

## §2.1046, §22.913(a), & §24.232 – CONDUCTED OUTPUT POWER

### Applicable Standard

According to FCC §2.1046 and §22.913 (a), the ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

According to FCC §2.1046 and §24.232 (a), in no case may the peak output power of a base station transmitter exceed 100 watt.

### Test Procedure

The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.

### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
HP	Spectrum Analyzer	HP8564E	3943A01781	2003-08-25
HP	Plotter	HP7470A	2541A49659	Not Required
A.H. Systems	Horn Antenna	SAS200	261	2003-08-01
ETS	Logperiodic Antenna	3148	0004-1155	2003-10-11
EMCO	Biconical Antenna	3110B	9603-2315	2003-10-11

\* **Statement of Traceability:** BACL Corp. certifies that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

### Environmental Conditions

2004-03-24

Temperature:	19° C
Relative Humidity:	60%
ATM Pressure:	1020 mbar

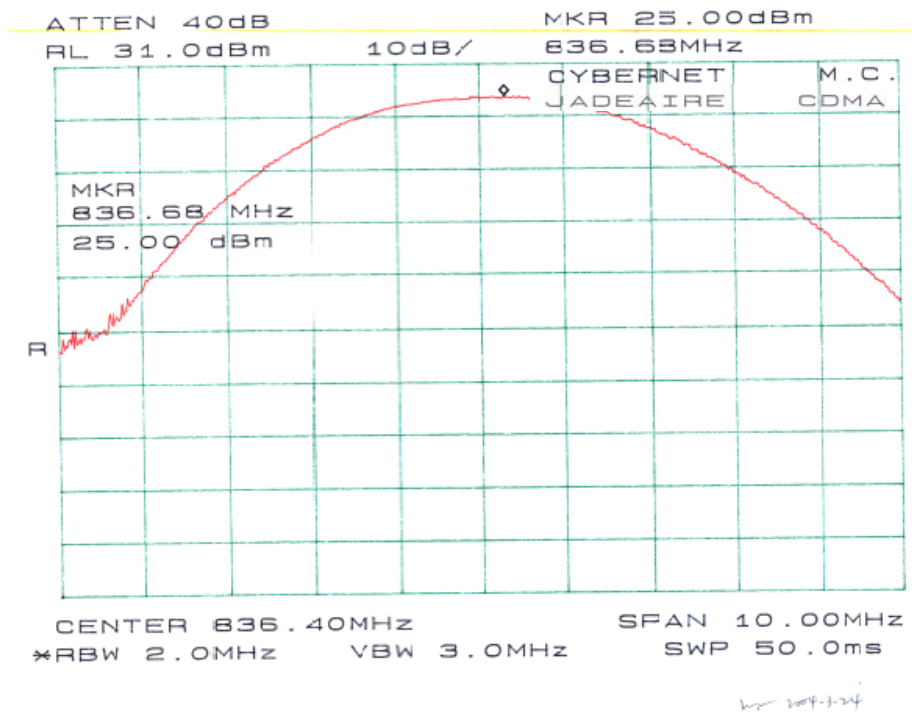
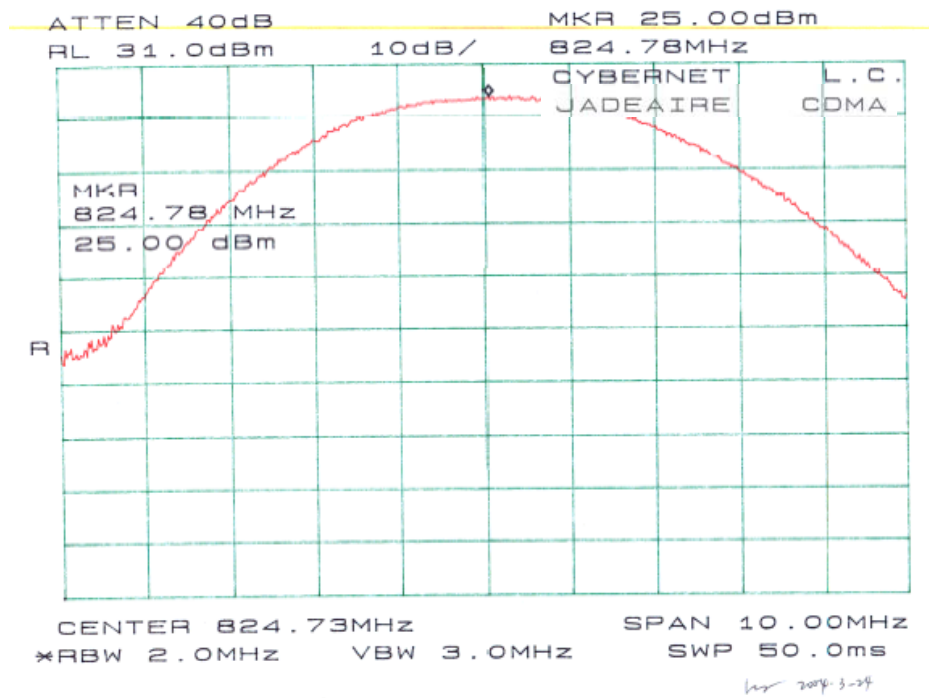
### Test Results

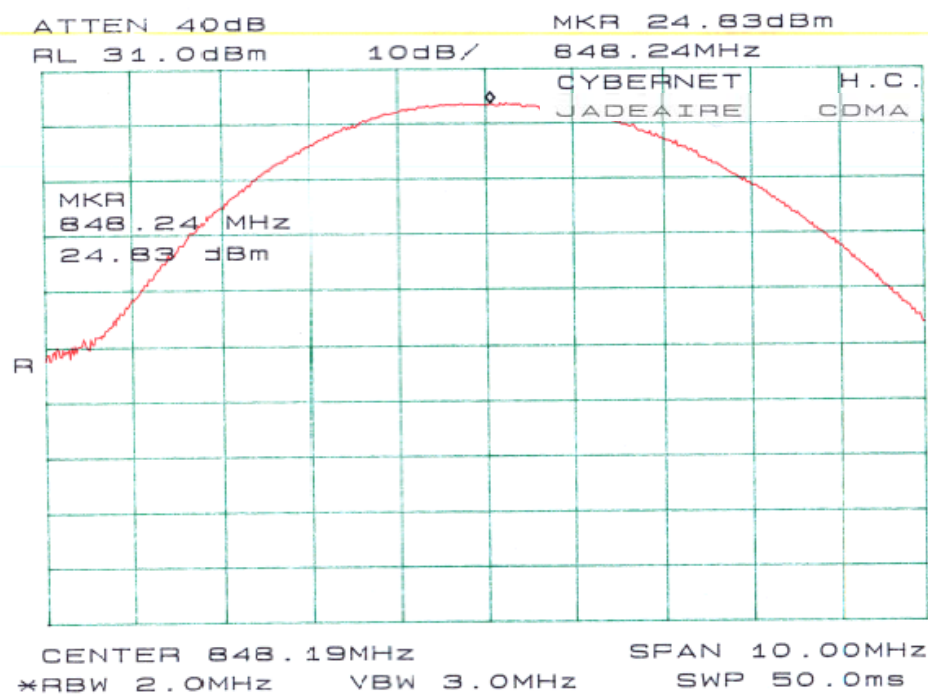
Part 22:

Channel	Frequency (MHz)	Output Power in dBm	Output Power in W	Limit in W
LOW	824.78	25.00	0.316	7
MIDDLE	836.68	25.00	0.316	7
HIGH	848.24	24.83	0.304	7

Part 24:

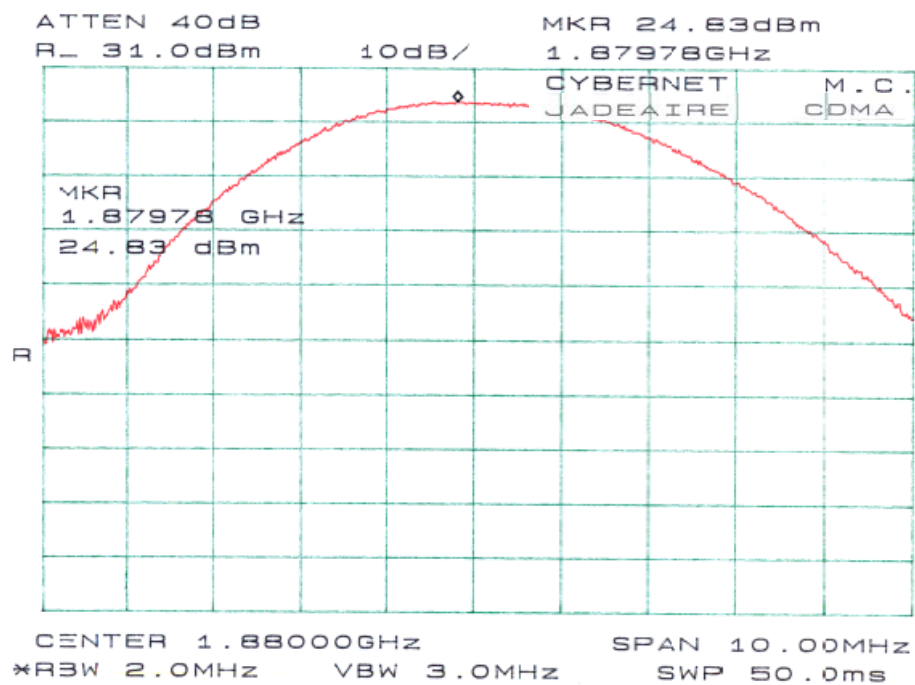
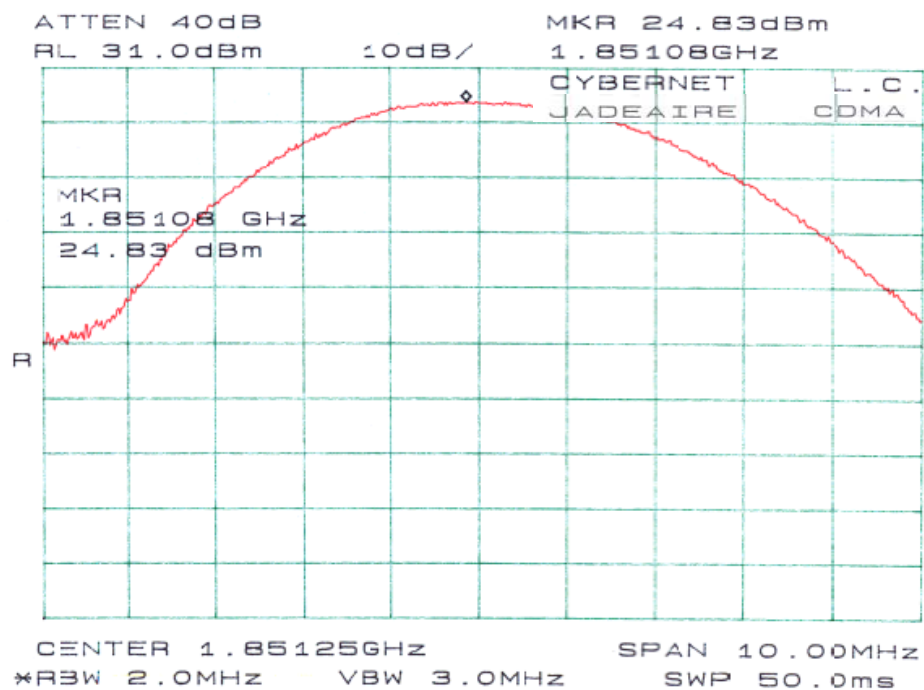
Channel	Frequency (MHz)	Output Power in dBm	Output Power in W	Limit in W
LOW	1851.08	24.83	0.304	100
MIDDLE	1879.78	24.83	0.304	100
HIGH	1908.60	24.67	0.293	100

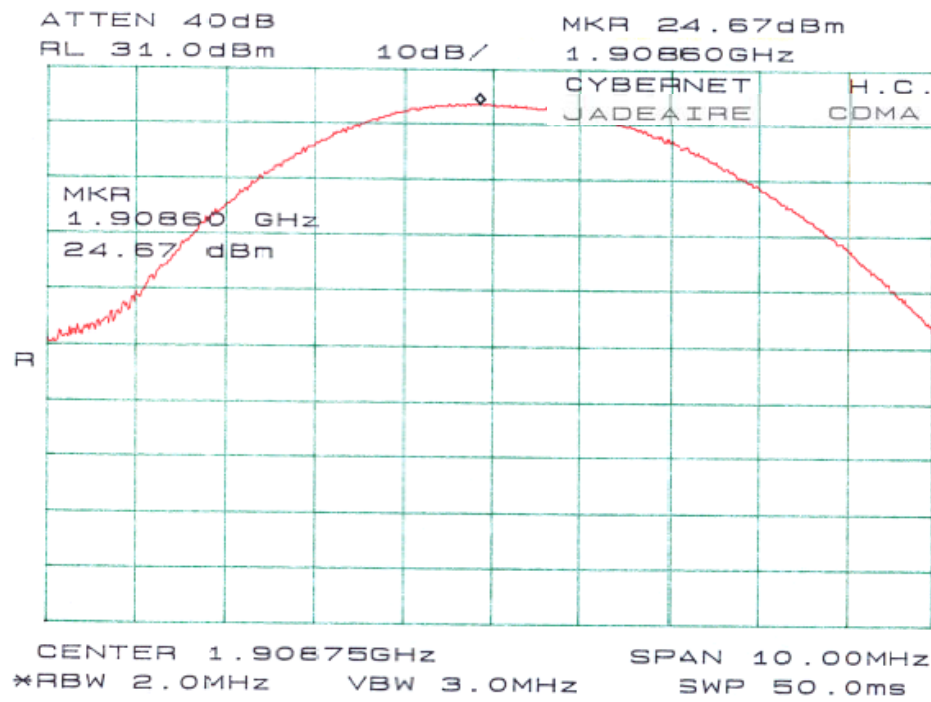
*Plots of Conducted Output Power for Part 22*



by 2004-3-24

## Plots of Conducted Output Power for Part24





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**§2.1049, §22.917, §22.905, & §24.238 - OCCUPIED BANDWIDTH**

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**Applicable Standard**

Requirements: CFR 47, Section 2.1049, Section 22.901, Section 22.917 and Section 24.238.

**Test Procedure**

The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.

The resolution bandwidth of the spectrum analyzer was set at 30 KHz and the 26 dB bandwidth was recorded.

**Test Equipment List and Details**

Manufacturer	Description	Model	Serial Number	Cal. Date
HP	Spectrum Analyzer	HP8564E	3943A01781	2003-08-01
HP	Plotter	HP7470A	2541A49659	Not Required

\* **Statement of Traceability:** BACL Corp. certifies that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

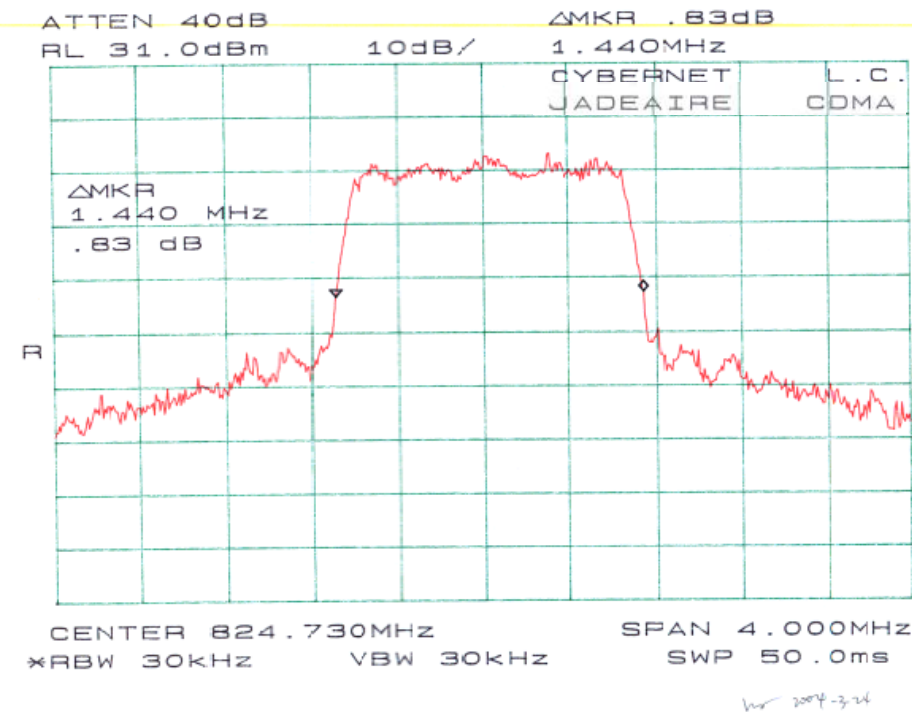
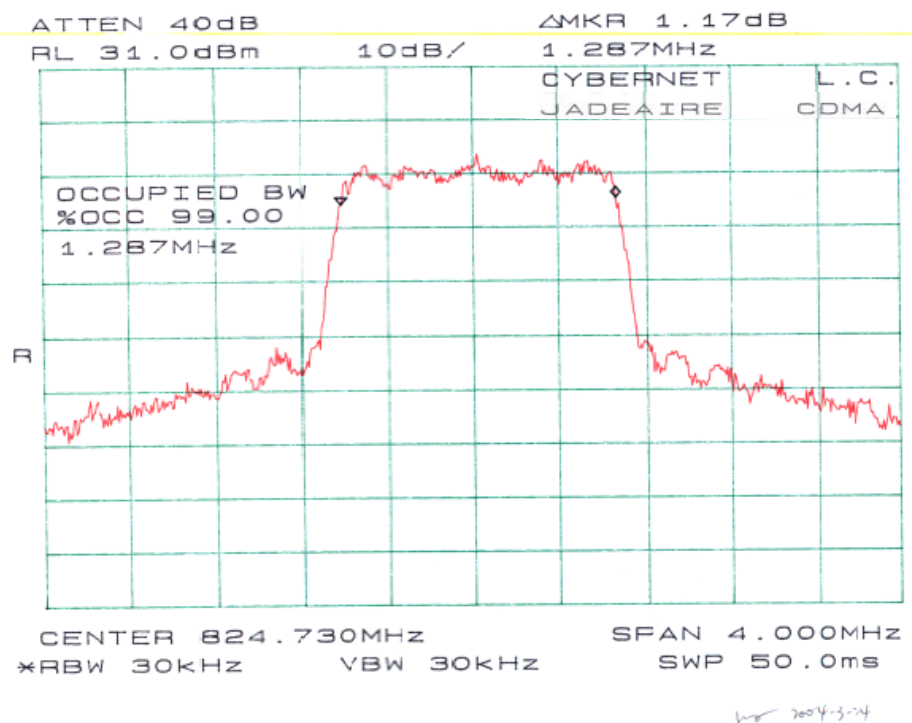
**Environmental Conditions**

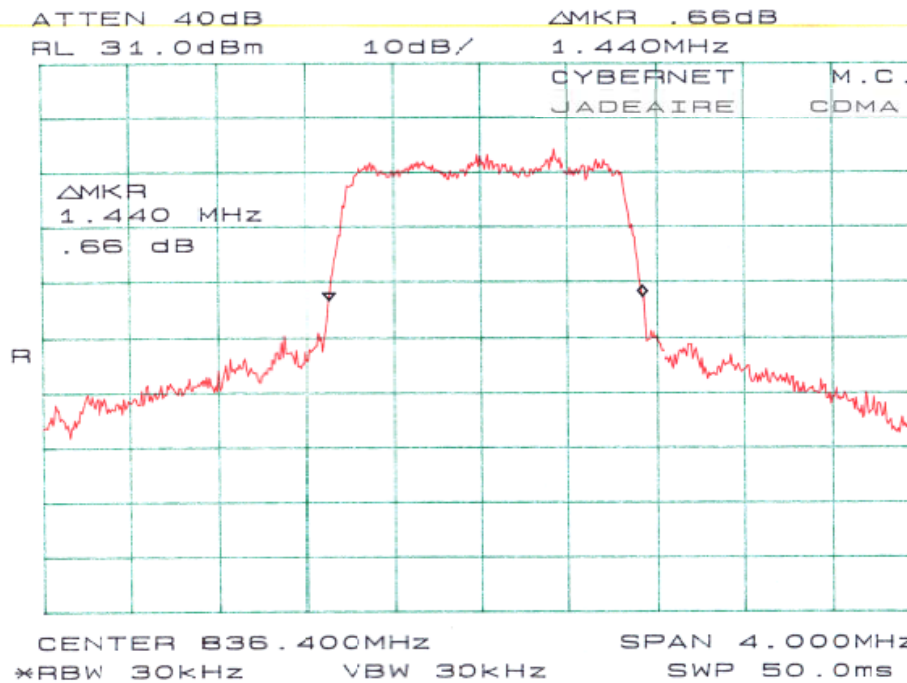
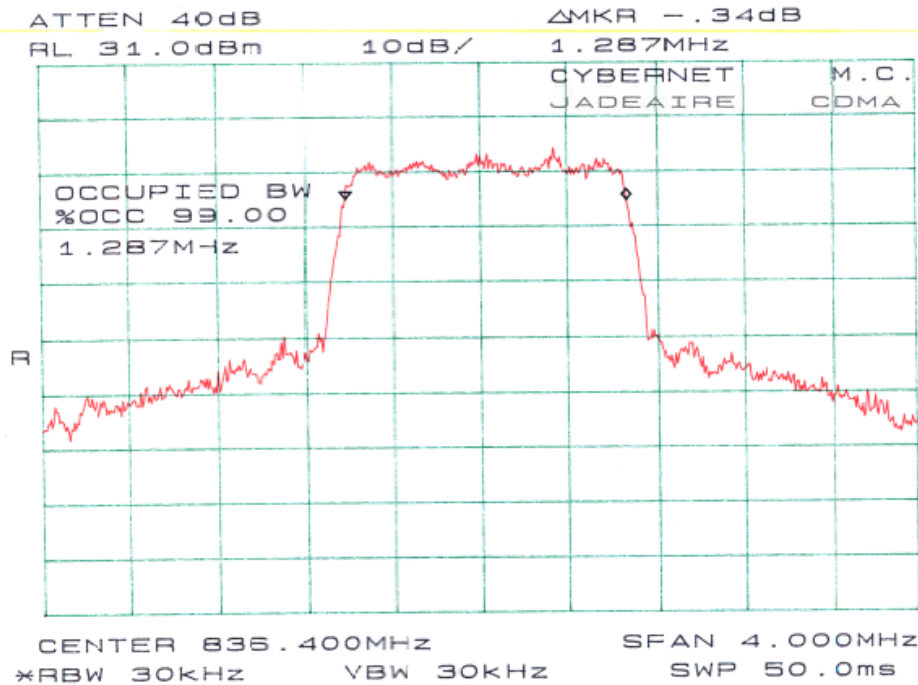
2004-03-24

Temperature:	19° C
Relative Humidity:	60%
ATM Pressure:	1020 mbar

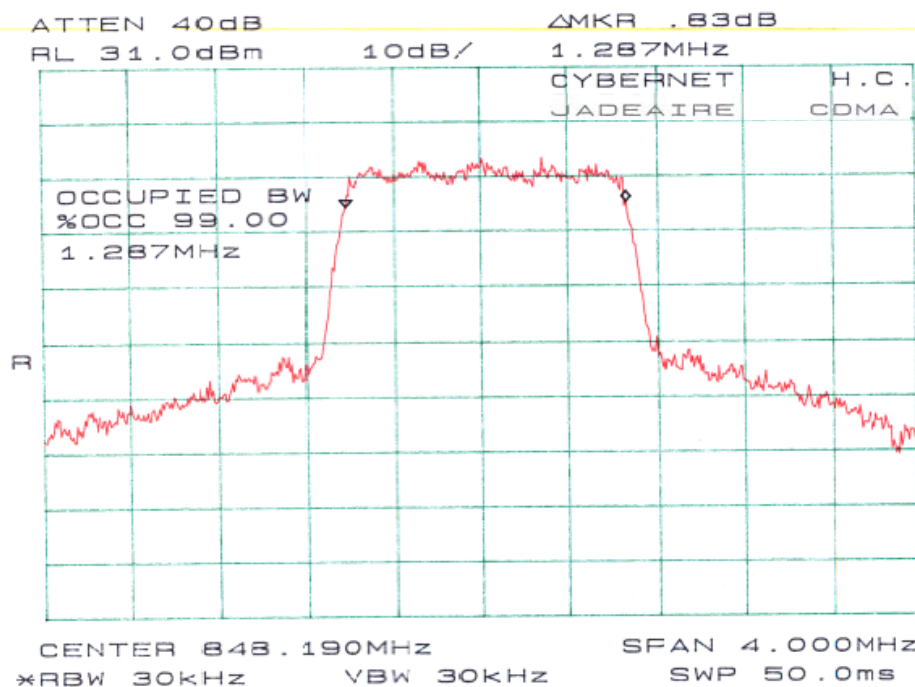
**Test Results**

Please refer to the following plots.

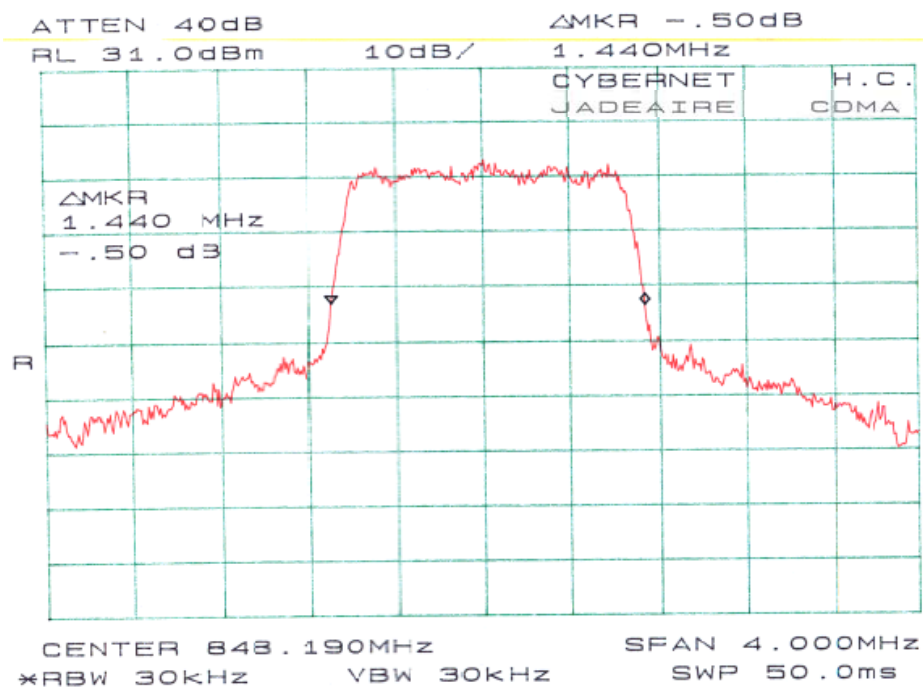
*Plots of Occupied Bandwidth and 99% Bandwidth for Part 22*





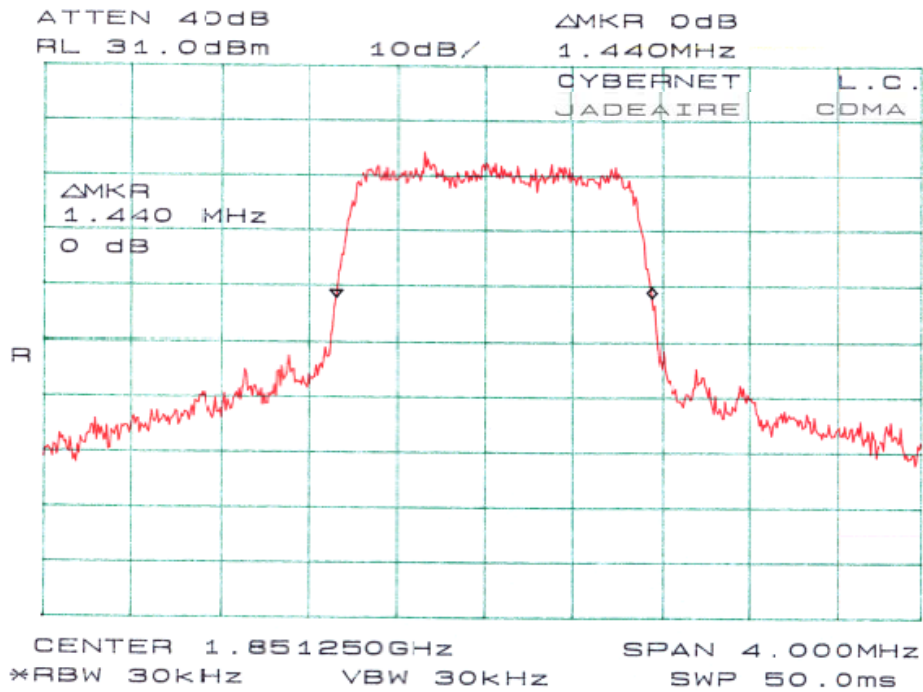
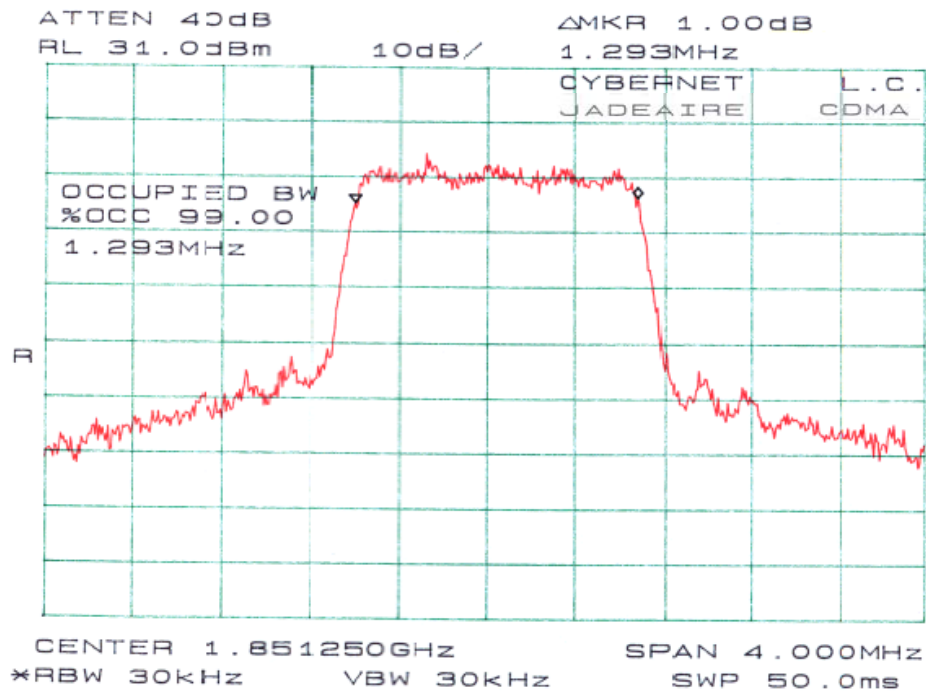


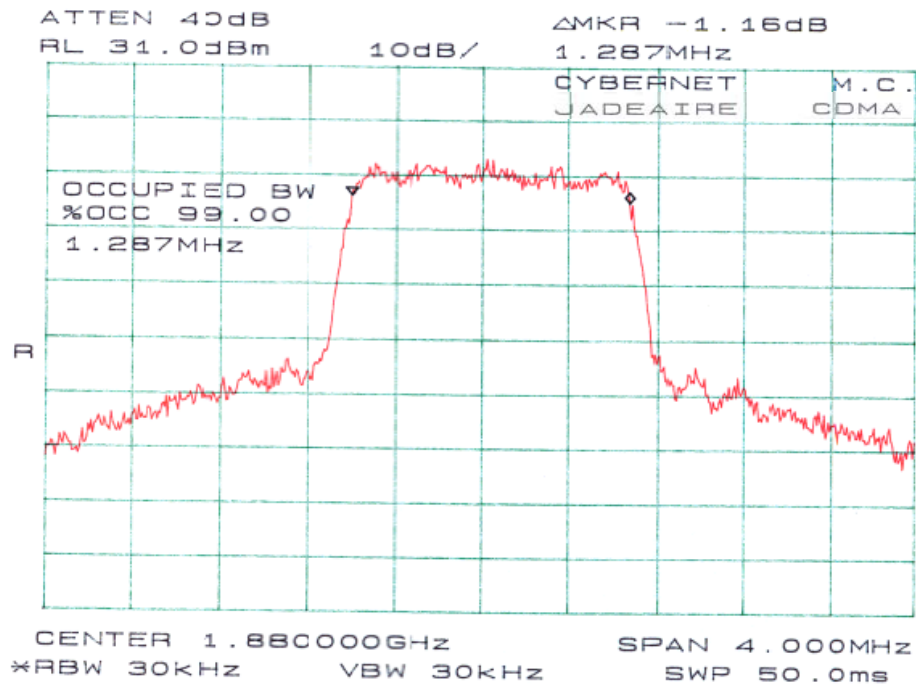
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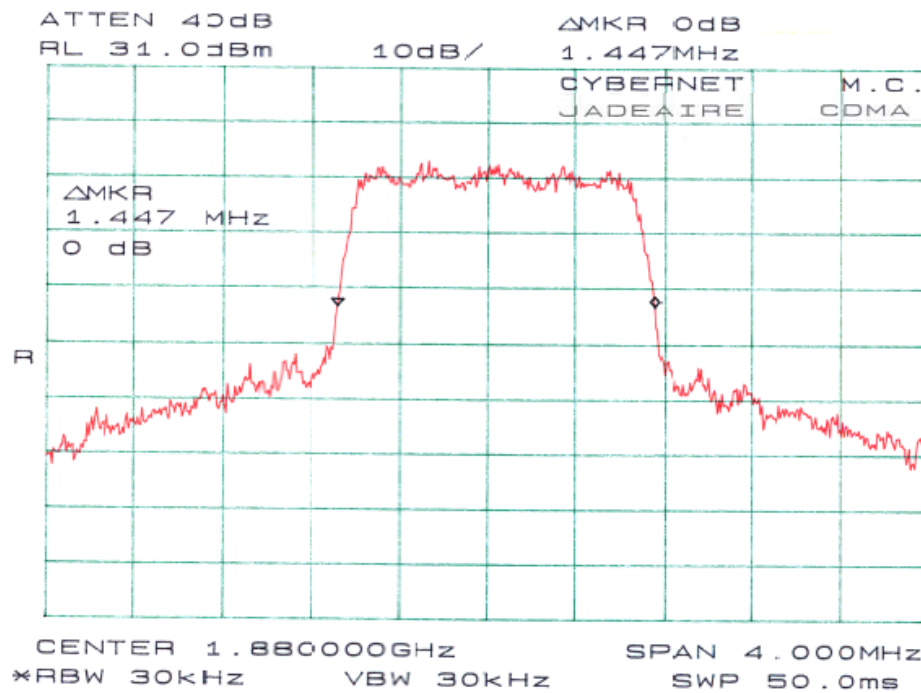
✓ 2004-3-24

## Plots of Occupied Bandwidth and 99% Bandwidth for Part 24

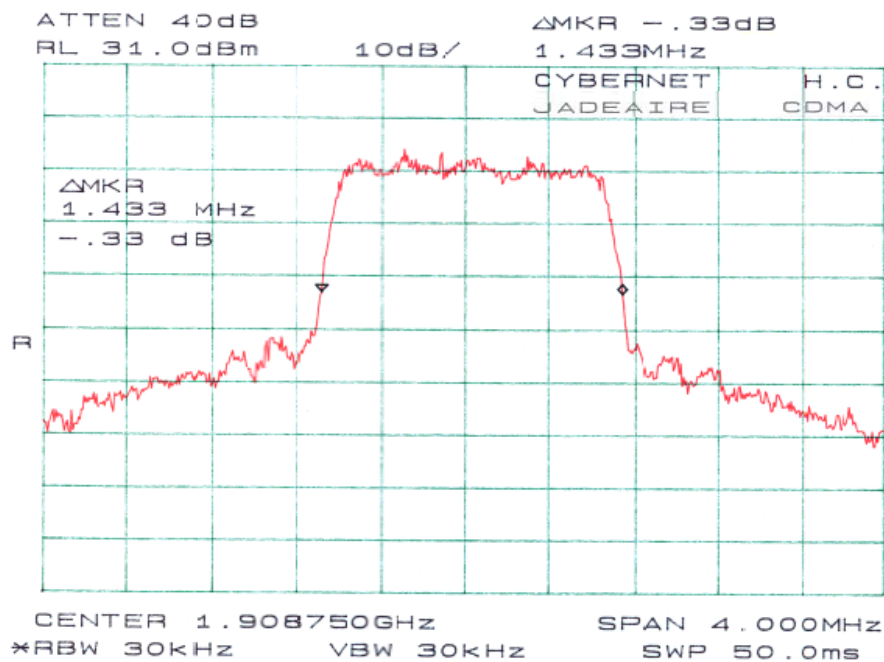
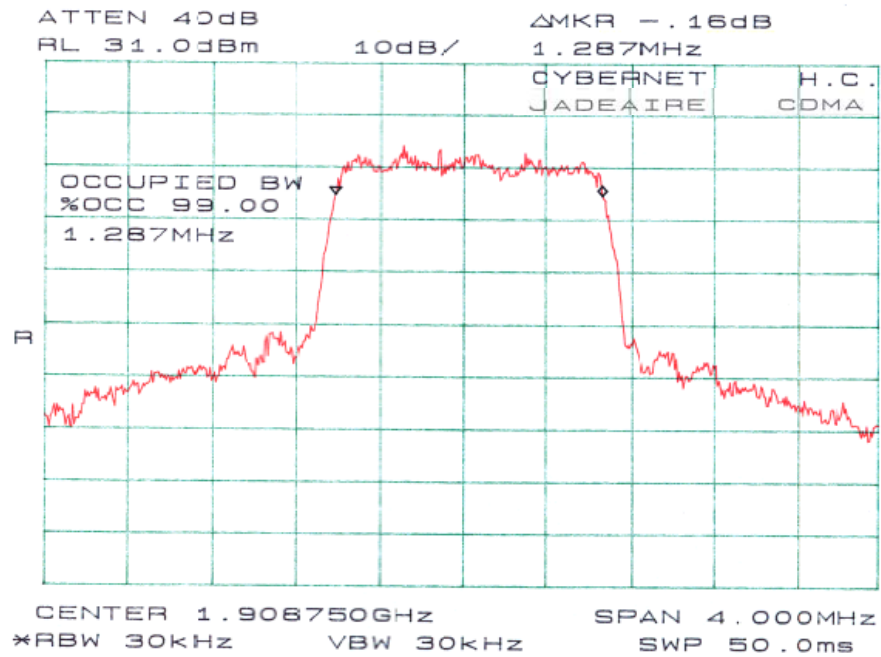




2004-3-24



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## §2.1051, §22.917, & §24.238(a) - SPURIOUS EMISSIONS AT ANTENNA TERMINALS

### Applicable Standard

Requirements: CFR 47, § 2.1051, § 22.917 & §24.238(a).

The spectrum was to be investigated to the tenth harmonics of the highest fundamental frequency as specified in § 2.1057.

### Test Procedure

The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 100 kHz. Sufficient scans were taken to show any out of band emissions up to 10<sup>th</sup> harmonic.

### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
HP	Spectrum Analyzer	HP8564E	3943A01781	2003-08-01
HP	Plotter	HP7470A	2541A49659	Not Required

\* **Statement of Traceability:** BACL Corp. certifies that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

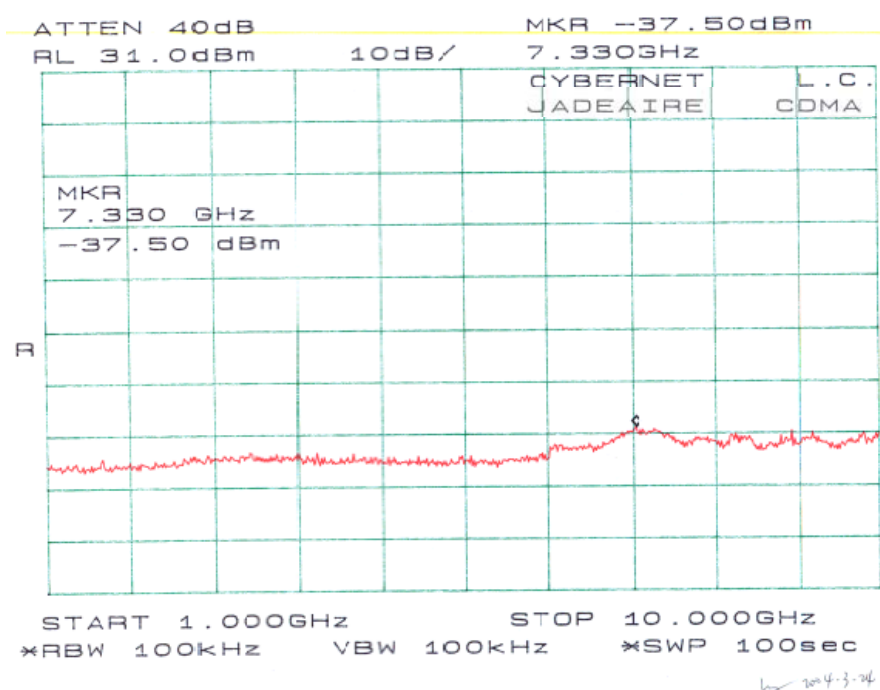
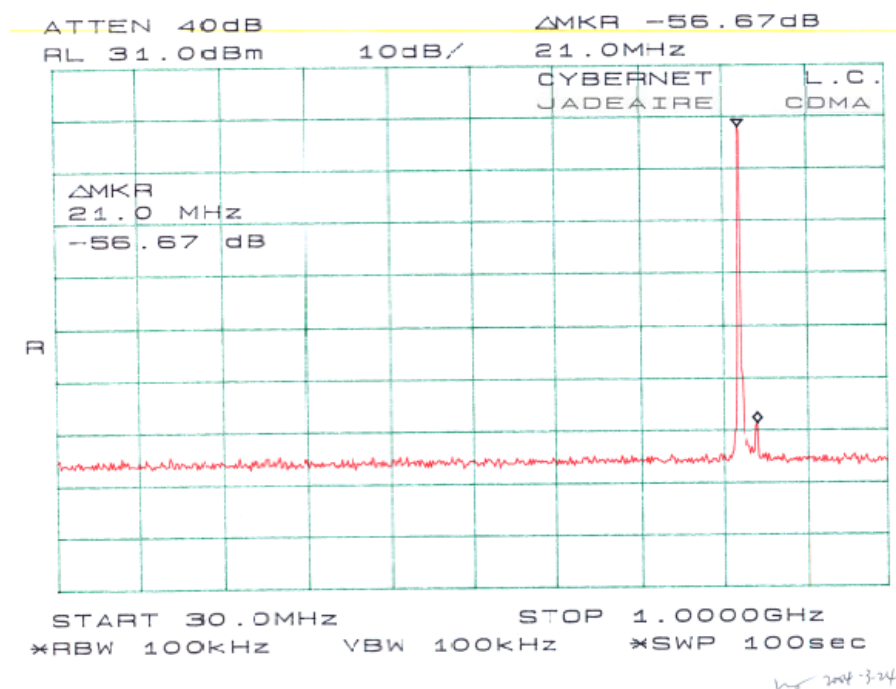
### Environmental Conditions

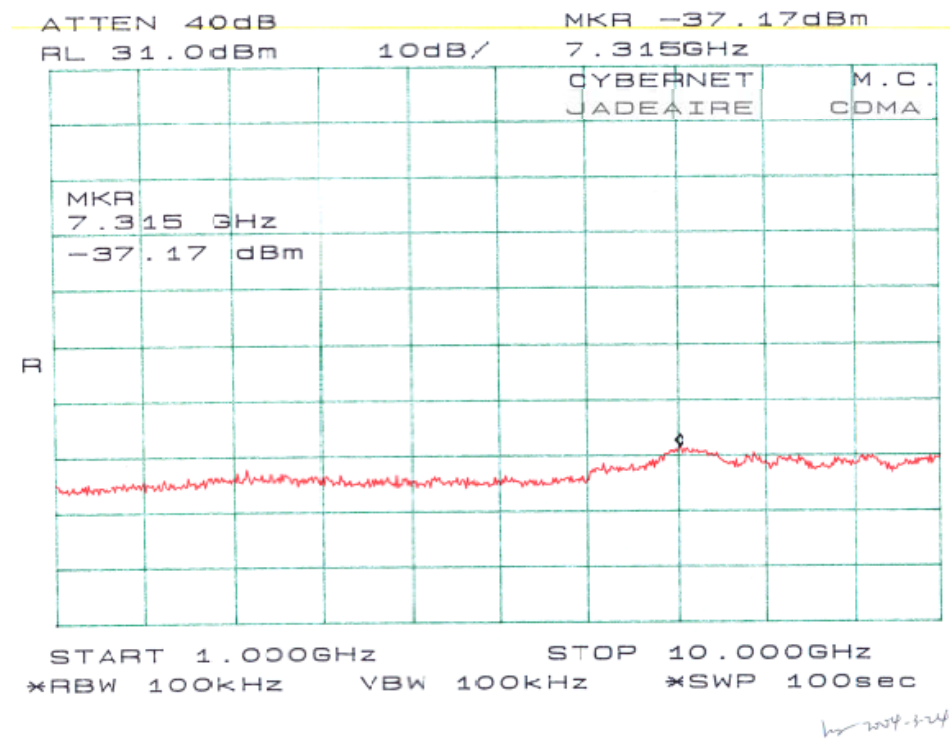
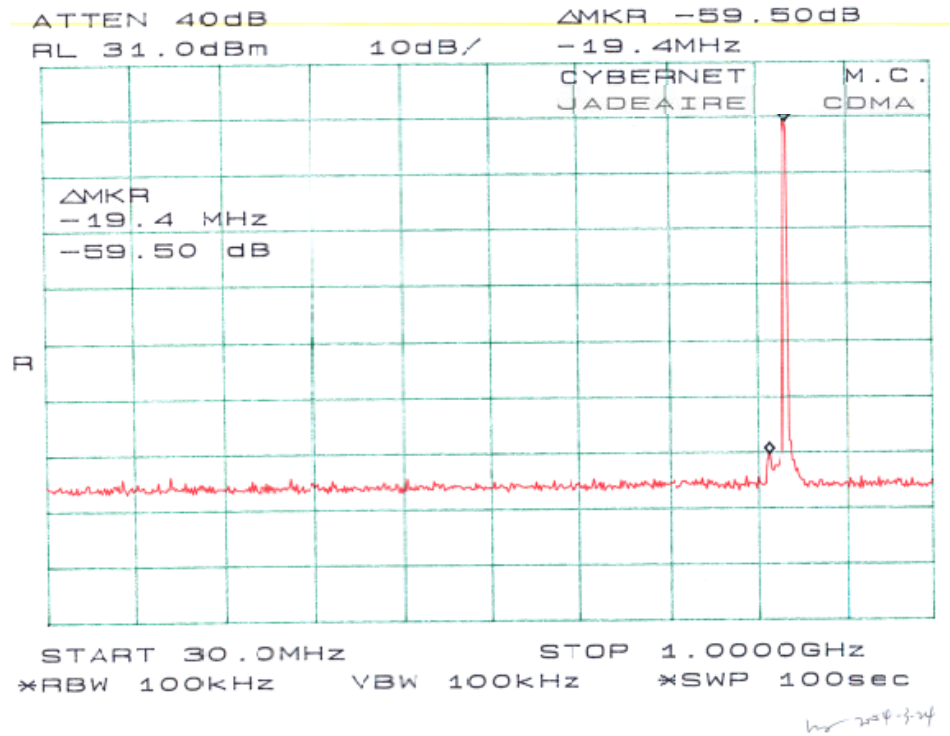
2004-03-24

Temperature:	19° C
Relative Humidity:	60%
ATM Pressure:	1020 mbar

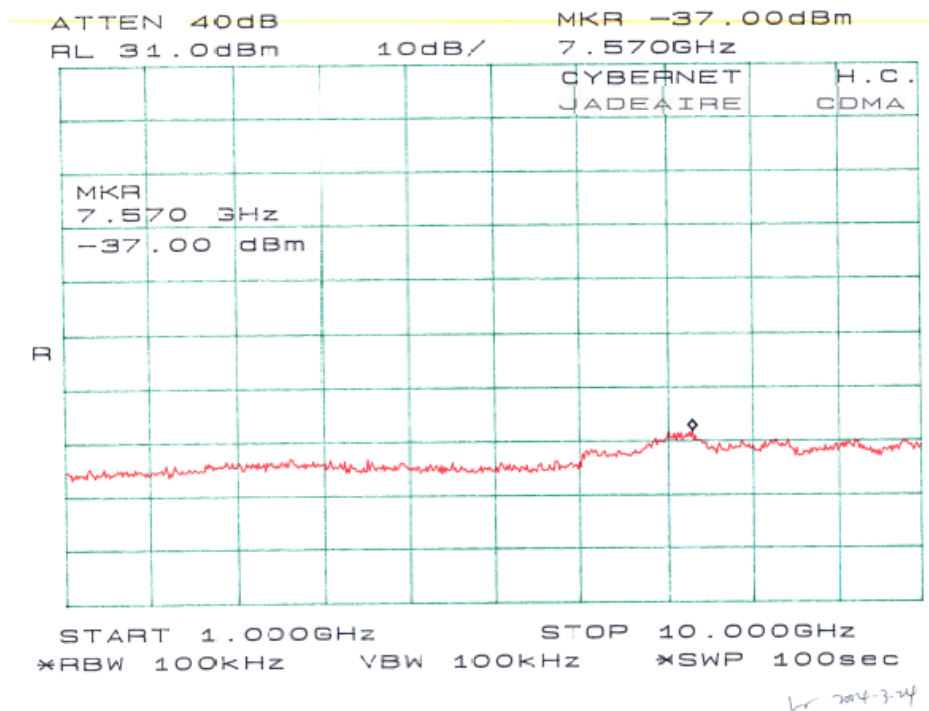
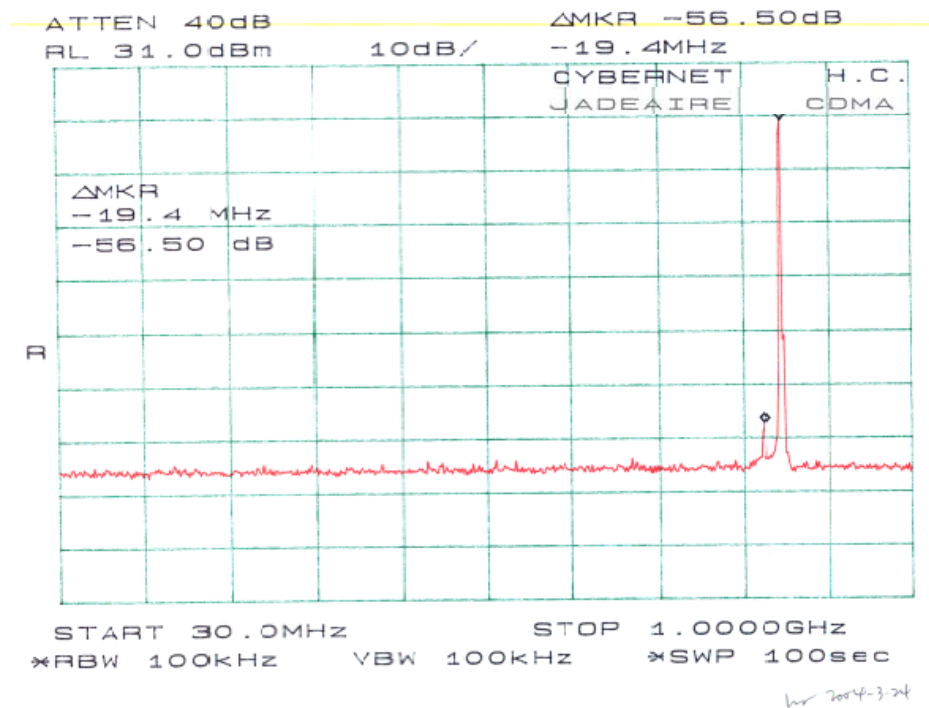
### Test Results

Please refer to the hereinafter plots.

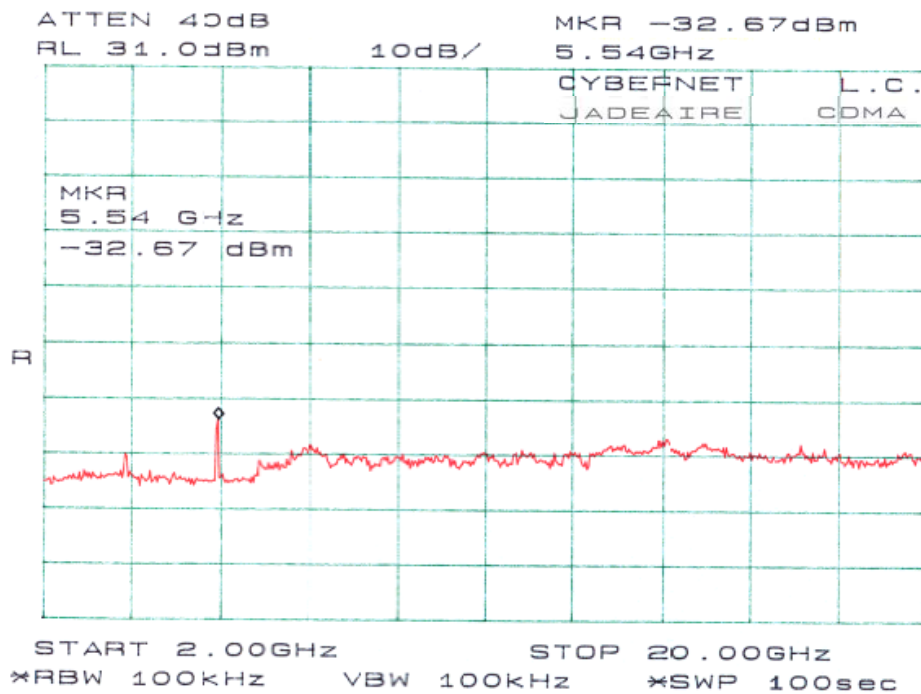
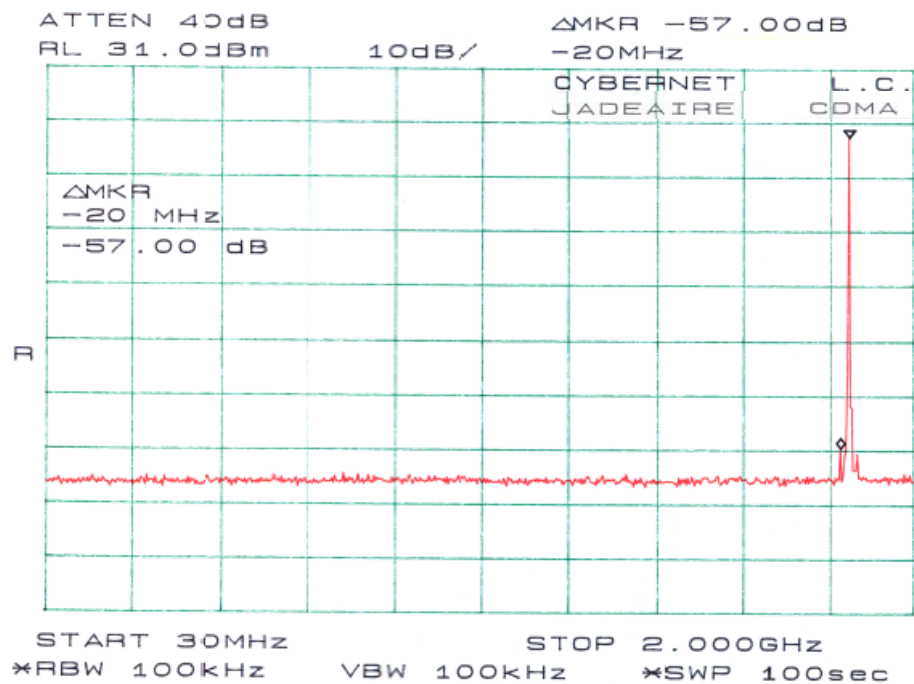
*Plots of Spurious Emission for Part22*

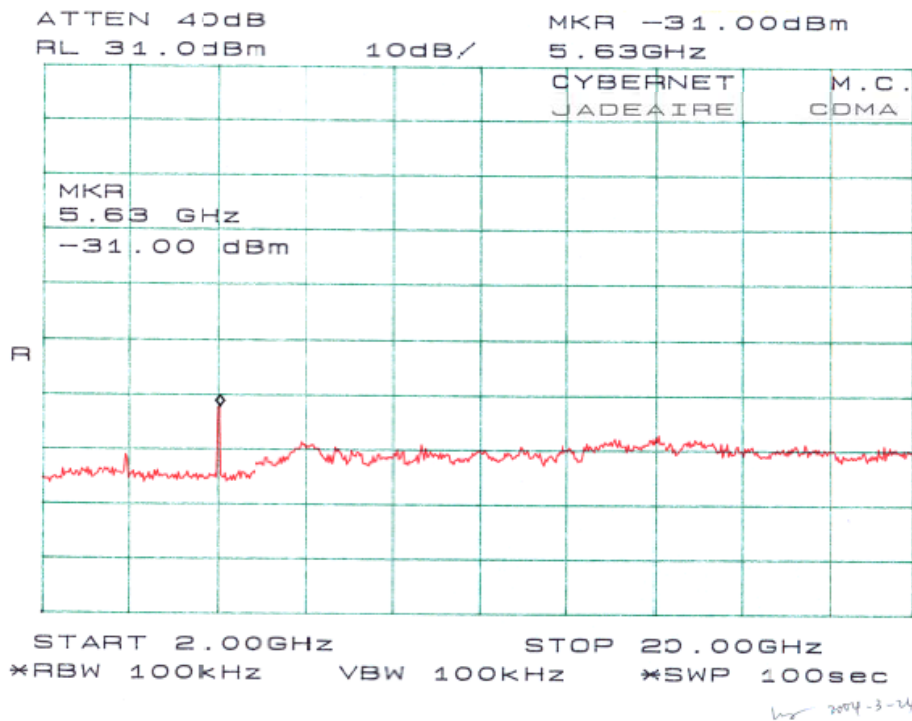
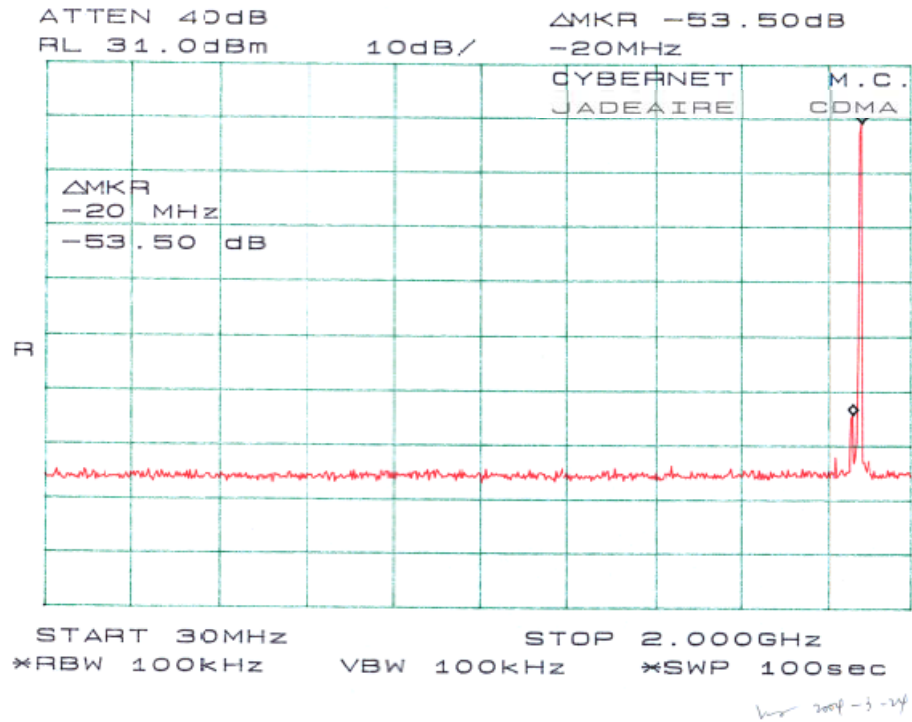


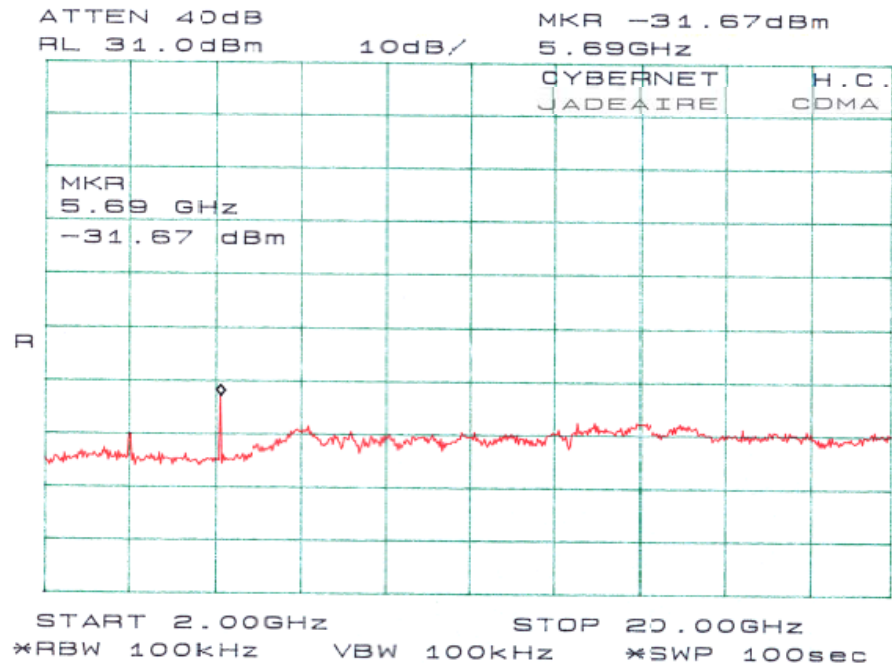
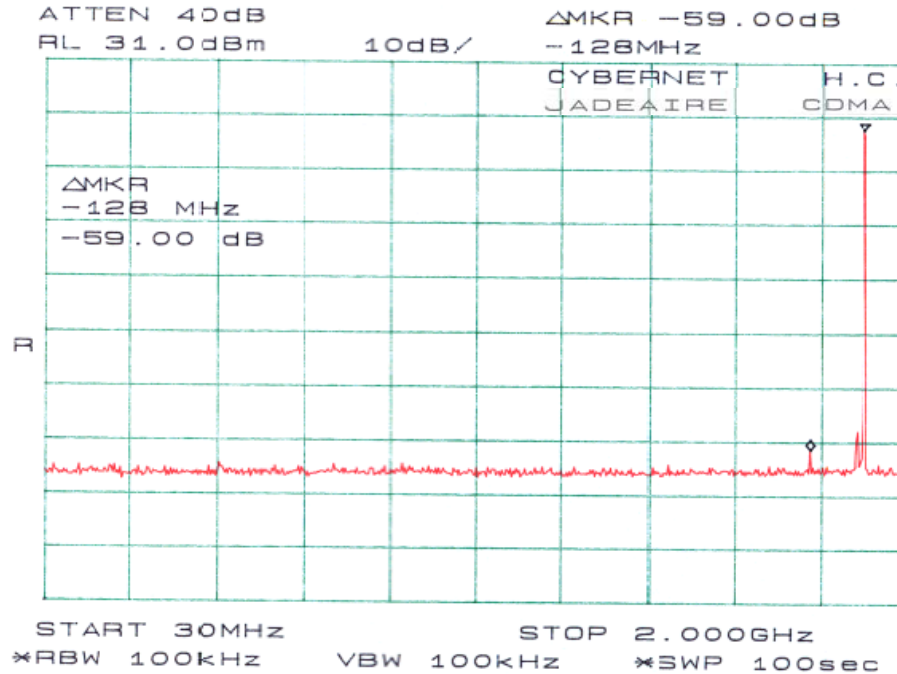






*Plots of Spurious Emission for Part24*





## **§2.1055 (a), §2.1055 (d), §22.355, & §24.235 - FREQUENCY STABILITY**

### **Applicable Standard**

Requirements: FCC § 2.1055 (a), § 2.1055 (d) & following:

According to §22.355, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table C-1 of this section.

Table C-1\_Frequency Tolerance for Transmitters in the Public Mobile Services

Frequency range (MHz)	Mobile Base, fixed	[SU][le]/	Mobile
	(ppm)	(ppm)	SU]3 watts [le]3 watts
	(ppm)	(ppm)	(ppm)
25 to 50.....	20.0	20.0	50.0
50 to 450.....	5.0	5.0	50.0
450 to 512.....	2.5	5.0	5.0
821 to 896.....	1.5	2.5	2.5
928 to 929.....	5.0	n/a	n/a
929 to 960.....	1.5	n/a	n/a
2110 to 2220.....	10.0	n/a	n/a

According to §24.235, The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

### **Test Procedure**

**Frequency Stability vs. Temperature:** The equipment under test was connected to an external DC power supply and the RF output was connected to a frequency counter via feed-through attenuators. The EUT was placed inside the temperature chamber. The DC leads and RF output cable exited the chamber through an opening made for the purpose.

After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the counter.

**Frequency Stability vs. Voltage:** An external variable DC power supply was connected to the battery terminals of the equipment under test. The voltage was set to 115% of the nominal value and was then decreased until the transmitter light no longer illuminated; i.e., the battery end point. The output frequency was recorded for each battery voltage.

### **Test Equipment List and Details**

Manufacturer	Description	Model	Serial Number	Cal. Due Date
HP	Spectrum Analyzer	HP8564E	3943A01781	2003-08-01
HP	Plotter	HP7470A	2541A49659	Not Required

**\* Statement of Traceability:** **BACL Corp.** certifies that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

## Environmental Conditions

Temperature:	19° C
Relative Humidity:	60%
ATM Pressure:	1020 mbar

## Test Results

Test Result for CDMA800

### *Frequency Stability Versus Temperature*

Reference Frequency: 836.4 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (Vdc)	Frequency Measure with Time Elapsed	
		MHz	PPM Error
50	7.4	836.40017	0.20
40	7.4	836.40011	0.13
30	7.4	836.40006	0.07
20	7.4	836.40000	0.00
10	7.4	836.40001	0.01
0	7.4	836.39998	-0.02
-10	7.4	836.39995	-0.06
-20	7.4	836.39991	-0.11
-30	7.4	836.39988	-0.14

Battery operating voltage: 7.4V

### *Frequency Stability Versus Battery Voltage*

Reference Frequency: 836.4MHz, Limit: 2.5ppm			
Power Supplied (Vdc)	Environment Temperature (°C)	MHz	ppm
6.5	20	836.40009	0.11

Battery end point: 6.5V

## Test Result for CDMA1900

*Frequency Stability Versus Temperature*

Reference Frequency: 1880 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (Vdc)	Frequency Measure with Time Elapsed	
		MHz	PPM Error
50	8	1880.00028	0.15
40	8	1880.00019	0.10
30	8	1880.00010	0.05
20	8	1880.00005	0.03
10	8	1880.00001	0.01
0	8	1879.99997	-0.02
-10	8	1879.99989	-0.06
-20	8	1879.99983	-0.09
-30	8	1879.99978	-0.12

*Frequency Stability Versus Battery Voltage*

Reference Frequency: 1880MHz, Limit: 2.5ppm			
Power Supplied (Vdc)	Environment Temperature (°C)	MHz	
		ppm	
6.5	20	1880.00015	0.08

Battery end point: 6.5V

## §22.917 & §24.238 – BAND EDGE

### Applicable Standard

According to § 22.917, the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB.

According to §24.238, the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB.

### Test Procedure

The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.

The center of the spectrum analyzer was set to block edge frequency, RBW set to 30KHz.

### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
HP	Spectrum Analyzer	HP8564E	3943A01781	2003-08-01
HP	Plotter	HP7470A	2541A49659	Not Required

\* **Statement of Traceability:** BACL Corp. certifies that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

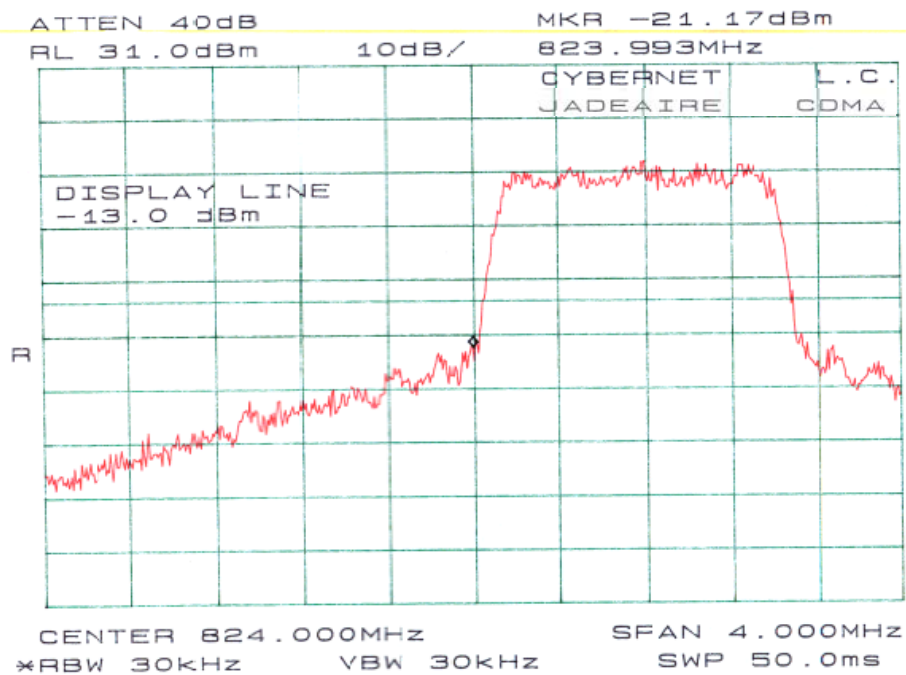
### Environmental Conditions

2004-03-24

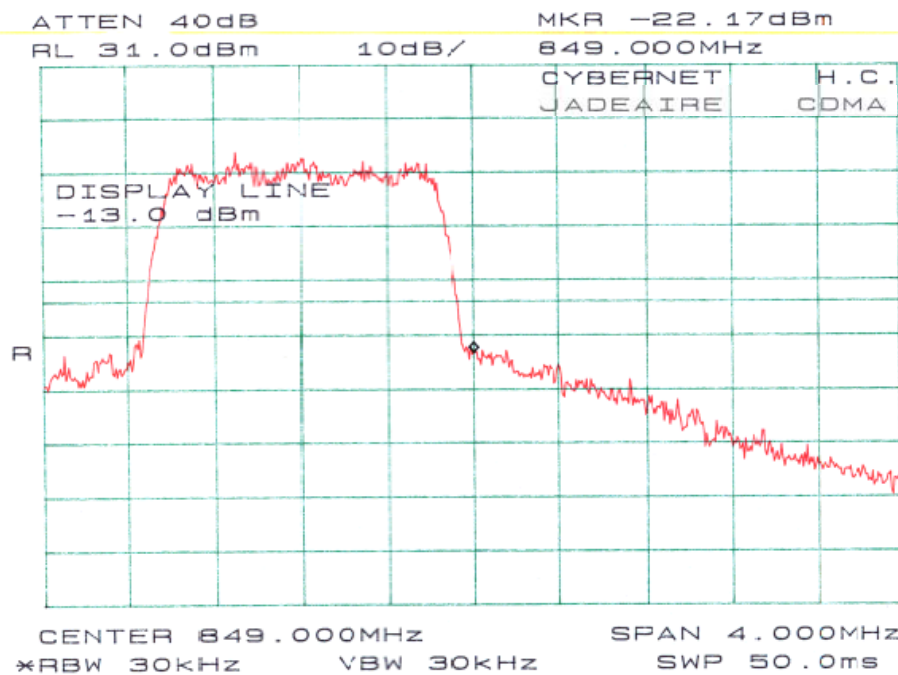
Temperature:	19° C
Relative Humidity:	60%
ATM Pressure:	1020 mbar

### Test Results

Please refer to the following plots.

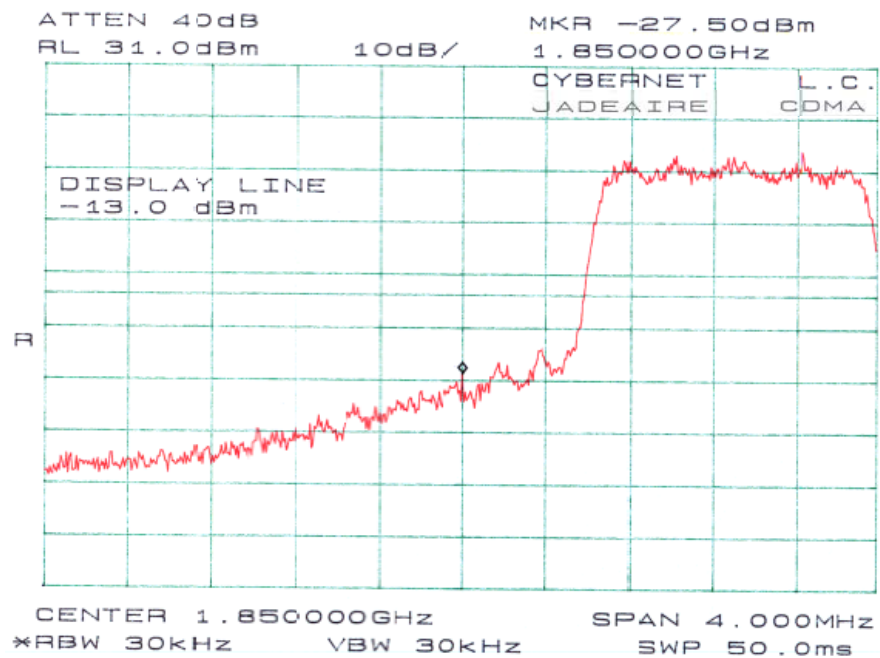
Plots of Band Edge for Part 22

204-3-24

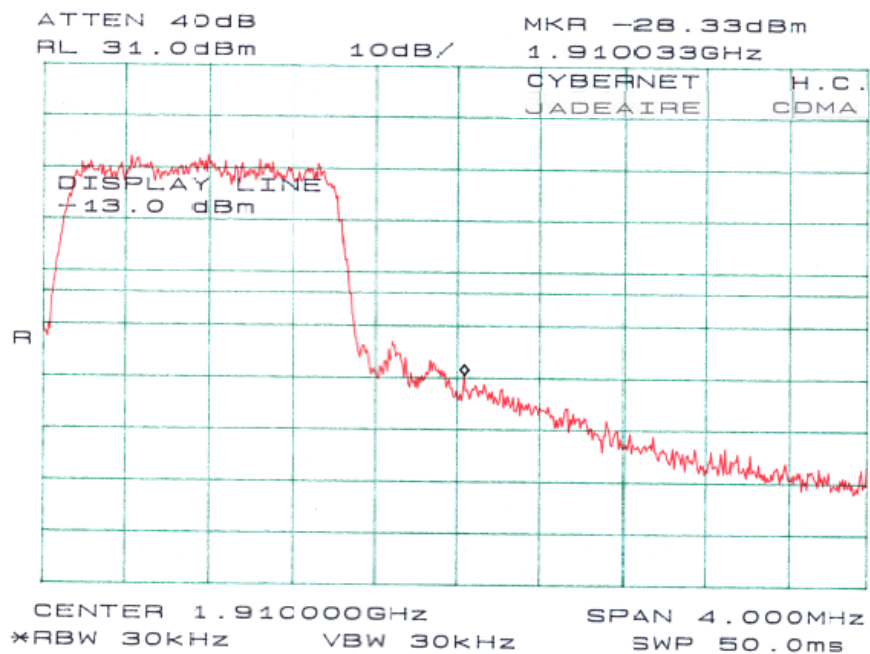


204-3-24



Plots of Band Edge for Part 24

2004-3-24



2004-3-24