Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
	)	
SkyTerra Subsidiary LLC	)	FCC Files Nos. SAT-MOD-20090813-00088
	)	SAT-MOD-20090813-00089
Application for Modification of Space	)	SES-MOD-20090813-00997
Station and Ancillary Terrestrial	)	
Component Authority	)	

REPLY OF SKYTERRA

SkyTerra Subsidiary LLC ("SkyTerra") hereby submits its response to the letters submitted by Mexico's Secretaria de Comunicaciones y Transportes ("SCT") regarding the above-captioned application, which requests authority to operate SkyTerra's next-generation Mobile Satellite Service ("MSS") system in the United States using certain frequencies in the L-band currently assigned internationally to two Mexican satellites.[1] The proposed reuse is critical to the successful deployment of SkyTerra's next-generation system, particularly with respect to accessing spectrum that is sufficiently contiguous to provide broadband services.

SkyTerra has demonstrated that its proposed operations will fully protect the Mexican system within the parameters the Mexican operator, Telecommunicaciones de Mexico ("Telecomm"), previously coordinated for its operations. SCT does not challenge this showing or the need for Telecomm to operate within these parameters if it wants to claim protection under the existing coordination agreement. The recently-filed Telecomm tests are too vague and inconsistent to be reliable, but in any event do not contradict the overwhelming evidence that

[1] *See* File Nos. SAT-MOD-20090813-00088, SAT-MOD-20090813-00089, SES-MOD-20090813-00997 (the "Application"). With the prior approval of Commission staff, due to a late submission by SCT, SkyTerra is submitting this reply one day after what otherwise would have been the deadline.

SkyTerra's operations will not cause harmful interference to Mexican operations. The final safety net, of course, is that if in the extraordinarily unlikely event that any harmful interference does develop to Mexican operations, the Commission will have ample authority to require SkyTerra to modify its operations to eliminate that interference.

SkyTerra strongly prefers and remains committed to a formal coordination agreement that encompasses both Mexico's existing satellite and any future Mexican L-band system. Unfortunately, the failure of the coordination efforts to date and SCT letters confirm that it is unlikely that a formal coordination agreement with Mexico can be reached soon. Since with every passing day SkyTerra moves closer to the launch of its next-generation satellites, it therefore becomes increasingly important to find a way forward. Grant of this application is the best, and perhaps the only, way forward.

Background

SkyTerra Application. On August 13, 2009, SkyTerra filed this Application in order to remove the uncertainty associated with reuse of the relevant frequencies. One of the two Mexican satellites (Solidaridad-1) has been completely inoperative since 2000.[2] With respect to the still-operational satellite (Solidaridad-2), SkyTerra demonstrated that its co-channel operation will be limited to levels that will protect Telecomm's operations as coordinated by Telecomm and the other parties to the outstanding coordination agreement, concluded in 1996. *See* SkyTerra Application, Technical Appendix. SkyTerra also described a procedure by which Telecomm could establish a baseline of emissions from SkyTerra's co-channel operations and monitor any increase in that baseline to reliably determine whether SkyTerra was operating within its proposed limits. *Id.* at 13. SkyTerra's Application affirmed that its application is

[2] SCT and Telecomm do not deny that Solidaridad-1 is inoperative.

limited to reusing spectrum assigned to Solidaridad-1 and Solidaridad-2 during the remaining life of Solidaridad-2 and does not seek authority to reuse the frequencies of any new Mexican L-band satellites without prior coordination. SkyTerra also stated that it is committed to good faith efforts to coordinate its next-generation system with any such next-generation Mexican satellites. SkyTerra Application at 1, n.2 and 10.

In the Application, SkyTerra demonstrated that: (i) efforts to complete coordination with Telecomm had been unsuccessful despite prolonged efforts (*id. at 5-7)*; (ii) SkyTerra's system can operate as proposed without causing harmful interference to the Mexican system (Technical Appendix at 3-12); (iii) the Commission is well within its authority to grant the Application and has made similar grants in the past (Application at 10-14);[3] and (iv) a grant will provide considerable public safety and other public interest benefits by providing reliable wireless broadband capacity throughout the United States, including to rural and remote areas (*id.* at 15).

Coordination efforts. Since the filing of its Application, SkyTerra's attempts to coordinate its next-generation system with both the existing Mexican system and any possible future Mexican system have continued to be unproductive. SkyTerra had reluctantly agreed in March 2009 that, despite the fact that the coordination with Mexico's existing satellite could be completed immediately and that the Mexican operator was not able to provide sufficient information about its next-generation system to conduct an appropriate coordination of that

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[3] *See, e.g., Mobile Satellite Ventures Subsidiary LLC*, 20 FCC Rcd 9752, at ¶ 59 (2005) ("[I]n the absence of a coordination agreement with other lawfully authorized L-band operators, [SkyTerra's] operations . . . will be on a non-harmful interference basis."); *AMSC Subsidiary Corporation*, 8 FCC Rcd 4040, at ¶¶ 15, 17 (1993) ("Applicants for domestic satellite systems are not required to demonstrate non-interference to other satellite systems under the international Radio Regulations . . . as a prior condition to receiving a license for domestic service."); *SatCom Systems, Inc., et al*., 14 FCC Rcd 20798, at ¶¶ 33-34 (1999) (concluding that "[i]n the absence of any continuing operator-to-operator agreement in the L-band, SatCom and TMI's operations . . . [would] be on a non-interference basis until a future operator-to-operator agreement is reached.").

system, SkyTerra would participate in a series of three additional quadrilateral meetings in an effort to reach a comprehensive agreement, to be concluded in September 2009. SkyTerra committed enormous resources to this effort, cooperating fully in providing Telecomm with whatever information it requested, making its technical experts available for intersessional conference calls to explain its proposed operations and its analysis of the potential for increased spectrum sharing, and participating fully in the quadrilateral meetings. The quadrilateral meetings focused almost exclusively on Telecomm's agenda of attempting to coordinate its next-generation system despite Telecomm not having any reliable information regarding its technical specifications. Unfortunately, those efforts remain unavailing.

After the London Quadrilateral at the end of July and the submission of this Application, Telecomm did not respond to SkyTerra's proposals for continued intersessional work. The Commission, the United States State Department, and Industry Canada sent senior officials to the September 21-25 Quadrilateral in Ottawa but SCT and Telecomm failed to send representatives with similar authority. The Ottawa Quadrilateral itself was again dominated by the Mexican operator's stated priority of planning for a possible next-generation Mexican system, an effort that continued to founder due primarily to the early stage of Telecomm's potential system development and the "placeholder" nature of its proposals. At the same time, Telecomm continually rebuffed attempts to deal with the more immediate requirement to coordinate its Solidaridad-2 operations with the next-generation systems of SkyTerra and Inmarsat.

Public Notice of the Application. Shortly before the Ottawa Quadrilateral, the Commission issued public notices requesting comments on the Application. *See* Public Notice, Report No. SAT-00633 (September 18, 2009); Public Notice, Report No. SES-01176 (September 23, 2009). SCT, the licensing administration for the Mexican operator, sent two letters to the

Commission that have been placed into the record.[4] Inmarsat plc ("Inmarsat") is the only party to file a formal pleading.[5]

SCT Letters. The initial SCT Letter focuses on SCT's unsubstantiated concern that SkyTerra's proposed operations may cause interference to a possible Mexican next-generation system that SCT concedes is still in the early stages of definition. In that regard, SCT requests further coordination meetings so that, according to SCT, it can complete the design of its new system and begin to solicit bids for its construction and launch. The only reference to the operations SkyTerra specifically proposes in its Application is a brief mention of the "possibility" of harmful interference "discussed" at the Ottawa meeting. The October 30 SCT Letter expands on this by including a copy of interference tests that Telecomm conducted in September 2009 and submitted for the record of the Ottawa meeting. (A copy of SkyTerra's translation of that document is attached as Appendix A.) The September tests were intended to simulate the effect of ATC interference on Solidaridad-2 operations, at the level of -42.3 dBW/Hz Power Spectral Density ("PSD") proposed in the Application. Telecomm generated an interfering signal from Mexico City towards its satellite on top of a reference signal. The interfering signal was then increased and decreased in 1 dB increments. The tests results show no interference to the Telecomm signaling channel at 8 dB more power than SkyTerra proposes and no perceptible interference to the voice channel until the power spectral density reached -36.4 dBW/Hz in one test and -41.3 dBW/Hz in the other test.

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[4] *See* Letter from Hector Olavarria Tapia, Director General, Secretaria de Comunicaciones Y Transportes, to Roderick Porter, Acting Bureau Chief, Federal Communications Commission (October 15, 2009) ("October 15 SCT Letter"); Letter from Luz Ma. Gabriela Hernandez Cardoso, Subsecretaria, Secretaria de Comunicaciones Y Transportes, to Roderick Porter, Deputy Chief, International Bureau, Federal Communications Commission (October 30, 2009) ("October 30 SCT Letter").

[5] *See* Comments of Inmarsat PLC (October 19, 2009).

Inmarsat Comments. Inmarsat agrees with SkyTerra that the proposed frequency reuse would facilitate a more efficient use of the L-band spectrum, consistent with the Commission's objectives in granting ATC flexibility to MSS operators, and that SkyTerra has demonstrated that its proposed frequency reuse will not cause harmful interference to the existing Mexican satellite. Comments of Inmarsat PLC at 3-4. Inmarsat also agrees that grant of the Application is consistent with Commission precedent, permitting uncoordinated L-band operations on a non-harmful interference basis. *Id.* at 5-6.

Discussion

The need for grant of the Application is urgent. The construction of SkyTerra's next-generation satellites is nearing completion. One of the principal risks confronting SkyTerra's efforts to deploy its nationwide wireless broadband system is the continued uncertainty regarding its authority to reuse the frequencies currently assigned to Telecomm's satellites. With growing recognition of the need for the commitment of more spectrum to wireless broadband, prompt grant of this application should be a high priority.[6]

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[6] *See, e.g.*, Prepared Remarks of Chairman Julius Genachowski, "America's Mobile Broadband Future," (October 7, 2009)("I believe that the biggest threat to the future of mobile in America is the looming spectrum crisis. . . . We must promote more efficient use of spectrum. That's why one of my earliest acts as FCC Chairman was [initiating] a proceeding that includes work on ways the FCC can develop policies and promote technologies to give us greater spectrum efficiency."); National Broadband Plan Public Notice #6, "Comments Sought on Spectrum For Broadband," GN Docket No. 09-47, 09-51, 09-137, DA 09-2100 (September 23, 2009) (requesting comment on the sufficiency of current spectrum allocations for mobile services); *In the Matter of Fostering Innovation and Investment in the Wireless Communications Market*, GN Docket Nos. 09-157, 09-51, FCC 09-66, Notice of Inquiry, at ¶20 (August 27, 2009); Statement of Commissioner Clyburn, GN Docket Nos. 09-157, 09-51 (August 27, 2009) ("As this Notice correctly recognizes, spectrum availability for new services and applications is an ongoing challenge and a handicap on wireless innovation. I greatly look forward to hearing from all of you on ways we can spur innovation and intensive use of spectrum."); Prepared Speech of Commissioner Baker, "The Rise of Broadband Video and the Future of Digital Media," (October 12, 2009) ("In order for broadband to achieve its potential as critical infrastructure, we must accelerate the development of the broadband ecosystem. . . .

The SCT Letters do not provide any basis for denial of the Application. SCT's concerns about potential interference to any possible next-generation Mexican satellites are misplaced. SkyTerra reiterates that the Application does not request authority to reuse spectrum used by any new Mexican satellites. Moreover, SkyTerra is committed (as it is obligated to be) to continued good faith efforts to coordinate its next-generation system with any such satellites. Indeed, SkyTerra has a strong preference for a comprehensive coordination agreement with regard to any and all Mexican L-band satellites.

The Commission has authority to grant the Application. The requested authority is fully consistent with Commission precedent permitting uncoordinated L-band operations on a non-harmful interference basis. The evidence that SkyTerra's proposed operations will not cause harmful interference to Telecomm's operations on Solidaridad-2 is overwhelming.

First, SkyTerra has demonstrated that the limits proposed in its Application are consistent with operational parameters Telecomm committed to in the coordination that led to the 1996 agreement. These are Telecomm's own parameters which have been used to reach the existing agreement to protect Telecomm's operations. Hence any Telecomm operations inconsistent with this agreement can only be considered to be uncoordinated operations. The analysis in SkyTerra's application demonstrates – and neither SCT nor Telecomm have argued otherwise – that, if Telecomm operates Solidaridad-2 as coordinated, SkyTerra's proposed operations will provide ample protection (roughly 8 dB of margin) to Mexican operations. Inmarsat supports this conclusion.

Specifically, first, we are exploring ways to increase deployment through reducing costs and increasing the supply of key inputs, such as allocation of appropriate amounts and types of spectrum.")

Second, the assumptions SkyTerra made in proposing its limits are extremely conservative and realistically would require SkyTerra's system to operate with millions of users before reaching these limits. During this time, the monitoring mechanism SkyTerra proposed, and to which SCT and Telecomm have not objected, could be put into place to insure that SkyTerra operates within its proposed limits. Moreover, all this assumes that Solidaridad-2 is still operational, which is highly unlikely given stated plans to deorbit it by no later than 2013.

Third, the tests Telecomm conducted do not demonstrate that SkyTerra's proposed operations, even at the maximum limits, would cause interference to Telecomm's operations. As an initial matter, the Telecomm report fails to provide the kind of standard detail and documentation of test procedures that would provide a reasonable indication of their reliability. In addition, none of the tests show any actual interference until the interfering signal is set at a level that exceeds what SkyTerra proposes. Furthermore, such tests ignore the additional 2 dB satellite receive beam discrimination that is provided by the beam roll-off towards interfering transmit sites located within the United States relative to an interfering signal transmitted within Mexico.

Finally, the ultimate safety net for SCT and Telecomm is SkyTerra's obligation to cease operations or reduce power in the event there is any actual harmful interference. Indeed, as SCT points out, SkyTerra's authorization necessarily requires it to operate on a non-harmful interference basis, not causing interference to Mexico's coordinated operations and accepting any interference from those operations.[7] SkyTerra fully understands and accepts that this obligation will be a fundamental condition to its new license.

[7] *See supra* note 3.

Conclusion

For the reasons stated above and in the Application, SkyTerra urges the Commission to grant the Application expeditiously.

SKYTERRA SUBSIDIARY LLC

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Dated: November 4, 2009

Technical Certification

I, Gustavo Nader, Ph.D, Program Director, SkyTerra Subsidiary LLC, certify that I am the technically qualified person with overall responsibility for preparation of the technical information contained in this application. I am familiar with the requirements of Part 25 of the Commission's rules, and the information contained in the application is true and correct to the best of my knowledge and belief.

/s/
Gustavo Nader, Ph.D
Program Director
SkyTerra Subsidiary LLC

Dated: November 4, 2009

CERTIFICATE OF SERVICE

I, Renee Williams, a secretary with the law firm of Pillsbury Winthrop Shaw Pittman LLP, hereby certify that on this 4th day of November 2009, I served a true copy of the foregoing by first-class United States mail, postage prepaid, upon the following:

Gabriela Hernandez Cardoso
Subsecretaria de Comunicaciones
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/s/

Renee Williams

Appendix A

ATC Interference Tests on Solidaridad 2

Power Spectral Density

Mexico, D.F.

September 2009

1 Introduction

This report presents the technical results from field tests simulating the effect of ATC interference originated by SkyTerra's new-generation MSS system on the geostationary satellite Solidaridad 2.

The results reflect data obtained under real operating conditions for Sol-2, since the field tests relied on satellites resources actually used for the provisioning of service. Hence, the present analysis shows real interference values that impact the MSS operations of the Mexican Government.

2 Objective

To determine he maximum Power Spectrum Density acceptable by Sol-2, vis-à-vis SkyTerra's ATC emissions.

3 Scenario

Based on the envisioned operation of ATC, the following possible operating scenario is assumed:

Sol-2 Co-channel interference, generated by SkyTerra's ATC MSS terminals

The interfering signal was generated from Mexico City (simulating ATC) towards Sol-2, with such signal having 100 KHz of bandwidth.

The victim system's signal was taken as reference, being the carrier generated for a voice channel by an MSS terminal when a call is placed over the Movisat system.

The possible interference to Sol-2 in the uplink comes from the ATC signal radiated outside its coverage U.S and Canada coverage area.

The ATC interference to Sol-2 is treated as aggregate interference from all ATC terminals.

3.1 Technical Data

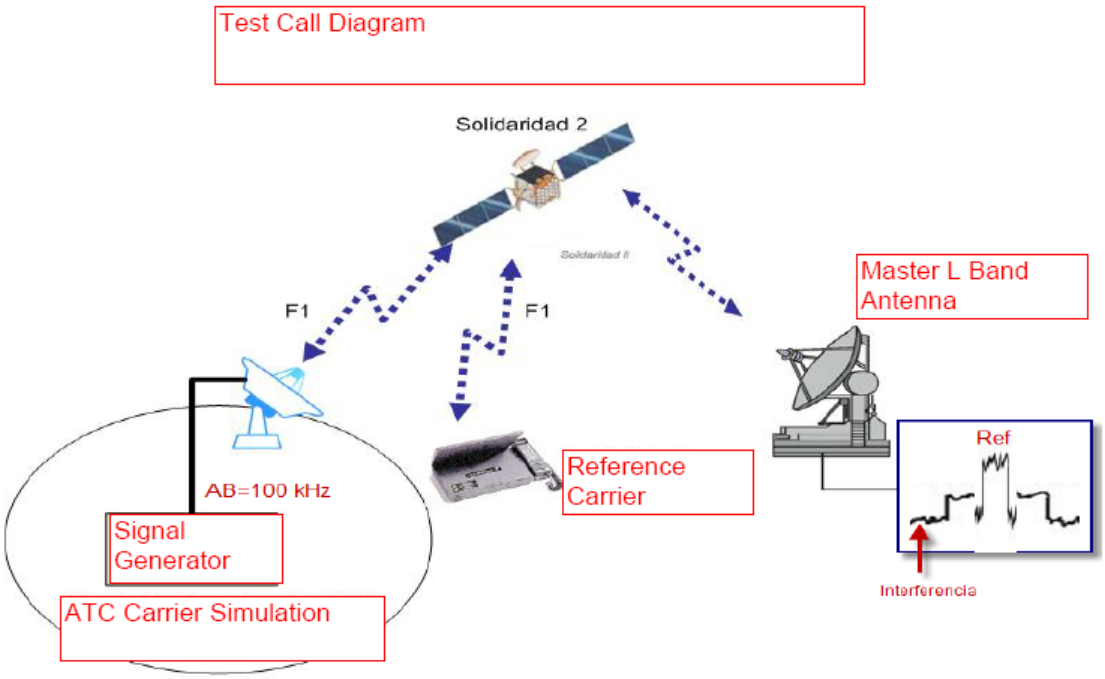
Victim Signal	Satellite	Bandwidth [Hz]	Service
	Solidaridad 2	6000	Voice

Interfering Signal	System	Bandwidth [Hz]	Location
	ATC	100,000	Mexico City

The following equation was used for the PSD calculation:

$$PSD_{ATC} = EIRP_{aggregate} - 10\log(ATC\ BW\ in\ the\ 1.6\ GHz\ band) \quad \text{[dBW/Hz]}$$

4 Procedure



As the first step in the test, a carrier with EIRP=7.7 dBW is generated to simulate SkyTerra's aggregate ATC interference with PSD of -42.3 dBW/Hz. This PSD level represents the maximum ATC emission towards Sol-2, and was proposed by SkyTerra during the London Coordination meetings.

The Movisat L Band Operations Center was used to assign the spectrum and link resources to an MSS terminal, which was used to place the reference signal call (Ref).

The simulated aggregate ATC interfering signal is transmitted from a 2.4m antenna, with the carrier at 11.956390 GHz.

In order to determine the maximum PSD level that Sol-2 can tolerate, the interfering signal is generated initially with PSD=-42.3 dBW/Hz. The signal power is then increased/decreased ,as needed, in 1 dB steps until the reference voice channel is affected by the interfering signal. This allows the determination of the maximum interference level the Sol-2 system can accept.

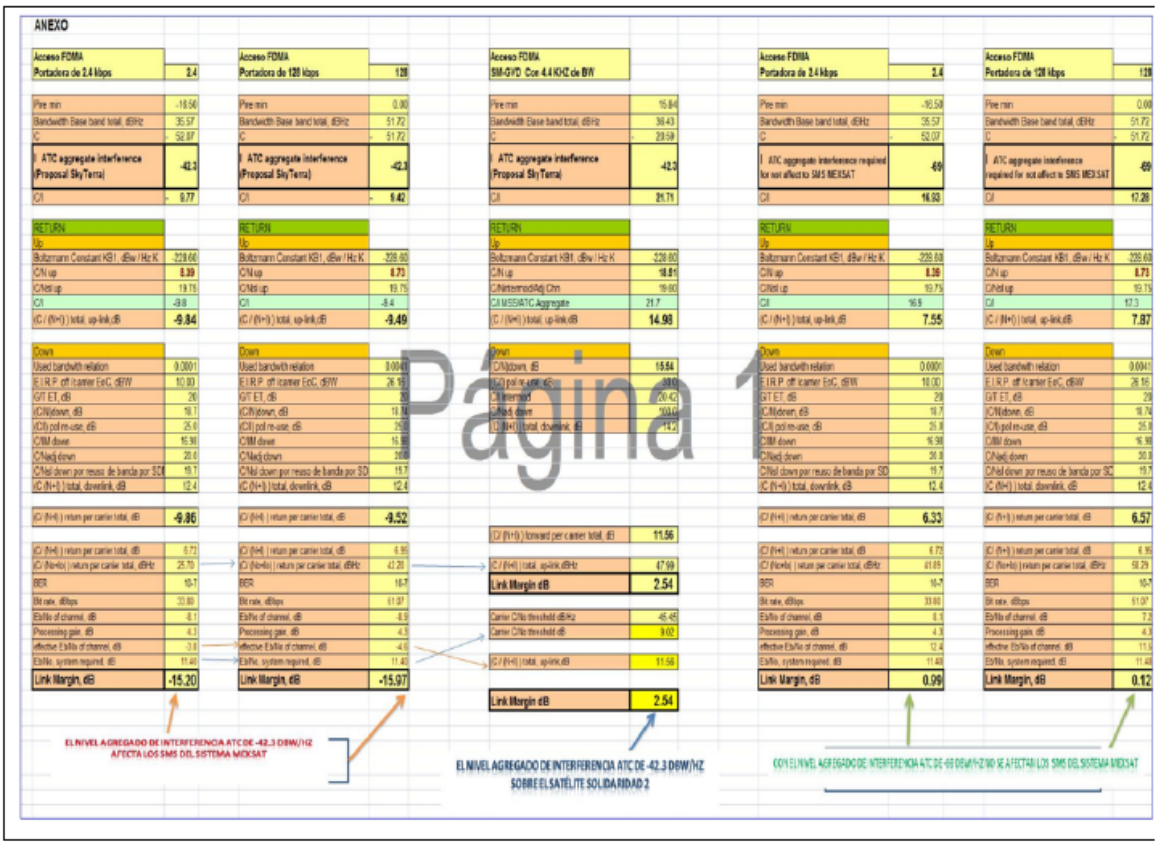
5 Test Results

	Voice Channel Interference (11.956390 GHz)					
Modulated signal level	Level CW (pilot)	real EIRP Tx, dBW	PSD dBW/Hz	Margin	Comments	Chart
Test 1						
-41	-22.7	7.7	- 42.3	14.85	No effect	1
-37.8	-19.8	11	- 39.0	12.84	No effect	2
-35.2	-16.7	13.6	- 36.4	10.5	Cuts after established	
Test 2						
-41	-22.7	7.7	- 42.3	15.17	No effect	4
-40	-21.5	8.7	-41.3	12.4	Noticeable Effect (Loss of letters)	5
-38.7	-20.7	9	-40.0	13.58	Noticeable Effect (Loss of letters)	6
-37.7	-19.7	11	-39.0	13.58 (Nivel de portadora incremento 1 dB)	Interruptions (Loss of Words)	7
-36.8	-18.7	11.9	- 38.1	11	Voice distortion and interruptions	No Chart
-35.7	**-17.7**	**13**	**-37.0**	**10.2**	**Channel and Voice Affected**	**8**

Interference in the signaling channel (11.958075 GHz)					
Modulated Signal level	CW level (pilot)	real EIRP Tx	Margin	Comments	Chart
- 36.8	-18.8	11.8	N.A.	No effect	9
	-20	9.7	N.A.	No effect	10
-36.2	-18.7	12.4		Chart to observe BW without interference	11
				Sample chart with interference	12
- 32.87	**-15.8**	**15.73**	N.A.	**1 dB before affecting the signaling. Máximum acceptable level.**	**13**
31.5	-14.7	17.1	N.A.	Return channel interfered; unable to establish communications	

6 Theoretical Analysis for the MEXSAT network

The tables show preliminary protection calculations in terms of PSD required for the MEXSAT network. From the field test results the following conclusions are drawn:



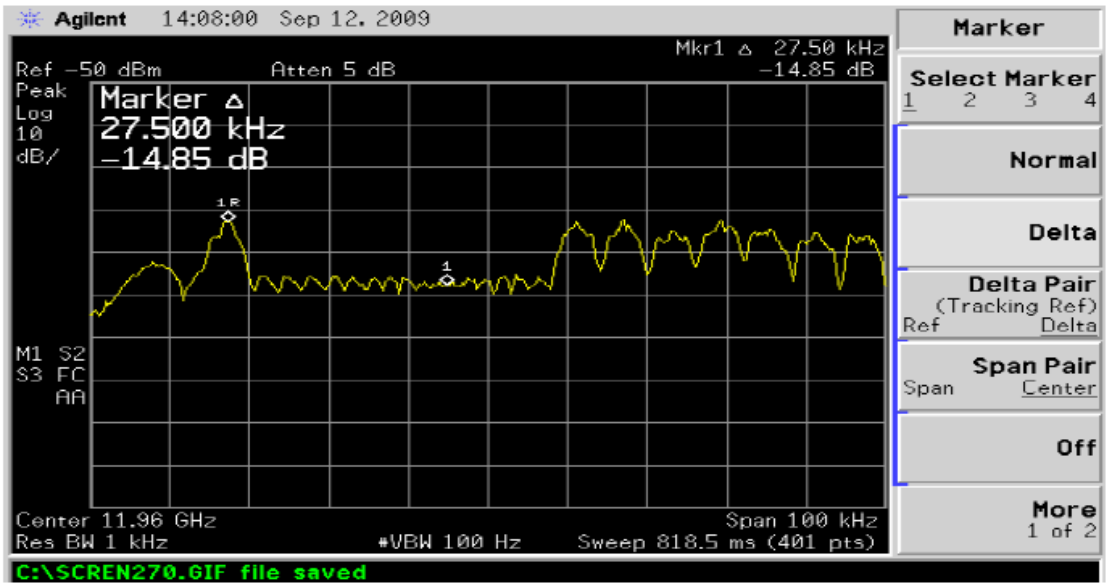
7 Conclusions

From the field test results the following conclusions are drawn:

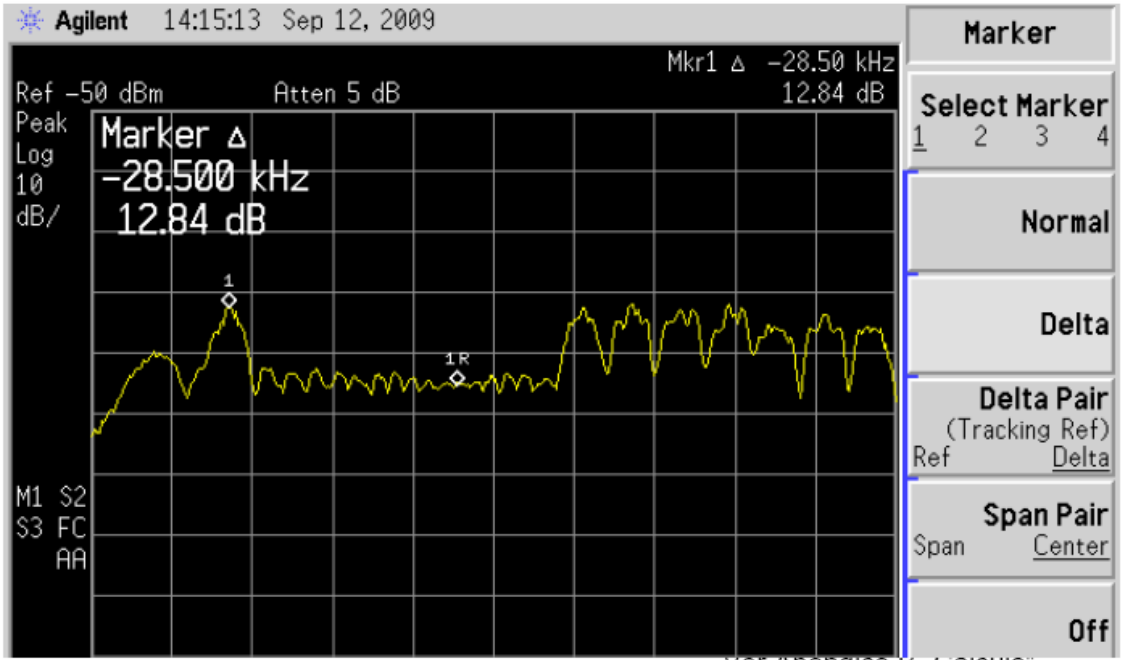
- The communications carried on Sol-2 are affected by a measured PSD of -41 dBW/Hz
- The maximum theoretical PSD of -42.3 dBW/Hz proposed by SkyTerra does not guarantee any protection of no interference to the referred satellite.
- Sol-2 is a system that uses L Band spectrum on a primary basis, which must be protected against interference from networks operating on a secondary basis
- Appendix 8 of the ITU Radio Regulations note that the DT/T increase to primary operators must be no greater than 6%
- The PSD generated by ATC will result in a DT/T equal to 48% (see Annex B “Interference to Sol 2”)
- On order to maintain the DT/T to Sol-2 under 6 % the PSD from Skyterra’s ATC must be no greater than -56 dBW/Hz and -69 dbW/Hz for the MEXSAT network (see Annex C “No interference to Sol 2 and Item 6”)
- The calculation methodology, as well as the reference ATC values, is presented by SkyTerra in the present coordination process.

Appendix A “Measurements”

Gráfica 1



Gráfica 2



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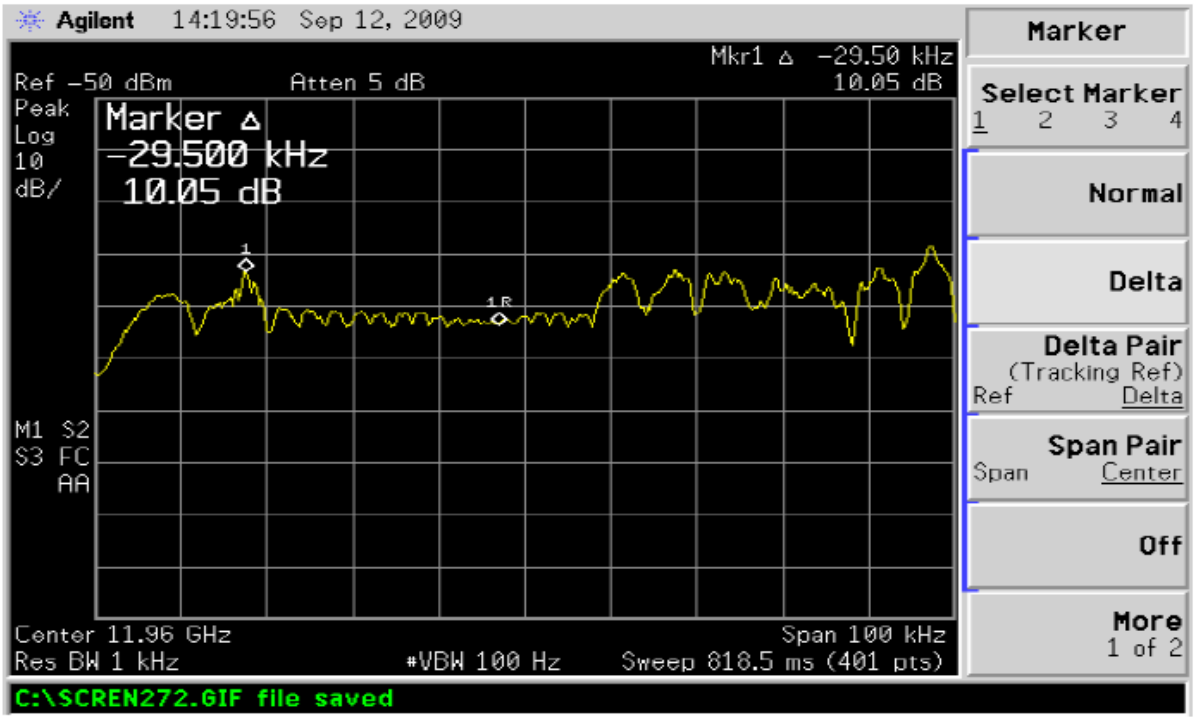

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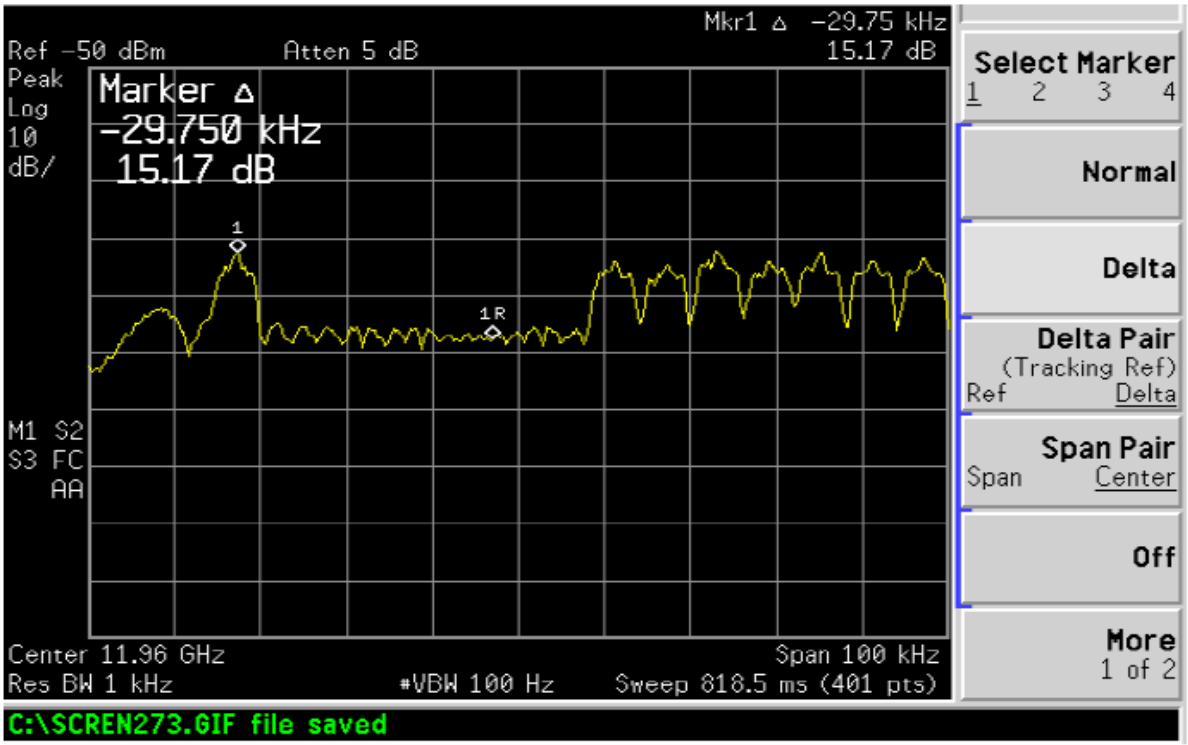

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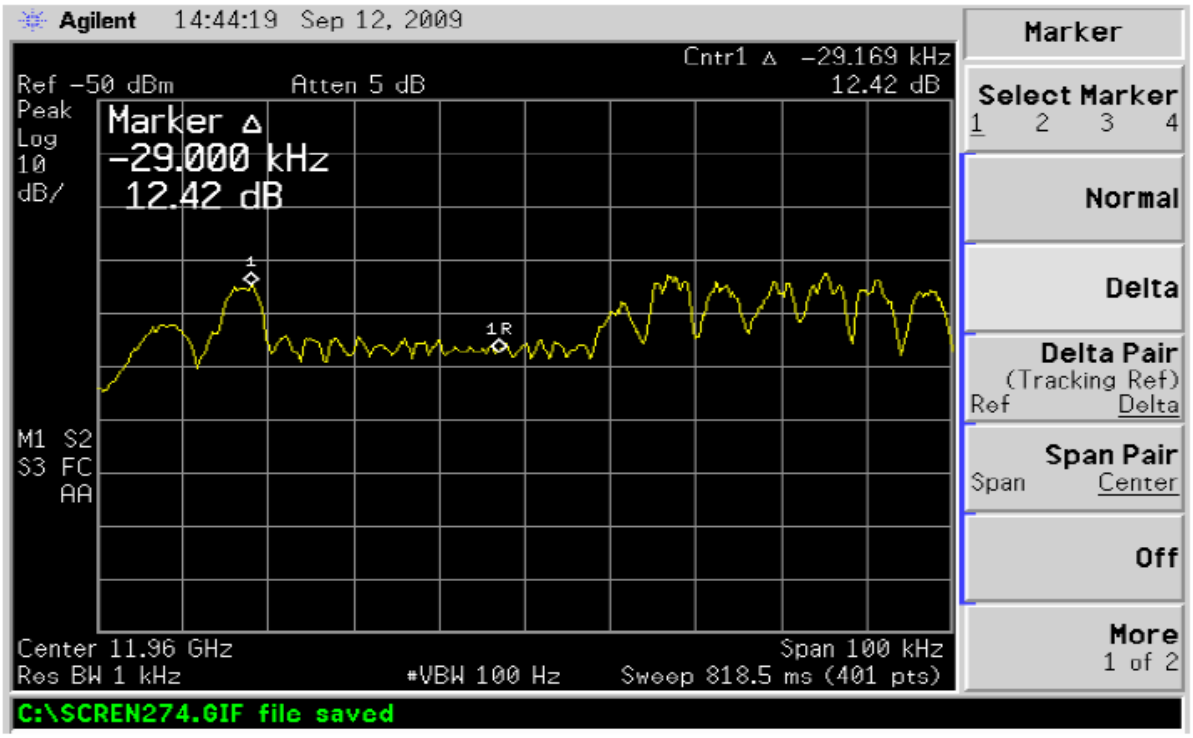

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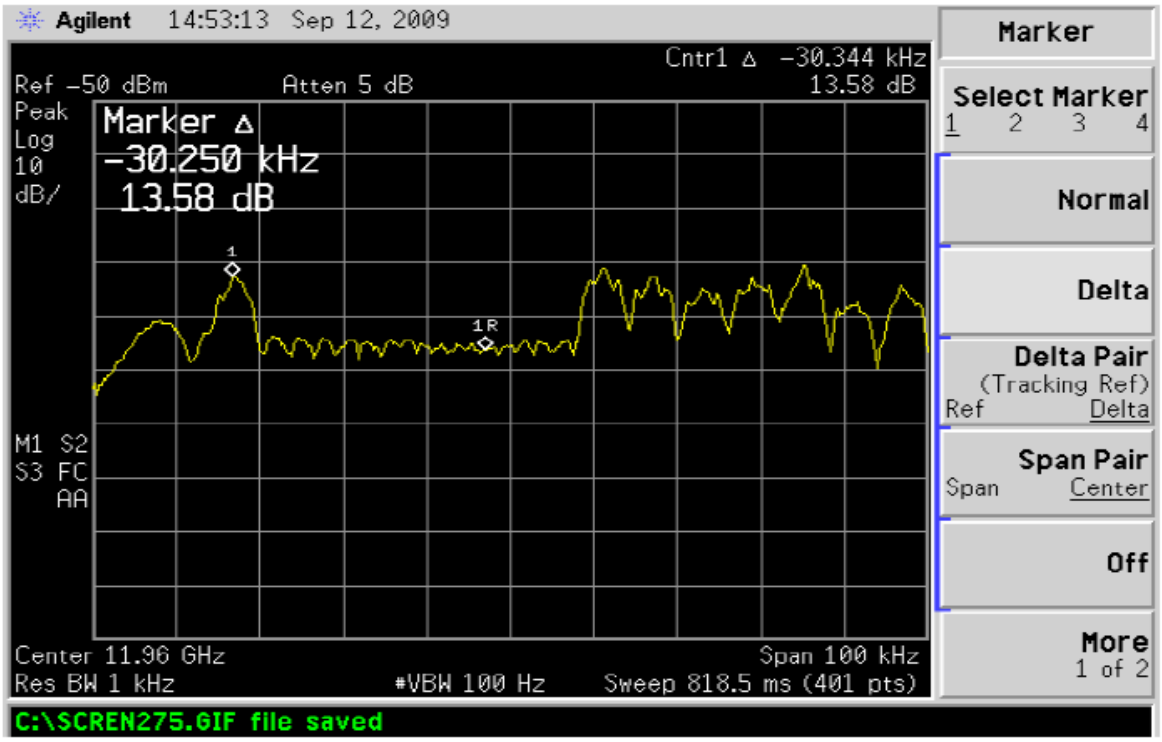

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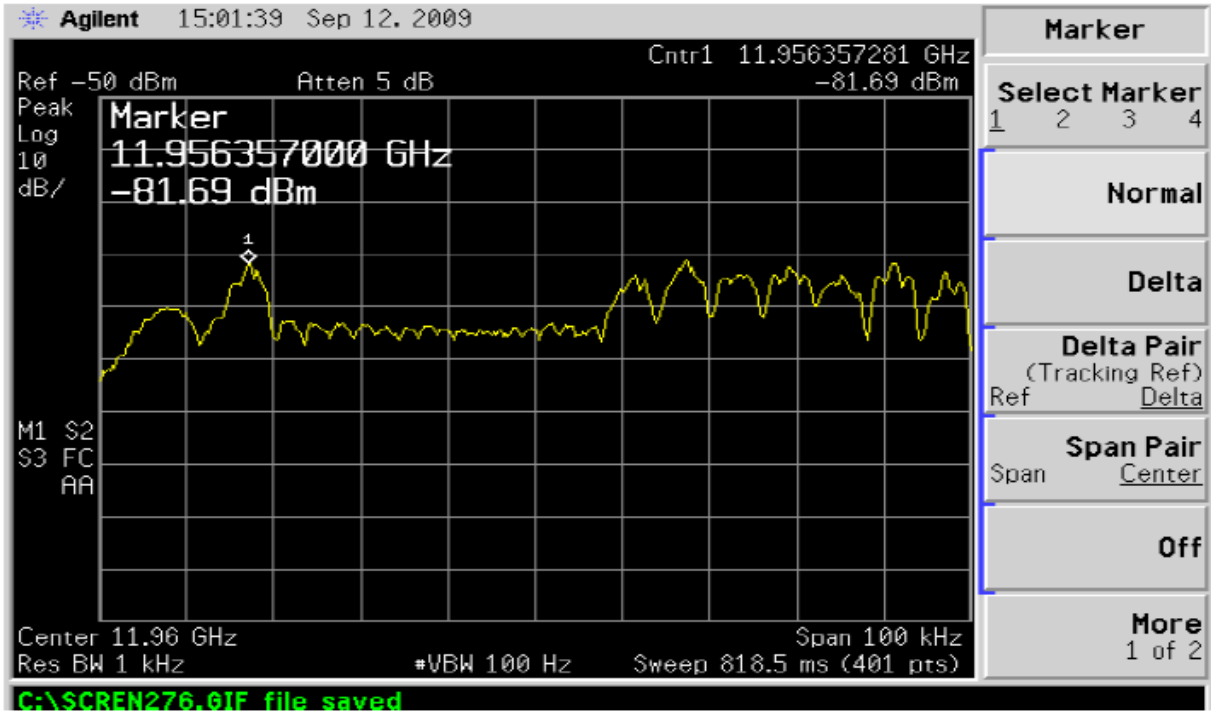

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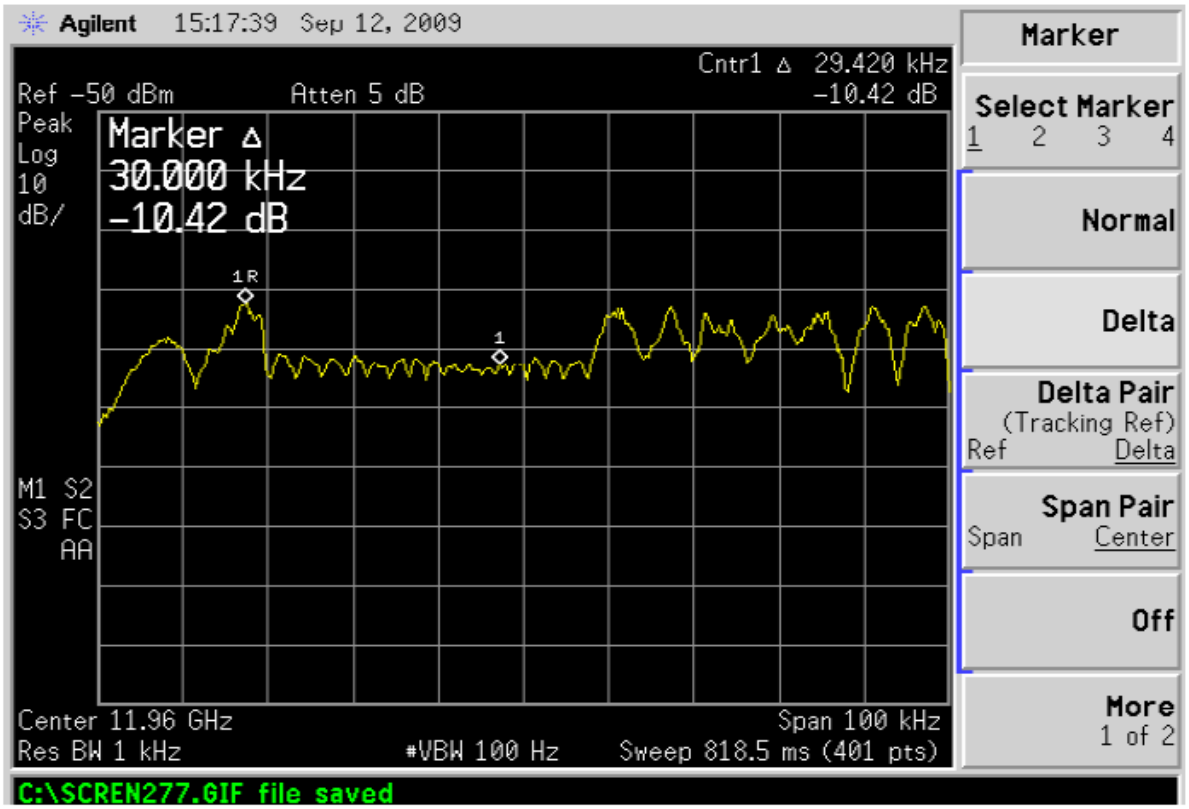
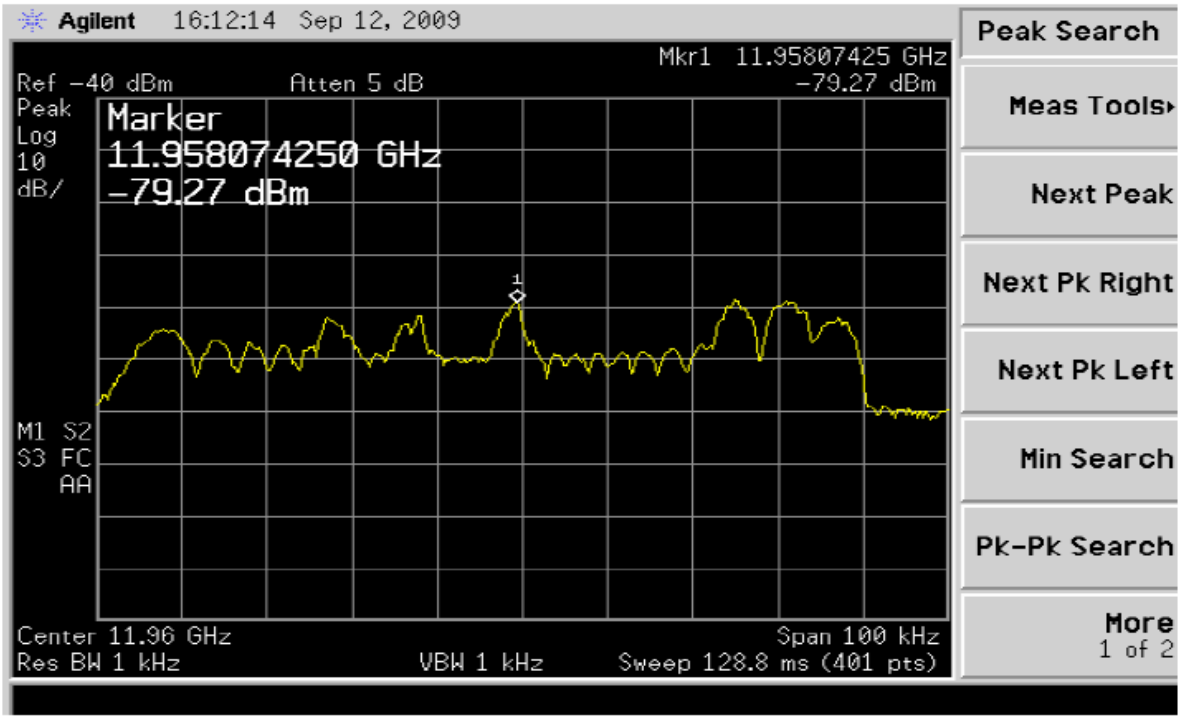
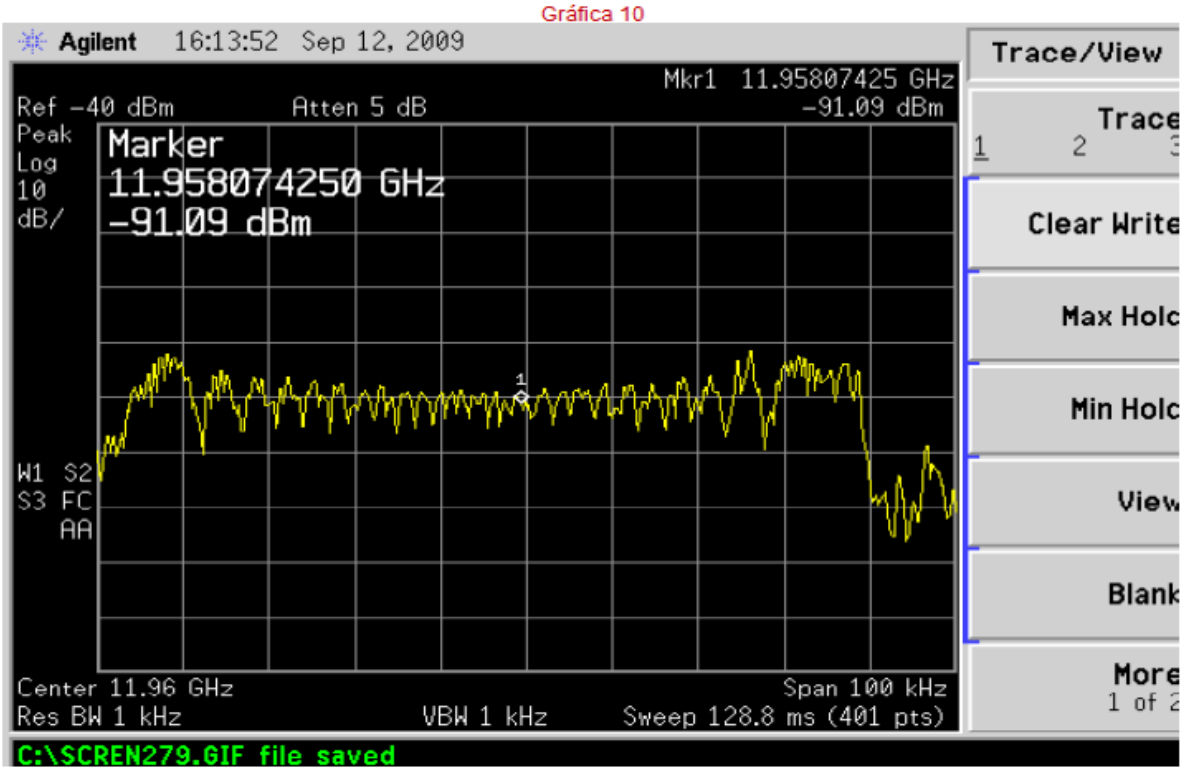


Gráfica 9



Gráfica 10



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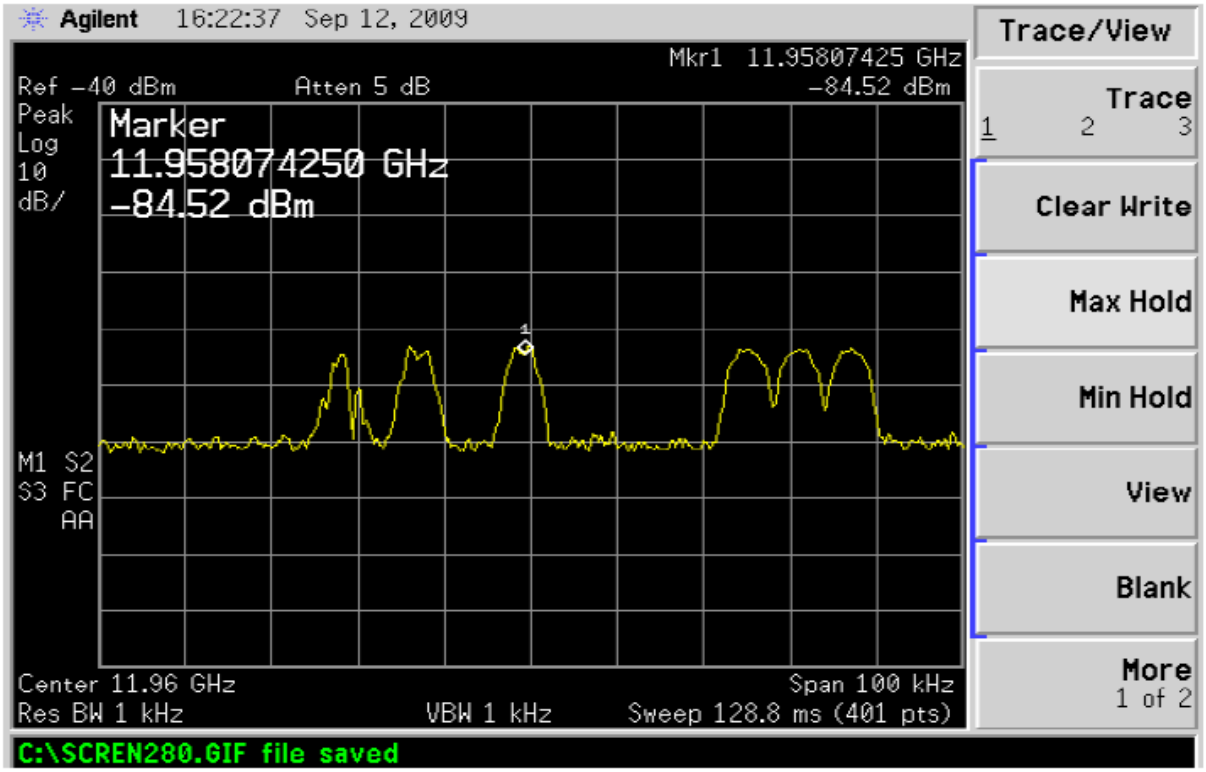

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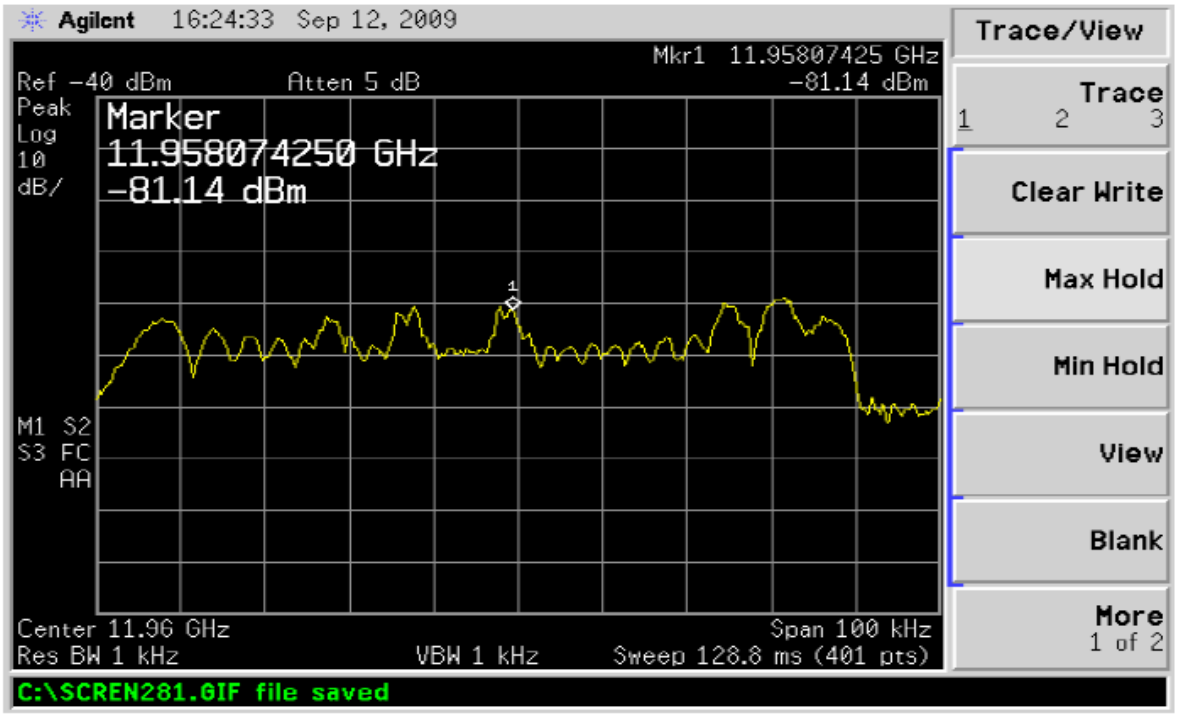
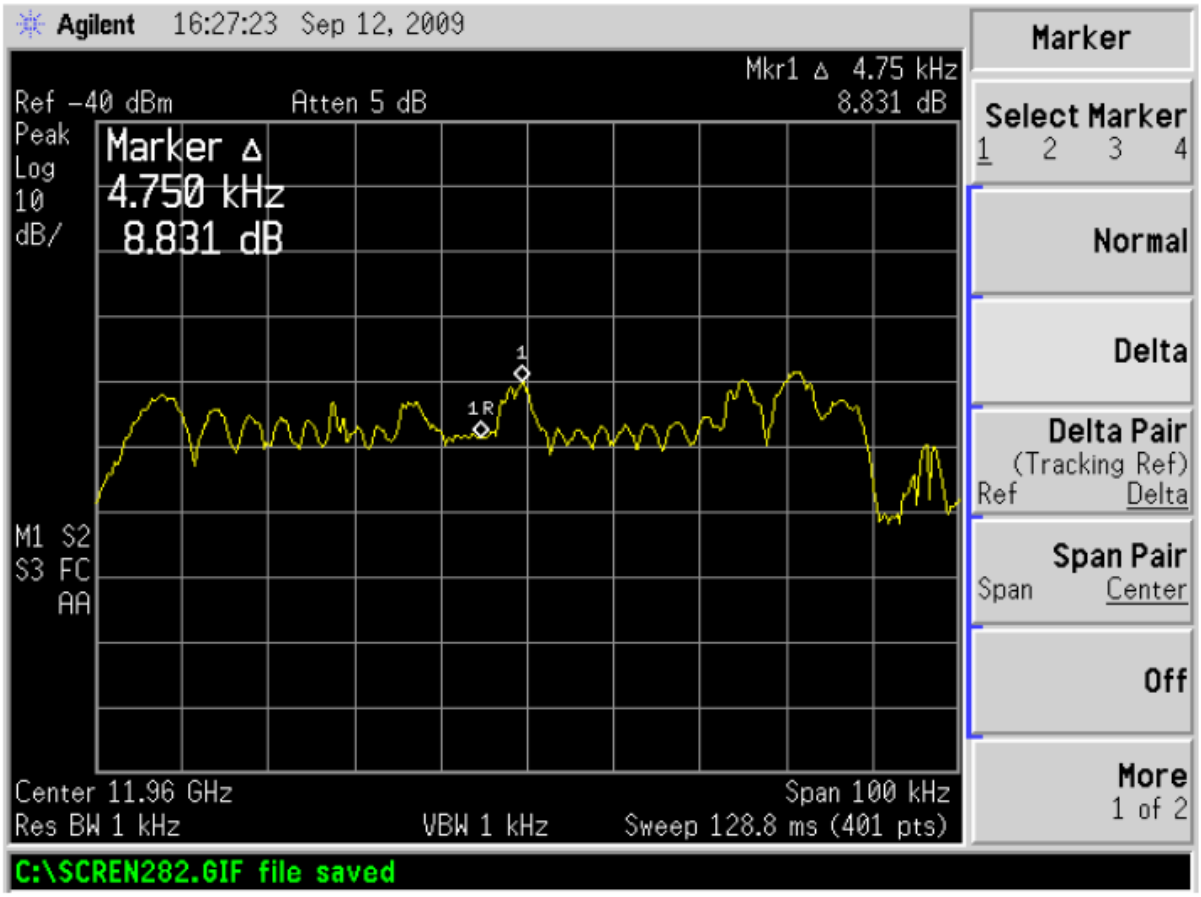


Gráfica 13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S3 FC
AA
Center 11.96 GHz
Res BW 1 kHz
VBW 1 kHz
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1 of 2
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