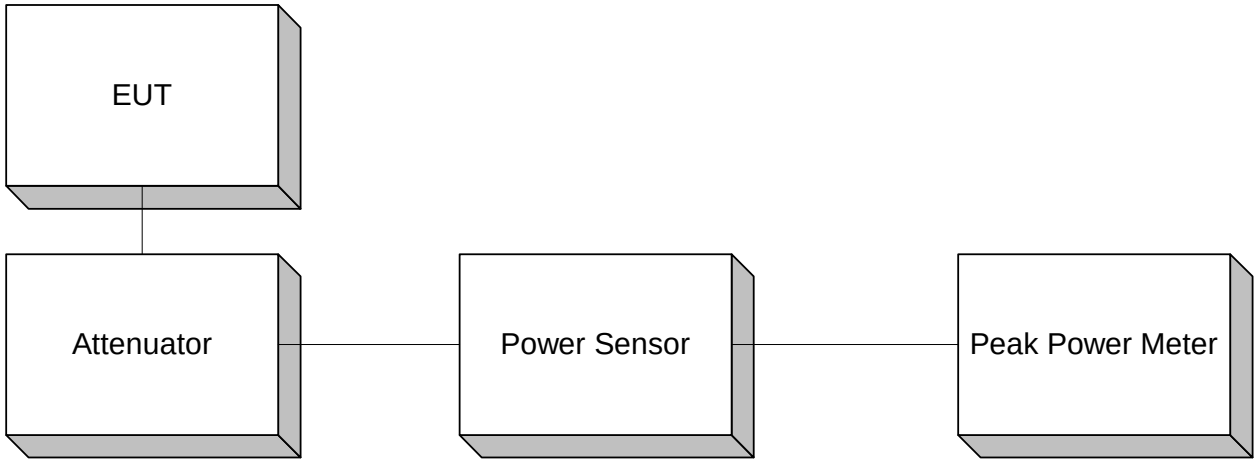
Test Site For Radiated Emissions



Conducted Emissions



Peak Power At Antenna Terminals



Minimum 6 dB Bandwidth
Peak Power Spectral Density
Spurious Emissions (conducted)