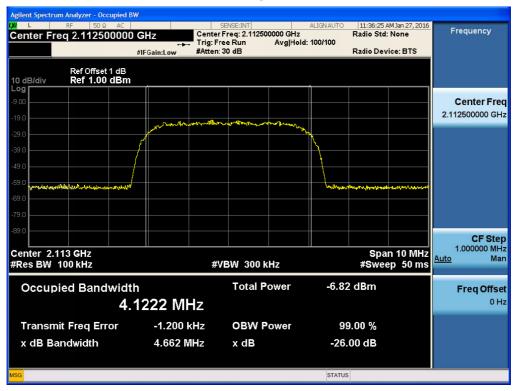


# [AGC threshold Input Downlink High]

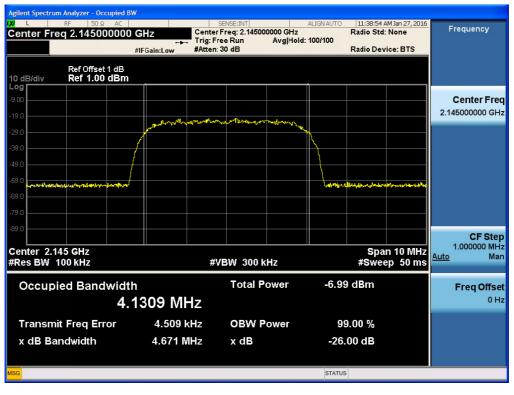


# Plots of Occupied Bandwidth\_AWS BAND WCDMA

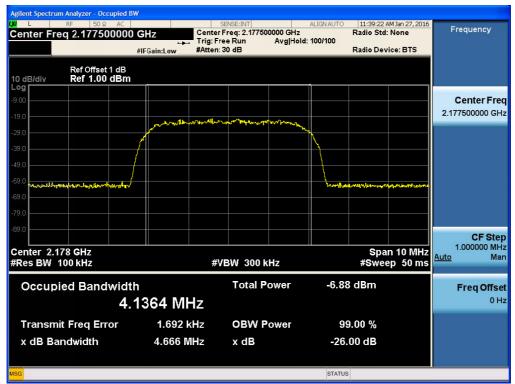


## [AGC threshold Input Downlink Low]

# [AGC threshold Input Downlink Middle]







# [AGC threshold Input Downlink High]



# 8. PASSBAND GAIN AND BANDWIDTH & OUT OF BAND REJECTION

## **FCC Rules**

## Test Requirement(s): KDB 935210 D02 v03r01

Out of Band Rejection – Test for rejection of out of band signals. Filter freq. response plots are acceptable.

#### Test Procedures:

Measurements were in accordance with the test methods section 3.3 of KDB 935210 D05 v01r01.

a) Connect a signal generator to the input of the EUT.

b) Configure a swept CW signal with the following parameters:

1) Frequency range =  $\pm$  250 % of the passband, for each applicable CMRS band (see also KDB Publication 935210 D02 [R7] and KDB Publication 634817 [R5] about selection of frequencies for testing and for grant listings).

2) Level = a sufficient level to affirm that the out-of-band rejection is > 20 dB above the noise floor and will not engage the AGC during the entire sweep.

3) Dwell time = approximately 10 ms.

4) Number of points = SPAN/(RBW/2).

c) Connect a spectrum analyzer to the output of the EUT using appropriate attenuation.

d) Set the span of the spectrum analyzer to the same as the frequency range of the signal generator.

e) Set the resolution bandwidth (RBW) of the spectrum analyzer to be 1 % to 5 % of the EUT passband, and the video bandwidth (VBW) shall be set to  $\geq$  3  $\times$  RBW.

f) Set the detector to Peak Max-Hold and wait for the spectrum analyzer's spectral display to fill.

g) Place a marker to the peak of the frequency response and record this frequency as f0.

h) Place two markers, one at the lowest and the other at the highest frequency of the envelope of the spectral display, such that each marker is at or slightly below the -20 dB down amplitude, to determine the 20 dB bandwidth.

i) Capture the frequency response of the EUT.

j) Repeat for all frequency bands applicable for use by the EUT.

#### **IC Rules**

#### Test Requirements: RSS-131 6.1

The passband gain shall not exceed the nominal gain by more than 1.0 dB. The 20 dB bandwidth shall not exceed the nominal bandwidth that is stated by the manufacturer. Outside of the 20 dB bandwidth, the gain shall not exceed the gain at the 20 dB point.

Test Procedures: RSS-131 4.2

Adjust the internal gain control of the equipment under test to the nominal gain for which equipment certification is sought.

With the aid of a signal generator and spectrum analyzer, measure the 20 dB bandwidth of the amplifier (i.e. at the point where the gain has fallen by 20 dB). Measure the gain-versus-frequency response of the amplifier from the midband frequency f0 of the passband up to at least f0 + 250% of the 20 dB bandwidth.

Signal generator sweep from the frequency more lower than the low frequency -250% to the frequency more higher than high frequency +250%.

	Input Level (dBm)	Mauimum Ama Opia	
Input Signal	Input Signal : Sinusoidal	Maximum Amp Gain	
1900 PCS	DL: -14 dBm	DL : 47.0 dB	
AWS	DL: -14 dBm	DL : 47.0 dB	

**Test Results:** The EUT complies with the requirements of this section.



# [Downlink\_1900 PCS BAND]

	20 dB point frequency (MHz)	Output power (dBm)	Gain (dB)
	1927.22 MHz		
1900 PCS Band	~	33.15	47.15
	1997.70 MHz		

# Plots of Passband Gain and Bandwidth & Out of Band Rejection

[1900 PCS BAND]

Agilent Spectrum Analyzer - Swept SA					
RF 50 Ω AC Center Freq 1.962500000	GHz	SENSE:INT	ALIGN AUTO Avg Type: Log-Pwr	06:08:21 AM Feb 01, 2016 TRACE 1 2 3 4 5 6	Frequency
	PNO: Fast ++ IFGain:Low	Trig: Free Run #Atten: 20 dB	Avg Hold: 10/10 Ext Gain: -40.50 dB		2011 S. 21 & 175
10 dB/div Ref 49.00 dBm			Mkr	3 1.997 70 GHz 12.258 dBm	Auto Tune
Log		1		12.200 aDm	
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19.0	2		3		1.962500000 GH
9.00	Ϋ́				Otort Free
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-21.0 <b>http://www.interface.org/</b> 1.0				المربعة المربعة المربعة المراجع المربعة المربعة المربعة المربعة المربعة المربعة المربعة المربعة المربعة المربعة المربعة المربعة	Stop Fre
-41:0					2.062500000 GH
Center 1.9625 GHz				Span 200.0 MHz	
#Res BW 1.0 MHz	#VBW	3.0 MHz	Sweep	1.00 ms (5001 pts)	CF Ster 20.000000 MH
MKR MODE TRC SCL X		Y	FUNCTION FUNCTION WIDTH	FUNCTION VALUE	Auto Mai
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4	97 70 GHz	12.258 dBm			Freq Offse
6					он
8					
9					
11 12					
ISG			STATUS		



# [Downlink\_AWS BAND]

	20 dB point frequency (MHz)	Output power (dBm)	Gain (dB)
	2102.220 MHz	22.11	
AWS Band	~ 2187.720 MHz	33.11	47.11

# Plots of Passband Gain and Bandwidth & Out of Band Rejection

[AWS BAND] M Feb 01, 201 Frequency Center Freq 2.145000000 GHz Avg Type: Log-Pwr Avg|Hold: 10/10 Ext Gain: -40.10 dB PNO: Fast +++ IFGain:Low #Atten: 20 dB TYPE DET Auto Tune Mkr3 2.187 72 GHz 13.109 dBm Ref 49.00 dBm 10 dB/div Log  $h^1$ **Center Freq** 2.145000000 GHz 3 Start Freq 1.995000000 GHz Stop Freq 2.295000000 GHz Center 2.1450 GHz #Res BW 1.0 MHz Span 300.0 MHz Sweep 1.00 ms (5001 pts) CF Step 30.00000 MHz #VBW 3.0 MHz Auto Man 2.116 92 GHz 2.102 22 GHz 2.187 72 GHz 33.109 dBm 12.959 dBm 13.109 dBm Ν f **Freq Offset** 0 Hz

STATUS

10 11 12

# 9. SPURIOUS AND HARMONIC EMISSION AT ANTENNA TERMINAL

#### **FCC Rules**

# Test Requirement(s): § 2.1051 Measurements required: Spurious emissions at antenna terminals:

The radio frequency voltage or powers generated within the equipment and appearing on a spurious frequency shall be checked at the equipment output terminals when properly loaded with a suitable artificial antenna. Curves or equivalent data shall show the magnitude of each harmonic and other spurious emission that can be detected when the equipment is operated under the conditions specified in § 2.1049 as appropriate. The magnitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be specified.

## § 24.238 Emission limitations for Broadband PCS equipment.

The rules in this section govern the spectral characteristics of emissions in the Broadband Personal Communications Service.

(a) Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

(b) Measurement procedure. Compliance with these rules 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 frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth ( i.e. 1 MHz or 1 percent of emission bandwidth, as specified). 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.

(c) Alternative out of band emission limit. Licensees in this service may establish an alternative out of band emission limit to be used at specified band edge(s) in specified geographical areas, in lieu of that set forth in this section, pursuant to a private contractual arrangement of all affected licensees and applicants. In this event, each party to such contract shall maintain a copy of the contract in their station files and disclose it to prospective assignees or transferees and, upon request, to the FCC.

(d) Interference caused by out of band emissions. If any emission from a transmitter operating in this service results in interference to users of another radio service, the FCC may require a greater attenuation of that emission than specified in this section.

Model:L2RDU\_1900P\_AWS13



§ 27.53 Emission limits

Report No.: HCT-R-1604-F001-1

(h) *AWS emission limits*—(1) *General protection levels.* Except as otherwise specified below, for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10  $\log_{10}$  (P) dB.

(3) *Measurement procedure.* (i) Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz 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. 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.

**Test Procedures:** Measurements were in accordance with the test methods section 3.6 and 4.7 of KDB 935210 D05 v01r01.

## 3.6.1. General

Spurious emissions shall be measured using a single test signal sequentially tuned to the low,

middle and high channels or frequencies within each authorized frequency band of operation.

Out-of-band/block emissions (including intermodulation products) shall be measured under each of the following two stimulus conditions:

a) two adjacent test signals sequentially tuned to the lower and upper frequency band/block edges;b) a single test signal, sequentially tuned to the lowest and highest frequencies or channels within the frequency band/block under examination.

NOTE—Single channel boosters that cannot accommodate two simultaneous signals within the passband, can be excluded from the test stipulated in step a).

# 3.6.2. EUT out-of-band/block emissions conducted measurement

a) Connect a signal generator to the input of the EUT.

NOTE—If the signal generator is not capable of generating two modulated carriers simultaneously, then two discrete signal generators can be connected with an appropriate combining network to support the two-tone test.

b) Set the signal generator to produce two AWGN signals as previously described (e.g., 4.1 MHz OBW).

c) Set the center frequencies such that the AWGN signals occupy adjacent channels, as defined by industry standards such as 3GPP or 3GPP2, at the upper edge of the frequency band or block of interest.

d) Set the composite power levels such that the input signal is just below the AGC threshold (see

3.2), but not more than 0.5 dB below. The composite power can be measured using the procedures provided in KDB Publication 971168, but it will be necessary to expand the power integration bandwidth so as to include both of the transmit channels. Alternatively, the composite power can be measured using an average power meter as described in KDB Publication 971168.e) Connect a spectrum analyzer to the output of the EUT using appropriate attenuation as necessary.

f) Set the RBW = reference bandwidth in the applicable rule section for the supported frequency band (typically 1 % of the emission bandwidth, 100 kHz, or 1 MHz)

g) Set the VBW =  $3 \times RBW$ .

h) Set the detector to power averaging (rms) detector.

i) Set the Sweep time = auto-couple.

j) Set the analyzer start frequency to the upper block edge frequency and the stop frequency to the upper block edge frequency plus 300 kHz or 3 MHz for frequencies below and above 1 GHz, respectively.

k) Trace average at least 100 traces in power averaging (i.e., rms) mode.

I) Use the marker function to find the maximum power level.

m) Capture the spectrum analyzer trace of the power level for inclusion in the test report.

n) Repeat the procedure with the composite input power level set to 3 dB above the AGC threshold.

o) Reset the input signals frequencies to the lower edge of the frequency block or band under examination.

p) Reset the spectrum analyzer start frequency to the lower block edge frequency minus 300 kHz, or 3 MHz (for frequencies below and above 1 GHz, respectively), and the stop frequency to the lower band or block edge frequency.

q) Repeat steps k) to n).

r) Repeat steps a) to q) with the signal generator configured for a single test signal tuned as close as possible to the block edges.

s) Repeat steps a) to r) with the narrowband test signal.

t) Repeat steps a) to s) for all authorized frequency bands or blocks used by the EUT.

3.6.3. EUT spurious emissions conducted measurement

a) Connect a signal generator to the input of the EUT.

b) Set the signal generator to produce the broadband test signal as previously described (e.g., 4.1 MHz OBW AWGN).

c) Set the center frequency of the test signal to the lowest available channel within the frequency band or block.

d) Set the EUT input power to a level that is just below the AGC threshold (see 3.2), but not more than 0.5 dB below.

e) Connect a spectrum analyzer to the output of the EUT using appropriate attenuation as



#### necessary.

f) Set the RBW = reference bandwidth in the applicable rule section for the supported frequency band of operation (e.g., reference bandwidth is typically 100 kHz or 1 MHz).

g) Set the VBW  $\geq$  3 × RBW.

h) Set the Sweep time = auto-couple.

i) Set the analyzer start frequency to the lowest radio frequency signal generated in the equipment, without going below 9 kHz, and the stop frequency to the lower band/block edge frequency minus 100 kHz or 1 MHz, as specified in the applicable rule part.

NOTE—The number of measurement points in each sweep must be  $\geq$  (2 × span/RBW) which may require that the measurement range defined by the start and stop frequencies be subdivided, depending on the available number of measurement points provided by the spectrum analyzer. j) Select the power averaging (rms) detector function.

k) Trace average at least 10 traces in power averaging (i.e., rms) mode.

I) Use the peak marker function to identify the highest amplitude level over each measured frequency range. Record the frequency and amplitude and capture a plot for inclusion in the test report.

m) Reset the analyzer start frequency to the upper band/block edge frequency plus 100 kHz or 1 MHz, as specified in the applicable rule part, and the analyzer stop frequency to 10 times the highest frequency of the fundamental emission (see §2.1057). Note that the number of measurement points in each sweep must be  $\geq$  (2 × span/RBW) which may require that the measurement range defined by the start and stop frequencies be subdivided, depending on the available number of measurement points provided by the spectrum analyzer.

n) Trace average at least 10 traces in power averaging (i.e., rms) mode.

o) Use the peak marker function to identify the highest amplitude level over each of the measured frequency ranges. Record the frequency and amplitude and capture a plot for inclusion in the test report and provide tabular data, if required.

p) Repeat the procedure with the input test signals tuned to a middle band/block frequency/channel and then a high band/block frequency/channel.

q) Repeat entire procedure with the narrowband test signal.

r) Repeat for all authorized frequency bands/blocks used by the EUT.

# **IC Rules**

# Test Requirement(s): RSS-131 6.4

Spurious emissions of zone enhancers and translators shall be suppressed as much as possible.

Spurious emissions shall be attenuated below the rated power of the enhancer by at least:

43 + 10 Log10(Prated in watts), or 70 dB, whichever is less stringent.

**Note:** If the minimum standard is not met, check to see if the input signal generators have a high harmonic content.



## Test Procedures: RSS-131 4.4

# 4.4.1 Multi-channel Enhancer

The spurious emissions of the equipment under test shall be measured using the two-tone method in section 4.3.1, with the two tones Po1 and Po2 set to the required levels.

Using a spectrum analyser with a resolution bandwidth set at 100 kHz, search for spurious emissions from 30 MHz to at least 5 times the highest RF passband frequency. The search may omit the band that contains the test tones and intermodulation products.

## 4.4.2 Single channel Enhancer

The enhancer shall be operated as described in section 4.3.2 during the search for spurious emissions.

Using a spectrum analyser with a resolution bandwidth set at 100 kHz, search for spurious emissions from 30 MHz to at least 5 times the highest RF passband frequency. The search may omit the band that contains the input signal.

**Test Results:** The EUT complies with the requirements of this section. There were no Detectable Spurious emissions for this EUT.



# Single channel Enhancer Plots of Spurious Emission for PCS1900 BAND LTE 5MHz Conducted Spurious Emissions (9 kHz – 150 kHz)



[Downlink Low]

#### [Downlink Middle]





## [Downlink High]



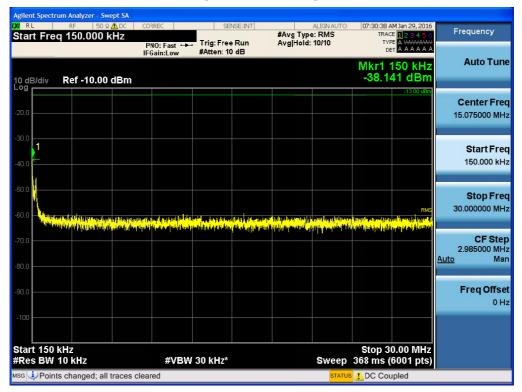


#### Conducted Spurious Emissions (150 kHz – 30 MHz)

Agilent Spectrum Anal	yzer - Swept SA								
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								-13.00 dBm	
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-30.0									
1									Start Freq
-40.0									150.000 kHz
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-50.0									Stop Freq
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#### [Downlink Low]

#### [Downlink Middle]





# [Downlink High]

RL			ORREC	SE	NSE:INT	#Avg Typ	ALIGNAUTO		4 Jan 29, 2016	Frequency
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100										
tart 150								Stop 30	.00 MHz	
Date Dial	10 kHz		#VP	N 30 kHz*			Sween	368 ms (6	(001 ntc)	



#### Conducted Spurious Emissions (30 MHz – 1 GHz)

#### [Downlink Low]



#### [Downlink Middle]





# [Downlink High]

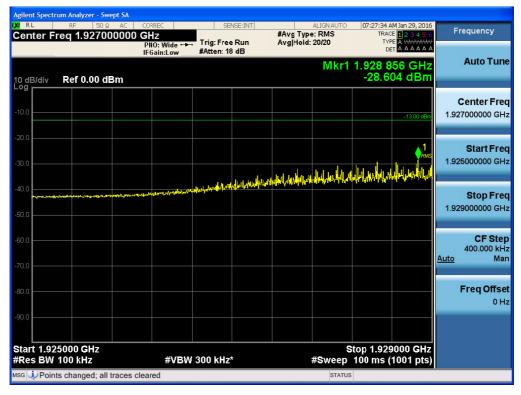
X/ RL	RF 50 Ω A(		SENSE:INT		AUTO 07:34:46 AM Jan 29, 201	
Center F	req 515.00000	O MHz PNO: Fast ↔ IFGain:Low	→ Trig: Free Run #Atten: 10 dB	#Avg Type: RM Avg Hold: 20/20		Å
0 dB/div	Ref -10.00 dB	m			Mkr1 941.41 MHz -48.926 dBm	z Auto Tun
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#### Conducted Spurious Emissions (1 GHz – 26.5 GHz)

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-100											
		00 GHz							Stop 1.9	250 GHz	
		1.0 MH;			V 3.0 MHz	×				2001 pts)	
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#### [Downlink Low]-1





# [Downlink Low]-3

Center Freq 1.998000000		#Avg Type: Run Avg Hold: 20		Frequency
0 dB/div Ref 0.00 dBm			Mkr1 1.996 012 GHz -38.129 dBm	
			-13.00 dBm	Center Fre 1.998000000 GH
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tart 2.0000 Res BW 1.0		#VB	W 3.0 MHz	*		Sweep		0000 GHz 2001 pts)	







# [Downlink Middle]-1

Agilent	Spectru	ım Ana	lyzer - Sw	ept SA									
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		Rei	-10.00	UBIII								-13.00 dBm	
												-13.00 dbm	Center Freq
-20.0													1.462500000 GHz
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100													
Start	1.00	00 G	Hz								Stop 1.	9250 GHz	
#Res						#VBN	/ 3.0 MHz	*		Sweep	1.20 ms (	2001 pts)	
MSG 🤳	Point	s chai	nged; all	traces of	cleared					STATU			

[Downlink Middle]-2

Agilent Spectru	m Analyzer - Swept SA	CORREC	SENSE:IN		ALIGN AUTO	07:31:08 AM Jan 29, 2016	
	1.925000000	GHz		#Avg Typ Avg Hold	e: RMS	TRACE 1 2 3 4 5 6 TYPE A WWWWW	Frequency
10 dB/div	Ref 0.00 dBm	PNO: Wide ↔ IFGain:Low	#Atten: 18 dB	Arghive		1.928 676 GHz -40.613 dBm	Auto Tune
-10.0						-13.00 dBm	Center Fred 1.927000000 GH
-20.0						.1	Start Free 1.925000000 GH
-40.0		nadaula naja ayan sana sanga awa y		eyyydda falwen festaffan	and a star of a star of a star of		Stop Fre 1.929000000 GH
60.0 70.0							CF Ste 400.000 kH Auto Ma
80.0							Freq Offs 0 H
Start 1.925 Res BW 1		#VBM	/ 300 kHz*		S #Sweep	top 1.929000 GHz 100 ms (1001 pts)	
	changed; all traces	cleared			STATUS		



## [Downlink Middle]-3

K RL RF 50 Q AC Start Freq 1.996000000 G	CORREC HZ PNO: Wide ↔ Trig	SENSE:INT	ALIGNAUTO #Avg Type: RMS Avg Hold: 20/20	TRACE 123456 TYPE A WWWWW	Frequency
10 dB/div Ref 0.00 dBm	IFGain:Low #Att	en: 20 dB	Mkr	DET A A A A A A I 1.996 024 GHz -38.303 dBm	Auto Tune
10.0				-13.00 dBm	Center Fred 1.998000000 GHz
-20.0 					<b>Start Fred</b> 1.996000000 GH;
-40.0		1.5		RMS	Stop Fred 2.000000000 GH:
60.0					<b>CF Ste</b> j 400.000 kH <u>Auto</u> Ma
.80.0					Freq Offse 0 H
Start 1.996000 GHz #Res BW 100 kHz	#VBW 300		#Sween	Stop 2.000000 GHz	

# [Downlink Middle]-4

-10.00 dBm	IFGain:Low	#Atten: 14		1- 	Mk	r1 2.663	3 5 GHz 02 dBm -13 00 dBm	Auto Tune Center Free 2.500000000 GH: Start Free 2.000000000 GH:
ungan di sengi segata di pigata di pigata	andue and a state of the state	efinitesing, for the of the same		1 _	eringen jagetart	Training and and	-13.00 dBm RMS	2.500000000 GH
	and the state of the	alan ya farika da alaan	ang tanah pana ing ta		herterseetingespreters	an and a state of the state of	RMS	
								Stop Fre 3.000000000 G⊢
								CF Ste 100.000000 M⊦ <u>Auto</u> Ma
								Freq Offso 0 ⊦
Hz MHz	#VBW	( 3.0 MHz	*		Sweep	Stop 3.0 1.33 ms (	0000 GHz 2001 pts)	
1	lHz		Hz #VBW 3.0 MHz	1Hz #VBW 3.0 MHz*	Hz #VBW 3.0 MHz*	IHz #VBW 3.0 MHz* Sweep	1Hz #VBW 3.0 MHz* Sweep 1.33 ms (	IHz #VBW 3.0 MHz* Sweep 1.33 ms (2001 pts)



#### [Downlink Middle]-5





## [Downlink High]-1

RL RF 50Ω AC	CORREC	SENSE:INT	ALIGN AUTO	07:34:56 AM Jan 29, 2016	Frequency
enter Freq 1.46250000	DICHZ PNO: Fast ↔ IFGain:Low	. Trig: Free Run #Atten: 16 dB	#Avg Type: RMS Avg Hold: 20/20	TRACE 123456 TYPE A WWWWW DET A A A A A A	
dB/div Ref -10.00 dBm			MI	(r1 1.826 0 GHz -32.841 dBm	Auto Tur
.0				-13.00 dBm	Center Fre 1.462500000 GH
.0 .0 Norman Jarrawicky Versenik Vier segente	nyumin futuringa angela	reservermenthallogtappingsaturta	entheologistrations	1 สมู่ไม่สะสถิสมใหญ่และการการการการการการการการการการการการการก	Start Fre
.0					<b>Stop Fr</b> 1.925000000 G
.0					<b>CF St</b> 92.500000 M <u>Auto</u> M
i.0					Freq Offs 0
art 1.0000 GHz				Stop 1.9250 GHz	

#### [Downlink High]-2





## [Downlink High]-3

a RL   RF  50 Ω AC   Center Freq 1.998000000 0	CORREC SENSE:INT GHZ PNO: Wide ↔ Trig: Free Run IFGain:Low #Atten: 20 dB	#Avg Type: RMS Avg Hold: 20/20	07:35:17 AM Jan 29, 2016 TRACE 1 2 3 4 5 6 TYPE A WWWW DET A A A A A A	Frequency
0 dB/div Ref 0.00 dBm		Mkr1	1.996 164 GHz -35.864 dBm	Auto Tuno
10.0			-13.00 dBm	Center Fre 1.998000000 GH
30.0				Start Free 1.996000000 GH
50.0	ne Departmente de provincio de la provinció de	10124-2012-2012-2012-2012-2012-2012-2012	RMS	<b>Stop Fre</b> 2.000000000 GH
60.0				CF Ste 400.000 kH Auto Ma
30.0				Freq Offs 0 F
90.0 Start 1.996000 GHz Res BW 100 kHz	#VBW 300 kHz*	#Sween	top 2.000000 GHz 100 ms (1001 pts)	

#### [Downlink High]-4



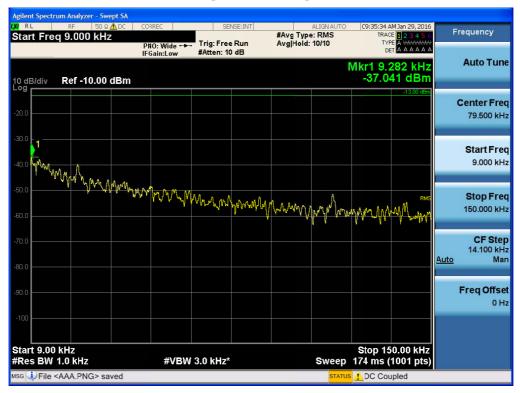


#### [Downlink High]-5





# Single channel Enhancer Plots of Spurious Emission for PCS1900 BAND LTE 10MHz Conducted Spurious Emissions (9 kHz – 150 kHz)



#### [Downlink Low]

#### [Downlink Middle]



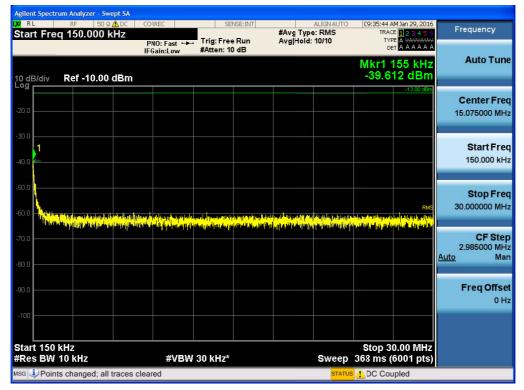


## [Downlink High]



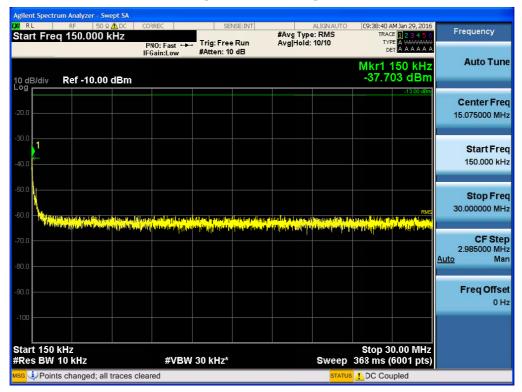


#### Conducted Spurious Emissions (150 kHz - 30 MHz)



#### [Downlink Low]

#### [Downlink Middle]





# [Downlink High]

RL RF 50 Q 🗘 DC	CORREC SEN	ISE:INT ALIGN AUTO	C9:45:22 AM Jan 29, 2016	
tart Freq 150.000 kHz	PNO: Fast ↔ Trig: Free IFGain:Low #Atten: 10		TRACE 123456 TYPE A WATAWAY DET A A A A A A	Frequency
dB/div Ref -10.00 dBm			Mkr1 160 kHz -38.537 dBm	Auto Tur
			-13.00 dBm	Center Fre
				15.075000 MH
1.0				Start Fre
				150.000 ki
).0 <b>.</b>			. RMS	Stop Fre 30.000000 MI
		n a fa de la factura de la La factura de la factura de		
0.0				CF Sto 2.985000 M Auto M
j.o				Freq Offs 0
100				
tart 150 kHz Res BW 10 kHz	#VBW 30 kHz*		Stop 30.00 MHz 368 ms (6001 pts)	



#### Conducted Spurious Emissions (30 MHz – 1 GHz)

#### [Downlink Low]



#### [Downlink Middle]





# [Downlink High]

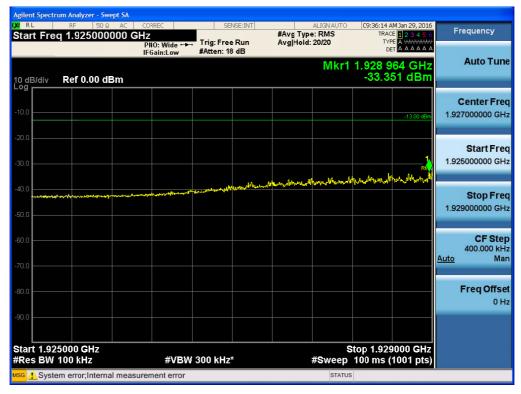
RL RF 50Ω AC Start Freq 30.000000 MH	PNO: Fast ↔ Trig:		ALIGNAUTO Avg Type: RMS vg Hold: 20/20	C9:45:31 AM Jan 29, 2016 TRACE 1 2 3 4 5 6 TYPE A WWWW DET A A A A A A	Frequency
0 dB/div Ref -10.00 dBm			Mł	r1 905.04 MHz -48.696 dBm	Auto Tun
20.0				-13.00 dBm	Center Fre 515.000000 MH
10.0				↓1 FMS	Start Fre 30.000000 MH
	n ny pang tang ang aki kang mang di Sah d Ba di ya di sa di sa di sa di sa di Sah d Sah di ya di sa di sa di sa di Sah	nn feith far an faith an an an tha faith an an an Anna Ng John Thair a Barmeira an ann an Anna Alb	ner a har ea fan a stran fan die	teren byrest dalen filmteter genede dele ny genede an beken filmteter genede af einer genede an beken filmteter genede af einer	<b>Stop Fre</b> 1.000000000 GH
0.0					CF Ste 97.000000 Mi <u>Auto</u> Mi
0.0					Freq Offs 0 I
100					



#### Conducted Spurious Emissions (1 GHz – 26.5 GHz)

		um Analyzer									
Star		RF 1.0000			SE	NSE:INT	#Avg Typ	ALIGNAUTO e: RMS		M Jan 29, 2016	Frequency
ener		q 1.0000	00000 C	PNO: Fast IFGain:Low			AvgHold		TYF		
10 dE Log	3/div	Ref -10.	00 dBm					M	kr1 1.910 -33.0	73 dBm	Auto Tune
-20.0										-13.00 dBm	Center Freq 1.462500000 GHz
-30.0 -40.0	wooden	hillion hard a handa	rtenantini	uryen <sup>d</sup> aar <del>e Toppel</del> ol	(Malationalisedes.lastrona	etastastasteriastek	unin alaanii y	<b>4</b> 14417744426004	on Muniperiology	Riv Alay hivaniyyaidyi V	<b>Start Freq</b> 1.000000000 GHz
-50.0 -60.0											<b>Stop Freq</b> 1.925000000 GHz
-70.0											<b>CF Step</b> 92.500000 MHz <u>Auto</u> Man
-90.0											Freq Offset 0 Hz
		00 GHz 1.0 MHz		#VE	3W 3.0 MHz	*		Sweep	Stop 1.9	9250 GHz 2001 pts)	
MSG 🤇	Point	ts changed;	all traces of	cleared				STATU			

#### [Downlink Low]-1





# [Downlink Low]-3

RL RF 50Ω AC tart Freq 1.996000000 G	CORREC HZ PNO: Wide ++	SENSE:INT	ALIGN AUTO #Avg Type: RMS Avg Hold: 20/20	C9:36:24 AM Jan 29, 2016 TRACE 1 2 3 4 5 6 TYPE A WWWWW	Frequency
dB/div Ref 0.00 dBm	IFGain:Low	#Atten: 20 dB	Mkr1	1.996 012 GHz -38.628 dBm	Auto Tun
<b>0</b> .0				-13.00 dBm	Center Fre 1.998000000 GH
0.0					<b>Start Fre</b> 1.996000000 GI
0.0 <b>*******************************</b>		9-9-45-5-48-549-48-5-49-5-5-5-5-5-5-5-5-5-5-5-5-5-5-5-5-5-	**************************************	RMS	<b>Stop Fr</b> 2.000000000 G
a.a 					<b>CF Ste</b> 400.000 kl <u>Auto</u> M
0.0					Freq Offs 0
tart 1.996000 GHz Res BW 100 kHz	#\/B\A	/ 300 kHz*		top 2.000000 GHz 100 ms (1001 pts)	

tart Fre	RF 50 Ω <b>q 2.0000000</b>	PN	0:Fast ↔→			#Avg Type Avg Hold:		TRAC TYP	M Jan 29, 2016 E <mark>1 2 3 4 5 6</mark> E A <del>VIVIVIVI</del> T A A A A A A A	Frequency
0 dB/div	Ref -10.00 d		ain:Low	#Attent			Mk		3 5 GHz 96 dBm	Auto Tune
20.0									-13.00 dBm	<b>Center Fre</b> 2.500000000 GH
30.0 40.0	y2.0 <sup>-</sup> 10 <sup>7</sup> 10 (1977-1977-1977-1977-1977-1977-1977-1977	Analysia and a state of the sta	niger-open-sectors.	oneg.com.edua.dog.c	aataa qooyiyiyiyootaalaayaa		filiteration and the party is	ylategi yevnarti yeliyyi sayloy	RMS	<b>Start Fre</b> 2.000000000 GH
60.0										Stop Fre 3.000000000 G⊦
70.0										CF Ste 100.000000 MH <u>Auto</u> Ma
0.0										Freq Offs 0 F
Start 2.00			4\/B\M	2.0 8411-2			Puroon	Stop 3.0	0000 GHz	
	1.0 MHZ ts changed; all tr	aces cleare		' 3.0 MHz <sup>•</sup>			Sweep	•	2001 pts)	







## [Downlink Middle]-1

RL RF 50 Ω		SENSE:INT	ALIGNAUTO	C9:38:59 AM Jan 29, 2016	Frequency
tart Freq 1.000000	IUU GHZ PNO: Fast ↔ IFGain:Low	→ Trig: Free Run #Atten: 16 dB	#Avg Type: RMS Avg Hold: 20/20	TRACE 123456 TYPE A WWWWW DET A A A A A A	
dB/div Ref -10.00 c	IBm		Mk	r1 1.569 8 GHz -33.052 dBm	Auto Tui
				-13.00 dBm	<b>Center Fr</b> 1.462500000 G
0.0 .0 .0	ningen syktet van de skielen de se	Angleson angleson angleson ang	1 	RMS พระบุทุ/ข่าสงสุรัญโปญญาไทยที่สุขางที่มา	<b>Start Fr</b> 1.000000000 G
0.0					<b>Stop Fr</b> 1.925000000 G
					<b>CF St</b> 92.500000 M <u>Auto</u> N
.0					Freq Offs 0
art 1.0000 GHz				Stop 1.9250 GHz	
Res BW 1.0 MHz	40/01/	/ 3.0 MHz*	Sweep	1.20 ms (2001 pts)	

Start Fre	q <b>1.925000</b>	000 GH	NO: Wide 中	Trig: Fre		#Avg Type Avg Hold:		TRAC TYP	M Jan 29, 2016 E 1 2 3 4 5 6 E A WAMAAAA T A A A A A A A	Frequency
10 dB/div	Ref 0.00 d		Gain:Low	#Atten: 1	3 dB		Mkr1	1.928 9	56 GHz 71 dBm	Auto Tune
-10.0									-13.00 dBm	Center Fre 1.927000000 GH
30.0									1	<b>Start Fre</b> 1.925000000 GH
40.0 50.0	na nga tailan (kang an	a geographic de la chraine			an a	trapt grand to some of the		*****		Stop Fre 1.929000000 G⊢
70.0										CF Ste 400.000 kH Auto Ma
30.0										Freq Offs 0 F
	5000 GHz 100 kHz		#VBV	V 300 kHz	*		S #Sweep	top 1.929 100 ms (	0000 GHz 1001 pts)	



## [Downlink Middle]-3

a RL RF 50Ω AC Start Freq 1.996000000 GH	CORREC Z PNO: Wide +++ IFGain:Low	SENSE:INT Trig: Free Run #Atten: 20 dB	ALIGNAUTO #Avg Type: RMS Avg Hold: 20/20	C9:39:20 AM Jan 29, 2016 TRACE 1 2 3 4 5 6 TYPE A WWWWW DET A A A A A A	Frequency
0 dB/div Ref 0.00 dBm			Mkr	1.996 048 GHz -38.647 dBm	Auto Tune
10.0				-13.00 dBm	Center Fre 1.998000000 GH
20.0 30.0					<b>Start Fre</b> 1.996000000 GH
40 0 <b>-</b>	1999 - January Stranger, January 1999 - January 19 		19-001-9-00-04-00-00-00-00-00-00-00-00-00-00-00-	RMS	<b>Stop Fre</b> 2.000000000 GH
70.0					CF Ste 400.000 k⊢ <u>Auto</u> Ma
90.0					Freq Offse 0 H
Start 1.996000 GHz Res BW 100 kHz	#\/B\/	300 kHz*	#Sween	Stop 2.000000 GHz	

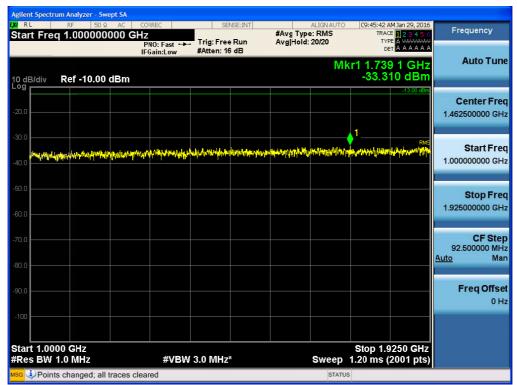
	um Analyzer - Swept SA							
Start Fre	RF 50 Ω AC q 2.0000000000		SENSE:INT	#Avg Type:		TRAC	M Jan 29, 2016 E 1 2 3 4 5 6 E A WANNAN	Frequency
		PNO: Fast ↔ IFGain:Low	. Trig: Free Run #Atten: 14 dB	Avg Hold: 1		DE		Auto Tuno
10 dB/div Log	Ref -10.00 dBm	1			Mk	r1 2.668 -34.10	3 0 GHz 62 dBm	Auto Tune
							-13.00 dBm	Center Freq
-20.0								2.500000000 GHz
-30.0				1				
Maghelan Market	معماريه والمراجعة والمراجعة والمراجعة والمراجعة	personal and a second second	a transmission apoption and the second second	after an and the second second	Capacitat Haster Ma	ander an arterian	RMS Alexandrogen Alexandro	Start Freq 2.000000000 GHz
-40.0								2.0000000000000
-50.0								Stop Freq
-60.0								3.000000000 GHz
								05.04
-70.0								CF Step 100.000000 MHz
-80.0								<u>Auto</u> Man
-90.0								Freq Offset
								0 Hz
-100								
Start 2.00	00 GH7					Ston 3.0	000 GHz	
#Res BW		#VBW	3.0 MHz*		Sweep		2001 pts)	
мsg 🕹 Poin	ts changed; all traces	s cleared			STATUS	5		







## [Downlink High]-1





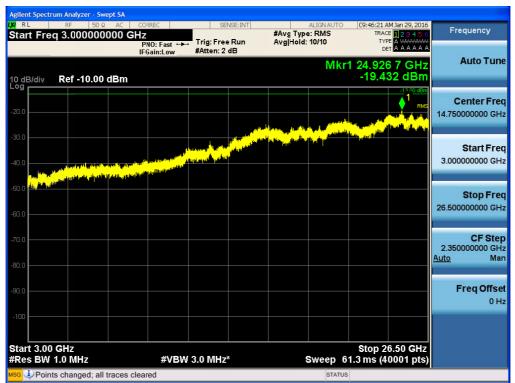


## [Downlink High]-3

r∟	PNO: Wide ↔	SENSE:INT Trig: Free Run #Atten: 20 dB	ALIGN AUTO #Avg Type: RMS Avg Hold: 20/20	C9:46:02 AM Jan 29, 2016 TRACE 1 2 3 4 5 6 TYPE A WWWW DET A A A A A A	Frequency
0 dB/div Ref 0.00 dBm	IFGain:Low	#Atten: 20 dB	Mkr1	1.996 100 GHz -36.103 dBm	Auto Tun
10.0				-13.00 dBm	Center Fre 1.998000000 G⊢
30.0					Start Fre 1.996000000 G⊦
50.0		14 age 21 - 24 a marting & 2 - 24 a		RMS	<b>Stop Fre</b> 2.000000000 GH
70.0					CF Ste 400.000 kł Auto Ma
10.0					Freq Offs 0 F
300 0 Start 1.996000 GHz Res BW 100 kHz	<i>*</i> 2004	300 kHz*	\$ #0	top 2.000000 GHz 100 ms (1001 pts)	









# Single channel Enhancer Plots of Spurious Emission for PCS1900 BAND LTE 20MHz Conducted Spurious Emissions (9 kHz – 150 kHz)



#### [Downlink Low]

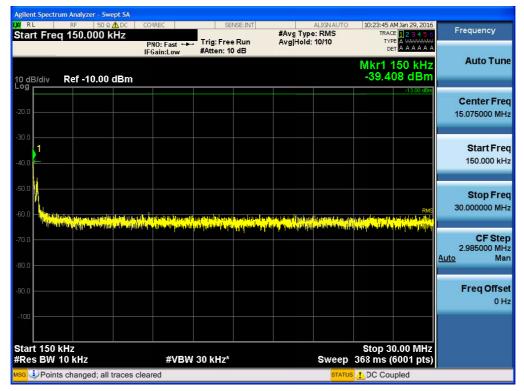




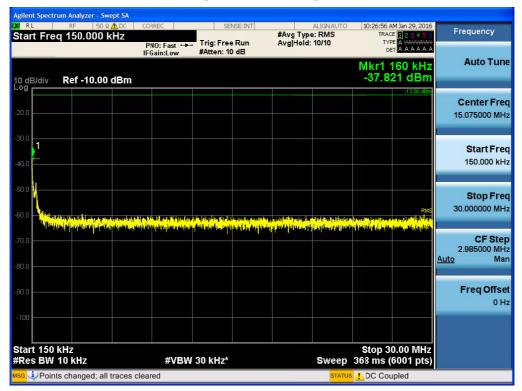




## Conducted Spurious Emissions (150 kHz - 30 MHz)



### [Downlink Low]



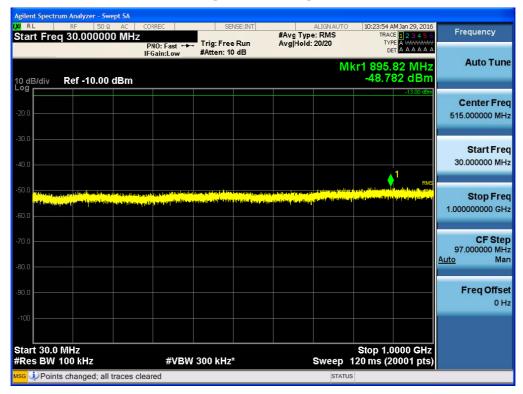


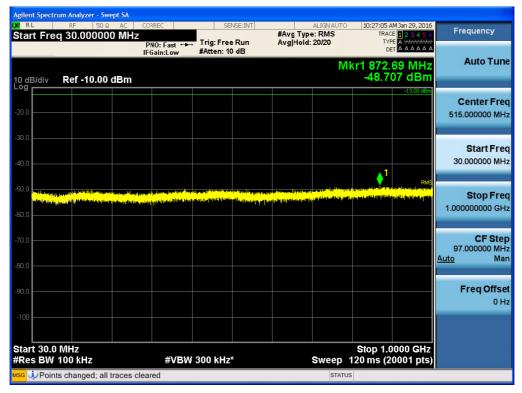
RL	Im Analyzer - Swept SA RF 50 Ω ▲ DC	CORREC	SE	NSE:INT		ALIGN AUTO	10:29:53 AM Jan 29	9,2016	
Start Free	q 150.000 kHz	PNO: Fast ↔ IFGain:Low		Run	#Avg Typ Avg Hold:		TRACE 1 2 3 TYPE A WW DET A A A	456	Frequency
0 dB/div	Ref -10.00 dBm						Mkr1 150 -37.965 d	kHz Bm	Auto Tun
. <sup>og</sup>							-13.	00 dBm	
									Center Fre
30.0									15.075000 MH
30.0									Start Fre
40.0 <b>É</b>									150.000 kH
50.0 4									_
10.0									Stop Fre
50.0 <b>1</b> 1								RMS	30.000000 MH
	din and a statistic state and			alah di di di dala Manangan di dalam di Manangan di dalam di				<mark>V N</mark> epe	
70.0									CF Ste
									2.985000 M
30.0								Aut	<u>o</u> M
90.0									Freq Offs
									01
100									
tart 150   Res BW		#\/B\/	/ / 30 kHz*			Sween	Stop 30.00   368 ms (6001		
KCS DVV		# 4 10 4				Sweep	<del>303 ms</del> (000 i	pts)	



### Conducted Spurious Emissions (30 MHz – 1 GHz)

#### [Downlink Low]







r∟ r⊧ 50 ହ Start Freq 30.000000 ।	AC CORREC MHZ PNO: Fast ↔ IFGain:Low	SENSE:INT Trig: Free Run #Atten: 10 dB	ALIGNAUTO #Avg Type: RMS Avg Hold: 20/20	10:30:03 AM Jan 29, 2016 TRACE 1 2 3 4 5 6 TYPE A WWWWW DET A A A A A A	Frequency
0 dB/div Ref -10.00 dE	3m		М	kr1 869.68 MHz -48.058 dBm	Auto Tun
20.0				-13.00 dBm	Center Fre 515.000000 M⊦
0.0				↓ <sup>1</sup> arr	Start Fre 30.000000 MF
0.0 Na se	andan dikura na na kata kata kata kata kata kata ka	generation and the second s Second second	ny ja agan kina tang mga pangan na kanang	n an Loren III de andre Ller et beseerte Angeler (1997 - 1997) en le serte de la participation de la participation de la participation de la participation La participation de la particip	<b>Stop Fre</b> 1.000000000 GH
					97.000000 M
					CF Ste 97.000000 MH <u>Auto</u> Ma Freq Offs 0 H



### Conducted Spurious Emissions (1 GHz – 26.5 GHz)

		um Analyze		SA								
LXI RI		<sub>RF</sub> q 1.000			REC	SEF	NSE:INT	#Avg Type	ALIGN AUTO		M Jan 29, 2016	Frequency
Sta	THE	q 1.000	00000	PN	0: Fast ↔ ain:Low	, Trig: Free #Atten: 16		Avg Hold:	20/20	TYF Di		Auto Tune
10 dE Log	3/div	Ref -10	).00 dE	3m					Mk	(r1 1.80) -33.0	7 1 GHz 22 dBm	Auto Tune
-20.0											-13.00 dBm	Center Freq 1.462500000 GHz
-30.0 -40.0	terreterrety	******	niniq'inq (ri	ndistans) data data data data data data data dat	hi hi fay ta tha an i fa	haltaninaturtaniatatata	ำเหขาง เ	vi-innthynthythythythythythythythythythythythythyt	Yar-Alingori, pati ya	nvilutiontificity	rms glui linn na Minn	Start Freq 1.000000000 GHz
-50.0 -60.0												Stop Freq 1.925000000 GHz
-70.0 -80.0												<b>CF Step</b> 92.500000 MHz <u>Auto</u> Man
-90.0												Freq Offset 0 Hz
		00 GHz 1.0 MHz			#VBV	V 3.0 MHz'			Sweep		250 GHz 2001 pts)	
MSG 🤇	Point	s change	d; all tra	ces cleare	ed				STATUS	3		

### [Downlink Low]-1

#### [Downlink Low]-2





## [Downlink Low]-3

RL RF 50Ω AC		. Trig: Free Run #Atten: 20 dB	ALIGNAUTO #Avg Type: RMS Avg Hold: 20/20	10:24:25 AM Jan 29, 2016 TRACE 1 2 3 4 5 6 TYPE A WWWWW DET A A A A A A	Frequency
0 dB/div Ref 0.00 dBm	IF Gall.LOW	Million 20 4B	Mkr1	1.996 092 GHz -38.284 dBm	Auto Tun
				-13.00 dBm	<b>Center Fre</b> 1.998000000 GH
20.0 30.0					<b>Start Fre</b> 1.996000000 GF
50.0	miningerige of particular and			RMS	<b>Stop Fre</b> 2.000000000 GH
70.0					CF Ste 400.000 kH Auto Ma
0.0					Freq Offs 0 F
etart 1.996000 GHz Res BW 100 kHz	#\/B\A	7 300 kHz*	s #Sween	top 2.000000 GHz 100 ms (1001 pts)	

## [Downlink Low]-4

a RL Start Free	RF 50 Ω AC q 2.000000000	GHz PNO: Fast ↔	SENSE:INT Trig: Free Run #Atten: 14 dB	#Avg Type Avg Hold:		TRAC TYP	M Jan 29, 2016 E 1 2 3 4 5 6 E A WWWWW	Frequency
0 dB/div	Ref -10.00 dBr	IFGain:Low	#Atten: 14 db		Mk	r1 2.681		Auto Tune
- <b>og</b>							-13.00 dBm	<b>Center Fre</b> 2.500000000 GH
30.0 40.0	มาสาขางสารเสราะการเสราะการเสราะการทำ	aan giban digaal galaga di sangga Talaya da ang	and a start of the second start			*****	RMS	<b>Start Fre</b> 2.000000000 GH
50.0								<b>Stop Fre</b> 3.000000000 G⊦
0.0								CF Ste 100.000000 MH Auto Ma
90.0								Freq Offs 0 F
itart 2.00						Stop 3.0	000 GHz	
Res BW	1.0 MHz is changed; all trace		3.0 MHz*		Sweep		2001 pts)	

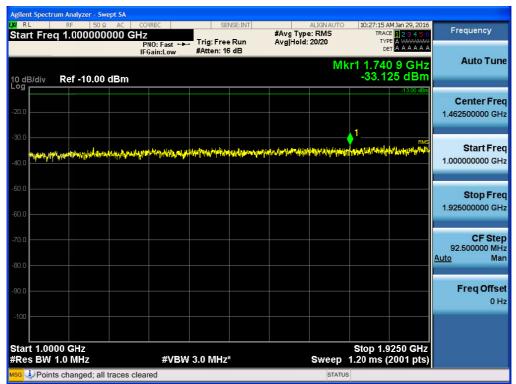


## [Downlink Low]-5





## [Downlink Middle]-1



Agilent Spectr	rum Analyzer - Swept SA RF 50 Ω AC	CORREC	SENSE:INT		LIGNAUTO	10:27:26 AM Jan 29, 2016	
	q 1.925000000			#Avg Type: Avg Hold: 2	RMS	TRACE 123456 TYPE A WARANAN	Frequency
10 dB/div	Ref 0.00 dBm	IFGain:Low	#Atten: 18 dB		Mkr1 1	.928 604 GHz -40.302 dBm	Auto Tune
-10.0						-13.00 dBm	Center Fred 1.927000000 GH:
30.0							<b>Start Fre</b> 1.925000000 GH
40.0	ราวันที่ขอ <mark>ง</mark> หารางทำออนกอยไหว้างสุขากประกง	nagana ay nakalahan jing minakalaha		understand gescher Umper einer Ausen werten der	ม <del>งสู่</del> กระมากกระบาทก-ปุลปร	RMS	<b>Stop Fre</b> 1.929000000 GF
70.0							CF Ste 400.000 kH <u>Auto</u> Ma
30.0							Freq Offs 0 F
	25000 GHz 100 kHz	# <u>VBM</u>	/ 300 kHz*	#	Sto Sweep _1	p 1.929000 GHz 00 ms (1001 pts)	
	ts changed; all traces	s cleared			STATUS		



## [Downlink Middle]-3

Start Freq 1.996000000 GH	CORREC Z PNO: Wide +++ IFGain:Low	SENSE:INT Trig: Free Run #Atten: 20 dB	#Avg Type: RMS Avg Hold: 20/20	0 10:27:36 AM Jan 29, 2016 TRACE 1 2 3 4 5 6 TYPE A WWWW DET A A A A A A	Frequency
0 dB/div Ref 0.00 dBm			Mkr	1 1.996 068 GHz -38.322 dBm	Auto Tuno
				-13.00 dBm	Center Fre 1.998000000 GH
30.0 <b>1</b>					<b>Start Fre</b> 1.996000000 GH
40.0 <b>********************************</b>	*****	Augusta Tartigori Bugara Godora (100	len Maria Intellina en al esta de la compositione de la compositione de la compositione de la compositione de l	RMS	<b>Stop Fre</b> 2.000000000 GF
/0.0					CF Ste 400.000 kH <u>Auto</u> Ma
30.0					Freq Offse 0 ⊦
Start 1.996000 GHz Res BW 100 kHz	#VBW	300 kHz*	#Swee	Stop 2.000000 GHz p 100 ms (1001 pts)	

Agilent Spectrum Analyzer - Swept	AC CORREC	SENSE:INT	ALIGN AUT		Frequency
Start Freq 2.00000000	DU GH2 PNO: Fast ↔→ IFGain:Low	Trig: Free Run #Atten: 14 dB	Avg Hold: 100/100		Auto Tune
10 dB/div Ref -10.00 dE	Autorune				
-20.0				-13.00 dBm	Center Free 2.500000000 GH;
-30.0	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~,~?\q.e-y`g.yy'Ya~di bika( <sup>au</sup> d <sup>a</sup> `di'ya <sup>b</sup> agi		RMS	Start Free 2.000000000 GH
60.0					Stop Fre 3.000000000 GH
80.0					CF Ste 100.000000 M⊢ <u>Auto</u> Ma
90.0					FreqOffse 0 ⊢
Start 2.0000 GHz #Res BW 1.0 MHz	#VBW	3.0 MHz*	Sweep	Stop 3.0000 GHz 1.33 ms (2001 pts)	
и <mark>sg</mark> ЏРоints changed; all tra	aces cleared		STAT	US	







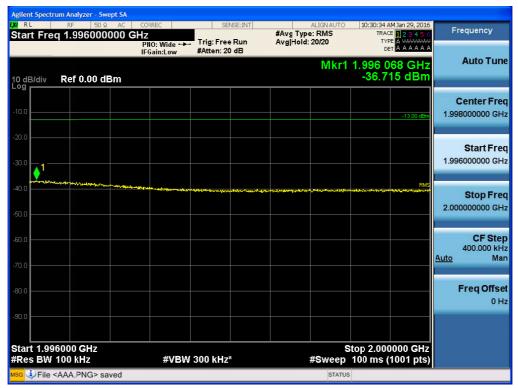
## [Downlink High]-1

RL RF Start Freq 1.00	0000000 GH	DRREC 2 2 2NO: Fast ++-	Trig: Free		#Avg Type Avg Hold:		TYPE	an 29, 2016 2 3 4 5 6 WWWWWW A A A A A	Frequency
0 dB/div Ref -	۳ 10.00 dBm	Gain:Low	#Atten: 16	6 dB		Mk	r1 1.922 7 -33.170	/ GHz	Auto Tun
20.0								-13.00 dBm	Center Fre 1.462500000 GH
30.0 40.0	hjmblentinisteren anter anter	powerthe production of the	n an	n <sup>a</sup> laya <sup>d</sup> alahiya kati ka	a fresterikereterik	₩ <mark>₽</mark> ₽₽ <mark>₩₽</mark> ₩₽₩₽₩₽₩₽₩₽	terestation de la constantion de la con	RM.	Start Fre 1.000000000 GF
50.0									<b>Stop Fr</b> 1.925000000 G
0.0									CF Sto 92.500000 M Auto M
0.0									Freq Offs 0
itart 1.0000 GH		#\/D\\\	3.0 MHz	*		Sweep	Stop 1.925 1.20 ms (20		





### [Downlink High]-3











# Single channel Enhancer Plots of Spurious Emission for PCS1900 BAND CDMA Conducted Spurious Emissions (9 kHz – 150 kHz)



#### [Downlink Low]

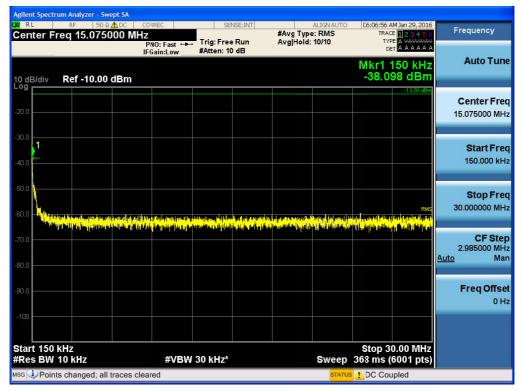








## Conducted Spurious Emissions (150 kHz – 30 MHz)



### [Downlink Low]

