

Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 1 of 463

# ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

# INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART E REQUIREMENT AND INDUSTRY CANADA RSS 210

**OF** 

**Product Name: PDA Phone** 

**Brand Name:** Sony

**Model No.:** C2004

Type No.: PM-0481-BV

**Model Difference:** N/A

PY7PM-0481 FCC ID:

4170B-PM0481 IC:

**Report No.:** EH/2013/70026

**Issue Date:** Aug. 05, 2013

**FCC Rule Part: §15.407** 

**IC Rule Part:** RSS-210 issue 8:2010, Annex 9

Prepared for:

**Sony Mobile Communications AB** 

Nya Vattentornet 22188 Lund/SWEDEN

SGS Taiwan Ltd. Prepared by:

**Electronics & Communication Laboratory** 

No.134, Wu Kung Road, New Taipei Industrial Park,

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Testing Laboratory 0513

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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 2 of 463

# VERIFICATION OF COMPLIANCE

**Applicant:** Sony Mobile Communications AB

Nya Vattentornet 22188 Lund/SWEDEN

PDA Phone **Product Name:** 

**Brand Name:** Sony

C2004 **Model No.:** 

**Type No.:** PM-0481-BV

**Model Difference:** N/A

FCC ID: PY7PM-0481

IC: 4170B-PM0481

File Number: EH/2013/70026

Date of test: Apr. 01, 2013 ~ Jul. 23, 2013

**Date of EUT Received:** Apr. 01, 2013

### We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Electronics & Communication Laboratory The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4:2009 & ANSI C63.10: 2009 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15.407 and RSS-210 issue 8: 2010 Annex 9.

The test results of this report relate only to the tested sample identified in this report.

Test By:	Marcus Iseny	Date:	Aug. 05, 2013
Prepared By:	Marcus Tseng/Engineer Utoletta Tang	Date:	Aug. 05, 2013
Approved By:	Violetta Tang / Clerk  Jim Chang / Supervisor	Date:	Aug. 05, 2013

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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 3 of 463

# **Revision History**

Report Number Revision		Description	Issue Date
EH/2013/70026	Rev.01	Initial creation of document	Jul. 26, 2013
EH/2013/70026	Rev.02	Update the Limit specific for conducted output complying with RSS-210 on page 72~75.	Aug. 05, 2013

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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 4 of 463

### **Table of Contents**

I.	GEN	ERAL INFORMATION	
	1.1.	Product Description	7
	1.2.	Related Submittal(s) / Grant (s)	13
	1.3.	Test Methodology	13
	1.4.	Test Facility	13
	1.5.	Special Accessories	13
	1.6.	Equipment Modifications	13
2.	SYS	TEM TEST CONFIGURATION	14
	2.1.	EUT Configuration	14
	2.2.	EUT Exercise	14
	2.3.	Test Procedure	14
	2.4.	Configuration of Tested System	15
3.	SUM	IMARY OF TEST RESULT	17
4.		CRIPTION OF TEST MODES	
5.	MEA	ASUREMENT UNCERTAINTY	25
6.	CON	NDUCTED EMISSION TEST	26
	6.1.	Standard Applicable	
	6.2.	Measurement Equipment Used:	26
	6.3.	EUT Setup	26
	6.4.	Test SET-UP (Block Diagram of Configuration)	27
	6.5.	Measurement Procedure	27
	6.6.	Measurement Result	27
7.	26dB	3 and 99%EMISSION BANDWIDTH MEASUREMENT	30
	7.1	Standard Applicable	30
	7.2	Measurement Procedure	30
	7.3	Measurement Equipment Used:	31
	7.4	Test Set-up:	31
	7.5	Measurement Result	
	7.6	Measurement Result	51

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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 5 of 463

8.	The I	MAXIMUM OUTPUT POWER MEASUREMENT	70
	8.1	Standard Applicable	70
	8.2	Measurement Procedure	71
	8.3	Measurement Equipment Used:	71
	8.4	Test Set-up:	71
	8.5	Measurement Result	72
9.	PEA	K POWER SPECTRAL DENSITY	78
	9.1	Standard Applicable	78
	9.2	Measurement Procedure (following procedure F, & E) d) method SA-2 in KDB789033 D01)	79
	9.3	Measurement Equipment Used:	79
	9.4	Test Set-up:	79
	9.5	Measurement Result	80
10.	PEA	K EXCURSION MEASUREMENT	99
	10.1	Standard Applicable	99
	10.2	Measurement Procedure (following procedure G in KDB789033)	99
	10.3	Measurement Equipment Used:	101
	10.4	Test Set-up:	101
	10.5	Test Results:	102
11.	UND	ESIRABLE EMISSION - CONDUCTED MEASUREMENT	. 150
	11.1	Standard Applicable	
	11.2	Measurement Procedure	151
	11.3	Measurement Equipment Used:	151
	11.4	Test Set-up:	151
	11.5	Measurement Result:	151
12.	UND	ESIRABLE EMISSION - RADIATED MEASUREMENT	. 239
	12.1	Standard Applicable	
	12.2	EUT Setup	245
	12.3	Measurement Procedure	245
	12.4	Test SET-UP (Block Diagram of Configuration)	246
	12.5	Measurement Equipment Used:	247
	12.6	Field Strength Calculation	248
	12.7	Measurement Result	248

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 6 of 463

<b>13.</b>	TRA	NSMISSION IN THE ABSENCE OF DATA	314
	13.1	Standard Applicable	
	13.2	Result:	314
14.	FRE	QUENCY STABILITY	315
	14.1	Standard Applicable	
	14.2	Result:	315
15.	ANT	ENNA REQUIREMENT	322
	15.1	Standard Applicable	
	15.2	Antenna Connected Construction	322
ME	ASUF	REMENT PLOT OF RADIATED SPURIOUS EMISSION	323

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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 7 of 463

### **GENERAL INFORMATION**

# 1.1. Product Description

General:

Octicial.	General:			
Product Name:	PDA Phone			
Brand Name:	Sony			
Model No.:	C2004			
Type No.:	PM-0481-1	BV		
Model Difference:	N/A			
Data Cable (USB):		: EC450, Supplier: K-one 242-6715.3, Length: 100 cm		
Simple Hands-Free (SHF-White):	Model No.: MH410c, Supplier: Foster Electric Type No.: AG-1100			
Simple Hands-Free (SHF-Black):	Model No.: MH410c, Supplier: Foster Electric Type No.: CCA-0004017			
Car Charger:	Model No.: AN400, Supplier: Salcomp Type No.: CAA-0003013			
Hi-Fi Wireless Headset:	Model No.: MW600, Supplier: BALDA Type No.: DDA-0002029.B coupling with Simple Hands Free (Model No.: MH755, Supplier: BALDA Type No.: AG-0502)			
Hardware Version:	A			
Software Version:	15.2.A.0.17			
	3.7Vdc			
Power Supply:	Battery:	Model No.: BA900, Supplier: Sony Type No.: AB-0500		
	Adapter:	Model No.: EP800, Supplier: Salcomp Type No.: CAA-0002016-US		

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Page 8 of 463

#### Bluetooth BR+EDR:

Bluetooth Version:	V3.0+HS
Channel number:	79 channels
Modulation type:	Frequency Hopping Spread Spectrum
Transmit Power:	10.11dBm
Frequency Range:	2.402GHz – 2.480GHz
Dwell Time:	<= 0.4s
Antenna Designation:	PIFA Antenna, Gain: 2.55dBi
Type of Emission:	915KF7D (GFSK) / 1M15G7D (π/4DQPSK) /1M20G7D (8DPSK)

### Bluetooth Low Energy:

Frequency Range:	2402 – 2480MHz
Bluetooth Version:	V4.0 Dual mode
Channel number:	40 channels
Modulation type:	GFSK
Transmit Power:	1.24dBm (Peak)
Antenna Designation:	PIFA Antenna, Gain: 2.55dBi
Type of Emission	1M05F7D

#### NFC:

Operating Frequency:	13.56MHz
Transmit Power:	< 123dBuV/m at 3m.
Number of Channels:	1
Antenna Type:	Loop Antenna
Modulation Type:	ASK, BPSK
Type of Emission:	15K0F1D

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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 9 of 463

#### WLAN 2.4GHz+5.7GHz:

Wi-Fi	Frequency Range	Channels	Rated Power Modulation Technology		Type of Emission	
11b/g	2412-2462	11	b: 17.27dBm g: 20.82dBm	DSSS, OFDM	b: 13M5G1D g: 16M6D1D	
11n	HT20 2412-2462	11	HT20: 20.84dBm	OFDM	n: 17M8D1D	
11a	5725-5850	5	a: 19.54dBm		a: 16M7D1D	
11n (5GHz)	HT20 5725-5850	5	HT20: 19.62dBm	OFDM	n_20HT:17M8D1D	
11n (5GHz)	HT40 5725-5850	2	HT40: 19.18dBm		n_40HT:36M0D1D	
Antenna l	Antenna Designation:		PIFA Antenna, 2.4GHz Gain: 2.55dBi 5GHz Gain: 1.66dBi (5725MHz-5850MHz)			
Modulation type:		CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM				
Transition Rate:		802.11 a: 802.11 b: 802.11 g: 802.11 n_	802.11 a: 6/9/12/18/24/36/48/54 Mbps 802.11 b: 1/2/5.5/11 Mbps 802.11 g: 6/9/12/18/24/36/48/54 Mbps 802.11 n_20MHz: 6.5 – 65.0Mbps 802.11 n_40MHz: 13.5 – 135.0Mbps			

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Page 10 of 463

#### WLAN 5GHz:

Wi-Fi	Frequency Range	Channels	Rated Power (Avg)	Rated Power (EIRP)	Modulation Technology	Type of Emission
	5150~5250	4	12.77dBm	12.03dBm		16M7D1D
11a	5250~5350	4	12.78dBm	13.79dBm	OFDM	16M7D1D
	5470~5725	11	12.87dBm	15.57dBm		16M6D1D
	HT20 5150~5250	4	HT20: 12.85dBm	HT20: 12.11dBm	OFDM	17M7D1D
11n	HT20 5250~5350	4	HT20: 12.84dBm	HT20: 13.85dBm		17M8D1D
	HT20 5470~5725	8	HT20: 12.88dBm	HT20: 15.58dBm		17M7D1D
	HT40 5150~5250	2	HT40: 11.76dBm	HT40: 11.02dBm		36M1D1D
11n	HT40 5250~5350	2	HT40: 11.79dBm	HT40: 12.80dBm	OFDM	36M1D1D
	HT40 5470~5725	3	HT40: 11.87dBm	HT40: 14.57dBm		36M0D1D
Antenna Designation:		5GHz Gai	n: -0.74dBi (51 n: 1.01dBi (525	50MHz-5250M 50MHz-5350MH 70MHz-5725MH	· Iz)	
Modulation type:		CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM				
Transition Rate:		802.11 n_	11 a: 6/9/12/18/24/36/48/54 Mbps 11 n_20MHz: 6.5 – 65.0Mbps 11 n_40MHz: 13.5 – 135.0Mbps			

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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 11 of 463

#### GSM / WCDMA:

	Operating Frequency		Rated Power		
	GSM/GPRS 850, Class 12	824.2 MHz– 848.8 MHz	33dBm		
	EDGE 850, Class 12	824.2 MHz– 848.8 MHz	27dBm		
Cellular Phone Stand-	GSM/GPRS 1900, Class 12	1850.2MHz – 1909.8MHz	30dBm		
ards Frequency Range	EDGE 1900, Class 12	1850.2MHz – 1909.8MHz	26dBm		
and Power.	WCDMA/HSUPA/HSDPA /HSPA+ Band II	1852.4MHz – 1907.6MHz	24dBm		
	WCDMA/HSUPA/HSDPA /HSPA+ Band IV	1712.4MHz - 1752.6MHz	24dBm		
	WCDMA/HSUPA/HSDPA /HSPA+ Band V 826.4MHz - 846.6MHz		24dBm		
Type of Emission:	GSM 850: 248KGXW, GSM 1900: 247KGXW GPRS 850: 247KGXW, GPRS 1900: 247KGXW EDGE 850: 244KG7W, EDGE 1900: 242KG7W WCDMA Band II: 4M20F9W, WCDMA Band IV: 4M16F9W, WCDMA Band V: 4M26F9W HSDPA Band II: 4M22F9W, HSDPA Band IV: 4M23F9W, HSDPA Band V: 4M17F9W HSUPA Band II: 4M20F9W, HSUPA Band IV: 4M25F9W, HSUPA Band V: 4M27F9W				
IMEI:	004402146722479				

This report applies for frequency bands 5150 MHz-5250 MHz, 5250MHz-5350MHz and 5470 MHz- 5725 MHz.

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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 12 of 463

# IEEE 802.11n Spec:

MCS Index				NBPSC	NCBPS		NDBPS		Datarate(Mbps)			
	Nss	Modulation	R						800nsGI		400nsGI	
					20MHz	40MHz	20MHz	40MHz	20MHz	40MHz	20MHz	40MHz
0	1	BPSK	1/2	1	52	108	26	54	6.5	13.5	7.200	15
1	1	QPSK	1/2	2	104	216	52	108	13.0	27.0	14.400	30
2	1	QPSK	3/4	2	104	216	78	162	19.5	40.5	21.700	45
3	1	16-QAM	1/2	4	208	432	104	216	26.0	54.0	28.900	60
4	1	16-QAM	3/4	4	208	432	156	324	39.0	81.0	43.300	90
5	1	64-QAM	2/3	6	312	648	208	432	52.0	108.0	57.800	120
6	1	64-QAM	3/4	6	312	648	234	486	58.5	121.5	65.000	135
7	1	64-QAM	5/6	6	312	648	260	540	65.0	135.0	72.200	150

Symbol	Explanation			
NSS	Number of spatial streams			
R	Code rate			
NBPSC	Number of coded bite per single carrier			
NCBPS	Number of coded bite per symbol			
NDBPS	Number of data bite per symbol			
GI	Guard interval			

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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 13 of 463

#### 1.2. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: PY7PM-0481 filing to comply with Section 15.407 of the FCC Part 15, Subpart C Rules. And IC: 4170B-PM0481 filing to comply with Industry Canada RSS-210 issue 8: 2010 Annex 9. The composite system (digital device) is compliance with Subpart B is authorized under the certification procedure.

#### 1.3. Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4:2009 & ANSI C63.10:2009 & KDB 789033 D01published on 04, 08, 2013. Radiated testing was performed at an antenna to EUT distance 3 meters.

Tested in accordance with FCC KDB789033 D01 for compliance to FCC 47CFR 15.407 requirements.

# 1.4. Test Facility

The measurement facilities used to collect the 3m Radiated Emission and AC power line conducted data are located on the address of SGS Taiwan Ltd. Electronics & Communication Laboratory No.134, Wu Kung Road, Wuku Industrial Zone, Taipei County, Taiwan which are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4:2009. & ANSI C63.10:2009. FCC Registration Number is: 990257. Canada Registration Number: 4620A-4.

The 10 m Open Area Test Sites located on the address of SGS Taiwan Ltd. Electronics & Communication Laboratory No. 29, Pau-Tou-Tsuo Valley Chia-Pau Tsuen, Linkou Hsiang, Taipei county, which is constructed and calibrated to meet the CISPR 22/EN 55022 requirements. SGS Site No. 1(3 &10 meters) and FCC Registration Number: 94644.

### 1.5. Special Accessories

There are no special accessories used while test was conducted.

# 1.6. Equipment Modifications

There was no modification incorporated into the EUT.

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Report No.: EH/2013/70026 Issue Date: Aug. 05, 2013

Page 14 of 463

#### 2. SYSTEM TEST CONFIGURATION

# 2.1. EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

#### 2.2. EUT Exercise

An engineering test mode (software/firmware) that applicant provided was utilized to manipulate the EUT into transmit, selection of the test channel, and modulation scheme.

#### 2.3. Test Procedure

#### 2.3.1 Conducted Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. According to the general criterion in Section 7.1 of ANSI C63.4:2009 & 6.2 ANSI 63.10:2009. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz, and the measurement procedure 7.3 in ANSI 63.4:2009 & 6.2.2, and 6.2.3 in ANSI 63.10:2009 is followed to carry out the test. The CISPR Quasi-Peak and Average detector mode is employed according to §15.107

## 2.3.2 Radiated Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes and measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made "while keeping the antenna in the 'cone of radiation' from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response." is still within the 3dB illumination BW of the measurement antenna according to the requirements in Section 8 and 13 and of ANSI C63.4:2009, & Section 6.3, 6.4, 6.5, and 6.6 of ANSI 63.10:2009.ANSI C63.10:2009.

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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 15 of 463

# 2.4. Configuration of Tested System

Fig. 2-1 Radiated Emission

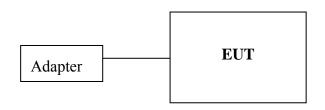


Fig. 2-2 Conducted (Antenna Port) Configuration

**EUT** 

Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Data Cable	Power Cord
1.	WLAN Test Software	QRCT	2.4.83.0	N/A	N/A	N/A

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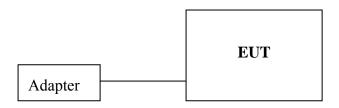
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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 16 of 463

Fig. 2-3 AC Power Line Conducted Emission



**Table 2-2 Equipment Used in Tested System** 

Iten	n Equipment	Mfr/Brand	Model/Type No.	Series No.	Data Cable	<b>Power Cord</b>
1.	WLAN Test Software	QRCT	2.4.83.0	N/A	N/A	N/A

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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 17 of 463

# SUMMARY OF TEST RESULT

FCC Rules	<b>Description Of Test</b>	Result
§15.207	AC Power Line Conducted	Compliant
RSS-Gen §7.2.4	Emission	
§15.407(a) (1) (2)	26 dB and 99% Emission	Compliant
RSS 210 A9.2	Bandwidth	
RSS-Gen §4.6.1	Bandwidin	
§15.407(a) (1) (2)	The Maximum Output Pow-	Compliant
RSS 210 A9.2(1)(2)(3)	er Measurement	
§15.407(a) (5)	Peak Power Spectral Density	Compliant
RSS 210 A9.2(1)(2)(3)	Measurement	
15.407(a)(6)	Peak Excursion Measurement	Compliant
§15.407(b) (1) (2) (3)	Undesirable Emission – Con-	Compliant
RSS 210 A9.2(1)(2)(3)	ducted Measurement	
§15.407(b) (1) (2) (3)(6) (7)	Undesirable Emission – Radiated	Compliant
RSS 210 A9.2 (1) (2)(3)	Measurement	
RSS-Gen 7.2.5		
§15.407(c)	Transmission in case of Absence	Compliant
RSS 210 A9.4(4)	of Information	
§15.407(g)	Frequency Stability	Compliant
§15.203	Antenna Requirement	Compliant
RSS-Gen 7.1.2		
§15.407(h)	TPC and DFS Measurement	Compliant
RSS 210 A9.3		

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Report No.: EH/2013/70026 Issue Date: Aug. 05, 2013

Page 18 of 463

#### 4. DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition.

Test program used to control the EUT for staying in continuous transmitting mode is programmed.

#### a mode:

5150MHz-5250MHz: Channel lowest(5180MHz) · Mid(5220MHz) and Highest(5240MHz). 5250MHz-5350MHz: Channel lowest(5260MHz) · Mid(5300MHz) and Highest(5320MHz).

5470MHz-5725MHz: Channel lowest(5500MHz) • Mid(5580MHz) and Highest(5700MHz) and with 6Mbps data rate are chosen for full testing.

#### n HT 20 mode:

5150MHz-5250MHz: Channel lowest(5180MHz) · Mid(5220MHz) and Highest(5240MHz). 5250MHz-5350MHz: Channel lowest(5260MHz) · Mid(5300MHz) and Highest(5320MHz).

5470MHz-5725MHz: Channel lowest(5500MHz) \cdot Mid(5580MHz) and Highest(5700MHz)with 6.5Mbps data rate are chosen for full testing

#### n HT 40 mode:

5150MHz-5250MHz: Channel lowest (5190MHz) and Highest (5230MHz). 5250MHz-5350MHz: Channel lowest (5270MHz) and Highest (5310MHz).

5470MHz-5725MHz: Channel lowest(5510MHz) · Mid(5550MHz) and Highest(5670MHz)with

13.5Mbps data rate are chosen for full testing

The worst case is determined by the output power that generates the highest emission. As examined in the section of output power measurement, the section 7.5, the lowest data rate at a/b/g/n\_HT20/n\_HT40 resulted the highest level of fundamental emission, and therefore, the lowest data rate is chosen as the worst-case to conduct the remaining of other mandatory test cases.

The field strength of radiation emission was measured as EUT stand-up position (H mode) and lie down position (E1, E2 mode) for 802.11a/n WLAN Transmitter for channel Low, Mid and High, the worst case H position was reported.

The given application is dual SIM build of certified product, PY7PM-0480, 4170B-PM-0480. It differs only in the mental shield covering the portion of slot space that is preserved in the built applicable PY7PM-0480, and 4170B-PM-0480. Except for the change as aforementioned above, all hardware, software relevant to RF Parameter of Physical layer, I/O signal remains unchanged, and the data as measured in the authorization of PY7M-0480, 4170B-PM-0480, and remains, and entails representative.

This test report only demonstrates the result of spot-check on Radiated Spurious Emission in order to reveal of the evidence of compliance record proving the implementation of dual SIM built causes no degradation as compared to build, PY7PM-0480/4170B-PM-0480.

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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 19 of 463

Remark: While conducting average power measurement, duty cycle of each mode (a/n\_ht20/n\_ht40) shall be greater than 98%. All duty cycle is pre-scanned, but verified to be greater than 98%, where a = 99.7%,  $n_{HT}20\&HT40 = 99.7\%$ , and  $n_{ht}20\&n_{ht}40 = 99.7\%$ , where duty cycle is conducted as the given transmission with given virtual operation that expresses the percentage.

#### Formula:

 $Duty\ Cycle = Ton/(Ton+Toff)$ 

#### Test Procedure:

Set span = 0, RBW = 8MHz, the largest as possible, VBW = 8MHz, Detector = Peak, and RBW, and VBW =8 MHz where zero-span is permissible, that > 50/T, where T is ~ 4.3ms

# Duty Cycle:

	UNII Band 1	UNII Band 2 – Subband1	UNII Band 2 – Subband2
802.11a	0.996667	0.996667	0.996667
802.11n_20	0.996667	0.996667	0.996667
802.11n_40	0.996667	0.996667	0.996667

Duty Cycle Factor:  $10 * \log (1/0.997) = 0.013048$ 

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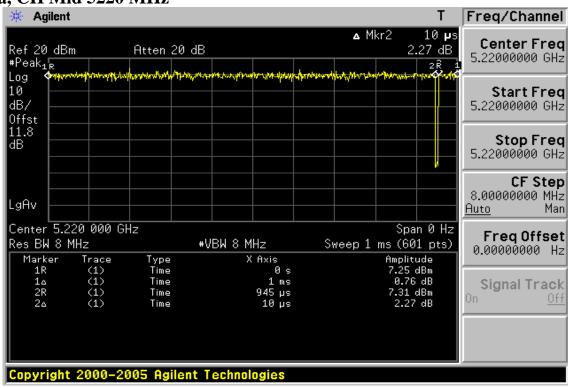
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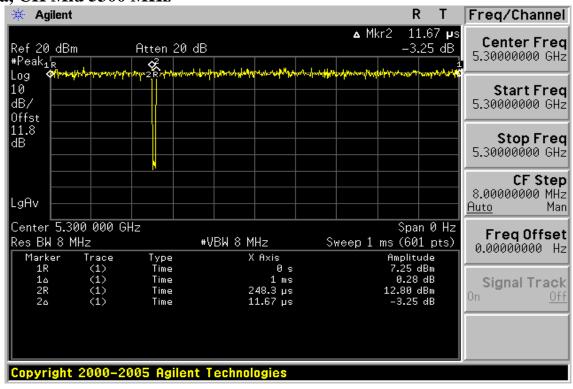
Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 20 of 463

# **DUTY CYCLE OF TEST SIGNAL** 802.11a, CH Mid 5220 MHz



# 802.11a, CH Mid 5300 MHz



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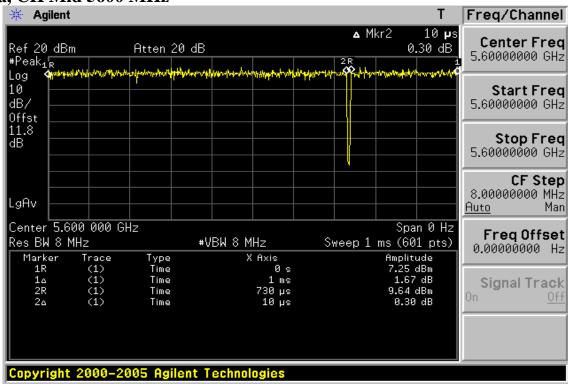
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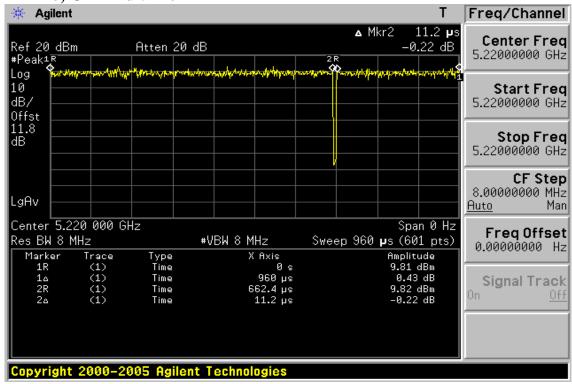
Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 21 of 463

# 802.11a, CH Mid 5600 MHz



### 802.11n HT20, CH Mid 5220 MHz



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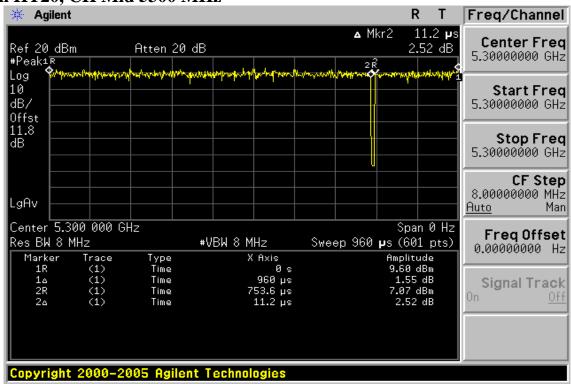
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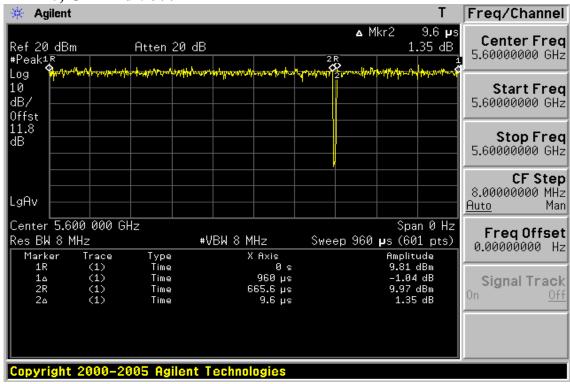
Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 22 of 463

# 802.11n HT20, CH Mid 5300 MHz



### 802.11n HT20, CH Mid 5600 MHz



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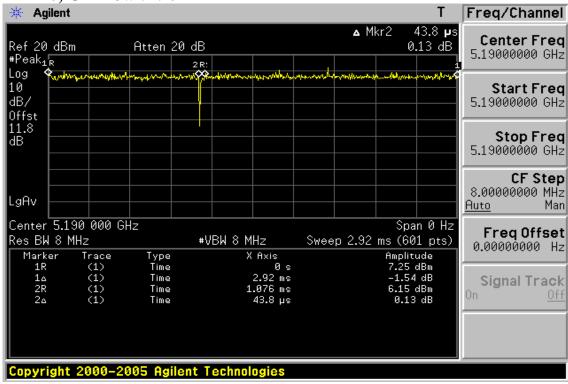
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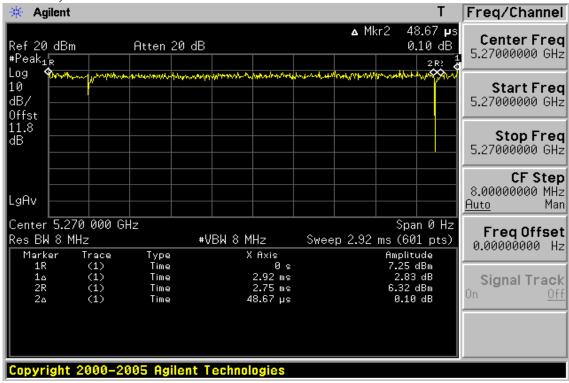
Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 23 of 463

# 802.11n HT40, CH Low 5190 MHz



# 802.11n HT40, CH Low 5270 MHz



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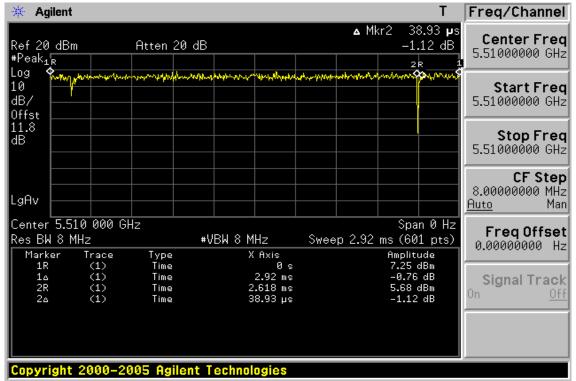
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Report No.: EH/2013/70026 Issue Date: Aug. 05, 2013

Page 24 of 463

# 802.11n HT40, CH Low 5510 MHz



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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 25 of 463

#### **MEASUREMENT UNCERTAINTY**

Test Items	Uncertainty		
AC Power Line Conducted Emission	+/- 2.586 dB		
26 dB and 99% Emission Bandwidth	+/- 123.36 Hz		
The Maximum Output Power Measurement	+/- 1.42 dB		
Peak Power Spectral Density Measurement	+/- 1.55 dB		
Peak Excursion Measurement	+/- 1.55 dB		
Undesirable Emission –	+/- 1.55 dB		
Conducted Measurement	17- 1.33 <b>u</b> b		
Transmission in case of Absence of Information	+/- 1.55 dB		
Frequency Stability	+/- 123.36 Hz		
TPC and DFS Measurement	+/- 123.36 Hz		
Temperature	+/- 0.8 °C		
Humidity	+/- 4.7 %		
DC / AC Power Source	DC= +/- 1%, AC=+/- 0.2%		

Radiated Spurious Emission:

	30MHz - 180MHz: +/- 3.37dB			
Measurement uncertainty	180MHz -417MHz: +/- 3.19dB			
(Polarization : <b>Vertical</b> )	0.417GHz-1GHz: +/- 3.19dB			
	1GHz - 18GHz: +/- 4.04dB			
	18GHz - 40GHz: +/- 4.04dB			

	30MHz - 167MHz: +/- 4.22dB
Measurement uncertainty	167MHz -500MHz: +/- 3.44dB
(Polarization : <b>Horizontal</b> )	0.5GHz-1GHz: +/- 3.39dB
	1GHz - 18GHz: +/- 4.08dB
	18GHz - 40GHz: +/- 4.08dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 26 of 463

#### CONDUCTED EMISSION TEST

# 6.1. Standard Applicable

According to §15.207 and RSS-Gen §7.2.4, frequency range within 150 KHz to 30 MHz shall not exceed the Limit table as below.

Frequency range	Limits dB(uV)		
MHz	Quasi-peak	Average	
0.15 to 0.50	66 to 56	56 to 46	
0.50 to 5	56	46	
5 to 30	60	50	

#### Note

# **6.2.** Measurement Equipment Used:

Conducted Emission Test Site								
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.			
TYPE		NUMBER	NUMBER	CAL.				
EMI Test Receiver	R&S	ESCI7	100759	05/20/2011	05/19/2013			
EMI Receiver	R&S	ESCS 30	828985/004	09/23/2012	09/22/2013			
LISN	Rolf-Heine	NNB-2/16Z	99012	03/23/2013	03/22/2014			
LISN	FCC	FCC-LISN-50/250-25-2-01	04034	03/23/2013	03/22/2014			
Coaxial Cables	N/A	WK CE Cable	N/A	01/05/2013	01/04/2014			

# 6.3. EUT Setup

- 1. The conducted emission tests were performed in the test site, using the setup in accordance with the ANSI C63.4:2009 & ANSI C63.10:2009.
- 2. The AC/DC Power adaptor of EUT was plug-in LISN. The rear of the EUT and peripherals were placed flushed with the rear of the tabletop.
- 3. The LISN was connected with 120Vac/60Hz power source.

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<sup>1.</sup> The lower limit shall apply at the transition frequencies

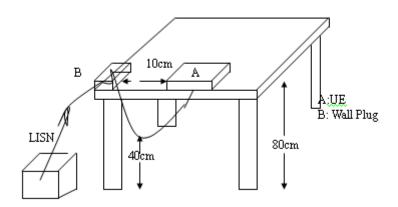
<sup>2.</sup> The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.



Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 27 of 463

# **6.4. Test SET-UP (Block Diagram of Configuration)**



#### **6.5.** Measurement Procedure

- 1. The EUT was placed on a table which is 0.8m above ground plane.
- 2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 3. Repeat above procedures until all phases of power being supplied by given UE are completed

### 6.6. Measurement Result

Note: Refer to next page for measurement data and plots.

Note2: The \* reveals the worst-case results that that closet to the limit

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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 28 of 463

Temperature:

Humidity: 60%

### AC POWER LINE CONDUCTED EMISSION TEST DATA

Operation Mode:	Operation mode			Test Date:	Apr. 24, 2013
Temperature:	26 ℃	Humidity:	60 %	Test By:	Marcus

Site ConductionRoom

Limit: FCC Class B Conduction(QP)

PDA Phone M/N: C2004

0.150

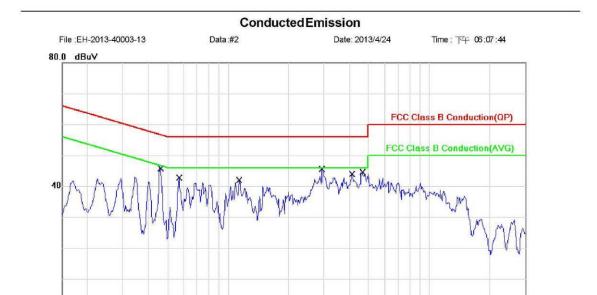
Note

Phase: L1

AC 120V/60Hz Power:

Distance:

Mode: Operationmode



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
		MHz	dBuV	dВ	dBuV	dBuV	dΒ	Detector	Comment
1		0.4681	37.79	0.07	37.86	56.55	-18.69	QP.	
2		0.4681	27.37	0.07	27.44	46.55	-19.11	AVG	
3		0.5703	22.96	0.08	23.04	56.00	-32.96	QP	
4		0.5703	18.65	80.0	18.73	46.00	-27.27	AVG	
5	*	1.1406	41.78	0.08	41.86	56.00	-14.14	QP	
6		2.9336	31.45	0.10	31.55	56.00	-24.45	QP	
7		2.9336	20.71	0.10	20.81	46.00	-25.19	AVG	
8		4.1406	33.27	0.12	33.39	56.00	-22.61	QP	
9		4.1406	21.85	0.12	21.97	46.00	-24.03	AVG	
10		4.6523	33.13	0.13	33.26	56.00	-22.74	QP	
11		4.6523	23.59	0.13	23.72	46.00	-22.28	AVG	

(MHz)

5

0.5

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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 29 of 463

Site ConductionRoom

Limit: FCC Class B Conduction(QP)

EUT: PDA Phone M/N: C2004

Note:

0.0

0.150

0.5

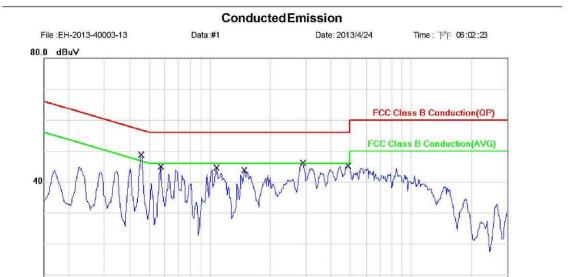
Phase: AC 120V/60Hz Power:

Distance:

Mode: Operationmode

Temperature: 26 °C Humidity:

30.000



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
		MHz	dBuV	dВ	dBuV	dBuV	dΒ	Detector	Comment
1		0.4586	47.21	0.12	47.33	56.72	-9.39	QP.	
2	*	0.4586	41.62	0.12	41.74	46.72	-4.98	AVG	
3		0.5703	42.78	0.14	42.92	56.00	-13.08	QP	
4		0.5703	37.22	0.14	37.36	46.00	-8.64	AVG	
5		1.0781	38.71	0.16	38.87	56.00	-17.13	QP	
6		1.0781	30.31	0.16	30.47	46.00	-15.53	AVG	
7		1.4805	38.88	0.16	39.04	56.00	-16.96	QP	
8		1.4805	29.48	0.16	29.64	46.00	-16.36	AVG	
9		2.9141	40.99	0.17	41.16	56.00	-14.84	QP	
10		2.9141	31.72	0.17	31.89	46.00	-14.11	AVG	
11		4.8711	38.96	0.20	39.16	56.00	-16.84	QP	
12		4.8711	29.23	0.20	29.43	46.00	-16.57	AVG	

(MHz)

5

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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 30 of 463

#### 26dB and 99%EMISSION BANDWIDTH MEASUREMENT

# 7.1 Standard Applicable

According to §15.407(a). No Limit required.

According to RSS 210 A9.2 (1), No Limit required

RSS-Gen §4.6, the transmitter shall be operated at its maximum carrier power measured under normal test conditions. The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts. The resolution bandwidth shall be set to as close to 1% of the selected span as is possible without being below 1%. The video bandwidth shall be set to 3 times the resolution bandwidth. Video averaging is not permitted. Where practical, a sampling detector shall be used since a peak or, peak hold, may produce a wider bandwidth than actual.

The trace data points are recovered and are directly summed in linear terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached and that frequency recorded. The process is repeated for the highest frequency data points. This frequency is recorded.

#### 7.2 Measurement Procedure

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. Remove the antenna from the EUT and then connect a low loss RF cable from the Antenna port to the spectrum analyzer.

3.

- a. 26dB Band width Measurement: Set the spectrum analyzer as 1% of emission BW Sweep=auto, Detector = Peak, Trace Mode = Max Hold, Manually readjust RBW until the RBW/EBW ratio is 1% based on EBW as observed on the result of pre-sequence measurement.
- b. A) 99% Bandwidth Measurement: set resolution BW as close to 1% of the selected span without it is being lower than 1%, & VBW = 3 XRBW. Detector = Peak or Sample, where sample must be selected whenever it is appropriate, Trace Mode = Max Hold
  - B) Mark the peak frequency and -26dB (upper and lower) frequency.
- 4. Repeat the procedures as list above until all test default channels (low, middle, and high) are completed.

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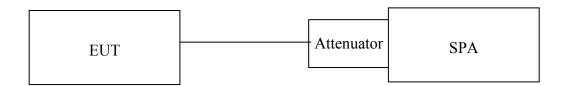
Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 31 of 463

# 7.3 Measurement Equipment Used:

Conducted Emission Test Site							
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.		
TYPE		NUMBER	NUMBER	CAL.			
Power Sensor	Anritsu	ML2495A	1005007	02/08/2012	02/07/2014		
Power Meter	Anritsu	MA2411B	917032	02/08/2012	02/07/2014		
Spectrum Analyzer	Agilent	E4446A	MY51100003	04/15/2013	04/14/2014		
Spectrum Analyzer	Agilent	E4440A	MY45304525	03/15/2013	03/14/2014		
DC Block	Mini-Circuits	BLK-18-S+	1	02/28/2013	02/27/2014		
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA	N/A	01/05/2013	01/04/2014		
Attenuator	Mini-Circuit	BW-S10W2+	002	02/28/2013	02/27/2014		
Splitter	Agilent	11636B	N/A	02/28/2013	02/27/2014		

#### **7.4 Test Set-up:**



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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 32 of 463

#### **Measurement Result**

### 26dB Bandwidth

802.11a, 5150~5250 MHz

Frequency (MHz)	26dB Bandwidth (B) (MHz)	10 Log (B) (dB)
5180	24.955	13.97
5220	24.312	13.86
5240	24.951	13.97

802.11a, 5250~5350 MHz

Frequency (MHz)	26dB Bandwidth (B) (MHz)	10 Log (B) (dB)
5260	24.017	13.81
5300	24.880	13.96
5320	24.627	13.91

802.11a, 5470~5725 MHz

Frequency (MHz)	26dB Bandwidth (B) (MHz)	10 Log (B) (dB)
5500	21.552	13.33
5580	21.642	13.35
5700	21.905	13.41

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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 33 of 463

#### 802.11n HT20, 5150~5250 MHz

Frequency (MHz)	26dB Bandwidth (B) (MHz)	10 Log (B) (dB)
5180	24.326	13.86
5220	24.268	13.85
5240	24.826	13.95

#### 802.11n HT20, 5250~5350 MHz

Frequency (MHz)	26dB Bandwidth (B) (MHz)	10 Log (B) (dB)
5260	24.752	13.94
5300	24.816	13.95
5320	24.222	13.84

#### 802.11n HT20, 5470~5725 MHz

Frequency (MHz)	26dB Bandwidth (B) (MHz)	10 Log (B) (dB)
5500	22.140	13.45
5580	23.445	13.70
5700	23.174	13.65

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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 34 of 463

#### 802.11n HT40, 5150~5250 MHz

Frequency (MHz)	26dB Bandwidth (B) (MHz)	10 Log (B) (dB)
5190	75.353	18.77
5230	59.728	17.76

# 802.11n HT40, 5250~5350 MHz

Frequency (MHz)	26dB Bandwidth (B) (MHz)	10 Log (B) (dB)
5270	60.834	17.84
5310	62.453	17.96

#### 802.11n HT40, 5470~5725 MHz

Frequency (MHz)	26dB Bandwidth (B) (MHz)	10 Log (B) (dB)
5510	41.331	16.16
5550	42.236	16.26
5670	42.378	16.27

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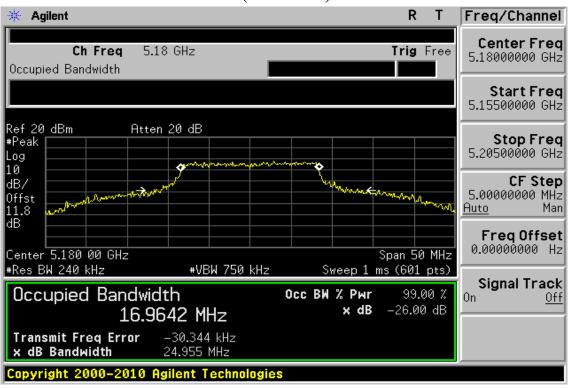
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Report No.: EH/2013/70026 Issue Date: Aug. 05, 2013

Page 35 of 463

# 802.11a, 5150~5250 MHz 26dB Band Width Test Data CH-Low (5180MHz)



# 26dB Band Width Test Data CH-Mid (5220MHz)



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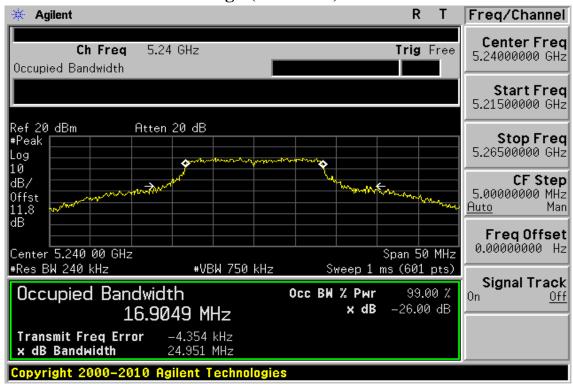
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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 36 of 463

# 26dB Band Width Test Data CH-High (5240MHz)



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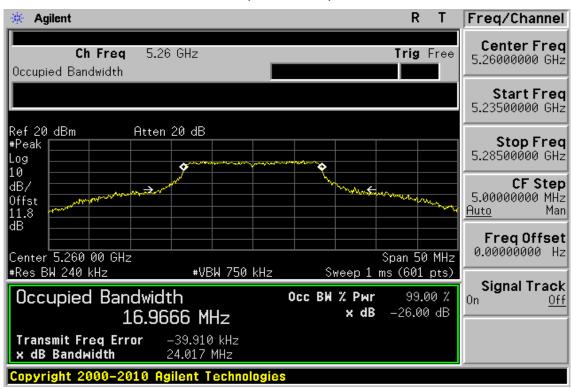
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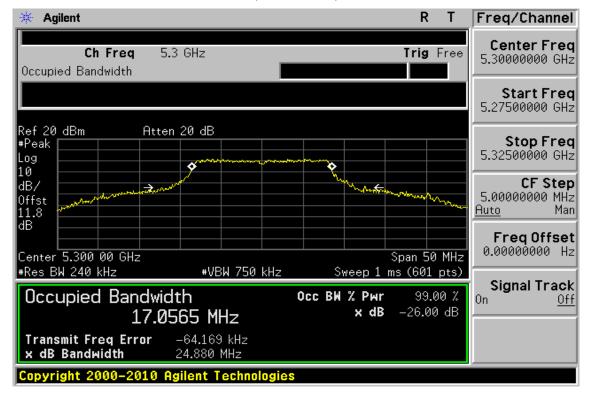
Report No.: EH/2013/70026 Issue Date: Aug. 05, 2013

Page 37 of 463

# 802.11a, 5250~5350 MHz 26dB Band Width Test Data CH-Low (5260MHz)



#### 26dB Band Width Test Data CH-Mid (5300MHz)



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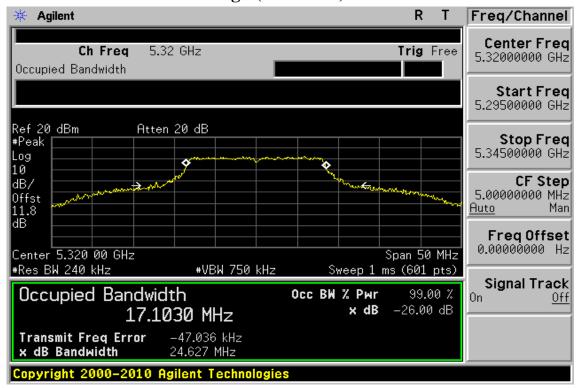
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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 38 of 463

#### 26dB Band Width Test Data CH-High (5320MHz)



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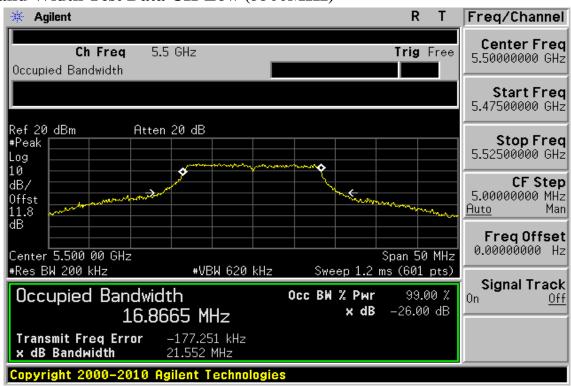
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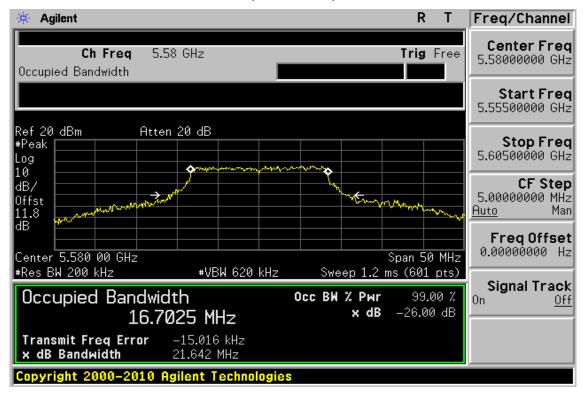
Report No.: EH/2013/70026 Issue Date: Aug. 05, 2013

Page 39 of 463

# 802.11a, 5470~5725 MHz 26dB Band Width Test Data CH-Low (5500MHz)



## 26dB Band Width Test Data CH-Mid (5580MHz)



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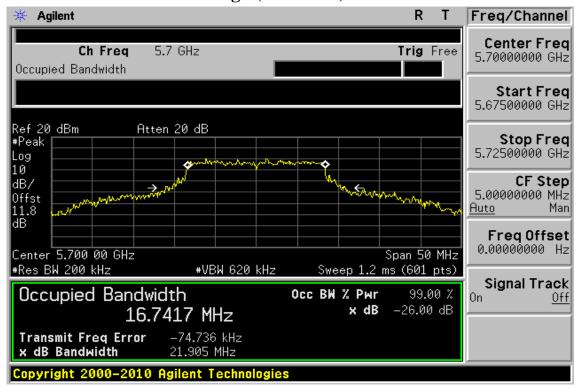
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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 40 of 463

#### 26dB Band Width Test Data CH-High (5700MHz)



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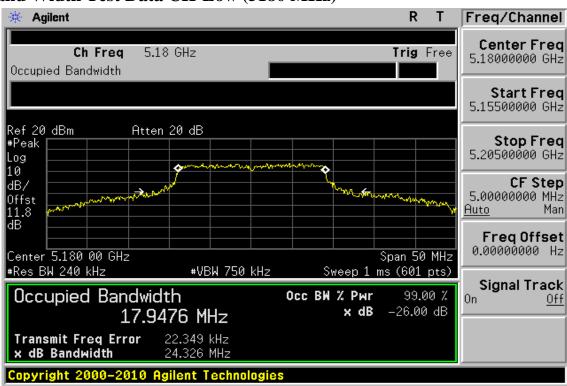
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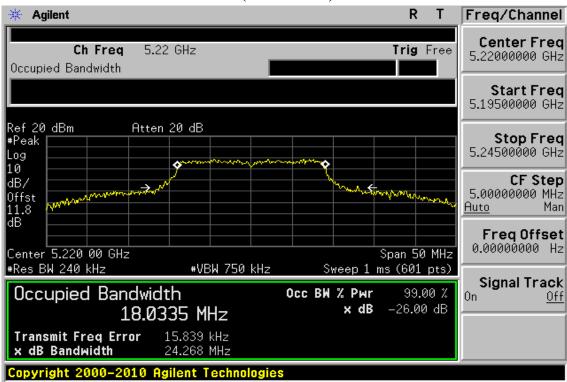
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Page 41 of 463

# 802.11n HT20, 5150~5250 MHz 26dB Band Width Test Data CH-Low (5180 MHz)



#### 26dB Band Width Test Data CH-Mid (5220 MHz)



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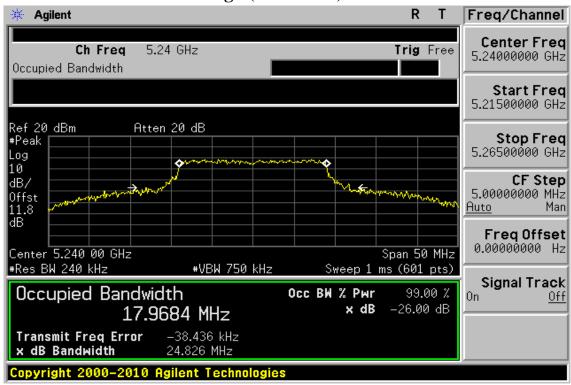
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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 42 of 463

### 26dB Band Width Test Data CH-High (5240 MHz)



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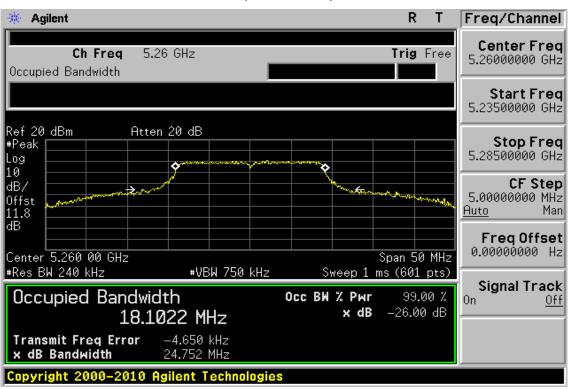
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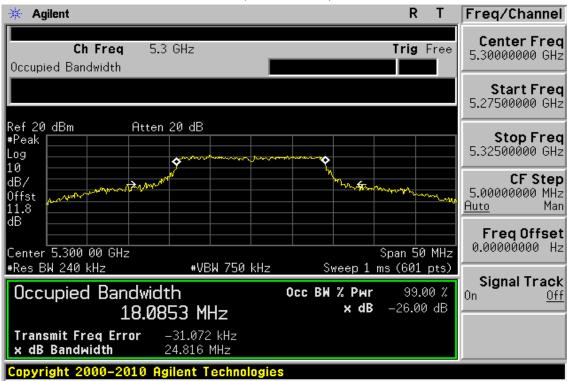
Report No.: EH/2013/70026 Issue Date: Aug. 05, 2013

Page 43 of 463

# 802.11n HT20, 5250~5350 MHz 26dB Band Width Test Data CH-Low (5260 MHz)



# 26dB Band Width Test Data CH-Mid (5300 MHz)



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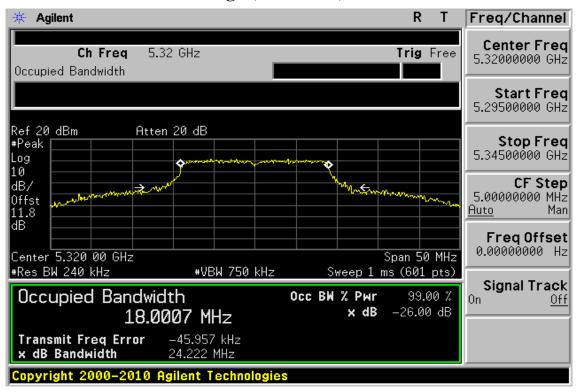
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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 44 of 463

#### 26dB Band Width Test Data CH-High (5320 MHz)



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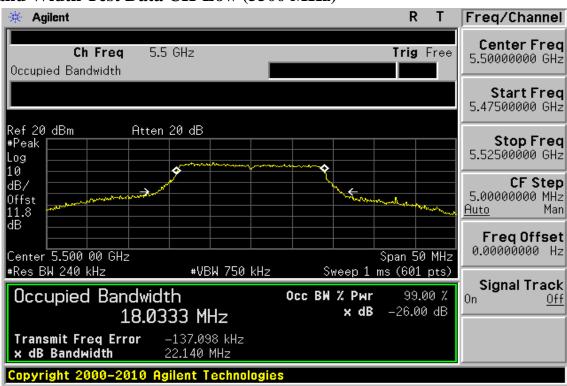
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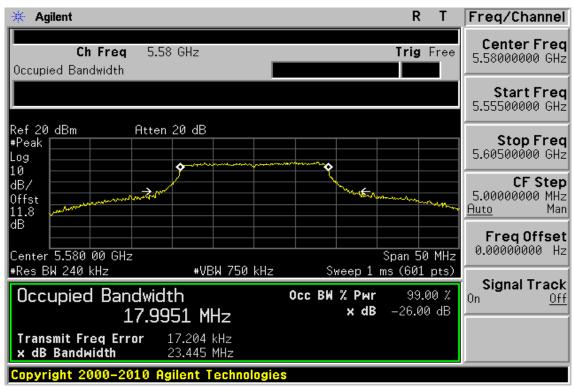
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Page 45 of 463

# 802.11n HT20, 5470~5725 MHz 26dB Band Width Test Data CH-Low (5500 MHz)



#### 26dB Band Width Test Data CH-Mid (5580 MHz)



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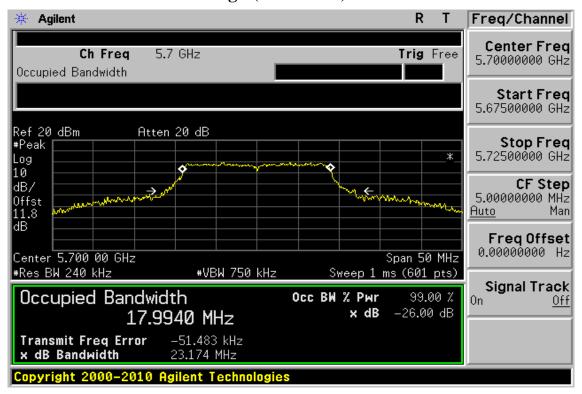
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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 46 of 463

#### 26dB Band Width Test Data CH-High (5700 MHz)



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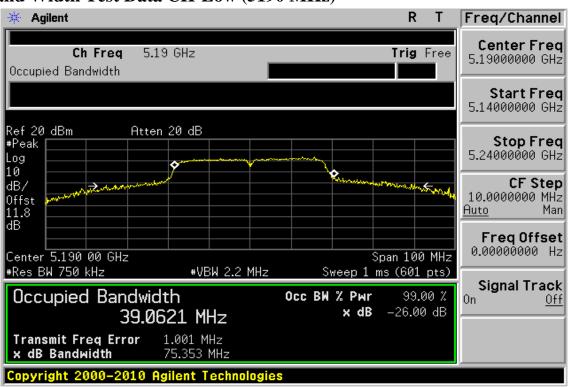
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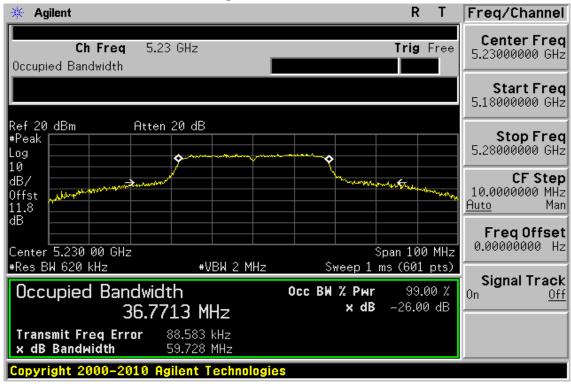
Report No.: EH/2013/70026 Issue Date: Aug. 05, 2013

Page 47 of 463

# 802.11n HT40, 5150~5250 MHz 26dB Band Width Test Data CH-Low (5190 MHz)



# 26dB Band Width Test Data CH-High (5230 MHz)



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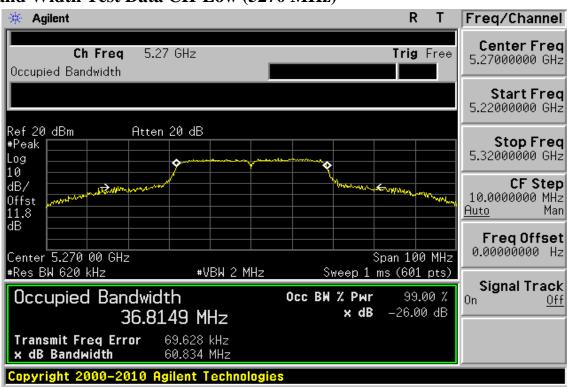
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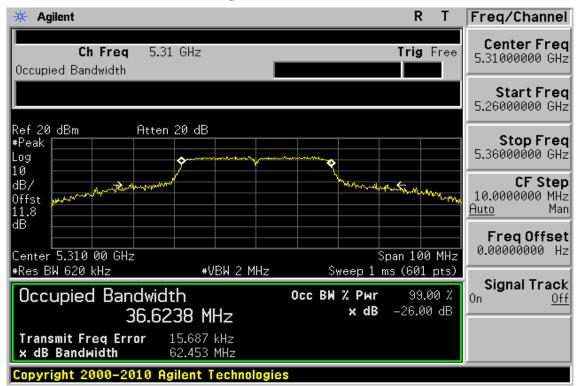
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Page 48 of 463

# 802.11n HT40, 5250~5350 MHz 26dB Band Width Test Data CH-Low (5270 MHz)



## 26dB Band Width Test Data CH-High (5310MHz)



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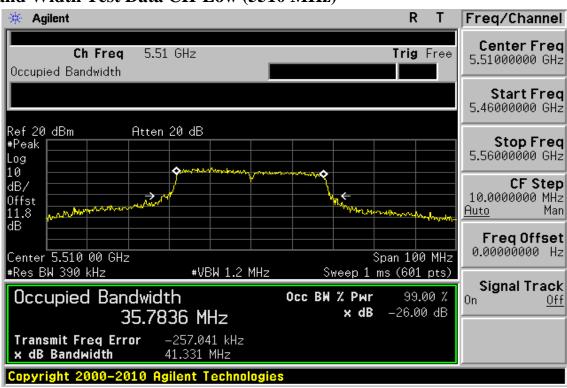
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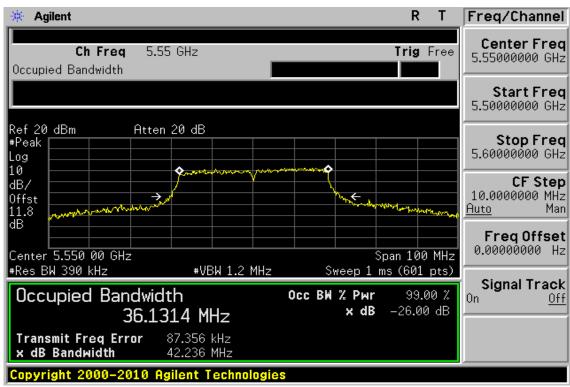
Report No.: EH/2013/70026 Issue Date: Aug. 05, 2013

Page 49 of 463

# 802.11n HT40, 5470~5725 MHz 26dB Band Width Test Data CH-Low (5510 MHz)



#### 26dB Band Width Test Data CH-Mid (5550 MHz)



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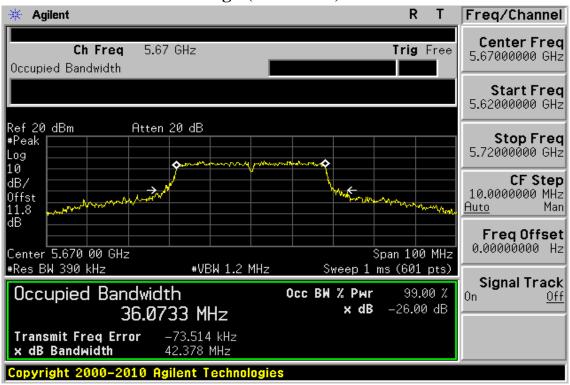
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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 50 of 463

### 26dB Band Width Test Data CH-High (5670 MHz)



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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 51 of 463

#### 7.6 Measurement Result

#### 99% Bandwidth

802.11a, 5150~5250 MHz

Frequency (MHz)	99% Bandwidth (MHz)	10 Log (B) (dB)		
5180	16.4482	12.16		
5220	16.5513	12.19		
5240	16.6661	12.22		

802.11a, 5250~5350 MHz

Frequency (MHz)	- · ·				
5260	16.4952	12.17			
5300	16.6595	12.22			
5320	16.5338	12.18			

802.11a, 5470~5725 MHz

Frequency (MHz)	99% Bandwidth (MHz)	10 Log (B) (dB)		
5500	16.5297	12.18		
5580	16.5420	12.19		
5700	16.5635	12.19		

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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 52 of 463

#### 802.11n HT20, 5150~5250 MHz

Frequency (MHz)	99% Bandwidth (MHz)	10 Log (B) (dB)		
5180	17.6548	12.47		
5220	17.7133	12.48		
5240	17.6844	12.48		

#### 802.11n HT20, 5250~5350 MHz

Frequency (MHz)	99% Bandwidth (MHz)	10 Log (B) (dB)		
5260	17.7907	12.50		
5300	17.8060	12.51		
5320	17.6836	12.48		

#### 802.11n HT20, 5470~5725 MHz

Frequency (MHz)	99% Bandwidth (MHz)	10 Log (B) (dB)		
5500	17.7499	12.49		
5580	17.6990	12.48		
5700	17.7431	12.49		

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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 53 of 463

#### 802.11n HT40, 5150~5250 MHz

Frequency (MHz)	99% Bandwidth (MHz)	10 Log (B) (dB)	
5190	36.1010	15.58	
5230	35.8882	15.55	

#### 802.11n HT40, 5250~5350 MHz

Frequency (MHz)	99% Bandwidth (MHz)	10 Log (B) (dB)		
5270	35.9809	15.56		
5310	36.0955	15.57		

#### 802.11n HT40, 5470~5725 MHz

Frequency (MHz)	99% Bandwidth (MHz)	10 Log (B) (dB)		
5510	35.5683	15.51		
5550	35.9915	15.56		
5670	36.0082	15.56		

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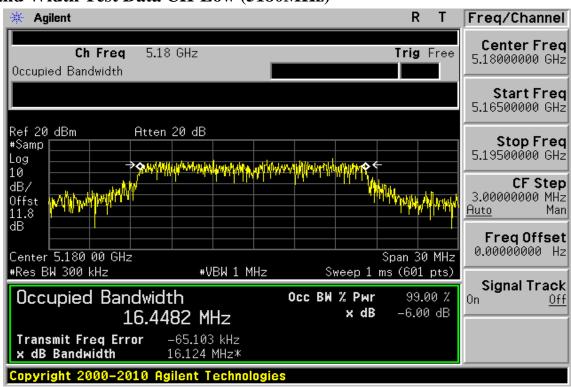
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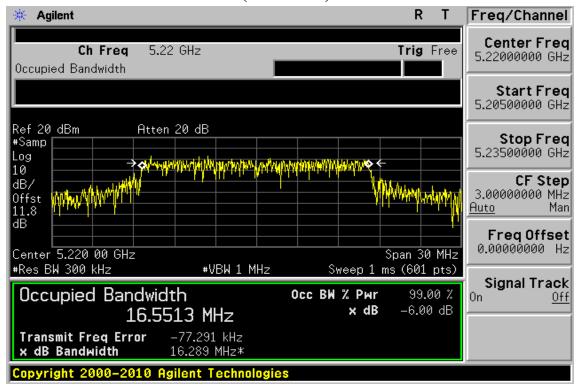
Report No.: EH/2013/70026 Issue Date: Aug. 05, 2013

Page 54 of 463

# 802.11a, 5150~5250 MHz 99% Band Width Test Data CH-Low (5180MHz)



# 99% Band Width Test Data CH-Mid (5220MHz)



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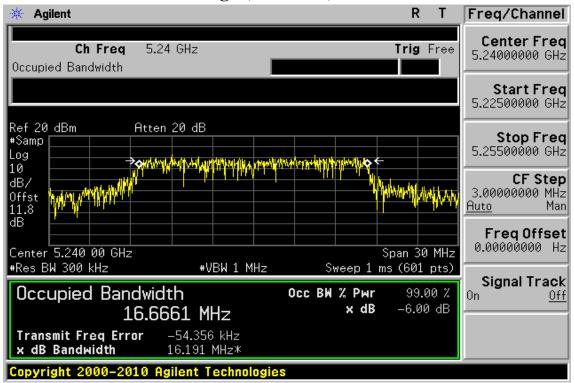
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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 55 of 463

# 99% Band Width Test Data CH-High (5240MHz)



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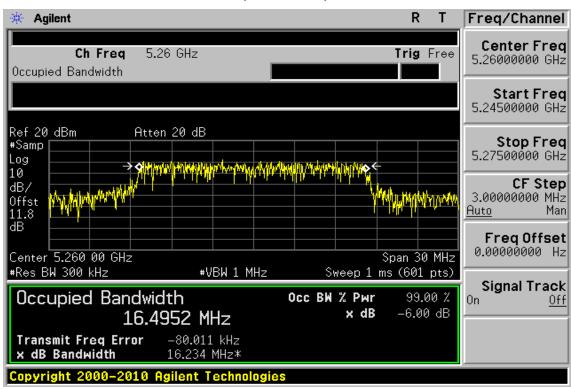
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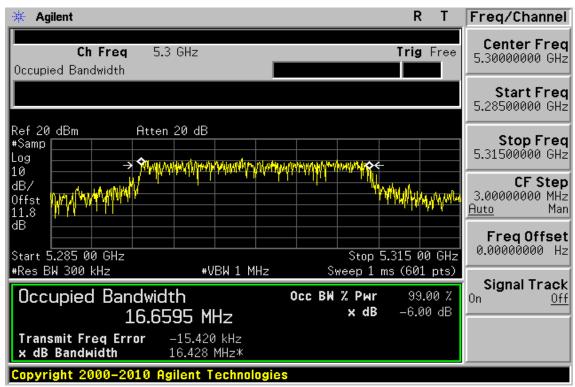
Report No.: EH/2013/70026 Issue Date: Aug. 05, 2013

Page 56 of 463

# 802.11a, 5250~5350 MHz 99% Band Width Test Data CH-Low (5260MHz)



# 99% Band Width Test Data CH-Mid (5300MHz)



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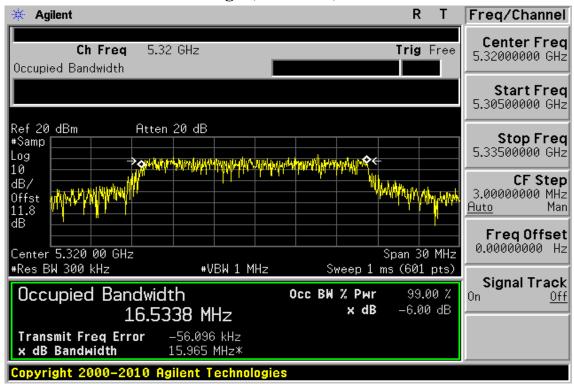
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Report No.: EH/2013/70026 Issue Date: Aug. 05, 2013

Page 57 of 463

## 99% Band Width Test Data CH-High (5320MHz)



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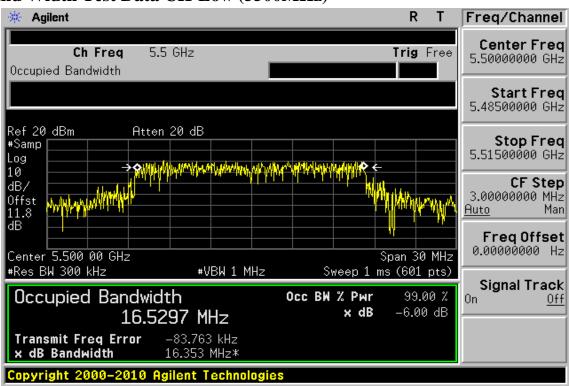
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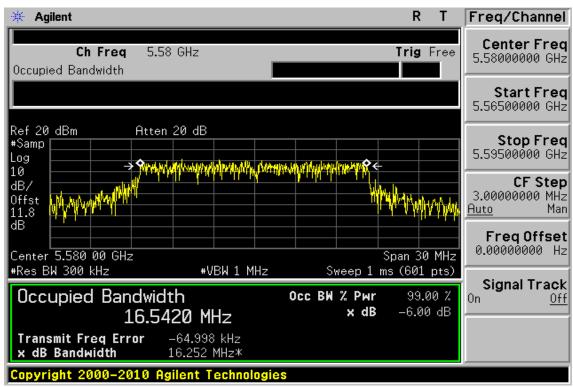
Report No.: EH/2013/70026 Issue Date: Aug. 05, 2013

Page 58 of 463

# 802.11a, 5470~5725 MHz 99% Band Width Test Data CH-Low (5500MHz)



# 99% Band Width Test Data CH-Mid (5580MHz)



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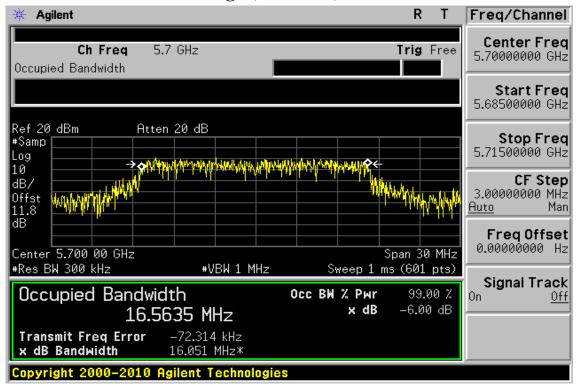
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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 59 of 463

## 99% Band Width Test Data CH-High (5700MHz)



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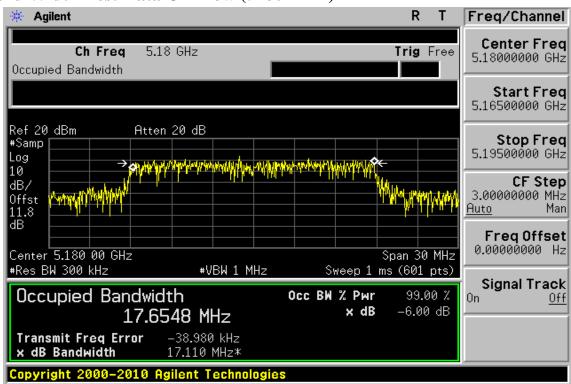
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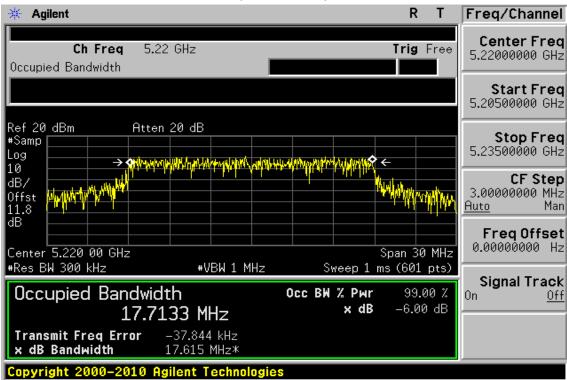
Report No.: EH/2013/70026 Issue Date: Aug. 05, 2013

Page 60 of 463

# 802.11n HT20, 5150~5250 MHz 99% Band Width Test Data CH-Low (5180 MHz)



## 99% Band Width Test Data CH-Mid (5220 MHz)



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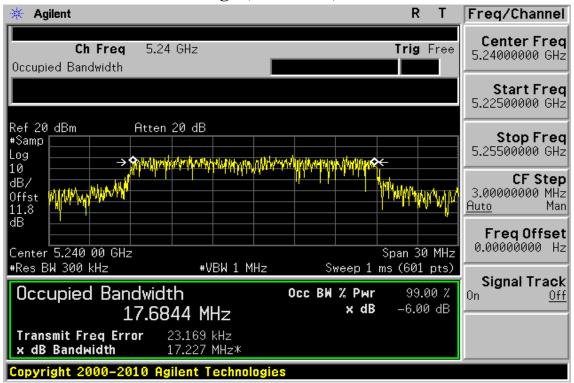
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Report No.: EH/2013/70026 Issue Date: Aug. 05, 2013

Page 61 of 463

# 99% Band Width Test Data CH-High (5240 MHz)



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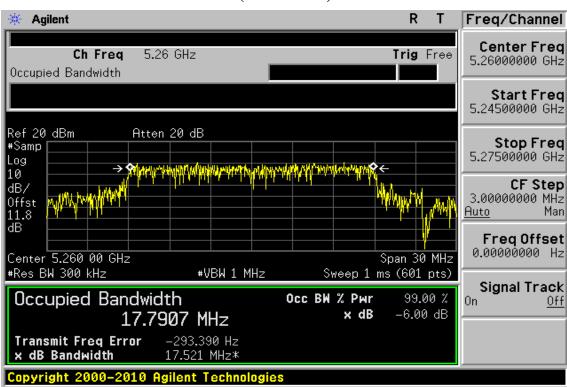
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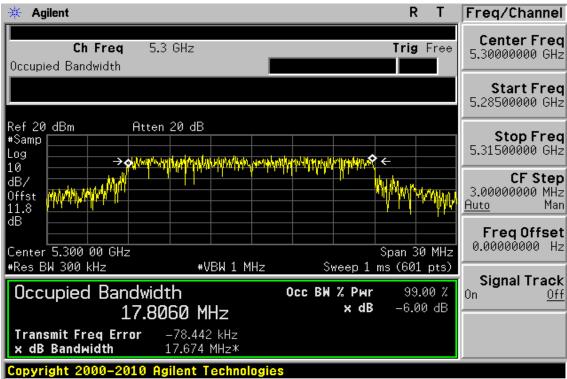
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Page 62 of 463

# 802.11n HT20, 5250~5350 MHz 99% Band Width Test Data CH-Low (5260 MHz)



# 99% Band Width Test Data CH-Mid (5300 MHz)



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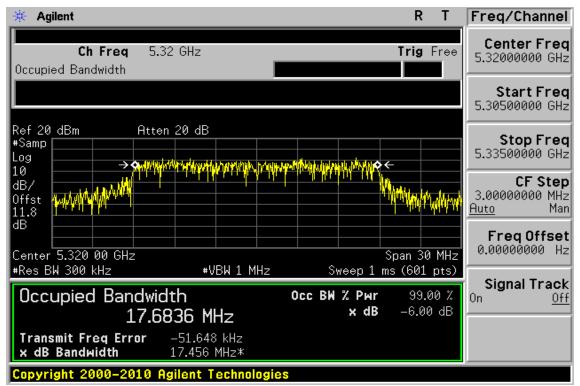
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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 63 of 463

# 99% Band Width Test Data CH-High (5320 MHz)



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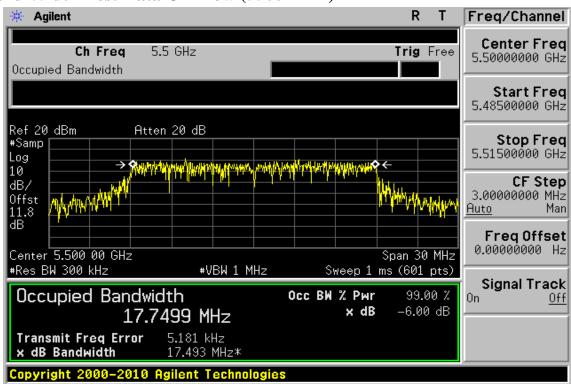
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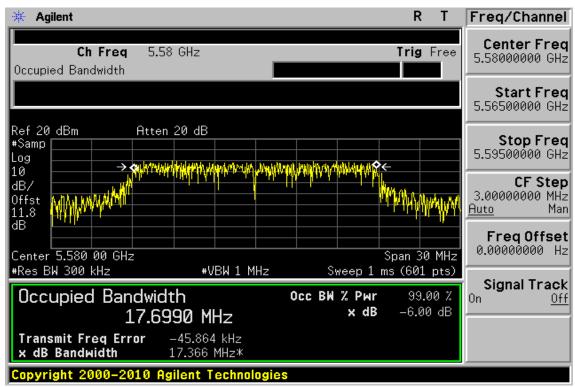
Report No.: EH/2013/70026 Issue Date: Aug. 05, 2013

Page 64 of 463

# 802.11n HT20, 5470~5725 MHz 99% Band Width Test Data CH-Low (5500 MHz)



# 99% Band Width Test Data CH-Mid (5580 MHz)



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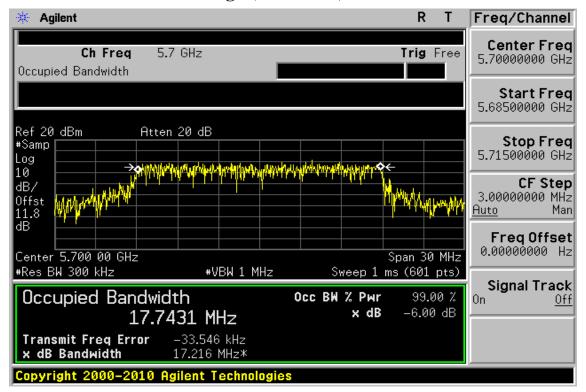
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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 65 of 463

## 99% Band Width Test Data CH-High (5700 MHz)



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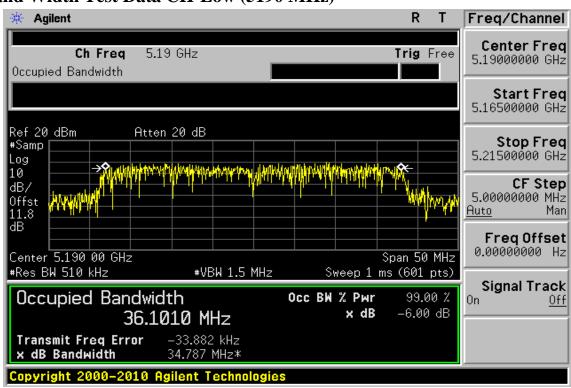
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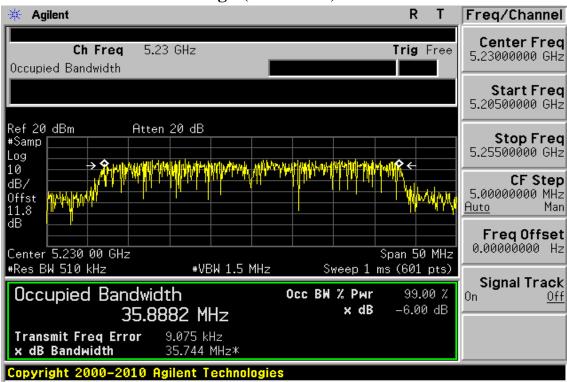
Report No.: EH/2013/70026 Issue Date: Aug. 05, 2013

Page 66 of 463

# 802.11n HT40, 5150~5250 MHz 99% Band Width Test Data CH-Low (5190 MHz)



## 99% Band Width Test Data CH-High (5230 MHz)



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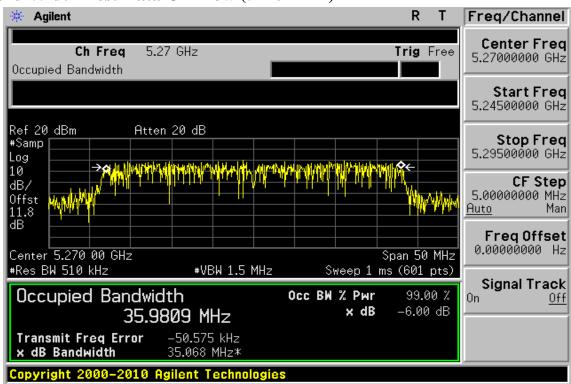
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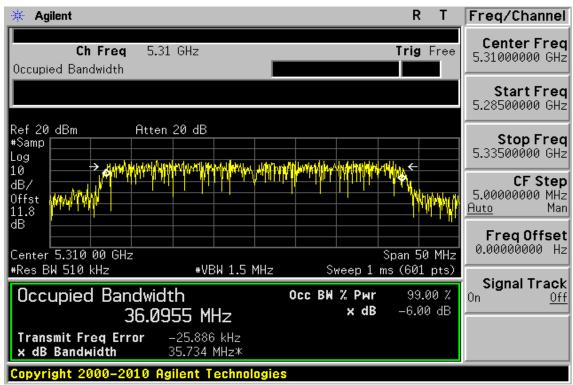
Report No.: EH/2013/70026 Issue Date: Aug. 05, 2013

Page 67 of 463

# 802.11n HT40, 5250~5350 MHz 99% Band Width Test Data CH-Low (5270 MHz)



# 99% Band Width Test Data CH-High (5310MHz)



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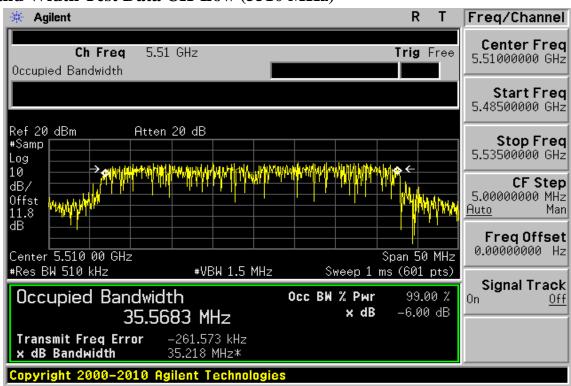
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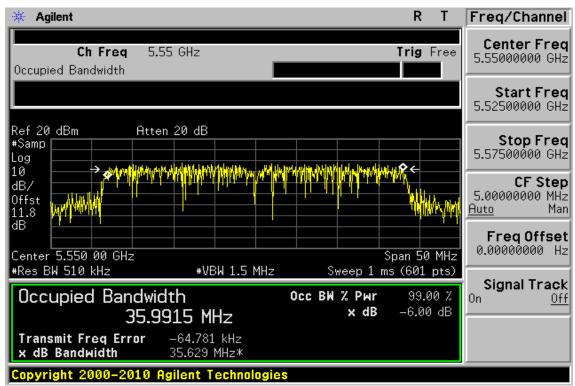
Report No.: EH/2013/70026 Issue Date: Aug. 05, 2013

Page 68 of 463

# 802.11n HT40, 5470~5725 MHz 99% Band Width Test Data CH-Low (5510 MHz)



# 99% Band Width Test Data CH-Mid (5550 MHz)



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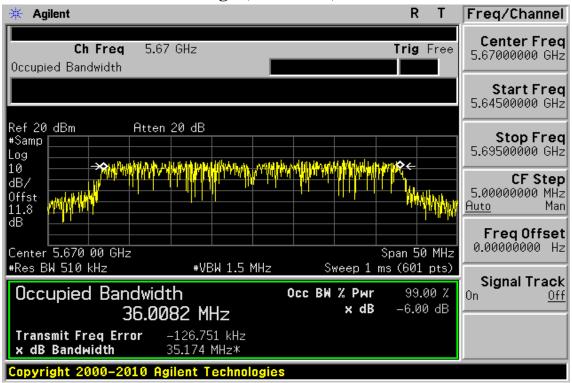
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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 69 of 463

# 99% Band Width Test Data CH-High (5670 MHz)



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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 70 of 463

#### 8. The MAXIMUM OUTPUT POWER MEASUREMENT

# 8.1 Standard Applicable

According to §15.407(a)

- 1. For the band 5.15-5.25 GHz, the maximum conducted power over the frequency of operation shall not exceed the lesser of 50 mW (17dBm) or 4 dBm + 10log B.
- 2. For the band 5.25-5.35 GHz and 5.47-5.725GMHz, the maximum conducted power over the frequency of operation shall not exceed the lesser of 250 mW (24dBm) or 11 dBm + 10log B.
- 3. For the band 5.725-5.825 GHz, the maximum conducted power over the frequency of operation shall not exceed the lesser of 1W (30dBm) or 17 dBm + 10log B.

#### According to RSS-210 A9.2

- 1. For the band 5150-5250 MHz, the maximum equivalent isotropically radiated power (e.i.r.p.) shall not exceed 200 mW or 10 + 10 log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.
- 2. For the bands 5250-5350 MHz and 5470-5725 MHz, the maximum conducted output power shall not exceed 250 mW or 11 + 10 log10 B, dBm, whichever power is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band. The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz.

In addition, devices with maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

In addition to the above requirements, devices operating in the band 5250-5350 MHz with maximum e.i.r.p. greater than 200 mW shall comply with the following e.i.r.p. elevation mask where θ is the angle above the local horizontal plane (of the earth) as shown below:

- (i) -13 dB(W/MHz) for  $0o \le \theta \le 8o$
- (ii) -13 0.716 ( $\theta$ -8) dB(W/MHz) for 80 <  $\theta$  < 400
- (iii) -35.9 1.22 ( $\theta$ -40) dB(W/MHz) for  $40o < \theta < 45o$
- (iv) -42 dB(W/MHz) for  $\theta > 45$ o

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Report No.: EH/2013/70026 Issue Date: Aug. 05, 2013

Page 71 of 463

3. For the band 5725-5825 MHz, the maximum conducted output power shall not exceed 1.0 W or 17 + 10 log10 B, dBm, whichever power is less. The power spectral density shall not exceed 17 dBm in any 1.0 MHz band. The maximum e.i.r.p. shall not exceed 4.0 W or 23 + 10 log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz.

Fixed point-to-point systems for this band are permitted to have an e.i.r.p. greater than 4 W, provided that the higher e.i.r.p. is achieved by employing higher gain antennas, but not higher transmitter output powers. Point-to-multipoint systems, omni-directional applications and multiple co-located transmitters transmitting the same information are prohibited from exceeding 4 W e.i.r.p. However, remote stations of point-to-multipoint systems shall be permitted to operate at greater than 4 W e.i.r.p, under the same conditions as for point-to-point systems.

where B is the 26dB emission bandwidth in MHz.

#### **8.2** Measurement Procedure

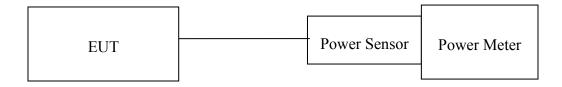
- 1. Place the EUT on the table and set it in transmitting mode.
- 2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power meter
- 3. Set the offset  $10*\log(1/x)$  (x=0.997), 0.013048 approximately
- 4. Record the max. reading.
- 5. Repeat above procedures until all frequency (low, middle, and high channel) measured were complete.

Note: For EIRP/ERP measurement complying with RSS-210 9.2, the formula as deduced in 1.3.2 of KDB 412172 D01 is used to calculate. ERP/EIRP = Pt + Gt - Lc, where Pt= transmitter output power measured directly at antenna port, expressing in dBm, and Gt = gain of the transmitting antenna in dBi that can be referred in antenna spec provided by the manufacturer in section 1.1, Lc = signal attenuation in the cable between the transmitting port and antenna.

#### 8.3 Measurement Equipment Used:

Refer to section 7.3 for details.

#### 8.4 Test Set-up:



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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 72 of 463

#### 8.5 Measurement Result

202 11a

	$\frac{2.11a}{\text{ole loss} = 0}$			The	Maxi	mum O	utput l	Power		
СН	Frequency (MHz)	Data Rate				Required Limit				
	(141112)	6	9	12	18	24	36	48	54	Required Limit
36	5180	12.51	12.45	12.41	12.39	12.36	12.33	12.31	12.29	16.99dBm or 4+10log(B) = 17.97dBm (FCC) None (IC)
44	5220	12.77	12.74	12.72	12.69	12.66	12.65	12.62	12.60	16.99dBm or 4+10log(B) = 17.86dBm (FCC) None (IC)
48	5240	12.75	12.73	12.70	12.69	12.66	12.64	12.63	12.62	16.99dBm or 4+10log(B) = 17.97dBm (FCC) None (IC)
52	5260	12.78	12.75	12.71	12.69	12.68	12.66	12.62	12.59	23.98dBm or 11+10log(B) = 24.81dBm (FCC) 23.98dBm or 11 +10Log (B) =23.17dBm (IC)
60	5300	12.76	12.74	12.72	12.69	12.65	12.64	12.62	12.59	23.98dBm or 11+10log(B) = 24.96dBm (FCC) 23.98dBm or 11 + 10Log (B) = 23.22dBm (IC)
64	5320	12.73	12.71	12.68	12.65	12.62	12.59	12.58	12.56	23.98dBm or 11+10log(B) = 24.91dBm (FCC) 23.98dBm or 11 + 10log(B) = 23.18dBm (IC)
100	5500	12.87	12.83	12.82	12.79	12.78	12.74	12.72	12.69	23.98dBm or 11+10log(B) = 24.33dBm (FCC) 23.98dBm or 11+10log (B) = 23.18dBm (IC)
116	5580	12.77	12.75	12.74	12.71	12.68	12.65	12.64	12.62	23.98dBm or 11+10log(B) = 24.35dBm (FCC) 23.98dBm or 11+10log(B) = 23.19dBm (IC)
140	5700	12.83	12.81	12.78	12.77	12.73	12.70	12.68	12.66	23.98dBm or 11+10log(B) = 24.41dBm (FCC) 23.98dBm or 11 + 10log(B) = 23.19dBm (IC)

Note: B is measured in 26dB bandwidth for FCC or 99% bandwidth for RSS

Note: Limit is re-adjusted in terms of dBm

10\*log(50mW) = 16.99dBm for the limit on the band of  $5150\sim5250MHz$ 

10\*log(250mW)=23.98dBm for the limit on the band of 5260~5320Mz, &5470~5725MHz

Note: Cable loss is 11.8dB is set as the offset on the spectrum to compensate the loss causing by cable.

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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 73 of 463

### 802 11n HT20

	$\frac{2.11n \text{ H} 120}{\text{ole loss} = 0}$			The	Maxii	num O	utput l	Power		
СН	Frequency (MHz)		Data Rate						Required Limit	
	(171112)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	•
36	5180	12.79	12.74	12.72	12.69	12.66	12.64	12.62	12.59	16.99dBm or 4+10log(B) = 17.86dBm (FCC) or None (IC)
44	5220	12.85	12.82	12.78	12.75	12.72	12.69	12.66	12.65	16.99dBm or 4+10log(B) = 17.85dBm or None (IC)
48	5240	12.81	12.78	12.75	12.71	12.68	12.66	12.63	12.60	16.99dBm or 4+10log(B) = 17.95dBm (FCC) or None (IC)
52	5260	12.83	12.80	12.78	12.74	12.72	12.69	12.66	12.64	23.98dBm or 11+10log(B) = 24.94dBm (FCC) or 23.98dBm or 11 + 11 log (B) = 23.50dBm (IC)
60	5300	12.84	12.82	12.80	12.78	12.75	12.71	12.69	12.66	23.98dBm or 11+10log(B) = 24.95dBm or 11 + 11 Log (B) = 23.51dBm (IC)
64	5320	12.81	12.80	12.75	12.74	12.71	12.69	12.68	12.65	23.98dBm or 11+10log(B) = 24.84dBm (FCC) 23.98dBm or 11 + 11 Log (B) = 23.51dBm (IC)
100	5500	12.88	12.84	12.82	12.81	12.78	12.76	12.72	12.70	23.98dBm or 11+10log(B) = 24.45dBm (FCC) 23.98dBm or 11 + 11 Log (B) = 23.49dBm (IC)
116	5580	12.83	12.82	12.80	12.75	12.73	12.72	12.70	12.67	23.98dBm or 11+10log(B) = 24.70dBm (FCC) 23.98dBm or 11 + 10log (B) = 23.48dBm (IC)
140	5700	12.63	12.62	12.59	12.58	12.54	12.52	12.50	12.47	23.98dBm or 11+10log(B) = 24.65dBm (FCC) 23.98dBm or 11 + 10 log (B) = 23.49dBm (IC)

Note: Offset 11.8dB

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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 74 of 463

#### 802 11n HT40

_	ole loss = 0		The Maximum Output Power							
СН	Frequency (MHz)		Data Rate						Required Limit	
	(1.222)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	required Emile
38	5190	11.76	11.75	11.72	11.70	11.69	11.67	11.62	11.60	16.99dBm or 4+10log(B) = 22.77dBm (FCC ) None (IC)
46	5230	11.71	11.69	11.66	11.62	11.59	11.55	11.54	11.52	16.99dBm or 4+10log(B) = 21.76dBm (FCC) None (IC)
54	5270	11.79	11.76	11.74	11.72	11.70	11.69	11.64	11.62	23.98dBm or 11+10log(B) = 28.84dBm (FCC) 23.98dBm or 26.56dBm (IC)
62	5310	11.79	11.77	11.75	11.72	11.69	11.67	11.65	11.61	23.98dBm or 11+10log(B) = 28.96dBm (FCC) 23.98dBm or 11 + 10log (B) = 26.57dBm (IC)
102	5510	11.52	11.49	11.45	11.42	11.40	11.39	11.37	11.35	23.98dBm or 11+10log(B) = 27.16dBm (FCC) 23.98dBm or 11 + 10 log (B) = 26.51dBm (IC)
118	5550	11.62	11.60	11.58	11.55	11.54	11.52	11.49	11.48	23.98dBm or 11+10log(B) = 27.26dBm (FCC) 23.98dBm or 11 + 10log (B) = 26.56dBm (IC)
134	5670	11.87	11.85	11.80	11.79	11.78	11.74	11.72	11.70	23.98dBm or 11+10log(B) = 27.27dBm (FCC) 23.98dBm or 11 + 10log (B) = 26.56dBm (IC)

Note: Offset 11.8dB

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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 75 of 463

#### **ERP/EIRP Measurement:**

802 11a

	2.11a									
Cal	ole $loss = 0$		EIRP							
СН	Frequency (MHz)		Data Rate							Required Limit
	(1/11/2)	6	9	12	18	24	36	48	54	required Emile
36	5180	11.77	11.71	11.67	11.65	11.62	11.59	11.57	11.55	23.01dBm or 10+10log(B) = 22.16dBm
44	5220	12.03	12.00	11.98	11.95	11.92	11.91	11.88	11.86	23.01dBm or 10+10log(B) = 22.19dBm
48	5240	12.01	11.99	11.96	11.95	11.92	11.09	11.89	11.88	23.01dBm or 10+10log(B) = 22.22dBm
52	5260	13.79	13.76	13.72	13.70	13.69	13.67	13.63	13.60	30.00dBm or 17+10log(B) = 29.17dBm
60	5300	13.77	13.75	13.73	13.70	13.66	13.65	13.63	13.60	30.00dBm or 17+10log(B) = 29.22dBm
64	5320	13.74	13.72	13.69	13.66	13.63	13.60	13.59	13.57	30.00dBm or 17+10log(B) = 29.18dBm
100	5500	15.57	15.53	15.52	15.49	15.48	15.44	15.42	15.39	30.00dBm or 17+10log(B) = 29.18dBm
116	5580	15.47	15.45	15.44	15.41	15.38	15.35	15.34	15.32	30.00dBm or 17+10log(B) = 29.19dBm
140	5700	15.53	15.51	15.48	15.47	15.43	15.40	15.38	15.36	30.00dBm or 17+10log(B) = 29.19dBm

Note: Limit is re-adjusted in terms of dBm

10\*log(200mW) = 23.01dBm for the limit on the band of  $5150\sim5250MHz$ 

10\*log(1000mW)=30.00dBm for the limit on the band of 5260~5320Mz, &5470~5725MHz

EIRP = Conducted Power + antenna Gain of respective frequency band

*Note: Cable loss is 11.8dB is set as the offset on the spectrum to compensate the loss causing by cable.* 

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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 76 of 463

### 802 11n HT20

	$\frac{2.110 \text{ H} 120}{\text{ole loss} = 0}$			EIR	RP					
СН	Frequency (MHz)		Data Rate							Required Limit
	(17112)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	required 2mm
36	5180	12.05	12.00	11.98	11.95	11.92	11.90	11.88	11.85	23.01dBm or 10+10log(B) = 22.47dBm
44	5220	12.11	12.08	12.04	12.01	11.98	11.95	11.92	11.91	23.01dBm or 10+10log(B) = 22.48dBm
48	5240	12.07	12.04	12.01	11.97	11.94	11.92	11.89	11.86	23.01dBm or 10+10log(B) = 22.48dBm
52	5260	13.84	13.81	13.79	13.75	13.73	13.70	13.67	13.65	30.00dBm or 17+10log(B) = 29.50dBm
60	5300	13.85	13.83	13.81	13.79	13.76	13.72	13.70	13.67	30.00dBm or 17+10log(B) = 29.51dBm
64	5320	13.82	13.81	13.76	13.75	13.72	13.70	13.69	13.66	30.00dBm or 17+10log(B) = 29.48dBm
100	5500	15.58	15.54	15.52	15.51	15.48	15.46	15.42	15.40	30.00dBm or 17+10log(B) = 29.49dBm
116	5580	15.53	15.52	15.50	15.45	15.43	15.42	15.40	15.37	30.00dBm or 17+10log(B) = 29.48dBm
140	5700	15.33	15.32	15.29	15.28	15.24	15.22	15.20	15.17	30.00dBm or 17+10log(B) = 29.49dBm

Note: Offset 11.8dB

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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 77 of 463

### 802 11n HT40

	$\frac{2.11n \text{ H} 140}{\text{ole loss}} = 0$		EIRP							
СН	Frequency (MHz)		Data Rate						Required Limit	
	(17112)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	required Emile
38	5190	11.02	11.01	10.98	10.96	10.95	10.93	10.88	10.86	23.01dBm or 10+10log(B) = 25.58dBm
46	5230	10.97	10.95	10.92	10.88	10.85	10.81	10.80	10.78	23.01dBm or 10+10log(B) = 25.55dBm
54	5270	11.05	11.02	11.00	10.98	10.96	10.95	10.90	10.88	30.00dBm or 17+10log(B) = 32.56dBm
62	5310	12.80	12.78	12.76	12.73	12.70	12.68	12.66	12.62	30.00dBm or 17+10log(B) = 32.57dBm
102	5510	12.53	12.50	12.46	12.43	12.41	12.40	12.38	12.36	30.00dBm or 17+10log(B) = 32.51dBm
118	5590	14.32	14.30	14.28	14.25	14.24	14.22	14.19	14.18	30.00dBm or 17+10log(B) = 32.56dBm
134	5670	14.57	14.55	14.50	14.49	14.48	14.44	14.42	14.40	30.00dBm or 17+10log(B) = 32.56dBm

Note: Offset 11.8dB

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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 78 of 463

## PEAK POWER SPECTRAL DENSITY

# Standard Applicable

According to §15.407(a)

- 1. For the band 5.15-5.25 GHz, the peak power spectral density shall not exceed 4 dBm in any 1-MHz band.
- 2. For the band 5.25-5.35 GHz and 5.47-5.725GMHz, the peak power spectral density shall not exceed 11 dBm in any 1-MHz band.

If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

### According to RSS-210 A9.2

- For the band 5150-5250 MHz, the maximum equivalent isotropically radiated power (e.i.r.p.) shall not exceed 200 mW or 10 + 10 log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.
- 2. For the bands 5250-5350 MHz and 5470-5725 MHz, the maximum conducted output power shall not exceed 250 mW or 11 + 10 log10 B, dBm, whichever power is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band. The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz.

In addition, devices with maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

In addition to the above requirements, devices operating in the band 5250-5350 MHz with maximum e.i.r.p. greater than 200 mW shall comply with the following e.i.r.p. elevation mask where  $\theta$  is the angle above the local horizontal plane (of the earth) as shown below:

- (i) -13 dB (W/MHz) for  $0o < \theta < 8o$
- (ii) -13 0.716 ( $\theta$ -8) dB (W/MHz) for  $80 \le \theta < 400$
- (iii) -35.9 1.22 ( $\theta$ -40) dB (W/MHz) for  $40o \le \theta \le 45o$
- (iv) -42 dB (W/MHz) for  $\theta > 45$ o

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Report No.: EH/2013/70026 Issue Date: Aug. 05, 2013

Page 79 of 463

### 9.2 Measurement Procedure (following procedure F, & E) d) method SA-2 in KDB789033 D01)

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to Spectrum.
- 3. Set RBW=1MHz, VBW=3MHz, Span=50MHz/80MHz (Base Mode), where span is enough to capture the entire bandwidth, Sweep time = Auto (601 pts), detector = sample, traces 100 sweeps of video averaging. (SA-2 with the omission of procedure x, the integration with 26dB EBW bandwidth)
- 4. User the cursor on spectrum to peak search the highest level of trace
- 5. Add offset, duty factor = 0.013048, on the spectrum
- 6. Record the max. reading.
- 7. Repeat above procedures until all default test channel (low, middle, and high) was complete.

# 9.3 Measurement Equipment Used:

Refer to section 7.3 for details.

### 9.4 Test Set-up:

Refer to section 7.4 for details.

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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 80 of 463

### 9.5 Measurement Result

802.11a, 5150~5250 MHz

Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
5180	0.08	4.00	-3.92
5220	0.25	4.00	-3.75
5240	0.25	4.00	-3.75

802.11a, 5250~5350 MHz

Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
5260	0.56	11.00	-10.45
5300	0.22	11.00	-10.78
5320	0.22	11.00	-10.78

802.11a, 5470~5725 MHz

Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
5500	-0.64	11.00	-11.64
5580	-0.45	11.00	-11.45
5700	0.59	11.00	-10.41

Note: Offset 11.8dB

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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 81 of 463

#### 802.11n HT20, 5150~5250 MHz

Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
5180	-0.16	4.00	-4.16
5220	-0.48	4.00	-4.48
5240	-0.04	4.00	-4.04

#### 802.11n HT20, 5250~5350 MHz

Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
5260	-0.30	11.00	-11.30
5300	0.22	11.00	-10.78
5320	0.38	11.00	-10.63

#### 802.11n HT20, 5470~5725 MHz

Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
5500	-1.13	11.00	-12.13
5580	-0.26	11.00	-11.26
5700	0.03	11.00	-10.97

Note: Offset 11.8dB

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Page 82 of 463

#### 802.11n HT40, 5150~5250 MHz

Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
5190	-1.53	4.00	-5.53
5230	-1.27	4.00	-5.27

#### 802.11n HT40, 5250~5350 MHz

Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
5270	-1.47	11.00	-12.47
5310	-1.33	11.00	-12.33

### 802.11n HT40, 5470~5725 MHz

Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
5510	-5.07	11.00	-16.07
5550	-5.40	11.00	-16.40
5670	-4.50	11.00	-15.50

Note: Offset 11.8dB

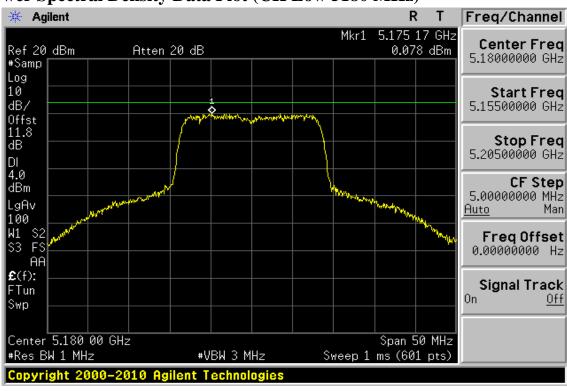
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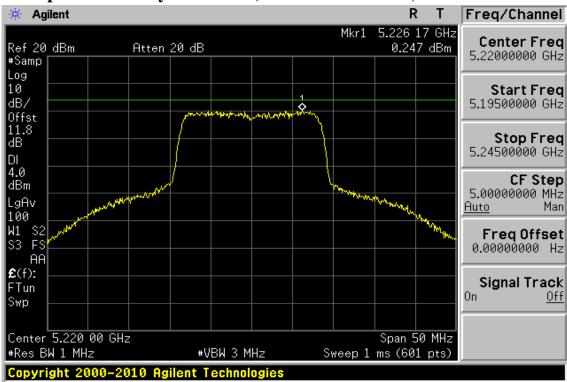
Report No.: EH/2013/70026 Issue Date: Aug. 05, 2013

Page 83 of 463

# 802.11a, 5150~5250 MHz Peak Power Spectral Density Data Plot (CH Low 5180 MHz)



## Peak Power Spectral Density Data Plot (CH Mid 5220 MHz)



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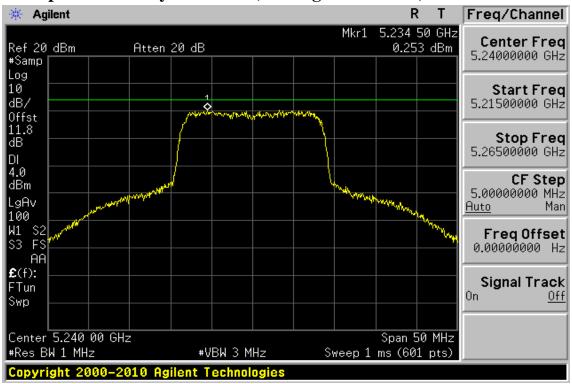
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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 84 of 463

## Peak Power Spectral Density Data Plot (CH High 5240 MHz)



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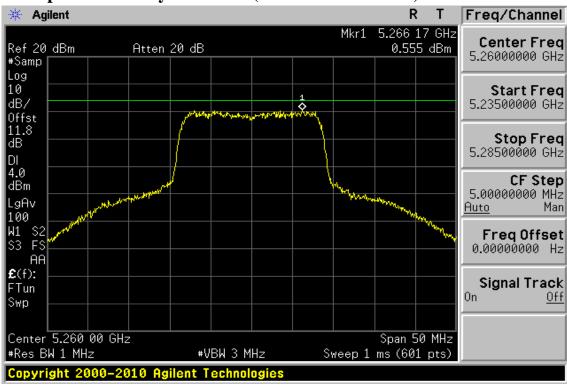


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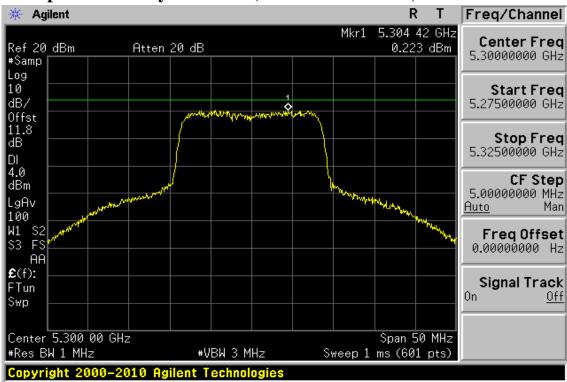
Page 85 of 463

## 802.11a, 5250~5350 MHz

# Peak Power Spectral Density Data Plot (CH Low 5260 MHz)



## Peak Power Spectral Density Data Plot (CH Mid 5300 MHz)



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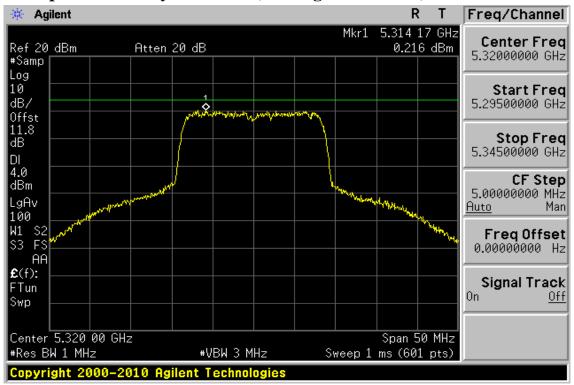
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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 86 of 463

# Peak Power Spectral Density Data Plot (CH High 5320 MHz)



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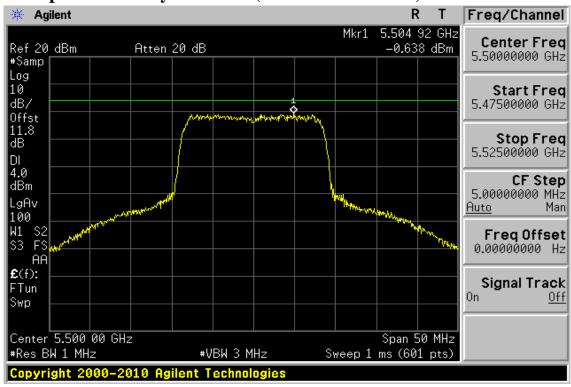


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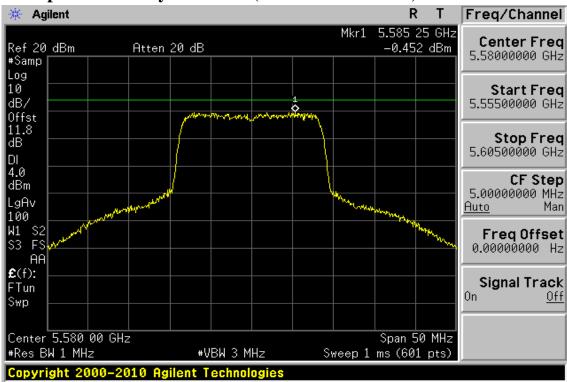
Page 87 of 463

### 802.11a, 5470~5725 MHz

# Peak Power Spectral Density Data Plot (CH Low 5500 MHz)



## Peak Power Spectral Density Data Plot (CH Mid 5580 MHz)



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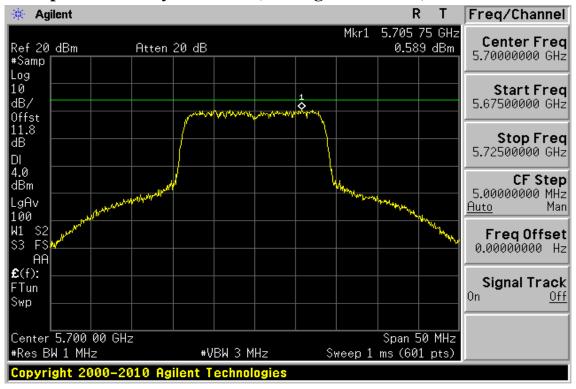
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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 88 of 463

# Peak Power Spectral Density Data Plot (CH High 5700 MHz)



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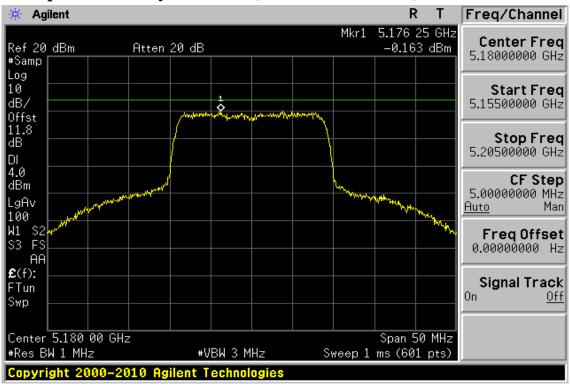


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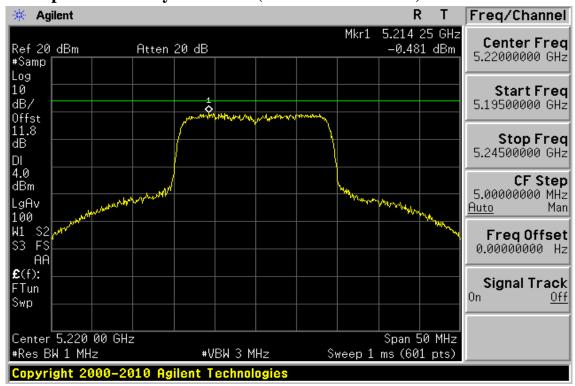
Page 89 of 463

### 802.11n HT20, 5150~5250 MHz

# Peak Power Spectral Density Data Plot (CH Low 5180 MHz)



## Peak Power Spectral Density Data Plot (CH Mid 5220 MHz)



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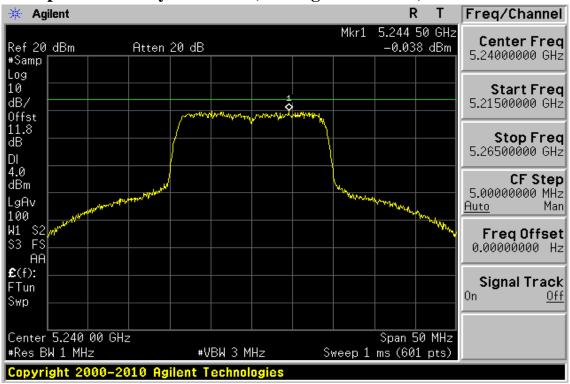
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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 90 of 463

## Peak Power Spectral Density Data Plot (CH High 5240 MHz)



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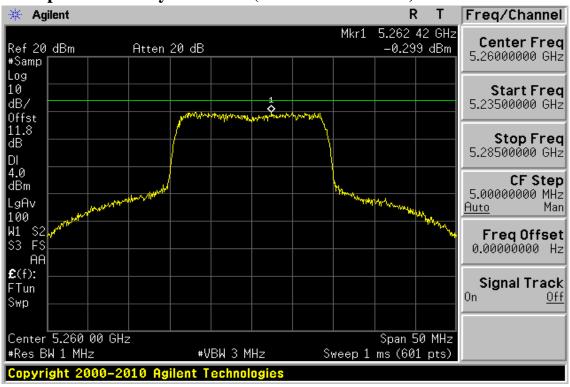


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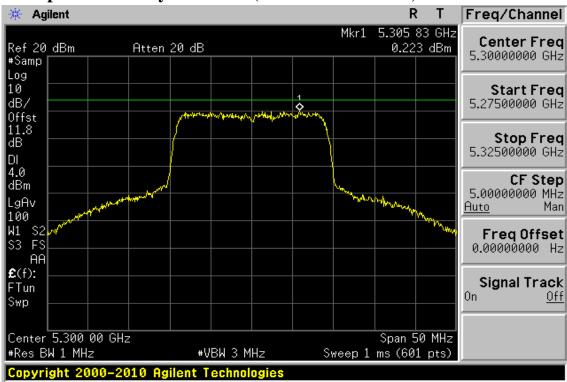
Page 91 of 463

## 802.11n HT20, 5250~5350 MHz

# Peak Power Spectral Density Data Plot (CH Low 5260MHz)



## Peak Power Spectral Density Data Plot (CH Mid 5300 MHz)



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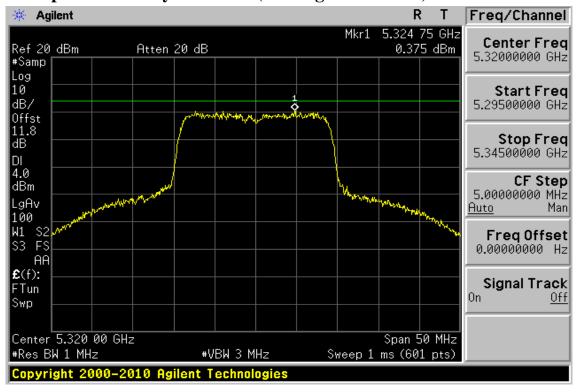
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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 92 of 463

# Peak Power Spectral Density Data Plot (CH High 5320 MHz)



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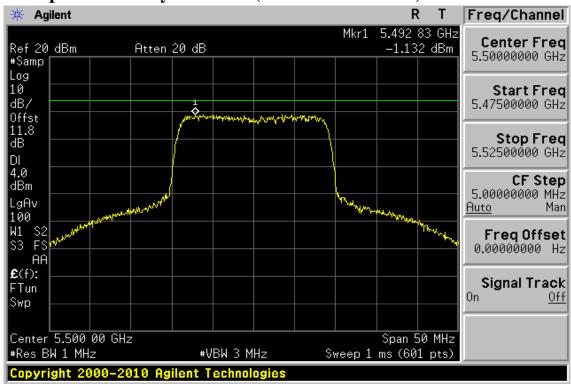


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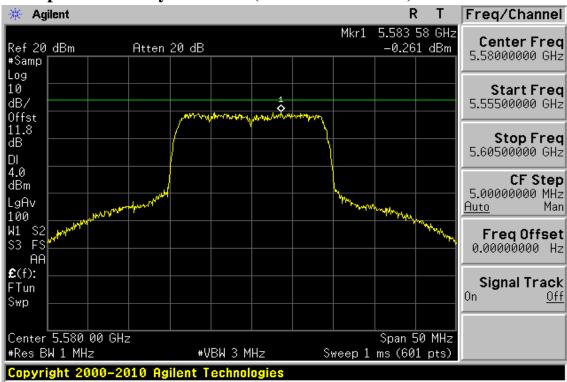
Page 93 of 463

## 802.11n HT20, 5470~5725 MHz

## Peak Power Spectral Density Data Plot (CH Low 5500 MHz)



## Peak Power Spectral Density Data Plot (CH Mid 5580MHz)



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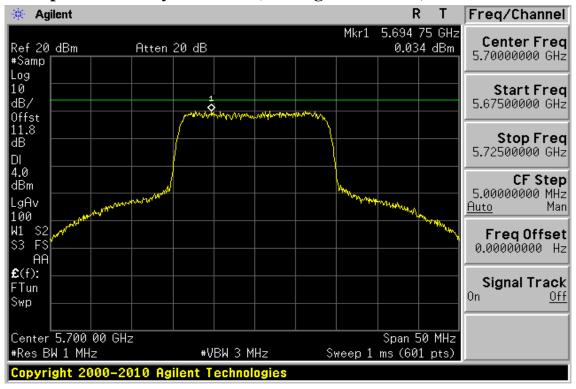
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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 94 of 463

# Peak Power Spectral Density Data Plot (CH High 5700 MHz)



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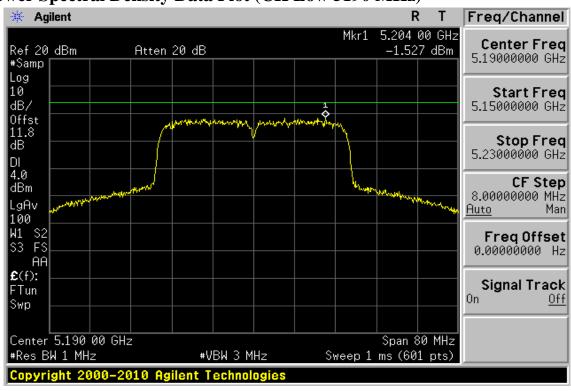
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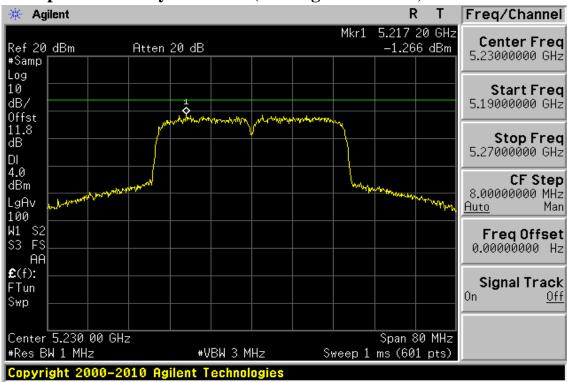
Report No.: EH/2013/70026 Issue Date: Aug. 05, 2013

Page 95 of 463

# 802.11n HT40, 5150~5250 MHz Peak Power Spectral Density Data Plot (CH Low 5190 MHz)



## Peak Power Spectral Density Data Plot (CH High 5230 MHz)



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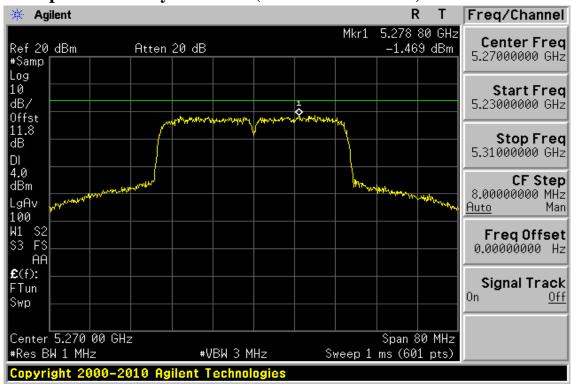


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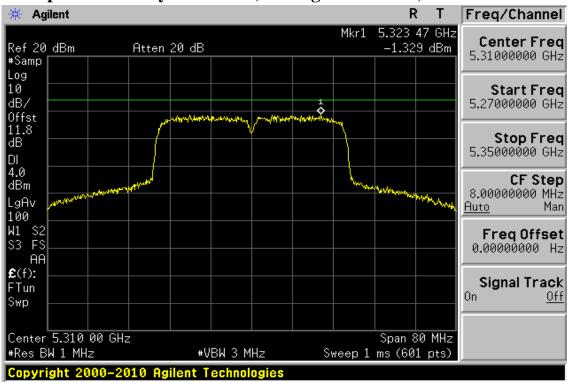
Page 96 of 463

## 802.11n HT40, 5250~5350 MHz

## Peak Power Spectral Density Data Plot (CH Low 5270 MHz)



## Peak Power Spectral Density Data Plot (CH High 5310 MHz)



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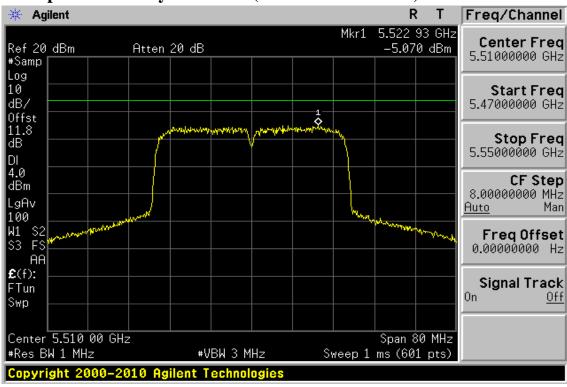


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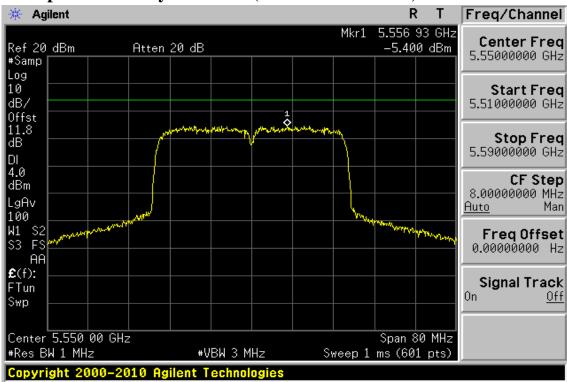
Page 97 of 463

## 802.11n HT40, 5470~5725 MHz

## Peak Power Spectral Density Data Plot (CH Low 5510 MHz)



## Peak Power Spectral Density Data Plot (CH Mid 5550 MHz)



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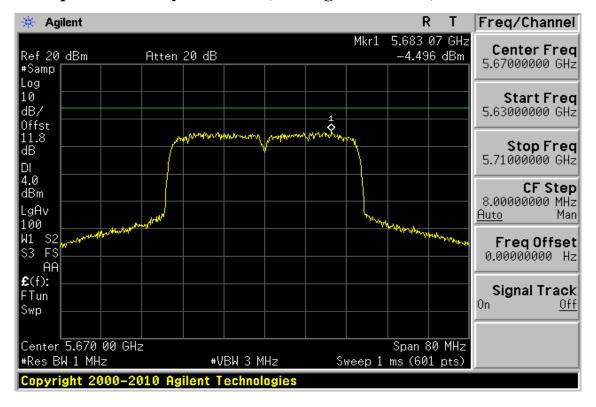
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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 98 of 463

### Peak Power Spectral Density Data Plot (CH High 5670 MHz)



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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 99 of 463

### 10. PEAK EXCURSION MEASUREMENT

### 10.1 Standard Applicable

15.407(a)(6) The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

### 10.2 Measurement Procedure (following procedure G in KDB789033)

- 1. Pre-evaluation in selection for test mode based on KDB789033
- 2. Tests mode selection is based on the variations in signal structure,
  - (i) All signal types OFDM;
  - (ii) All modulation types (BPSK, QPSK, 16-QAM, 64-QAM);
  - (iii) All bandwidth modes (20MHz, and 40MHz for 802.11n);
  - (iv) All variations in signal parameters (inapplicable);
  - (v) Error-correction coding rate (not required);
- 3. Place the EUT on the table and set it in transmitting mode.
- 4. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to spectrum.
- 5. Set RBW=1MHz, VBW = 3MHz, span = enough to capture the signal of the interest, Max. Hold, Detector = peak
- 6. use the procedure specified in KDB 789033 F) to determine the PPSD
- 7. compute the ratio of the maximum of the peak-max-hold spectrum to the PPSD by the subtraction
- 8. Repeat above procedures until all default test mode of default frequency band of the test is completed.

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Page 100 of 463

802.11a

Table 18-4—Modulation-dependent parameters

Modulation	Coding rate (R)	Coded bits per subcarrier (N <sub>BPSC</sub> )	Coded bits per OFDM symbol (N <sub>CBPS</sub> )	Data bits per OFDM symbol (N <sub>DBPS</sub> )	Data rate (Mb/s) (20 MHz channel spacing)	Data rate (Mb/s) (10 MHz channel spacing)	Data rate (Mb/s) (5 MHz channel spacing)
BPSK	1/2	1	48	24	6	3	1.5
BPSK	3/4	1	48	36	9	4.5	2.25
QPSK	1/2	2	96	48	12	6	3
QPSK	3/4	2	96	72	18	9	4.5
16-QAM	1/2	4	192	96	24	12	6
16-QAM	3/4	4	192	144	36	18	9
64-QAM	2/3	6	288	192	48	24	12
64-QAM	3/4	6	288	216	54	27	13.5

802.11n 20

Table 20-30—MCS parameters for mandatory 20 MHz,  $N_{SS}$  = 1,  $N_{ES}$  = 1

1100								Data ra	ite (Mb/s)
MCS Index	Modulation	R	N <sub>BPSCS</sub> (i <sub>SS</sub> )	N <sub>SD</sub>	N <sub>SP</sub>	N <sub>CBPS</sub>	$N_{DBPS}$	800 ns GI	400 ns GI (see NOTE)
0	BPSK	1/2	1	52	4	52	26	6.5	7.2
1	QPSK	1/2	2	52	4	104	52	13.0	14.4
2	QPSK	3/4	2	52	4	104	78	19.5	21.7
3	16-QAM	1/2	4	52	4	208	104	26.0	28.9
4	16-QAM	3/4	4	52	4	208	156	39.0	43.3
5	64-QAM	2/3	6	52	4	312	208	52.0	57.8
6	64-QAM	3/4	6	52	4	312	234	58.5	65.0
7	64-QAM	5/6	6	52	4	312	260	65.0	72.2
NOTE—S	upport of 400 ns (	3I is op	tional on transm	it and re	eceive.				

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Report No.: EH/2013/70026 Issue Date: Aug. 05, 2013

Page 101 of 463

802.11n 40

Table 20-34—MCS parameters for optional 40 MHz,  $N_{SS}$  = 1,  $N_{ES}$  = 1

MCS	Madalada		V (C )	N	N	N	N	Data rat	Data rate (Mb/s)	
Index	Modulation	R	$N_{BPSCS}(i_{SS})$	N <sub>SD</sub>	N <sub>SP</sub>	N <sub>CBPS</sub>	$N_{DBPS}$	800 ns GI	400 ns GI	
0	BPSK	1/2	1	108	6	108	54	13.5	15.0	
1	QPSK	1/2	2	108	6	216	108	27.0	30.0	
2	QPSK	3/4	2	108	6	216	162	40.5	45.0	
3	16-QAM	1/2	4	108	6	432	216	54.0	60.0	
4	16-QAM	3/4	4	108	6	432	324	81.0	90.0	
5	64-QAM	2/3	6	108	6	648	432	108.0	120.0	
6	64-QAM	3/4	6	108	6	648	486	121.5	135.0	
7	64-QAM	5/6	6	108	6	648	540	135.0	150.0	

Note: The test mode to be performed is circle in red as presents above

## 10.3 Measurement Equipment Used:

Refer to section 7.3 for details.

### 10.4 Test Set-up:

Refer to section 7.4 for details.

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Report No.: EH/2013/70026 Issue Date: Aug. 05, 2013

Page 102 of 463

#### 10.5 Test Results:

**Modulation Type: BPSK** 

Coding Rate: 1/2

802.11a, 5150~5250 MHz

Channel	Frequency (MHz)	Peak Value(dBm)	PPSD (dBm)	Peak Excursion (dB)	Limit (dB)
Mid	5220	1.78	0.25	1.53	13.00

### 802.11a, 5250~5350 MHz

Channel	Frequency (MHz)	Peak Value(dBm)	PPSD (dBm)	Peak Excursion (dB)	Limit (dB)
Mid	5300	8.64	0.22	8.42	13.00

#### 802.11a, 5470~5725 MHz

Channel	Frequency (MHz)	Peak Value(dBm)	PPSD (dBm)	Peak Excursion (dB)	Limit (dB)
Mid	5580	5.27	-0.45	5.72	13.00

### 802.11n HT20, 5150~5250 MHz

Channel	Frequency (MHz)	Peak Value(dBm)	PPSD (dBm)	Peak Excursion (dB)	Limit (dB)
Mid	5220	7.38	-0.48	7.86	13.00

### 802.11n HT20, 5250~5350 MHz

Channel	Frequency (MHz)	Peak Value(dBm)	PPSD (dBm)	Peak Excursion (dB)	Limit (dB)
Mid	5300	8.73	0.22	8.51	13.00

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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 103 of 463

### 802.11n HT20, 5470~5725 MHz

Channel	Frequency (MHz)	Peak Value(dBm)	PPSD (dBm)	Peak Excursion (dB)	Limit (dB)
Mid	5580	4.37	-0.26	4.63	13.00

#### 802.11n HT40, 5150~5250 MHz

Channel	Frequency (MHz)	Peak Value(dBm)	PPSD (dBm)	Peak Excursion (dB)	Limit (dB)
Low	5190	1.98	-1.53	3.51	13.00

### 802.11n HT40, 5250~5350 MHz

Channel	Frequency (MHz)	Peak Value(dBm)	PPSD (dBm)	Peak Excursion (dB)	Limit (dB)
Low	5270	4.14	-1.47	5.61	13.00

### 802.11n HT40, 5470~5725 MHz

Channel	Frequency (MHz)	Peak Value(dBm)	PPSD (dBm)	Peak Excursion (dB)	Limit (dB)
Low	5510	-1.08	-5.07	3.99	13.00

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Report No.: EH/2013/70026 Issue Date: Aug. 05, 2013

Page 104 of 463

**Modulation Type: QPSK** 

Coding Rate: 1/2

802.11a, 5150~5250 MHz

Channel	Frequency (MHz)	Peak Value(dBm)	PPSD (dBm)	Peak Excursion (dB)	Limit (dB)
Mid	5220	7.23	0.116	7.11	13.00

### 802.11a, 5250~5350 MHz

Channel	Frequency (MHz)	Peak Value(dBm)	PPSD (dBm)	Peak Excursion (dB)	Limit (dB)
Mid	5300	10.09	0.423	9.67	13.00

### 802.11a, 5470~5725 MHz

Channel	Frequency (MHz)	Peak Value(dBm)	PPSD (dBm)	Peak Excursion (dB)	Limit (dB)
Mid	5580	5.23	-0.437	5.67	13.00

#### 802.11n HT20, 5150~5250 MHz

Channel	Frequency (MHz)	Peak Value(dBm)	PPSD (dBm)	Peak Excursion (dB)	Limit (dB)
Mid	5220	7.12	-0.139	7.26	13.00

#### 802.11n HT20, 5250~5350 MHz

Channel	Frequency (MHz)	Peak Value(dBm)	PPSD (dBm)	Peak Excursion (dB)	Limit (dB)
Mid	5300	10.09	0.047	10.04	13.00

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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 105 of 463

#### 802.11n HT20, 5470~5725 MHz

Channel	Frequency (MHz)	Peak Value(dBm)	PPSD (dBm)	Peak Excursion (dB)	Limit (dB)
Mid	5580	5.31	-0.614	5.92	13.00

#### 802.11n HT40, 5150~5250 MHz

Channel	Frequency (MHz)	Peak Value(dBm)	PPSD (dBm)	Peak Excursion (dB)	Limit (dB)
Low	5190	3.88	-1.613	5.49	13.00

### 802.11n HT40, 5250~5350 MHz

Channel	Frequency (MHz)	Peak Value(dBm)	PPSD (dBm)	Peak Excursion (dB)	Limit (dB)
Low	5270	-2.57	-1.421	-1.15	13.00

### 802.11n HT40, 5470~5725 MHz

Channel	Frequency (MHz)	Peak Value(dBm)	PPSD (dBm)	Peak Excursion (dB)	Limit (dB)
Low	5510	0.24	-4.804	5.04	13.00

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Report No.: EH/2013/70026 Issue Date: Aug. 05, 2013

Page 106 of 463

**Modulation Type: 16-QAM** 

Coding Rate: 1/2

802.11a, 5150~5250 MHz

Channel	Frequency (MHz)	Peak Value(dBm)	PPSD (dBm)	Peak Excursion (dB)	Limit (dB)
Mid	5220	7.47	-0.296	7.77	13.00

### 802.11a, 5250~5350 MHz

Channel	Frequency (MHz)	Peak Value(dBm)	PPSD (dBm)	Peak Excursion (dB)	Limit (dB)
Mid	5300	10.61	-0.104	10.71	13.00

### 802.11a, 5470~5725 MHz

Channel	Frequency (MHz)	Peak Value(dBm)	PPSD (dBm)	Peak Excursion (dB)	Limit (dB)
Mid	5580	7.05	-0.105	7.16	13.00

#### 802.11n HT20, 5150~5250 MHz

Channel	Frequency (MHz)	Peak Value(dBm)	PPSD (dBm)	Peak Excursion (dB)	Limit (dB)
Mid	5220	8.11	-0.417	8.53	13.00

#### 802.11n HT20, 5250~5350 MHz

Channel	Frequency (MHz)	Peak Value(dBm)	PPSD (dBm)	Peak Excursion (dB)	Limit (dB)
Mid	5300	9.67	-0.256	9.93	13.00

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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 107 of 463

### 802.11n HT20, 5470~5725 MHz

Channel	Frequency (MHz)	Peak Value(dBm)	PPSD (dBm)	Peak Excursion (dB)	Limit (dB)
Mid	5580	5.75	-0.733	6.48	13.00

#### 802.11n HT40, 5150~5250 MHz

Channel	Frequency (MHz)	Peak Value(dBm)	PPSD (dBm)	Peak Excursion (dB)	Limit (dB)
Low	5190	3.04	-1.798	4.84	13.00

### 802.11n HT40, 5250~5350 MHz

Channel	Frequency (MHz)	Peak Value(dBm)	PPSD (dBm)	Peak Excursion (dB)	Limit (dB)
Low	5270	-2.05	-1.94	-0.11	13.00

### 802.11n HT40, 5470~5725 MHz

Channel	Frequency (MHz)	Peak Value(dBm)	PPSD (dBm)	Peak Excursion (dB)	Limit (dB)
Low	5510	-0.08	-5.401	5.32	13.00

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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 108 of 463

**Modulation Type: 64-QAM** 

Coding Rate: 2/3

802.11a, 5150~5250 MHz

Channel	Frequency (MHz)	Peak Value(dBm)	PPSD (dBm)	Peak Excursion (dB)	Limit (dB)
Mid	5220	7.83	-0.613	8.44	13.00

### 802.11a, 5250~5350 MHz

Channel	Frequency (MHz)	Peak Value(dBm)	PPSD (dBm)	Peak Excursion (dB)	Limit (dB)
Mid	5300	9.94	-0.159	10.10	13.00

### 802.11a, 5470~5725 MHz

Channel	Frequency (MHz)	Peak Value(dBm)	PPSD (dBm)	Peak Excursion (dB)	Limit (dB)
Mid	5580	6.52	-0.669	7.19	13.00

#### 802.11n HT20, 5150~5250 MHz

Channel	Frequency (MHz)	Peak Value(dBm)	PPSD (dBm)	Peak Excursion (dB)	Limit (dB)
Mid	5220	7.96	-0.586	8.55	13.00

#### 802.11n HT20, 5250~5350 MHz

Channel	Frequency (MHz)	Peak Value(dBm)	PPSD (dBm)	Peak Excursion (dB)	Limit (dB)
Mid	5300	9.66	-0.332	9.99	13.00

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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 109 of 463

#### 802.11n HT20, 5470~5725 MHz

Channel	Frequency (MHz)	Peak Value(dBm)	PPSD (dBm)	Peak Excursion (dB)	Limit (dB)
Mid	5580	5.25	-0.862	6.11	13.00

#### 802.11n HT40, 5150~5250 MHz

Channel	Frequency (MHz)	Peak Value(dBm)	PPSD (dBm)	Peak Excursion (dB)	Limit (dB)
Low	5190	3.78	-1.944	5.72	13.00

#### 802.11n HT40, 5250~5350 MHz

Channel	Frequency (MHz)	Peak Value(dBm)	PPSD (dBm)	Peak Excursion (dB)	Limit (dB)
Low	5270	5.16	-1.612	6.77	13.00

### 802.11n HT40, 5470~5725 MHz

Channel	Frequency (MHz)	Peak Value(dBm)	PPSD (dBm)	Peak Excursion (dB)	Limit (dB)
Low	5510	0.20	-5.3	5.50	13.00

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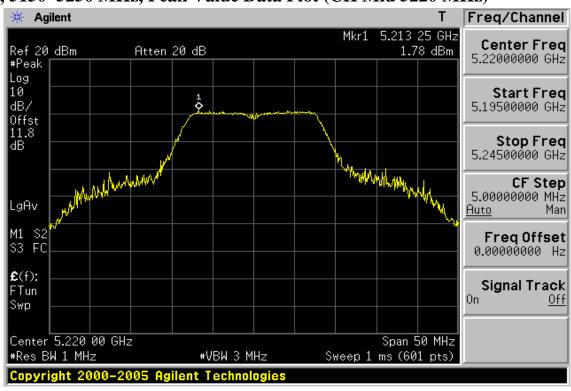
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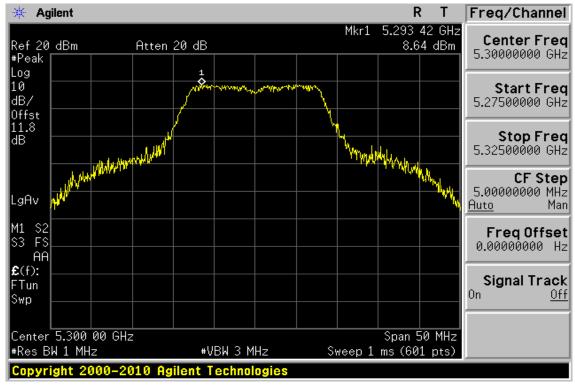
Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 110 of 463

# **Modulation Type: BPSK, Coding Rate: 1/2** 802.11a, 5150~5250 MHz, Peak Value Data Plot (CH Mid 5220 MHz)



## 802.11a, 5250~5350 MHz, Peak Value Data Plot (CH Mid 5300 MHz)



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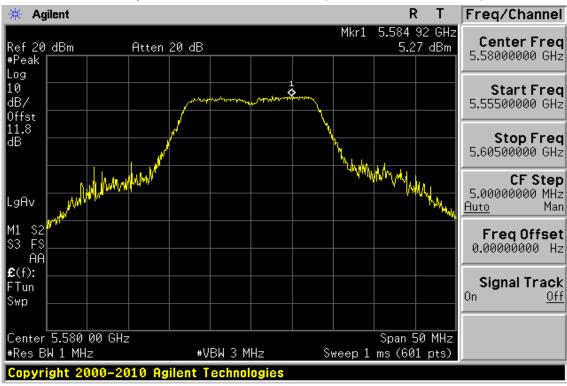
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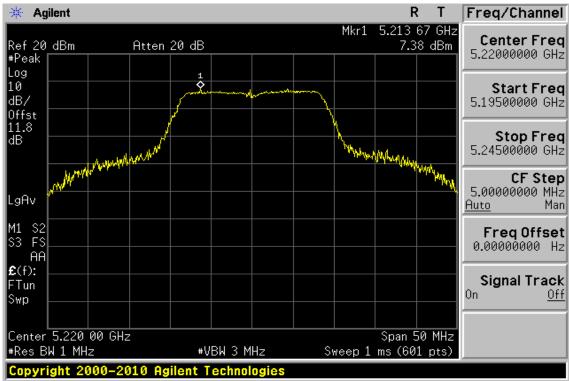
Report No.: EH/2013/70026 Issue Date: Aug. 05, 2013

Page 111 of 463

### 802.11a, 5470~5725 MHz, Peak Value Data Plot (CH Mid 5580 MHz)



### 802.11n HT20, 5150~5250 MHz, Peak Value Data Plot (CH Mid 5220 MHz)



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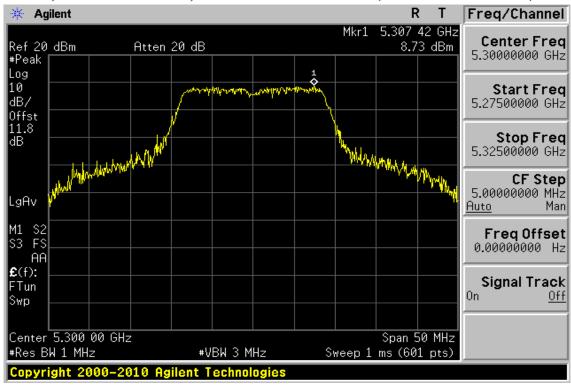
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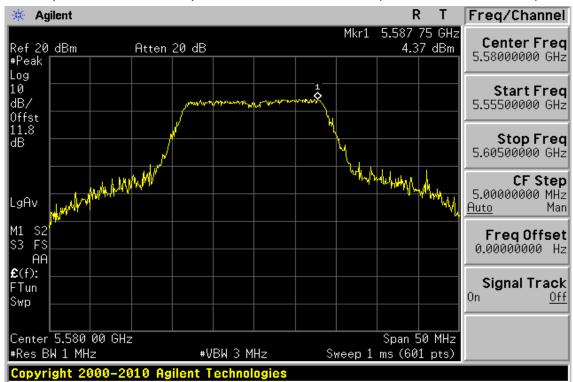
Report No.: EH/2013/70026 Issue Date: Aug. 05, 2013

Page 112 of 463

#### 802.11n HT20, 5250~5350 MHz, Peak Value Data Plot (CH Mid 5300MHz)



### 802.11n HT20, 5470~5725 MHz, Peak Value Data Plot (CH Mid 5580 MHz)



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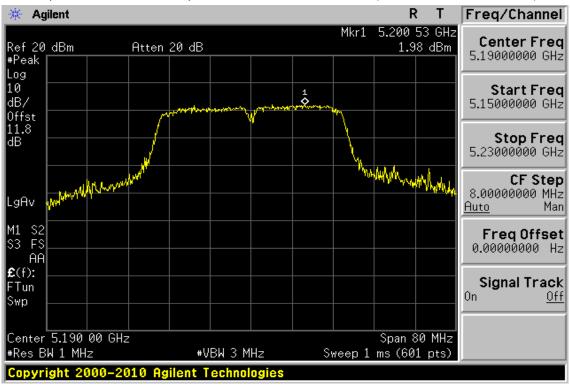
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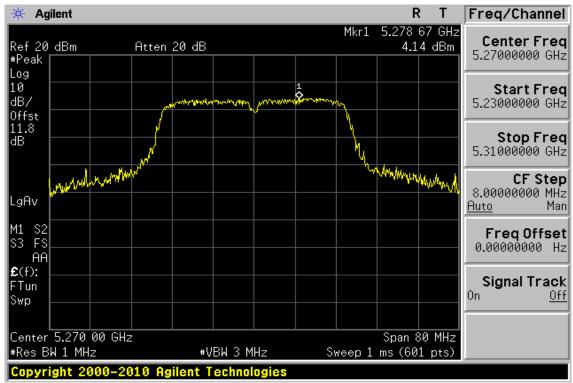
Report No.: EH/2013/70026 Issue Date: Aug. 05, 2013

Page 113 of 463

### 802.11n HT40, 5150~5250 MHz, Peak Value Data Plot (CH Low 5190 MHz)



### 802.11n HT40, 5250~5350 MHz, Peak Value Data Plot (CH Low 5270 MHz)



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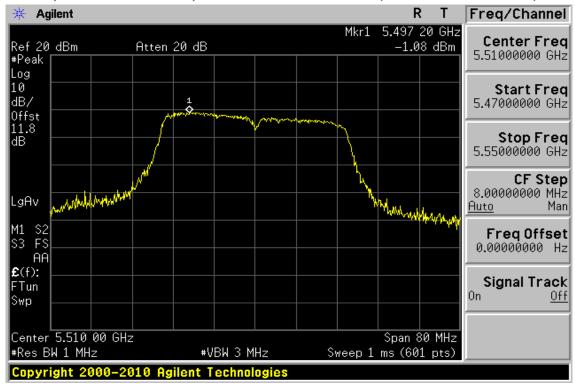
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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 114 of 463

### 802.11n HT40, 5470~5725 MHz, Peak Value Data Plot (CH Low 5510MHz)



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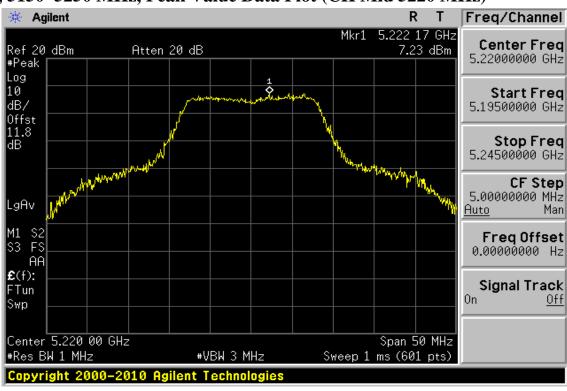
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Page 115 of 463

## **Modulation Type: QPSK, Coding Rate: 1/2** 802.11a, 5150~5250 MHz, Peak Value Data Plot (CH Mid 5220 MHz)



## 802.11a, 5250~5350 MHz, Peak Value Data Plot (CH Mid 5300 MHz)



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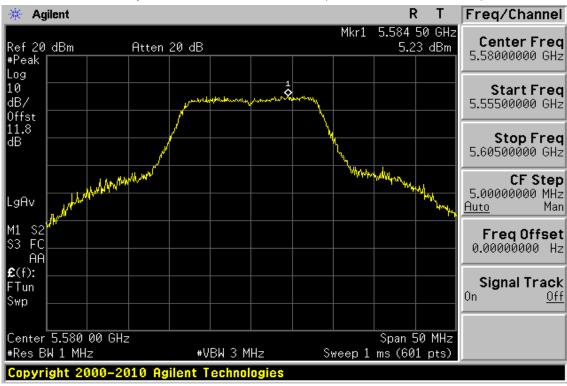
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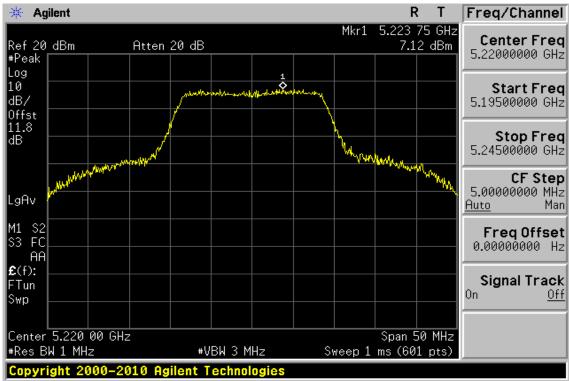
Report No.: EH/2013/70026 Issue Date: Aug. 05, 2013

Page 116 of 463

### 802.11a, 5470~5725 MHz, Peak Value Data Plot (CH Mid 5580 MHz)



### 802.11n HT20, 5150~5250 MHz, Peak Value Data Plot (CH Mid 5220 MHz)



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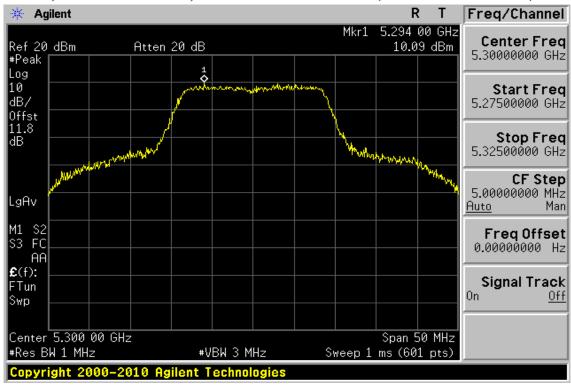
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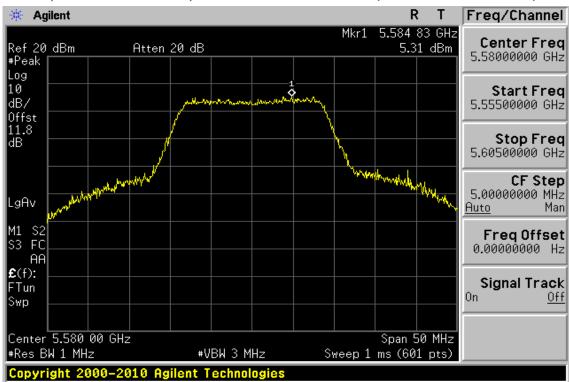
Report No.: EH/2013/70026 Issue Date: Aug. 05, 2013

Page 117 of 463

#### 802.11n HT20, 5250~5350 MHz, Peak Value Data Plot (CH Mid 5300MHz)



### 802.11n HT20, 5470~5725 MHz, Peak Value Data Plot (CH Mid 5580 MHz)



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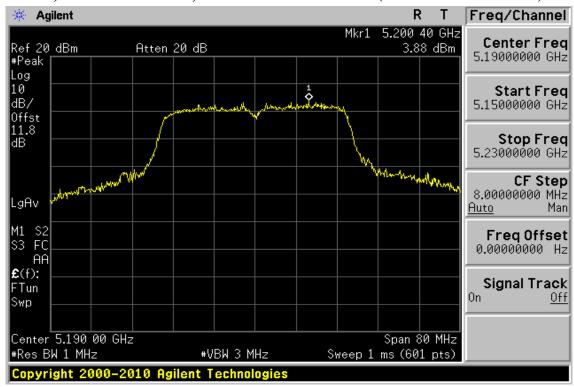
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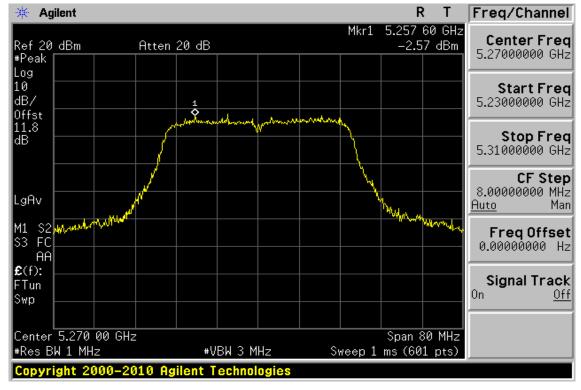
Report No.: EH/2013/70026 Issue Date: Aug. 05, 2013

Page 118 of 463

#### 802.11n HT40, 5150~5250 MHz, Peak Value Data Plot (CH Low 5190 MHz)



### 802.11n HT40, 5250~5350 MHz, Peak Value Data Plot (CH Low 5270 MHz)



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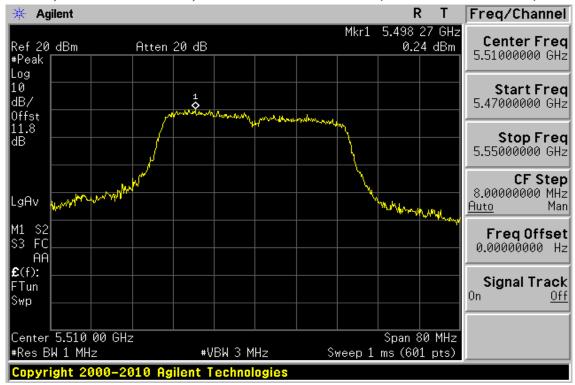
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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 119 of 463

### 802.11n HT40, 5470~5725 MHz, Peak Value Data Plot (CH Low 5510MHz)



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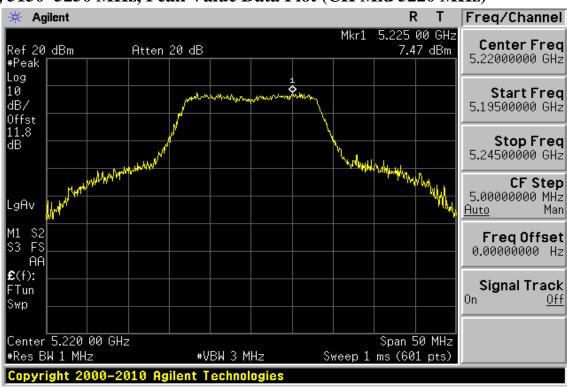
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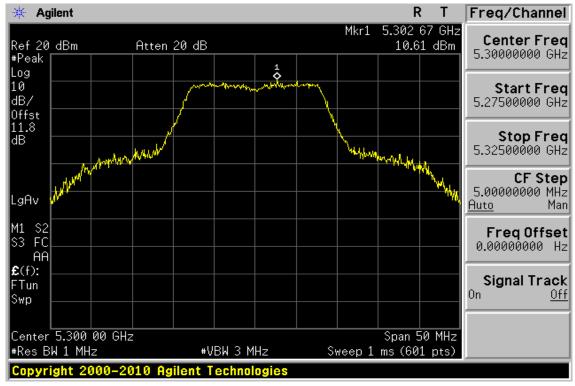
Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 120 of 463

# **Modulation Type: 16-QAM, Coding Rate: 1/2** 802.11a, 5150~5250 MHz, Peak Value Data Plot (CH Mid 5220 MHz)



## 802.11a, 5250~5350 MHz, Peak Value Data Plot (CH Mid 5300 MHz)



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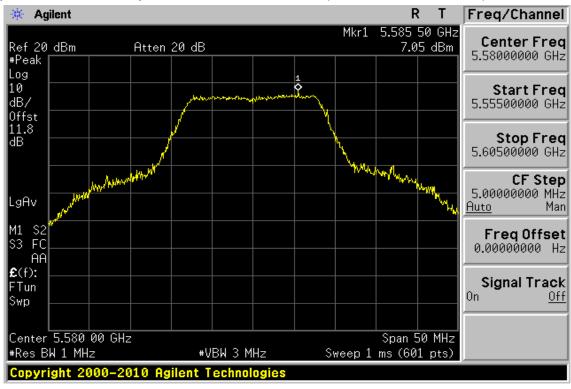
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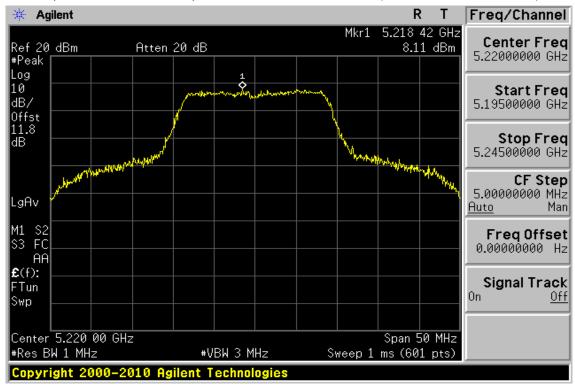
Report No.: EH/2013/70026 Issue Date: Aug. 05, 2013

Page 121 of 463

### 802.11a, 5470~5725 MHz, Peak Value Data Plot (CH Mid 5580 MHz)



### 802.11n HT20, 5150~5250 MHz, Peak Value Data Plot (CH Mid 5220 MHz)



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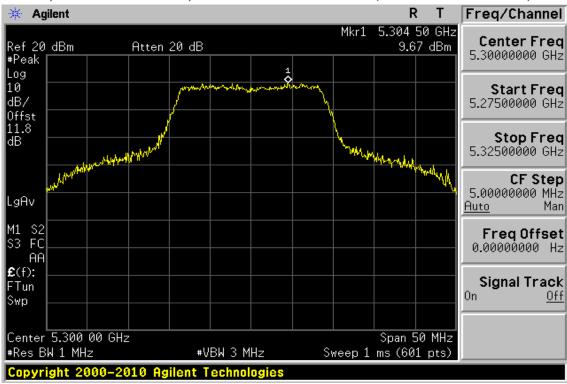
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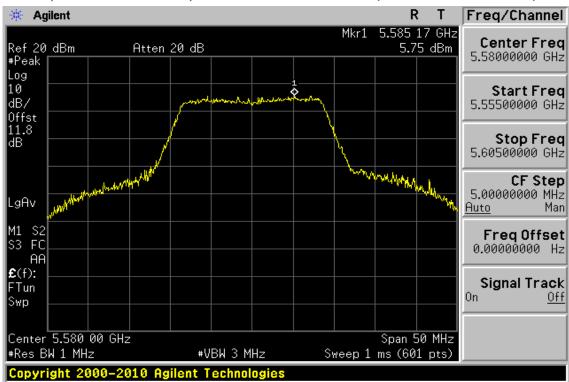
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Page 122 of 463

### 802.11n HT20, 5250~5350 MHz, Peak Value Data Plot (CH Mid 5300MHz)



### 802.11n HT20, 5470~5725 MHz, Peak Value Data Plot (CH Mid 5580 MHz)



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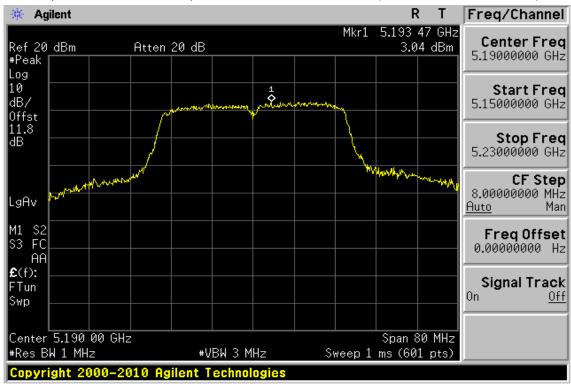
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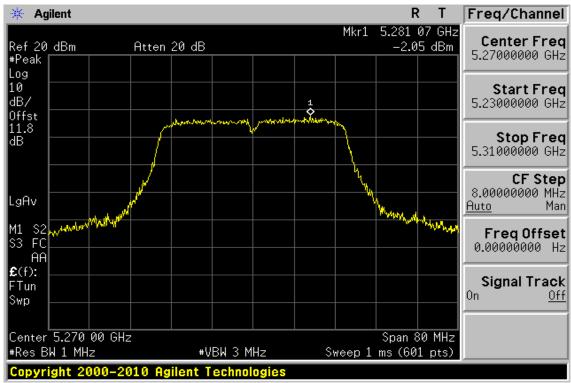
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Page 123 of 463

### 802.11n HT40, 5150~5250 MHz, Peak Value Data Plot (CH Low 5190 MHz)



### 802.11n HT40, 5250~5350 MHz, Peak Value Data Plot (CH Low 5270 MHz)



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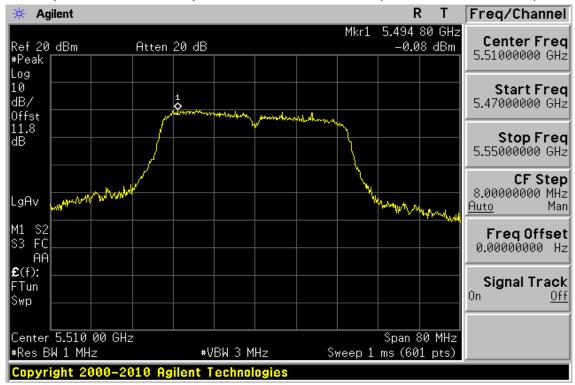
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Page 124 of 463

### 802.11n HT40, 5470~5725 MHz, Peak Value Data Plot (CH Low 5510MHz)



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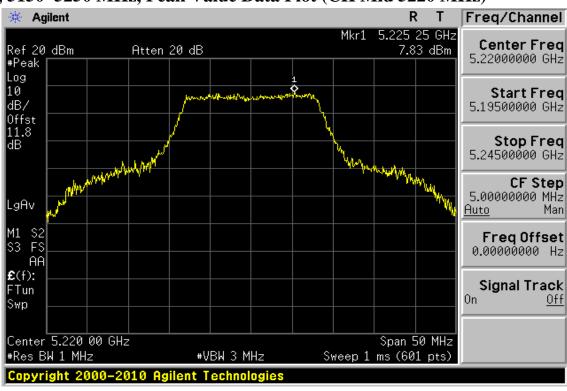
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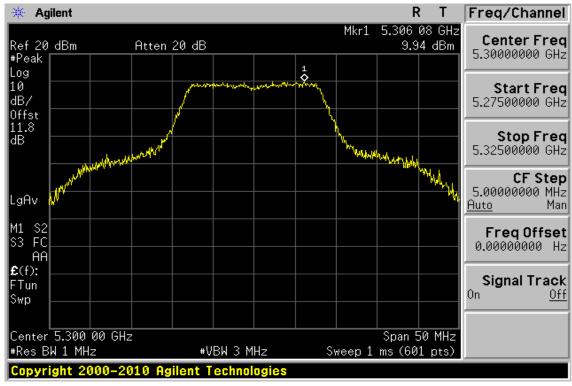
Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 125 of 463

# Modulation Type: 64-QAM, Coding Rate: 2/3 802.11a, 5150~5250 MHz, Peak Value Data Plot (CH Mid 5220 MHz)



## 802.11a, 5250~5350 MHz, Peak Value Data Plot (CH Mid 5300 MHz)



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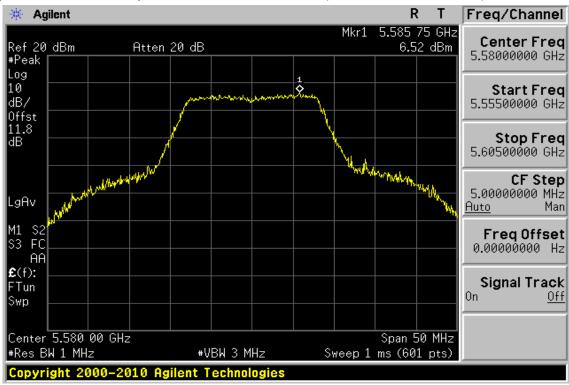
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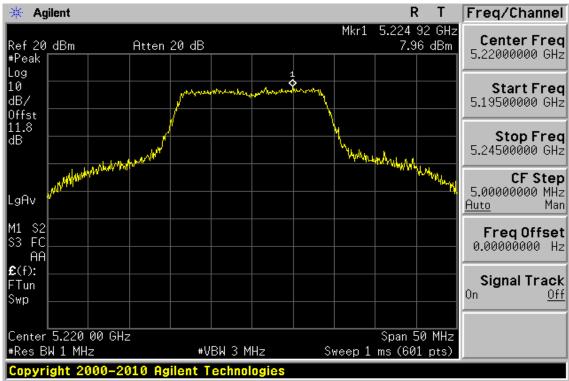
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Page 126 of 463

### 802.11a, 5470~5725 MHz, Peak Value Data Plot (CH Mid 5580 MHz)



### 802.11n HT20, 5150~5250 MHz, Peak Value Data Plot (CH Mid 5220 MHz)



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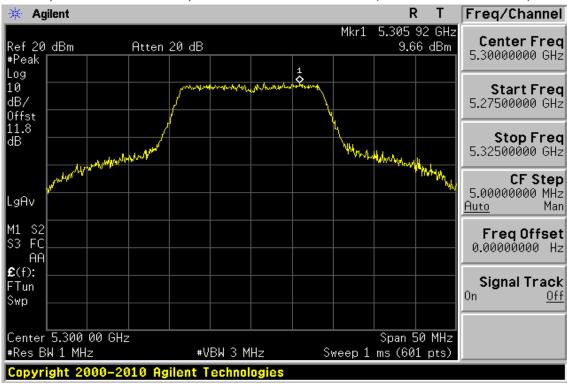
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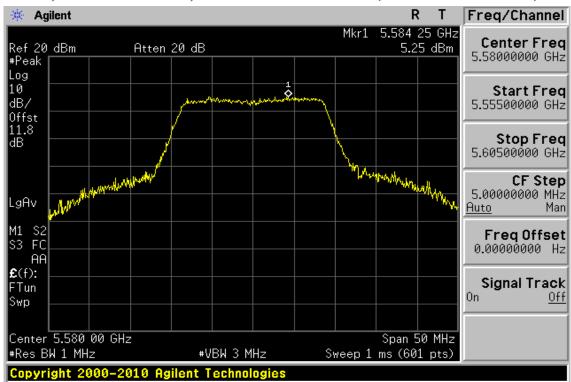
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Page 127 of 463

### 802.11n HT20, 5250~5350 MHz, Peak Value Data Plot (CH Mid 5300MHz)



### 802.11n HT20, 5470~5725 MHz, Peak Value Data Plot (CH Mid 5580 MHz)



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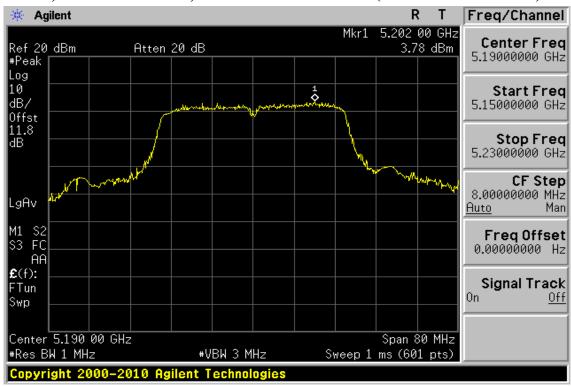
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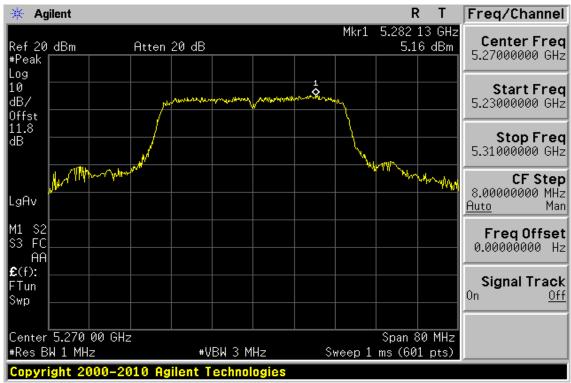
Report No.: EH/2013/70026 Issue Date: Aug. 05, 2013

Page 128 of 463

#### 802.11n HT40, 5150~5250 MHz, Peak Value Data Plot (CH Low 5190 MHz)



### 802.11n HT40, 5250~5350 MHz, Peak Value Data Plot (CH Low 5270 MHz)



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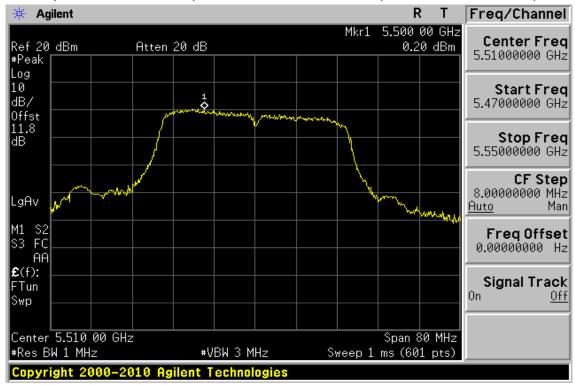
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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 129 of 463

### 802.11n HT40, 5470~5725 MHz, Peak Value Data Plot (CH Low 5510MHz)



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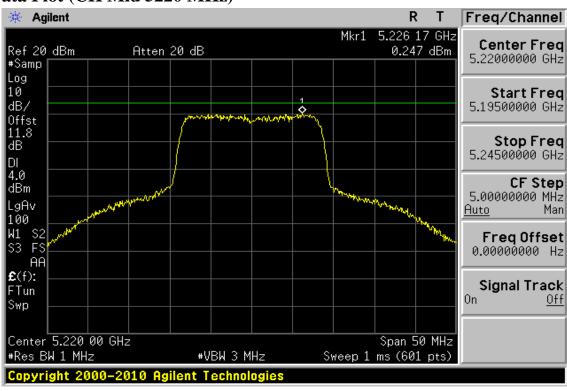
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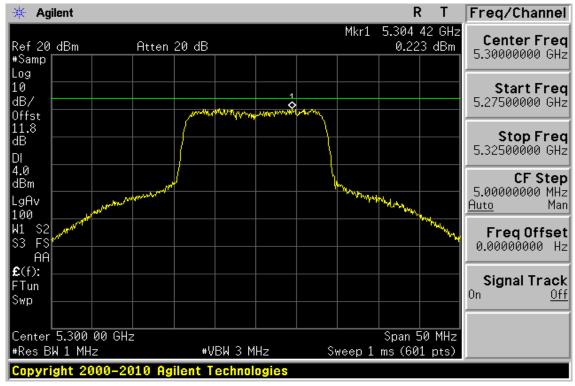
Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 130 of 463

## **Modulation Type: BPSK, Coding Rate: 1/2** PPSD Data Plot (CH Mid 5220 MHz)



## 802.11a, 5250~5350 MHz, PPSD Data Plot (CH Mid 5300 MHz)



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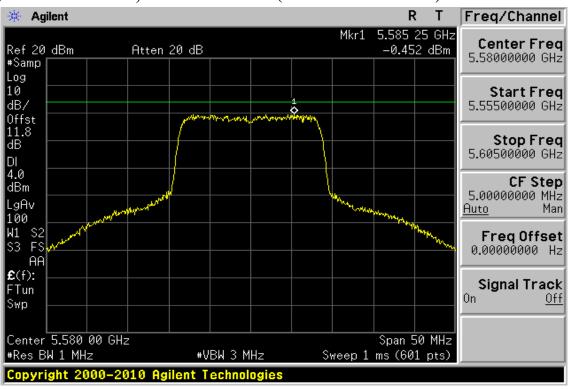
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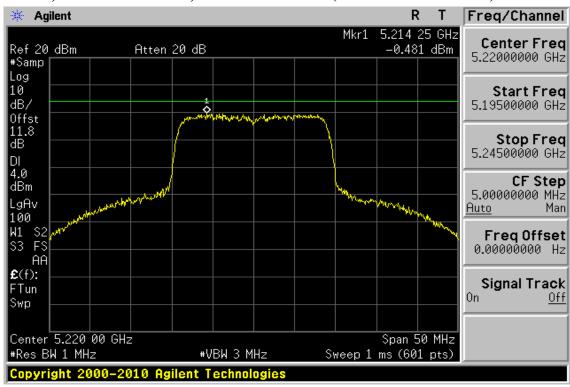
Report No.: EH/2013/70026 Issue Date: Aug. 05, 2013

Page 131 of 463

### 802.11a, 5470~5725 MHz, PPSD Data Plot (CH Mid 5580 MHz)



#### 802.11n HT20, 5150~5250 MHz, PPSD Data Plot (CH Mid 5220 MHz)



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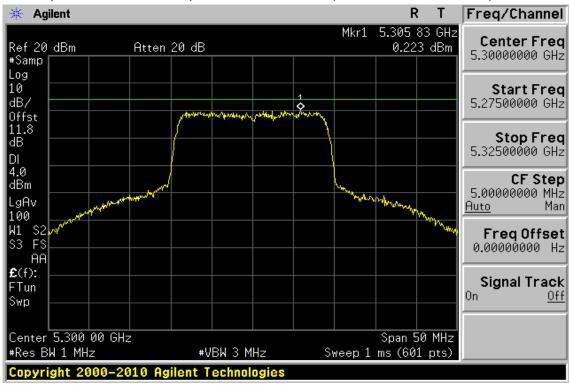
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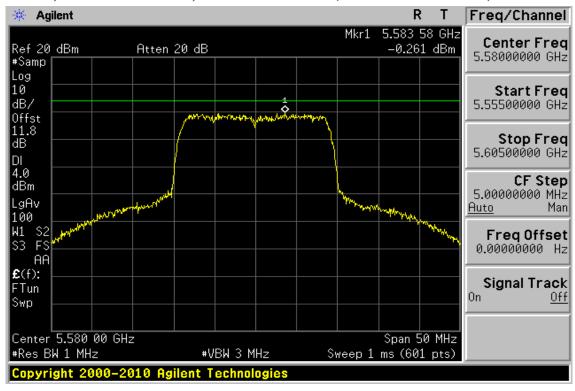
Report No.: EH/2013/70026 Issue Date: Aug. 05, 2013

Page 132 of 463

#### 802.11n HT20, 5250~5350 MHz, PPSD Data Plot (CH Mid 5300 MHz)



### 802.11n HT20, 5470~5725 MHz, PPSD Data Plot (CH Mid 5580MHz)



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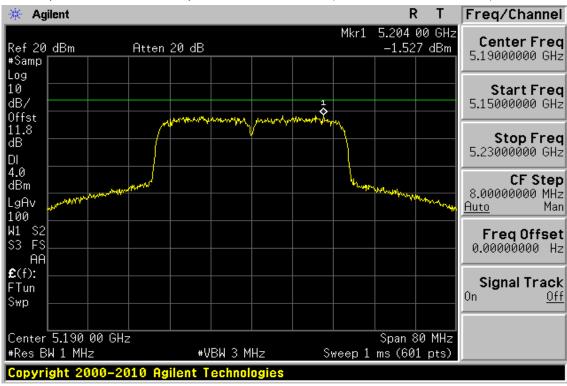
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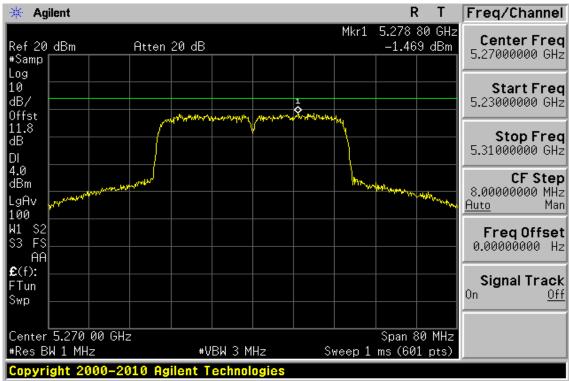
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Page 133 of 463

### 802.11n HT40, 5150~5250 MHz, PPSD Data Plot (CH Low 5190 MHz)



### 802.11n HT40, 5250~5350 MHz, PPSD Data Plot (CH Low 5270 MHz)



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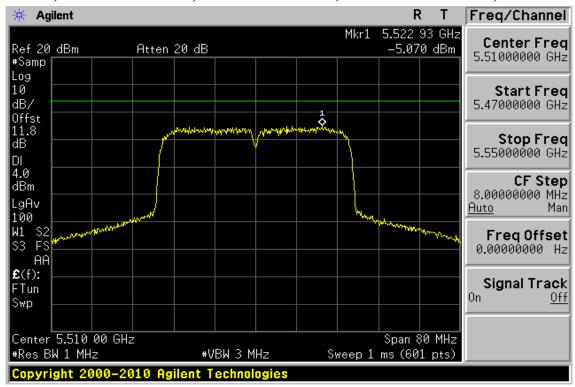
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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 134 of 463

## 802.11n HT40, 5470~5725 MHz, PPSD Data Plot (CH Low 5510 MHz)



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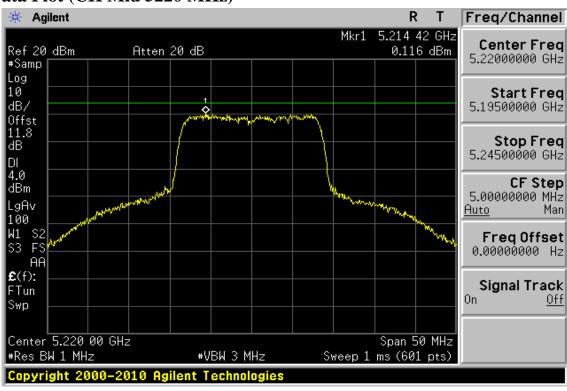
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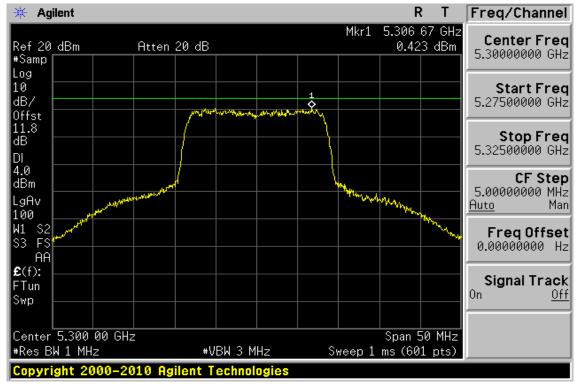
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Page 135 of 463

## **Modulation Type: QPSK, Coding Rate: 1/2** PPSD Data Plot (CH Mid 5220 MHz)



## 802.11a, 5250~5350 MHz, PPSD Data Plot (CH Mid 5300 MHz)



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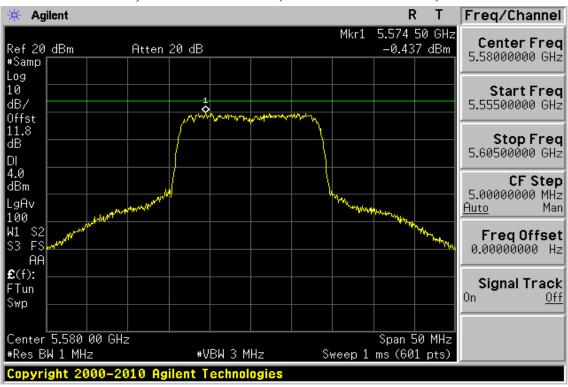
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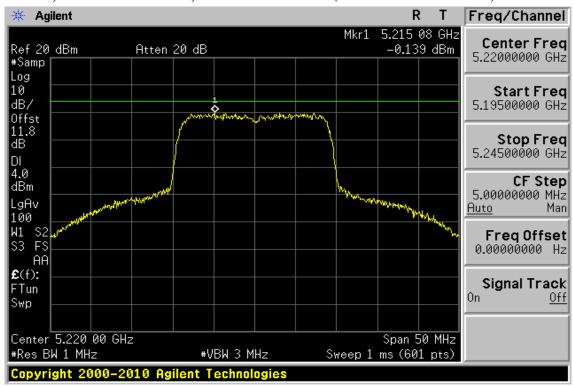
Report No.: EH/2013/70026 Issue Date: Aug. 05, 2013

Page 136 of 463

#### 802.11a, 5470~5725 MHz, PPSD Data Plot (CH Mid 5580 MHz)



#### 802.11n HT20, 5150~5250 MHz, PPSD Data Plot (CH Mid 5220 MHz)



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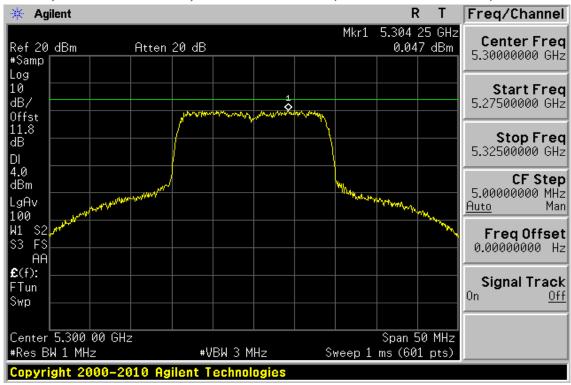
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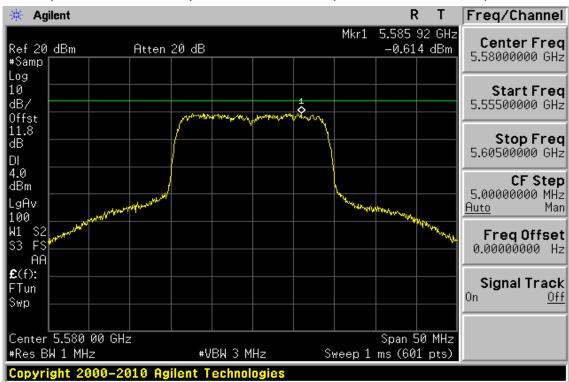
Report No.: EH/2013/70026 Issue Date: Aug. 05, 2013

Page 137 of 463

#### 802.11n HT20, 5250~5350 MHz, PPSD Data Plot (CH Mid 5300 MHz)



### 802.11n HT20, 5470~5725 MHz, PPSD Data Plot (CH Mid 5580MHz)



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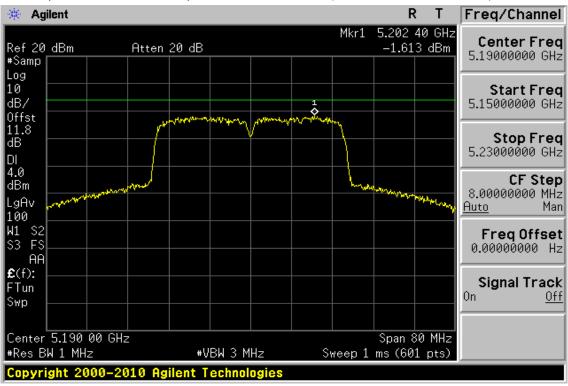
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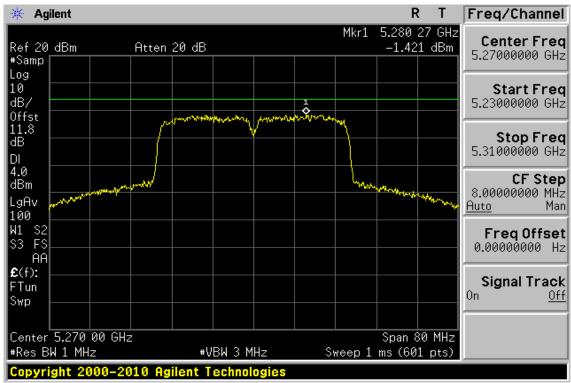
Report No.: EH/2013/70026 Issue Date: Aug. 05, 2013

Page 138 of 463

### 802.11n HT40, 5150~5250 MHz, PPSD Data Plot (CH Low 5190 MHz)



### 802.11n HT40, 5250~5350 MHz, PPSD Data Plot (CH Low 5270 MHz)



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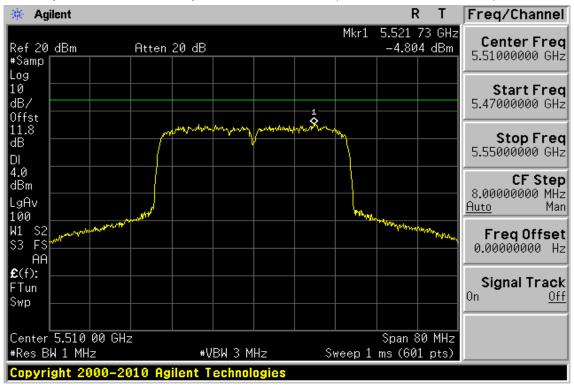
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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 139 of 463

## 802.11n HT40, 5470~5725 MHz, PPSD Data Plot (CH Low 5510 MHz)



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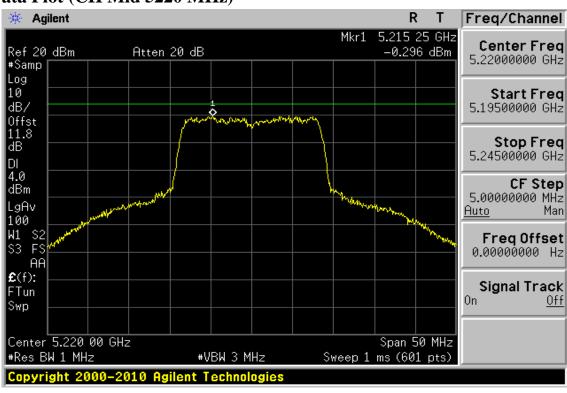
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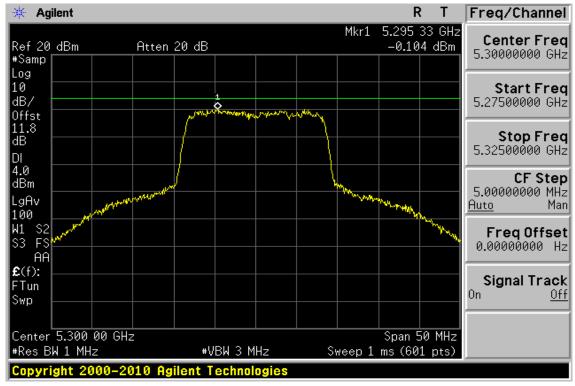
Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 140 of 463

## Modulation Type: 16-QAM, Coding Rate: 1/2 PPSD Data Plot (CH Mid 5220 MHz)



## 802.11a, 5250~5350 MHz, PPSD Data Plot (CH Mid 5300 MHz)



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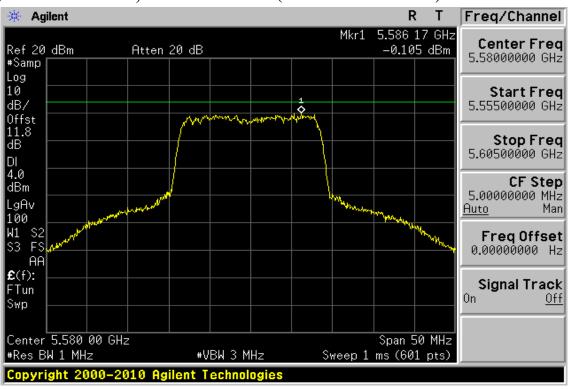
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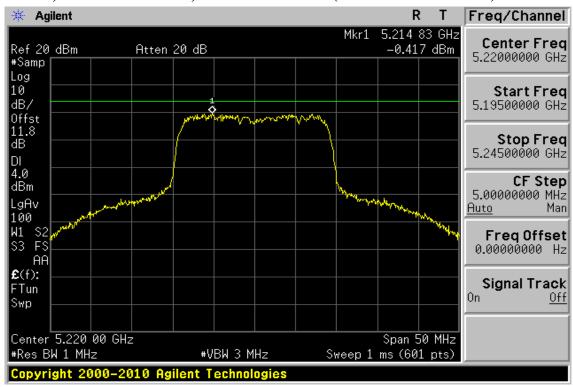
Report No.: EH/2013/70026 Issue Date: Aug. 05, 2013

Page 141 of 463

#### 802.11a, 5470~5725 MHz, PPSD Data Plot (CH Mid 5580 MHz)



#### 802.11n HT20, 5150~5250 MHz, PPSD Data Plot (CH Mid 5220 MHz)



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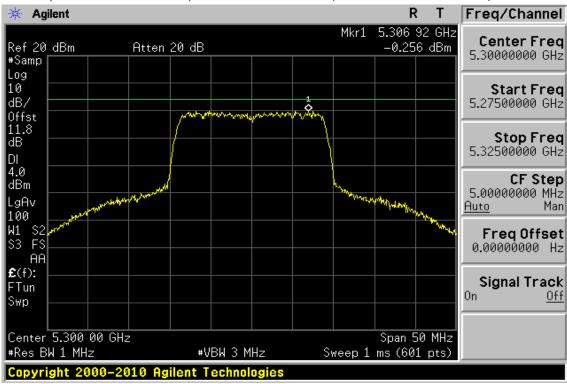
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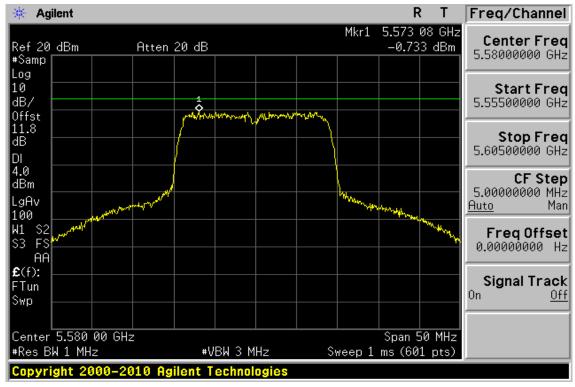
Report No.: EH/2013/70026 Issue Date: Aug. 05, 2013

Page 142 of 463

### 802.11n HT20, 5250~5350 MHz, PPSD Data Plot (CH Mid 5300 MHz)



## 802.11n HT20, 5470~5725 MHz, PPSD Data Plot (CH Mid 5580MHz)



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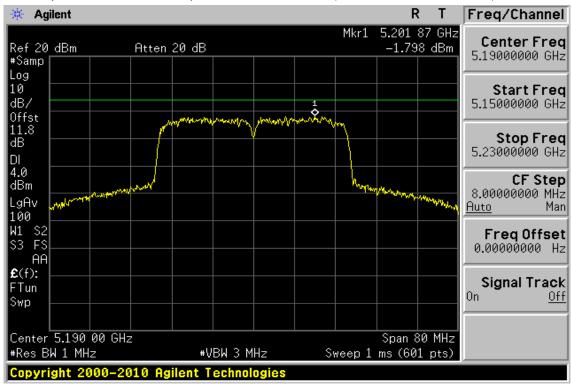
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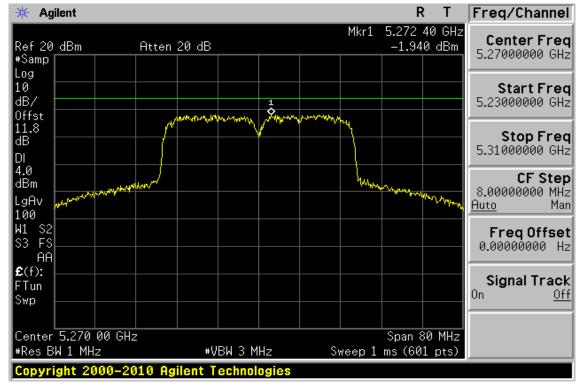
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Page 143 of 463

### 802.11n HT40, 5150~5250 MHz, PPSD Data Plot (CH Low 5190 MHz)



### 802.11n HT40, 5250~5350 MHz, PPSD Data Plot (CH Low 5270 MHz)



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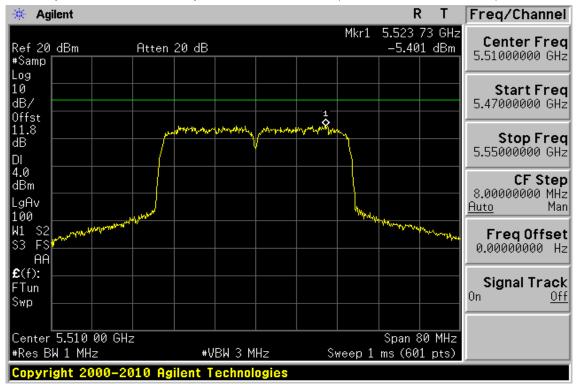
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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 144 of 463

## 802.11n HT40, 5470~5725 MHz, PPSD Data Plot (CH Low 5510 MHz)



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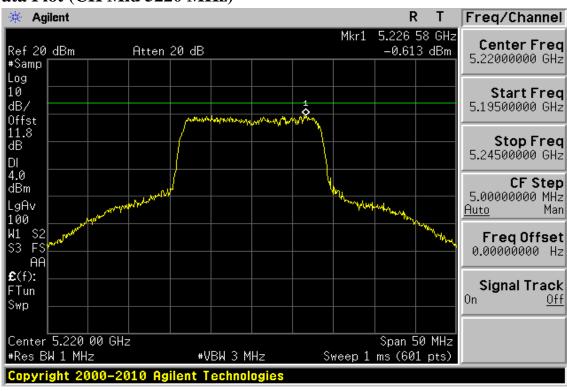
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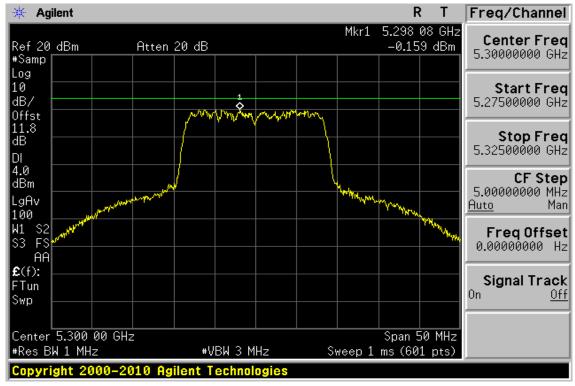
Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 145 of 463

# Modulation Type: 64-QAM, Coding Rate: 2/3 PPSD Data Plot (CH Mid 5220 MHz)



# 802.11a, 5250~5350 MHz, PPSD Data Plot (CH Mid 5300 MHz)



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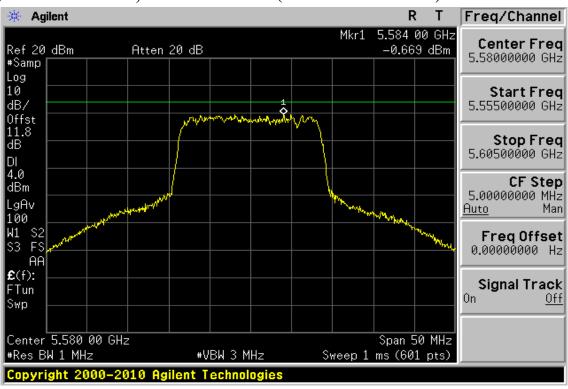
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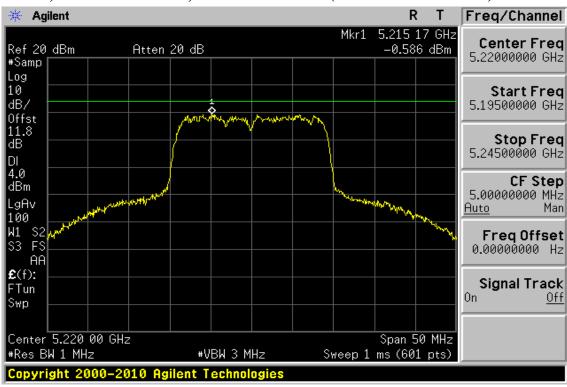
Report No.: EH/2013/70026 Issue Date: Aug. 05, 2013

Page 146 of 463

# 802.11a, 5470~5725 MHz, PPSD Data Plot (CH Mid 5580 MHz)



### 802.11n HT20, 5150~5250 MHz, PPSD Data Plot (CH Mid 5220 MHz)



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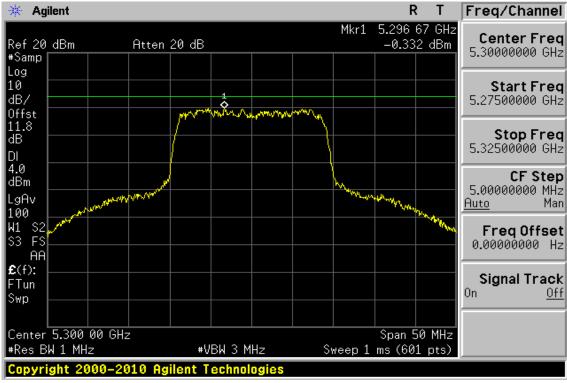
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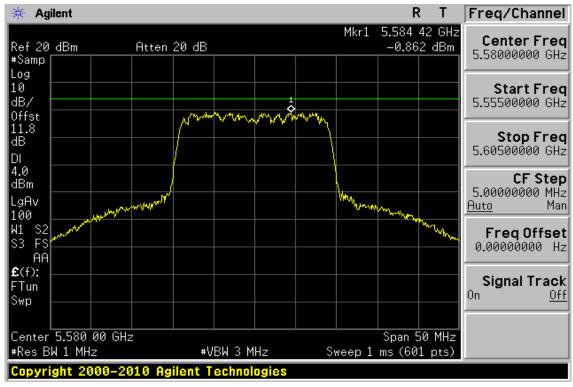
Report No.: EH/2013/70026 Issue Date: Aug. 05, 2013

Page 147 of 463

# 802.11n HT20, 5250~5350 MHz, PPSD Data Plot (CH Mid 5300 MHz)



# 802.11n HT20, 5470~5725 MHz, PPSD Data Plot (CH Mid 5580MHz)



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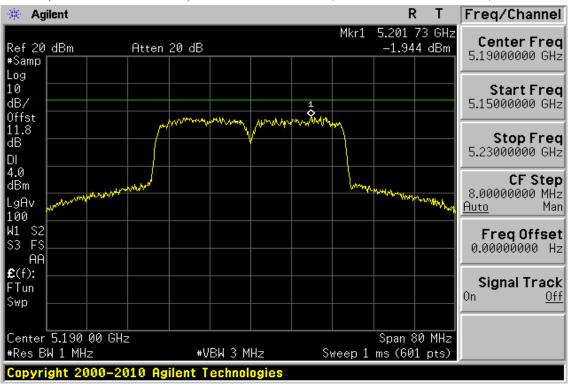
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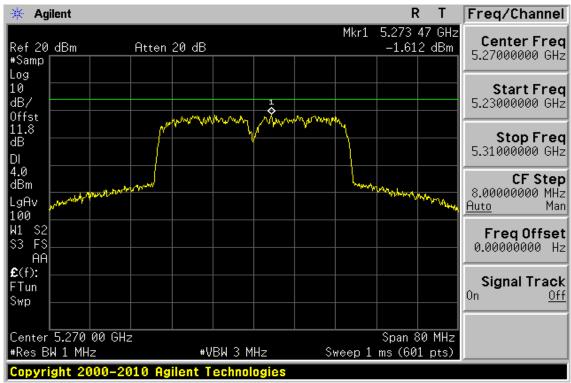
Report No.: EH/2013/70026 Issue Date: Aug. 05, 2013

Page 148 of 463

# 802.11n HT40, 5150~5250 MHz, PPSD Data Plot (CH Low 5190 MHz)



# 802.11n HT40, 5250~5350 MHz, PPSD Data Plot (CH Low 5270 MHz)



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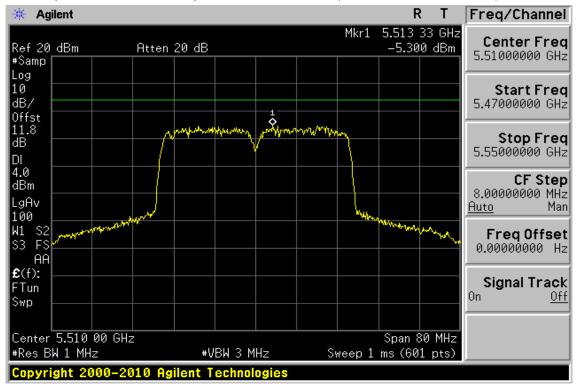
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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 149 of 463

# 802.11n HT40, 5470~5725 MHz, PPSD Data Plot (CH Low 5510 MHz)



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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 150 of 463

#### 11. UNDESIRABLE EMISSION - CONDUCTED MEASUREMENT

# **Standard Applicable**

According to §15.407(b),

- (b) Undesirable Emission Limits: Except as shown in Paragraph (b)(6) of this section, the peak emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:
  - For transmitters operating in the 5.15-5.25 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz.
  - (2) For transmitters operating in the 5.25-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz. Devices operating in the 5.25-5.35 GHz band that generate emissions in the 5.15-5.25 GHz band must meet all applicable technical requirements for operation in the 5.15-5.25 GHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27 dBm/MHz in the 5.15-5.25 GHz band.
  - For transmitters operating in the 5.47-5.725 GHz band: all emissions outside of the 5.47-5.725 GHz (3) band shall not exceed an EIRP of -27 dBm/MHz.
  - The above emission measurements shall be performed using a minimum resolution bandwidth of 1 (4) MHz. A lower resolution bandwidth may be employed near the band edge, when necessary, provided the measured energy is integrated to show the total power over 1 MHz.

# According to RSS-210 A9.2

- 1. For transmitters operating in the band 5150-5250 MHz, all emissions outside the band 5150-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p.
- 2. Emissions outside the band 5250-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p.
- 3. For transmitters operating in the band 5470-5725 MHz, all emissions outside that band shall not exceed -27 dBm/MHz e.i.r.p.

Procedure H2) a) b) c) are adopted, KDB 789033 D01, where the conducted measurement is being used to comply with out of emission requirement as per FCC 15.407 b) 1) 2) 3), and RSS-210 A9.2 1), 2), and 3)

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Report No.: EH/2013/70026 Issue Date: Aug. 05, 2013

Page 151 of 463

#### 11.2 Measurement Procedure

#### **Conducted Emission:**

- 1. To connect Antenna Port of EUT to Spectrum.
- 2. Set RBW = 100 kHz, VBW = 300 kHz while frequency of the measurement is swept below 1GHz, RBW = 1MHz & VBW = 3MHz while frequency of the measurement is swept above 1GHz on Spectrum. Detector = Peak, set DL as the limit line to -27dBm, add the offset = 4.7dB for frequency below 1GHz, and 2dB for frequency above 1GHz.
- 3. Sweep the frequency to determine spurious emission as seen on spectrum from span of 30 to 1G, 1G to 3G, 3G to 6G, 6G to 13G,13G to 18G, 18G to 26.5G and 26.5G to 40GHz
- 4. Via Software, combine 6 spans of frequency range into one plot

Conducted RF measurements of the transmitter output were made at the band edges and the adjacent restricted bands.

Also, conducted RF measurements of the transmitter output over the 30 MHz to 40 GHz band were made in order to identify any spurious signals that require further investigation or measurements on the radiated emissions site.

Note: the spike on the spectrum is the fundamental emission that does not account for the test outside the frequency band as required by associative regulatory provision.

### 11.3 Measurement Equipment Used:

Refer to section 7.3 for details.

### 11.4 Test Set-up:

Refer to section 7.4 for details.

#### 11.5 Measurement Result:

Refer to next page for plots.

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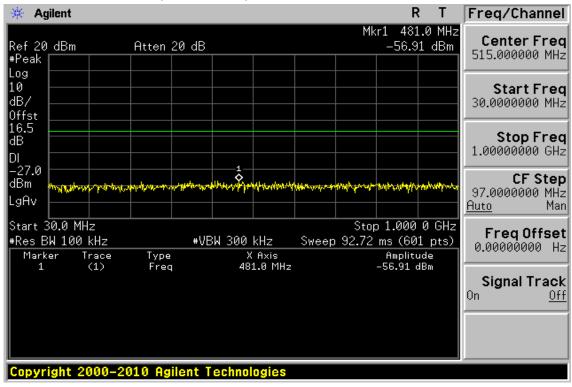
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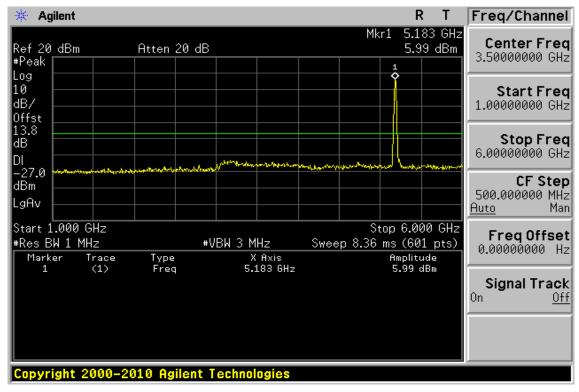
Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 152 of 463

# 802.11a, 5150~5250 MHz Ch Low 30MHz – 1GHz (5180 MHz)



### Ch Low 1GHz - 6GHz



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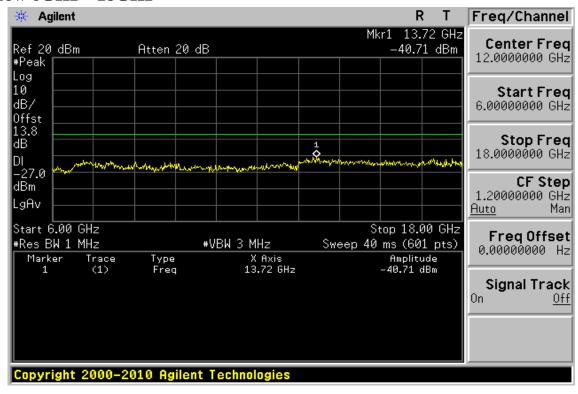
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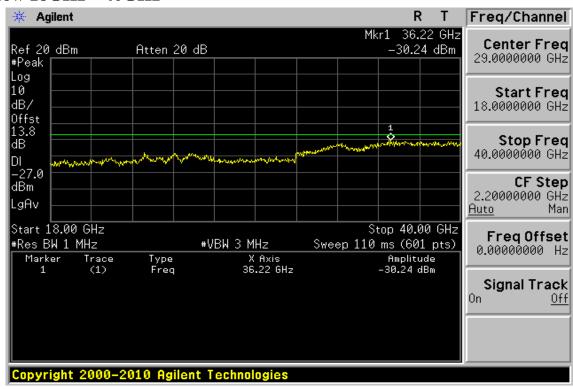
Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 153 of 463

### Ch Low 6GHz - 18GHz



### Ch Low 18GHz - 40GHz



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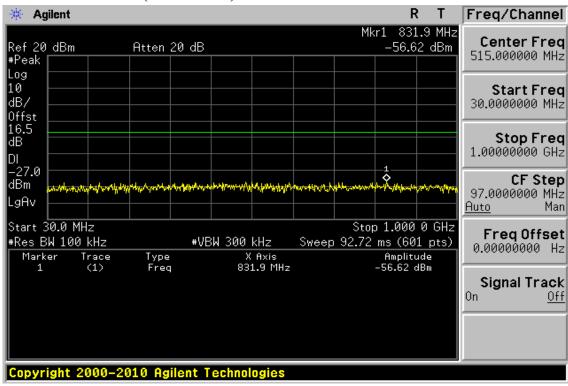
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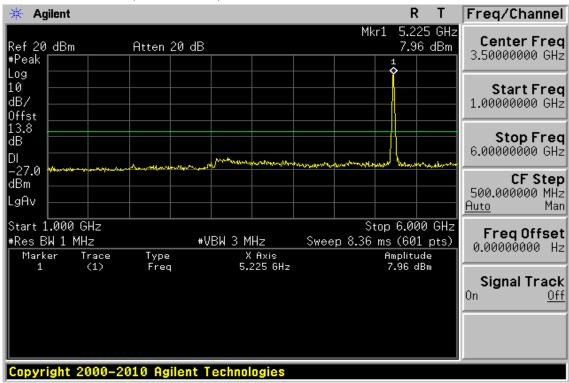
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Page 154 of 463

### **Ch Mid 30MHz – 1GHz (5220 MHz)**



# **Ch Mid 1GHz – 6GHz (5220 MHz)**



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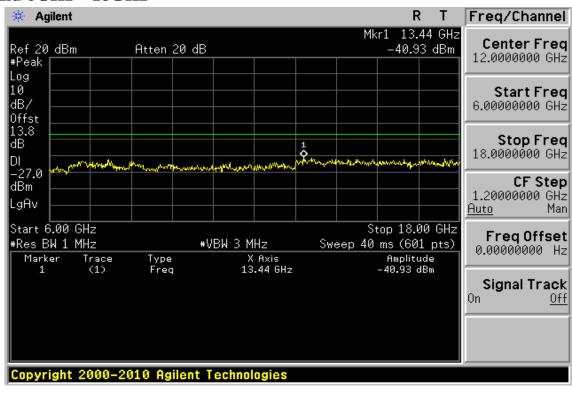
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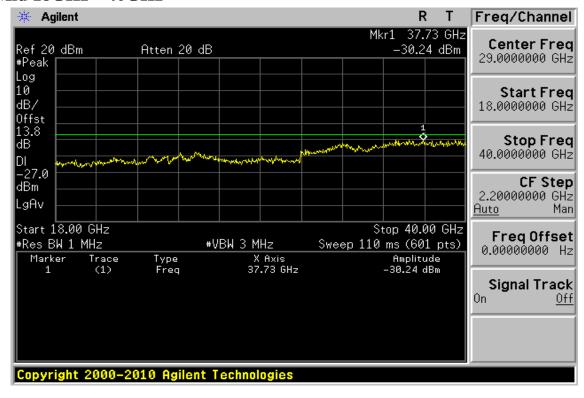
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Page 155 of 463

### Ch Mid 6GHz – 18GHz



### Ch Mid 18GHz – 40GHz



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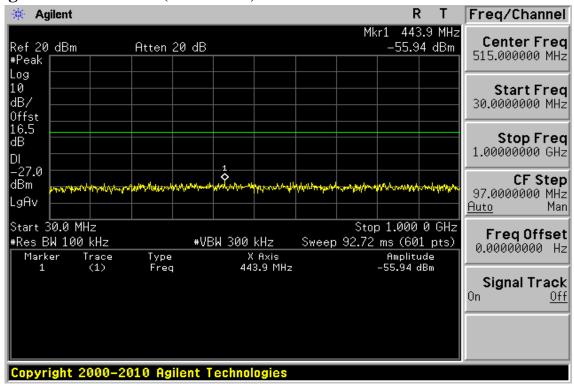
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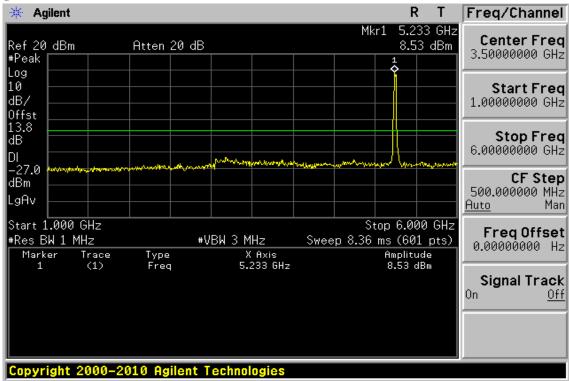
Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 156 of 463

### **Ch High 30MHz – 1GHz (5240 MHz)**



# Ch High 1GHz – 6GHz



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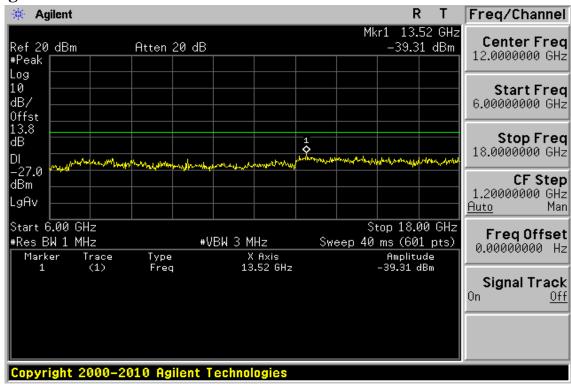
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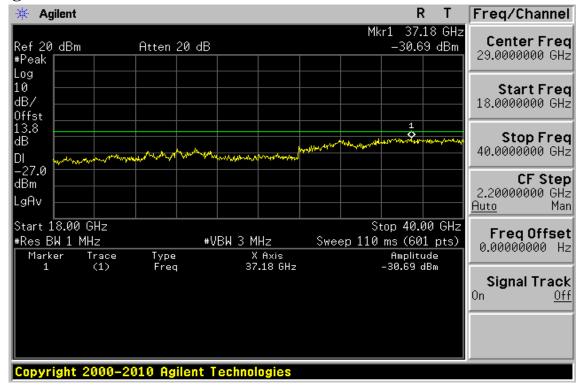
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Page 157 of 463

### Ch High 6GHz – 18GHz



# Ch High 18GHz – 40GHz



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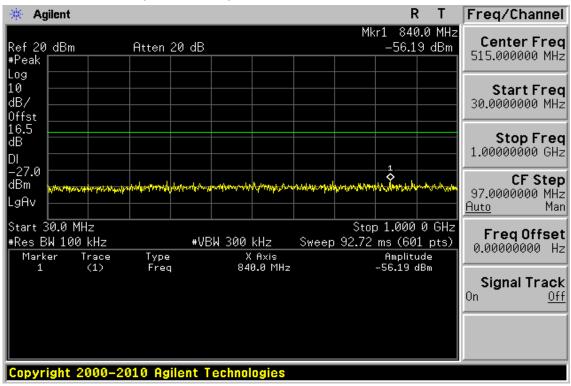
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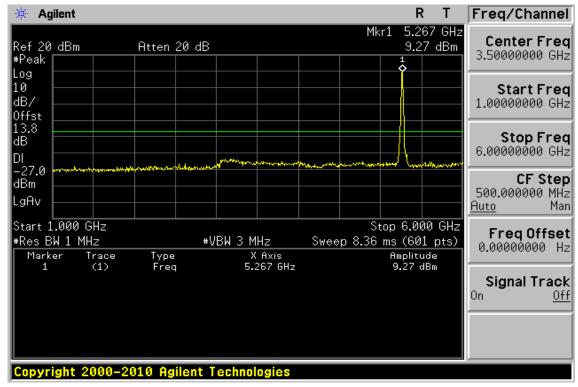
Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 158 of 463

# 802.11a, 5250~5350 MHz **Ch Low 30MHz – 1GHz (5260 MHz)**



# **Ch Low 1GHz – 6GHz (5260 MHz)**



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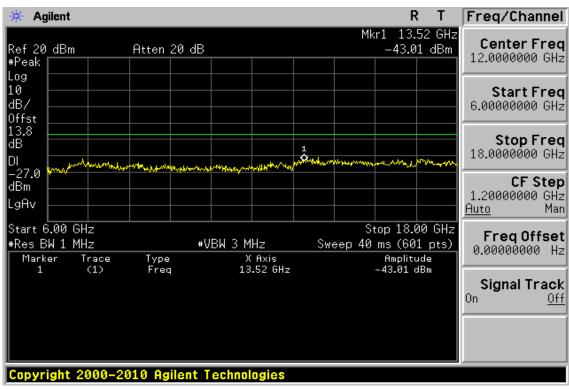
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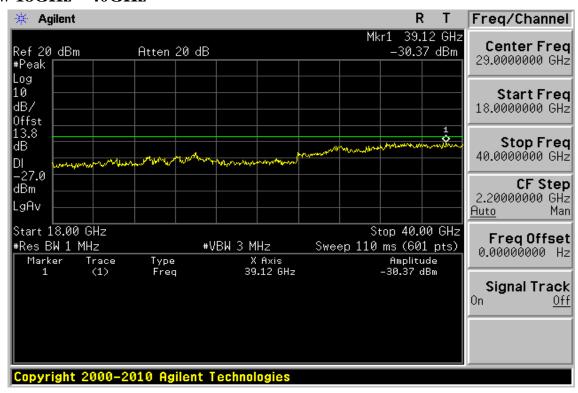
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Page 159 of 463

### Ch Low 6GHz - 18GHz



### Ch Low 18GHz - 40GHz



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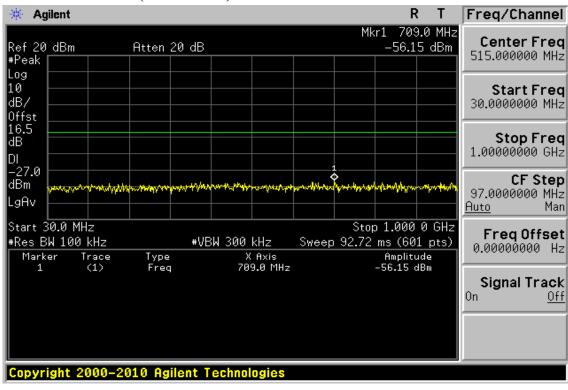
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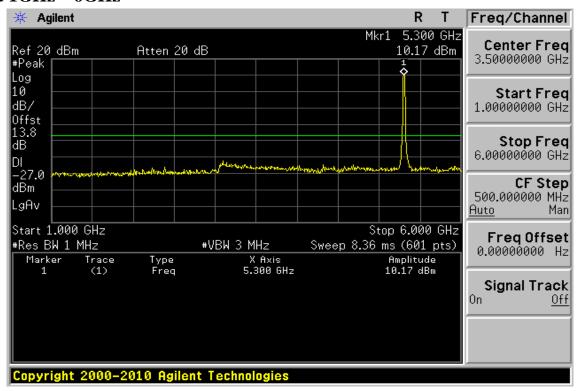
Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 160 of 463

### Ch Mid 30MHz – 1GHz (5300 MHz)



#### Ch Mid 1GHz – 6GHz



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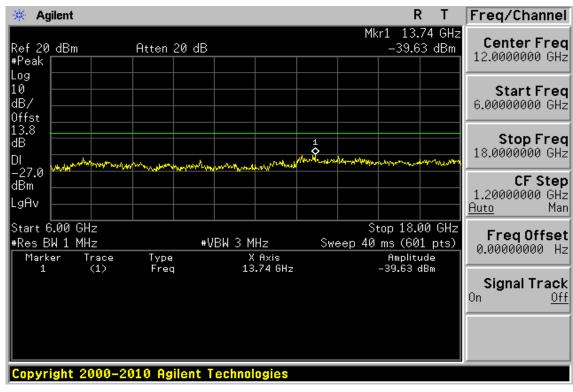
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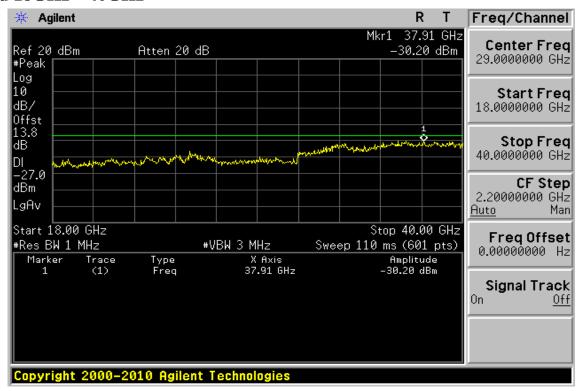
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Page 161 of 463

### Ch Mid 6GHz – 18GHz



### Ch Mid 18GHz – 40GHz



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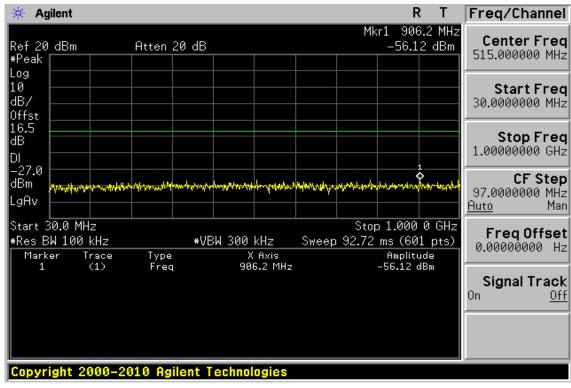
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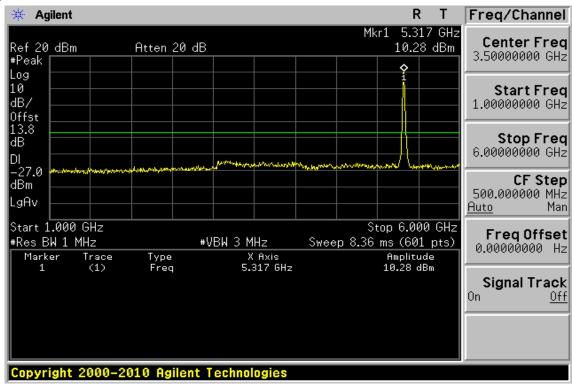
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Page 162 of 463

# **Ch High 30MHz – 1GHz (5320 MHz)**



# Ch High 1GHz – 6GHz



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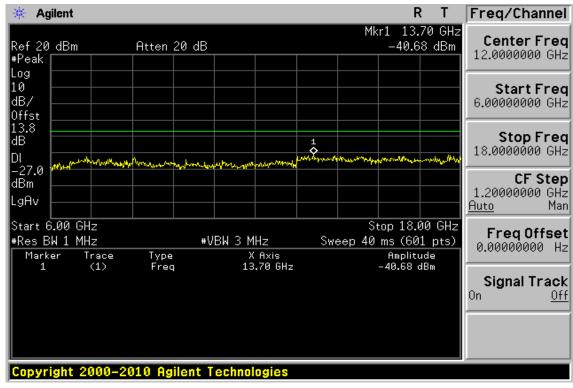
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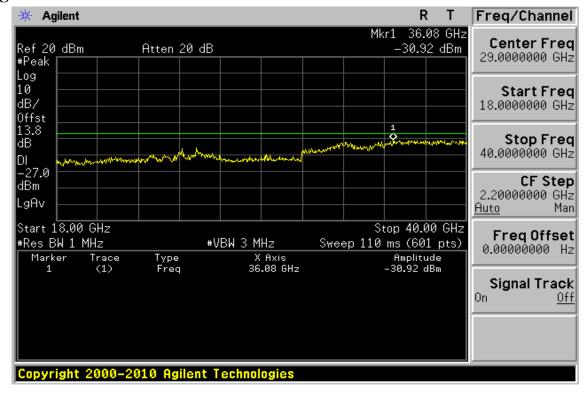
Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 163 of 463

# Ch High 6GHz – 18GHz



## Ch High 18GHz - 40GHz



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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 164 of 463

### Out of Band emission at antenna terminals – 802.11a

Fundamental Frequency 5180 MHz Engineer :Nick

Operation Mode :TX Low

Freq. (MHz)	Note F/H/E/S	Reading dBm	Limit dBm	Safe Margin dB
< 30	S		-27.00	
30-1000	S	<b>-</b> 56.91	-27.00	29.91
10360.00	Н		-27.00	
13720.00	S	<b>-4</b> 0.71	-27.00	13.71
15540.00	H		-27.00	
20720.00	H		-27.00	
25900.00	Н		-27.00	
31080.00	Н		-27.00	
36220.00	S	-30.24	-27.00	3.24

Note: "H": denotes Harmonic Frequency. "S": denotes Spurious Frequency.

"---": denotes Noise Floor. Ref: Reference Signal

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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 165 of 463

Fundamental Frequency Engineer 5220 MHz :Nick Operation Mode :TX Mid

Freq. (MHz)	Note F/H/E/S	Reading dBm	Limit dBm	Safe Margin dB
				_
< 30	S		-27.00	
30-1000	S	-56.62	-27.00	29.62
10440.00	Н		-27.00	
13440.00	S	-40.93	-27.00	13.93
15660.00	Н		-27.00	
20880.00	Н		-27.00	
26100.00	Н		-27.00	
31320.00	Н		-27.00	
36540.00	Н		-27.00	
37730.00	S	-30.24	-27.00	3.24

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"---": denotes Noise Floor.

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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 166 of 463

Fundamental Frequency Operation Mode		5240 MHz Engineer :TX High		eer	:Nick
	Freq. (MHz)	Note F/H/E/S	Reading dBm	Limit dBm	Safe Margin dB
	<30	S		-27.00	<del>_</del> -
	30-1000	S	-55.94	-27.00	28.94
	10480.00	Н		-27.00	
	13520.00	S	-39.31	-27.00	12.31
	15720.00	Н		-27.00	
	20960.00	Н		-27.00	<del></del>
	26200.00	Н		-27.00	
	31440.00	Н		-27.00	
	36680.00	Н		-27.00	
	37180.00	S	-30.69	-27.00	3.69

"H": denotes Harmonic Frequency. "S": denotes Spurious Frequency. Note:

"---": denotes Noise Floor.

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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 167 of 463

Fundamental Frequency 5260 MHz Engineer :Nick Operation Mode :TX Low

Freq. (MHz)	Note F/H/E/S	Reading dBm	Limit dBm	Safe Margin dB
< 30	S		-27.00	
30-1000	S	-56.19	-27.00	29.19
10520.00	H		-27.00	
13520.00	Н	-43.01	-27.00	16.01
15780.00	S		-27.00	
21040.00	Н		-27.00	
26300.00	Н		-27.00	
31560.00	H		-27.00	
36820.00	H		-27.00	
39120.00	S	-30.37	-27.00	3.37

Note: "H": denotes Harmonic Frequency. "S": denotes Spurious Frequency.

"---": denotes Noise Floor. Ref: Reference Signal

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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 168 of 463

3.20

Fundamental Frequency Operation Mode		5300 MHz :TX Mid	Engine	eer	:Nick
	Freq. (MHz)	Note F/H/E/S	Reading dBm	Limit dBm	Safe Margin dB
		a		27.00	
	<30	S		-27.00	
	30-1000	S	-56.15	-27.00	29.15
	10600.00	Н		-27.00	
	13740.00	Н	-39.63	-27.00	12.63
	15900.00	Н		-27.00	
	21200.00	Н		-27.00	
	26500.00	Н		-27.00	
	31800.00	Н		-27.00	
	37100.00	Н		-27.00	
	37340.00	Н		-27.00	

-30.2

-27.00

"H": denotes Harmonic Frequency. "S": denotes Spurious Frequency. Note:

S

"---": denotes Noise Floor.

37910.00

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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 169 of 463

Fundamental Frequency Operation Mode		5320 MHz :TX High	$\mathcal{E}$		:Nick
	Freq. (MHz)	Note F/H/E/S	Reading dBm	Limit dBm	Safe Margin dB
	<30	S		-27.00	
	30-1000	S	-56.12	-27.00	29.12
	10640.00	Н		-27.00	
	13700.00	S	-40.68	-27.00	13.68
	15960.00	Н		-27.00	
	21280.00	Н		-27.00	
	26600.00	Н		-27.00	
	31920.00	Н		-27.00	
	36080.00	S	-30.92	-27.00	3.92
	37240.00	Н		-27.00	

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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 170 of 463

# 802.11a 5150~5350 MHz **Band Edges Test Data CH 5150**



# **Band Edges Test Data CH 5350**



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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 171 of 463

### **Tabular Results:**

### 802.11a - Band Edge falling into un-restricted band

Frequency (GHz)	Results (dBm)	Limit (dBm)	Verdict
5.150	-37.50	-27.00	Pass
5.350	-33.85	-27.00	Pass

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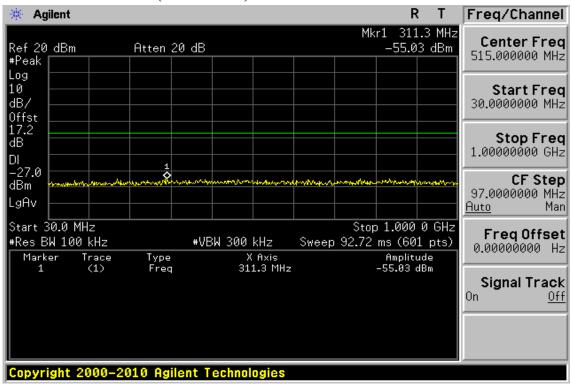
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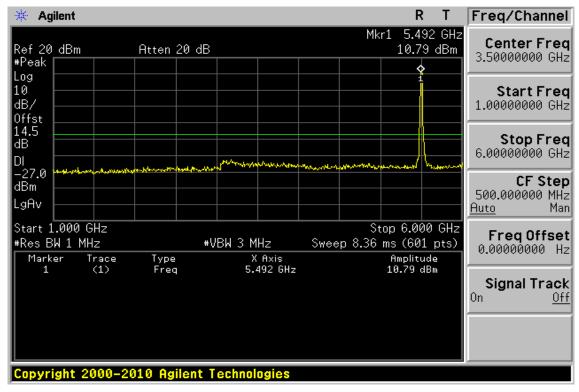
Report No.: EH/2013/70026 Issue Date: Aug. 05, 2013

Page 172 of 463

# 802.11a, 5470~5725 MHz **Ch Low 30MHz – 1GHz (5500 MHz)**



### Ch Low 1GHz - 6GHz



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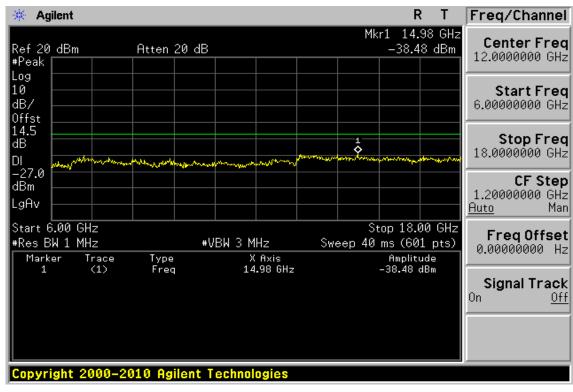
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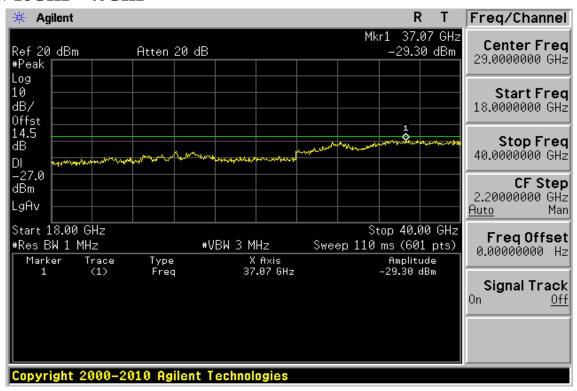
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Page 173 of 463

### Ch Low 6GHz - 18GHz



### Ch Low 18GHz - 40GHz



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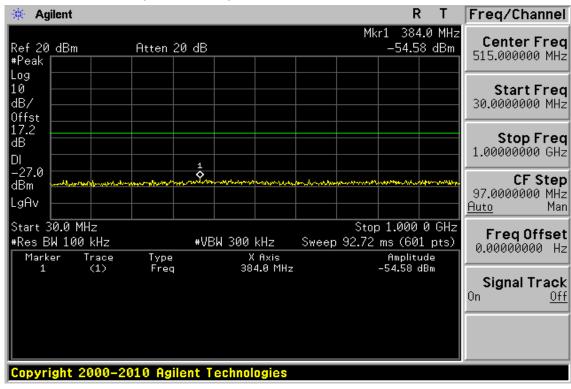
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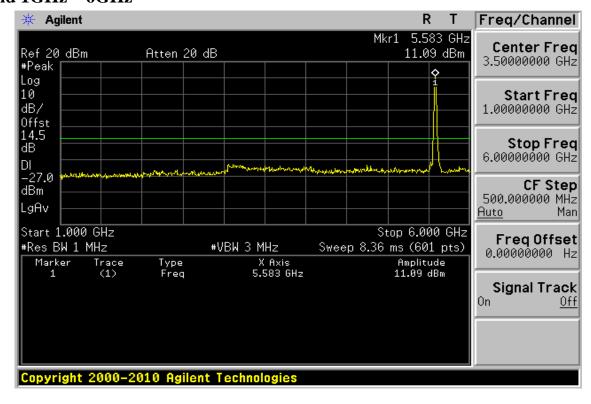
Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 174 of 463

# **Ch Mid 30MHz – 1GHz (5580 MHz)**



#### Ch Mid 1GHz – 6GHz



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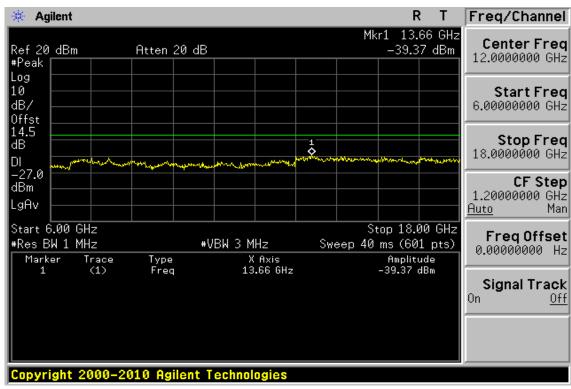
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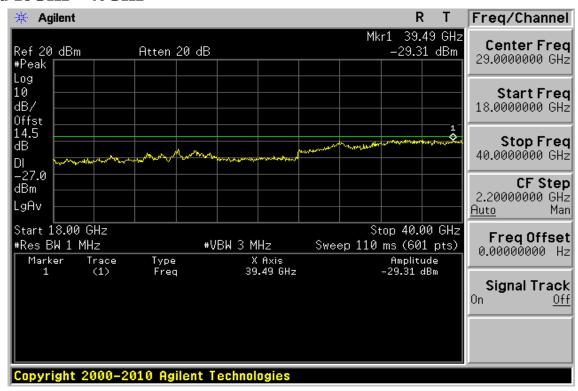
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Page 175 of 463

### Ch Mid 6GHz – 18GHz



### Ch Mid 18GHz – 40GHz



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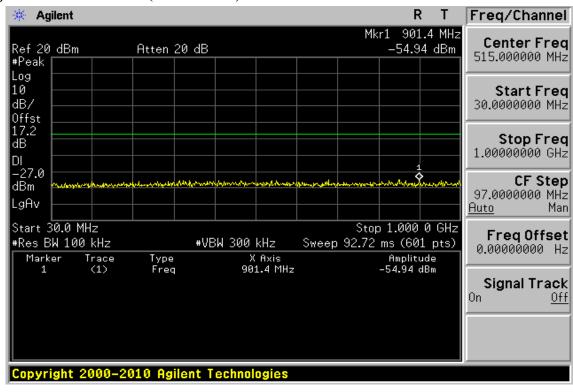
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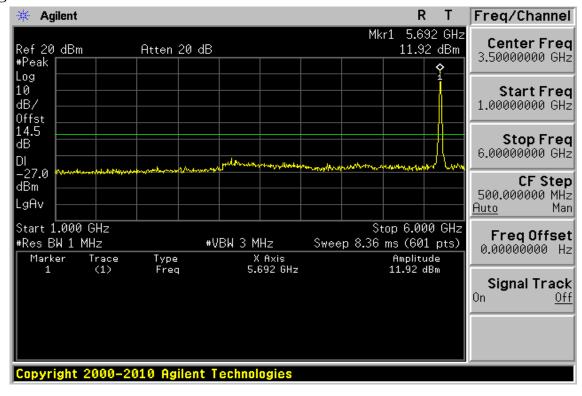
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Page 176 of 463

### **Ch High 30MHz – 1GHz (5700 MHz)**



### Ch High 1GHz – 6GHz



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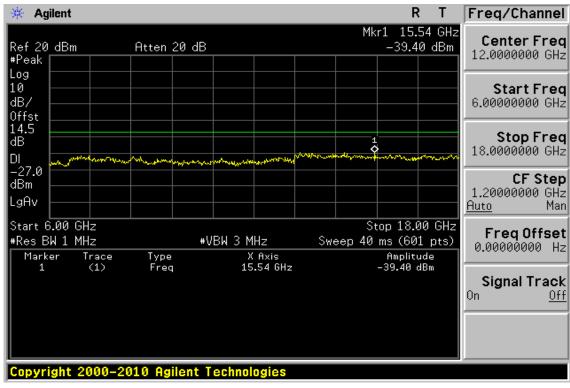
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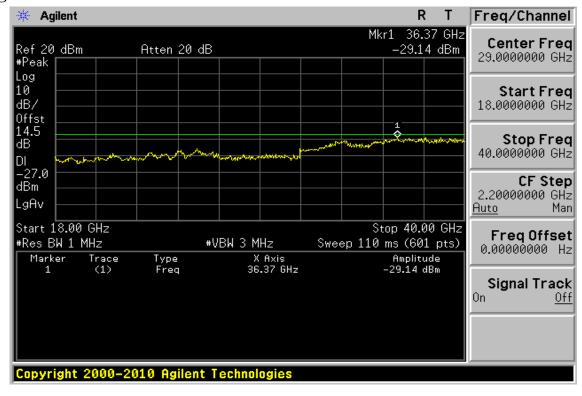
Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 177 of 463

# Ch High 6GHz – 18GHz



## Ch High 18GHz - 40GHz



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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 178 of 463

## Out of Band emission at antenna terminals - 802.11a

Fundamental Frequency 5500 MHz Engineer :Nick

Operation Mode :TX Low

Freq. (MHz)	Note F/H/E/S	Reading dBm	Limit dBm	Safe Margin dB
< 30	S		-27.00	
30-1000	S	-55.03	-27.00	28.03
11000.00	Н		-27.00	
14980.00	S	-38.48	-27.00	11.48
16500.00	H		-27.00	
22000.00	H		-27.00	
27500.00	Н		-27.00	
33000.00	Н		-27.00	
37070.00	S	-29.3	-27.00	2.30
38500.00	H		-27.00	

"H": denotes Harmonic Frequency. "S": denotes Spurious Frequency. Note:

"---": denotes Noise Floor. Ref: Reference Signal

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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 179 of 463

Fundamental Frequency Engineer 5580 MHz :Nick Operation Mode :TX Mid

Note F/H/E/S	Reading dBm	Limit dBm	Safe Margin dB
			_
S		-27.00	
S	-54.58	-27.00	27.58
Н		-27.00	
S	-39.37	-27.00	12.37
Н		-27.00	
Н	-29.31	-27.00	2.31
Н		-27.00	
	F/H/E/S  S S H H H H	S S -54.58 H S -39.37 H H H H H H H	F/H/E/S     dBm     dBm       S      -27.00       S     -54.58     -27.00       H      -27.00       S     -39.37     -27.00       H      -27.00       H     -29.31     -27.00

"H": denotes Harmonic Frequency. "S": denotes Spurious Frequency. Note:

"---": denotes Noise Floor.

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Fundamen Operation

**FCC ID: PY7PM-0481** IC: 4170B-PM0481

Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 180 of 463

ntal Frequency Mode		5700 MHz :TX High	Engine	Engineer	
	Freq. (MHz)	Note F/H/E/S	Reading dBm	Limit dBm	Safe Margin dB
-					
	<30	S		-27.00	
	30-1000	S	-54.94	-27.00	27.94
	11400.00	Н		-27.00	
	15540.00	S	-39.4	-27.00	12.40
	17100.00	Н		-27.00	
	22800.00	Н		-27.00	
	28500.00	Н		-27.00	
	34200.00	Н		-27.00	
	36370.00	S	-29.14	-27.00	2.14
	39900.00	Н		-27.00	
	2222000				

"H": denotes Harmonic Frequency. "S": denotes Spurious Frequency. Note:

"---": denotes Noise Floor.

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Page 181 of 463

## 802.11a 5470~5725 MHz Band Edges Test Data CH 5500



# 802.11a 5470~5725 MHz Band Edges Test Data CH 5700



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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 182 of 463

### 802.11a - Band Edge falling into un-restricted band

Frequency (GHz)	Results (dBm)	Limit (dBm)	Verdict
5.470	-34.71	-27.00	Pass
5.725	-31.95	-27.00	Pass

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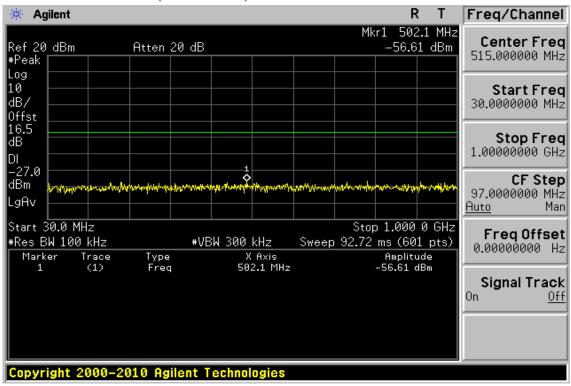
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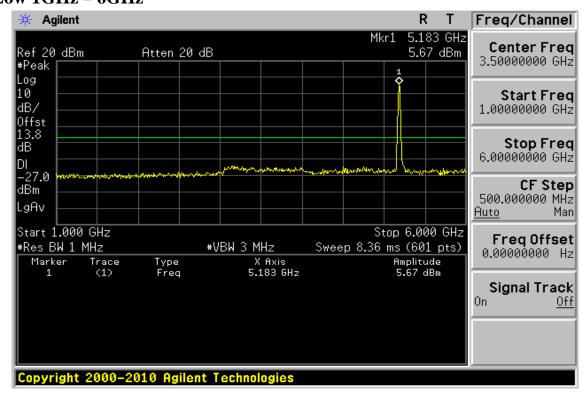
Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 183 of 463

# 802.11n HT20, 5150~5250 MHz **Ch Low 30MHz – 1GHz (5180 MHz)**



### Ch Low 1GHz - 6GHz



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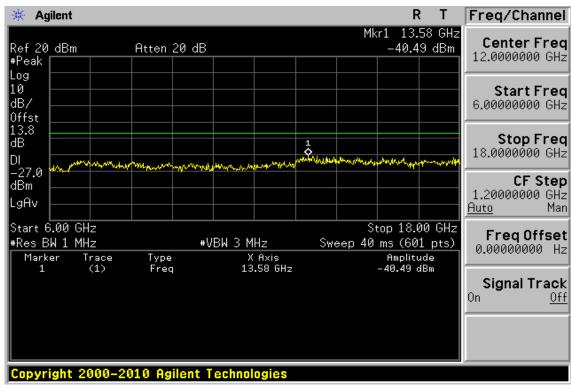
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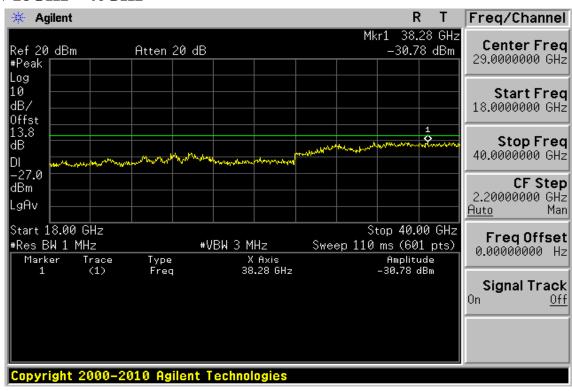
Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 184 of 463

### Ch Low 6GHz - 18GHz



### Ch Low 18GHz - 40GHz



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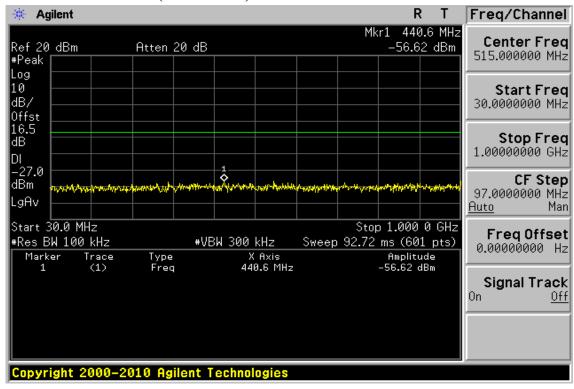
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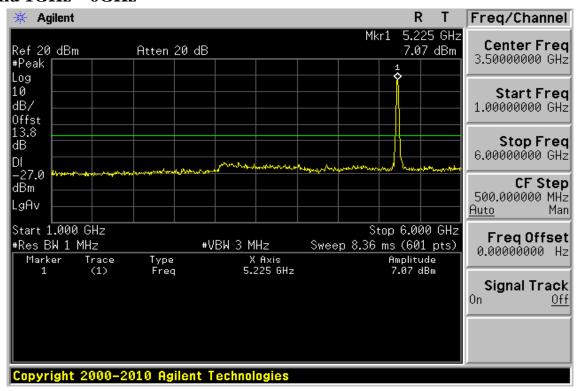
Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 185 of 463

## **Ch Mid 30MHz – 1GHz (5220 MHz)**



### Ch Mid 1GHz - 6GHz



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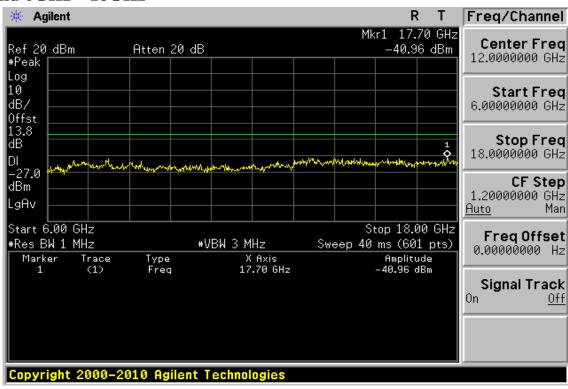
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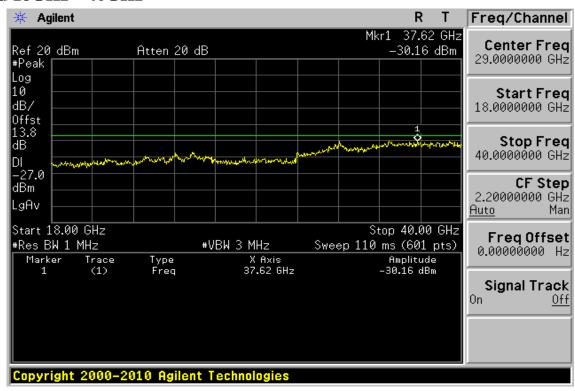
Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 186 of 463

### Ch Mid 6GHz – 18GHz



### Ch Mid 18GHz – 40GHz



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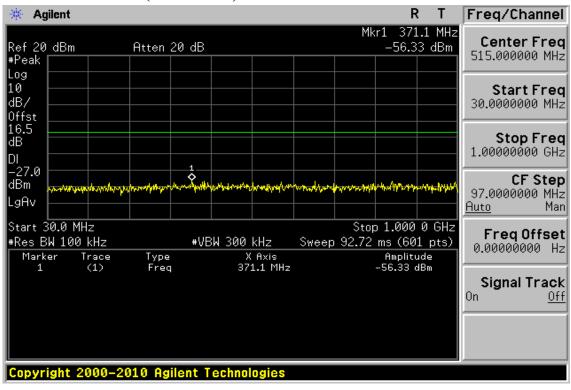
f (886-2) 2298-0488



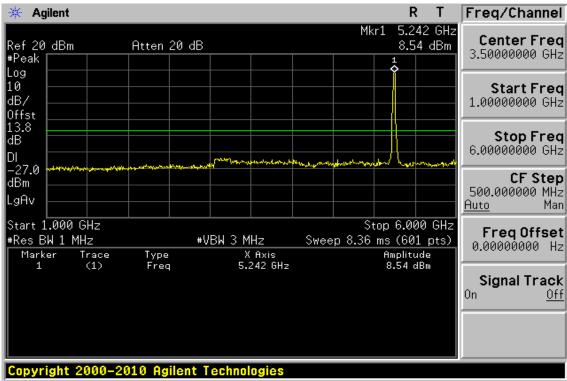
Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 187 of 463

# **Ch High 30MHz – 1GHz (5240 MHz)**



# Ch High 1GHz – 6GHz



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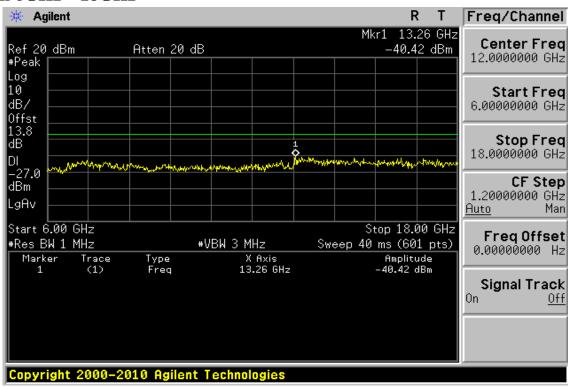
f (886-2) 2298-0488



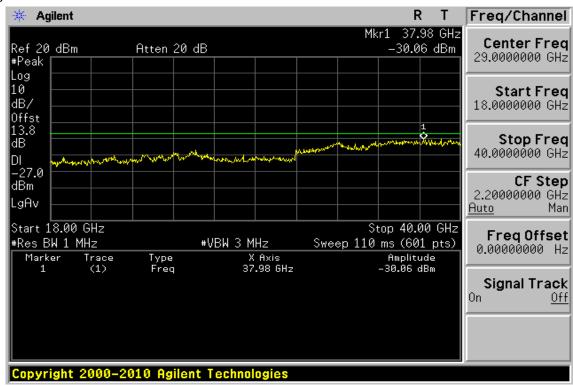
Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 188 of 463

## Ch High 6GHz – 18GHz



## Ch High 18GHz - 40GHz



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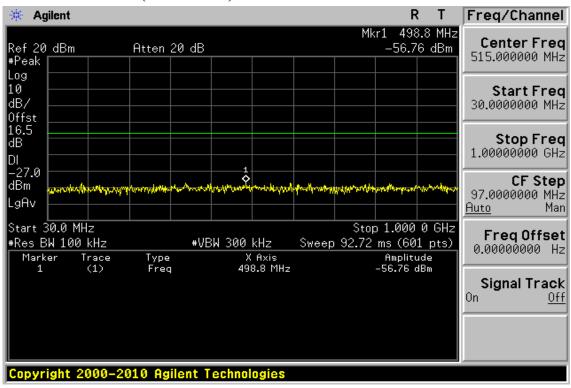
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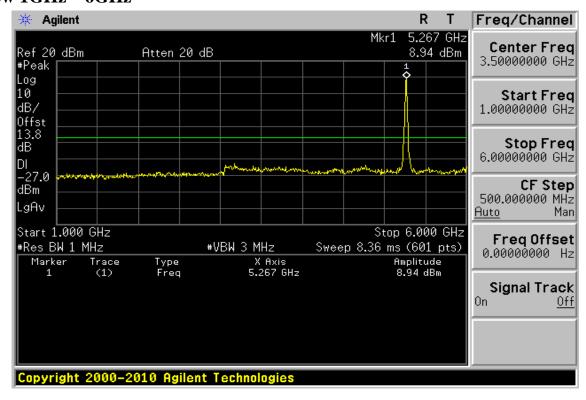
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Page 189 of 463

# 802.11n HT20, 5250~5350 MHz Ch Low 30MHz – 1GHz (5260 MHz)



#### Ch Low 1GHz - 6GHz



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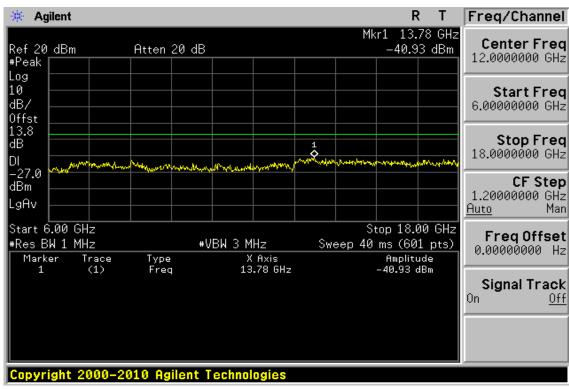
f (886-2) 2298-0488



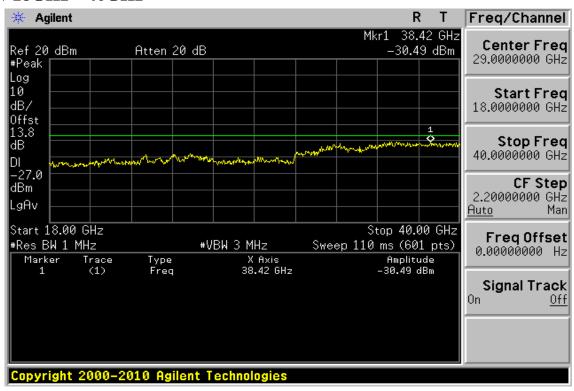
Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 190 of 463

### Ch Low 6GHz - 18GHz



### Ch Low 18GHz - 40GHz



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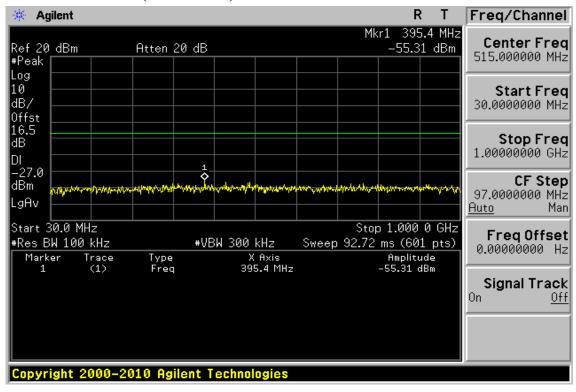
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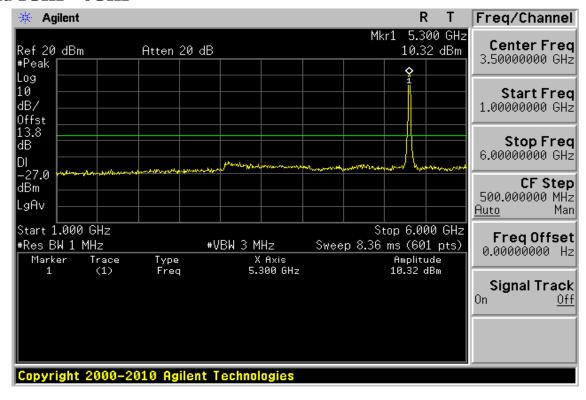
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Page 191 of 463

## **Ch Mid 30MHz – 1GHz (5300 MHz)**



### Ch Mid 1GHz - 6GHz



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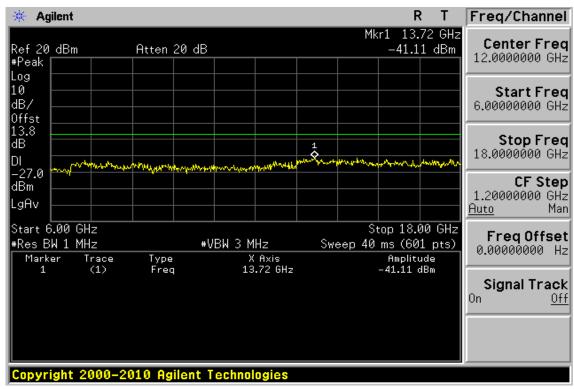
f (886-2) 2298-0488



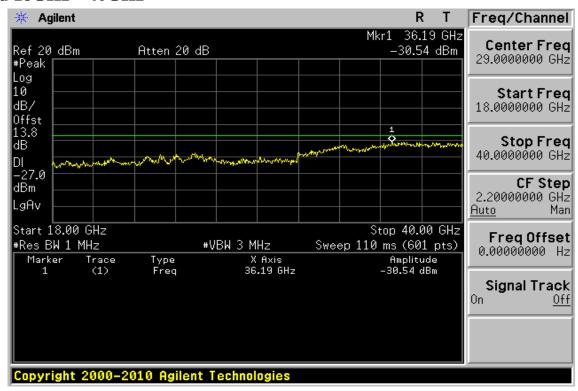
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Page 192 of 463

#### Ch Mid 6GHz – 18GHz



### Ch Mid 18GHz – 40GHz



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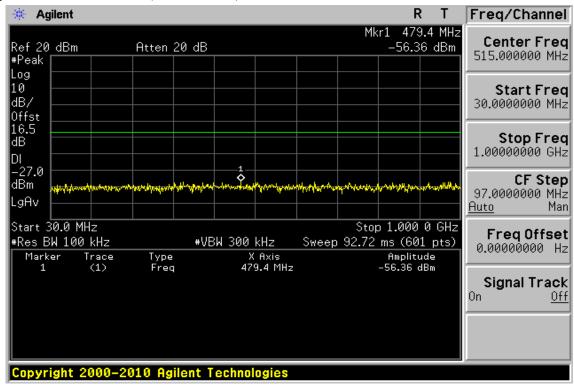
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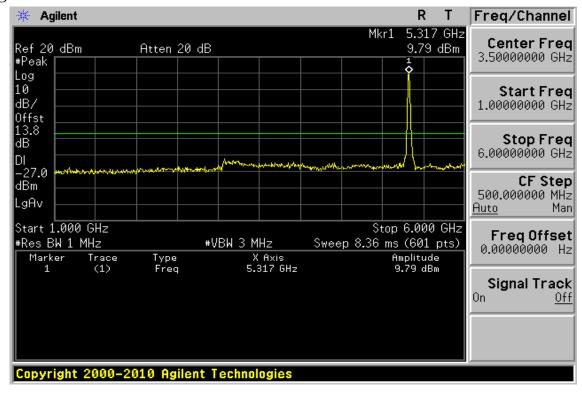
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Page 193 of 463

## **Ch High 30MHz – 1GHz (5320 MHz)**



## Ch High 1GHz – 6GHz



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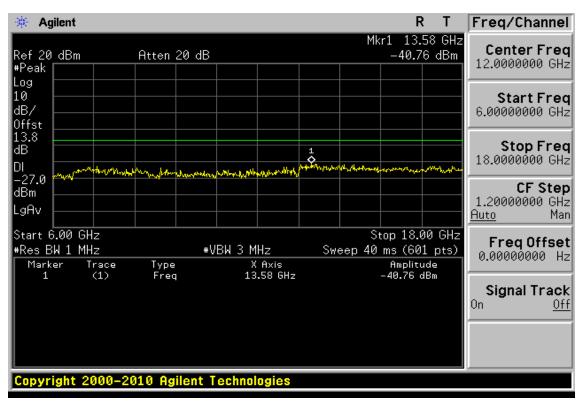
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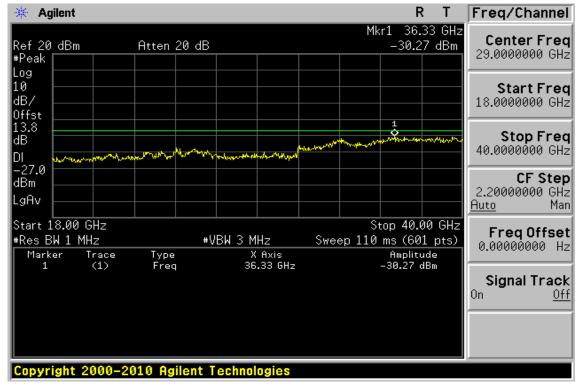
Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 194 of 463

# Ch High 6GHz – 18GHz



# Ch High 18GHz – 40GHz



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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 195 of 463

### Out of Band emission at antenna terminals - 802.11n HT20

Fundamental Frequency 5180 MHz Engineer :Nick

Operation Mode :TX Low

Freq. (MHz)	Note F/H/E/S	Reading dBm	Limit dBm	Safe Margin dB
< 30	S		-27.00	
30-1000	S	-56.61	-27.00	29.61
10360.00	Н		-27.00	
13580.00	Н	-40.49	-27.00	13.49
15540.00	Н		-27.00	
20720.00	Н		-27.00	
25900.00	Н		-27.00	
31080.00	Н		-27.00	
36220.00	Н		-27.00	
38280.00	S	-30.78	-27.00	3.78

"H": denotes Harmonic Frequency. "S": denotes Spurious Frequency. Note:

"---": denotes Noise Floor. Ref: Reference Signal

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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 196 of 463

Fundamental Frequency Engineer 5220 MHz :Nick Operation Mode :TX Mid

Freq. (MHz)	Note F/H/E/S	Reading dBm	Limit dBm	Safe Margin dB
<30	S		-27.00	
30-1000	S	-56.62	-27.00	29.62
10440.00	Н		-27.00	
15660.00	Н		-27.00	
17700.00	Н	-40.96	-27.00	13.96
20880.00	Н		-27.00	
26100.00	Н		-27.00	
31320.00	Н		-27.00	
36540.00	Н		-27.00	
37620.00	S	-30.16	-27.00	3.16

"H": denotes Harmonic Frequency. "S": denotes Spurious Frequency. Note:

"---": denotes Noise Floor.

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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 197 of 463

Fundamental Frequency Operation Mode	5240 MHz :TX High	Engin	eer	:Nick
Freq. (MHz)	Note F/H/E/S	Reading dBm	Limit dBm	Safe Margin dB
<30	S		-27.00	
30-1000	S	-56.33	-27.00	29.33
10480.00	Н		-27.00	
13260.00	S	-40.42	-27.00	13.42
15720.00	Н		-27.00	
20960.00	Н		-27.00	
26200.00	Н		-27.00	
31440.00	Н		-27.00	
36680.00	Н		-27.00	
37980.00	S	-30.06	-27.00	3.06

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"---": denotes Noise Floor.

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Report No.: EH/2013/70026 Issue Date: Aug. 05, 2013

Page 198 of 463

Fundamental Frequency 5260 MHz Engineer :Nick Operation Mode :TX Low

Freq. (MHz)	Note F/H/E/S	Reading dBm	Limit dBm	Safe Margin dB
< 30	S	<del></del>	-27.00	
30-1000	S	-56.76	-27.00	29.76
10520.00	Н		-27.00	
13780.00	Н	-40.93	-27.00	13.93
15780.00	Н		-27.00	
21040.00	Н		-27.00	
26300.00	Н	<del></del>	-27.00	
31560.00	Н		-27.00	
36820.00	Н		-27.00	
38420.00	S	-30.49	-27.00	3.49

Note: "H": denotes Harmonic Frequency. "S": denotes Spurious Frequency.

"---": denotes Noise Floor. Ref: Reference Signal

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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 199 of 463

Fundamenta Operation N	al Frequency Mode	5300 MHz :TX Mid	Engine	eer	:Nick
	Freq. (MHz)	Note F/H/E/S	Reading dBm	Limit dBm	Safe Margin dB
		G		27.00	
	<30	S		-27.00	
	30-1000	S	-55.31	-27.00	28.31
	10600.00	Н		-27.00	
	13720.00	Н	<b>-4</b> 1.11	-27.00	14.11
	15900.00	Н		-27.00	
	21200.00	Н		-27.00	
	26500.00	Н		-27.00	
	31800.00	Н		-27.00	
	37100.00	Н		-27.00	
	36190.00	S	-30.54	-27.00	3.54
	21200.00 26500.00 31800.00 37100.00	Н Н Н Н	 	-27.00 -27.00 -27.00 -27.00	   3.54

"H": denotes Harmonic Frequency. "S": denotes Spurious Frequency. Note:

Η

"---": denotes Noise Floor.

37340.00

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-27.00



Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 200 of 463

Fundamenta Operation N	al Frequency Mode	5320 MHz :TX High	Engine	eer	:Nick
	Freq. (MHz)	Note F/H/E/S	Reading dBm	Limit dBm	Safe Margin dB
	-0	C		27.00	
	<30	S		-27.00	
	30-1000	S	-56.36	-27.00	29.36
	10640.00	Н		-27.00	
	13580.00	S	-40.76	-27.00	13.76
	15960.00	Н		-27.00	
	21280.00	Н		-27.00	
	26600.00	Н		-27.00	
	31920.00	Н		-27.00	
	36330.00	S	-30.27	-27.00	3.27
	37240.00	Н		-27.00	

"H": denotes Harmonic Frequency. "S": denotes Spurious Frequency. Note:

"---": denotes Noise Floor.

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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 201 of 463

# 802.11n HT20 5150~5350 MHz **Band Edges Test Data CH 5150**



# **Band Edges Test Data CH 5350**



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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 202 of 463

### 802.11n\_HT20 - Band Edge falling into un-restricted band

Frequency (GHz)	Results (dBm)	Limit (dBm)	Verdict
5.150	-37.17	-27.00	Pass
5.350	-36.08	-27.00	Pass

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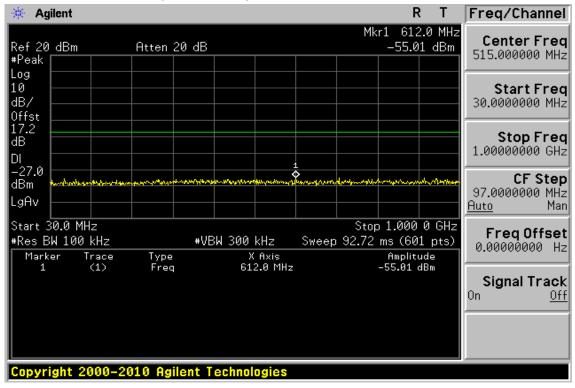
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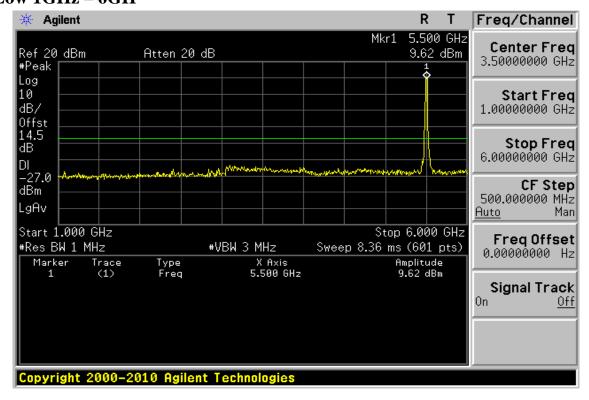
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Page 203 of 463

# 802.11n HT20, 5470~5725 MHz **Ch Low 30MHz – 1GHz (5500 MHz)**



### Ch Low 1GHz - 6GH



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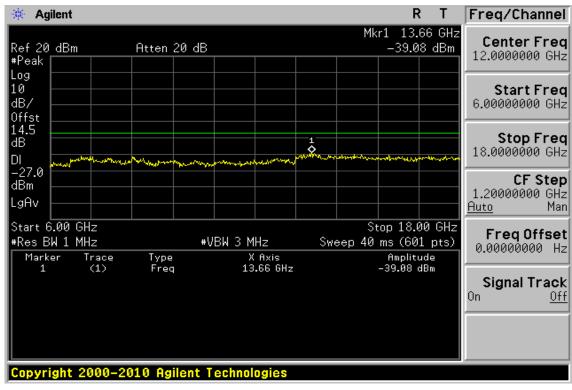
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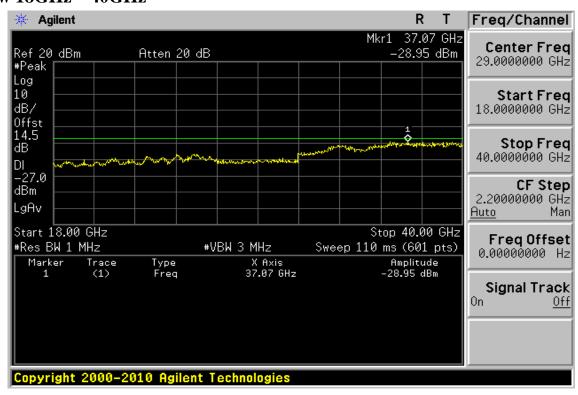
Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 204 of 463

### Ch Low 6GHz - 18GHz



### Ch Low 18GHz - 40GHz



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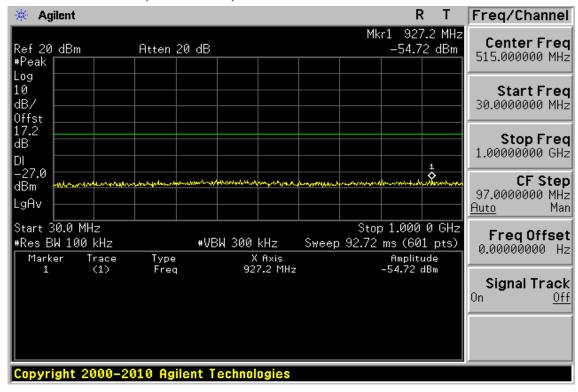
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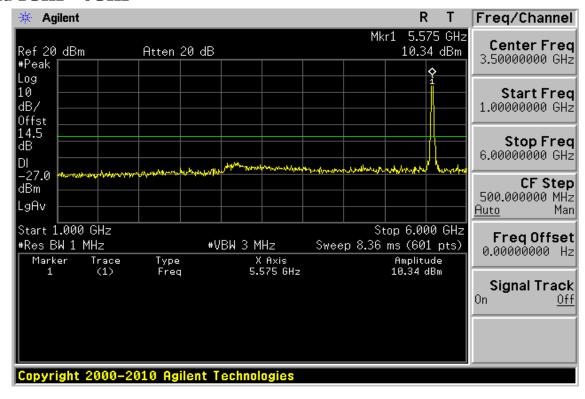
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Page 205 of 463

## **Ch Mid 30MHz – 1GHz (5580 MHz)**



#### Ch Mid 1GHz – 6GHz



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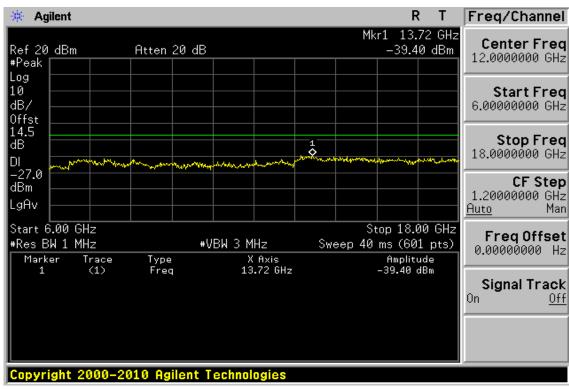
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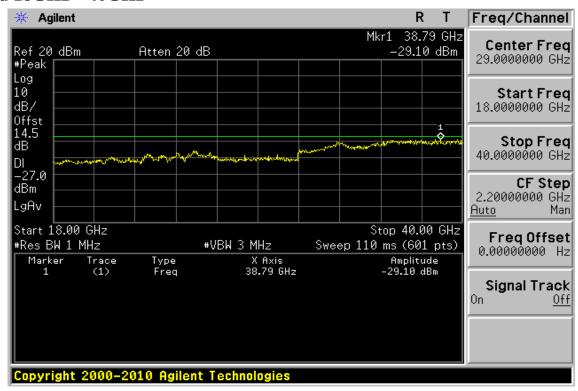
Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 206 of 463

### Ch Mid 6GHz – 18GHz



### Ch Mid 18GHz – 40GHz



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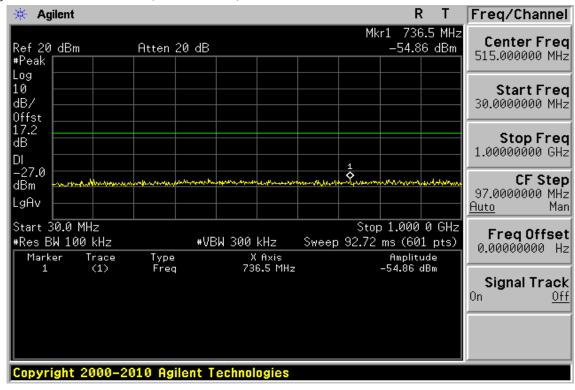
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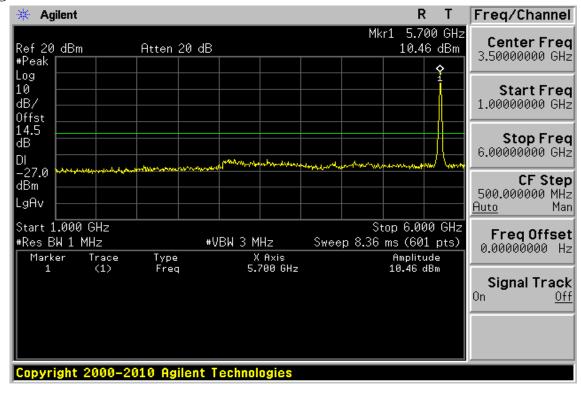
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Page 207 of 463

# **Ch High 30MHz – 1GHz (5700 MHz)**



# Ch High 1GHz – 6GHz



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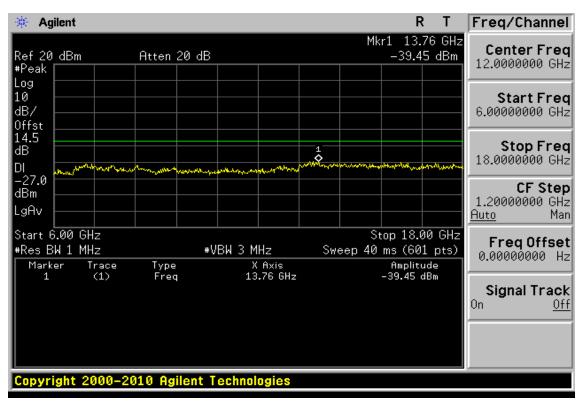
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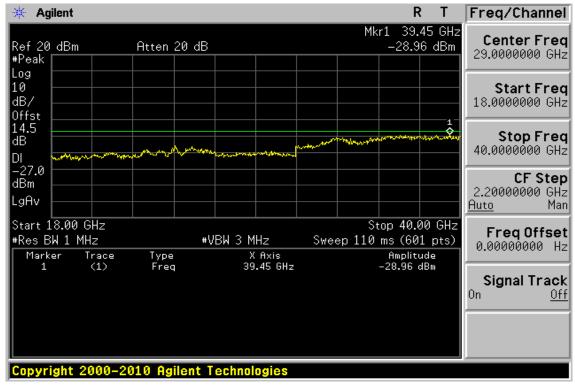
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Page 208 of 463

# Ch High 6GHz – 18GHz



# Ch High 18GHz – 40GHz



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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 209 of 463

### Out of Band emission at antenna terminals - 802.11n HT20

Fundamental Frequency 5500 MHz Engineer :Nick

Operation Mode :TX Low

Freq. (MHz)	Note F/H/E/S	Reading dBm	Limit dBm	Safe Margin dB
< 30	S		-27.00	
30-1000	S	-55.01	-27.00	28.01
11000.00	Н		-27.00	_
13660.00	S	-39.08	-27.00	12.08
16500.00	H		-27.00	
22000.00	Н		-27.00	
27500.00	Н		-27.00	
33000.00	Н		-27.00	
37070.00	S	-28.95	-27.00	1.95
38500.00	Н		-27.00	

"H": denotes Harmonic Frequency. "S": denotes Spurious Frequency. Note:

"---": denotes Noise Floor. Ref: Reference Signal

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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 210 of 463

Fundamental Frequency Engineer 5580 MHz :Nick Operation Mode :TX Mid

Freq. (MHz)	Note F/H/E/S	Reading dBm	Limit dBm	Safe Margin dB
< 30	S		-27.00	
30-1000	S	-54.72	-27.00	27.72
11160.00	Н		-27.00	
13720.00	S	-39.4	-27.00	12.40
16740.00	H		-27.00	
22320.00	H		-27.00	
27900.00	H		-27.00	
33480.00	Н		-27.00	
38790.00	Н	-29.1	-27.00	2.10
39060.00	Н		-27.00	

"H": denotes Harmonic Frequency. "S": denotes Spurious Frequency. Note:

"---": denotes Noise Floor.

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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 211 of 463

Fundamenta Operation M	ll Frequency Mode	5700 MHz :TX High	Engine	eer	:Nick
	Freq. (MHz)	Note F/H/E/S	Reading dBm	Limit dBm	Safe Margin dB
	.20	S		27.00	
	<30 30-1000	S S	 -54.86	-27.00 -27.00	27.86
		Н		-27.00 -27.00	
	11400.00		20.45		10.45
	13760.00	S	-39.45	-27.00	12.45
	17100.00	Н		-27.00	
	22800.00	Н		-27.00	
	28500.00	Н		-27.00	
	34200.00	Н		-27.00	
	39450.00	S	-28.96	-27.00	1.96
	39900.00	Н		-27.00	

"H": denotes Harmonic Frequency. "S": denotes Spurious Frequency. Note:

"---": denotes Noise Floor.

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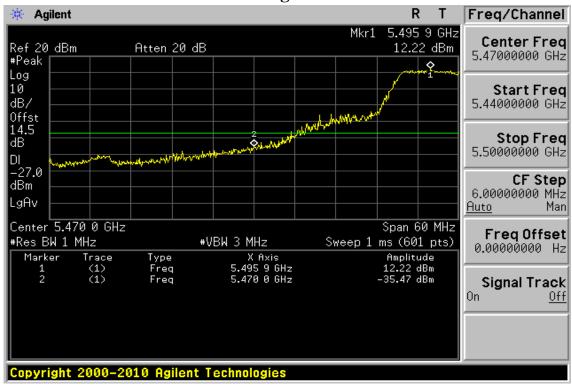
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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 212 of 463

## 802.11n HT20 5470~5725 MHz Band Edges Test Data CH 5500



# 802.11n HT20 5470~5725 MHz Band Edges Test Data CH 5700



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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 213 of 463

### 802.11n\_HT20 - Band Edge falling into un-restricted band

Frequency (GHz)	Results (dBm)	Limit (dBm)	Verdict
5.470	-35.47	-27.00	Pass
5.725	-28.98	-27.00	Pass

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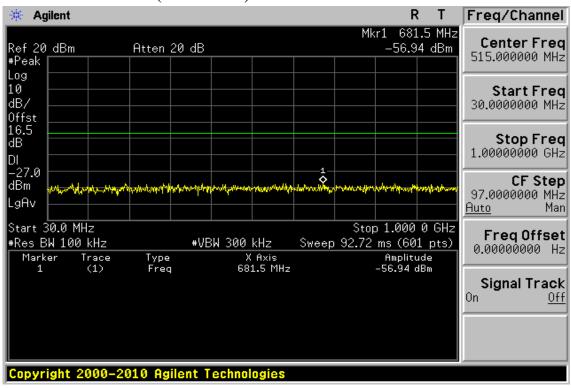
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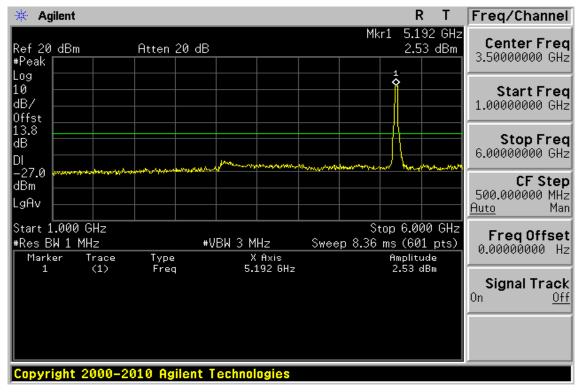
Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 214 of 463

# 802.11n HT40, 5150~5250 MHz **Ch Low 30MHz – 1GHz (5190 MHz)**



### Ch Low 1GHz - 6GHz



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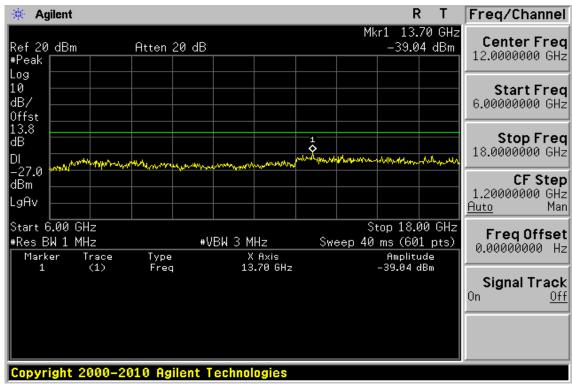
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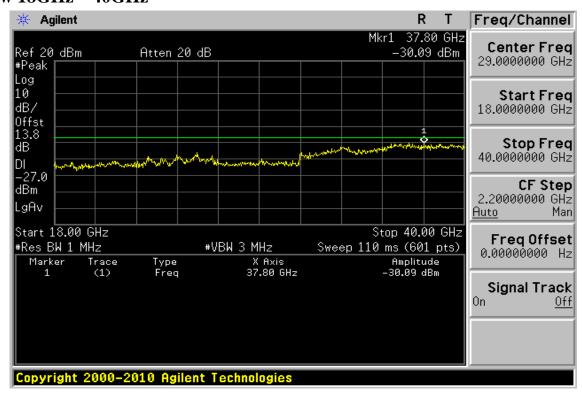
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Page 215 of 463

### Ch Low 6GHz - 18GHz



### Ch Low 18GHz - 40GHz



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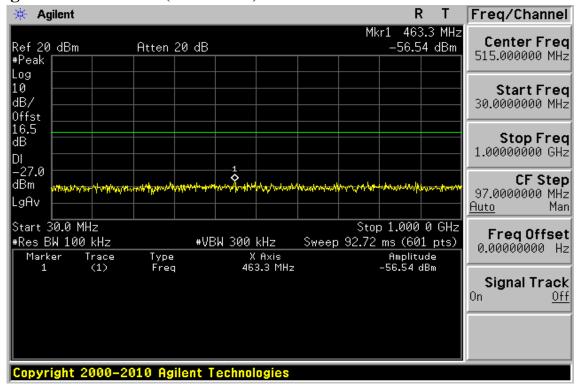
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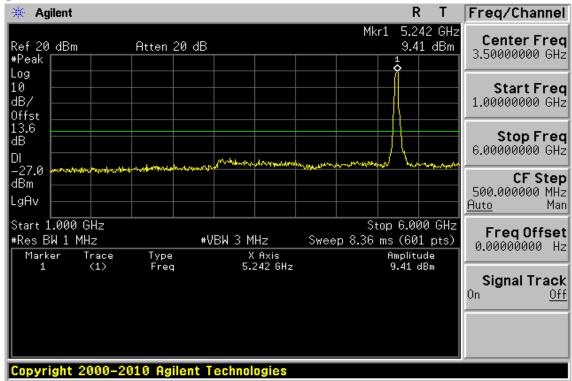
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Page 216 of 463

## **Ch High 30MHz – 1GHz (5230 MHz)**



# Ch High 1GHz – 6GHz



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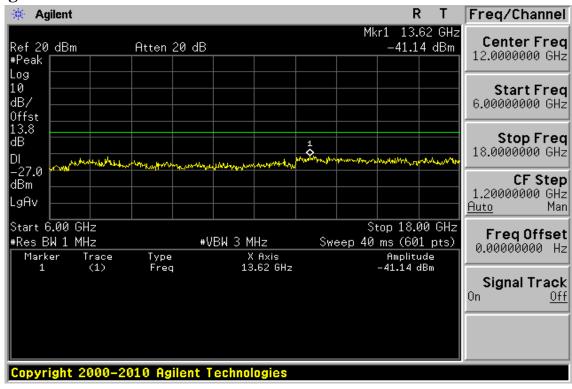
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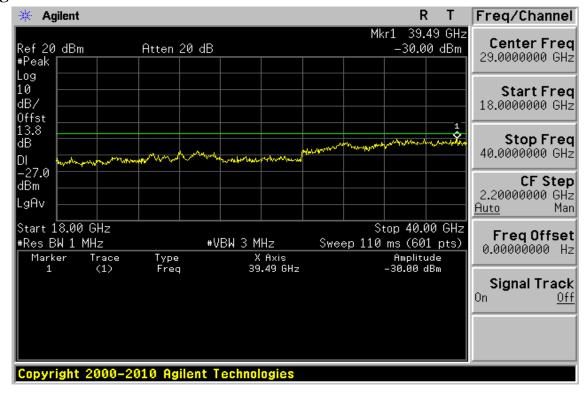
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Page 217 of 463

### Ch High 6GHz – 18GHz



## Ch High 18GHz - 40GHz



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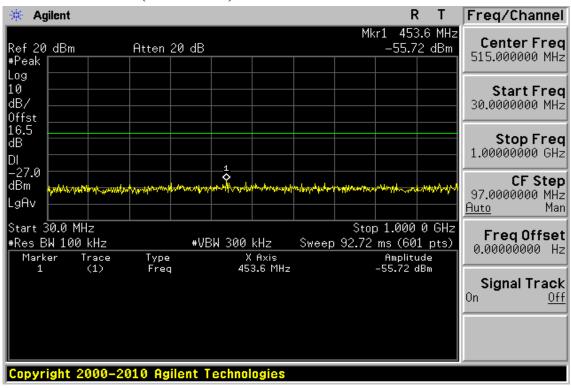
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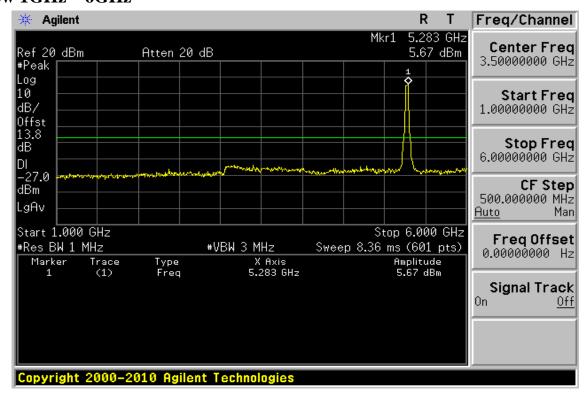
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Page 218 of 463

# 802.11n HT40, 5250~5350 MHz Ch Low 30MHz – 1GHz (5270 MHz)



#### Ch Low 1GHz - 6GHz



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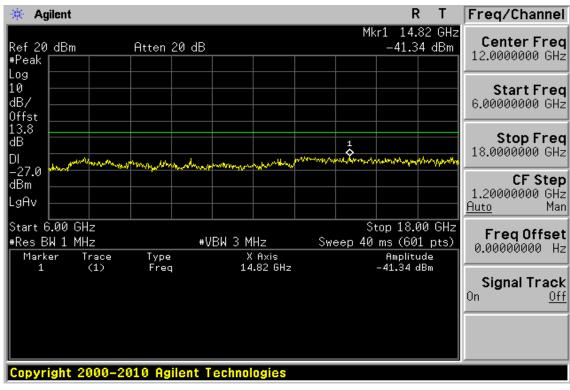
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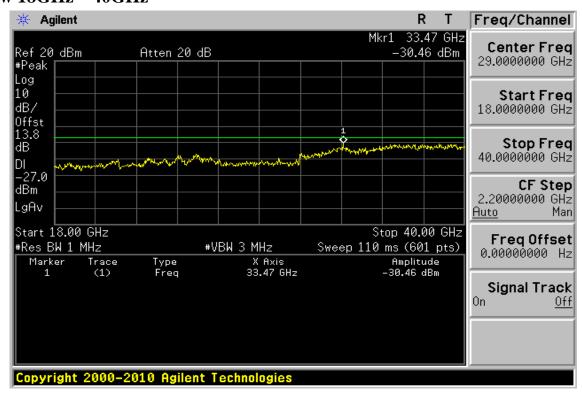
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Page 219 of 463

### Ch Low 6GHz - 18GHz



#### Ch Low 18GHz - 40GHz



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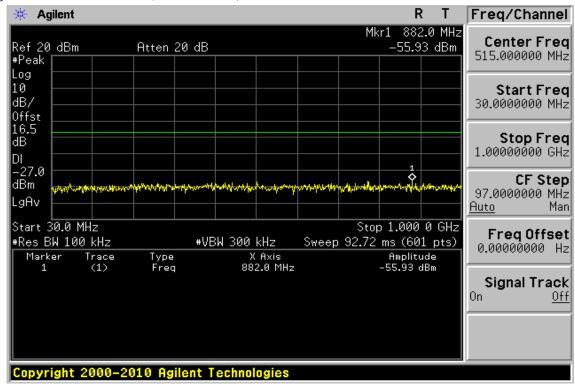
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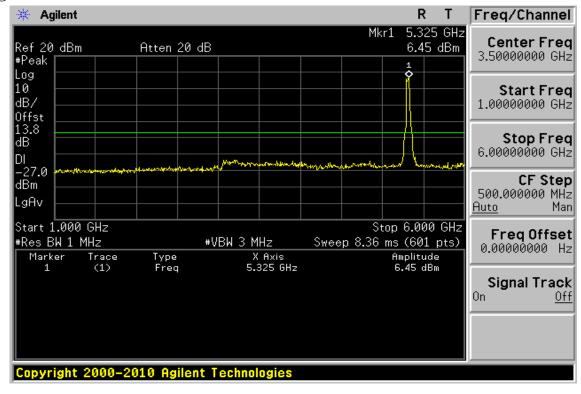
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Page 220 of 463

### **Ch High 30MHz – 1GHz (5310 MHz)**



# Ch High 1GHz – 6GHz



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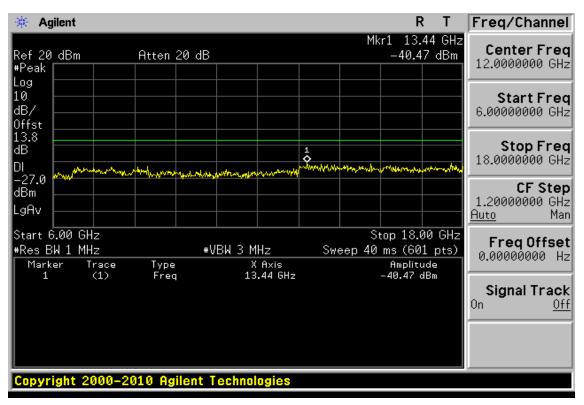
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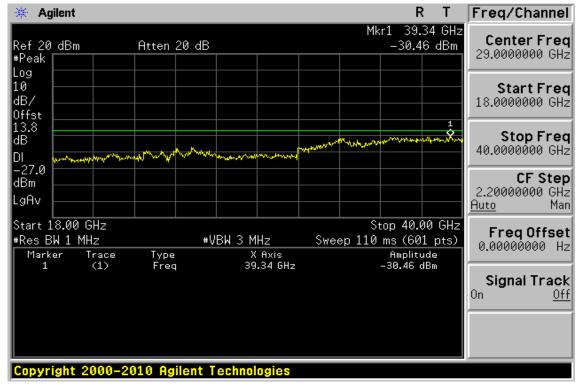
Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 221 of 463

# Ch High 6GHz – 18GHz



# Ch High 18GHz – 40GHz



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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 222 of 463

### Out of Band emission at antenna terminals - 802.11n HT40

Fundamental Frequency 5190 MHz Engineer :Nick

Operation Mode :TX Low

Freq. (MHz)	Note F/H/E/S	Reading dBm	Limit dBm	Safe Margin dB
< 30	S		-27.00	
30-1000	S	-56.94	-27.00	29.94
10380.00	Н		-27.00	
13700.00	S	-39.04	-27.00	12.04
15570.00	Н		-27.00	
20760.00	H		-27.00	
25950.00	Н		-27.00	
31140.00	Н		-27.00	
36300.00	Н	<del></del>	-27.00	
37800.00	S	-30.09	-27.00	3.09

"H": denotes Harmonic Frequency. "S": denotes Spurious Frequency. Note:

"---": denotes Noise Floor. Ref: Reference Signal

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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 223 of 463

Fundamenta Operation N	al Frequency Mode	5230 MHz :TX High	Engine	eer	:Nick
	Freq. (MHz)	Note F/H/E/S	Reading dBm	Limit dBm	Safe Margin dB
	<b>~20</b>	S		-27.00	
	<30 30-1000	S	-56.54	-27.00	29.54
	10460.00	H		-27.00	
	13620.00	S	-41.14	-27.00	14.14
	15690.00	Н		-27.00	
	20920.00	Н		-27.00	
	26150.00	Н		-27.00	
	31380.00	Н		-27.00	
	36610.00	Н		-27.00	
	39490.00	S	-30	-27.00	3.00

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"---": denotes Noise Floor.

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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 224 of 463

Fundamental Frequency Operation Mode		5270 MHz :TX Low	Engineer		:Nick
	Freq. (MHz)	Note F/H/E/S	Reading dBm	Limit dBm	Safe Margin dB
	<30	S		-27.00	
	30-1000	S	-55.72	-27.00	28.72
	10540.00	Н		-27.00	
	14820.00	S	-41.34	-27.00	14.34
	15810.00	Н		-27.00	
	21080.00	Н		-27.00	
	26350.00	Н		-27.00	
	31620.00	Н		-27.00	
	33470.00	S	-30.46	-27.00	3.46
	36890.00	Н		-27.00	

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"---": denotes Noise Floor.

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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 225 of 463

Fundamental Frequency 5310 MHz Engineer :Nick Operation Mode :TX High

Freq. (MHz)	Note F/H/E/S	Reading dBm	Limit dBm	Safe Margin dB
< 30	S		-27.00	
30-1000	S	-55.93	-27.00	28.93
10540.00	Н		-27.00	
13440.00	S	-40.47	-27.00	13.47
15810.00	Н		-27.00	
21080.00	Н		-27.00	
26350.00	H		-27.00	
31620.00	Н		-27.00	
36890.00	Н		-27.00	
39340.00	S	-30.46	-27.00	3.46

Note: "H": denotes Harmonic Frequency. "S": denotes Spurious Frequency.

"---": denotes Noise Floor. Ref: Reference Signal

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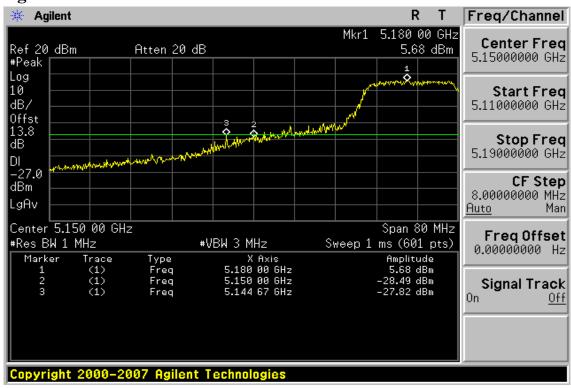
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Report No.: EH/2013/70026 Issue Date: Aug. 05, 2013

Page 226 of 463

# 802.11n HT40 5150~5350 MHz **Band Edges Test Data CH 5150**



# **Band Edges Test Data CH 5350**



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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 227 of 463

### 802.11n\_HT40 - Band Edge falling into un-restricted band

Frequency (GHz)	Results (dBm)	Limit (dBm)	Verdict
5.150	-28.49	-27.00	Pass
5.350	-29.46	-27.00	Pass

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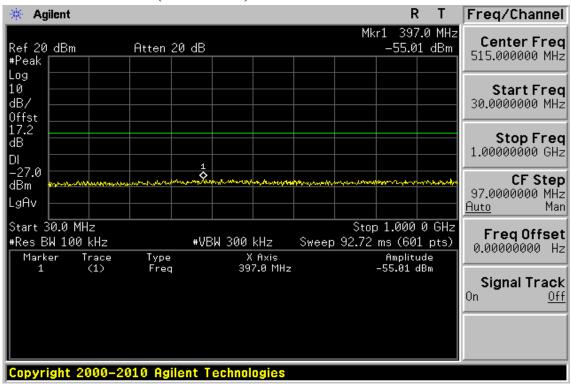
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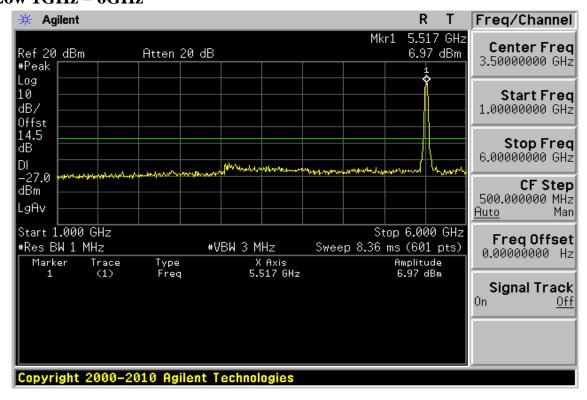
Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 228 of 463

# 802.11n HT40, 5470~5725 MHz **Ch Low 30MHz – 1GHz (5510 MHz)**



#### Ch Low 1GHz - 6GHz



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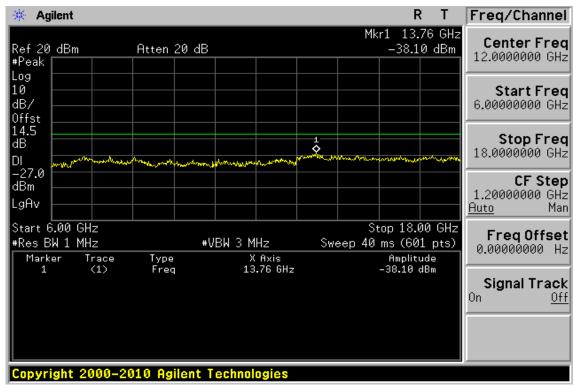
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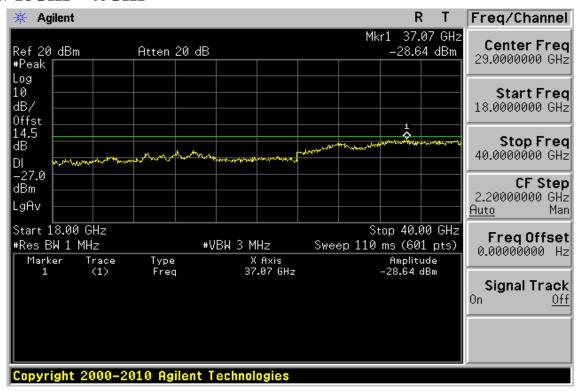
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Page 229 of 463

#### Ch Low 6GHz - 18GHz



#### Ch Low 18GHz - 40GHz



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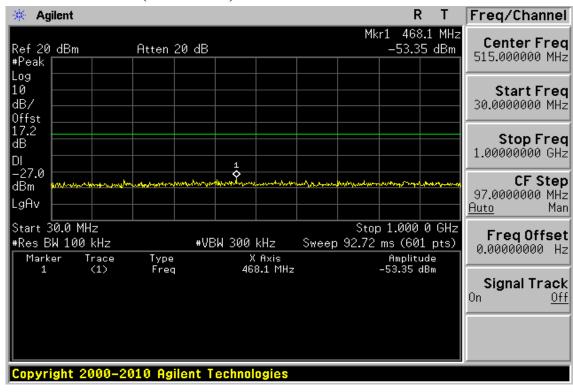
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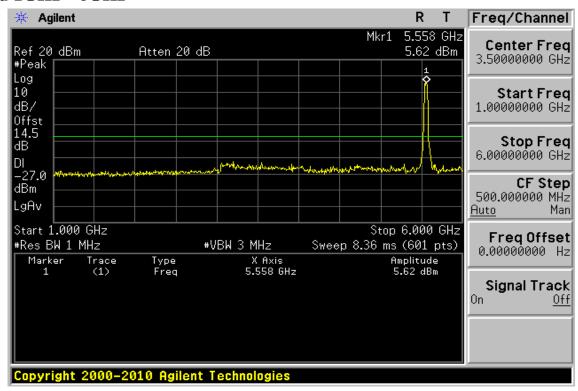
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Page 230 of 463

### **Ch Mid 30MHz – 1GHz (5550 MHz)**



#### Ch Mid 1GHz – 6GHz



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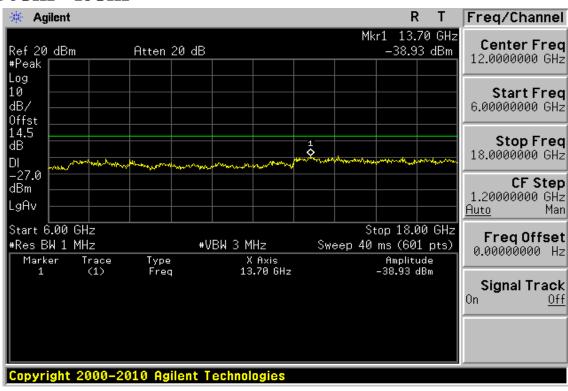
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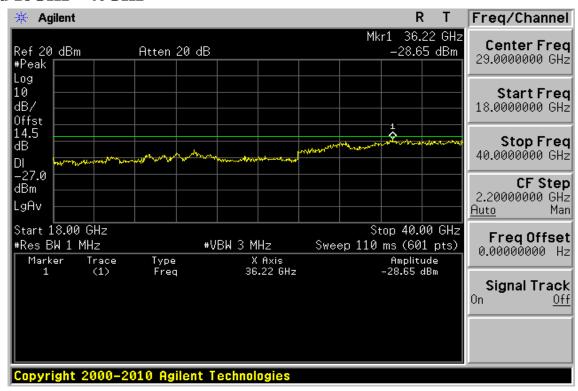
Report No.: EH/2013/70026 Issue Date: Aug. 05, 2013

Page 231 of 463

### Ch Mid 6GHz – 18GHz



#### Ch Mid 18GHz – 40GHz



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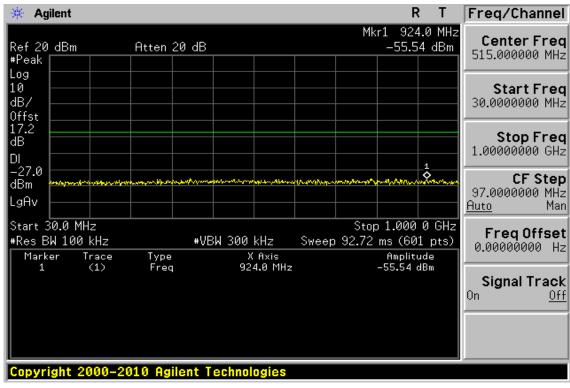
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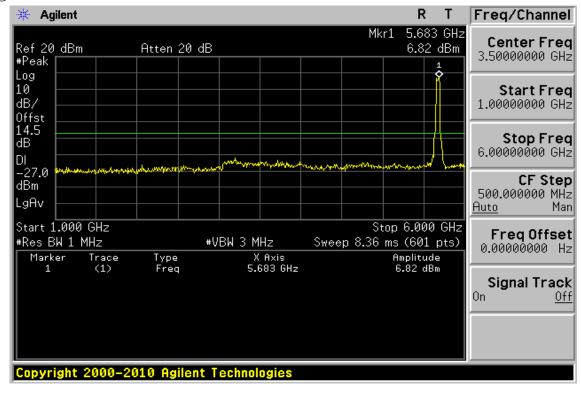
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Page 232 of 463

# **Ch High 30MHz – 1GHz (5670 MHz)**



# Ch High 1GHz – 6GHz



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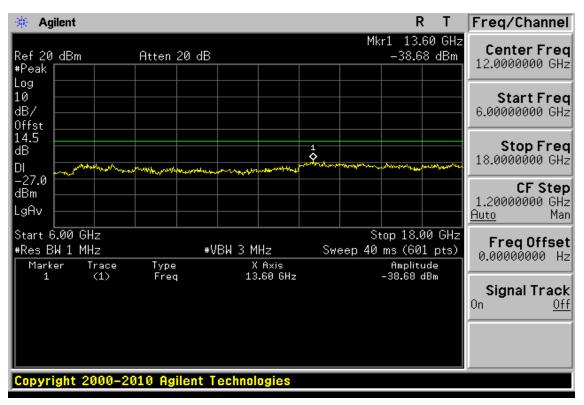
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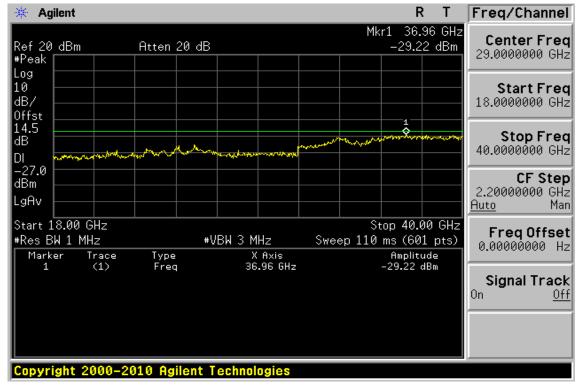
Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 233 of 463

# Ch High 6GHz – 18GHz



# Ch High 18GHz – 40GHz



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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 234 of 463

Fundamental Frequency 5510 MHz Engineer :Nick Operation Mode :TX Low

Freq. (MHz)	Note F/H/E/S	Reading dBm	Limit dBm	Safe Margin dB
< 30	S		-27.00	
30-1000	S	-55.01	-27.00	28.01
11020.00	Н		-27.00	
13760.00	S	-38.1	-27.00	11.10
16530.00	Н		-27.00	
22040.00	Н		-27.00	
27550.00	Н		-27.00	
33060.00	Н		-27.00	
37070.00	S	-28.64	-27.00	1.64
38570.00	Н	_	-27.00	

Note: "H": denotes Harmonic Frequency. "S": denotes Spurious Frequency.

"---": denotes Noise Floor. Ref: Reference Signal

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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 235 of 463

Fundamental Frequency 5550 MHz Engineer :Nick Operation Mode :TX Mid

Freq. (MHz)	Note F/H/E/S	Reading dBm	Limit dBm	Safe Margin dB
< 30	S		-27.00	
30-1000	S	-53.35	-27.00	26.35
11100.00	Н		-27.00	
13700.00	S	-38.93	-27.00	11.93
16650.00	Н		-27.00	
22200.00	Н		-27.00	
27750.00	Н		-27.00	
33300.00	Н		-27.00	
36220.00	S	-28.65	-27.00	1.65
38850.00	Н		-27.00	

"H": denotes Harmonic Frequency. "S": denotes Spurious Frequency. Note:

"---": denotes Noise Floor.

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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 236 of 463

Fundamenta Operation M	l Frequency Iode	5670 MHz :TX High	Engine	eer	:Nick
	Freq. (MHz)	Note F/H/E/S	Reading dBm	Limit dBm	Safe Margin dB
	<30	S		-27.00	
	30-1000	S	-55.54	-27.00	28.54
	11340.00	Н		-27.00	
	13600.00	S	-38.68	-27.00	11.68
	17010.00	Н		-27.00	
	22680.00	Н		-27.00	
	28350.00	Н		-27.00	
	34020.00	Н		-27.00	
	36960.00	S	-29.22	-27.00	2.22
	39690.00	Н		-27.00	

"H": denotes Harmonic Frequency. "S": denotes Spurious Frequency. Note:

"---": denotes Noise Floor.

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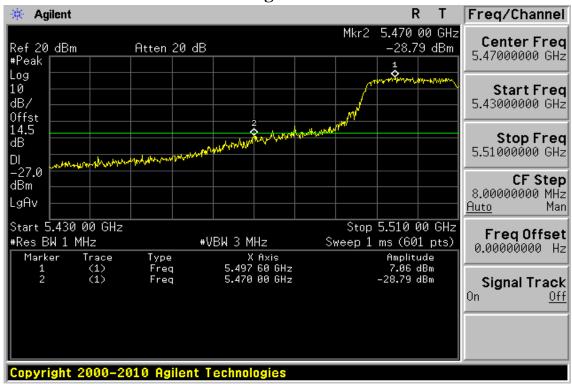
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Report No.: EH/2013/70026 **Issue Date: Aug. 05, 2013** 

Page 237 of 463

### 802.11n HT40 5470~5725 MHz Band Edges Test Data CH 5510



# 802.11n HT40 5470~5725 MHz Band Edges Test Data CH 5670



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Page 238 of 463

### 802.11n\_HT40 - Band Edge falling into un-restricted band

Frequency (GHz)	Results (dBm)	Limit (dBm)	Verdict
5.470	-28.79	-27.00	Pass
5.715	-35.51	-27.00	Pass

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