



**REPORT ON THE CERTIFICATION TESTING OF A  
AXELL WIRELESS  
3307D REPEATER  
WITH RESPECT TO  
THE FCC RULES CFR 47,  
FCC CFR Part 2 and 27 Testing**

TEST REPORT NO: TTR-004971WUS1  
COPY NO: 1  
ISSUE NO: 1  
FCC ID: NEO-DFR-LTE-3307

**REPORT ON THE CERTIFICATION TESTING OF A  
AXELL WIRELESS  
3307D REPEATER  
WITH RESPECT TO  
THE FCC RULES CFR 47,  
FCC CFR Part 2 and 27 Testing  
PRIVATE LAND MOBILE REPEATER.**

TEST DATE: 11<sup>th</sup> - 15<sup>th</sup> April 2011



APPROVED BY: .....

J CHARTERS  
PRODUCT MANAGER

DATE: 27<sup>th</sup> June 2011 .....

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1. Axell Wireless
  2. TRaC

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## CONTENTS

	<b>PAGE</b>		
CERTIFICATE OF CONFORMITY & COMPLIANCE	4		
APPLICANT'S SUMMARY	5		
EQUIPMENT TEST CONDITIONS	6		
TESTS REQUIRED	6		
SYSTEM DESCRIPTION	7		
TEST RESULTS	8 – 127		
		<b>ANNEX</b>	
PHOTOGRAPHS		A	
PHOTOGRAPH No. 1&2: Test setup			
PHOTOGRAPH No. 3: Equipment overview			
APPLICANT'S SUBMISSION OF DOCUMENTATION LIST		B	
EQUIPMENT CALIBRATION		C	
MEASUREMENT UNCERTAINTY		D	
<b>Notes:</b>			
1. Component failure during test		YES	[ ]
		NO	[X]
2. If Yes, details of failure:			
3. The facilities used for the testing of the product contain in this report are FCC Listed.			

**CERTIFICATE OF CONFORMITY & COMPLIANCE**

FCC IDENTITY:	NEO-DFR-LTE-3307
PURPOSE OF TEST:	Certification
TEST SPECIFICATION:	FCC CFR Part 2 and 27 Testing
TEST RESULT:	Compliant to Specification
EQUIPMENT UNDER TEST:	3307D Repeater
EQUIPMENT TYPE:	Private Land Mobile Repeater
MAXIMUM GAIN:	Uplink Lower band = 698 - 716 MHz Uplink High band = 776 - 787 MHz Downlink Lower band = 728 - 746 MHz Downlink High band = 746 - 757 MHz
MAXIMUM GAIN:	Uplink Lower band = 84.70dB Uplink High band = 83.14dB Downlink Lower band = 82.20dB Downlink High band = 84.29dB
MAXIMUM INPUT:	Uplink Lower band = - 54.48dBm Uplink High band = - 56.29dBm Downlink Lower band = - 48.06dBm Downlink High band = - 50.37dBm
MAXIMUM OUTPUT CONDUCTED:	Uplink Lower band = +27.18dBm Uplink High band = +25.77dBm Downlink Lower band = +33.45dBm Downlink High band = +33.56dBm
CHANNEL BANDWIDTH:	Selectable 1.4MHz 3MHz 5MHz 10MHz 15MHz
FREQUENCY GENERATION:	N/A
MODULATION TYPE:	LTE
POWER SOURCE(s):	+110Vac
TEST DATE(s):	11 <sup>th</sup> – 15 <sup>th</sup> April 2011
ORDER No(s):	7142
APPLICANT:	Axell Wireless
ADDRESS:	Aerial House Asheridge Road Chesham Buckinghamshire HP5 1TU
TESTED BY:	D WINSTANLEY

APPROVED BY:



J CHARTERS  
PRODUCT  
MANAGER

## APPLICANT'S SUMMARY

EQUIPMENT UNDER TEST (EUT): 3307D Repeater

EQUIPMENT TYPE: Private Land Mobile Repeater

PURPOSE OF TEST: Certification

TEST SPECIFICATION(s): FCC CFR Part 2 and 27 Testing

TEST RESULT: COMPLIANT Yes   
No

APPLICANT'S CATEGORY: MANUFACTURER   
IMPORTER   
DISTRIBUTOR   
TEST HOUSE   
AGENT

APPLICANT'S ORDER No(s): 7142

APPLICANT'S CONTACT PERSON(s): Mr Peter Bradfield

E-mail address: [peter.bradfield@axellwireless.com](mailto:peter.bradfield@axellwireless.com)

APPLICANT: Axell Wireless

ADDRESS: Aerial House  
Asheridge Road  
Chesham  
Buckinghamshire  
HP5 1TU  
United Kingdom

TEL: +44 (0)1494 777000

FAX: +44 (0)1494 778456

MANUFACTURER: Axell Wireless

EUT(s) COUNTRY OF ORIGIN: United Kingdom

TEST LABORATORY: TRaC Telecoms and Radio

TEST DATE(s): 11<sup>th</sup> – 15<sup>th</sup> April 2011

TEST REPORT No: TTR-004971WUS1

**EQUIPMENT TEST / EXAMINATIONS REQUIRED**

1.	TEST/EXAMINATION	RULE PART	APPLICABILITY	RESULT
	RF Power Output	27.50	Yes	Complies
	Audio Frequency Response	TIA EIA-603.3.2.6	N/A	N/A
	Audio Low-Pass Filter Response	TIA EIA-603.3.2.6	N/A	N/A
	Modulation Limiting	TIA EIA-603.3.2.6	N/A	N/A
	Occupied Bandwidth	27.53	Yes	Complies
	Spurious Emissions at Antenna Terminals	27.53	Yes	Complies
	Field Strength of Spurious Emissions	27.53	Yes	Complies
	Frequency Stability	27.54	N/A(note 1)	N/A
	Transient behaviour	N/A	N/A(note 2)	N/A

Notes:

- 1 The EUT does not contain modulation circuitry, therefore the test was not performed.
- 2 The EUT is not a keyed carrier system, therefore the test was not performed.

- 2. Product class: Uplink Class A  Class B   
Downlink Class A  Class B
- 3. Product Use: Private Land Mobile Repeater
- 4. Emission Designator: F9E
- 5. Temperatures: Ambient (Tnom) 22°C
- 6. Supply Voltages: Vnom +110Vac  
Note: Vnom voltages are as stated above unless otherwise shown on the test report page
- 7. Equipment Category: Single channel   
Two channel   
Multi-channel
- 8. Channel spacing: Narrowband Uplink  
Narrowband Downlink
- 9. Test Location TRaC Global Skelmersdale
- 10. Modifications made during test program No modifications were performed.

**System description:**

Axell 3307D is a 700 MHz band LTE technology selective indoor mid-repeater that simultaneously supports the LTE lower and upper frequency range: Lower 700MHz A,B,C and Upper 700MHz C. The Repeater supports advanced digital filtering capabilities. Up to 8 or 12 (model dependent) LTE non-contiguous sub-bands can be selected via simple intuitive GUI, where each sub-band is independently tunable across the entire LTE band. The gain and output power can be set individually in each of these sub-bands. This provides an optimal solution for operators that have non-contiguous spectrum.

The repeater provides highly accurate out-of-band-rejection and simple, GUI based procedures for adjusting the pass band according to the 700 MHz spectrum.

3307D includes the SmartALC power control algorithm that automatically optimizes the gain setting by learning the actual range of RSSI levels over a user-specified period of time. The SmartALC algorithm prevents oscillations, reduces the amount of isolation required by the system and optimizes the system to minimize noise rise at the donor cell site.

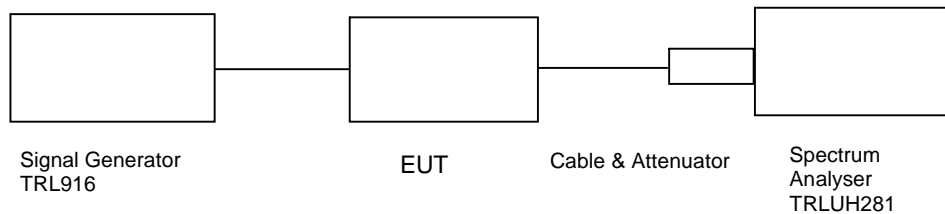
GUI based web management is supported through both Ethernet and remote wireless connections (wireless connection provided by an integrated modem). Local setup can be performed through a connection to the Ethernet port using a cross-cable.

**COMPLIANCE TESTS**

**AMPLIFIER GAIN – CONDUCTED – PART 2.1046 –UHF LOW BAND UPLINK**

Ambient temperature = 22°C  
 Relative humidity = 43%  
 Supply voltage = +110Vac  
 Channel number = See test results

Radio Laboratory



Frequency MHz	Signal Generator input level dBm	Input Cable Loss dB	Output Cable & Attenuator loss dB	Level at Spectrum Analyser dBm	Gain dB	Conducted Output Power dBm	Gain after 10dB input level increase dB
698.700	-54.10	0.38	36.10	-9.08	81.50	27.02	72.31
700.000	-57.20	0.32	36.10	-8.92	84.70	27.18	75.56
715.300	-56.40	0.29	36.10	-9.45	83.36	26.67	74.13

Notes: 1. The signal generator input was increased by 10dBs and the level of the output signal remeasured.

TYPE OF EQUIPMENT	MAKER/SUPPLIER	MODEL No	SERIAL No	TRL No	ACTUAL EQUIPMENT USED
SPECTRUM ANALYSER	RHODE & SCHWARZ	FSU46	200034	UH281	X
ATTENUATOR	BIRD	8308-200-N	N/A	103	X
ATTENUATOR	BIRD	8304-100-N	N/A	222	X
CABLE	TRL	N/A	N/A	UH271	X
CABLE	TRL	N/A	N/A	UH272	X
CABLE	TRL	N/A	N/A	UH273	X
SIGNAL GENERATOR	RHODE & SCHWARZ	Vector Signal Generator	255812	916	X

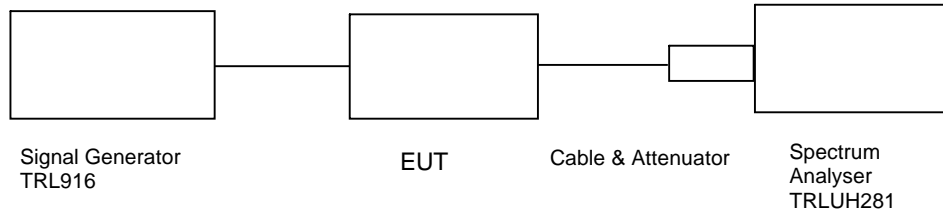


## COMPLIANCE TESTS

### AMPLIFIER GAIN – CONDUCTED – PART 2.1046 –UHF HIGH BAND UPLINK

Ambient temperature = 22°C  
 Relative humidity = 43%  
 Supply voltage = +110Vac  
 Channel number = See test results

Radio Laboratory



Frequency MHz	Signal Generator input level dBm	Input Cable Loss dB	Output Cable & Attenuator loss dB	Level at Spectrum Analyser dBm	Gain dB	Conducted Output Power dBm	Gain after 10dB input level increase dB
776.700	-56.00	0.29	36.10	-10.31	82.06	25.77	72.76
781.500	-56.80	0.28	36.10	-10.83	82.32	25.24	74.00
786.300	-56.70	0.26	36.10	-9.96	83.14	26.18	73.94

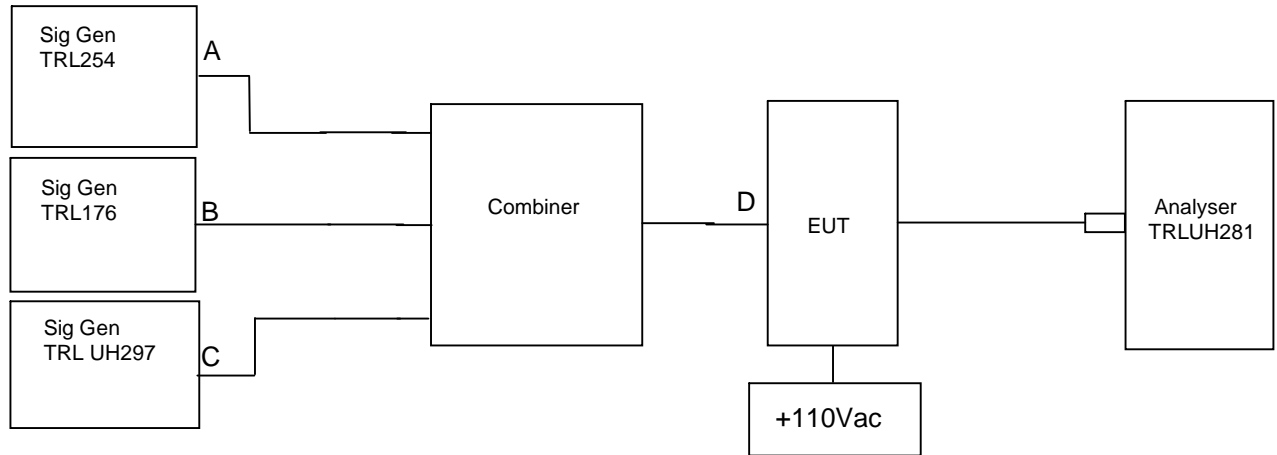
Notes: 1. The signal generator input was increased by 10dBs and the level of the output signal remeasured.

TYPE OF EQUIPMENT	MAKER/SUPPLIER	MODEL No	SERIAL No	TRL No	ACTUAL EQUIPMENT USED
SPECTRUM ANALYSER	RHODE & SCHWARZ	FSU46	200034	UH281	<b>X</b>
ATTENUATOR	BIRD	8308-200-N	N/A	103	<b>X</b>
ATTENUATOR	BIRD	8304-100-N	N/A	222	<b>X</b>
CABLE	TRL	N/A	N/A	UH271	<b>X</b>
CABLE	TRL	N/A	N/A	UH272	<b>X</b>
CABLE	TRL	N/A	N/A	UH273	<b>X</b>
SIGNAL GENERATOR	RHODE & SCHWARZ	Vector Signal Generator	255812	916	<b>X</b>

**AMPLIFIER INTERMODULATION SPURIOUS EMISSIONS – CONDUCTED – PART 2.1053  
UHF LOW BAND UPLINK**

Ambient temperature = 22°C  
Relative humidity = 42%  
Supply voltage = +110Vac

Radio Laboratory



The intermodulation and spurious products were measured with the amplifier operating at maximum gain. A three tone test was conducted using the equipment as above. The input power level was adjusted so the level at point D was 10dB above the maximum input of -54.40dBm. The cable and attenuator loss between the EUT and the spectrum analyser was 36.1dB.

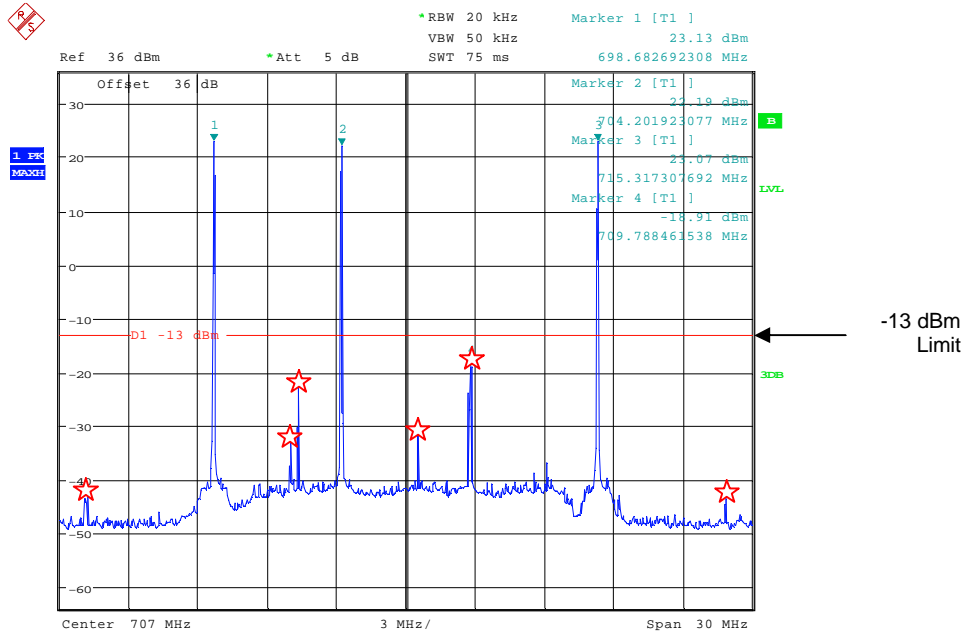
RF Input Frequency (MHz)			Highest Intermodulation Product Level (dBm)	Limit (dBm)
698.700	704.201	715.300	-18.91 @709.788MHz	-13

Sweep data is shown on the next page:

Test equipment used for intermodulation test

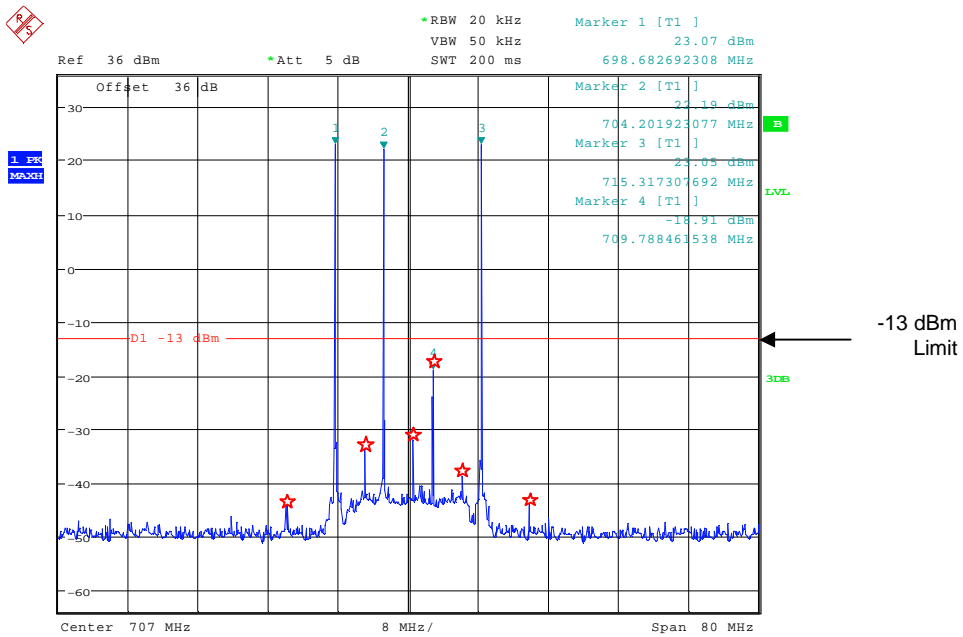
TYPE OF EQUIPMENT	MAKER/SUPPLIER	MODEL No	SERIAL No	TRL No	ACTUAL EQUIPMENT USED
SPECTRUM ANALYSER	R&S	FSU46	200034	UH281	<b>X</b>
SIGNAL GENERATOR	MARCONI	2042	119562/021	254	<b>X</b>
SIGNAL GENERATOR	R&S	SML 03	102268	UH297	<b>X</b>
SIGNAL GENERATOR	RHODE & SCHWARZ	Vector Signal Generator	255812	916	<b>X</b>
COMBINER	ELCOM	RC-4-50	N/A	170	<b>X</b>
CABLE	TRL	N/A	N/A	UH271	<b>X</b>
CABLE	TRL	N/A	N/A	UH272	<b>X</b>
CABLE	TRL	N/A	N/A	UH273	<b>X</b>
CABLE	TRL	N/A	N/A	UH269	<b>X</b>

### Intermodulation Close View



Date: 11.APR.2011 10:03:18

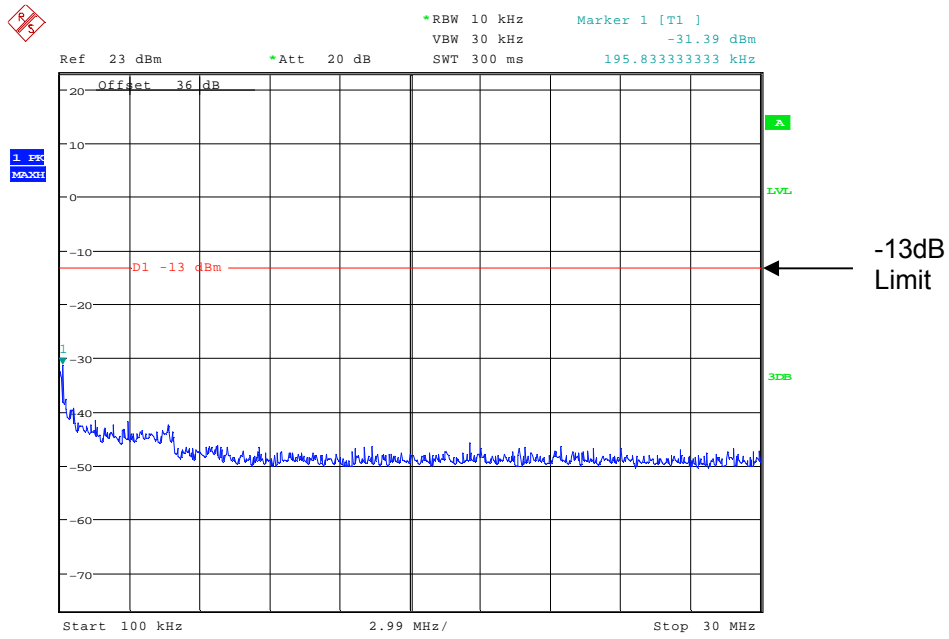
### Intermodulation Wide View



Date: 11.APR.2011 10:04:03

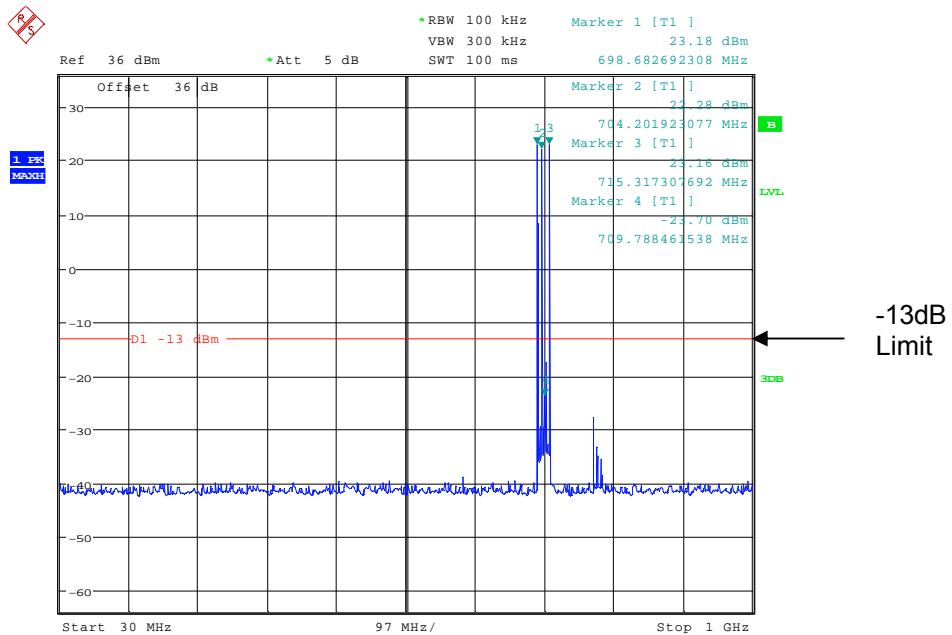
The above plots show that all products (designated by ☆) are below the spurious limit.

100kHz – 30MHz



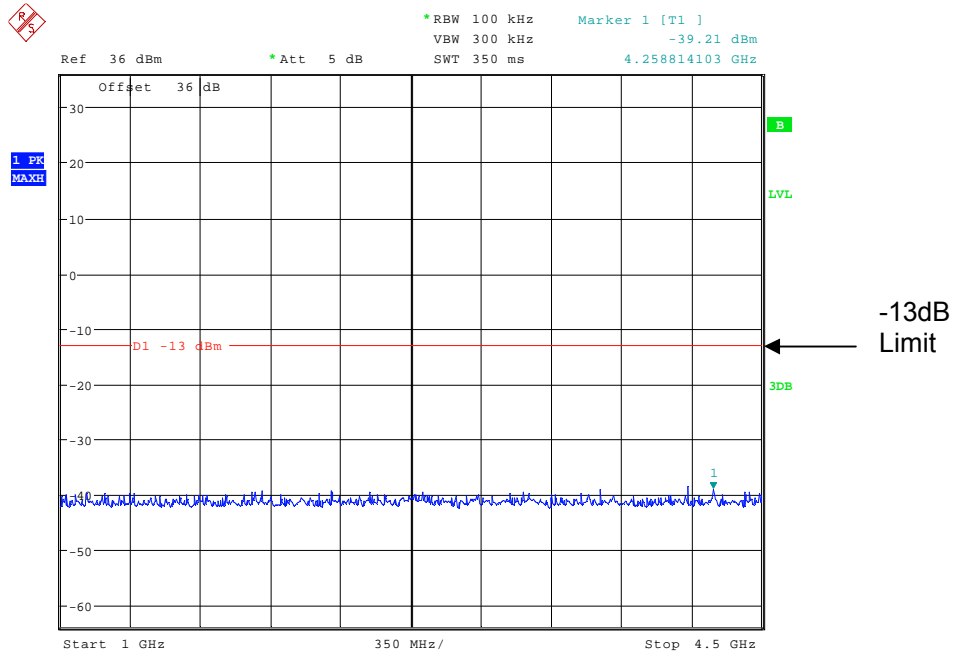
Date: 11.APR.2011 10:05:04

30MHz – 1GHz



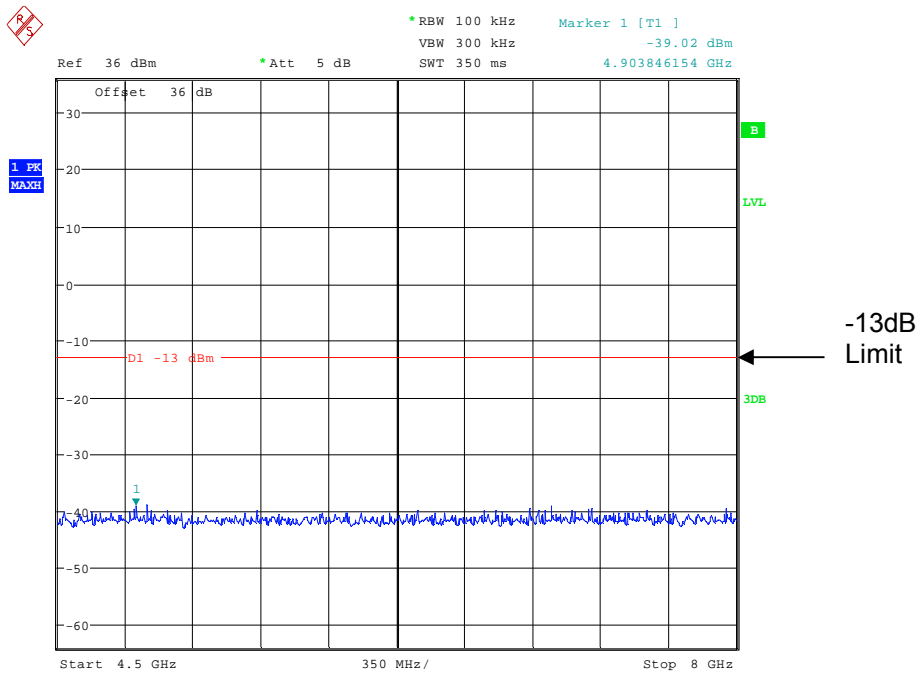
Date: 11.APR.2011 10:06:04

1GHz – 4.5GHz



Date: 11.APR.2011 10:06:51

4.5GHz – 8GHz

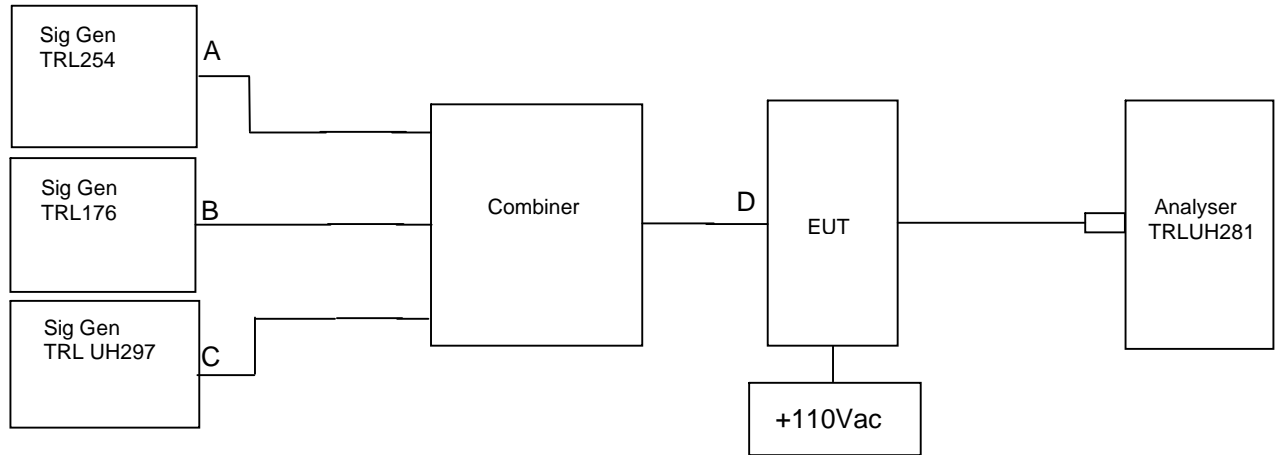


Date: 11.APR.2011 10:07:15

**AMPLIFIER INTERMODULATION SPURIOUS EMISSIONS – CONDUCTED – PART 2.1053  
UHF HIGH BAND UPLINK**

Ambient temperature = 22°C  
Relative humidity = 42%  
Supply voltage = +110Vac

Radio Laboratory



The intermodulation and spurious products were measured with the amplifier operating at maximum gain. A three tone test was conducted using the equipment as above. The input power level was adjusted so the level at point D was 10dB above the maximum input of -56.00dBm. The cable and attenuator loss between the EUT and the spectrum analyser was 36.1dB.

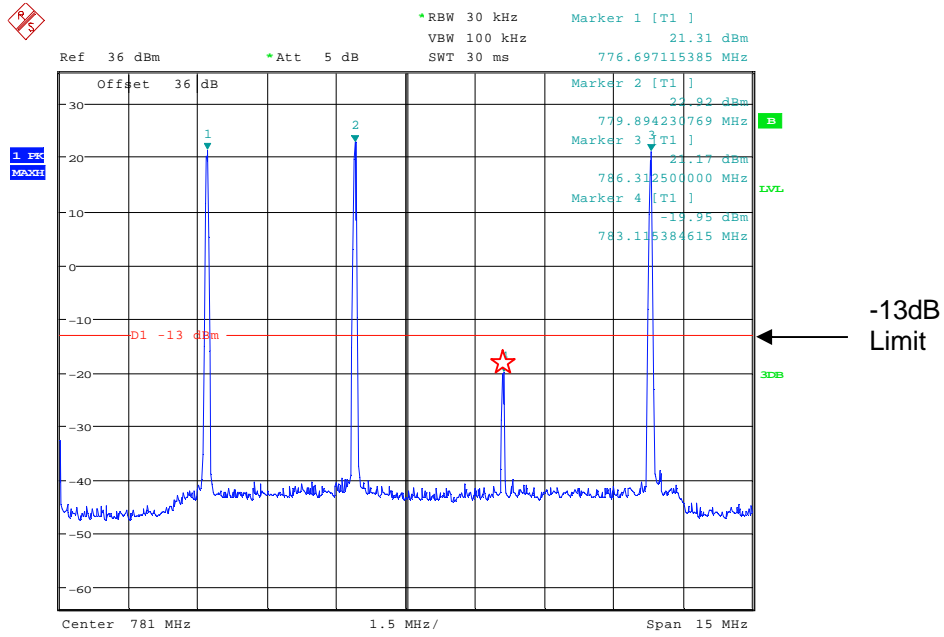
RF Input Frequency (MHz)			Highest Intermodulation Product Level (dBm)	Limit (dBm)
776.700	779.894	786.300	-19.95dBm@783.115MHz	-13

Sweep data is shown on the next page:

Test equipment used for intermodulation test

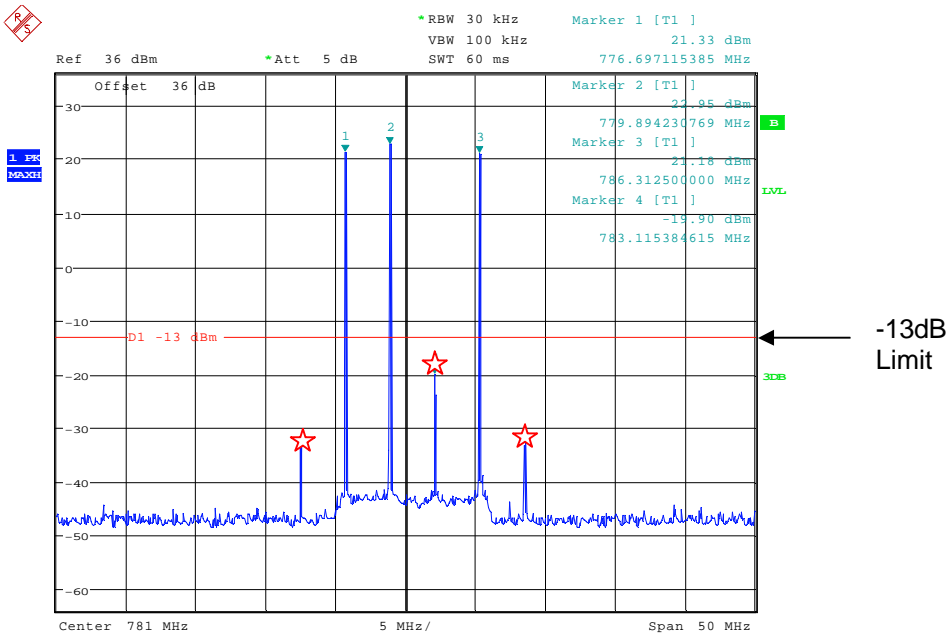
TYPE OF EQUIPMENT	MAKER/SUPPLIER	MODEL No	SERIAL No	TRL No	ACTUAL EQUIPMENT USED
SPECTRUM ANALYSER	R&S	FSU46	200034	UH281	<b>X</b>
SIGNAL GENERATOR	MARCONI	2042	119562/021	254	<b>X</b>
SIGNAL GENERATOR	R&S	SML 03	102268	UH297	<b>X</b>
SIGNAL GENERATOR	RHODE & SCHWARZ	Vector Signal Generator	255812	916	<b>X</b>
COMBINER	ELCOM	RC-4-50	N/A	170	<b>X</b>
CABLE	TRL	N/A	N/A	UH271	<b>X</b>
CABLE	TRL	N/A	N/A	UH272	<b>X</b>
CABLE	TRL	N/A	N/A	UH273	<b>X</b>
CABLE	TRL	N/A	N/A	UH269	<b>X</b>

### Intermodulation Close View



Date: 11.APR.2011 09:42:49

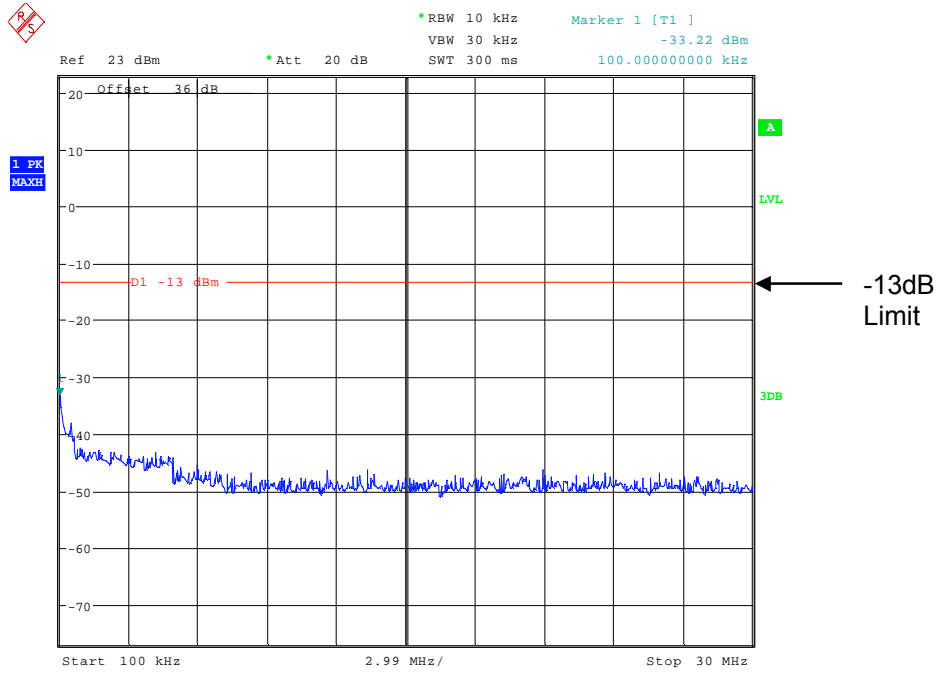
### Intermodulation Wide View



Date: 11.APR.2011 09:43:32

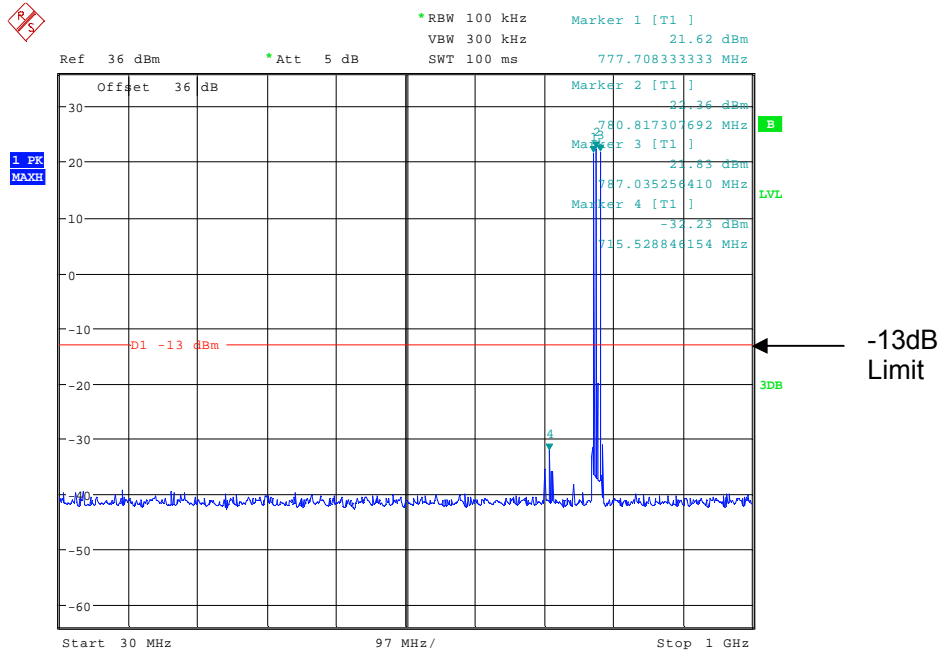
The above plots show that all products (designated by ☆) are below the spurious limit.

100kHz – 30MHz



Date: 11.APR.2011 09:55:17

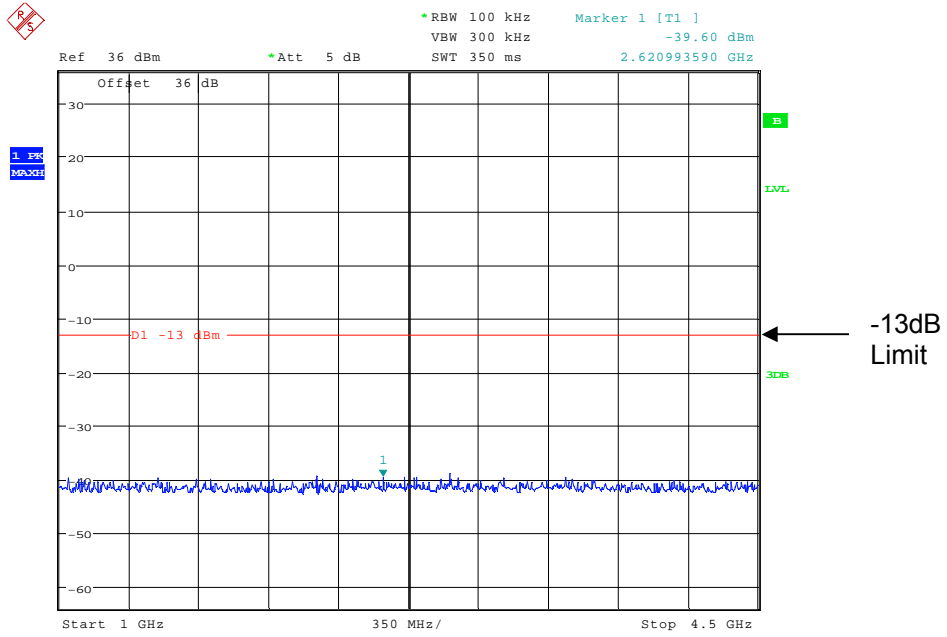
30MHz – 1GHz



Date: 11.APR.2011 09:54:48

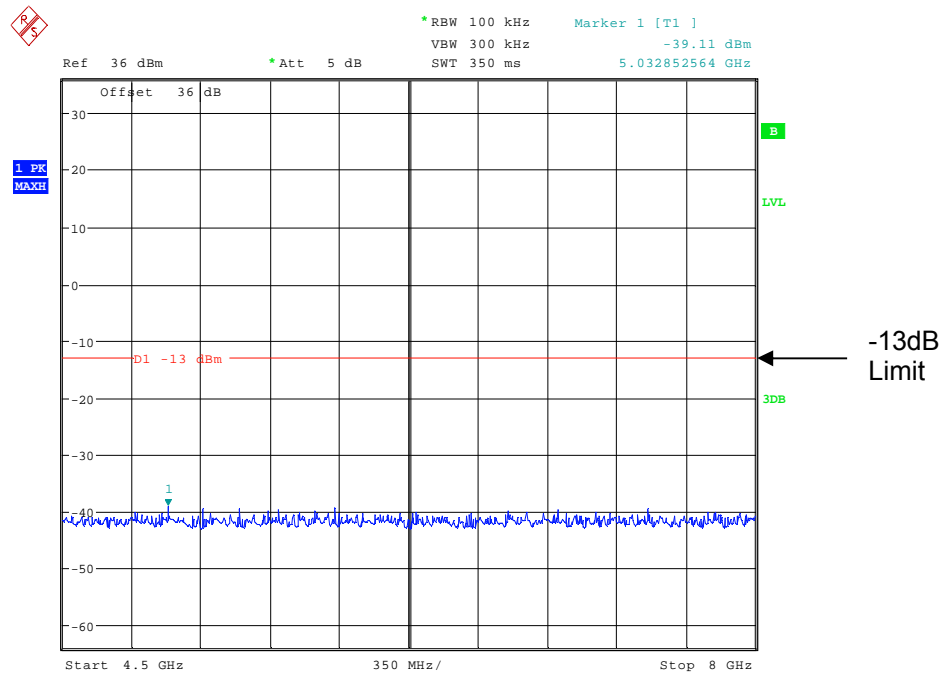


# 1GHz – 4.5GHz



Date: 11.APR.2011 09:55:57

# 4.5GHz – 8GHz



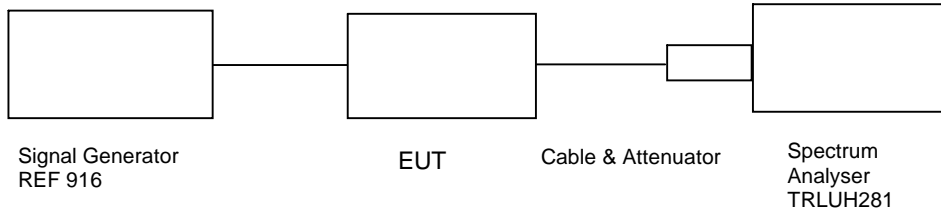
Date: 11.APR.2011 09:56:17

## TRANSMITTER TESTS

### AMPLIFIER MODULATED CHANNEL TEST – CONDUCTED – Part 2.1049 UHF LOW BAND UPLINK

Ambient temperature = 22°C  
 Relative humidity = 42%  
 Supply voltage = +110Vac  
 Channel number = See test results

Radio Laboratory



This test was performed to show that the amplifier does not alter the input signal in any way. The input signal was set to the maximum input and modulated with a LTE tone. The plots show the signal measured at the signal generator and the signal measured at the output of the EUT.

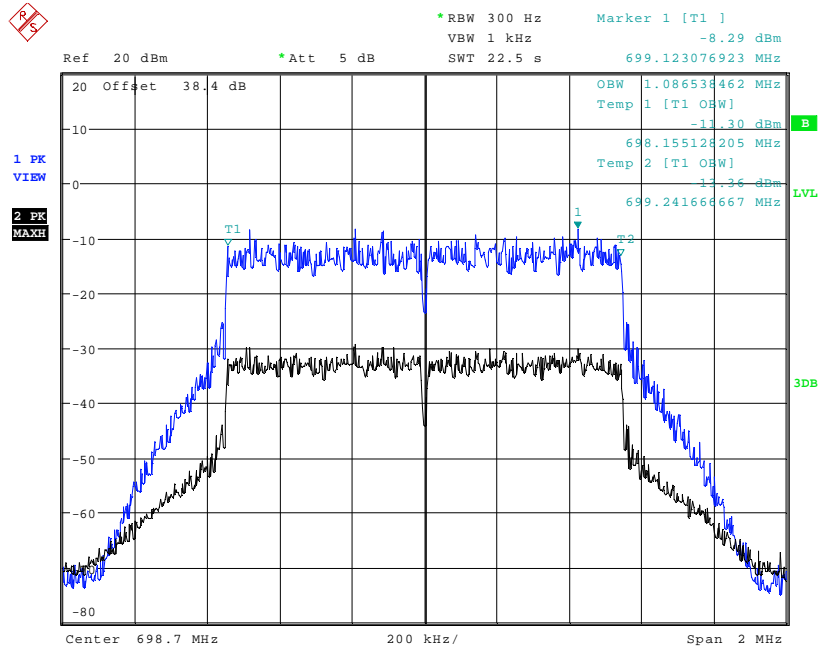
Note: The cables and attenuators had the following losses.

1. Cable and attenuator between EUT and spectrum analyser 36.1dB
2. Cable between signal generator and EUT 0.35dB
3. See Table below for 99% Power Occupied Bandwidth

Frequency Of Operation Channel	LTE Modulation				
	99% Bandwidth	1.4MHz deviation	3MHz deviation	5MHz deviation	10MHz deviation
698.700MHz	1.086538MHz	2.697115MHz	4.487179MHz	8.926282MHz	13.365384MHz
707.000MHz	1.088942MHz	2.701923MHz	4.479166MHz	8.942307MHz	13.365384MHz
715.300MHz	1.086538MHz	2.697115MHz	4.495192MHz	8.958333MHz	13.389423MHz

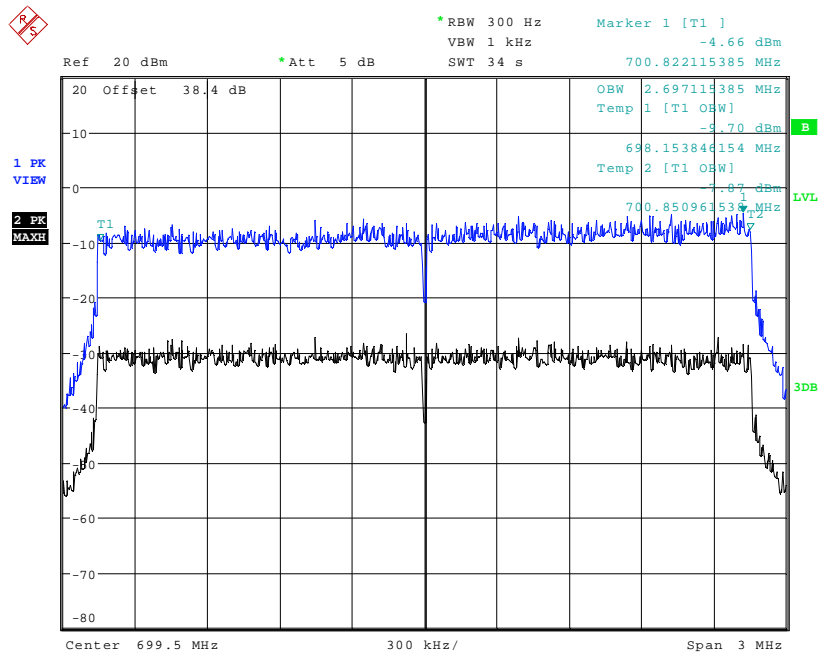
TYPE OF EQUIPMENT	MAKER/SUPPLIER	MODEL No	SERIAL No	TRL No	ACTUAL EQUIPMENT USED
SPECTRUM ANALYSER	RHODE & SCHWARZ	FSU46	200034	UH281	<b>X</b>
ATTENUATOR	BIRD	8308-200-N	N/A	103	<b>X</b>
ATTENUATOR	BIRD	8304-100-N	N/A	222	<b>X</b>
CABLE	TRL	N/A	N/A	UH271	<b>X</b>
CABLE	TRL	N/A	N/A	UH272	<b>X</b>
CABLE	TRL	N/A	N/A	UH273	<b>X</b>
SIGNAL GENERATOR	RHODE & SCHWARZ	Vector Signal Generator	255812	916	<b>X</b>

698.700 MHz Signal Generator, and EUT deviation set to 1.4MHz LTE



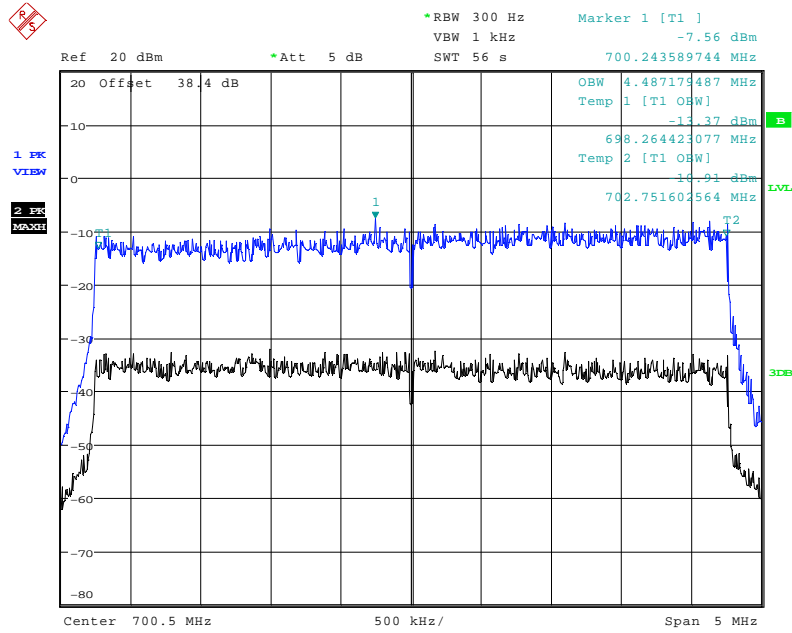
Date: 13.APR.2011 08:54:23

698.700 MHz Signal Generator, and EUT deviation set to 3MHz LTE



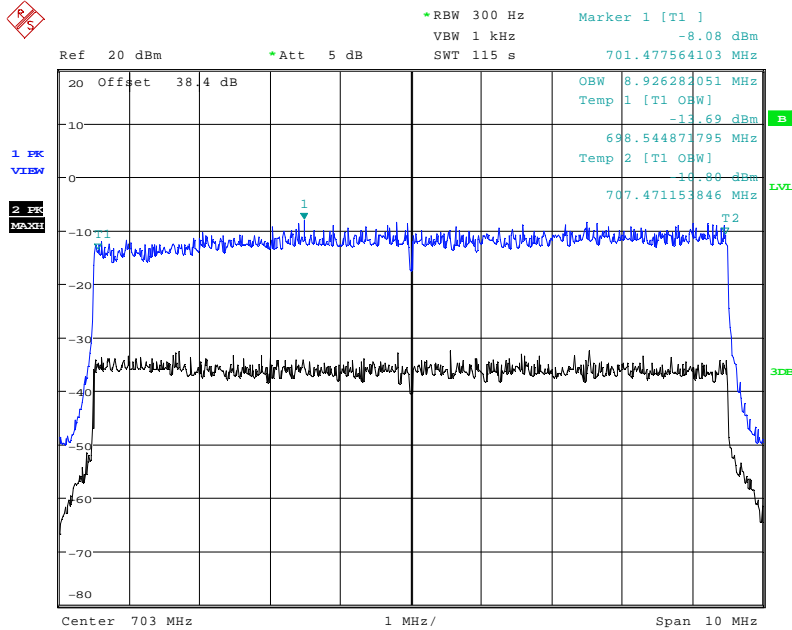
Date: 13.APR.2011 09:03:28

698.700 MHz Signal Generator, and EUT deviation set to 5MHz LTE



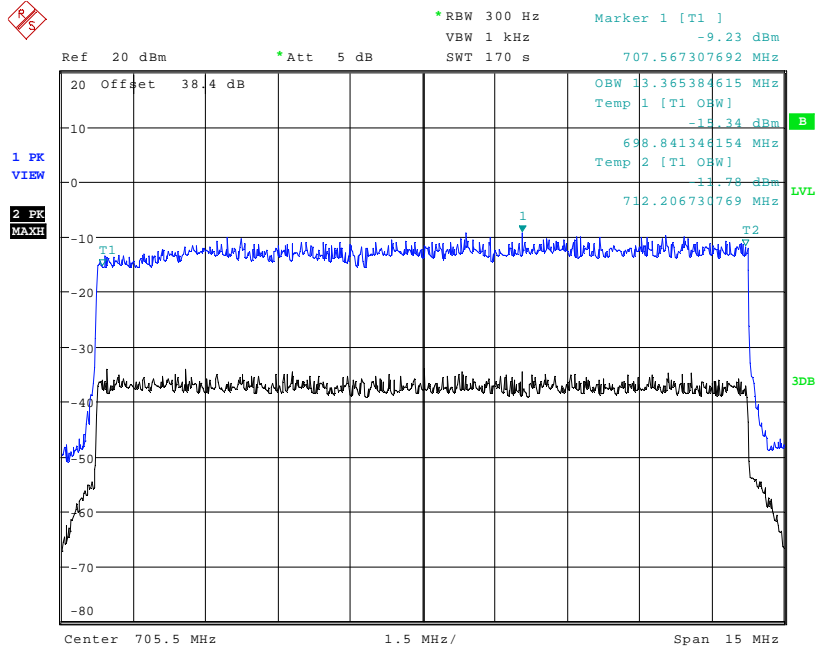
Date: 13.APR.2011 09:23:24

698.700 MHz Signal Generator, and EUT deviation set to 10MHz LTE



Date: 13.APR.2011 09:30:44

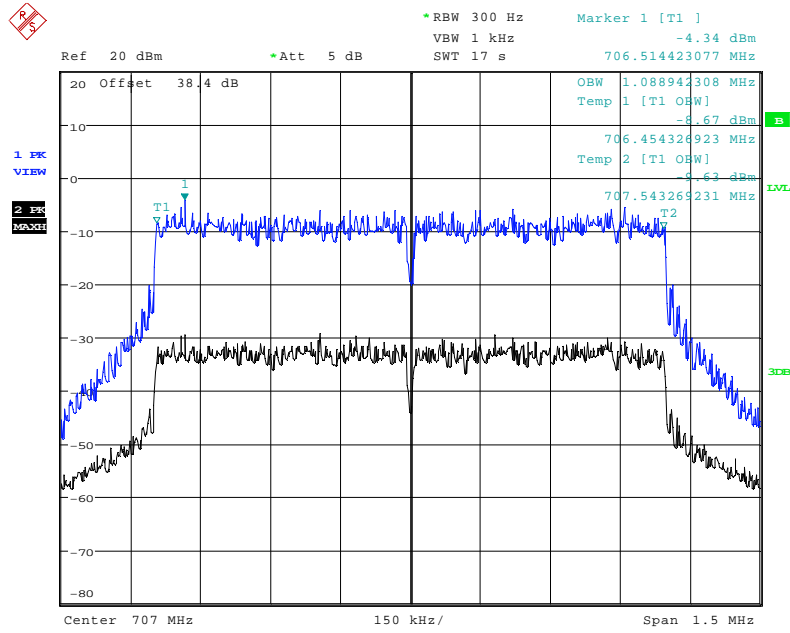
698.700 MHz Signal Generator, and EUT deviation set to 15MHz LTE



Date: 13.APR.2011 09:39:05

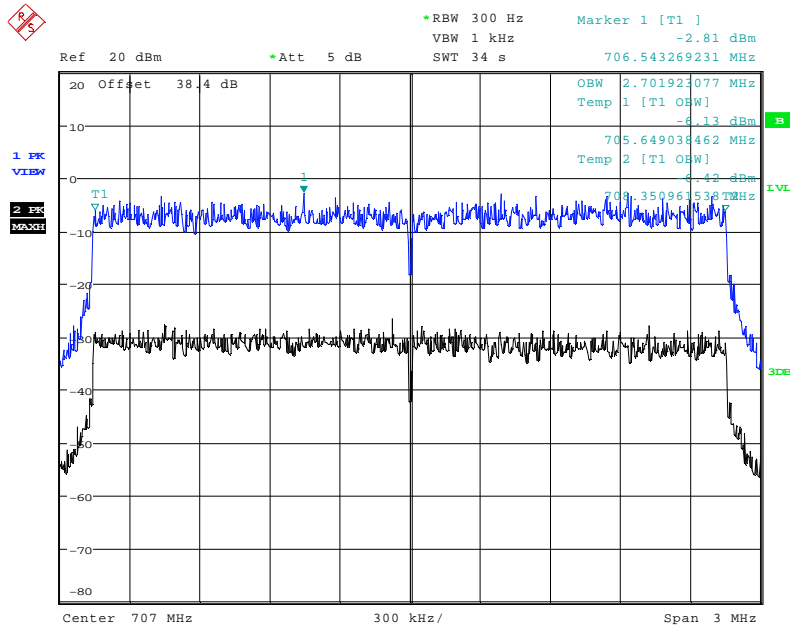
The above plots depicting the output waveshape show no measurable distortion visible when compared to the input signal.

707.000 MHz Signal Generator, and EUT deviation set to 1.4MHz LTE



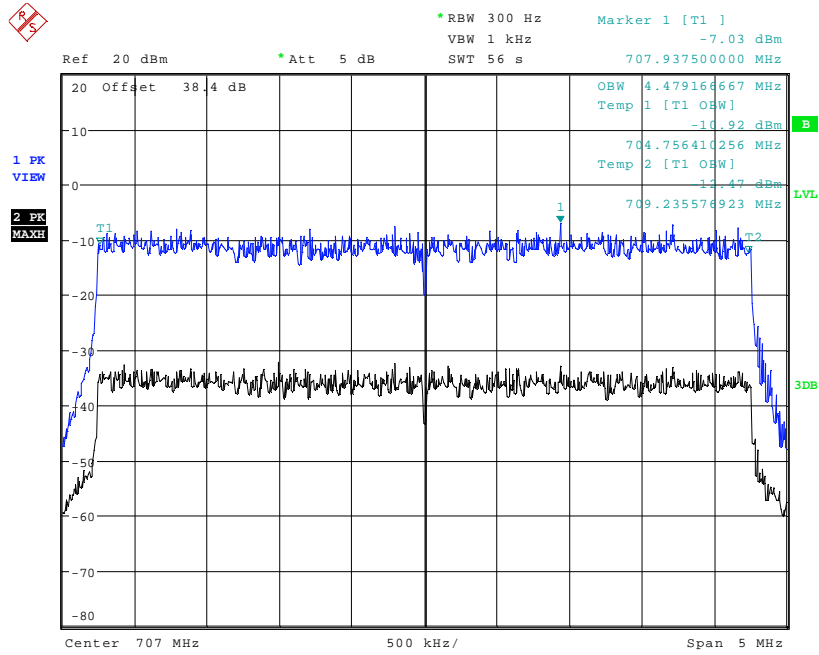
Date: 13.APR.2011 09:45:12

707.000 MHz Signal Generator, and EUT deviation set to 3MHz LTE



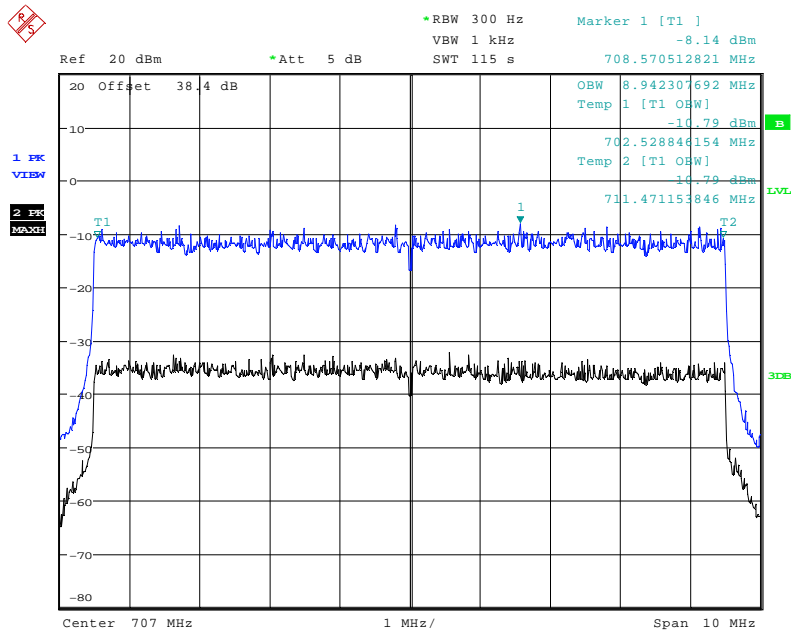
Date: 13.APR.2011 09:54:23

### 707.000 MHz Signal Generator, and EUT deviation set to 5MHz LTE



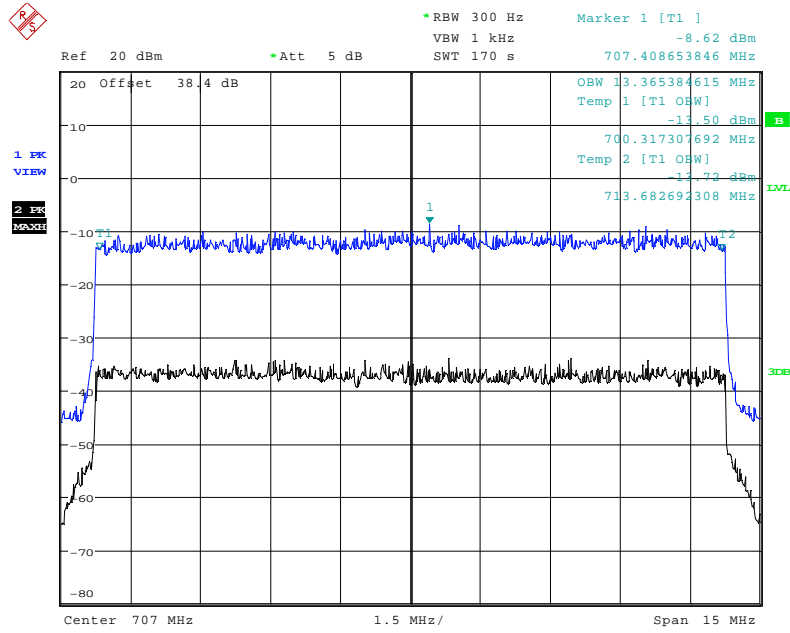
Date: 13.APR.2011 09:57:49

### 707.000 MHz Signal Generator, and EUT deviation set to 10MHz LTE



Date: 13.APR.2011 10:04:16

# 707.000 MHz Signal Generator, and EUT deviation set to 15MHz LTE

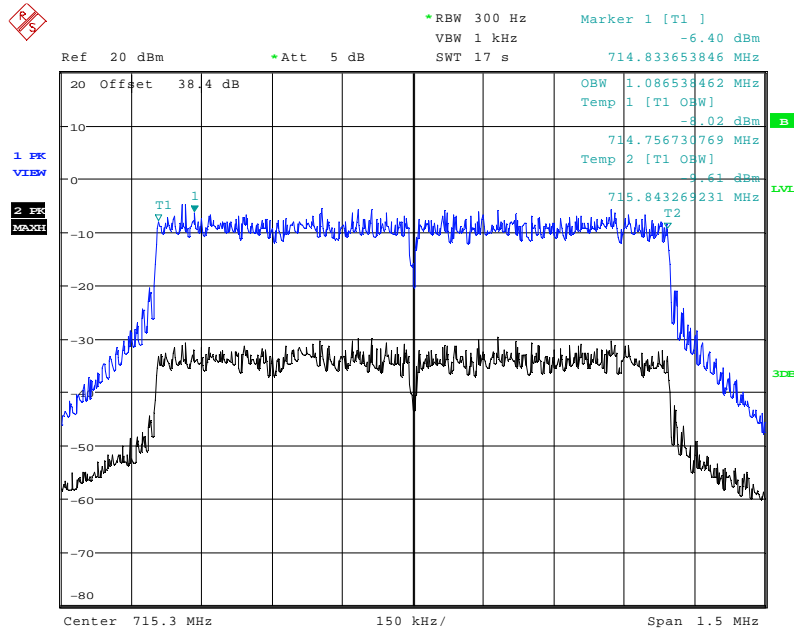


Date: 13.APR.2011 10:12:35

The above plots depicting the output wavelshape show no measurable distortion visible when compared to the input signal.

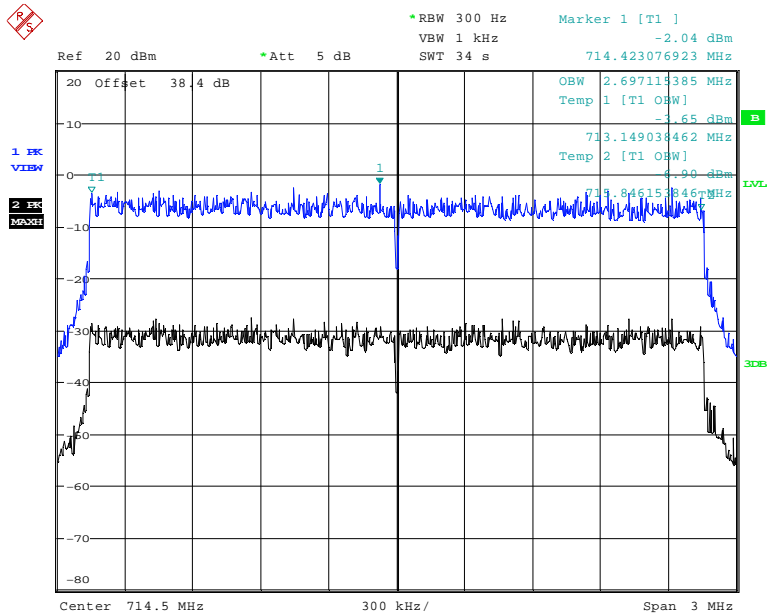


715.300 MHz Signal Generator, and EUT deviation set to 1.4MHz LTE



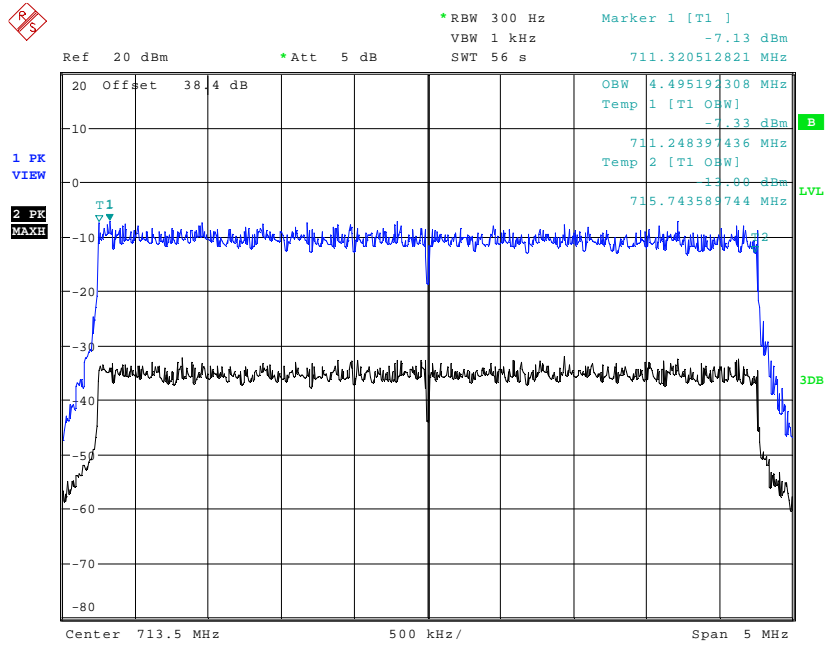
Date: 13.APR.2011 10:17:34

715.300 MHz Signal Generator, and EUT deviation set to 3MHz LTE



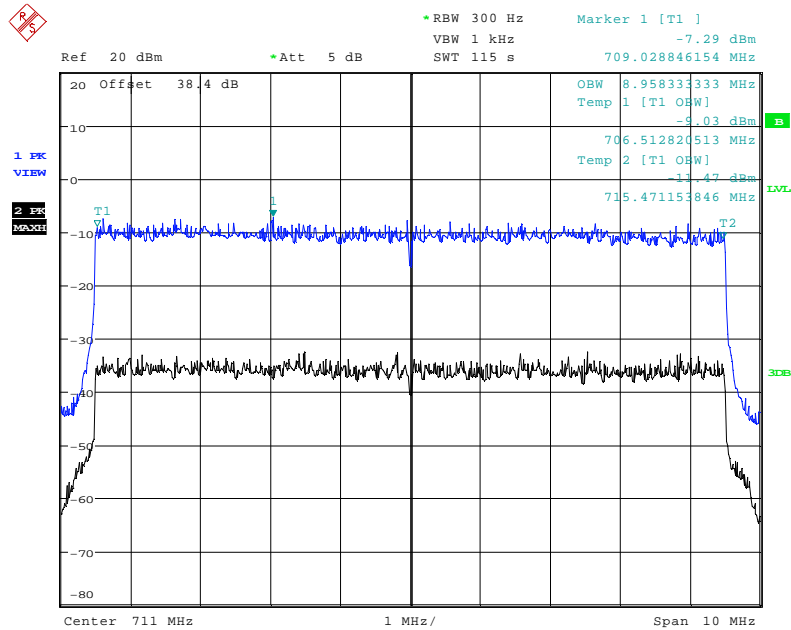
Date: 13.APR.2011 10:21:33

### 715.300 MHz Signal Generator, and EUT deviation set to 5MHz LTE



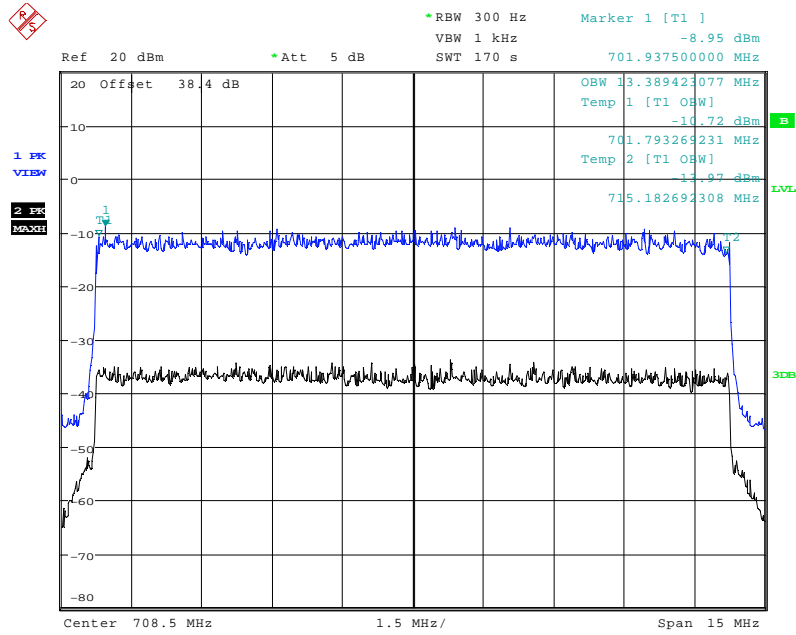
Date: 13.APR.2011 10:27:00

### 715.300 MHz Signal Generator, and EUT deviation set to 10MHz LTE



Date: 13.APR.2011 10:35:42

715.300 MHz Signal Generator, and EUT deviation set to 15MHz LTE



Date: 13.APR.2011 10:50:10

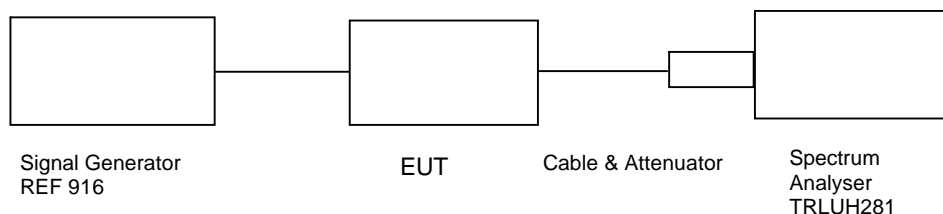
The above plots depicting the output wavseshape show no measurable distortion visible when compared to the input signal.

## TRANSMITTER TESTS

### AMPLIFIER MODULATED CHANNEL TEST – CONDUCTED – Part 2.1049 UHF HIGH BAND UPLINK

Ambient temperature = 22°C  
 Relative humidity = 42%  
 Supply voltage = +110Vac  
 Channel number = See test results

Radio Laboratory



This test was performed to show that the amplifier does not alter the input signal in any way. The input signal was set to the maximum input and modulated with a LTE tone. The plots show the signal measured at the signal generator and the signal measured at the output of the EUT.

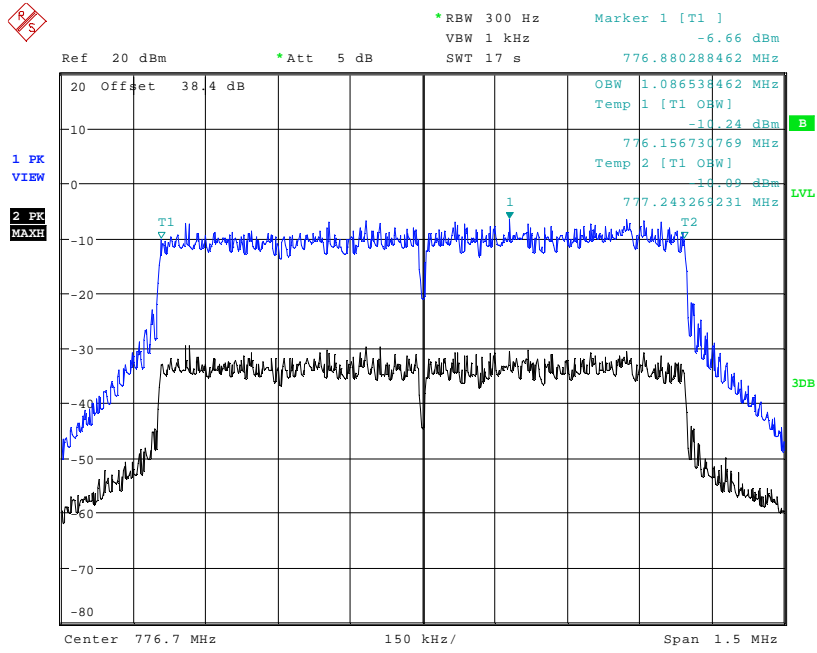
Note: The cables and attenuators had the following losses.

1. Cable and attenuator between EUT and spectrum analyser 36.10dB
2. Cable between signal generator and EUT 0.28dB
3. See Table below for 99% Power Occupied Bandwidth

Frequency Of Operation Channel	LTE Modulation			
	99% Bandwidth	1.4MHz deviation	3MHz deviation	5MHz deviation
776.700MHz	1.086538MHz	2.697115MHz	4.471153MHz	8.958333MHz
781.500MHz	1.086538MHz	2.697115MHz	4.487179MHz	8.942307MHz
786.300MHz	1.086538MHz	2.697115MHz	4.487179MHz	8.958333MHz

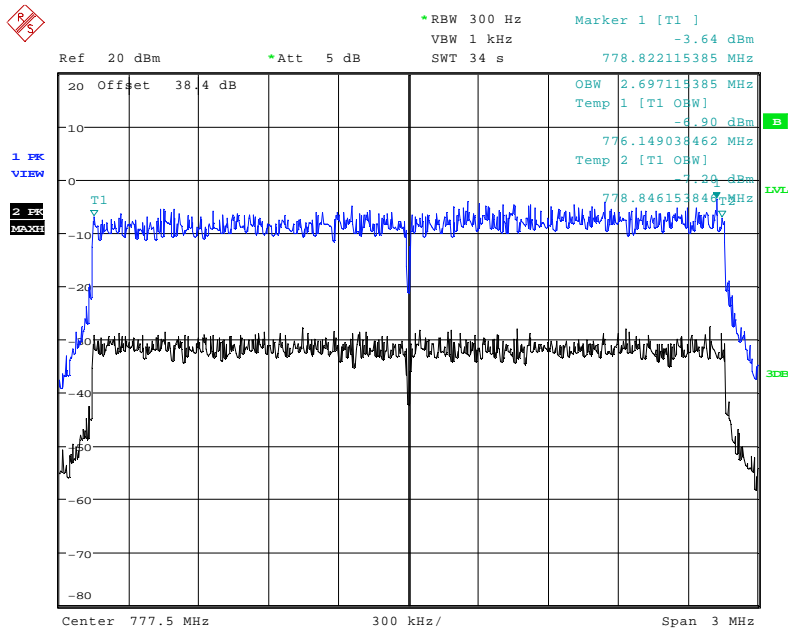
TYPE OF EQUIPMENT	MAKER/SUPPLIER	MODEL No	SERIAL No	TRL No	ACTUAL EQUIPMENT USED
SPECTRUM ANALYSER	RHODE & SCHWARZ	FSU46	200034	UH281	<b>X</b>
ATTENUATOR	BIRD	8308-200-N	N/A	103	<b>X</b>
ATTENUATOR	BIRD	8304-100-N	N/A	222	<b>X</b>
CABLE	TRL	N/A	N/A	UH271	<b>X</b>
CABLE	TRL	N/A	N/A	UH272	<b>X</b>
CABLE	TRL	N/A	N/A	UH273	<b>X</b>
SIGNAL GENERATOR	RHODE & SCHWARZ	Vector Signal Generator	255812	916	<b>X</b>

776.700 MHz Signal Generator, and EUT deviation set to 1.4MHz LTE



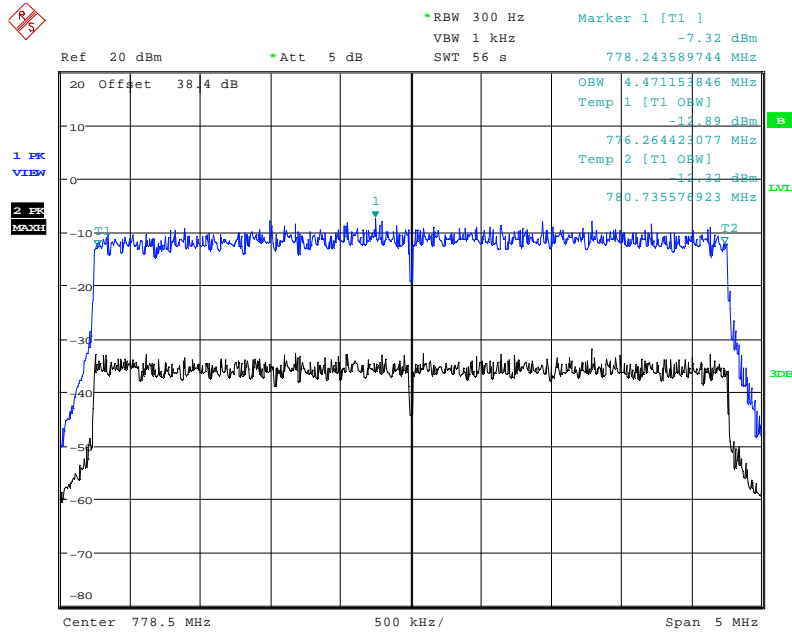
Date: 13.APR.2011 10:55:51

776.700 MHz Signal Generator, and EUT deviation set to 3MHz LTE



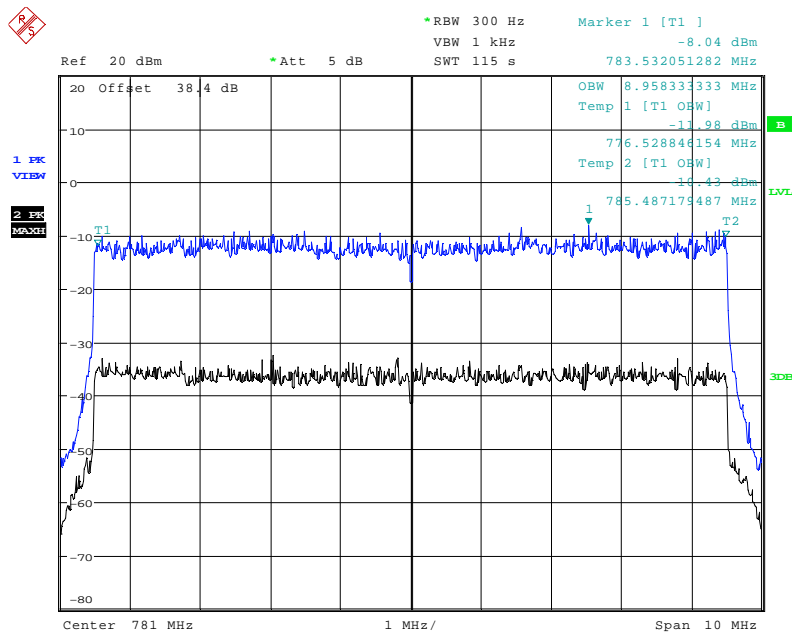
Date: 13.APR.2011 10:58:35

776.700 MHz Signal Generator, and EUT deviation set to 5MHz LTE



Date: 13.APR.2011 11:06:12

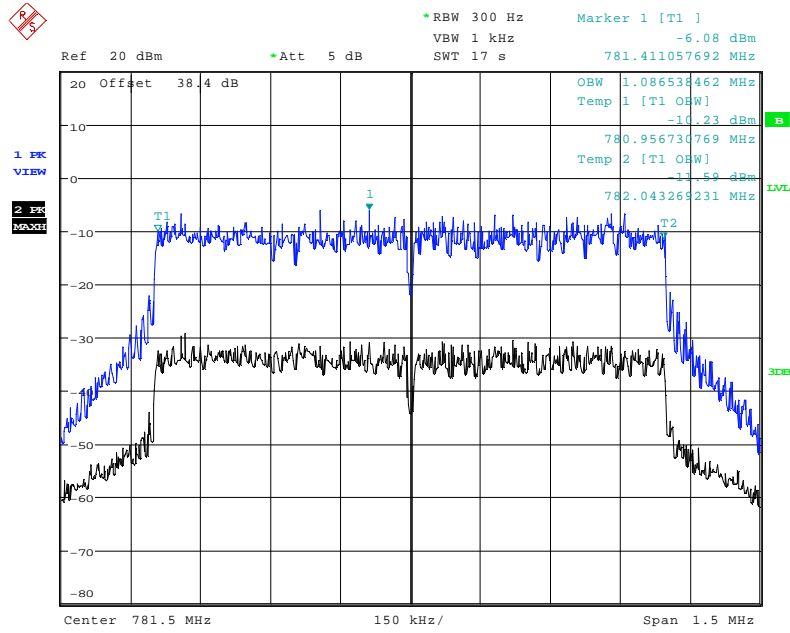
776.700 MHz Signal Generator, and EUT deviation set to 10MHz LTE



Date: 13.APR.2011 11:12:58

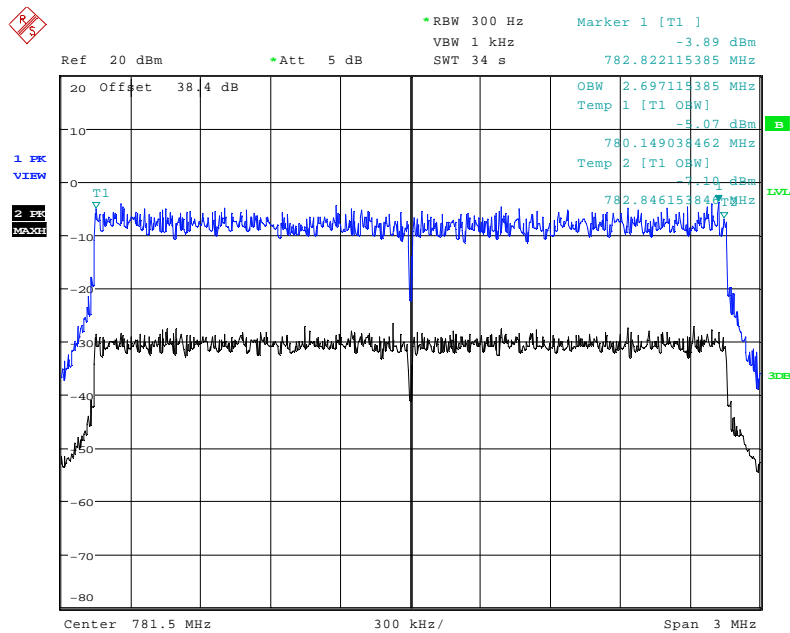
The above plots depicting the output wavelshape show no measurable distortion visible when compared to the input signal.

### 781.500 MHz Signal Generator, and EUT deviation set to 1.4MHz LTE



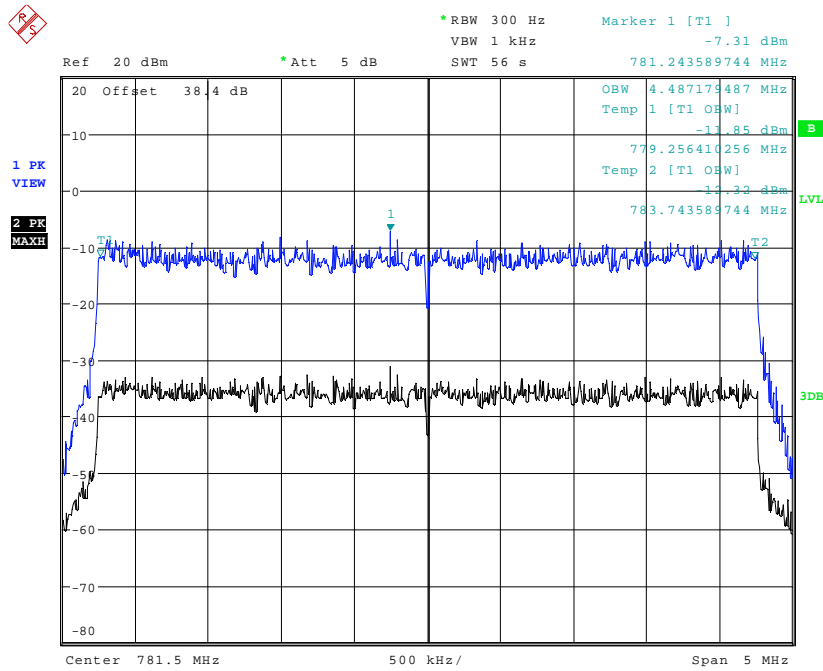
Date: 13.APR.2011 11:18:04

### 781.500 MHz Signal Generator, and EUT deviation set to 3MHz LTE



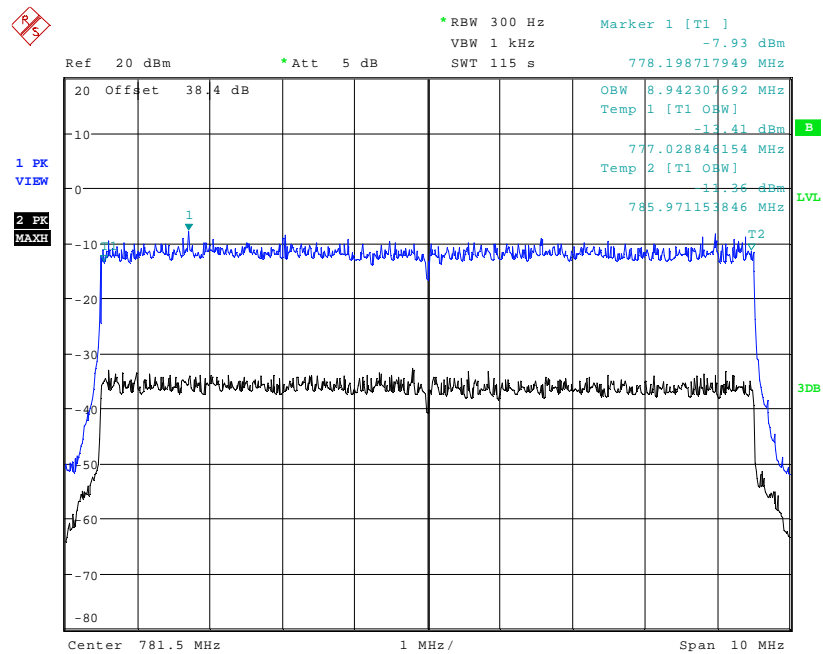
Date: 13.APR.2011 11:25:58

### 781.500 MHz Signal Generator, and EUT deviation set to 5MHz LTE



Date: 13.APR.2011 11:30:57

### 781.500 MHz Signal Generator, and EUT deviation set to 10MHz LTE

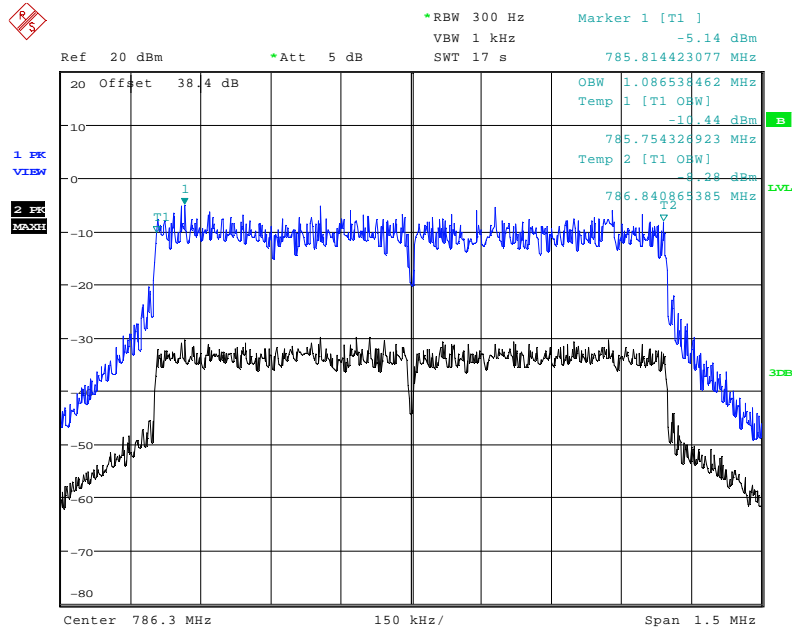


Date: 13.APR.2011 11:38:27

The above plots depicting the output waweshape show no measurable distortion visible when compared to the input signal.

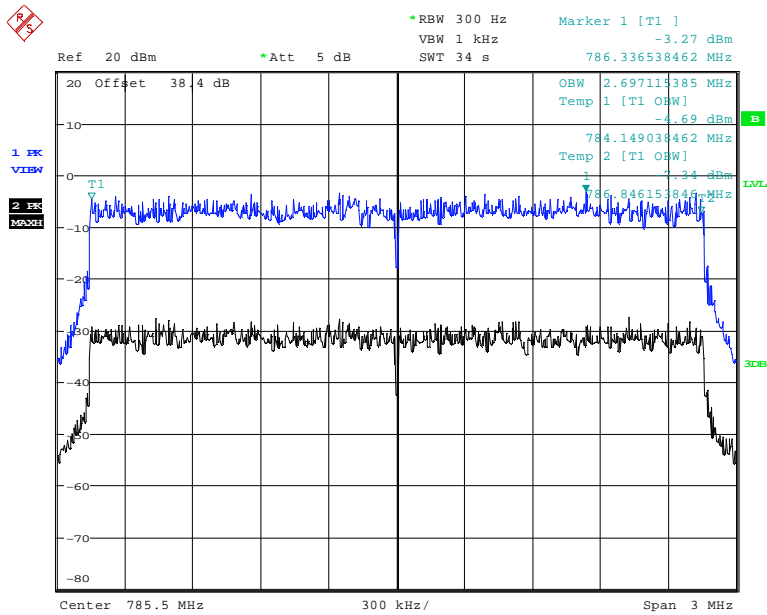


786.300 MHz Signal Generator, and EUT deviation set to 1.4MHz LTE



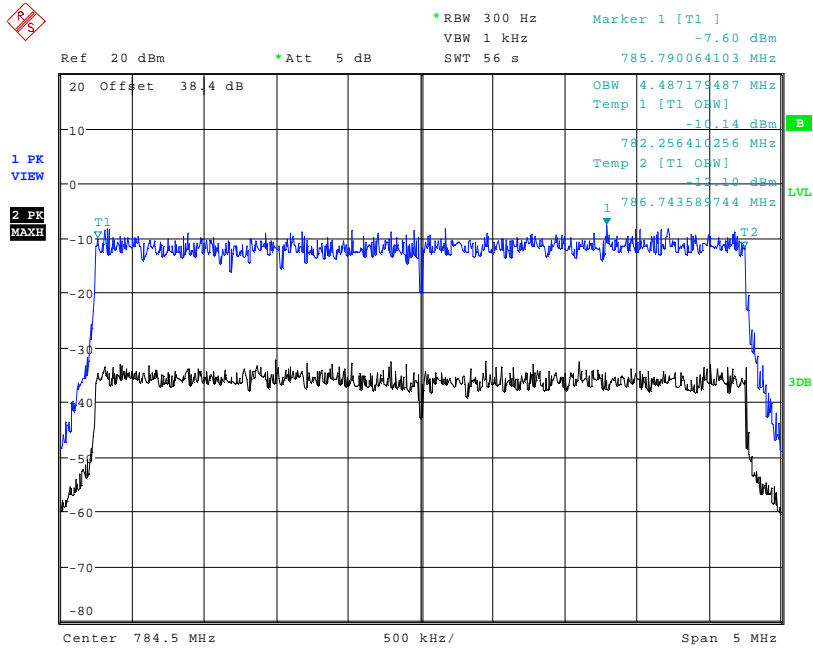
Date: 13.APR.2011 11:41:17

786.300 MHz Signal Generator, and EUT deviation set to 3MHz LTE



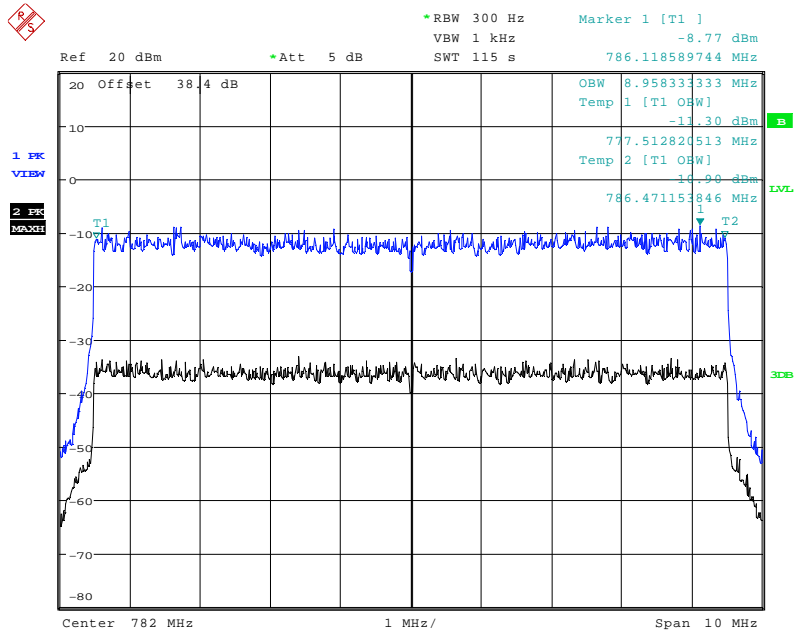
Date: 13.APR.2011 11:45:21

### 786.300 MHz Signal Generator, and EUT deviation set to 5MHz LTE



Date: 13.APR.2011 11:49:40

### 786.300 MHz Signal Generator, and EUT deviation set to 10MHz LTE



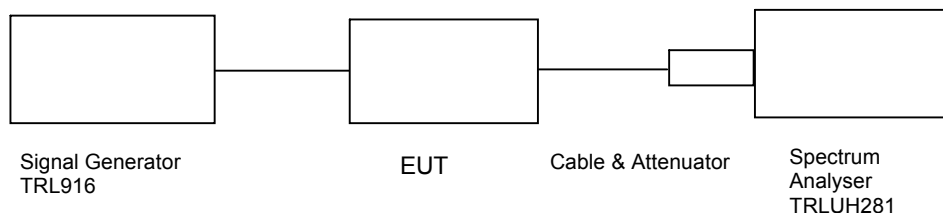
Date: 13.APR.2011 11:55:10

The above plots depicting the output waveshape show no measurable distortion visible when compared to the input signal.

## TRANSMITTER TESTS

### AMPLIFIER SPURIOUS EMISSIONS – CONDUCTED – Part 2.1053 UHF LOW BAND UPLINK

Ambient temperature	= 22°C	Radio Laboratory	
Relative humidity	= 42%	Test Signal	= F3E
Supply voltage	= +110Vac		



The test was set up as per the diagram. The level at the input was adjusted to compensate for the loss of the interconnecting cable. The unit was tested operating at maximum power and on three test frequencies.

The Spurious limit was calculated as follows:

On any frequency removed from the assigned frequency by more than 250% of the authorised bandwidth

At least 43 + 10 log PdB

$$(10 \log P_{\text{watts}}) - (43 + 10 \log (P_{\text{watts}} * 1000)) = \text{LIMIT} = -13 \text{ dBm}$$

## RESULTS

FREQUENCY RANGE	FREQ. (MHz)	MEASURED LEVEL (dBm)	ATTENUATOR & CABLE LOSSES (dB)	EMISSION LEVEL (dBm)	LIMIT (dBm)
100kHz – 8GHz	No Significant Emissions Within 20dB of Limit				-13

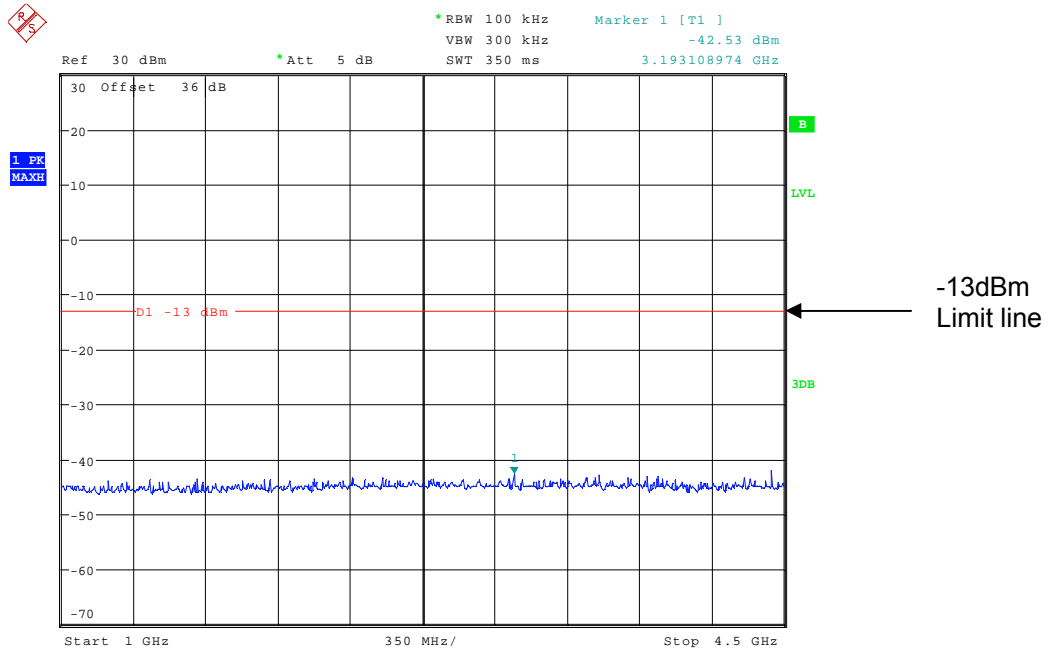
The test equipment used for the Transmitter Conducted Emissions:

TYPE OF EQUIPMENT	MAKER/SUPPLIER	MODEL No	SERIAL No	TRL No	ACTUAL EQUIPMENT USED
SPECTRUM ANALYSER	RHODE & SCHWARZ	FSU46	200034	UH281	<b>X</b>
ATTENUATOR	BIRD	8308-200-N	N/A	103	<b>X</b>
ATTENUATOR	BIRD	8304-100-N	N/A	222	<b>X</b>
CABLE	TRL	N/A	N/A	UH271	<b>X</b>
CABLE	TRL	N/A	N/A	UH272	<b>X</b>
CABLE	TRL	N/A	N/A	UH273	<b>X</b>
SIGNAL GENERATOR	RHODE & SCHWARZ	Vector Signal Generator	255812	916	<b>X</b>



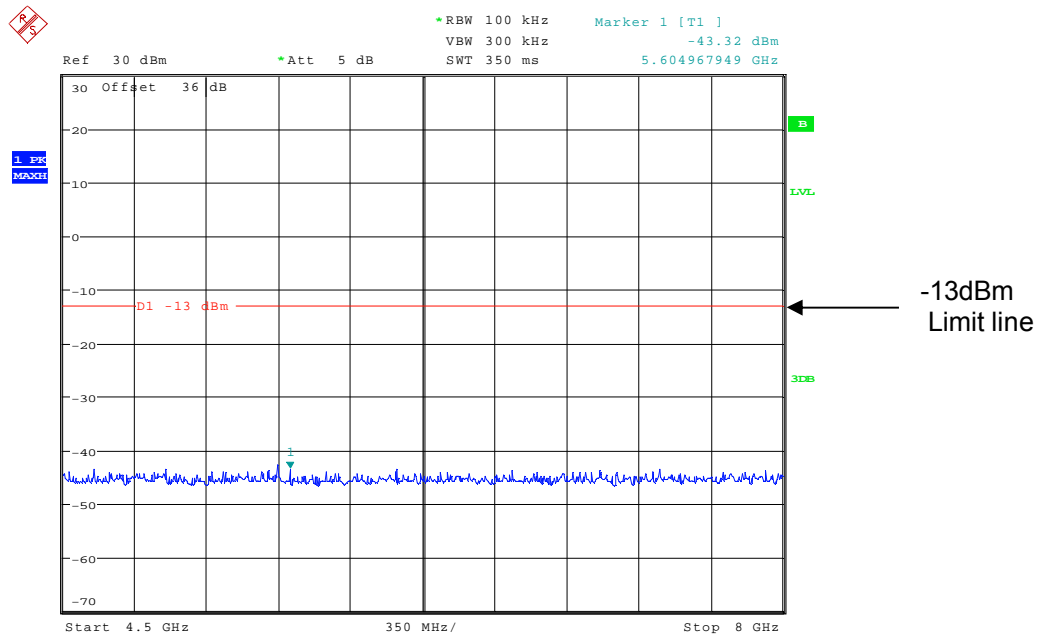
# Conducted emissions Bottom Channel

698.700MHz 1GHz – 4.5GHz



Date: 8.APR.2011 13:04:59

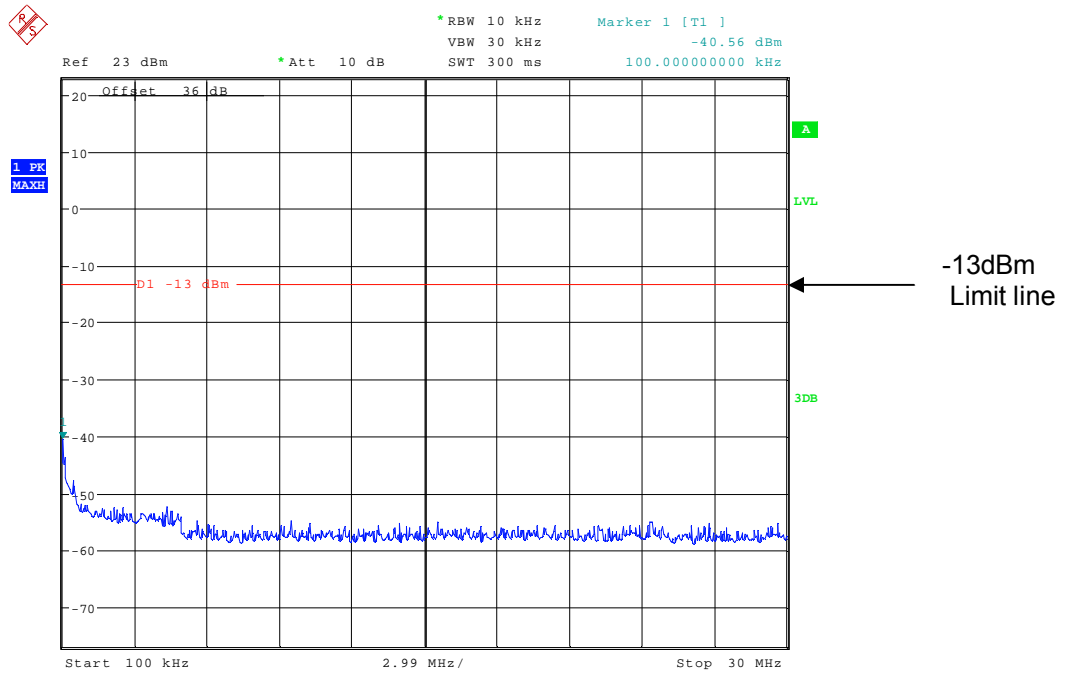
698.700MHz 4.5GHz – 8GHz



Date: 8.APR.2011 13:05:42

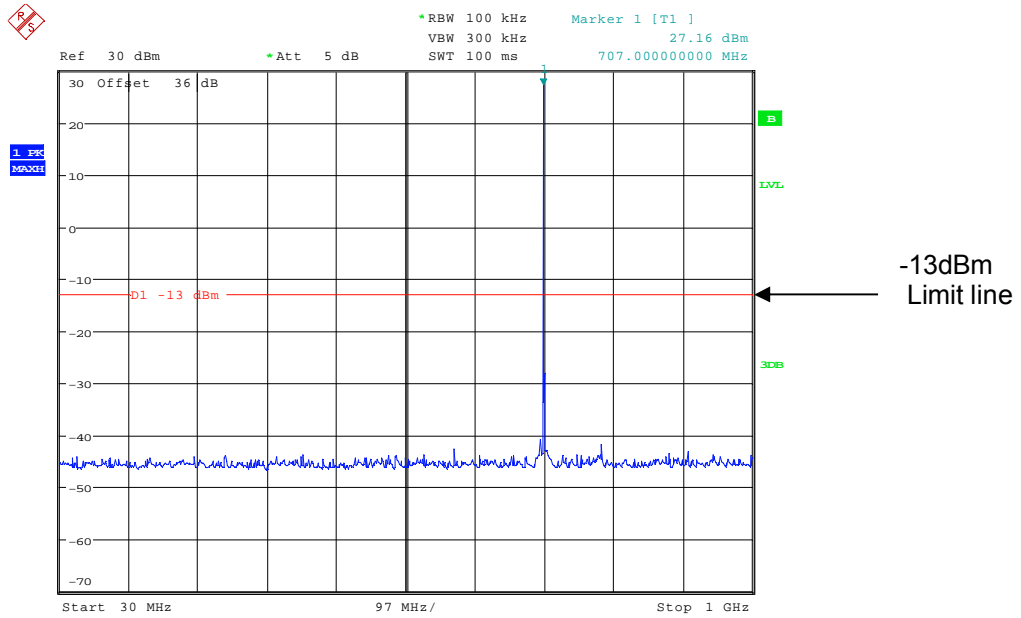
# Conducted emissions Middle Channel

707.00MHz 100kHz – 30MHz



Date: 8.APR.2011 13:09:38

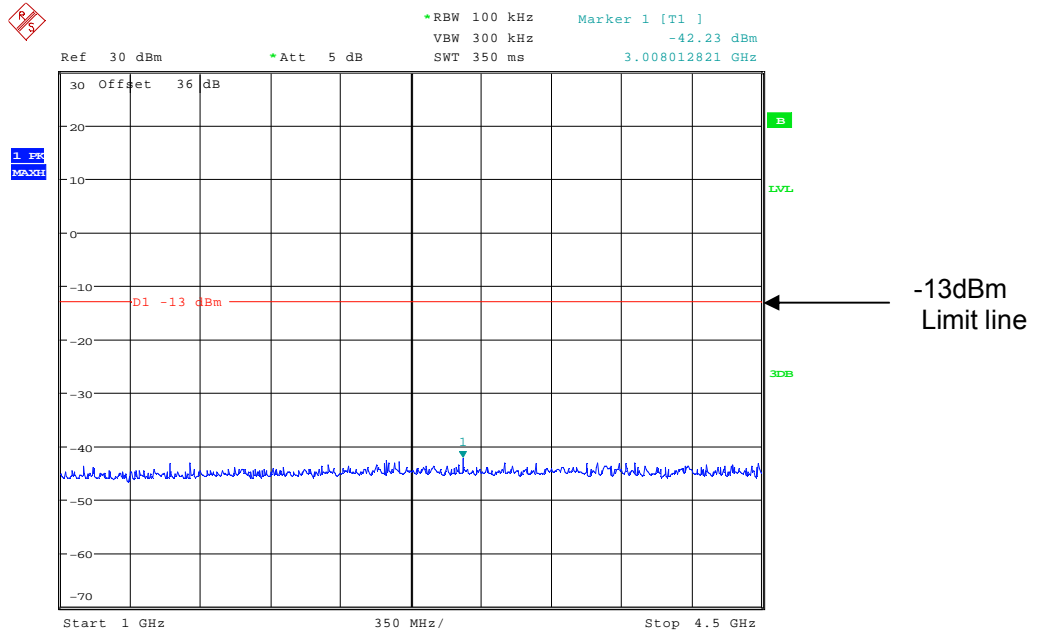
707.00MHz 30MHz – 1GHz



Date: 8.APR.2011 13:10:31

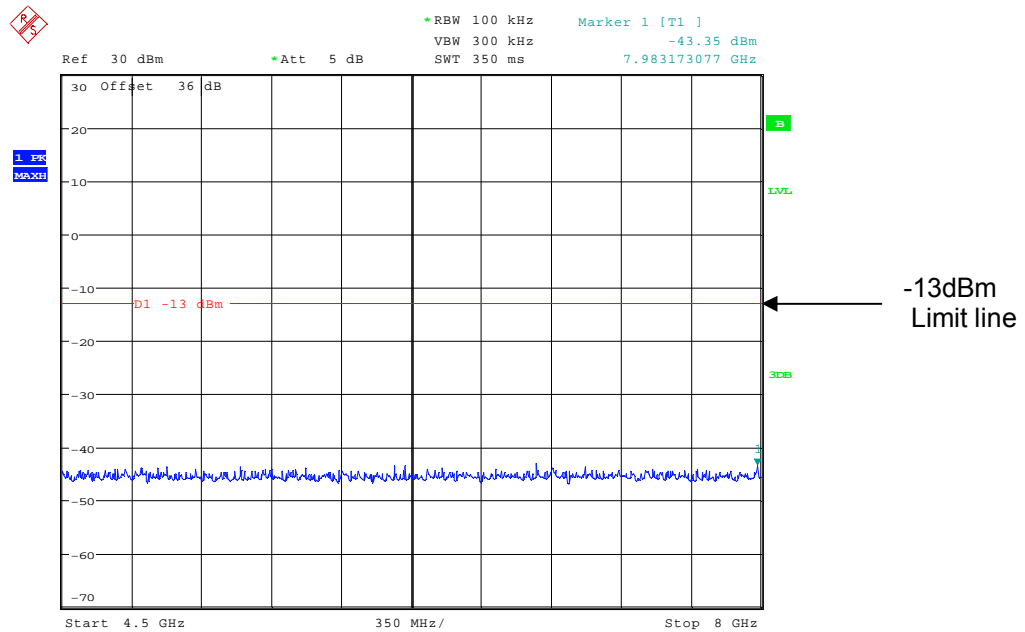
### Conducted emissions Middle Channel

707.00MHz 1GHz – 4.5GHz



Date: 8.APR.2011 13:11:26

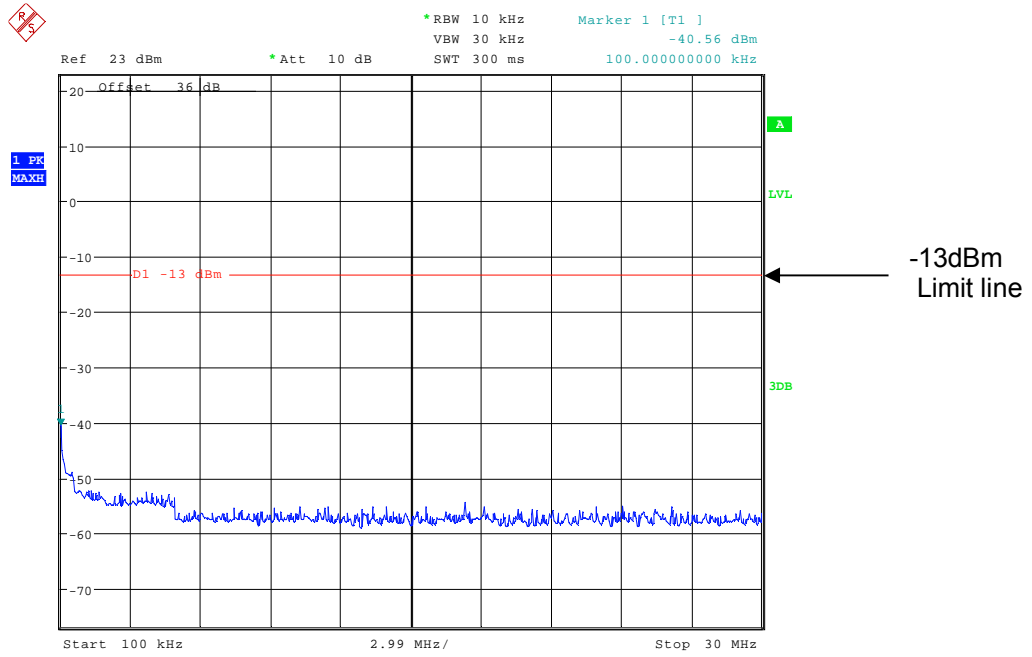
707.00MHz 4.5GHz – 8GHz



Date: 8.APR.2011 13:11:54

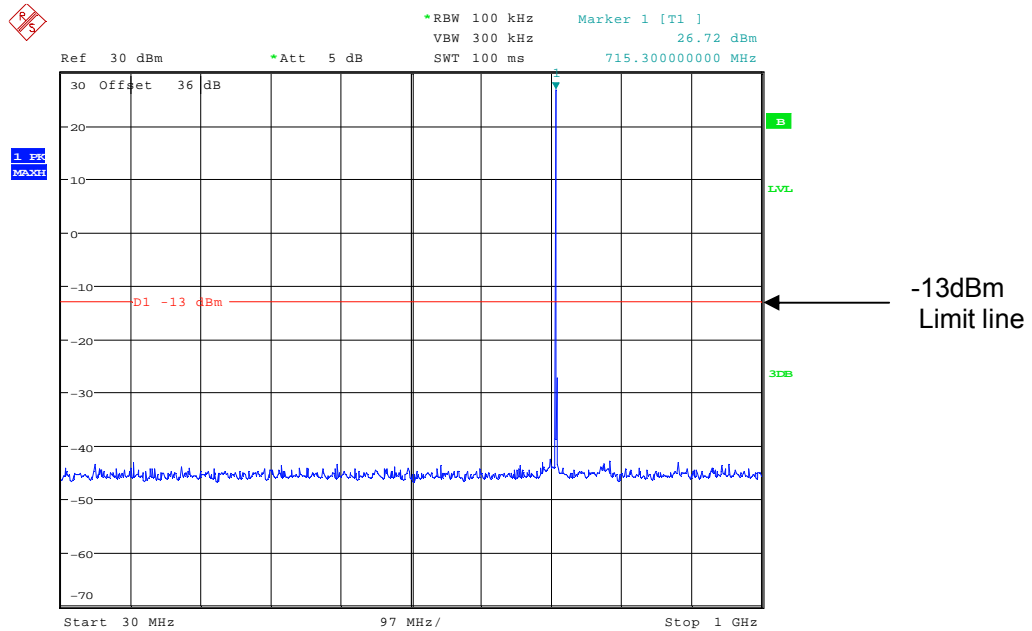
# Conducted emissions Top Channel

715.300MHz 100kHz – 30MHz



Date: 8.APR.2011 13:16:03

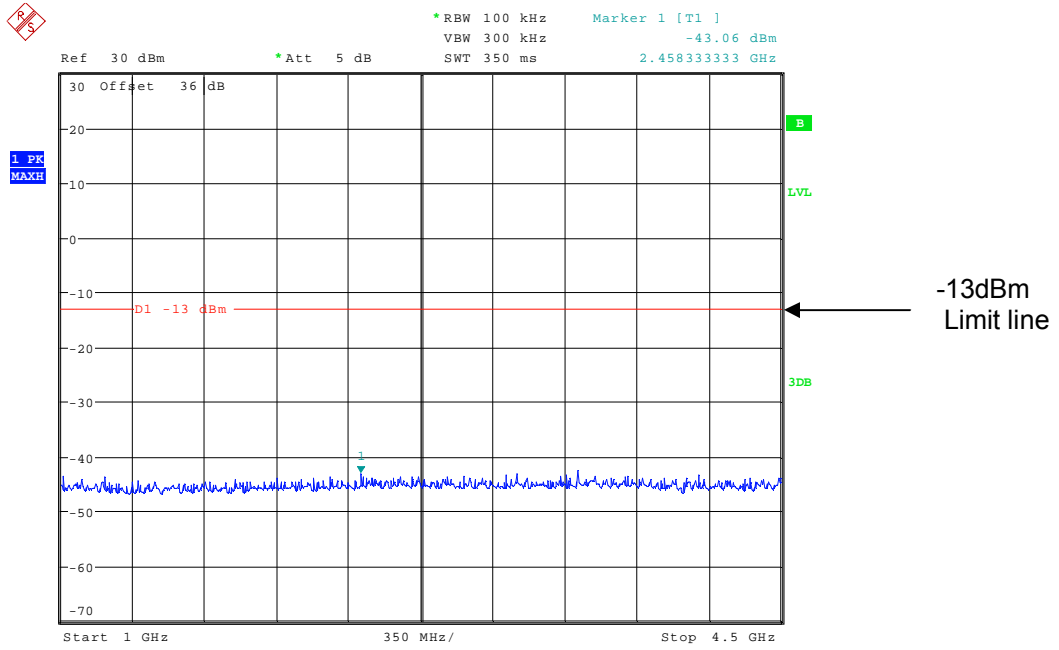
715.300MHz 30MHz – 1GHz



Date: 8.APR.2011 13:16:52

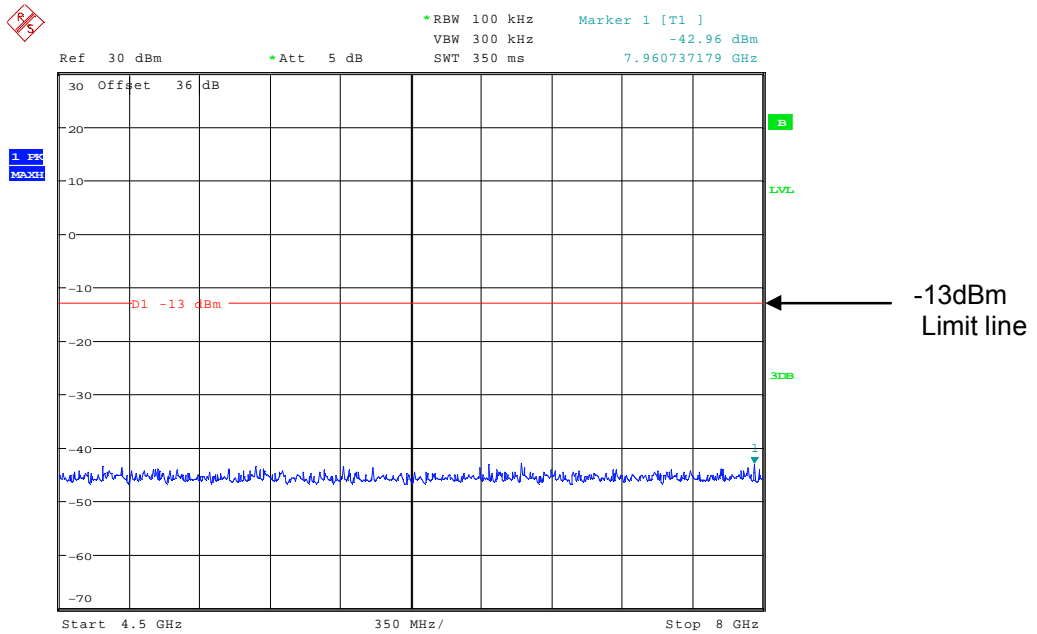


# 715.300MHz 1GHz – 4.5GHz



Date: 8.APR.2011 13:17:32

# 715.300MHz 4.5GHz – 8GHz

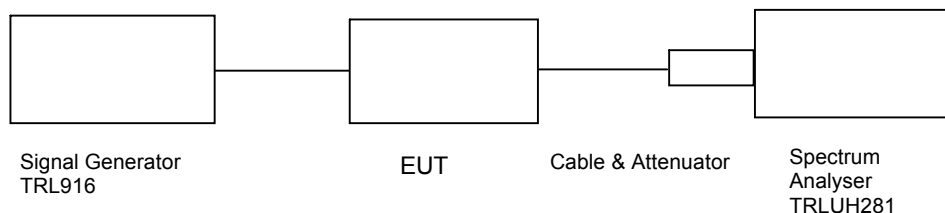


Date: 8.APR.2011 13:17:57

## TRANSMITTER TESTS

### AMPLIFIER SPURIOUS EMISSIONS – CONDUCTED – Part 2.1053 UHF HIGH BAND UPLINK

Ambient temperature	= 22°C	Radio Laboratory	
Relative humidity	= 42%	Test Signal	= F3E
Supply voltage	= +110Vac		



The test was set up as per the diagram. The level at the input was adjusted to compensate for the loss of the interconnecting cable. The unit was tested operating at maximum power and on three test frequencies.

The Spurious limit was calculated as follows:

On any frequency removed from the assigned frequency by more than 250% of the authorised bandwidth

At least 43 + 10 log PdB

$$(10 \log P_{\text{watts}}) - (43 + 10 \log (P_{\text{watts}} * 1000)) = \text{LIMIT} = -13 \text{ dBm}$$

## RESULTS

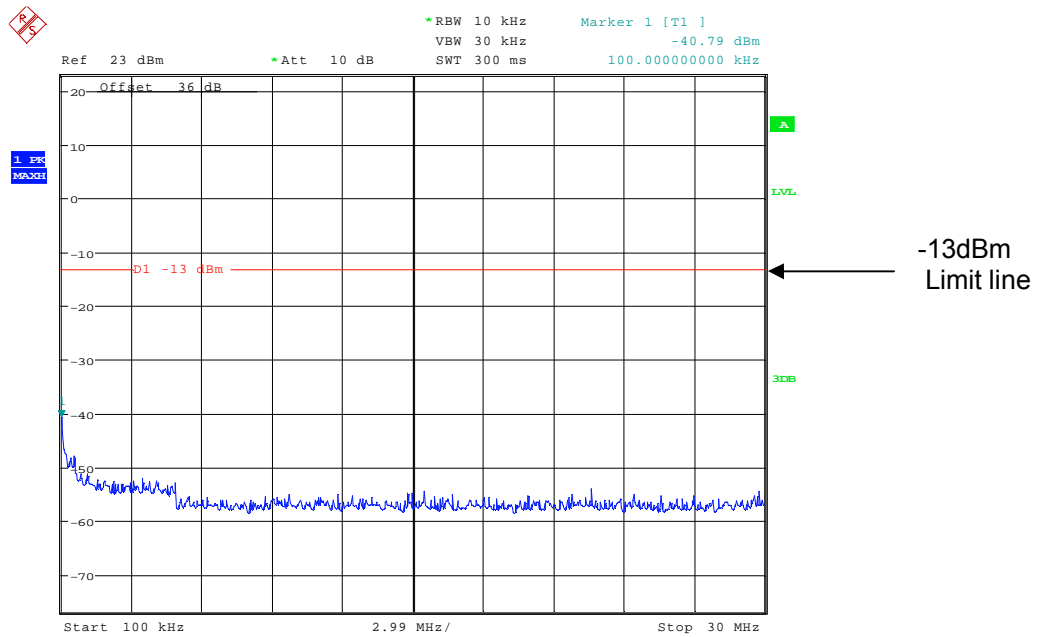
FREQUENCY RANGE	FREQ. (MHz)	MEASURED LEVEL (dBm)	ATTENUATOR & CABLE LOSSES (dB)	EMISSION LEVEL (dBm)	LIMIT (dBm)
100kHz – 8GHz	No Significant Emissions Within 20dB of Limit				-13

The test equipment used for the Transmitter Conducted Emissions:

TYPE OF EQUIPMENT	MAKER/SUPPLIER	MODEL No	SERIAL No	TRL No	ACTUAL EQUIPMENT USED
SPECTRUM ANALYSER	RHODE & SCHWARZ	FSU46	200034	UH281	<b>X</b>
ATTENUATOR	BIRD	8308-200-N	N/A	103	<b>X</b>
ATTENUATOR	BIRD	8304-100-N	N/A	222	<b>X</b>
CABLE	TRL	N/A	N/A	UH271	<b>X</b>
CABLE	TRL	N/A	N/A	UH272	<b>X</b>
CABLE	TRL	N/A	N/A	UH273	<b>X</b>
SIGNAL GENERATOR	RHODE & SCHWARZ	Vector Signal Generator	255812	916	<b>X</b>

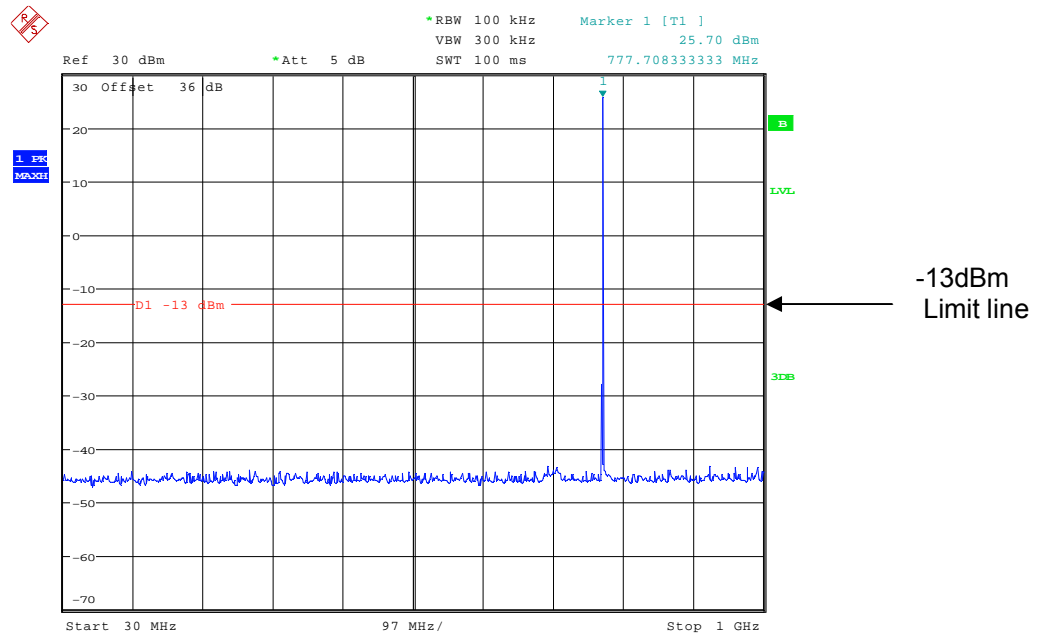
### Conducted emissions Bottom Channel

776.700MHz 100kHz – 30MHz



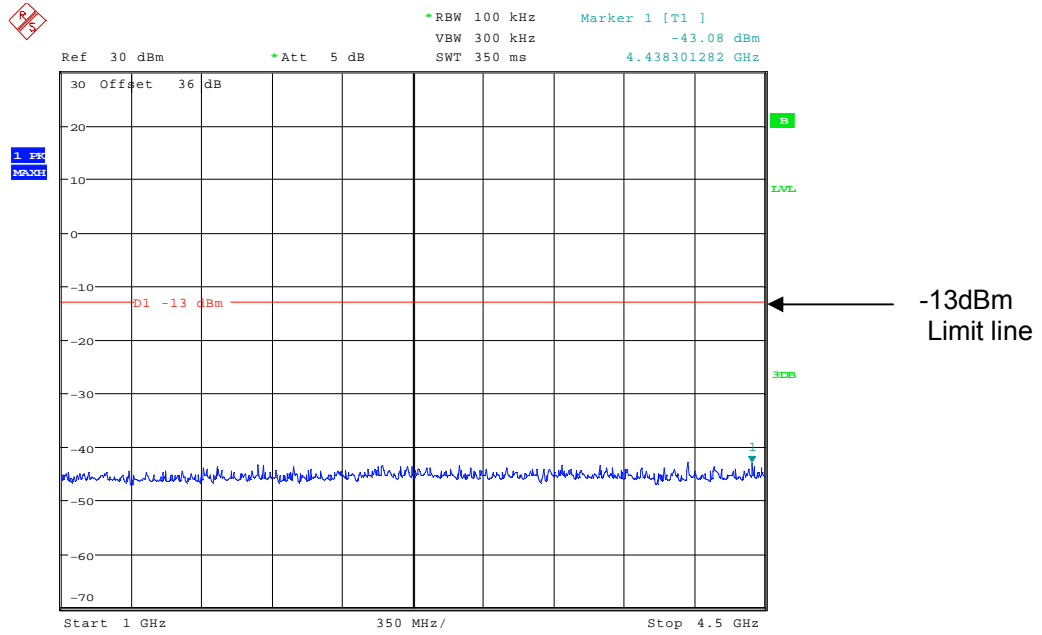
Date: 8.APR.2011 13:20:47

776.700MHz 30MHz – 1GHz



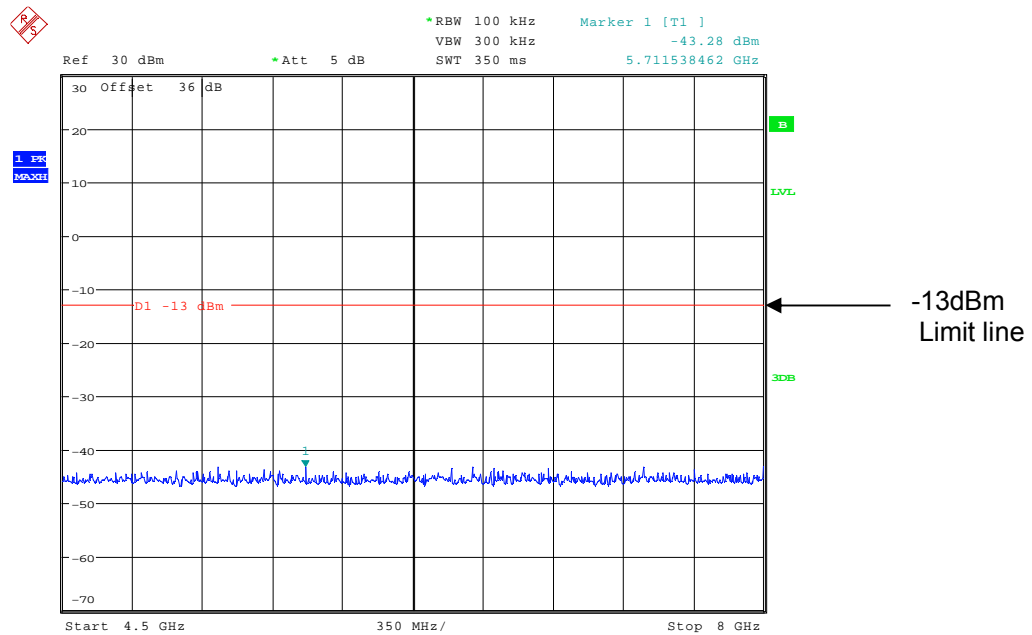
Date: 8.APR.2011 13:21:19

### 776.700MHz 1GHz – 4.5GHz



Date: 8.APR.2011 13:22:22

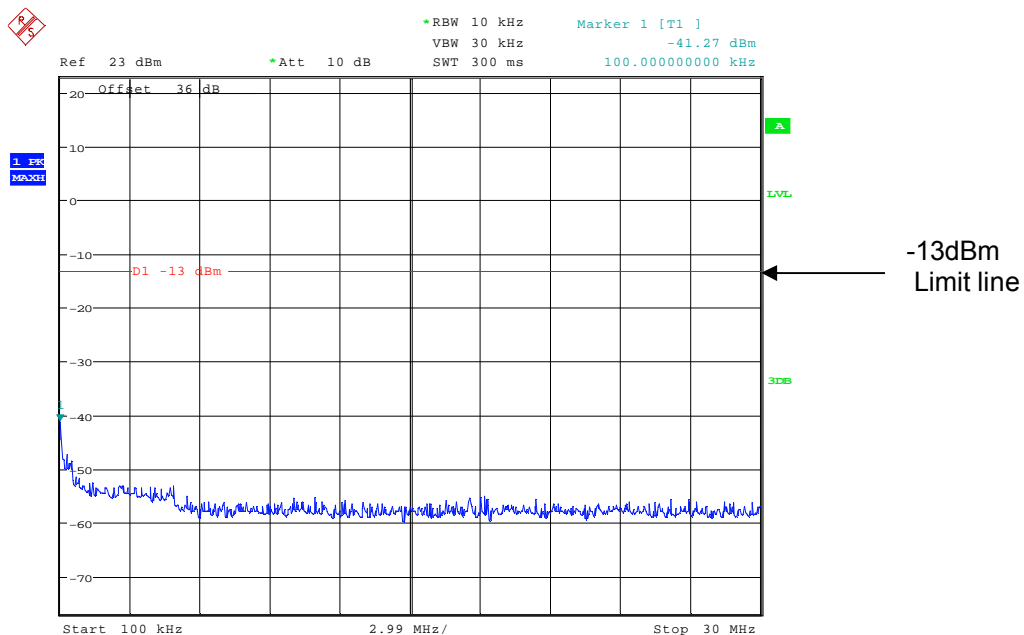
### 776.700MHz 4.5GHz – 8GHz



Date: 8.APR.2011 13:22:52

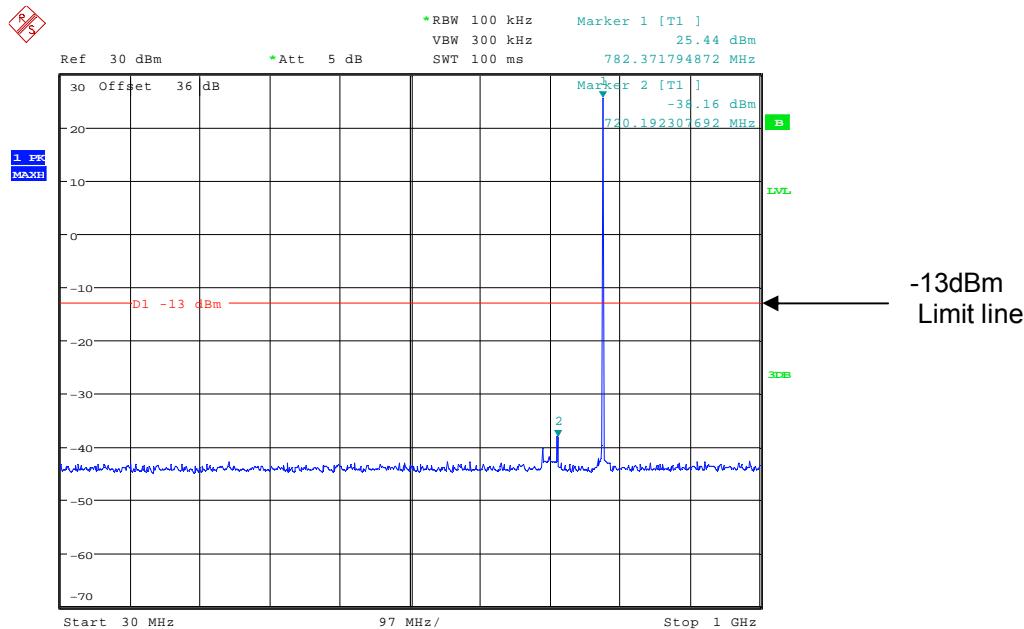
# Conducted emissions Middle Channel

781.500MHz 100kHz - 30MHz



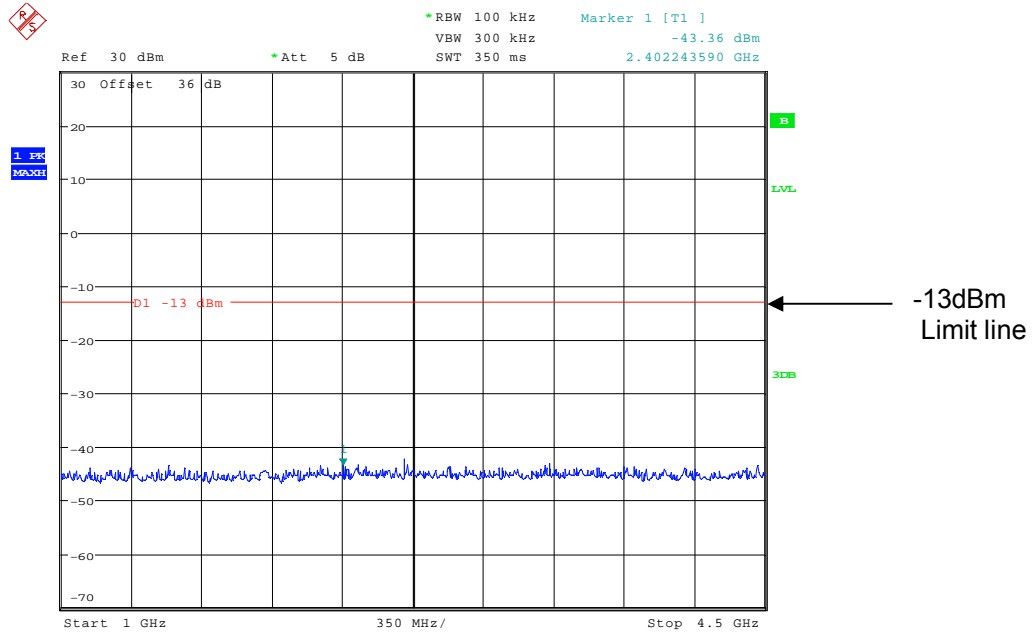
Date: 8.APR.2011 13:27:50

781.500MHz 30MHz - 1GHz



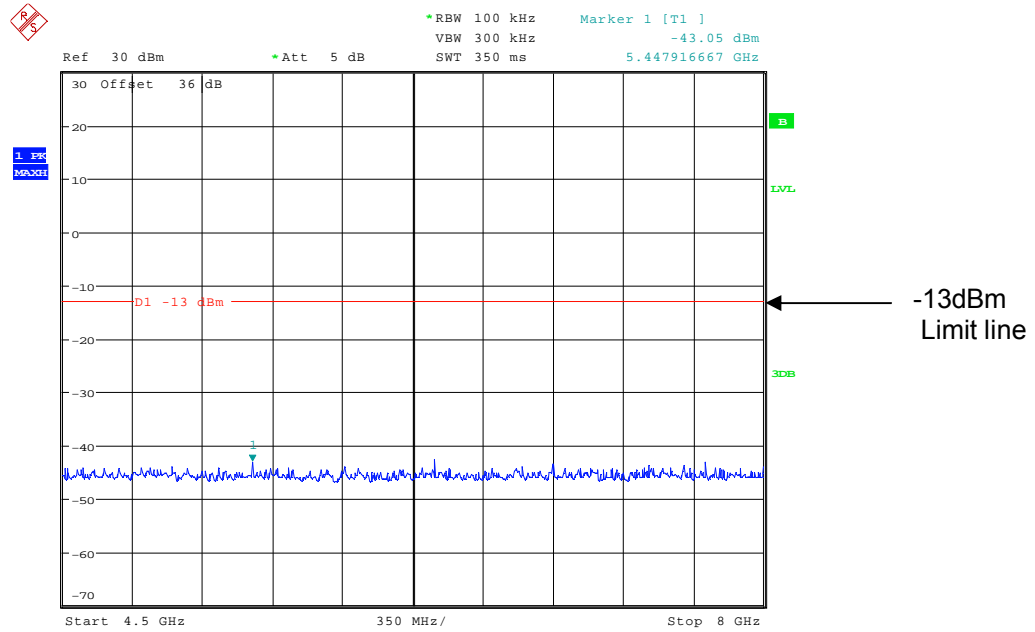
Date: 8.APR.2011 13:44:22

### 781.500MHz 1GHz - 4.5GHz



Date: 8.APR.2011 13:44:55

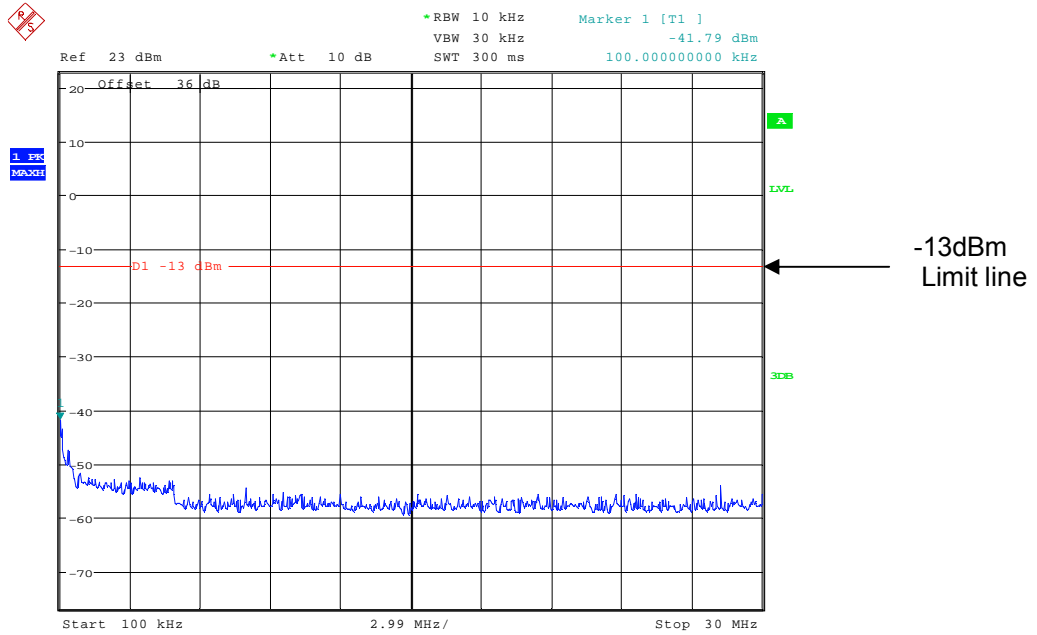
### 781.500MHz 4.5GHz - 8GHz



Date: 8.APR.2011 13:45:19

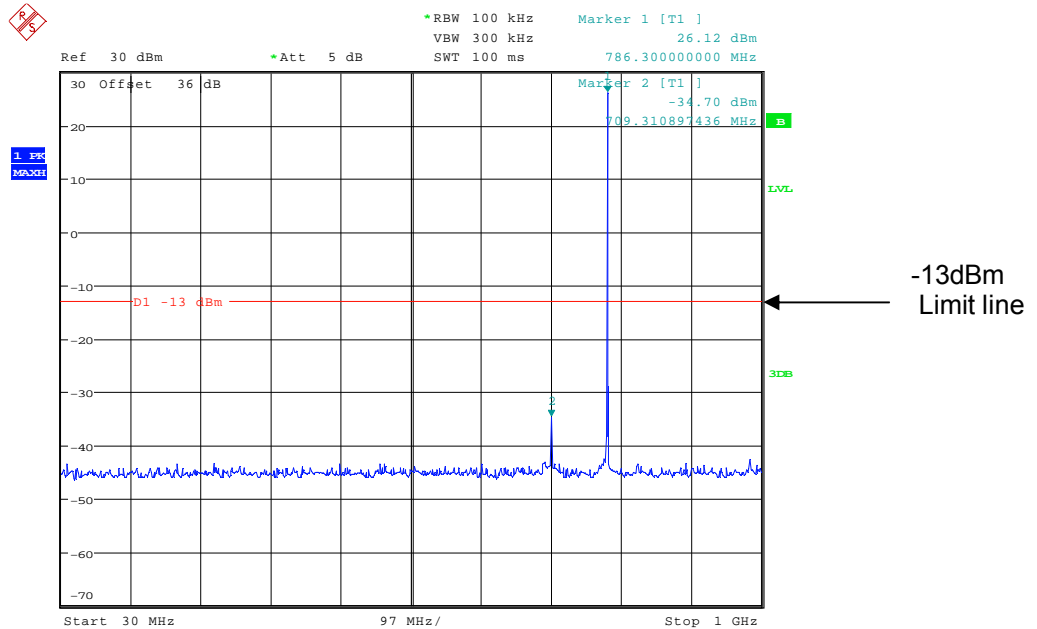
# Conducted emissions Top Channel

786.300MHz 100kHz - 30MHz



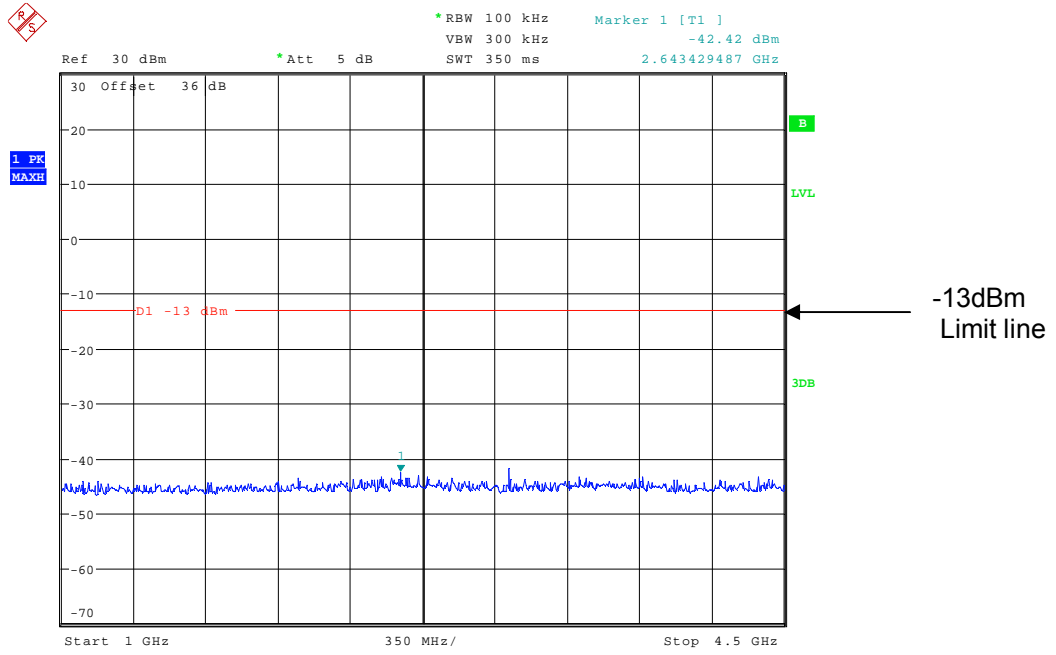
Date: 8.APR.2011 13:47:14

786.300MHz 30MHz - 1GHz



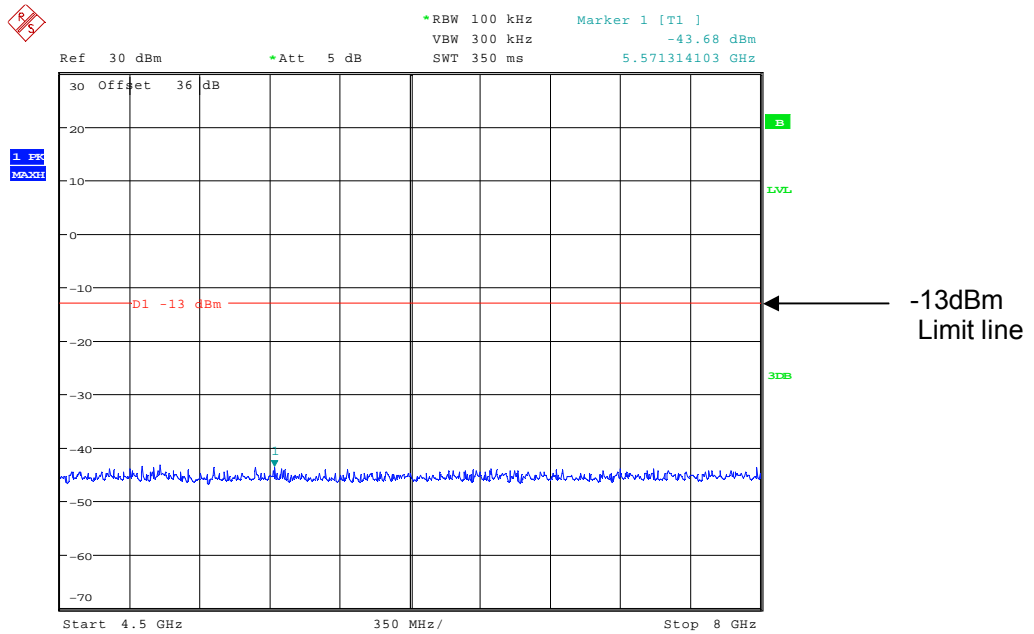
Date: 8.APR.2011 13:49:04

786.300MHz 1GHz – 4.5GHz



Date: 8.APR.2011 13:49:40

786.300MHz 4.5GHz – 8GHz



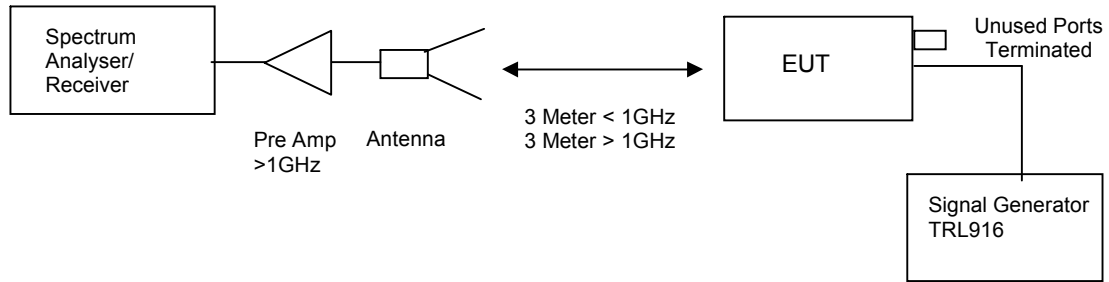
Date: 8.APR.2011 13:50:15



**AMPLIFIER SPURIOUS EMISSIONS – RADIATED – Part 2.1053  
UHF LOWBAND UPLINK**

Ambient temperature = 22°C  
 Relative humidity = 42%  
 Conditions = OATS  
 Supply voltage = +110Vac  
 Supply Frequency = N/A

Test Signal = F3E



The test was set up as per the diagram. The level at the input was adjusted to compensate for the loss of the interconnecting cable. The unit was tested operating maximum power on three test frequencies with a 50 ohm load on the output. The unit was also tested with the signal generator replaced by another 50ohm load.

The Spurious limit was calculated as follows:

On any frequency removed from the assigned frequency by more that 250% of the authorised bandwidth

At least 43 + 10 log PdB

$$(10\log P_{\text{watts}}) - (43+10\log (P_{\text{watts}} * 1000)) = \text{LIMIT} = -13 \text{ dBm}$$

**RESULTS**

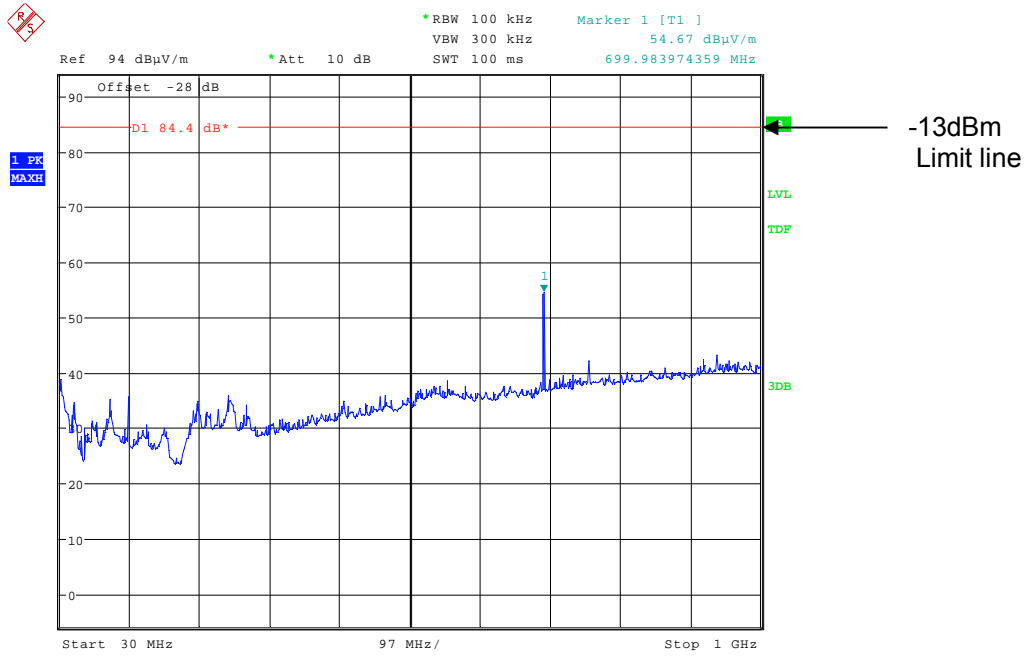
FREQUENCY RANGE	FREQ. (MHz)	MEAS. Rx. (dBµV)	CABLE LOSS (dB)	ANT FACTOR	FIELD STRENGTH (dBµV/m)	CALCULATED EIRP (dBm)	LIMIT (dBm)
30MHz – 8GHz	No Significant Emissions Within 20dB of Limit.						-13

The test equipment used for the Transmitter Spurious Emissions:

TYPE OF EQUIPMENT	MAKER/SUPPLIER	MODEL No	SERIAL No	TRL No	ACTUAL EQUIPMENT USED
HORN	EMCO	3115	9010-3580	138	<b>X</b>
SPECTRUM ANALYSER	R&S	FSU46	200034	UH281	<b>X</b>
PRE AMPLIFIER	HP	8449B	3008A016	572	<b>X</b>
SIGNAL GENERATOR	MARCONI	2042	119388/080	176	<b>X</b>
ANTENNA	YORK	CBL611/A	1618	UH191	<b>X</b>
RECEIVER	R&S	ESVS10	825892/006	UH04	<b>X</b>

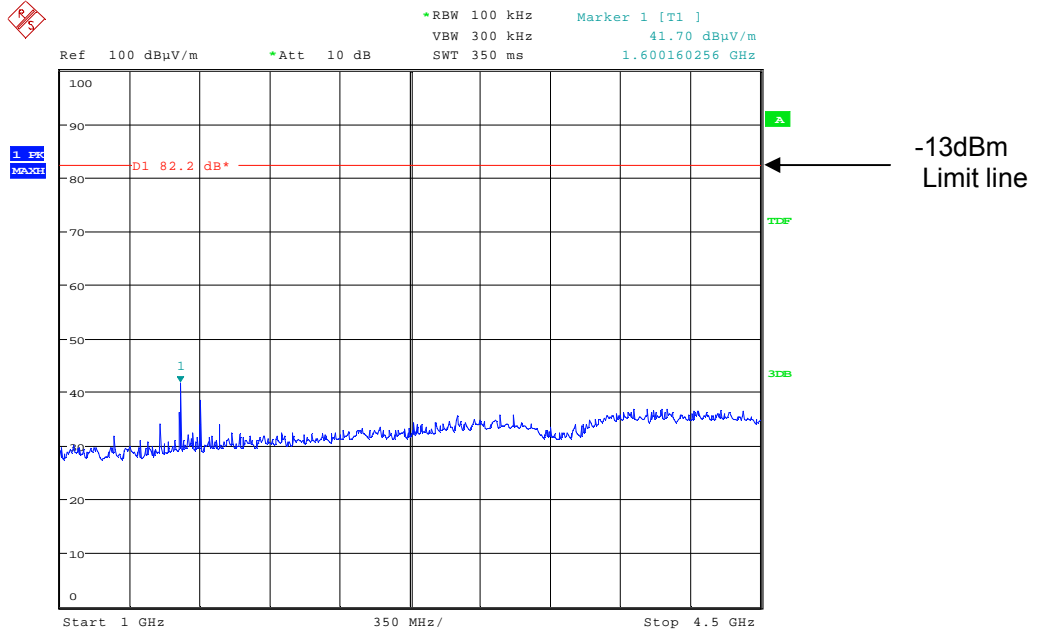
# Radiated emissions Bottom Channel

698.700MHz 30MHz – 1GHz



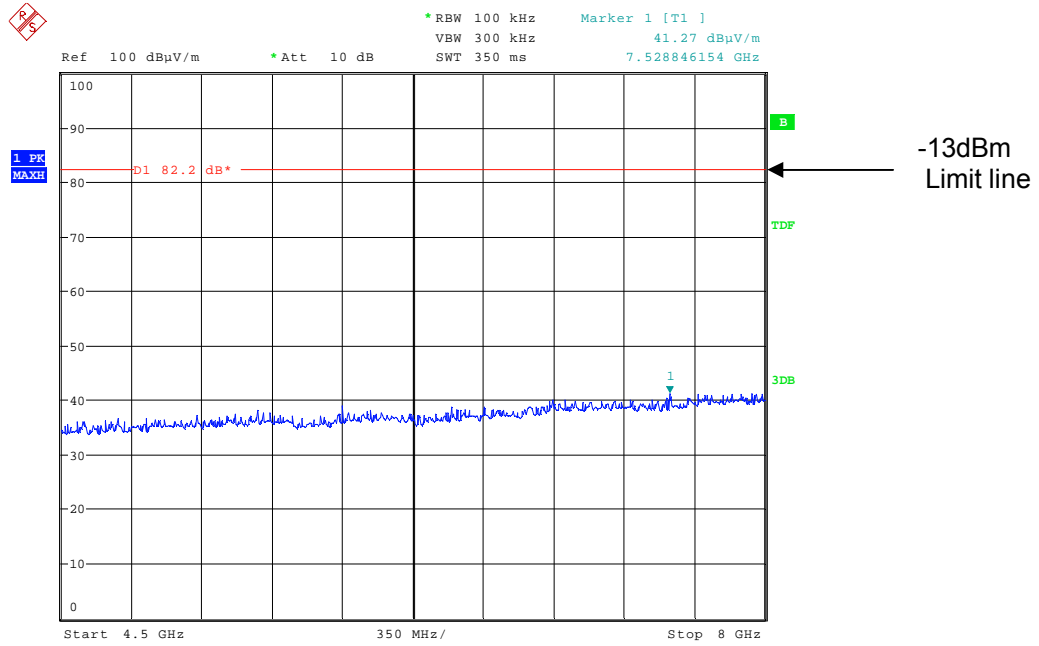
Date: 11.APR.2011 13:55:38

698.700MHz 1GHz – 4.5GHz



Date: 11.APR.2011 10:42:05

698.700MHz 4.5GHz – 8GHz

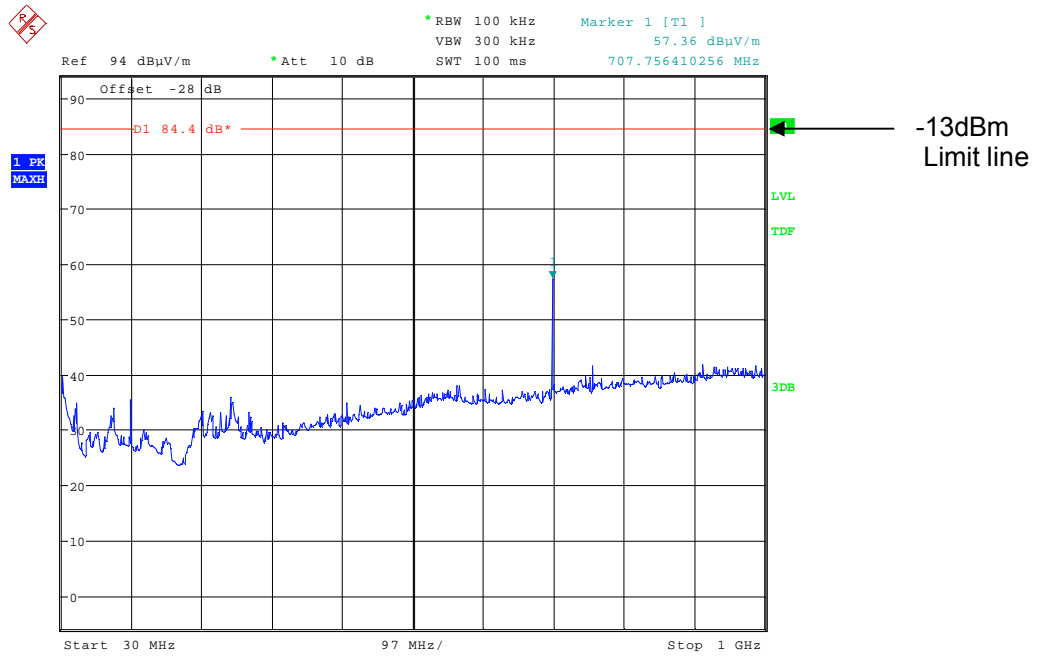


Date: 11.APR.2011 10:42:31

The above test results show that there were no emissions within 20dBs of the -13dBm limit.

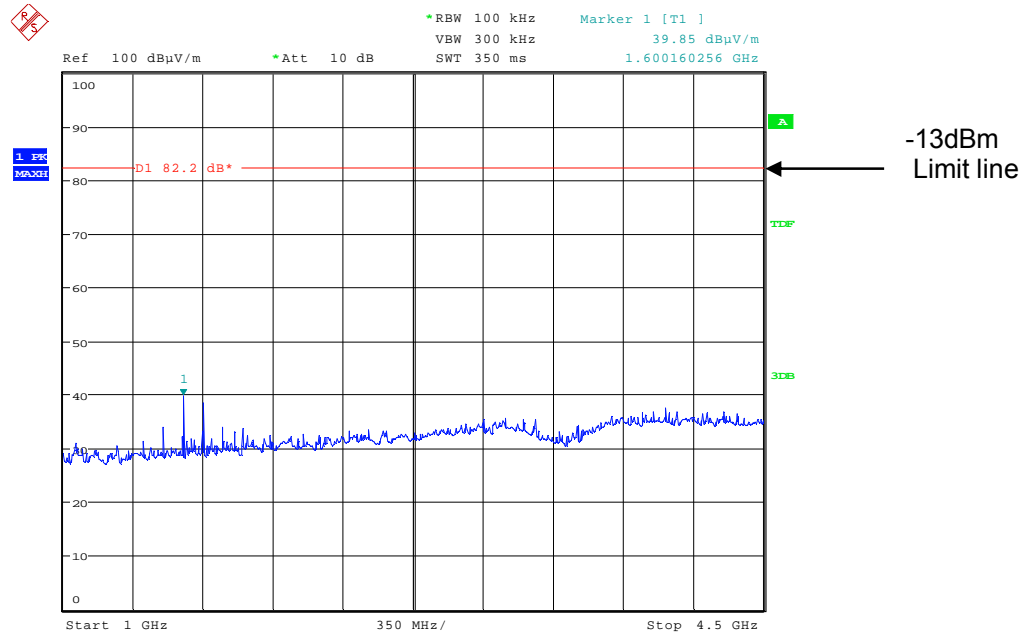
# Radiated emissions Middle Channel

707.000MHz - 30MHz – 1GHz



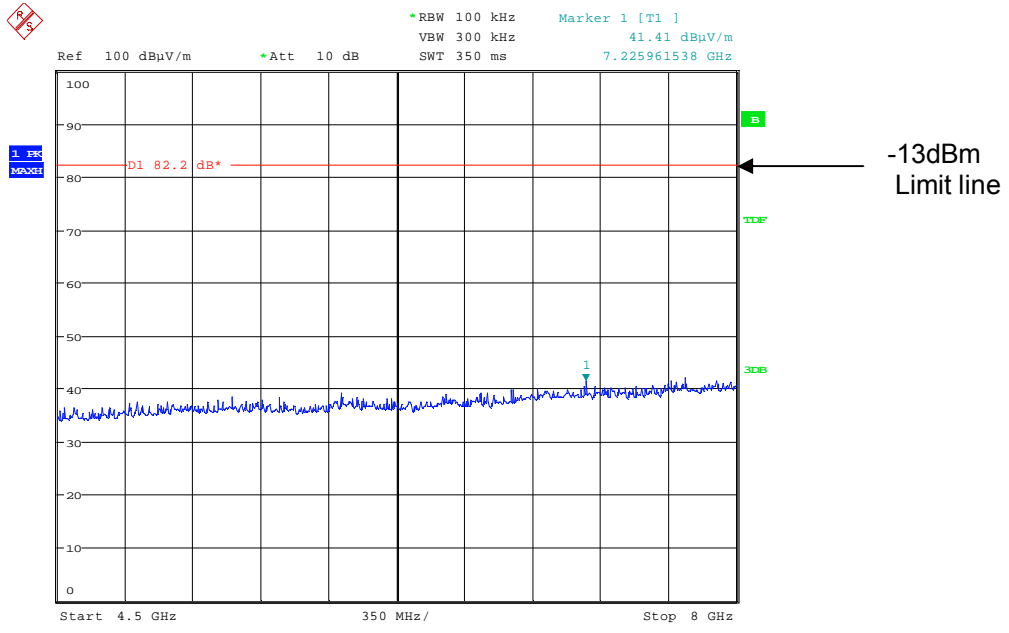
Date: 11.APR.2011 13:56:18

707.000MHz 1GHz – 4.5GHz



Date: 11.APR.2011 10:46:33

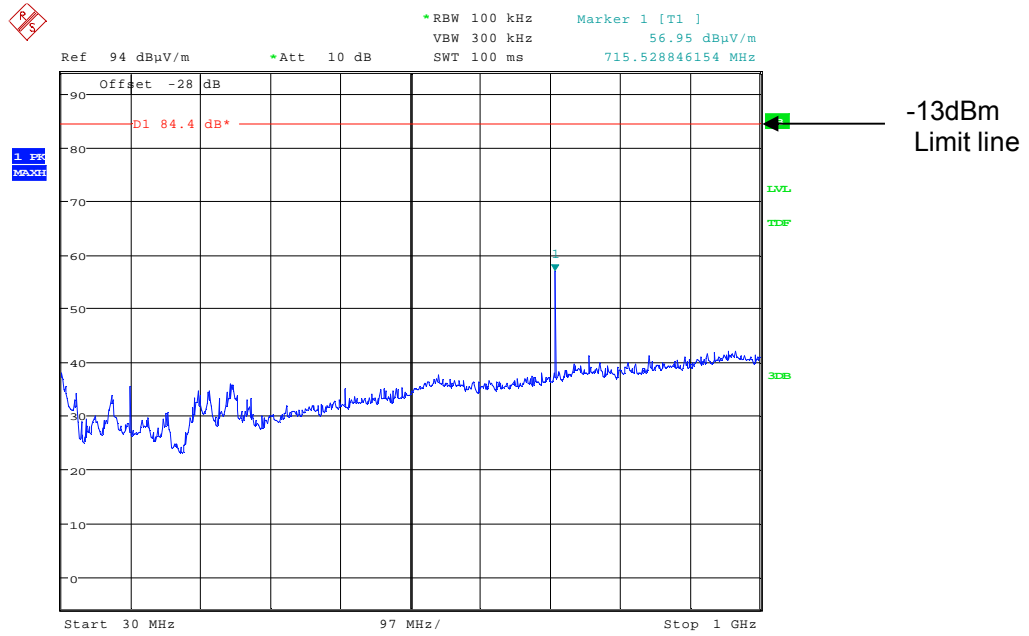
707.000MHz 4.5GHz – 8GHz



Date: 11.APR.2011 10:47:05

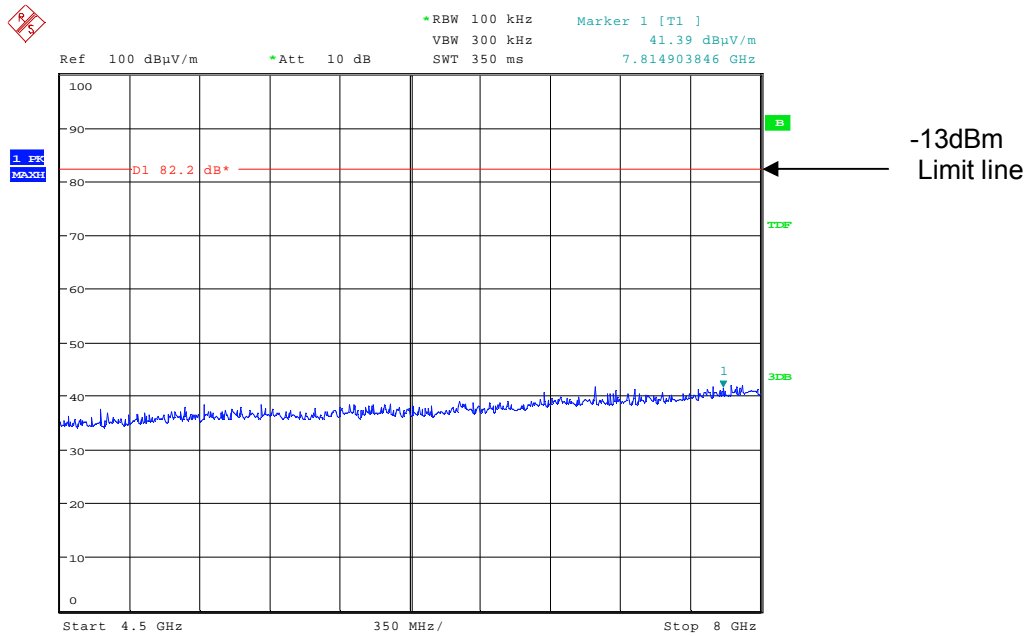
# Radiated emissions Top Channel

715.300MHz - 30MHz – 1GHz



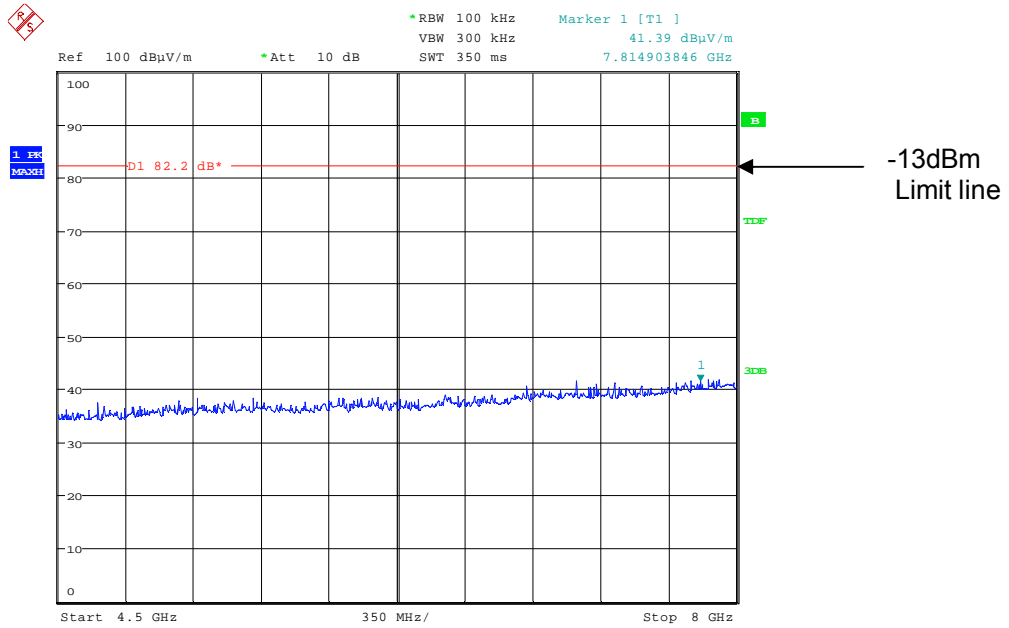
Date: 11.APR.2011 13:57:30

715.300MHz - 1GHz – 4.5GHz



Date: 11.APR.2011 10:48:54

715.300MHz - 4.5GHz - 8GHz



Date: 11.APR.2011 10:48:54

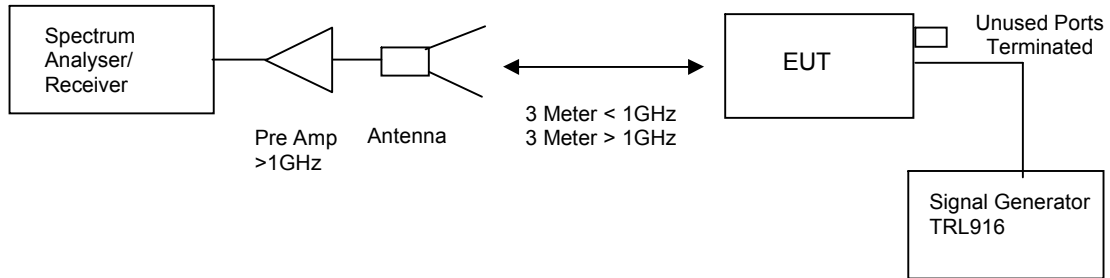
The above test results show that there were no emissions within 20dBs of the -13dBm limit.

## TRANSMITTER TESTS

### AMPLIFIER SPURIOUS EMISSIONS – RADIATED – Part 2.1053 UHF HIGH BAND UPLINK

Ambient temperature = 22°C  
 Relative humidity = 462%  
 Conditions = OATS  
 Supply voltage = +110Vac  
 Supply Frequency = N/A

Test Signal = F3E



The test was set up as per the diagram. The level at the input was adjusted to compensate for the loss of the interconnecting cable. The unit was tested operating maximum power on three test frequencies with a 50 ohm load on the output. The unit was also tested with the signal generator replaced by another 50ohm load.

The Spurious limit was calculated as follows:

On any frequency removed from the assigned frequency by more that 250% of the authorised bandwidth

At least  $43 + 10 \log P_{dB}$

$$(10 \log P_{\text{watts}}) - (43 + 10 \log (P_{\text{watts}} * 1000)) = \text{LIMIT} = -13 \text{ dBm}$$

### RESULTS

FREQUENCY RANGE	FREQ. (MHz)	MEAS. Rx. (dBµV)	CABLE LOSS (dB)	ANT FACTOR	FIELD STRENGTH (dBµV/m)	CALCULATED EIRP (dBm)	LIMIT (dBm)
30MHz – 8GHz	No Significant Emissions Within 20dB of Limit.						-13

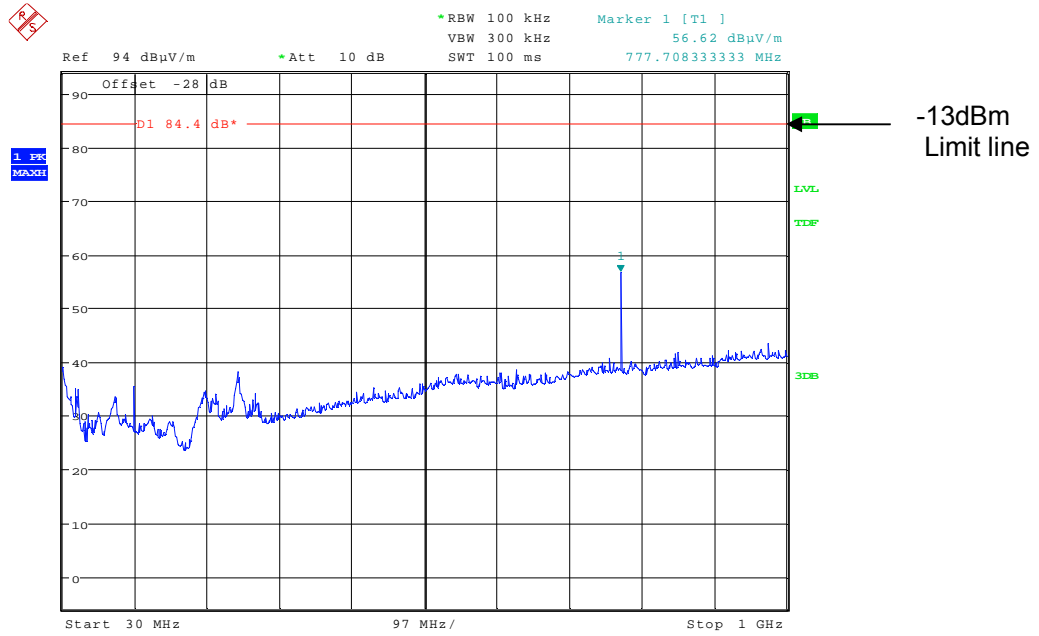
The test equipment used for the Transmitter Spurious Emissions:

TYPE OF EQUIPMENT	MAKER/SUPPLIER	MODEL No	SERIAL No	TRL No	ACTUAL EQUIPMENT USED
HORN	EMCO	3115	9010-3580	138	<b>X</b>
SPECTRUM ANALYSER	R&S	FSU46	200034	UH281	<b>X</b>
PRE AMPLIFIER	HP	8449B	3008A016	572	<b>X</b>
SIGNAL GENERATOR	MARCONI	2042	119388/080	176	<b>X</b>
ANTENNA	YORK	CBL611/A	1618	UH191	<b>X</b>
RECEIVER	R&S	ESVS10	825892/006	UH04	<b>X</b>



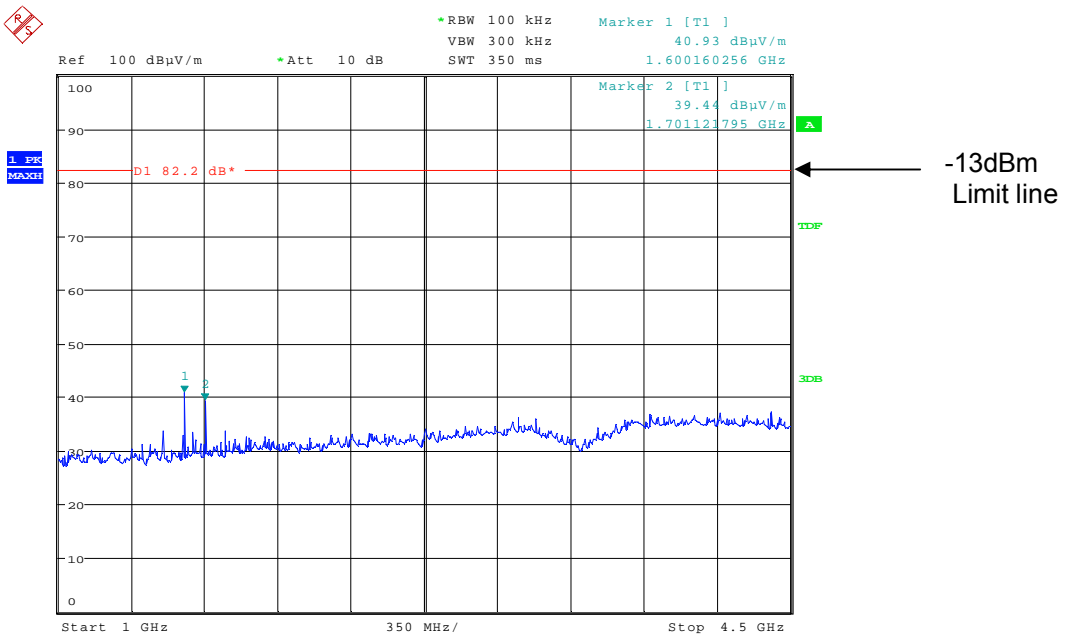
# Radiated emissions Bottom Channel

776.700MHz 30MHz – 1GHz



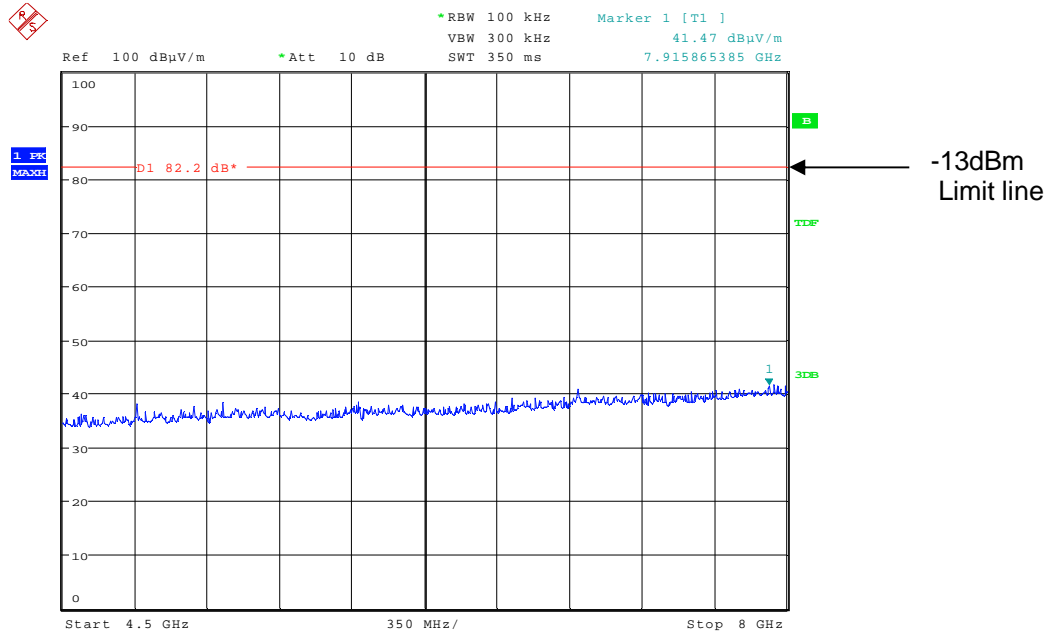
Date: 11.APR.2011 13:59:04

776.700MHz 1GHz - 4.5GHz



Date: 11.APR.2011 10:50:53

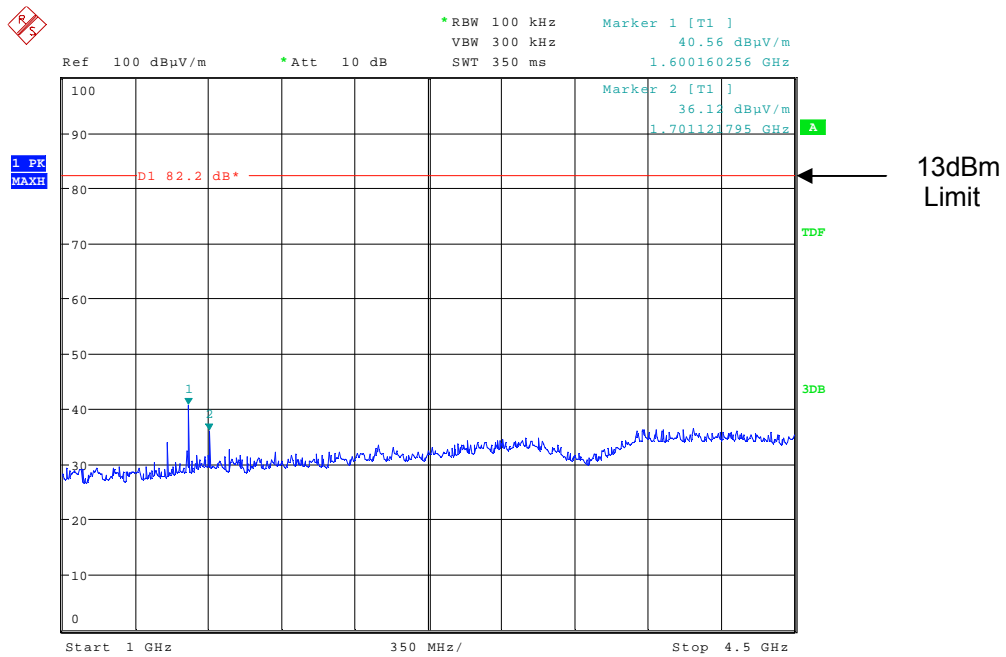
776.700MHz 4.5GHz - 8GHz



Date: 11.APR.2011 10:51:18

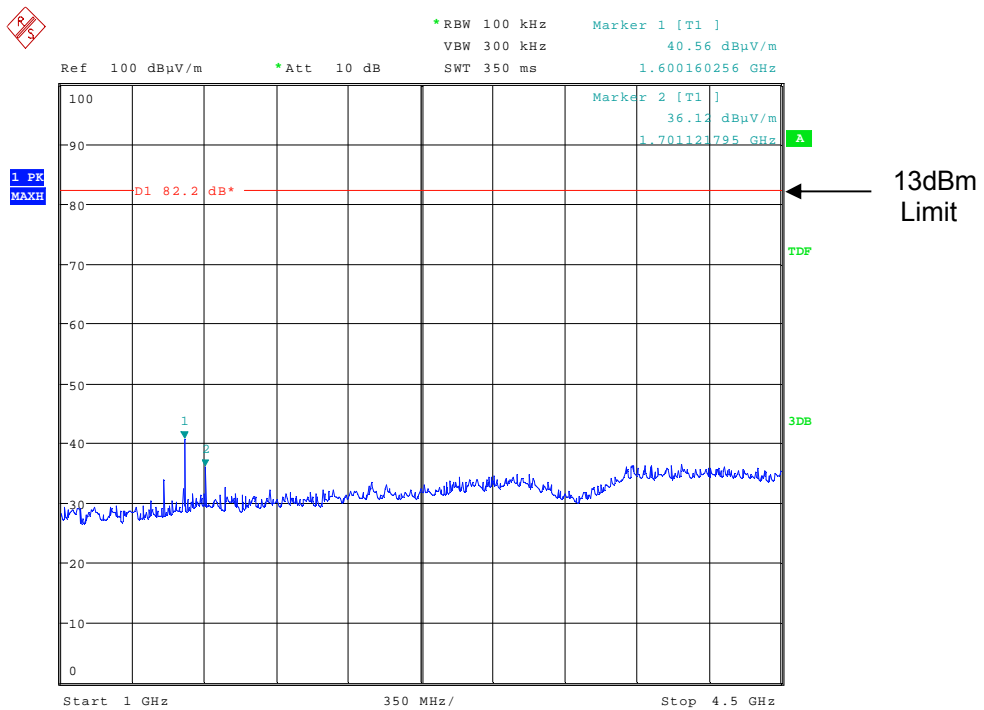
# Radiated emissions Middle Channel

781.500MHz 30MHz – 1GHz



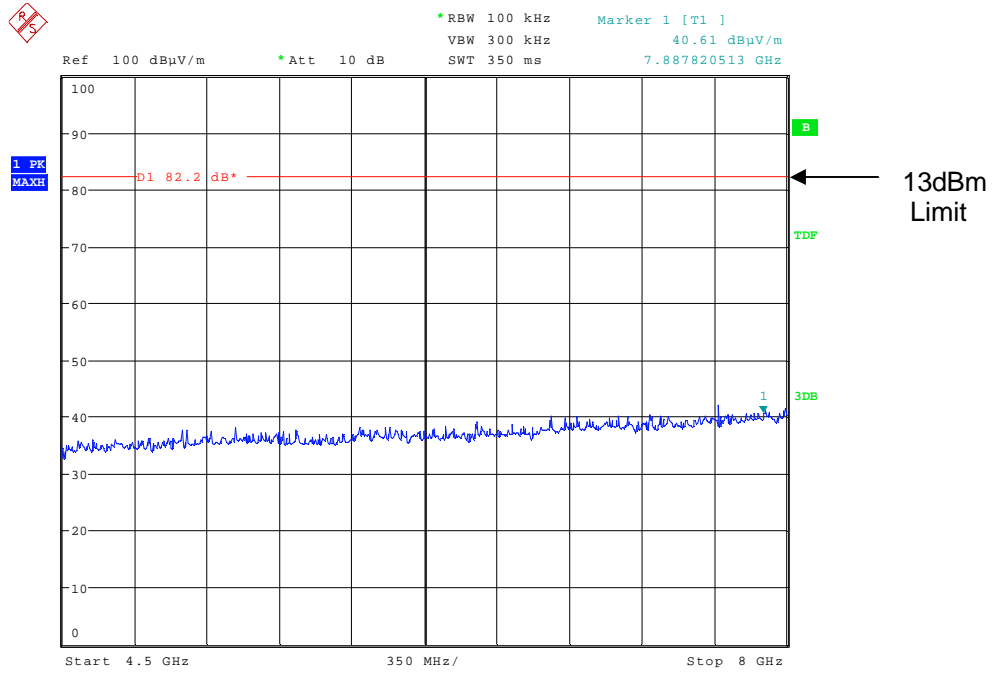
Date: 11.APR.2011 10:53:29

781.500MHz 1GHz - 4.5GHz



Date: 11.APR.2011 10:53:29

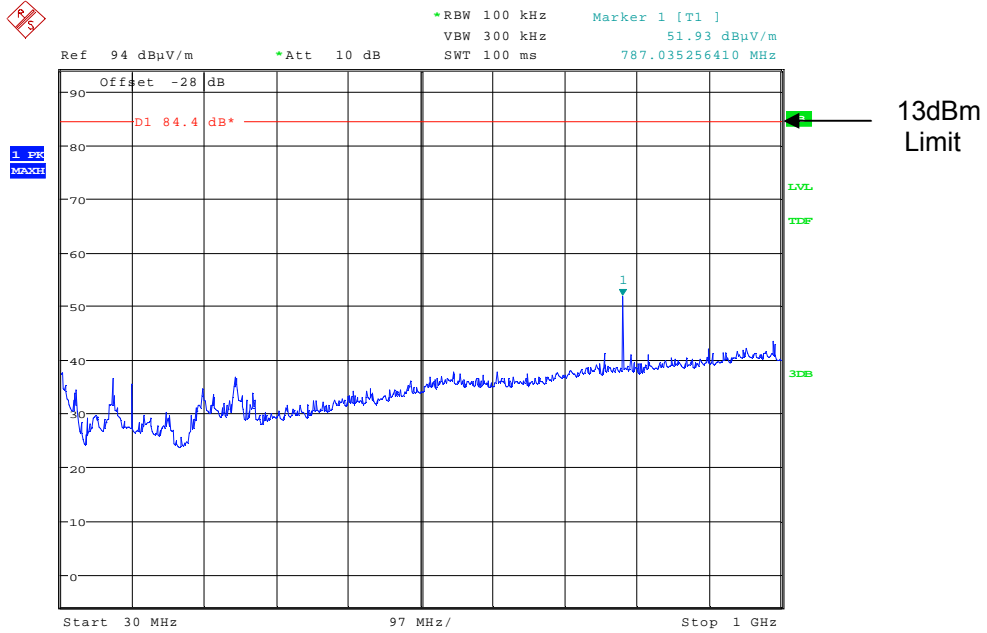
781.500MHz 4.5GHz -8GHz



Date: 11.APR.2011 10:53:53

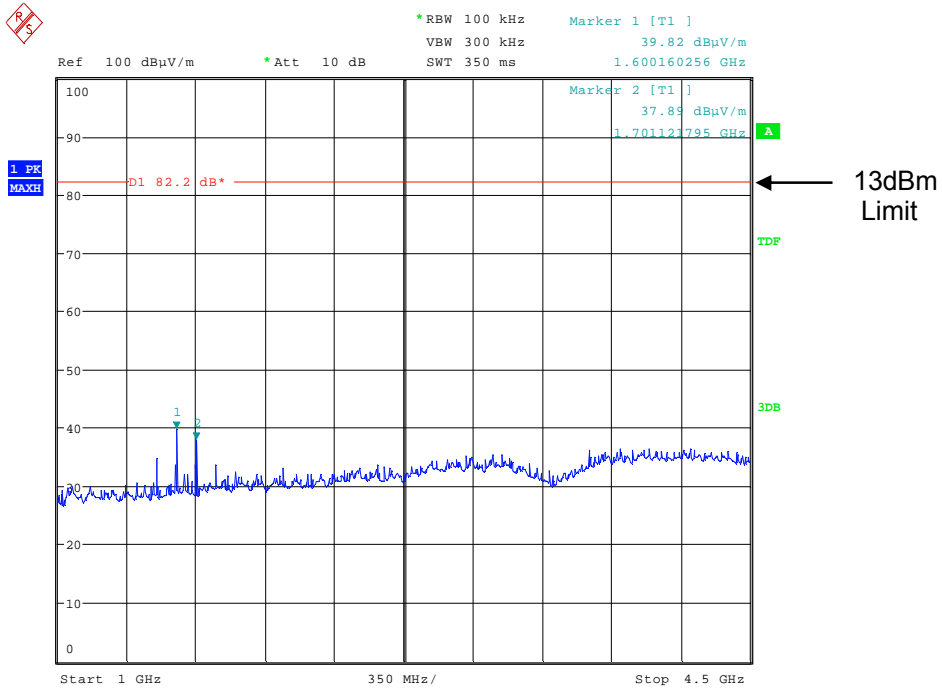
# Radiated emissions Top Channel

786.300MHz 30MHz – 1GHz



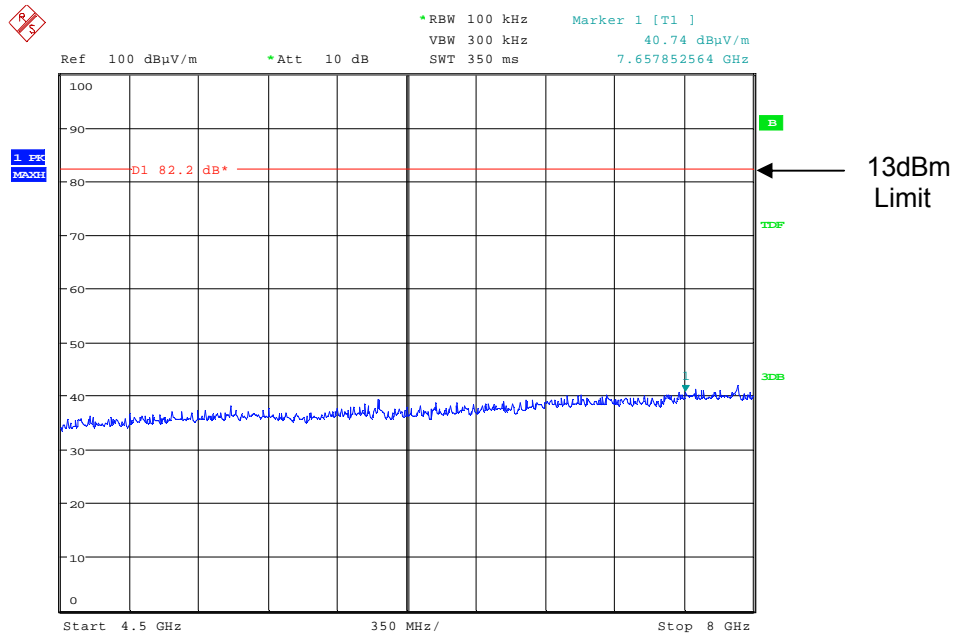
Date: 11.APR.2011 14:01:36

786.300MHz 1GHz- 4.5GHz



Date: 11.APR.2011 10:55:29

786.300MHz 4.5GHz- 8GHz

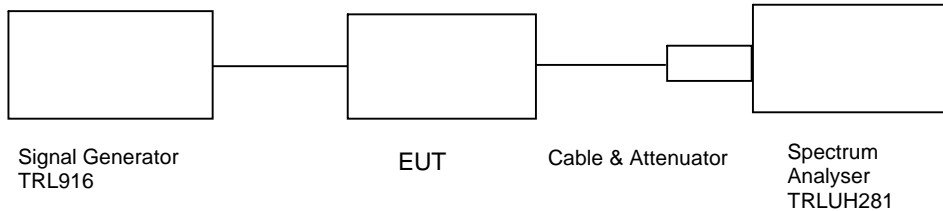


Date: 11.APR.2011 10:55:58

The above test results show that there were no emissions within 20dBs of the -13dBm limit.

**AMPLIFIER GAIN – CONDUCTED – PART 2.1046 – UHF LOW BAND DOWNLINK**

Ambient temperature = 22°C Radio Laboratory  
 Relative humidity = 42%  
 Supply voltage = +110Vac  
 Channel number = See test results



Frequency MHz	Signal Generator input level dBm	Input Cable Loss dB	Output Cable & Attenuator loss dB	Level at Spectrum Analyser dBm	Gain dB	Conducted Output Power dBm	Gain after 10dB input level increase dB
728.700	-47.80	0.26	36.07	-4.12	80.01	31.95	70.24
737.000	-49.10	0.19	36.10	-3.18	82.21	32.92	72.58
745.300	-48.50	0.27	36.22	-2.77	82.22	33.45	72.23

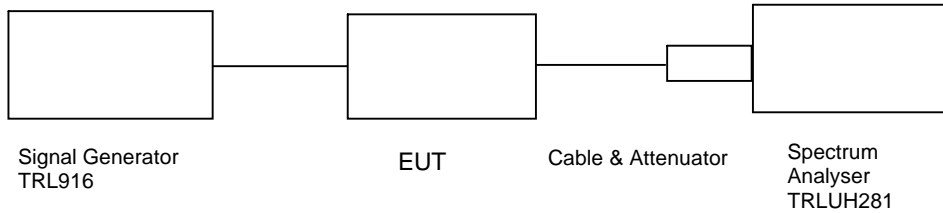
Notes: 1. The signal generator input was increased by 10dBs and the level of the output signal remeasured.

TYPE OF EQUIPMENT	MAKER/SUPPLIER	MODEL No	SERIAL No	TRL No	ACTUAL EQUIPMENT USED
SPECTRUM ANALYSER	RHODE & SCHWARZ	FSU46	200034	UH281	<b>X</b>
ATTENUATOR	BIRD	8308-200-N	N/A	103	<b>X</b>
ATTENUATOR	BIRD	8304-100-N	N/A	222	<b>X</b>
CABLE	TRL	N/A	N/A	UH271	<b>X</b>
CABLE	TRL	N/A	N/A	UH272	<b>X</b>
CABLE	TRL	N/A	N/A	UH273	<b>X</b>
SIGNAL GENERATOR	RHODE & SCHWARZ	Vector Signal Generator	255812	916	<b>X</b>

**AMPLIFIER GAIN – CONDUCTED – PART 2.1046 – UHF HIGH BAND DOWNLINK**

Ambient temperature = 22°C  
 Relative humidity = 42%  
 Supply voltage = +110Vac  
 Channel number = See test results

Radio Laboratory



Frequency MHz	Signal Generator input level dBm	Input Cable Loss dB	Output Cable & Attenuator loss dB	Level at Spectrum Analyser dBm	Gain dB	Conducted Output Power dBm	Gain after 10dB input level increase dB
746.700	-50.10	0.27	36.22	-2.80	83.79	33.42	73.98
751.500	-50.30	0.26	36.18	-2.62	84.12	33.56	74.59
756.300	-50.40	0.37	36.25	-2.73	84.29	33.52	74.77

Notes: 1. The signal generator input was increased by 10dBs and the level of the output signal remeasured.

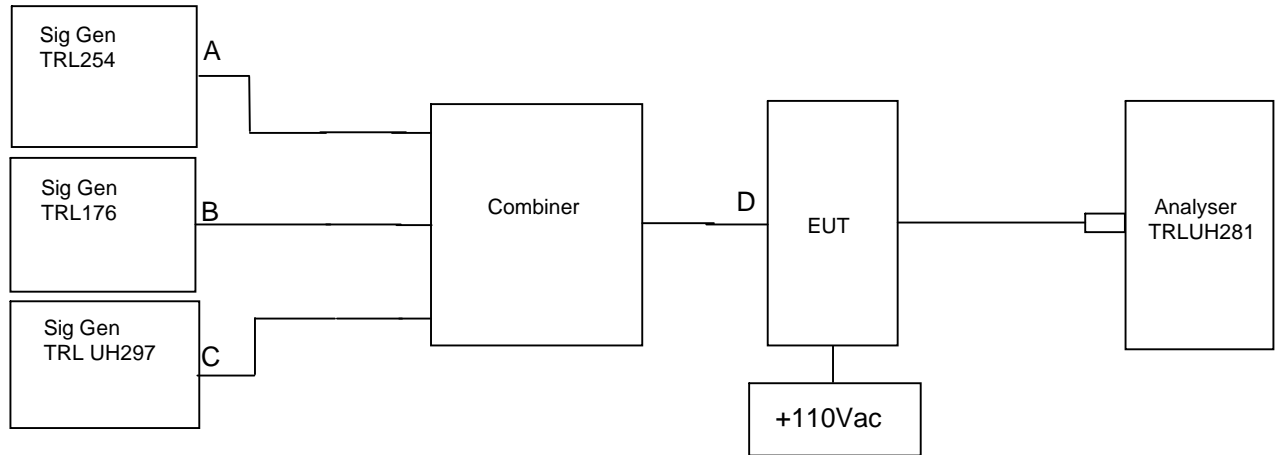
TYPE OF EQUIPMENT	MAKER/SUPPLIER	MODEL No	SERIAL No	TRL No	ACTUAL EQUIPMENT USED
SPECTRUM ANALYSER	RHODE & SCHWARZ	FSU46	200034	UH281	<b>X</b>
ATTENUATOR	BIRD	8308-200-N	N/A	103	<b>X</b>
ATTENUATOR	BIRD	8304-100-N	N/A	222	<b>X</b>
CABLE	TRL	N/A	N/A	UH271	<b>X</b>
CABLE	TRL	N/A	N/A	UH272	<b>X</b>
CABLE	TRL	N/A	N/A	UH273	<b>X</b>
SIGNAL GENERATOR	RHODE & SCHWARZ	Vector Signal Generator	255812	916	<b>X</b>



**AMPLIFIER INTERMODULATION SPURIOUS EMISSIONS – CONDUCTED – PART 2.1053  
UHF LOW BAND DOWNLINK**

Ambient temperature = 22°C  
Relative humidity = 42%  
Supply voltage = +110Vac

Radio Laboratory



The intermodulation and spurious products were measured with the amplifier operating at maximum gain. A three tone test was conducted using the equipment as above. The input power level was adjusted so the level at point D was 10dB above the maximum input of -53dBm. The cable and attenuator loss between the EUT and the spectrum analyser was 40.3dB.

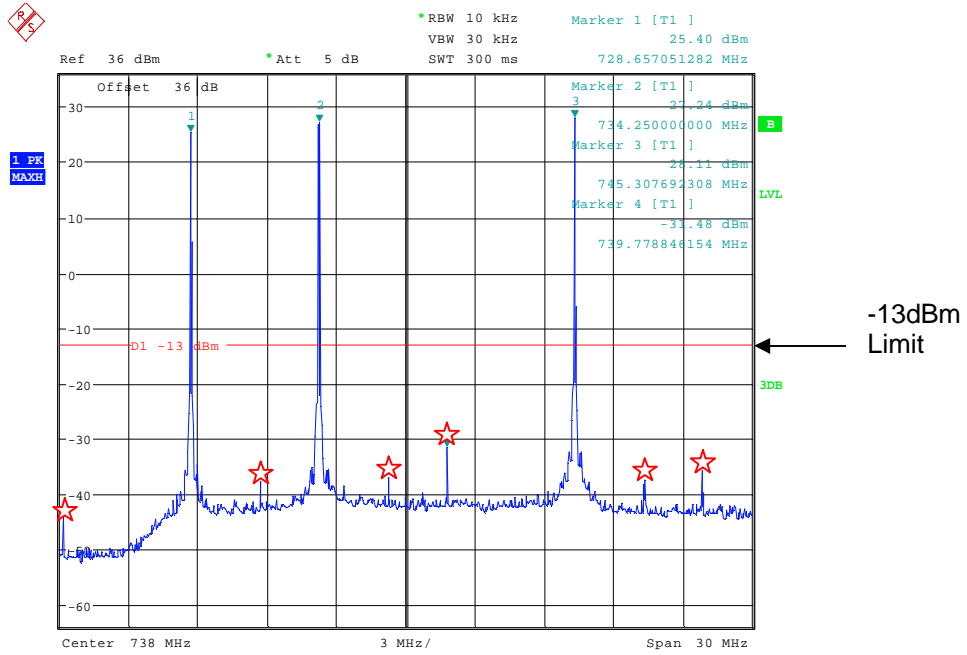
RF Input Frequency (MHz)			Highest Intermodulation Product Level (dBm)	Limit (dBm)
728.700	734.250	745.300	-31.48dBm@739.778MHz	-13

Sweep data is shown on the next page:

Test equipment used for intermodulation test

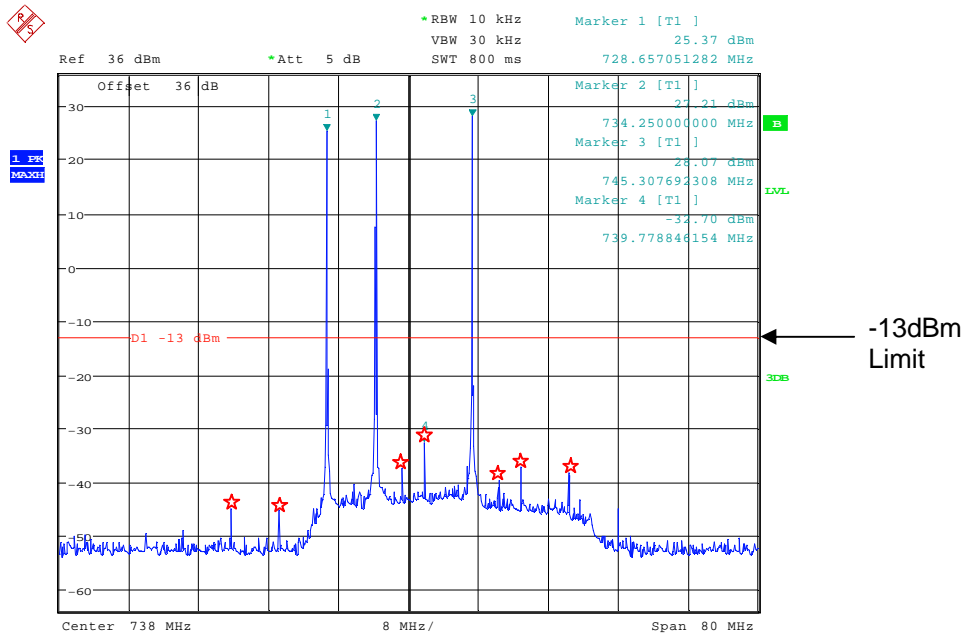
TYPE OF EQUIPMENT	MAKER/SUPPLIER	MODEL No	SERIAL No	TRL No	ACTUAL EQUIPMENT USED
SPECTRUM ANALYSER	R&S	FSU46	200034	UH281	<b>X</b>
SIGNAL GENERATOR	MARCONI	2042	119562/021	254	<b>X</b>
SIGNAL GENERATOR	R&S	SML 03	102268	UH297	<b>X</b>
SIGNAL GENERATOR	RHODE & SCHWARZ	Vector Signal Generator	255812	916	<b>X</b>
COMBINER	ELCOM	RC-4-50	N/A	170	<b>X</b>
CABLE	TRL	N/A	N/A	UH271	<b>X</b>
CABLE	TRL	N/A	N/A	UH272	<b>X</b>
CABLE	TRL	N/A	N/A	UH273	<b>X</b>
CABLE	TRL	N/A	N/A	UH269	<b>X</b>

### Intermodulation Close view



Date: 11.APR.2011 10:19:00

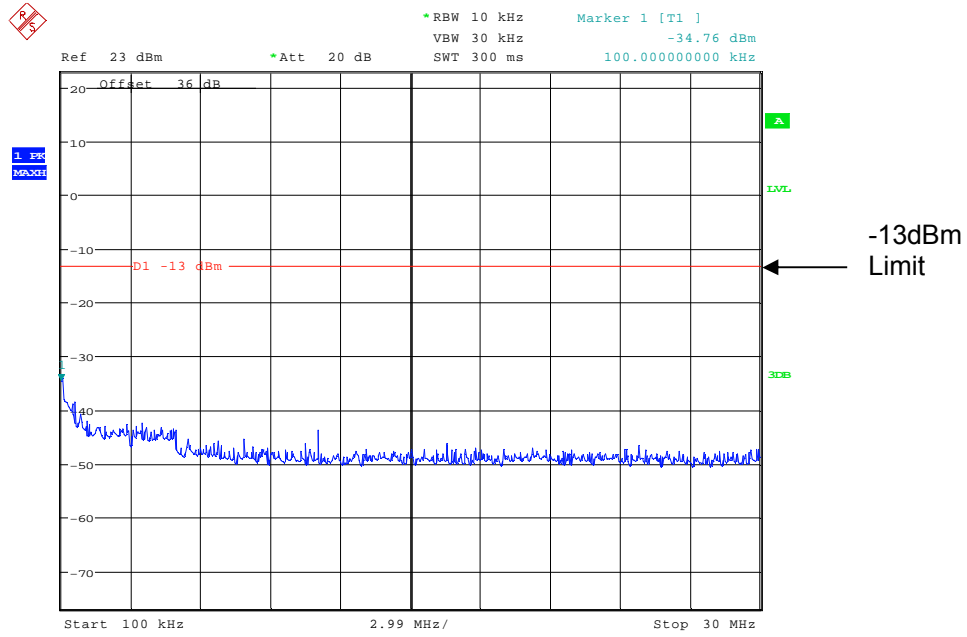
### Intermodulation wide view



Date: 11.APR.2011 10:19:33

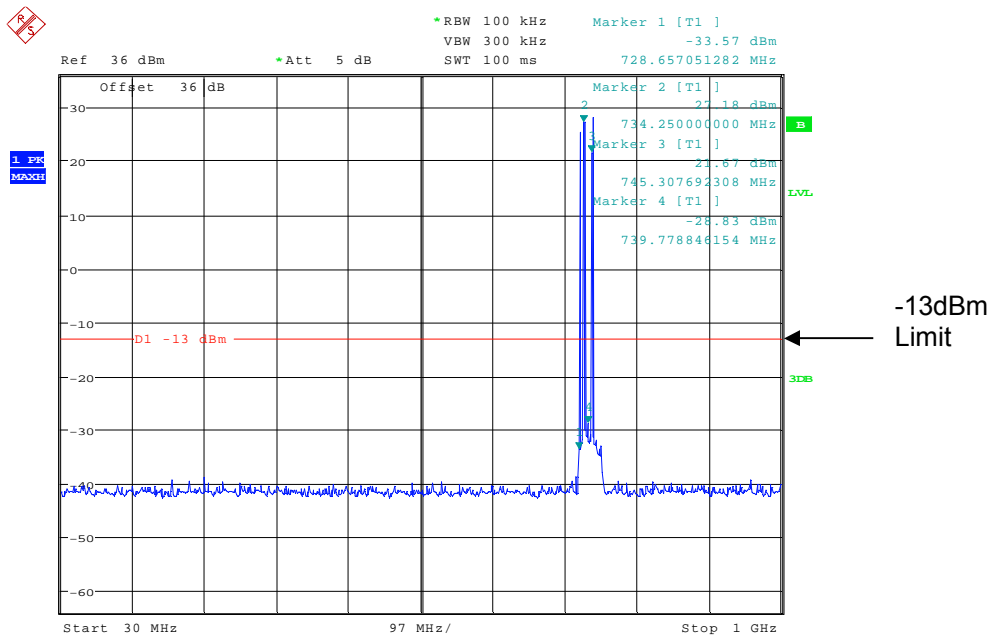
The above plots show that all products (designated by ☆) are below the spurious limit.

100kHz – 30MHz



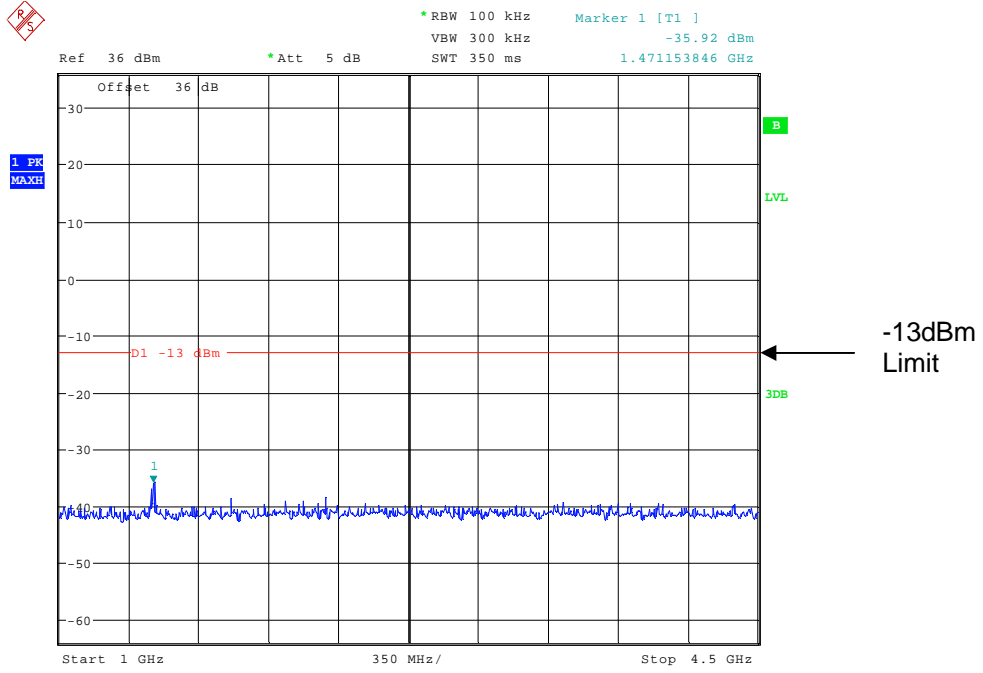
Date: 11.APR.2011 10:20:54

30MHz-1GHz



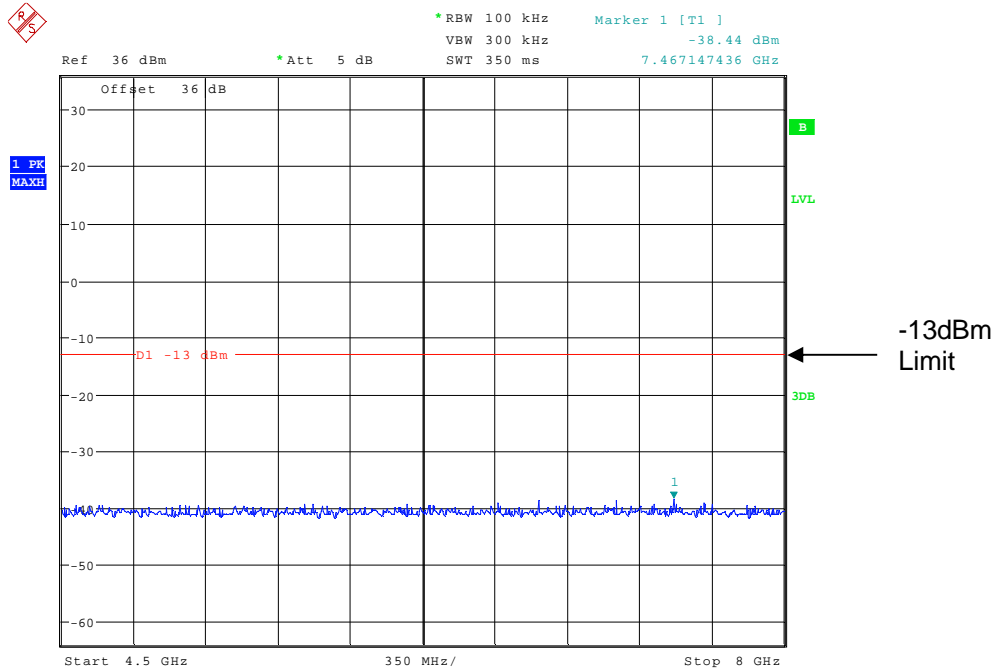
Date: 11.APR.2011 10:21:36

# 1GHz-4.5GHz



Date: 11.APR.2011 10:22:09

# 4.5GHz-8GHz

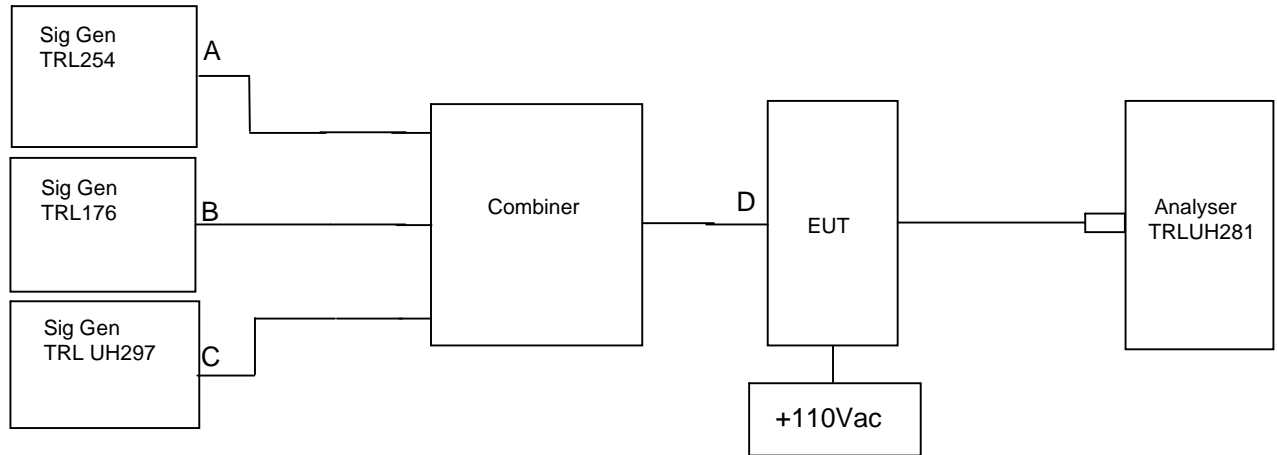


Date: 11.APR.2011 10:24:44

**AMPLIFIER INTERMODULATION SPURIOUS EMISSIONS – CONDUCTED – PART 2.1053  
UHF HIGH BAND DOWNLINK**

Ambient temperature = 22°C  
Relative humidity = 42%  
Supply voltage = +110Vac

Radio Laboratory



The intermodulation and spurious products were measured with the amplifier operating at maximum gain. A three tone test was conducted using the equipment as above. The input power level was adjusted so the level at point D was 10dB above the maximum input of -63dBm. The cable and attenuator loss between the EUT and the spectrum analyser was 40.5dB.

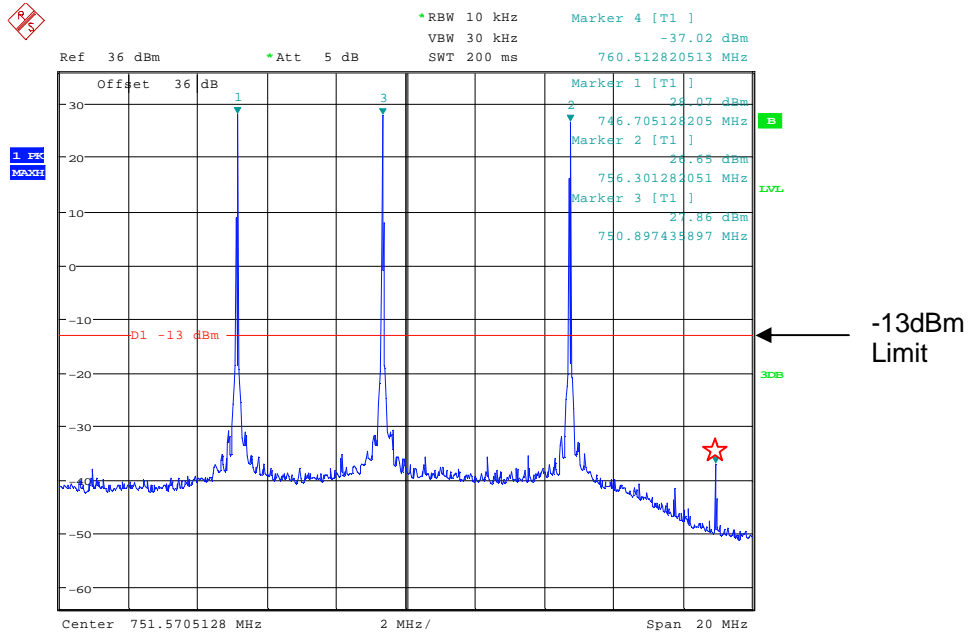
RF Input Frequency (MHz)			Highest Intermodulation Product Level (dBm)	Limit (dBm)
746.700	750.897	756.300	No Significant emissions within 20dBm	-13

Sweep data is shown on the next page:

Test equipment used for intermodulation test

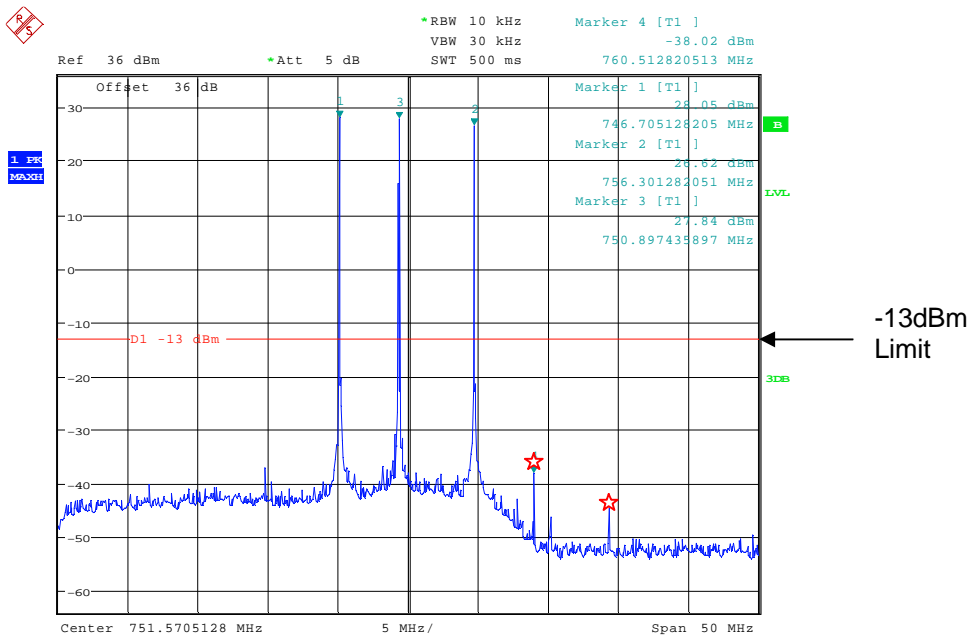
TYPE OF EQUIPMENT	MAKER/SUPPLIER	MODEL No	SERIAL No	TRL No	ACTUAL EQUIPMENT USED
SPECTRUM ANALYSER	R&S	FSU46	200034	UH281	<b>X</b>
SIGNAL GENERATOR	MARCONI	2042	119562/021	254	<b>X</b>
SIGNAL GENERATOR	R&S	SML 03	102268	UH297	<b>X</b>
SIGNAL GENERATOR	RHODE & SCHWARZ	Vector Signal Generator	255812	916	<b>X</b>
COMBINER	ELCOM	RC-4-50	N/A	170	<b>X</b>
CABLE	TRL	N/A	N/A	UH271	<b>X</b>
CABLE	TRL	N/A	N/A	UH272	<b>X</b>
CABLE	TRL	N/A	N/A	UH273	<b>X</b>
CABLE	TRL	N/A	N/A	UH269	<b>X</b>

### Intermodulation Close view



Date: 11.APR.2011 09:16:52

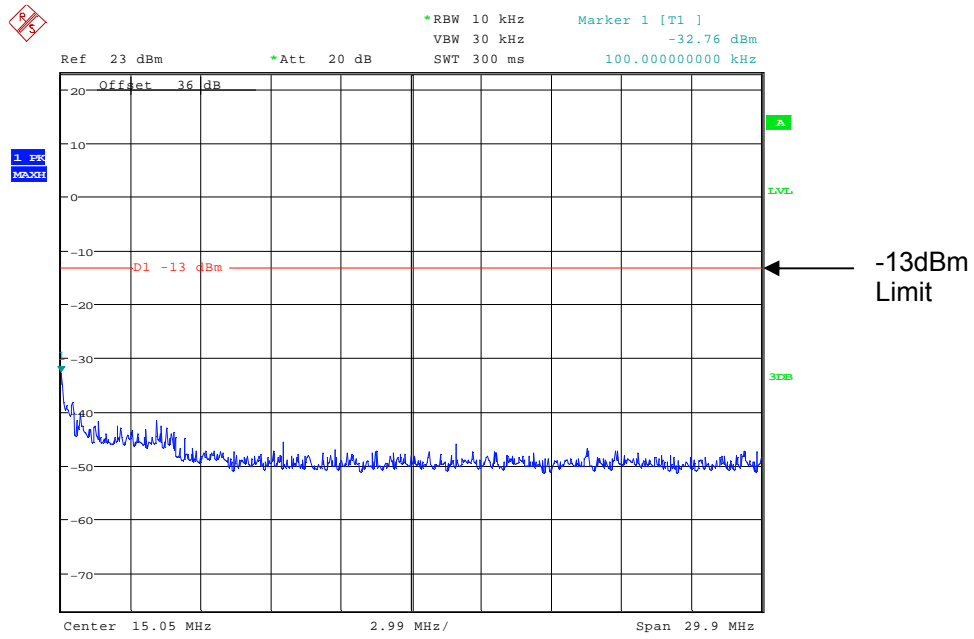
### Intermodulation wide view



Date: 11.APR.2011 09:17:14

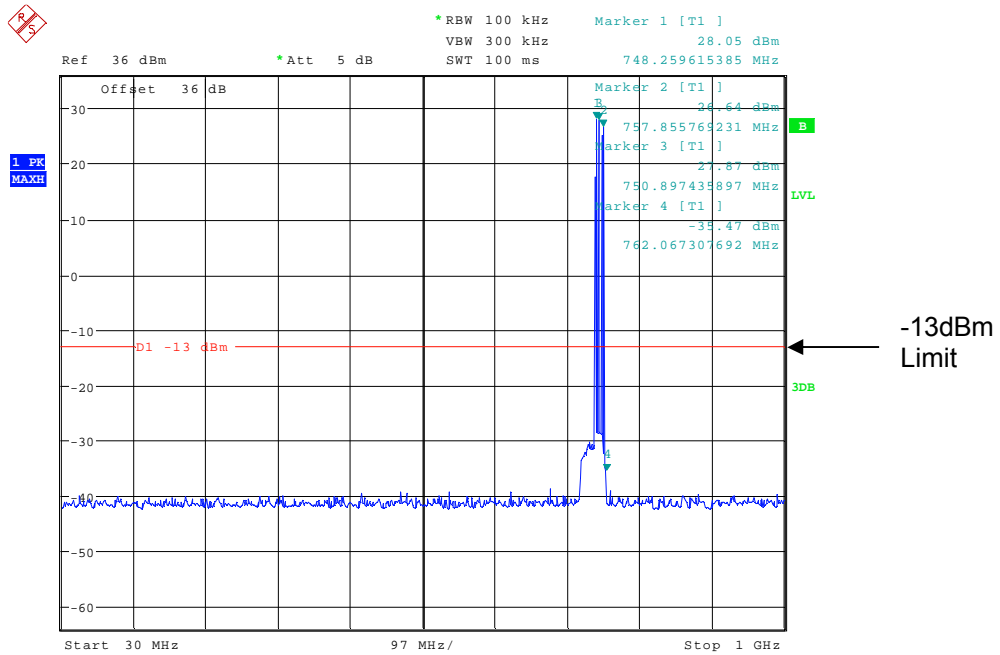
The above plots show that all products (designated by ☆) are below the spurious limit.

### 100kHz – 30MHz



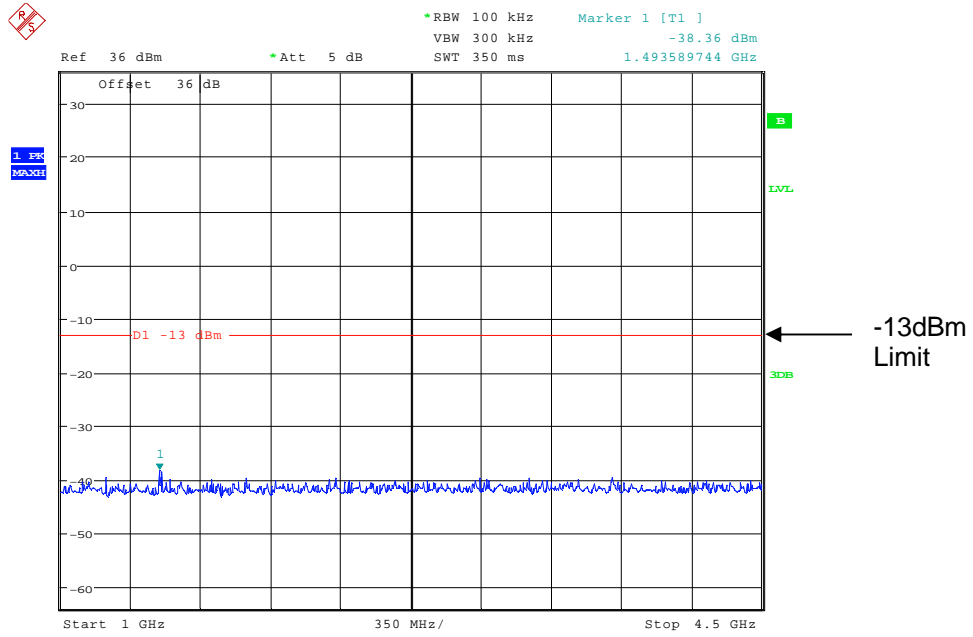
Date: 11.APR.2011 09:17:41

### 30MHz-1GHz



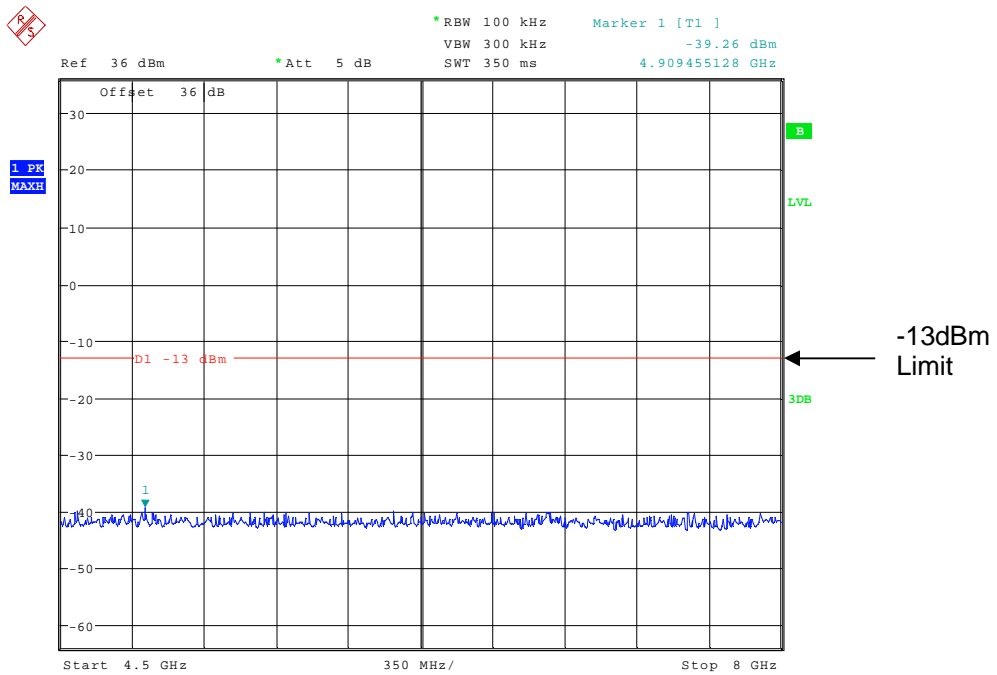
Date: 11.APR.2011 09:18:11

# 1GHz-4.5GHz



Date: 11.APR.2011 09:18:31

# 4.5GHz-8GHz



Date: 11.APR.2011 09:18:53

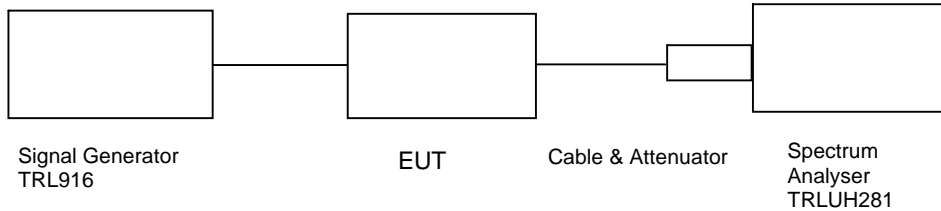


## TRANSMITTER TESTS

### AMPLIFIER MODULATED CHANNEL TEST – CONDUCTED – Part 2.1049 UHF LOW BAND DOWNLINK

Ambient temperature = 22°C  
 Relative humidity = 42%  
 Supply voltage = +230Vac  
 Channel number = See test results

Radio Laboratory



This test was performed to show that the amplifier does not alter the input signal in any way. The input signal was set to the maximum input level and modulated with a 2500Hz tone. The plots show the signal measured at the signal generator and the signal measured at the output of the EUT.

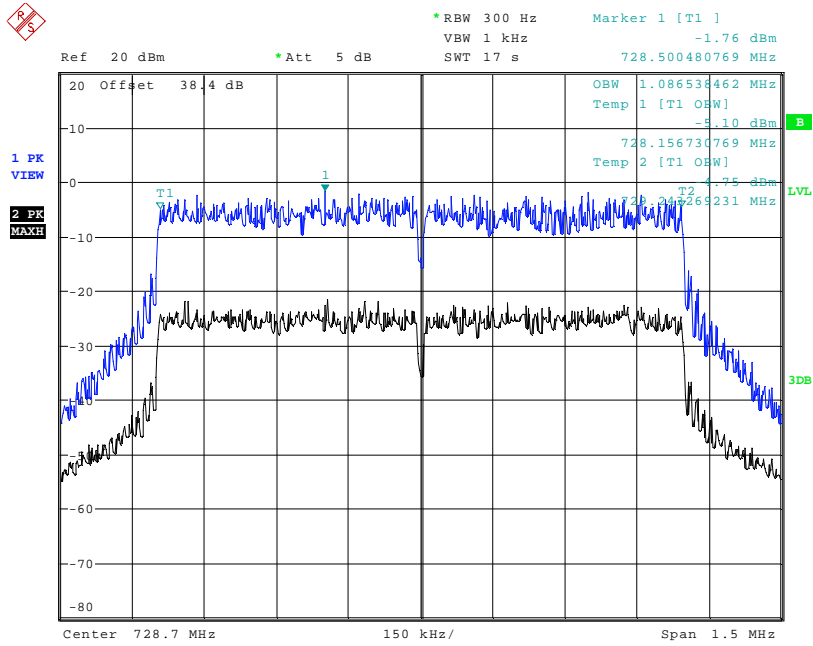
Note: The cables and attenuators had the following losses.

1. Cable and attenuator between EUT and spectrum analyser 36.10dB
2. Cable between signal generator and EUT 0.24dB
3. See Table below for 99% Power Occupied Bandwidth

Frequency Of Operation Channel	LTE Modulation					
	99% Bandwidth	1.4MHz deviation	3MHz deviation	5MHz deviation	10MHz deviation	15MHz deviation
728.700MHz		1.0865538MHz	2.697115MHz	4.487179MHz	8.942307MHz	13.365384MHz
737.000MHz		1.0865384MHz	2.697115MHz	4.487179MHz	8.926282MHz	13.365384MHz
745.300MHz		1.086538MHz	2.697115MHz	4.479166MHz	8.942307MHz	13.365384MHz

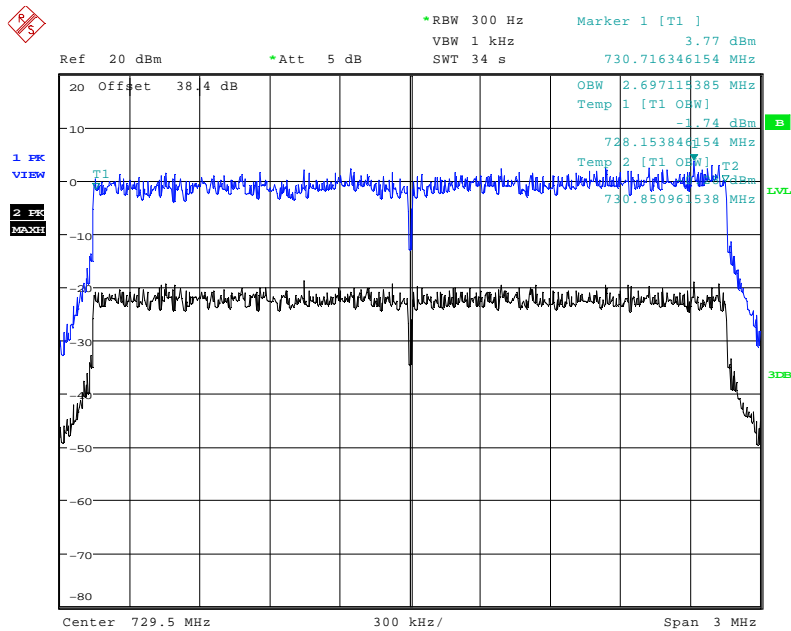
TYPE OF EQUIPMENT	MAKER/SUPPLIER	MODEL No	SERIAL No	TRL No	ACTUAL EQUIPMENT USED
SPECTRUM ANALYSER	RHODE & SCHWARZ	FSU46	200034	UH281	<b>X</b>
ATTENUATOR	BIRD	8308-200-N	N/A	103	<b>X</b>
ATTENUATOR	BIRD	8304-100-N	N/A	222	<b>X</b>
CABLE	TRL	N/A	N/A	UH271	<b>X</b>
CABLE	TRL	N/A	N/A	UH272	<b>X</b>
CABLE	TRL	N/A	N/A	UH273	<b>X</b>
SIGNAL GENERATOR	RHODE & SCHWARZ	Vector Signal Generator	255812	916	<b>X</b>

728.700 MHz Signal Generator, and EUT deviation set to 1.4MHz LTE



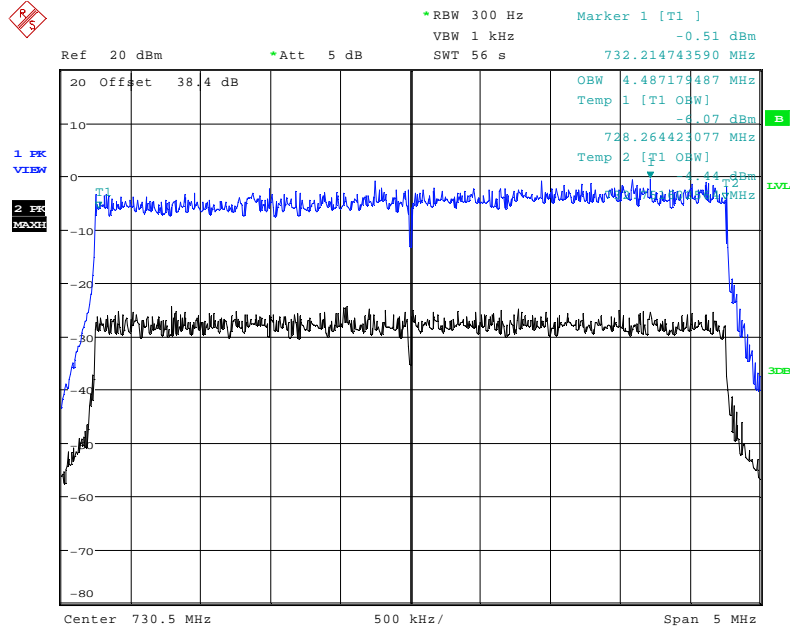
Date: 12.APR.2011 16:16:44

728.700 MHz Signal Generator, and EUT deviation set to 3MHz LTE



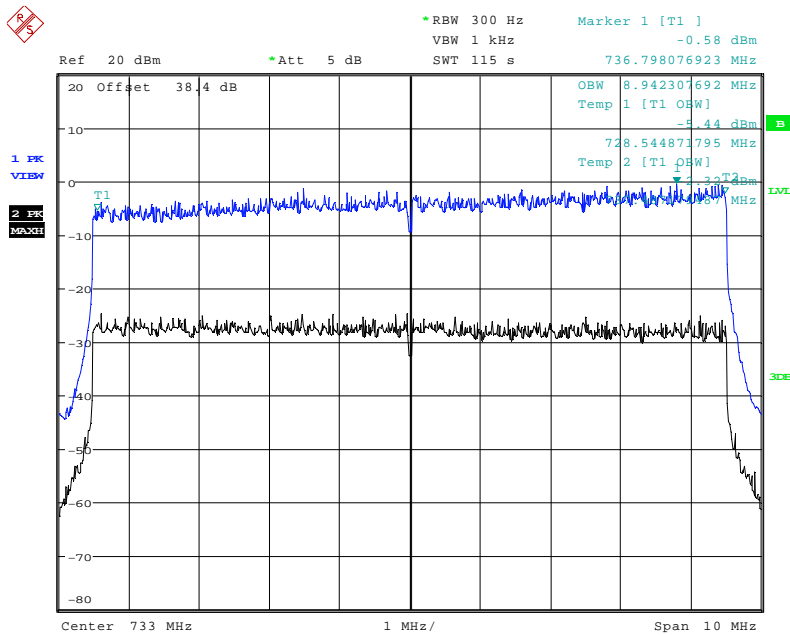
Date: 12.APR.2011 16:23:34

728.700 MHz Signal Generator, and EUT deviation set to 5MHz LTE



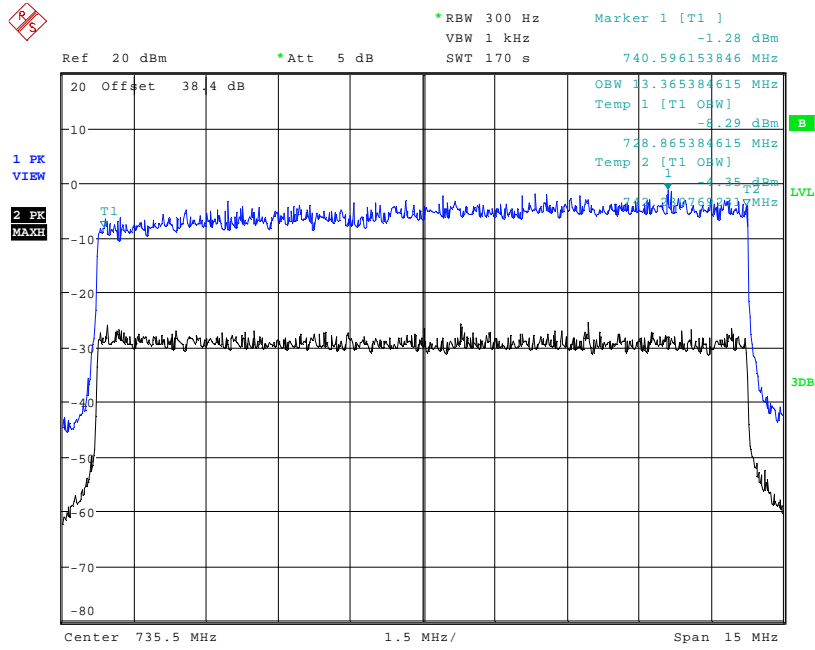
Date: 12.APR.2011 16:34:15

728.700 MHz Signal Generator, and EUT deviation set to 10MHz LTE



Date: 12.APR.2011 16:43:37

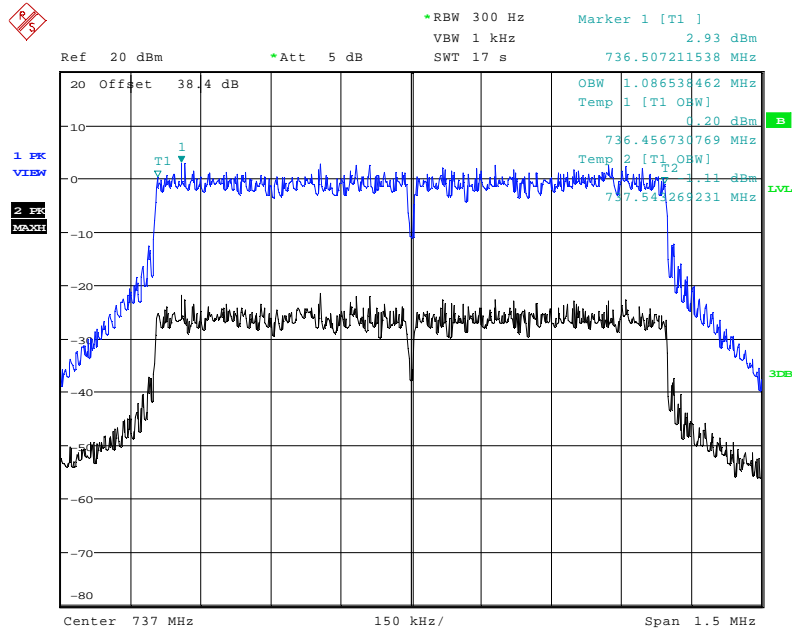
728.700 MHz Signal Generator, and EUT deviation set to 15MHz LTE



Date: 12.APR.2011 16:52:56

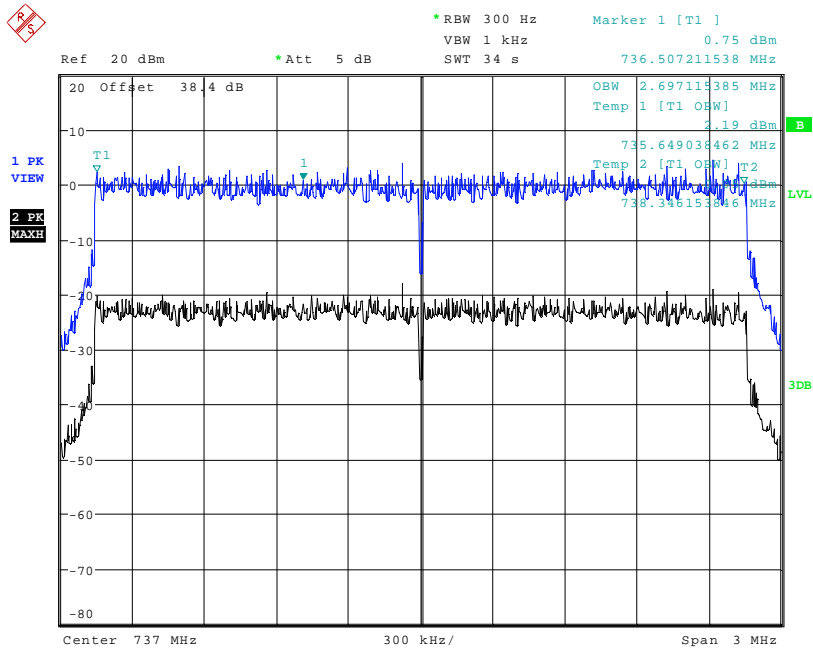
The above plots depicting the output wavelshape show no measurable distortion visible when compared to the input signal.

737.000 MHz Signal Generator, and EUT deviation set to 1.4MHz LTE



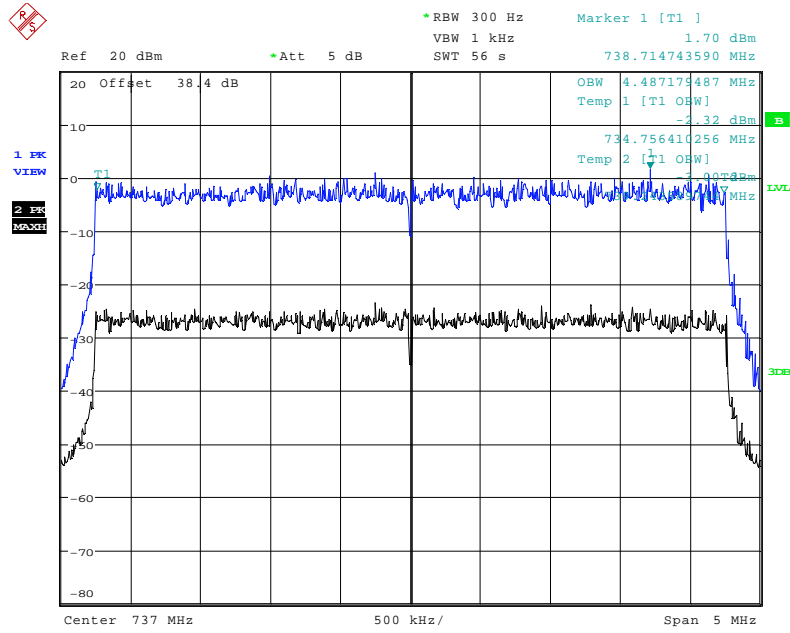
Date: 12.APR.2011 14:44:37

737.000 MHz Signal Generator, and EUT deviation set to 3MHz LTE



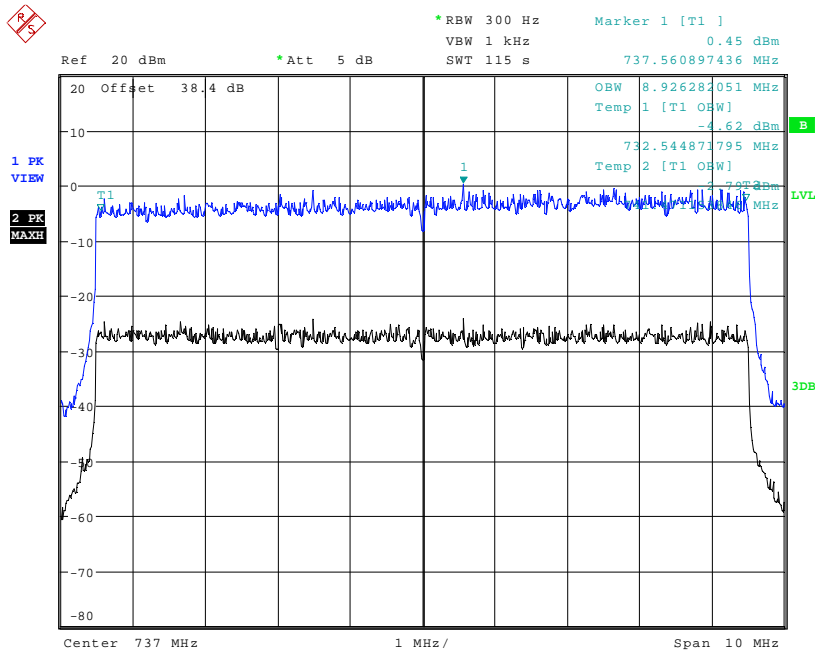
Date: 12.APR.2011 14:48:34

### 737.000 MHz Signal Generator, and EUT deviation set to 5MHz LTE



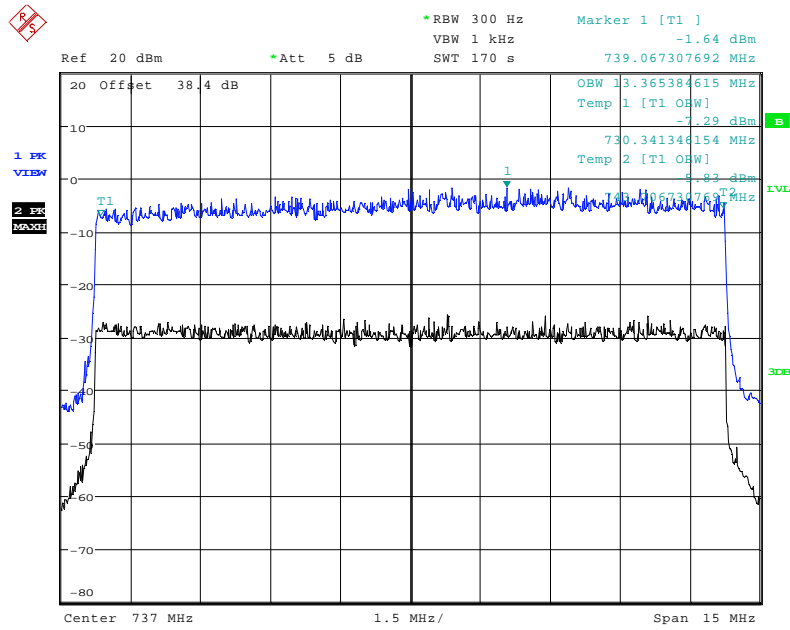
Date: 12.APR.2011 14:56:27

### 737.000 MHz Signal Generator, and EUT deviation set to 10MHz LTE



Date: 12.APR.2011 15:20:58

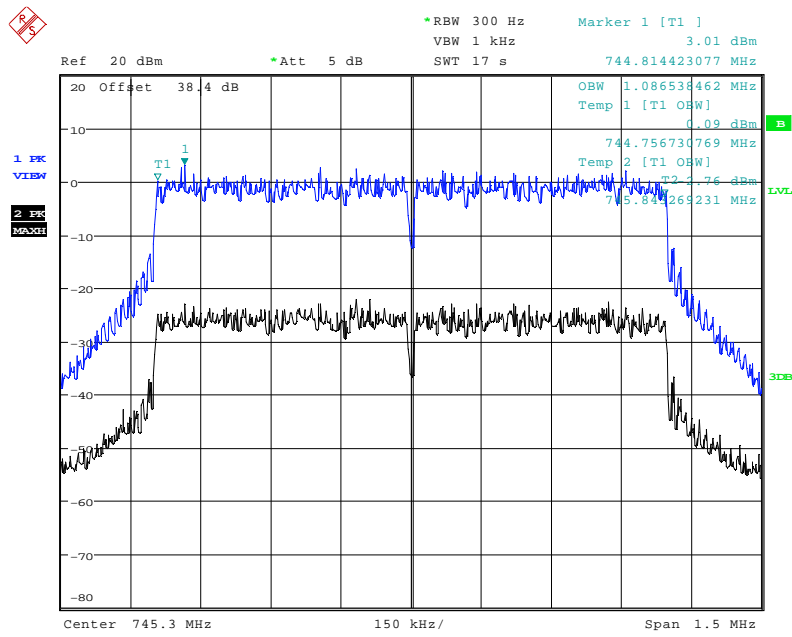
737.000 MHz Signal Generator, and EUT deviation set to 15MHz LTE



Date: 12.APR.2011 15:34:13

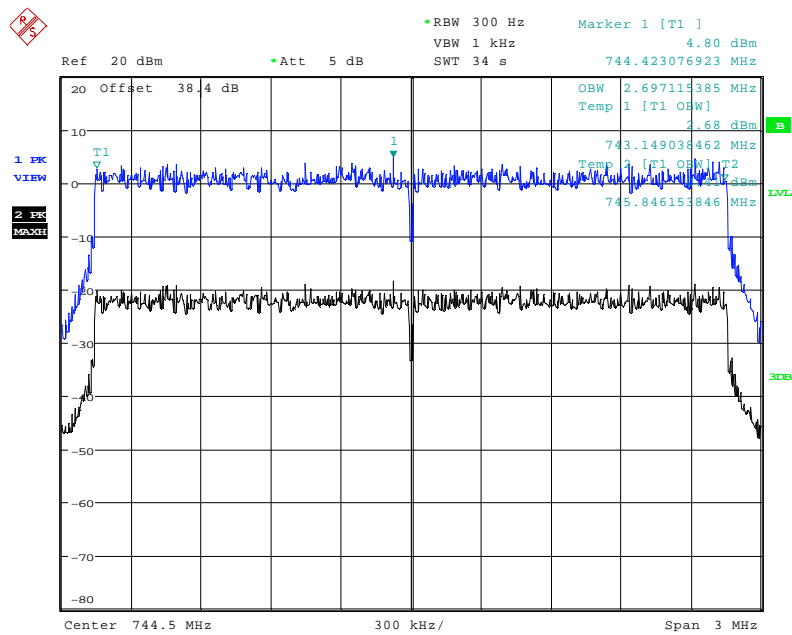
The above plots depicting the output waveshape show no measurable distortion visible when compared to the input signal.

745.300 MHz Signal Generator, and EUT deviation set to 1.4MHz LTE



Date: 12.APR.2011 14:03:51

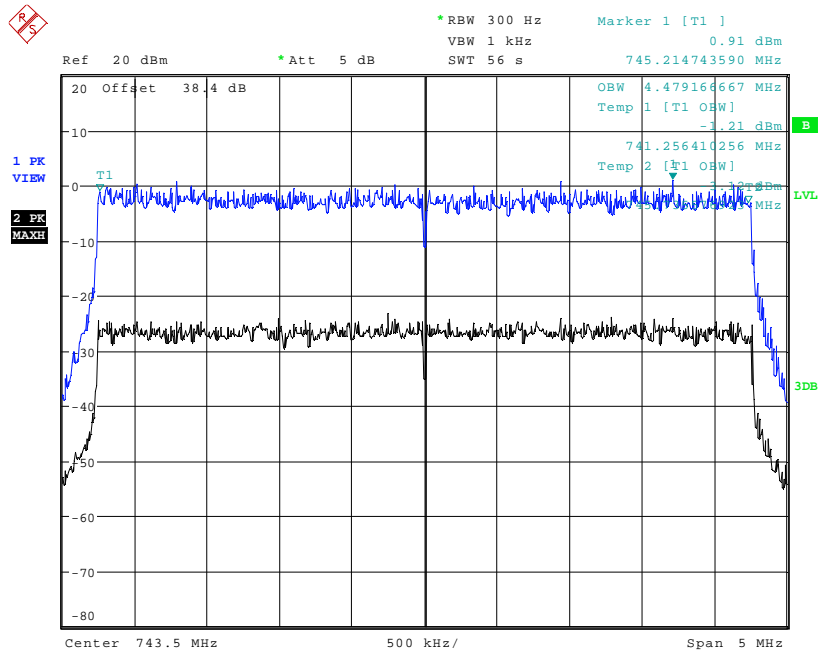
745.300 MHz Signal Generator, and EUT deviation set to 3MHz LTE



Date: 12.APR.2011 14:16:18

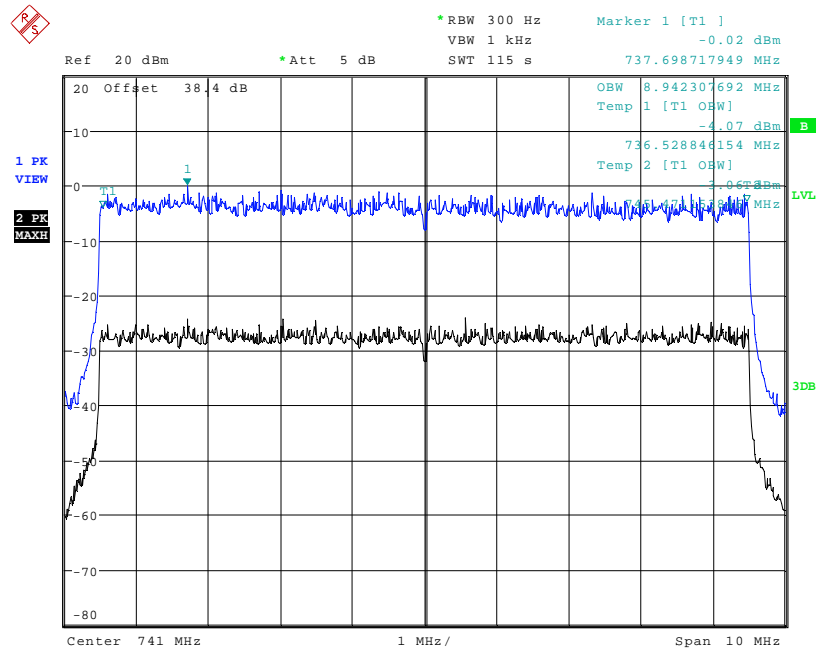


745.300 MHz Signal Generator, and EUT deviation set to 5MHz LTE



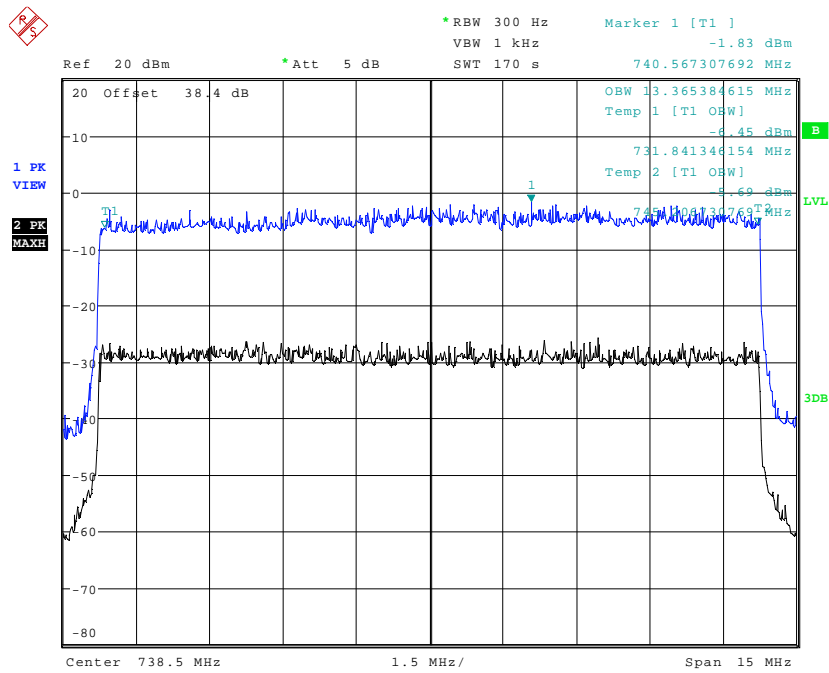
Date: 12.APR.2011 14:30:52

745.300 MHz Signal Generator, and EUT deviation set to 10MHz LTE



Date: 12.APR.2011 14:39:12

745.300 MHz Signal Generator, and EUT deviation set to 15MHz LTE



Date: 12.APR.2011 15:50:50

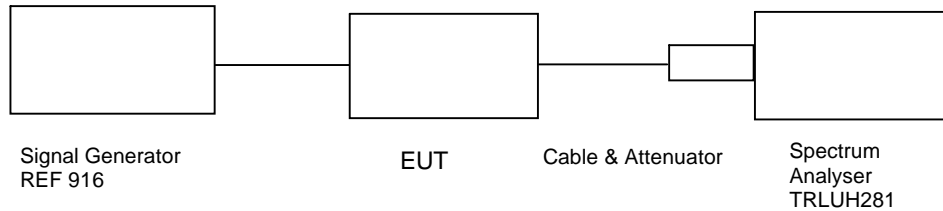
The above plots depicting the output wavseshape show no measurable distortion visible when compared to the input signal.

## TRANSMITTER TESTS

### AMPLIFIER MODULATED CHANNEL TEST – CONDUCTED – Part 2.1049 UHF HIGH BAND DOWNLINK

Ambient temperature = 22°C  
 Relative humidity = 42%  
 Supply voltage = +230Vac  
 Channel number = See test results

Radio Laboratory



This test was performed to show that the amplifier does not alter the input signal in any way. The input signal was set to the maximum input and modulated with a 2500Hz tone. The plots show the signal measured at the signal generator and the signal measured at the output of the EUT.

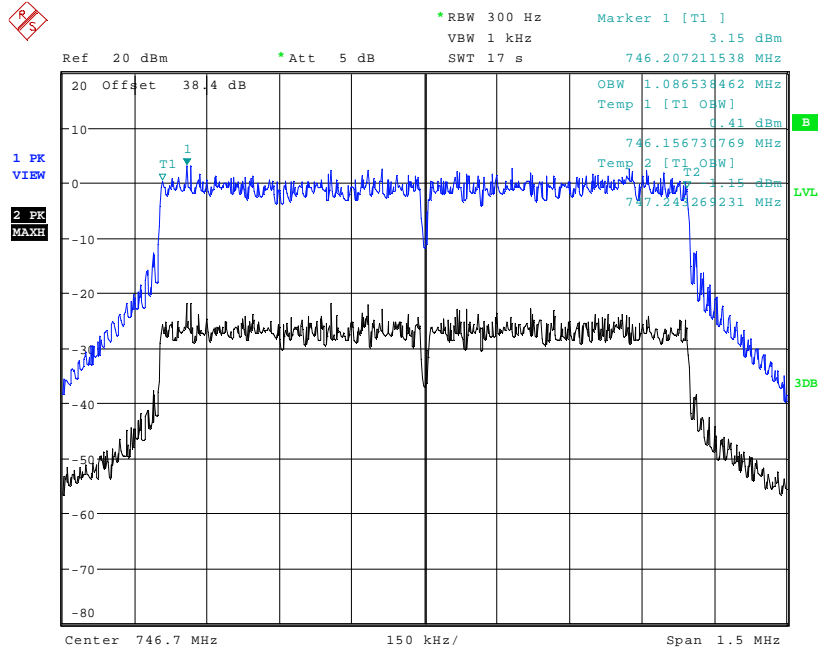
Note: The cables and attenuators had the following losses.

3. Cable and attenuator between EUT and spectrum analyser 36.10dB
4. Cable between signal generator and EUT 0.25dB
3. See Table below for 99% Power Occupied Bandwidth

Frequency Of Operation Channel	LTE Modulation			
	99% Bandwidth	1.4MHz deviation	3MHz deviation	5MHz deviation
746.700MHz	1.086538MHz	2.697115MHz	4.495192MHz	8.942307MHz
751.500MHz	1.084134MHz	2.697115MHz	4.495192MHz	8.942307MHz
756.300MHz	1.086538MHz	2.697115MHz	4.487179MHz	8.942307MHz

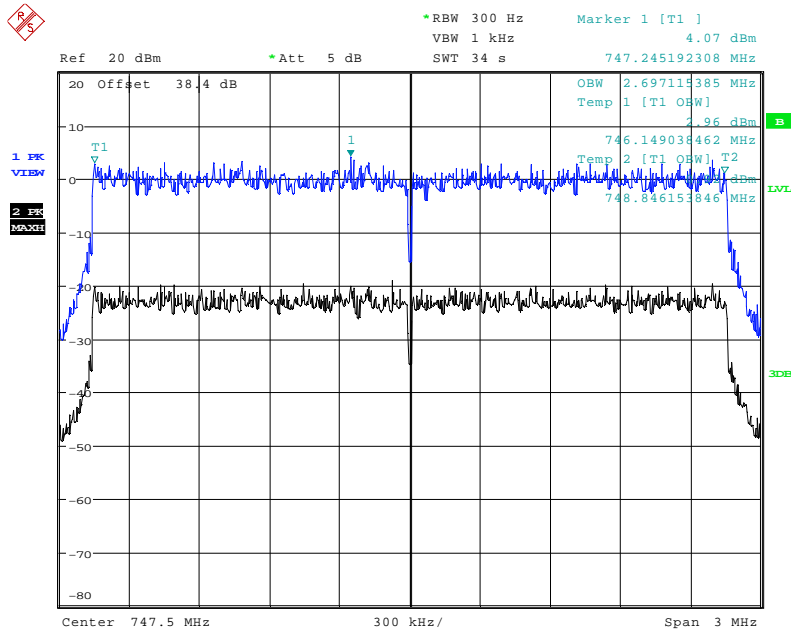
TYPE OF EQUIPMENT	MAKER/SUPPLIER	MODEL No	SERIAL No	TRL No	ACTUAL EQUIPMENT USED
SPECTRUM ANALYSER	RHODE & SCHWARZ	FSU46	200034	UH281	<b>X</b>
ATTENUATOR	BIRD	8308-200-N	N/A	103	<b>X</b>
ATTENUATOR	BIRD	8304-100-N	N/A	222	<b>X</b>
CABLE	TRL	N/A	N/A	UH271	<b>X</b>
CABLE	TRL	N/A	N/A	UH272	<b>X</b>
CABLE	TRL	N/A	N/A	UH273	<b>X</b>
SIGNAL GENERATOR	RHODE & SCHWARZ	Vector Signal Generator	255812	916	<b>X</b>

746.700 MHz Signal Generator, and EUT deviation set to 1.4MHz LTE



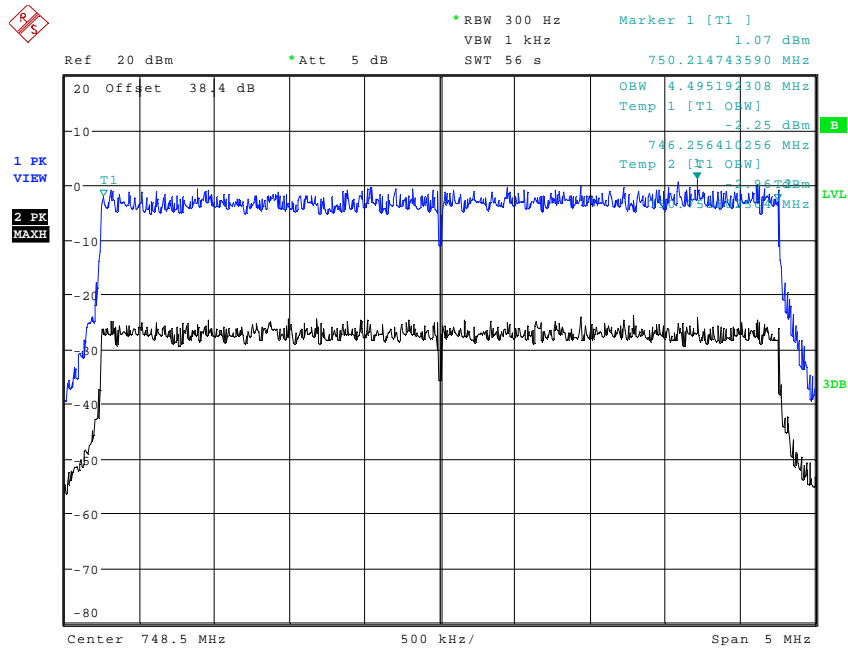
Date: 12.APR.2011 13:31:28

746.700 MHz Signal Generator, and EUT deviation set to 3MHz LTE



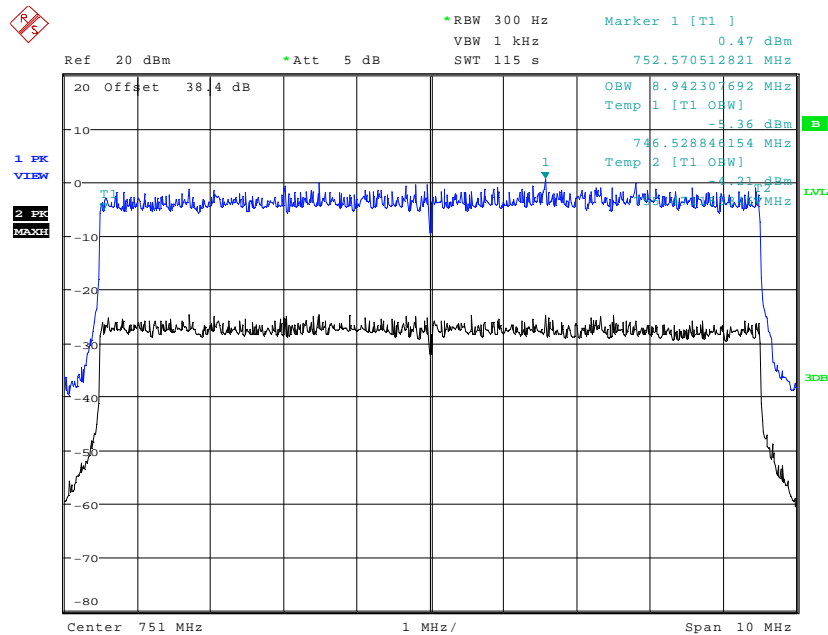
Date: 12.APR.2011 13:37:12

### 746.700 MHz Signal Generator, and EUT deviation set to 5MHz LTE



Date: 12.APR.2011 13:47:24

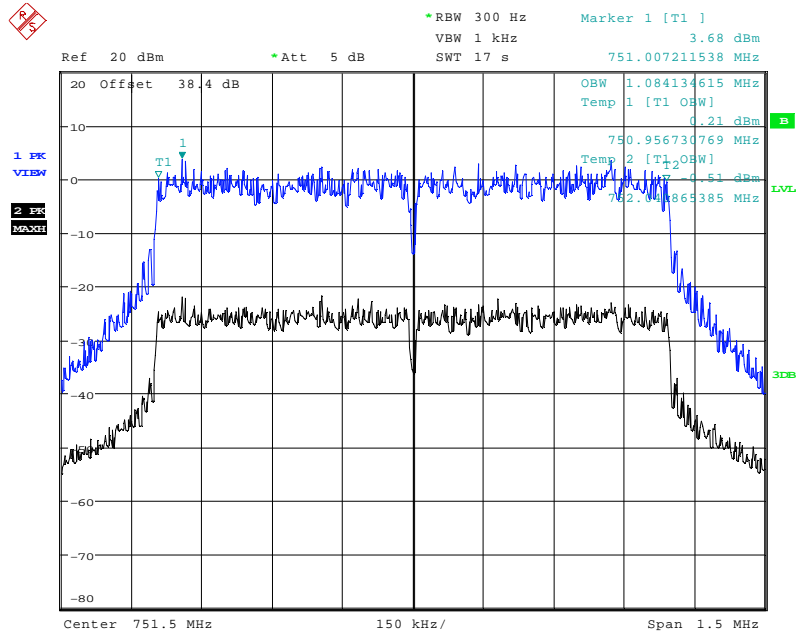
### 746.700 MHz Signal Generator, and EUT deviation set to 10MHz LTE



Date: 12.APR.2011 13:57:25

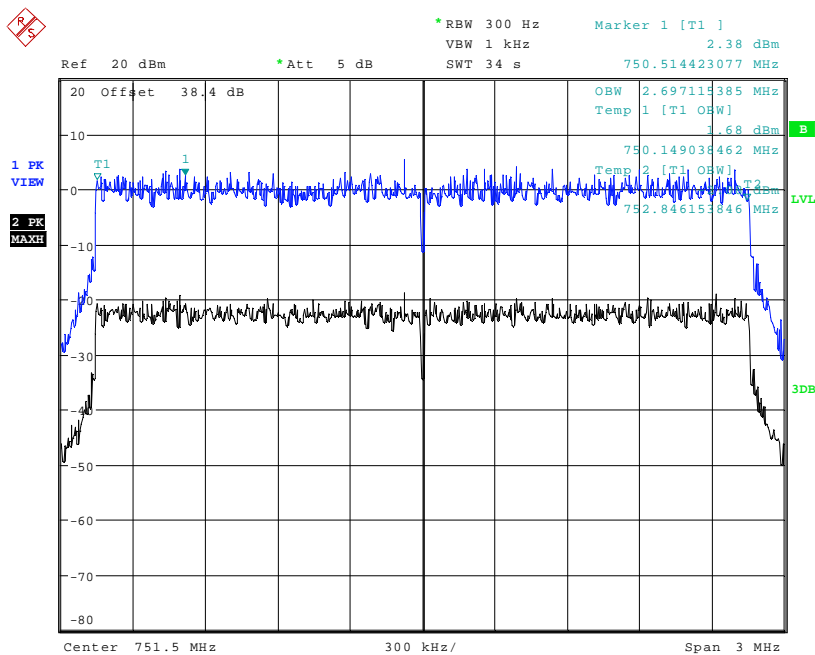
The above plots depicting the output wavelshape show no measurable distortion visible when compared to the input signal.

751.500 MHz Signal Generator, and EUT deviation set to 1.4MHz LTE



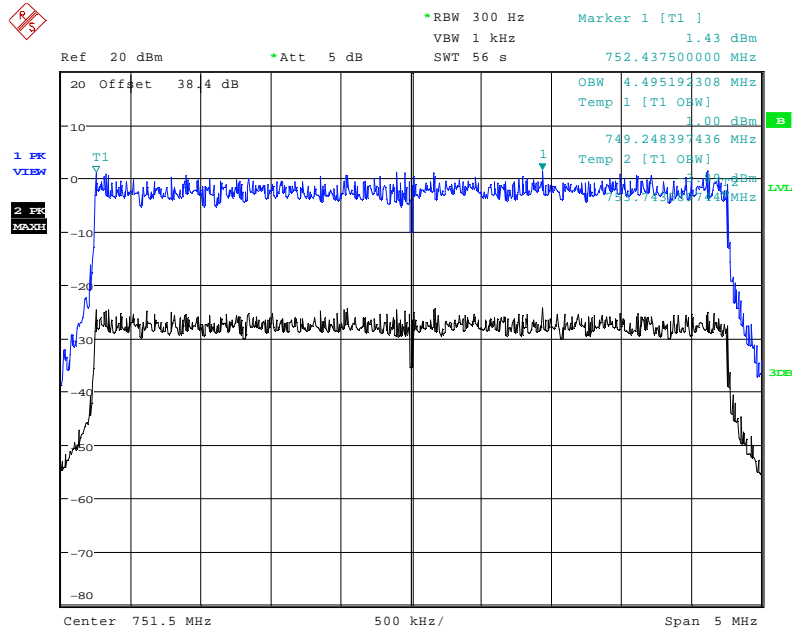
Date: 12.APR.2011 13:04:47

751.500 MHz Signal Generator, and EUT deviation set to 3MHz LTE



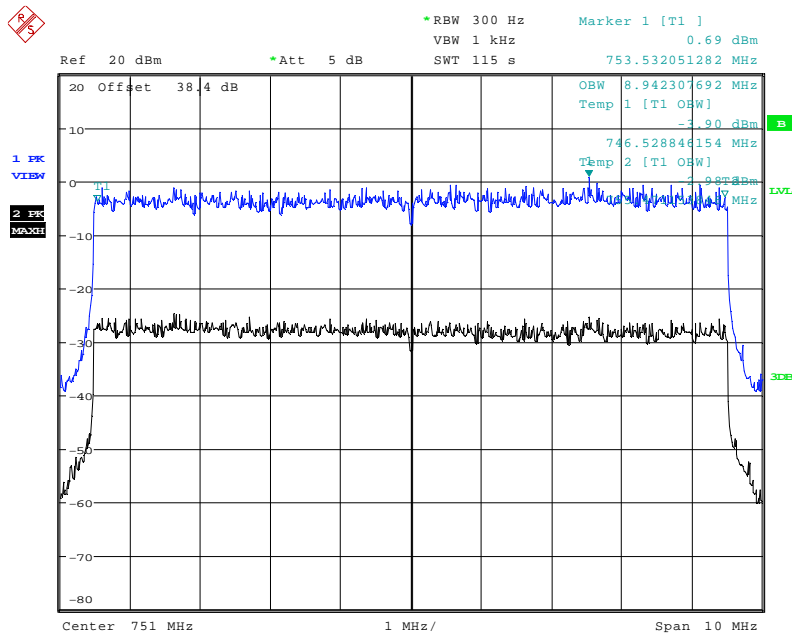
Date: 12.APR.2011 13:09:00

### 751.500 MHz Signal Generator, and EUT deviation set to 5MHz LTE



Date: 12.APR.2011 13:16:09

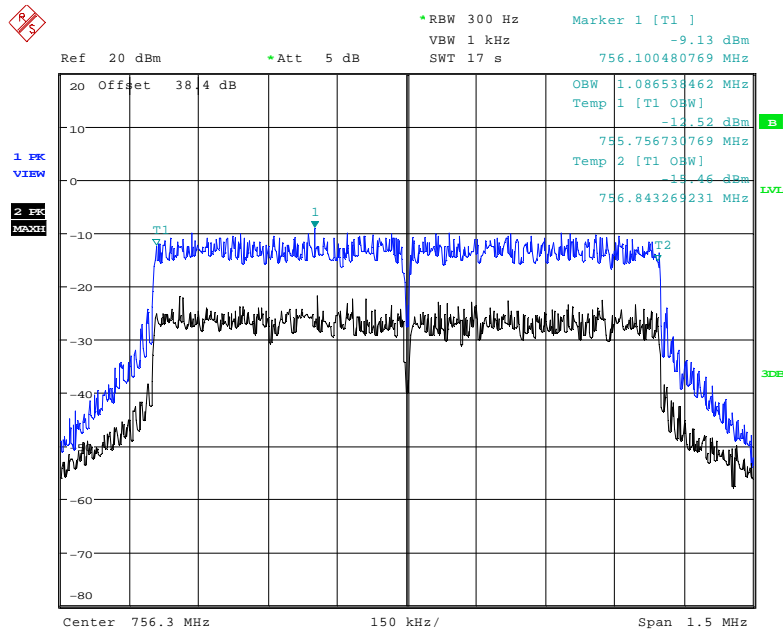
### 751.500 MHz Signal Generator, and EUT deviation set to 10MHz LTE



Date: 12.APR.2011 13:24:35

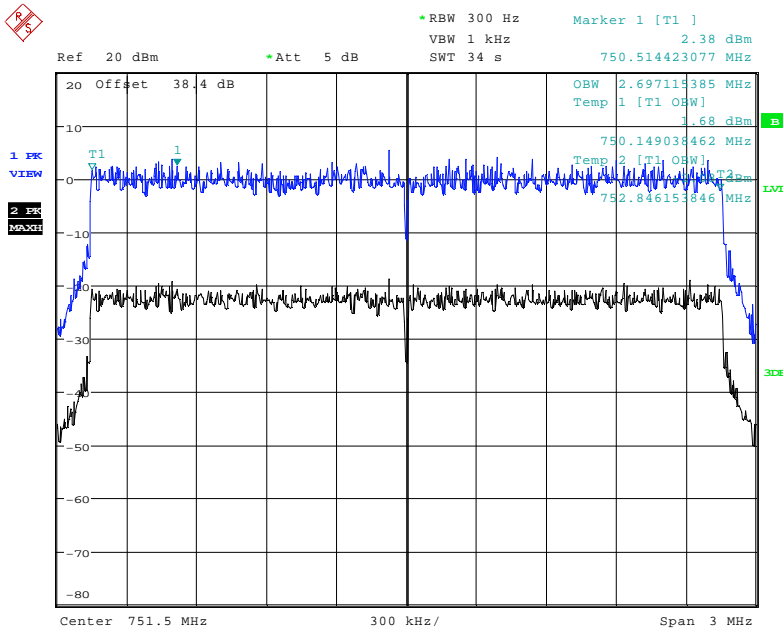
The above plots depicting the output wavsshape show no measurable distortion visible when compared to the input signal.

756.300 MHz Signal Generator, and EUT deviation set to 1.4MHz LTE



Date: 13.APR.2011 12:09:48

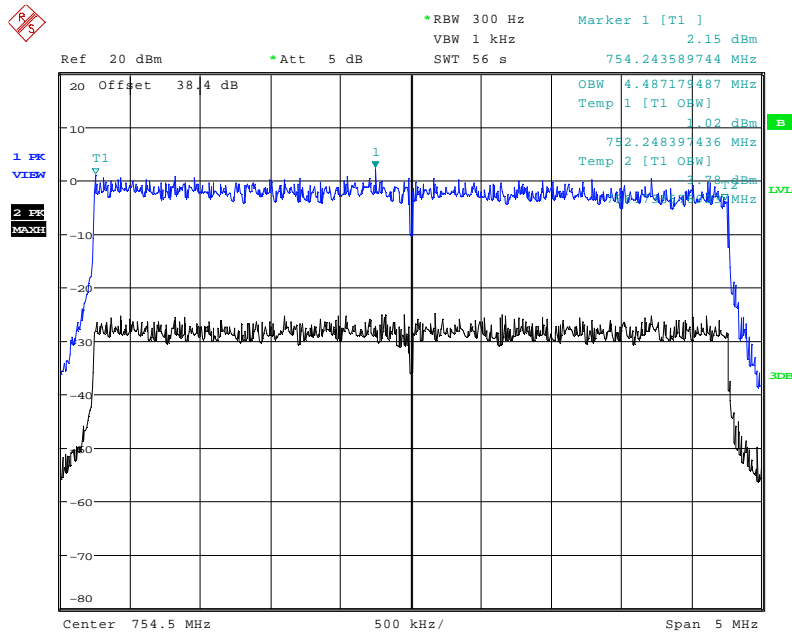
756.300 MHz Signal Generator, and EUT deviation set to 3MHz LTE



Date: 12.APR.2011 13:09:00

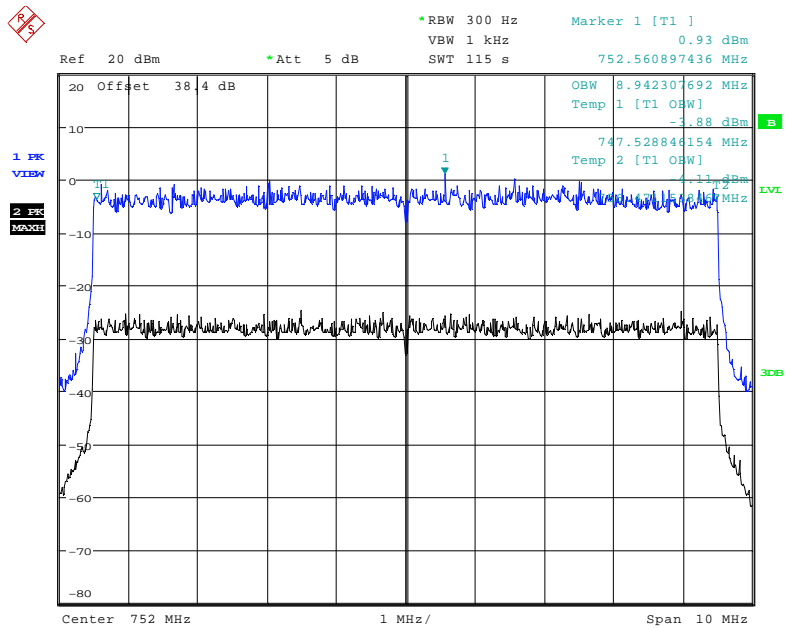


756.300 MHz Signal Generator, and EUT deviation set to 5MHz LTE



Date: 12.APR.2011 12:00:35

756.300 MHz Signal Generator, and EUT deviation set to 10MHz LTE



Date: 12.APR.2011 12:09:03

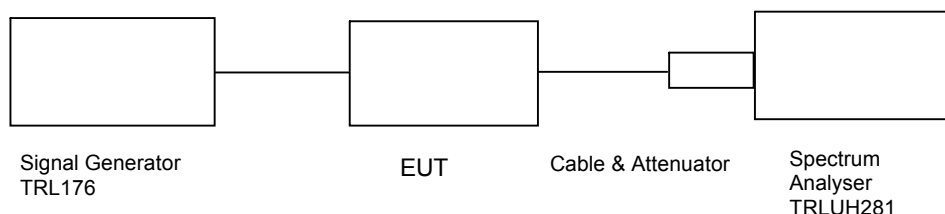
The above plots depicting the output waveshape show no measurable distortion visible when compared to the input signal.

## TRANSMITTER TESTS

### AMPLIFIER SPURIOUS EMISSIONS – CONDUCTED – Part 2.1053 UHF DOWNLINK LOW BAND

Ambient temperature = 24°C  
 Relative humidity = 65%  
 Supply voltage = +110Vac

Radio Laboratory  
 Test Signal = F3E



The test was set up as per the diagram. The level at the input was adjusted to compensate for the loss of the interconnecting cable. The unit was tested operating at maximum power and on three test frequencies.

The Spurious limit was calculated as follows:

On any frequency removed from the assigned frequency by more than 250% of the authorised bandwidth

At least  $43 + 10 \log P_{dB}$

$$(10 \log P_{\text{watts}}) - (43 + 10 \log (P_{\text{watts}} * 1000)) = \text{LIMIT} = -13 \text{ dBm}$$

## RESULTS

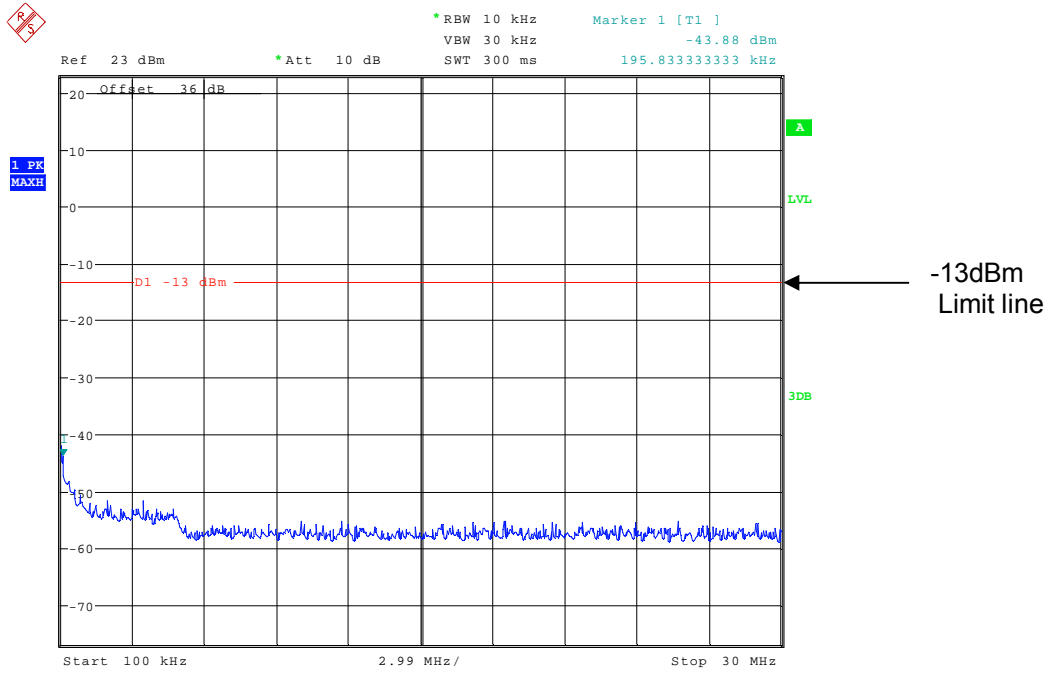
FREQUENCY RANGE	FREQ. (MHz)	EMISSION FREQ. (GHz)	EMISSION LEVEL (dBm)	LIMIT (dBm)
100kHz – 8GHz	737.000	1.471153	-29.18	-13
100kHz – 8GHz	745.300	1.487980	-30.92	-13

The test equipment used for the Transmitter Conducted Emissions:

TYPE OF EQUIPMENT	MAKER/SUPPLIER	MODEL No	SERIAL No	TRL No	ACTUAL EQUIPMENT USED
SPECTRUM ANALYSER	RHODE & SCHWARZ	FSU46	200034	UH281	<b>X</b>
ATTENUATOR	BIRD	8308-100	N/A	TRL112	<b>X</b>
ATTENUATOR	BIRD	8304-0600N	N/A	TRL266	<b>X</b>
ATTENUATOR	2 X CUSTOMER SUPPLIED 20dB ATTENUATORS	N/A	N/A	N/A	<b>X</b>
CABLE	TRL	N/A	N/A	UH273	<b>X</b>
CABLE	TRL	N/A	N/A	UH274	<b>X</b>

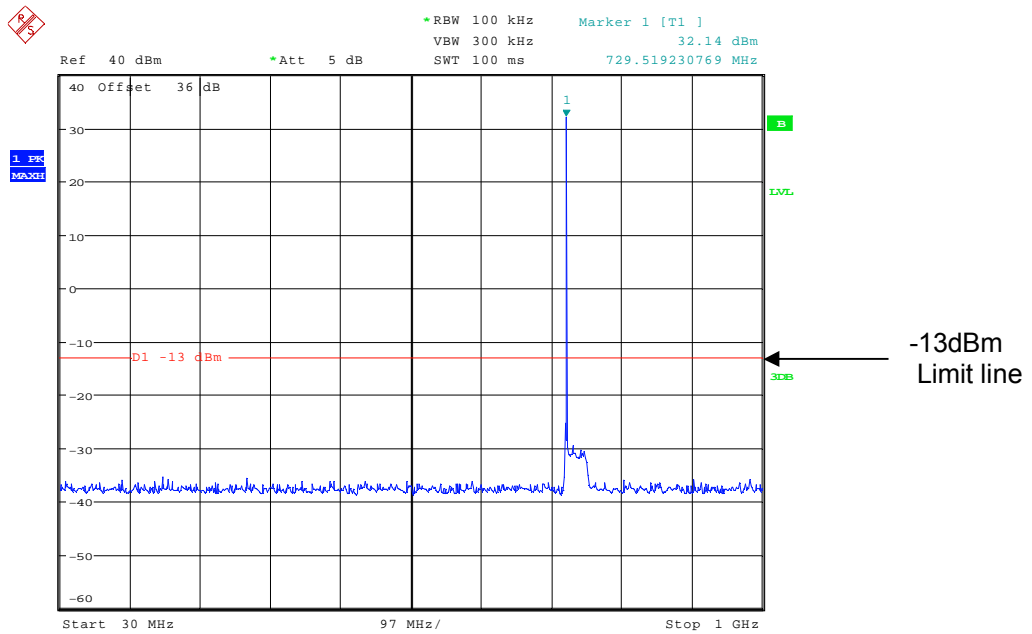
### Conducted emissions Bottom Channel

728.700MHz 100kHz – 30MHz



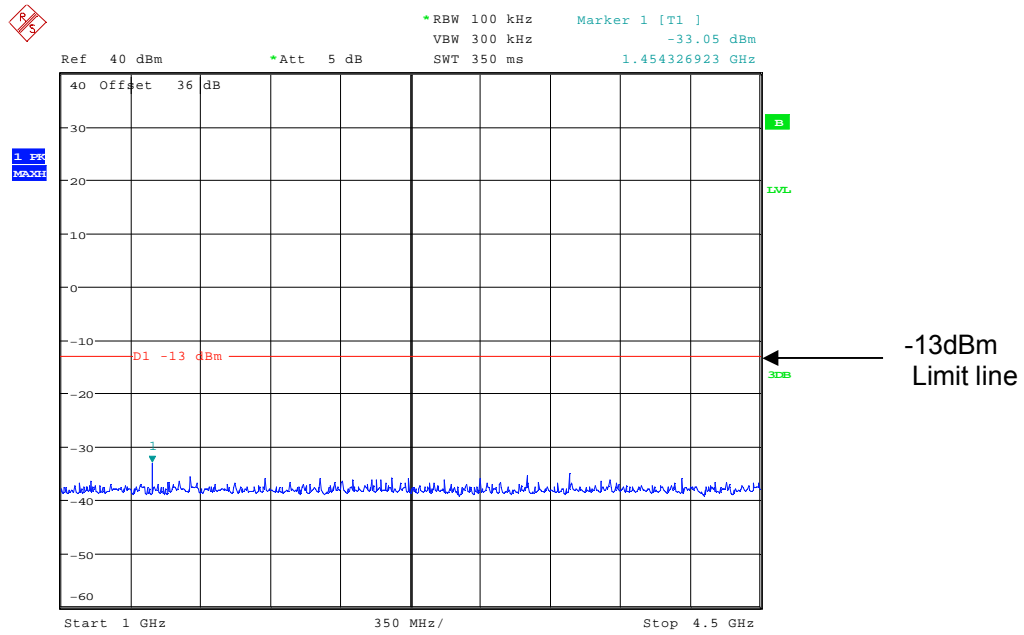
Date: 8.APR.2011 14:03:01

728.700MHz 30MHz – 1GHz



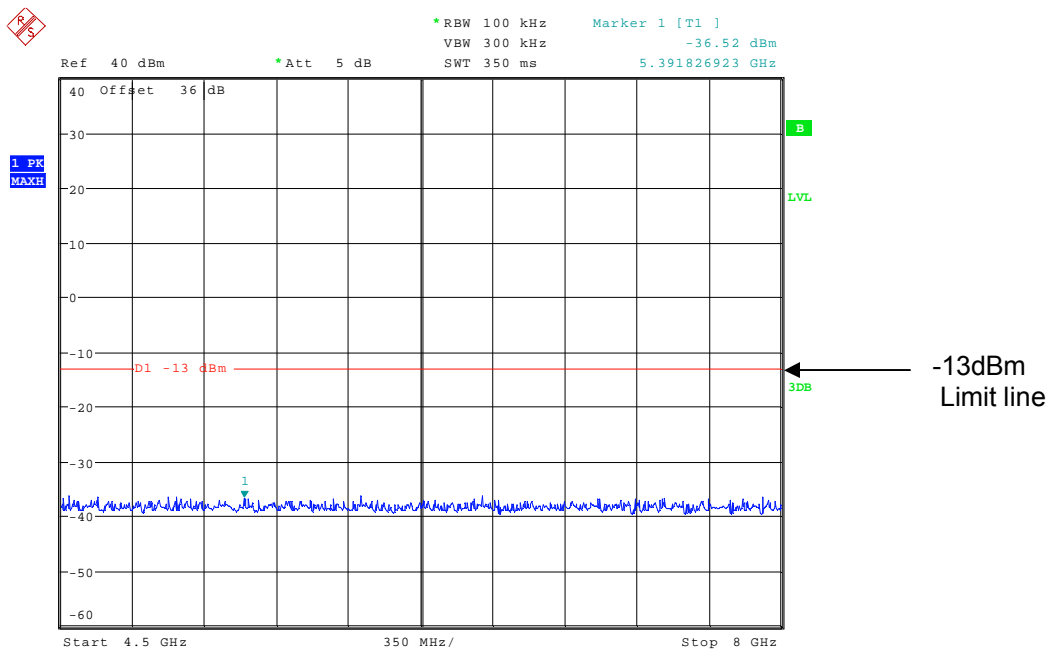
Date: 8.APR.2011 14:05:13

### 728.700MHz 1GHz – 4.5GHz



Date: 8.APR.2011 14:06:44

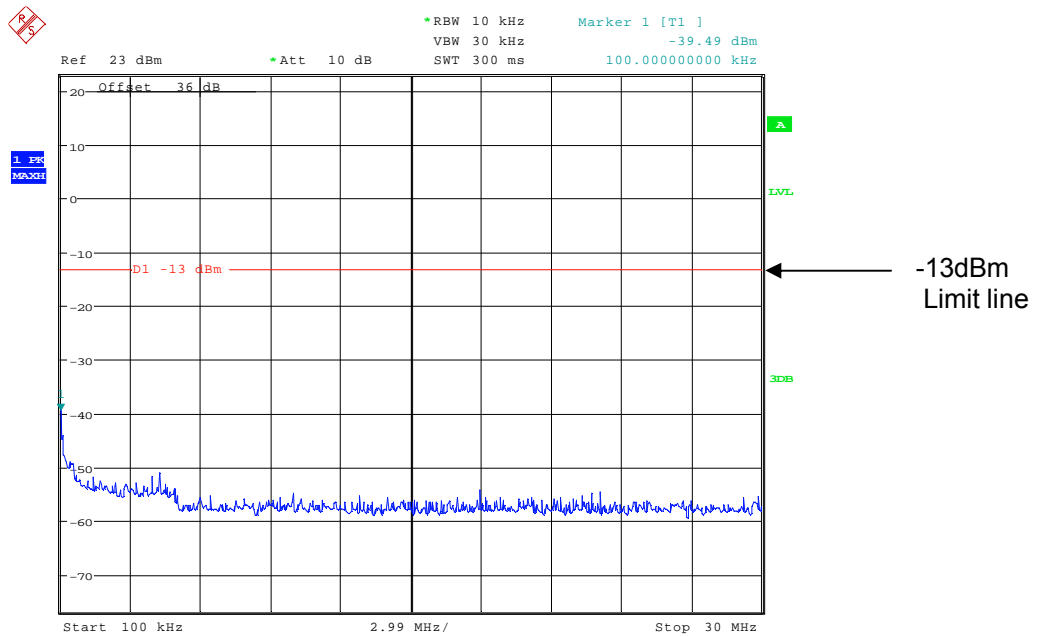
### 728.700MHz 4.5GHz – 8GHz



Date: 8.APR.2011 14:07:09

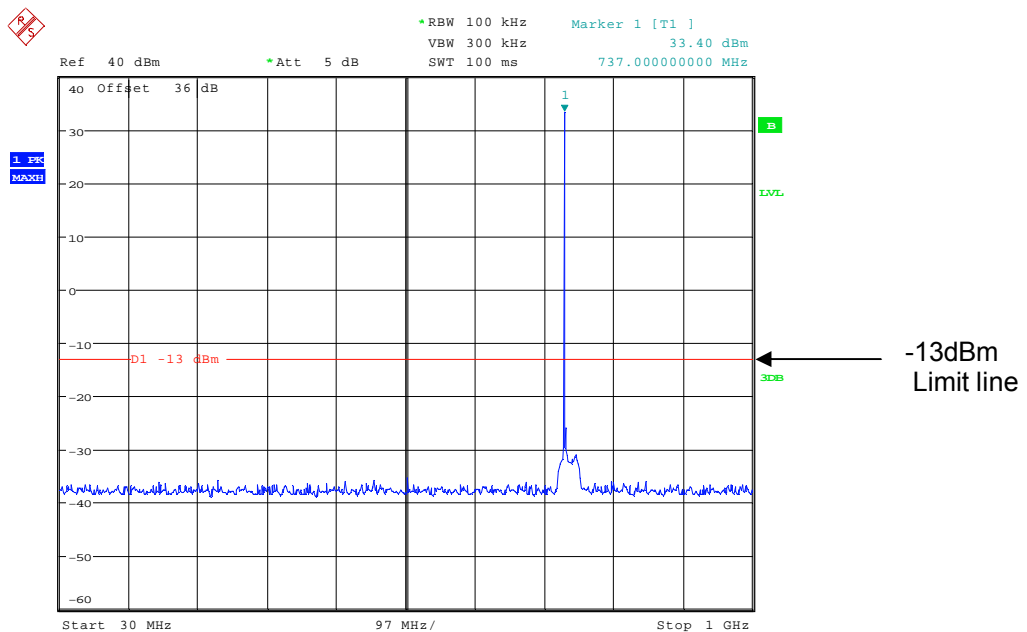
# Conducted emissions Middle Channel low

737.000MHz 100kHz – 30MHz



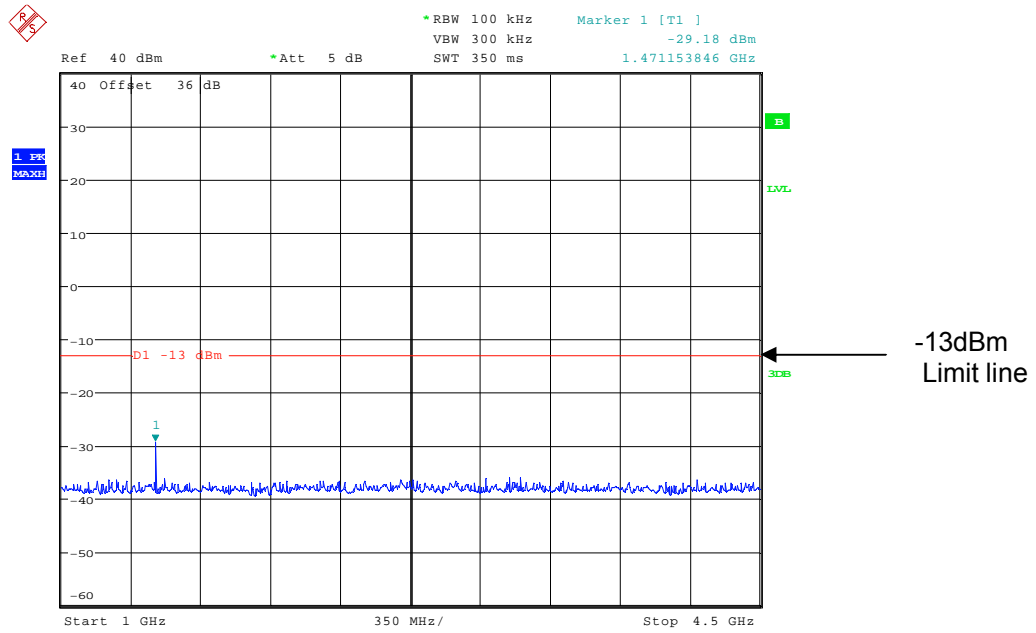
Date: 8.APR.2011 14:09:19

737.000MHz 30MHz – 1GHz



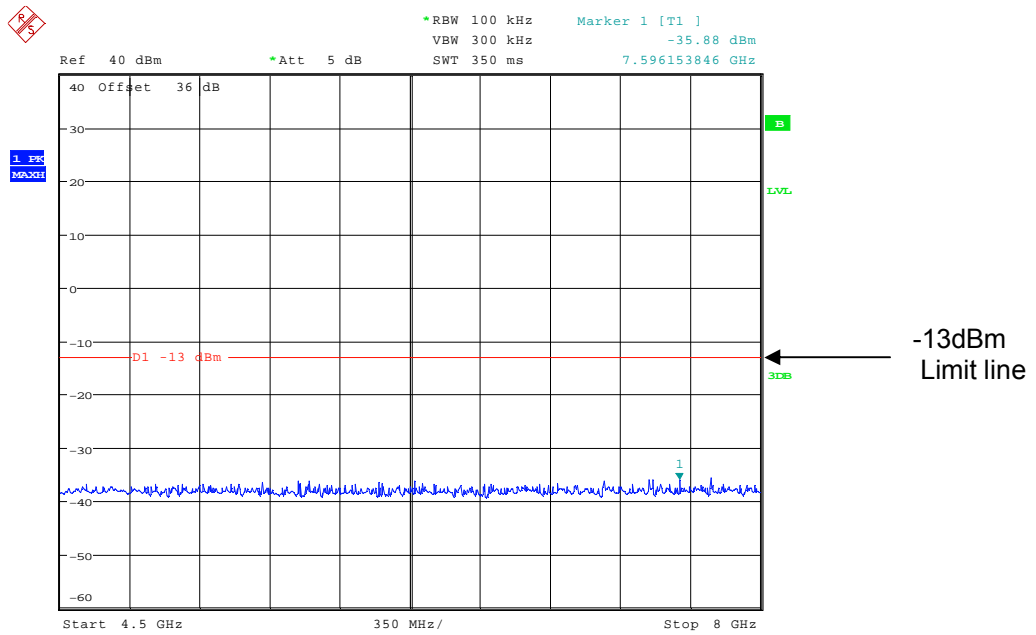
Date: 8.APR.2011 14:10:40

737.000MHz 1GHz – 4.5GHz



Date: 8.APR.2011 14:11:07

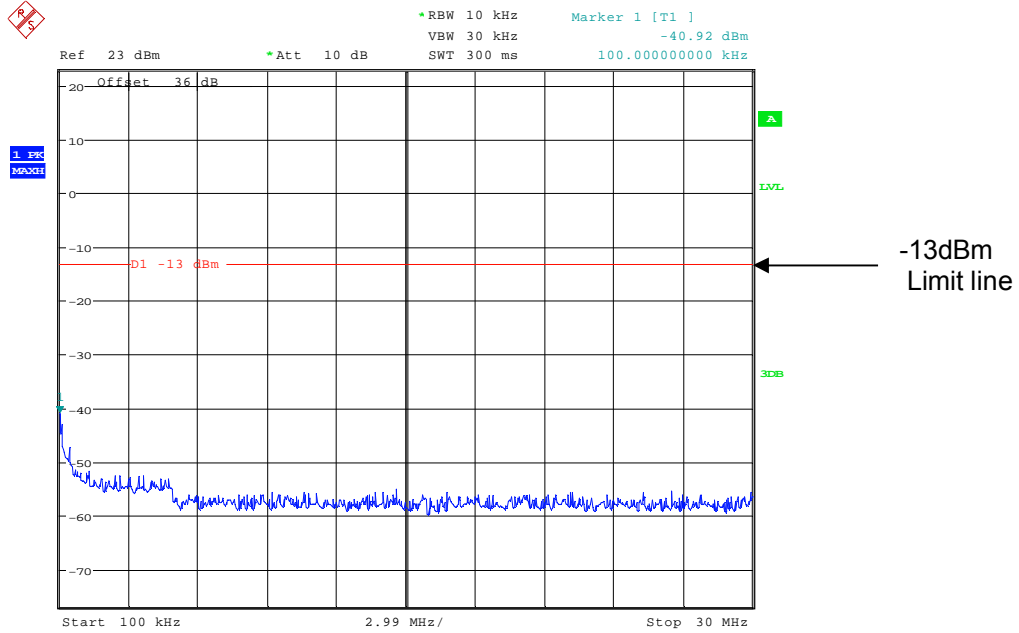
737.000MHz 4.5GHz -8GHz



Date: 8.APR.2011 14:11:43

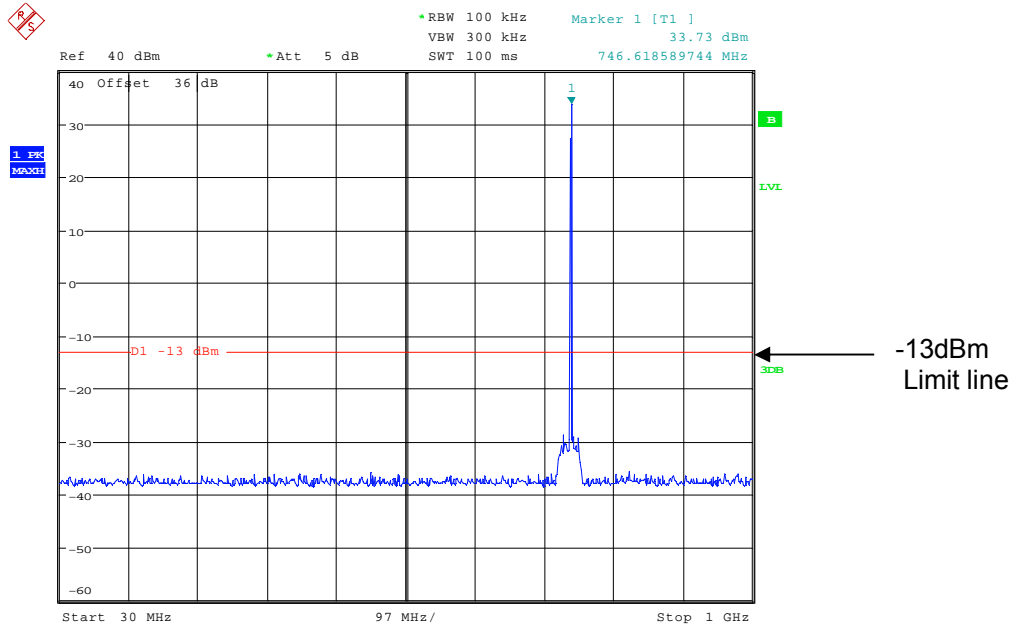
# Conducted emissions Top Channel

745.300MHz 100kHz – 30MHz



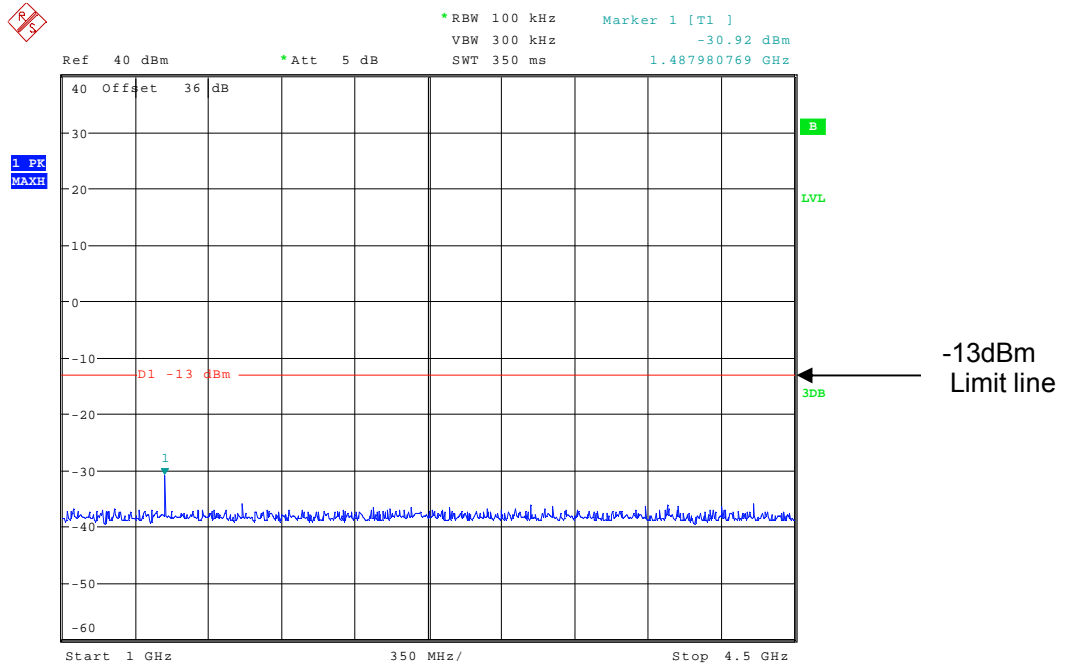
Date: 8.APR.2011 14:13:09

745.300MHz 30MHz – 1GHz



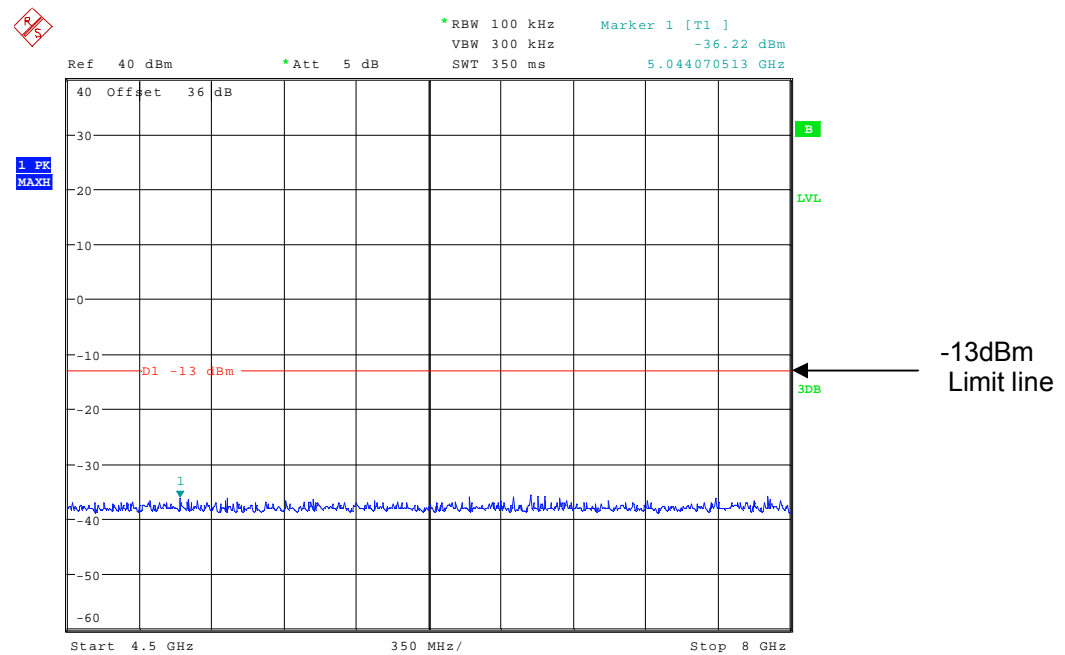
Date: 8.APR.2011 14:16:24

### 745.300MHz 1GHz – 4.5GHz



Date: 8.APR.2011 14:16:49

### 745.300MHz 4.5GHz – 8GHz



Date: 8.APR.2011 14:17:34

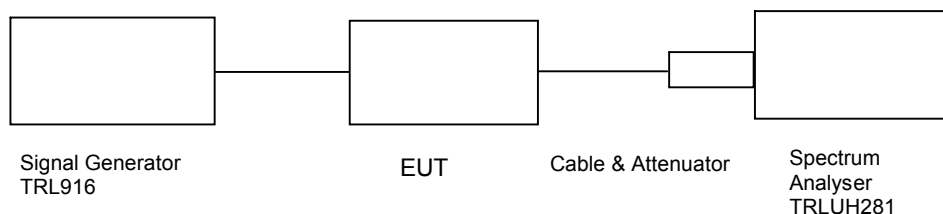


## TRANSMITTER TESTS

### AMPLIFIER SPURIOUS EMISSIONS – CONDUCTED – Part 2.1053 UHF DOWNLINK HIGH BAND

Ambient temperature = 22°C  
 Relative humidity = 42%  
 Supply voltage = +230Vac

Radio Laboratory  
 Test Signal = F3E



The test was set up as per the diagram. The level at the input was adjusted to compensate for the loss of the interconnecting cable. The unit was tested operating at maximum power and on three test frequencies.

The Spurious limit was calculated as follows:

On any frequency removed from the assigned frequency by more than 250% of the authorised bandwidth

At least 43 + 10 log PdB

$$(10\log P_{\text{watts}}) - (43 + 10\log (P_{\text{watts}} * 1000)) = \text{LIMIT} = -13 \text{ dBm}$$

## RESULTS

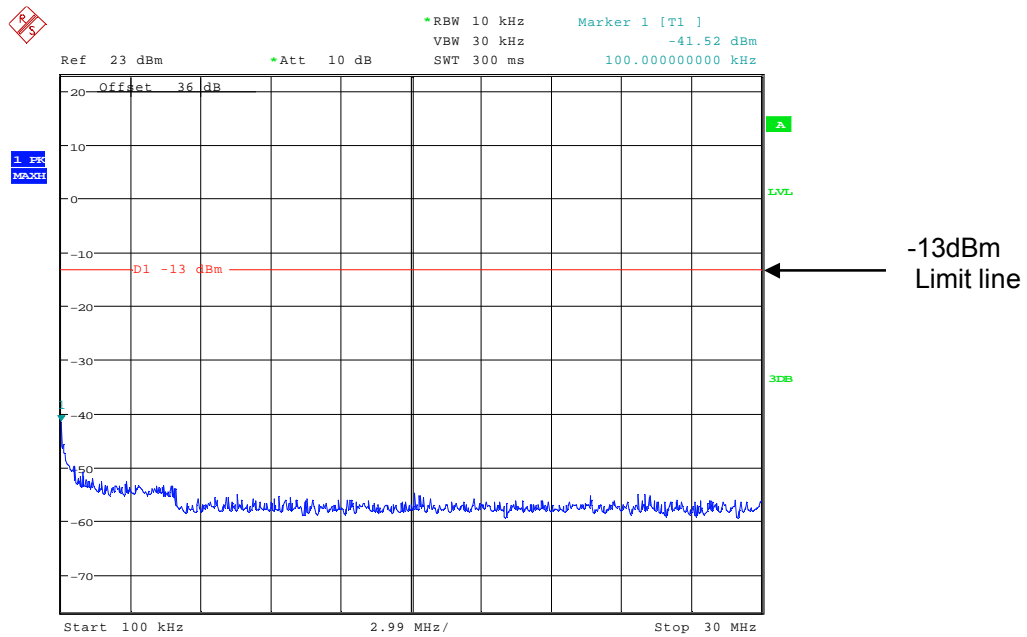
FREQUENCY RANGE	FREQ. (MHz)	EMISSION FREQ. (GHz)	EMISSION LEVEL (dBm)	LIMIT (dBm)
100kHz – 8GHz	746.700	1.49358	-31.04	-13

The test equipment used for the Transmitter Conducted Emissions:

TYPE OF EQUIPMENT	MAKER/SUPPLIER	MODEL No	SERIAL No	TRL No	ACTUAL EQUIPMENT USED
SPECTRUM ANALYSER	RHODE & SCHWARZ	FSU46	200034	UH281	<b>X</b>
ATTENUATOR	BIRD	8308-200-N	N/A	103	<b>X</b>
ATTENUATOR	BIRD	8304-100-N	N/A	222	<b>X</b>
CABLE	TRL	N/A	N/A	UH271	<b>X</b>
CABLE	TRL	N/A	N/A	UH272	<b>X</b>
CABLE	TRL	N/A	N/A	UH273	<b>X</b>
SIGNAL GENERATOR	RHODE & SCHWARZ	Vector Signal Generator	255812	916	<b>X</b>

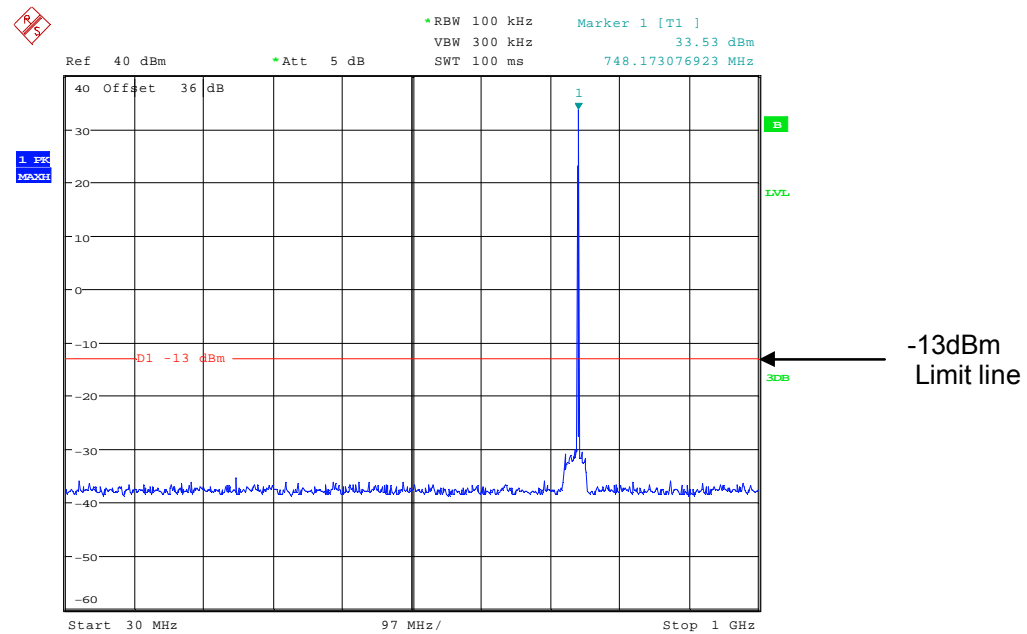
# Conducted emissions Bottom Channel

746.700MHz 100kHz – 30MHz



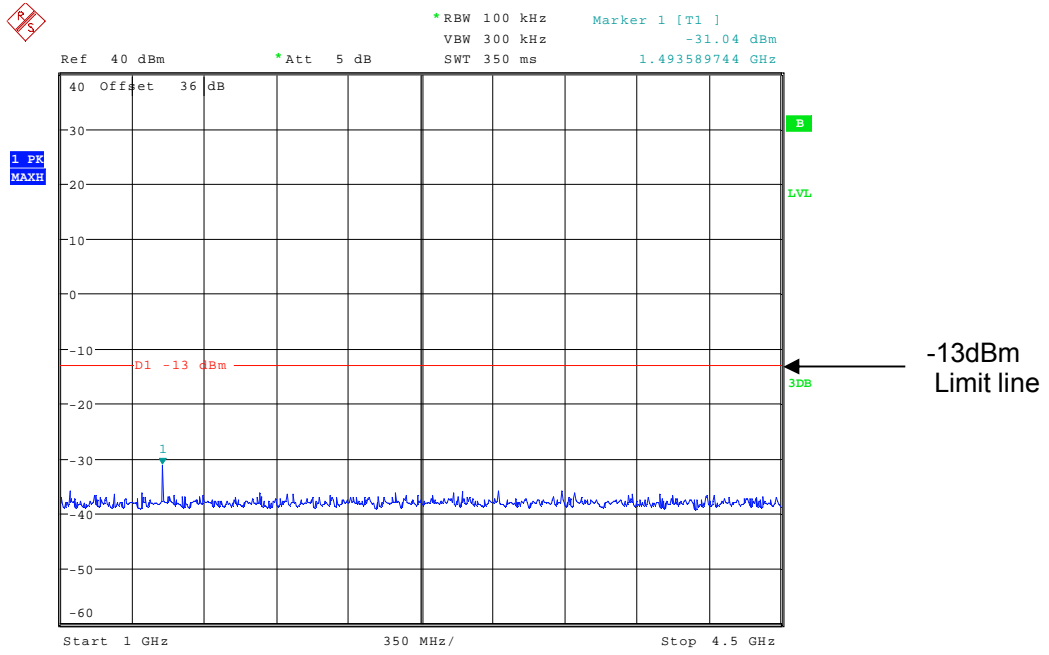
Date: 8.APR.2011 14:22:17

746.700MHz 30MHz – 1GHz



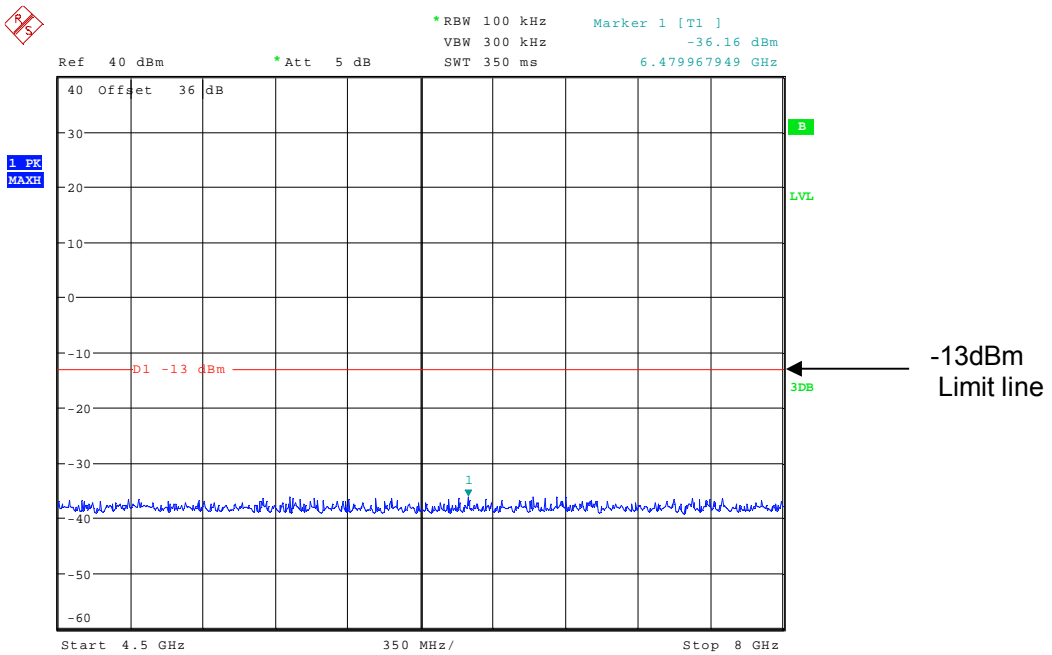
Date: 8.APR.2011 14:23:37

746.700MHz 1GHz – 4.5GHz



Date: 8.APR.2011 14:24:12

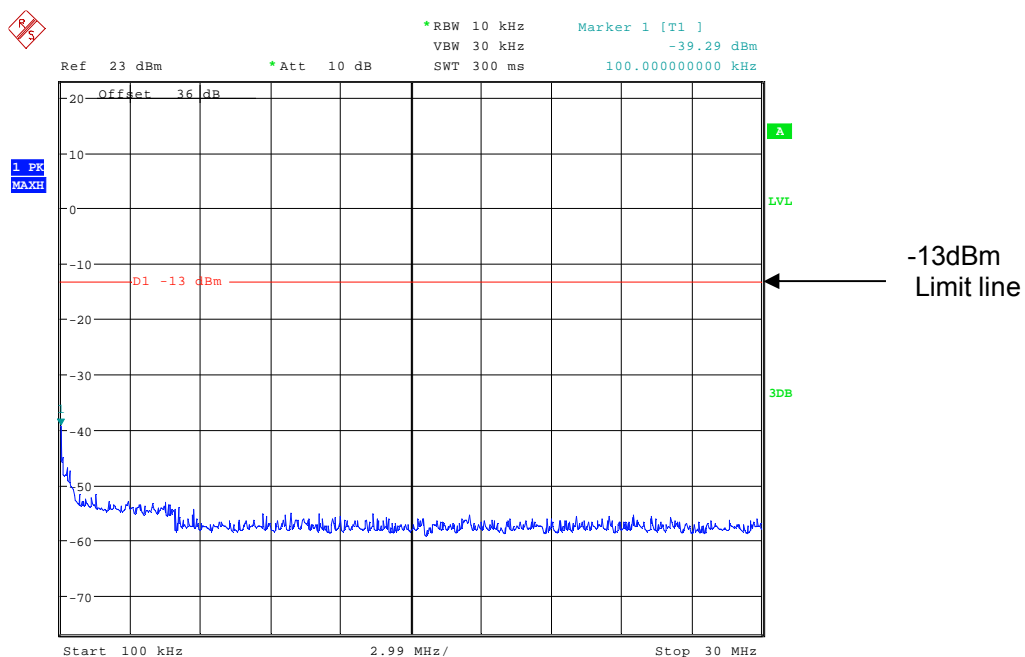
746.700MHz 4.5GHz – 8GHz



Date: 8.APR.2011 14:24:38

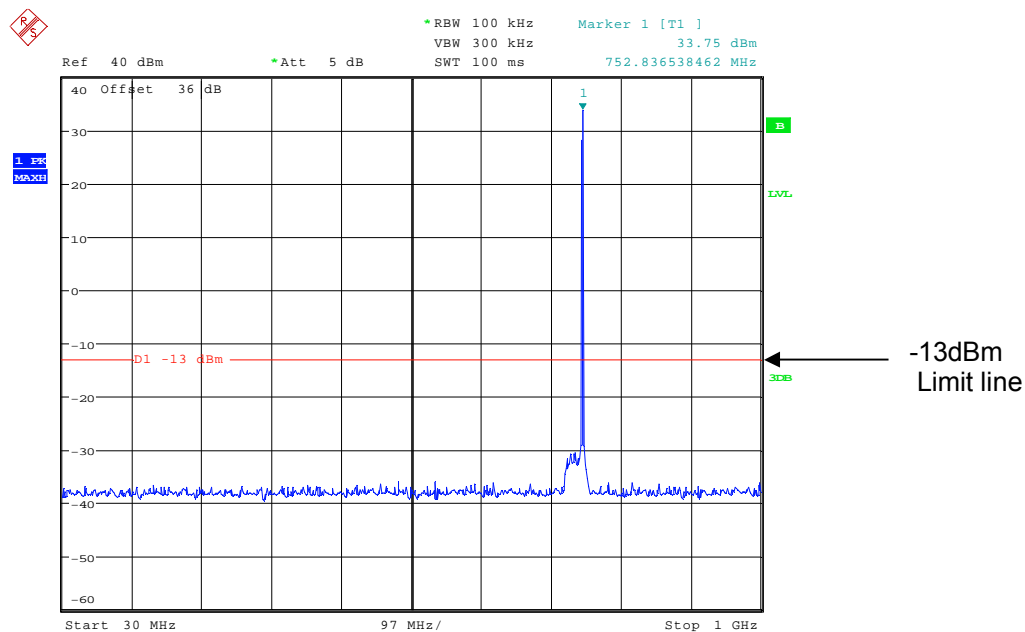
### Conducted emissions Middle Channel

751.500MHz 100kHz – 30MHz



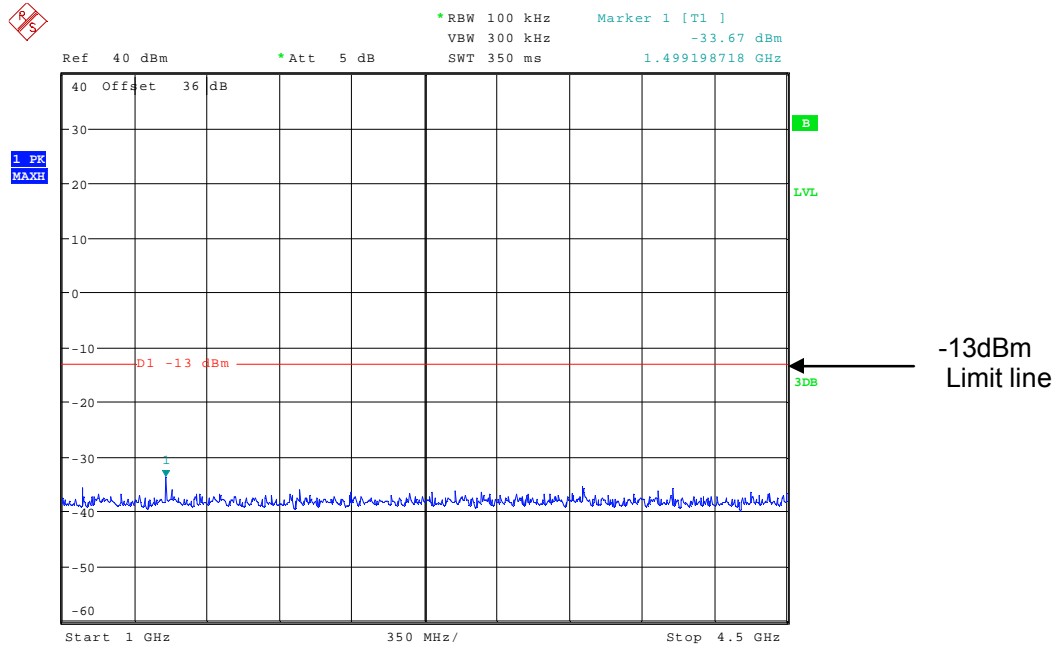
Date: 8.APR.2011 14:26:00

751.500MHz 30MHz – 1GHz



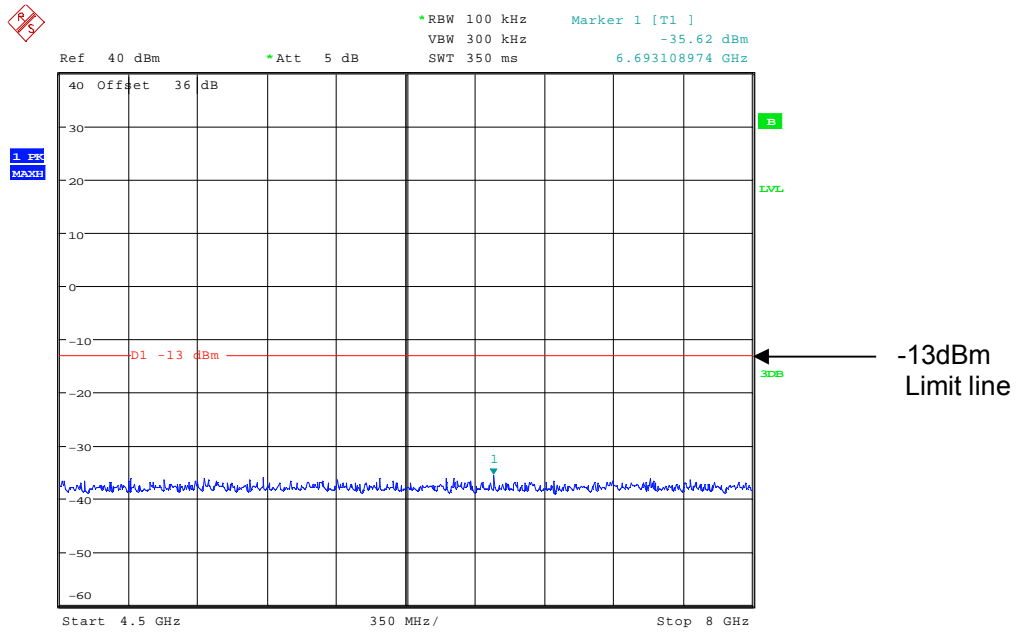
Date: 8.APR.2011 14:27:34

### 751.500MHz 1GHz – 4.5GHz



Date: 8.APR.2011 14:28:22

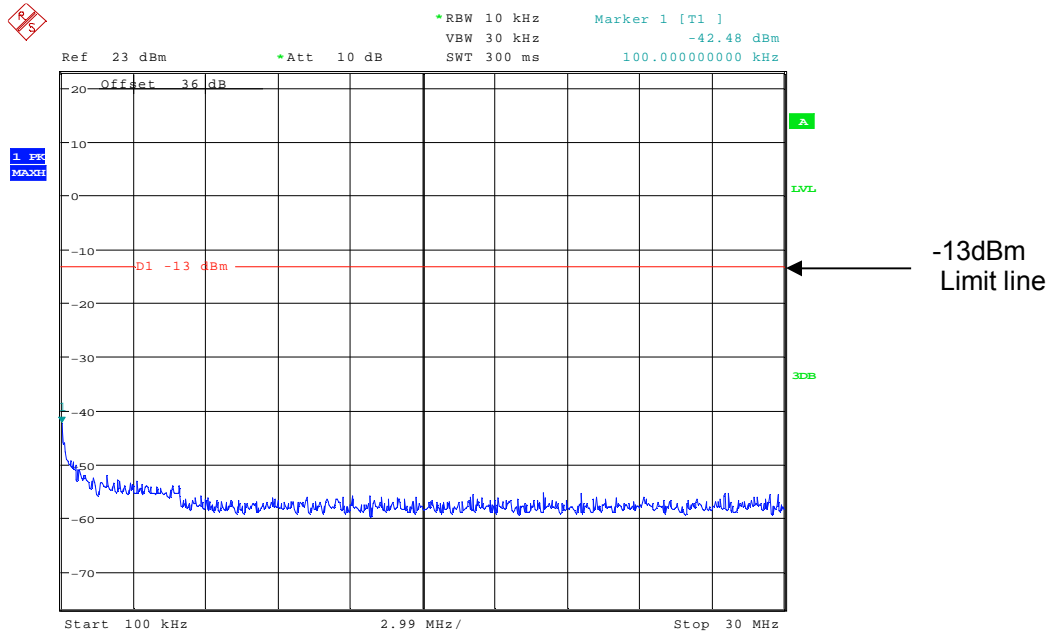
### 751.500MHz 4.5GHz – 8GHz



Date: 8.APR.2011 14:29:00

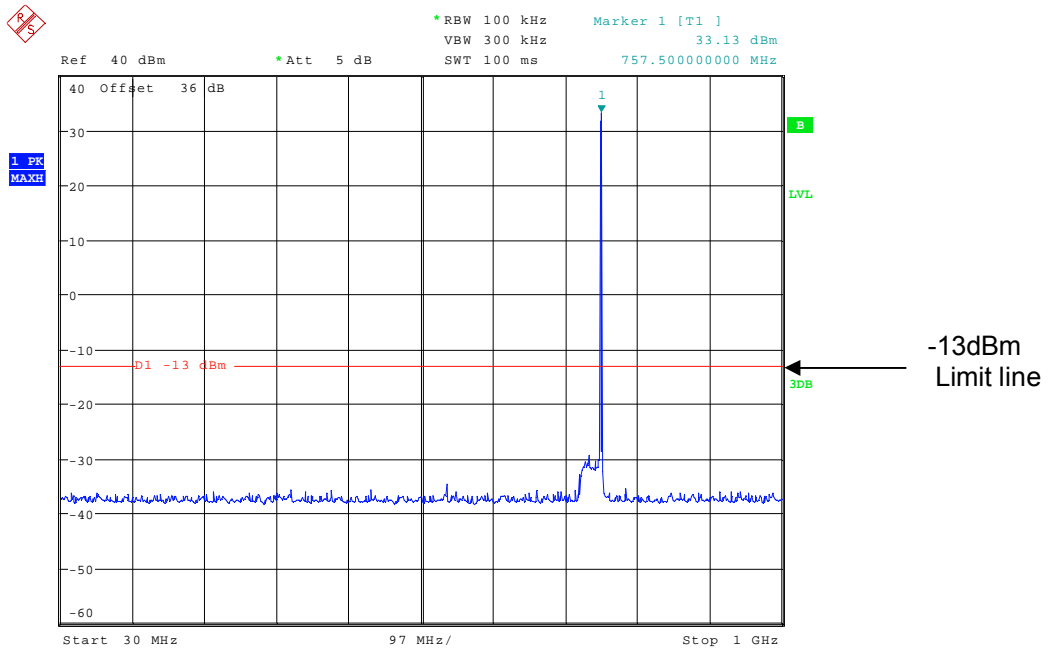
# Conducted emissions Top Channel

756.300MHz 100kHz – 30MHz



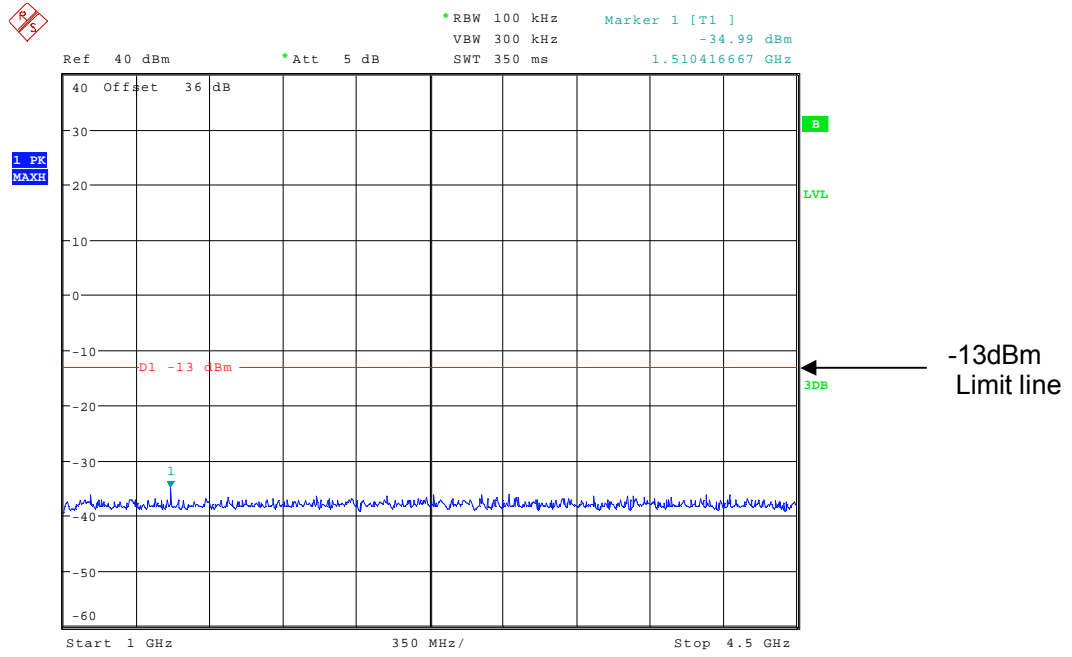
Date: 8.APR.2011 14:30:31

756.300MHz 30MHz – 1GHz



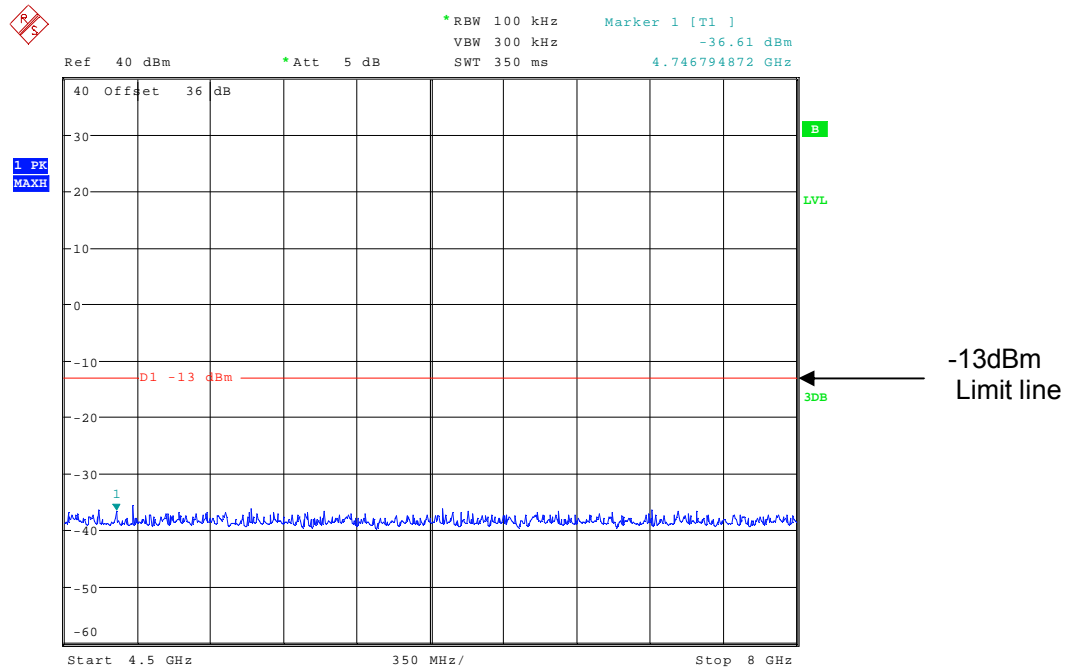
Date: 8.APR.2011 14:32:17

### 756.300MHz 1GHz – 4.5GHz



Date: 8.APR.2011 14:39:06

### 756.300MHz 4.5GHz – 8GHz



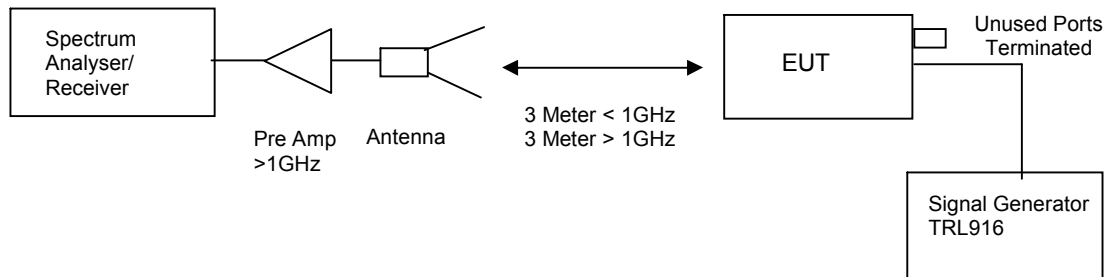
Date: 8.APR.2011 14:39:28

## TRANSMITTER TESTS

### AMPLIFIER SPURIOUS EMISSIONS – RADIATED – Part 2.1053 UHF DOWNLINK LOW BAND

Ambient temperature = 22°C  
 Relative humidity = 42%  
 Conditions = OATS  
 Supply voltage = +230Vac  
 Supply Frequency = N/A

Test Signal = F3E



The test was set up as per the diagram. The level at the input was adjusted to compensate for the loss of the interconnecting cable. The unit was tested operating maximum power on three test frequencies with a 50 ohm load on the output. The unit was also tested with the signal generator replaced by another 50ohm load.

The Spurious limit was calculated as follows:

On any frequency removed from the assigned frequency by more than 250% of the authorised bandwidth

At least  $43 + 10 \log P_{dB}$

$(10 \log P_{watts}) - (43 + 10 \log (P_{watts} * 1000)) = \text{LIMIT} = -13 \text{ dBm}$

## RESULTS

FREQUENCY RANGE	FREQ. (MHz)	MEAS. Rx. (dBµV)	CABLE LOSS (dB)	ANT FACTOR	FIELD STRENGTH (dBµV/m)	CALCULATED EIRP (dBm)	LIMIT (dBm)
30MHz – 8GHz	No Significant Emissions Within 20dB of Limit.						-13

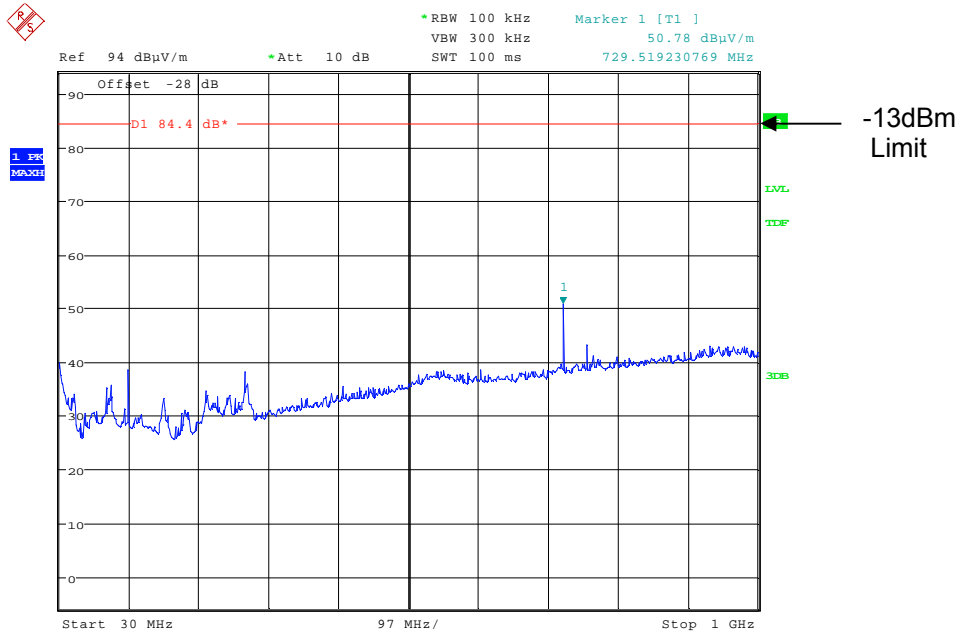
The test equipment used for the Transmitter Spurious Emissions:

TYPE OF EQUIPMENT	MAKER/SUPPLIER	MODEL No	SERIAL No	TRL No	ACTUAL EQUIPMENT USED
HORN	EMCO	3115	9010-3580	138	X
SPECTRUM ANALYSER	R&S	FSU46	200034	UH281	X
PRE AMPLIFIER	HP	8449B	3008A016	572	X
SIGNAL GENERATOR	MARCONI	2042	119388/080	176	X
ANTENNA	YORK	CBL611/A	1618	UH191	X
RECEIVER	R&S	ESVS10	825892/006	UH04	X



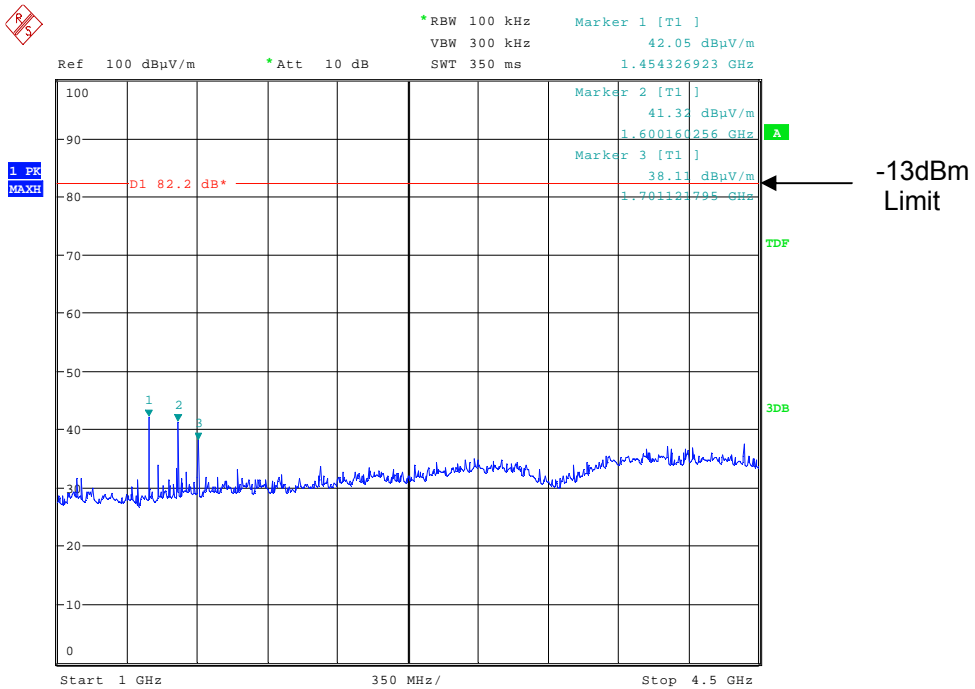
# Radiated emissions Bottom Channel

728.700MHz 30MHz – 1GHz



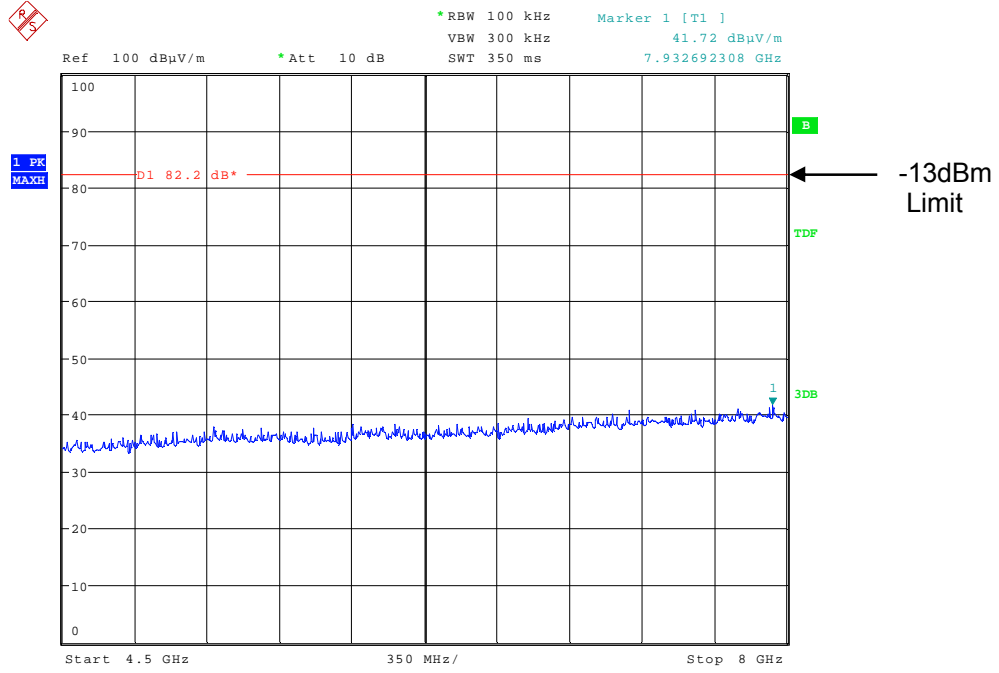
Date: 11.APR.2011 13:23:51

728.700MHz 1GHz – 4.5GHz



Date: 11.APR.2011 12:22:49

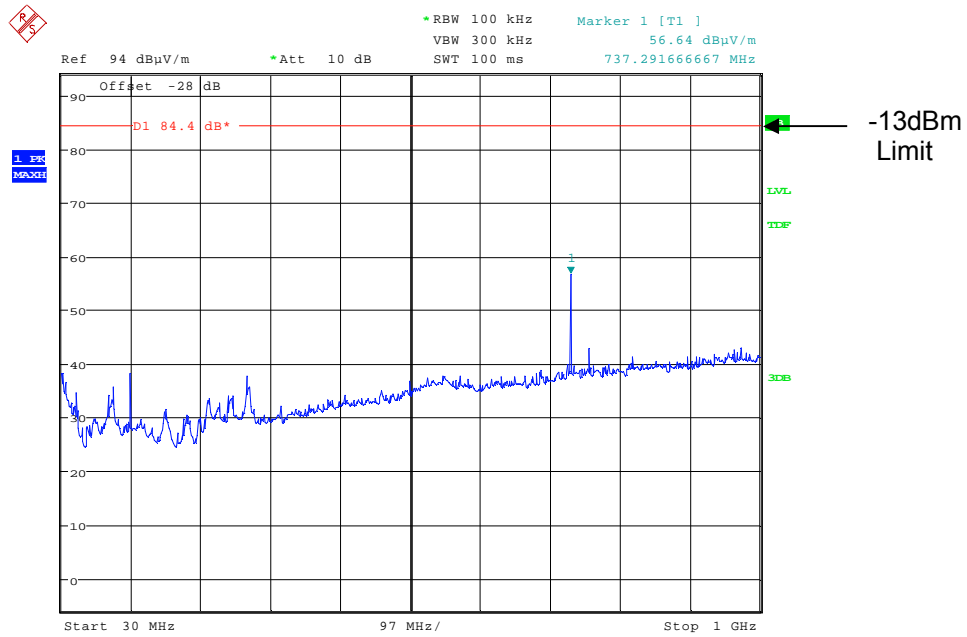
728.700MHz 4.5GHz – 8GHz



Date: 11.APR.2011 12:23:15

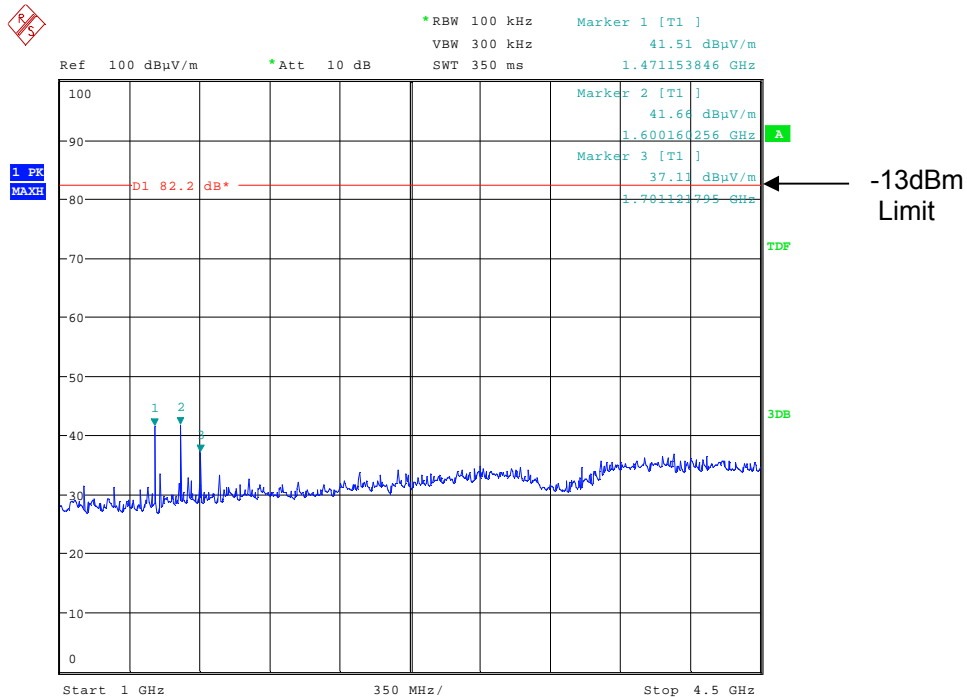
# Radiated emissions Middle Channel

737.000MHz 30MHz – 1GHz



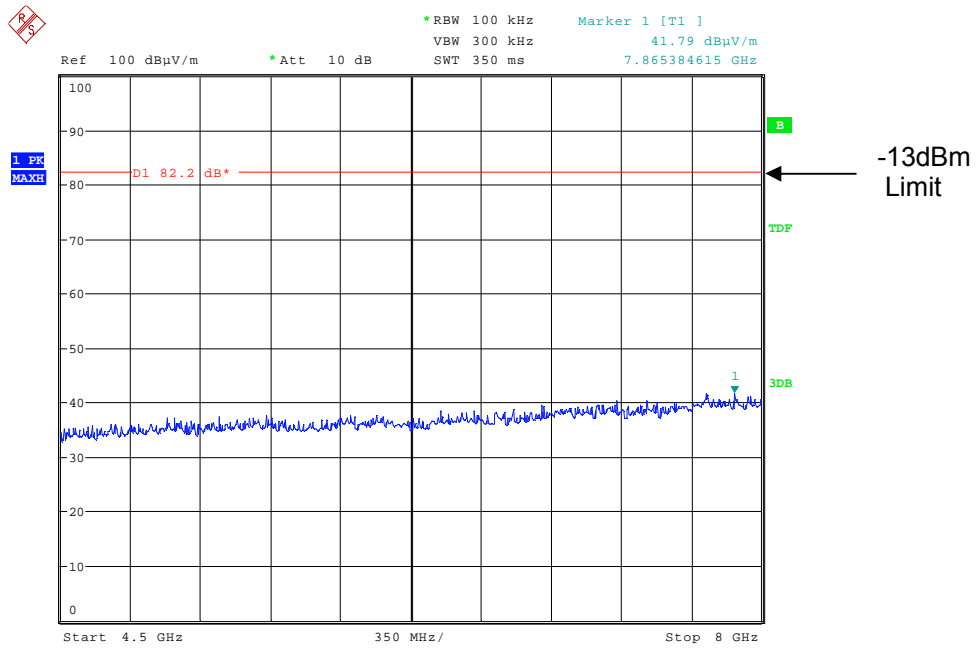
Date: 11.APR.2011 13:20:56

737.000MHz 1GHz – 4.5GHz



Date: 11.APR.2011 12:24:34

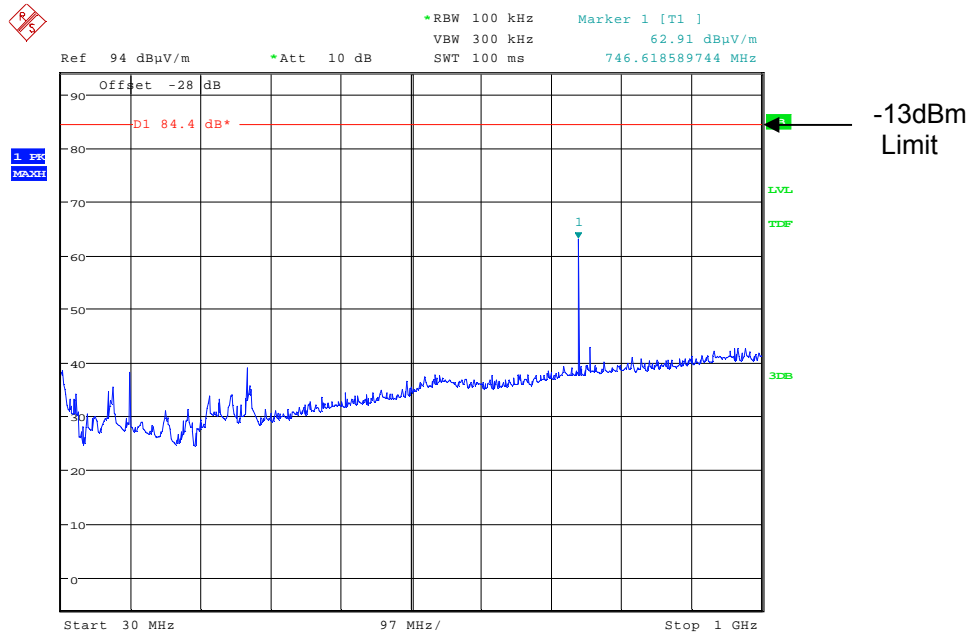
737.000MHz 4.5GHz – 8GHz



Date: 11.APR.2011 12:24:55

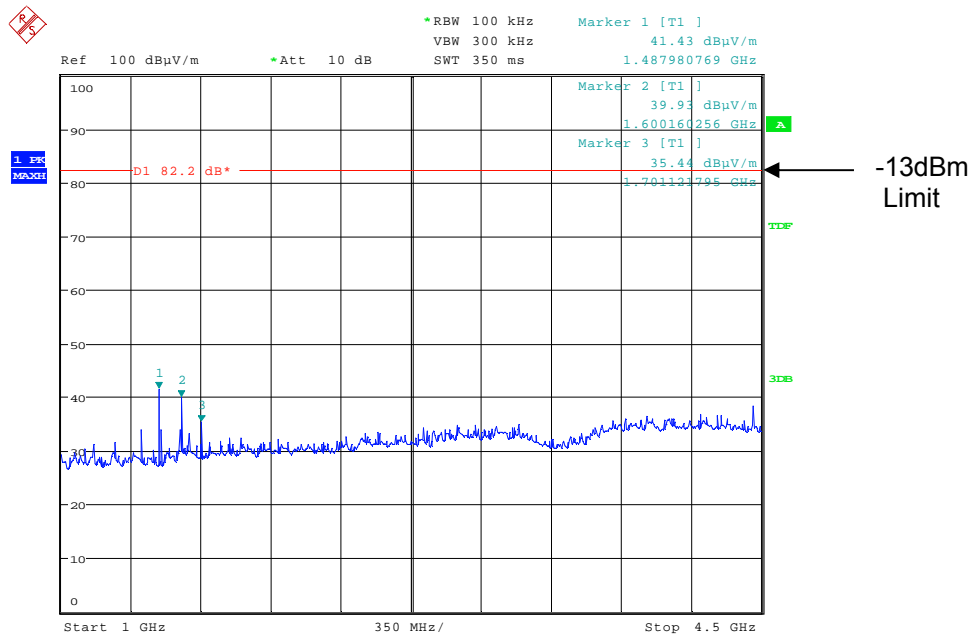
# Radiated emissions Top Channel

745.300MHz 30MHz – 1GHz



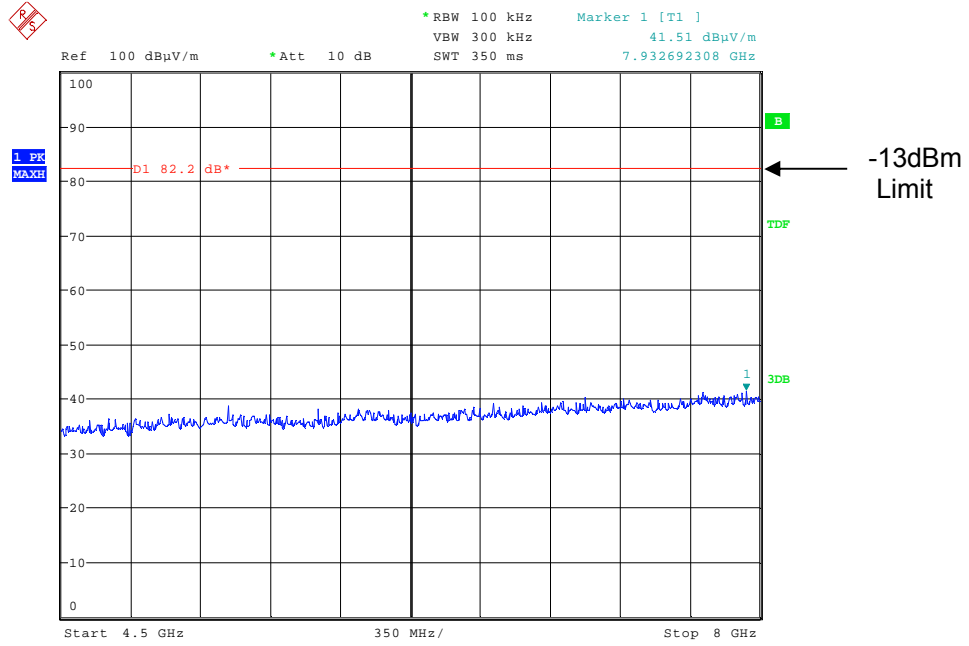
Date: 11.APR.2011 13:19:44

745.300MHz 1GHz – 4.5GHz



Date: 11.APR.2011 12:26:53

745.300MHz 4.5GHz – 8GHz



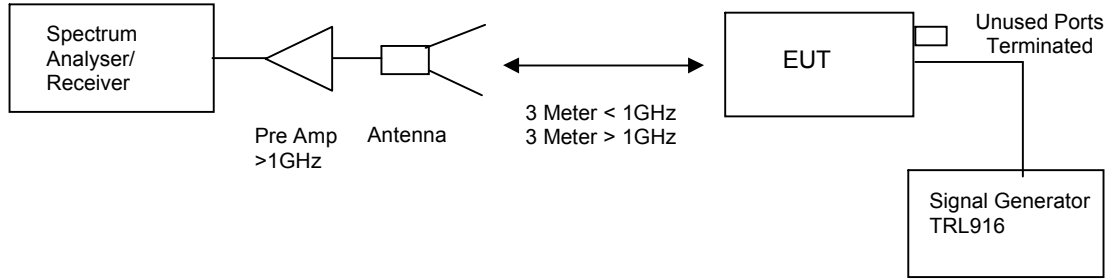
Date: 11.APR.2011 12:28:21

## TRANSMITTER TESTS

### AMPLIFIER SPURIOUS EMISSIONS – RADIATED – Part 2.1053 UHF DOWNLINK HIGH BAND

Ambient temperature = 22°C  
 Relative humidity = 42%  
 Conditions = OATS  
 Supply voltage = +230Vac  
 Supply Frequency = N/A

Test Signal = F3E



The test was set up as per the diagram. The level at the input was adjusted to compensate for the loss of the interconnecting cable. The unit was tested operating maximum power on three test frequencies with a 50 ohm load on the output. The unit was also tested with the signal generator replaced by another 50ohm load.

The Spurious limit was calculated as follows:

On any frequency removed from the assigned frequency by more that 250% of the authorised bandwidth

At least  $43 + 10 \log PdB$

$(10 \log P_{watts}) - (43 + 10 \log (P_{watts} * 1000)) = LIMIT = -13 \text{ dBm}$

### RESULTS

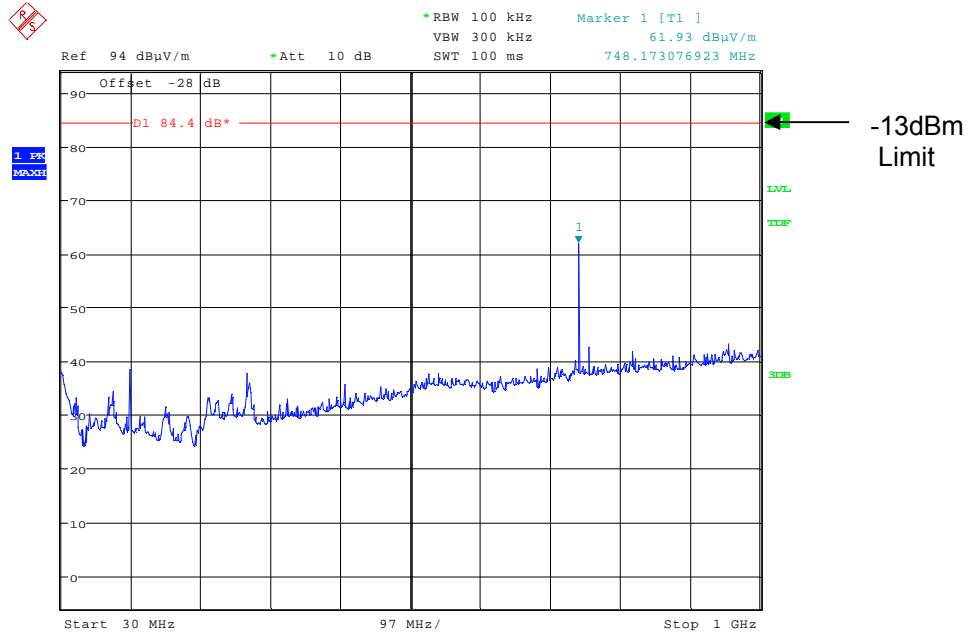
FREQUENCY RANGE	FREQ. (MHz)	MEAS. Rx. (dBµV)	CABLE LOSS (dB)	ANT FACTOR	FIELD STRENGTH (dBµV/m)	CALCULATED EIRP (dBm)	LIMIT (dBm)
30MHz – 8GHz	No Significant Emissions Within 20dB of Limit.						-13

The test equipment used for the Transmitter Spurious Emissions:

TYPE OF EQUIPMENT	MAKER/SUPPLIER	MODEL No	SERIAL No	TRL No	ACTUAL EQUIPMENT USED
HORN	EMCO	3115	9010-3580	138	<b>X</b>
SPECTRUM ANALYSER	R&S	FSU46	200034	UH281	<b>X</b>
PRE AMPLIFIER	HP	8449B	3008A016	572	<b>X</b>
SIGNAL GENERATOR	MARCONI	2042	119388/080	176	<b>X</b>
ANTENNA	YORK	CBL611/A	1618	UH191	<b>X</b>
RECEIVER	R&S	ESVS10	825892/006	UH04	<b>X</b>

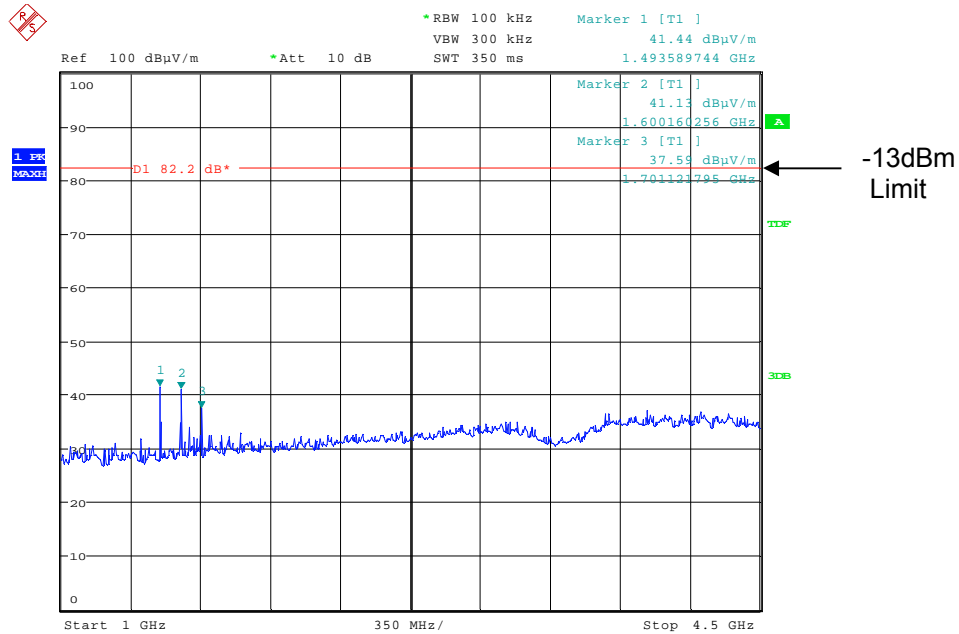
### Radiated emissions Bottom Channel

746.700MHz 30MHz – 1GHz



Date: 11.APR.2011 13:18:00

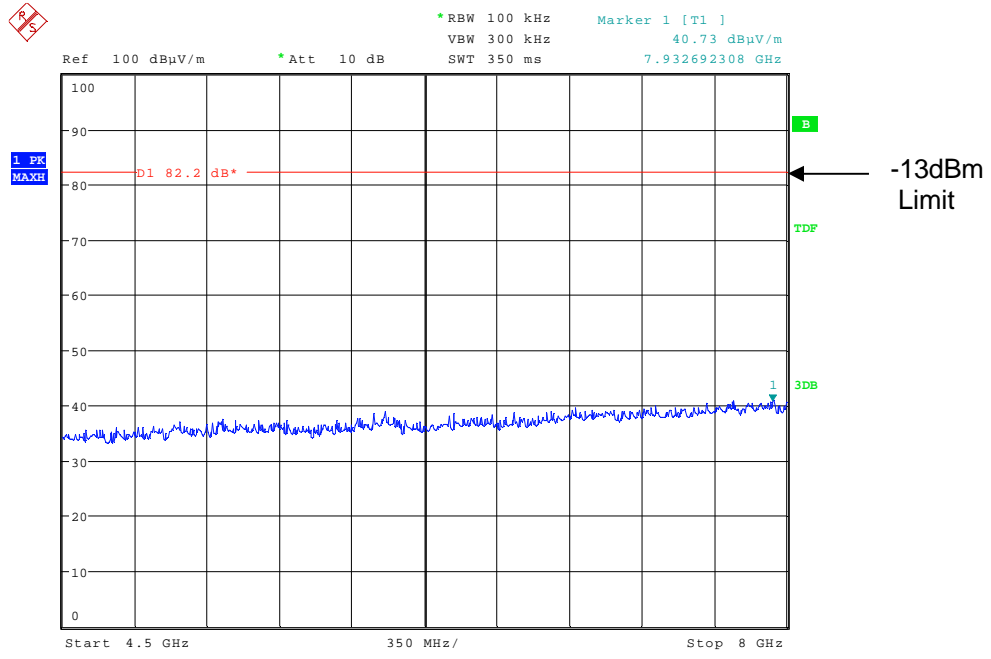
746.700MHz 1GHz – 4.5GHz



Date: 11.APR.2011 12:29:57



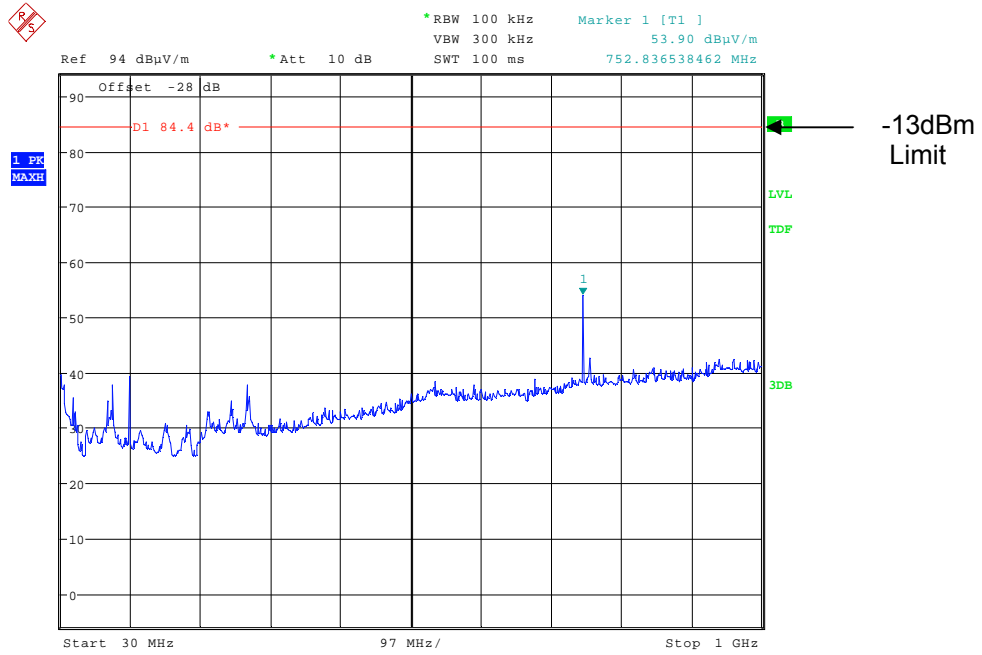
746.700MHz 4.5GHz -8GHz



Date: 11.APR.2011 12:30:16

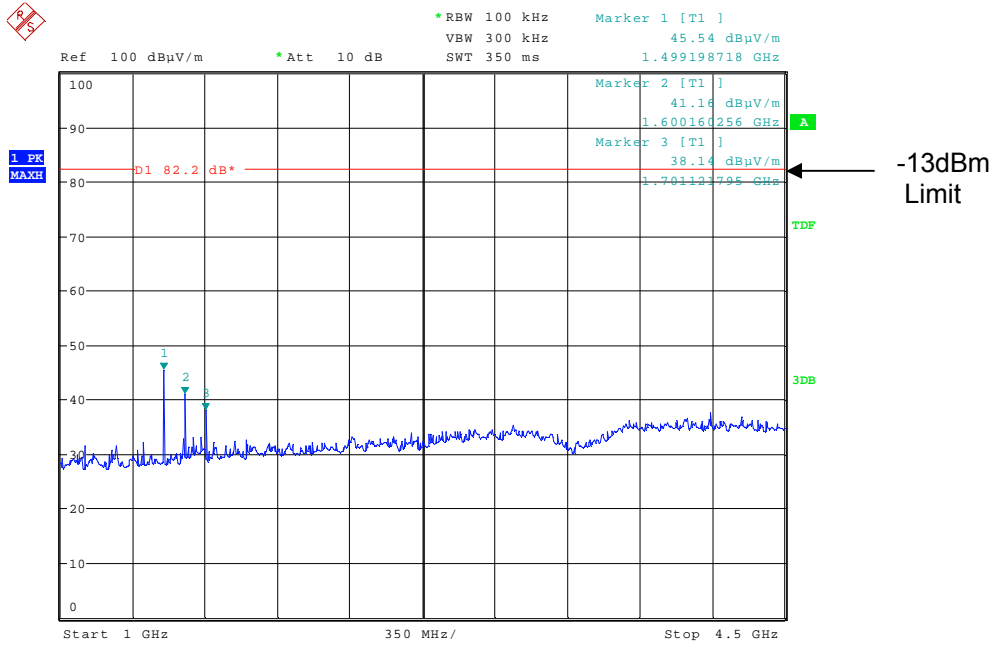
# Radiated emissions Middle Channel

751.500MHz 30MHz – 1GHz



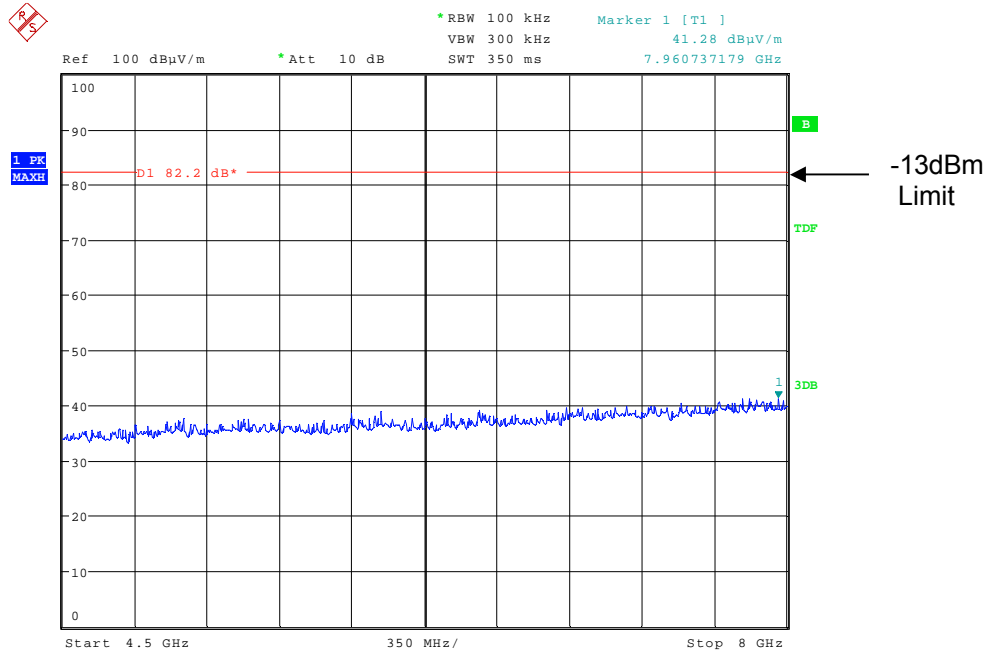
Date: 11.APR.2011 13:16:38

751.500MHz 1GHz – 4.5GHz



Date: 11.APR.2011 12:32:03

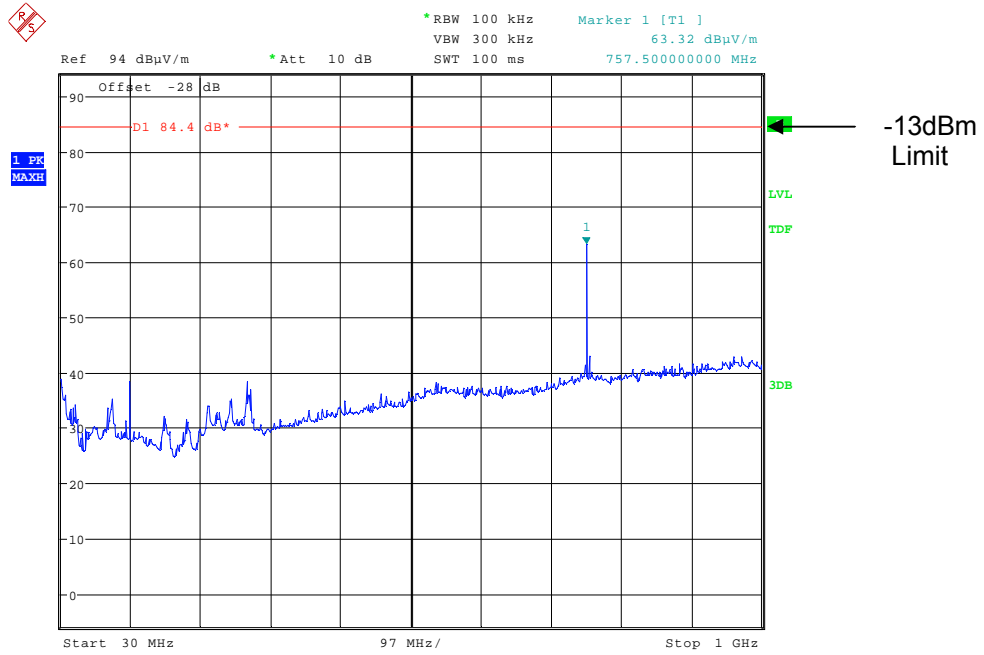
751.500MHz 4.5GHz – 8GHz



Date: 11.APR.2011 12:32:30

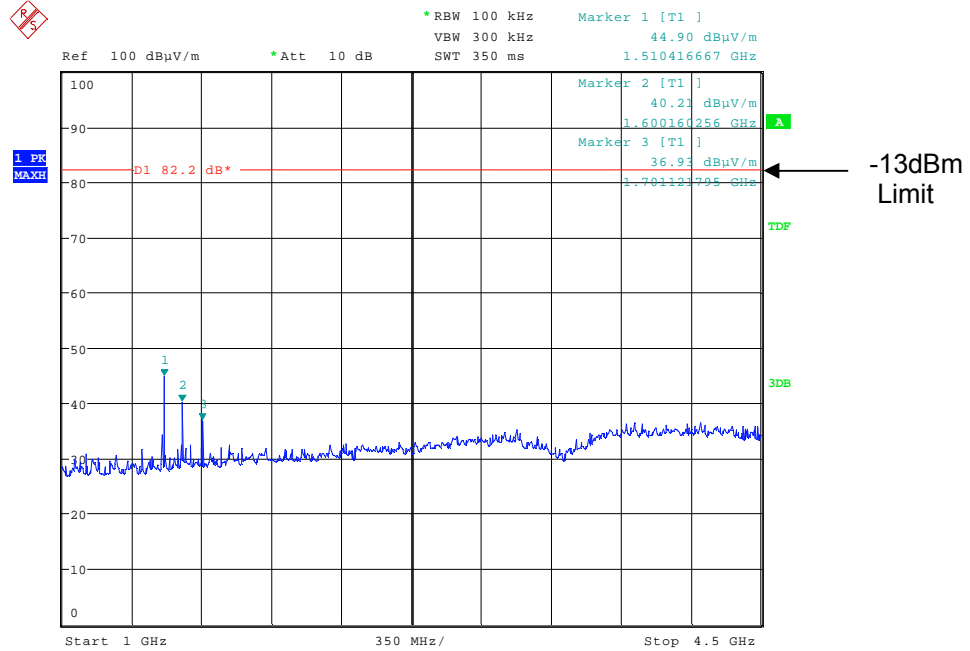
# Radiated emissions Top Channel

756.300MHz 30MHz – 1GHz



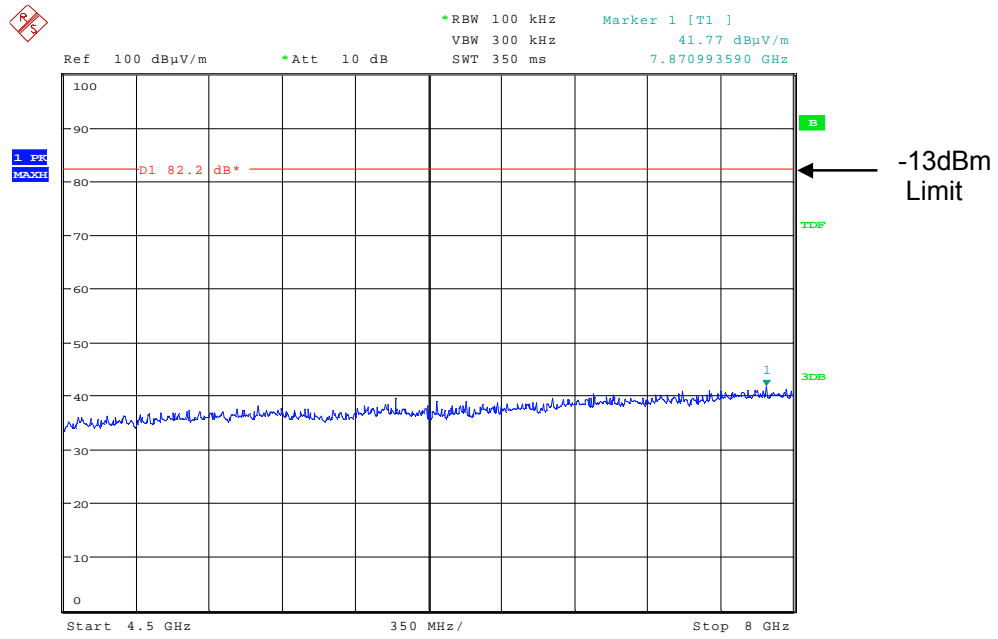
Date: 11.APR.2011 13:15:29

756.300MHz 1GHz – 4.5GHz



Date: 11.APR.2011 12:33:55

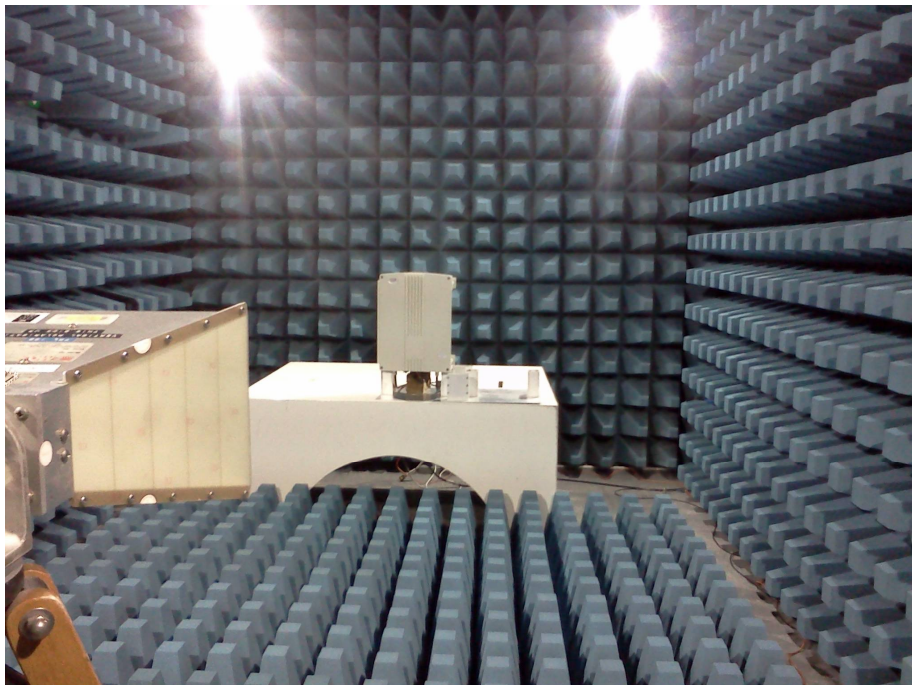
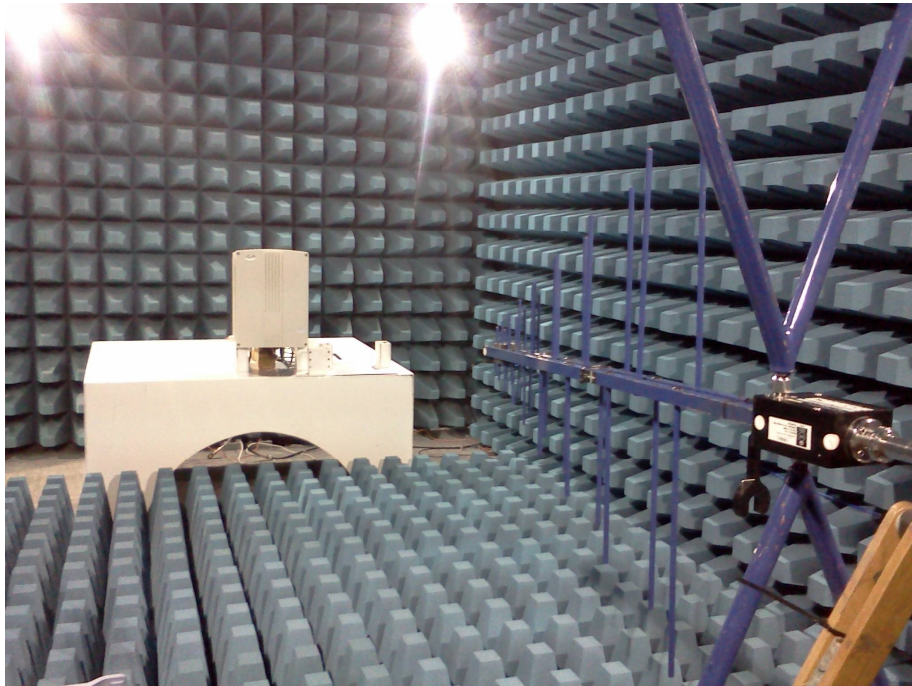
756.300MHz 4.5GHz – 8GHz

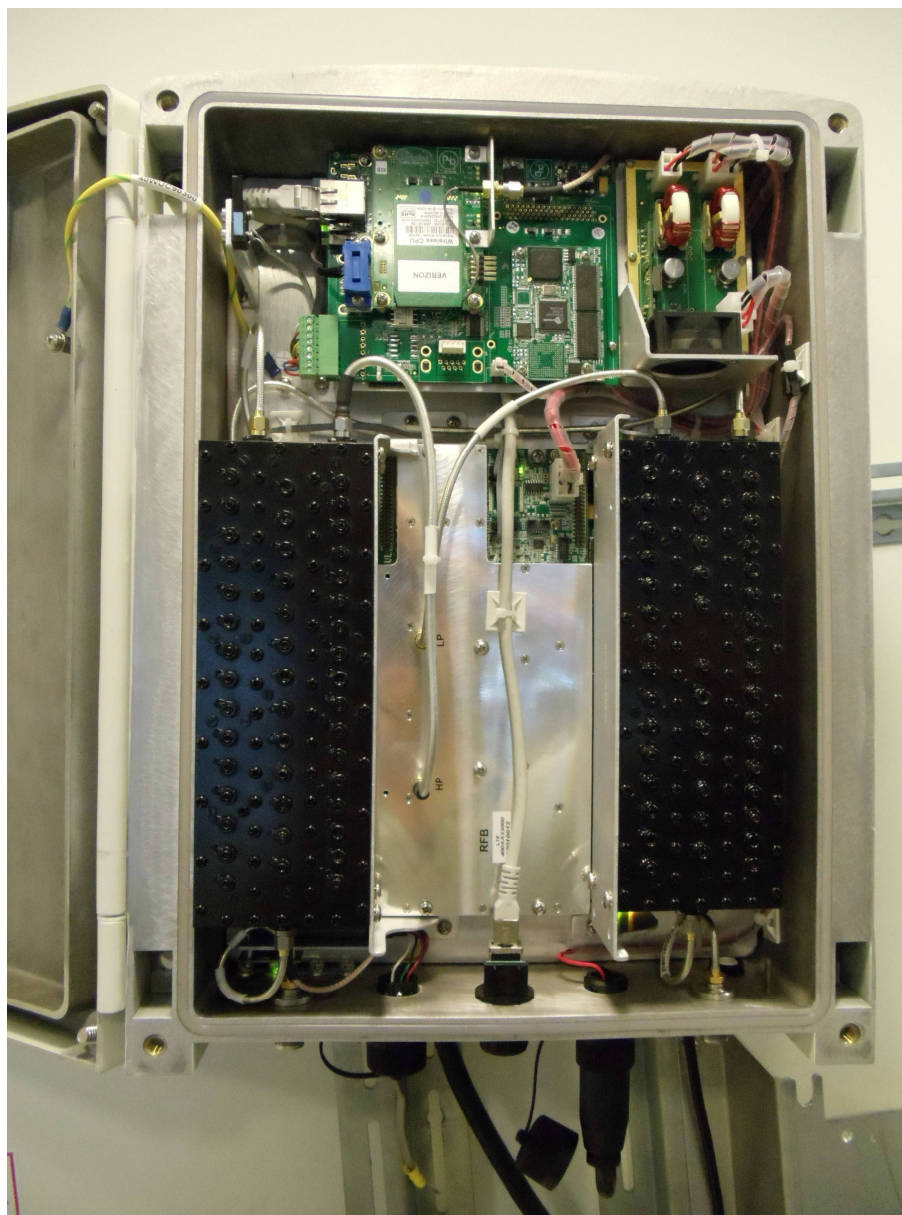


Date: 11.APR.2011 12:34:46

The above test results show that there were no emissions within 20dBs of the -13dBm limit.

**ANNEX A**  
**PHOTOGRAPHS**







**ANNEX B**  
**APPLICANT'S SUBMISSION OF DOCUMENTATION LIST**

### APPLICANT'S SUBMISSION OF DOCUMENTATION LIST

a.	TCB	-	APPLICATION	[X]
		-	FEE	[X]
b.	AGENT'S LETTER OF AUTHORISATION	-		[X]
c.	MODEL(s) vs IDENTITY	-		[ ]
d.	ALTERNATIVE TRADE NAME DECLARATION(s)	-		[ ]
e.	LABELLING	-	PHOTOGRAPHS	[ ]
		-	DECLARATION	[ ]
		-	DRAWINGS	[ ]
f.	TECHNICAL DESCRIPTION	-		[X]
g.	BLOCK DIAGRAMS	-	Tx	[X]
		-	Rx	[ ]
		-	PSU	[ ]
		-	AUX	[ ]
h.	CIRCUIT DIAGRAMS	-	Tx	[X]
		-	Rx	[ ]
		-	PSU	[ ]
		-	AUX	[ ]
i.	COMPONENT LOCATION	-	Tx	[ ]
		-	Rx	[ ]
		-	PSU	[ ]
		-	AUX	[ ]
j.	PCB TRACK LAYOUT	-	Tx	[ ]
		-	Rx	[ ]
		-	PSU	[ ]
		-	AUX	[ ]
k.	BILL OF MATERIALS	-	Tx	[X]
		-	Rx	[ ]
		-	PSU	[ ]
		-	AUX	[ ]
l.	USER INSTALLATION / OPERATING INSTRUCTIONS	-		[X]

**ANNEX C**  
**EQUIPMENT CALIBRATION**

REF Number	Equipment Type	Manufacturer	Last Cal Calibration	Calibration Period	Due For Calibration
UH003	Receiver	R&S	13/01/2011	12	13/01/2012
UH004	Receiver	R&S	14/12/2010	12	14/12/2011
UH06/07	IC OATS Submission	TRL	02/07/2009	24	02/07/2011
UH06/07	NSA Calibration	TRL	24/06/2010	12	24/06/2011
UH093	Bilog	Chase	03/06/2009	24	03/06/2011
UH191	Bilog	Chase	08/11/2010	24	08/11/2012
UH253	1m Cable N type	TRL	01/03/2011	12	01/03/2012
UH254	1m Cable N type	TRL	01/03/2011	12	01/03/2012
UH269	1m Cable N type	TRL	01/03/2011	12	01/03/2012
UH270	1m Cable N type	TRL	01/03/2011	12	01/03/2012
UH271	1.5m Cable N type	TRL	01/03/2011	12	01/03/2012
UH272	1.5m Cable N type	TRL	01/03/2011	12	01/03/2012
UH273	2m Cable N type	TRL	01/03/2011	12	01/03/2012
UH274	2m Cable N type	TRL	01/03/2011	12	01/03/2012
UH281	Spectrum Analyser	R&S	10/02/2011	12	10/02/2012
UH288	1m Cable N type	N/A	01/03/2011	12	01/03/2012
UH293	K-Type Cable	Megaphase	24/11/2010	12	24/11/2011
UH372	PreAmp	Wat-John	14/04/2010	12	14/04/2011
UH377	ESU 26	R&S	11/06/2010	13	11/07/2011
UH378	3M Cable	TRaC	01/03/2011	12	01/03/2012
UH387	Chamber 1	Rainford EMC	26/06/2010	12	26/06/2011
UH388	Chamber 2	Rainford EMC	23/06/2010	12	23/06/2011
L138	1-18GHz Horn	EMCO	10/09/2009	24	10/09/2011
L139	1-18GHz Horn	EMCO	17/08/2009	24	17/08/2011
L176	Signal Generator	Marconi	08/07/2010	12	08/07/2011
L254	Signal Generator	Marconi	15/09/2010	12	15/09/2011
L572	Pre Amp	Agilent	24/11/2010	12	24/11/2011
L664	3M Cable	TRaC	01/03/2011	12	01/03/2012
REF910	Spectrum Analyser	R&S	27/10/2010	12	27/10/2011
TRL170	Combiner	Elcom		Calibrate in use	

**ANNEX D**  
**MEASUREMENT UNCERTAINTY**

## Radio Testing – General Uncertainty Schedule

All statements of uncertainty are expanded standard uncertainty using a coverage factor of 1.96 to give a 95% confidence where no required test level exists.

### **[1] Adjacent Channel Power**

Uncertainty in test result = **1.86dB**

### **[2] Carrier Power**

Uncertainty in test result (Equipment - TRLUH120) = **2.18dB**

Uncertainty in test result (Equipment – TRL05) = **1.08dB**

Uncertainty in test result (Equipment – TRL479) = **2.48dB**

### **[3] Effective Radiated Power**

Uncertainty in test result = **4.71dB**

### **[4] Spurious Emissions**

Uncertainty in test result = **4.75dB**

### **[5] Maximum frequency error**

Uncertainty in test result (Equipment - TRLUH120) = **119ppm**

Uncertainty in test result (Equipment – TRL05) = **0.113ppm**

Uncertainty in test result (Equipment – TRL479) = **0.265ppm**

### **[6] Radiated Emissions, field strength OATS 14kHz-18GHz Electric Field**

Uncertainty in test result (14kHz – 30MHz) = **4.8dB**, Uncertainty in test result (30MHz – 1GHz) = **4.6dB**,

Uncertainty in test result (1GHz-18GHz) = **4.7dB**

### **[7] Frequency deviation**

Uncertainty in test result = **3.2%**

### **[8] Magnetic Field Emissions**

Uncertainty in test result = **2.3dB**

### **[9] Conducted Spurious**

Uncertainty in test result (Equipment TRL479) Up to 8.1GHz = **3.31dB**

Uncertainty in test result (Equipment TRL479) 8.1GHz – 15.3GHz = **4.43dB**

Uncertainty in test result (Equipment TRL479) 15.3GHz – 21GHz = **5.34dB**

Uncertainty in test result (Equipment TRLUH120) Up to 26GHz = **3.14dB**

### **[10] Channel Bandwidth**

Uncertainty in test result = **15.5%**

### **[11] Amplitude and Time Measurement – Oscilloscope**

Uncertainty in overall test level = **2.1dB**, Uncertainty in time measurement = **0.59%**, Uncertainty in Amplitude measurement = **0.82%**

### **[11] Power Line Conduction**

Uncertainty in test result = **3.4dB**

**[12] Spectrum Mask Measurements**

Uncertainty in test result = **2.59% (frequency)**  
Uncertainty in test result = **1.32dB (amplitude)**

**[13] Adjacent Sub Band Selectivity**

Uncertainty in test result = **1.24dB**

**[14] Receiver Blocking – Listen Mode, Radiated**

Uncertainty in test result = **3.42dB**

**[15] Receiver Blocking – Talk Mode, Radiated**

Uncertainty in test result = **3.36dB**

**[16] Receiver Blocking – Talk Mode, Conducted**

Uncertainty in test result = **1.24dB**

**[17] Receiver Threshold**

Uncertainty in test result = **3.23dB**

**[18] Transmission Time Measurement**

Uncertainty in test result = **7.98%**