

Compliance Testing, LLC

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http://www.ComplainceTesting.com info@ComplainceTesting.com

Test Report

Prepared for: Wilson Electronics, Inc.

Model: 460020

Description: Quint Band Signal Booster

FCC ID: PWO460020

То

FCC Part 20

Date of Issue: November 24, 2014

On the behalf of the applicant:

Wilson Electronics, Inc. 3301 E Deseret Drive St. George, UT 84790

Attention of:

Patrick Cook, Sr Research & Development Engineer Ph: (435) 673-5021 E-Mail: pcook@infowest.com

Prepared By Compliance Testing, LLC 1724 S. Nevada Way Mesa, AZ 85204 (480) 926-3100 phone / (480) 926-3598 fax <u>www.compliancetesting.com</u> Project No: p1460015

Mike Graffeo Project Test Engineer

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Test Report Revision History

Revision	Date Revised By		Reason for Revision
1.0	October 31, 2014	Mike Graffeo	Original Document
2.0	November 11, 2014	Mike Graffeo	Corrected 1930 - 1995 MHz AWGN power
3.0	November 20, 2014	Mike Graffeo	Corrected type on 1930 - 1995 MHz AWGN power

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ILAC / A2LA

Compliance Testing, LLC, has been accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to the joint ISO-ILAC-IAF Communiqué dated January 2009).

The tests results contained within this test report all fall within our scope of accreditation, unless noted below.

Please refer to <u>http://www.compliancetesting.com/labscope.html</u> for current scope of accreditation.

Testing Certificate Number: 2152.01



FCC Site Reg. #349717

IC Site Reg. #2044A-2

Non-accredited tests contained in this report:

N/A

Test and Measurement Data Sub-part

2.1033(c)(14):

All tests and measurement data shown were performed in accordance with FCC Rules and Regulations, Part 2, Subpart J and the following individual Parts: 20.21 in conjunction with latest version of KDB 935210.

Standard Test Conditions and Engineering Practices

Except as noted herein, the following conditions and procedures were observed during the testing:

In accordance with ANSI/C63.4-2009, and unless otherwise indicated in the specific measurement results, the ambient temperature of the actual EUT was maintained within the range of 10° to 40°C (50° to 104°F), unless the particular equipment requirements specified testing over a different temperature range. Also, unless otherwise indicated, the humidity levels were in the range of 10% to 90% relative humidity.

Environmental Conditions								
Temp (°C)	Humidity (%)	Pressure (mbar)						
24.9 – 31.0	33.5 - 63.0	985.5 - 943.0						

Measurement results, unless otherwise noted, are worst-case measurements.

EUT Description

Model: 460020

Description: Quint Band Signal Booster

Firmware: N/A

Software: N/A

Serial Number: N/A

Additional Information:

The EUT is a Fixed Install, bi-directional amplifier for the boosting of cellular phone signals and data communication devices.

The following frequency bands and emission types are utilized.

Frequency Band (MHz)										
Uplink	698 - 716	776 - 787	824 - 849	1850 - 1915	1710 – 1755					
Downlink	728 - 746	746 - 757	869 - 894	1930 - 1995	2110 - 2155					
Modulation Type	LI	ΓE		MA, EDGE, VDO, LTE	CDMA, HSPA, LTE, EDGE, EVDO					

Emission Designators								
CDMA HSPA LTE EVDO EDGE GSM								
F9W	F9W	G7D	F9W	G7W	GXW			

The modulation types and emission designators listed in the tables represent the modulations that the cell phone providers use for each frequency band. GSM, CDMA, and WCDMA represent all the modulation types (phase and amplitude or a combination thereof) utilized within the industry. EDGE, HSPA, LTE etc. are all protocols or multiplexing techniques using the base modulations.

EUT Operation during Tests

The EUT was in a normal operating condition.

Test Result Summary

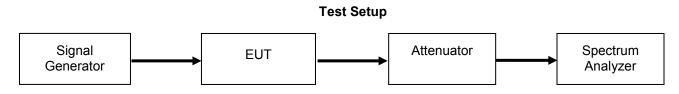
Specification	Test Name	Pass, Fail, N/A	Comments
20.21(e)(3)	Authorized Frequency Band	Pass	
20.21(e)(8)(i)(B) 20.21(e)(8)(i)(C) 20.21(e)(8)(i)(D)	Maximum Power and Gain	Pass	
20.21(e)(8)(i)(F)	Intermodulation	Pass	
20.21(e)(8)(i)(E)	Out-of-Band Emissions	Pass	
2.1051 22.917(a) 24.238((a) 27.53(c) 27.53(e) 27.53(f) 27.53(g)	Conducted Spurious Emissions	Pass	
20.21(e)(8)(i)(A)	Noise Limits	Pass	
20.21(e)(8)(i)(l)	Uplink Inactivity	Pass	
20.21(e)(8)(i)(C)(1) 20.21(e)(8)(i)(H) Choose: 20.21(e)(8)(i)(C)(2)(i) (Fixed)	Variable Gain	Pass	
2.1049	Occupied Bandwidth	Pass	
20.21(e)(8)(ii)(A)	Oscillation Detection	Pass	
2.1053	Radiated Spurious	Pass	
20.21(e)(8)(i)(B)	Spectrum Block Filtering	N/A	This only applies to devices utilizing spectrum block filtering



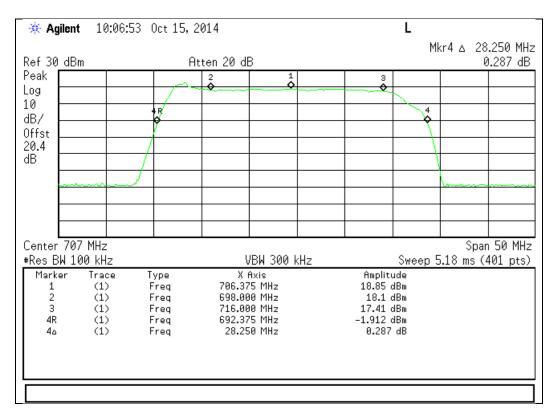
Authorized Frequency Band Engineer: Mike Graffeo Test Date: 10/15/14

Test Procedure

The EUT was connected to a spectrum analyzer through an attenuator with the losses being input into the spectrum analyzer as a combination of reference level offset and correction factor as needed to ensure accurate readings. A signal generator was utilized to produce a CW input signal tuned to the center channel of the operational band. The RF input level was increased to a point just prior to the AGC being in control of the power. The Signal generator was set to sweep across 2X the operational band of the EUT while the spectrum analyzer was set to MAX HOLD. Two markers were placed at the edges of the operational band and a third marker was placed at the highest point within the band no closer than 2.5 MHz from the band edge.



Uplink Test Results

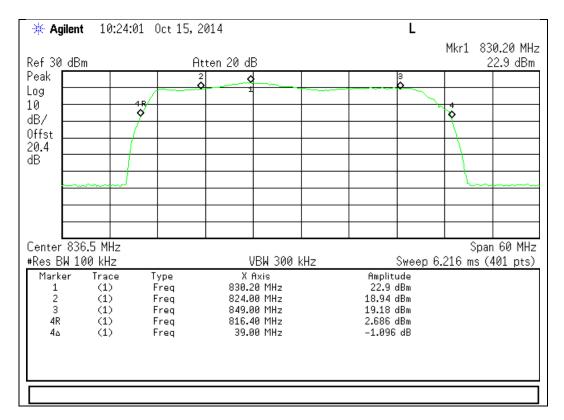


698 - 716 MHz Band

776 - 787 MHz Band

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40	(1	· ·	req	20.	11112		-0.132	ub		

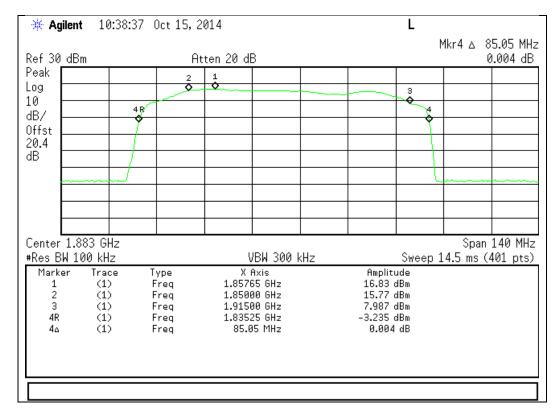




824 - 849 MHz Band

1710 - 1755 MHz Band

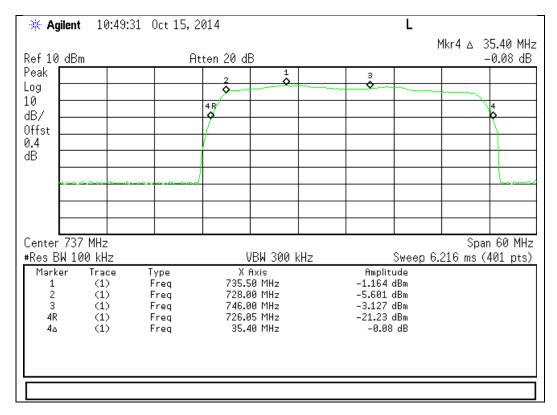
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4R 4∆			Freq Freq		50 GHz 10 MHz		-1.69 -0.964			

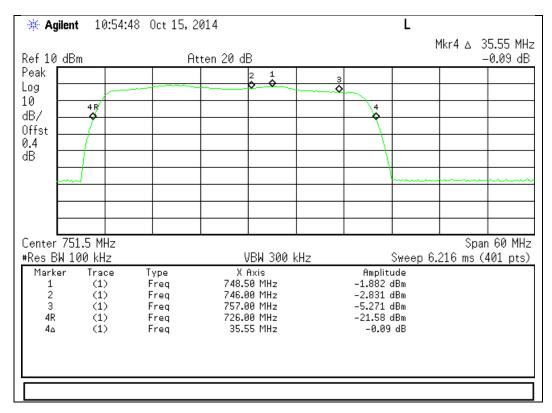


1850 - 1915 MHz Band

Downlink Test Results

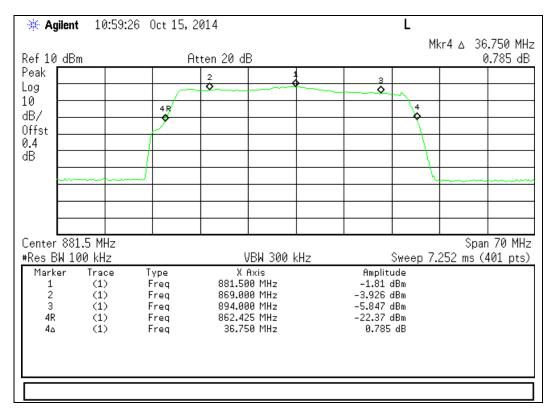
728 - 746 MHz Band

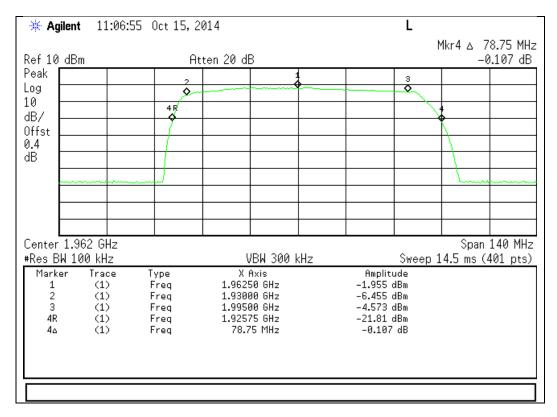




746 - 757 MHz Band

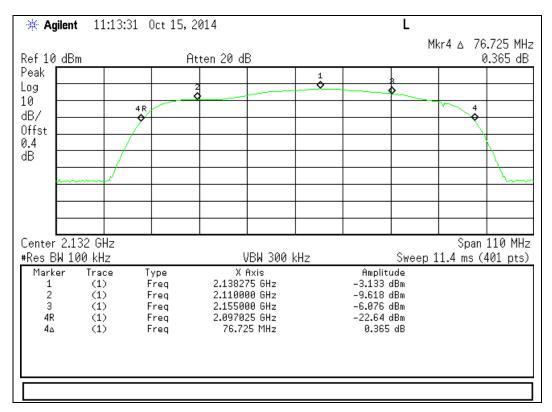
869 - 894 MHz Band





1930 - 1995 MHz Band

2110 - 2155 MHz Band





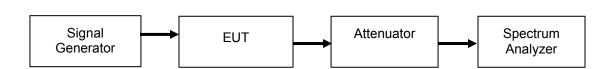
Maximum Power and Gain Engineer: Mike Graffeo Test Date: 9/25/14

Test Procedure

The EUT was connected to a spectrum analyzer through an attenuator with the losses being input into the spectrum analyzer as a combination of reference level offset and correction factor as needed to ensure accurate readings. The spectrum analyzer and signal generator were tuned to the frequency with the highest power level in the band, as determined by the Authorized Frequency Band test. The RF input level was increased to a point just prior to the AGC being in control of the power for both pulsed single time slot GSM modulation and 4.1 MHz AWGN modulation. The maximum power was measured and verified to meet the minimum and maximum levels allowed, with the maximum gain being computed from these values. The uplink and downlink gain under each condition were verified to be within 9 dB of each other.

Gain limit: 6.5dB + 20* LOG10(midband of UL freq)

F_{MHz} is the uplink mid-band frequency with the downlink gain limit being equivalent to the paired Uplink band gain limit.



Test Setup

Uplink Power Test Results

Frequency Band (MHz)	Input Level (dBm)	Output Power (dBm)	Lower Limit (dBm)	Upper Limit (dBm)	Result
698 - 716 MHz Pulsed CW	-36.7	23.94	17	30	Pass
698 - 716 MHz AWGN	-41.4	20.20	17	30	Pass
776 - 787 MHz Pulsed CW	-36.7	24.19	17	30	Pass
776 - 787 MHz AWGN	-39.8	20.16	17	30	Pass
824 - 849 MHz Pulsed CW	-37.7	23.42	17	30	Pass
824 - 849 MHz AWGN	-37.6	23.49	17	30	Pass
1710 - 1755 MHz Pulsed CW	-38.7	24.55	17	30	Pass
1710 - 1755 MHz AWGN	-39.6	22.15	17	30	Pass
1850 - 1915 MHz Pulsed CW	-40.3	23.61	17	30	Pass
1850 - 1915 MHz AWGN	-45.0	20.62	17	30	Pass

Frequency Band (MHz)	Input Level (dBm)	Output Power (dBm)	Upper Limit (dBm)	Result
728 - 746 MHz Pulsed CW	-51.0	9.43	17	Pass
728 - 746 MHz AWGN	-50.0	11.64	17	Pass
746 - 757 MHz Pulsed CW	-51.0	10.88	17	Pass
746 - 757 MHz AWGN	-50.9	11.92	17	Pass
869 - 894 MHz Pulsed CW	-54.4	10.12	17	Pass
869 - 894 MHz AWGN	-52.6	12.08	17	Pass
1930 - 1995 MHz Pulsed CW	-57.9	9.46	17	Pass
1930 - 1995 MHz AWGN	-59.2	9.50	17	Pass
2110 - 2155 MHz Pulsed CW	-56.9	9.89	17	Pass
2110 - 2155 MHz AWGN	-55.2	11.93	17	Pass

Downlink Power Test Results

Uplink and Downlink Gain Test Results

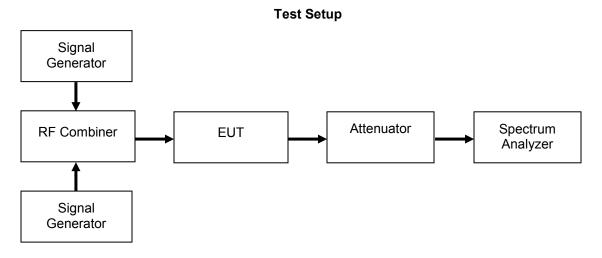
Modulation	Uplink Frequency (MHz)	Downlink Frequency (MHz)	Uplink Gain (dB)	Uplink Limit (dB)	Downlink Gain (dB)	Downlink Limit (dB)	Delta (dB)	Limit (dB)	Margin (dB)
Pulsed CW	706.4	735.5	60.64	63.5	60.4	63.5	0.21	9	-8.79
AWGN	706.4	735.5	61.60	63.5	61.6	63.5	0.04	9	-8.96
Pulsed CW	784.2	748.5	60.89	64.4	61.9	64.4	0.99	9	-8.01
AWGN	784.2	748.5	59.96	64.4	62.8	64.4	2.86	9	-6.14
Pulsed CW	830.2	881.5	61.12	64.9	64.5	64.9	3.4	9	-5.6
AWGN	830.2	881.5	61.09	64.9	64.7	64.9	3.59	9	-5.41
Pulsed CW	1721.3	2138.3	63.25	71	66.8	71	3.54	9	-5.46
AWGN	1721.3	2138.3	61.75	71	67.1	71	5.38	9	-3.62
Pulsed CW	1857.7	1962.5	63.93	72	67.4	72	3.43	9	-5.57
AWGN	1857.7	1962.5	65.62	72	68.7	72	3.08	9	-5.92



Intermodulation Engineer: Mike Graffeo Test Date: 9/23/14

Test Procedure

The EUT was connected to a spectrum analyzer through an attenuator. Two signal generators were utilized to produce two CW signals 600 kHz apart and centered in the operational band. Attenuator and cable insertion loss correction factors were input to either the signal generator or the spectrum analyzer as required to ensure that accurate measurements were recorded. The input power was set at the maximum allowable power and the RMS intermodulation products were measured to ensure they were less than -19 dBm in a 3 kHz RBW. The uplink and downlink intermodulation products were plotted, with the levels being listed in the summary tables.



Uplink Test Results

Frequency Band (MHz)	Intermodulation Level (dBm)	Limit (dBm)	Result
698 - 716 MHz	-22.35	-19	Pass
776 - 787 MHz	-21.29	-19	Pass
824 - 849 MHz	-19.42	-19	Pass
1710 - 1755 MHz	-22.13	-19	Pass
1850 - 1915 MHz	-20.09	-19	Pass

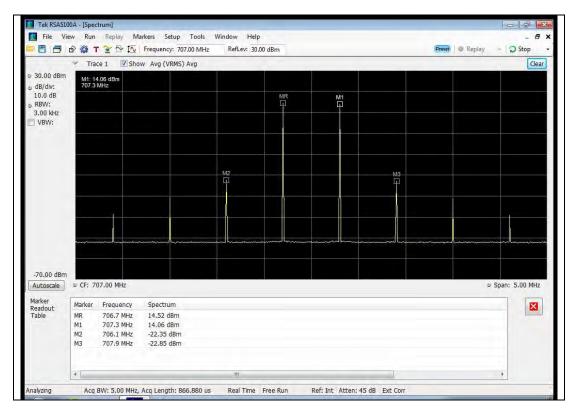
Downlink Test Results

Frequency Band (MHz)	Intermodulation Level (dBm)	Limit (dBm)	Result
728 - 746 MHz	-37.73	-19	Pass
746 - 757 MHz	-36.55	-19	Pass
869 - 894 MHz	-33.63	-19	Pass
1930 - 1995 MHz	-36.44	-19	Pass
2110 - 2155 MHz	-34.64	-19	Pass



Uplink Test Results





776 - 787 MHz Band

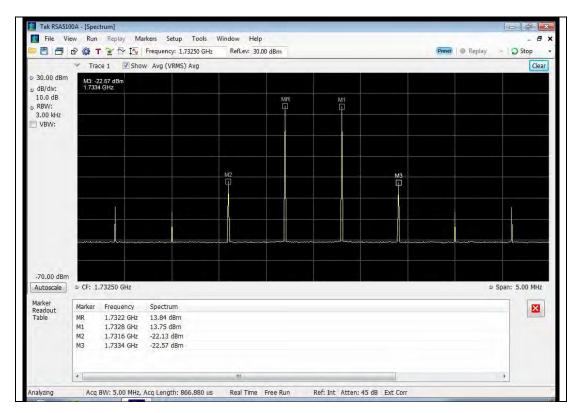
Tek RSA510	and the second second								
File Vie			arkers Setup Tool						- 8
			Frequency: 781.50 M	Hz RefLev: 30,	00 dBm			Preset 💿 R	
30.00 dBm	✓ Trac		w Avg (VRMS) Avg				_		Clea
dB/div:	M3: -2 782.4	1.29 dBm MHz							
10.0 dB RBW:					MR	M1			
3.00 kHz	-					<u> </u>			
VBW:									
				9.6			M3		
				1M2			M3		
			 						
-70.00 dBm									
Autoscale	🗢 CF: 78	31.50 MHz							Span: 5.00 MHz
larker	Marker	Frequency	Spectrum						×
teadout Table	MR	781.2 MHz	12.51 dBm						
	M1	781.8 MHz	12.50 dBm						
	M2 M3	780.6 MHz 782.4 MHz	-21.39 dBm -21.29 dBm						
	4			III					E.



824 - 849	MHz Band	l
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	🖄 🎆 T 😤 🍄 🏠 Frequency: 836.50	MHz RefLev: 30.00 dBm		Preset 💿 Replay - 💭 Stop				
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30.00 dBm								
dB/div: 10.0 dB	837.4 MHz		M1					
RBW:								
3.00 kHz VBW:		đ						
VDVV.								
		M2	M3					
70.00 dBm								
Autoscale	© CF: 836.50 MHz			© Span: 5.00 MHz				
larker	Marker Frequency Spectrum			×				
eadout able	MR 836.2 MHz 16.36 dBm							
	M1 836.8 MHz 15.64 dBm							
	M2 835.6 MHz -19.47 dBm M3 837.4 MHz -19.42 dBm							
		11/		F.				

1710 - 1755 MHz Band



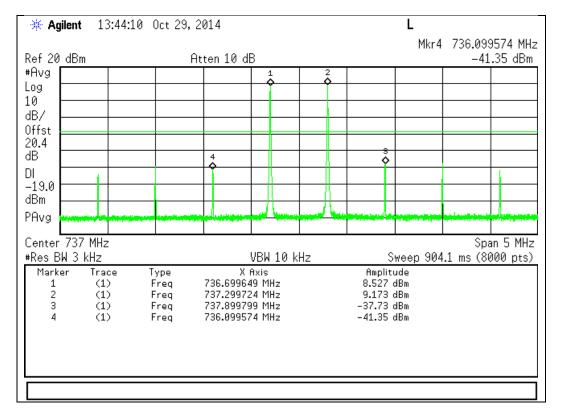


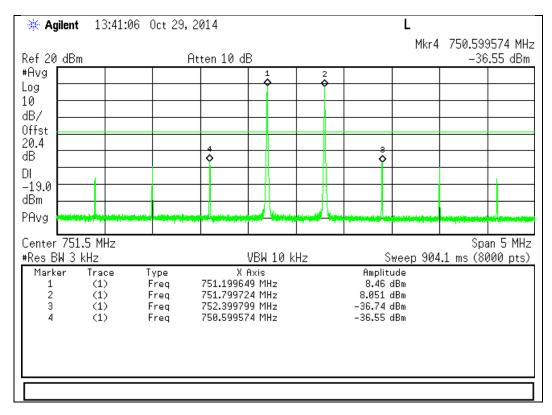
	✓ Trace 1 Sho	ow Avg (VRMS) Avg					 Clear
30.00 dBm	M3: -20.09 dBm						
dB/div: 10.0 dB RBW: 3.00 kHz VBW:	1.8834 GHz			MR	M1		
			M2			M3	
-70.00 dBm							
Autoscale	© CF: 1.88250 GHz						Span: 5.00 MHz
Marker Readout Table	Marker Frequency MR 1.8822 GHz M1 1.8828 GHz M2 1.8816 GHz M3 1.8834 GHz	Spectrum 14.00 dBm 13.84 dBm -20.18 dBm -20.09 dBm					
	-		111				

1850 - 1915 MHz Band

Downlink Test Results

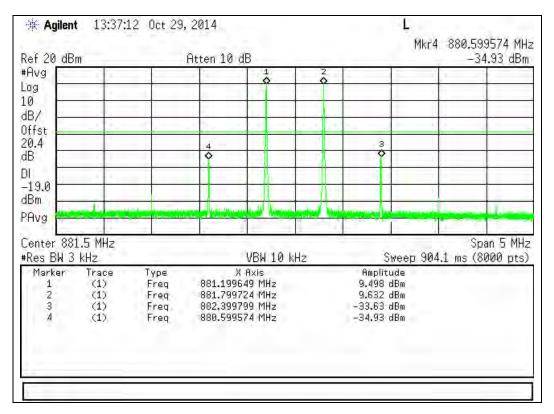
728 - 746 MHz Band

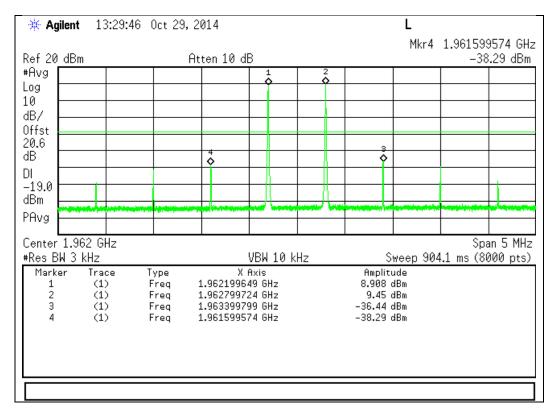




746 - 757 MHz Band

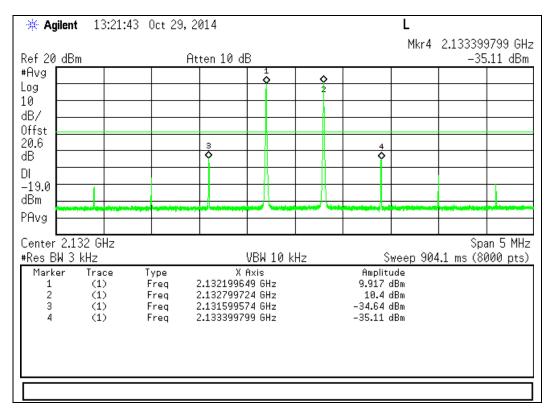
869 - 894 MHz Band





1930 - 1995 MHz Band

2110 - 2155 MHz Band





Out-of-Band Emissions Engineer: Mike Graffeo Test Date: 9/30/14

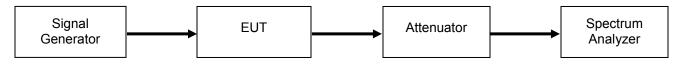
Test Procedure

The EUT was connected to a spectrum analyzer through an attenuator with the losses being input into the spectrum analyzer as a combination of reference level offset and correction factor in order to ensure accurate readings. A signal generator was utilized to produce the following signals: GSM, CDMA, and WCDMA. The signal generator was tuned to the lowest allowable upper and lower channel within the EUT operational band for each respective modulation type. The RF input level was increased to a point just prior to the AGC being in control of the power. For each modulation type the Out of Band Emissions were measured to ensure they met the limits

The following formula was used for calculating the limits:

Limit = P1 - 6 - (43+ 10Log(P2)) = -19dBm P1 = power in dBm P2 = power in Watts





Frequency Band (MHz)	Band Edge	Measured Level (dBm)	Limit (dBm)	Result
698 - 716	Lower	-27.71	-19	Pass
698 - 716	Upper	-29.04	-19	Pass
776 - 787	Lower	-28.40	-19	Pass
776 - 787	Upper	-29.12	-19	Pass
824 - 849	Lower	-37.24	-19	Pass
824 - 849	Upper	-34.92	-19	Pass
1710 - 1755	Lower	-37.68	-19	Pass
1710 - 1755	Upper	-38.29	-19	Pass
1850 - 1915	Lower	-40.09	-19	Pass
1850 - 1915	Upper	-48.63	-19	Pass

GSM Uplink Test Results

CDMA Uplink Test Results

Frequency Band (MHz)	Band Edge	Measured Level (dBm)	Limit (dBm)	Result
698 - 716	Lower	-43.68	-19	Pass
698 - 716	Upper	-42.35	-19	Pass
776 - 787	Lower	-40.54	-19	Pass
776 - 787	Upper	-39.45	-19	Pass
824 - 849	Lower	-33.60	-19	Pass
824 - 849	Upper	-34.29	-19	Pass
1710 - 1755	Lower	-40.62	-19	Pass
1710 - 1755	Upper	-41.26	-19	Pass
1850 - 1915	Lower	-40.87	-19	Pass
1850 - 1915	Upper	-42.16	-19	Pass

WCDMA Uplink Test Results

Frequency Band (MHz)	Band Edge	Measured Level (dBm)	Limit (dBm)	Result
698 - 716	Lower	-56.14	-19	Pass
698 - 716	Upper	-54.89	-19	Pass
776 - 787	Lower	-40.16	-19	Pass
776 - 787	Upper	-40.85	-19	Pass
824 - 849	Lower	-33.67	-19	Pass
824 - 849	Upper	-36.44	-19	Pass
1710 - 1755	Lower	-37.40	-19	Pass
1710 - 1755	Upper	-38.96	-19	Pass
1850 - 1915	Lower	-45.01	-19	Pass
1850 - 1915	Upper	-49.58	-19	Pass

GSM Downlink Test Results

Frequency Band (MHz)	Band Edge	Measured Level (dBm)	Limit (dBm)	Result
728 - 746	Lower	-39.73	-19	Pass
728 - 746	Upper	-32.47	-19	Pass
746 - 757	Lower	-31.83	-19	Pass
746 - 757	Upper -40.54		-19	Pass
869 - 894	Lower	wer -50.02		Pass
869 - 894	Upper	-47.37	-19	Pass
1930 - 1995	Lower	-55.37	-19	Pass
1930 - 1995	Upper	-52.86	-19	Pass
2110 - 2155	Lower	-48.30	-19	Pass
2110 - 2155	Upper	-45.81	-19	Pass

CDMA Downlink Test Results

Frequency Band (MHz)	Band Edge	Measured Level (dBm)	Limit (dBm)	Result
728 - 746	Lower	-59.52	-19	Pass
728 - 746	Upper	-53.38	-19	Pass
746 - 757	Lower	-54.27	-19	Pass
746 - 757	Upper	Upper -63.89		Pass
869 - 894	Lower	-61.51	-19	Pass
869 - 894	Upper	-61.38	-19	Pass
1930 - 1995	Lower	-64.40	-19	Pass
1930 - 1995	Upper	-61.48	-19	Pass
2110 - 2155	Lower	-59.78	-19	Pass
2110 - 2155	Upper	-54.59	-19	Pass

WCDMA Downlink Test Results

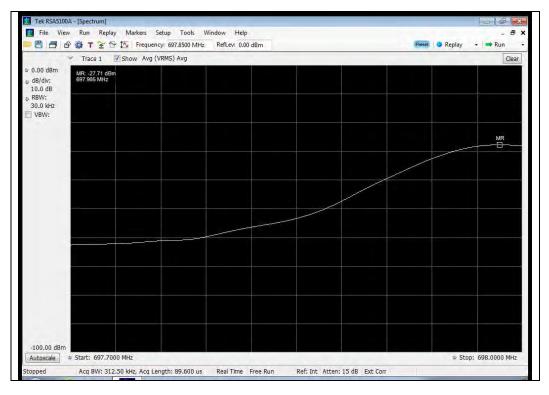
Frequency Band (MHz)	Band Edge	Measured Level (dBm)	Limit (dBm)	Result
728 - 746	Lower	-60.27	-19	Pass
728 - 746	Upper	-56.35	-19	Pass
746 - 757	Lower	-54.24	-19	Pass
746 - 757	Upper -63.14		-19	Pass
869 - 894	Lower	-53.80	-19	Pass
869 - 894	Upper	-51.63	-19	Pass
1930 - 1995	Lower	-57.56	-19	Pass
1930 - 1995	Upper	-54.32	-19	Pass
2110 - 2155	Lower	-51.76	-19	Pass
2110 - 2155	Upper	-47.39	-19	Pass

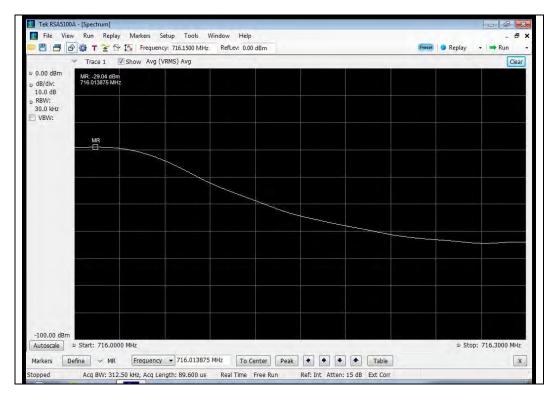


GSM Uplink Test Plots

698 - 716 MHz Band

Lower Band Edge

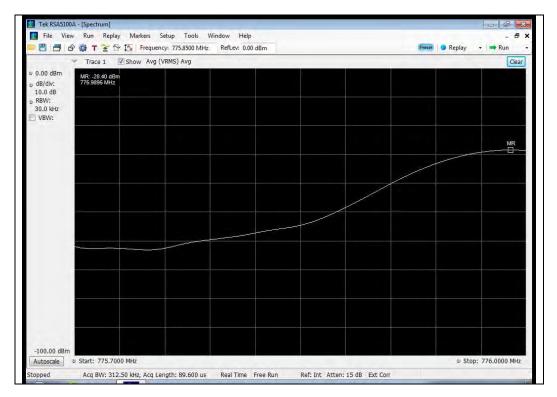


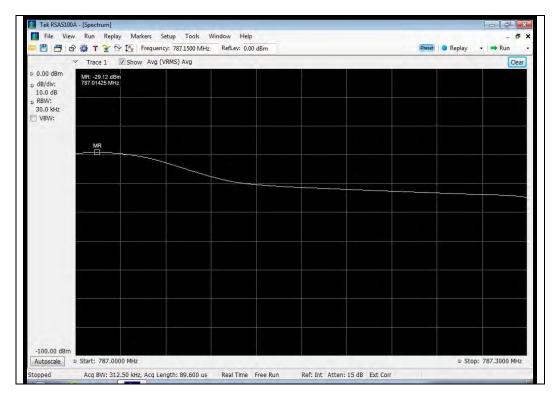




776 - 787 MHz Band

Lower Band Edge

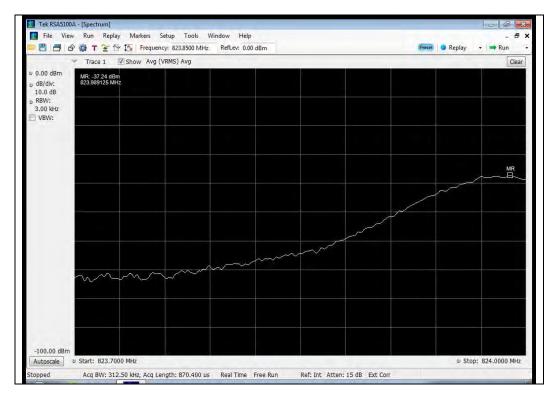


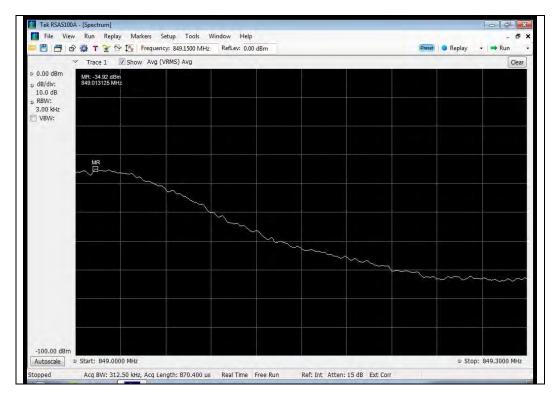




824 - 849 MHz Band

Lower Band Edge

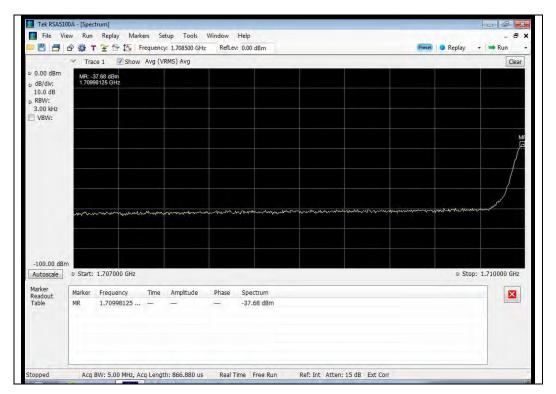


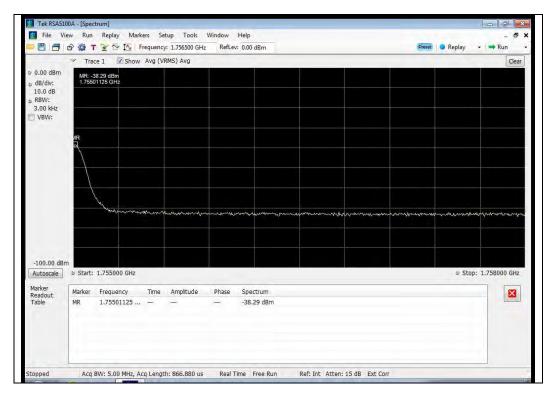




1710 - 1755 MHz Band

Lower Band Edge

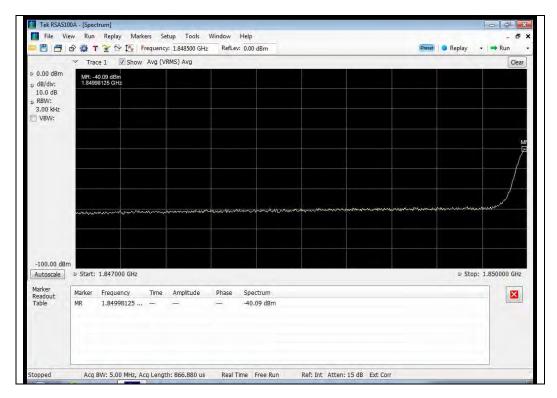






1850 - 1915 MHz Band

Lower Band Edge



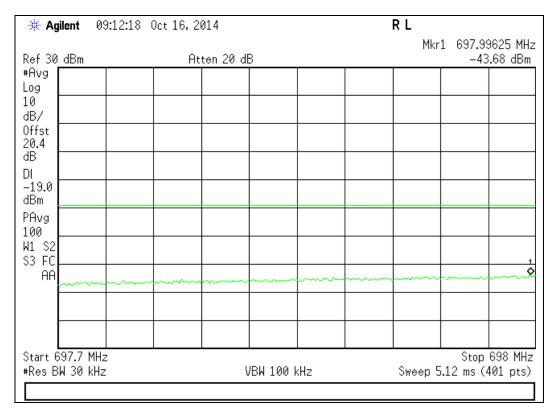
	ŵ 🏟 1	r 蜜 🔂 🏧 Fre	quency	1.916500 GHz	RefLe	v: 0.00 dBm			Preset	Replay	- 👄 Run
	✓ Tra										Clear
0.00 dBm	MR: .	48.63 dBm									
dB/div:	1.915	01125 GHz									
10.0 dB RBW:											
3.00 kHz	-										
VBW:											
	AR										
	a										
	1										
	1										
		- manufactures	win	and the second s	Marrian marine	mannen	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	annin high go	www.c.s.human	March Made & days of	
										· · · · · · · ·	and and and and and
-100.00 dBr		1.015000.011									1 010000 011
Autoscale	Start:	1.915000 GHz								⊘ Stop:	1.918000 GHz
Marker Readout	Marker	Frequency	Time	Amplitude	Phase	Spectrum					X
Table	MR	1.91501125		-	-	-48.63 dBm					
	1										



CDMA Uplink Test Plots

698 - 716 MHz Band

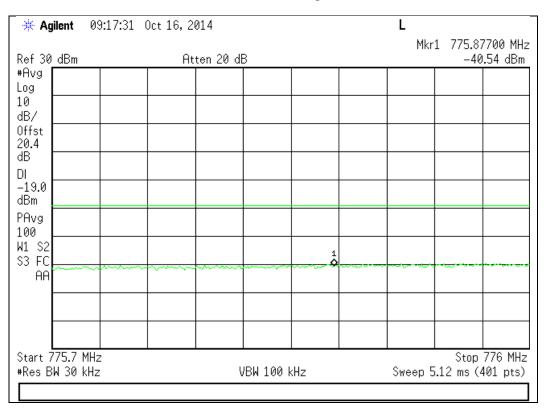
Lower Band Edge



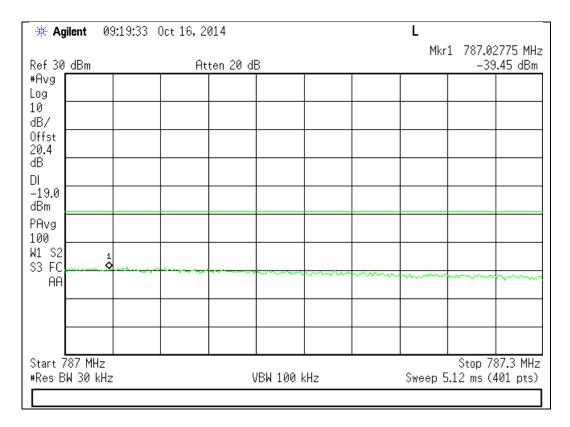
🔆 🔆 Ag	jilent (9:15:36	Oct 16, 20	014				L		_
Ref 30	dBm		At	ten 20 di	3			Mkr		4050 MHz .35 dBm
#Avg Log										
10										
dB/ Offst										
20.4										
dB DI										
-19.0										
dBm PAvg										
100										
W1 S2 S3 FC		1								
ÂA	~~~~~	- Que		· · · · · ·	m	~~~~	·····	m		
<u></u>										
	716 MHz 3W 30 kH			l	/BW 100 k	кНz		Sweep 5	Stop /1 5.12 ms (4	16.3 MHz 401 pts)



776 - 787 MHz Band



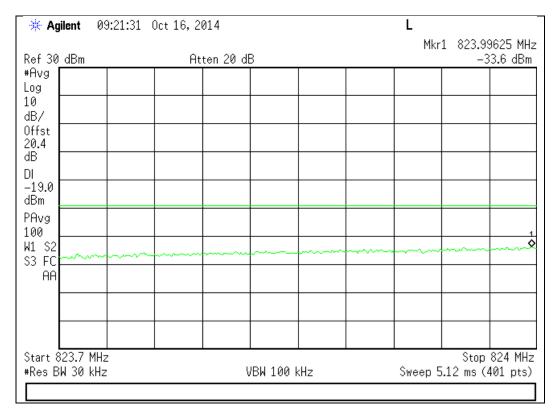
Lower Band Edge





824 - 849 MHz Band

Lower Band Edge

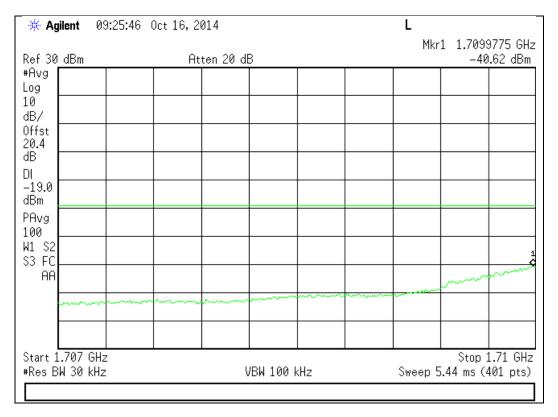


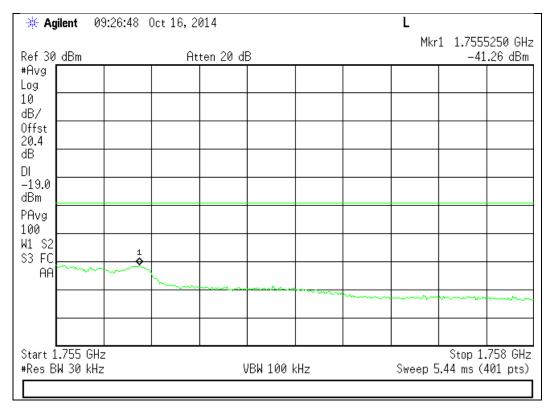
* Aç	jilent	09:22:35	Oct 16, 20	014			L Mkr	1 84900	0825 MHz
Ref 30	dBm		At	ten 20 dl	В		T IN		.29 dBm
#Avg Lo∝									
Log 10									
dB/									
Offst 20.4									
dB									
DI		_							
-19.0 dBm									
PAvg									
100	1	_							
W1 S2 S3 FC	em	m			~~~~~	mm	 ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	·	
AA									
Start S	1 349 MHz	,						Stop 8	49.3 MHz
	343 MHZ 30 kl			(/BW 100 k	Hz	Sweep 5	i.12 ms (4	



1710 - 1755 MHz Band

Lower Band Edge

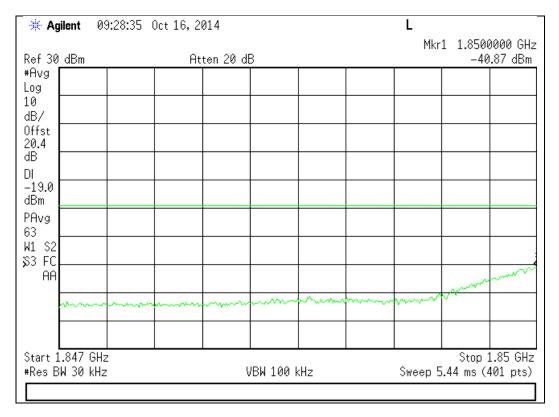






1850 - 1915 MHz Band

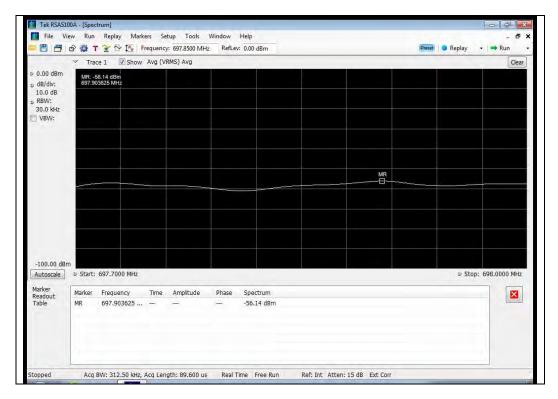
Lower Band Edge



₩ A(gilent	09:30:	;35 0)ct 16, 2	014				L		
Ref 30	0_dBm_			At	:ten 20 d	łВ			Mkr		0225 GHz 2.16 dBm
#Avg Log											
10 dB/											
Offst 20.4						1	1				
dB							+				
DI -19.0			\neg			+					
dBm PAvg			\rightarrow		<u> </u>	+	+				
100 W1 S2	, —	_	-+		<u> </u>						
S3 FC	° k		-+			+					
		\sim	~	Jamas.							
			\square				<u> </u>	hun			
	1.915 (BW 30 K				ļ	VBW 100	kHz		Sweep 5	. Stop 1 45.44 ms (4	.918 GHz 401 pts)



WCDMA Uplink Test Plots 698 - 716 MHz Band Lower Band Edge

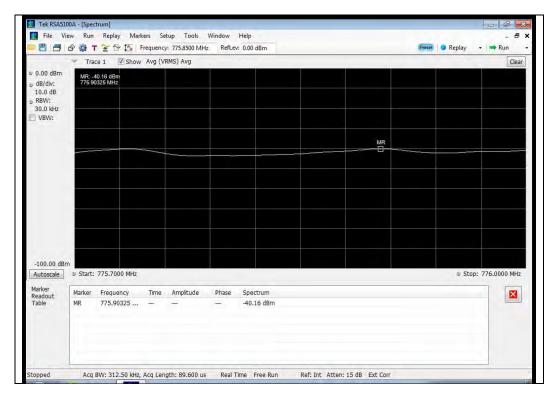


		* <u>*</u> ☆ <u>1</u> √ F			z KerLe	v: 0.00 dBm	 	Preset	Replay	▪ ➡ Run
	✓ Trail	ce 1 🔽 Show	Avg (V	RMS) Avg						Clear
0.00 dBm	MR: -	54.89 dBm 37625 MHz								
dB/div: 10.0 dB	710.1.	57025 WII 12								
RBW:										
30.0 kHz VBW:										
						MR	 			
-100.00 dBm										
Autoscale	Start:	716.0000 MHz							 Stop: 	716,3000 MHz
larker	Marker	Frequency	Time	Amplitude	Phase	Spectrum				×
eadout able	MR	716.137625				-54.89 dBm				
	_									-



776 - 787 MHz Band

Lower Band Edge

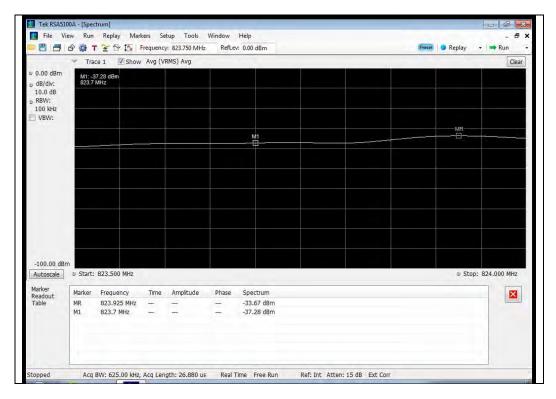


		• 😤 🕾 🌆 F					Preset	Replay - Run
	V Tra	ce 1 🔽 Show	Avg (V	RMS) Avg				Clear
0.00 dBm dB/div:	MR: -4	0.85 dBm 2375 MHz						
10.0 dB	101.10							
RBW: 30.0 kHz								
30.0 KHZ								
					MR			
-100.00 dBr	n							
Autoscale	Start:	787.0000 MHz						© Stop: 787.3000 MHz
Marker	Marker	Frequency	Time	Amplitude	Phase	Spectrum		×
Readout Table	MR	787.102375				-40.85 dBm		



824 - 849 MHz Band

Lower Band Edge

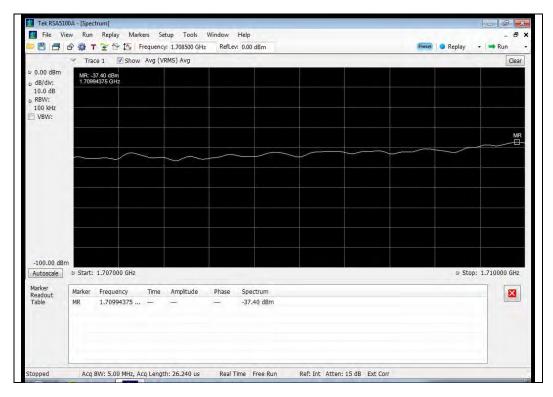


		A 134	D110) A						(dia)
✓ Trac	te 1 Show	AVG (V	RMS) AVG						Clear
M1: -3	6.44 dBm MHz								
			110						
		_	MR			M1			
_									
	849.000 MHz			1					849.500 MHz
Marker	Fraguency	Time	Amplitudo	Dhace	Fraction				
M1	849.3 MHz				-36.44 dBm				
	Mir-3 8493	M1: -36.44 dBm 849.3 MHz 5 Start: 849.000 MHz 7 Marker Frequency 7 MR 849.113125	M1:-36.44 dBm 849.3 MHz	Mit - 36.44 dBm 849.3 MHz MR Start: 849.000 MHz Marker Frequency Time Amplitude MR 849.113125	Mit - 36.44 dBm 849.3 MHz MR Start: 849.000 MHz Marker Frequency Time Amplitude Phase MR 849.113125 — — — —	Mit - 36.44 dBm MR B49.3 MHz MR B49.3 MHz B B49.113125	Mit - 36.44 dBm MR MI B49.3 MHz MR MI B MR MI B B B B B B B B B B B B B B B B B B B B B MR B B MR B B MR B B MR B B MAR B B Marker Frequency Time MR B B MAR B B	Mit - 36.44 dBm 849.3 MHz MR MR MI MI MI MI Marker Frequency Time Amplitude Phase Spectrum MR 849.113125	Mit - 36.44 dBm Mit Mit Mit B49.3 MHz Mit Mit Mit MR Mit Mit Mit Start: B49.000 MHz Start: B49.000 MHz Start: Start: B49.000 MHz Start:



1710 - 1755 MHz Band

Lower Band Edge

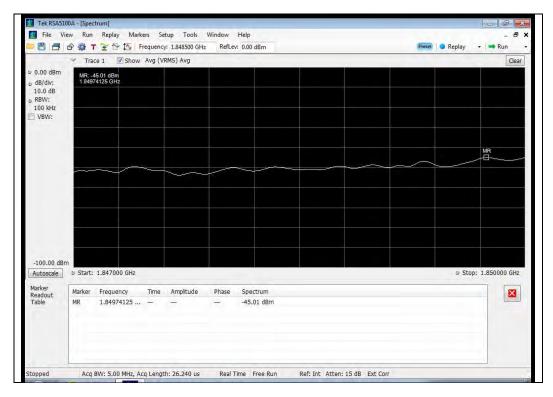


		• 😤 🏠 🖡				in oleo deni	 	19000	Replay	-
	✓ Trail	te 1 🔽 Show	Avg (V	RMS) Avg						Clear
0.00 dBm dB/div: 10.0 dB RBW: 100 kHz VBW:	MR: -: 1.755	18.96 dBm 1425 GHz								
		IR]				~~~				
-100.00 dBr	n									
Autoscale	Start:	1.755000 GHz							 Stop: 	1.758000 GHz
Marker Readout Table	Marker MR	Frequency 1.7551425 G		Amplitude 	Phase 	Spectrum -38.96 dBm				



1850 - 1915 MHz Band

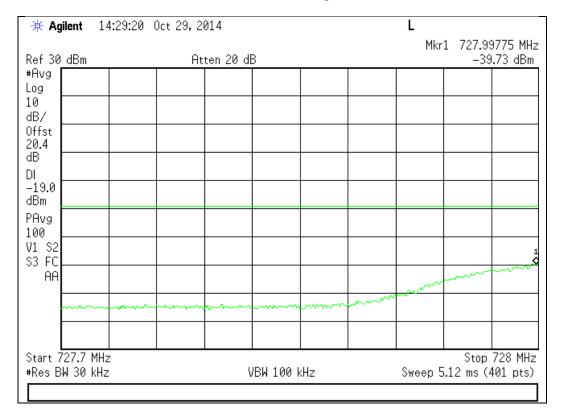
Lower Band Edge

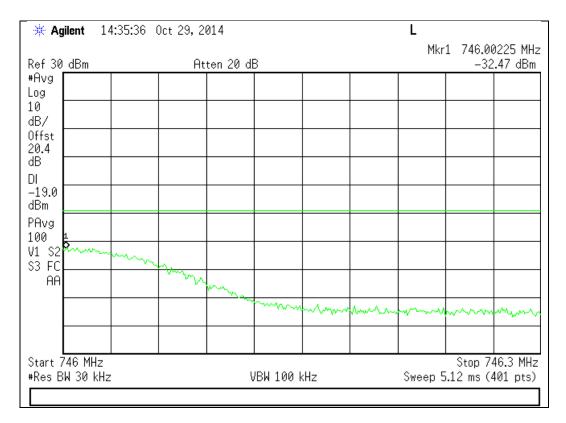


	✓ Trac	ce 1 🔽 Show	Auro (M	DHC) AVG						Clea
0.00 dBm			Avg (vi	(MS) AVY			-	_		Clea
dB/div:	MR: -4 1.9151	19.58 dBm 10875 GHz								
10.0 dB										
RBW: 100 kHz										
VBW:										
	MR									
				~~~			 	~~		
-100.00 dBr	n									
Autoscale		1.915000 GHz							Stop:	1.918000 GHz
larker	Marker	Frequency	Time	Amplitude	Phase	Spectrum				
Readout Fable	MR	1.91510875		Amplicade	FildSe	-49.58 dBm				
auto in	City	1.515100/5				19190 0011				



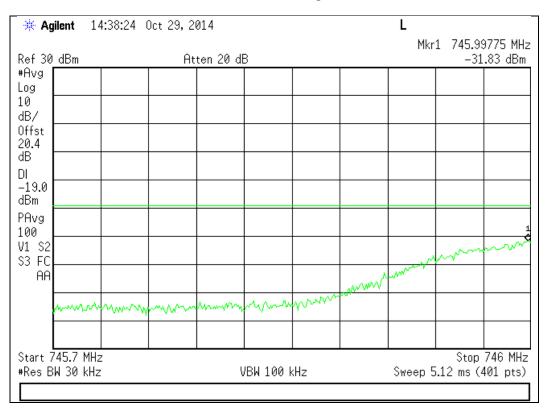
#### GSM Downlink Test Plots 728 - 746 MHz Band Lower Band Edge





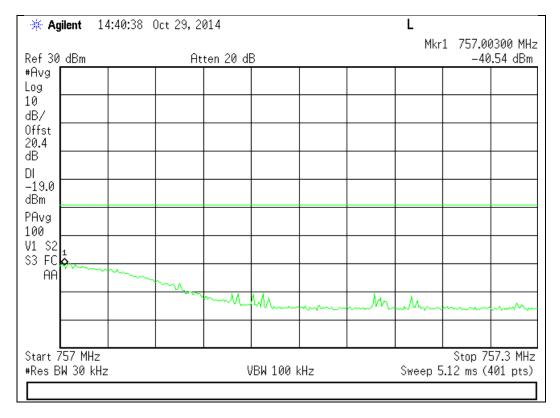


## 746 - 757 MHz Band



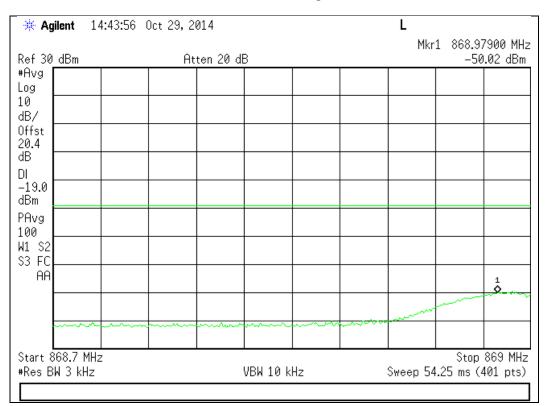
### Lower Band Edge

Upper Band Edge



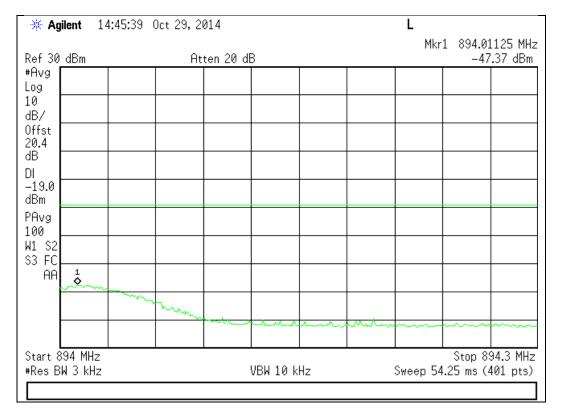


### 869 - 894 MHz Band



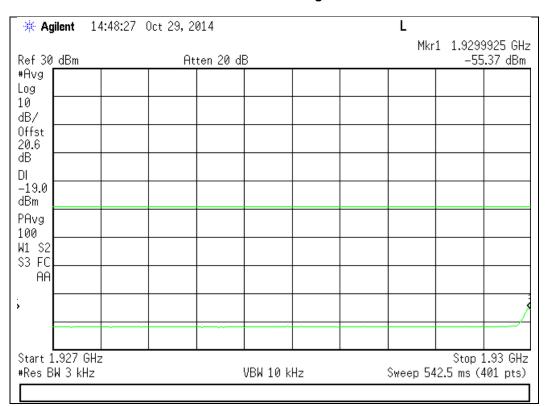
### Lower Band Edge

Upper Band Edge





## 1930 - 1995 MHz Band

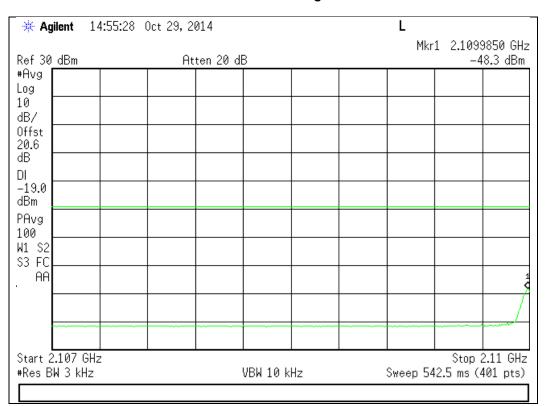


## Lower Band Edge

🔆 Agilent	14:53:02 0	ct 29, 2014				L		
Ref 30 dBm		Atten 20		Mkr1 1.9950075 GHz 52.86 dBm				
#Avg Log								
10 dB/								
Offst 20.6								
dB								
DI -19.0								
dBm PAvg								
100 W1 S2								
\$3 FC								
AA								
Start 1.995 #Res BW 3 k			VBW 10 k	Hz	S	weep 54	Stop 1. 2.5 ms (4	998 GHz 101 pts)



# 2110 - 2155 MHz Band



# Lower Band Edge

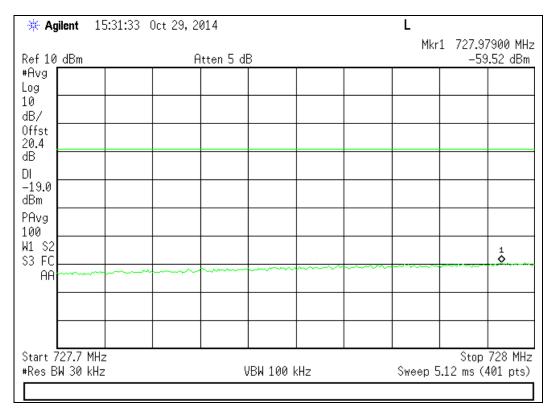
🔆 Agilent	14:59:18 (	)ct 29, 2014				L Mkr	1 2155	
Ref 30 dBm		Atten 20	dB	-45.81 dBm				
#Avg								
Log 10								
dB/								
Offst 20.6								
dB								
DI								
-19.0 dBm								
PAvg								
100								
W1 S2 S3 FC								
AAD								
I A-								
Start 2.155								158 GHz
#Res BWI3 k	Hz		VBW 10 k	(Hz	S	weep 54	2.5 ms (	401 pts)



### **CDMA Downlink Test Plots**

# 728 - 746 MHz Band

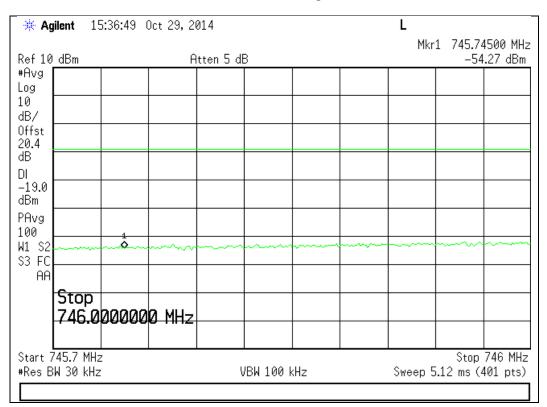
### Lower Band Edge



🔆 Agilent	15:34:26	Oct 29, 20	014			L		
Ref 10_dBm		A	tten 5 dl	В		Mkr		0075 MHz 3.38 dBm
#Avg Log								
10								
dB/ Offst								
20.4 dB								
DI								
-19.0 dBm								
PAvg								
100 W1 S2				·		 		
S3 FC								
Start 746 M				IDU 100 I		С Г		46.3 MHz
#Res BW 30	КПZ			/BW 100 k	(HZ	აweep ე	5.12 ms (4	401 pts)

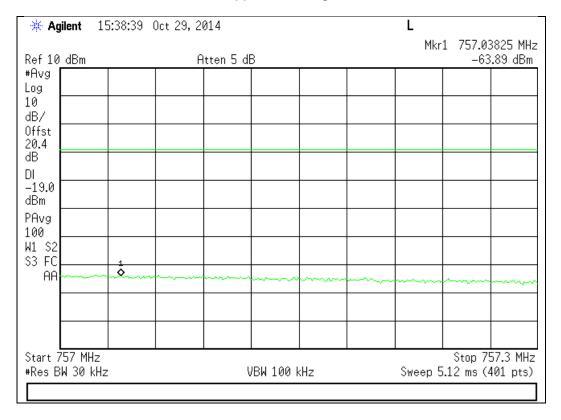


## 746 - 757 MHz Band



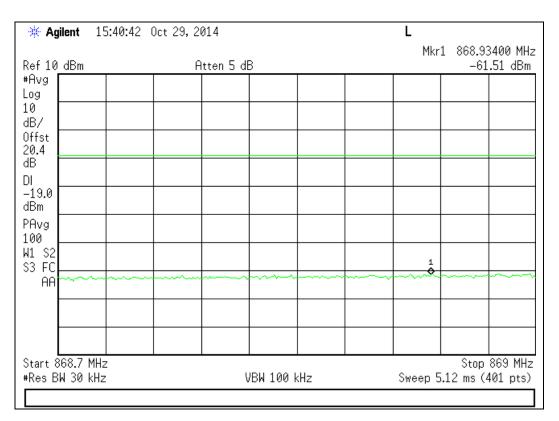
### Lower Band Edge

**Upper Band Edge** 





### 869 - 894 MHz Band

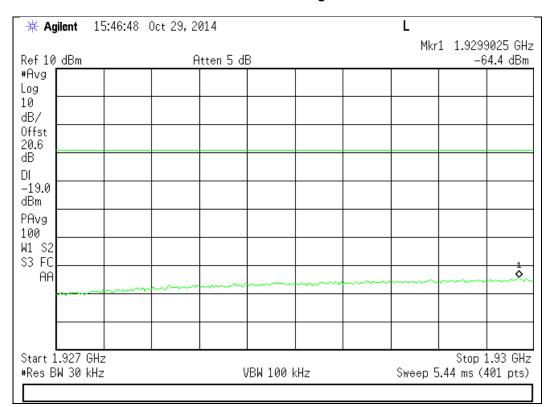


# Lower Band Edge

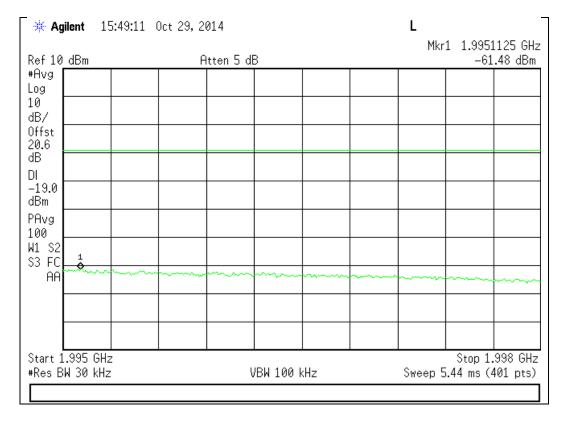
🔆 🔆 Agi	ent	15:43	:23 0	ct 29, 2	014			L		
Ref 10	dBm			F	ltten 5 di	В		Mkr		5900 MHz 38 dBm
#Avg Log										
10 dB/										
Offst 20.4										
dB								 		
DI -19.0										
dBm PAvg										
100 W1 S2										
S3 FC	~~~			<del></del>			1 •	 		
AA		_								
Start 89 #Res Bl					l	/BW 100 k	(Hz	Sweep 5	8 Stop 6.12 ms	94.3 MHz 401 pts)



# 1930 - 1995 MHz Band



#### Lower Band Edge



# 2110 - 2155 MHz Band

.0 dBm	Atten 5	dB	Mkr1 2.1072550 G HB59.78 dB				
		1 To	1.00				
			-	-			
0							
				-	+		
		1.1.1	-	-			
CQ					. p		
FI.				-			
		-		-			
				-	+ +		
	10 11 1 1 I						

# Lower Band Edge

