Radiated Emission: 802.11a mode

Operation Mode	TX CH Low	Test Date	2013/03/12
Fundamental Frequency	5180 MHz	Test By	Dino
Temperature	25 ℃	Humidity	60 %

No	Freq MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
1	5120.20	48.85	-1.35	47.50	74.00	-26.50	Peak	VERTICAL
2	5150.00	48.31	-1.27	47.04	74.00	-26.96	Peak	VERTICAL
1	5125.80	48.60	-1.33	47.27	74.00	-26.73	Peak	HORIZONTAL
2	5150.00	46.50	-1.27	45.23	74.00	-28.77	Peak	HORIZONTAL

Operation Mode	TX CH High	Test Date	2013/03/12
Fundamental Frequency	5320MHz	Test By	Dino
Temperature	25 ℃	Humidity	60 %

No	Freq MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
1	5350.00	45.24	-0.75	44.49	74.00	-29.51	Peak	VERTICAL
2	5385.78	47.70	-0.65	47.05	74.00	-26.95	Peak	VERTICAL
1	5350.00	45.06	-0.75	44.31	74.00	-29.69	Peak	HORIZONTAL
2	5374.44	47.55	-0.68	46.87	74.00	-27.13	Peak	HORIZONTAL

Remark:

1 Measuring frequencies from the lowest internal frequency to the 10th of fundamental frequency

2 Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.

3 Measurement of data within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

4 Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.

5 Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Band Edges Test Data

802.11a mode, 5500MHz

802.11a mode, 5700MHz

Radiated Emission: 802.11a mode

Operation Mode	TX CH Low	Test Date	2013/03/12
Fundamental Frequency	5500 MHz	Test By	Dino
Temperature	25 ℃	Humidity	60 %

No	Freq MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
1	5447.64	47.30	-0.48	46.82	74.00	-27.18	Peak	VERTICAL
2	5470.00	46.10	-0.43	45.67	74.00	-28.33	Peak	VERTICAL
1	5428.08	47.12	-0.53	46.59	74.00	-27.41	Peak	HORIZONTAL
2	5470.00	45.02	-0.43	44.59	74.00	-29.41	Peak	HORIZONTAL

Operation Mode	TX CH High	Test Date	2013/03/12
Fundamental Frequency	5700MHz	Test By	Dino
Temperature	25 ℃	Humidity	60 %

No	Freq MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
1	5725.00	45.42	0.23	45.65	74.00	-28.35	Peak	VERTICAL
2	5735.56	46.79	0.25	47.04	74.00	-26.96	Peak	VERTICAL
1	5725.00	45.17	0.23	45.40	74.00	-28.60	Peak	HORIZONTAL
2	5750.08	46.63	0.30	46.93	74.00	-27.07	Peak	HORIZONTAL

Remark:

1 Measuring frequencies from the lowest internal frequency to the 10th of fundamental frequency

2 Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.

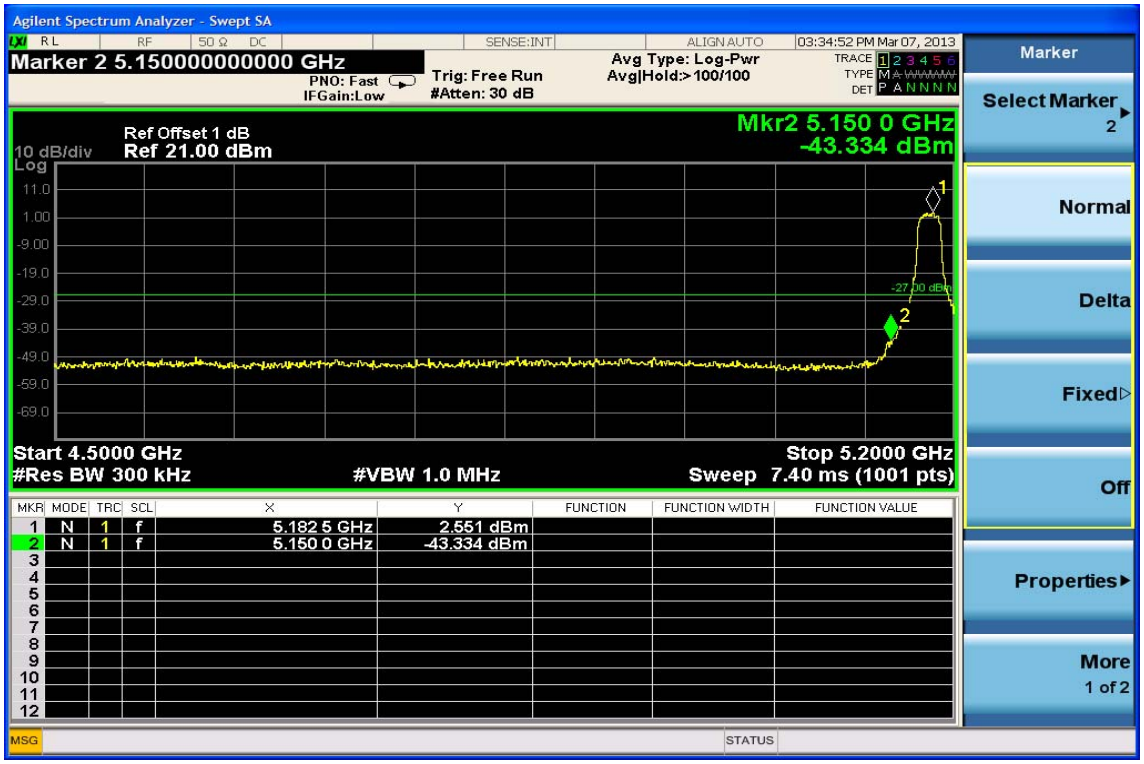
3 Measurement of data within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

4 Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.

5 Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Band Edges Test Data

802.11n HT20 mode, 5180MHz



802.11n HT20 mode, 5320MHz

Radiated Emission: 802.11n HT20 mode

Operation Mode	TX CH Low	Test Date	2013/03/12
Fundamental Frequency	5180 MHz	Test By	Dino
Temperature	25 ℃	Humidity	60 %

No	Freq MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
1	5102.70	49.21	-1.40	47.81	74.00	-26.19	Peak	VERTICAL
2	5150.00	48.64	-1.27	47.37	74.00	-26.63	Peak	VERTICAL
1	4769.50	49.19	-2.44	46.75	74.00	-27.25	Peak	HORIZONTAL
2	5150.00	45.71	-1.27	44.44	74.00	-29.56	Peak	HORIZONTAL

Operation Mode	TX CH High	Test Date	2013/03/12
Fundamental Frequency	5320MHz	Test By	Dino
Temperature	25 ℃	Humidity	60 %

No	Freq MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
1	5350.00	46.67	-0.75	45.92	74.00	-28.08	Peak	VERTICAL
2	5391.00	47.55	-0.63	46.92	74.00	-27.08	Peak	VERTICAL
1	5350.00	45.30	-0.75	44.55	74.00	-29.45	Peak	HORIZONTAL
2	5357.97	47.74	-0.72	47.02	74.00	-26.98	Peak	HORIZONTAL

Remark:

1 Measuring frequencies from the lowest internal frequency to the 10th of fundamental frequency

2 Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.

3 Measurement of data within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

4 Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.

5 Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Band Edges Test Data

802.11n HT20 mode, 5500MHz

802.11n HT20 mode, 5700MHz

Radiated Emission: 802.11n HT20 mode

Operation Mode	TX CH Low	Test Date	2013/03/12
Fundamental Frequency	5500 MHz	Test By	Dino
Temperature	25 ℃	Humidity	60 %

No	Freq MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
1	5449.92	47.31	-0.48	46.83	74.00	-27.17	Peak	VERTICAL
2	5470.00	45.24	-0.43	44.81	74.00	-29.19	Peak	VERTICAL
1	5456.28	47.64	-0.47	47.17	74.00	-26.83	Peak	HORIZONTAL
2	5470.00	45.00	-0.43	44.57	74.00	-29.43	Peak	HORIZONTAL

Operation Mode	TX CH High	Test Date	2013/03/12
Fundamental Frequency	5700MHz	Test By	Dino
Temperature	25 ℃	Humidity	60 %

No	Freq MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
1	5725.00	44.69	0.23	44.92	74.00	-29.08	Peak	VERTICAL
2	5775.88	46.76	0.37	47.13	74.00	-26.87	Peak	VERTICAL
1	5725.00	44.68	0.23	44.91	74.00	-29.09	Peak	HORIZONTAL
2	5750.08	47.79	0.30	48.09	74.00	-25.91	Peak	HORIZONTAL

Remark:

1 Measuring frequencies from the lowest internal frequency to the 10th of fundamental frequency

2 Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.

3 Measurement of data within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

4 Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.

5 Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

12. TRANSMISSION IN THE ABSENCE OF DATA

12.1 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 signalling 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.

According to RSS-210 A9.4(4)

The device shall automatically discontinue transmission in case of absence of information to transmit, or operational failure. A description on how this is done shall accompany the application for equipment certification. Note that this is not intended to prohibit transmission of control or signalling information or the use of repetitive codes where required by the technology.

12.2 Result:

No non-compliance noted:

Refer to the theory of operation.

13. FREQUENCY STABILITY

13.1 Standard Applicable

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.

According to A9.5

(5) The applicant shall ensure frequency stability by showing that an emission is maintained within the band of operation under all normal operating conditions as specified in the user's manual.

13.2 Result:

No non-compliance noted:

±20ppm ppm was defined in product specification.

14. ANTENNA REQUIREMENT

14.1 Standard Applicable

According to §15.203, Antenna requirement.

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.

14.2 Antenna Connected Construction

The directional gins of antenna used for transmitting is -0.03dBi for 5180 – 5320MHz; 0.25dBi for 5500 – 5700MHz, 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.

15. TPC and DFS MEASUREMENT

15.1 TPC: Standard Applicable

According to §15.407(h)(1), Transmit power control (TPC). 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 30 dBm. A TPC mechanism is not required for systems with an e.i.r.p. of less than 500 mW.

According to RSS 210 A9.2 (3), The maximum conducted output power shall not exceed 250mW or 11 + 10 log10 B, dBm, whichever power is less. The power spectral density shall not exceed 11dBm in any 1.0 MHz band. The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. Note that devices with a maximum e.i.r.p. greater than 500mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

15.1.1. Result: N/A, The output power is less than 500mW(27dBm).

15.2 DFS: Standard Applicable

According to §15.407(h)(2), Radar Detection Function of Dynamic Frequency Selection (DFS). U-NII devices operating in the 5.25-5.35 GHz and 5.47-5.725 GHz bands shall employ a DFS radar detection.

According to RSS 210 A9.3), Note: For the band 5600-5650 MHz, no operation is permitted. Until further notice, devices subject to this annex shall not be capable of transmitting in the band 5600-5650 MHz. This restriction is for the protection of Environment Canada weather radars operating in this band.

Devices operating in the bands 5250-5350 MHz, 5470-5600 MHz and 5650-5725 MHz band shall comply with the following:
(a) Devices shall employ a DFS radar detection mechanism to detect the presence of radar systems and to avoid co-channel operation with radar systems (see Note below). The minimum DFS radar signal detection threshold is -62dBm for devices with a maximum e.i.r.p. less than 200mW, and -64dBm for devices with a maximum e.i.r.p. of 200mW to 1 W. The detection threshold power is the received power, averaged over a 1-microsecond reference to a 0dBi antenna. The DFS process shall provide a uniform spreading of the loading over all the available channels.

Note: Test procedures for demonstrating compliance with the DFS radar detection requirements set out in this section are being evaluated by Industry Canada. As an interim measure, the Department will, until further notice, accept utilization of the DFS test procedures published by the U.S. Federal Communications Commission (FCC) 3 to demonstrate compliance with the requirements of this section.

(b) Operational requirements: the requirement for channel availability check time applies in the master operational mode. The requirement for channel move time applies in both the master and slave operational modes.

(i) In-service monitoring: an LE-LAN device should be able to monitor the operating channel to check that a co-channel radar has not moved or started operation within range of the LE-LAN device. During in-service monitoring, the LE-LAN radar detection function continuously searches for radar signals between normal LE-LAN transmissions.
(ii) Channel availability check time: the device shall check if there is a radar system already operating on the channel before it initiates a transmission on a channel and when it moves to a channel. The device may start using the channel if no radar signals with a power level greater than the interference threshold value specified in A9.3 (a) above is detected within 60 seconds.
(iii) Channel move time: after a radar's signal is detected, the device shall cease all transmissions on the operating channel within 10 seconds. Transmission during this period shall consist of normal traffic for a maximum of 200 ms after detection of the radar signal. Intermittent management and control signals may also be sent during the remaining time to facilitate vacating the operating channel.

(iv) Channel closing time: the maximum channel closing time is 260 ms.
(v) Non-occupancy period: a channel that has been flagged as containing a radar signal, either by a channel availability check or in-service monitoring, is subject to a 30-minute non-occupancy period where the channel cannot be used by the LE-LAN device. The non-occupancy period starts from the time that the radar signal is detected.

15.2.1. Limit

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

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

Table 2: Applicability of DFS requirements during normal operation

Requirement	Operational Mode		
	Master	Client(without radar detection)	Client(with radar detection)
DFS Detection Threshold	Yes	Not required	Yes
Channel Closing Transmis-sion Time	Yes	Yes	Yes
Channel Move Time	Yes	Yes	Yes
U-NII Detection Bandwidth	Yes	Not required	Yes

Refer to KDB Number: 848637

Refer to KDB Number: 905462 APPENDIX B COMPLIANCE MEASUREMENT PROCEDURES FOR UNLICENSED-NATIONAL INFORMATION INFRASTRUCTURE DEVICES OPERATING IN THE 5.25-5.35 GHz AND 5.47-5.725 GHz BANDS INCORPORATING DYNAMIC FREQUENCY SELECTION.

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

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 assuming a 0 dBi receive antenna Note 2: Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response.	

Table 4: DFS Response requirement values

Parameter	Value
Non-occupancy period	Minimum 30 minutes
Channel Availability Check Time	60 seconds
Channel Move Time	10 seconds See Note 1.
Channel Closing Transmission Time	200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period. See Notes 1 and 2.
U-NII Detection Bandwidth	Minimum 80% of the U-NII 99% transmission power bandwidth. See Note 3.

Note 1: The instant that the *Channel Move Time* and the *Channel Closing Transmission Time* begins is as follows:

- For the Short Pulse Radar Test Signals this instant is the end of the *Burst*.
- For the Frequency Hopping radar Test Signal, this instant is the end of the last radar *Burst* generated.
- For the Long Pulse Radar Test Signal this instant is the end of the 12 second period defining the *Radar Waveform*.

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 to facilitate a *Channel* move (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions.

Note 3: During the *U-NII Detection Bandwidth* detection test, radar type 1 is used and for each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.

Table 5: Radar Test Waveforms

Short Pulse Radar

Radar Type	Pulse Width (μsec)	PRI (μsec)	Number of Pulses	Minimum Percentage of Successful Detection	Minimum Trials
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 (Radar Types 1-4)				80%	120

A minimum of 30 unique waveforms are required for each of the Short Pulse Radar Types 2 through 4. For Short Pulse Radar Type 1, the same waveform is used a minimum of 30 times. If more than 30 waveforms are used for Short Pulse Radar Types 2 through 4, then each additional waveform must also be unique and not repeated from the previous waveforms

Long Pulse Radar

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

The parameters for this waveform are randomly chosen. Thirty unique waveforms are required for the Long Pulse Radar Type waveforms. If more than 30 waveforms are used for the Long Pulse Radar Type waveforms, then each additional waveform must also be unique and not repeated from the previous waveforms.

Frequency Hopping Radar

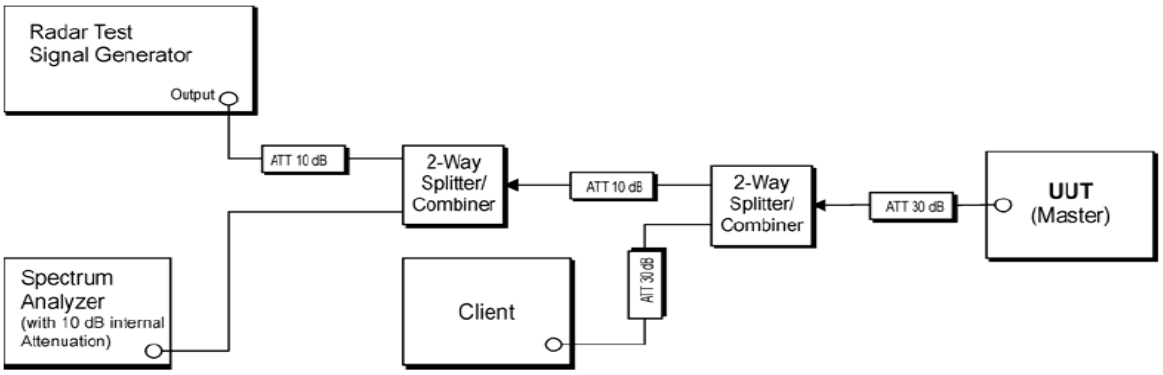
Radar Type	Pulse Width (μsec)	PRI (μsec)	Pulses per Hop	Hopping Rate (kHz)	Hopping Sequence Length (msec)	Minimum Percentage of Successful Detection	Minimum Trials
6	1	333	9	.333	300	70%	30

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 defined by the following algorithm: 3

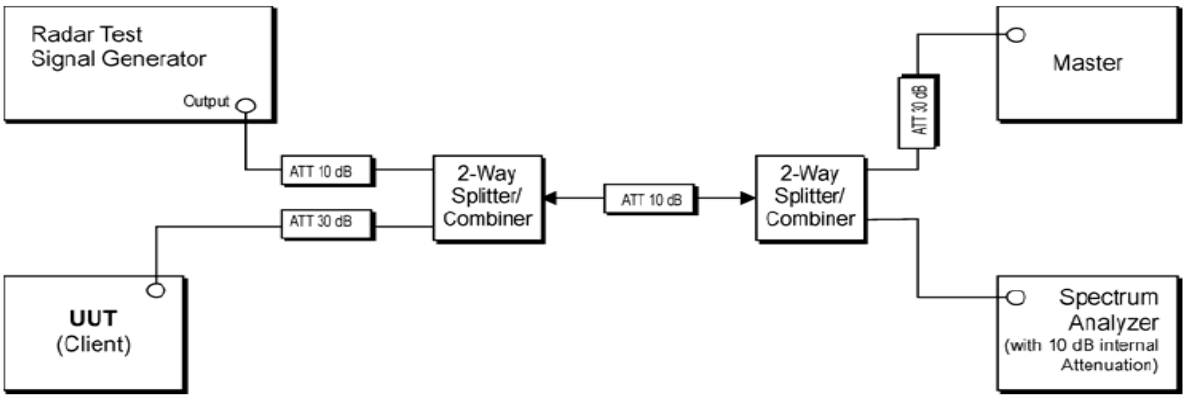
The first frequency in a hopping sequence is selected randomly from the group of 475 integer frequencies from 5250 – 5724 MHz. Next, the frequency that was just chosen is removed from the group and a frequency is randomly selected from the remaining 474 frequencies in the group. This process continues until all 475 frequencies are chosen for the set. For selection of a random frequency, the frequencies remaining within the group are always treated as equally likely.

15.2.2.Test Setup

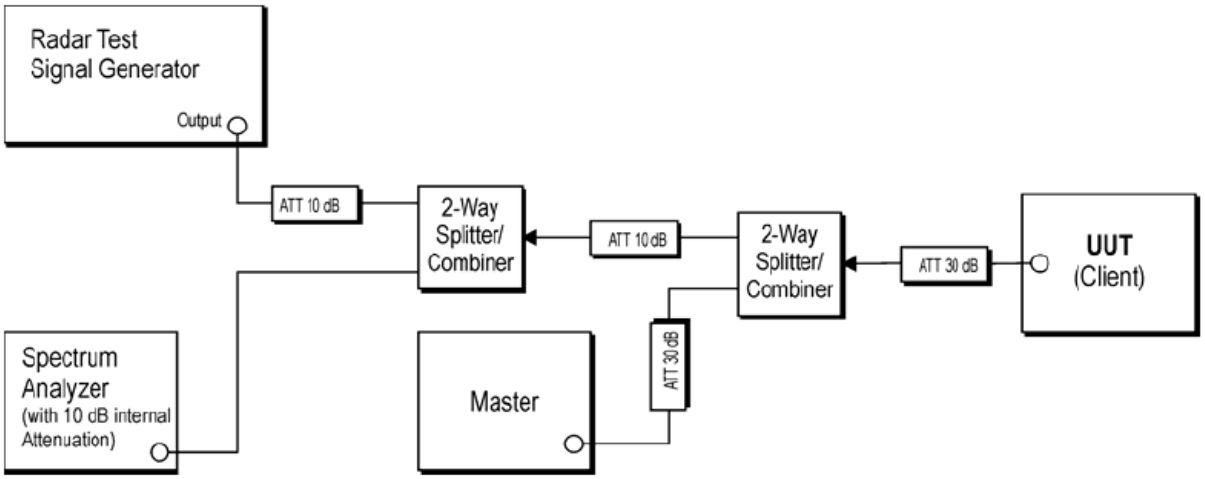
Setup for Master with injection at the Master



Setup for Client with injection at the Master



Setup for Client with injection at the Client



15.3 Test Equipment Used:

Conducted DFS Test Site					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
Signal Generator	Agilent	E4438C	MY49071550	04/10/2012	04/09/2013
Spectrum analyzer	Agilent	N9030A	MY51360021	03/10/2013	03/09/2014
AP Router	Cisco	AIR-RM1252AG-A-K9	FTX1220905D	NA	NA
Splitter	Mini-Circuits	ZN2PD-63-S	UU97201111	NA	NA
Attenuator	Woken	Watt-65m3502	11051601	NA	NA
Software	Agilent	DFS TEST	NA	NA	NA
Cable	Draka	NA	NA	NA	NA

15.2.4. Description of EUT :

EUT operates over the 5250-5350MHz and 5470-5725MHz ranges and EUT is a slave device (client equipment) w/o radar detection and DFS capability. EUT has a gain of -0.03 and 0.25dBi in the 5GHz Band.

The EUT utilizes the 802.11a architecture, with a nominal channel bandwidth of 20MHz WLAN traffic is generated by streaming the mpeg file from the master to slave in full monitor video mode using the media player.

The rated output power of the master unit is >23dBm(EIRP).therefore the required interference threshold level is -64dBm.after correction for antenna gain and procedural adjustments, the required conducted threshold at the antenna port is -64+6=-58, and the master device as employed for the applicable DFS test is CISCO router whose FCC ID= LDK102061

15.4 Test results

Applicability of DFS requirements prior to use of a channel

Requirement	Operational Mode: Client(without radar detection)	
	Test Result	Remark
Non-occupancy Period	N/A	Pass
DFS Detection Threshold	N/A	Pass
Channel Availability Check Time	N/A	Pass
Uniform Spreading	N/A	Pass
U-NII Detection Bandwidth	N/A	Pass

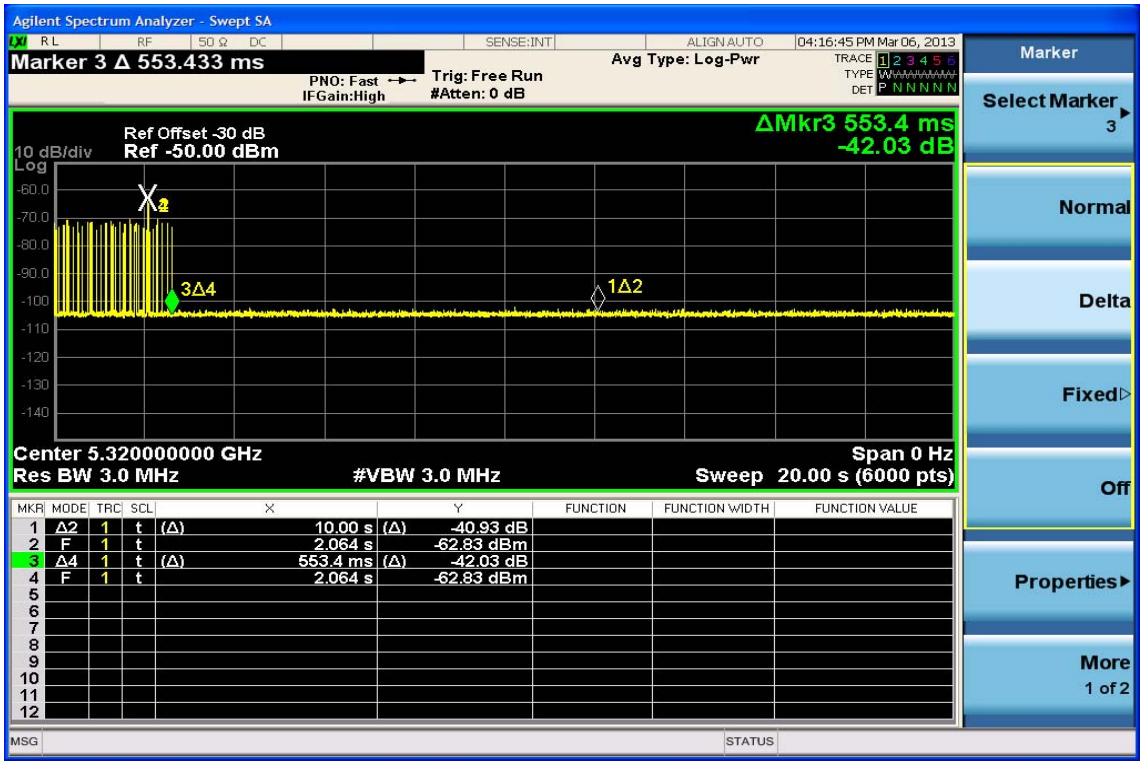
Applicability of DFS requirements during normal operation

Requirement	Operational Mode: Client(without radar detection)	
	Test Result	Remark
DFS Detection Threshold	N/A	Pass
Channel Closing Transmission Time	Less than 200ms, Refer to next page for plots.	Pass
Channel Move Time	Less than 10s, Refer to next page for plots.	Pass
U-NII Detection Bandwidth	N/A	Pass

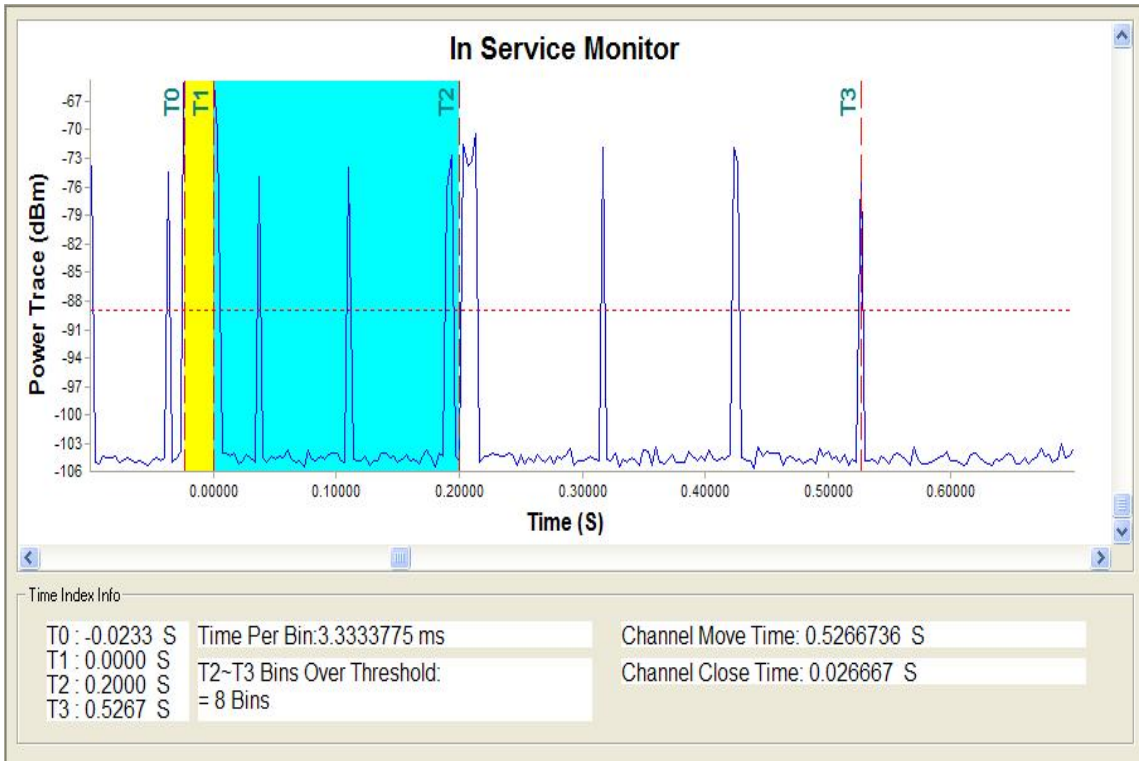
Input Level to Master AP= -62dBm

5250MHz ~ 5350MHz

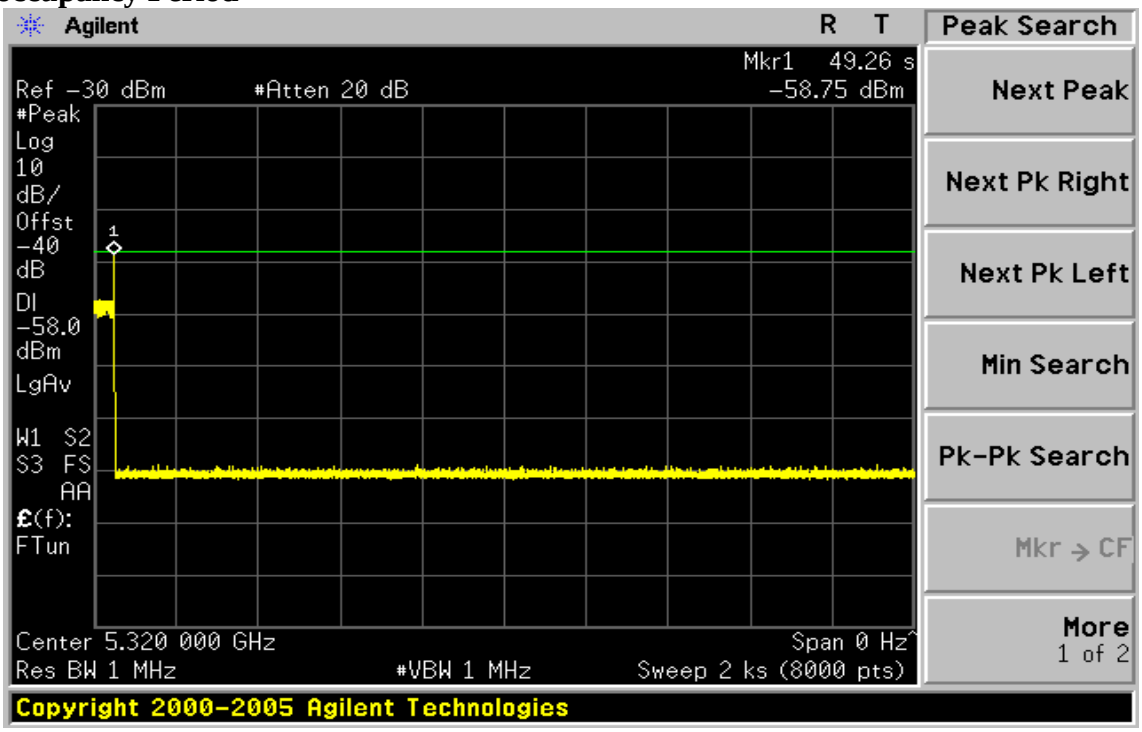
Radar Type 1 Channel Move Time



Radar Type 1 Channel Closing Transmission Time

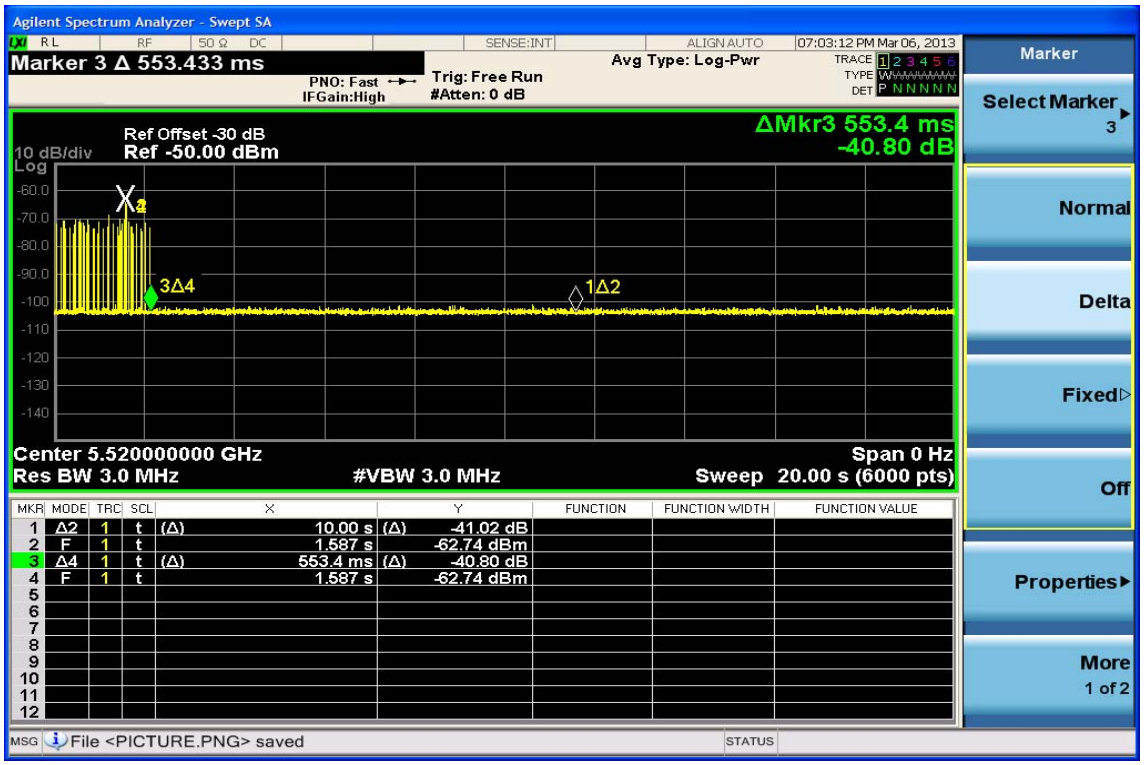


Non-occupancy Period

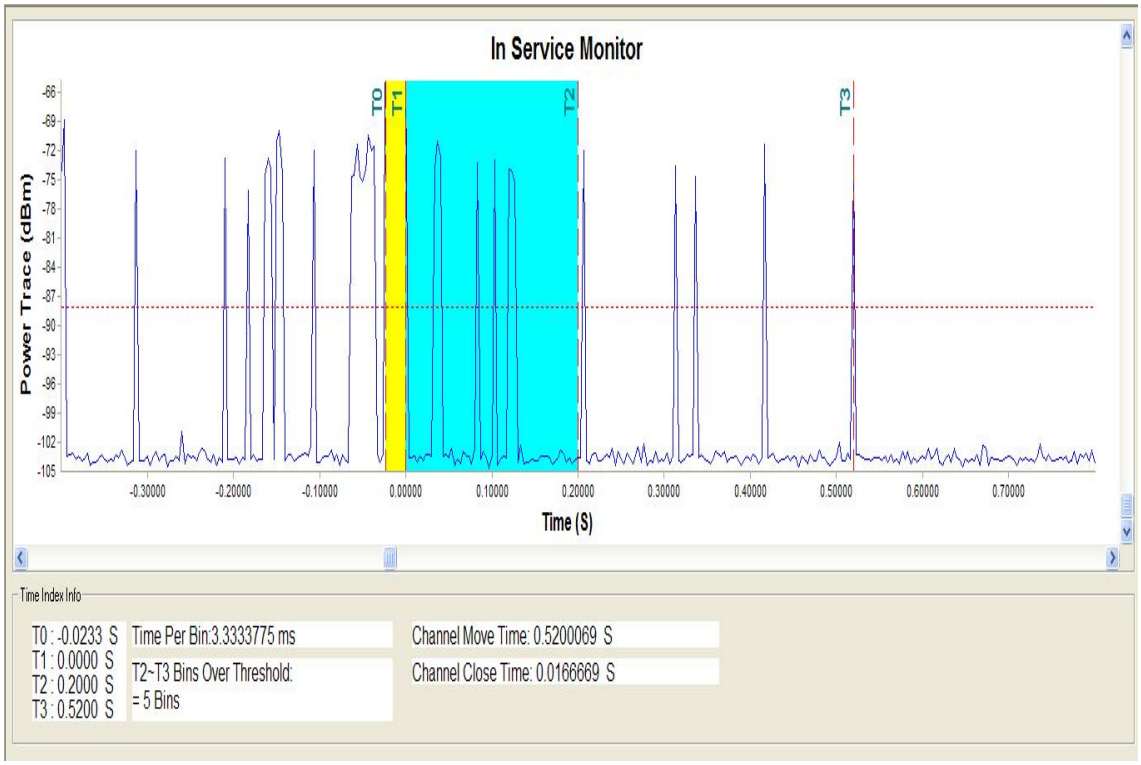


5500MHz ~ 5700MHz

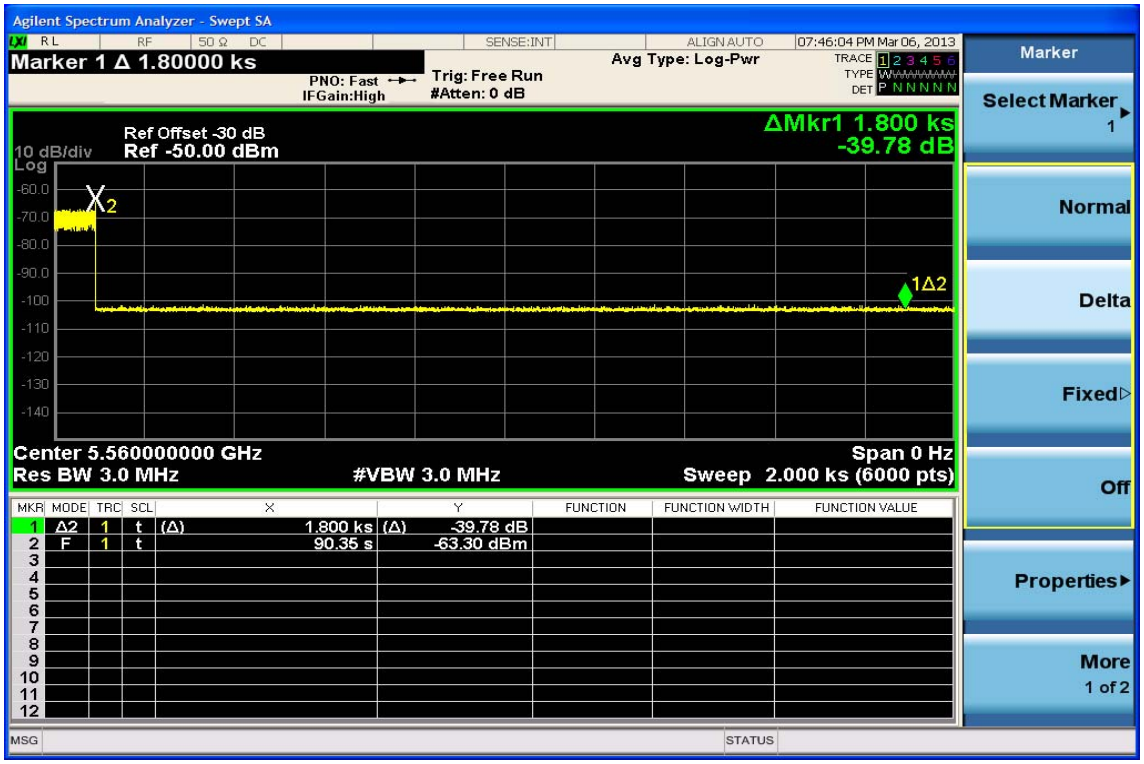
Radar Type 1 Channel Move Time



Radar Type 1 Channel Closing Transmission Time

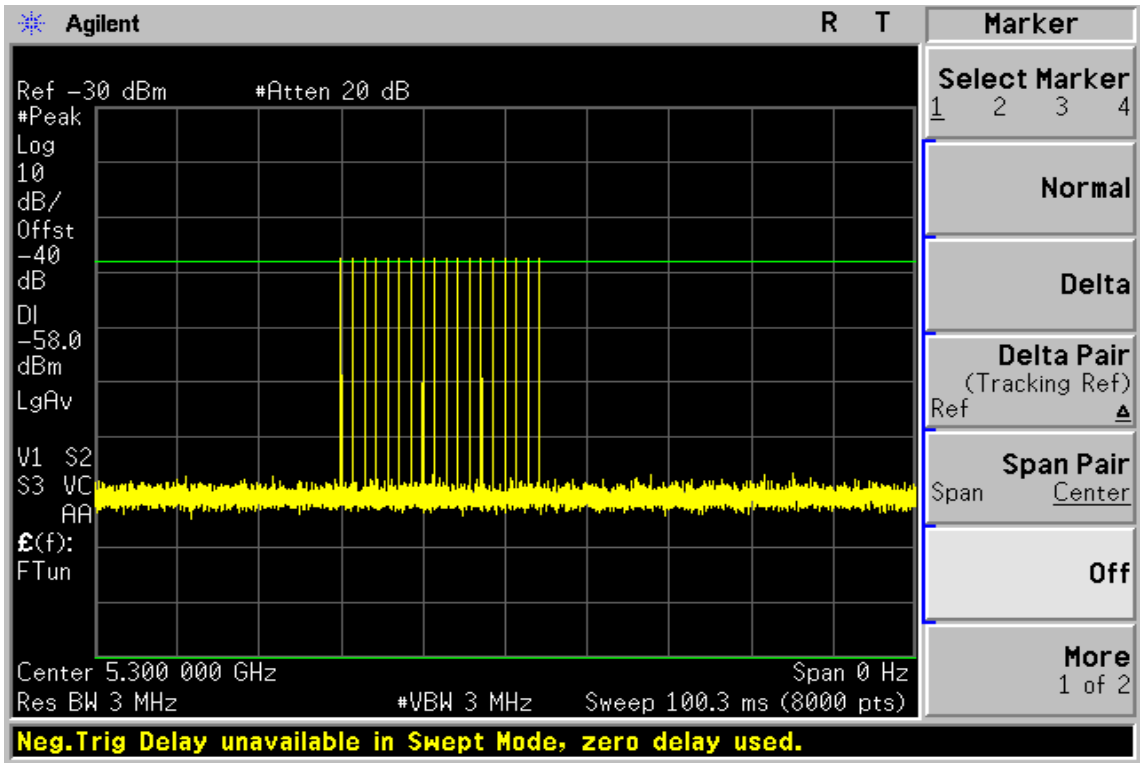


Non-occupancy Period

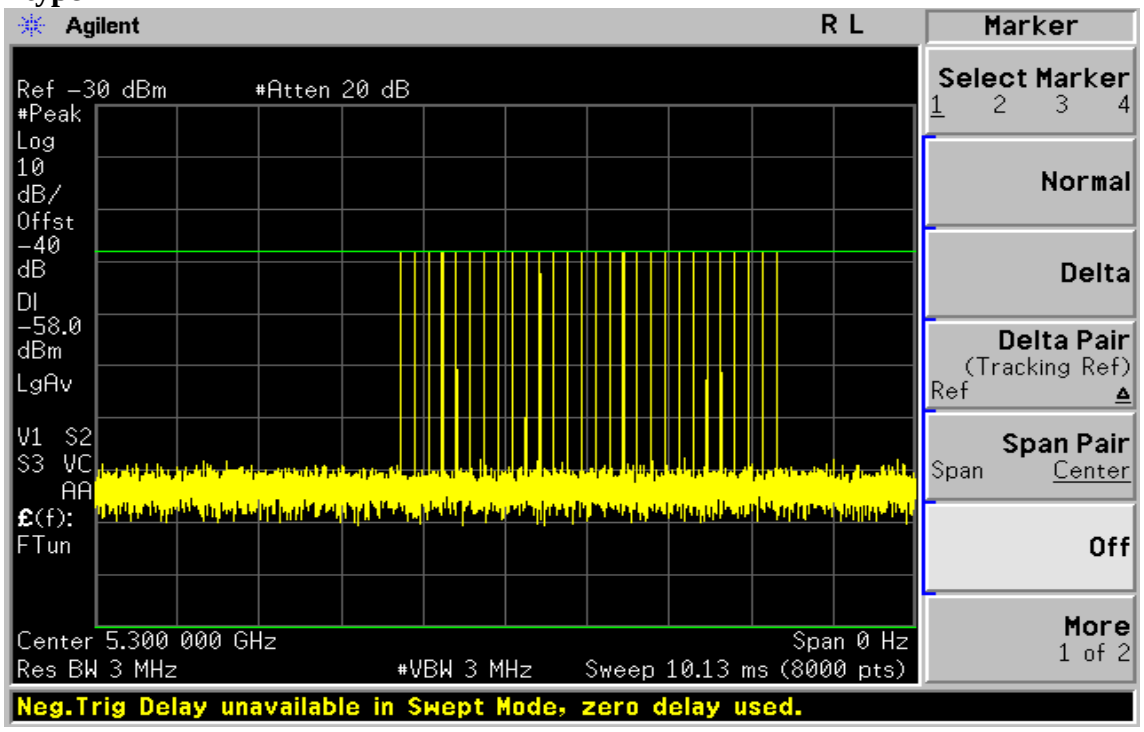


Calibration plots for each of the required radar waveforms

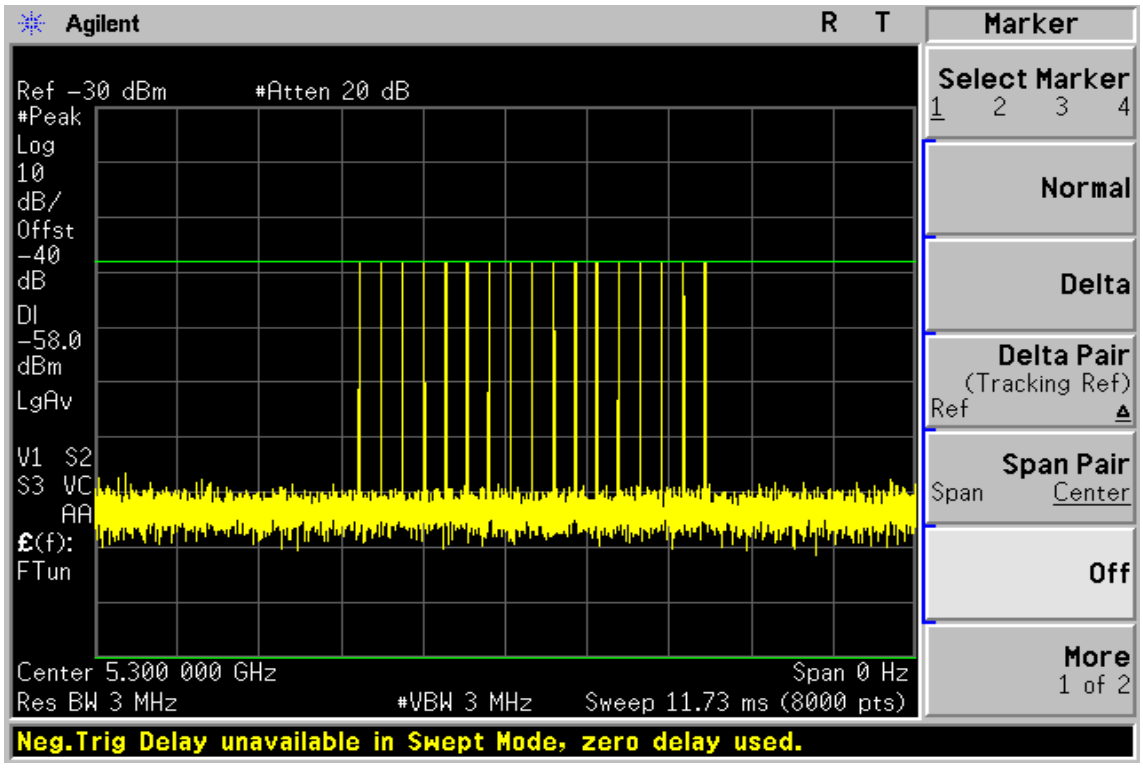
Radar type 1



Radar type 2



Radar type 3



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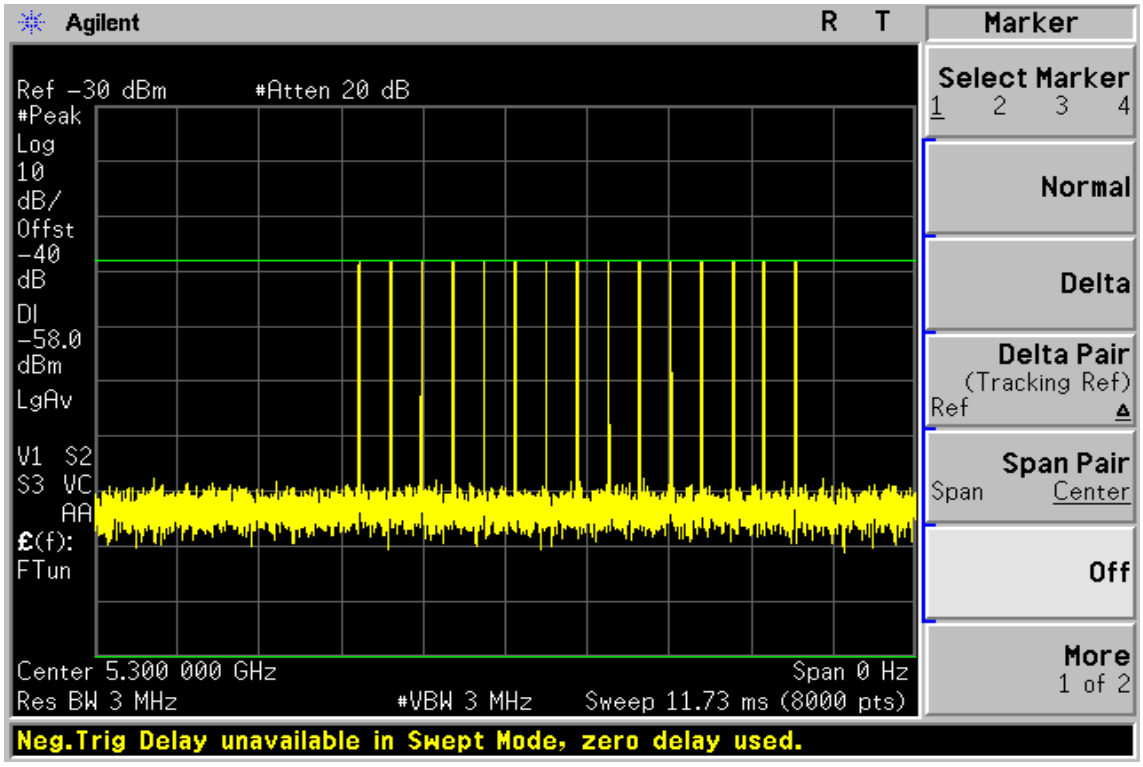
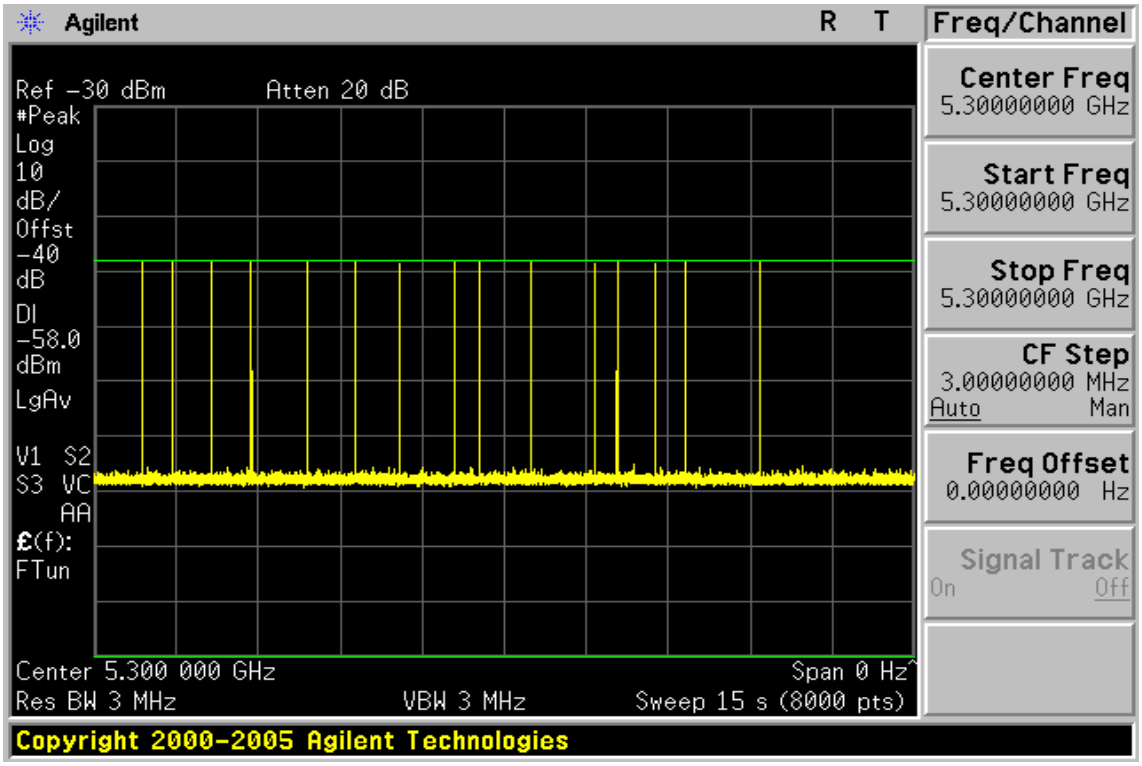
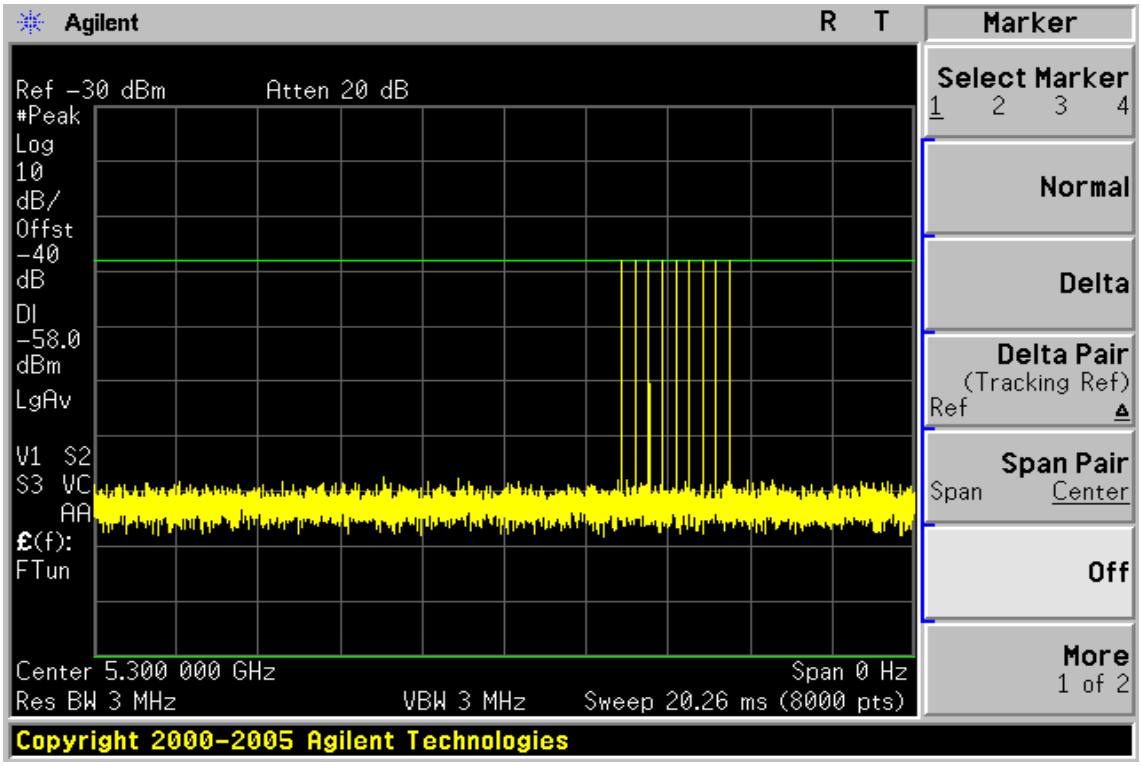


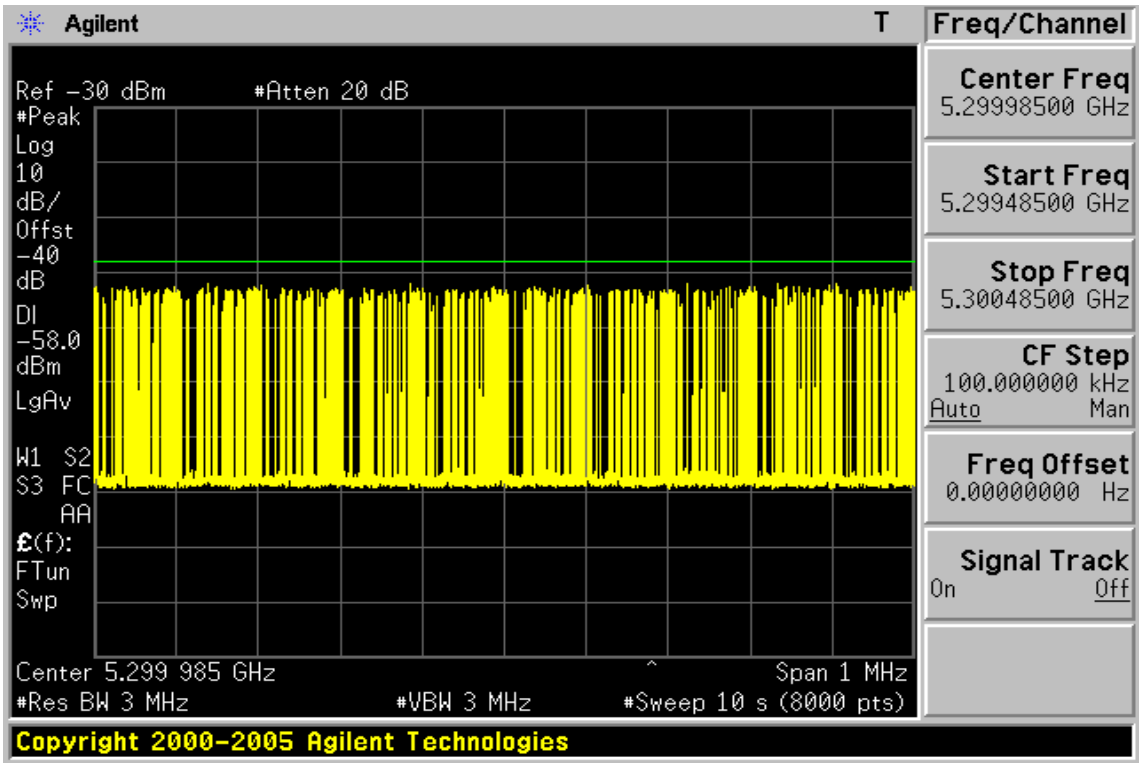
Radar type 5



Radar type 6



WLAN traffic



16. Maximum Permissible Exposure (MPE)

16.1 Standard Applicable

According to §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

This is a Mobile device, the MPE is required.

According to §1.1310 and §2.1093 RF exposure is calculated.

Limits for Maximum Permissive Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Averaging Time (minute)
Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*($180/f^2$)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	F/1500	30
1500-15000	/	/	1.0	30

F = frequency in MHz

* = Plane-wave equipment power density

16.2 Maximum Permissible Exposure (MPE) Evaluation

MPE Prediction (802.11a) (worst case)

802.11a

Mode	Freq(MHz)	channel	Peak power (dBm)	limit(dBm)	result
802.11a	5180	36	12.53	16.98	pass
	5260	52	12.49	23.97	pass
	5320	64	12.25	23.97	pass
	5500	100	12.07	23.97	pass
	5580	116	11.90	23.97	pass
	5700	140	12.16	23.97	pass

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$S=PG/4\pi R^2$

Where: S = Power density

P = Power input to antenna

G = Power gain of the antenna in the direction of interest relative to an isotropic radiator

R = Distance to the center of radiation of the antenna

Maximum peak output power at antenna input terminal:	12.53	(dBm)
Maximum peak output power at antenna input terminal:	17.90605854	(mW)
Duty cycle:	100	(%)
Maximum Pav :	17.90605854	(mW)
Antenna gain (typical):	-0.03	(dBi)
Maximum antenna gain:	0.993116048	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	5180	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm2)
Power density at predication frequency at 20 (cm)	0.0035396	(mW/cm^2)

Measurement Result

The predicted power density level at 20 cm is 0.00619 mW/cm^2. This is below the uncontrolled exposure limit of 1 mW/cm^2 at 5180MHz.