Certification
Technological Center

Campus UAB, Apartado de Correos 18
08193 Bellaterra (Barcelona)
T 93 567 20 00
F 93 567 20 01
ctc@appluscorp.com
www.applusctc.com
www.appluscorp.com

Bellaterra : **January 28, 2008** File number: **07/32011897-M1**

Petitioner's reference: **MIER COMUNICACIONES, S.A**

P.I. CONGOST, PARC. 45
08530 LA GARRIGA (SPAIN)

On its behalf:
Nicasio Sanchez

This file replaces to 07/32011897. Modifications performed: Section 4.0. Results.

TEST REPORT

TEST REQUESTED
Tests according to FCC CFR 47 Part 2 and Part 27.

This report contains all the required data for certification FLO repeater system for FLO signal broadcasting. The data presented was taken from tests performed on a production repeater system model FLO Repeater 100Wrms having an 100Wrms nominal rated output power, tuned to operate on a fixed 716-722MHz (6MHz BW) channel and using a mask filter. Mier Comunicaciones, S.A wishes to certify its FLO Repeater with two different output mask filters. For this reason, the Ocuppied Bandwidth test has been performed with two different mask filters.

INDEX

1.0 EQUIPMENT RECEIVED AND TESTED
FLO repeater, brand Mier Comunicaciones, model FLO repeater 100Wrms s/n:612280

Test product reception:	18/9/2007
Test initial date:	18/9/2007
Test final date:	25/9/2007

1.1 Test configuration
Power supply: 120V 60Hz
Set-up: On table

Test exercise: Transmitting to the maximum output power on a resistive load

1.2 Auxiliary and control equipment

-Input filter, brand Telmec, channel 55, UHF band, s/n: 07/00/0376/02/001, p/n: PBN38/12-6c/n
-Vector signal generator, brand Agilent, model E4458G, s/n MY45096106
-GPS Receiver, brand Mier Comunicaciones, s/n 75
-Output filter, brand ERI Electronics Research, p/n: CF528-055, s/n: 01168-031306-5
-Output filter, brand Mier Comunicaciones, model 840583-00, s/n: 17
-Attenuator, brand R&S RBU 30 p/n:100.8654.37, calibration date: 9/11/2006
-Attenuator, brand Weinschel Corp DC-18GHz 10dB 100W, calibration date: 9/11/2006
-RF Terminator, model 5600 s/n:---
-Directional coupler brand Narda model 3001-30 (30dB) s/n: 20938, calibration date: 16/2/2007

2.0 MEASURING EQUIPMENT USED

RF Power Output

-Boonton 4300 RF power meter s/n 94805Efm, calibration date: 17/11/2006
-Power sensor model 51013 s/n 04-665106, calibration date: 17/11/2006

Ocuppied Bandwidth

-Emi Receiver brand: HP model 8546A s/n: 3710A00389, calibration date: 30/8/2006
-FSP ROHDE&SCHWARZ SPECTR.ANALYZER 093.4495K03 s/n: 100015, calibration date: 08/11/2006

Spurious Emissions at Antenna Terminals

- Emi Receiver brand: HP model 8546A s/n: 3710A00389, calibration date: 30/8/2006

Field Strenght of Spurious Radiation

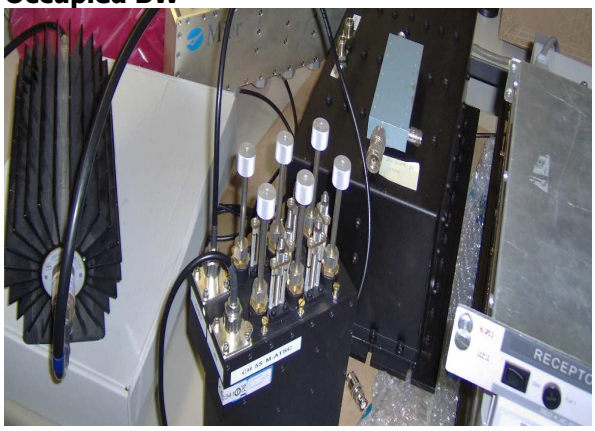
- Semianechoic chamber EUROSHIELD model TC2 TEST CHAMBER
- Spectrum analyser HP model 8566B s/n: 3138A08001, calibration date: 16/4/2007
- Preselector HP model 85685A s/n: 3506A01519, calibration date: 16/4/2007
- Horn antenna EMCO model 3115 s/n: 4240, calibration date: 28/9/2006
- Attenuator 3dB NARDA model 773-3 s/n: 111, calibration date: 16/1/2007
- Directional coupler: NARDA 3001-30 (30 dB) s/n: 20938, calibration date:
- Bilogoperiodic antenna MESS-ELEKTRONIK model VULB 9165 s/n: 2009, calibration date: 8/2/2007
- Turntable HD model DS 430
- Antenna tower HD model MA 240T s/n: 240/458
- Computer system brand:HP model P2190N s/n: FR10717868
- Emi Receiver brand: HP model 8546A s/n: 3710A00389, calibration date: 30/8/2006
- Pre-Amplifier brand: HP model 8449B OPT H02 s/n: 3008A00739
- Signal Generator brand: HP model HP 8648B s/n: 3642U01234, calibration date: 20/8/2007

Frequency stability

- Emi Receiver brand: HP model 8546A s/n: 3710A00389, calibration date: 30/8/2006
- Climatic chamber Dycometal model CM-40/480 s/n: 1642/02, calibration date: 15/12/2006
- Spitzenberger + Spies EMV E 1000/PAS, calibration date: 5/12/2006
- Computer system HP model D4541N s/n: FR71084499

3.0 IDENTIFICATION PICTURES

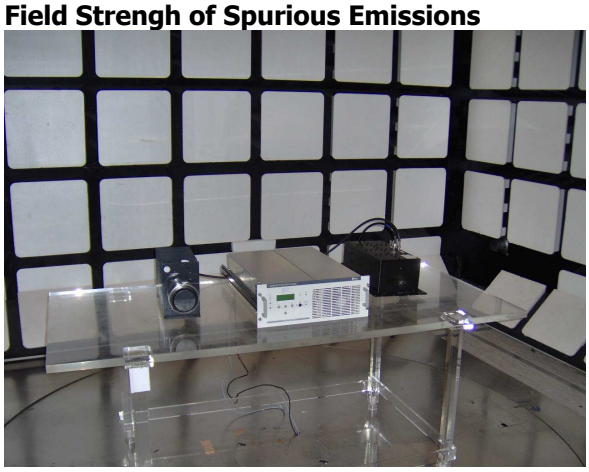
Occupied BW



Spurious at Antenna Terminals.

Frequency Stability

Field Strengh of Spurious Emissions



4.0 RESULTS

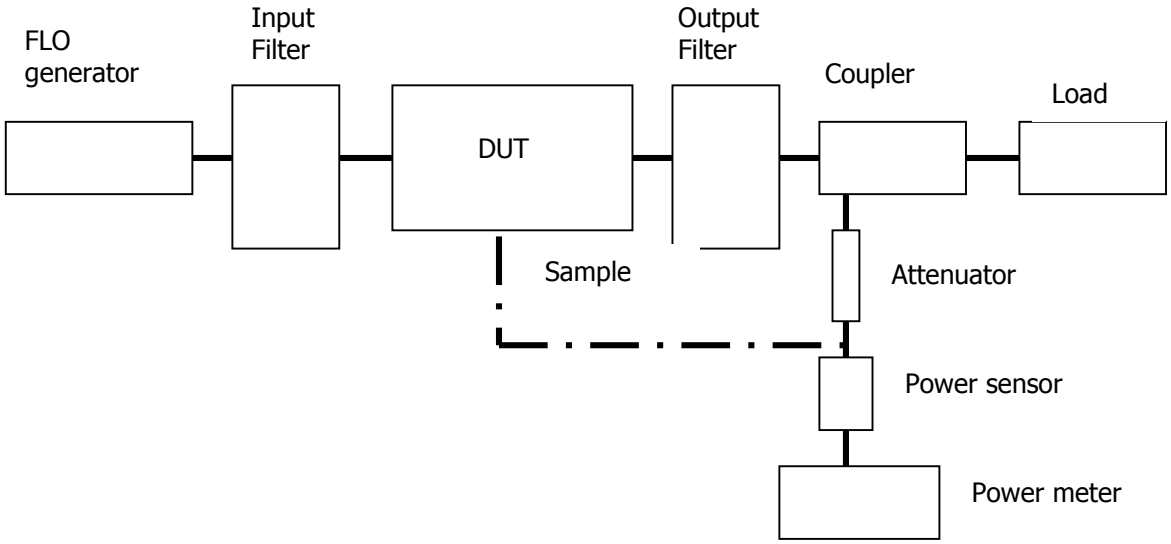
4.1 RF Power output

Nominal output power: 100 watts

Method of Measurement: According to FCC 2.1046 (a) (c)

The repeater was operated into a dummy load of substantially zero reactive with a resistance equal to the transmission line characteristic impedance. Average power was indirectly measured using a Boontom 4300 RF power meter by means of an external directional coupler which coupling factor was previously determined.
It is recorded in different amplification steps the output power displayed by the power meter and by the DUT.

Figure 3.1-1 shows the test setup



A) Measurements at the output mask filter (external coupler)

Amplifier	Power meter displayed (dBm)	DUT level displayed (dB)	Coupler Correction factor (dB)	Attenuator factor (dB)	Power output corrected (dBm)
1045	-12,34	0	29,3	30,58	47,54
950	-15,98	-3,3	29,3	30,58	43,90
900	-18,54	-5,7	29,3	30,58	41,34
850	-21,55	-8,4	29,3	30,58	38,33
800	-25,24	Low (<-10)	29,3	30,58	34,64

B) Measurements at the sample signal (internal coupler)

Amplifier	Power meter displayed (dBm)	DUT level displayed (dB)	Correction factor (dB)	Power output corrected (dBm)
1045	18,45	0	35,45	53,90
850	10,64	-8,3	35,45	46,09

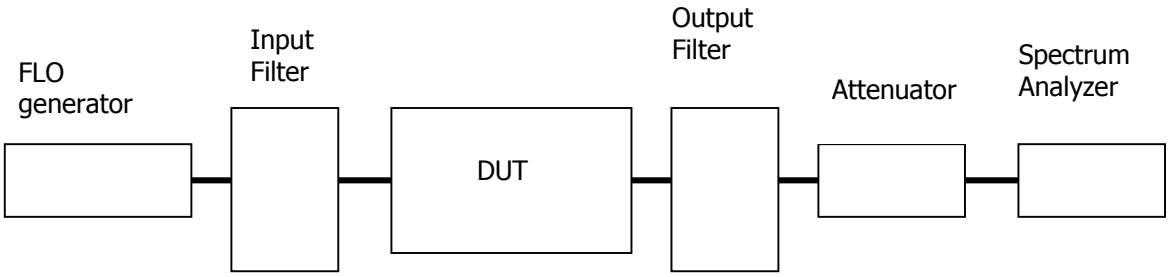
4.2 Ocuppied Bandwidth/Emissions

Method of Measurement: According to FCC 2.1049 (h), 2.202 (a), 2.1047, 27.53 (f)

Type of modulation: Media FLO (COFDM) QPSK/16QAM

The repeater is operated into a attenuators (30dB). The output signal is conducted directly to the spectrum analyzer input. Measurements in the channel limit, channel limit+100kHz and channel limit+13MHz are performed to check the occupied bandwidth and modulation characteristics.

Figure 3.2-1 shows the test setup



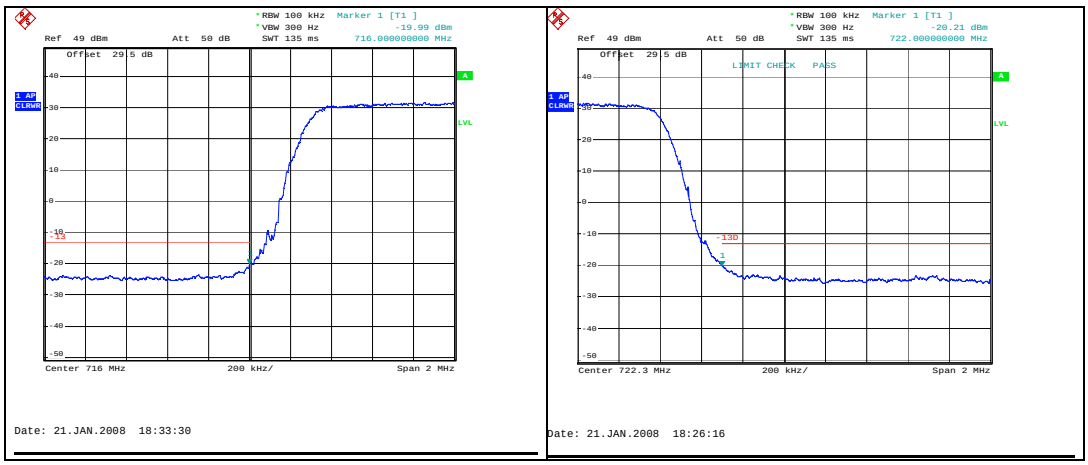
These measurements have been performed with two different output filters:
-Output filter, brand ERI Electronics Research, p/n: CF528-055, s/n: 01168-031306-5
-Output filter, brand Mier Comunicaciones, model 840583-00, s/n: 17

Different peak measurements are performed to establish the BW occupied by the repeater with both filters:

A) ERI ELECTRONICS RESEARCH FILTER

1.- Measurements in the channel limit (716MHz and 722MHz)

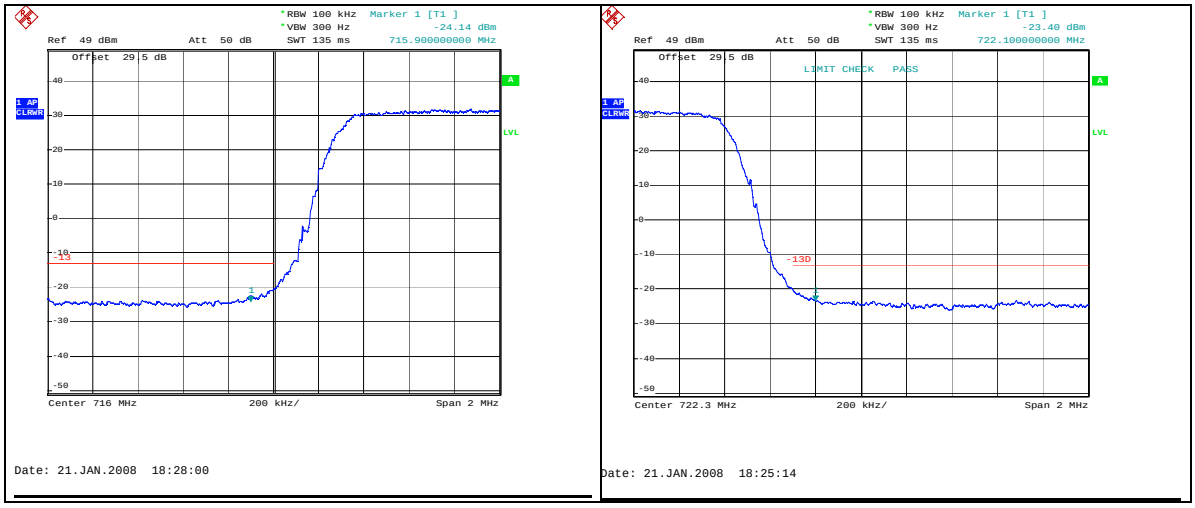
Resolution Bandwidth 100KHz
Video filter OUT
Center Frequency: 719MHz
Amplitude Scale: 10dB per Division



Frequency (MHz)	**Level (dBm)**
716,00	-19,99
722,00	-20,21

2.- Measurements in the channel limit+100KHz (715,9MHz and 722,1MHz)

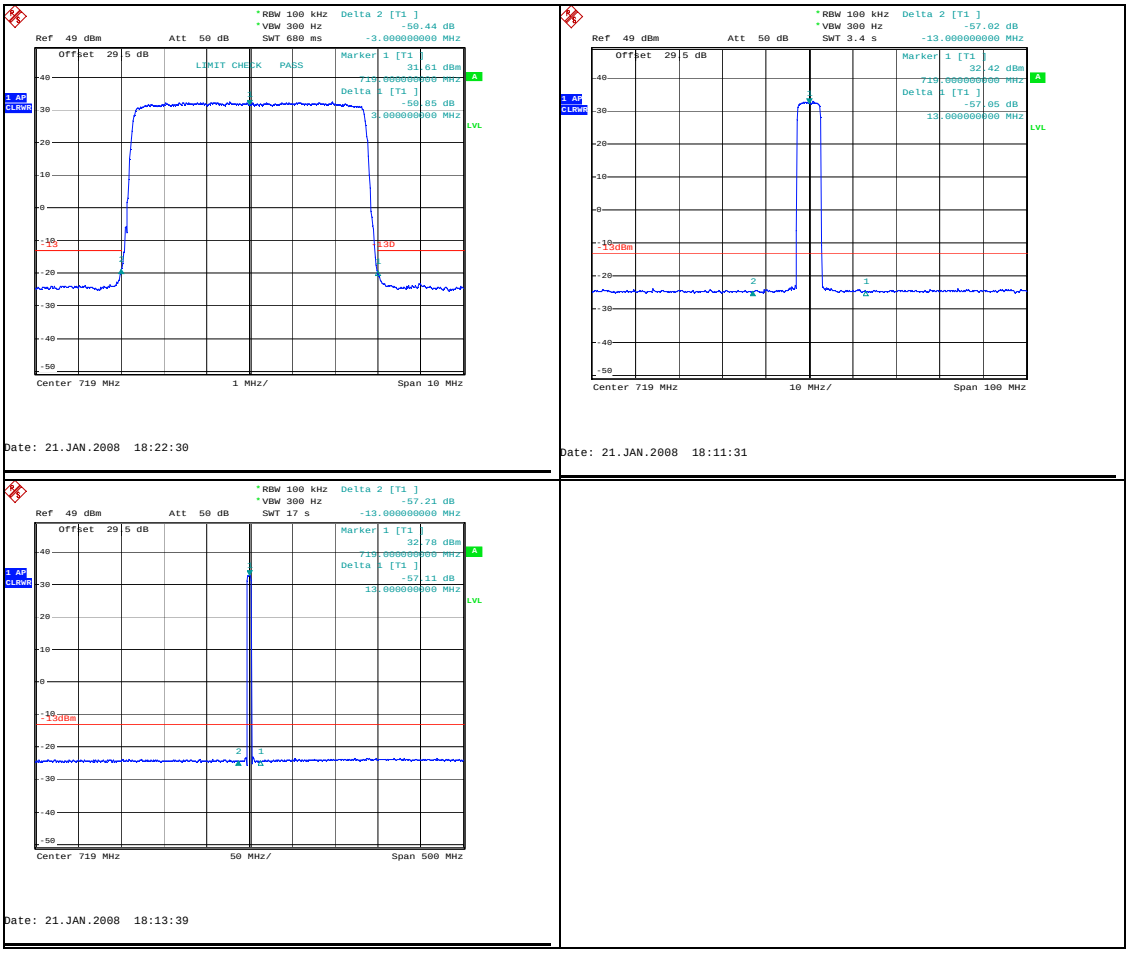
Resolution Bandwidth 100KHz
Video filter: OUT
Center Frequency: 719MHz
Amplitude Scale: 10dB per Division



Frequency (MHz)	Level (dBm)
715,90	-24,14
722,10	-23,40

3.- Measurements in the channel limit+13MHz (703MHz and 735MHz)

Resolution Bandwith 100KHz
Video filter: OUT
Center Frequency: 719MHz
Amplitude Scale: 10dB per Division



Frequency (MHz)	**Level (dBm)**
703,00	-57,02
719,00	31,61
735,00	-57,05

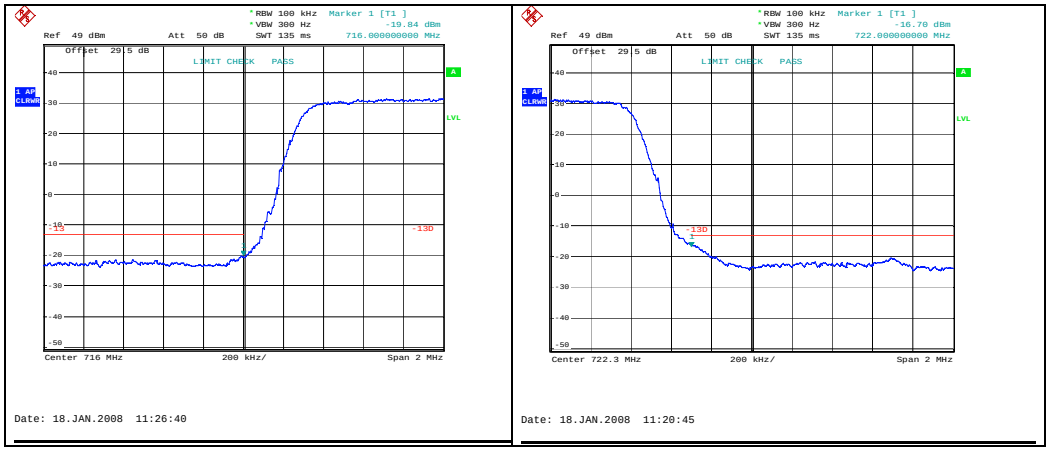
In all cases, emissions outside the transmission band are below -13 dBm.

B) MIER COMUNICACIONES FILTER:

1.- Measurements in the channel limit (716MHz and 722MHz)

Resolution Bandwidth 30KHz

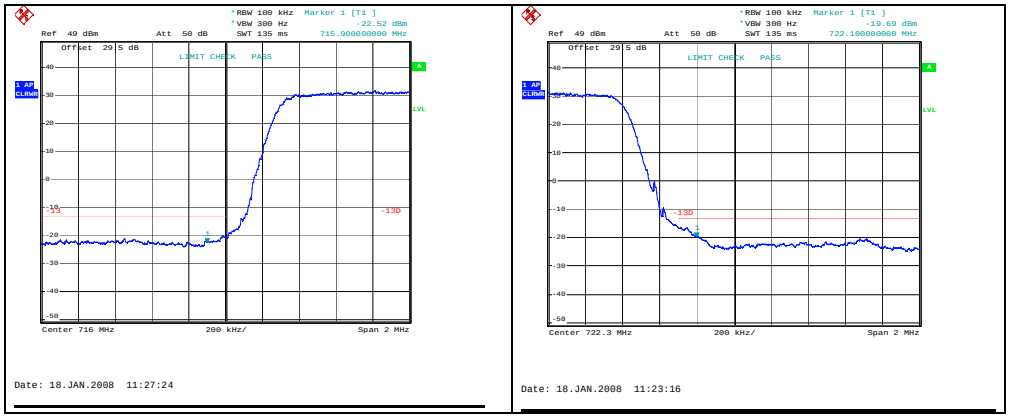
Video filter OUT
Center Frequency: 719MHz
Amplitude Scale: 10dB per Division



Frequency (MHz)	**Level (dBm)**
716,00	-19,84
722,00	-16,70

2.- Measurements in the channel limit+100KHz (715,9MHz and 722,1MHz)

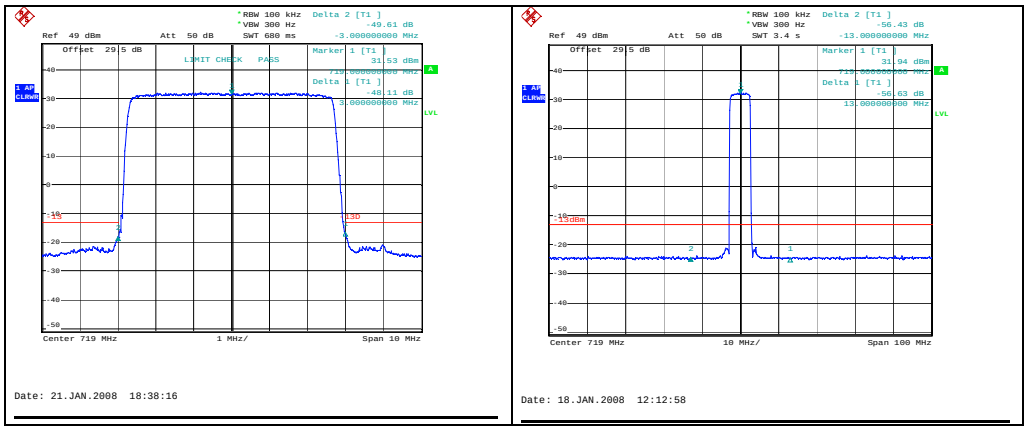
Resolution Bandwith 100KHz
Video filter: OUT
Center Frequency: 719MHz
Amplitude Scale: 10dB per Division

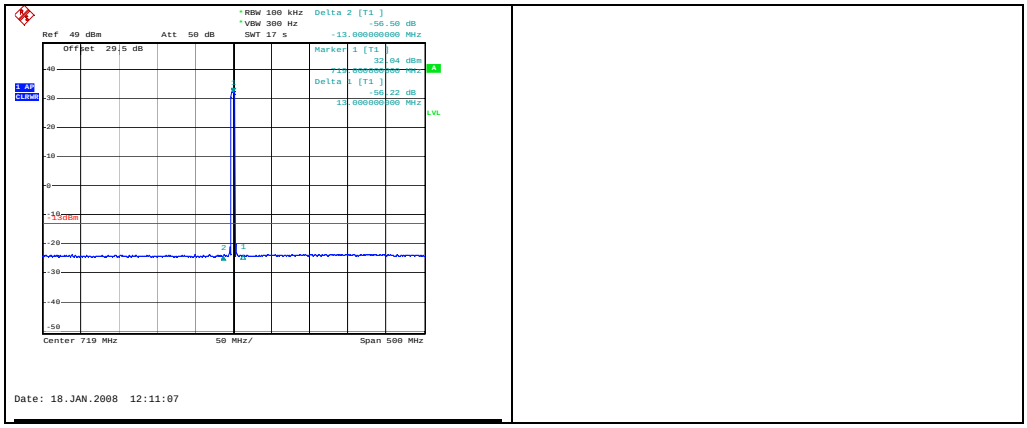


Frequency (MHz)	Level (dBm)
715,90	-22,52
722,10	-19,69

3.- Measurements in the channel limit+13MHz (703MHz and 735MHz)

Resolution Bandwidth: 100KHz
Video filter: OUT
Center Frequency: 719MHz
Amplitude Scale: 10dB per Division





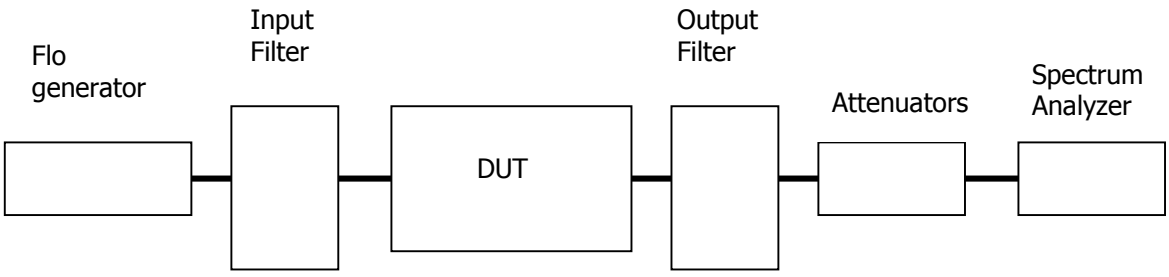
Frequency (MHz)	Level (dBm)
703,00	-56,43
719,00	31,53
735,00	-56,63

In all cases, emissions outside the transmission band are below -13 dBm.

4.3 Spurious Emissions at Antenna Terminals

Method of Measurement: According to FCC 2.1051/2.1057 (a)(1) (b) (c)

The directional coupler is removed for this test. Two high power –30dB and –10dB are placed in the device output connector.
Figure 3.3-1 shows the test setup.



Resolution Bandwith 100KHz
Video filter: OUT
Amplitude Scale: 10dB per Division
The center channel power is measured (719MHz) and it is taken as a reference power for calculation of the required attenuation.

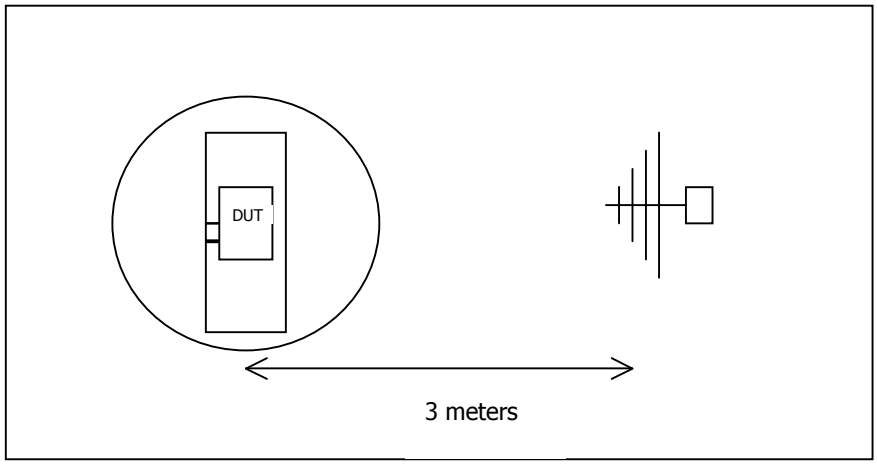
Frequency (MHz)	Power measurement (dBm)	Attenuation (dB)	Power adjusted (dBm)	Relative to Fundamental (dB) >63dB
719,0	-8,75	41,58	32,83	0
36,0	-92,70	41,17	-51,53	84,36
755,0	-105,00	43,31	-61,69	94,52
1438,0	-88,27	45,29	-42,98	75,81
2921,4	-92,90	46,58	-46,32	79,15
2161,1	-96,90	45,82	-51,08	83,91

4.4 Field Strenght of Spurious Radiation

Method of Measurement: FCC Section 2.1053, 2.1057 (a)(1) (b) (c)

This setup for conducting radiated emissions test is shown in Figure 3.5-1. It was performed in a semi-anechoic chamber. The repeater is mounted on a 80 cm table and operated at full rated power into a 50-ohm terminating load, while biconilog antenna was connected to the spectrum analyzer and used to measure radiated emissions at a distance of 3-meters away from the repeater on all sides. The repeater was rotated 360 degrees so the emissions could be maximized with each frequency scan.

Figure 4.4-1 shows the test setup.



Type of modulation: Media FLO COFDM w/QPSK
Spectrum analyzer Settings: A receiver is used to measure the spurious emissions at a distance of 3 meters.
Frequencies analized: From 30MHz to 7190 MHz.
Resolution Bandwidth: 100KHz.

The antenna was placed at a distance of 3 meters from the repeater. A turn table allowed the

Device Under Test to be rotated 360 degrees in order to maximize emissions. Also, the antenna mast allows height variations of between 1 and 4 meters and both horizontal and vertical antenna positioning. At each reading, the DUT was rotated 360 degrees and the antenna height and polarization varied. Absolute level of the spurious radiation was measured on a spectrum analyzer and the highest emission level was recorded on a receiver.
Then the DUT is replaced by the substitution antenna.
The substitution antenna is orientated for vertical polarization and calibrated for the frequency of the spurious component detected.
The substitution antenna is connected to a calibrated signal generator.
The frequency of the calibrated signal generator is set to the frequency of the spurious component detected. The input attenuator setting of the measuring receiver is adjusted in order to increase the sensitivity of the measuring receiver, if necessary.
The test antenna is raised and lowered through the specified range of heights to ensure that the maximum signal is received. When a test site according to clause A.1.1 is used, the height of the antenna need not be varied.
The input signal to the substitution antenna is adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the spurious component was measured, corrected for any change of input attenuator setting of the measuring receiver.
The input level to the substitution antenna is recorded as a power level, corrected for any change of input attenuator setting of the measuring receiver and by the antenna factor to a half-wave dipole antenna (gain=2,15dB).

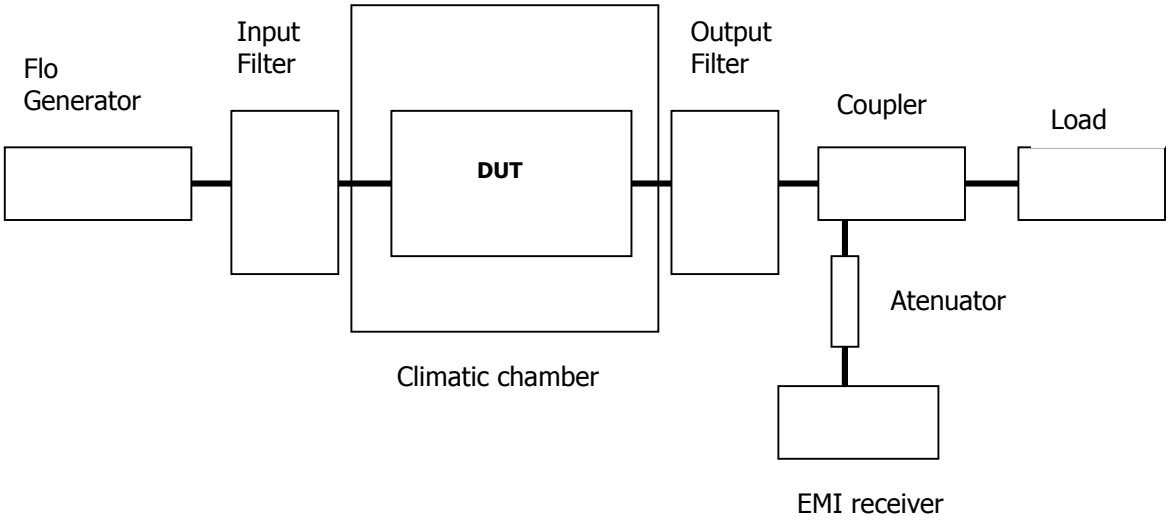
Frequency (MHz)	Level displayed (dBm)	Polarization	Level corrected (dBm)	Ratio to fundamental (47,54dBm) (dB)
65,566	-75,22	V	-80,39	127,93
220,028	-69,87	H	-66,63	114,17
380,043	-69,82	V	-63,34	110,88
433,800	-68,88	V	-63,99	111,53
470,500	-70,00	V	-64,19	111,73
755,100	-66,29	V	-52,37	99,91
793,770	-66,53	V	-52,54	100,08
867,600	-73,89	V	-61,17	108,71
1438,5	-46,62	V	-60,46	108,00

4.5 Frequency stability

Method of Measurement: FCC Section 2.1055 (a) (1) (b)(c)(d), 27.54

Frequency Stability over Temperature: The unit was placed inside a temperature chamber to control the ambient temperature; each measurement was recorded after approx 30 minutes at each temperature interval. The measurements were performed in the RF output. The RF measurement was taken by a directional coupler connected to a EMI receiver.

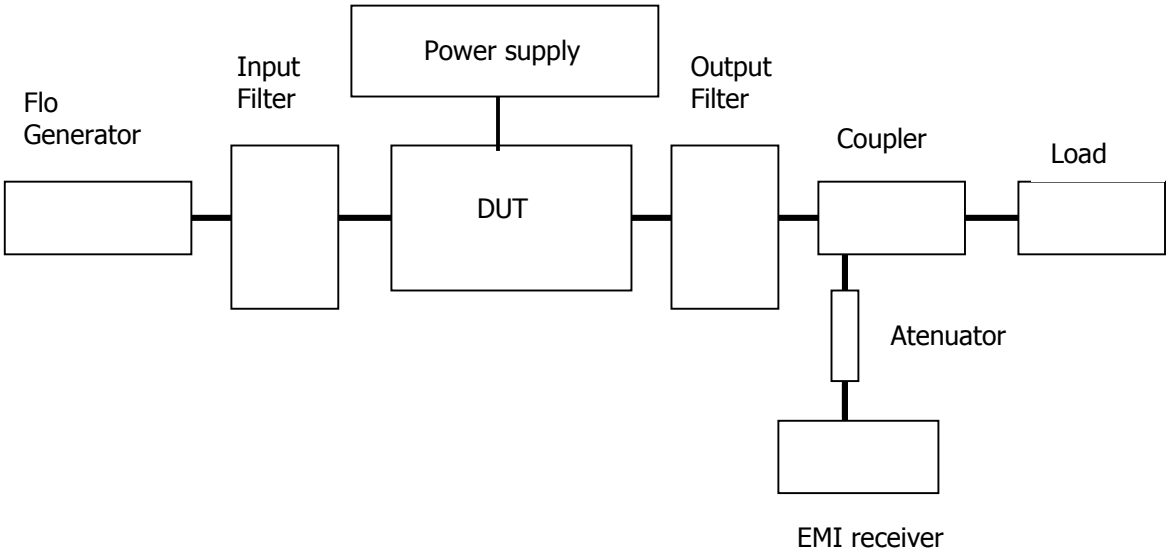
Figure 4.5-1 shows the test setup.



Temperature	Emi levels (ref point -3dB to 25ºC) (MHz)		Emi levels (channel limit and central point) (dBm)		
25ºC	716,362500	721,525800	-55,04	-6,54	-57,29
-30ºC	716,329538	721,435610	-48,35	-6,40	-49,45
-20ºC	716,335628	721,440464	-53,55	-6,71	-53,09
-10ºC	716,326588	721,402461	-56,86	-6,20	-55,47
0ºC	716,337388	721,412385	-57,25	-5,69	-57,87
10ºC	716,334563	721,532025	-56,42	-5,12	-58,15
20ºC	716,335255	721,532520	-55,32	-5,99	-56,25
30ºC	716,335455	721,532028	-55,81	-6,47	-57,01
40ºC	716,323050	721,532026	-58,22	-7,23	-58,68
50ºC	716,420950	721,525890	-60,86	-6,54	-57,37

Frequency Stability over Voltage: The unit was connected to a power supply.
The measurements were performed in the RF output. The RF measurement was taken by a directional coupler connected to a EMI receiver.

Figure 4.5-2 shows the test setup.



Voltage Stability over voltage:

Voltage AC (V)	Emi levels (ref point -3dB to 25ºC) (MHz)		Emi levels (channel limit and central point) (dBm)		
120	716,352355	721,657235	-55,65	-6,05	-56,34
102	716,351883	721,654200	-58,86	-3,77	-58,05
108	716,347380	721,657090	-56,21	-6,40	-58,42
114	716,344980	721,654550	-56,38	-6,68	-56,73
126	716,345355	721,654563	-54,90	-5,89	-57,94
132	716,352150	721,655018	-57,72	-4,43	-55,72
138	716,351888	721,654200	-57,97	-4,62	-58,05

Albert Marginet i Morales ETE Responsible Consumer Products Area – Certification Division LGAI Technological Center S.A.	Jordi Gorchs i Pahisa Technical Responsible Consumer Products Area – Certification Division LGAI Technological Center S.A.

The results refer only and exclusively to the sample, product or material delivered for testing in "Received Material" section above. The equipment has been tested under conditions stipulated by standard(s) quoted in this document.

Service Quality Assurance

Applus+, guarantees that this work has been made in accordance with our Quality and Sustainability System, fulfilling the contractual conditions and legal norms.

Within our improvement program we would be grateful if you would send us any commentary that you consider opportune, to the person in charge who signs this document, or to the Quality Manager of Applus+, in the following e-mail address: satisfaccion.cliente@appluscorp.com