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<b>Report Reference ID:</b>	253922-6TRFWL
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<b>Test specification:</b>	Title 47 – Telecommunication Chapter I – Federal Communications Commission Subchapter B – Common carrier services – <b>Part 27 – Miscellaneous wireless communications services</b>
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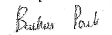
<b>Applicant:</b>	TEKO Telecom Srl. Via Meucci, 24/a I-40024 Castel S. Pietro Terme (BO) (Italy)
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<b>Apparatus:</b>	Remote Unit
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<b>FCC ID:</b>	XM2-EP6B
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<b>Model:</b>	TRE7S8SC8A9S19AWAS
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<b>Testing laboratory:</b>	<b>Nemko Italy S.p.A.</b> Via Carroccio, 4 I-20853 Biassono (Italy)
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	Name and title	Date
<b>Tested by:</b>	 G. Curioni, Wireless/EMC Specialist	2014/03/27
<b>Reviewed by:</b>	 P. Barbieri, Wireless/EMC Specialist	2014/03/27


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	Section 1: Report summary	Product: TRE7S8SC8A9S19AWAS

## Section 1: Report summary

1.1 Test specification	
<b>Specifications</b>	<b>Part 27 – Miscellaneous wireless communications services</b>

1.2 Statement of compliance	
<b>Compliance</b>	<p>In the configuration tested the EUT was found compliant          Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p> <p>This report contains an assessment of apparatus against specifications based upon tests carried out on samples submitted at Nemko Canada Inc. These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 27. Radiated tests were conducted in accordance with ANSI C63.4-2003.</p>

1.3 Exclusions	
<b>Exclusions</b>	None

1.4 Registration number	
<b>Registration number:</b>	481407 (10 m Semi anechoic chamber)

1.5 Test report revision history	
Revision #	Details of changes made to test report
TRF	Original report issued
---	---

1.6 Limits of responsibility	
<p>Note that the results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.</p> <p>This test report has been completed in accordance with the requirements of ISO/IEC 17025. All results contain in this report are within Nemko Canada's ISO/IEC 17025 accreditation.</p> <p>Nemko Canada Inc. authorizes the applicant to reproduce this report provided it is reproduced in its entirety and for use by the company's employees only.</p> <p>Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties.</p> <p>Nemko Canada Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.</p>	




## Section 2: Summary of test results

### 2.1 FCC Part 27, test results

Part	Test description	Verdict
§27.50(d)	Peak output power at RF antenna connector	Pass
§27.52	RF safety	N/A a)
§27.53(h)	Spurious emissions at RF antenna connector	Pass
§27.53(h)	Radiated spurious emissions	Pass
§27.53(f)	Radiated spurious emissions within 1559–1610 MHz band	N/A b)
§27.54	Frequency stability	N/A c)
§2.1049	Occupied bandwidth	Pass
§2.1047	Modulation characteristics	Pass
§2-11-04/EAB/RF	Filter Frequency Response	Pass

Notes:

- a) NO Antenna provided
- b) NOT APPLICABLE: 728-746MHz working band
- c) NOT APPLICABLE: Modulation/frequency conversion circuitry not in use. No frequency change in EUT (input and output have same frequency)

	Section 3: Equipment under test (EUT) details	Product: TRE7S8SC8A9S19AWAS

## Section 3: Equipment under test (EUT) and application details

### 3.1 Applicant details

<b>Applicant complete business name</b>	Name:	Teko Telecom Srl.
	Federal Registration Number (FRN):	0018963462
	Grantee code	XM2
<b>Mailing address</b>	Address:	Via Meucci, 24/a
	City:	Castel S. Pietro Terme
	Province/State:	Bologna
	Post code:	40024
	Country:	Italy

### 3.2 Modular equipment

<b>a) Single modular approval</b>	Single modular approval Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
<b>b) Limited single modular approval</b>	Limited single modular approval Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>

### 3.3 Product details

<b>FCC ID</b>	Grantee code:	XM2
	Product code:	-EP6B
<b>Equipment class</b>	B2I	
<b>Description of product as it is marketed</b>	Remote Unit for optical system	
	Model name/number:	TRE7S8SC8A9S19AWAS
	Serial number:	132059001

### 3.4 Application purpose


<b>Type of application</b>	<input checked="" type="checkbox"/> Original certification <input type="checkbox"/> Change in identification of presently authorized equipment Original FCC ID: _____ Grant date: _____ <input type="checkbox"/> Class II permissive change or modification of presently authorized equipment
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### 3.5 Composite/related equipment

<b>a) Composite equipment</b>	The EUT is a composite device subject to an additional equipment authorization Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
<b>b) Related equipment</b>	The EUT is part of a system that operates with, or is marketed with, another device that requires an equipment authorization Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
<b>c) Related FCC ID</b>	If either of the above is "yes": <input type="checkbox"/> has been granted under the FCC ID(s) listed below: <input type="checkbox"/> is in the process of being filled under the FCC ID(s) listed below: <input type="checkbox"/> is pending with the FCC ID(s) listed below: <input type="checkbox"/> has a mix of pending and granted statues under the FCC ID(s) listed below: i FCC ID: ii FCC ID:

### 3.6 Sample information

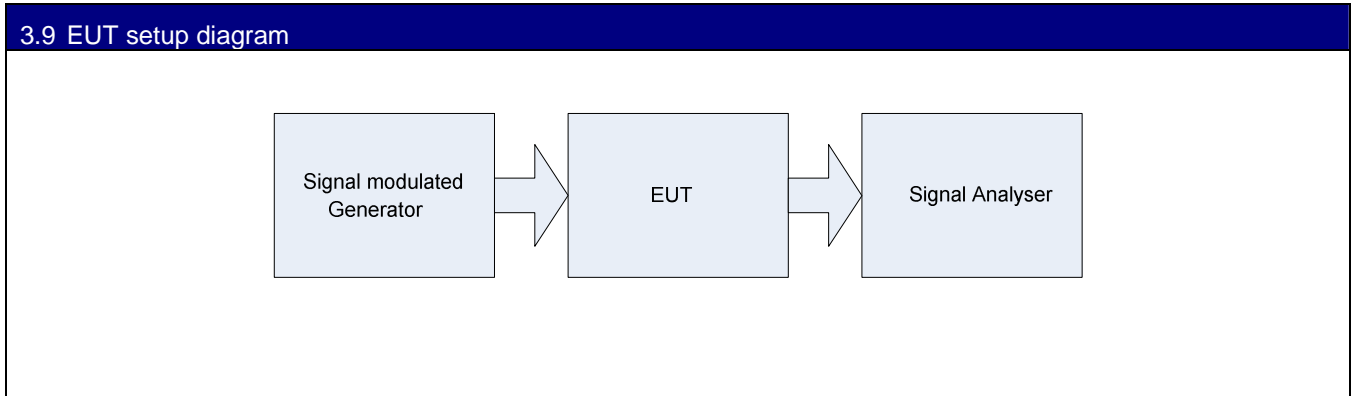
<b>Receipt date:</b>	2014-03-03
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	Section 3: Equipment under test (EUT) details	Product: TRE7S8SC8A9S19AWAS

Nemko sample ID number:	-----
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3.7 EUT technical specifications	
Operating band:	AWS: Down Link: 2110–2155 MHz, Up Link: 1710-1755 MHz
Operating frequency:	Wideband
Modulation type:	CDMA, WCDMA, LTE (QAM and QPSK)
Occupied bandwidth:	CDMA: 1,25 MHz, WCDMA: 5 MHz LTE: 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz
Channel spacing:	standard
Emission designator:	CDMA, WCDMA: F9W, LTE: D7W
RF Output	Down Link: 31dBm (1,25W) Up Link: N.A. (The EUT does not transmit over the air in the up-link direction)
Gain	Down Link: 36dB Up Link: N.A. (The EUT does not transmit over the air in the up-link direction)
Antenna type:	External Antenna is not provided, equipment that has an external 50 Ω RF connector
Power source:	100-240 Vac

3.8 Operation of the EUT during testing	
Details:	In down-link direction, normal working at max gain with max RF power output



	Section 4: Engineering considerations	Product: TRE7S8SC8A9S19AWAS

## Section 4: Engineering considerations

### 4.1 Modifications incorporated in the EUT

<b>Modifications</b>	Modifications performed to the EUT during this assessment None <input checked="" type="checkbox"/> Yes <input type="checkbox"/> , performed by Client <input type="checkbox"/> or Nemko <input type="checkbox"/> Details:
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### 4.2 Deviations from laboratory tests procedures

<b>Deviations</b>	Deviations from laboratory test procedures None <input checked="" type="checkbox"/> Yes <input type="checkbox"/> - details are listed below:
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### 4.3 Technical judgment

<b>Judgment</b>	None
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## Section 5: Test conditions

### 5.1 Power source and ambient temperatures

<b>Normal temperature, humidity and air pressure test conditions</b>	Temperature: 15–30 °C Relative humidity: 30–60 % Air pressure: 860–1060 hPa  When it is impracticable to carry out tests under these conditions, a note to this effect stating the ambient temperature and relative humidity during the tests shall be recorded and stated.
<b>Power supply range:</b>	The normal test voltage for equipment to be connected to the mains shall be the nominal mains voltage. For the purpose of the present document, the nominal voltage shall be the declared voltage, or any of the declared voltages $\pm 5$ %, for which the equipment was designed.





## Section 6: Measurement uncertainty

Nemko S.p.A. measurement uncertainty has been calculated using the standard CISPR 16-4-2 “Specification for radio disturbance and immunity measuring apparatus and methods – Part 4-2: Uncertainties, statistics and limit modeling – Uncertainty in EMC measurements”. All calculations have been performed to provide a confidence level of 95 % and can be found in Nemko S.p.A. document WML1002.



Section 7: Test equipment

Product: TRE7S8SC8A9S19AWAS

## Section 7: Test equipment


Client's property:

Identification number	Description	Manufacturer model	s/n	Cal. Due
1a	Vector Signal Generator	Agilent N5182A MXG	MY48180714	May 2015
1b	Vector Signal Generator	Agilent E4438C ESG	MY45094485	Ago 2016
2a	Spectrum Analyzer	Agilent E4440A	US40420470	May 2015
2b	Spectrum Analyzer	Agilent E9020A MXA	MY48011812	Ago 2015
3	Network Analyzer	Agilent E5071B	MY42301133	Ago 2016
4	Climatic chamber	Angelantoni Hygros 600	7237	Nov 2014

Property of Nemko Italy:

Equipment	Manufacturer	Model no.	Asset no.	Cal cycle months	Next cal.
Trilog Broad Band Antenna 25-2000 MHz	Schwarzbeck	VULB 9168	VULB 9168-242	36	02/2015
Trilog Broad Band Antenna 25-8000 MHz	Schwarzbeck	VULB 9162	VULB 9162-25	36	05/2015
Antenna 1-18 GHz	Schwarzbeck	STLP 9148	STPL 9148-123	36	02/2015
Double ridge waveguide horn	RFspin	DRH40	061106A40		08/2016
Preamplifier 18-40 GHz	Miteq	JS44	1648665		09/2014
Broadband preamplifier 1-18 GHz	Schwarzbeck	BBV 9718	9718-137	36	09/2014
EMI receiver 20 Hz ÷ 8 GHz	R&S	ESU8	100202	12	02/2015
EMI receiver 20 Hz ÷ 3 GHz	R&S	ESCI	100888	12	08/2014
Hydraulic revolving platform	Nemko	RTPL 01	4.233		NCR
Turning-table	R&S	HCT	835 803/03		NCR
Antenna mast	R&S	HCM	836 529/05		NCR
Controller	R&S	HCC	836 620/7		NCR
Spectrum Analyzer 9kHz ÷ 40GHz	R&S	FSEK	848255/005		08/2014
Semi-anechoic chamber	Nemko	10m semi-anechoic chamber	530		08/2014
Shielded room	Siemens	10m control room	1947		NCR
Semi-anechoic chamber	Nemko	10m semi-anechoic chamber	70		NCR
Shielded Room	Siemens	3m semi-anechoic chamber	3		NCR
Motor controller	Emco	1051-25	9012-1559		NCR
Motor controller	Emco	1061-1.521	9012-1508		NCR
Antenna Tower	Emco	2071-2	9601-1940		NCR
Controller pole/table	Emco	2090	9511-1099		NCR
V-Network	Rohde & Schwarz	ESH2-Z5	872 460/041	12	09/2014

Note: N/A = Not applicable, NCR = No cal required, COU = Cal on use

	<b>Section 8:</b> Testing data		<b>Product:</b> TRE7S8SC8A9S19AWAS
	<b>Test name:</b> Clause 27.52 RF safety		
	<b>Test date:</b> 03-27 March 2014		<b>Test engineer:</b> G. Curioni
	<b>Verdict:</b> Pass		<b>Supply input:</b> 100-240 Vac
	<b>Temperature:</b> 25 °C	<b>Air pressure:</b> 860-1060 hPa	<b>Relative humidity:</b> 50 %
	<b>Specification:</b> FCC Part 27		

## Section 8: Testing data


### 8.1 Clause 27.50(d) Peak output power at RF antenna connector

(1) The power of each fixed or base station transmitting in the 2110-2155 MHz band and located in any county with population density of 100 or fewer persons per square mile, based upon the most recently available population statistics from the Bureau of the Census, is limited to a peak equivalent isotropically radiated power (EIRP) of 3280 watts. The power of each fixed or base station transmitting in the 2110-2155 MHz band from any other location is limited to a peak EIRP of 1640 watts. A licensee operating a base or fixed station utilizing a power of more than 1640 watts EIRP must coordinate such operations in advance with all Government and non-Government satellite entities in the 2025-2110 MHz band. Operations above 1640 watts EIRP must also be coordinated in advance with the following licensees within 120 kilometers (75 miles) of the base or fixed station: all Broadband Radio Service (BRS) licensees authorized under Part 27 in the 2155-2160 MHz band and all AWS licensees in the 2110-2155 MHz band.

(2) Fixed, mobile, and portable (handheld) stations operating in the 1710–1755MHz band are limited to a peak EIRP of 1 watt. Fixed stations operating in this band are limited to a maximum antenna height of 10 meters above ground, and mobile and portable stations must employ a means for limiting power to the minimum necessary for successful communications.

### Special notes

- The power was measured using spectrum analyzer with RMS detector / average power meter.
- In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13dB

	<b>Section 8: Testing data</b>		<b>Product: TRE7S8SC8A9S19AWAS</b>	
	<b>Test name:</b> Clause 27.52 RF safety			
	<b>Test date:</b> 03-27 March 2014		<b>Test engineer:</b> G. Curioni	
	<b>Verdict:</b> Pass		<b>Supply input:</b> 100-240 Vac	
	<b>Temperature:</b> 25 °C		<b>Air pressure:</b> 860-1060 hPa	
	<b>Relative humidity:</b> 50 %			
<b>Specification:</b> FCC Part 27				

**RF Output Power at RF connectors**

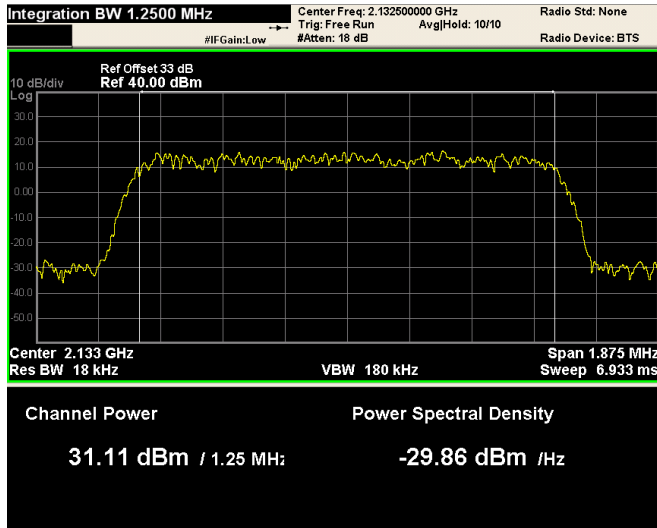
Test data						
Direction	Modulation	Frequency (MHz)	RF output Power (dBm)	RF output channel Power (W)	RF output Power (W/MHz)	PAR (dB)
Down-link	CDMA (1,25MHz)	2132.5	31.11	1.29	1.032	8.53
Down-link	WCDMA (5MHz)	2132.5	31.10	1.29	0.258	9.83
Down-link	LTE (QAM, 1,4MHz)	2132.5	31.11	1.29	0.921	9.39
Down-link	LTE (QPSK, 1,4MHz)	2132.5	31.11	1.29	0.921	9.02
Down-link	LTE (QAM, 3MHz)	2132.5	31.16	1.31	0.437	9.54
Down-link	LTE (QPSK, 3MHz)	2132.5	31.17	1.31	0.437	9.67
Down-link	LTE (QAM, 5MHz)	2132.5	31.16	1.31	0.262	9.90
Down-link	LTE (QPSK, 5MHz)	2132.5	31.18	1.31	0.262	9.35
Down-link	LTE (QAM, 10MHz)	2132.5	31.12	1.29	0.129	9.96
Down-link	LTE (QPSK, 10MHz)	2132.5	31.17	1.31	0.131	9.69
Down-link	LTE (QAM, 15MHz)	2132.5	31.18	1.31	0.087	9.27
Down-link	LTE (QPSK, 15MHz)	2132.5	31.19	1.32	0.088	10.01
Down-link	LTE (QAM, 20MHz)	2132.5	31.11	1.29	0.065	10.40
Down-link	LTE (QPSK, 20MHz)	2132.5	31.19	1.32	0.066	9.94

Transmitting these powers by a  $\lambda/2$  dipole tuned on the carriers' frequency we get: erp.

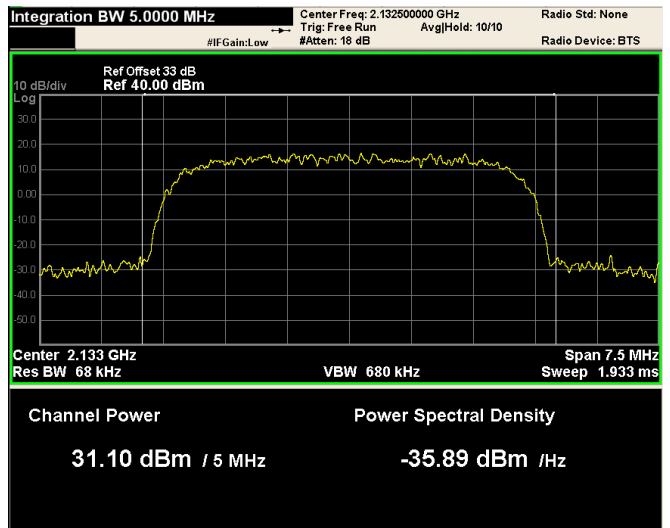


Section 8: Testing data		Product: TRE7S8SC8A9S19AWAS
Test name: Clause 27.52 RF safety		
Test date 03-27 March 2014		Test engineer: G. Curioni
Verdict: Pass		Supply input: 100-240 Vac
Temperature: 25 °C	Air pressure: 860-1060 hPa	Relative humidity: 50 %
Specification: FCC Part 27		

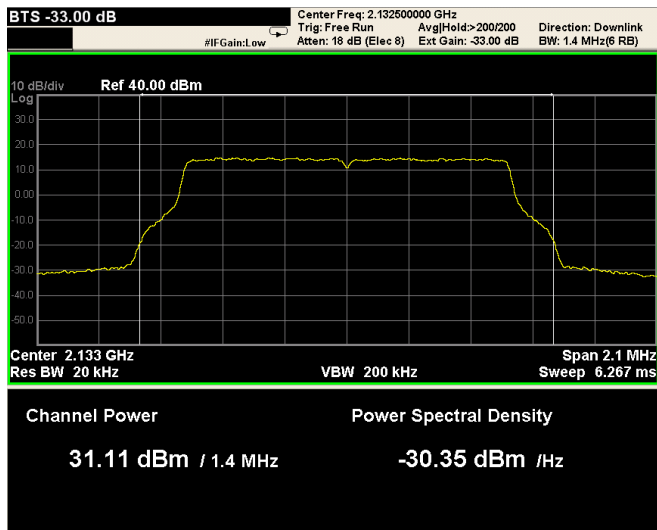
### Mod. CDMA



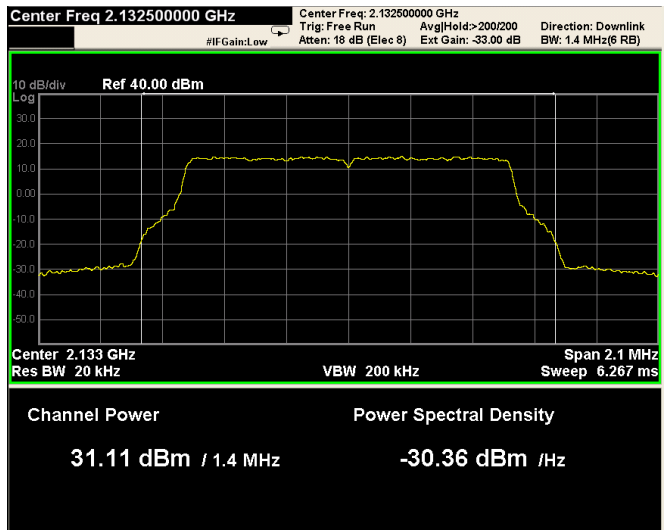
### Mod. WCDMA



### Mod. LTE 1,4MHz (Down-link)



QAM

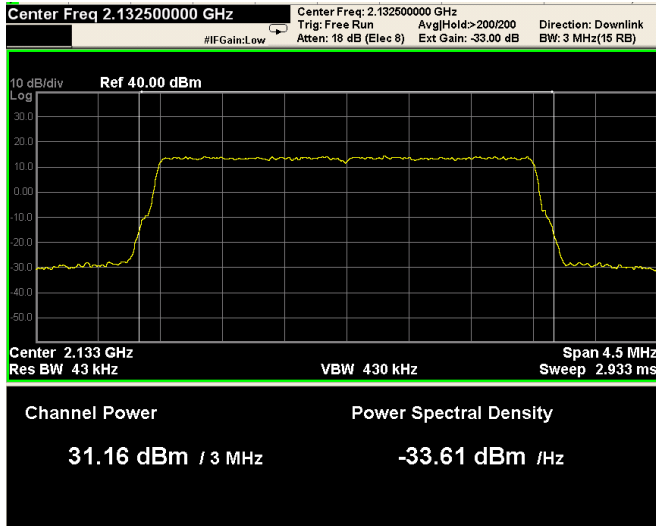


QPSK

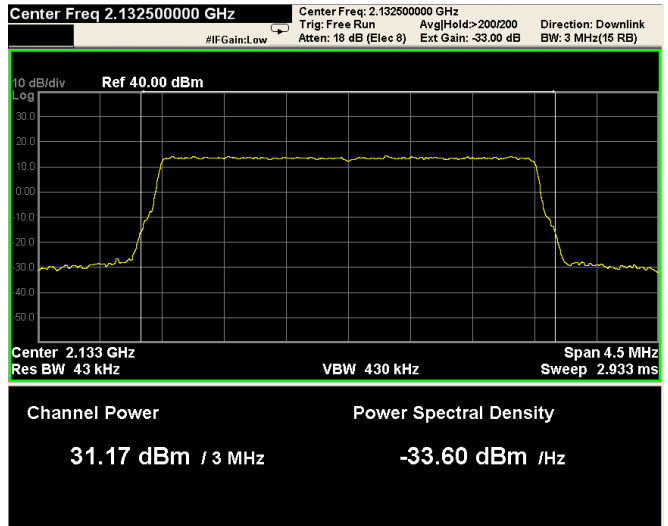


Section 8: Testing data		Product: TRE7S8SC8A9S19AWAS
Test name: Clause 27.52 RF safety		
Test date: 03-27 March 2014		Test engineer: G. Curioni
Verdict: Pass		Supply input: 100-240 Vac
Temperature: 25 °C	Air pressure: 860-1060 hPa	Relative humidity: 50 %
Specification: FCC Part 27		

### Mod. LTE 3MHz (Down-link)

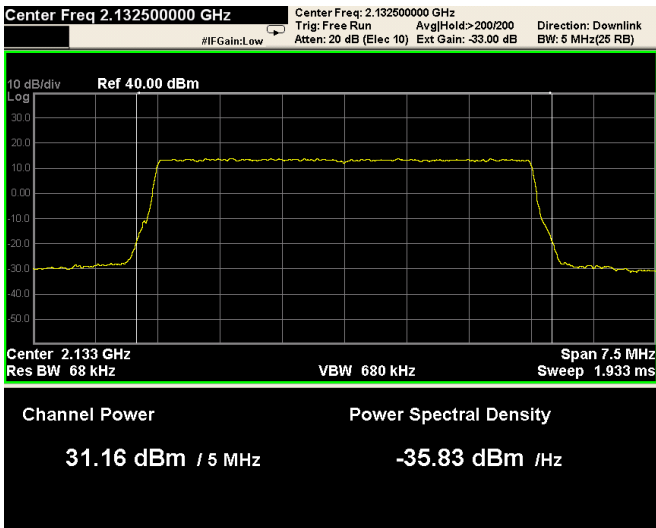


QAM

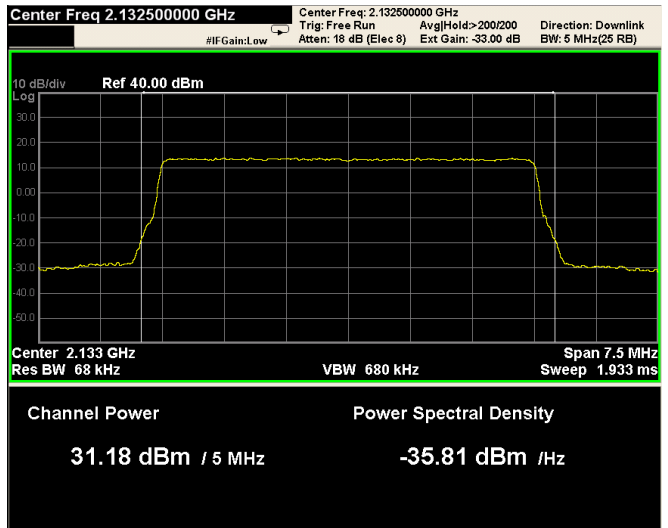


QPSK

### Mod. LTE 5MHz (Down-link)



QAM

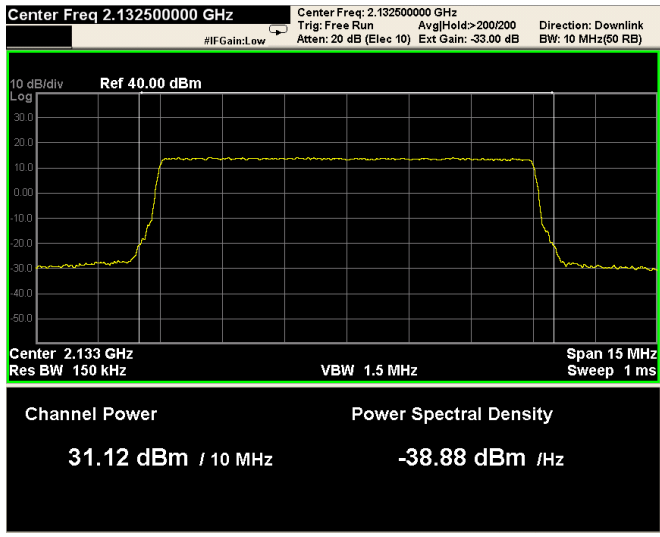


QPSK

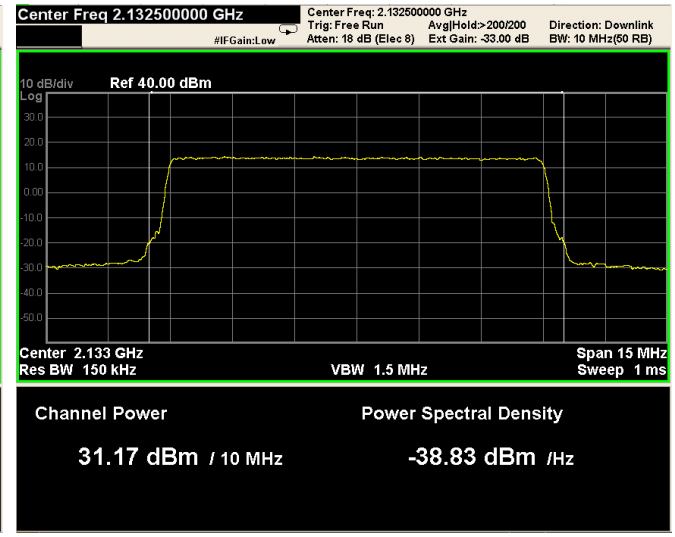


Section 8: Testing data		Product: TRE7S8SC8A9S19AWAS
Test name: Clause 27.52 RF safety		
Test date: 03-27 March 2014		Test engineer: G. Curioni
Verdict: Pass		Supply input: 100-240 Vac
Temperature: 25 °C	Air pressure: 860-1060 hPa	Relative humidity: 50 %
Specification: FCC Part 27		

### Mod. LTE 10MHz (Down-link)

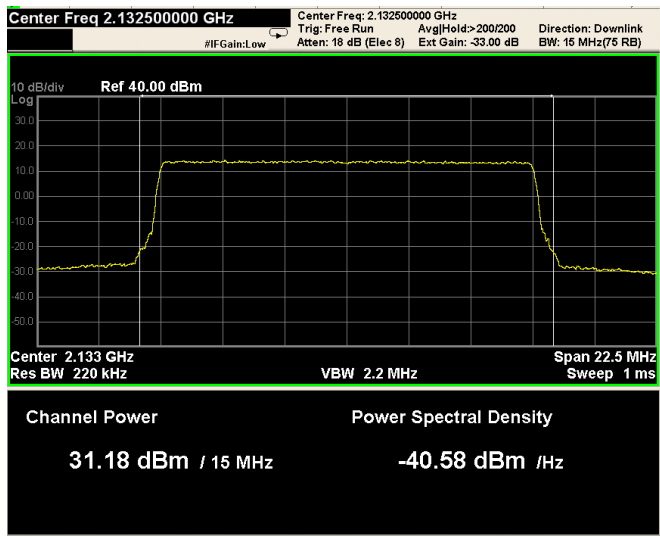


QAM

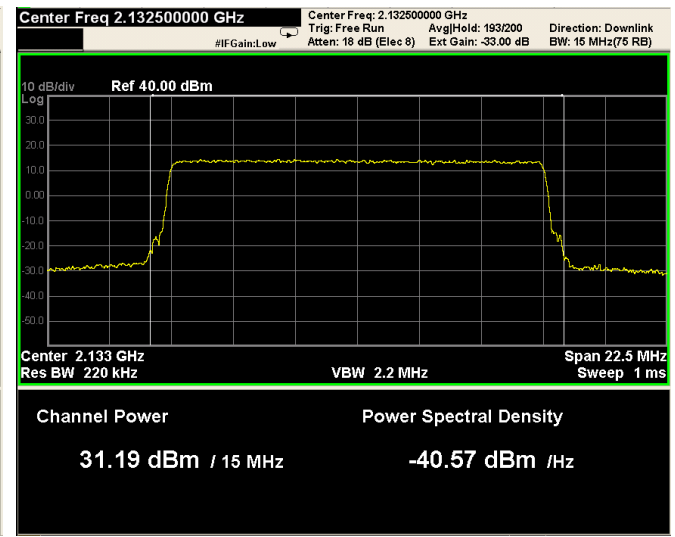


QPSK

### Mod. LTE 15MHz (Down-link)



QAM

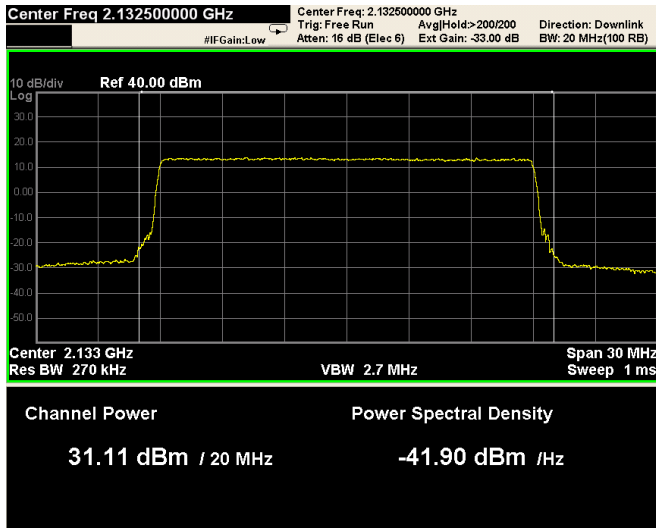


QPSK

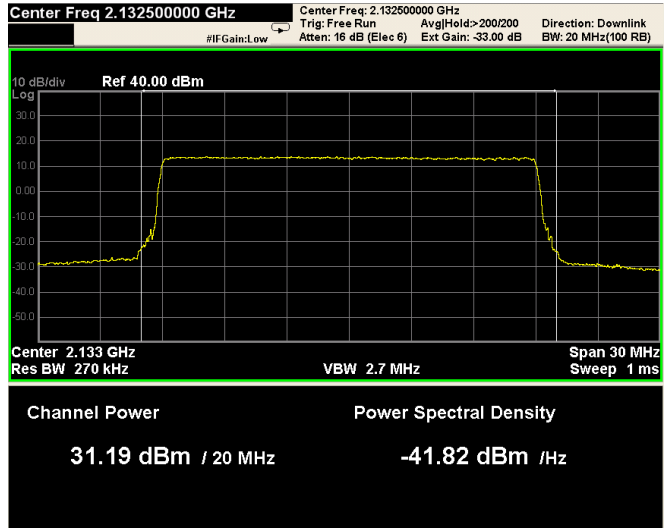


Section 8: Testing data		Product: TRE7S8SC8A9S19AWAS
Test name: Clause 27.52 RF safety		
Test date: 03-27 March 2014		Test engineer: G. Curioni
Verdict: Pass		Supply input: 100-240 Vac
Temperature: 25 °C	Air pressure: 860-1060 hPa	Relative humidity: 50 %
Specification: FCC Part 27		

### Mod. LTE 20MHz (Down-link)




QAM



QPSK



	<b>Section 8:</b> Testing data		<b>Product:</b> TRE7S8SC8A9S19AWAS	
	<b>Test name:</b> Clause 27.52 RF safety			
	<b>Test date:</b> 03-27 March 2014		<b>Test engineer:</b> G. Curioni	
	<b>Verdict:</b> Pass		<b>Supply input:</b> 100-240 Vac	
	<b>Temperature:</b> 25 °C		<b>Air pressure:</b> 860-1060 hPa	
	<b>Relative humidity:</b> 50 %			
<b>Specification:</b> FCC Part 27				

## 8.2 Clause 27.52 RF safety

Licenses and manufacturers are subject to the radio frequency radiation exposure requirements specified in sections 1.1307(b), 2.1091, and 2.1093 of this chapter, as appropriate. Applications for equipment authorization of mobile or portable devices operating under this section must contain a statement confirming compliance with these requirements for both fundamental emissions and unwanted emissions. Technical information showing the basis for this statement must be submitted to the Commission upon request.

### Special notes

The test was performed using E-field probe slowly moving towards the EUT until E-field equivalent to the maximum permitted power density was measured  
 Equivalent power density was calculated from electric field strength as follows:

$$S_{[mW/cm^2]} = \frac{0.1 \times E^2_{[V/m]}}{120 \times \pi} \quad S[W/m^2] = E^2[V/m]/377[\Omega]$$

where S is power density and E is electric field strength.

### Test data

Test distance (cm)	Field strength (V/m)	Equivalent power density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )	Margin (mW/cm <sup>2</sup> )
300				
250				
200				
150				
100				
50				
30				
20				
10				
5				

NOT APPLICABLE; External Antenna not provided

### 8.3 Clause 27.53 (h) Spurious emissions at RF antenna connector

For operations in the 1710-1755 MHz and 2110-2155 MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log_{10}(P)$  dB.

(1) Compliance with the provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

(2) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the licensee's frequency block edges, both upper and lower, as the design permits.

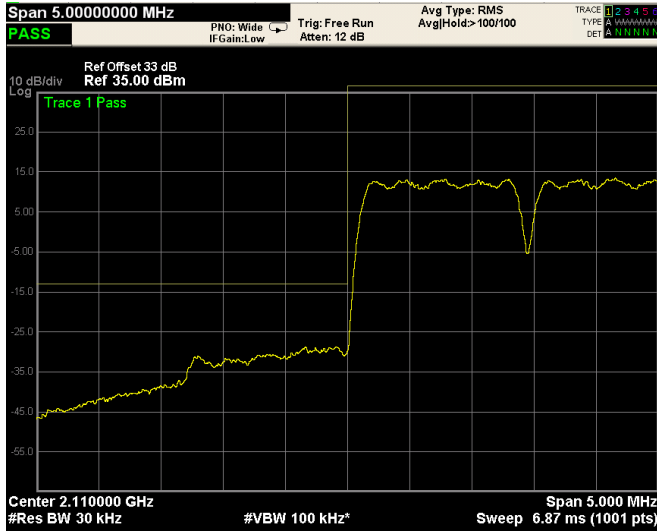
(3) The measurements of emission power can be expressed in peak or average values, provided they are expressed in the same parameters as the transmitter power.

#### Special notes

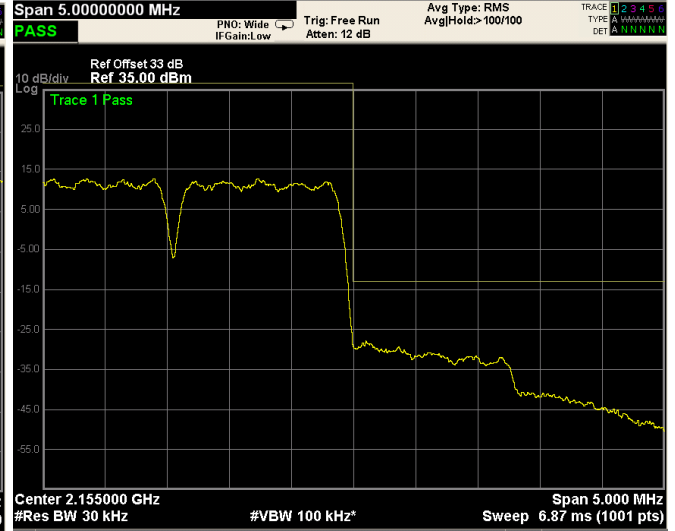
- The spectrum was searched from 30 MHz to the 10<sup>th</sup> harmonic.
- RBW within 30–1000 MHz was 100 kHz 1 MHz above 1 GHz. VBW was wider than RBW.

Band edges Inter modulation:

Mod. CDMA (Down-link)

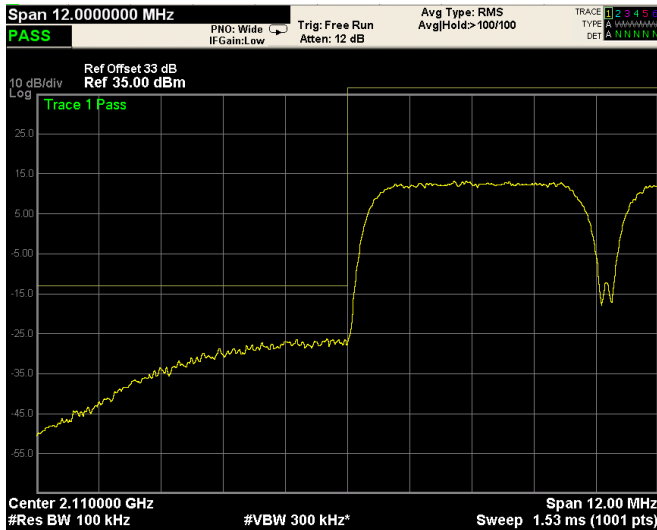


Low Band Edge

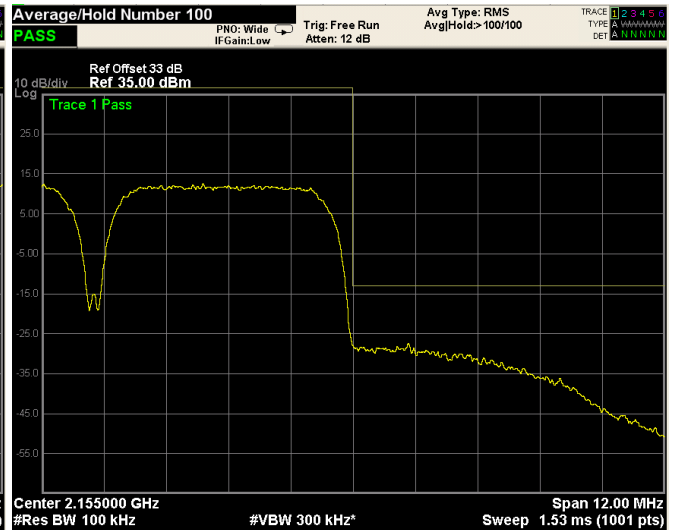


High Band Edge

Mod. WCDMA (Down-link)

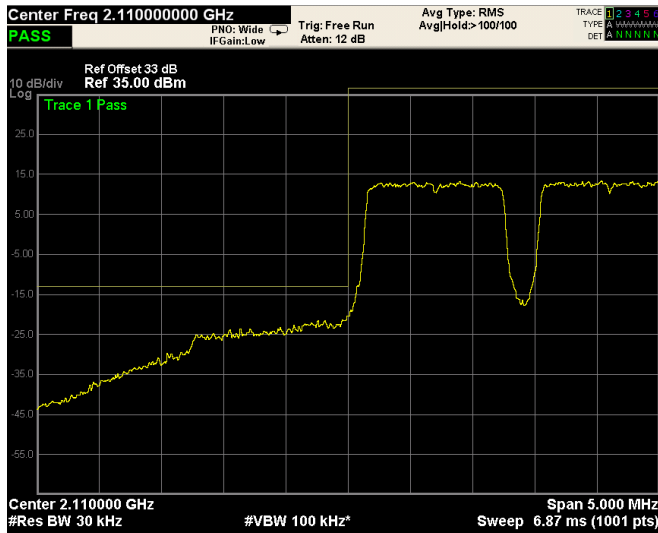


Low Band Edge

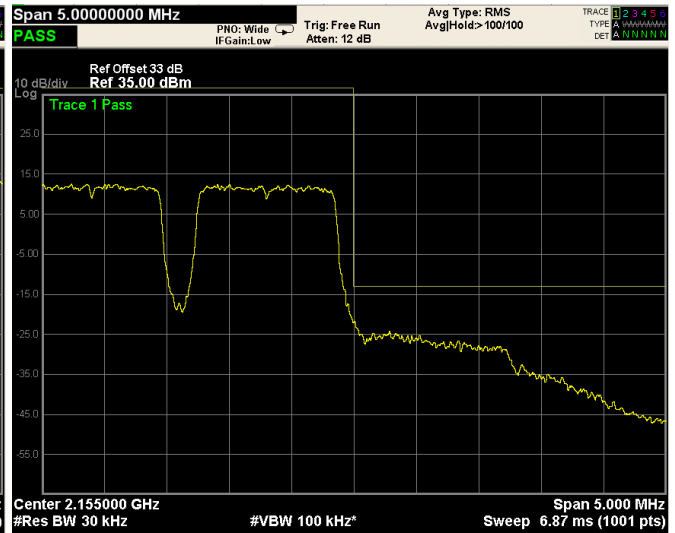


High Band Edge

Mod. LTE 1.4MHz (QAM) (Down-link)

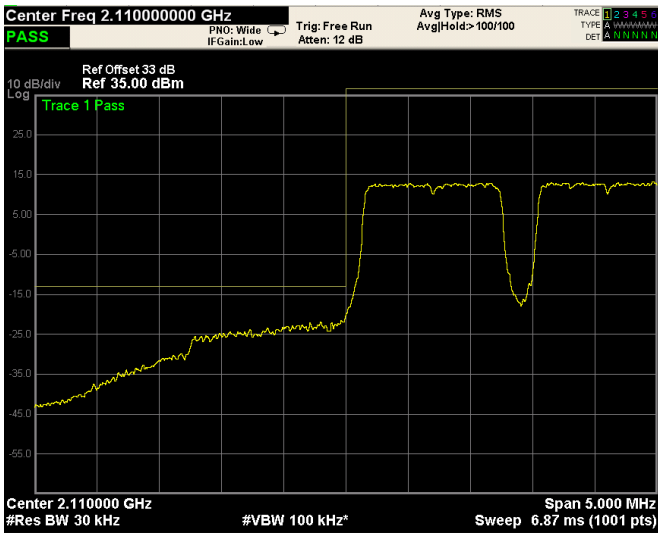


Low Band Edge

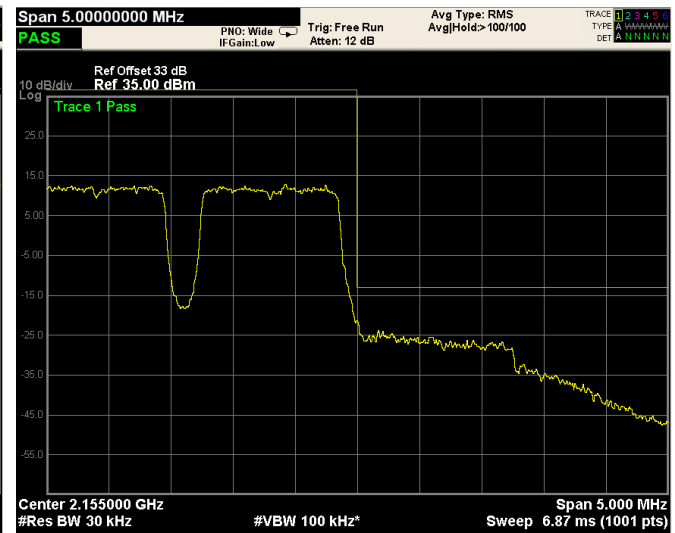


High Band Edge

Mod. LTE 1.4MHz (QPSK) (Down-link)

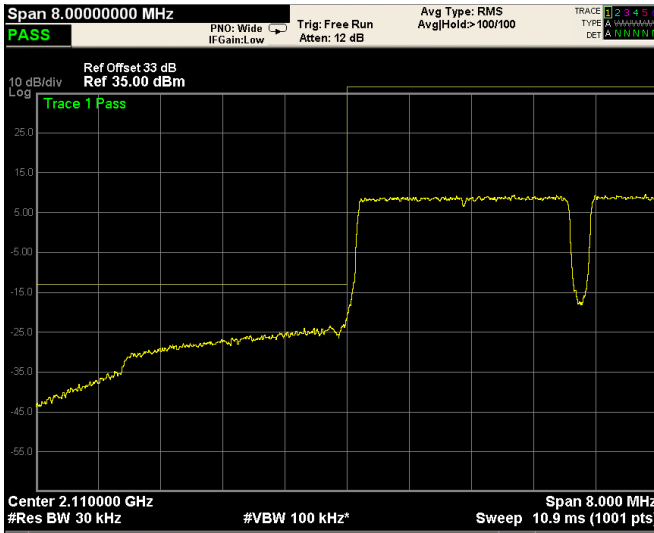


Low Band Edge

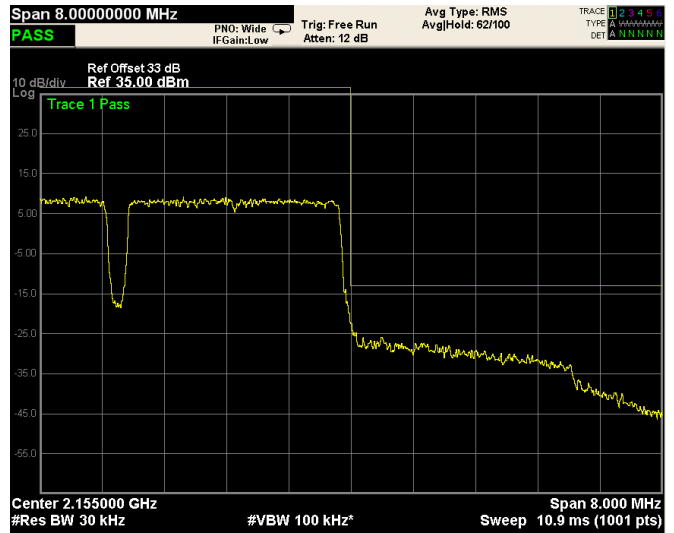


High Band Edge

Mod. LTE 3MHz (QAM) (Down-link)

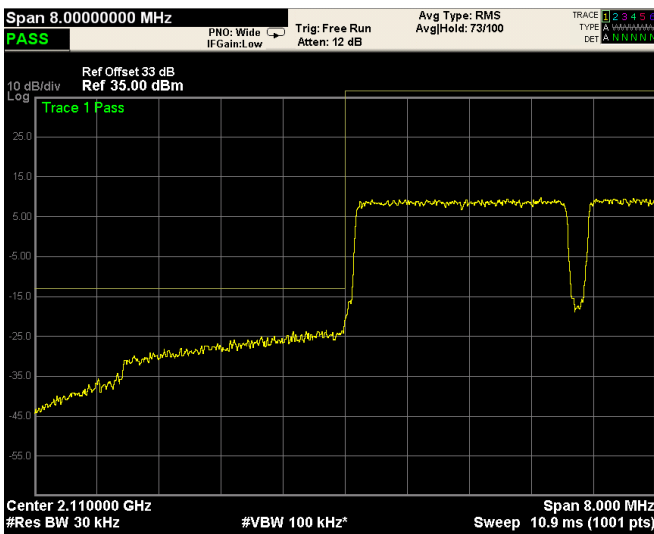


Low Band Edge

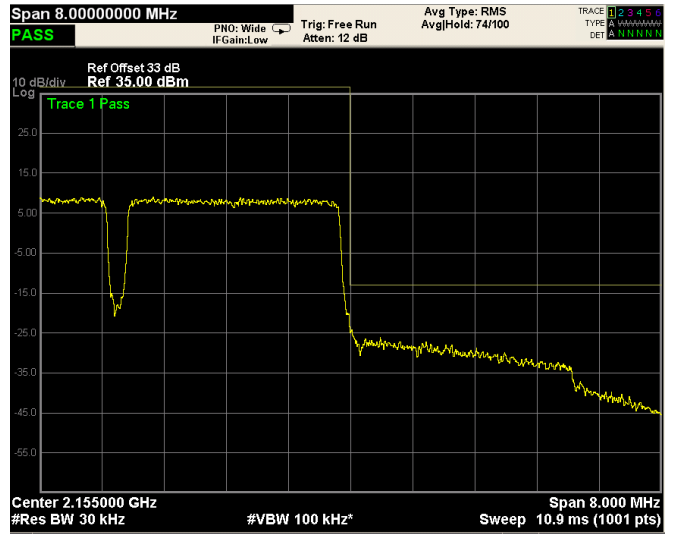


High Band Edge

Mod. LTE 3MHz (QPSK) (Down-link)

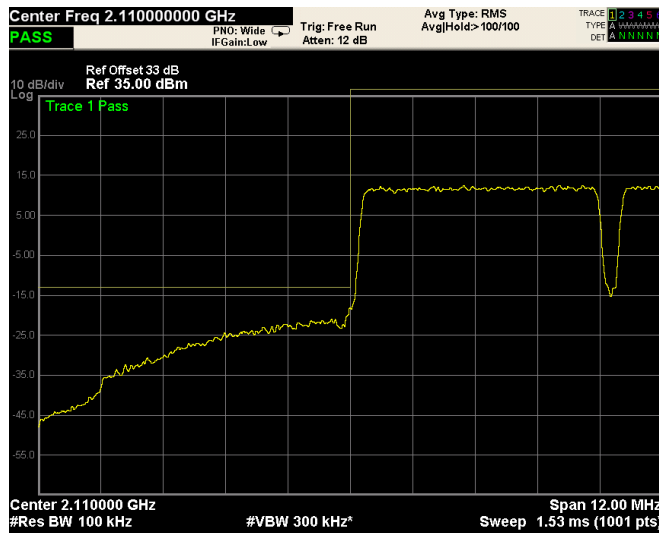


Low Band Edge

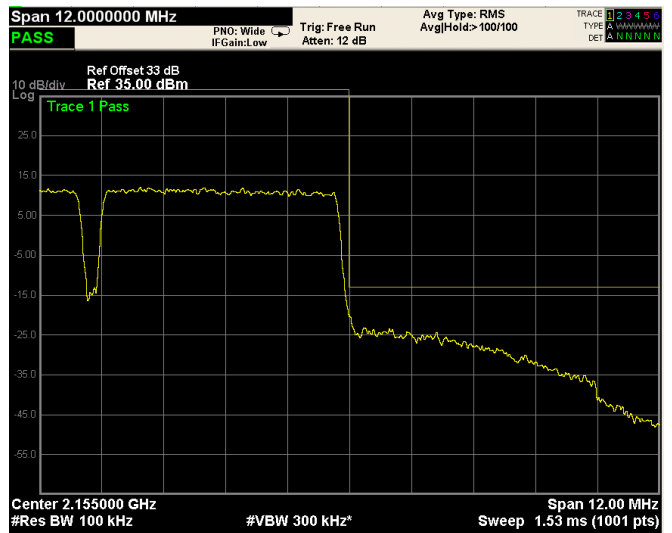


High Band Edge

Mod. LTE 5MHz (QAM) (Down-link)

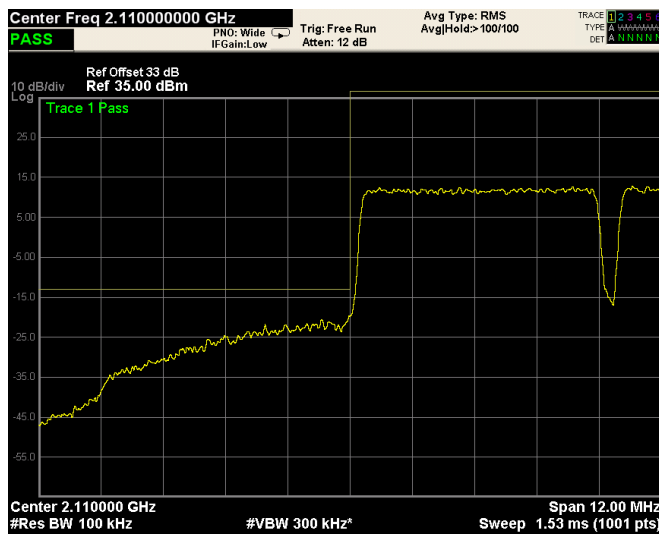


Low Band Edge

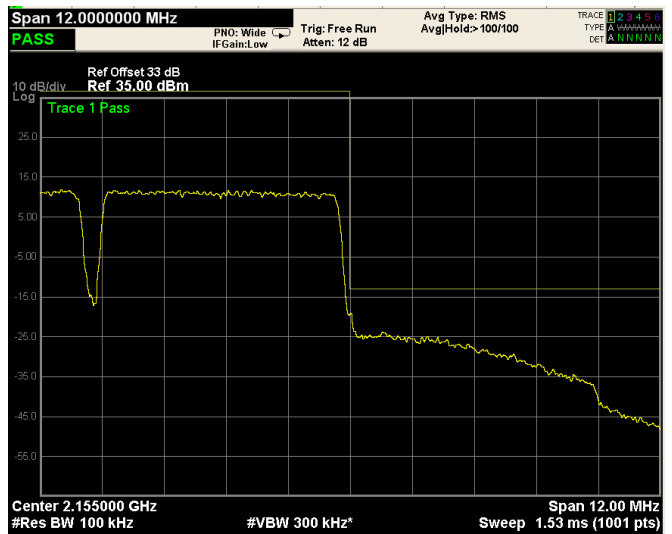


High Band Edge

Mod. LTE 5MHz (QPSK) (Down-link)

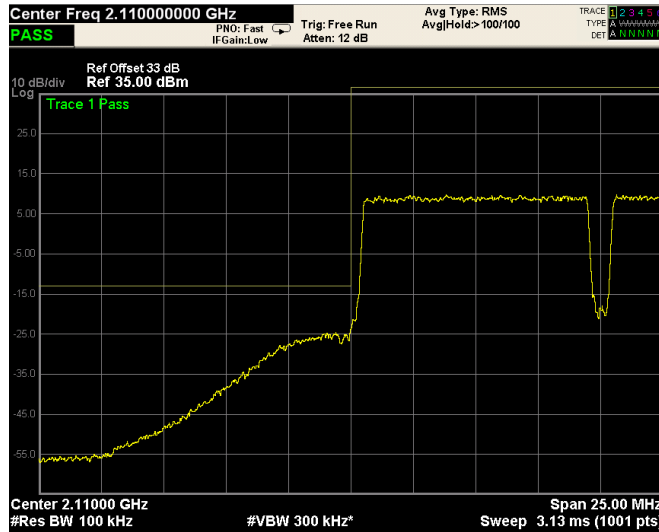


Low Band Edge

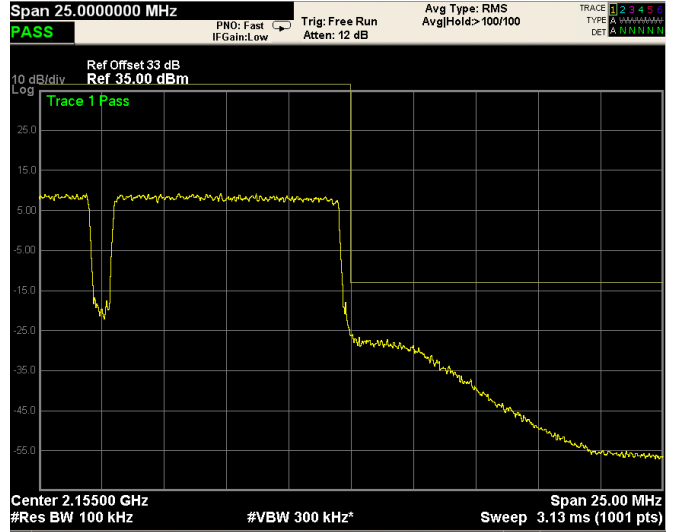


High Band Edge

Mod. LTE 10MHz (QAM) (Down-link)

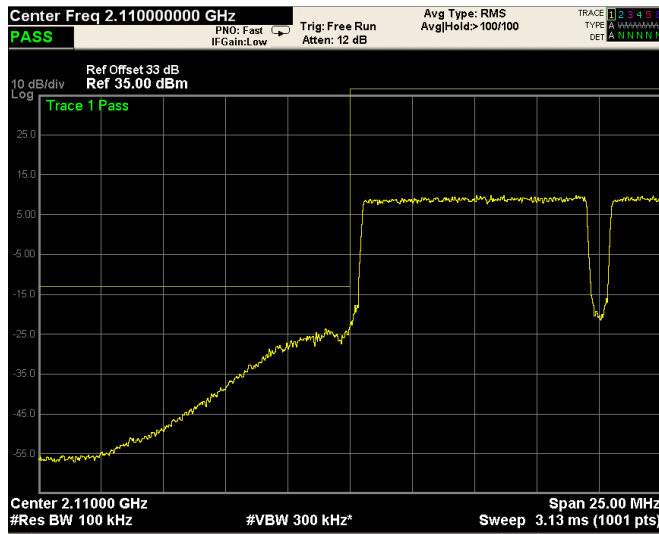


Low Band Edge

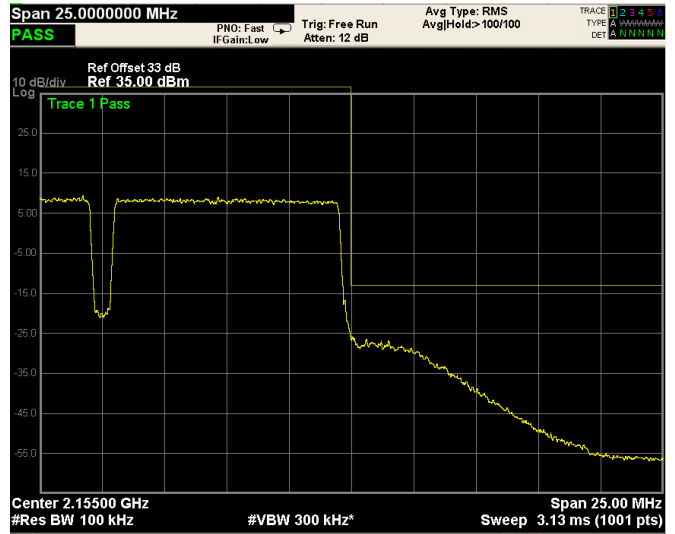


High Band Edge

Mod. LTE 10MHz (QPSK) (Down-link)

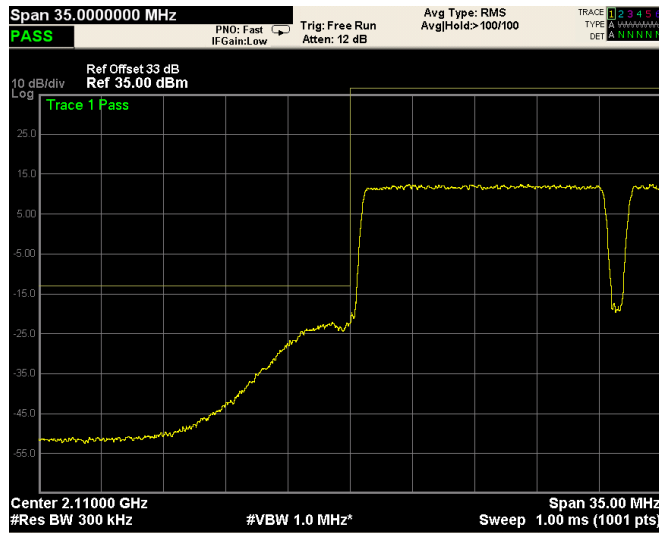


Low Band Edge

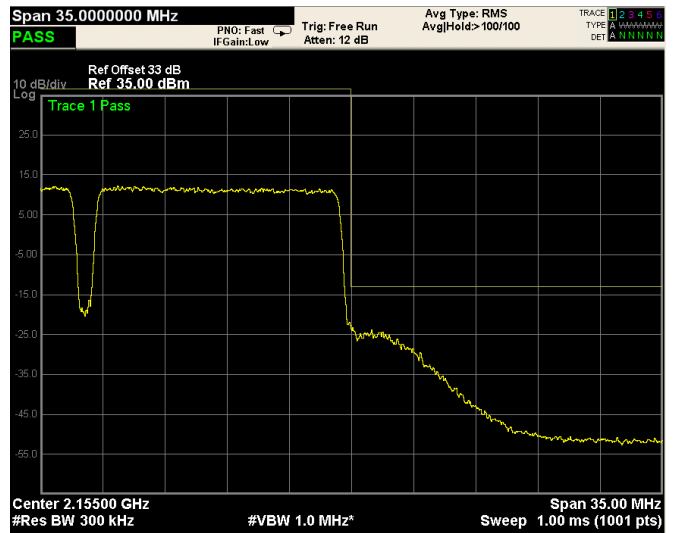


High Band Edge

Mod. LTE 15MHz (QAM) (Down-link)

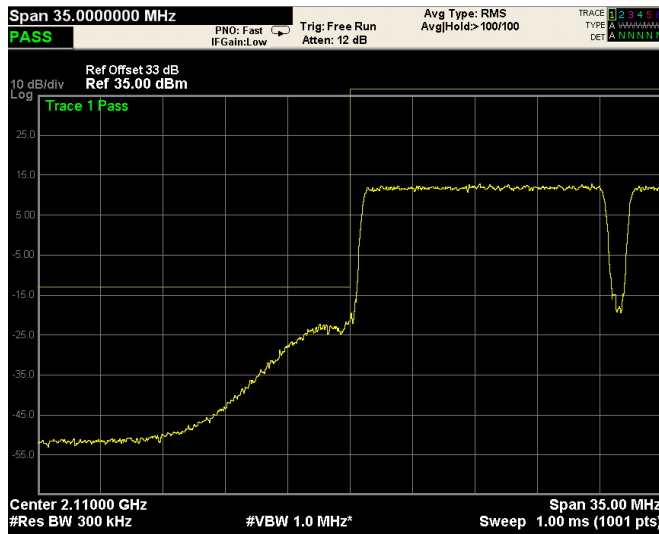


Low Band Edge

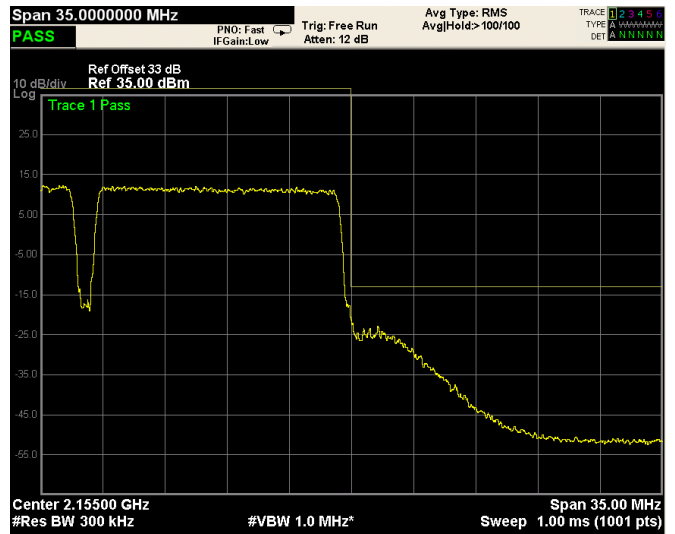


High Band Edge

Mod. LTE 15MHz (QPSK) (Down-link)



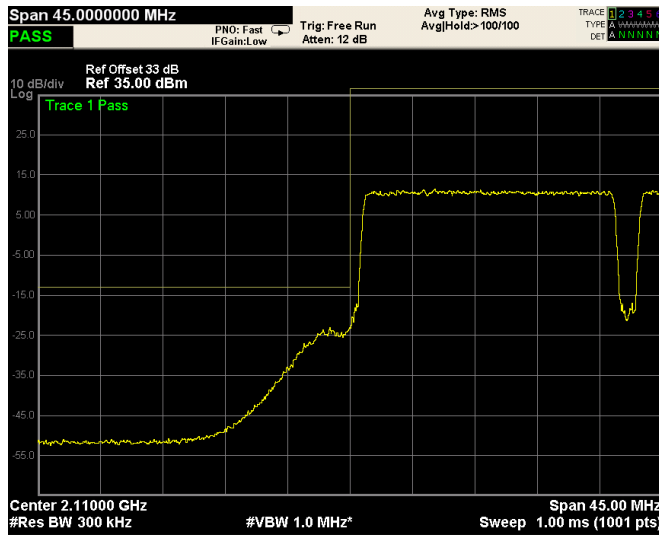
Low Band Edge



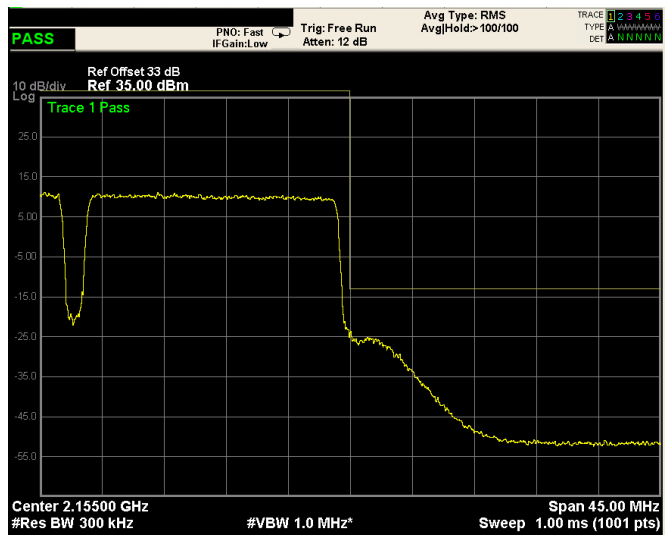
High Band Edge



Mod. LTE 20MHz (QAM) (Down-link)

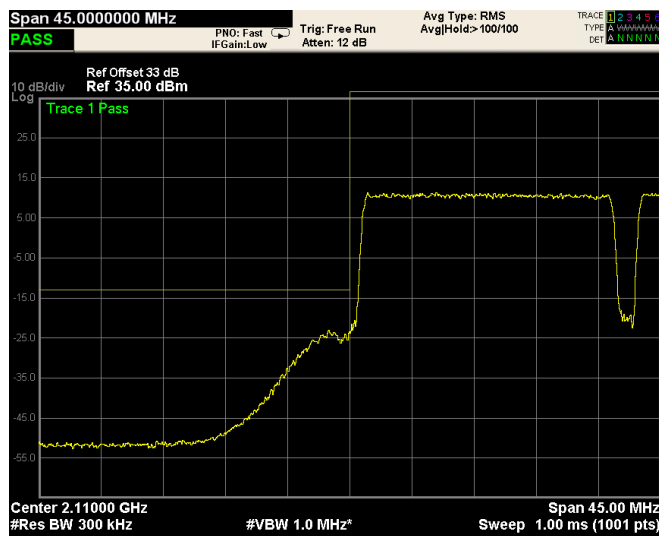


Low Band Edge

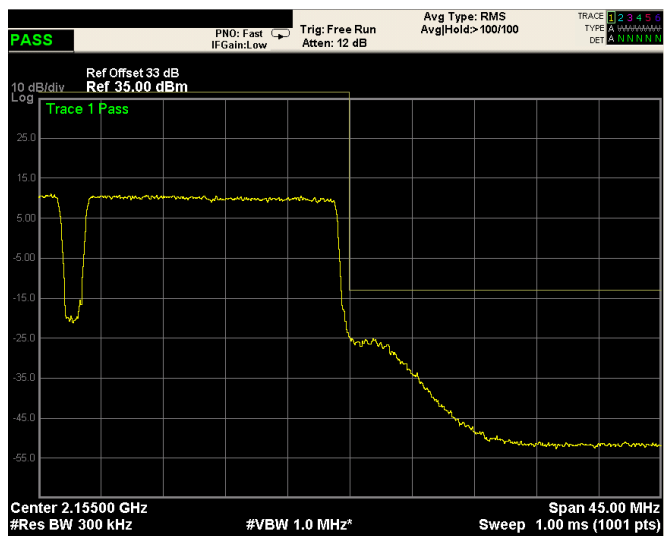


High Band Edge

Mod. LTE 20MHz (QPSK) (Down-link)



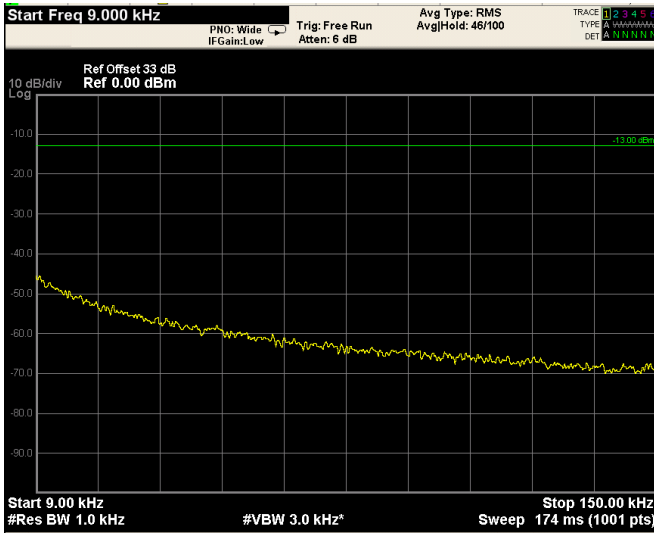
Low Band Edge



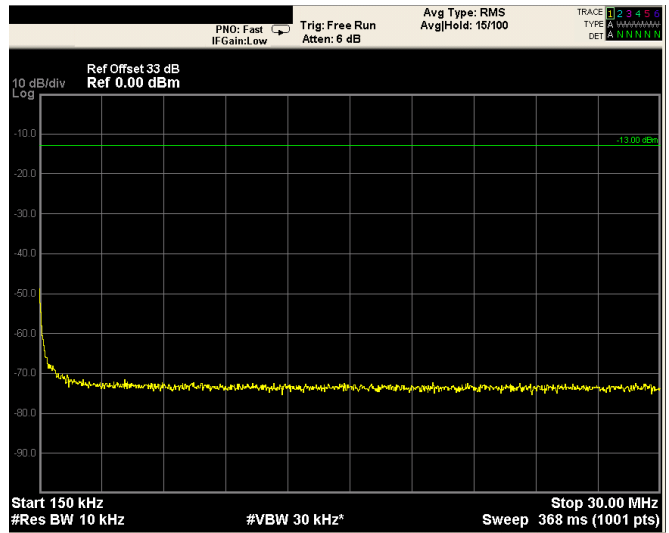
High Band Edge

Spurious emissions at antenna terminal,

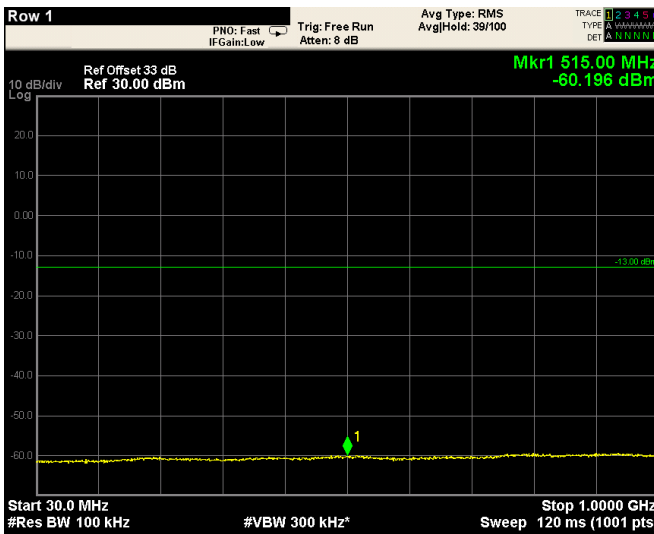
Mod. CDMA (Down-link)



9kHz-150kHz



150kHz-30MHz

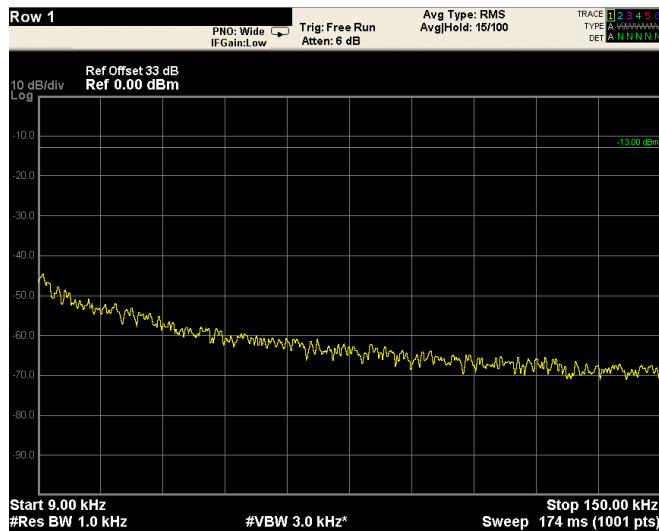


30MHz-1GHz

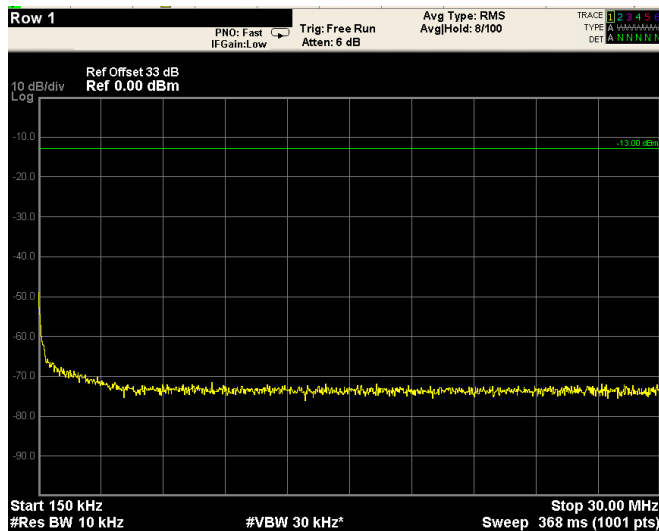


1GHz-22GHz

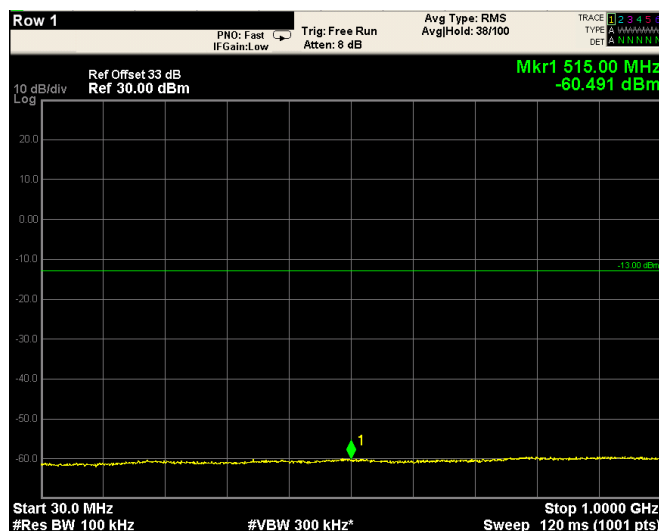
Mod. WCDMA (Down-link)



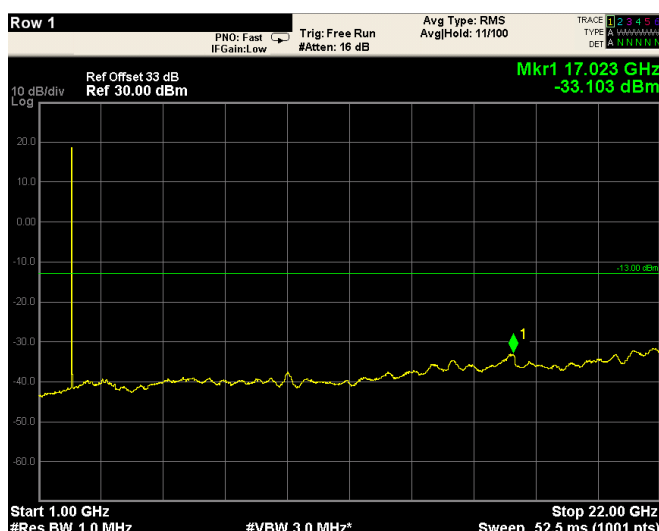
9kHz-150kHz



150kHz-30MHz

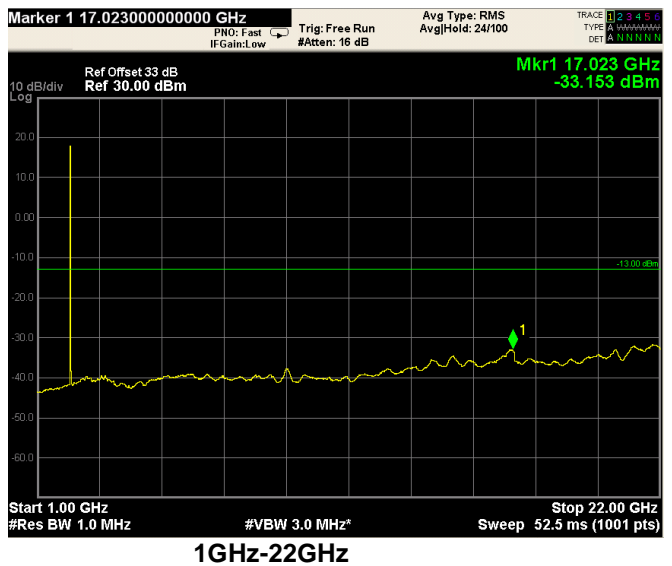
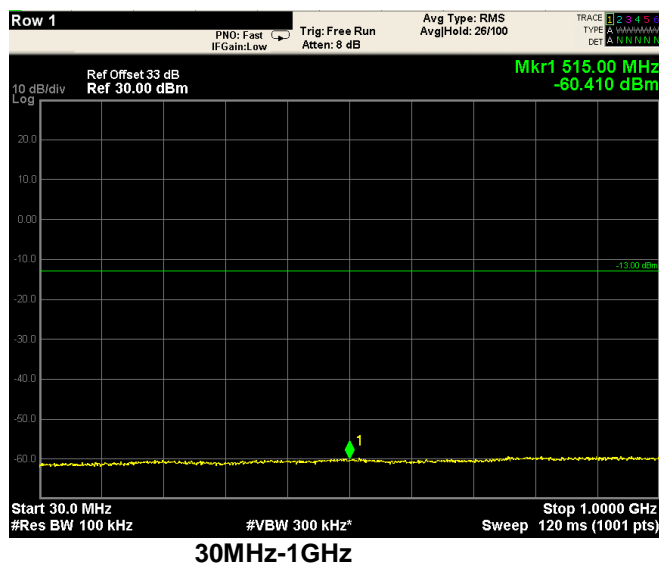
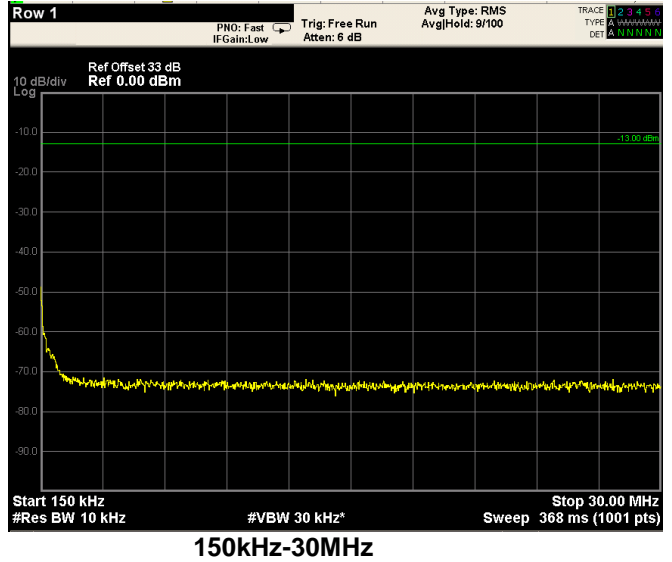
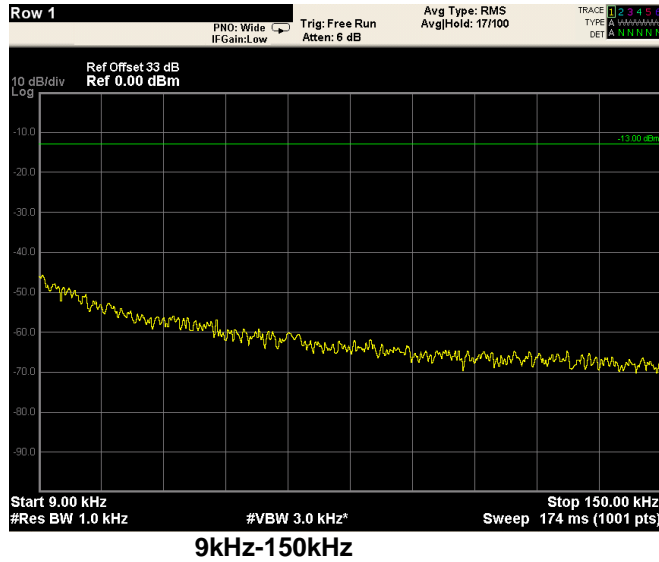


30MHz-1GHz



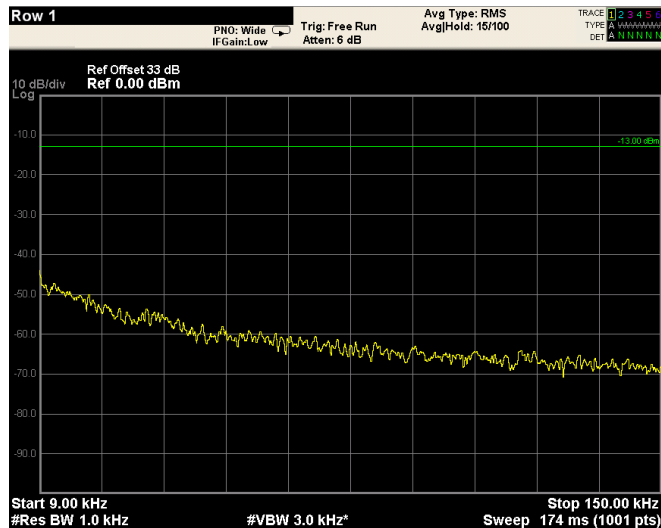
1GHz-22GHz

Mod. LTE 1.4MHz (QAM) (Down-link)

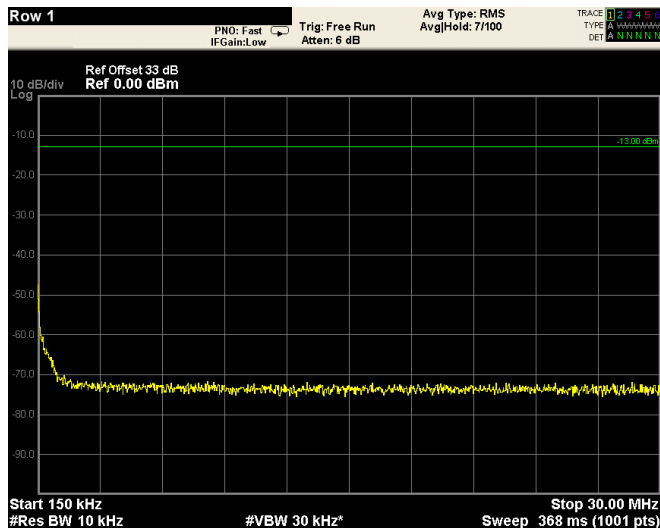




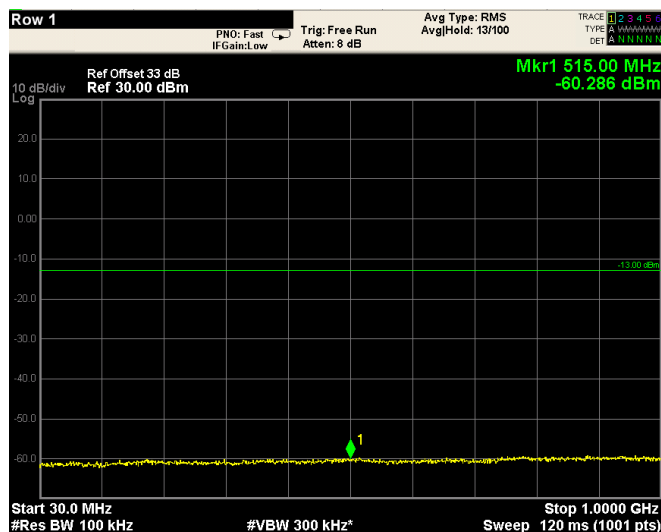
### Mod. LTE 1.4MHz (QPSK) (Down-link)



9kHz-150kHz



150kHz-30MHz



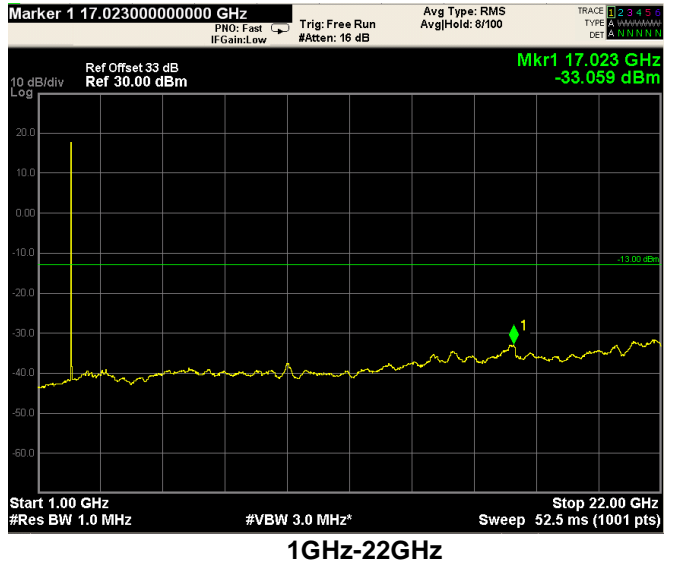
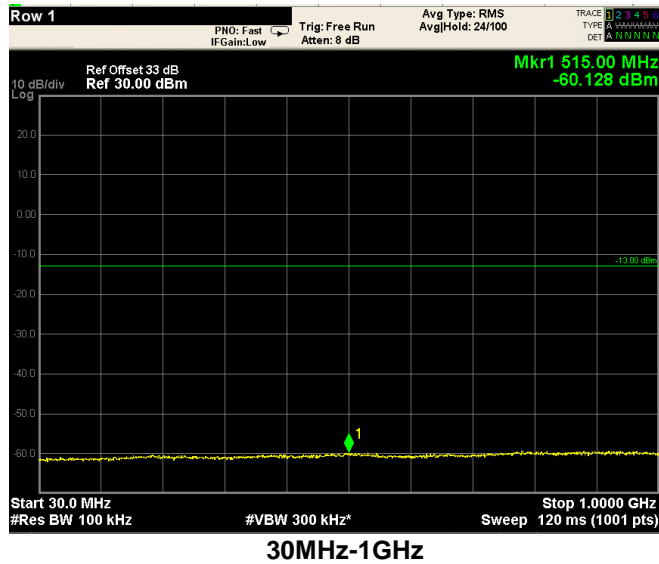
30MHz-1GHz



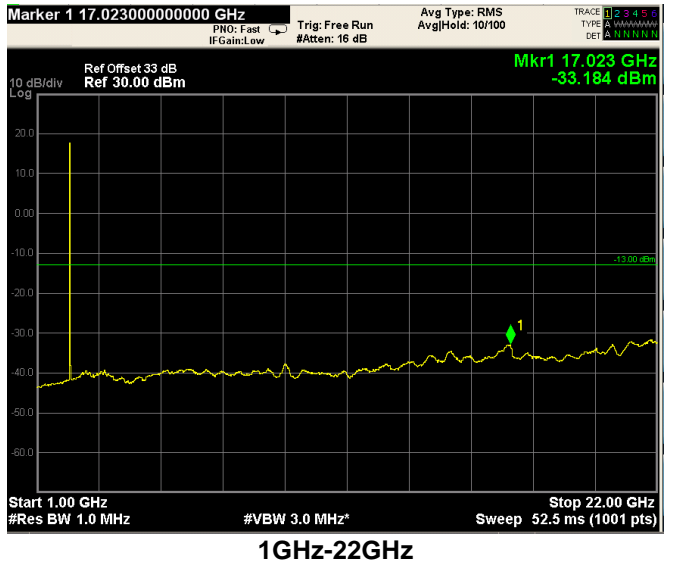
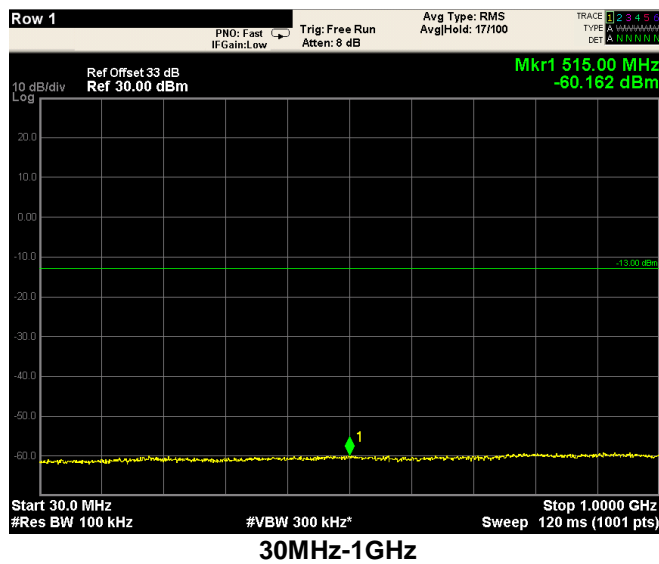
1GHz-22GHz



### Mod. LTE 3MHz, only 30M-22G plot (Down-link)

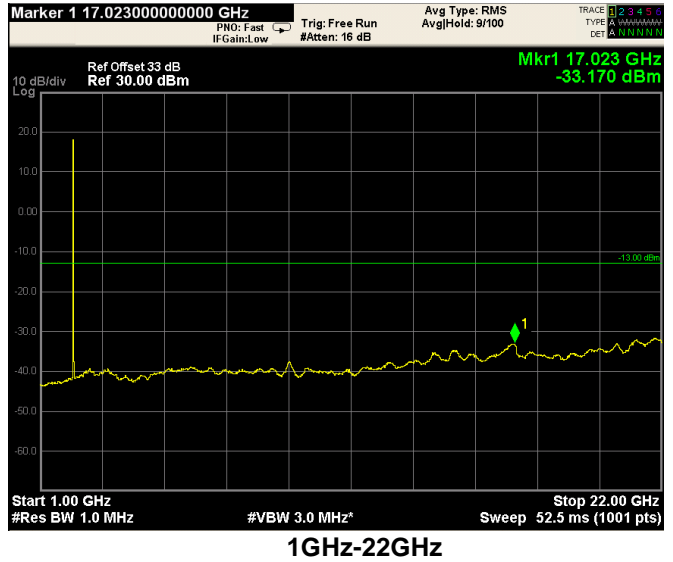
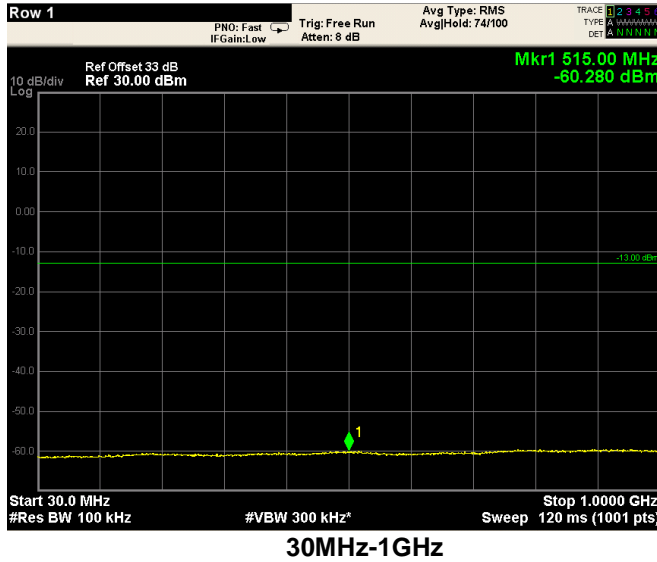


### Mod. LTE 5MHz, only 30M-22G plot (Down-link)

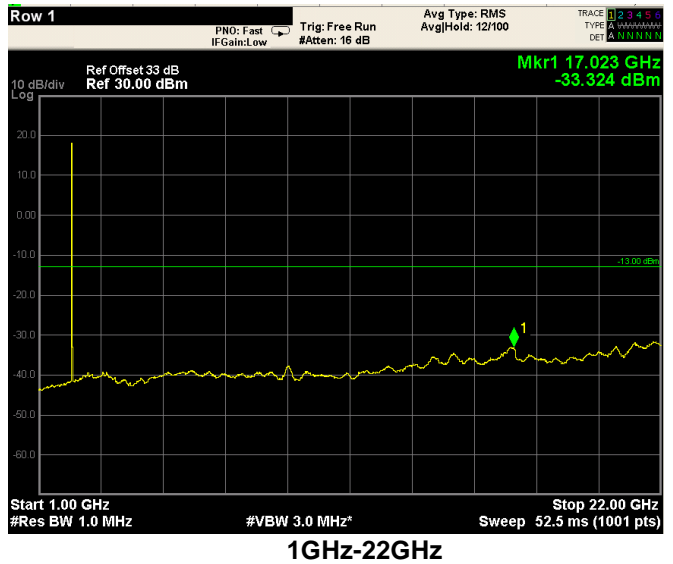
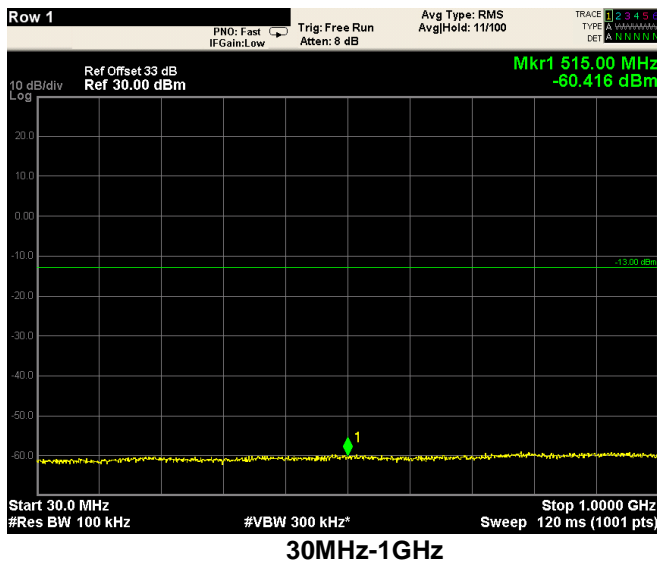




### Mod. LTE 10MHz, only 30M-22G plot (Down-link)

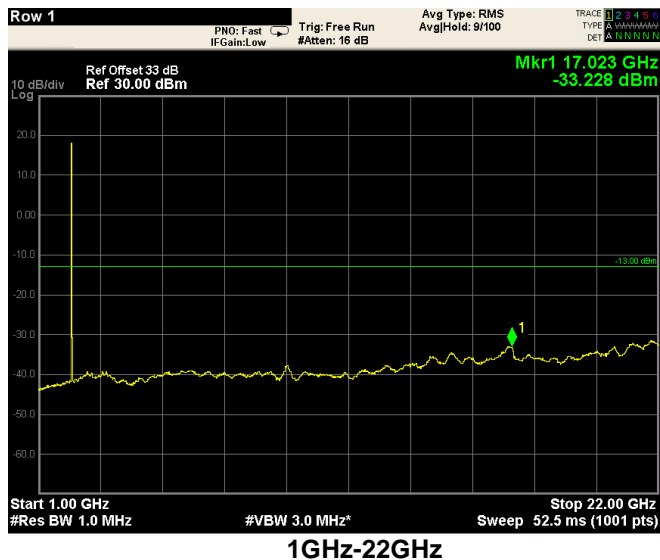
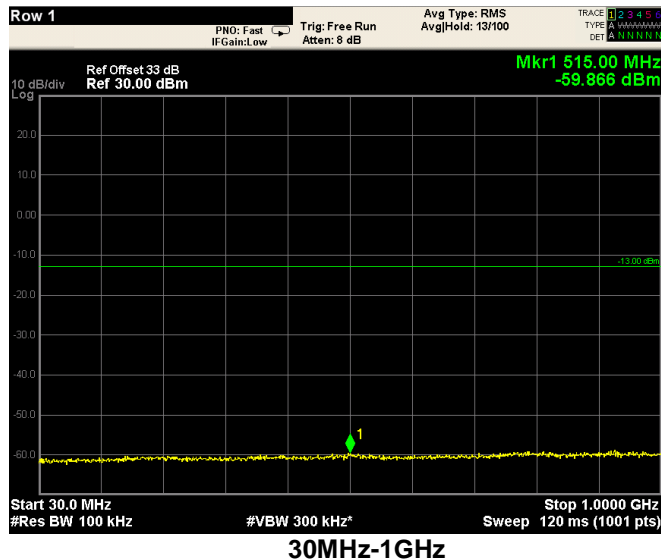


### Mod. LTE 15MHz, only 30M-22G plot (Down-link)





Mod. LTE 20MHz, only 30M-22G plot (Down-link)





#### 8.4 Clause 27.53 (g) Radiated spurious emissions

For operations in the 1710-1755 MHz and 2110-2155 MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log_{10}(P)$  dB.

(1) Compliance with the provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

(2) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the licensee's frequency block edges, both upper and lower, as the design permits.

(3) The measurements of emission power can be expressed in peak or average values, provided they are expressed in the same parameters as the transmitter power.

#### Special notes

- The spectrum was searched from 30 MHz to the 10<sup>th</sup> harmonic.
- All measurements were performed using a peak detector.
- The measurements were performed at the distance of 3 m.
- RBW within 30–1000 MHz was 100 kHz and 1 MHz above 1 GHz. VBW was wider than RBW.



Test Data

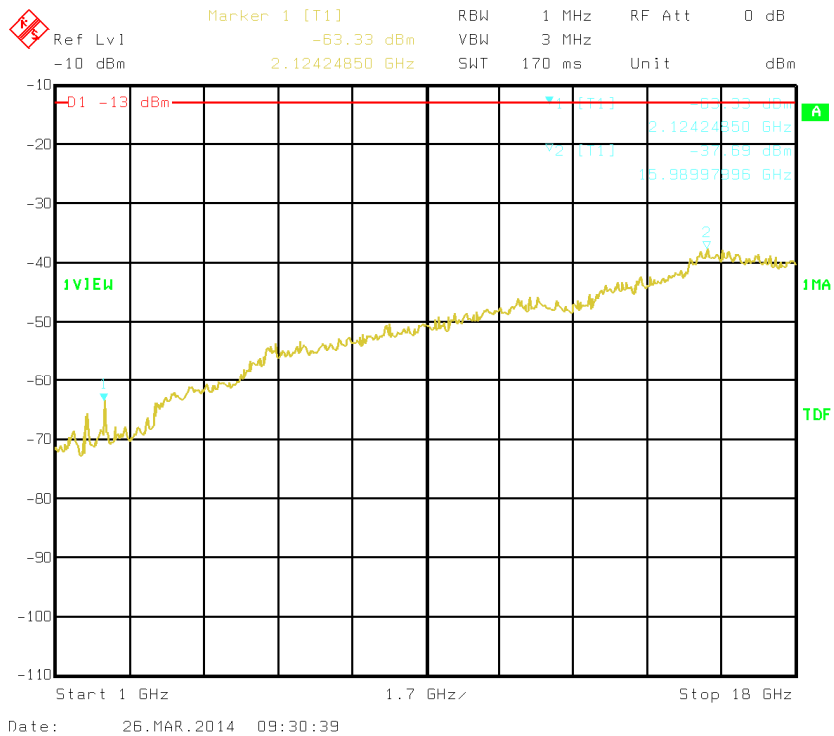
The D.U.T. was positioned according to the radiated emissions set-up

The D.U.T. antenna connector was terminated by a 50  $\Omega$  shielded dummy load.

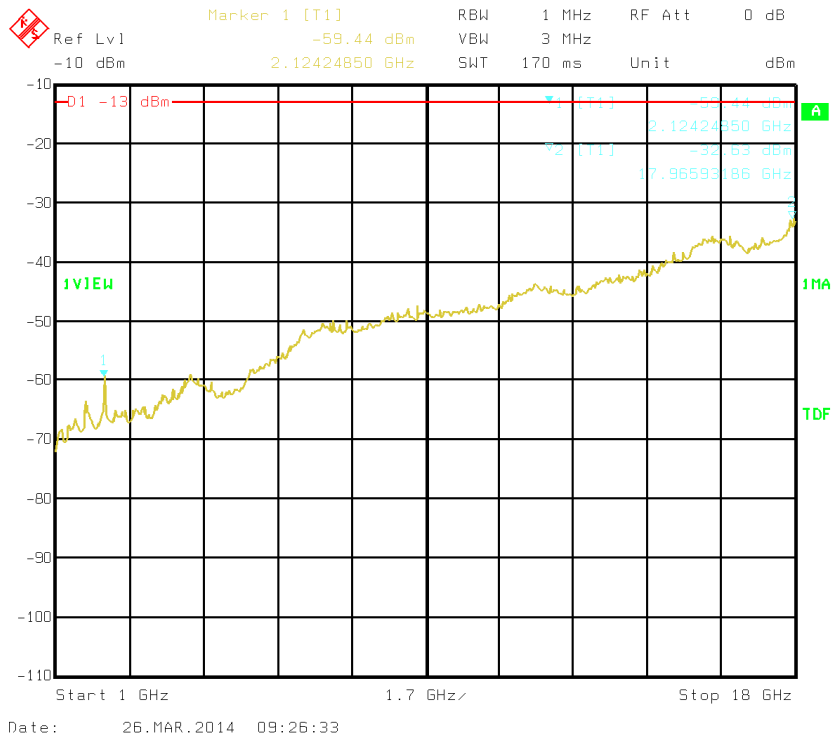
The spectrum was searched from 30 MHz to 1 GHz (RBW 100 kHz) & 1 GHz (RBW 1 MHz) to the tenth harmonic of the carrier.

There were no emissions detected above the noise floor which was at least 20 dB below the specification limit.

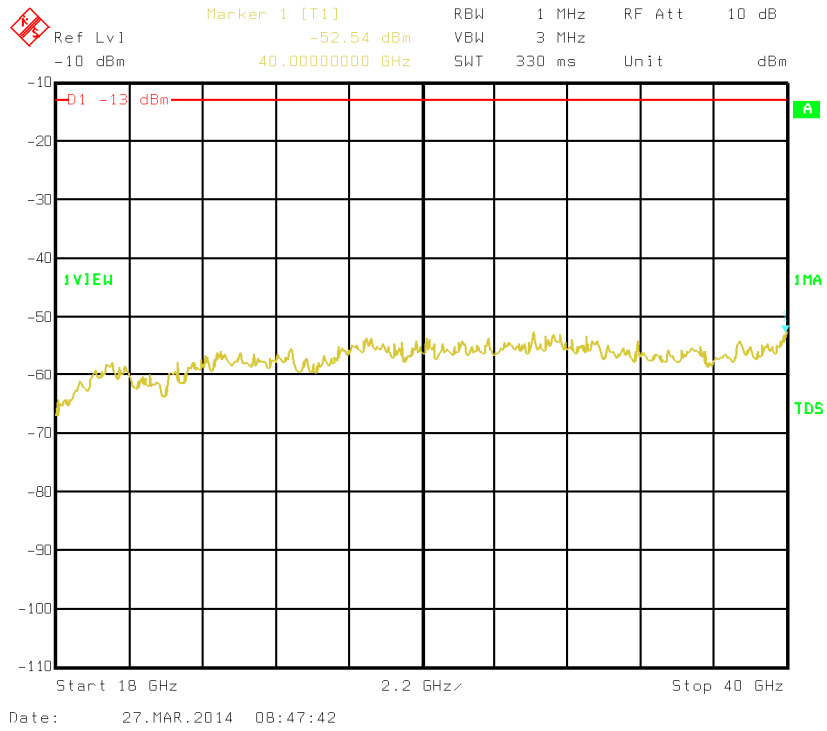




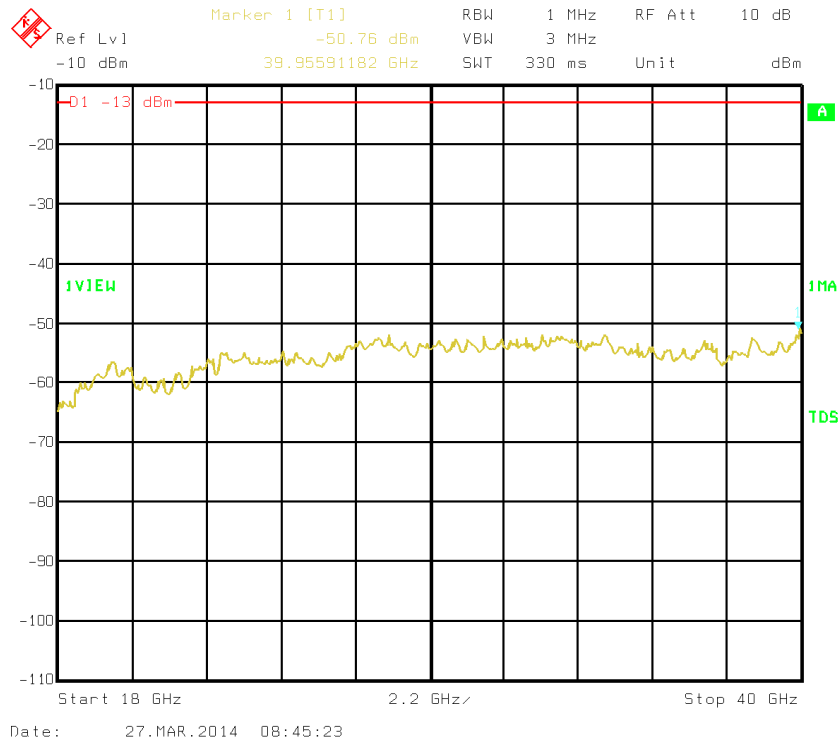
1GHz-18GHz – H Pol



1GHz-18GHz – V Pol



18GHz-40GHz – H Pol



18GHz-40GHz – V Pol



**8.5 Clause 27.53(f) Radiated spurious emissions within 1559–1610 MHz band**

(f) For operations in the 746–763 MHz, 775–793 MHz, and 805–806 MHz bands, emissions in the band 1559–1610 MHz shall be limited to –70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and –80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

**Special notes**

- The spectrum was searched from 1559–1610 MHz.
- All measurements were performed using a peak detector.
- The measurements were performed at the distance of 3 m.
- RBW was set to 1 MHz and VBW was wider than RBW.

**Test data**

[Insert plots here](#)

Spurious emissions measurement results:

Frequency (MHz)	Polarization. V/H	Field strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
Low channel				
Mid channel				
High channel				

Note: Field strength includes correction factor of antenna, cable loss, amplifier, and attenuators where applicable.

NOT APPLICABLE: AWS band.



### 8.6 Clause 27.54 Frequency stability

The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

#### Special notes

- 26 dBc points including frequency tolerance were assessed to remain within assigned band. The resolution bandwidth was set to 100 kHz, video bandwidth was set to 100 kHz

#### Test data

NOT APPLICABLE: Modulation/frequency conversion circuitry not in use. No frequency change in EUT (input and output have same frequency)

#### Down-link

Frequency tolerance measurements:

Test conditions	$\Delta$ Frequency (Hz)	Offset (Hz)
+50 °C, Nominal		
+40 °C, Nominal		
+30 °C, Nominal		
+20 °C, +15 %		
+20 °C, Nominal		
+20 °C, -15 %		
+10 °C, Nominal		
0 °C, Nominal		
-10 °C, Nominal		
-20 °C, Nominal		
-30 °C, Nominal		



### 8.7 Clause 2.1049 Occupied bandwidth

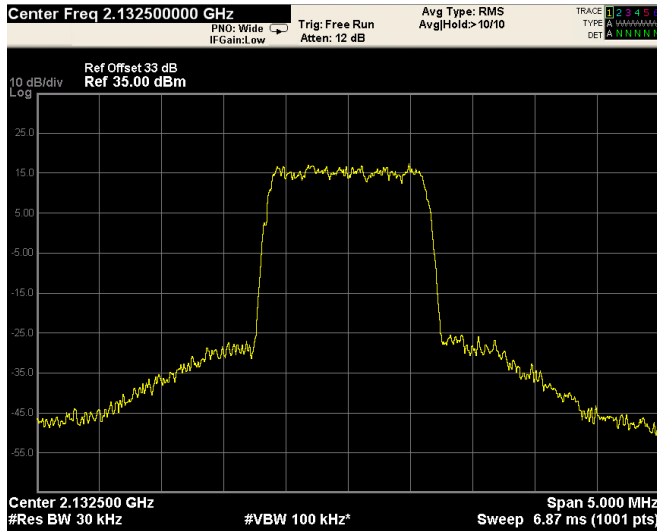
The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

#### Special notes

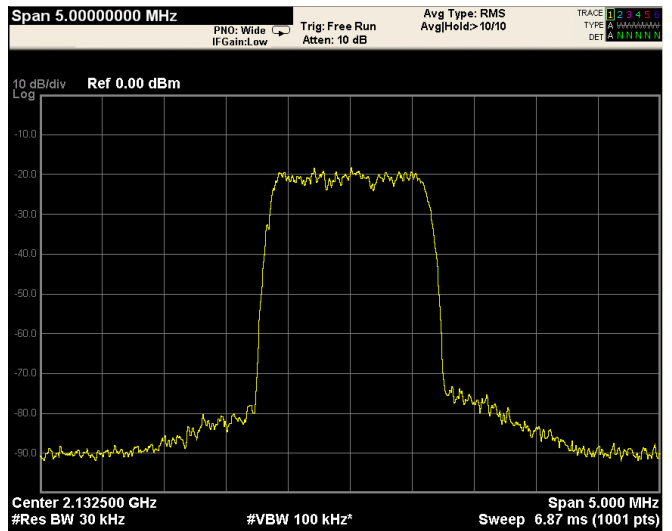
- 26 dBc points provided in terms of attenuation below unmodulated carrier.
- RBW was set to 1 % of emissions bandwidth.



Mod. CDMA (Down-link)

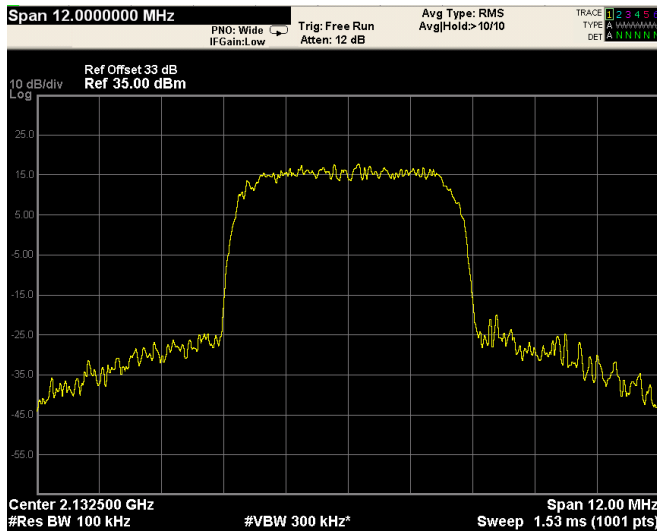


Output

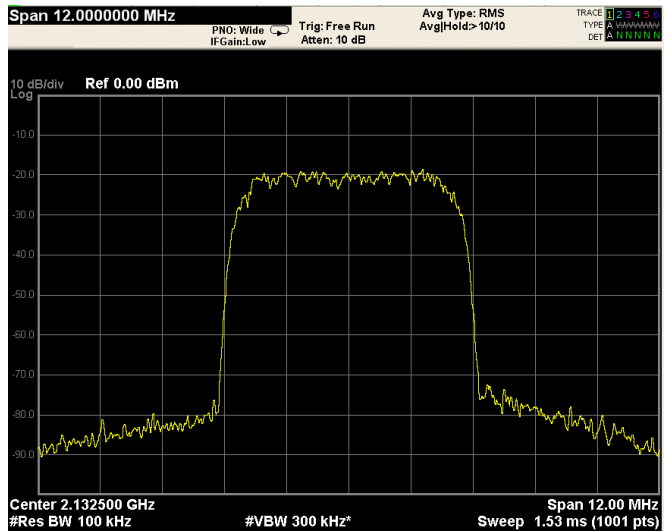


Input

Mod. WCDMA (Down-link)

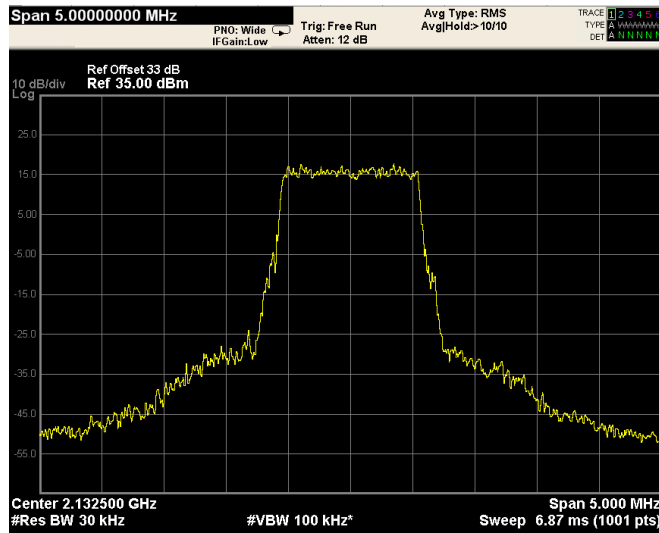


Output

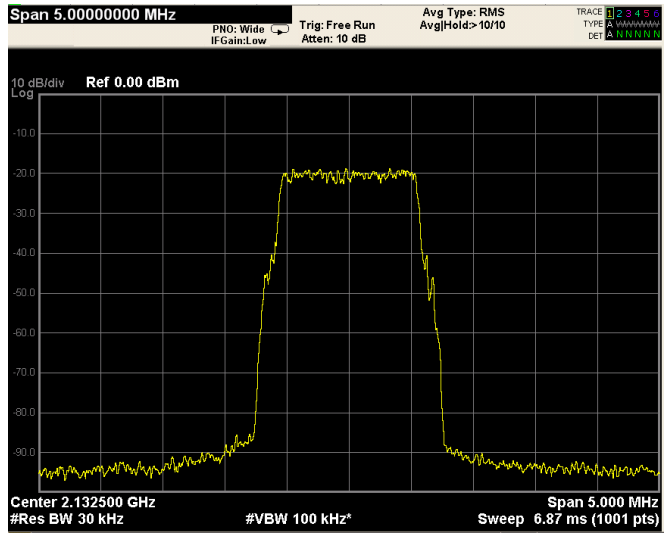


Input

Mod. LTE 1.4MHz (QAM) (Down-link)

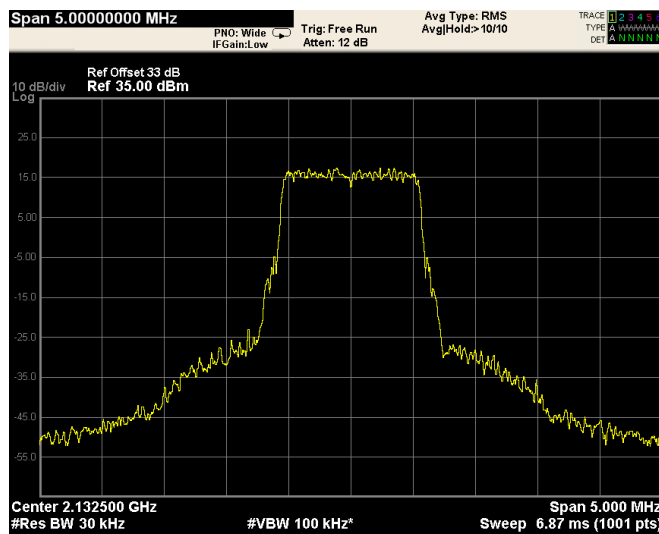


Output

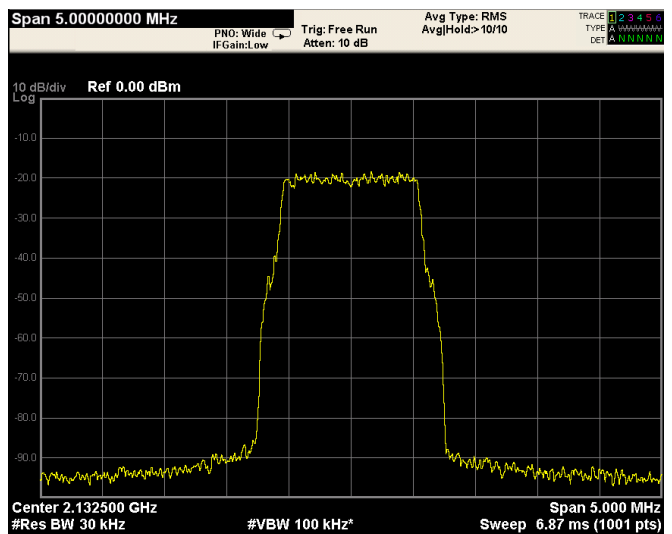


Input

Mod. LTE 1.4MHz (QPSK) (Down-link)

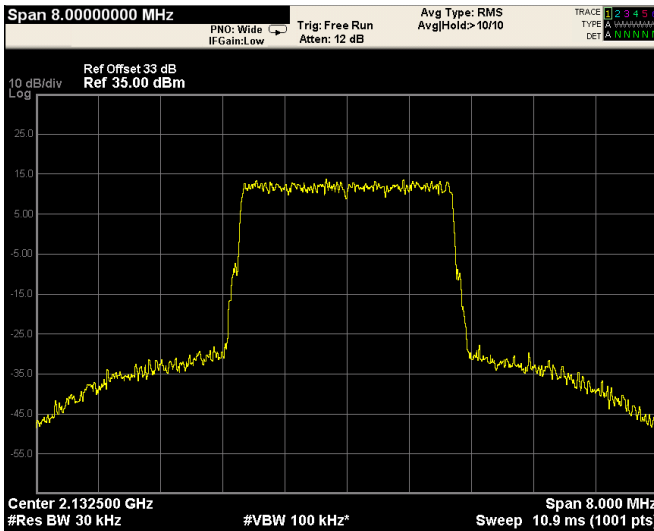


Output

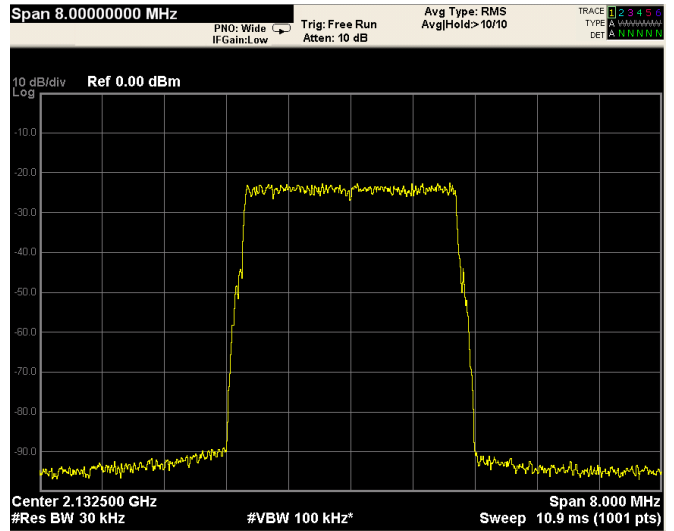


Input

Mod. LTE 3MHz (QAM) (Down-link)

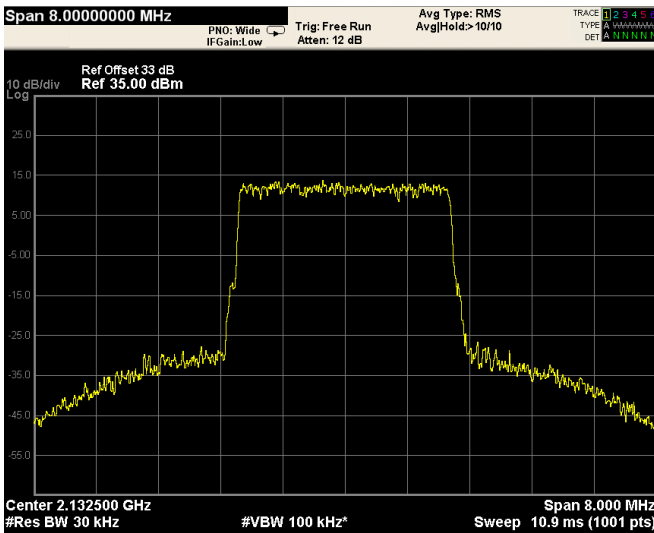


Output

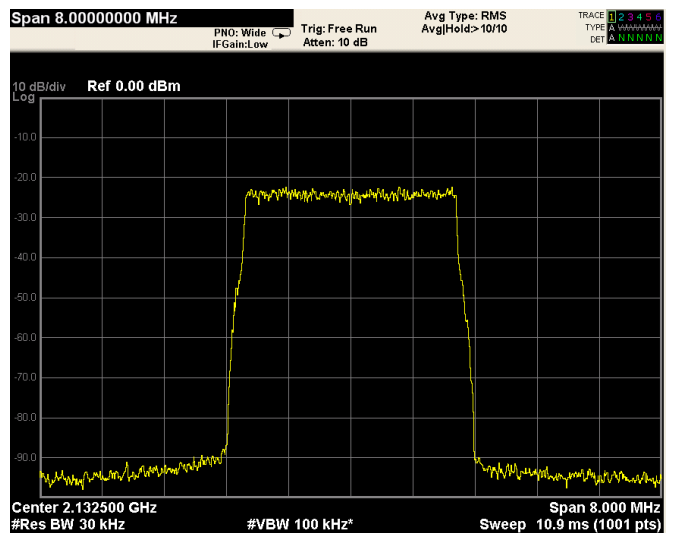


Input

Mod. LTE 3MHz (QPSK) (Down-link)

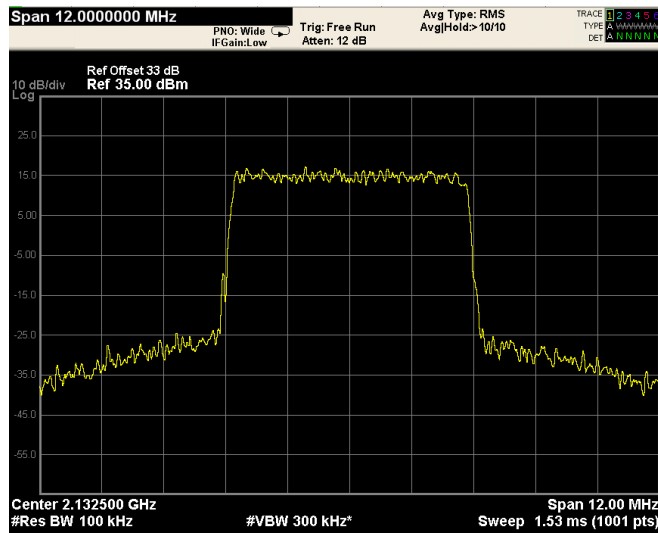


Output

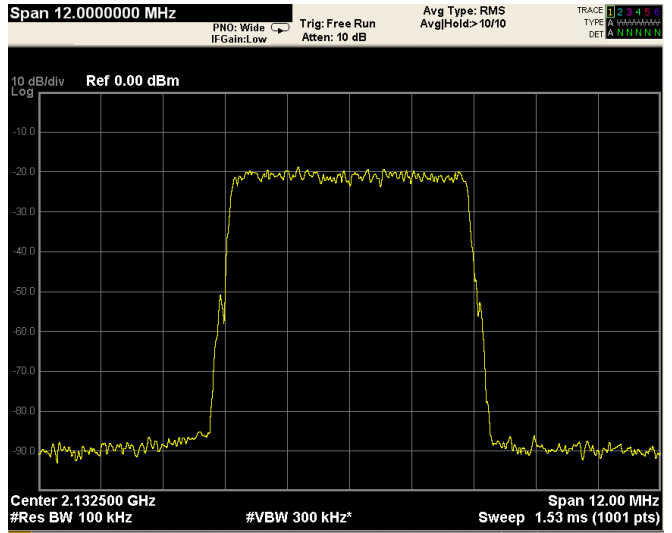


Input

Mod. LTE 5MHz (QAM) (Down-link)

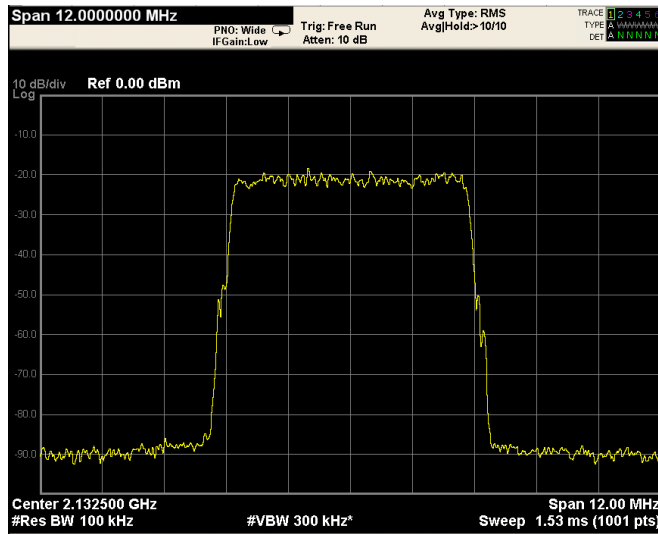


Output

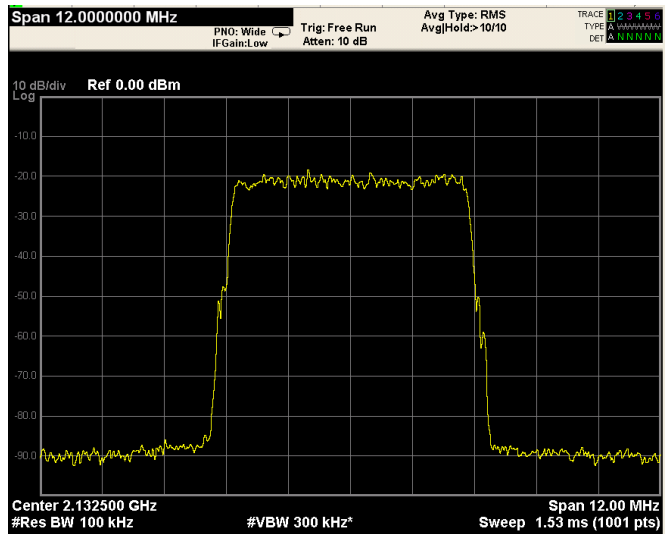


Input

Mod. LTE 5MHz (QPSK) (Down-link)

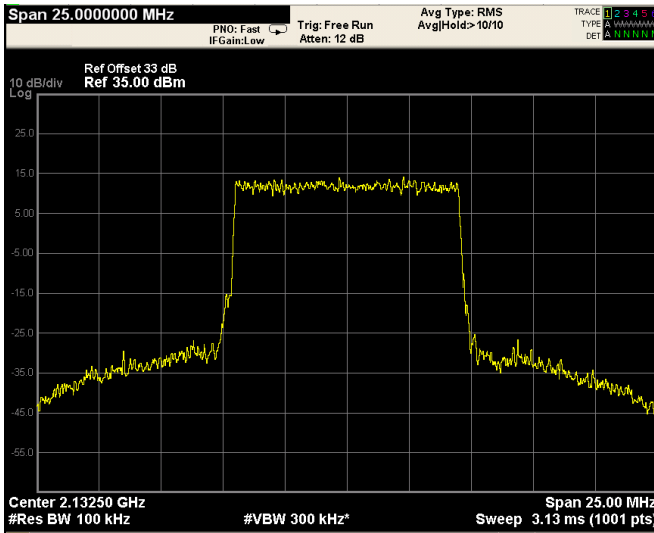


Output

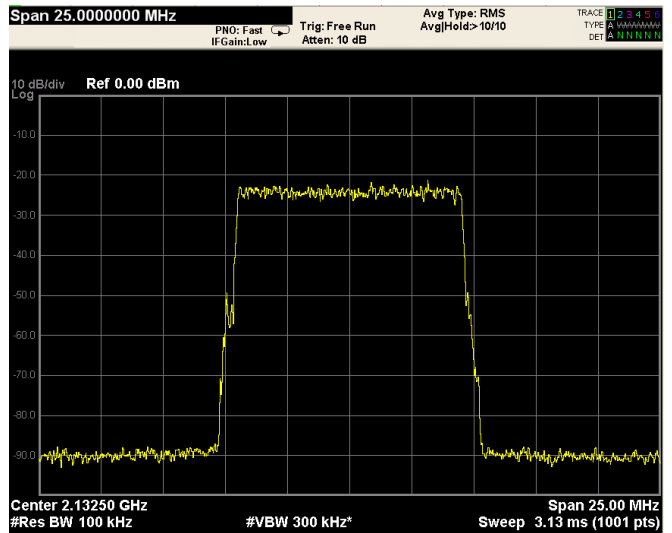


Input

Mod. LTE 10MHz (QAM) (Down-link)

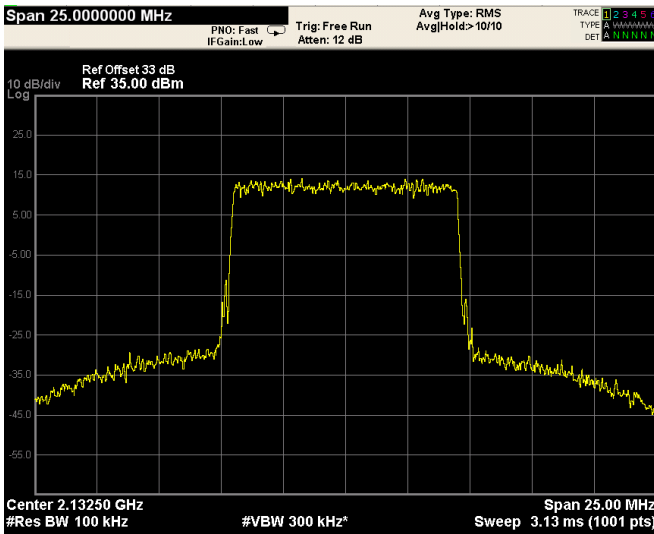


Output

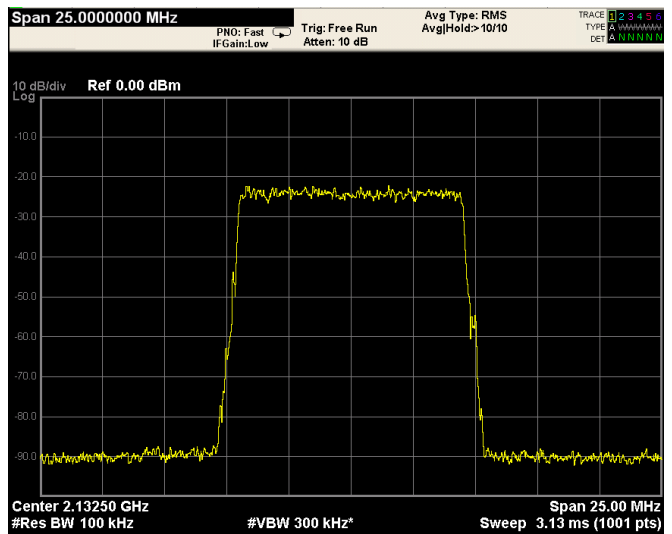


Input

Mod. LTE 10MHz (QPSK) (Down-link)

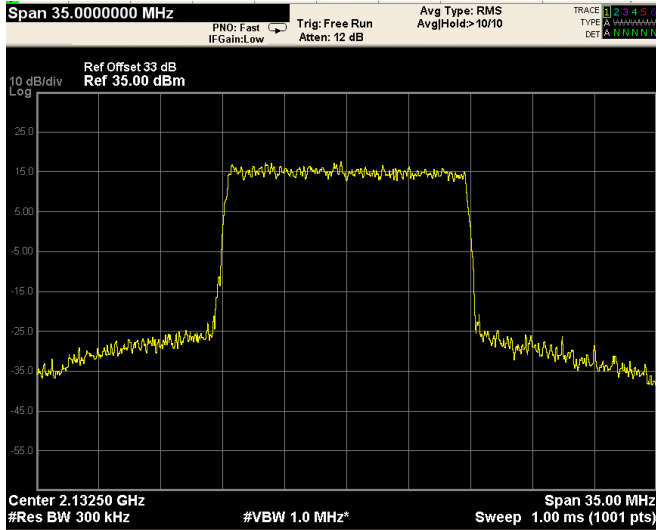


Output

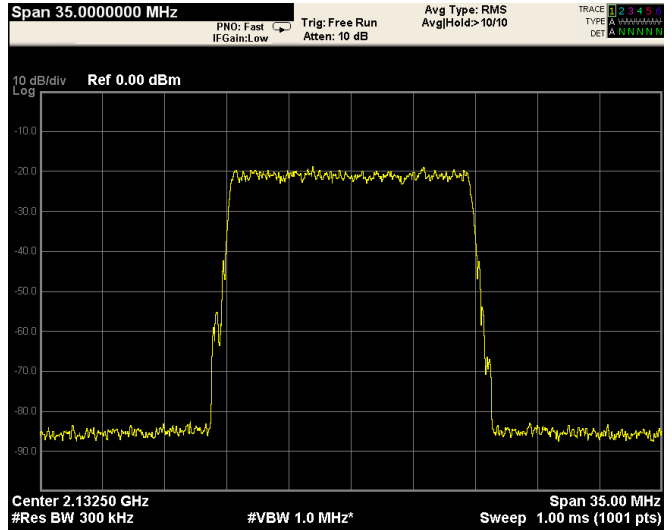


Input

Mod. LTE 15MHz (QAM) (Down-link)

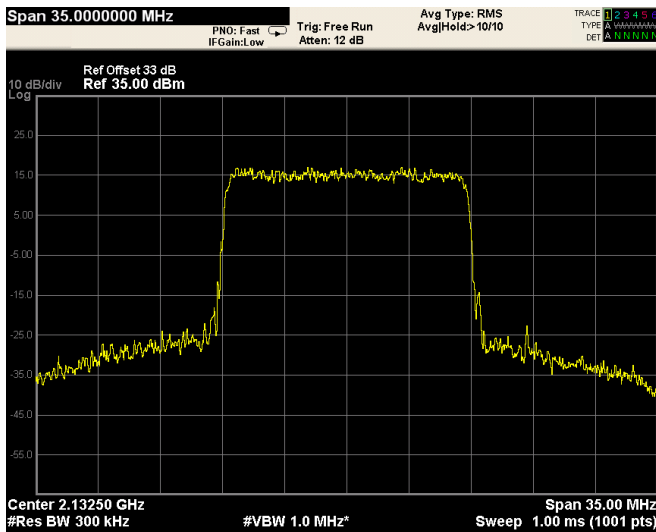


Output

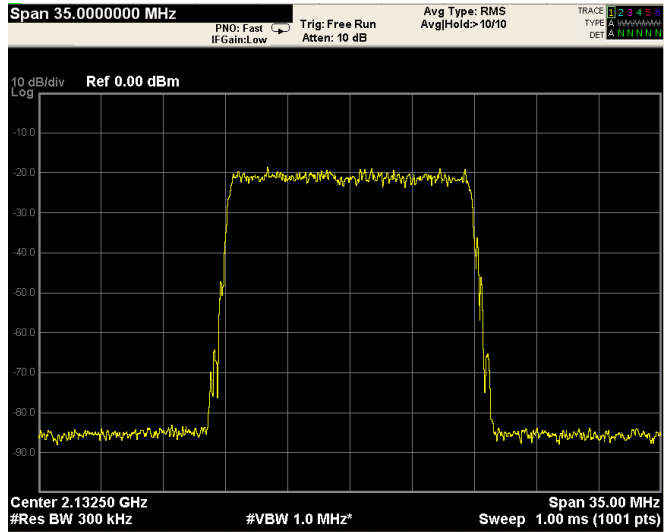


Input

Mod. LTE 15MHz (QPSK) (Down-link)

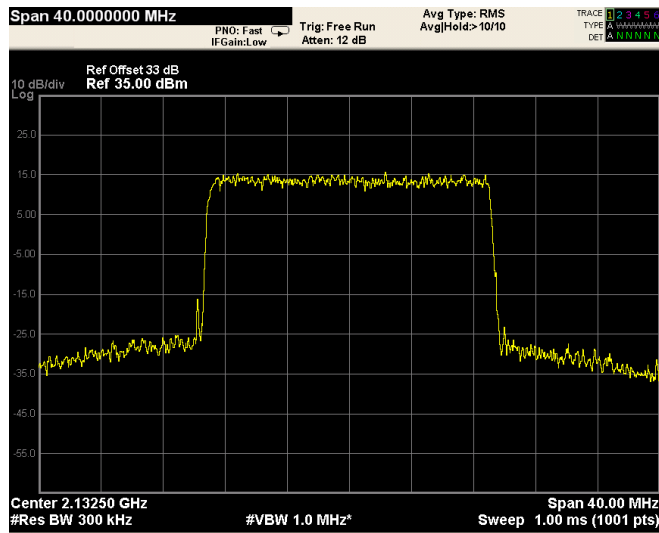


Output

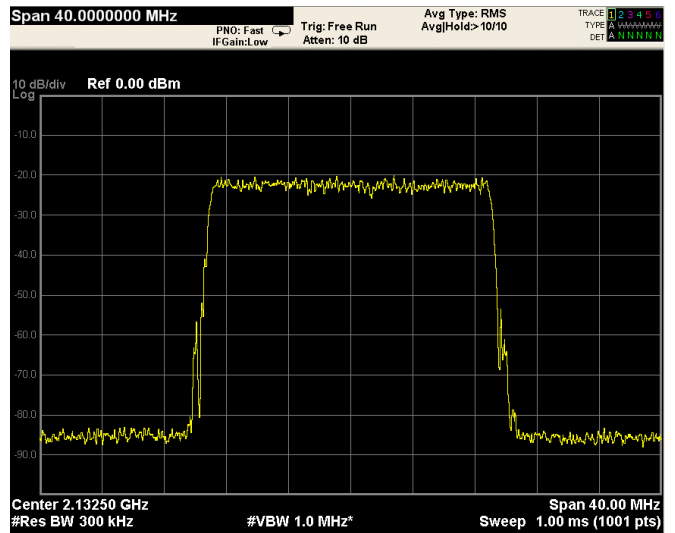


Input

**Mod. LTE 20MHz (QAM) (Down-link)**

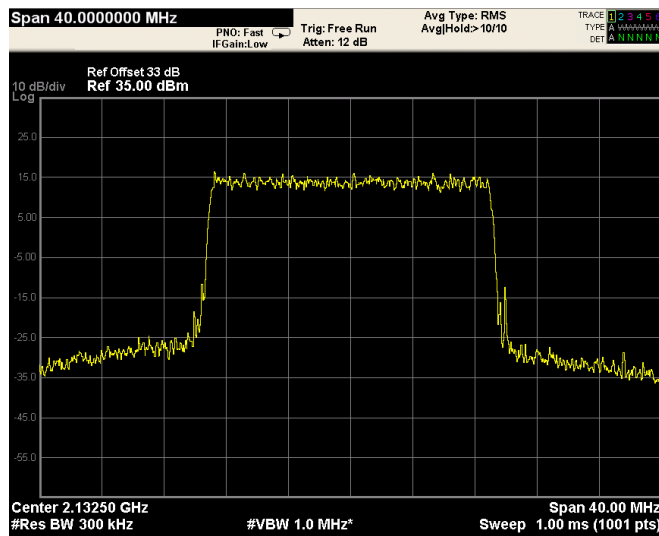


Output

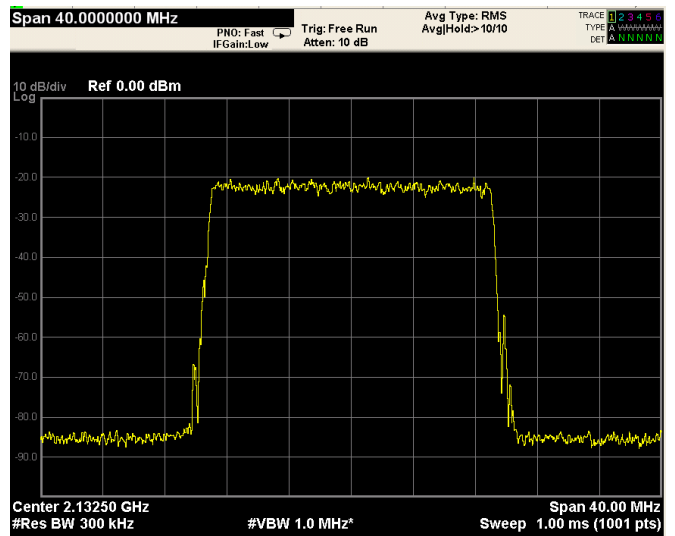


Input

**Mod. LTE 20MHz (QPSK) (Down-link)**

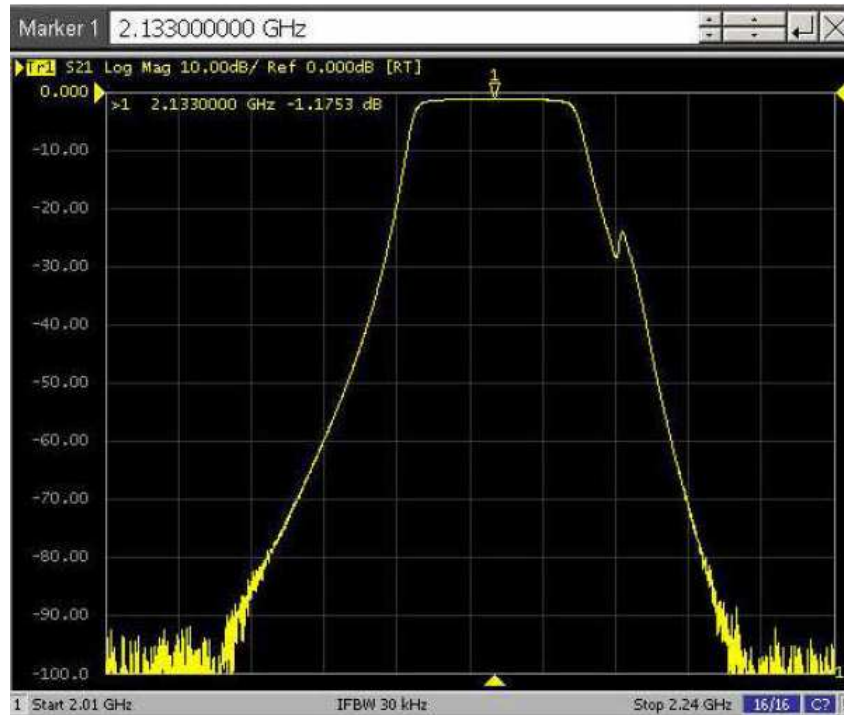


Output



Input

## Section 9: Filter Frequency Response

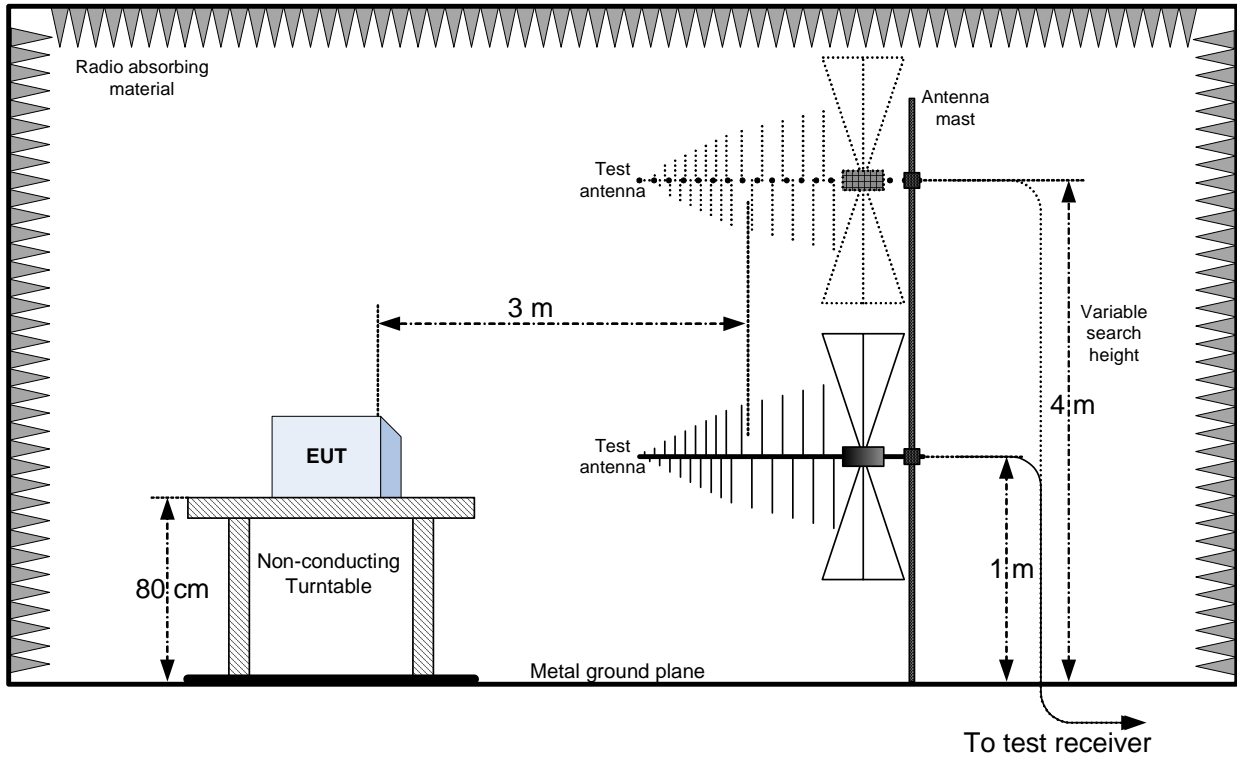


Down-link



Section 10: Block diagrams of test set-ups

Radiated emissions set-up



## Section 11: EUT photos

### Photo Set up



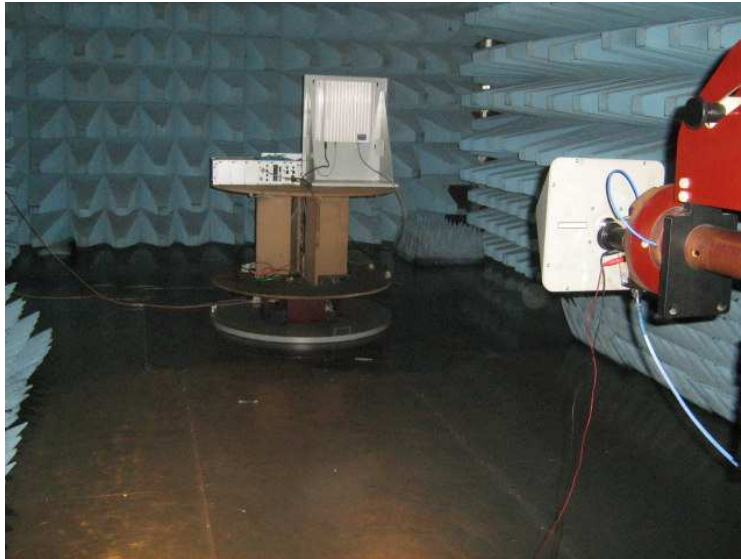




Photo EUT



