# 9. RADIATED TEST RESULTS

# 9.1. LIMITS AND PROCEDURE

### <u>LIMITS</u>

FCC §15.205 and §15.209

Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

#### TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane. The antenna to EUT distance is 3 meters.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 1 MHz for peak measurements and as applicable for average measurements.

The spectrum from 30 MHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band.

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

#### TEST RESULT

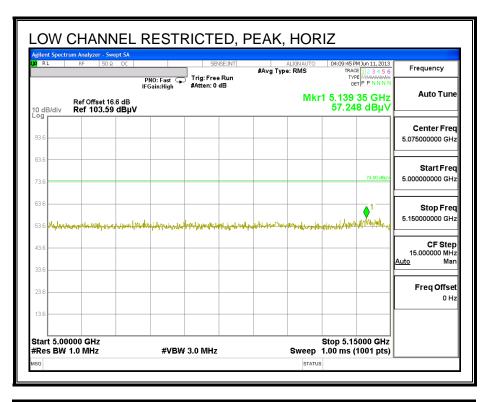
No other spurious emissions were found above 18G.

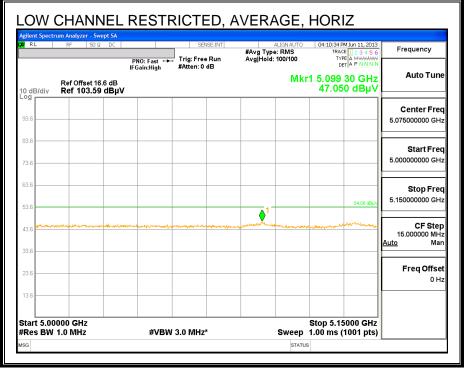
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# 9.2. TRANSMITTER ABOVE 1 GHz

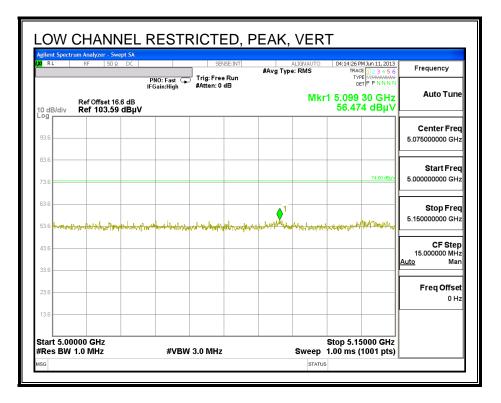
# 9.2.1. TX ABOVE 1 GHz 802.11a MODE IN THE 5.2 GHz BAND

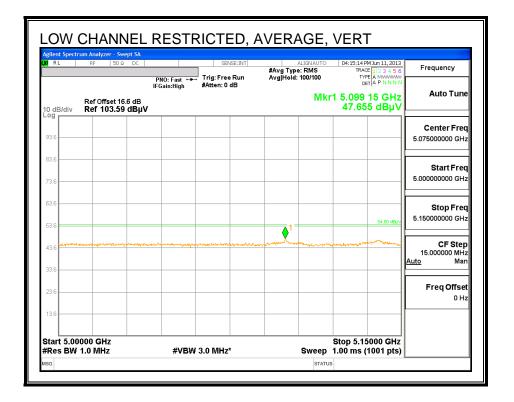
## RESTRICTED BANDEDGE (LOW CHANNEL)





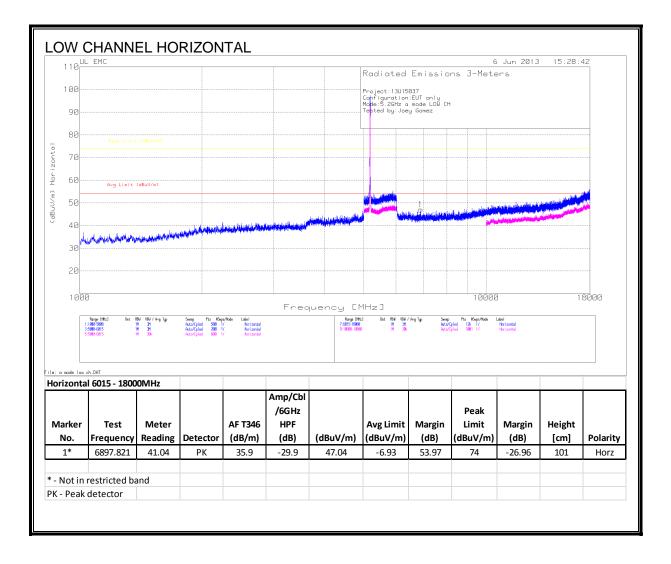
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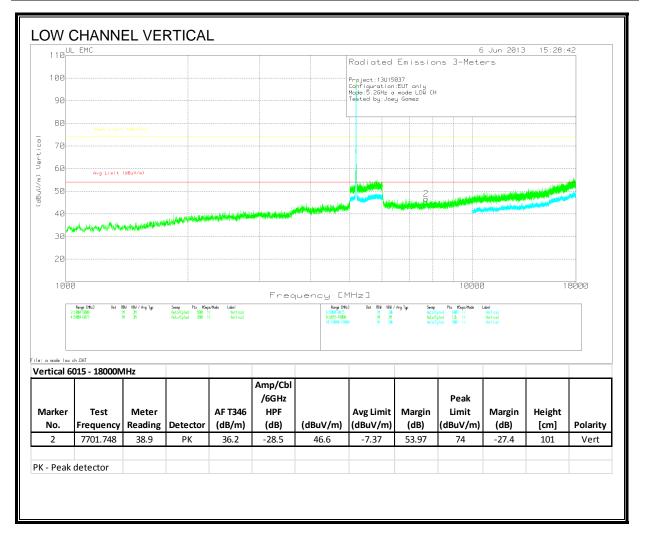


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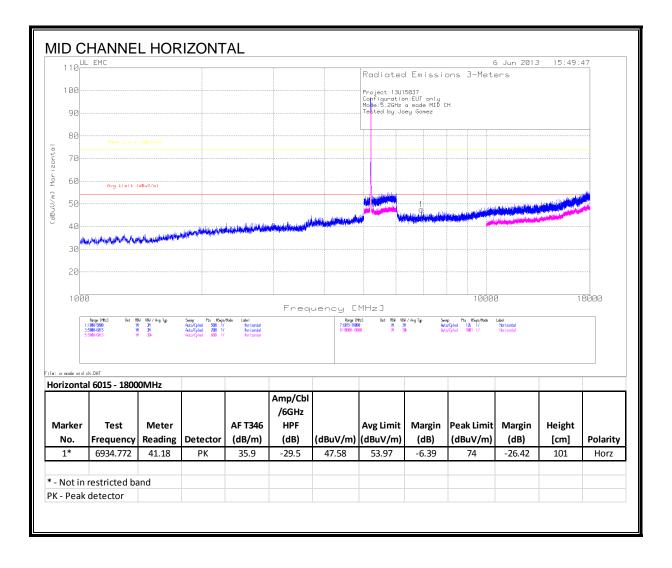
### HARMONICS AND SPURIOUS EMISSIONS



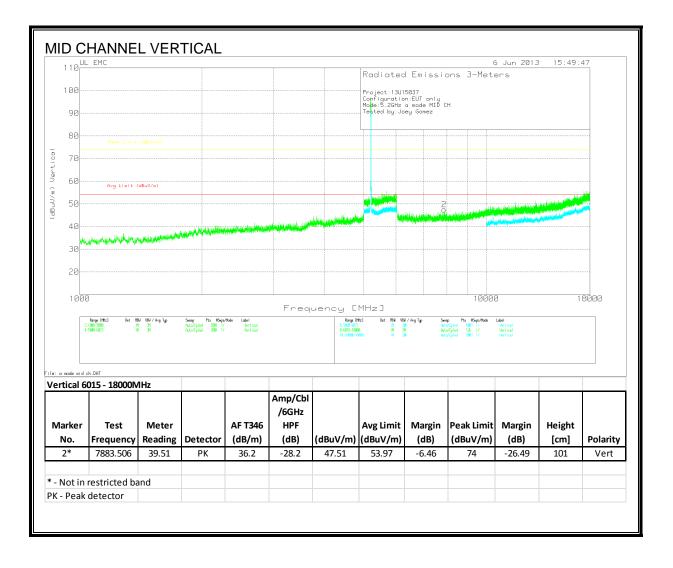
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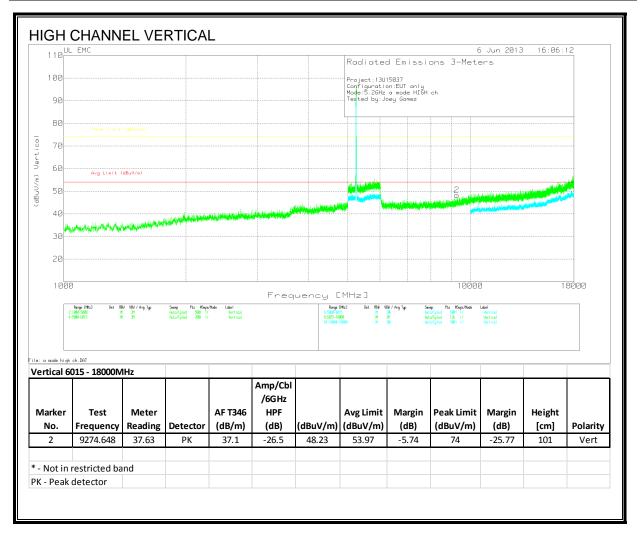
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110	CHANN									5 Jun 2013	16:06:	12
							Radiated	d Emissi	ons 3-Mete	ers		
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/ 8												
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	al 6015 - 1800	0MHz										
Aarker No.	Test Frequency	Meter Reading	Detector	AF T346 (dB/m)	Amp/Cbl /6GHz HPF (dB)	(dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Height [cm]	Polarity
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1 - Not in	restricted ba detector	ind										

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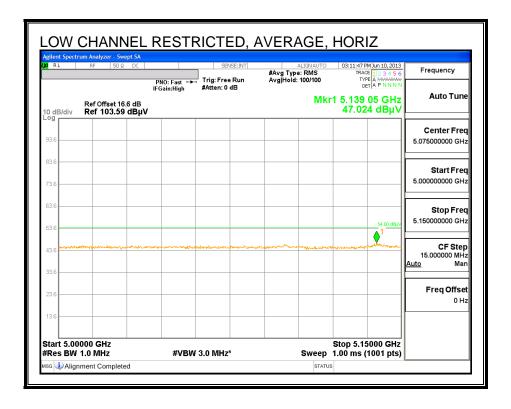


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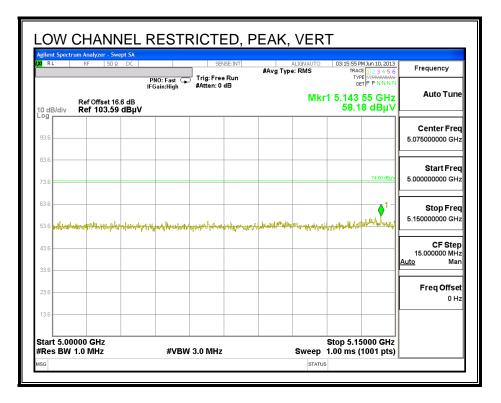
## 9.2.2. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 5.2 GHz BAND

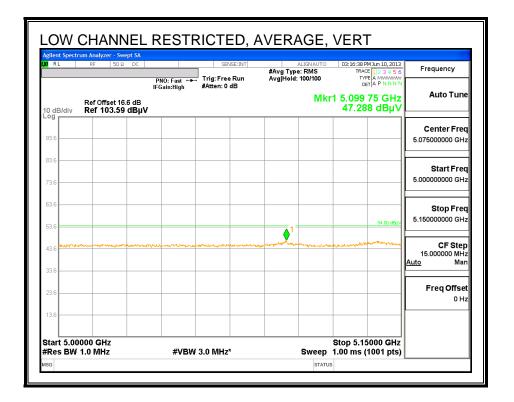
#### **RESTRICTED BANDEDGE (LOW CHANNEL)**

LOW CHANNEL RESTRICTED, PEAK, HORIZ SENSE:INT 0 03:09:57 PM Jun 10, 2013 #Avg Type: RMS Frequency TYPE MMMMMMM DET P P N N N PNO: Fast 🖵 IFGain:High Trig: Free Run #Atten: 0 dB Auto Tune Mkr1 5.139 20 GHz 56.844 dBµV Ref Offset 16.6 dB Ref 103.59 dBµV 10 dB/div **Center Freq** 5.075000000 GHz Start Freq 5.00000000 GHz Stop Frea 5.150000000 GHz al halfs, does CF Step 15.000000 MHz Auto Mar Freq Offset 0 Hz Stop 5.15000 GHz Start 5.00000 GHz #Res BW 1.0 MHz #VBW 3.0 MHz Sweep 1.00 ms (1001 pts) STATUS



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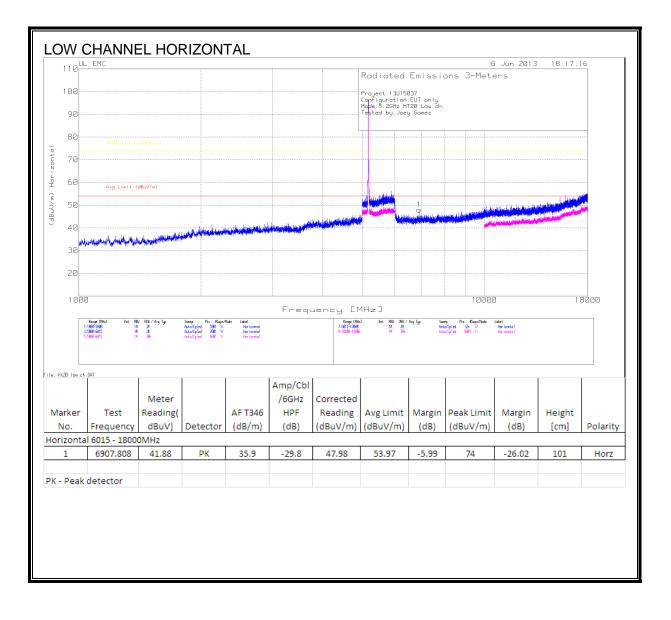




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### HARMONICS AND SPURIOUS EMISSIONS

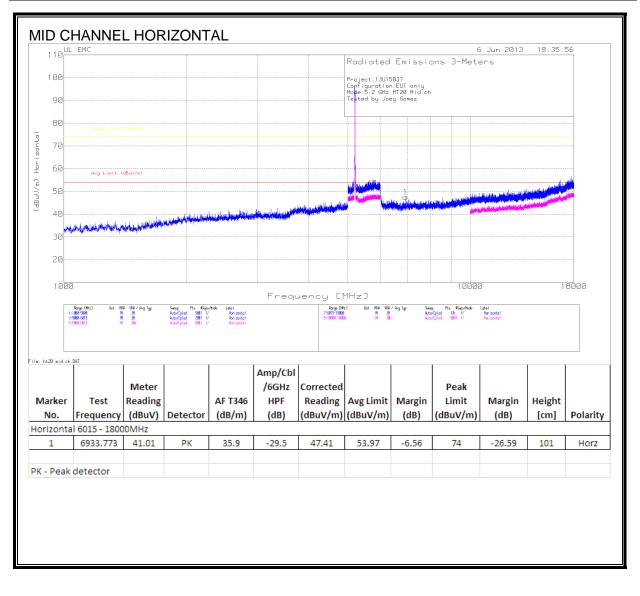


UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701H 47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888 This report shall not be reproduced except in full, without the written approval of UL Verification Services Inc.

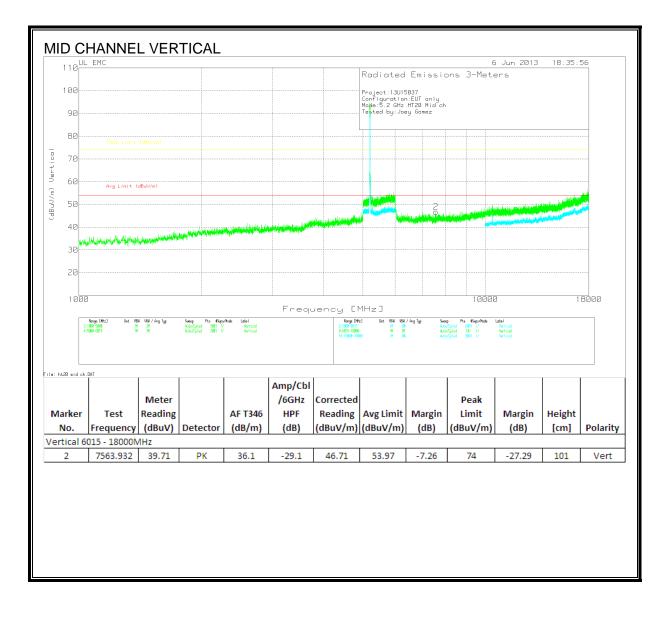
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110 <mark>0</mark>	L EMC				,					5 Jun 2013	8 18:17:	16
							Radiated	Emissi	ons 3-Mete	ers		
100							Project:13U15 Configuration	037 I:EUT only				
90							Project:13U15 Configuration Mode:5.2GHz H Tested by:Joe	IT20 Low ch Iy Gomez				
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70 60 50												
00	Avg Limit (	dBuV/m)										
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	Test	Meter Reading(		AF T346		1	Avg Limit		Peak Limit	Margin	Height	
			Detector	AF T346 (dB/m)	/6GHz	Corrected	-				Height [cm]	Polarity
ertical 6	Test Frequency 5015 - 18000M	Reading( dBuV) Hz		(dB/m)	/6GHz HPF (dB)	Corrected Reading (dBuV/m)	(dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	[cm]	
/larker No.	Test Frequency	Reading( dBuV)	Detector PK		/6GHz HPF	Corrected Reading	-	Margin	Peak Limit	Margin	-	Polarity
Marker No. ertical 6 2	Test Frequency 5015 - 18000M	Reading( dBuV) Hz		(dB/m)	/6GHz HPF (dB)	Corrected Reading (dBuV/m)	(dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	[cm]	

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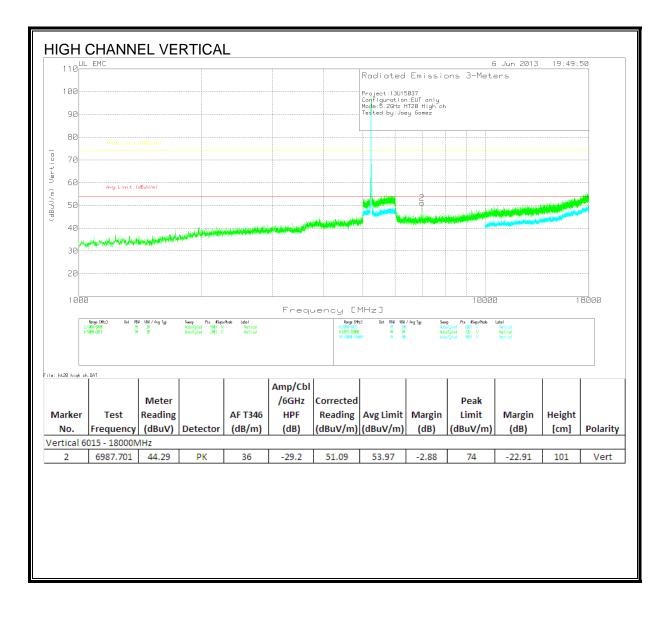
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110		EMC	EL HC								5 Jun 2013	19:49:	50
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10			NU UNU / Avg Typ 1 3H 1 3H	Sweep Pts #Swpr Auto/Opted 5681 1 Auto/Opted 2681 1	a/Node Label / Horizantal / Horizantal	Frequ	Lency El 7:6815-1886 9:18689-1886		WBW / Avg Typ Swe 3H Aut 3Bk Aut	np Pts KSwps/Mede a/Opled 12k 1/ a/Opled 9881 1/	Label Harizoata I Harizoata I	1	8000
			NI UNI/Avglyp 1 3H 1 3A 1 3A	Secop Pts Hop Ruto/Galed S981 In Ruto/Galed 3981 In Ruto/Caled 6981 In	s/Node Label / Horizantal / Horizantal / Horizantal	Frequ	_		VBW∕AngTyp Swa 3H Aut 3Bk Aut		Label Horizonta I	1	8000
t: ht20 hic	1:1 3:5 5:5	Peope (1942) Det 98 3995-3939 3990-6215 II 3990-6215 II 10 000-7	Meter	Swag Pto KSag Androfied Stell II Autorfield Stell II Autorfield Stell II		Amp/Cbl /6GHz	Corrected	z3 Det R8W IM 3 IM		Pts Kaps/Hode Poled 133, 1/ Colici 3931 1/	Label Horizontal Horizontal		
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marke No.	1:1 3:5 5:5 9h ch.	Rever (Micc) bet 89 488-481 B 488-481 B 488-481 B 488-481 B Frequency	Meter Reading (dBuV)		AF T346	Amp/Cbl /6GHz HPF	Corrected Reading	Avg Limi	t Margin	Peak Limit	Latel (Pricontal (Pricontal (Pricontal)	Height	
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: ht28 hid Vlarke No. Drizor 1	gh.ch.	баре (Mic) Det R 489-348 489-348 489-348 489-348 489-348 199 199 199 199 199 199 199 19	Meter Reading (dBuV)	Detector	AF T346 (dB/m)	Amp/Cbl /6GHz HPF (dB)	Corrected Reading (dBuV/m)	Avg Limi	t Margin ) (dB)	Peak Linit Vicini Vicini Peak Limit (dBuV/m)	Margin (dB)	Height [cm]	Polarity
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Marke No. 1	gh.ch.	баре (Mic) Det R 489-348 489-348 489-348 489-348 489-348 199 199 199 199 199 199 199 19	Meter Reading (dBuV)	Detector	AF T346 (dB/m)	Amp/Cbl /6GHz HPF (dB)	Corrected Reading (dBuV/m)	Avg Limi	t Margin ) (dB)	Peak Linit Vicini Vicini Peak Limit (dBuV/m)	Margin (dB)	Height [cm]	Polarity
Marke No. 0rizor	gh.ch.	баре (Mic) Det R 489-348 489-348 489-348 489-348 489-348 199 199 199 199 199 199 199 19	Meter Reading (dBuV)	Detector	AF T346 (dB/m)	Amp/Cbl /6GHz HPF (dB)	Corrected Reading (dBuV/m)	Avg Limi	t Margin ) (dB)	Peak Linit Vicini Vicini Peak Limit (dBuV/m)	Margin (dB)	Height [cm]	Polarity

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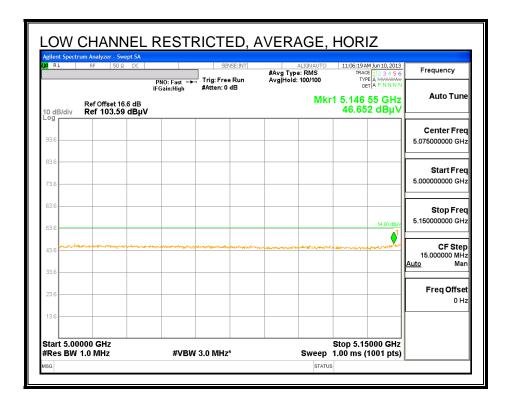


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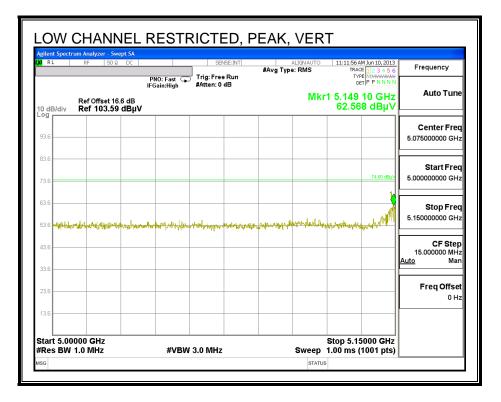
## 9.2.3. TX ABOVE 1 GHz 802.11n HT40 MODE IN THE 5.2 GHz BAND

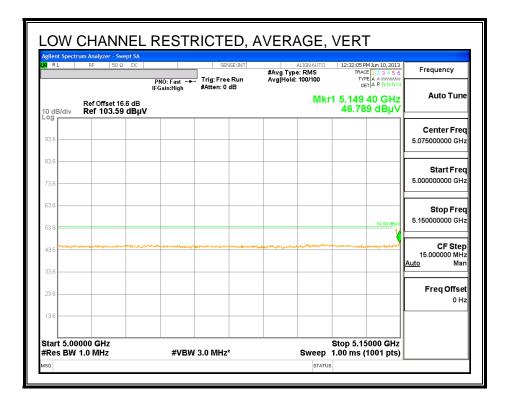
#### **RESTRICTED BANDEDGE (LOW CHANNEL)**

LOW CHANNEL RESTRICTED, PEAK, HORIZ SENSE:INT 0 11:02:32 AM Jun 10, 2013 #Avg Type: RMS Frequency TYPE MMM DET P P N PNO: Fast 🖵 IFGain:High Trig: Free Run #Atten: 0 dB Auto Tune Mkr1 5.146 85 GHz Ref Offset 16.6 dB Ref 103.59 dBµV 58.53 dBµV 10 dB/div **Center Freq** 5.075000000 GHz Start Freq 5.00000000 GHz Stop Frea 5.150000000 GHz اللماء الأرتقا وتر CF Step 15.000000 MHz Mar Auto Freq Offset 0 Hz Stop 5.15000 GHz Start 5.00000 GHz #Res BW 1.0 MHz #VBW 3.0 MHz Sweep 1.00 ms (1001 pts) STATUS



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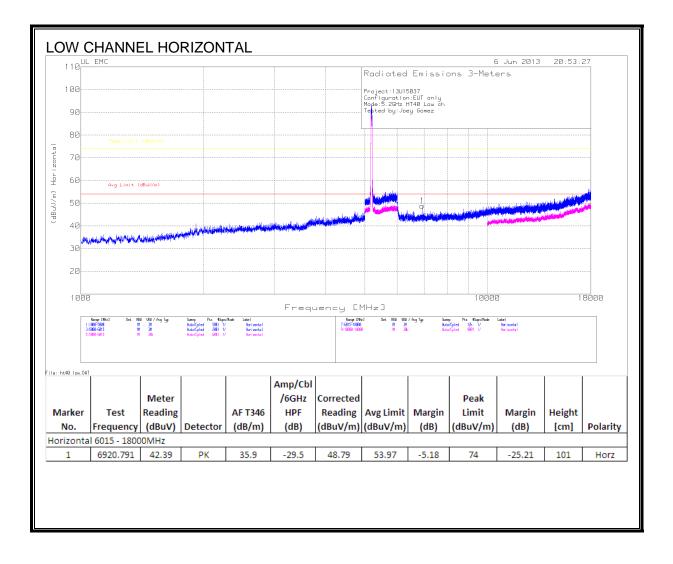




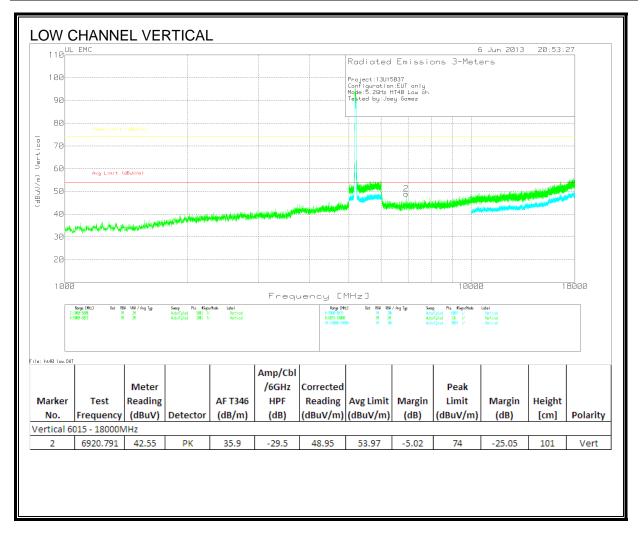
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### HARMONICS AND SPURIOUS EMISSIONS



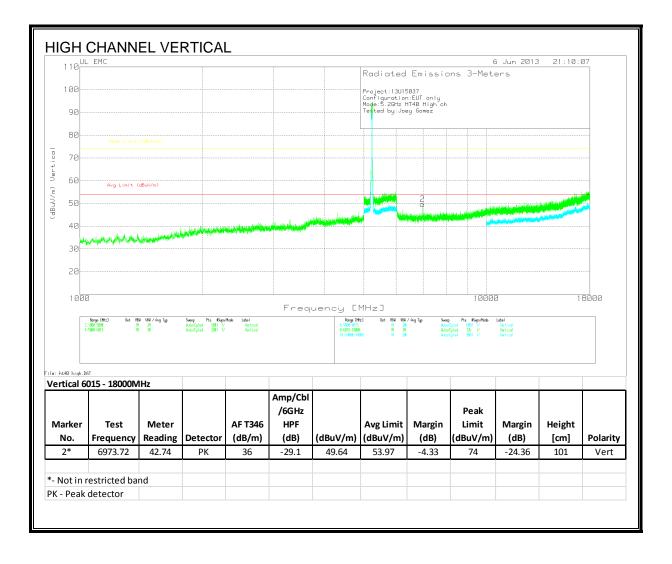
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e: ht40 high.D	T											
35	-5888-6815 1M -5888-6815 1M	3H 38k	Auto/Cpled 2881 1) Auto/Cpled 6881 1)	Horizantal Horizantal		9: 18889-188	NE IN 384	< Auto	/Upted 99881 1/	Her izonta l		
[	Parage (NHz) Det RB 1999-5808 IN 5989-5815 IN 5989-6815 IN	N UBN ∕Avg Typ 3M 3M	Sweep Pts #Swps Auto/Cpled 5081 1) Auto/Cpled 2081 1)	/Mode Label Horizantal	Freq	uency E 76015-1000 9:1002-100	EJ Det RSN VBN IN 341	/ Ang Typ Swee	p Pts Kixps/Made /Opted 12k 1/ /Opted 9831 1/	Label Harizonta I		
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. 80	Peak Limit											
90							Mode:5.2GHz H Tested by:Joe	1140 High ch ≊y Gomez				
100							Project:13U15 Configuration Mode:5.2GHz H	5037 h:EUT only				
	. EMC						Radiated	Emissio	ons 3-Met	5 Jun 2013 ens	3 21:10:	

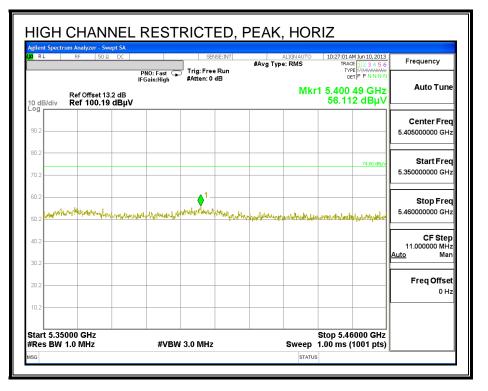
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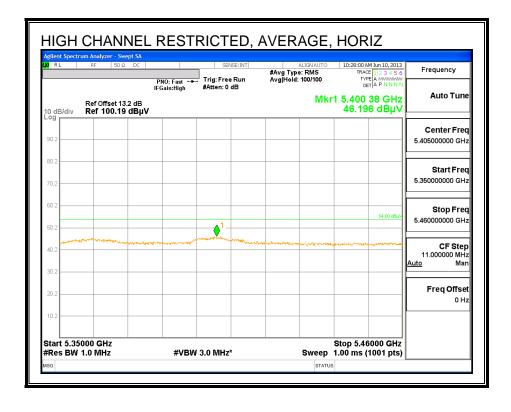


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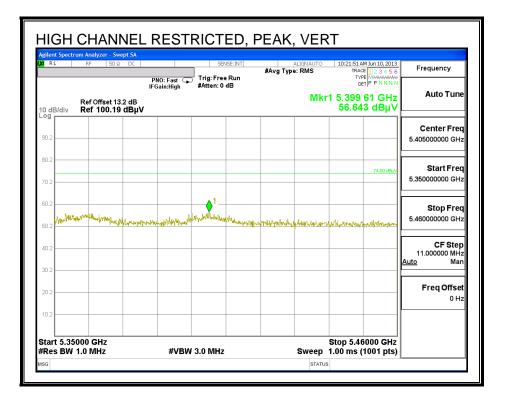
## 9.2.4. TX ABOVE 1 GHz 802.11a MODE IN THE 5.3 GHz BAND

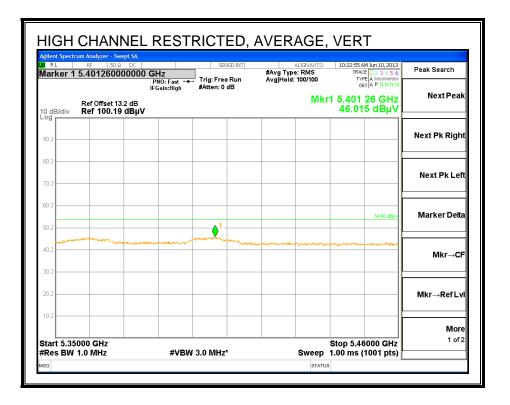
### **RESTRICTED BANDEDGE (HIGH CHANNEL)**





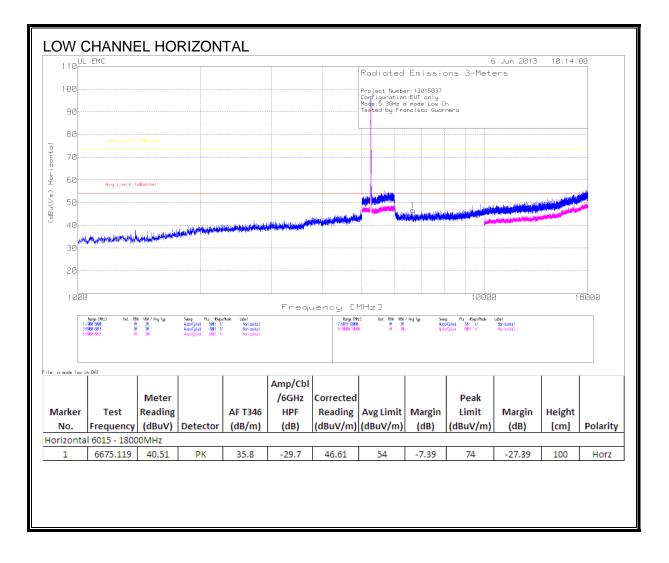
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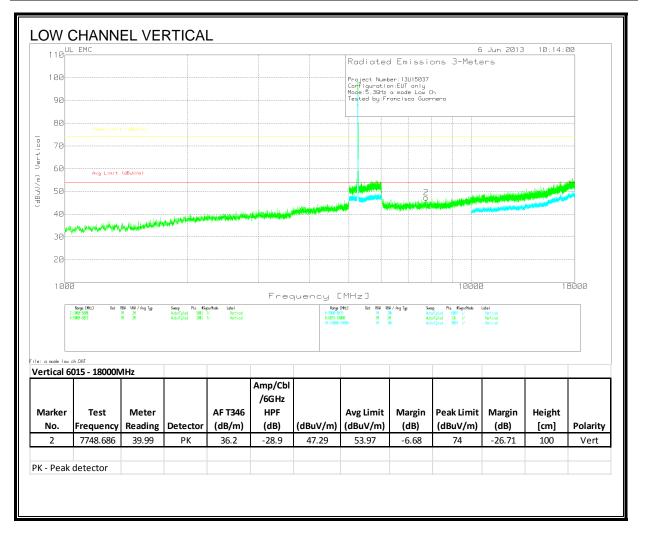


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### HARMONICS AND SPURIOUS EMISSIONS



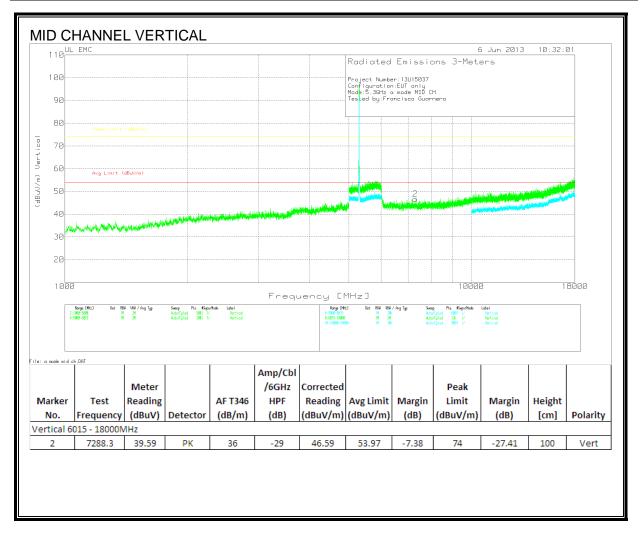
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11M—	_ EMC								6	5 Jun 2013	10:32:	01
110							Radiated	Emissio	ons 3-Met	ers		
100							Project Numbe Configuration Mode:5.36Hz (	er:13U15037 n:EUT onlu				
90							Mode:5.3GHz ( Tested by:Fr	a mode MIĎ C ancisco Guar	H nero			
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	- Rong- (NHz.) Det RB (1000-500 In (5000-6015 IN (5000-6015 In	N UBN ∕AvgTgp 30r 30r 30r	Sweep Pts Kings Ruto/Cgiled 5981 I/ Ruto/Cgiled 5981 I/ Ruto/Cgiled 5981 I/	Mode Label Horizantal Horizantal Horizantal	Freq	Range D 7:6815-198 9:1988-19	Hz] Det RBN UBN 8 IN 3M	i I/AngTgp See Aut k Auts		Label Herizota I Herizota I	1	8000
a mode nid	- Rong- (NHz.) Det RB :1080-508 IN :5080-6815 IN :5080-6815 IN		Seep Pto Hisps Anto/Cated Stell 1/ Anto/Cated 2001 1/ Anto/Cated 6001 1/	Mode Label Horizantol Horizantol Horizantol	Freq	Range D 7:6815-188	Hz] Det RBN VBN	i I/AngTge Sam Att k Att		Label Herizontal	1	8000
a mode nid	- Romp (1962) Det 68 1699-288 In 5699-2815 In 5699-2815 In 5699-2815 In 5699-2815 In 5699-2815 In 569-2815 In 569-	Meter	Seep Pts Espe Add/Seld 388 17 Add/Seld 988 17 Add/Seld 988 17 Add/Seld 988 17	AF T346 (dB/m)	Amp/Cbl /6GHz HPF (dB)	Range D 7:6815-188	H2] Det 1984 (584) 8 H H 29 8 H 30	k Rut		Label Herizontal	Height [cm]	Polarity
: a mode nid prizonta Marker	eh.DAT Test	DMHz Meter		AF T346	Amp/Cbl /6GHz HPF	Rome: 0 7:6815-988 5:1800-15	H2] Det 1984 (584) 8 H H 29 8 H 30	Margin	Post Kieckhek Vorder 12. V Vorder 12. V Vorder 12. V Peak Limit	Letel Iterioadal Iterioadal Margin	Height	
a mode nid prizonta Marker No. 1	eh. 001 Test Frequency 7902.48	Meter Reading	Detector	AF T346 (dB/m)	Amp/Cbl /6GHz HPF (dB)	(dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Ldet Pricodal Noricodal Margin (dB)	Height [cm]	Polarity
a mode nid prizonta Marker No. 1	eh. DRT Test Frequency	Meter Reading	Detector	AF T346 (dB/m)	Amp/Cbl /6GHz HPF (dB)	(dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Ldet Pricodal Noricodal Margin (dB)	Height [cm]	Polarit

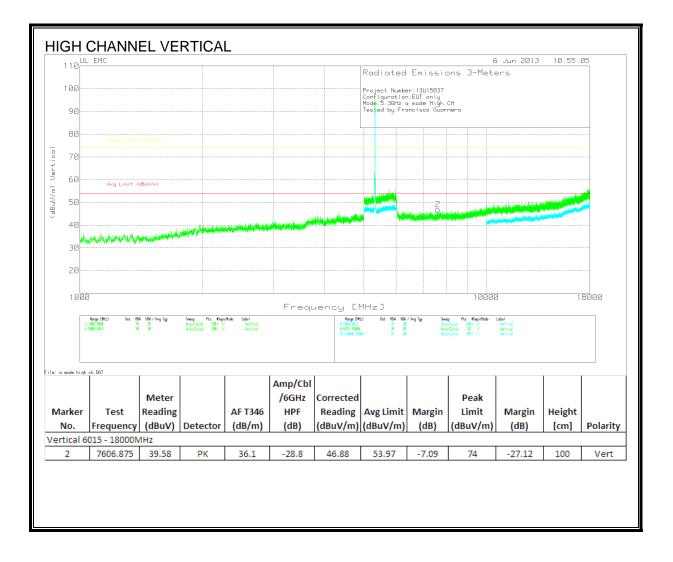
Page 120 of 218



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	IL EMC		RIZON						6	5 Jun 2013	10:55:	05
110-							Radiated	e Emissi	ons 3-Mete			
100							Project Numb	en:13U15037				
90							Configuratio Mode:5.3GHz Tested by:Fr	n.cui oniy a mode High ancisco Guar	CH			
							Ļ					
80	Peak Limit	(dBuV/m)										
70												
70 60 50												
	Avg Limit (	(dBuU/m)					and a lot a still				a Louist	
50…								Para - Lasa di aktivitati	a dan bara da da da da san san da sa		denter ander den den state andere andere Andere andere	<u> </u>
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30	ed with growth with which have made	výš hogy skuda od skoletý bi										
50												
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100	10								1000	a	1	8000
100	10				Frequ	uency [	MHzJ		1000	3	1	8000
Г	Range (Miz) Det RB	84 UBM ∕Avg Typ 1 3M 1 3M	Sweep Pis Siep Auto/Opted 5081 17 Auto/Opted 2081 17	/Node Label Horizantal 'Borizantal	Frequ	uency [ 7:809-103 7:809-103	tz] Det RBN UBN 3 IN 3M	1 Aut		Label Herizoeta I Herizoeta I	1	8000
		NI UNI / Avg Typ 1 3H 1 3A 1 304	Seep Pts fSep AutoCyled S881 // AutoCyled 3881 // AutoCyled 6881 //	/Mode Label / Horizantal / Horizantal / Horizantal	Frequ	Range DH 7:6815-1888	tz] Det RBA WBA	1 Aut	ep Pts #Swps/Mode z/Dpled 12k 1/	Label Herizontal	1	8000
	Range (Miz) Det RB	84 U847/Avg1gp 1 34 1 34 1 385	Seep Pts (Sep Auto/Cpied S98) 17 Auto/Cpied 3981 17 Auto/Cpied 6981 17	v/Node Label F Borizantol F Borizantol F Borizantol	Frequ	Range DH 7:6815-1888	tz] Det RBA WBA	1 Aut	ep Pts #Swps/Mode z/Dpled 12k 1/	Label Herizontal	1	8000
	Range (MH2) Det RB 1-1689-8986 IN 3-5589-615 IN 5-5889-6815 IN 5-5889-6815 IN	N UN / Ang Tup 3 3H 3 3H 3 3H 3 3h	Sweep Pts Rapp Ractogland SBR 17 Actor gland SBR 17 Actor gland SBR 17	v/fode Label f Borizandal f Borizandal f Borizandal		80000 7:6815-1886 9:18688-188	tz] Det RBA WBA	1 Aut	ep Pts #Swps/Mode z/Dpled 12k 1/	Label Herizontal	1	8000
	Range (MH2) Det RB 1-1689-8986 IN 3-5589-615 IN 5-5889-6815 IN 5-5889-6815 IN		Swop Pts. Bags AutoSpled Still 17 RutoSpled Still 17	vYkde Lajel V Noriandal Noriandal Noriandal	Amp/Cbl	90092 DV 27 6815-1930 9: 18689-130	tt.] Det RSM 488 3 IN 39 39 IN 38	1 Aut	np Pts Kieps/Node ar/Gpled 13A 1/ ar/Gpled 9881 1/	Label Herizontal	1	8000
a mode hig	Parger (MHz)         Det.         R           100095500         33000-6015         19           33000-6015         19         19           b (b, De)         10         10	Multivia Series	Seep Pts Esep Rear gled Sell I/ Rear gled Sell I/ Rear gled Sell I/	Vilde Latel Iteriantal Iteriantal Iteriantal		0009.01 7:615-108 9:1869-139 Corrected	123 Det RSM 486 8 IM 38 98 IM 38	1 Aut 3. Aut	ep Pts #Swps/Mode z/Dpled 12k 1/	Label Nericostal Nericostal		
a mode hig	Parger (MHz)         Det.         R           100095500         33000-6015         19           33000-6015         19         19           b (b, De)         10         10	Meter Reading	See Pts Ese Autorise Still IT Autorise Office Still IT Autority Office Office IT	ther i sont al	Amp/Cbl /6GHz	Corrected Reading	tt.] Det RSM 488 3 IN 39 39 IN 38	1 Aut 3. Aut	ep Pts Kaps/Hode articled 1331 // articled 9991 //	Label Herizontal	Height [cm]	Polarity
: a mode high Marker No.	Resp. (Mt2)         Det         Rf           1000-508         H1           3-3080-6815         H1           b)         ch. DAT	Meter Reading (dBuV)	Hundrugted 1981 17	AF T346	Amp/Cbl /6GHz HPF	Corrected Reading	L) Det 189 UBA M M 39 Avg Limit	Margin	Peak Limit	ldei Brandal Brandal Margin	Height	

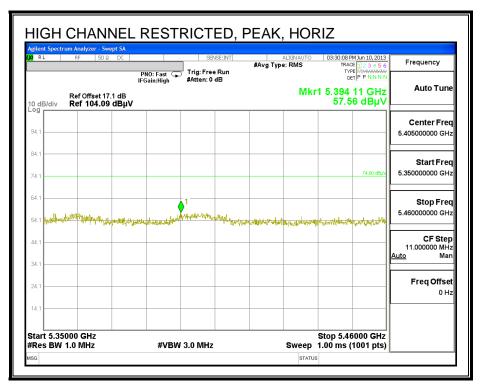
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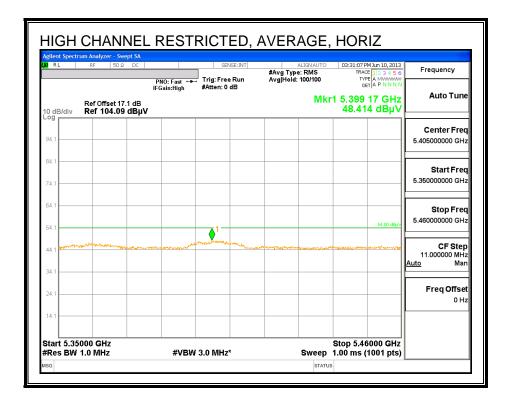


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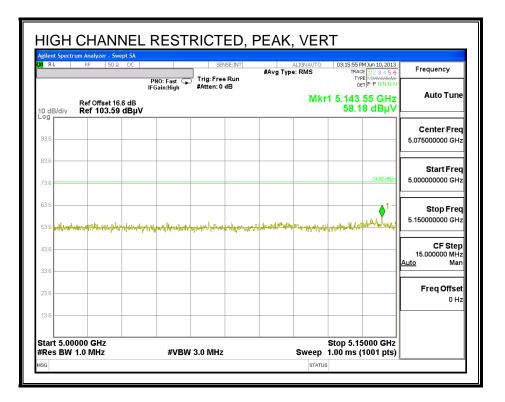
## 9.2.5. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 5.3 GHz BAND

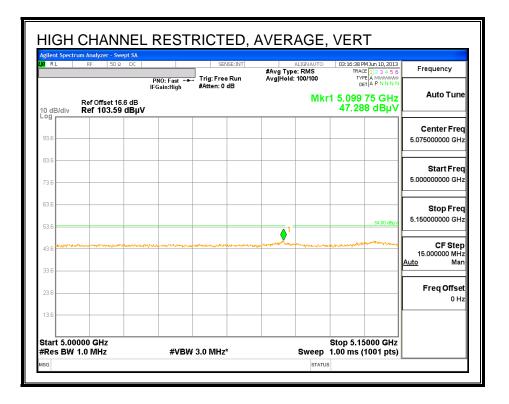
#### **RESTRICTED BANDEDGE (HIGH CHANNEL)**





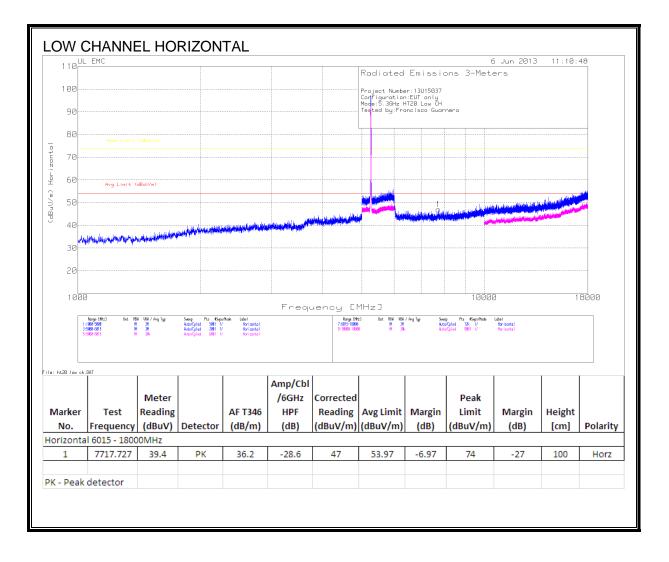
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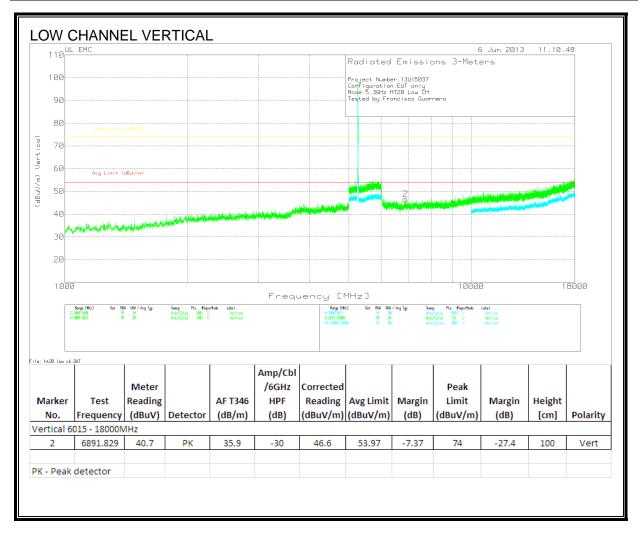


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### HARMONICS AND SPURIOUS EMISSIONS



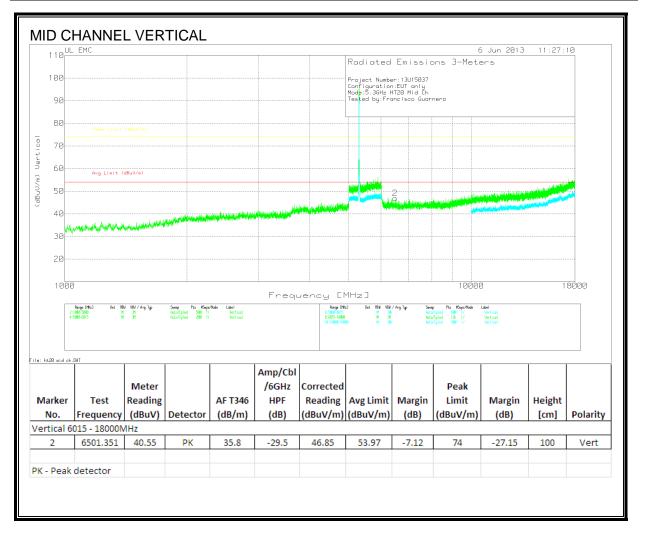
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110-	EMC	LHOF							E	Jun 2013	11:27:	10
110							Radiated	Emissi	ons 3-Mete	ens		
100							Project Numbe Configuration Mode:5.3GHz H	en:13U15037 h:EUT only				
90							Tested by:Fro	ancisco Guar	nero			
80	Peak Limit											
70												
70	Avg Limit (	dBuV/m)										
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1000	)					uency El	<u>.                                    </u>		10000	)	1	8000
:: ht20 mid ch.( Marker	080-2800 mm 2006-2815 mm DAT Test	** Meter Reading	Seep Pts (Spe Autorpte) State Autorpte) State Autorpte) State Autorpte) State Autorpte)	AF T346	Amp/Cbl /6GHz HPF	Corrected Reading	Avg Limit	Margin	Peak Limit	Herizottal Herizottal Margin	Height	
	Frequency		Detector	(dB/m)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV/m)	(dB)	[cm]	Polarity
orizonta 1	6640.165	40.29	РК	35.8	-29.8	46.29	53.97	-7.68	74	-27.71	100	Horz
-												
	detector											

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	_ EMC						Radiated	Emissi	ons 3-Mete	ers		
100 90							Project Numba Configuration Mode:5.3GHz H Tested by:Fro	n:EUT only HT20 High CH	nero			
80												
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	Avg Limit (	dBuV/m)					adapti Ula ibiida					
) 50								udd a miri na a da	a lite day and a start	ing diaman <mark>namba anin 12</mark> Anina anina ani		1
40····	sala - ar a badal ata dikita		h diyyor a far piparadi	an a		pla juliidigadii	<b>.</b>	a sulface of the second second				
30	ng ling kan pangan di pangan pang Pangan pangan	Male States of a second										
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135	1 (883-5880 11) 15883-6815 11 15883-6815 11		Sweep Pts 45wp Auto/Tpied 5981 fr Auto/Tpied 3281 fr Auto/Tpied 6981 fr	/fiede Label Bori aontal Bori aontal Bori aontal		Rangs DH 7:6815-1886 9:1868-186	I IN 3N	/AngTyp Swa Aut Aut	ap Pta Koupa/Note α/Cpied 12t i/ α/Cpied 5001 i/	Label Horizontal Horizontal		
n: ht:20 kink of					Amp/Cbl /6GHz	Corrected			Peak			
e: ht28 high cl Marker No.	Test Frequency	Meter Reading (dBuV)	Detector	AF T346 (dB/m)	HPF (dB)	Reading	Avg Limit (dBuV/m)	Margin (dB)		Margin (dB)	Height [cm]	Polarity
Marker No.	Test Frequency	Reading (dBuV)	Detector	AF T346 (dB/m)	HPF	Reading	Avg Limit (dBuV/m)		Limit (dBuV/m)	-	1	Polarity
Marker No.	Frequency	Reading (dBuV)	Detector PK		HPF	Reading	-			-	1	Polarity Horz

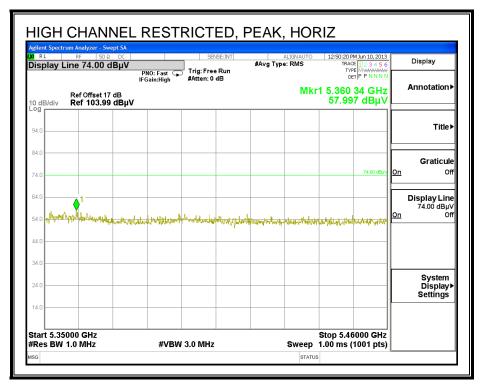
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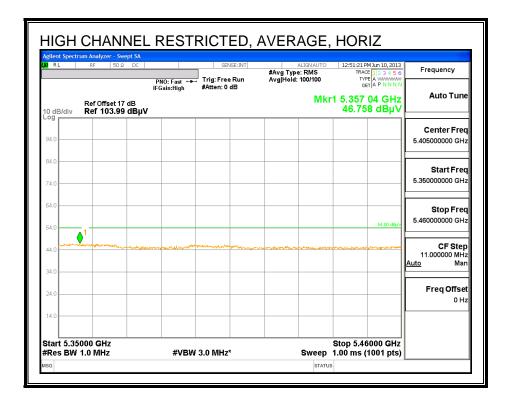
110 <sup>UL</sup>	CHANN						1			i Jun 2013	11:42:	22
							Radiated	Emissi	ons 3-Mete	ers		
100							Project Numbe Configuration Mode:5.3GHz H	er:13U15037 h:EUT only				
90							Mode:5.3GHz H Tested by:Fro	HTZØ High Ch ancisco Guar	nero			
80							ļ					
0												_
60	Avg Limit (	dBuV∕m)										
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40				and the design of	فأفره بدارا والم			alla de la Calendaria de l				
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30	And the second second	1										
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100	0				Frequ	uency El	MHz]		10000	3	1	8000
	Range [Mtz] Det RB 2:1880-5880 1H 4:5880-5815 1H	U UBU / Avg Typ JH	Sweep Pts #Swee Auto/Upled S001 1/ Auto/Upled 2001 1/	v/fode Label		Ronge Dfl 6:5808-6815 8:6815-1889	IN 39	s Aut	o/Coled 6891 1/	Label Ventical		
	10080-0810 18		никопртва глет гл	versical		0:0010-1000 18:10008-18	9 IN 38 988 IN 381	c Aut	a/Cpled 12k I/ a/Cpled 9881 I/	Vertical Vertical		
e: ht20 high c	h.DAT		1	1		1	1		1		1	
		Meter			Amp/Cbl /6GHz	Corrected			Peak			
	Test	Reading		AF T346	HPF		Avg Limit	Margin	Limit	Margin	Height	
Marker	Free market and	(dBuV)	Detector	(dB/m)	(dB)	-	(dBuV/m)	(dB)	(dBuV/m)	(dB)	[cm]	Polarity
Marker No.	Frequency	ЛНz										
No.	5015 - 18000N			36.2	-28.8	46.81	53.97	-7.16	74	-27.19	100	Vert
No.		39.41	PK	30.2								
No. /ertical 6 2	5015 - 18000N 7734.704		РК	30.2								
No. /ertical 6 2	5015 - 18000N		РК	30.2								

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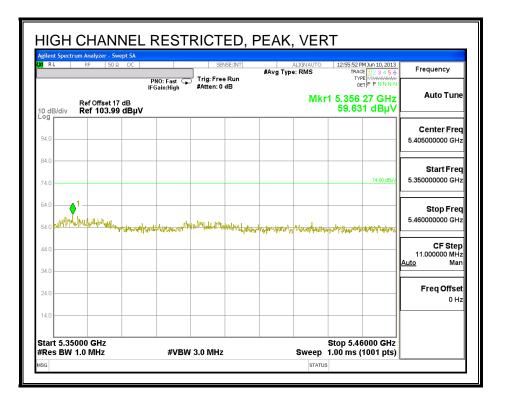
## 9.2.6. TX ABOVE 1 GHz 802.11n HT40 MODE IN THE 5.3 GHz BAND

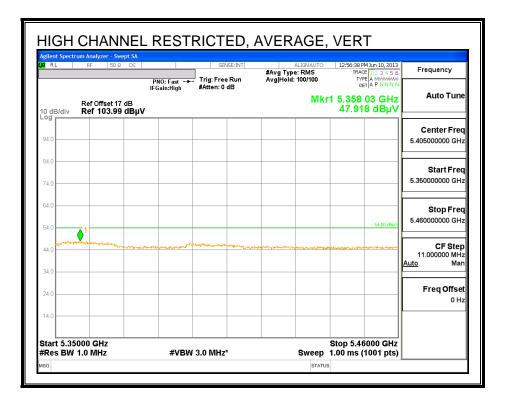
### **RESTRICTED BANDEDGE (HIGH CHANNEL)**





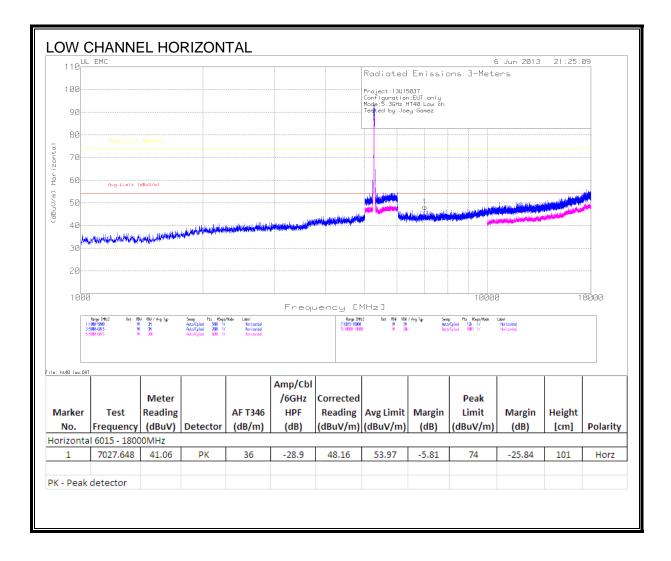
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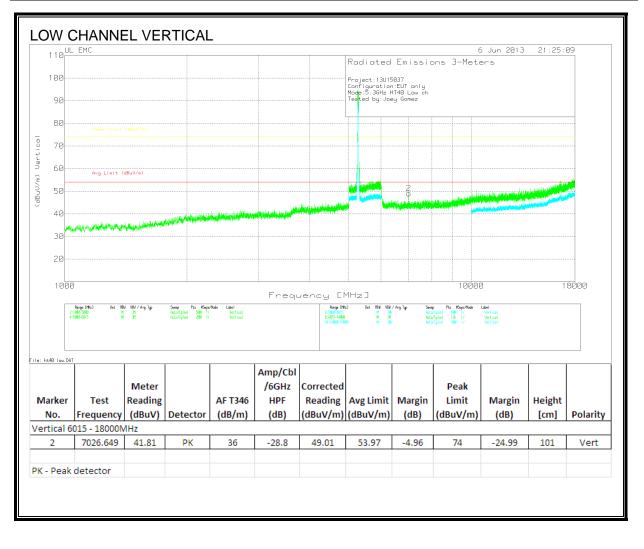
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### HARMONICS AND SPURIOUS EMISSIONS



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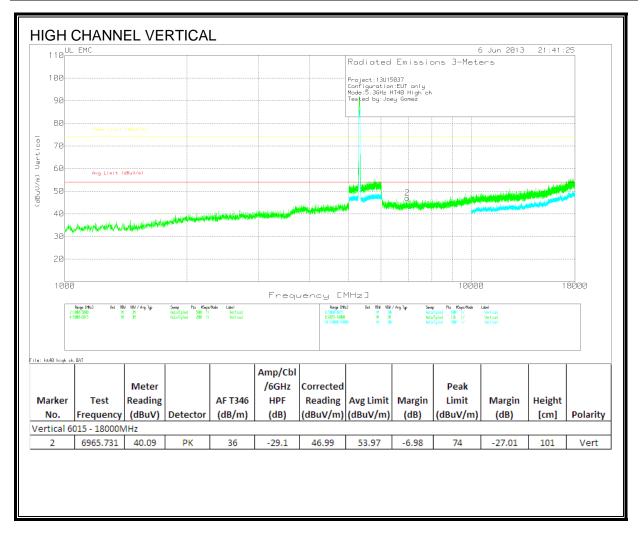
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שוו	UL EMC						Radiated	Emical	e ons 3-Mete	i Jun 2013	21:41:	25
100										31.2		
							Project:13U1 Configuration Mode:5.3GHz 1	n:EUT only HT40 High ch				
90							.Tested by:Jo	ey Gomez				
80	Peak Limit	(dBuV/m)										
70												
1 2 60												
Ê I	Rvg Limit	(dBuU/m)					white the state					
50								والألاب والمتراف والمراف	and the local division of the second			
40	Manulaneralisekinteralasi	فلالتفاء وارتبار	Line of the section	the second second second	and a state of the			and <sup>proc</sup> onsecution of a				
30	ki tu ji ang king pina ki ji na king bagi Ki tu ji ang king pina	All all the second second										
20												
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10	00					uency El			10000	3	1	8000
e: ht40 high	1:1680-5880 3:5880-6815 5:5880-6815 1		Sweep Pts 45xp Auto/Cpted 5001 1 Auto/Cpted 2001 1 Auto/Cpted 5001 1	Vilode Label Horizantol Horizantol Borizantol		Range DH 7:6815-1686 9:1968-1696	I IN 3M	Aut	ap Pts K6wps/Node α/Ωled 12t 17 α/Ωpled 968117	Label Horizontal Horizontal		
					Amp/Cbl							
	Test	Meter		45 7346	/6GHz	Corrected	a		Peak		11-1-1-1-4	
	r Test Frequency	Reading (dBuV)	Detector	AF T346 (dB/m)	HPF (dB)	-	Avg Limit (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Margin (dB)	Height [cm]	Polarity
Marke No.	tal 6015 - 180		Dettettor	(0.27.11)	(42)	(4247)	(abat) iii	(0.2)	(abat) mj	(42)	tend	i olullej
No.		40.12	PK	35.9	-29.3	46.72	53.97	-7.25	74	-27.28	101	Horz
No.	6314.6	10122										
No. orizon 1		10112										

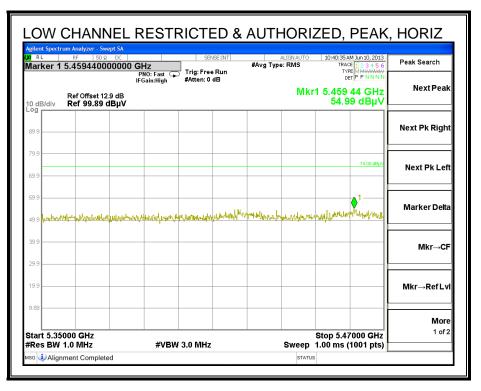
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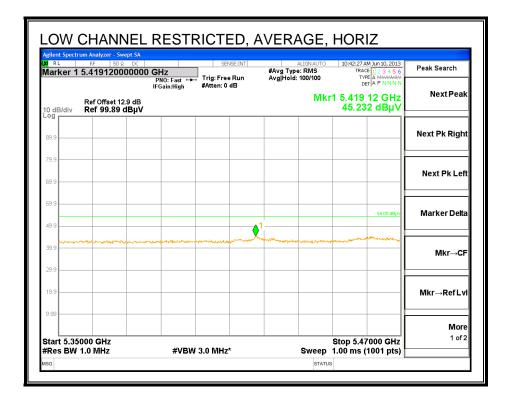


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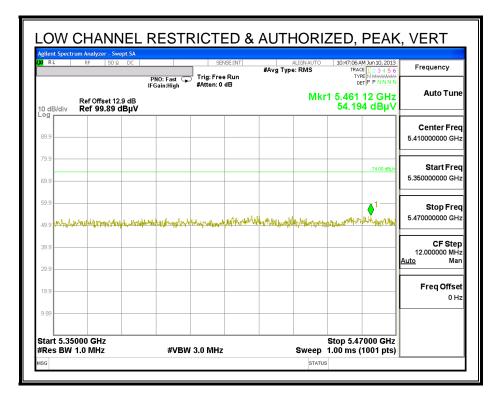
## 9.2.7. TX ABOVE 1 GHz 802.11a MODE IN THE 5.6 GHz BAND

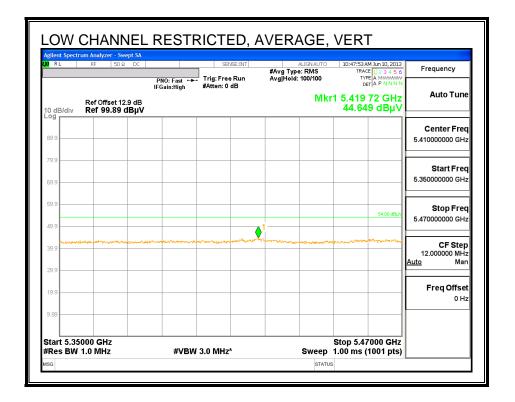
### **RESTRICTED & AUTHORIZED BANDEDGE (LOW CHANNEL)**





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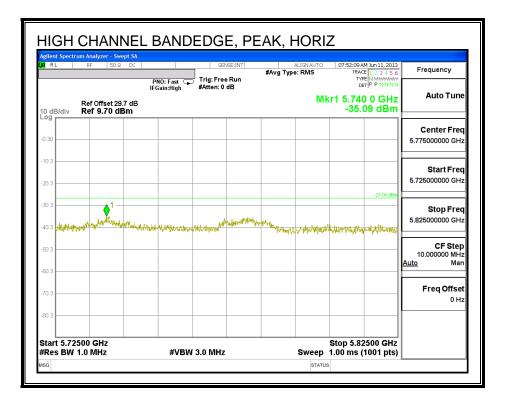


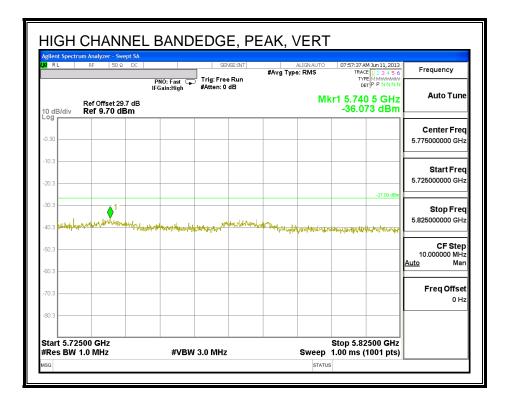


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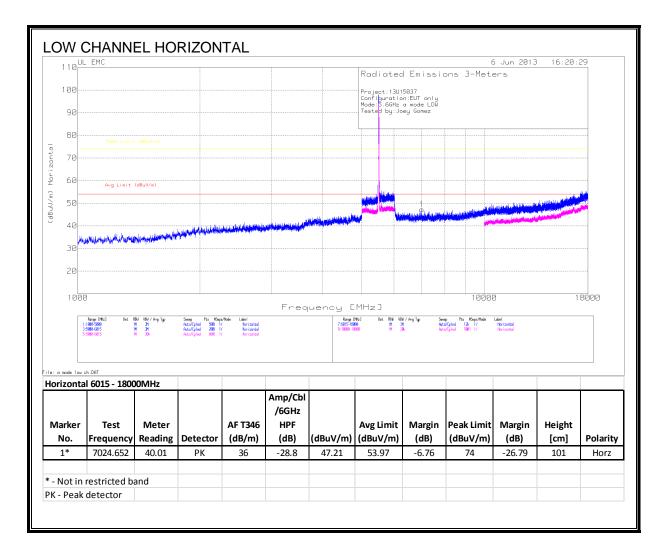
## **AUTHORIZED BANDEDGE (HIGH CHANNEL)**



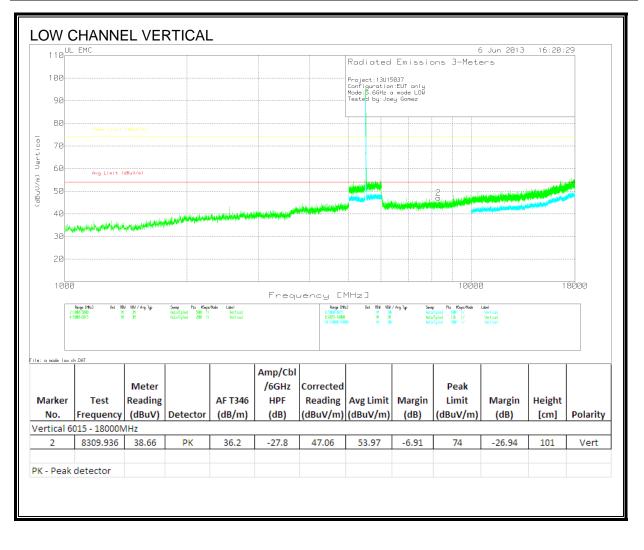


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## HARMONICS AND SPURIOUS EMISSIONS



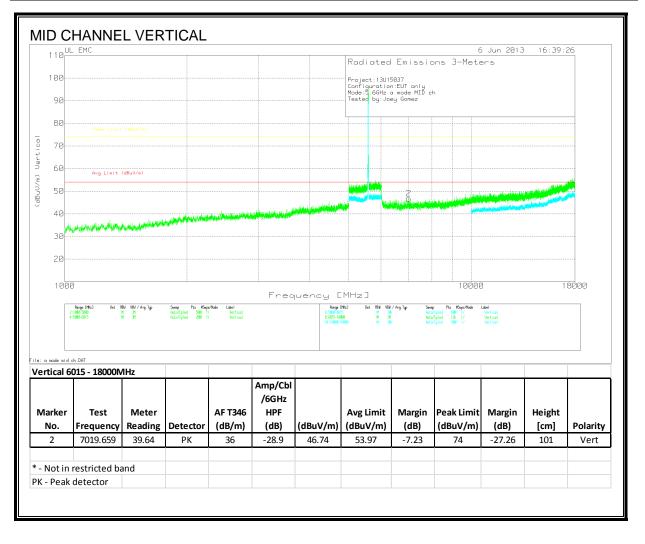
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11000	_ EMC								6	5 Jun 2013	16:39:	26
							Radiatec	l Emissi	ons 3-Mete	ers		
100							Project:13U1 Configuratio Mode:5.66Hz	5037 n:EUT onlu				
90							Mode:5.6GHz Tested by:Jo	a mode MID c ey Gomez	:h			
80												
70												
60	Avg Limit (	dBuV/m)										
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					هد			ا اللار هو الارتدان ال				
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20												
1000	-				Frequ	uency El			1000		1	8000
	Range (1442) Bet 98 (1899-5800 14 (5889-5815 14 (5889-5815 14 (5889-5815 14	NJ USU / Ang Tup 34 34 38k	: Sweep Pts 4Sept AutoCpled S981 17 AutoCpled S981 17	Vitade Label f Bori zantal f Bori zantal f Bori zantal		- Ronge Dri 7:6815-1880 9:18689-188	tz] Det RBN VBN	//ñng Tup Swa f Ant k Nut		Litel Horizontal Horizontal	1	
   3   5	Range (1442) Bet 98 (1899-5800 14 (5889-5815 14 (5889-5815 14 (5889-5815 14	34	Seep Pts KSpp AutoSplad SRM I/ AutoSplad SRM I/ ReduKplad SRM I/	Vited Latel / Biorizantal / Biorizantal / Biorizantal	Amp/Cbl	Ronge D1 7: 6015-1838 9: 18669-189	tz] Det 968 V68 3 IH 33 88 IH 33	i / Ang Tgp Swa Ang Tgp Swa Ik But	ep Pta Kieps/Yode a/Gpled 13: 1/ a/Gpled 9881 1/	Lakel Har izontal	1	8000
a mode nid o	- 1995 1995 201 1995 2000 201 1905 2000 2000 2000 2000 200000 2000 2000	Meter	Sweep Pts ESpect		Amp/Cbl /6GHz	Corrected	tz] Det 958 UB 3 IM 33 30 IM 3	f Aut	ep Pts Keps/Hode artigled 133 1/2 ortgined 9801 1/2 Peak	Label Horizontal Horizontal		
a mode nid o	- 1000 (Mt) et 80 	Meter Reading	Seeon Pta Esec AutoCipied Self In AutoCipied Self In AutoCipied Self In AutoCipied Self In AutoCipied Self In	AF T346 (dB/m)	Amp/Cbl	Corrected Reading	tz] Det 968 V68 3 IH 33 88 IH 33	f Aut	ep Pta Kieps/Yode a/Gpled 13: 1/ a/Gpled 9881 1/	Lakel Har izontal	Height [cm]	Polarity
o mode nid o Aarker No.	- 1995 1995 201 1995 2000 2000 2000 2000 2000000000000000	Meter Reading (dBuV)		AF T346	Amp/Cbl /6GHz HPF	Corrected Reading	Lt Out REW US M M 3 Avg Limit	Margin	Peak Limit	ldel thricostal thricostal Margin	Height	
o mode nid o Aarker No.	eh. Dat Frequency and a state the state the state Frequency	Meter Reading (dBuV)		AF T346	Amp/Cbl /6GHz HPF	Corrected Reading	Lt Out REW US M M 3 Avg Limit	Margin	Peak Limit	ldel thricostal thricostal Margin	Height	
Aarker No. 1	eh. Dat Frequency and data the formation the formation Test Frequency 16015 - 1800	Meter Reading (dBuV)	Detector	AF T346 (dB/m)	Amp/Cbl /6GHz HPF (dB)	Corrected Reading (dBuV/m)	Avg Limit	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Height [cm]	Polarity

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110		CHANN EMC	•								5 Jun 2013	16:57:	31
										ons 3-Mete	ers		
10	0							Project:13U Configuratio	15037 on:EUT only a mode HIGH				
90	ø							Mode: 5.66Hz Tested by: J	a mode HIGH bey Gomez	ch			
8	ø												
_													_
70	u												
70 60 50	0	Avg Limit (	dBuV/m)										
50	ø										the second of	weed does not state to be	899 <sup>9</sup> 2011
							an ha malatati al al		ala Bardat da			n (himter)	
40	Ø	الإراحير المطابق ويداعهم والمعرف والماقي	in the second provided	المباللعيان الماحية لمحاصل فالمتعالم	k y jelen sjetteljet								
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20	a												
1	000	l		i		-	uency El			10000	3	1	8000
	5.5	1880-5880 11 1888-6815 11 1880-6815 11 1980-6815 11	ul UBU / Avg Typ JH JH JH JH JH	Sweep Pts #Swp Auto/Cpled 5981 1 Auto/Cpled 2081 1 Auto/Cpled 6981 1	forizantal Norizantal		Ronge Di 7:6815-1896 9:18069-1999	z] Det RBW U IH 8 IH	3M Aut	np Pta Kaupa/Made ra/Cpled 13: 1/ ra/Cpled 9601 1/	Latel Horizontal Horizontal		
: a mode	ingi .					Amp/Cbl							
: a mode			Meter			/6GHz	Corrected			Peak			
		Test	Reading	Detertor	AF T346	HPF	_	Avg Limit	_	Limit	Margin	Height	Deleth
Mark			(abuv)	Detector	(dB/m)	(dB)	(dBuV/m)	(aBuv/m	) (dB)	(dBuV/m)	(dB)	[cm]	Polarity
Vark No.		Frequency						53.97	-7.92	74		1.01	Horz
Mark No.		Frequency   6015 - 1800   6745.025		PK	35.8	-29.9	46.05	00.07		/4	-27.95	101	11012
Marko No. orizo 1	nta	6015 - 1800 6745.025	0MHz	PK	35.8	-29.9	46.05	00.07		74	-27.95	101	
orizo 1	nta	l 6015 - 1800	0MHz	РК	35.8	-29.9	46.05	00107		/4	-27.95	101	

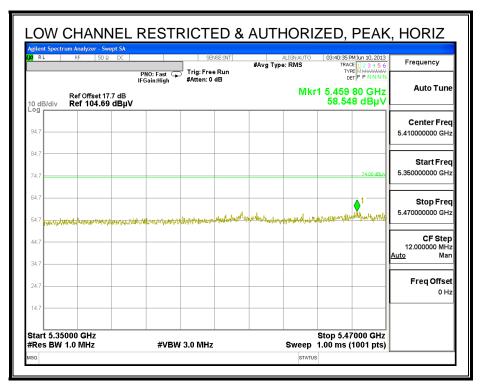
Page 145 of 218

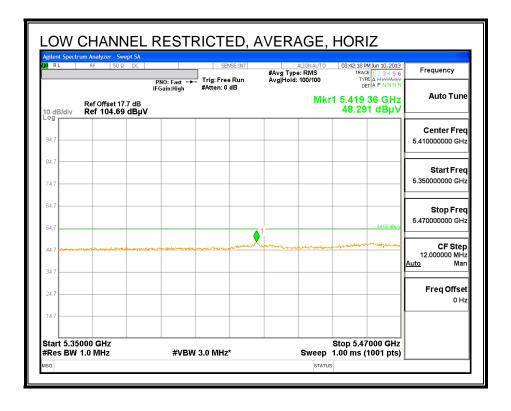
110 <sup>UI</sup>	L EMC				1					5 Jun 2013	16:57:	31
							Radiate	d Emissic	ons 3-Mete	ers		
100							Project:13U Configurati	15837 on:EUT only a mode HIGH (				
90							Mode:5.66Hz Tested by:J	a mode HIGH ( oey Gomez	zh			
80												
70												
2 60 2	Avg Limit	(dBuV/m)										 
60 50								2	المحاولية والمحاود والمحاو	ere liteled as statistics and the		<u>MB</u>
9 40…				ssearcask de blat ek Militet	الجريفية التوقيل المتله	and a substantiant	W 1			and a character of		
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30												
20												
100	0								1000	3	1	8000
e: a mode higt	s.ch.DAT	M 34	Sweep Pts 4Sup Auto/Cpied 5001 1 Auto/Cpied 2001 1	/ Vertical / Vertical		8:6815-102 10:10888-1	60 IX 8889 IX	3M Arta	arched 134 17 Cipled 1981 17	Vertical Vertical		
ertical 6	015 - 18000N	/Hz										
Marker	Test Frequency	Meter Reading	Detector	AF T346 (dB/m)	Amp/Cbl /6GHz HPF (dB)	(dBuV/m)	Avg Limit (dBuV/m)	-	Peak Limit (dBuV/m)	Margin (dB)	Height [cm]	Polarity
No.	6954.745	40.03	РК	36	-29.2	46.83	53.97	-7.14	74	-27.17	101	Vert
<b>No.</b> 2*												
<b>No.</b> 2* - Not in	restricted ba detector	and						_				

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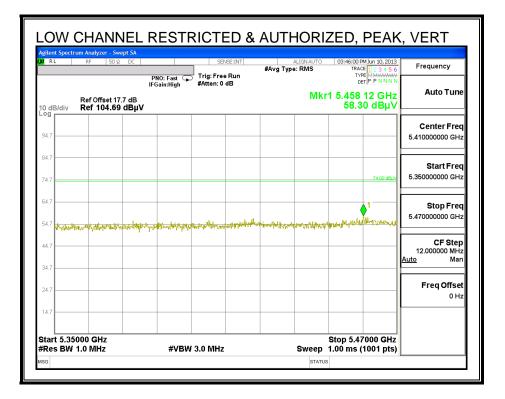
## 9.2.8. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 5.6 GHz BAND

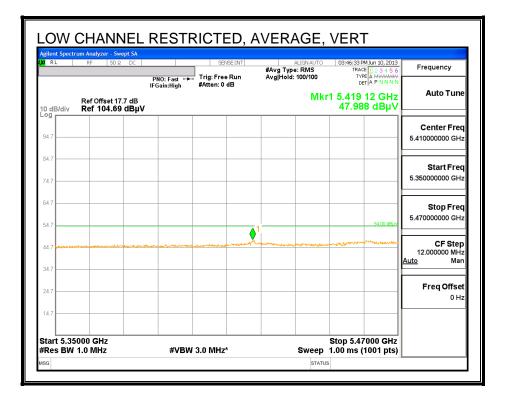
#### **RESTRICTED & AUTHORIZED BANDEDGE (LOW CHANNEL)**





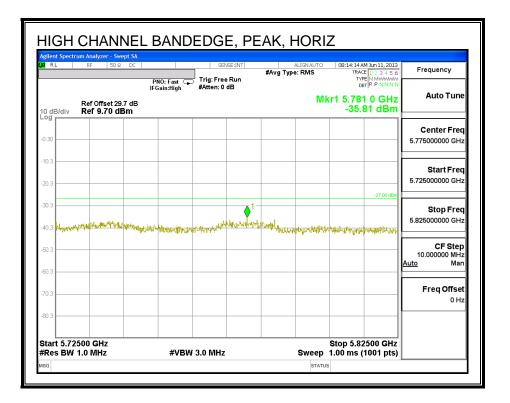
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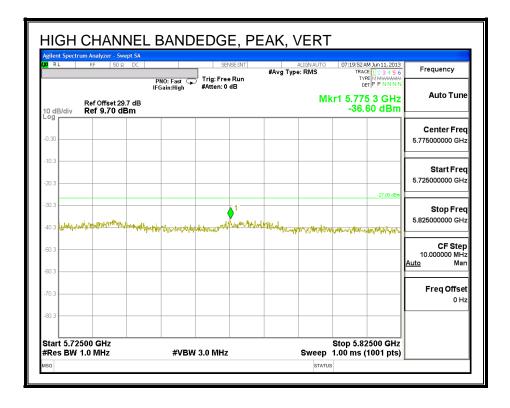




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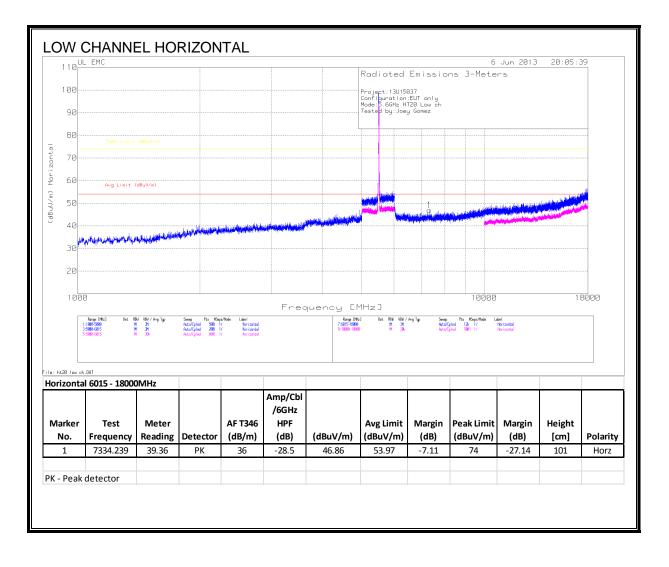
## AUTHORIZED BANDEDGE (HIGH CHANNEL)



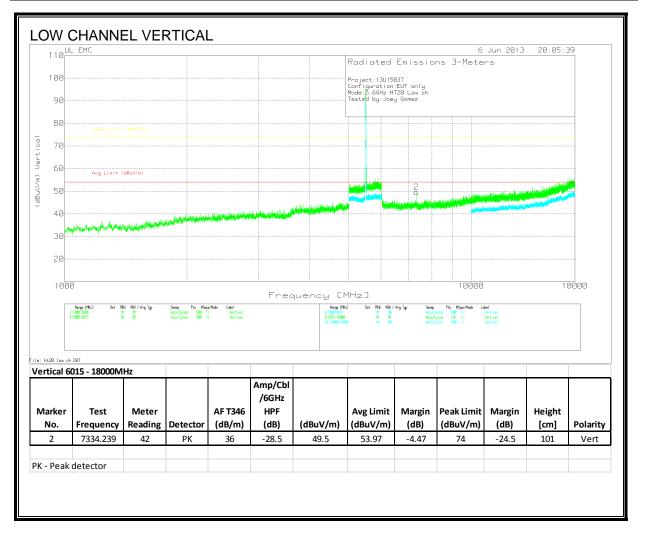


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### HARMONICS AND SPURIOUS EMISSIONS



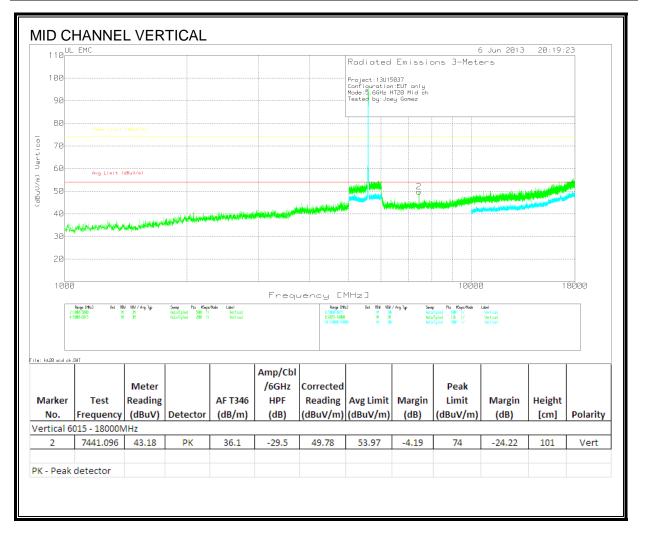
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1.1	о <sup>UL</sup>	HANNE EMC									i Jun 2013	20:19:	23
								Radiated	l Emissi	ons 3-Mete	ers		
10	0							Project:13U1 Configuration Mode:5.6GHz 1	5037 n:EUT only				
9	0							Mode:5.6GHz   Tested by:Jo	HT20 Mid ch ey Gomez				
8	0												
7	_												_
/	0												
	0	Avg Limit (	dBuV∕m)										
5	ø							lender ber			and a star state of a star	gital tank a startin	anda.
5						فلأهد والمعادية	والمتحافظ والمتحد والمتح		Hand Black				
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2	0												
1	000	)				Erea	Jency []	чн <sub>а</sub> 1		10000	3	1	8000
	5:	1880-5880 11 5883-5815 11 5880-5815 11 5880-5815 11	ii U8U / Ang Tgp 3H 3H 3R	Sweep Pts 4Swp Auto/Cpiled 5060 1 Auto/Cpiled 2060 1 Auto/Cpiled 6660 1	/ Honizantal / Honizantal		Ronge DM 7:6815-1500 9:1868-1860	IN 3M	l / Ang Typ Sae Aut k Aut	np Pts Kompanhoden /Cpied 12t i/ /Cpied 9081 i/	Lakel Horizontal Horizontal		
: ht20 =						Amp/Cbl							
: ht20 =		Test	Meter		45 7346	/6GHz	Corrected			Peak			
		Test	Reading	Detector	AF T346 (dB/m)	HPF (dB)	-	Avg Limit (dBuV/m)	(dB)	Limit (dBuV/m)	Margin (dB)	Height [cm]	Polarity
Mark				Detettor	(ub/iii)	(ub)	(ubuv/iii)	lanavini	(ub)	(ubuv/iii)	(ub)	[ciii]	Polarity
Vlark No.		Frequency 6015 - 1800	OMHz				46.99	53.97	-6.98	74	-27.01	101	Horz
Vlark No.			0MHz 39.99	PK	36	-29							
Mark No. orizo 1	onta	6015 - 1800 7291.296		PK	36	-29							
orizo 1	onta	6015 - 1800		РК	36	-29							

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110 <sub>0</sub>	L EMC						<b>D</b>			5 Jun 2013	20:34:	34
									ons 3-Mete	ers		
100							Project:13U1 Configuratio Mode:5.6GHz	15037 on:EUT only				
90							Tested by: Jo	nizø nign er bey Gomez	1			
80												
70 												
2 60	Avg Limit (	dBuV∕m)					lles					
§ 50-								1	ور الله يعاملون	asta in a submitted of the		
g 40			ta alka	an and bandra ban bi	-	فاردته فرياديني						
	two and productor baseling	the lower she have a state of the	ndeddaweddanweddon									
30												
20												
100	Ø								1000	3	1	8000
	-				Frequ	uency El	MH∠] z] Det R51 VB		10000	_		0000
e: ht20 high	Perep (1Hz) Pet 8 1:1080-5800 11 5:3080-6815 11 5:3080-6815 11 ch.DAT	91	Sweep Pts (Sup Auto/Cpiled 5001 ) Auto/Cpiled 2001 ) Auto/Cpiled 6001 1	Borizantal Borizantal Borizantal		8 ange 01 7:6815-1000 9:1868-1000	e 14 3	M Aut	sp Pta Kisper/Node ar/Epiled 124: 1/ ar/Epiled 9601 1/	Har izontal Har izontal		
					Amp/Cbl							
	Test	Meter Reading		AF T346	/6GHz HPF	Corrected Reading	Avg Limit	Margin	Peak Limit	Margin	Height	
	Frequency		Detector	(dB/m)	(dB)		(dBuV/m)		(dBuV/m)	(dB)	[cm]	Polarity
Marker No.	al 6015 - 1800	· · /		(,,	()			(/	(,,,,,,,,,	()		
No.		39.17	PK	36.1	-29.1	46.17	53.97	-7.8	74	-27.83	101	Horz
No.	7572.92											
No. orizont 1												
No. Iorizont 1	7572.92 detector											

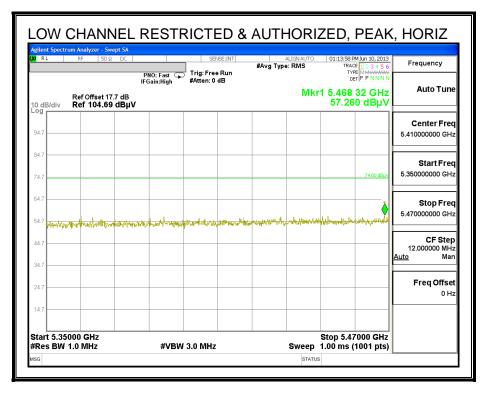
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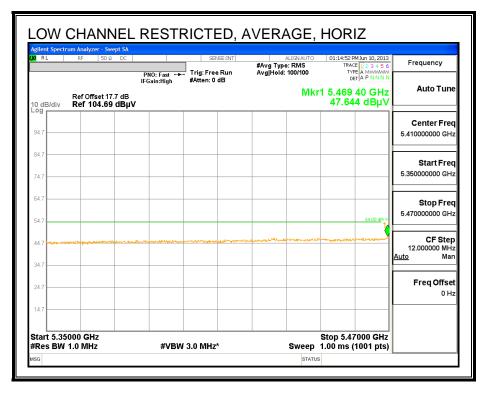
110     LLEMC     6 Jun 2013     20       110     Radiated Emissions 3-Meters       100     Project:13U15037       200     Configuration:Ell only       90     Tested by:Joey Gomez       80     Project:13U15037       70     Tested by:Joey Gomez       60     Reg List (dBull/s)       70     Tested by:Joey Gomez       70     Tested by:Joey Gomez				ns J-Meter		115937	Pop last : 13							
90     Configuration:EUT on 1y Mode 5 8 Given that HT2B High ch Tested by: Joey Gonez       80     Peak Linit (db///m)       70     Image: State of the					only igh ch ez	U15037 ion:EUT or z HT20 Hig Joey Gomes	Project:13 Configurat Mode:5.6GP Tested by:							100
80     Peak Linit (@U//w)       70     1       60     Avg Linit (@U//w)       50     1       50     1       30     1					ez	Joey Gomez	Tested by:							
Peak Linit (db.U/m)       60       Avg Linit (db.U/m)       50       40       40       30														90
78     60     <														80
40 30														70
														, 0
												BuV∕m)	Avg Limit (c	60
40 30		alaine i differiti	in a sector state		2									50
					<b>u R</b> upi	<b>Wellingsonder</b>			الاستاب المستعد	anna dhuad				
											And a light of the second second	والإلجام والمعام والمعاد والمعادية	إخبامي الجريان والمتر	40
28													terest and an an all and	30
														20
1000 Frequency [MHz]	18000	18		10000					_		i			1000
Brose Pithri Det BBJ UBJ / Jon Ian. Samon Pits (Seco/Kode John) Romon Pitri Det BBJ UBJ / Jon Tan. Samon Pitri John			abel Vertical	stad 6001 17 18		VBW / Avg Typ	z] Det RBN	Range Ditt		iode Label	Sweep Pts #Swps/#	UBU / Avg Typ	Range [Mtz] Det FBi	2
2.1997-9999 11 31 32 444/541et 599 1/ fertical 6:5997-9997 1/ 1997 144/541et 5997 1/ 1997 144/541et 5997 1/ 1997 144 4-5999-6415 11 31 444/541et 301 1/ fertical 6:6979-1999 1/ 31 444/541et 331 1/ fertical 6:6979-1999 1/ 1997 1/ 1919-1919-1919 11 39 444/541et 391 1/ fertical			Verticel Verticel	oled 12k 1/ W oled 9881 1/ W	Auto/Cp Auto/Cp	38 386	69 IN	8:6815-18868 18:16888-188		Vertical	Auto/Cpled 2081 1/	й	889-6815 1M	Ĩ
: ht28 high cb.04T													.DAT	: ht28 high ch
rtical 6015 - 18000MHz												Hz	)15 - 18000M	ertical 6
Amp/Cbl														
			Margin H		rgin	it Mar	Avglim			AE T3/6		Motor	Test	Aarkor
Aarker Test Meter AFT346 HPF Avg Limit Margin Limit Margin Hei	zht	Height		-	-		-	(dBuV/m)	(dB)		Detector			No.
Narker Test Meter AF T346 HPF Avg Limit Margin Limit Margin Hei	-	Height [cm]	-	(авиу/т)		<i>i</i> .	•	• • •	-28.8	36.1	РК	39.26	7594.891	2
Marker     Test     Meter     AF T346     HPF     Avg Limit     Margin     Limit     Margin     Hein       No.     Frequency     Reading     Detector     (dB/m)     (dB)     (dBuV/m)     (dBuV/m)     (dB)     (dB)     [cr	n] Polarit	-	(dB)		.41	-7.4	53.97	40.50	20.0					
Marker     Test     Meter     AF T346     HPF     Avg Limit     Margin     Limit     Margin     Hein       No.     Frequency     Reading     Detector     (dB/m)     (dB)     (dBuV/m)     (dBuV/m)     (dB)     (dB)     [cr	n] Polarit	[cm]	(dB)		.41	-7.4	53.97	40.50	20.0					

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# 9.2.9. TX ABOVE 1 GHz 802.11n HT40 MODE IN THE 5.6 GHz BAND

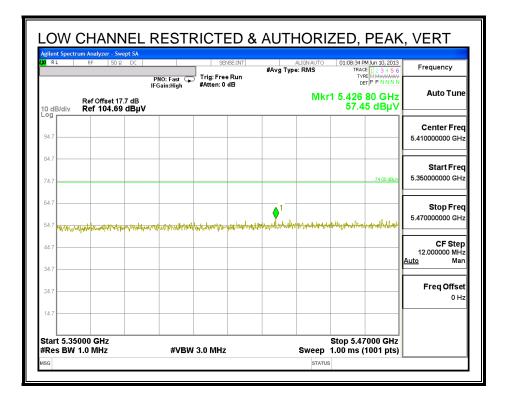
#### **RESTRICTED & AUTHORIZED BANDEDGE (LOW CHANNEL)**

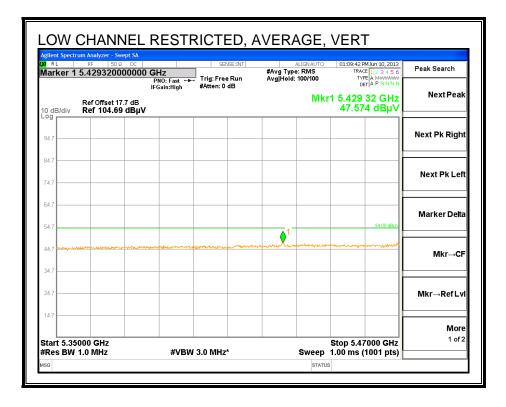




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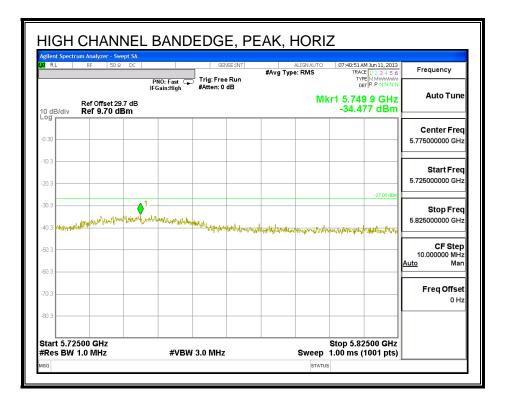
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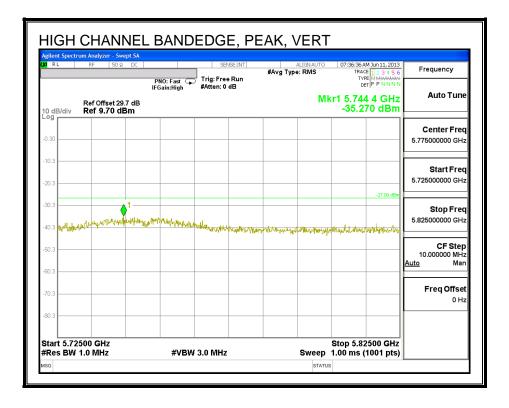




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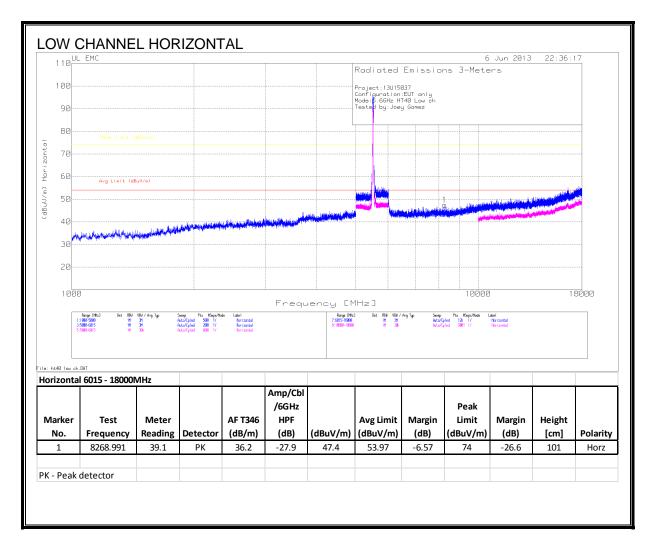
## **AUTHORIZED BANDEDGE (HIGH CHANNEL)**



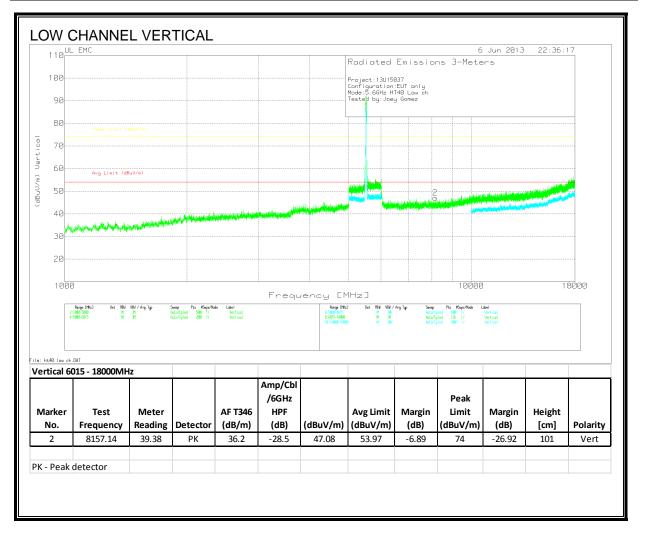


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### HARMONICS AND SPURIOUS EMISSIONS



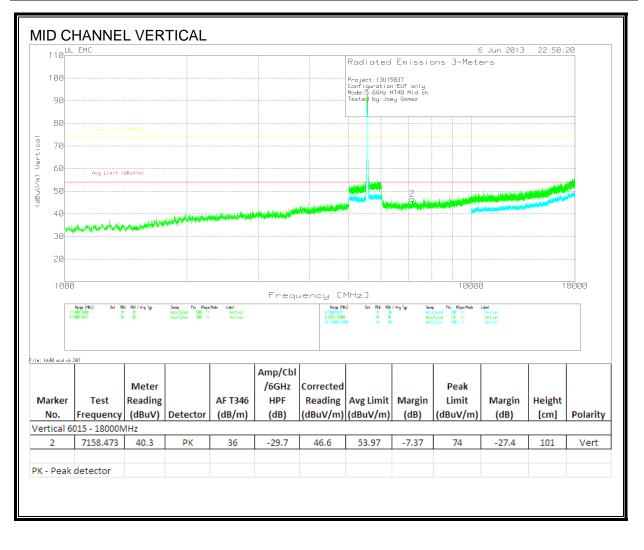
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	. EMC			AL					e	Jun 2013	22:50:	20
110 <sup>UL</sup>							Radiatec	Emissi	ons 3-Mete			
100							Project:13U1	5037				
90							Configuratio Mode:5.6GHz .Tested by:Jo	n:EUI only HT40 Mid ch ey Gomez				
								-				
80	Peak Limit	(dBuV/m)										
70												
70 ···· 60 ···· 50 ····												
	Avg Limit (	dBuV/m)					a sur la la la la					iteli
50								1 	and a second		to be added to the second s	<u>بم</u>
40			h water to be the second s	in dialah dini di	المحفظ والمعاد والمتعاد		<b>/</b>	a a la strategia d'an de la seconda de la		Allow of the lot of the		
30	whites the straight white	hompillipiting	All the second second	- and the second second								
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20												
	-									-		
1000	9				Frequ	lency []	MHz]		10000	]	I	8000
	Range [Mtz] Det RB 1889-5880 1M 5888-6815 1M	U UBU / Avg Typ 3M 3M	Sweep Pts #Swee Auto/Cpled S981 1/ Auto/Cpled 3981 1/ Auto/Cpled 3981 1/	/Node Label Nonizantal Nonizantal		Range DH 7:6815-1888 9:1868-1886	tz] Det RBN VBN I IM 31 NG IM 32	k Aut	ep Pts Kops/Mode ∣ a/Cpled 12k I/ a/Cpled 9881 I/	Label Honizontal Honizontal		
5	5888-6815 1M	34 38k	Ruto/Cpied 2001 17 Auto/Cpied 6001 17	forizontal								
5	5888-6815 1M	30k	Auto/Cpied 2001 17 Auto/Cpied 8001 17	for i zantel	Amp/Cbl							
5 : ht40 mid ch	000-6415 1H	<sup>3*</sup> Meter	Autolipied 2001 17 Autolipied 9801 17		/6GHz	Corrected			Peak			
: ht40 mid ch Marker	DAT Test	™ Meter Reading		AF T346	/6GHz HPF	Corrected Reading	Avg Limit	-	Limit	Margin	Height	
s: ht40 mid ch Marker No.	DAT Test Frequency	» Meter Reading (dBuV)	Detector		/6GHz	Corrected Reading		Margin (dB)		Margin (dB)	Height [cm]	Polarity
s Marker No. orizonta	DAT Test Frequency 1 6015 - 1800	Meter Reading (dBuV)	Detector	AF T346 (dB/m)	/6GHz HPF (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	(dB)	Limit (dBuV/m)	(dB)	[cm]	
: ht40 mid ch Varker No.	DAT Test Frequency	» Meter Reading (dBuV)		AF T346	/6GHz HPF	Corrected Reading	Avg Limit	-	Limit	-	-	Polarity
s: ht48 mid ch Marker No. orizonta 1	DAT Test Frequency 1 6015 - 1800	Meter Reading (dBuV)	Detector	AF T346 (dB/m)	/6GHz HPF (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	(dB)	Limit (dBuV/m)	(dB)	[cm]	

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110 <sup>U</sup>	CHANN									5 Jun 2013	23:03:	07
							Radiate	ed Emissi	ons 3-Mete	ers		
100							Project:13 Configurat	U15037 ion:EUT only z HT40 High of				
90							Mode:5 6GH Tested by:	z HT40 High cł Joey Gomez	ſ			
80												
												_
70 60												
60	Avg Limit I	dBuV/m)										
50	-										h e state het die	e delle Le delle
					. 41	a al contration and an and an	No.	uth to a l <sup>1</sup> ar more		an a		<b>^</b>
40			الاستعادية والمرتب والمعادية المعادية والمعادية والمعادية والمعادية والمعادية والمعادية والمعادية والمعادية وال	waya bilina wa Amanta	electric de la constante						-	
30	An water and a second	Marine a										
20												
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100	0					uency El			1000	3	1	8000
≊:ht48 hiqh i	1:1080-5880 11 5:5680-6815 11 5:5680-6815 11		Sweep PLs (Supp Auto/Cpled 2001 17 Auto/Cpled 2001 17 Auto/Cpled 8001 17	forizantal forizantal		Range D1 7:6815-1890 9:19699-189	21 Det 1054    8	UBU / Ang Typ Sw 3H Aut 3Bk Aut	ep Pta Kiepp/Node ra/Cpied 12: 1/ ra/Cpied 9601 1/	Latel Horizontal Horizontal		
z. noto nign i					Amp/Cbl							
		Meter			/6GHz	Corrected			Peak			
Marker		Reading		AF T346	HPF	-	-	it Margin	Limit	Margin	Height	
No.	Frequency al 6015 - 1800		Detector	(dB/m)	(dB)	(dBuV/m)	(dBuV/n	n) (dB)	(dBuV/m)	(dB)	[cm]	Polarity
	7013.667	39.7	PK	36	-29.1	46.6	53.97	-7.37	74	-27.4	101	Horz
orizont 1												
1	detector											

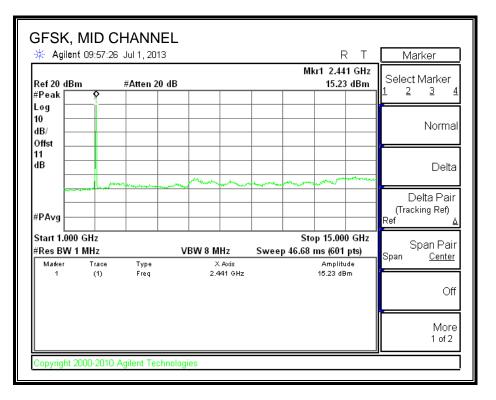
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		EMC						Radiat	od Emisci	ons 3-Meter	Jun 2013	23:03:0	17
1	00												
								Configura Mode:5.6G	3U15037 tion:EUT only Hz HT40 High ch	ì			
	90							Tested by	:Joey Gomez				
	80	Peak Limit											
	70												
	60	Avg Limit	(dBuV/m)										
	50								2 1.00.00 MB-000	العمارية ويرتب			<u>.</u>
	40			a settered	accente ablica e debaixibilitada		المسابقا ويتجار الماريلين	144			in an		
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	30												
	20												
	1000									10000			3000
	å å			AutolCp1ed 9801 AutolCp1ed 2809	1/ Vertical 1/ Vertical		8:6815-18 18:16668-	000 IN 10000 IN	-001 Au 314 Au 316 Au	avCpiled 12k 1/ 1 avCpiled 9881 1/ 1	Articol Articol		
: ht48		)15 - 18000M	Hz										
	cal 60					Amp/Cbl							
erti	ker	Test Frequency	Meter Reading	Detector	AF T346 (dB/m)	/6GHz HPF (dB)	(dBuV/m)	Avg Limi (dBuV/n	-	Peak Limit (dBuV/m)	Margin (dB)	Height [cm]	Polarity
ertio ⁄Iar	ker					HPF	<b>(dBuV/m)</b> 46.68	-	i) (dB)	(dBuV/m)	-	[cm]	<b>Polarit</b> Vert
ertio Mar No	ker p. 2	Frequency	Reading		(dB/m)	HPF (dB)		(dBuV/m	i) (dB)	(dBuV/m)	(dB)	[cm]	

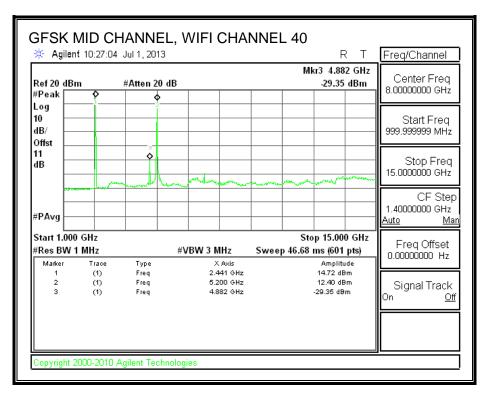
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## 9.2.10. 2.4GHz and 5GHz Band Co-Location

#### **BLUETOOTH ON**

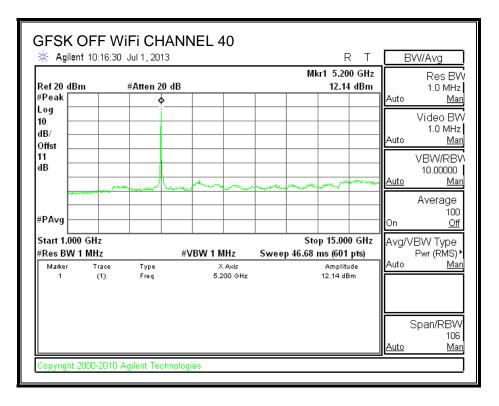


#### **BLUETOOTH AND WIFI ON**



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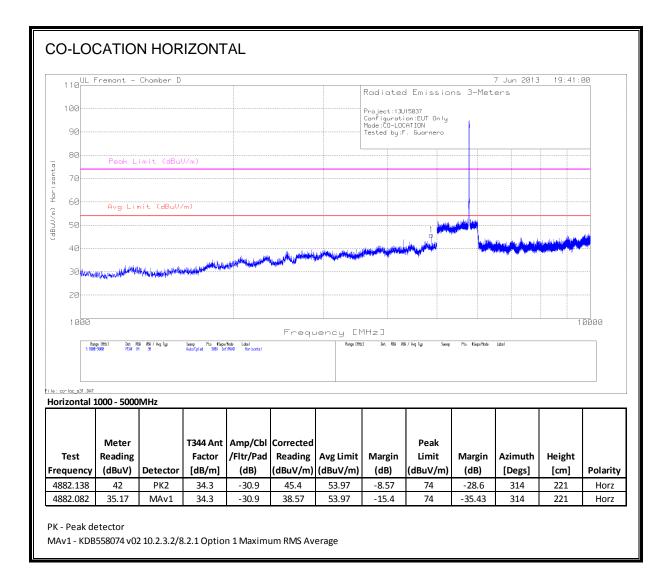
#### **BLUETOOTH OFF WiFi ON**



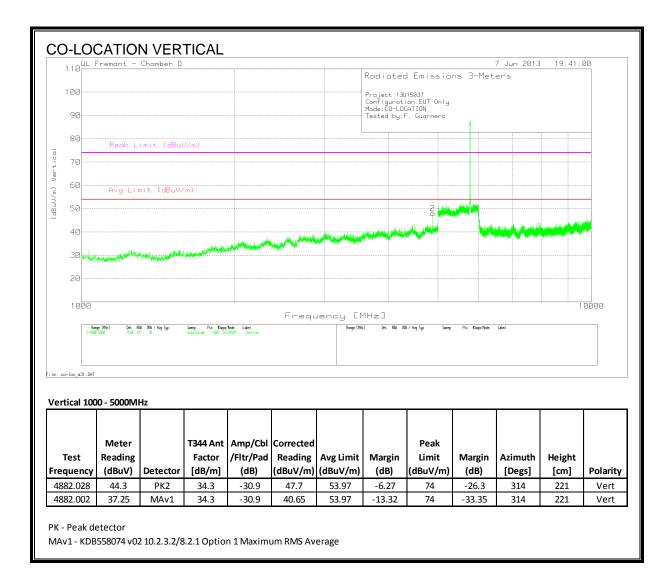
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#### HARMONICS AND SPURIOUS EMISSIONS



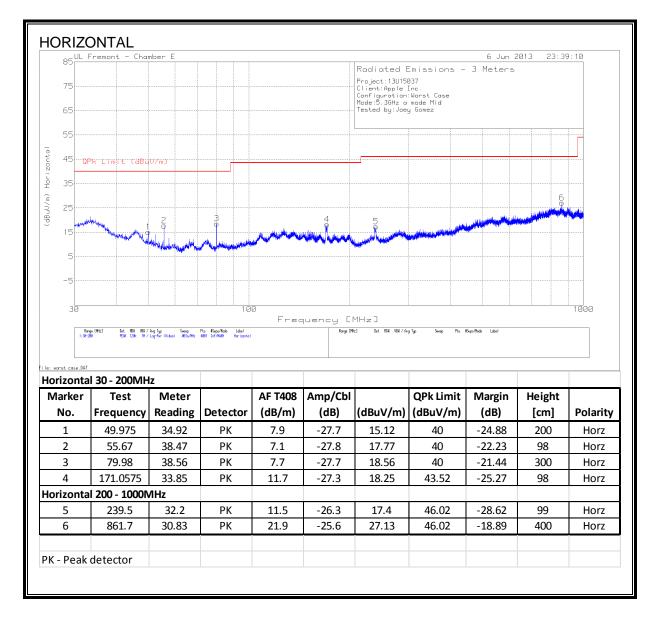
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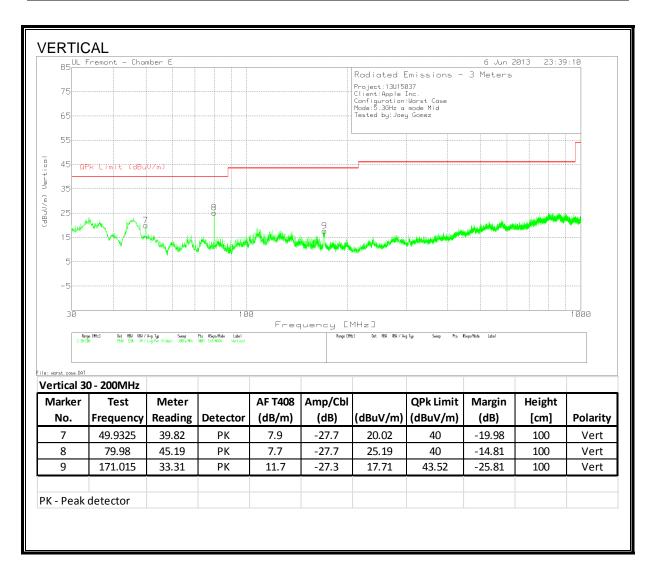
# 9.3. WORST-CASE BELOW 1 GHz

#### SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)



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## SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, VERTICAL)



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# **10. AC POWER LINE CONDUCTED EMISSIONS**

#### **LIMITS**

FCC §15.207 (a)

Frequency of Emission (MHz)	Conducted Limit (dBµV)			
	Quasi-peak	Average		
0.15-0.5	66 to 56 *	56 to 46 *		
0.5-5	56	46		
5-30	60	50		

\*Decreases with the logarithm of the frequency.

#### TEST PROCEDURE

The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.4.

The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

Line conducted data is recorded for both NEUTRAL and HOT lines.

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#### **RESULTS**

#### **<u>6 WORST EMISSIONS</u>**

#### Line-L1 .15 - 30MHz

						CISPR 11/22		CISPR	
			T24 IL	LC Cables		Class B		11/22	
Test	Meter		L1.TXT	1&3.TXT		Quasi-		Class B	
Frequency	Reading	Detector	(dB)	(dB)	dB(uVolts)	peak	Margin	Average	Margin
0.159	54.38	QP	0.1	0	54.48	65.52	-11.04	-	-
0.159	48.7	Av	0.1	0	48.8	-	-	55.5	-6.7
0.8295	48.8	РК	0.1	0	48.9	56	-7.1	-	-
0.8295	30.76	Av	0.1	0	30.86	-	-	46	-15.14
7.278	39.71	РК	0.1	0.1	39.91	60	-20.09	-	-
7.278	25.72	Av	0.1	0.1	25.92	-	-	50	-24.08
16.854	45.42	РК	0.2	0.2	45.82	60	-14.18	-	-
16.854	28.85	Av	0.2	0.2	29.25	-	-	50	-20.75

#### Line-L2 .15 - 30MHz

Test Frequency	Meter Reading	Detector	T24 IL L2.TXT (dB)	LC Cables 2&3.TXT (dB)	dB(uVolts)	CISPR 11/22 Class B Quasi- peak	Margin	CISPR 11/22 Class B Average	Margin
0.1545	54.75	РК	0.1	0	54.85	65.8	-10.95	-	-
0.1545	40.25	Av	0.1	0	40.35	-	-	55.8	-15.45
0.78	42.3	РК	0.1	0	42.4	56	-13.6	-	-
0.78	24.89	Av	0.1	0	24.99	-	-	46	-21.01
2.4585	35.55	РК	0.1	0.1	35.75	56	-20.25	-	-
2.4585	22.07	Av	0.1	0.1	22.27	-	-	46	-23.73
17.5425	42	РК	0.2	0.2	42.4	60	-17.6	-	-
17.5425	29.72	Av	0.2	0.2	30.12	-	-	50	-19.88

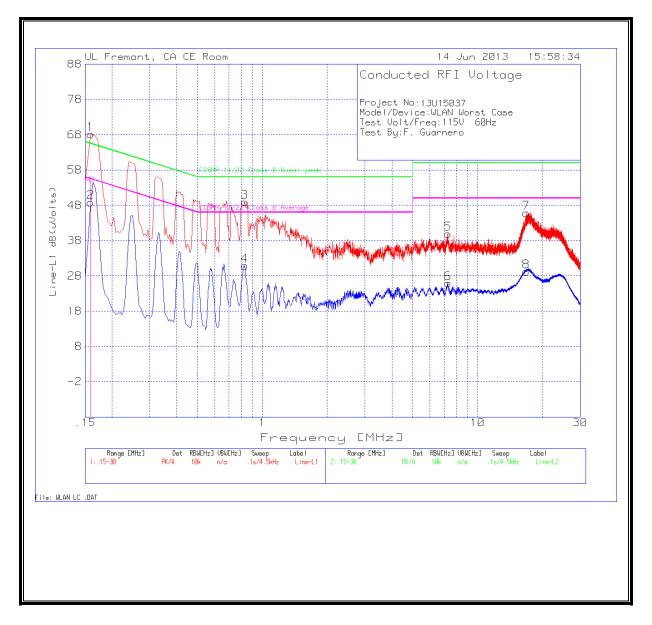
PK - Peak detector

QP - Quasi-Peak detector

Av - Average detector

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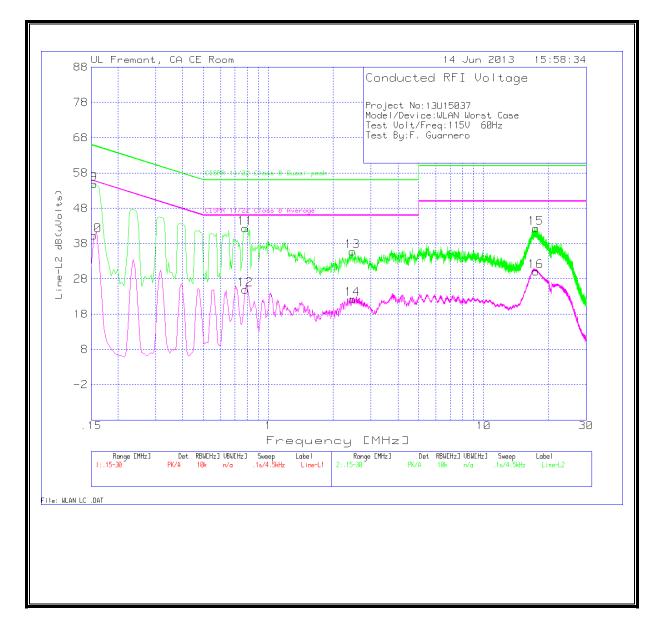
## LINE 1 RESULTS



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## LINE 2 RESULTS



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# 11. DYNAMIC FREQUENCY SELECTION

# 11.1. OVERVIEW

## 11.1.1. LIMITS

#### FCC

§15.407 (h) and FCC 06-96 APPENDIX "COMPLIANCE MEASUREMENT PROCEDURES FOR UNLICENSED-NATIONAL INFORMATION INFRASTRUCTURE DEVCIES OPERATING IN THE 5250-5350 MHz AND 5470-5725 MHz BANDS INCORPORATING DYNAMIC FREQUENCY SELECTION".

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#### Table 1: Applicability of DFS requirements prior to use of a channel

Requirement	Operational Mode				
	Master	Client (without radar detection)	Client (with radar detection)		
Non-Occupancy Period	Yes	Not required	Yes		
DFS Detection Threshold	Yes	Not required	Yes		
Channel Availability Check Time	Yes	Not required	Not required		
Uniform Spreading	Yes	Not required	Not required		

## Table 2: Applicability of DFS requirements during normal operation

Requirement	Operational	Operational Mode				
	Master	Master Client Client				
		(without DFS)	(with DFS)			
DFS Detection Threshold	Yes	Not required	Yes			
Channel Closing Transmission Time	Yes	Yes	Yes			
Channel Move Time	Yes	Yes	Yes			

# Table 3: Interference Threshold values, Master or Client incorporating In-Service Monitoring

ee note)						
4 dBm						
2 dBm						
Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna						
peen added to the amplitude						
of the test transmission waveforms to account for variations in measurement equipment. This						
will ensure that the test signal is at or above the detection threshold level to trigger a DFS						
2 E D a						

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#### Table 4: DFS Response requirement values

Parameter	Value
Non-occupancy period	30 minutes
Channel Availability Check Time	60 seconds
Channel Move Time	10 seconds
Channel Closing Transmission Time	200 milliseconds +
	approx. 60 milliseconds
	over remaining 10 second
	period

The instant that the Channel Move Time and the Channel Closing Transmission Time begins is as follows:

For the Short pulse radar Test Signals this instant is the end of the *Burst*.

For the Frequency Hopping radar Test Signal, this instant is the end of the last radar burst generated.

For the Long Pulse radar Test Signal this instant is the end of the 12 second period defining the radar transmission.

The Channel Closing Transmission Time is comprised of 200 milliseconds starting at the beginning of the Channel Move Time plus any additional intermittent control signals required to facilitate channel changes (an aggregate of approximately 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions.

#### Table 5 – Short Pulse Radar Test Waveforms

Radar	Pulse Width	PRI	Pulses	Minimum	Minimum
Туре	(Microseconds)	(Microseconds)		Percentage of	Trials
				Successful	
				Detection	
1	1	1428	18	60%	30
2	1-5	150-230	23-29	60%	30
3	6-10	200-500	16-18	60%	30
4	11-20	200-500	12-16	60%	30
Aggregate (F	Radar Types 1-4)	80%	120		

#### Table 6 – Long Pulse Radar Test Signal

Radar Waveform	Bursts	Pulses per Burst	Pulse Width (µsec)	Chirp Width (MHz)	PRI (µsec)	Minimum Percentage of Successful Detection	Minimum Trials
5	8-20	1-3	50-100	5-20	1000- 2000	80%	30

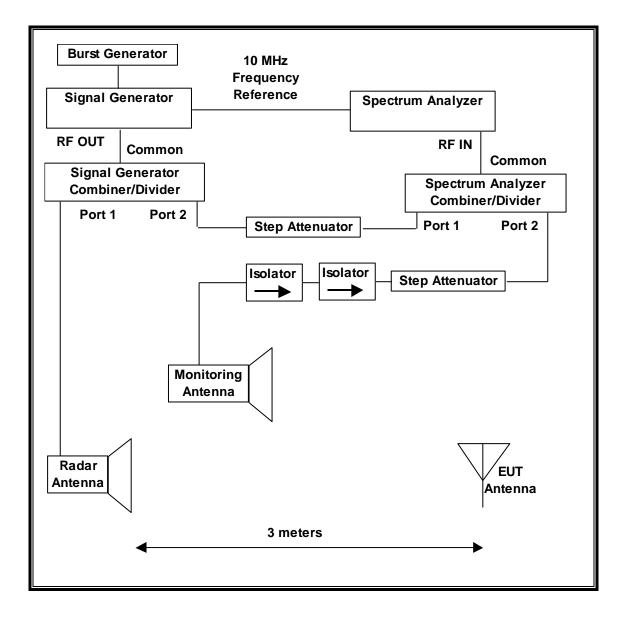
#### Table 7 – Frequency Hopping Radar Test Signal

Radar Waveform	Pulse Width (µsec)	PRI (µsec)	Burst Length (ms)	Pulses per Hop	Hopping Rate (kHz)	Minimum Percentage of Successful Detection	Minimum Trials
6	1	333	300	9	.333	70%	30

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# 11.1.2. TEST AND MEASUREMENT SYSTEM

#### RADIATED METHOD SYSTEM BLOCK DIAGRAM



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#### SYSTEM OVERVIEW

The short pulse and long pulse signal generating system utilizes the NTIA software. The Vector Signal Generator has been validated by the NTIA. The hopping signal generating system utilizes the CCS simulated hopping method and system, which has been validated by the DoD, FCC and NTIA. The software selects waveform parameters from within the bounds of the signal type on a random basis using uniform distribution.

The short pulse types 2, 3 and 4, and the long pulse type 5 parameters are randomized at runtime.

The hopping type 6 pulse parameters are fixed while the hopping sequence is based on the August 2005 NTIA Hopping Frequency List. The initial starting point randomized at run-time and each subsequent starting point is incremented by 475. Each frequency in the 100-length segment is compared to the boundaries of the EUT Detection Bandwidth and the software creates a hopping burst pattern in accordance with Section 7.4.1.3 Method #2 Simulated Frequency Hopping Radar Waveform Generating Subsystem of FCC 06-96 APPENDIX. The frequency of the signal generator is incremented in 1 MHz steps from  $F_L$  to  $F_H$  for each successive trial. This incremental sequence is repeated as required to generate a minimum of 30 total trials and to maintain a uniform frequency distribution over the entire Detection Bandwidth.

The signal monitoring equipment consists of a spectrum analyzer. The aggregate ON time is calculated by multiplying the number of bins above a threshold during a particular observation period by the dwell time per bin, with the analyzer set to peak detection and max hold.

#### SYSTEM CALIBRATION

A 50-ohm load is connected in place of the spectrum analyzer, and the spectrum analyzer is connected to a horn antenna via a coaxial cable, with the reference level offset set to (horn antenna gain – coaxial cable loss). The signal generator is set to CW mode. The amplitude of the signal generator is adjusted to yield a level of –64 dBm as measured on the spectrum analyzer.

Without changing any of the instrument settings, the spectrum analyzer is reconnected to the Common port of the Spectrum Analyzer Combiner/Divider. The Reference Level Offset of the spectrum analyzer is adjusted so that the displayed amplitude of the signal is –64 dBm.

The spectrum analyzer displays the level of the signal generator as received at the antenna ports of the Master Device. The interference detection threshold may be varied from the calibrated value of –64 dBm and the spectrum analyzer will still indicate the level as received by the Master Device.

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#### ADJUSTMENT OF DISPLAYED TRAFFIC LEVEL

A link is established between the Master and Slave and the distance between the units is adjusted as needed to provide a suitable received level at the Master and Slave devices. The video test file is streamed to generate WLAN traffic. The monitoring antenna is adjusted so that the WLAN traffic level, as displayed on the spectrum analyzer, is at lower amplitude than the radar detection threshold.

#### TEST AND MEASUREMENT EQUIPMENT

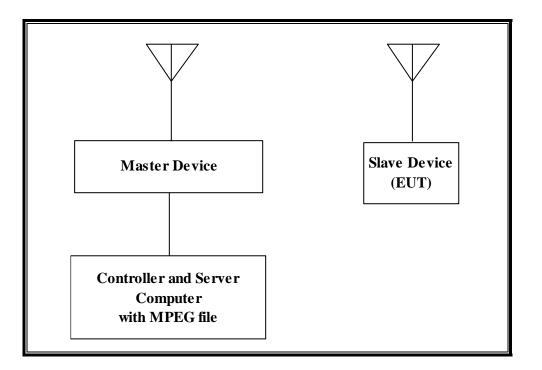
The following test and measurement equipment was utilized for the DFS tests documented in this report:

TEST EQUIPMENT LIST							
Description	Manufacturer	Model	Asset Number	Cal Due			
Spectrum Analyzer, 26.5 GHz	Agilent / HP	E4440A	C01178	08/18/13			
Vector Signal Generator, 20GHz	Agilent / HP	E8267C	C01066	11/20/13			

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# 11.1.3. SETUP OF EUT (CLIENT MODE)

#### RADIATED METHOD EUT TEST SETUP



#### SUPPORT EQUIPMENT

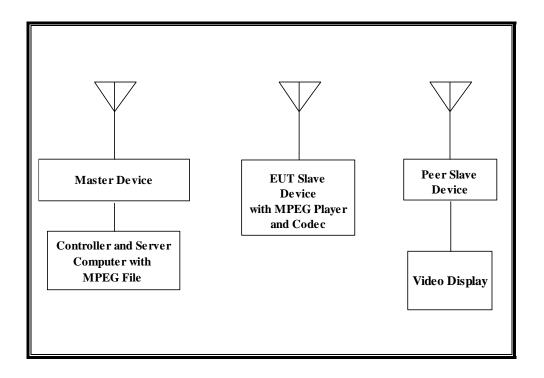
The following support equipment was utilized for the DFS tests documented in this report:

PERIPHERAL SUPPORT EQUIPMENT LIST									
Description	Manufacturer	Model	Serial Number	FCC ID					
Wireless Access Point (Master Device)	Cisco	AIR-AP1252AG-A- K9	FTX130390D9	LDK102061					
AC Adapter (AP)	Delta Electronics	EADP-45BB B	DTH1049902N	DoC					
Notebook PC (Controller/Server)	Apple	MacBook Pro A1150	AOU257941	DoC					
AC Adapter (Controller/Server PC)	Delta Electronics	A1330	MV952157KAGKA	DoC					

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# 11.1.4. SETUP OF EUT (CLIENT-TO-CLIENT COMMUNICATIONS MODE)

#### RADIATED METHOD EUT TEST SETUP



#### SUPPORT EQUIPMENT

The following support equipment was utilized for the DFS tests documented in this report:

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
Wireless Access Point (Master Device)	Cisco	AIR-AP1252AG-A- K9	FTX130390D9	LDK102061
AC Adapter (AP)	Delta Electronics	EADP-45BB B	DTH1049902N	DoC
Notebook PC (Controller/Server)	Apple	MacBook Pro A1150	AOU257941	DoC
AC Adapter (Controller/Server PC)	Delta Electronics	A1330	MV952157KAGKA	DoC
Apple TV (Peer Slave	Apple	A1469	V07JV1Z7FF54	BCGA1469
Video Display	Dell	U2410f	CN-0FJ525N- 72872-1B5-AGAL	DoC

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# 11.1.5. DESCRIPTION OF EUT

The EUT operates over the 5250-5350 MHz and 5470-5725 MHz ranges.

The EUT is a Slave Device without Radar Detection.

The highest power level within these bands is 9.54 dBm EIRP in the 5250-5350 MHz band and 11.74 dBm EIRP in the 5470-5725 MHz band.

The only antenna assembly utilized with the EUT has a gain of –5.83 dBi in the 5250-5350 MHz band and –4.25 dBi in the 5470-5725 MHz band.

The rated output power of the Master unit is > 23dBm (EIRP). Therefore the required interference threshold level is -64 dBm. After correction for procedural adjustments, the required radiated threshold at the antenna port is -64 + 1 = -63 dBm.

The calibrated radiated DFS Detection Threshold level is set to –64 dBm. The tested level is lower than the required level hence it provides margin to the limit.

The EUT uses one transmitter/receiver chain connected to an antenna to perform radiated tests.

WLAN traffic is generated by streaming the video file TestFile.mp2 "6 ½ Magic Hours" from the Master to the Slave in full motion video mode using Safari web browser.

TPC is not required since the maximum EIRP is less than 500 mW (27 dBm).

The EUT utilizes the 802.11a/n architecture. Two nominal channel bandwidths of 20 MHz and 40 MHz are implemented.

The software installed in the EUT is 11A5400f.

#### UNIFORM CHANNEL SPREADING

This requirement is not applicable to Slave radio devices.

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#### **OVERVIEW OF MASTER DEVICE WITH RESPECT TO §15.407 (h) REQUIREMENTS**

The Master Device is a Cisco Access Point, FCC ID: LDK102061. The minimum antenna gain for the Master Device is 3.5 dBi.

The rated output power of the Master unit is > 23dBm (EIRP). Therefore the required interference threshold level is -64 dBm. After correction for procedural adjustments, the required radiated threshold at the antenna port is -64 + 1 = -63 dBm.

The calibrated radiated DFS Detection Threshold level is set to –64 dBm. The tested level is lower than the required level hence it provides margin to the limit.

The software installed in the access point is 12.4(25d)JA1.

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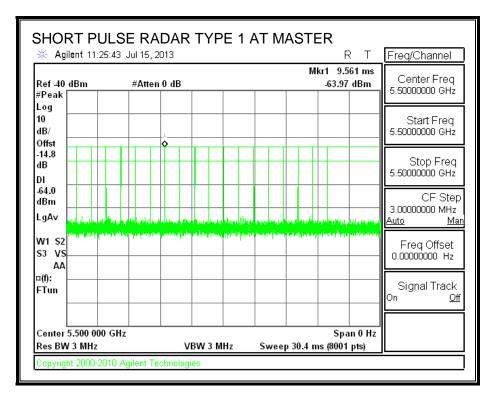
# 11.2. CLIENT MODE RESULTS FOR 20 MHz BANDWIDTH

## 11.2.1. TEST CHANNEL

All tests were performed at a channel center frequency of 5500 MHz.

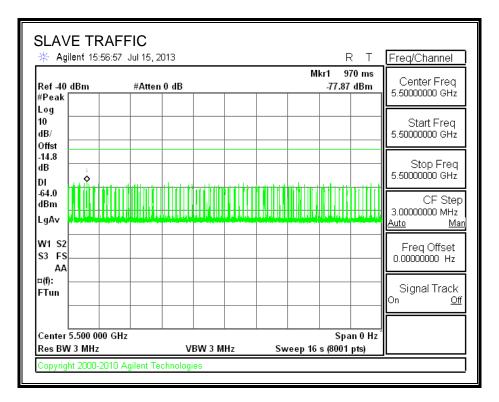
# 11.2.2. RADAR WAVEFORM AND TRAFFIC

#### RADAR WAVEFORM



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#### **TRAFFIC**



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# 11.2.3. OVERLAPPING CHANNEL TESTS

#### RESULTS

These tests are not applicable.

# 11.2.4. MOVE AND CLOSING TIME

#### **REPORTING NOTES**

The reference marker is set at the end of last radar pulse.

The delta marker is set at the end of the last WLAN transmission following the radar pulse. This delta is the channel move time.

The aggregate channel closing transmission time is calculated as follows:

```
Aggregate Transmission Time = (Number of analyzer bins showing transmission) * (dwell time per bin)
```

The observation period over which the FCC aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

The observation period over which the IC aggregate time is calculated begins at (Reference Marker) and ends no earlier than (Reference Marker + 10 sec).

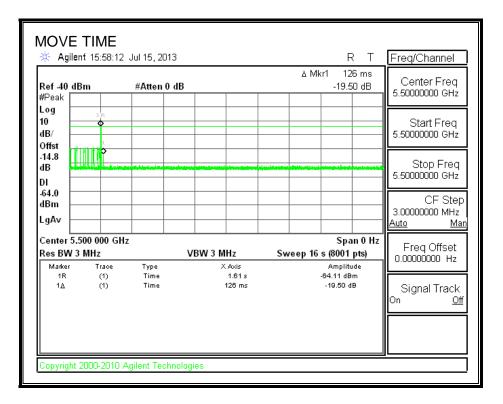
#### RESULTS

Agency	Channel Move Time	Limit
	(sec)	(sec)
FCC / IC	0.126	10

Agency	Aggregate Channel Closing Transmission Time	Limit
	(msec)	(msec)
FCC	0.0	60
IC	2.0	260

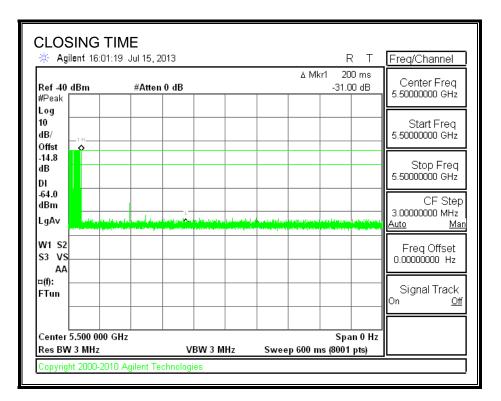
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#### MOVE TIME



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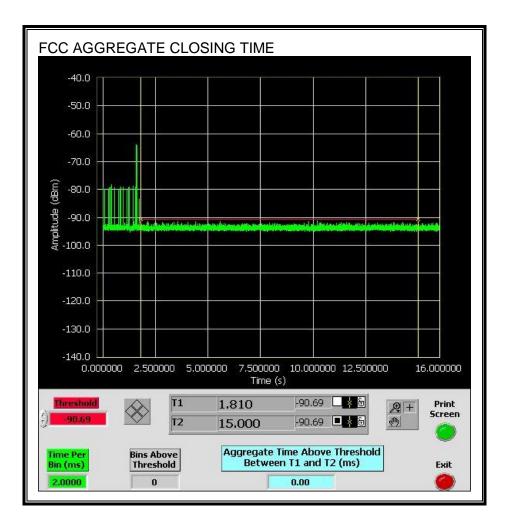
#### **CHANNEL CLOSING TIME**



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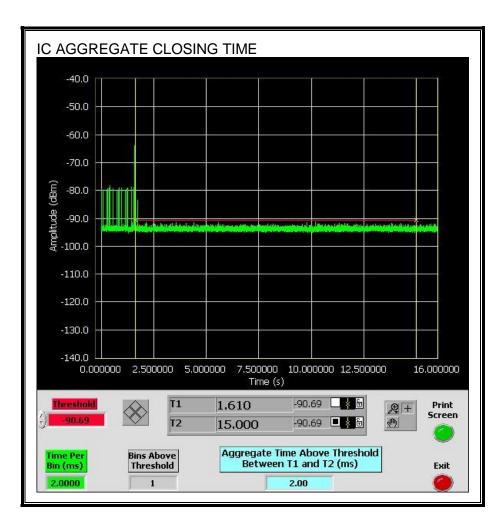
#### AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

No transmissions are observed during the FCC aggregate monitoring period.



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Only intermittent transmissions are observed during the IC aggregate monitoring period.



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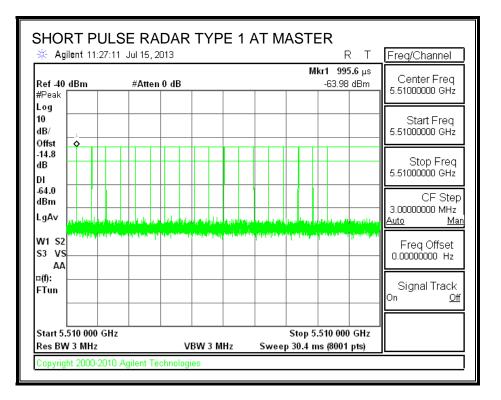
# 11.3. CLIENT MODE RESULTS FOR 40 MHz BANDWIDTH

## 11.3.1. TEST CHANNEL

All tests were performed at a channel center frequency of 5510 MHz.

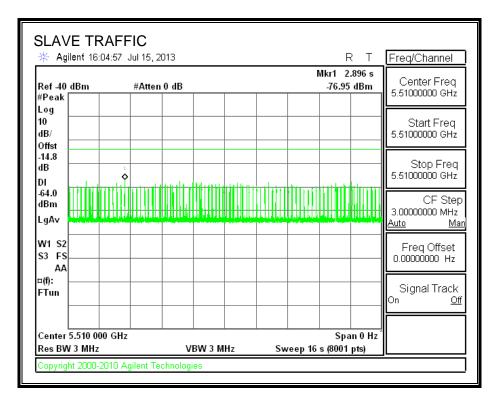
# 11.3.2. RADAR WAVEFORM AND TRAFFIC

#### RADAR WAVEFORM



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#### **TRAFFIC**



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# 11.3.3. OVERLAPPING CHANNEL TESTS

#### RESULTS

These tests are not applicable.

# 11.3.4. MOVE AND CLOSING TIME

#### **REPORTING NOTES**

The reference marker is set at the end of last radar pulse.

The delta marker is set at the end of the last WLAN transmission following the radar pulse. This delta is the channel move time.

The aggregate channel closing transmission time is calculated as follows:

```
Aggregate Transmission Time = (Number of analyzer bins showing transmission) * (dwell time per bin)
```

The observation period over which the FCC aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

The observation period over which the IC aggregate time is calculated begins at (Reference Marker) and ends no earlier than (Reference Marker + 10 sec).

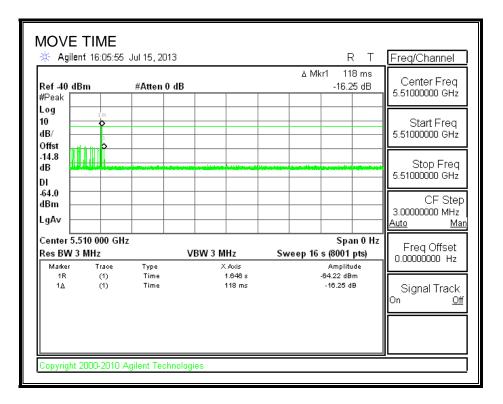
#### RESULTS

Agency	Channel Move Time	Limit
	(sec)	(sec)
FCC / IC	0.118	10

Agency	Aggregate Channel Closing Transmission Time	Limit
	(msec)	(msec)
FCC	0.0	60
IC	2.0	260

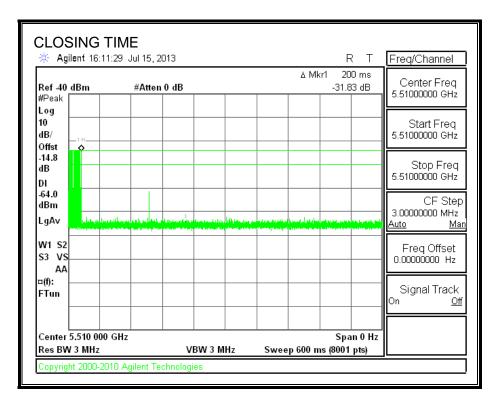
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#### MOVE TIME



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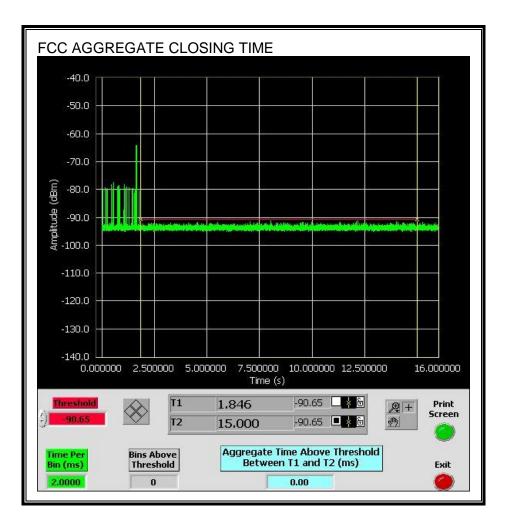
#### **CHANNEL CLOSING TIME**



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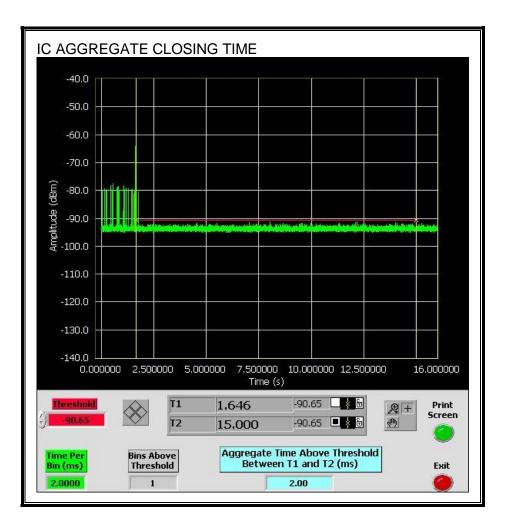
#### AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

No transmissions are observed during the FCC aggregate monitoring period.



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Only intermittent transmissions are observed during the IC aggregate monitoring period.



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# 11.3.5. NON-OCCUPANCY PERIOD

#### **RESULTS**

No EUT transmissions were observed on the test channel during the 30-minute observation time.

🔆 Agilent 16:48:	03 Jul 15, 2013	R T	Freq/Channel
Ref 40 dBm #Peak	#Atten 0 dB	∆ Mkr1 1.8 ks -28.12 dB	Center Freq 5.51000000 GHz
Log 10 dB/ Offst			Start Freq 5.5100000 GHz
-14.8 dB DI			Stop Freq 5.51000000 GHz
-64.0 dBm LgAv		1	CF Step 3.00000000 MHz <u>Auto Ma</u>
W1 S2 S3 FS AA			Freq Offset 0.00000000 Hz
¤(f): FTun			Signal Track <sup>On <u>Of</u></sup>
Center 5.510 000 ( Res BW 3 MHz	GHz VBW 3 MHz	Span 0 Hz Sweep 2 ks (8001 pts)	

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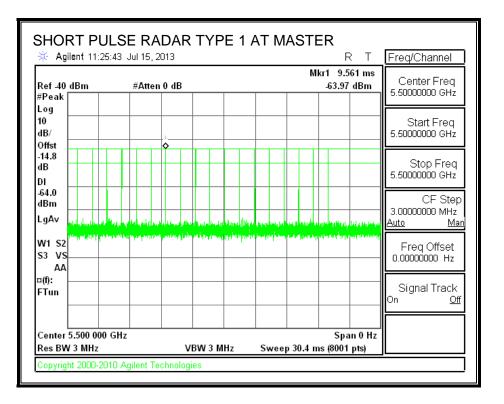
# 11.4. CLIENT-TO-CLIENT COMMUNICATIONS MODE RESULTS FOR 20 MHz BANDWIDTH

# 11.4.1. TEST CHANNEL

All tests were performed at a channel center frequency of 5500 MHz.

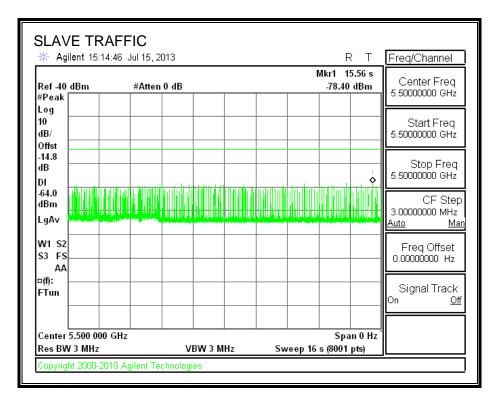
# 11.4.2. RADAR WAVEFORM AND TRAFFIC

#### RADAR WAVEFORM



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#### **TRAFFIC**



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## 11.4.3. OVERLAPPING CHANNEL TESTS

## RESULTS

These tests are not applicable.

## 11.4.4. MOVE AND CLOSING TIME

## **REPORTING NOTES**

The reference marker is set at the end of last radar pulse.

The delta marker is set at the end of the last WLAN transmission following the radar pulse. This delta is the channel move time.

The aggregate channel closing transmission time is calculated as follows:

```
Aggregate Transmission Time = (Number of analyzer bins showing transmission) * (dwell time per bin)
```

The observation period over which the FCC aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

The observation period over which the IC aggregate time is calculated begins at (Reference Marker) and ends no earlier than (Reference Marker + 10 sec).

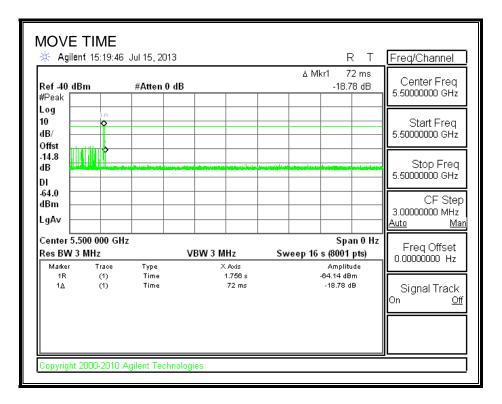
### RESULTS

Agency	Channel Move Time	Limit
	(sec)	(sec)
FCC / IC	0.072	10

Agency	Aggregate Channel Closing Transmission Time	Limit
	(msec)	(msec)
FCC	0.0	60
IC	2.0	260

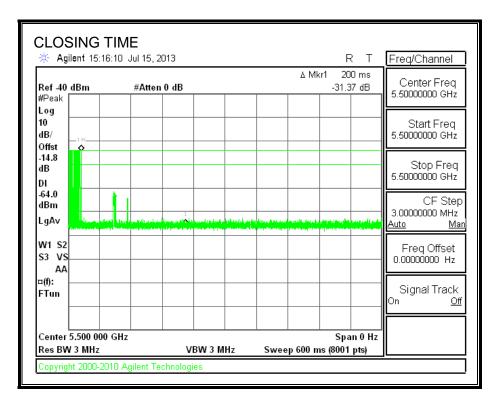
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### MOVE TIME



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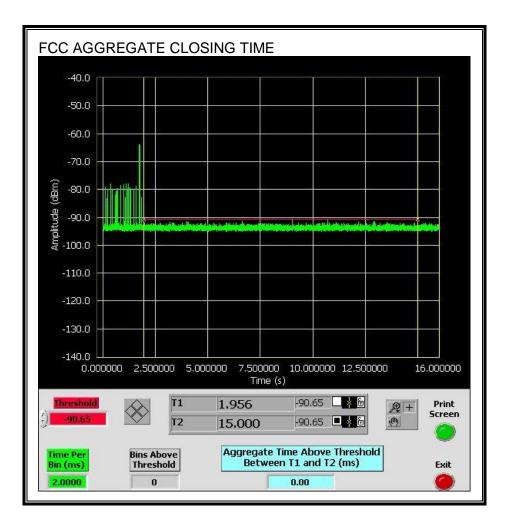
### **CHANNEL CLOSING TIME**



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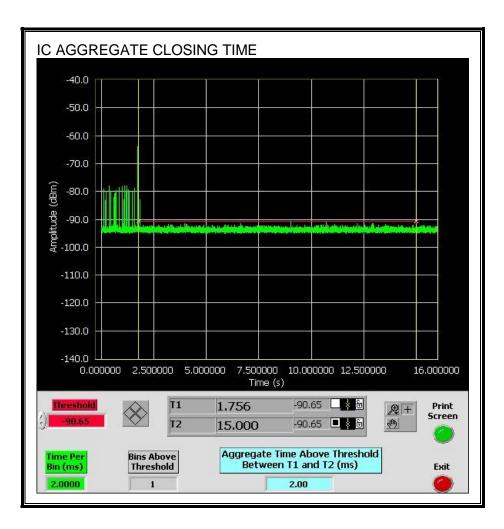
### AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

No transmissions are observed during the FCC aggregate monitoring period.



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Only intermittent transmissions are observed during the IC aggregate monitoring period.



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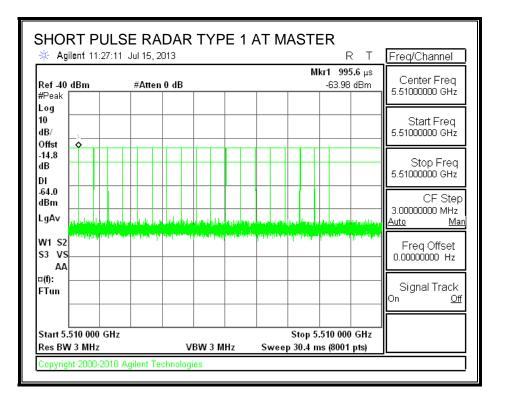
# 11.5. CLIENT-TO-CLIENT COMMUNICATIONS MODE RESULTS FOR 40 MHz BANDWIDTH

## 11.5.1. TEST CHANNEL

All tests were performed at a channel center frequency of 5500 MHz.

## 11.5.2. RADAR WAVEFORM AND TRAFFIC

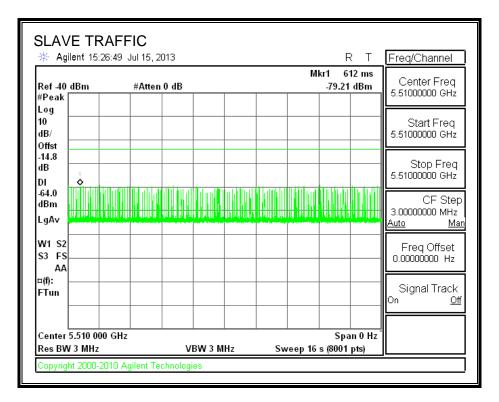
## RADAR WAVEFORM



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#### **TRAFFIC**



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## 11.5.3. OVERLAPPING CHANNEL TESTS

## RESULTS

These tests are not applicable.

## 11.5.4. MOVE AND CLOSING TIME

## **REPORTING NOTES**

The reference marker is set at the end of last radar pulse.

The delta marker is set at the end of the last WLAN transmission following the radar pulse. This delta is the channel move time.

The aggregate channel closing transmission time is calculated as follows:

```
Aggregate Transmission Time = (Number of analyzer bins showing transmission) * (dwell time per bin)
```

The observation period over which the FCC aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

The observation period over which the IC aggregate time is calculated begins at (Reference Marker) and ends no earlier than (Reference Marker + 10 sec).

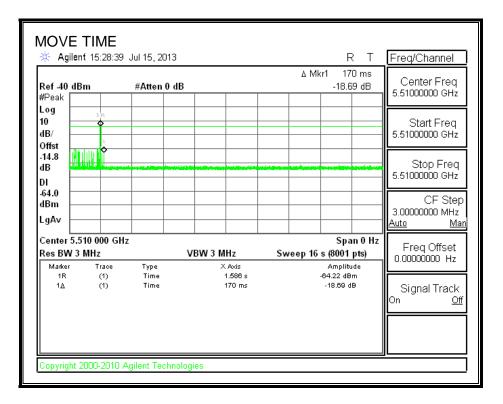
### RESULTS

Agency	Channel Move Time	Limit
	(sec)	(sec)
FCC / IC	0.170	10

Agency	Aggregate Channel Closing Transmission Time	Limit
	(msec)	(msec)
FCC	0.0	60
IC	4.0	260

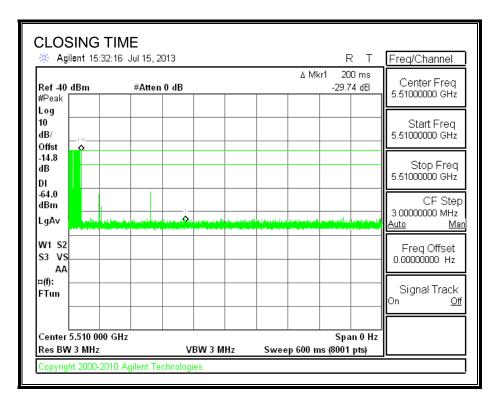
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### MOVE TIME



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### **CHANNEL CLOSING TIME**

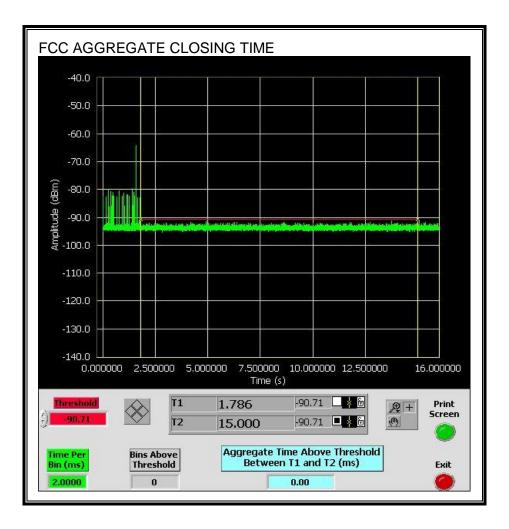


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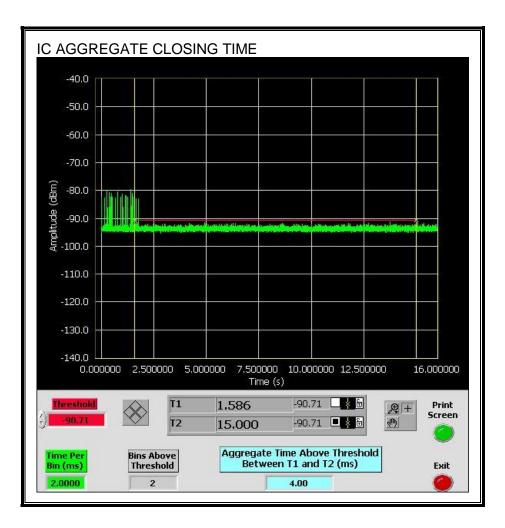
### AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

No transmissions are observed during the FCC aggregate monitoring period.



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Only intermittent transmissions are observed during the IC aggregate monitoring period.



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