# **Dynamic Frequency Selection (DFS)**

## **Test Report**

Product Name	: 802.11a/b/g/n WLAN Module
Model No.	: 95.0209T02
FCC ID	: TC2N1101

Applicant	:	RoKu						
Address	:	12980	Saratoga	Avenue,	Suite	D,	Saratoga,	CA
		95070	USA					

Date of Receipt	: 2009/09/17
Issued Date	: 2009/11/10
Report No.	: 099S059R-DFS-US-P08V01
Report Version	: V2.1

The test results relate only to the samples tested.

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Product Name

Manufacturer

Applicant Address

Address

Model No.

EUT Voltage Trade Name

FCC ID

## **DFS** Test Report

Issued Date: 2009.11.10 Report No.: 099S059R-DFS-US-P08V01

	QuieTek
:	802.11a/b/g/n WLAN Module
:	Roku
:	12980 Saratoga Avenue, Suite D, Saratoga, CA 95070 USA
:	Foxconn
:	No 1925, Nanle road, Songjiang Export Processing Zone,
	Shanghai , China 201613
:	95.0209T02
:	TC2N1101
:	DC 3.3V
:	Roku

Applicable Standard : FCC CFR Title 47 Part 15 Subpart E: 2008 – DFS FCC-06-96A1 DFS Test Method

Test Result : Complied
 Performed Location : SuZhou EMC laboratory
 No.99 Hongye Rd., Suzhou Industrial Park Loufeng Hi-Tech
 Development Zone., SuZhou, China
 TEL: +86-512-6251-5088 / FAX: +86-512-6251-5098
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#### 1. GENERAL INFORMATION

#### **1.1. EUT Description**

Product Name	802.11a/b/g/n WLAN Module
Trade Name	Roku
FCC ID.	TC2N1101
Model No.	95.0209T02
DFS Frequency Range	5250-5350MHz, 5470-5725MHz
Number of Channels	802.11a/n-20MHz : 15 ; 802.11n-40MHz: 9
Data Rate	802.11a/n-20MHz: 6 - 135Mbps ; 802.11n-40MHz: up 270Mbps
Channel Control	Auto
Type of Modulation	802.11a/n: OFDM
	BPSK, QPSK, 16QAM, 64QAM
Antenna type	PIFA (Fixed)
Peak Antenna Gain	5.2dBi

#### Statement:

Information regarding the parameters of the detected Radar Waveforms is not available to the end user.

#### 802.11a/n-20MHz Center Working Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 52	: 5260 MHz	Channel 56:	5280 MHz	Channel 60:	5300 MHz	Channel 64:	5320 MHz
Channel 100	0: 5500 MHz	Channel 104:	5520 MHz	Channel 108:	5540 MHz	Channel 112:	5560 MHz
Channel 11	5: 5580 MHz	Channel 120:	5600 MHz	Channel 124:	5620 MHz	Channel 128:	5640 MHz
Channel 132	2: 5660 MHz	Channel 136:	5680 MHz	Channel 140:	5700 MHz	N/A	N/A

#### 802.11n-40MHz Center Working Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 38:	5190 MHz	Channel 46:	5230 MHz	Channel 54:	5270 MHz	Channel 62:	5310 MHz
Channel 102:	5510 MHz	Channel 110:	5550 MHz	Channel 118:	5590 MHz	Channel 126:	5630 MHz
Channel 134:	5670 MHz						

Test Mode	Mode 1: Transmitter (802.11n-20BW)
	Mode 2: Transmitter (802.11n-40BW)

#### **1.2.** Standard Requirement

#### FCC Part 15.407:

U-NII devices operating in the 5.25-5.35 GHz band and the 5.47-5.725 GHz band shall employ a TPC mechanism. The U-NII device is required to have the capability to operate at least 6 dB below the mean EIRP value of 30dBm. A TPC mechanism is not required for systems with an E.I.R.P. of less than 500mW.

#### **1.3.** UNII Device Description

The UUT operates in the following band:

- 1. 5250-5350 MHz
- 2. 5470-5725 MHz

The UUT is a Client Device that does not have radar detection capability and ad-hoc function. The highest gain antenna assembly utilized with the EUT has a maximum gain of 5.2dBi in 5GHz frequency band. The 50-ohm Tx/Rx antenna port is connected to the test system to perform conducted tests. TPC is not required since the maximum EIRP is less than 500mW (27dBm).

The UUT utilizes 802.11a/b/g/n IP based architecture. Two nominal channel bandwidths, 20 MHz and 40MHz are implemented.

WLAN traffic is generated by streaming the video file "TestFile.mp2" from the Master device to the Slave device in full motion video mode using the "Nero Show Time 3" with the V3.0.1.3 Codec package.

The master device is a NETGEAR 802.11a/b/g/n Access Point. The NETGEAR Access Point FCC ID: PY308100078.

The UUT is a client device without radar detection therefore the interference threshold level is not required.

**Statement:** Information regarding the parameters of the detected Radar Waveforms is not available to the end user.

#### 1.4. Test Equipment

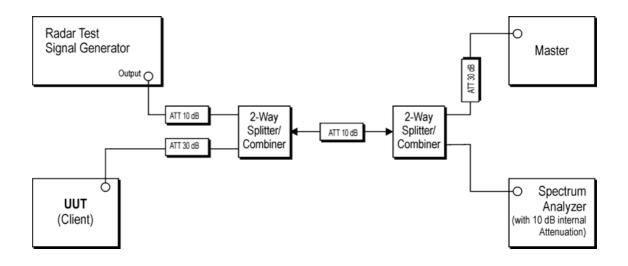
Dynamic Frequency Selection (DFS) / AC-6

Instrument	Manufacturer	Туре No.	Serial No	Cal. Date
Signal Analyzer	Agilent	N9010A	MY48030495	Apr, 23, 2009
Vector Signal Generator	Agilent	E4438C	MY49070137	Apr, 02, 2009

Instrument	Manufacturer	Type No.	Serial No
Splitter/Combiner (Qty: 2)	Mini-Circuits	ZFRSC-123-S+	SN331000910
ATT (Qty: 2)	Mini-Circuits	15542	30912
ATT (Qty: 2)	Mini-Circuits	15542	30909
Access Point	NETGEAR	WNDR3300	1SL2827U04C78
Notebook PC	Dell	M65	20503381024
Notebook PC	HP	HP541	CNU8476RVZ
RF Cable (Qty: 4)	GORE	C86	N/A

Software	Manufacturer	Function
Agilent Signal Studio for Pulse Building V1.3.13.0	Agilent	Radar Signal Generation Software
Agilent DFS_TEST V1.0.0.73	Agilent	Radar Signal Generation Software
Nero Show Time 3	Nero	Multimedia Player

#### 1.5. Test Setup



#### 1.6. Limits

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

	Operational Mo	ode	
Requirement	Master	Client (with radar detection)	Client (without radar detection)
Non-Occupancy Period	Yes	Yes	Yes
DFS Detection Threshold	Yes	Yes	Not Required
Channel Availability Check Time	Yes	Not Required	Not Required
Uniform Spreading	Yes	Not Required	Not Required
U-NII Detection Bandwidth	Yes	Yes	Not Required

#### Applicability of DFS requirements prior to use of a channel

#### Applicability of DFS requirements during normal operation

	Operational Mode		
Requirement	Master	Client (with radar	Client (without radar
	Wiaster	detection)	detection)
DFS Detection	Yes	Yes	Not Required
Threshold	108	108	Not Kequiled
Channel Closing	Yes	Yes	Yes
Transmission Time	108	105	105
Channel Move Time	Yes	Yes	Yes
U-NII Detection	Yes	Yes	Not required
Bandwidth	105	105	noi icquiicu

#### Interference Threshold value, Master or Client incorporating In-Service Monitoring

signal is at or above the detection threshold level to trigger a DFS response.

· · · · · · · · · · · · · · · · · · ·	
Maximum Transmit Power	Value (see note)
≥200 milliwatt	-64 dBm
< 200 milliwatt	-62 dBm
Note 1: This is the level at the input of the receiver as	ssuming a 0 dBi receive antenna.
Note 2: Throughout these test procedures an addition	al 1 dB has been added to the amplitude of the test
transmission waveforms to account for variations in r	neasurement equipment. This will ensure that the test

### DFS Response requirement values

Parameter	Value
Non-Occupancy Period	30 Minutes
Channel Availability Check Time	60 Seconds
Channel Move Time	10 Seconds
Channel Closing Transmission Time	200 milliseconds + approx. 60 milliseconds over remaining 10 seconds period (See Notes 1 and 2)

Note1: The instant that the Channel Move Time and the Channel Closing Transmission Time begins is as follows:

For the short pulse radar test signals this instant is the end of the burst.

For the frequency hopping radar test signal, this instant is the end of the last radar burst generated For the long pulse radar test signal this instant is the end of the 12 seconds period defining the radar transmission.

Note 2: The channel closing transmission time is comprised of 200 milliseconds starting at the beginning of the channel move time plus any additional intermittent control signals required facilitating channel changes (an aggregate of approximately 60 milliseconds) during the remainder of the 10 seconds period. The aggregate duration of control signals will not count quiet periods in between transmissions.

Short Pulse Radar T	<b>Test Waveforms</b>
---------------------	-----------------------

				Minimum	
Dodor Typo	Pulse Width		Pulses	Percentage of	Minimum
Radar Type	$(\mu \sec)$	PRI ( $\mu \sec$ )	ruises	Successful	Trials
				Detection	
1	1	1428	18	60%	30
2	1-5	150-230	23-29	60%	30
3	6-10	200-500	16-18	60%	30
4	11-20	200-500	12-16	60%	30
Aggregate (ra	dar types 1-4)			80%	120

A minimum of 30 unique waveforms is required for each of the short pulse radar type 2 through 4. For short pulse radar type 1, then same waveform is used a minimum of 30 times. If more than 30 waveforms are used for short pulse radar type 2 through 4, then each additional waveform must also be unique and not repeated from the previous waveforms. The aggregate is the average of the percentage of successful detections of short pulse radar type 1-4.

#### Long Pulse Radar Test Signal

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

The parameters for this waveform are randomly chosen. Thirty unique waveforms are required for the long pulse radar test signal. If more than 30 waveforms are used for the long pulse radar test signal, then each additional waveform must also be unique and not repeated from the previous waveforms.

#### **Frequency Hopping Radar Test Signal**

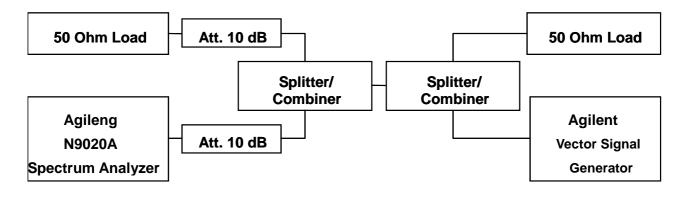
Radar	Pulse	PRI	Hopping	Pulses Per	Hopping	Minimum	Minimum
Waveform	Width	$(\mu \text{sec})$	Sequence	Нор	Rate (kHz)	Percentage	Trials
	$(\mu \text{sec})$		Length			of	
			(msec)			Successful	
						Detection	
6	1	333	300	9	.333	70%	30

For the frequency hopping radar type, the same burst parameters are used for each waveform. The hopping sequence is different for each waveform and a 100-length segment is selected from the hopping sequence.

#### **1.7. Radar Waveform Calibration**

The following equipment setup was used to calibrate the conducted radar waveform. A spectrum analyzer was used to establish the test signal level for each radar type. During this process there were replace 50ohm terminal from master and client device and no transmissions by either the master or client device. The spectrum analyzer was switched to the zero span (time domain) at the frequency of the radar waveform generator. Peak detection was utilized. The spectrum analyzer resolution bandwidth (RBW) and video bandwidth (VBW) were set to 3MHz and 3 MHz.

The signal generator amplitude was set so that the power level measured at the spectrum analyzer was -61dBm due to the interference threshold level is not required.



Conducted Calibration Setup

#### **1.8.** Radar Waveform Calibration Result

🗩 Agi	lent Spec	trum i	Analyzer	- Swe	pt SA																	
Mar		50 ຊ <b>21.</b> 4	4236			 						ela	NSE:		ms	 Avg Type	ALIGN. : Log-		Т	RACE	1 2 3 4 5 6	Peak Search
10 di	3/div		Offset		в	NO: Gain		t⊶∎ jh			g: V ten					 			Mkr1	DET 21	.42 ms 9 dBm	NextPeak
-60.0					<u>, , , , , , , , , , , , , , , , , , , </u>	1																Next Right
-70.0 -80.0																						Next Left
-90.0 -100																					TRIGLVL	Marker Delta
-110 -120	dese and b and and b		al localitation • M <sup>an</sup> ikini PM			1) 1	a Na Mirpi	unitar Planga													ender auf het felder de felder Norder de felder de f	Mkr→CF
-130 -140																						Mkr→RefLvl
Cen	ter 5.3 BW 3			GH	Z		VI	зw	3.	0 N	ЛН	z				S	weep	0 72	.00 ms		pan 0 Hz 1001 pts)	More 1 of 2
MSG																	1	STATUS	3			

Radar Type 1 Calibration Plot at 5300MHz

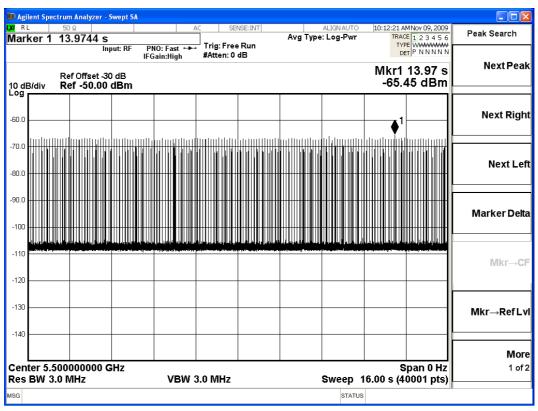
#### Radar Type 1 Calibration Plot 5500MHz

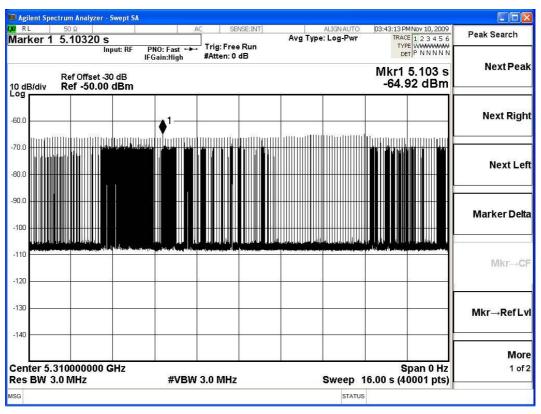
											. 1					wep	er - Sv	ı Analyz	pectrum		
Peak Search	ACE 1 2 3 4 5 6 YPE WWWWWW DET P N N N N N	TRAC	nauto g-Pwr	ALIGN e: Log	а Тур	Av	 	ree	ig: F tten	]			IO: F ain:I		RF		9 m: Inpi		50 1 31		۹ Ла
Next Pea	31.42 ms .05 dBm								uen			ngn	ain:r	IFG				f Offse ef -50.		dB/div	0
Next Rig	*					<b>♦</b> <sup>1</sup>															.ōg
																				,	70.
Next L																				-	30.
Marker De	F													-	+					-	90.
																L					10
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Mkr→RefL		· · ·	·																	,	13
Ma																					-14
<b>М</b> о 1 о	Span 0 Hz 40001 pts)		ep 50.	 Swee	ę			Ηz	Mł	3.0	зw	ŧ٧I	7			Hz	0 G		5.5000 3.0 N		
	J	3	STATUS																		SG

	_							wept SA	Analyzer - S		
Peak Search	1Nov 10, 2009	TRACE	ALIGNAUTO	Avg Type	SE:INT	1	A		<u>∞</u> 8480 s	50 s	RL Arker
Next Pea	6.185 s 2 dBm	Mkr1				<sup>J</sup> Trig: Free #Atten: 0	NO: Fast ↔ Gain:High	IF(		Ref	dB/div
Next Rig											
Next Le											
Marker De											20 30 10
Mkr→0			Sweep 1	ION FU	FUN	3.0 MHz		×		3.0 M	S BW
Mkr→RefL					m	-67.02 dE	6.185 s			1 t	
<b>Mo</b> 1 o											
			STATUS		1						

#### Plot of WLAN Traffic at 5300MHz-n20

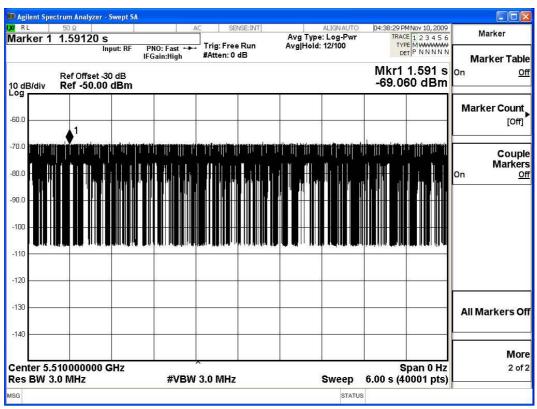
#### Plot of WLAN Traffic at 5500MHz-n20





#### Plot of WLAN Traffic at 5310MHz-n40





#### 2. Channel Move Time and Channel Closing Transmission Time

#### 2.1. Test Procedure

These tests define how the following DFS parameters are verified during In-Service Monitoring; Channel Closing Transmission Time and Channel Move Time.

The steps below define the procedure to determine the above mentioned parameters when a radar burst with a level -61dBm is generated on the operating channel of the U-NII device.

A U-NII device operating as a Client device will associate with the Master device at 5300MHz, 5660MHz.

During the in-service monitoring detection probability and channel moving tests the system was configured with a streaming video file from the master device (sourced by the PC connected to the master device via an Ethernet interface) to the client device. The streamed file was the "FCC" test file and the client device was using Media Player Classic as required by FCC Part 15 Subpart E.

Observe the transmissions of the EUT at the end of the radar burst on the operating channel for duration greater than 10 seconds. Measure and record the transmissions from the spectrum analyzer during the observation time (Channel Move Time). Compare the channel move time and channel closing transmission time results to the limits defined in the DFS Response requirement values table.

#### 2.2. Test Requirement

Parameter	Value
Channel Move Time	10 Seconds
Channel Closing Transmission Time	200 milliseconds + approx. 60 milliseconds over remaining 10
Channel Closing Halishiission Hille	seconds period

#### 2.3. Uncertainty

± 1ms.

#### 2.4. Test Result of Channel Move Time and Channel Closing Transmission Time

Product	:	802.11a/b/g/n WLAN Module
Test Item	:	Channel Move Time Test
Radar Type	:	Type 1
Test Mode	:	Mode 1: Transmitter (802.11n-20BW)

#### Channel Move Time for Radar Test Type 1 at 5300MHz

		pectr	um i	Analyzer - S	Swept SA											
LXI RL			50 S	.13880			Δ	IC SE	NSE:INT	Ava		ALIGNAUTO : Log-Pwr		MNov 09, 2009		Marker
ivia r	Nei -	14	4		S put: RF	PNO: Fa IFGain:Hi		Trig: Free #Atten: 0				9/100	TY		м	arker Table
10 dE	3/div			Offset -30 -50.00										4.139 s .784 dB	<u>On</u>	Off
Log -60.0 -70.0 -80.0			×2				1Δ2								Mai	rker Count [off]
-90.0 -100 -110								an a th <b>h san de</b> maria							On	Couple Markers <u>Off</u>
-120 -130			_													
-140 Cent Res				00000 G Hz	SHz	#	vвw	3.0 MHz				Sweep 1		span 0 Hz 0001 pts)		
	400E Δ2 F	TRC 1		(Δ)	×	4.139 s 1.415 s	s (Δ)	-7.784 -60.416 d	dB	FUNCTION	FUN	NCTION WIDTH	FUNCTI	DN VALUE		
2 3 4 5 6 7						1.410 3	> 								All I	Markers Off
8 9 10 11 12																More 2 of 2
MSG							<u>.</u>					STATUS	;			

Test Item	Value (s)	Limit	Results
Channel Move Time	4.139	10 Seconds	Pass

RL	rum Analyzer - Swe 50 Ω 3.99640 s		AC SENSE		ALIGN AUTO Type: Log-Pwr	10:16:17 AM Nov 09, 2009	Peak Search
	1 3.33040 S Input:	RF PNO: Fast IFGain:High	Trig: Free R #Atten: 0 dB		.,,	DET P N N N N	
0 dB/div	Ref Offset -30 dl Ref -50.00 dE					∆Mkr1 3.996 s -2.95 dB	NextPea
<b>°g</b> 50.0 70.0		∳1∆2					Next Rigi
0.0 100 110					h dites on a solution of the		Next Le
120 130 140							Marker Del
es BW 3.		VB	N 3.0 MHz		· · ·	Span 0 Hz 16.00 s (40001 pts)	Mkr→C
KR MODE TRC 1 Δ2 1 2 F 1	<u>sci</u> t (∆) t	× 3.996 s (, 1.202 s	⊻ <u>∆) -2.95 dE</u> -64.15 dBm		FUNCTION WIDTH	FUNCTION VALUE	
3 4 5 6							Mkr→RefL
7 8 9 0							<b>Mo</b> 1 of
1				1		I	

#### Channel Move Time for Radar Test Type 1 at 5500MHz

Test Item	Value (s)	Limit	Results
Channel Move Time	3.996	10 Seconds	Pass

Product	:	802.11a/b/g/n WLAN Module
Test Item	:	Channel Move Time Test
Radar Type	:	Type 1
Test Mode	:	Mode 2: Transmitter (802.11n-40BW)

#### Channel Move Time for Radar Test Type 1 at 5310MHz

💴 Agilent Spectrum Analyzer - Swept SA					
202 RL 50Ω Marker 1 Δ 4.13040 s		Avg Type	: Log-Pwr TRAC	MNov 10, 2009 E 1 2 3 4 5 6 E WWWWWW	Marker
	PNO: Fast 🛶 Trig: Free Gain:High #Atten: 0		DE	PNNNNN	Marker Table
Ref Offset -30 dB 10 dB/div Ref -50.00 dBm			∆Mkr1 -	4.130 s <u>c</u> 8.25 dB	<u>on</u> Off
Log -60.0 -70.0 -80.0	1∆2				Marker Count [Off]
-90.0 -100 -110		A sin the latence of a state of the state of	uid, an a su a tha an		Couple Markers On Off
-120 -130 -140				<u> </u>	
Center 5.310000000 GHz Res BW 3.0 MHz	#VBW 3.0 MHz		S Sweep 16.00 s (4	pan 0 Hz 0001 pts)	
	4.130 s (Δ) -8.25 1.096 s -59.28 dE	dB	ICTION WIDTH FUNCTIO	IN VALUE	
3         -	1.030 \$ -33.28 ut				All Markers Off
7 8 9 10 11 12					More 2 of 2
MSG			STATUS		

Test Item	Value (s)	Limit	Results
Channel Move Time	4.130	10 Seconds	Pass



	10:14:51 AM Nov 10, 2009	ALIGN AUTO		SENSE:IN	AC	er - Swept SA	0Ω	50	R L
Marker	TRACE 1 2 3 4 5 6	oe: Log-Pwr	Avg	Trig: Free Rur			4.1048	1Δ	
Marker Tabl	DET P N N N N N			#Atten: 0 dB		Input: RF P IFC			
On Of	∆Mkr1 4.105 s -23.37 dB	2		Ref Offset -30 dB iB/div Ref -50.00 dBm					
Marker Count							-	₩2	Ï
[Off]		2 2			▲1∆2		50	//\\\Z	
Coupl		8							S
Marker On O									2
	el a del ante (a bi a trac) ha el bà y i denora ha lla adar								
					<u>.</u>				2
	Span 0 Hz 6.00 s (40001 pts)	Sween 4	60		#VBW 3	0 GHz	000000	5.510 V 3.0 M	
	FUNCTION VALUE	UNCTION WIDTH	FUNCTION		#VDVV J	×			
			TONOTION	-23.37 dB -62.80 dBm	.105 s (∆) .065 s	2	t (Δ)		<u>Δ2</u> F
							-		
All Markers O									
All Markers O					1				
All Markers O					0 0 0		2		
All Markers O Mor 2 of									

#### Channel Move Time for Radar Test Type 1 at 5510MHz

Test Item	Value (s)	Limit	Results
Channel Move Time	4.105	10 Seconds	Pass

Product	:	802.11a/b/g/n WLAN Module
Test Item	:	Channel Closing Transmission Time
Radar Type	:	Type 1
Test Mode	:	Mode 1: Transmitter (802.11n-20BW)

Channel Closing Transmission Time for Radar Test Type 1 at 5300 MHz



Test Item	Value (ms)	Limit	Results
Channel Closing Transmission	< 200	200 milliseconds + approx. 60	
Aggregate Transmission Time	10	milliseconds over remaining 10	Pass
over remaining 10s period	48	seconds period	



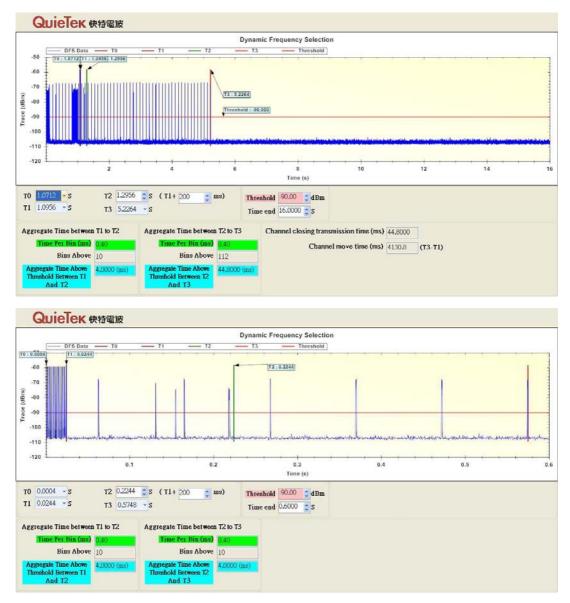
#### Channel Closing Transmission Time for Radar Test Type 1 at 5500 MHz

Test Item	Value (ms)	Limit	Results
Channel Closing Transmission	< 200	200 milliseconds + approx. 60	
Aggregate Transmission Time	46.9	milliseconds over remaining 10	Pass
over remaining 10s period	46.8	seconds period	

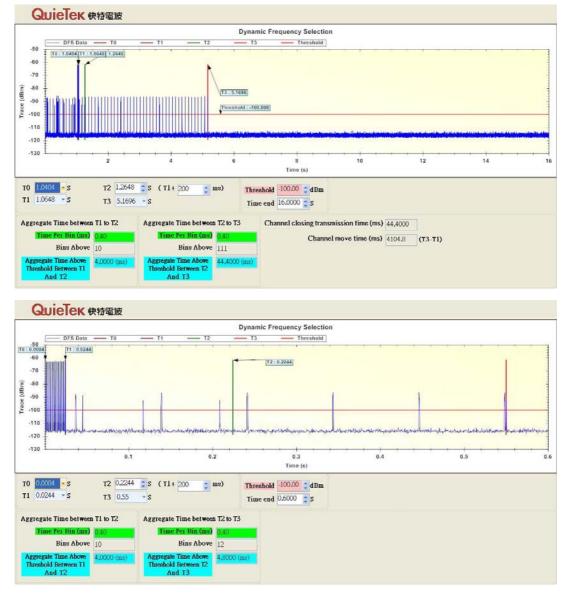
## QuieTer

Product	:	802.11a/b/g/n WLAN Module
Test Item	:	Channel Closing Transmission Time
Radar Type	:	Type 1
Test Mode	:	Mode 2: Transmitter (802.11n-40BW)

Channel Closing Transmission Time for Radar Test Type 1 at 5310 MHz



Test Item	Value (ms)	Limit	Results
Channel Closing Transmission	< 200	200 milliseconds + approx. 60	
Aggregate Transmission Time	44.8	milliseconds over remaining 10	Pass
over remaining 10s period	44.0	seconds period	



#### Channel Closing Transmission Time for Radar Test Type 1 at 5510 MHz

Test Item	Value (ms)	Limit	Results
Channel Closing Transmission	< 200	200 milliseconds + approx. 60	
Aggregate Transmission Time over remaining 10s period	44.4	milliseconds over remaining 10 seconds period	Pass

#### 3. Non-Occupancy Period

#### 3.1. Test Procedur

Measure the EUT for more than 30 minutes following the channel close/move time to verify that the UUT does not resume any transmissions on this channel.

#### **3.2.** Test Requirement

Parameter	Value
Non-Occupancy Period	30 Minutes

#### 3.3. Uncertainty

± 1ms.

#### 4. Test Result of Non-Occupancy Period

Product	:		802.11a/b/g/n WLAN Module
Test Item		:	Non-Occupancy Period
Radar Type	:		Type 1
Test Mode	:		Mode 1: Transmitter (802.11n-20BW)

#### 30 Minute Non-Occupancy Period (Associated test) at 5300 MHz

	m Analyzer - Swept SA					
Marker 3 Δ	ັΩ 1.80000 ks	A	7	ALIGNAUTO Avg Type: Log-Pwr	03:27:20 PM Nov 10, 2009 TRACE 1 2 3 4 5 6	Peak Search
R	Input: RF ef Offset -30 dB	PNO: Fast ↔ IFGain:High	┘ Trig: Free Run #Atten: 0 dB		Mkr3 1.800 ks -36.11 dB	Next Peak
10 dB/div R Log -60.0 22 -70.0 4 -80.0	ef -50.00 dBm				-36.11 0.51	Next Right
-90.0 -100 -110		un u kapana ka	uk, dik, rock institution		3∆4	Next Lef
-120 -130 -140						Marker Delta
Res BW 3.0	al X		3.0 MHz	Sweep 2.	Span 0 Hz 020 ks (40001 pts) FUNCTION VALUE	Mkr→CF
2 F 1 3 ∆4 1 4 F 1 5 6	t (Δ) t (Δ) t (Δ)	4.192 s (Δ) 47.67 s 1.800 ks (Δ) 51.86 s	-8.03 dB -60.39 dBm -36.11 dB -68.42 dBm			Mkr→RefLv
7 8 9 10 11 12						More 1 of 2
MSG				STATUS		

Test Item	Limit	Results
Non-Occupancy Period	30 Minutes	Pass



RL		50 :	2				AC		SENSE:IN	JT		,	ALIGN AUTO	06:16:4	43 PM	Nov 10, 2009	[	
	er 3.	Δ 1	.800	00 ks Input: RF		): Fast		Trig: Fr	ig: Free Run			Avg Type: Log-Pwr			TRACE 1 2 3 4 5 6 TYPE WWWWWW DET P N N N N N		Marker Table	
					IFGa	in:High		#Atten:	0 dB							,		arker Tab
dB/d	liv			-30 dB 00 dBm	1									∆Mkr3	3 1. -37	800 ks .14 dB	<u>On</u>	(
	×1∆	2															Mar	ker Coun
).0 ).0	₩2 4	+													_		Ivia	[Off
.0																		_
00			e	-	م ال و مع م ما ال			aliana a sate	ىبىر _ جار	الم سطقين	. hu mash un		-1-0-0-0-1-0-0-0-0-0-0-0-0-0-0-0-0-0-0-	→3	Δ4 			Cou Marke
10 -																	On	
20																		
30																		
40																		
	r 5.5 W 3.			) GHz		#V	BW 3	3.0 MH	z			S	weep 2	2.200 ks	Sp (40	oan 0 Hz 001 pts)		
	DE TRO			×				Y		FUN	CTION	FUN	CTION WIDTH	H FUN	ICTION	VALUE		
Ι <u>Δ2</u> 2 F	1	t	(Δ)		61	25 s .55 s		-61.03										
Δ4 F	1	t	(Δ)			)0 ks .67 s	<u>(Δ)</u>	<u>-37.1</u> -68.53	4 dB dBm									/larkers (
5	<u> </u>	<u> </u>						00.00										nai kei sv
r																		
3																		Мо
		+																2 0
2	-	1										1					1	

#### 30 Minute Non-Occupancy Period (Associated test) at 5500 MHz

Test Item	Limit	Results
Non-Occupancy Period	30 Minutes	Pass



A 5 6 Marker Select Marker KS 1	MNov 10, 2009	TRAC	ALIGNAUTO : Log-Pwr	Avg Typ	E:INT		AC			Ω	50 9		t L	R
Select Marke		TYP				Trig: Free #Atten: 0 c		PNO: Fast IFGain:Hig	Input: RF					
1	.800 ks 0.32 dB	Mkr1 1. -(	2						-30 dB 10 dBm	Offset -		liv	IB/di	) d
														<b>9</b> 0.0
Norn											+			0.0
											+			D.O
Delt	1Δ2												1	0.0 100
		er-seller ik.	and an and an area		في المراجع الم	hand the providence	alum du mi	en pierre de	and a second second	<del>hui)thhat</del>			`{{++-	110
											_			20
Fixed											+		⊢	30
											+			40
	pan 0 Hz 0001 pts)	S 20 ks (4)	weep 2.0	:		3.0 MHz	/BW :	#V	) GHz	00000 Hz		r5.3 ₩3.		
	IN VALUE	FUNCTIO	ICTION WIDTH	TION FL		Y -0.32 (	(0)	1.800 ks	×	(Δ)	SCL		MODI ∆2	
					n	-0.52 d -104.47 dB	<u>(Δ)</u>	0.000 ks			t	1	F	2
Propertie					-									4
					+							_		6 7
Mo												-		3
1 0					-							-		5 1
					-		1			1	1			2

Test Item	Limit	Results
Non-Occupancy Period	30 Minutes	Pass



	4Nov 10, 2009	02:40:06 PN	ALIGNAUTO		E:INT	SEN	AC		Swept SA	nalyzer -	rum A 50 Ω	it Spec		Ag R
Marker Select Marker	E 1 2 3 4 5 6 E WWWWWW T P N N N N N	TYP	: Log-Pwr	Avg T		ig: Free tten: 0 d		PNO: Fast IFGain:Hig	<b>) ks</b> put: RF	80000 In	1.	er 1 /	rke	lar
Select Marke	.800 ks I.23 dB		Δ							Offset -3 -50.00		div	dB/c	
Norm														<b>9</b> 0.0
											+			0.0 0.0
De	1∆2													).0 00
De		unterlicite en en en el	ant-opposition of	u danalara		anteri dan b	yd-godl y a silon					<b>esterio</b>	¢2	10
Fixe														20 30
													L	40
	pan 0 Hz 0001 pts)	S 20 ks (4	weep 2.0			MHz	'BW 3.0	#V	GHz	0000 <b>(</b> Iz		r 5.5 W 3.		
	N VALUE	FUNCTIO	NCTION WIDTH	ICTION	в	Y -1.23 (		1.800 ks	×	(Δ)	t	de tiru 2   1		ľ
Propertie					n	4.85 dE	-10	0.000 s			t	1	F	2 3
														5
м														3
1 c														)   2
1			STATUS											à

30 Minute Non-Occupancy Period	(Non-associated test) at 5500 MHz
So minute rion occupancy renou	(ittoli associated test) at 5500 mile

Test Item	Limit	Results
Non-Occupancy Period	30 Minutes	Pass

Product :	802.11a/b/g/n	WLAN Module
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Test Item :	Non-Occupancy Period
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Radar Type : Type 1

Test Mode : Mode 2: Transmitter (802.11n-40BW)

#### 30 Minute Non-Occupancy Period (Associated test) at 5310 MHz

Peak Search	04:19:18 PM Nov 10, 2009 TRACE 1 2 3 4 5 6 TYPE WWWWWW		Avg 1		1	4	DNA F				er 3	RL ark
NextPea	DET P N N N N N	Δ 1.80000 ks       Avg Type: Log-Pwr       Tr         Input: RF       PN0: Fast ↔       #Atten: 0 dB       ΔMkr3         Ref 0ffset -30 dB       ΔMkr3										
NextFed	Mkr3 1.800 ks -45.21 dB	Δ									div	) dB
			_	_						2		
Next Rig							č.					0.0 0.0
							~					0.0
Next Le	_3∆4	-				din dan an	وي بغ مند و المحمد	-				100
												10
Marker Del										-		130 -
												140 -
att-0112-07 300	Span 0 Hz 20 ks (40001 pts)	Sweep 2.0	-60	,	3.0 MH	VBW	#∖	0 GHz				
Mkr→C	FUNCTION VALUE		INCTION		Y			X		ic  sci	DDE TR	KR M
				IBm	-59.98	S	45.96 s			t		2 1
Mkr→RefL										_	4 1	3 <u>/</u> 4   5
											-	6 7
	S	52		_		2			2	14		8
Мо	7	2							1	_	_	9

Test Item	Limit	Results
Non-Occupancy Period	30 Minutes	Pass



	MNov 10, 2009	05:25:50 PI	ALIGN AUTO		SE:INT	C SEN	AC			2	50 \$		Log	R
Marker	E 123456 WWWWWWW TPNNNNN	TYP	Avg Type: Log-Pwr			] Trig: Free #Atten: 0 o	Fast 🔸		<b>10 ks</b> Input: RF	.8000	1 1	3 /	ker	ar
Select Marker 3	.800 ks 5.71 dB		Ĺ			#Atten. 0 t	ı:High	IFG	30 dB 0 dBm	Offset			3/div	
Norm													X	0.0
Del	● <sup>3∆4</sup>		y		. le lese_		and the second					ki		).0 ).0 00 10
Fixed														20 30 40
c	pan 0 Hz 0001 pts) N VALUE	)20 ks (4	weep 2.0			3.0 MHz -8.08 d	#VBW		GHz		o M	3.0	ter BW	es Gl
Properties					im dB	-61.93 dE -35.71 d -70.01 dE	23 s 3 s 1 ks (∆) 2 s	3		(Δ) (Δ)	t	1 1 1	F Δ4 F	2
<b>Мо</b> 1 о											8			7 3 ) )

30 Minute Non-Occupancy Pe	riod (Associated test) at 5510 MHz
50 Minute Non-Occupancy I e	TIOU (Associated test) at 5510 MIL

Test Item	Limit	Results
Non-Occupancy Period	30 Minutes	Pass



123456	TRACE	ALIGNAUTO e: Log-Pwr	Avg T					50 Ω		L
PNNNNN	DET					PNO: Fast IFGain:High	Input: RF			
		Ĺ								B/div
		_			-			_		
			-		₽¢.					-
		-	-		5			-		
1Δ2					10					
معرينا برخطيت	and the state of the			فاست خريبان جا ساره					اد <u>ر</u> ه بروب	Kz-
					.4	4				
			-							-
		<u> </u>			8	0.				
pan 0 Hz	SI					in the second second	00 GHz			
					V 3.0 MHz	#VE				
N VALUE	FUNCTION	UNCTION WIDTH	ICTION	dB	) -0.85	1.800 ks (	X	scu t (Δ)	TRC 1	MODE
[				Bm	-104.57 d	0.000 s		t	1	F
						(a. (c.		6		
		2								
	123456 NNNNN 800 ks 85 dB 1Δ2 1Δ2 1Δ2 1001 pts)	-0.85 dB	ype: Log-Pwr         TRACE 1/2/3/45 6           TYPE WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW	Avg Type: Log-Pwr         TRACE 1/23/45/6           YPPE         DEI           ΔMkr1         1.800 ks           -0.85 dB         -0.85 dB           1Δ2         -0.85 dB           1Δ2         -0.85 dB           Span 0 Hz         Span 0 Hz           Sweep         2.020 ks (40001 pts)	Avg Type: Log-Pwr         TRACE         1/2/3/4/5 6           e Run dB         TYPE         Def P         NNNNN           ΔMkr1         1.800 ks         -0.85 dB           Image: State of the	Avg Type: Log-Pwr         TRACE 123456           Trig: Free Run         TYPE           #Atten: 0 dB         ΔMkr1 1.800 ks           -0.85 dB         -0.85 dB           1Δ2         1Δ2           1Δ2         5           Span 0 Hz         Sweep 2.020 ks (40001 pts)	Avg Type: Log-Pwr         Trace I 23456           PN0: Fast ++         #Atten: 0 dB         Trig: Free Run           Avg Type: Log-Pwr         TRACE I 23456           Avg Type: Log-Pwr         Avg Type: Log-Pwr           Avg Type: Log-Pwr         Avg Type: Log-Pwr	Avg Type: Log-Pwr       TRACE 1/23456         Input: RF       PNO: Fast → #Atten: 0 dB       Avg Type: Log-Pwr       TRACE 1/23456         et -30 dB       ΔMkr1 1.800 ks       -0.85 dB         .00 dBm       -0.85 dB       -1Δ2         .00 dBm       1Δ2       1Δ2	Avg Type: Log-Pwr         TRACE         1/2/3/4/5 6           Input: RF         PN0: Fast         Trig: Free Run         Avg Type: Log-Pwr         TrRACE         1/2/3/4/5 6           Ref Offset -30 dB         ΔMkr1 1.800 ks         -0.85 dB         -0.85 dB         -0.85 dB           Imput: RF         PN0: Fast         -0.85 dB         -0.85 dB         -0.85 dB           Imput: RF         Imput: RF         Imput: RF         -0.85 dB         -0.85 dB         -0.85 dB           Imput: RF         Imput: RF         Imput: RF         Imput: RF         -0.85 dB         -0.8	Input: RF         PN0: Fast         Trig: Free Run #Atten: 0 dB         Avg Type: Log-Pwr         TRACE 123456           Ref Offset -30 dB Ref -50.00 dBm         ΔMkr1 1.800 ks -0.85 dB         ΔMkr1 1.800 ks -0.85 dB           1Δ2         1Δ2           1Δ2         1Δ2           1Δ1         1Δ2           1Δ1         1Δ000000 GHz           3.0 MHz         #VBW 3.0 MHz           FUNCTION         FUNCTION           1 t         (Δ)           1 t         (Δ)

30 Minute Non-Occupancy Period	d (Non-associated test) at 5310 MHz
Jo Minute Non-Occupancy Terrot	(INOII-associated test) at 5510 MILL

Test Item	Limit	Results
Non-Occupancy Period	30 Minutes	Pass



Marker	1 Nov 10, 2009 1 2 3 4 5 6 E WWWWWWW T P N N N N N	TRACE	ALIGNAUTO : Log-Pwr	Avg Ty		Trig: Free	PNO: Fast ↔	Input: RF	2	50		R
Select Marke		Mkr1 1.	Ĺ		dB	#Atten: 0	IFGain:High	t -30 dB 00 dBm			3/div	
Norm												<b>og</b> 0.0 0.0
De	1Δ2										,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	0.0 0.0 100
					<u></u>	and a second	ere mellen er er et den er		utilizzoni		<u> 1</u>	110 120
Fixe												130 140
c			weep 2.	CTION	Fill	3.0 MHz	#VBV	0 GHz	Hz	.5100 3.0 M	BW	es
Properties					dB	-0.33 -104.99 di	1.800 ks (Δ) 0.000 s		(Δ)	1 t 1 t	Δ2	1 2 3 4
				25 27 27			55 			66 10 10		5 6 7 8
Мо 1 о												9 0 1 2

30 Minute Non-Occupancy Period	d (Non-associated test) at 5510 MHz
Jo Minute Mon-Occupancy I cho	

Test Item	Limit	Results
Non-Occupancy Period	30 Minutes	Pass