

# ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

# INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART E REQUIREMENT

OF

Product Name:	PeopleNet Connected Tablet
Brand Name:	PeopleNet
Model No.:	MS5
Model Difference:	N/A
FCC ID:	NKS-MS5
Report No.:	E2/2015/10036
Issue Date:	Mar. 11, 2015
FCC Rule Part:	<b>§15.407</b>
Prepared for:	PEOPLENET 4400 Baker Road, Minnetonka, MN 55343, USA
Prepared by:	SGS Taiwan Ltd. Electronics & Communication Laboratory No.2, Keji 1st Rd., Guishan District, Taoyuan City, Taiwan 333

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# VERIFICATION OF COMPLIANCE

Applicant:	PEOPLENET 4400 Baker Road, Minnetonka, MN 55343, USA
Product Name:	PeopleNet Connected Tablet
Brand Name:	PeopleNet
Model No.:	MS5
Model Difference:	N/A
FCC ID:	NKS-MS5
File Number:	E2/2015/10036
Date of test:	Jan. 30, 2015 ~ Mar. 11, 2015
Date of EUT Received:	Jan. 30, 2015

## 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 C63.4:2014 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.

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

Test By:	Marcus -	Seng Date:	Mar. 11, 2015
- Prepared By:	Marcus Tseng / E Allen T	ingineer	Mar. 11, 2015
- Approved By:	Allen Tsai / Eng Trim Cl	-	Mar. 11, 2015

Jim Chang / Supervisor

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# Version

Version No.	Date	Description
00	Mar. 11, 2015	Initial creation of document

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#### **GENERAL INFORMATION** 1.

## **1.1. Product Description**

General:

Product Name:	PeopleNet	PeopleNet Connected Tablet				
Brand Name:	PeopleNet	PeopleNet				
Model No.:	MS5	MS5				
Model Difference:	N/A	N/A				
Hardware Version:	N/A					
Software Version:	N/A					
Tablet Docking Station	Model No.: MS-57602, Supplier: MSI					
Power Cable	P/N: L016-0576, Supplier: ELECTRI-CORD MFG.CO.					
Power Supply:	7.4Vdc from LITHIUM-ION rechargeable battery or 12/24Vdc from DC Car battery					
ronor coppy.	Battery:	Battery: Model No.: MS5760 , Supplier: Getac				

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WLAN 5GHz:

Wi-Fi	Frequency Range	Channels	Rated Power (Avg.)	Modulation Technology
	5150~5250	4	13.86dBm (Avg.)	
11a	5250~5350	4	13.97dBm (Avg.)	OFDM
11a	5470~5725	8	13.97dBm (Avg.)	OrdM
	5725-5850	5	13.97dBm (Avg.)	
	HT20 5150~5250	4	12.97dBm (Avg.)	
11n	HT20 5250~5350	4	12.83dBm (Avg.)	OFDM
	HT20 5470~5725	8	12.97dBm (Avg.)	
	HT20 5725-5850	5	12.96dBm (Avg.)	

Antenna Designation	PIFA Antenna: 5GHz Gain: 2.96dBi (5150MHz-5250MHz) 5GHz Gain: 2.96dBi (5250MHz-5350MHz) 5GHz Gain: 2.91dBi (5470MHz-5725MHz) 5GHz Gain: 2.11dBi (5725MHz-5850MHz)
Modulation type	64QAM, 16QAM, QPSK, BPSK for OFDM
Transition Rate:	802.11 a: 6/9/12/18/24/36/48/54 Mbps 802.11 n_20MHz: 6.5 – 65.0Mbps

This report applies for frequency bands 5150 MHz- 5250 MHz, 5250MHz-5350MHz and 5470 MHz- 5725 MHz 5725 MHz- 5850 MHz.

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#### IEEE 802.11n Spec:

MCS Index Nss	Modulation			NCBPS		NDBPS		Datarate(Mbps)				
		R	NBPSC					800nsGI		400nsGI		
- 2003 (State 1942)					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

#### 802.11n\_HT20 MCS8 -15

100								Data ra	nte (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 <sub>DBPS</sub>	800 ns GI	400 ns GI (see NOTE)
8	BPSK	1/2	1	52	4	104	52	13.0	14.4
9	QPSK	1/2	2	52	4	208	104	26.0	28.9
10	QPSK	3/4	2	52	4	208	156	39.0	43.3
11	16-QAM	1/2	4	52	4	416	208	52.0	57.8
12	16-QAM	3/4	4	52	4	416	312	78.0	86.7
13	64-QAM	2/3	6	52	4	624	416	104.0	115.6
14	64-QAM	3/4	6	52	4	624	468	117.0	130.0
15	64-QAM	5/6	6	52	4	624	520	130.0	144.4
NOTE-T	The 400 ns GI rate	values	are rounded to 1	decima	l place.				

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

This submittal(s) (test report) is intended for **FCC ID:** <u>NKS-MS5</u> filing to comply with Section 15.407 of the FCC Part 15, Subpart E Rules. The composite system (digital device) is compliance with Subpart B is authorized under a DoC procedure.

### **1.3.** Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4:2014 & ANSI C63.10:2013 & 789033 D02 published on 06, 06, 2014 General UNII Test Procedure New Rules v01. Radiated testing was performed at an antenna to EUT distance 3 meters.

Tested in accordance with Jun. 2014 KDB789033 D02v01 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.2, Keji 1st Rd., Guishan District, Taoyuan City, Taiwan 333 which are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4:2014 & ANSI C63.10:2013. FCC Registration Number: 628985. Canada Registration Number: 4620A-4.

The 10 m Open Area Test Sites located on the address of SGS Taiwan Ltd. Electronics & Communication Laboratory No.2, Keji 1st Rd., Guishan Township, Taoyuan County, Taiwan, which is constructed and calibrated to meet the CISPR 22/EN 55022 requirements. SGS Site No. 1(3 &10 meters) and FCC Registration Number: 455997

#### 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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### 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 C63.4:2014 & 6.2 ANSI 63.10:2013.Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz, and the measurement procedure 7.3 in ANSI 63.4:2014 & 6.2.2, and 6.2.3 in ANSI 63.10:2013 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 C63.4:2014, & Section 6.3, 6.4, 6.5, and 6.6 of ANSI 63.10:2013.

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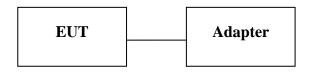
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### 2.4. Configuration of Tested System

#### Fig. 2-1 Radiated Emission & Conduction Emission Configuration



#### Fig. 2-2 Conducted (Antenna Port) Configuration



**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	N/A	N/A	N/A	N/A	N/A
2.	Notebook	Lenovo	L430	R9-YYG88	N/A	Unshielded

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#### SUMMARY OF TEST RESULT 3.

FCC Rules	<b>Description Of Test</b>	Result
§15.207	AC Power Line Conducted	Compliant
	Emission	
§15.407(a) (1) (2)	26 dB & 6dB Emission	Compliant
	Bandwidth	
§15.407(a) (1) (2)	The Maximum Output Pow-	Compliant
	er Measurement	
§15.407(a) (5)	Peak Power Spectral Density	Compliant
	Measurement	
§15.407(b) (1) (2) (3)	Undesirable Emission – Con-	Compliant
	ducted Measurement	
§15.407(b) (1) (2) (3)(6) (7)	Undesirable Emission – Radiated	Compliant
	Measurement	
§15.407(c)	Transmission in case of Absence	Compliant
	of Information	
§15.407(g)	Frequency Stability	Compliant
§15.203	Antenna Requirement	Compliant

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## 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)
5725MHz-5850MHz: Channel lowest(5745MHz), Mid(5785MHz) and Highest(5850MHz) 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),	Mid(5580MHz) and Highest(5700MHz)
5725MHz-5850MHz: Channel lowest(5745MHz),	Mid(5785MHz) and Highest(5850MHz)
with 6.5Mbps 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 8.5, the lowest data rate at  $a/n_HT20$  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 E2 position was reported.

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## **Duty Cycle Analysis:**

Pre-analysis Check: While conducting average power measurement, duty cycle of each mode (a/n\_ht20) shall be checked to ensure its duty cycle in order to compensate for the loss due to insufficient ratio of duty cycle. All duty cycle is pre-scanned, resulted as obtained below, and showed only the most representative ones

Tabular results as indicates below entails the results of duty factor for all supported modes. *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 = the highest RBW the spectrum is capable of, where zero-span is permissible, that > 50/T, where T is ~ 4.3ms

Duty Cycle:

	Antenna	Duty Cycle	Duty Factor (dBm)
802.11a	Single	0.986	0.06
802.11n_20	Single	0.983	0.07

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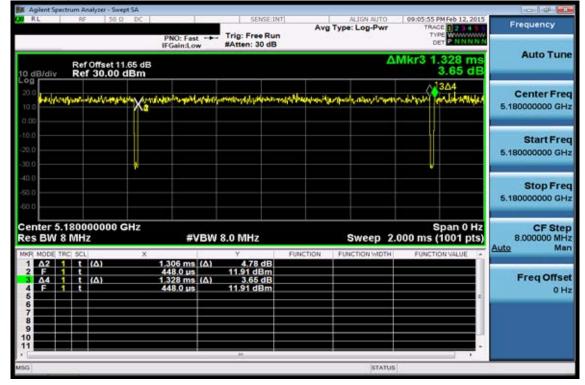
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## **DUTY CYCLE OF TEST SIGNAL** 802.11a, CH Low 5180 MHz

0.4							nalyzer - Swep			
Frequency	09:04:59 PM Feb 12, 2015 TRACE 2 2 14 5 Type DET P NNNN N	ALIGN AUTO		Trig: Free Rur #Atten: 30 dB	NO: Fast	P	50 Ω	RF		RL
Auto Tu	1.414 ms 2.37 dB	Δ		WAtten: 30 db	Gasn:Low	.65 dB	Offset 11 30.00		Vdiv	0 dB
Center Fr 5.18000000 G	nutiviliti inditropoli	مورسياره وارسو	convision of the	y y hige y de de bal	righter and the				riya-a	0.0 0.0
Start Fr 5.180000000 G										00 1.0 1.0 1.0
Stop Fr 5.180000000 G										10
CF St 8.000000 M Auto M	Span 0 Hz 00 ms (1001 pts)			8.0 MHz	#VBW	Hz		3 MH	BW	es
	FUNCTION VALUE	INCTION WIDTH	FUNCTION	Y 2.22 dB	394 ms (Δ)		(4)	RC SCL	A2	12.0
Freq Offs 0				14.07 dBm 2.37 dB 14.07 dBm	10.0 μs 414 ms (Δ) 10.0 μs	1.4	(Δ)			
										7890
	-			H.						1
		STATUS						-	-	3

## 802.11n HT20, CH Low 5180 MHz



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#### 5. **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 1.55 db
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 : Vertical)	0.417GHz-1GHz: +/- 3.19dB
	1GHz - 18GHz: +/- 4.04dB
	18GHz - 40GHz: +/- 4.04dB

	30MHz - 167MHz: +/- 4.22dB
Measurement uncertainty	167MHz -500MHz: +/- 3.44dB
(Polarization : Horizontal)	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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## 6. CONDUCTED EMISSION TEST

## 6.1. Standard Applicable

According to \$15.207 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						
1. The lower limit shall apply at the transition frequencies						
2. The limit decreases linearly with the	2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.					

## 6.2. Measurement Equipment Used:

Conducted Emission Test Site							
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.		
ТҮРЕ		NUMBER	NUMBER	CAL.			
EMI Test Receiver	R&S	ESCI 3	101311	06/20/2014	06/19/2015		
Coaxial Cables	N/A	N30N30-1042-150c m	N/A	01/06/2015	01/07/2016		
LISN	Schwarzbeck	NSLK 8127	8127-648	06/10/2014	06/09/2015		
LISN	Rolf-Heine	NNB-2/16Z	99012	03/26/2014	03/25/2015		
Test Software	Farad	EZ-EMC	Ver. SGS-03A2	N.C.R.	N.C.R.		

## 6.3. EUT Setup

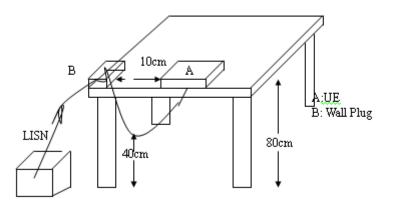
- 1. The conducted emission tests were performed in the test site, using the setup in accordance with the ANSI C63.4:2014.
- 2. The AC/DC Power adaptor of EUT was plug-in LISN. The rear of the EUT and peripherals were placed flushed with the rear of the tabletop.
- 3. The LISN was connected with 120Vac/60Hz power source.

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## 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 closet to the limit

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## AC POWER LINE CONDUCTED EMISSION TEST DATA

Operation Mode:	Operation Mode	)		Test Date:	Feb. 26, 2015
Temperature:	23	Humidity:	58 %	Test By:	Vito
Probe:	L1				
0 dBuV					
			CISPR	13 / CISPR 22 Con	duction(QP)
X 2			CISPR 1	3 / CISPR 22 Condu	uction(AVG)
M. M.		4	6 X		
I. I. Markan		n Åd M.	MAMMAN	MANNA WAR	MANNA MANNA
' N W WW	All Martin and a state	MM. A M. N.			, ( µ,
150	0.5	(MHz)	5		30.0

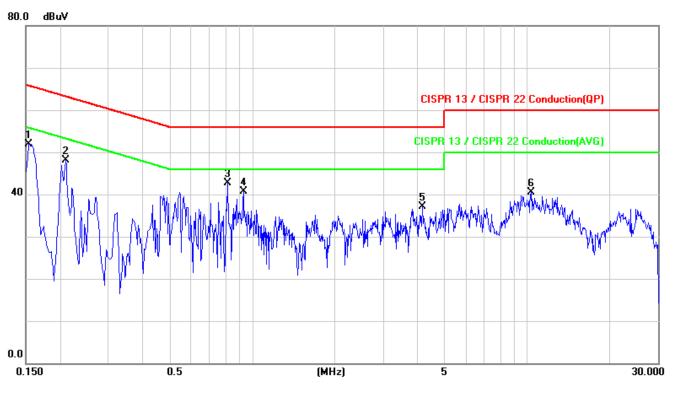
No.	Mk.	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Comment
		(MHz)	dBuV	(dB)	(dBuV)	(dBuV)	(dB)		
1		0.1660	52.15	0.05	52.20	65.16	-12.96	peak	
2		0.2260	47.72	0.05	47.77	62.60	-14.83	peak	
- 3	*	0.5580	45.17	0.20	45.37	56.00	-10.63	peak	
4		1.6140	38.24	0.45	38.69	56.00	-17.31	peak	
-5		2.3180	36.43	0.51	36.94	56.00	-19.06	peak	
6		4.2860	41.89	0.50	42.39	56.00	-13.61	peak	

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Operation Mode:	Operation Mode			Test Date:	Feb. 26, 2015
Temperature:	23	Humidity:	58 %	Test By:	Vito
Probe:	Ν	·			



No.	Mk.	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Comment
		(MHz)	dBuV	(dB)	(dBuV)	(dBuV)	(dB)		
1		0.1540	51.84	0.05	51.89	65.78	-13.89	peak	
2		0.2100	48.04	0.04	48.08	63.21	-15.13	peak	
3	*	0.8140	42.47	0.30	42.77	56.00	-13.23	peak	
4		0.9300	40.35	0.34	40.69	56.00	-15.31	peak	
- 5		4.1660	36.51	0.51	37.02	56.00	-18.98	peak	
6		10.3620	39.97	0.47	40.44	60.00	-19.56	peak	

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## 7. 26dB & 6dB EMISSION BANDWIDTH MEASUREMENT

## 7.1 Standard Applicable

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

And §15.407 (e) Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

## 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. 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.

5. Minimum Emission Bandwidth for the band 5.725-5.850GHz

a. Set the spectrum analyzer as RBW = 100 kHz, VBW = 3\*RBW, Span = 30M/50MHz, Detector=Peak,

Sweep=auto

b. Mark the peak frequency and –6dB (upper and lower) frequency.

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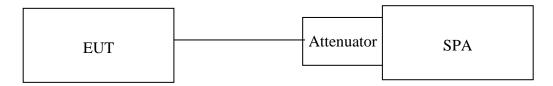


Conducted Emission Test Site						
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.	
TYPE		NUMBER	NUMBER	CAL.		
Power Meter	Anritsu	ML2495A	1005007	12/20/2014	12/19/2015	
Power Sensor	Anritsu	MA2411B	917032	12/20/2014	12/19/2015	
Spectrum Analyzer	Agilent	E4446A	MY51100003	05/19/2014	05/18/2015	
Spectrum Analyzer	Agilent	E4440A	MY45304525	03/08/2014	03/07/2015	
DC Block	Mini-Circuits	BLK-18-S+	1	01/02/2015	01/01/2016	
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA	N/A	01/02/2015	01/01/2016	
Attenuator	Mini-Circuit	BW-S10W2+	002	01/02/2015	01/01/2016	
Splitter	Agilent	11636B	N/A	01/02/2015	01/01/2016	

#### Measurement Equipment Used: 7.3

Remark: Please note that the duration to conduct the test took place in the mean time when the calibration for several equipments is due, and therefore extra tables of equipment calibration is constructed to indicate the calibration work is still maintained.

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



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#### 7.5 Measurement Result

### **26dB Bandwidth**

802.11a, 5150~5250 MHz

Frequency (MHz)	26dB Bandwidth (B) (MHz)	10 Log (B) (dB)
5180	23.170	13.65
5220	21.940	13.41
5240	20.920	13.21

#### 802.11a, 5250~5350 MHz

Frequency (MHz)	26dB Bandwidth (B) (MHz)	10 Log (B) (dB)
5260	21.410	13.31
5300	20.650	13.15
5320	21.360	13.30

#### 802.11a, 5470~5725 MHz

Frequency (MHz)	26dB Bandwidth (B) (MHz)	10 Log (B) (dB)
5500	20.750	13.17
5580	21.580	13.34
5700	20.790	13.18

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#### 802.11n HT20, 5150~5250 MHz MIMO-Main

Frequency (MHz)	26dB Bandwidth (B) (MHz)	10 Log (B) (dB)
5180	21.760	13.38
5220	21.580	13.34
5240	22.250	13.47

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

Frequency (MHz)	26dB Bandwidth (B) (MHz)	10 Log (B) (dB)
5260	21.490	13.32
5300	21.390	13.30
5320	21.080	13.24

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

Frequency (MHz)	26dB Bandwidth (B) (MHz)	10 Log (B) (dB)
5500	21.090	13.24
5580	20.860	13.19
5700	21.090	13.24

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#### 6dB Bandwidth

802.11a, 5725~5850 MHz

Frequency (MHz)	6dB Bandwidth (B) (MHz)	10 Log (B) (dB)
5745	16.380	12.14
5785	16.420	12.15
5825	16.400	12.15

802.11n HT20, 5725~5850 MHz

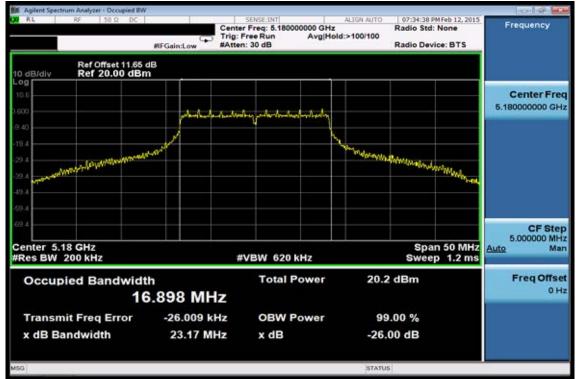
Frequency (MHz)	6dB Bandwidth (B) (MHz)	10 Log (B) (dB)
5745	17.620	12.46
5785	17.640	12.46
5825	17.630	12.46

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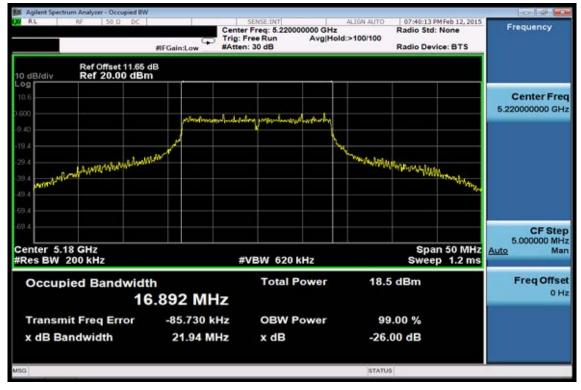
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# 802.11a, 5150~5250 MHz 26dB Band Width Test Data CH-Low (5180MHz)



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



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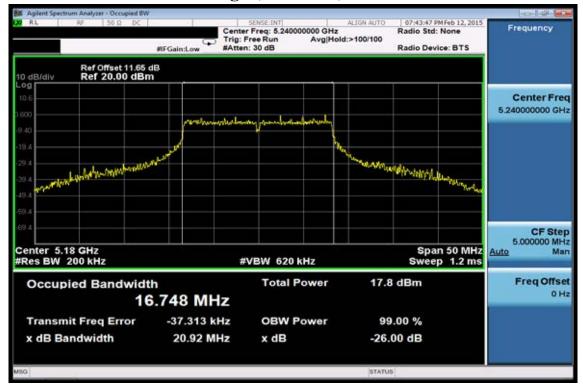
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## 26dB Band Width Test Data CH-High (5240MHz)

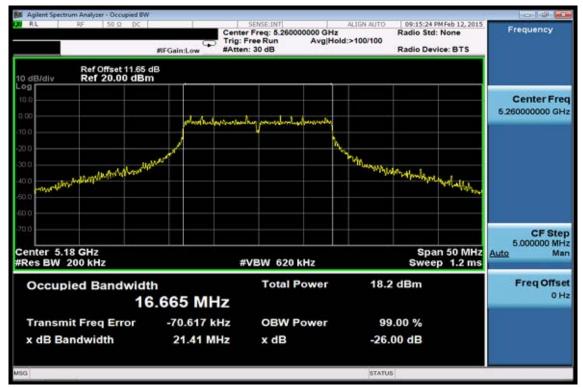


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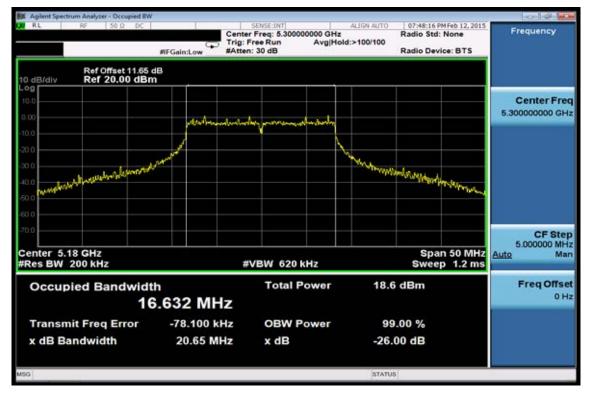
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## 802.11a, 5250~5350 MHz 26dB Band Width Test Data CH-Low (5260MHz)



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

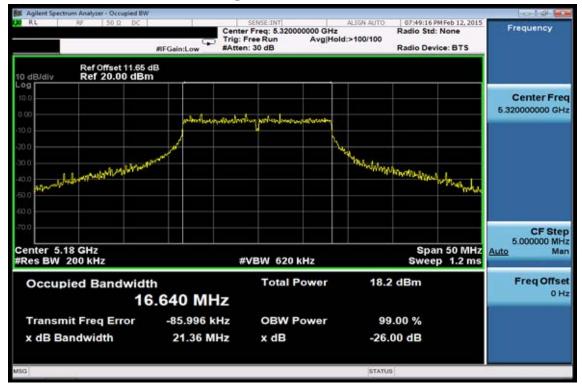


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## 26dB Band Width Test Data CH-High (5320MHz)

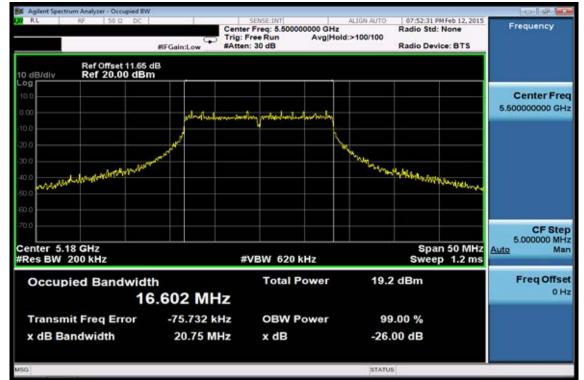


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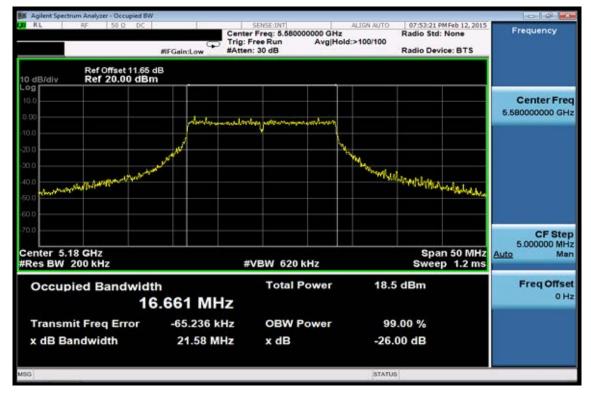
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## 802.11a, 5470~5725 MHz 26dB Band Width Test Data CH-Low (5500MHz)



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



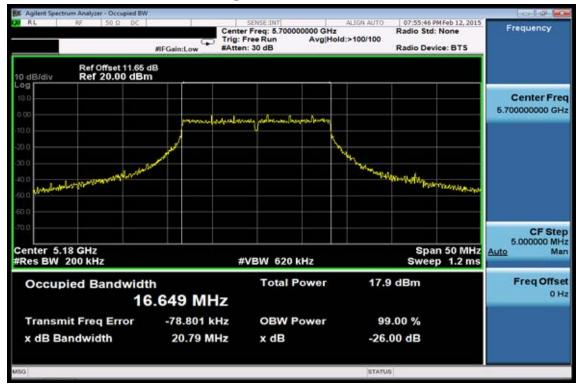
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## 26dB Band Width Test Data CH-High (5700MHz)

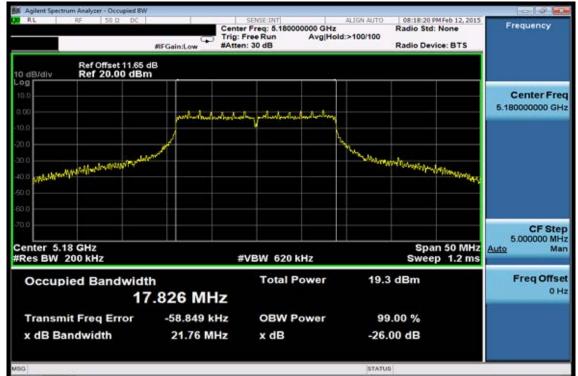


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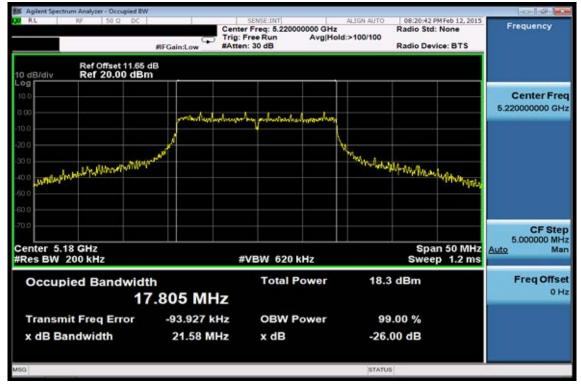
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# 802.11n HT20, 5150~5250 MHz 26dB Band Width Test Data CH-Low (5180 MHz)



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



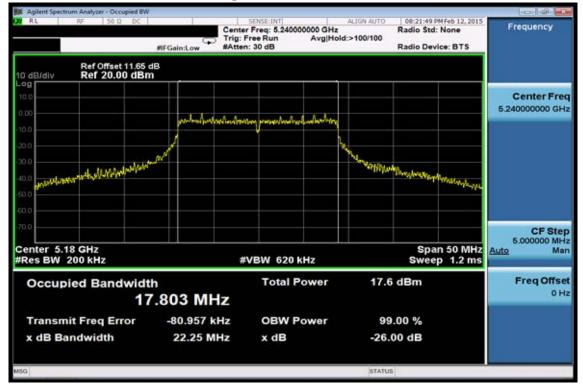
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## 26dB Band Width Test Data CH-High (5240 MHz)

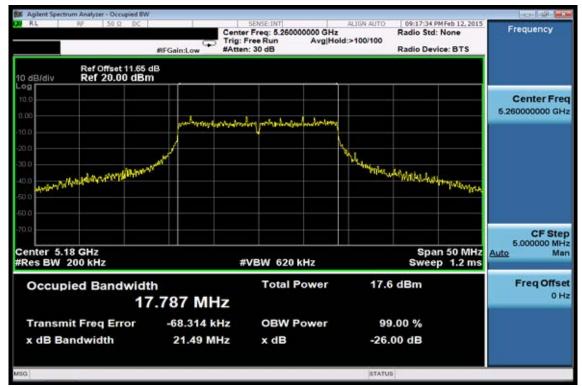


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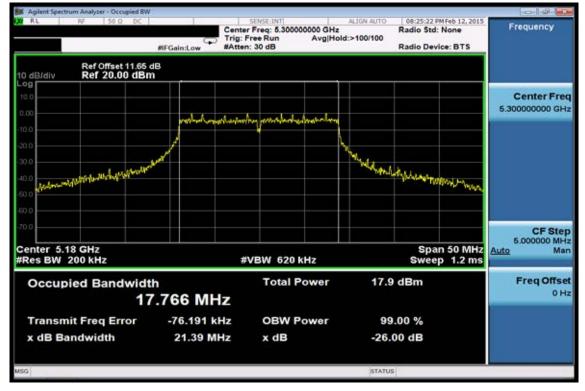
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## 802.11n HT20, 5250~5350 MHz 26dB Band Width Test Data CH-Low (5260 MHz)



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



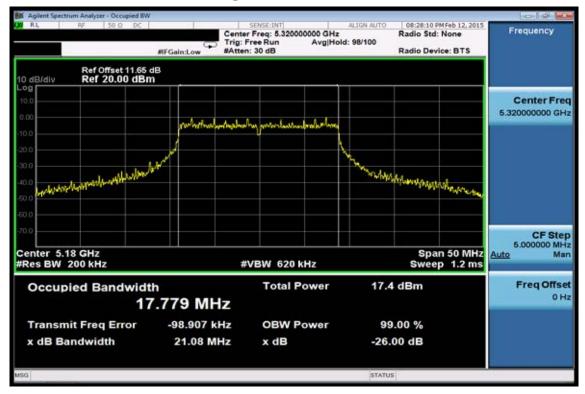
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## 26dB Band Width Test Data CH-High (5320 MHz)

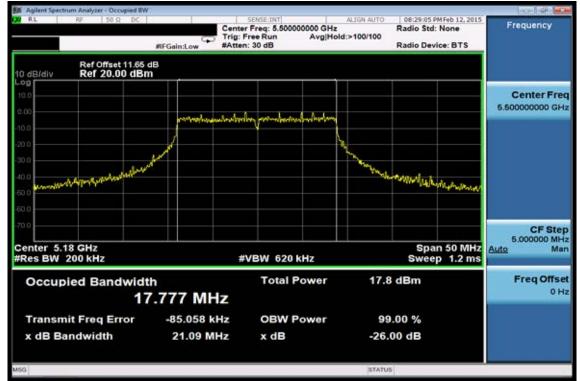


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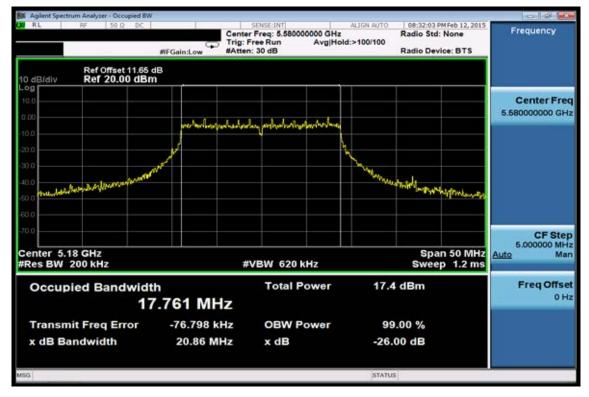
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## 802.11n HT20, 5470~5725 MHz 26dB Band Width Test Data CH-Low (5500 MHz)



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



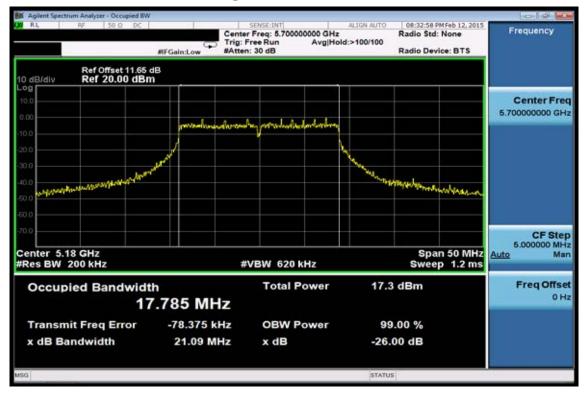
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#### 26dB Band Width Test Data CH-High (5700 MHz)



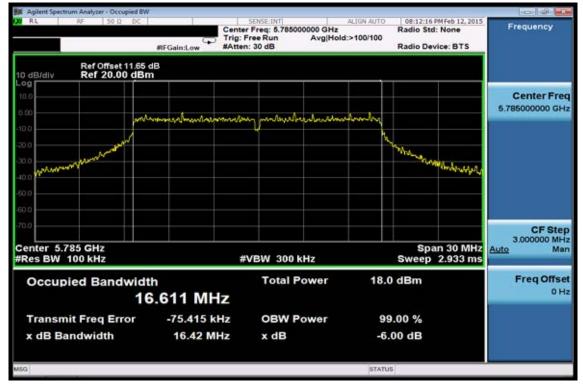
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#### 802.11a, 5725~5850 MHz 6dB Band Width Test Data CH-Low (5745 MHz)

N RL	RF 50 Q DC	#IFGain:Low	SENSE:INT Center Freq: 5.7450 Trig: Free Run #Atten: 30 dB		ALIGN AUTO	Radio Dev		Frequency
10 dB/div	Ref Offset 11.6 Ref 20.00 dB							
10.0 0.00		Mr. Anorton		na la saran	Andar			Center Fre 5.745000000 GH
20.0	- And				Y			
40.0 40.0	and when the					and we	and had had a state	
60.0 70.0								CF Ste
Center 5.74 #Res BW 1			#VBW 300	kHz			n 30 MHz 2.933 ms	3.000000 MH
Occupi	ied Bandwid	ith 6.588 MH	Total f	ower	18.4	dBm		Freq Offse 0 H
Transmi	it Freq Error	-87.005 k	Hz OBW F	ower	99	.00 %		
x dB Ba	ndwidth	16.38 M	Hz xdB		-6.	00 dB		
6G					STATUS			-

#### 6dB Band Width Test Data CH-Mid (5785 MHz)

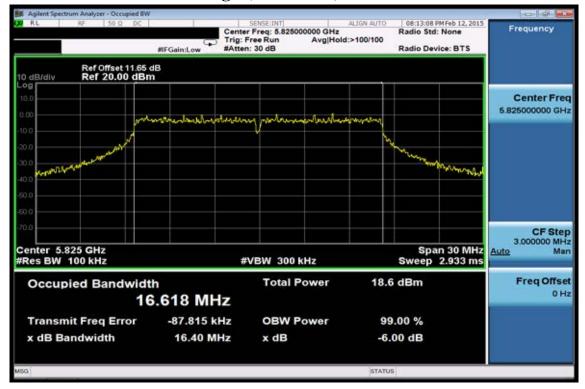


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#### 6dB Band Width Test Data CH-High (5825 MHz)



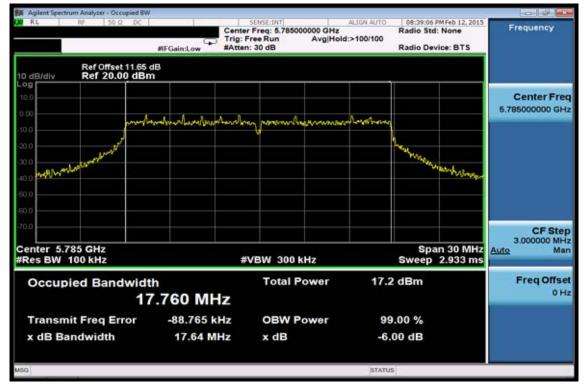
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#### 802.11n HT20, 5725~5850 MHz 6dB Band Width Test Data CH-Low (5745 MHz)

RL	RF 50 D DC	#FGain:Low	SENSE:INT Center Freq: 5.74500 Trig: Free Run #Atten: 30 dB	ALIGN AUTO 0000 GHz Avg Hold:>100/100	08:35:03 PM Feb 12, 2015 Radio Std: None Radio Device: BTS	Frequency
10 dB/div	Ref Offset 11.65 Ref 20.00 dB					
10,0 0.00		merenduschair	montes material	allowformon		Center Free 5.745000000 GH
10.0 20.0	. Surphismond				k –	
40.0 <b>MMMM</b>					Mary and a second and a second	
center 5.74					Span 30 MHz	CF Ste 3.000000 MH Auto Ma
Res BW 1	ied Bandwid	<sup>th</sup> 7.755 MH	#VBW 300 F Total P		Sweep 2.933 ms 8 dBm	Freq Offse 0 H
Transmi	It Freq Error	-98.324 k		ower 9	9.00 %	
x dB Bar		17.62 M			.00 dB	
56				STAT	15	

#### 6dB Band Width Test Data CH-Mid (5785 MHz)

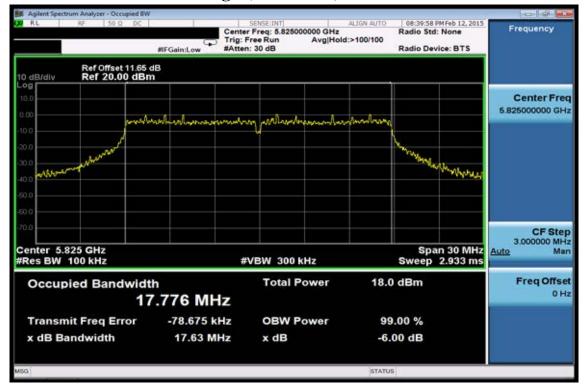


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#### 6dB Band Width Test Data CH-High (5825 MHz)



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#### The MAXIMUM OUTPUT POWER MEASUREMENT 8.

#### 8.1 **Standard Applicable**

According to §15.407(a)

- 1. For the band 5.150-5.250 GHz, the maximum conducted power over the frequency of operation shall not exceed the lesser of 250mW (23.98dBm).
- 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 (23.98dBm) or 11 dBm + 10log B.
- 3. For the band 5.725-5.850 GHz, the maximum conducted power over the frequency of operation shall not exceed the lesser of 1W (30dBm)

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#### 8.2 Measurement Procedure

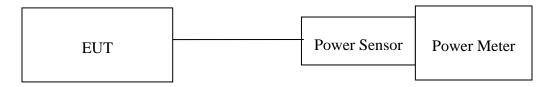
- 1. Place the EUT on the table and set it in transmitting mode.
- 2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power meter
- 3. Set the offset 10\*log(1/x), a=0.06, n\_HT20=0.07
- 4. Record the max. reading.
- 5. Repeat above procedures until all frequency (low, middle, and high channel) measured were complete.

Note: For EIRP/ERP measurement, 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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#### 8.5 Measurement Result

#### 802.11a

	The Maximum Output Power				
СН	Frequency	Data Rate	Required Limit		
	(MHz)	6			
36	5180	13.84	23.98dBm		
44	5220	13.86	23.98dBm		
48	5240	13.72	23.98dBm		
52	5260	13.97	23.98dBm or 11+10log(B) = 23.22dBm		
60	5300	13.64	23.98dBm or 11+10log(B) = 23.21dBm		
64	5320	13.74	23.98dBm or 11+10log(B) = 23.21dBm		
100	5500	13.97	23.98dBm or 11+10log(B) = 23.20dBm		
116	5580	13.84	23.98dBm or 11+10log(B) = 23.22dBm		
140	5700	13.7	23.98dBm or 11+10log(B) = 23.21dBm		
149	5745	13.78	30dBm		
157	5785	13.9	30dBm		
165	5825	13.97	30dBm		

Note: Limit is re-adjusted in terms of dBm

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

Note: Cable loss is 11.65dB is set as the offset on the spectrum to compensate the loss causing by cable

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802.11n HT20

	The Maximum Output Power				
СН	Frequency	Data Rate	Required Limit		
	(MHz)	MCS0			
36	5180	12.91	23.98dBm		
44	5220	12.97	23.98dBm		
48	5240	12.71	23.98dBm		
52	5260	12.83	23.98dBm or 11+10log(B) = 23.50dBm		
60	5300	12.76	23.98dBm or 11+10log(B) = 23.50dBm		
64	5320	12.83	23.98dBm or 11+10log(B) = 23.50dBm		
100	5500	12.97	23.98dBm or 11+10log(B) = 23.50dBm		
116	5580	12.95	23.98dBm or 11+10log(B) = 23.49dBm		
140	5700	12.76	23.98dBm or 11+10log(B) = 23.50dBm		
149	5745	12.79	30dBm		
157	5785	12.96	30dBm		
165	5825	12.96	30dBm		

Note: Offset 11.65dB

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#### 9. PEAK POWER SPECTRAL DENSITY

#### 9.1 Standard Applicable

According to §15.407(a)

- 1. For the band 5.15-5.25 GHz, the peak power spectral density shall not exceed 11 dBm in any 1 MHz band.
- 2. For the band 5.25-5.35 GHz, the peak power spectral density shall not exceed 11 dBm in any 1-MHz band.
- 3. For the band 5.725-5.850 GHz and 5.47-5.725GMHz, the peak power spectral density shall not exceed 30 dBm in any 500KHz 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.

#### 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, where span is enough to capture the entire bandwidth, Sweep time = Auto (1001 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 a=0.06, n\_HT20=0.07.
- 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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#### 9.5 Measurement Result

802.11a, 5150~5250 MHz

Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
5180	-0.03	11.00	-11.03
5220	-0.84	11.00	-11.84
5240	-1.38	11.00	-12.38

#### 802.11a, 5250~5350 MHz

Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
5260	-1.21	11.00	-12.21
5300	-0.62	11.00	-11.62
5320	-0.77	11.00	-11.77

#### 802.11a, 5470~5725 MHz

Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
5500	-0.38	11.00	-11.38
5580	-1.22	11.00	-12.22
5700	-1.31	11.00	-12.31

#### 802.11a, 5725~5850 MHz

Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
5745	-2.84	30.00	-32.84
5785	-3.12	30.00	-33.12
5825	-3.02	30.00	-33.02

*Note: Offset 11.65dB, where = cable loss + attenuator + duty factor* 

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802.11n HT20, 5150~5250 MHz

Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
5180	-1.15	4.00	-5.15
5220	-1.49	4.00	-5.49
5240	-2.69	4.00	-6.69

802.11n HT20, 5250~5350 MHz

Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
5260	-2.58	11.00	-13.58
5300	-1.87	11.00	-12.87
5320	-2.19	11.00	-13.19

802.11n HT20, 5470~5725 MHz

Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
5500	-2.00	11.00	-13.00
5580	-2.54	11.00	-13.54
5700	-2.62	11.00	-13.62

#### 802.11n HT20, 5725~5850 MHz

Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
5745	-4.52	30.00	-34.52
5785	-4.25	30.00	-34.25
5825	-4.27	30.00	-34.27

*Note: Offset 11.65dB, where = cable loss + attenuator + duty factor* 

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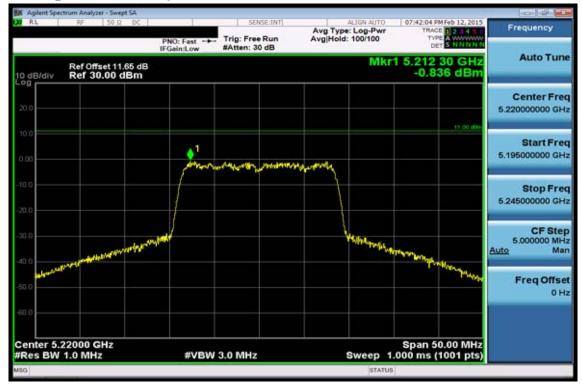
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#### 802.11a, 5150~5250 MHz Peak Power Spectral Density Data Plot (CH Low 5180 MHz)



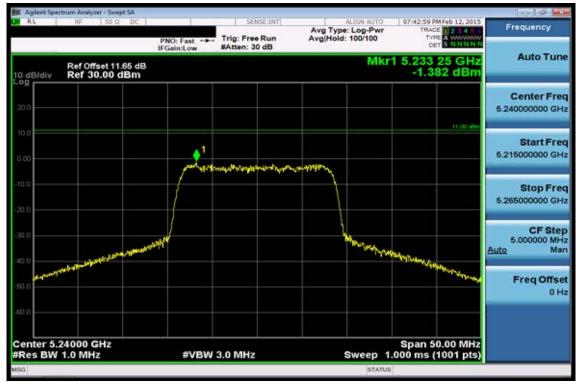
Peak Power Spectral Density Data Plot (CH Mid 5220 MHz)



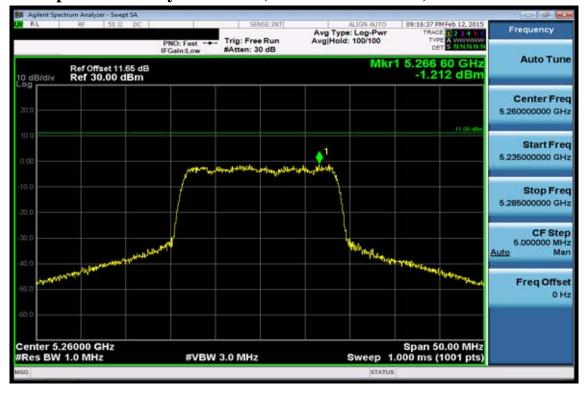
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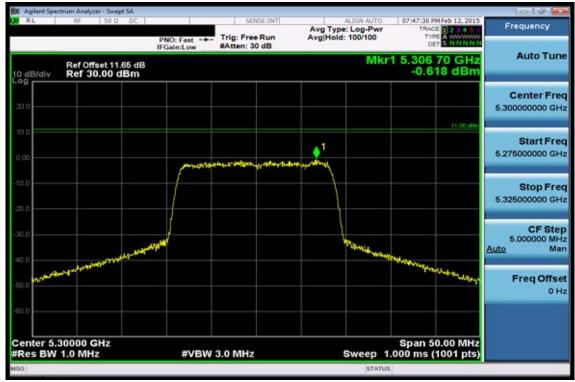
#### 802.11a, 5250~5350 MHz Peak Power Spectral Density Data Plot (CH Low 5260 MHz)



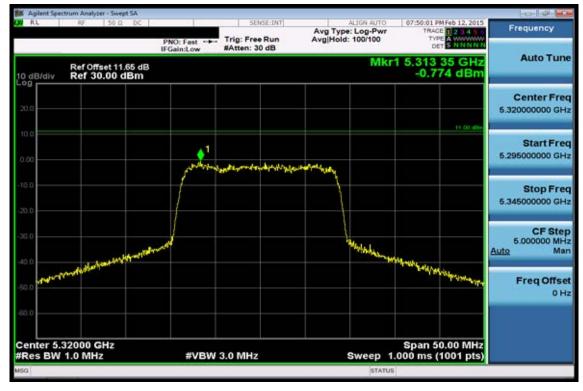
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#### Peak Power Spectral Density Data Plot (CH High 5320 MHz)

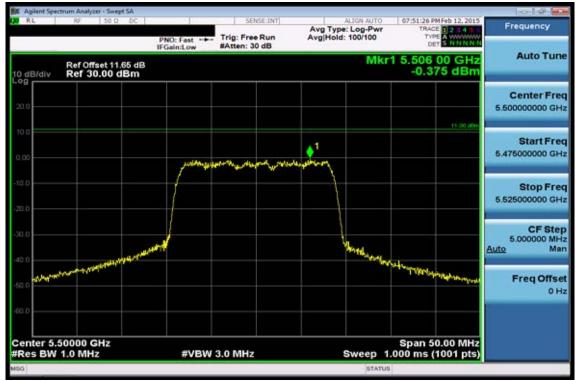


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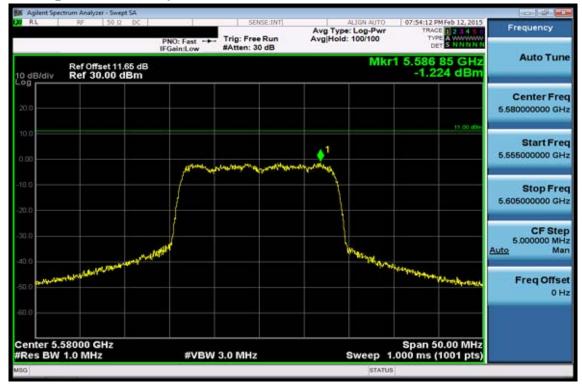
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### 802.11a, 5470~5725 MHz Peak Power Spectral Density Data Plot (CH Low 5500 MHz)



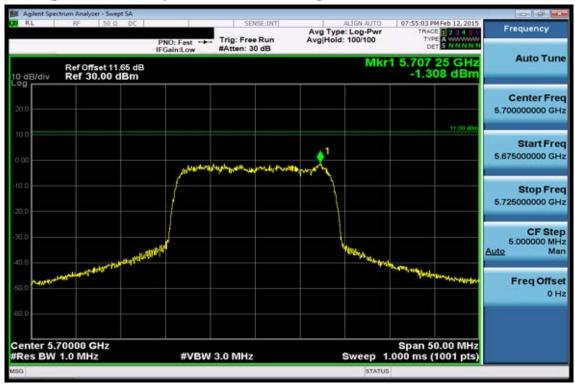
#### Peak Power Spectral Density Data Plot (CH Mid 5580 MHz)



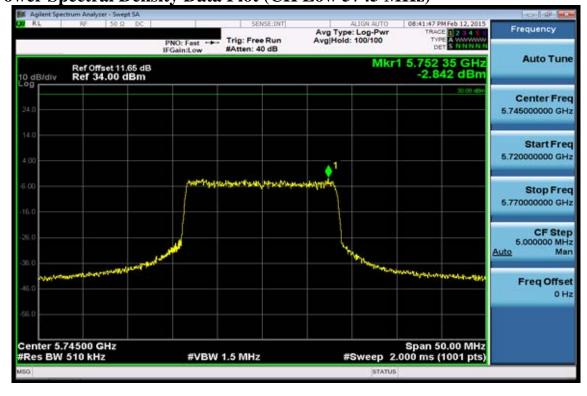
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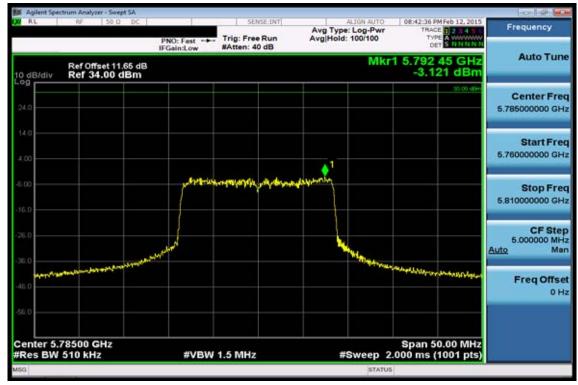
# 802.11a, 5725~5850 MHz Peak Power Spectral Density Data Plot (CH Low 5745 MHz)



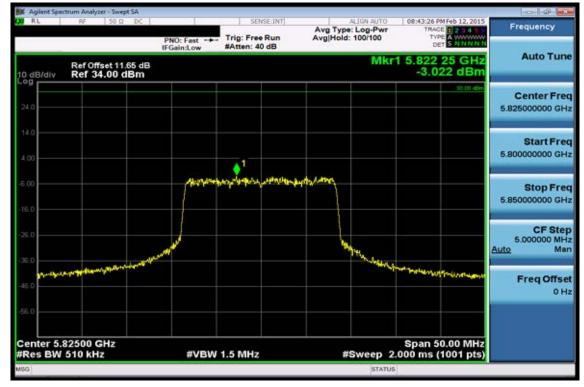
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# Peak Power Spectral Density Data Plot (CH Mid 5785 MHz)



#### Peak Power Spectral Density Data Plot (CH High 5825 MHz)

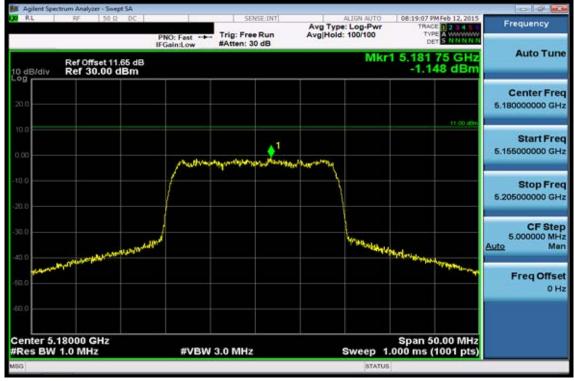


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# 802.11n HT20, 5150~5250 MHz Peak Power Spectral Density Data Plot (CH Low 5180 MHz)



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

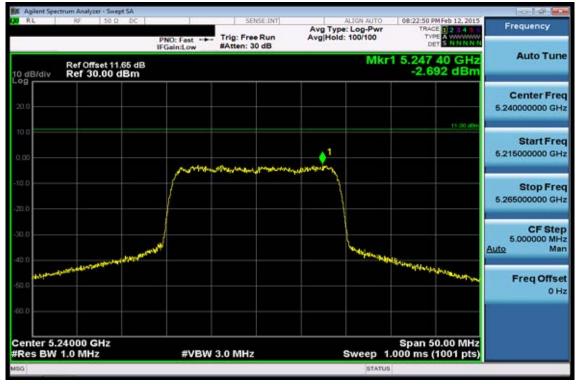


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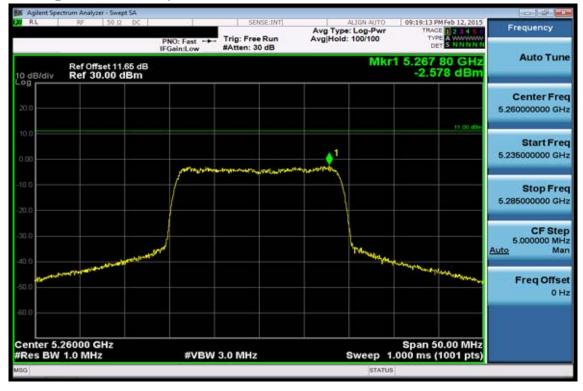
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802.11n HT20, 5250~5350 MHz Peak Power Spectral Density Data Plot (CH Low 5260MHz)



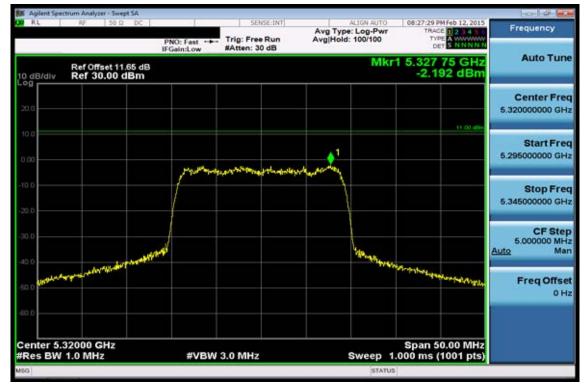
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#### Peak Power Spectral Density Data Plot (CH High 5320 MHz)

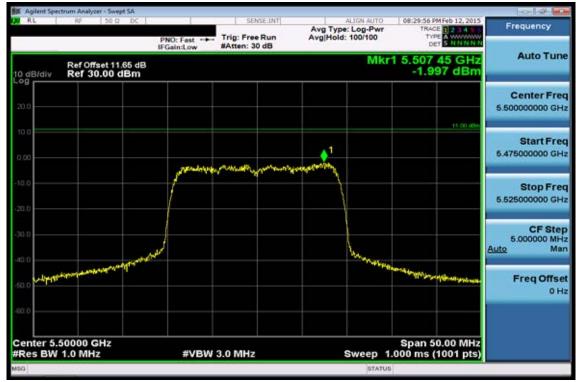


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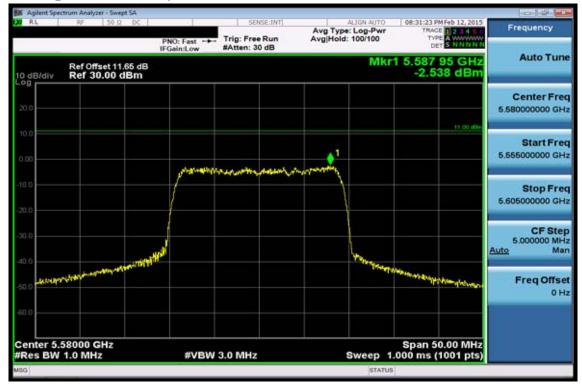
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# 802.11n HT20, 5470~5725 MHz Peak Power Spectral Density Data Plot (CH Low 5500 MHz)



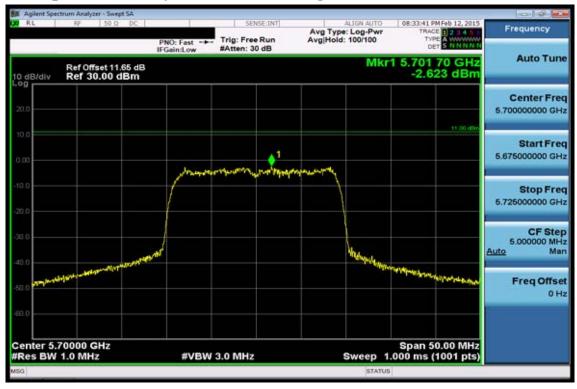
#### Peak Power Spectral Density Data Plot (CH Mid 5580MHz)



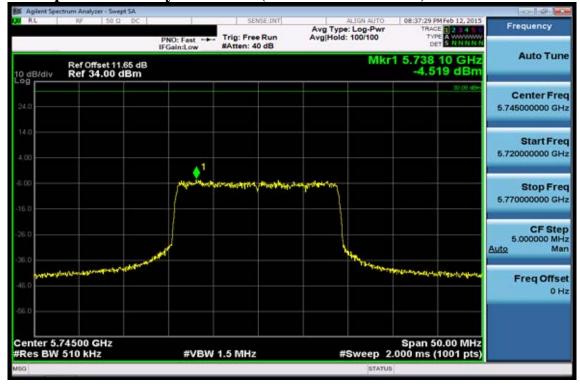
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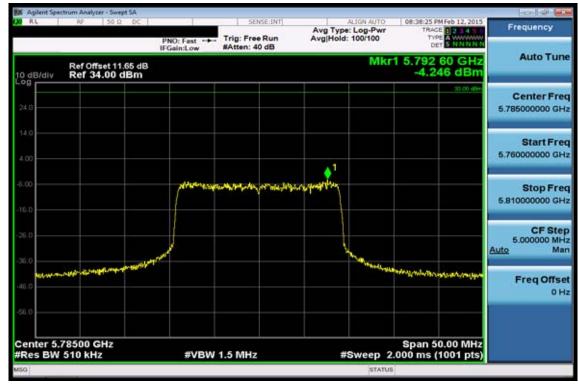
#### 802.11n HT20, 5725~5850 MHz Peak Power Spectral Density Data Plot (CH Low 5745 MHz)



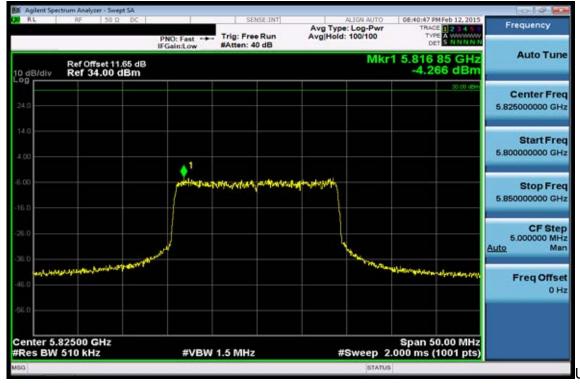
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# Peak Power Spectral Density Data Plot (CH Mid 5785 MHz)



#### Peak Power Spectral Density Data Plot (CH High 5825 MHz)



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# 10. UNDESIRABLE EMISSION - RADIATED MEASUREMENT10.1 Standard Applicable

According to §15.407(b) (6) (7),

(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:

- (1) Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in Section 15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in Section 15.207.
- (2) The provisions of Section 15.205 of this part apply to intentional radiators operating under this section.
- (3) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the upper and lower frequency block edges as the design of the equipment permits.

Procedure H1) a) b) c) are adopted, KDB 789033 D02, where the conducted measurement is being used to comply with out of emission requirement as per FCC 15.407 b) 6) 7).

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#### **§15.205- RESTRICTED BANDS OF OPERATIONS**

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
<sup>1</sup> 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 -	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.52525	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	156.7 - 156.9	3260 - 3267	23.6 - 24.0
12.29 - 12.293	162.0125 - 167.17	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	167.72 - 173.2	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	240 - 285	3600 - 4400	( <sup>2</sup> )
13.36 - 13.41	322 - 335.4		

<sup>1</sup> Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

<sup>2</sup> Above 38.6

(b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

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#### §15.209- RADIATED EMISSION LIMITS: GENERAL REQUIREMENTS

FCC PART 15.209						
MEASUR	ING DISTANCE OF 3 MET	ER				
FREQUENCY RANGE	FIELD STRENGTH	FIELD STRENGTH				
(MHz)	(Microvolts/m)	(dBuV/m)				
30-88 100 40						
88-216	150	43.5				
216-960 200 46						
Above 960	500	54				

#### **10.1.1 Transmitter Spurious Emission Limits**

Spurious emissions from licence-exempt transmitters shall comply with the field strength limits shown below. Additionally, the level of any transmitter spurious emission shall not exceed the level of the transmitter's fundamental emission.

#### Table 5: General Field Strength Limits for Transmitters at Frequencies Above 30 MHz

Frequency (MHz)	Field Strength (microvolt/m at 3 metres)
30-88	100
88-216	150
216-960	200
Above 960	500

Note: Transmitting devices are not permitted in Table 1 bands or, unless stated otherwise, in TV bands (54-72 MHz, 76-88 MHz, 174-216 MHz, 470-608 MHz and 614-806 MHz).

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10.1.2 Unwanted Emission that complies with the undesirable emission ruling by 15.407 (b) (1) (2) (3), RSS-210 A9.2 (1) (2) (3)

Frequencies (MHz)	EIRP Limit (dBm)	Equivalent Field Strength at 3m (dBuV/m)
5150 - 5250	-27	68.3
5250 - 5350	-27	68.3
5470 - 5725	-27	68.3

Limit derivation in terms of Field Strength:

EIRP =  $((E^*d)^2)/30$ , where E is the field in V/m, d is the measurement distance (3m), EIRP is the equivalent isotropically radiated power in Watts.

 $E = 1000000* (30*EIRP)^{(1/2)} / 3 uV/m$ = 68.3 dBuV/m

#### 10.1.3 Band edge that complies with the ruling by FCC 14-30 90,

Frequencies (MHz)	EIRP Limit (dBm)	Equivalent Field Strength at
		3m (dBuV/m)
5725 - 5850	-17	78.2

Limit derivation in terms of band edge:

 $E = 1000000* (30*EIRP)^{(1/2)} / 3 uV/m$ 

= 78.2 dBuV/m

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#### 10.2 EUT Setup

- The radiated emission tests were performed in the 3 meter open-test site, using the setup in ac-1. cordance with the ANSI C63.4:2009 & ANSI C63.10:2009.
- 2. The EUT was put in the front of the test table. The host PC system was placed on the center of the back edge on the test table. The peripherals like modem, monitor printer, K/B, and mouse were placed on the side of the host PC system. The rear of the EUT and peripherals were placed flushed with the rear of the tabletop.
- 3. The keyboard was placed directly in the front of the monitor, flushed with the front tabletop. The mouse was placed next to the Keyboard, flushed with the back of keyboard.
- 4. The spacing between the peripherals was 10 centimeters.
- 5. External I/O cables were draped along the edge of the test table and bundle when necessary.
- The host PC system was connected with 120Vac/60Hz power source. 6.

#### **10.3** Measurement Procedure

- The EUT was placed on a turn table which is 0.8m above ground plane. 1.
- 2. The turn table shall rotate 360 degrees to determine the position of maximum emission level.
- 3. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emissions.
- Maximum procedure was performed on the six highest emissions to ensure EUT compliance. 4.
- And also, each emission was to be maximized by changing the polarization of receiving antenna 5. both horizontal and vertical.
- Repeat above procedures until all frequency measured were complete. 6.

For measurements below 1GHz, follow the KDB 789033 D01 requirements in section H)3), "General Requirements for Unwanted Emissions Measurements" Compliance shall be demonstrated using CISPR quasi-peak detection; however, peak detection is permitted as an alternative to quasi-peak detection.

For Measurement above 1GHz, for peak unwanted emission measurements follow the KDB 789033 D02 requirements in section H)5) b), for average unwanted emission measurements follow the KDB 789033 D02 requirements in section H)6) c) or d).

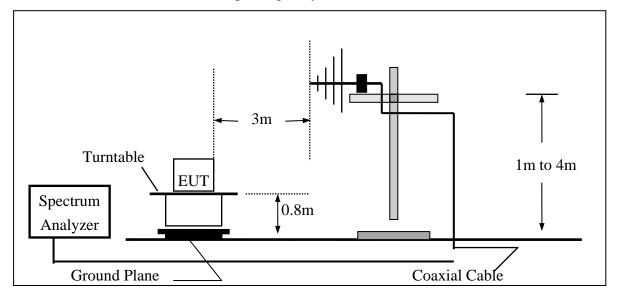
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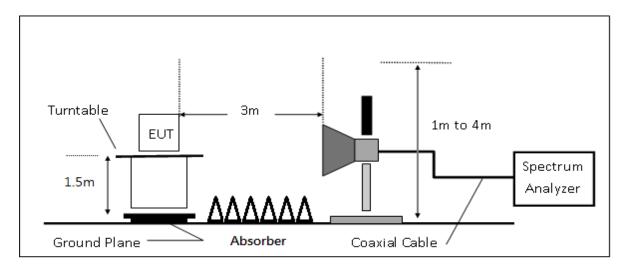


#### 12.1 **Test SET-UP (Block Diagram of Configuration)**

(A) Radiated Emission Test Set-Up, Frequency Below 1000MHz



#### (B) Radiated Emission Test Set-UP Frequency Over 1 GHz



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#### **Measurement Equipment Used:** 12.2

966 Chamber						
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.	
ТҮРЕ		NUMBER	NUMBER	CAL.		
EMI Test Receiver	R&S	ESU 40	100363	04/12/2014	04/11/2015	
Loop Antenna	ETS-Lindgren	6502	00143303	12/09/2014	12/08/2015	
Broadband Antenna	TESEQ	CBL 6112D	35240	12/05/2014	12/04/2015	
Horn Antenna	ETS-Lindgren	3117	00143272	12/08/2014	12/07/2015	
Horn Antenna	ETS-Lindgren	3160-09	00117911	11/13/2014	11/12/2015	
Horn Antenna	ETS-Lindgren	3160-10	00117783	11/13/2014	11/12/2015	
Pre Amplifier	EMC Instruments	EMC330	980096	12/19/2014	12/18/2015	
Pre Amplifier	EMC Instruments	EMC0011830	980199	12/19/2014	12/18/2015	
Pre Amplifier	R&S	SCU-18	10204	12/19/2014	12/18/2015	
Pre Amplifier	R&S	SCU-26	100780	12/19/2014	12/18/2015	
Coaxial Cable	Huber+Suhner	RG 214/U	966Rx 9K-30M	12/19/2014	12/18/2015	
Coaxial Cable	Huber+Suhner	RG 214/U SUCOFLEX 104	966Rx 30M-3G	12/19/2014	12/18/2015	
Coaxial Cable	Huber+Suhner	SUCOFLEX 104	966Rx 1G-18G	12/19/2014	12/18/2015	
Coaxial Cable	Huber+Suhner	mini 141-12 SUCOFLEX 104	966Rx 18G-40G	12/19/2014	12/18/2015	
Coaxial Cable	Huber+Suhner	SUCOFLEX 104	966Tx 30M-18G	12/19/2014	12/18/2015	
Coaxial Cable	Huber+Suhner	SUCOFLEX 102	966Tx 18G-40G	12/19/2014	12/18/2015	
Attenuator	WOKEN	218FS-10	RF27	12/19/2014	12/18/2015	
Site NSA	SGS	966 Chamber C	SAC-C	03/04/2015	03/03/2016	
Site VSWR	SGS	966 Chamber C	SAC-C	03/04/2015	03/03/2016	
DC Power Supply	HOLA	DP-3003	D7070035	05/31/2014	05/30/2015	
Controller	MF	MF-7802	N/A	N.C.R.	N.C.R.	
Antenna Master	MF	N/A	N/A	N.C.R.	N.C.R.	
Turn Table	MF	N/A	N/A	N.C.R.	N.C.R.	
Test Software	World-Pallas	Dr. E	V 3.0 Lite	N.C.R.	N.C.R.	

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#### **12.3** Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows: na DA · AE · CI

	$\mathbf{FS} = \mathbf{KA} + \mathbf{AF} + \mathbf{CL} \cdot \mathbf{AG}$	
Where	FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
	RA = Reading Amplitude	AG = Amplifier Gain
	AF = Antenna Factor	

#### 12.4 Measurement Result

Refer to attach tabular data sheets.

#### NOTE:

The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 100kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.

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#### Radiated Spurious Emission Measurement Result 802.11a, 5150~5250 MHz

Operation Band	:802.11 a	Test Date	:2014-02-22
Fundamental Frequency	:5180 MHz	Temp./Humi.	:25.5 deg_C / 62 RH
Operation Mode	:TX LOW	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E": denotes Band Edge Frequency.; "S": denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
62.98	Peak	S	49.23	-28.27	20.96	40.00	-19.04
71.71	Peak	S	51.78	-27.63	24.15	40.00	-15.85
101.78	Peak	S	51.73	-23.54	28.19	43.50	-15.31
312.27	Peak	S	38.66	-18.66	19.99	46.00	-26.01
452.92	Peak	S	38.46	-14.83	23.63	46.00	-22.37
528.58	Peak	S	40.68	-13.16	27.52	46.00	-18.48
10360.00	Peak	Н	36.46	18.94	55.40	68.30	-12.90
15540.00	Peak	Н	-				
20720.00	Peak	Н	-				
25900.00	Peak	Н	-				
31080.00	Peak	Н	-				
36260.00	Peak	Н	-				

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#### FCC ID: NKS-MS5

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Operation Band	:802.11 a	Test Date	:2014-02-22
Fundamental Frequency	:5180 MHz	Temp./Humi.	:16.7 deg_C / 52 RH
Operation Mode	:TX LOW	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
71.71	Peak	S	49.99	-27.63	22.36	40.00	-17.64
101.78	Peak	S	52.02	-23.54	28.48	43.50	-15.02
172.59	Peak	S	45.65	-23.96	21.69	43.50	-21.81
312.27	Peak	S	41.06	-18.66	22.40	46.00	-23.60
445.16	Peak	S	40.20	-15.18	25.01	46.00	-20.99
528.58	Peak	S	41.31	-13.16	28.15	46.00	-17.85
10360.00	Peak	Н	37.95	18.94	56.89	68.30	-11.41
15540.00	Peak	Н	-				
20720.00	Peak	Н	-				
25900.00	Peak	Н	-				
31080.00	Peak	Н	-				
36260.00	Peak	Н	-				

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#### FCC ID: NKS-MS5

Report No.: E2/2015/10036 Issue Date: Mar. 11, 2015 Page 71 of 135

Operation Band	:802.11 a	Test Date	:2014-02-22
Fundamental Frequency	:5220 MHz	Temp./Humi.	:16.7 deg_C / 52 RH
Operation Mode	:TX MID	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
80.44	Peak	S	62.14	-26.83	35.31	40.00	-4.69
83.35	Peak	S	61.54	-26.46	35.08	40.00	-4.92
101.78	Peak	S	53.94	-23.54	30.40	43.50	-13.10
452.92	Peak	S	38.51	-14.83	23.68	46.00	-22.32
503.36	Peak	S	37.57	-14.15	23.42	46.00	-22.58
528.58	Peak	S	40.69	-13.16	27.53	46.00	-18.47
10440.00	Peak	Н	37.27	19.03	56.29	68.30	-12.01
15660.00	Peak	Н	-				
20880.00	Peak	Н	-				
26100.00	Peak	Н	-				
31320.00	Peak	Н	-				
36540.00	Peak	Н	-				

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#### FCC ID: NKS-MS5

Report No.: E2/2015/10036 Issue Date: Mar. 11, 2015 Page 72 of 135

Operation Band	:802.11 a	Test Date	:2014-02-22
Fundamental Frequency	:5220 MHz	Temp./Humi.	:16.7 deg_C / 52 RH
Operation Mode	:TX MID	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
71.71	Peak	S	45.45	-27.63	17.82	40.00	-22.18
96.93	Peak	S	44.82	-24.36	20.46	43.50	-23.04
528.58	Peak	S	40.44	-13.16	27.27	46.00	-18.73
600.36	Peak	S	36.45	-12.45	24.00	46.00	-22.00
647.89	Peak	S	35.72	-11.08	24.64	46.00	-21.36
720.64	Peak	S	37.18	-10.77	26.41	46.00	-19.59
10440.00	Peak	Н	36.90	19.03	55.93	68.30	-12.37
15660.00	Peak	Н	-				
20880.00	Peak	Н	-				
26100.00	Peak	Н	-				
31320.00	Peak	Н	-				
36540.00	Peak	Н	-				

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Operation Band	:802.11 a	Test Date	:2014-02-22
Fundamental Frequency	:5240 MHz	Temp./Humi.	:16.7 deg_C / 52 RH
Operation Mode	:TX HIGH	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
71.71	Peak	S	49.33	-27.63	21.70	40.00	-18.30
101.78	Peak	S	50.91	-23.54	27.37	43.50	-16.13
352.04	Peak	S	38.85	-17.31	21.54	46.00	-24.46
445.16	Peak	S	38.91	-15.18	23.73	46.00	-22.27
503.36	Peak	S	37.31	-14.15	23.16	46.00	-22.84
528.58	Peak	S	40.45	-13.16	27.29	46.00	-18.71
10480.00	Peak	Н	37.08	19.13	56.21	68.30	-12.09
15720.00	Peak	Н	-				
20960.00	Peak	Н	-				
26200.00	Peak	Н	-				
31440.00	Peak	Н	-				
36680.00	Peak	Н	-				

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Operation Band	:802.11 a	Test Date	:2014-02-22
Fundamental Frequency	:5240 MHz	Temp./Humi.	:16.7 deg_C / 52 RH
Operation Mode	:TX HIGH	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
71.71	Peak	S	48.28	-27.63	20.66	40.00	-19.34
101.78	Peak	S	47.09	-23.54	23.55	43.50	-19.95
528.58	Peak	S	40.82	-13.16	27.65	46.00	-18.35
624.61	Peak	S	40.14	-12.15	27.99	46.00	-18.01
647.89	Peak	S	40.32	-11.08	29.24	46.00	-16.76
672.14	Peak	S	39.61	-11.68	27.92	46.00	-18.08
10480.00	Peak	Н	36.73	19.13	55.86	68.30	-12.44
15720.00	Peak	Н	-				
20960.00	Peak	Н	-				
26200.00	Peak	Н	-				
31440.00	Peak	Н	-				
36680.00	Peak	Н	-				

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Operation Band	:802.11 a	Test Date	:2014-02-22
Fundamental Frequency	:5180 MHz	Temp./Humi.	:25.5 deg_C / 63 RH
Operation Mode	:Bandedge LOW	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:VERTICAL
LUTTOI.	.L2 I Iali	Weasurement Antenna 101.	. VERTICAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
5150.00	Peak	Е	50.91	11.14	62.05	74.00	-11.95
5150.00	Average	Е	33.95	11.14	45.09	54.00	-8.91

Operation Band	:802.11 a	Test Date	:2014-02-22
Fundamental Frequency	:5180 MHz	Temp./Humi.	:25.5 deg_C / 63 RH
Operation Mode	:Bandedge LOW	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we've employed is

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5150.00	Peak	E	57.28	11.14	68.42	74.00	-5.58
5150.00	Average	E	37.58	11.14	48.72	54.00	-5.28

peak detector.

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#### Radiated Spurious Emission Measurement Result 802.11n HT20, 5150~5250 MHz (MIMO) **Operation Band** :802.11 n20M Test Date :2014-02-22 **Fundamental Frequency** :5180 MHz Temp./Humi. :16.7 deg\_C / 52 RH **Operation Mode** :TX LOW Engineer :Vito EUT Pol. :E2 Plan Measurement Antenna Pol. :VERTICAL Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB) Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB) "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note : "E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency. "---": denotes Noise Floor. Freq. Detector Note Spectrum Factor Actual Limit Margin

· · <b>I</b> ·			I see a				8
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
71.71	Peak	S	53.69	-27.63	26.06	40.00	-13.94
101.78	Peak	S	51.36	-23.54	27.82	43.50	-15.68
288.02	Peak	S	41.30	-19.45	21.85	46.00	-24.15
445.16	Peak	S	38.46	-15.18	23.28	46.00	-22.72
503.36	Peak	S	38.81	-14.15	24.66	46.00	-21.34
528.58	Peak	S	39.85	-13.16	26.69	46.00	-19.31
10360.00	Peak	Н	37.08	18.94	56.02	68.30	-12.28
15540.00	Peak	Н	-				
20720.00	Peak	Н	-				
25900.00	Peak	Н	-				
31080.00	Peak	Н	-				
36260.00	Peak	Н	-				



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Operation Band	:802.11 n20M	Test Date	:2014-02-22
Fundamental Frequency	:5180 MHz	Temp./Humi.	:16.7 deg_C / 52 RH
Operation Mode	:TX LOW	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
101.78	Peak	S	50.91	-23.54	27.37	43.50	-16.13
173.56	Peak	S	43.64	-23.99	19.65	43.50	-23.85
528.58	Peak	S	41.28	-13.16	28.12	46.00	-17.88
624.61	Peak	S	39.23	-12.15	27.08	46.00	-18.92
672.14	Peak	S	39.27	-11.68	27.59	46.00	-18.41
905.91	Peak	S	32.55	-7.87	24.68	46.00	-21.32
10360.00	Peak	Н	36.30	18.94	55.24	68.30	-13.06
15540.00	Peak	Н	-				
20720.00	Peak	Н	-				
25900.00	Peak	Н	-				
31080.00	Peak	Н	-				
36260.00	Peak	Н	-				

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Operation Band	:802.11 n20M	Test Date	:2014-02-22
Fundamental Frequency	:5220 MHz	Temp./Humi.	:16.7 deg_C / 52 RH
Operation Mode	:TX MID	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
71.71	Peak	S	49.23	-27.63	21.61	40.00	-18.39
101.78	Peak	S	49.77	-23.54	26.23	43.50	-17.27
352.04	Peak	S	39.22	-17.31	21.90	46.00	-24.10
452.92	Peak	S	37.38	-14.83	22.56	46.00	-23.44
503.36	Peak	S	38.86	-14.15	24.71	46.00	-21.29
528.58	Peak	S	39.44	-13.16	26.28	46.00	-19.72
10440.00	Peak	Н	36.92	19.03	55.94	68.30	-12.36
15660.00	Peak	Н	-				
20880.00	Peak	Н	-				
26100.00	Peak	Н	-				
31320.00	Peak	Н	-				
36540.00	Peak	Н	-				



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Operation Band	:802.11 n20M	Test Date	:2014-02-22
Fundamental Frequency	:5220 MHz	Temp./Humi.	:16.7 deg_C / 52 RH
Operation Mode	:TX MID	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
77.53	Peak	S	56.30	-27.08	29.23	40.00	-10.77
101.78	Peak	S	45.56	-23.54	22.02	43.50	-21.48
528.58	Peak	S	40.75	-13.16	27.59	46.00	-18.41
647.89	Peak	S	40.62	-11.08	29.54	46.00	-16.46
672.14	Peak	S	40.17	-11.68	28.49	46.00	-17.51
720.64	Peak	S	38.28	-10.77	27.51	46.00	-18.49
10440.00	Peak	Н	37.06	19.03	56.09	68.30	-12.21
15660.00	Peak	Н	-				
20880.00	Peak	Н	-				
26100.00	Peak	Н	-				
31320.00	Peak	Н	-				
36540.00	Peak	Н	-				

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Operation Band	:802.11 n20M	Test Date	:2014-02-22
Fundamental Frequency	:5240 MHz	Temp./Humi.	:16.7 deg_C / 52 RH
Operation Mode	:TX HIGH	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
71.71	Peak	S	51.38	-27.63	23.76	40.00	-16.24
101.78	Peak	S	50.75	-23.54	27.21	43.50	-16.29
312.27	Peak	S	40.11	-18.66	21.45	46.00	-24.55
452.92	Peak	S	36.09	-14.83	21.27	46.00	-24.73
503.36	Peak	S	37.91	-14.15	23.77	46.00	-22.23
528.58	Peak	S	37.60	-13.16	24.44	46.00	-21.56
10480.00	Peak	Н	36.54	19.13	55.66	68.30	-12.64
15720.00	Peak	Н	-				
20960.00	Peak	Н	-				
26200.00	Peak	Н	-				
31440.00	Peak	Н	-				
36680.00	Peak	Н	-				

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Operation Band	:802.11 n20M	Test Date	:2014-02-22
Fundamental Frequency	:5240 MHz	Temp./Humi.	:16.7 deg_C / 52 RH
Operation Mode	:TX HIGH	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
71.71	Peak	S	49.65	-27.63	22.03	40.00	-17.97
101.78	Peak	S	52.58	-23.54	29.03	43.50	-14.47
352.04	Peak	S	39.25	-17.31	21.94	46.00	-24.06
528.58	Peak	S	42.20	-13.16	29.03	46.00	-16.97
624.61	Peak	S	41.12	-12.15	28.97	46.00	-17.03
672.14	Peak	S	40.21	-11.68	28.52	46.00	-17.48
10480.00	Peak	Н	36.55	19.13	55.68	68.30	-12.62
15720.00	Peak	Н	-				
20960.00	Peak	Н	-				
26200.00	Peak	Н	-				
31440.00	Peak	Н	-				
36680.00	Peak	Н	-				

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Operation Band	:802.11 n20M	Test Date	:2014-02-22
Fundamental Frequency	:5180 MHz	Temp./Humi.	:25.5 deg_C / 63 RH
Operation Mode	:Bandedge LOW	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
5150.00	Peak	Е	49.25	11.14	60.39	74.00	-13.61
5150.00	Average	Е	33.22	11.14	44.36	54.00	-9.64

Operation Band	:802.11 n20M	Test Date	:2014-02-22
Fundamental Frequency	:5180 MHz	Temp./Humi.	:25.5 deg_C / 63 RH
Operation Mode	:Bandedge LOW	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we've employed is

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
5150.00	Peak	Е	49.13	11.14	60.27	74.00	-13.73
5150.00	Average	Е	33.11	11.14	44.25	54.00	-9.75

peak detector.



#### Radiated Spurious Emission Measurement Result 802.11a, 5250MHz-5350MHz

Operation Band	:802.11 a	Test Date	:2014-02-22
Fundamental Frequency	:5260 MHz	Temp./Humi.	:16.7 deg_C / 52 RH
Operation Mode	:TX LOW	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E": denotes Band Edge Frequency.; "S": denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
36.79	Peak	S	52.49	-16.96	35.53	40.00	-4.47
49.40	Peak	S	52.85	-25.16	27.69	40.00	-12.31
101.78	Peak	S	52.67	-23.54	29.12	43.50	-14.38
288.02	Peak	S	40.82	-19.45	21.37	46.00	-24.63
503.36	Peak	S	38.89	-14.15	24.74	46.00	-21.26
528.58	Peak	S	40.07	-13.16	26.90	46.00	-19.10
10520.00	Peak	Н	37.08	19.25	56.33	68.30	-11.97
15780.00	Peak	Н	-				
21040.00	Peak	Н	-				
26300.00	Peak	Н	-				
31560.00	Peak	Н	-				
36820.00	Peak	Н	-				



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Operation Band	:802.11 a	Test Date	:2014-02-22
Fundamental Frequency	:5260 MHz	Temp./Humi.	:16.7 deg_C / 52 RH
Operation Mode	:TX LOW	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
71.71	Peak	S	48.63	-27.63	21.01	40.00	-18.99
352.04	Peak	S	40.28	-17.31	22.97	46.00	-23.03
528.58	Peak	S	41.68	-13.16	28.52	46.00	-17.48
647.89	Peak	S	40.15	-11.08	29.08	46.00	-16.92
672.14	Peak	S	40.32	-11.68	28.64	46.00	-17.36
720.64	Peak	S	38.27	-10.77	27.50	46.00	-18.50
10520.00	Peak	Н	37.67	19.25	56.92	68.30	-11.38
15780.00	Peak	Н	-				
21040.00	Peak	Н	-				
26300.00	Peak	Н	-				
31560.00	Peak	Н	-				
36820.00	Peak	Н	-				

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Operation Band	:802.11 a	Test Date	:2014-02-22
Fundamental Frequency	:5300 MHz	Temp./Humi.	:16.7 deg_C / 52 RH
Operation Mode	:TX MID	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

 $Factor(dB) = Antenna Factor(dB\mu V/m) + Cable Loss(dB) - Pre_Amplifier Gain(dB)$ 

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
71.71	Peak	S	51.22	-27.63	23.59	40.00	-16.41
101.78	Peak	S	52.94	-23.54	29.40	43.50	-14.10
288.02	Peak	S	40.55	-19.45	21.10	46.00	-24.90
311.30	Peak	S	40.70	-18.71	21.99	46.00	-24.01
445.16	Peak	S	36.64	-15.18	21.46	46.00	-24.54
503.36	Peak	S	37.83	-14.15	23.68	46.00	-22.32
10600.00	Peak	Н	36.78	19.38	56.16	74.00	-17.84
10600.00	Average	Н	23.90	19.38	43.28	54.00	-10.72
15900.00	Peak	Н	-				
21200.00	Peak	Н	-				
26500.00	Peak	Н	-				
31800.00	Peak	Н	-				
37100.00	Peak	Н	-				

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Peak

### FCC ID: NKS-MS5

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Operation Band	:802.11 a	Test Date	:2014-02-22
Fundamental Frequency	:5300 MHz	Temp./Humi.	:16.7 deg_C / 52 RH
Operation Mode	:TX MID	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
71.71	Peak	S	48.13	-27.63	20.51	40.00	-19.49
101.78	Peak	S	49.26	-23.54	25.71	43.50	-17.79
174.53	Peak	S	45.68	-24.02	21.66	43.50	-21.84
528.58	Peak	S	40.70	-13.16	27.54	46.00	-18.46
624.61	Peak	S	39.99	-12.15	27.84	46.00	-18.16
720.64	Peak	S	38.76	-10.77	27.99	46.00	-18.01
10600.00	Peak	Н	36.77	19.38	56.15	74.00	-17.85
10600.00	Average	Н	23.92	19.38	43.30	54.00	-10.70
15900.00	Peak	Н	-				
21200.00	Peak	Н	-				
26500.00	Peak	Н	-				
31800.00	Peak	Н	-				

Η

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Operation Band	:802.11 a	Test Date	:2014-02-22
Fundamental Frequency	:5320 MHz	Temp./Humi.	:16.7 deg_C / 52 RH
Operation Mode	:TX HIGH	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
71.71	Peak	S	51.34	-27.63	23.71	40.00	-16.29
101.78	Peak	S	52.78	-23.54	29.24	43.50	-14.26
352.04	Peak	S	38.72	-17.31	21.40	46.00	-24.60
445.16	Peak	S	38.43	-15.18	23.25	46.00	-22.75
503.36	Peak	S	37.62	-14.15	23.47	46.00	-22.53
528.58	Peak	S	40.05	-13.16	26.89	46.00	-19.11
10640.00	Peak	Н	36.61	19.28	55.89	74.00	-18.11
10640.00	Average	Н	29.30	19.28	48.58	54.00	-5.42
15960.00	Peak	Н	-				
21280.00	Peak	Н	-				
26600.00	Peak	Н	-				
31920.00	Peak	Н	-				
37240.00	Peak	Н	-				



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Operation Band	:802.11 a	Test Date	:2014-02-22
Fundamental Frequency	:5320 MHz	Temp./Humi.	:16.7 deg_C / 52 RH
Operation Mode	:TX HIGH	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
53.28	Peak	S	53.24	-26.52	26.72	40.00	-13.28
101.78	Peak	S	51.53	-23.54	27.98	43.50	-15.52
173.56	Peak	S	45.11	-23.99	21.12	43.50	-22.38
528.58	Peak	S	41.01	-13.16	27.85	46.00	-18.15
647.89	Peak	S	39.91	-11.08	28.83	46.00	-17.17
720.64	Peak	S	39.07	-10.77	28.29	46.00	-17.71
10640.00	Peak	Н	35.99	19.28	55.27	74.00	-18.73
10640.00	Average	Н	24.93	19.28	44.21	54.00	-9.79
15960.00	Peak	Н	-				
21280.00	Peak	Н	-				
26600.00	Peak	Н	-				
31920.00	Peak	Н	-				
37240.00	Peak	Н	-				



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RH

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
5350.00	Peak	E	52.07	11.30	63.37	74.00	-10.63
5350.00	Average	E	31.95	11.30	43.25	54.00	-10.75

Operation Band	:802.11 a	Test Date	:2014-02-22
Fundamental Frequency	:5320 MHz	Temp./Humi.	:25.5 deg_C / 63 RH
Operation Mode	:Bandedge HIGH	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

peak detector.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we've employed is

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
5350.00	Peak	Е	56.20	11.30	67.50	74.00	-6.50
5350.00	Average	Е	36.88	11.30	48.18	54.00	-5.82

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## Radiated Spurious Emission Measurement Result 802.11n HT20, 5250~5350 MHz

Operation Band	:802.11 n20M	Test Date	:2014-02-22
Fundamental Frequency	:5260 MHz	Temp./Humi.	:16.7 deg_C / 52 RH
Operation Mode	:TX LOW	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E": denotes Band Edge Frequency.; "S": denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
71.71	Peak	S	51.77	-27.63	24.14	40.00	-15.86
101.78	Peak	S	51.83	-23.54	28.29	43.50	-15.21
216.24	Peak	S	38.16	-22.96	15.20	46.00	-30.80
312.27	Peak	S	40.07	-18.66	21.41	46.00	-24.59
452.92	Peak	S	38.88	-14.83	24.06	46.00	-21.94
528.58	Peak	S	41.20	-13.16	28.03	46.00	-17.97
10520.00	Peak	Н	36.71	19.25	55.96	68.30	-12.34
15780.00	Peak	Н	-				
21040.00	Peak	Н	-				
26300.00	Peak	Н	-				
31560.00	Peak	Н	-				
36820.00	Peak	Н	-				

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Operation Band	:802.11 n20M	Test Date	:2014-02-22
Fundamental Frequency	:5260 MHz	Temp./Humi.	:16.7 deg_C / 52 RH
Operation Mode	:TX LOW	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
71.71	Peak	S	51.49	-27.63	23.86	40.00	-16.14
352.04	Peak	S	41.03	-17.31	23.71	46.00	-22.29
528.58	Peak	S	40.59	-13.16	27.43	46.00	-18.57
624.61	Peak	S	39.46	-12.15	27.31	46.00	-18.69
672.14	Peak	S	39.87	-11.68	28.19	46.00	-17.81
720.64	Peak	S	38.97	-10.77	28.20	46.00	-17.80
10520.00	Peak	Н	37.19	19.25	56.44	68.30	-11.86
15780.00	Peak	Н	-				
21040.00	Peak	Н	-				
26300.00	Peak	Н	-				
31560.00	Peak	Н	-				
36820.00	Peak	Н	-				



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Operation Band	:802.11 n20M	Test Date	:2014-02-22
Fundamental Frequency	:5300 MHz	Temp./Humi.	:16.7 deg_C / 52 RH
Operation Mode	:TX MID	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
100.81	Peak	S	50.34	-23.69	26.66	43.50	-16.84
288.02	Peak	S	41.05	-19.45	21.61	46.00	-24.39
312.27	Peak	S	39.94	-18.66	21.27	46.00	-24.73
445.16	Peak	S	37.30	-15.18	22.12	46.00	-23.88
503.36	Peak	S	38.65	-14.15	24.50	46.00	-21.50
528.58	Peak	S	36.21	-13.16	23.05	46.00	-22.95
10600.00	Peak	Н	36.72	19.38	56.10	74.00	-17.90
10600.00	Average	Н	24.13	19.38	43.51	54.00	-10.49
15900.00	Peak	Н	-				
21200.00	Peak	Н	-				
26500.00	Peak	Н	-				
31800.00	Peak	Н	-				
37100.00	Peak	Н	-				

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Operation Band	:802.11 n20M	Test Date	:2014-02-22
Fundamental Frequency	:5300 MHz	Temp./Humi.	:16.7 deg_C / 52 RH
Operation Mode	:TX MID	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
71.71	Peak	S	50.35	-27.63	22.72	40.00	-17.28
101.78	Peak	S	46.59	-23.54	23.04	43.50	-20.46
170.65	Peak	S	45.91	-23.79	22.11	43.50	-21.39
528.58	Peak	S	40.35	-13.16	27.19	46.00	-18.81
647.89	Peak	S	39.81	-11.08	28.74	46.00	-17.26
672.14	Peak	S	40.09	-11.68	28.41	46.00	-17.59
10600.00	Peak	Н	36.42	19.38	55.79	74.00	-18.21
10600.00	Average	Н	24.15	19.38	43.53	54.00	-10.47
15900.00	Peak	Н	-				
21200.00	Peak	Н	-				
26500.00	Peak	Н	-				
31800.00	Peak	Н	-				
37100.00	Peak	Н	-				

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Peak

Η

## FCC ID: NKS-MS5

Report No.: E2/2015/10036 Issue Date: Mar. 11, 2015 Page 94 of 135

Operation Band	:802.11 n20M	Test Date	:2014-02-22
Fundamental Frequency	:5320 MHz	Temp./Humi.	:16.7 deg_C / 52 RH
Operation Mode	:TX HIGH	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
71.71	Peak	S	49.74	-27.63	22.12	40.00	-17.88
101.78	Peak	S	54.06	-23.54	30.52	43.50	-12.98
312.27	Peak	S	39.31	-18.66	20.65	46.00	-25.35
359.80	Peak	S	33.31	-17.16	16.15	46.00	-29.85
452.92	Peak	S	36.77	-14.83	21.95	46.00	-24.05
503.36	Peak	S	37.54	-14.15	23.40	46.00	-22.60
10640.00	Peak	Н	37.12	19.28	56.40	74.00	-17.60
10640.00	Average	Н	24.32	19.28	43.60	54.00	-10.40
15960.00	Peak	Н	-				
21280.00	Peak	Н	-				
26600.00	Peak	Н	-				
31920.00	Peak	Н	-				



Peak

## FCC ID: NKS-MS5

Report No.: E2/2015/10036 Issue Date: Mar. 11, 2015 Page 95 of 135

Operation Band	:802.11 n20M	Test Date	:2014-02-22
Fundamental Frequency	:5320 MHz	Temp./Humi.	:16.7 deg_C / 52 RH
Operation Mode	:TX HIGH	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
101.78	Peak	S	51.35	-23.54	27.81	43.50	-15.69
110.51	Peak	S	51.43	-22.26	29.17	43.50	-14.33
125.06	Peak	S	56.36	-21.38	34.98	43.50	-8.52
528.58	Peak	S	40.57	-13.16	27.41	46.00	-18.59
647.89	Peak	S	37.42	-11.08	26.34	46.00	-19.66
720.64	Peak	S	38.56	-10.77	27.79	46.00	-18.21
10640.00	Peak	Н	36.66	19.28	55.94	74.00	-18.06
10640.00	Average	Н	24.10	19.28	43.38	54.00	-10.62
15960.00	Peak	Н	-				
21280.00	Peak	Н	-				
26600.00	Peak	Н	-				
31920.00	Peak	Н	-				

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Report No.: E2/2015/10036 Issue Date: Mar. 11, 2015 Page 96 of 135

Operation Band	:802.11 n20M	Test Date	:2014-02-22
Fundamental Frequency	:5320 MHz	Temp./Humi.	:25.5 deg_C / 63 RH
Operation Mode	:Bandedge HIGH	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
5350.00	Peak	Е	51.70	11.30	63.00	74.00	-11.00
5350.00	Average	Е	34.05	11.30	45.35	54.00	-8.65

Operation Band	:802.11 n20M	Test Date	:2014-02-22
Fundamental Frequency	:5320 MHz	Temp./Humi.	:25.5 deg_C / 63 RH
Operation Mode	:Bandedge HIGH	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we've employed is

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
5350.00	Peak	Е	56.81	11.30	68.11	74.00	-5.89
5350.00	Average	E	37.03	11.30	48.33	54.00	-5.67

peak detector.



Peak

#### Radiated Spurious Emission Measurement Result 802.11a, 5470~5725 MHz

Operation Band	:802.11 a	Test Date	:2014-02-22
Fundamental Frequency	:5500 MHz	Temp./Humi.	:16.7 deg_C / 52 RH
Operation Mode	:TX LOW	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E": denotes Band Edge Frequency.; "S": denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
71.71	Peak	S	51.46	-27.63	23.83	40.00	-16.17
101.78	Peak	S	54.34	-23.54	30.79	43.50	-12.71
312.27	Peak	S	37.88	-18.66	19.22	46.00	-26.78
352.04	Peak	S	38.46	-17.31	21.15	46.00	-24.85
445.16	Peak	S	38.86	-15.18	23.68	46.00	-22.32
528.58	Peak	S	40.17	-13.16	27.01	46.00	-18.99
11000.00	Peak	Н	36.76	20.02	56.77	74.00	-17.23
11000.00	Average	Н	24.66	20.02	44.68	54.00	-9.32
16500.00	Peak	Н	-				
22000.00	Peak	Н	-				
27500.00	Peak	Н	-				
33000.00	Peak	Н	-				

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Operation Band	:802.11 a	Test Date	:2014-02-22
Fundamental Frequency	:5500 MHz	Temp./Humi.	:16.7 deg_C / 52 RH
Operation Mode	:TX LOW	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
71.71	Peak	S	50.51	-27.63	22.88	40.00	-17.12
178.41	Peak	S	44.26	-24.30	19.97	43.50	-23.53
312.27	Peak	S	39.42	-18.66	20.76	46.00	-25.24
528.58	Peak	S	37.76	-13.16	24.60	46.00	-21.40
672.14	Peak	S	39.50	-11.68	27.81	46.00	-18.19
720.64	Peak	S	39.19	-10.77	28.42	46.00	-17.58
11000.00	Peak	Н	37.19	20.02	57.21	74.00	-16.79
11000.00	Average	Н	25.93	20.02	45.95	54.00	-8.05
16500.00	Peak	Н	-				
22000.00	Peak	Н	-				
27500.00	Peak	Н	-				
33000.00	Peak	Н	-				
38500.00	Peak	Н	-				



Peak

#### FCC ID: NKS-MS5

Operation Band	:802.11 a	Test Date	:2014-02-22
Fundamental Frequency	:5580 MHz	Temp./Humi.	:16.7 deg_C / 52 RH
Operation Mode	:TX MID	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
71.71	Peak	S	51.94	-27.63	24.31	40.00	-15.69
101.78	Peak	S	52.83	-23.54	29.29	43.50	-14.21
288.02	Peak	S	40.50	-19.45	21.05	46.00	-24.95
312.27	Peak	S	40.29	-18.66	21.63	46.00	-24.37
452.92	Peak	S	36.61	-14.83	21.79	46.00	-24.21
503.36	Peak	S	38.82	-14.15	24.67	46.00	-21.33
11160.00	Peak	Н	37.21	20.38	57.59	74.00	-16.41
11160.00	Average	Н	24.34	20.38	44.72	54.00	-9.28
16740.00	Peak	Н	-				
22320.00	Peak	Н	-				
27900.00	Peak	Н	-				
33480.00	Peak	Н	-				

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Peak

### FCC ID: NKS-MS5

Report No.: E2/2015/10036 Issue Date: Mar. 11, 2015 Page 100 of 135

Operation Band	:802.11 a	Test Date	:2014-02-22
Fundamental Frequency	:5580 MHz	Temp./Humi.	:16.7 deg_C / 52 RH
Operation Mode	:TX MID	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
71.71	Peak	S	49.94	-27.63	22.32	40.00	-17.68
101.78	Peak	S	52.83	-23.54	29.29	43.50	-14.21
171.62	Peak	S	46.44	-23.88	22.57	43.50	-20.93
528.58	Peak	S	40.25	-13.16	27.09	46.00	-18.91
624.61	Peak	S	39.64	-12.15	27.49	46.00	-18.51
720.64	Peak	S	38.66	-10.77	27.88	46.00	-18.12
11160.00	Peak	Н	36.36	20.38	56.74	74.00	-17.26
11160.00	Average	Н	24.81	20.38	45.19	54.00	-8.81
16740.00	Peak	Н	-				
22320.00	Peak	Н	-				
27900.00	Peak	Н	-				
33480.00	Peak	Н	-				
<b>2</b> 00 60 00							

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Peak

### FCC ID: NKS-MS5

Report No.: E2/2015/10036 Issue Date: Mar. 11, 2015 Page 101 of 135

Operation Band	:802.11 a	Test Date	:2014-02-22
Fundamental Frequency	:5700 MHz	Temp./Humi.	:16.7 deg_C / 52 RH
Operation Mode	:TX HIGH	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV∕m	dB
71.71	Peak	S	53.40	-27.63	25.77	40.00	-14.23
101.78	Peak	S	53.36	-23.54	29.82	43.50	-13.68
187.14	Peak	S	42.53	-24.24	18.29	43.50	-25.21
288.02	Peak	S	40.74	-19.45	21.30	46.00	-24.70
445.16	Peak	S	38.31	-15.18	23.13	46.00	-22.87
528.58	Peak	S	40.64	-13.16	27.48	46.00	-18.52
11400.00	Peak	Н	37.47	20.81	58.28	74.00	-15.72
11400.00	Average	Н	25.07	20.81	45.88	54.00	-8.12
17100.00	Peak	Н	-				
22800.00	Peak	Н	-				
28500.00	Peak	Н	-				
34200.00	Peak	Н	-				

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Peak

### FCC ID: NKS-MS5

Report No.: E2/2015/10036 Issue Date: Mar. 11, 2015 Page 102 of 135

Operation Band	:802.11 a	Test Date	:2014-02-22
Fundamental Frequency	:5700 MHz	Temp./Humi.	:16.7 deg_C / 52 RH
Operation Mode	:TX HIGH	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
71.71	Peak	S	49.63	-27.63	22.00	40.00	-18.00
101.78	Peak	S	49.69	-23.54	26.15	43.50	-17.35
176.47	Peak	S	44.95	-24.14	20.81	43.50	-22.69
528.58	Peak	S	39.28	-13.16	26.12	46.00	-19.88
647.89	Peak	S	37.92	-11.08	26.84	46.00	-19.16
720.64	Peak	S	38.07	-10.77	27.30	46.00	-18.70
11400.00	Peak	Н	36.50	20.81	57.31	74.00	-16.69
11400.00	Average	Н	24.90	20.81	45.71	54.00	-8.29
17100.00	Peak	Н	-				
22800.00	Peak	Н	-				
28500.00	Peak	Н	-				
34200.00	Peak	Н	-				

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Operation Ba Fundamental Operation Mo EUT Pol.	Frequency	:802.11 a :5500 MHz :Bandedge H :E2 Plan	IIGH	Test Date Temp./Humi. Engineer Measurement Ar	itenna Pol.	:2014-02-22 :25.5 deg_C / :Vito :VERTICAL	63 RH
Actual FS(dB	$B\mu V/m) = SPA$	. Reading leve	$el(dB\mu V) + Fac$	ctor(dB)			
Factor(dB) =	Antenna Factor	$(dB\mu V/m) +$	Cable Loss(dE	B) – Pre_Amplifie	er Gain(dB)		
Note : "F"	: denotes Fund	amental Frequ	uency. ; "H" : de	enotes Harmonic F	Frequency.		
"Е	": denotes Band	d Edge Frequer	ncy.; "S" : deno	tes Spurious Free	quency. "" : (	denotes Noise F	loor.
The	e trace on RE(ra	diation emiss	ion) plot is as c	olored blue, and t	the detection m	anner we've en	nployed is
pea	k detector.						
Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Leve	el	FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
5460.00	Peak	Е	45.48	11.46	56.94	74.00	-17.06
5460.00	Average	E	33.76	11.46	45.22	54.00	-8.78
5470.00	Peak	Е	50.28	11.46	61.74	68.30	-6.56

Operation Band	:802.11 a	Test Date	:2014-02-22
Fundamental Frequency	:5500 MHz	Temp./Humi.	:25.5 deg_C / 63 RH
Operation Mode	:Bandedge HIGH	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we've employed is

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
5460.00	Peak	Е	50.25	11.46	61.71	74.00	-12.29
5460.00	Average	E	36.02	11.46	47.48	54.00	-6.52
5469.08	Peak	S	55.89	11.46	67.34	68.30	-0.96
5470.00	Peak	Е	55.10	11.46	66.56	68.30	-1.74

peak detector.

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Operation Band	:802.11 a	Test Date	:2014-02-22
Fundamental Frequency	:5700 MHz	Temp./Humi.	:25.5 deg_C / 63 RH
Operation Mode	:Bandedge HIGH	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
5725.00	Peak	Е	49.14	12.27	61.41	68.30	-6.89

Operation Band	:802.11 a	Test Date	:2014-02-22
Fundamental Frequency	:5700 MHz	Temp./Humi.	:25.5 deg_C / 63 RH
Operation Mode	:Bandedge HIGH	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

 $Factor(dB) = Antenna Factor(dB\mu V/m) + Cable Loss(dB) - Pre_Amplifier Gain(dB)$ 

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
5725.00	Peak	Е	53.14	12.27	65.41	68.30	-2.89
5725.76	Peak	S	54.12	12.27	66.39	68.30	-1.91

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Peak

## FCC ID: NKS-MS5

#### Radiated Spurious Emission Measurement Result 802.11n HT20, 5470~5725 MHz (MIMO) **Operation Band** :802.11 n20M Test Date :2014-02-22

Fundamental Frequency	:5500 MHz	Temp./Humi.	:16.7 deg_C / 52 RH
Operation Mode	:TX LOW	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
71.71	Peak	S	50.14	-27.63	22.51	40.00	-17.49
101.78	Peak	S	49.84	-23.54	26.30	43.50	-17.20
216.24	Peak	S	37.84	-22.96	14.88	46.00	-31.12
352.04	Peak	S	38.95	-17.31	21.64	46.00	-24.36
503.36	Peak	S	37.10	-14.15	22.95	46.00	-23.05
528.58	Peak	S	40.47	-13.16	27.31	46.00	-18.69
11000.00	Peak	Н	37.33	20.02	57.35	74.00	-16.65
11000.00	Average	Н	24.56	20.02	44.58	54.00	-9.42
16500.00	Peak	Н	-				
22000.00	Peak	Н	-				
27500.00	Peak	Н	-				
33000.00	Peak	Н	-				

Η

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Peak

## FCC ID: NKS-MS5

Report No.: E2/2015/10036 Issue Date: Mar. 11, 2015 Page 106 of 135

Operation Band	:802.11 n20M	Test Date	:2014-02-22
Fundamental Frequency	:5500 MHz	Temp./Humi.	:16.7 deg_C / 52 RH
Operation Mode	:TX LOW	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
71.71	Peak	S	49.53	-27.63	21.91	40.00	-18.09
170.65	Peak	S	45.27	-23.79	21.48	43.50	-22.02
352.04	Peak	S	40.21	-17.31	22.90	46.00	-23.10
528.58	Peak	S	41.73	-13.16	28.56	46.00	-17.44
647.89	Peak	S	40.14	-11.08	29.06	46.00	-16.94
672.14	Peak	S	40.45	-11.68	28.77	46.00	-17.23
11000.00	Peak	Н	36.58	20.02	56.59	74.00	-17.41
11000.00	Average	Н	24.44	20.02	44.46	54.00	-9.54
16500.00	Peak	Н	-				
22000.00	Peak	Н	-				
27500.00	Peak	Н	-				
33000.00	Peak	Н	-				

Η



Report No.: E2/2015/10036 Issue Date: Mar. 11, 2015 Page 107 of 135

Operation Band	:802.11 n20M	Test Date	:2014-02-22
Fundamental Frequency	:5580 MHz	Temp./Humi.	:16.7 deg_C / 52 RH
Operation Mode	:TX MID	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
71.71	Peak	S	51.62	-27.63	24.00	40.00	-16.00
101.78	Peak	S	53.72	-23.54	30.18	43.50	-13.32
288.02	Peak	S	39.95	-19.45	20.51	46.00	-25.49
445.16	Peak	S	37.36	-15.18	22.18	46.00	-23.82
503.36	Peak	S	37.74	-14.15	23.60	46.00	-22.40
528.58	Peak	S	37.45	-13.16	24.29	46.00	-21.71
11160.00	Peak	Н	38.64	20.38	59.02	74.00	-14.98
11160.00	Average	Н	24.26	20.38	44.64	54.00	-9.36
16740.00	Peak	Н	-				
22320.00	Peak	Н	-				
27900.00	Peak	Н	-				
33480.00	Peak	Н	-				
39060.00	Peak	Н	-				

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Operation Band	:802.11 n20M	Test Date	:2014-02-22
Fundamental Frequency	:5580 MHz	Temp./Humi.	:16.7 deg_C / 52 RH
Operation Mode	:TX MID	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E": denotes Band Edge Frequency.; "S": denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
71.71	Peak	S	48.95	-27.63	21.32	40.00	-18.68
101.78	Peak	S	41.63	-23.54	18.09	43.50	-25.41
528.58	Peak	S	40.48	-13.16	27.32	46.00	-18.68
576.11	Peak	S	37.84	-12.45	25.39	46.00	-20.61
647.89	Peak	S	40.90	-11.08	29.82	46.00	-16.18
672.14	Peak	S	40.47	-11.68	28.78	46.00	-17.22
11160.00	Peak	Н	37.39	20.38	57.77	74.00	-16.23
11160.00	Average	Н	24.57	20.38	44.95	54.00	-9.05
16740.00	Peak	Н	-				
22320.00	Peak	Н	-				
27900.00	Peak	Н	-				
33480.00	Peak	Н	-				
39060.00	Peak	Н	-				



Peak

#### FCC ID: NKS-MS5

Report No.: E2/2015/10036 Issue Date: Mar. 11, 2015 Page 109 of 135

Operation Band	:802.11 n20M	Test Date	:2014-02-22
Fundamental Frequency	:5700 MHz	Temp./Humi.	:16.7 deg_C / 52 RH
Operation Mode	:TX HIGH	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV∕m	dBµV/m	dB
62.98	Peak	S	49.38	-28.27	21.11	40.00	-18.89
71.71	Peak	S	52.05	-27.63	24.43	40.00	-15.57
101.78	Peak	S	53.85	-23.54	30.31	43.50	-13.19
452.92	Peak	S	39.26	-14.83	24.43	46.00	-21.57
503.36	Peak	S	38.27	-14.15	24.12	46.00	-21.88
528.58	Peak	S	41.26	-13.16	28.10	46.00	-17.90
11400.00	Peak	Н	37.41	20.81	58.22	74.00	-15.78
11400.00	Average	Н	24.59	20.81	45.40	54.00	-8.60
17100.00	Peak	Н	-				
22800.00	Peak	Н	-				
28500.00	Peak	Н	-				
34200.00	Peak	Н	-				

Η



Peak

#### FCC ID: NKS-MS5

Report No.: E2/2015/10036 Issue Date: Mar. 11, 2015 Page 110 of 135

Operation Band	:802.11 n20M	Test Date	:2014-02-22
Fundamental Frequency	:5700 MHz	Temp./Humi.	:16.7 deg_C / 52 RH
Operation Mode	:TX HIGH	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
rieq.		Note	-	Pactor			iviai giii
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV∕m	dB
71.71	Peak	S	50.04	-27.63	22.41	40.00	-17.59
101.78	Peak	S	50.60	-23.54	27.06	43.50	-16.44
528.58	Peak	S	40.29	-13.16	27.13	46.00	-18.87
624.61	Peak	S	38.53	-12.15	26.38	46.00	-19.62
672.14	Peak	S	39.68	-11.68	27.99	46.00	-18.01
720.64	Peak	S	37.86	-10.77	27.09	46.00	-18.91
11400.00	Peak	Н	36.71	20.81	57.52	74.00	-16.48
11400.00	Average	Н	24.43	20.81	45.24	54.00	-8.76
17100.00	Peak	Н	-				
22800.00	Peak	Н	-				
28500.00	Peak	Н	-				
34200.00	Peak	Н	-				

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Report No.: E2/2015/10036 Issue Date: Mar. 11, 2015 Page 111 of 135

Operation Band	:802.11 n20M	Test Date	:2014-02-22
Fundamental Frequency	:5500 MHz	Temp./Humi.	:25.5 deg_C / 63 RH
Operation Mode	:Bandedge LOW	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

F	Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
		Mode		Reading Level		FS	@3m	
N	ИНz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
54	60.00	Peak	Е	44.36	11.46	55.82	74.00	-18.18
54	60.00	Average	Е	33.57	11.46	45.03	54.00	-8.97
54	70.00	Peak	Е	50.36	11.46	61.82	68.30	-6.48

Operation Band	:802.11 n20M	Test Date	:2014-02-22
Fundamental Frequency	:5500 MHz	Temp./Humi.	:25.5 deg_C / 63 RH
Operation Mode	:Bandedge LOW	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
5460.00	Peak	Е	48.37	11.46	59.83	74.00	-14.17
5460.00	Average	Е	35.56	11.46	47.02	54.00	-6.98
5470.00	Peak	Е	56.03	11.46	67.48	68.30	-0.82

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Operation Band	:802.11 n20M	Test Date	:2014-02-22
Fundamental Frequency	:5700 MHz	Temp./Humi.	:25.5 deg_C / 63 RH
Operation Mode	:Bandedge HIGH	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
5725.00	Peak	Е	49.37	12.27	61.64	68.30	-6.66

Operation Band	:802.11 n20M	Test Date	:2014-02-22
Fundamental Frequency	:5700 MHz	Temp./Humi.	:25.5 deg_C / 63 RH
Operation Mode	:Bandedge HIGH	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

 $Factor(dB) = Antenna Factor(dB\mu V/m) + Cable Loss(dB) - Pre_Amplifier Gain(dB)$ 

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/OP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
IVITIZ	110,21,111	1/11/L/D	azav	uр	u2pi ( )	aba ( / m	чD



#### Radiated Spurious Emission Measurement Result 802.11a, 5725~5850 MHz

Operation Band	:802.11 a	Test Date	:2014-02-22
Fundamental Frequency	:5745 MHz	Temp./Humi.	:16.7 deg_C / 52 RH
Operation Mode	:TX LOW	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E": denotes Band Edge Frequency.; "S": denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
71.71	Peak	S	52.38	-27.63	24.75	40.00	-15.25
101.78	Peak	S	54.15	-23.54	30.61	43.50	-12.89
312.27	Peak	S	38.92	-18.66	20.26	46.00	-25.74
352.04	Peak	S	39.32	-17.31	22.01	46.00	-23.99
452.92	Peak	S	38.69	-14.83	23.86	46.00	-22.14
528.58	Peak	S	40.39	-13.16	27.23	46.00	-18.77
11490.00	Peak	Н	37.12	21.08	58.21	74.00	-15.79
11490.00	Average	Н	24.68	21.08	45.76	54.00	-8.24
17235.00	Peak	Н	-				
22980.00	Peak	Н	-				
28725.00	Peak	Н	-				

Η

Peak

34470.00

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#### FCC ID: NKS-MS5

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Operation Band	:802.11 a	Test Date	:2014-02-22
Fundamental Frequency	:5745 MHz	Temp./Humi.	:16.7 deg_C / 52 RH
Operation Mode	:TX LOW	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
71.71	Peak	S	50.34	-27.63	22.71	40.00	-17.29
101.78	Peak	S	53.18	-23.54	29.64	43.50	-13.86
312.27	Peak	S	40.32	-18.66	21.66	46.00	-24.34
359.80	Peak	S	40.22	-17.16	23.06	46.00	-22.94
445.16	Peak	S	39.49	-15.18	24.31	46.00	-21.69
528.58	Peak	S	39.75	-13.16	26.59	46.00	-19.41
11490.00	Peak	Н	37.94	21.08	59.02	74.00	-14.98
11490.00	Average	Н	24.93	21.08	46.01	54.00	-7.99
17235.00	Peak	Н	-				
22980.00	Peak	Н	-				
28725.00	Peak	Н	-				

Η

Peak

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Operation Band	:802.11 a	Test Date	:2014-02-22
Fundamental Frequency	:5785 MHz	Temp./Humi.	:16.7 deg_C / 52 RH
Operation Mode	:TX MID	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
71.71	Peak	S	49.84	-27.63	22.21	40.00	-17.79
101.78	Peak	S	53.07	-23.54	29.53	43.50	-13.97
352.04	Peak	S	39.11	-17.31	21.80	46.00	-24.20
445.16	Peak	S	38.92	-15.18	23.74	46.00	-22.26
503.36	Peak	S	37.65	-14.15	23.50	46.00	-22.50
528.58	Peak	S	39.89	-13.16	26.72	46.00	-19.28
11570.00	Peak	Н	38.60	21.14	59.74	74.00	-14.26
11570.00	Average	Н	24.96	21.14	46.10	54.00	-7.90
17355.00	Peak	Н	-				
23140.00	Peak	Н	-				
28925.00	Peak	Н	-				

Η

Peak



#### FCC ID: NKS-MS5

Report No.: E2/2015/10036 Issue Date: Mar. 11, 2015 Page 116 of 135

Operation Band	:802.11 a	Test Date	:2014-02-22
Fundamental Frequency	:5785 MHz	Temp./Humi.	:16.7 deg_C / 52 RH
Operation Mode	:TX MID	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E": denotes Band Edge Frequency.; "S": denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
71.71	Peak	S	51.21	-27.63	23.58	40.00	-16.42
101.78	Peak	S	48.23	-23.54	24.69	43.50	-18.81
125.06	Peak	S	49.87	-21.38	28.49	43.50	-15.01
528.58	Peak	S	41.54	-13.16	28.38	46.00	-17.62
647.89	Peak	S	40.61	-11.08	29.54	46.00	-16.46
720.64	Peak	S	39.32	-10.77	28.55	46.00	-17.45
11570.00	Peak	Н	37.63	21.14	58.77	74.00	-15.23
11570.00	Average	Н	24.87	21.14	46.01	54.00	-7.99
17355.00	Peak	Н	-				
23140.00	Peak	Н	-				
28925.00	Peak	Н	-				

Η

Peak



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Operation Band	:802.11 a	Test Date	:2014-02-22
Fundamental Frequency	:5825 MHz	Temp./Humi.	:16.7 deg_C / 52 RH
Operation Mode	:TX HIGH	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
71.71	Peak	S	53.39	-27.63	25.76	40.00	-14.24
101.78	Peak	S	53.19	-23.54	29.65	43.50	-13.85
288.02	Peak	S	40.58	-19.45	21.13	46.00	-24.87
312.27	Peak	S	39.65	-18.66	20.99	46.00	-25.01
445.16	Peak	S	38.10	-15.18	22.91	46.00	-23.09
528.58	Peak	S	41.13	-13.16	27.97	46.00	-18.03
11650.00	Peak	Н	37.30	21.27	58.57	74.00	-15.43
11650.00	Average	Н	24.97	21.27	46.24	54.00	-7.76
17475.00	Peak	Н	-				
23300.00	Peak	Н	-				
29125.00	Peak	Н	-				
34950.00	Peak	Н	-				

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Operation Band	:802.11 a	Test Date	:2014-02-22
Fundamental Frequency	:5825 MHz	Temp./Humi.	:16.7 deg_C / 52 RH
Operation Mode	:TX HIGH	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
71.71	Peak	S	52.38	-27.63	24.75	40.00	-15.25
101.78	Peak	S	48.04	-23.54	24.50	43.50	-19.00
169.68	Peak	S	43.31	-23.70	19.61	43.50	-23.89
528.58	Peak	S	41.24	-13.16	28.08	46.00	-17.92
647.89	Peak	S	40.39	-11.08	29.32	46.00	-16.68
720.64	Peak	S	39.32	-10.77	28.55	46.00	-17.45
11650.00	Peak	Н	37.78	21.27	59.06	74.00	-14.94
11650.00	Average	Н	24.92	21.27	46.19	54.00	-7.81
17475.00	Peak	Н	-				
23300.00	Peak	Н	-				
29125.00	Peak	Н	-				
34950.00	Peak	Н	-				



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Operation Band	:802.11 a	Test Date	:2014-02-22
Fundamental Frequency	:5745 MHz	Temp./Humi.	:25.5 deg_C / 63 RH
Operation Mode	:Bandedge LOW	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
IVITIZ	IKQIAV	1711/L/S	մերտ	uD	uDµ v / III	ubμv/m	uD

Operation Band	:802.11 a	Test Date	:2014-02-22
Fundamental Frequency	:5745 MHz	Temp./Humi.	:25.5 deg_C / 63 RH
Operation Mode	:Bandedge LOW	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

 $Factor(dB) = Antenna Factor(dB\mu V/m) + Cable Loss(dB) - Pre_Amplifier Gain(dB)$ 

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB



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Operation Band	:802.11 a	Test Date	:2014-02-22
Fundamental Frequency	:5825 MHz	Temp./Humi.	:25.5 deg_C / 63 RH
Operation Mode	:Bandedge LOW	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
5850.00	Peak	_	52.12	12.61	64.73	68.30	-3.57

Operation Band	:802.11 a	Test Date	:2014-02-22
Fundamental Frequency	:5825 MHz	Temp./Humi.	:25.5 deg_C / 63 RH
Operation Mode	:Bandedge LOW	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

 $Factor(dB) = Antenna Factor(dB\mu V/m) + Cable Loss(dB) - Pre_Amplifier Gain(dB)$ 

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/OP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
IVITIZ	IK/QI/AV	1/11/12/5	uυμν	uD	ubµ v / m	αυμ • / Π	uD



#### Radiated Spurious Emission Measurement Result 802.11n\_HT20 , 5725~5850 MHz

Operation Band	:802.11 n20M	Test Date	:2014-02-22
Fundamental Frequency	:5745 MHz	Temp./Humi.	:16.7 deg_C / 52 RH
Operation Mode	:TX LOW	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E": denotes Band Edge Frequency.; "S": denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
71.71	Peak	S	52.02	-27.63	24.39	40.00	-15.61
101.78	Peak	S	54.21	-23.54	30.66	43.50	-12.84
312.27	Peak	S	39.70	-18.66	21.04	46.00	-24.96
452.92	Peak	S	39.23	-14.83	24.40	46.00	-21.60
503.36	Peak	S	37.74	-14.15	23.59	46.00	-22.41
528.58	Peak	S	41.46	-13.16	28.30	46.00	-17.70
11490.00	Peak	Н	38.21	21.08	59.29	74.00	-14.71
11490.00	Average	Н	24.63	21.08	45.71	54.00	-8.29
17235.00	Peak	Н	-				
22980.00	Peak	Н	-				
28725.00	Peak	Н	-				

Η

Peak

34470.00

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Operation Band	:802.11 n20M	Test Date	:2014-02-22
Fundamental Frequency	:5745 MHz	Temp./Humi.	:16.7 deg_C / 52 RH
Operation Mode	:TX LOW	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV∕m	dB
101.78	Peak	S	46.82	-23.54	23.28	43.50	-20.22
170.65	Peak	S	45.46	-23.79	21.67	43.50	-21.83
528.58	Peak	S	37.22	-13.16	24.06	46.00	-21.94
624.61	Peak	S	38.48	-12.15	26.33	46.00	-19.67
672.14	Peak	S	39.31	-11.68	27.63	46.00	-18.37
720.64	Peak	S	37.26	-10.77	26.49	46.00	-19.51
11490.00	Peak	Н	37.65	21.08	58.73	74.00	-15.27
11490.00	Average	Н	24.61	21.08	45.69	54.00	-8.31
17235.00	Peak	Н	-				
22980.00	Peak	Н	-				
28725.00	Peak	Н	-				

Η

Peak



#### FCC ID: NKS-MS5

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Operation Band	:802.11 n20M	Test Date	:2014-02-22
Fundamental Frequency	:5785 MHz	Temp./Humi.	:16.7 deg_C / 52 RH
Operation Mode	:TX MID	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
71.71	Peak	S	51.56	-27.63	23.94	40.00	-16.06
101.78	Peak	S	54.98	-23.54	31.43	43.50	-12.07
216.24	Peak	S	39.49	-22.96	16.53	46.00	-29.47
452.92	Peak	S	38.52	-14.83	23.70	46.00	-22.30
503.36	Peak	S	38.68	-14.15	24.54	46.00	-21.46
528.58	Peak	S	40.30	-13.16	27.13	46.00	-18.87
11570.00	Peak	Н	38.18	21.14	59.32	74.00	-14.68
11570.00	Average	Н	24.90	21.14	46.04	54.00	-7.96
17355.00	Peak	Н	-				
23140.00	Peak	Н	-				
28925.00	Peak	Н	-				

Η

Peak

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#### FCC ID: NKS-MS5

Report No.: E2/2015/10036 Issue Date: Mar. 11, 2015 Page 124 of 135

Operation Band	:802.11 n20M	Test Date	:2014-02-22
Fundamental Frequency	:5785 MHz	Temp./Humi.	:16.7 deg_C / 52 RH
Operation Mode	:TX MID	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E": denotes Band Edge Frequency.; "S": denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
77.53	Peak	S	60.84	-27.08	33.76	40.00	-6.24
101.78	Peak	S	52.42	-23.54	28.88	43.50	-14.62
167.74	Peak	S	42.93	-23.65	19.28	43.50	-24.22
288.02	Peak	S	40.66	-19.45	21.21	46.00	-24.79
431.58	Peak	S	41.00	-15.34	25.66	46.00	-20.34
528.58	Peak	S	41.12	-13.16	27.96	46.00	-18.04
11570.00	Peak	Н	38.19	21.14	59.32	74.00	-14.68
11570.00	Average	Н	24.85	21.14	45.99	54.00	-8.01
17355.00	Peak	Н	-				
23140.00	Peak	Н	-				
28925.00	Peak	Н	-				

Η

Peak



Report No.: E2/2015/10036 Issue Date: Mar. 11, 2015 Page 125 of 135

Operation Band	:802.11 n20M	Test Date	:2014-02-22
Fundamental Frequency	:5825 MHz	Temp./Humi.	:16.7 deg_C / 52 RH
Operation Mode	:TX HIGH	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
71.71	Peak	S	53.48	-27.63	25.85	40.00	-14.15
83.35	Peak	S	52.76	-26.46	26.30	40.00	-13.70
101.78	Peak	S	52.52	-23.54	28.98	43.50	-14.52
445.16	Peak	S	38.62	-15.18	23.44	46.00	-22.56
503.36	Peak	S	37.76	-14.15	23.61	46.00	-22.39
528.58	Peak	S	40.03	-13.16	26.87	46.00	-19.13
11650.00	Peak	Н	37.15	21.27	58.42	74.00	-15.58
11650.00	Average	Н	24.92	21.27	46.19	54.00	-7.81
17475.00	Peak	Н	-				
23300.00	Peak	Н	-				
29125.00	Peak	Н	-				
34950.00	Peak	Н	-				



#### FCC ID: NKS-MS5

Report No.: E2/2015/10036 Issue Date: Mar. 11, 2015 Page 126 of 135

Operation Band	:802.11 n20M	Test Date	:2014-02-22
Fundamental Frequency	:5825 MHz	Temp./Humi.	:16.7 deg_C / 52 RH
Operation Mode	:TX HIGH	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
71.71	Peak	S	45.84	-27.63	18.21	40.00	-21.79
96.93	Peak	S	44.82	-24.36	20.46	43.50	-23.04
352.04	Peak	S	39.25	-17.31	21.93	46.00	-24.07
445.16	Peak	S	39.23	-15.18	24.04	46.00	-21.96
528.58	Peak	S	40.15	-13.16	26.99	46.00	-19.01
647.89	Peak	S	38.57	-11.08	27.50	46.00	-18.50
11650.00	Peak	Н	38.02	21.27	59.29	74.00	-14.71
11650.00	Average	Н	24.92	21.27	46.19	54.00	-7.81
17475.00	Peak	Н	-				
23300.00	Peak	Н	-				
29125.00	Peak	Н	-				

Η

Peak

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Report No.: E2/2015/10036 Issue Date: Mar. 11, 2015 Page 127 of 135

Operation Band	:802.11 n20 M	Test Date	:2014-02-22
Fundamental Frequency	:5745 MHz	Temp./Humi.	:25.5 deg_C / 63 RH
Operation Mode	:Bandedge LOW	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
5725.00	Peak	Е	57.80	12.27	70.07	78.20	-8.13

Operation Band	:802.11 n20 M	Test Date	:2014-02-22
Fundamental Frequency	:5745 MHz	Temp./Humi.	:25.5 deg_C / 63 RH
Operation Mode	:Bandedge LOW	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

 $Factor(dB) = Antenna Factor(dB\mu V/m) + Cable Loss(dB) - Pre_Amplifier Gain(dB)$ 

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/OP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
IVITIL		1/11/L/S	աթաւ	uD	azµ1/m	αρμι/ Π	uD



Report No.: E2/2015/10036 Issue Date: Mar. 11, 2015 Page 128 of 135

Operation Band	:802.11 n20 M	Test Date	:2014-02-22
Fundamental Frequency	:5825 MHz	Temp./Humi.	:25.5 deg_C / 63 RH
Operation Mode	:Bandedge LOW	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:VERTICAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

Factor(dB) = Antenna Factor( $dB\mu V/m$ ) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

"F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency. Note :

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/QP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
	III QI/III	1/11/L/D	abai	чв	a2pi ( / 111	u2pi ( / 111	чв

Operation Band	:802.11 n20 M	Test Date	:2014-02-22
Fundamental Frequency	:5825 MHz	Temp./Humi.	:25.5 deg_C / 63 RH
Operation Mode	:Bandedge LOW	Engineer	:Vito
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS( $dB\mu V/m$ ) = SPA. Reading level( $dB\mu V$ ) + Factor(dB)

 $Factor(dB) = Antenna Factor(dB\mu V/m) + Cable Loss(dB) - Pre_Amplifier Gain(dB)$ 

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---": denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
	Mode		Reading Level		FS	@3m	
MHz	PK/OP/AV	F/H/E/S	dBµV	dB	dBµV/m	dBµV/m	dB
IVITIZ		1/11/12/3	ubμv	uD	uDµ v / III	ubμv/m	uD



## **TRANSMISSION IN THE ABSENCE OF DATA 13.1 Standard Applicable**

According to §15.407(c)

The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signaling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization a description of how this requirement is met.

## 13.2 Result:

No non-compliance noted: Refer to the theory of operation.

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# **11. FREQUENCY STABILITY**

#### **Standard Applicable** 14.1

According to §15.407 (g) Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

#### 14.2 **Result:**

Refer to next page for plots.

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Operation Mode	802.11 a	Test Date	2015,02,12
Temperature	:24	Test By	Henry
Humidity	:58 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
		36	5180.0000	5,179.880000	0.1200
		44	5220.0000	5,219.880000	0.1200
		48	5240.0000	5,239.850000	0.1500
		52	5260.0000	5,259.830000	0.1700
		60	5300.0000	5,299.850000	0.1500
-30	8.51V	64	5320.0000	5,319.910000	0.0900
-30	0.31 V	100	5500.0000	5,499.820000	0.1800
		116	5580.0000	5,579.860000	0.1400
		140	5700.0000	5,699.820000	0.1800
		149	5745.0000	5,744.891400	0.1086
		157	5785.0000	5,784.820500	0.1795
		165	5825.0000	5,824.877600	0.1224
		36	5180.0000	5,179.890000	0.1100
		44	5220.0000	5,219.910000	0.0900
		48	5240.0000	5,239.840000	0.1600
		52	5260.0000	5,259.820000	0.1800
		60	5300.0000	5,299.780000	0.2200
-30	6.29V	64	5320.0000	5,319.850000	0.1500
-30	0.29 V	100	5500.0000	5,499.790000	0.2100
		116	5580.0000	5,579.820000	0.1800
		140	5700.0000	5,699.840000	0.1600
		149	5745.0000	5,744.885900	0.1141
		157	5785.0000	5,784.865300	0.1347
		165	5825.0000	5,824.847900	0.1521



		<u> </u>			
		36	5180.0000	5,179.960000	0.0400
		44	5220.0000	5,219.980000	0.0200
		48	5240.0000	5,239.940000	0.0600
		52	5260.0000	5,259.900000	0.1000
		60	5300.0000	5,299.920000	0.0800
25	7.4V	64	5320.0000	5,319.940000	0.0600
25	/. <b>+</b> v	100	5500.0000	5,499.920000	0.0800
		116	5580.0000	5,579.920000	0.0800
		140	5700.0000	5,699.920000	0.0800
		149	5745.0000	5,744.960000	0.0400
		157	5785.0000	5,784.900000	0.1000
		165	5825.0000	5,824.900000	0.1000
		36	5180.0000	5,179.850000	0.1500
		44	5220.0000	5,219.860000	0.1400
	8.51V	48	5240.0000	5,239.880000	0.1200
		52	5260.0000	5,259.830000	0.1700
		60	5300.0000	5,299.830000	0.1700
80		64	5320.0000	5,319.910000	0.0900
80		100	5500.0000	5,499.770000	0.2300
		116	5580.0000	5,579.860000	0.1400
		140	5700.0000	5,699.820000	0.1800
		149	5745.0000	5,744.889500	0.1105
		157	5785.0000	5,784.890900	0.1091
		165	5825.0000	5,824.857900	0.1421
		36	5180.0000	5,179.840000	0.1600
		44	5220.0000	5,219.880000	0.1200
		48	5240.0000	5,239.890000	0.1100
		52	5260.0000	5,259.780000	0.2200
		60	5300.0000	5,299.830000	0.1700
20	C 2014	64	5320.0000	5,319.920000	0.0800
80	6.29V	100	5500.0000	5,499.780000	0.2200
		116	5580.0000	5,579.850000	0.1500
		140	5700.0000	5,699.800000	0.2000
		149	5745.0000	5,744.943600	0.0564
		157	5785.0000	5,784.824100	0.1759
		165	5825.0000	5,824.858000	0.1420



Operation Mode	802.11n_HT20	Test Date	2015,02,12
Temperature	:24	Test By	Henry
Humidity	:58 %		

Test Temp.	Test Voltage	Channel	Measured Frequency (MHz)	Spectrum Frequency (MHz)	ΔFrequency (MHz)
		36	5180.0000	5,179.940000	0.0600
		44	5220.0000	5,219.900000	0.1000
		48	5240.0000	5,239.770000	0.2300
		52	5260.0000	5,259.960000	0.0400
		60	5300.0000	5,299.880000	0.1200
-30	8.51V	64	5320.0000	5,319.850000	0.1500
		100	5500.0000	5,499.890000	0.1100
		116	5580.0000	5,579.790000	0.2100
		140	5700.0000	5,699.860000	0.1400
		149	5745.0000	5,744.842700	0.1573
		157	5785.0000	5,784.869900	0.1301
		165	5825.0000	5,824.865200	0.1348
		36	5180.0000	5,179.910000	0.0900
		44	5220.0000	5,219.840000	0.1600
		48	5240.0000	5,239.840000	0.1600
		52	5260.0000	5,259.990000	0.0100
		60	5300.0000	5,299.840000	0.1600
-30	6.29V	64	5320.0000	5,319.860000	0.1400
-30	0.29 V	100	5500.0000	5,499.890000	0.1100
		116	5580.0000	5,579.820000	0.1800
		140	5700.0000	5,699.800000	0.2000
		149	5745.0000	5,744.872200	0.1278
		157	5785.0000	5,784.876400	0.1236
		165	5825.0000	5,824.914000	0.0860



		36	5180.0000	5,179.960000	0.0400
		44	5220.0000	5,219.940000	0.0600
		48	5240.0000	5,239.920000	0.0800
		52	5260.0000	5,260.000000	0.0000
		60	5300.0000	5,299.940000	0.0600
25	7 41	64	5320.0000	5,319.900000	0.1000
23	7.4V	100	5500.0000	5,499.940000	0.0600
		116	5580.0000	5,579.920000	0.0800
		140	5700.0000	5,699.900000	0.1000
		149	5745.0000	5,744.920000	0.0800
		157	5785.0000	5,784.900000	0.1000
		165	5825.0000	5,824.940000	0.0600
		36	5180.0000	5,179.870000	0.1300
		44	5220.0000	5,219.800000	0.2000
		48	5240.0000	5,239.750000	0.2500
	0.5111	52	5260.0000	5,259.880000	0.1200
		60	5300.0000	5,299.810000	0.1900
00		64	5320.0000	5,319.830000	0.1700
80	8.51V	100	5500.0000	5,499.790000	0.2100
		116	5580.0000	5,579.800000	0.2000
		140	5700.0000	5,699.790000	0.2100
		149	5745.0000	5,744.874700	0.1253
		157	5785.0000	5,784.827500	0.1725
		165	5825.0000	5,824.888800	0.1112
		36	5180.0000	5,179.870000	0.1300
		44	5220.0000	5,219.810000	0.1900
		48	5240.0000	5,239.740000	0.2600
		52	5260.0000	5,259.930000	0.0700
		60	5300.0000	5,299.780000	0.2200
<u>80</u>	6 2034	64	5320.0000	5,319.830000	0.1700
80	6.29V	100	5500.0000	5,499.800000	0.2000
		116	5580.0000	5,579.820000	0.1800
		140	5700.0000	5,699.820000	0.1800
		149	5745.0000	5,744.880500	0.1195
		157	5785.0000	5,784.882200	0.1178
		165	5825.0000	5,824.888900	0.1111



# **12. ANTENNA REQUIREMENT**

# 12.1 Standard Applicable

For intentional device, according to \$15.203, an intentional radiator shall be designed to ensure that no antenna other than furnished by the responsible party shall be used with the device.

## 12.2Antenna Connected Construction

The directional gains of antenna used for transmitting is 2.96dBi (5150MHz– 5250MHz), 2.96dBi (5250MHz– 5350MHz), 2.91dBi (5470MHz– 5725MHz), 2.11dBi (5725MHz- 5850MHz) and the antenna connector is designed with unique type RF connector and no consideration of replacement. Please see EUT photo and antenna spec. for details.

~ End of Report ~

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. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。

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