FCC/ IC DFS TEST REPORT

Issued Date	**:** Nov. 16, 2012
Project No.	**:** 1209C079A
Equipment	**:** Wireless LAN Access Point
Model Name	**:** AP5010DN-AGN
Applicant	**:** Huawei Technologies Co.,Ltd.
Address for FCC	**:** Bantian, Longgang District, Shenzhen China
Address for IC	**:** Bantian, Longgang District, Shenzhen, 518129 China

Tested by:
Neutron Engineering Inc. EMC Laboratory
Date of Receipt: Sep. 13, 2012
Date of Test: Sep. 13, 2012 ~ Nov. 15, 2012

Testing Engineer : David Mao
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Declaration

Neutron represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with the standards traceable to National Measurement Laboratory (**NML**) of **R.O.C.**, or National Institute of Standards and Technology (**NIST**) of **U.S.A.**

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Limitation

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.

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1. CERTIFICATION

Equipment	:	Wireless LAN Access Point
Trade Name		HUAWEI
Model Name.		AP5010DN-AGN
Applicant	:	Huawei Technologies Co.,Ltd.
Date of Test:		Sep. 13, 2012 ~ Nov. 15, 2012
Test Item	:	ENGINEERING SAMPLE
Standards	:	FCC Part 15, Subpart E (Section 15.407) FCC 06-96 Canada RSS-210:2010

The above equipment has been tested and found compliance with the requirement of the relative standards by Neutron Engineering Inc. EMC Laboratory.
The test data, data evaluation, and equipment configuration contained in our test report (Ref No. NEI-FICP-1-1209C079A) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of NVLAP and TAF according to the ISO-17025 quality assessment standard and technical standard(s).

2. EUT INFORMATION

2.1 EUT SPECIFICATION TABLE

Table 1: Specification of EUT

Product name	Wireless LAN Access Point
Brand Name	HUAWEI
Model	AP5010DN-AGN
FCC ID	QISAP5010DNAGN
IC ID	6369A-AP5010DNAGN
Software Version	V200R002C00B025
Firmware Version	VER.B
Operational Mode	Master
Operating Frequency Range	5260~5320MHz&5500~5700MHz without 5600~5650MHz
Modulation	OFDM

Note: This device was functioned as a ■Master ☐Slave device during the DF

2.2 DESCRIPTION OF AVAILABLE ANTENNAS TO THE EUT

Table for Filed Antenna

The product has 2 group antenna: Amphenol-SAA and Nippon Antenna(Shanghai)

Ant.	Brand	Model Name	Antenna Type / Connector	function	Gain (dBi)
1	Amphenol-SAA	N/A	Integral	TX/RX	5.3
2	Amphenol-SAA	N/A	Integral	TX/RX	5.5

Ant.	Brand	Model Name	Antenna Type / Connector	function	Gain (dBi)
1 (Short)	Nippon Antenna (Shanghai)	N/A	Integral	TX/RX	5.79
2 (Long)	Nippon Antenna (Shanghai)	N/A	Integral	TX/RX	5.51

2.3 CONDUCTED OUTPUT POWER AND EIRP POWER

TABLE 3: THE CONDUCTED OUTPUT POWER LIST

TX (11a)

FREQUENCY BAND (MHz)	MAX. POWER – For 1TX	
	OUTPUT POWER(dBm)	OUTPUT POWER(mW)
5180~5240	14.11	25.76
5260~5320	15.50	35.48
5500~5700	15.30	33.88

TX (40MHz)

FREQUENCY BAND (MHz)	MAX. POWER – For 1TX	
	OUTPUT POWER(dBm)	OUTPUT POWER(mW)
5190~5230	14.33	27.10
5270~5310	14.49	28.12
5510~5670	15.27	33.65

TX (11a)

FREQUENCY BAND (MHz)	MAX. POWER – For 2TX	
	OUTPUT POWER(dBm)	OUTPUT POWER(mW)
5180~5240	14.21	26.36
5260~5320	15.71	37.24
5500~5700	16.43	43.95

TX (11n 40MHz)

FREQUENCY BAND (MHz)	MAX. POWER – For 2TX	
	OUTPUT POWER(dBm)	OUTPUT POWER(mW)
5190~5230	14.69	29.44
5270~5310	14.62	28.97
5510~5670	15.36	34.36

2.4 EUT MAXIMUM AND MINIMUM E.I.R.P. POWER

TABLE 4: THE MAX EIRP LIST

TX (11a)

FREQUENCY BAND (MHz)	MAX. POWER – For 1TX	
	OUTPUT POWER(dBm)	OUTPUT POWER(mW)
5180~5240	19.90	97.72
5260~5320	21.29	134.59
5500~5700	21.09	128.53

TX (11n 40MHz)

FREQUENCY BAND (MHz)	MAX. POWER – For 1TX	
	OUTPUT POWER(dBm)	OUTPUT POWER(mW)
5190~5230	20.12	102.80
5270~5310	20.28	106.66
5510~5670	21.06	127.64

TX (11a)

FREQUENCY BAND (MHz)	MAX. POWER – For 2TX	
	OUTPUT POWER(dBm)	OUTPUT POWER(mW)
5180~5240	20.00	100.00
5260~5320	21.50	141.25
5500~5700	22.22	166.72

TX (11n 40MHz)

FREQUENCY BAND (MHz)	MAX. POWER – For 2TX	
	OUTPUT POWER(dBm)	OUTPUT POWER(mW)
5190~5230	20.48	111.69
5270~5310	20.41	109.90
5510~5670	21.15	130.32

3. U-NII DFS RULE REQUIREMENTS

3.1 WORKING MODES AND REQUIRED TEST ITEMS

The manufacturer shall state whether the UUT is capable of operating as a Master and/or a Client. If the UUT is capable of operating in more than one operating mode then each operating mode shall be tested separately. See tables 1 and 2 for the applicability of DFS requirements for each of the operational modes.

Table 5: Applicability of DFS requirements prior to use a channel

Requirement	**Operational Mode**		
	Master	**Client without radar detection**	**Client with radar detection**
Non-Occupancy Period	✓	Not required	✓
DFS Detection Threshold	✓	Not required	✓
Channel Availability Check Time	✓	Not required	Not required
Uniform Spreading	✓	Not required	Not required
U-NII Detection Bandwidth	✓	Not required	✓

Table 6: Applicability of DFS requirements during normal operation.

Requirement	**Operational Mode**		
	Master	**Client without radar detection**	**Client with radar detection**
DFS Detection Threshold	✓	Not required	✓
Channel Closing Transmission Time	✓	✓	✓
Channel Move Time	✓	✓	✓
U-NII Detection Bandwidth	✓	Not required	✓

3.2 TEST LIMITS AND RADAR SIGNAL PARAMETERS

DETECTION THRESHOLD VALUES

Table 7: DFS Detection Thresholds for Master Devices and Client Devices With Radar Detection.

Maximum Transmit Power	Value (See Notes 1 and 2)
⩾ 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 8: 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 UNII 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.

PARAMETERS OF DFS TEST SIGNALS

Step intervals of 0.1 microsecond for Pulse Width, 1 microsecond for PRI, 1 MHz for chirp width and 1 for the number of pulses will be utilized for the random determination of specific test waveforms.

Table 9: Short Pulse Radar Test Waveforms.

Radar Type	Pulse Width (μsec)	PRI (μsec)	Number of Pulses	Minimum Percentage of Successful Detection	Minimum Number of 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

Table 10: Long Pulse Radar Test Waveform

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

Table 11: Frequency Hopping Radar Test Waveform

Radar Type	Pulse Width (μsec)	Chirp Width (MHz)	PRI (μsec)	Numberof Pulsesper Burst	Numberof Bursts	Minimum Percentage of Successful Detection	Minimum Number ofTrials
6	1	333	9	0.333	300	70%	30

4. TEST INSTRUMENTS

Table 1: Test instruments list.

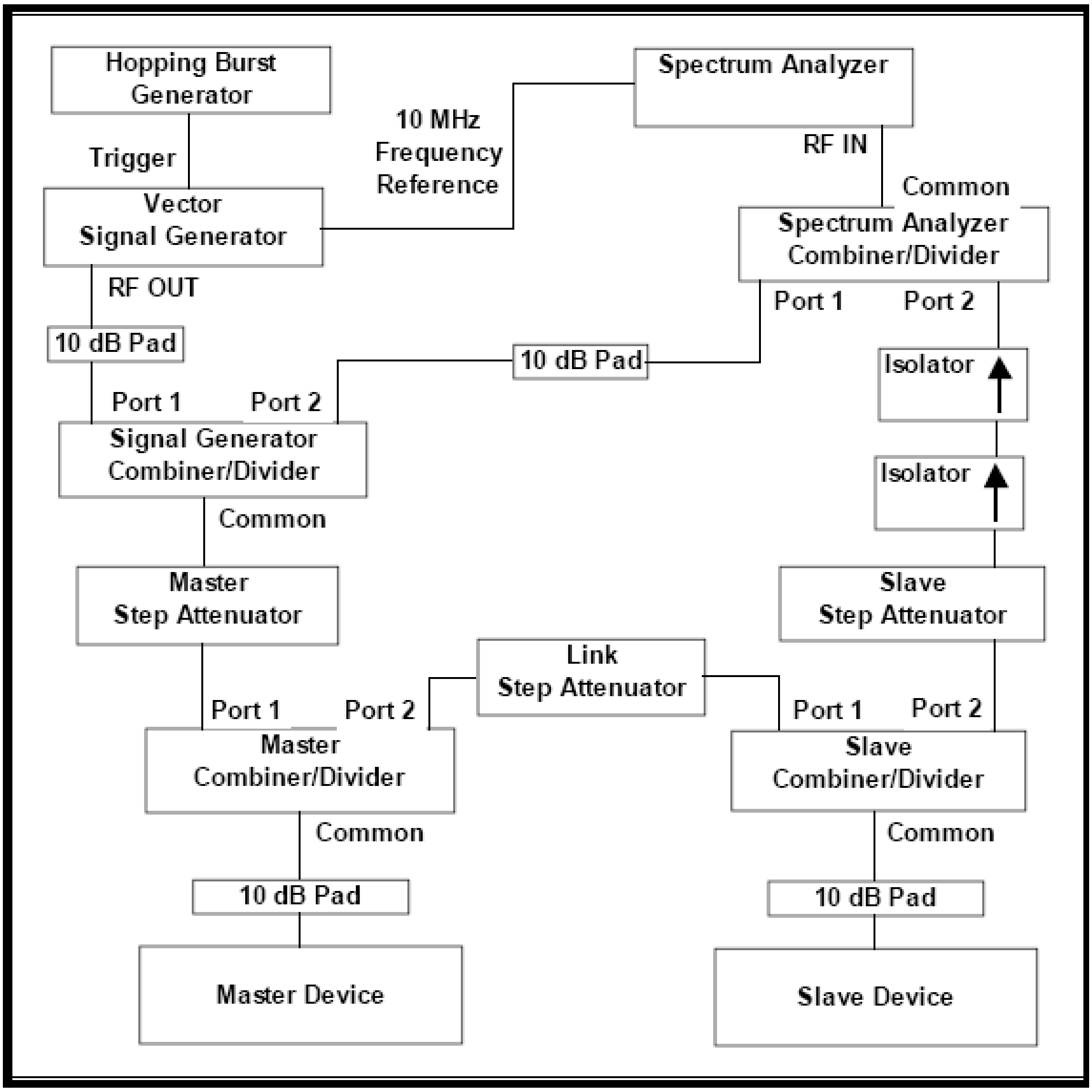
DESCRIPTION	MANUFACTURER	MODEL NO.	Serial No	Last Calibration	Next Calibration
EXA Specturm Analyzer	Agilent	N9010A	MY50520044	2012-05-04	2013-05-04
Signal Generator	Agilent	E4438C	My49071316	2012-05-04	2013-05-04
POWER SPLITTER	Mini-Cicuits	ZFRSC-123-S+	331000910	2012-05-04	2013-05-04
POWER SPLITTER	Mini-Cicuits	ZN4PD1-63-S+	SF933501045	2012-05-04	2013-05-04
POWER SPLITTER	Mini-Cicuits	ZN2PD-9G-S+	SF012700714	2012-05-04	2013-05-04
attenuator	Mini-Cicuits	VAT-30+	30912	2012-05-04	2013-05-04
attenuator	Mini-Cicuits	VAT-10+	30909	2012-05-04	2013-05-04
Specturm Analyzer	R&S	FSL6	1004423	2011-11-25	2012-11-25
PC	Dell 745	DCSM	G7K832X	--	--
Netbook	Hp	HSTNN-I69C-3	CNU02203XG	--	--

Note: Calibration interval of instruments listed above is one year.

5. EMC EMISSION TEST

5.1 DFS MEASUREMENT SYSTEM:

CONDUCTED METHOD SYSTEM BLOCK DIAGRAM



SYSTEM OVERVIEW

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

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

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

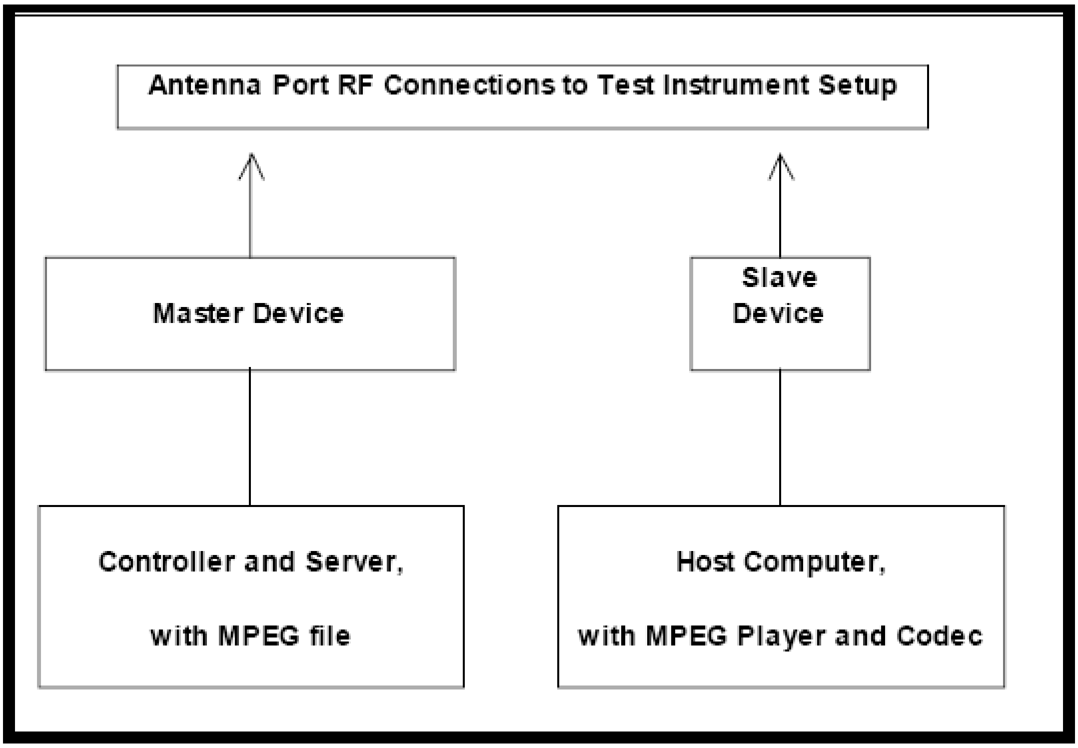
The signal monitoring equipment consists of a spectrum analyzer set to display 8001 bins on the horizontal axis. The time-domain resolution is 2 msec / bin with a 16 second sweep time, meeting the 10 second short pulse reporting criteria. The aggregate ON time is calculated by multiplying the number of bins above a threshold during a particular observation period by the dwell time per bin, with the analyzer set to peak detection and max hold.

Should multiple RF ports be utilized for the Master and/or Slave devices (for example, for diversity or MIMO implementations), additional combiner/dividers are inserted between the Master Combiner/Divider and the pad connected to the Master Device (and/or between the Slave Combiner/Divider and the pad connected to the Slave Device). Additional pads are utilized such that there is one pad at each RF port on each EUT.

5.2 CALIBRATION OF DFS DETECTION THRESHOLD LEVEL:

A 50 ohm load is connected in place of the spectrum analyzer, and the spectrum analyzer is connected in place of the master device and the signal generator is set to CW mode. The amplitude of the signal generator is adjusted to yield a level of –62 dBm as measured on the spectrum analyzer.

Without changing any of the instrument settings, the spectrum analyer is reconnected to the Common port of the Spectrum Analyzer Combiner/Divider. Measure the amplitude and calculate the difference from –62 dBm. Adjust the Reference Level Offset of the spectrum analyzer to this difference.
The spectrum analyzer displays the level of the signal generator as received at the antenna ports of the Master Device. The interference detection threshold may be varied from the calibrated value of –62 dBm and the spectrum analyzer will still indicate the level as received by the Master Device.
Set the signal generator to produce a radar waveform, trigger a burst manually and measure the level on the spectrum analyzer. Readjust the amplitude of the signal generator as required so that the peak level of the waveform is at a displayed level equal to the required or desired interference detection threshold. Separate signal generator amplitude settings are determined as required for each radar type.



5.3 DEVIATION FROM TEST STANDARD

No deviation.

6. TEST RESULTS

6.1 SUMMARY OF TEST RESULT

Clause	Test Parameter	Remarks	Pass/Fail
15.407	DFS Detection Threshold	Applicable	Pass
15.407	Channel Availability Check Time	Applicable	Pass
15.407	Channel Move Time	Applicable	Pass
15.407	Channel Closing Transmission Time	Applicable	Pass
15.407	Non- Occupancy Period	Applicable	Pass
15.407	Uniform Spreading	Applicable	Pass
15.407	U-NII Detection Bandwidth	Applicable	Pass

6.2 DETELED TEST RESULTS

Clause	Test Parameter	Remarks	Pass/Fail
15.407	DFS Detection Threshold	Applicable	Pass
15.407	Channel Availability Check Time	Applicable	Pass
15.407	Channel Move Time	Applicable	Pass
15.407	Channel Closing Transmission Time	Applicable	Pass
15.407	Non- Occupancy Period	Applicable	Pass
15.407	Uniform Spreading	Applicable	Pass
15.407	U-NII Detection Bandwidth	Applicable	Pass

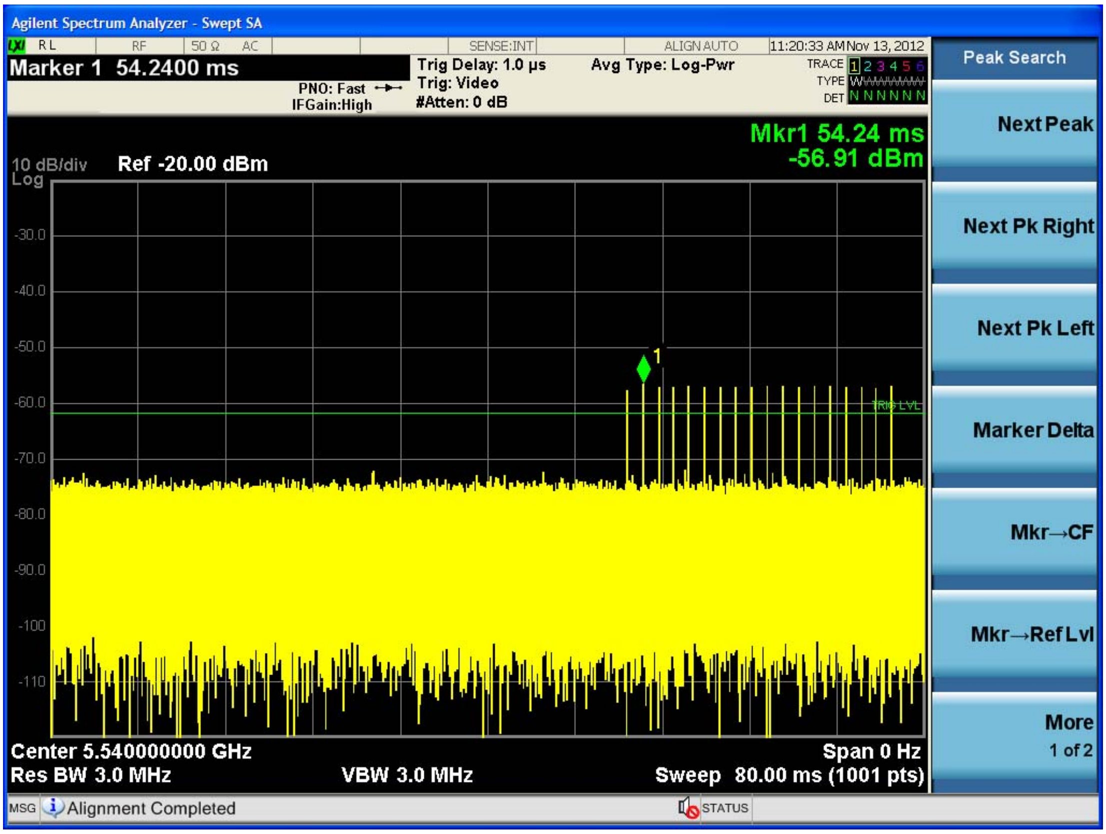
6.2.1 TEST MODE: DEVICE OPERATING IN MASTER MODE.

Master with injection at the Master. (Radar Test Waveforms are injected into the Master)

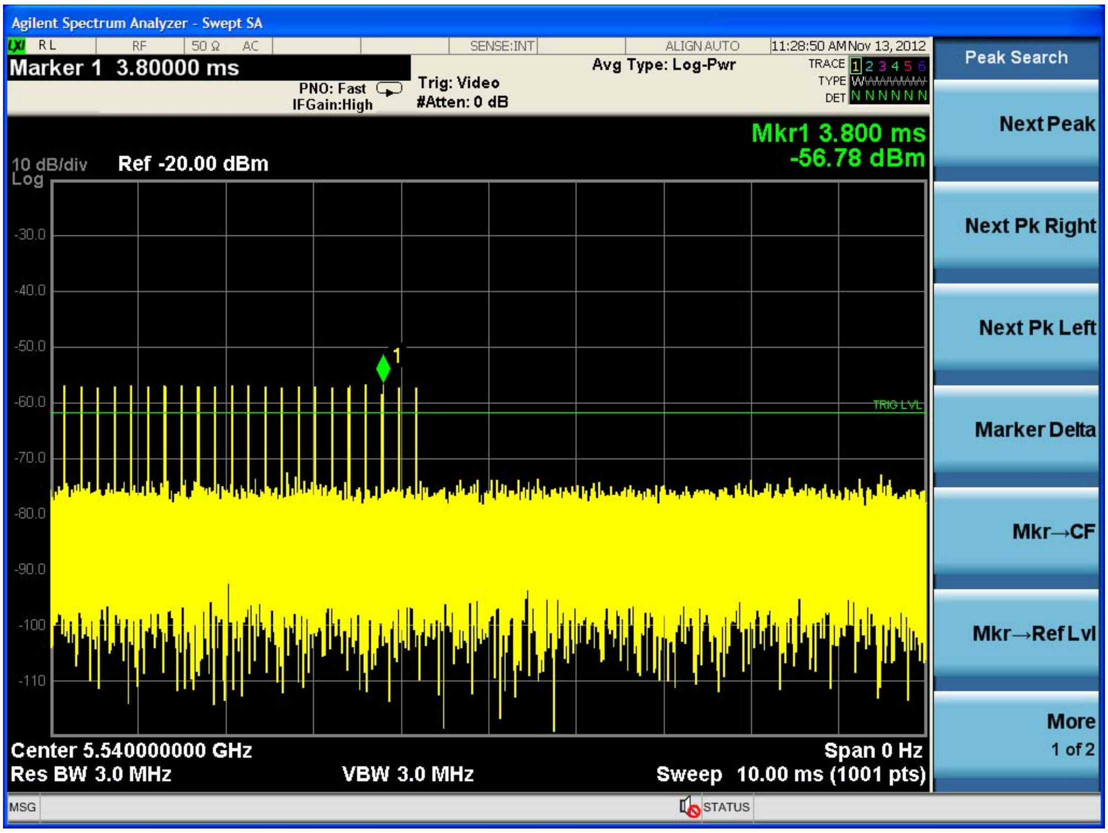
6.2.2 DFS DETECTION THRESHOLD

Calibration:
For a detection threshold level of -62dBm and the EUT antenna gain is 5.3dBi, required detection threshold is -56.7 dBm (= -62+5.3).

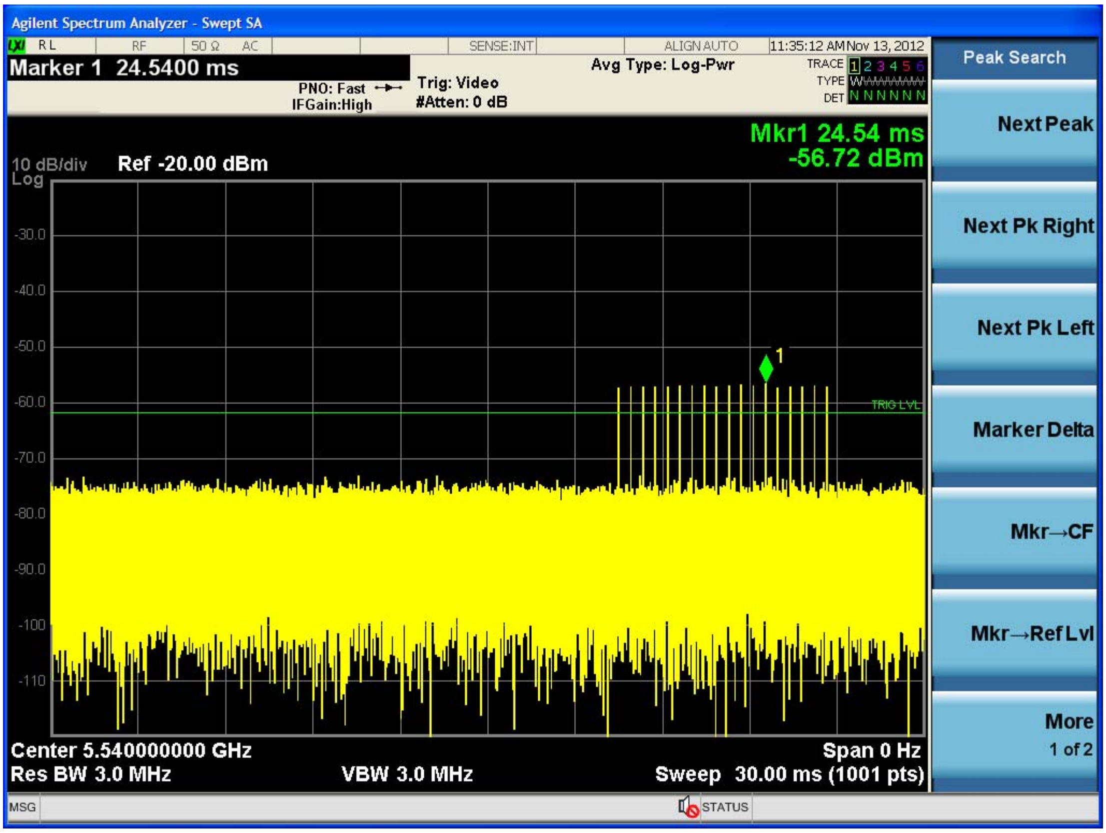
Radar Signal 1



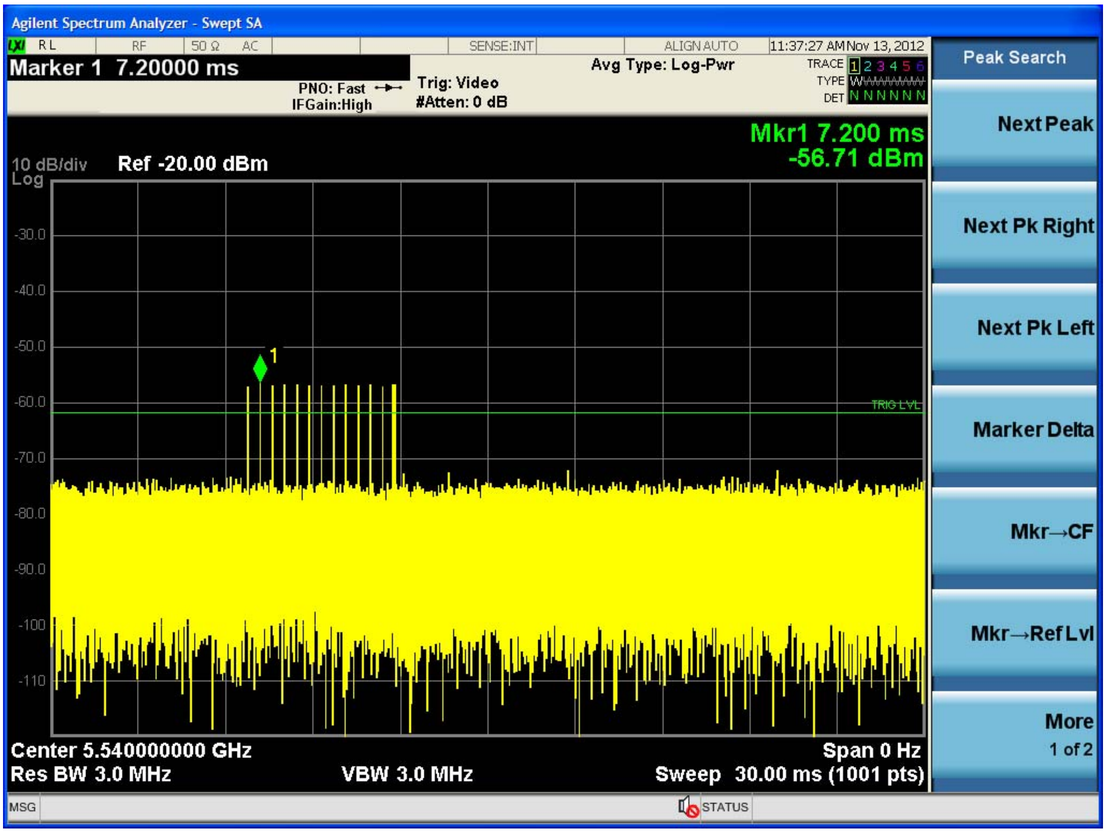
Radar Signal 2



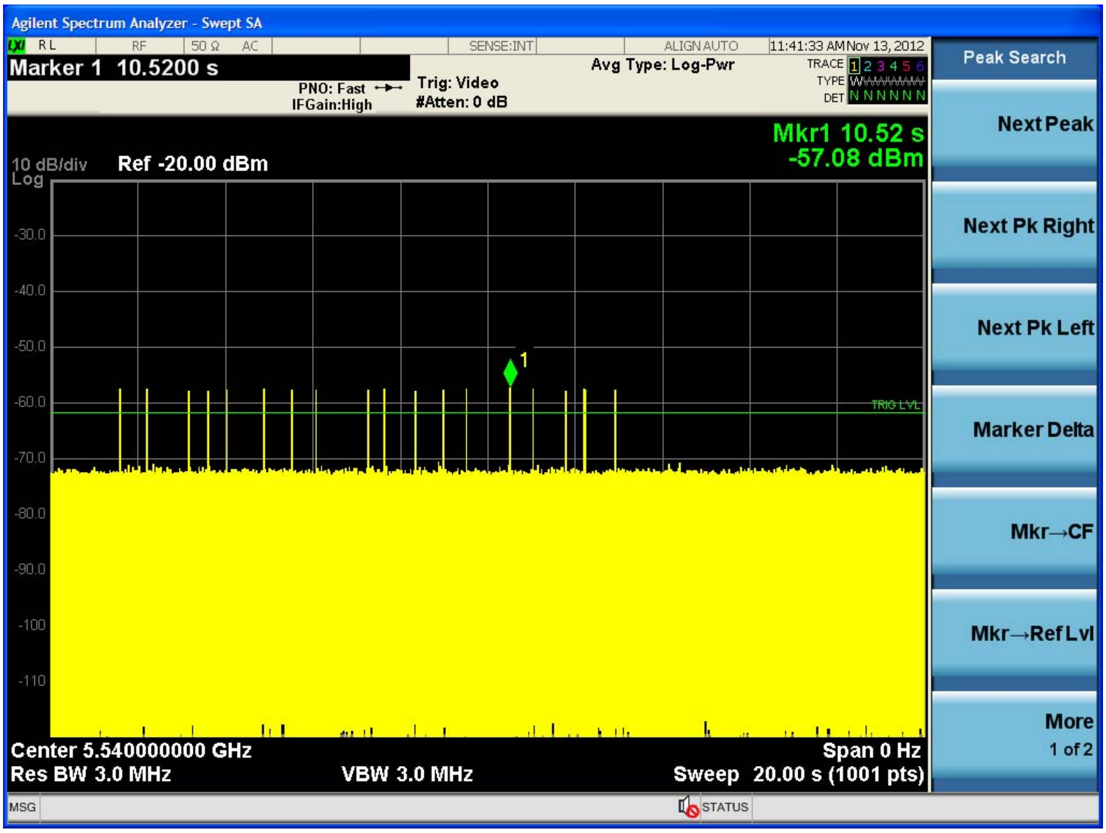
Radar Signal 3



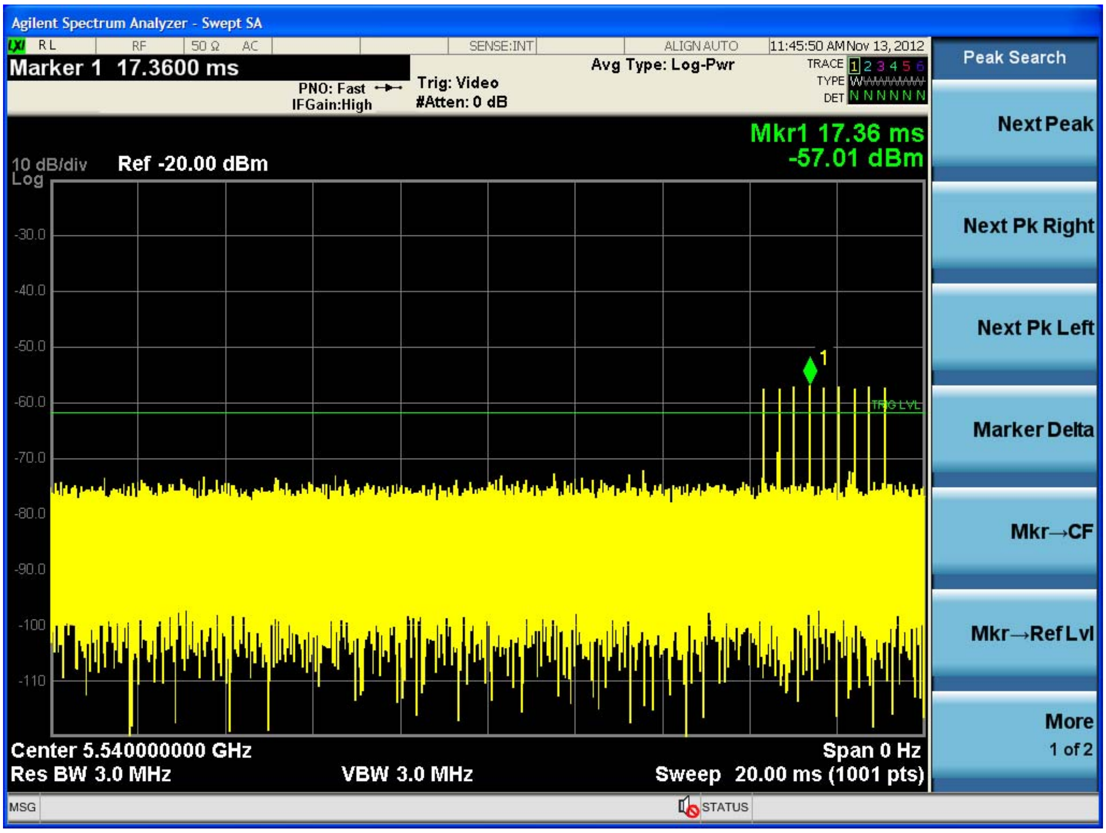
Radar Signal 4



Radar Signal 5



Radar Signal 6



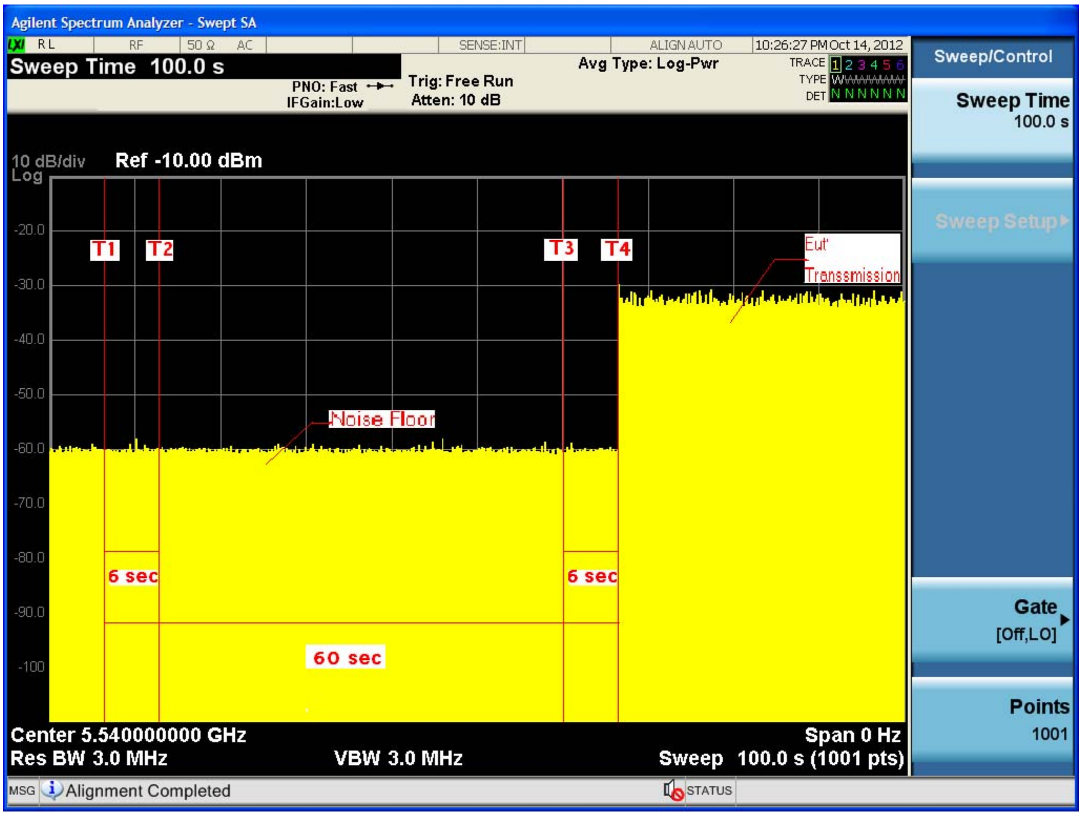
6.2.3 CHANNEL AVAILABILITY CHECK TIME

If the UUT successfully detected the radar burst, it should be observed as the UUT has no transmissions occurred until the UUT starts transmitting on another channel.

Timing of Radar Signal	Observation	
	UUT	Spectrum Analyzer
Spectrum Analyzer	Spectrum Analyzer	Spectrum Analyzer
Spectrum Analyzer	Spectrum Analyzer	Spectrum Analyzer

A Mode

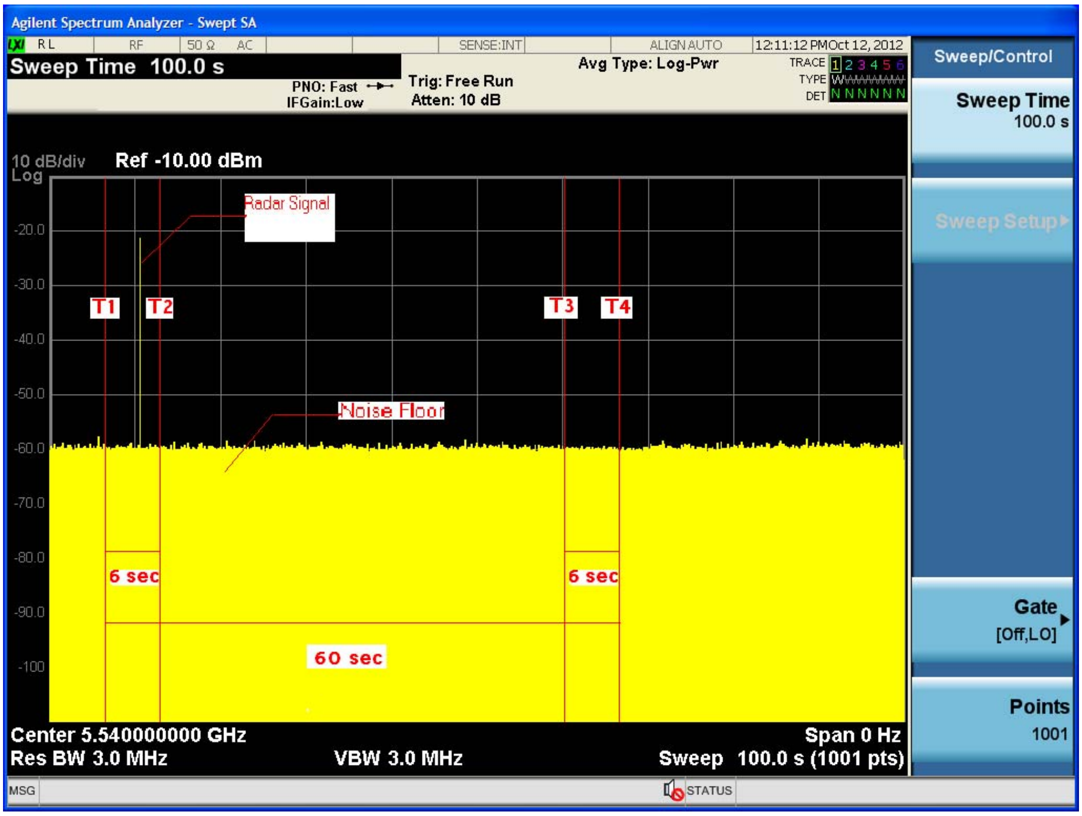
Initial Channel Availability Check Time



Note: T1 denotes the end of power-up time period is 7 second. T4 denotes the end of Channel Availability Check time is 67 second. Channel Availability Check time is equal to (T4 – T1) 60 seconds.

A Mode

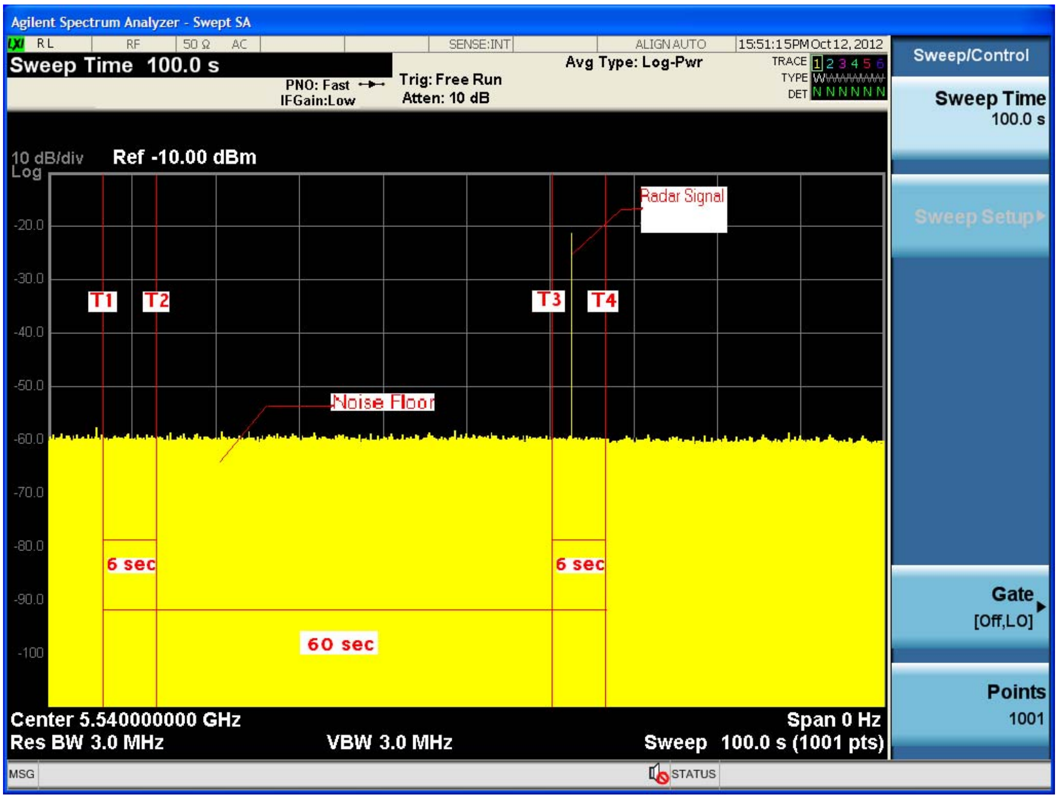
Radar Burst at the Beginning of the Channel Availability Check Time



Note: T1 denotes the end of power up time period is 7 second.
T2 denotes 13 second. the radar burst was commenced within a 6 second window starting from the end of power-up sequence.
T4 denotes the 67 second.

A Mode

Radar Burst at the End of the Channel Availability Check Time



Note: T1 denotes the end of power up time period is 7 second.

T3 denotes 63 second and radar burst was commenced within 54^{th} second to 60^{th} second window starting from the end of power-up sequence.

T4 denotes the 67 second.

6.2.4 CHANNEL CLOSING TRANSMISSION AND CHANNEL MOVE TIME WLAN TRAFFIC

TX (A Mode)

Table 1: Short Pulse Radar Test Waveforms.

Radar Type	Pulse Width (μsec)	PRI (μsec)	Number of Pulses	Pass times	Fail times	Percentage of Successful Detection (%)
1	1	1428	18	27	3	90
2	1-5	150-230	23-29	26	4	87
3	6-10	200-500	16-18	26	4	87
4	11-20	200-500	12-16	27	3	90
Aggregate (Radar Types 1-4)			-	106	14	88%

Table 2: Long Pulse Radar Test Waveform

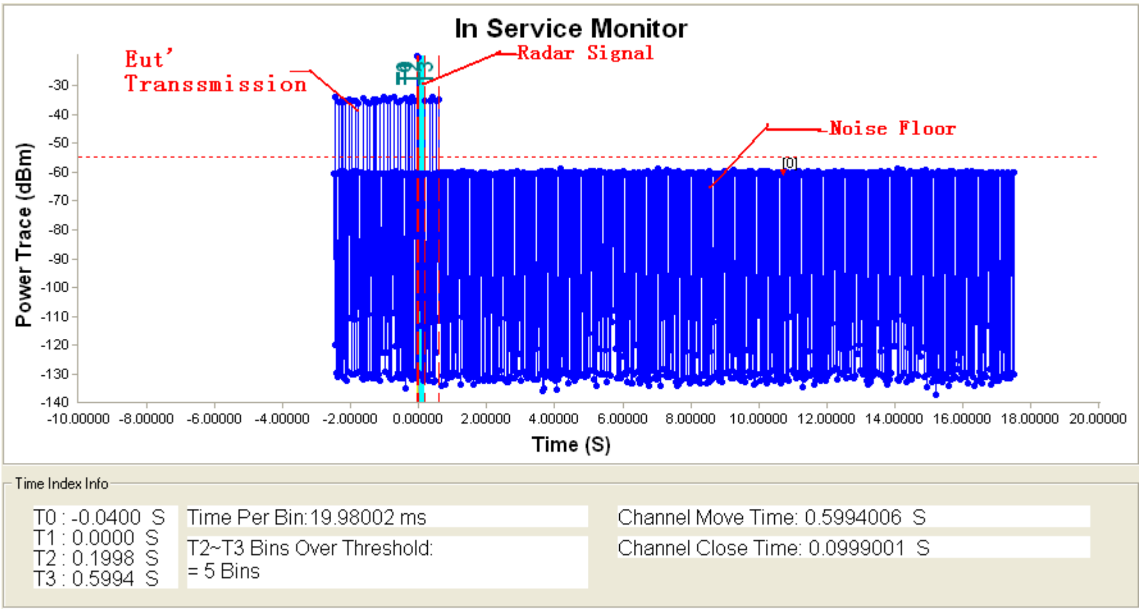
Radar Type	Pulse Width (μsec)	Chirp Width (MHz)	PRI (μsec)	Number of Pulses Per Burst	Number of Bursts	Pass times	Fail times	Percentage of Successful Detection (%)
5	50-100	5-20	1000-2000	1-3	8-20	29	3	97%

Table 3: Frequency Hopping Radar Test Waveform

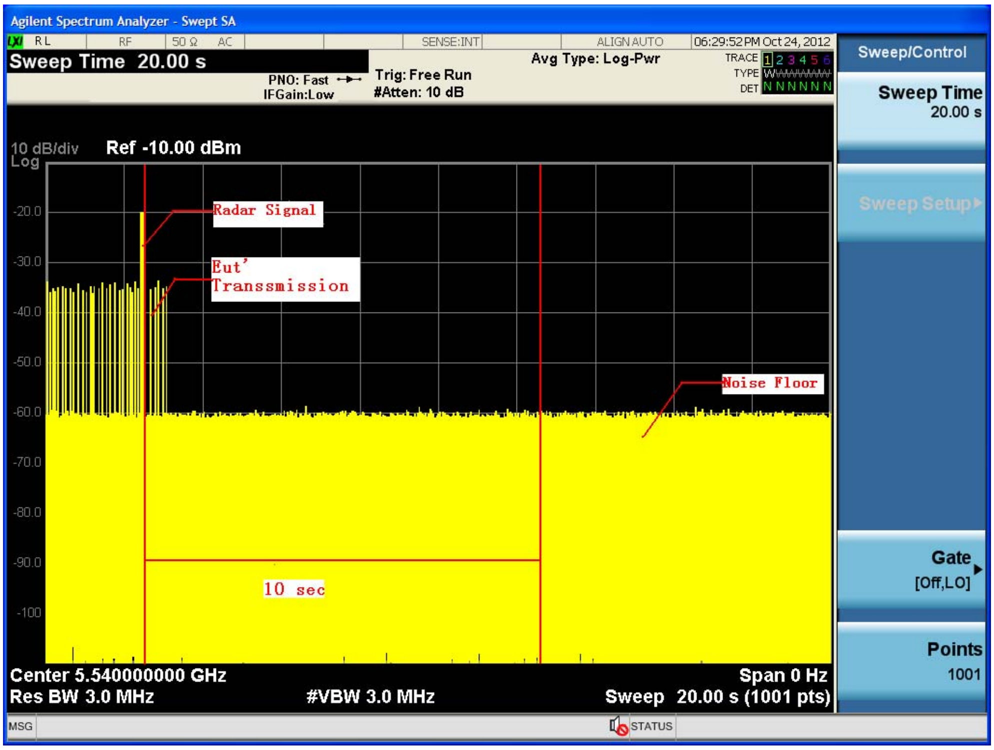
Radar Type	Pulse Width (μsec)	Chirp Width (MHz)	PRI (μsec)	Number of Pulses Per Burst	Number of Bursts	Pass times	Fail times	Percentage of Successful Detection (%)
6	1	333	9	0.333	300	25	5	83%

TX (A Mode)

Radar signal 1



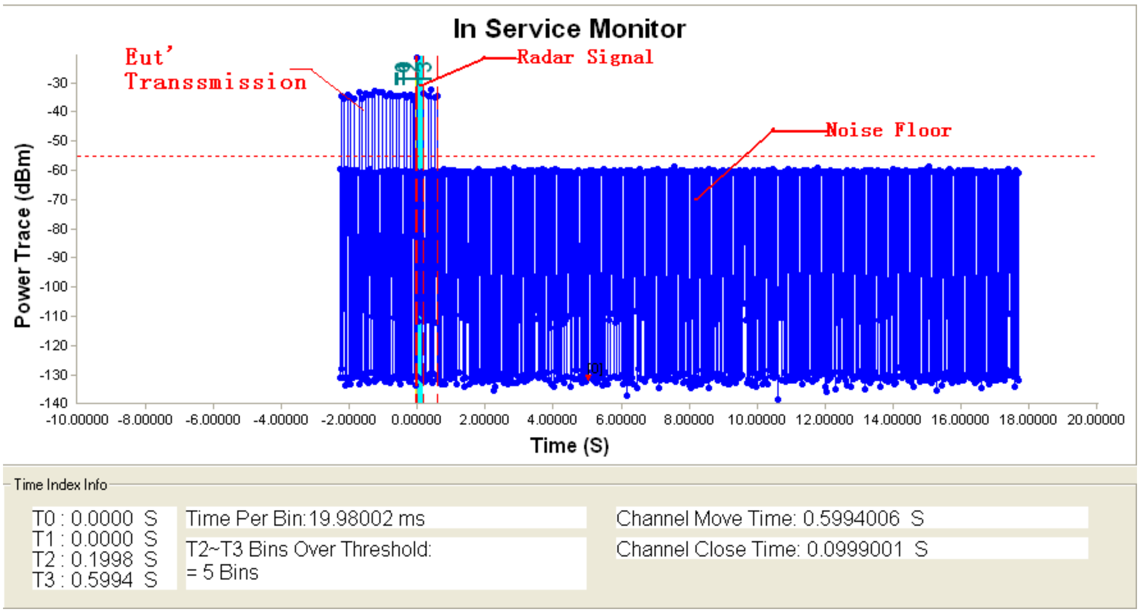
Note: T1 denotes the start of Channel Move Time upon the end of the last Radar burst.
T2 denotes the data transmission time of 200ms from T1.
T3 denotes the end of Channel Move Time.
T4 denotes the 10 second from T1 to observe the aggregate duration of transmissions.



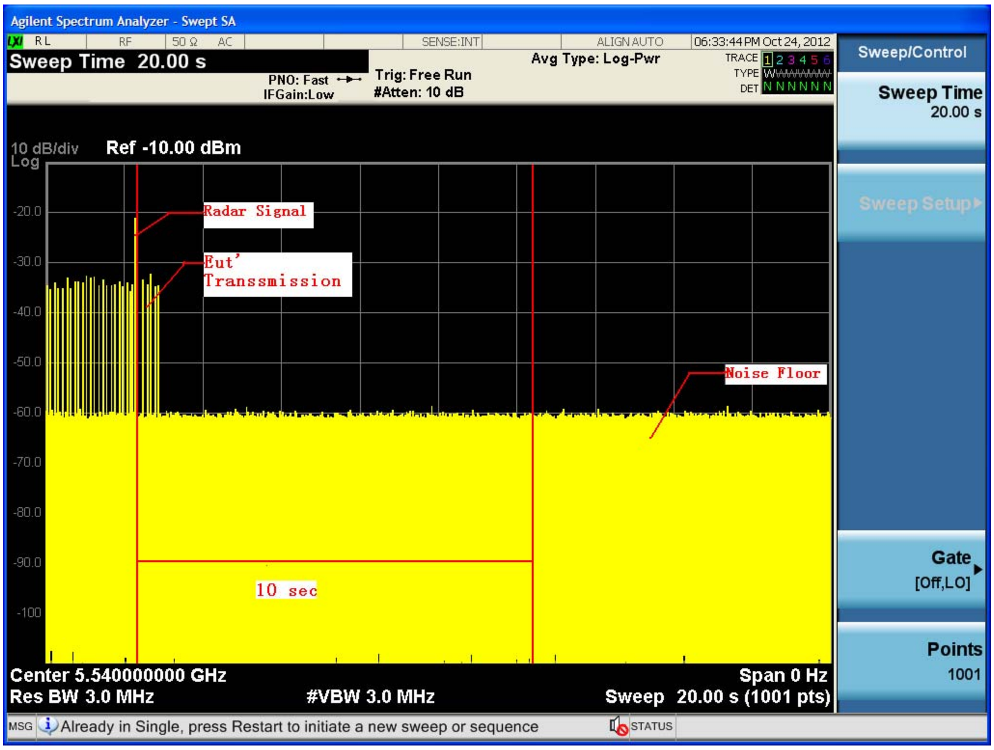
Note: An expanded plot for the device vacates the channel in the required 500ms

TX (A Mode)

Radar signal 2



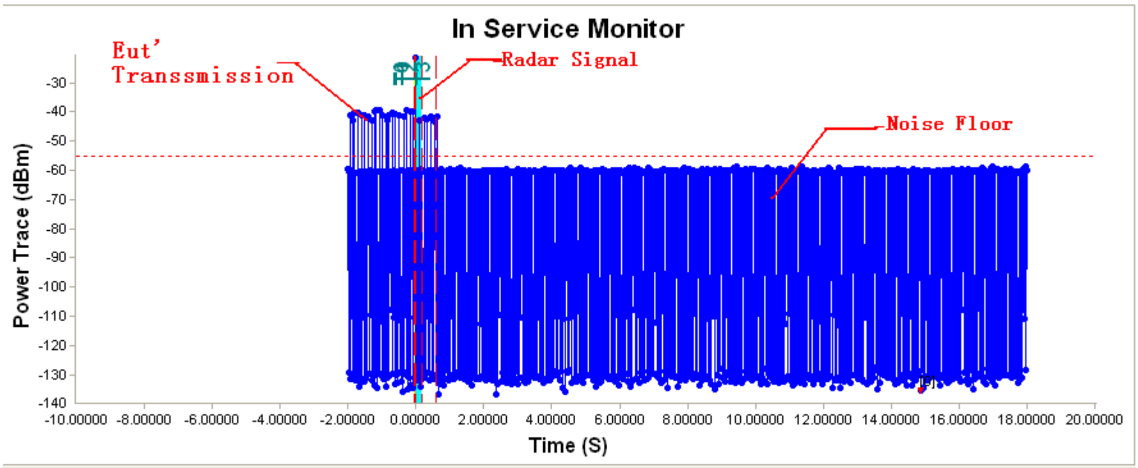
Note: T1 denotes the start of Channel Move Time upon the end of the last Radar burst.
T2 denotes the data transmission time of 200ms from T1.
T3 denotes the end of Channel Move Time.
T4 denotes the 10 second from T1 to observe the aggregate duration of transmissions.



Note: An expanded plot for the device vacates the channel in the required 500ms

TX (A Mode)

Radar signal 3



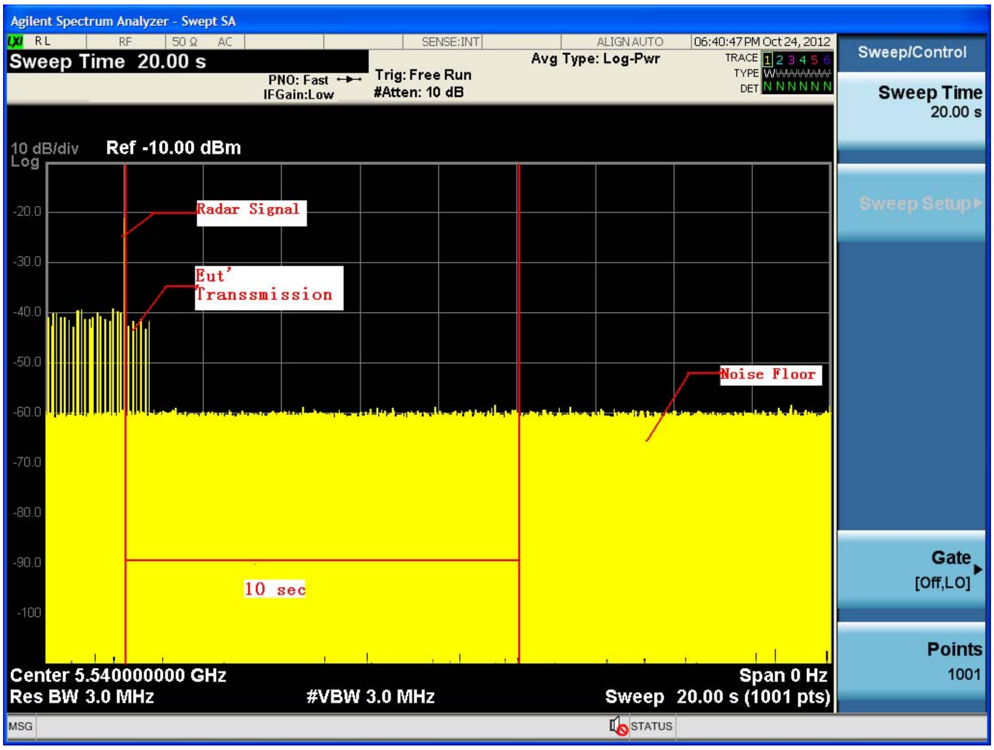
Time Index Info

T0 : 0.0000 S
T1 : 0.0000 S
T2 : 0.1998 S
T3 : 0.6394 S

Time Per Bin: 19.98002 ms
T2~T3 Bins Over Threshold: = 5 Bins

Channel Move Time: 0.6393606 S
Channel Close Time: 0.0999001 S

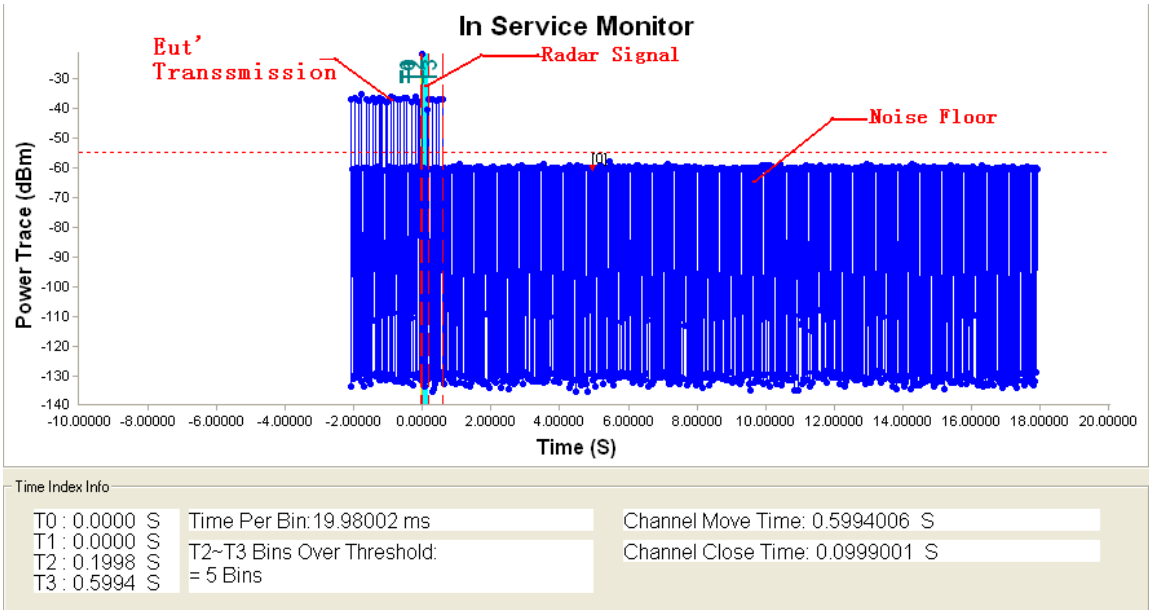
Note: T1 denotes the start of Channel Move Time upon the end of the last Radar burst.
T2 denotes the data transmission time of 200ms from T1.
T3 denotes the end of Channel Move Time.
T4 denotes the 10 second from T1 to observe the aggregate duration of transmissions.



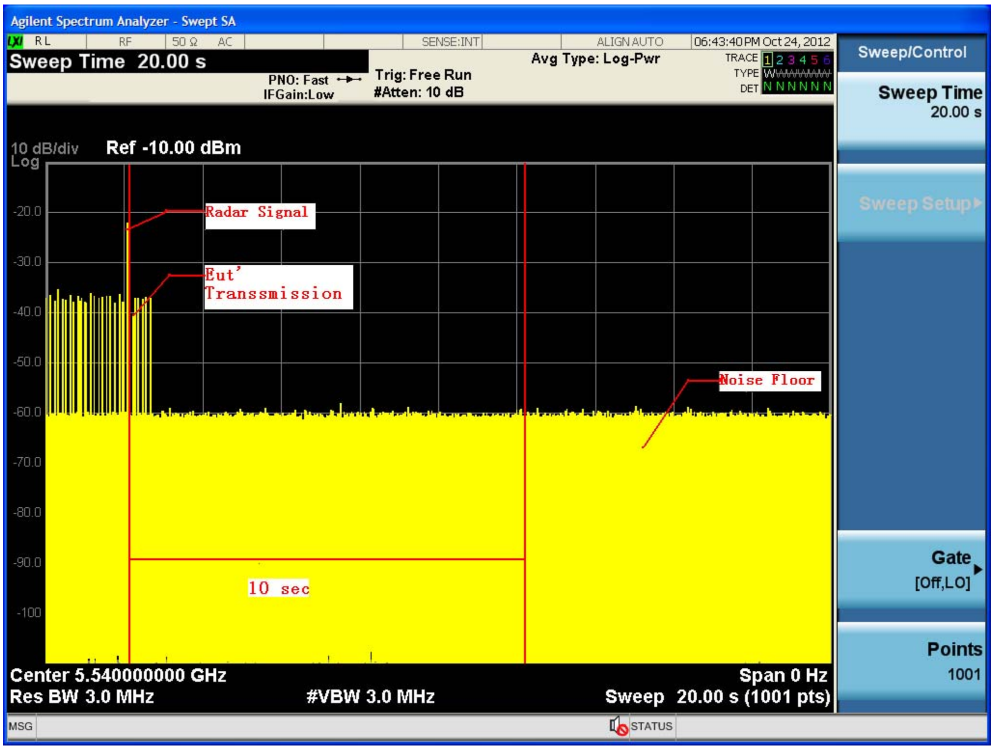
Note: An expanded plot for the device vacates the channel in the required 500ms

TX (A Mode)

Radar signal 4



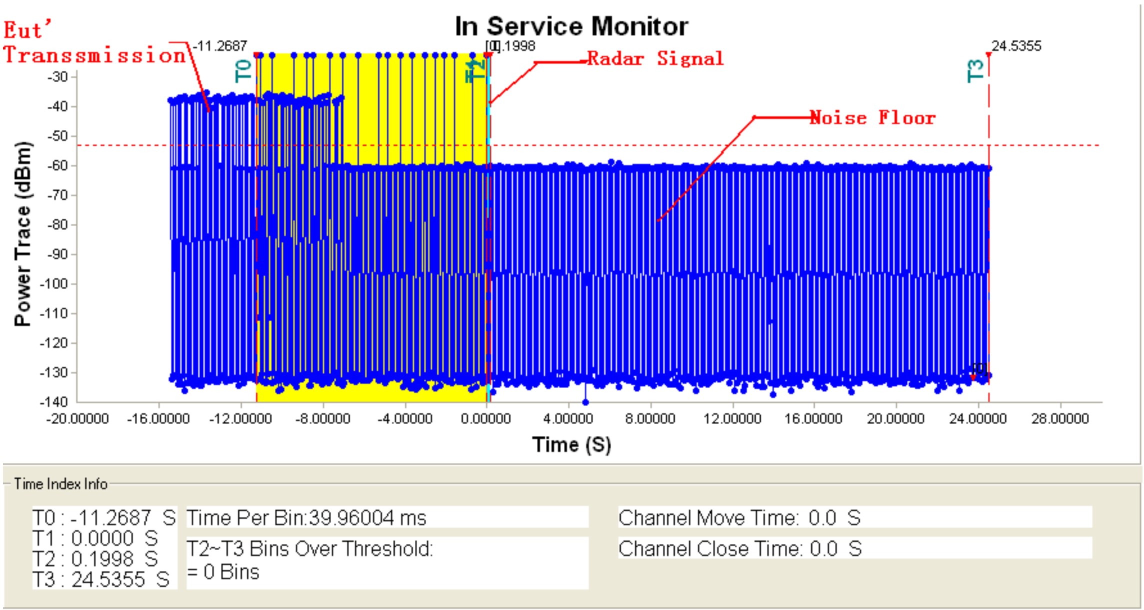
Note: T1 denotes the start of Channel Move Time upon the end of the last Radar burst.
T2 denotes the data transmission time of 200ms from T1.
T3 denotes the end of Channel Move Time.
T4 denotes the 10 second from T1 to observe the aggregate duration of transmissions.



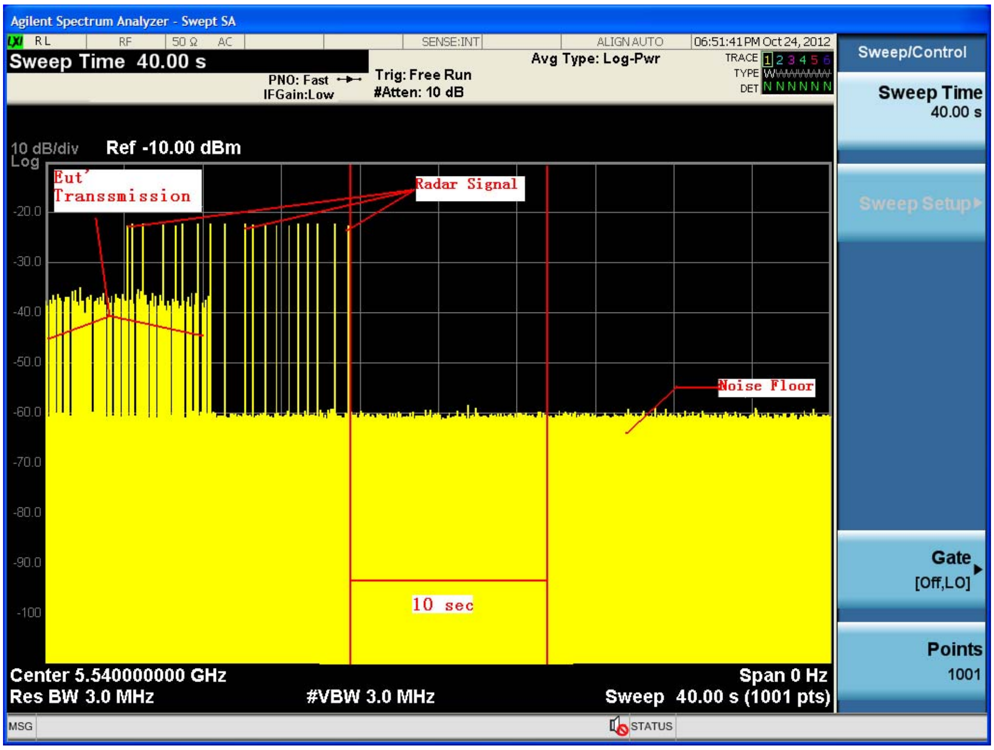
Note: An expanded plot for the device vacates the channel in the required 500ms

TX (A Mode)

Radar signal 5



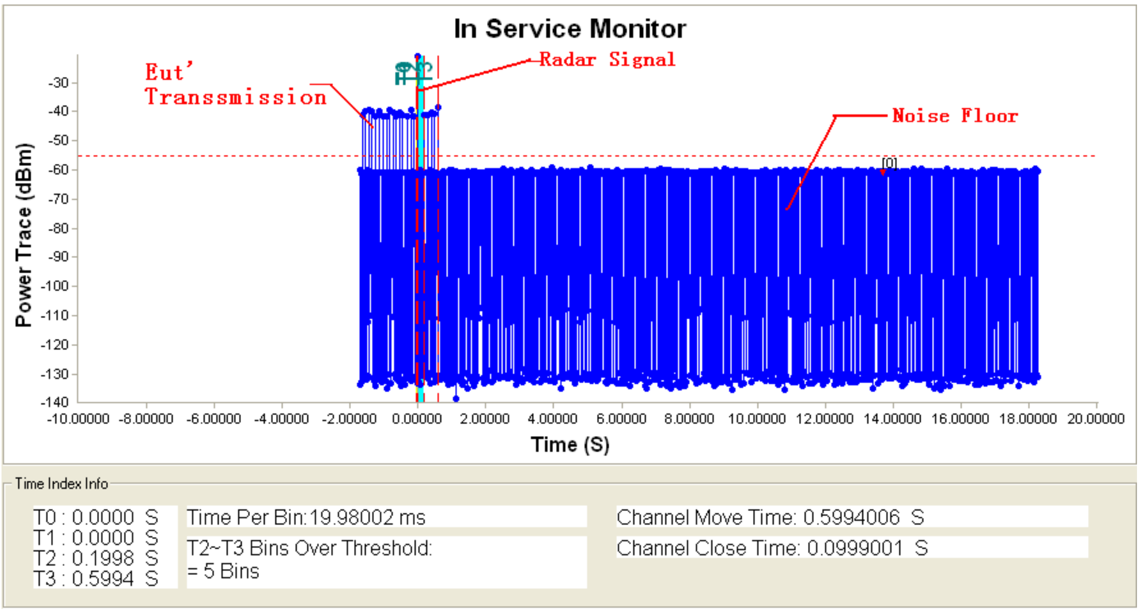
Note: T1 denotes the start of Channel Move Time upon the end of the last Radar burst.
T2 denotes the data transmission time of 200ms from T1.
T3 denotes the end of Channel Move Time.
T4 denotes the 10 second from T1 to observe the aggregate duration of transmissions.



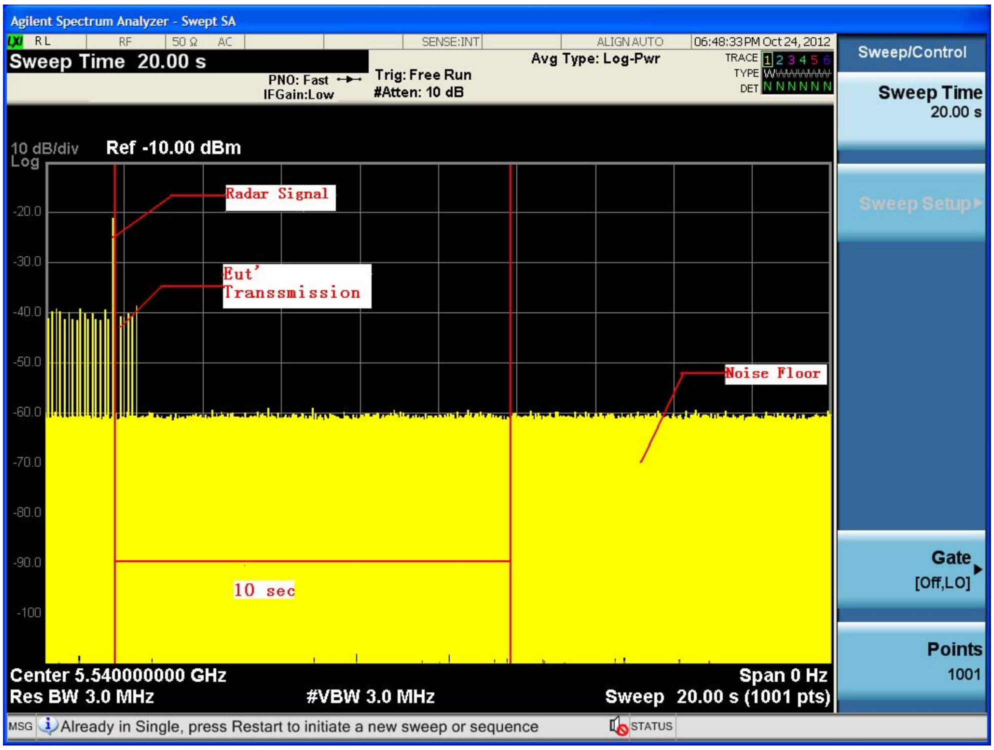
Note: An expanded plot for the device vacates the channel in the required 500ms

TX (A Mode)

Radar signal 6



Note: T1 denotes the start of Channel Move Time upon the end of the last Radar burst.
T2 denotes the data transmission time of 200ms from T1.
T3 denotes the end of Channel Move Time.
T4 denotes the 10 second from T1 to observe the aggregate duration of transmissions.



Note: An expanded plot for the device vacates the channel in the required 500ms

TX (A Mode)

Radar1 Statical Performances				
Trial #	Pluse per Burst	Pluse Width(us)	PRI(us)	Detection(Yes / No)
1	18	1.0u	1.428	YES
2	18	1.0u	1.428	YES
3	18	1.0u	1.428	YES
4	18	1.0u	1.428	NO
5	18	1.0u	1.428	YES
6	18	1.0u	1.428	YES
7	18	1.0u	1.428	YES
8	18	1.0u	1.428	YES
9	18	1.0u	1.428	YES
10	18	1.0u	1.428	YES
11	18	1.0u	1.428	YES
12	18	1.0u	1.428	YES
13	18	1.0u	1.428	NO
14	18	1.0u	1.428	YES
15	18	1.0u	1.428	YES
16	18	1.0u	1.428	YES
17	18	1.0u	1.428	YES
18	18	1.0u	1.428	YES
19	18	1.0u	1.428	YES
20	18	1.0u	1.428	YES
21	18	1.0u	1.428	YES
22	18	1.0u	1.428	YES
23	18	1.0u	1.428	YES
24	18	1.0u	1.428	YES
25	18	1.0u	1.428	NO
26	18	1.0u	1.428	YES
27	18	1.0u	1.428	YES
28	18	1.0u	1.428	YES
29	18	1.0u	1.428	YES
30	18	1.0u	1.428	YES
Detection Rate 90%				

Radar2 Statical Performances				
Trial #	Pluse per Burst	Pluse Width(us)	PRI(us)	Detection(Yes / No)
1	23	4.5u	209	YES
2	24	3.3u	225	YES
3	26	2.4u	218	NO
4	27	3.8u	224	YES
5	27	2.7u	224	YES
6	23	2.9u	158	YES
7	24	1.2u	220	YES
8	24	1.3u	199	YES
9	25	1.3u	193	NO
10	26	1.4u	228	YES
11	26	4.5u	216	YES
12	23	3.3u	225	YES
13	28	2.4u	221	YES
14	26	3.8u	229	YES
15	26	2.7u	169	YES
16	27	2.2u	208	YES
17	28	1.3u	220	YES
18	27	1.6u	168	YES
19	29	2.5u	221	YES
20	29	3.4u	225	YES
21	24	4.2u	200	NO
22	26	2.7u	139	YES
23	25	2.9u	193	YES
24	27	2.0u	151	YES
25	28	1.8u	208	NO
26	28	2.0u	160	YES
27	25	2.3u	189	YES
28	24	3.0u	186	YES
29	28	4.5u	176	YES
30	29	4.0u	176	YES
Detection Rate 87%				

Radar3 Statical Performances				
Trial #	Pluse per Burst	Pluse Width(us)	PRI(us)	Detection(Yes / No)
1	18	8.5u	445	YES
2	18	8.0u	442	YES
3	16	8.6u	414	YES
4	18	8.4u	409	YES
5	18	9.3u	398	NO
6	16	8.0u	364	YES
7	17	9.6u	386	YES
8	17	8.0u	258	YES
9	16	8.8u	445	YES
10	16	7.6u	310	YES
11	18	7.9u	481	YES
12	18	8.0u	268	YES
13	16	9.9u	463	YES
14	17	8.6u	225	NO
15	18	8.2u	477	YES
16	17	8.7u	240	YES
17	16	9.0u	213	YES
18	16	9.8u	480	NO
19	17	7.9u	436	YES
20	18	9.3u	269	YES
21	18	7.2u	431	YES
22	16	7.2u	330	YES
23	16	6.9u	452	YES
24	18	6.0u	488	YES
25	18	8.3u	388	NO
26	17	8.2u	443	YES
27	18	6.6u	408	YES
28	16	8.8u	350	YES
29	17	9.5u	480	YES
30	17	9.8u	216	YES
Detection Rate 87%				

Radar4 Statical Performances				
Trial #	Pluse per Burst	Pluse Width(us)	PRI(us)	Detection(Yes / No)
1	14	17.5u	405	YES
2	15	15.0u	463	YES
3	15	13.6u	330	YES
4	12	14.4u	410	YES
5	13	15.3u	398	YES
6	13	14.0u	365	NO
7	13	15.3u	367	YES
8	11	11.7u	319	YES
9	12	19.8u	274	YES
10	16	16.0u	377	YES
11	12	16.6u	463	YES
12	13	12.5u	445	YES
13	13	12.0u	445	YES
14	15	13.8u	405	YES
15	16	14.9u	409	YES
16	15	15.8u	436	YES
17	14	14.8u	447	YES
18	14	13.9u	400	NO
19	15	16.0u	481	YES
20	15	17.0u	496	YES
21	15	15.8u	463	YES
22	13	14.6u	445	YES
23	13	17.0u	442	YES
24	14	14.0u	485	YES
25	12	14.0u	260	NO
26	15	15.6u	280	YES
27	15	17.0u	450	YES
28	15	19.3u	330	YES
29	15	18.5u	470	YES
30	16	20.0u	335	YES
Detection Rate 90%				

Radar5 Statical Performances		
Trial #	Test Signal name	Detection(Yes / No)
1	LP_Signal_01	Yes
2	LP_Signal_02	Yes
3	LP_Signal_03	Yes
4	LP_Signal_04	Yes
5	LP_Signal_05	Yes
6	LP_Signal_06	Yes
7	LP_Signal_07	Yes
8	LP_Signal_08	Yes
9	LP_Signal_09	Yes
10	LP_Signal_10	Yes
11	LP_Signal_11	Yes
12	LP_Signal_12	Yes
13	LP_Signal_13	No
14	LP_Signal_14	Yes
15	LP_Signal_15	Yes
16	LP_Signal_16	Yes
17	LP_Signal_17	Yes
18	LP_Signal_18	Yes
19	LP_Signal_19	Yes
20	LP_Signal_20	Yes
21	LP_Signal_21	Yes
22	LP_Signal_22	Yes
23	LP_Signal_23	Yes
24	LP_Signal_24	Yes
25	LP_Signal_25	Yes
26	LP_Signal_26	Yes
27	LP_Signal_27	Yes
28	LP_Signal_28	Yes
29	LP_Signal_29	Yes
30	LP_Signal_30	Yes
Detection Rate 97%		

Radar6 Statical Performances		
Trial #	Hoping Frequency Sequence Name	Detection(Yes / No)
1	HOP_FREQ_SEQ_01	Yes
2	HOP_FREQ_SEQ_02	Yes
3	HOP_FREQ_SEQ_03	Yes
4	HOP_FREQ_SEQ_04	No
5	HOP_FREQ_SEQ_05	Yes
6	HOP_FREQ_SEQ_06	Yes
7	HOP_FREQ_SEQ_07	Yes
8	HOP_FREQ_SEQ_08	Yes
9	HOP_FREQ_SEQ_09	Yes
10	HOP_FREQ_SEQ_10	Yes
11	HOP_FREQ_SEQ_11	No
12	HOP_FREQ_SEQ_12	Yes
13	HOP_FREQ_SEQ_13	Yes
14	HOP_FREQ_SEQ_14	Yes
15	HOP_FREQ_SEQ_15	Yes
16	HOP_FREQ_SEQ_16	Yes
17	HOP_FREQ_SEQ_17	Yes
18	HOP_FREQ_SEQ_18	No
19	HOP_FREQ_SEQ_19	Yes
20	HOP_FREQ_SEQ_20	Yes
21	HOP_FREQ_SEQ_21	Yes
22	HOP_FREQ_SEQ_22	Yes
23	HOP_FREQ_SEQ_23	Yes
24	HOP_FREQ_SEQ_24	Yes
25	HOP_FREQ_SEQ_25	No
26	HOP_FREQ_SEQ_26	No
27	HOP_FREQ_SEQ_27	Yes
28	HOP_FREQ_SEQ_28	Yes
29	HOP_FREQ_SEQ_29	Yes
30	HOP_FREQ_SEQ_30	Yes
Detection Rate 83%		

TX (40MHz Mode)

Table 1: Short Pulse Radar Test Waveforms.

Radar Type	Pulse Width (μsec)	PRI (μsec)	Number of Pulses	Pass times	Fail times	Percentage of Successful Detection (%)
1	1	1428	18	29	1	97
2	1-5	150-230	23-29	28	2	93
3	6-10	200-500	16-18	29	1	97
4	11-20	200-500	12-16	28	2	93
Aggregate (Radar Types 1-4)			-	114	6	95

Table 2: Long Pulse Radar Test Waveform

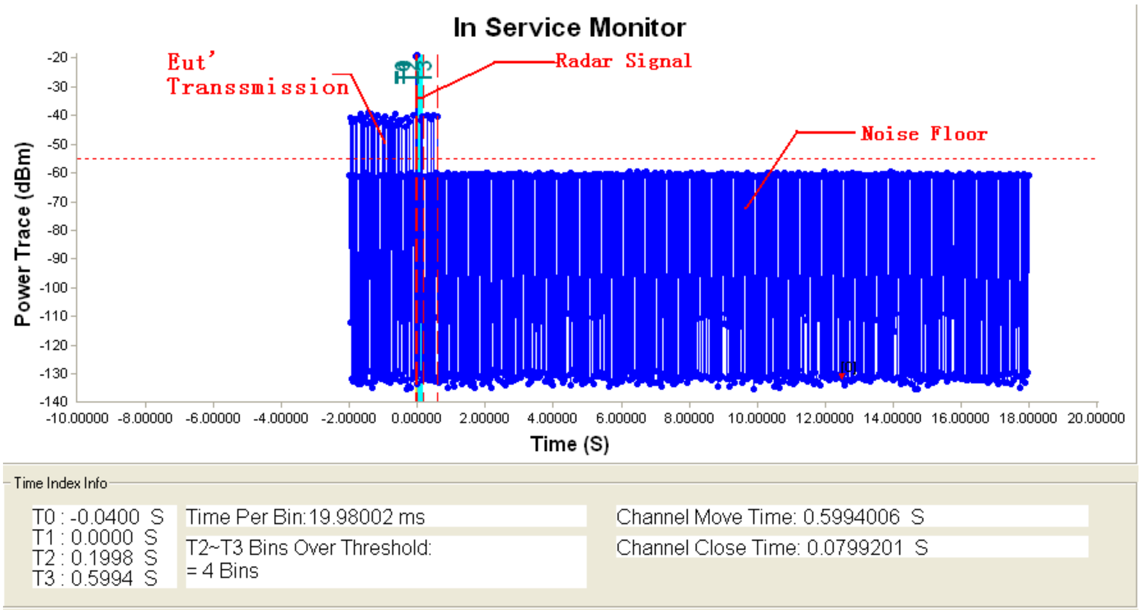
Radar Type	Pulse Width (μsec)	Chirp Width (MHz)	PRI (μsec)	Numberof Pulses Per Burst	Number of Bursts	Number of Trials (Times)	Percentage of Successful Detection (%)
5	50-100	5-20	1000-2000	1-3	30	0	100%

Table 3: Frequency Hopping Radar Test Waveform

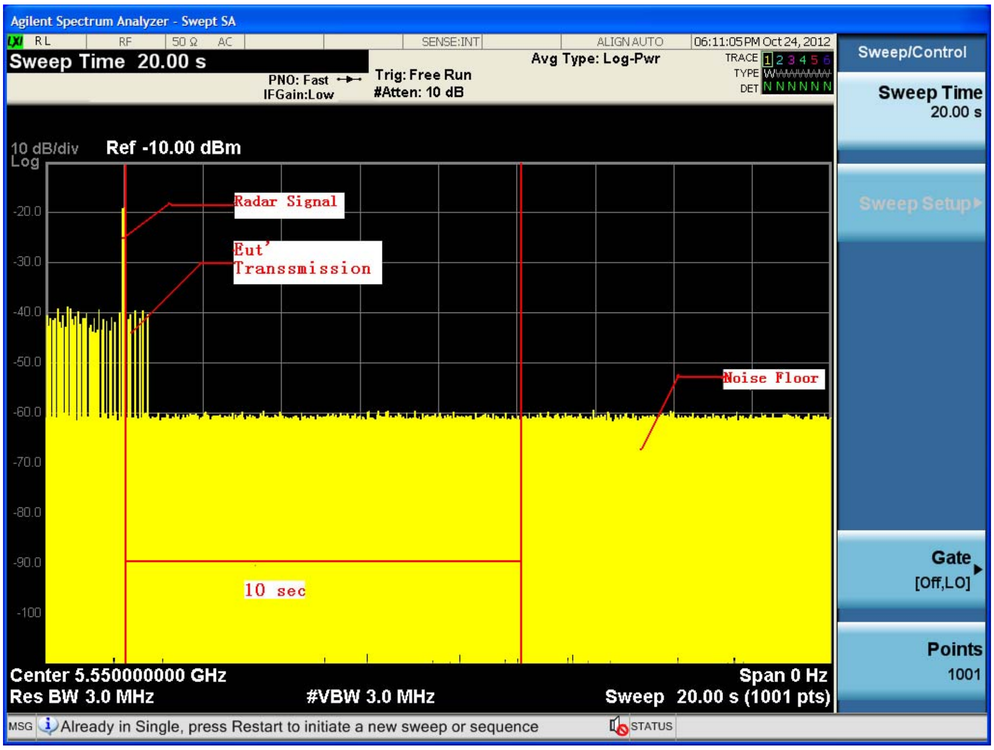
Radar Type	Pulse Width (μsec)	PRI (μsec)	Pulses per Hop	Hopping Rate (kHz)	Hopping Sequence Length (msec)	Number of Trials(Times)	Percentage of Successful Detection (%)
6	1	333	9	0.333	300	30	97%

TX (N40 Mode)

Radar signal 1



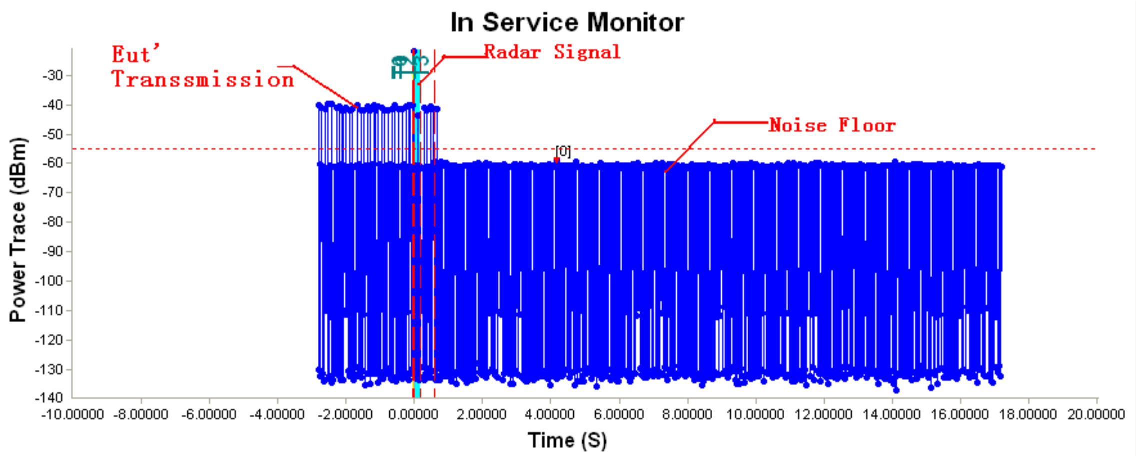
Note: T1 denotes the start of Channel Move Time upon the end of the last Radar burst.
T2 denotes the data transmission time of 200ms from T1.
T3 denotes the end of Channel Move Time.
T4 denotes the 10 second from T1 to observe the aggregate duration of transmissions.



Note: An expanded plot for the device vacates the channel in the required 500ms

TX (N40 Mode)

Radar signal 2



Time Index Info

T0 : 0.0000 S
T1 : 0.0000 S
T2 : 0.1998 S
T3 : 0.6793 S

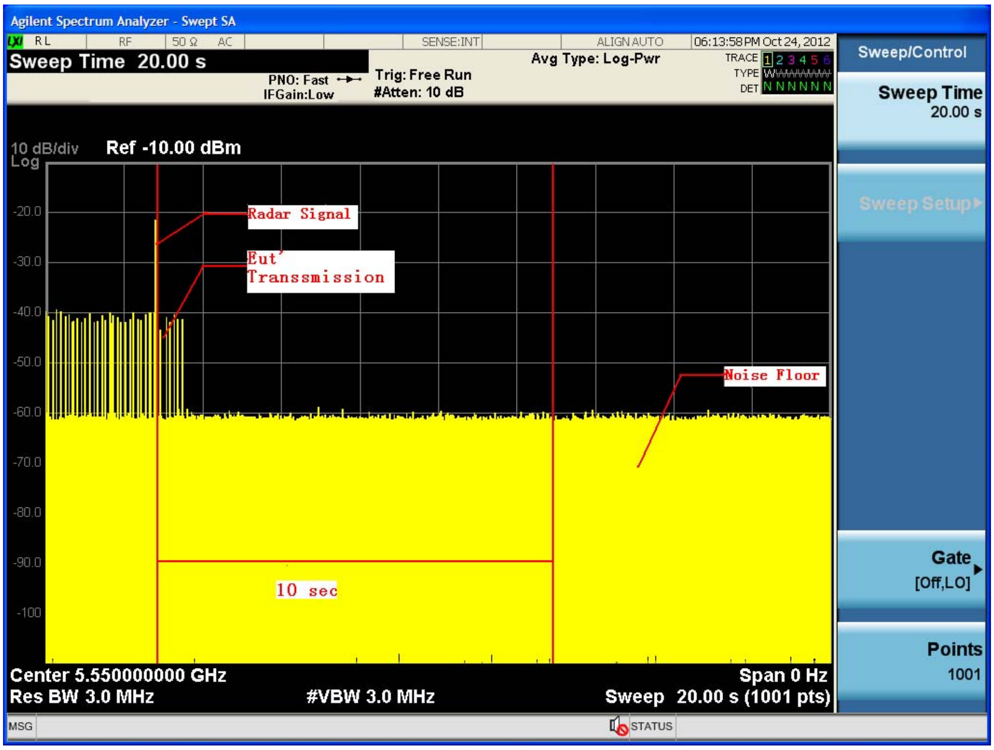
Time Per Bin: 19.98002 ms

T2~T3 Bins Over Threshold: = 5 Bins

Channel Move Time: 0.6793207 S

Channel Close Time: 0.0999001 S

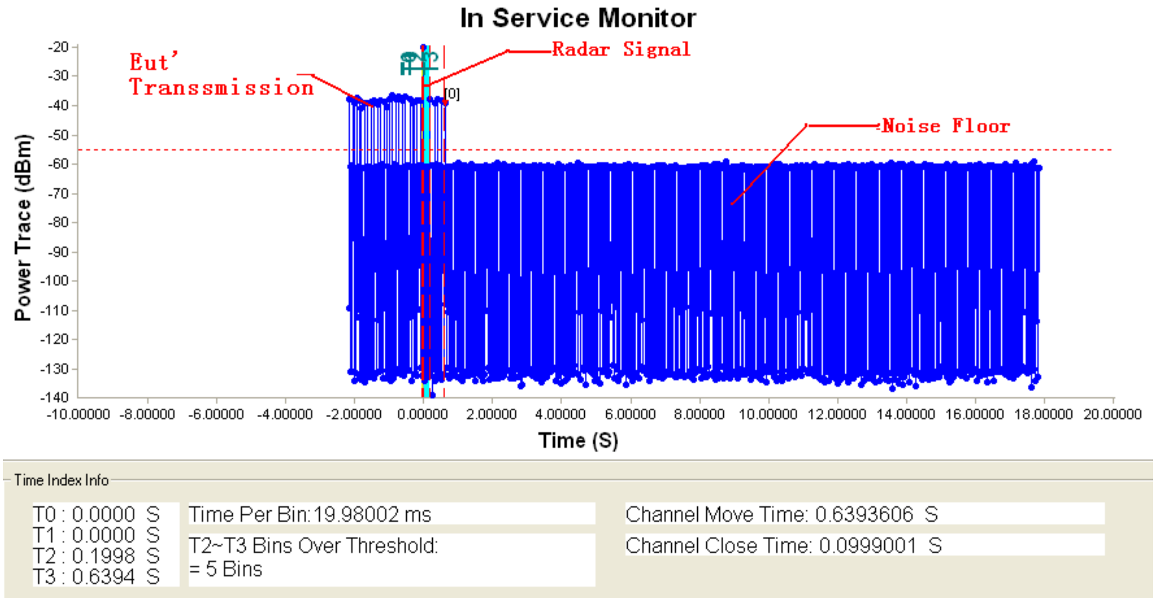
Note: T1 denotes the start of Channel Move Time upon the end of the last Radar burst.
T2 denotes the data transmission time of 200ms from T1.
T3 denotes the end of Channel Move Time.
T4 denotes the 10 second from T1 to observe the aggregate duration of transmissions.



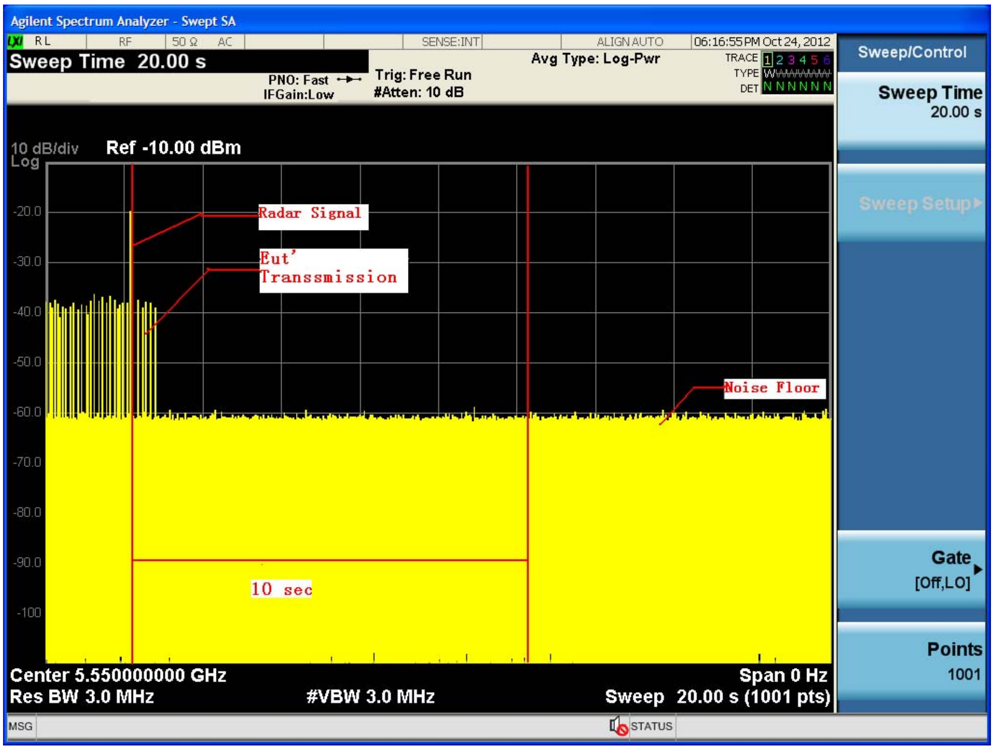
Note: An expanded plot for the device vacates the channel in the required 500ms

TX (N40 Mode)

Radar signal 3



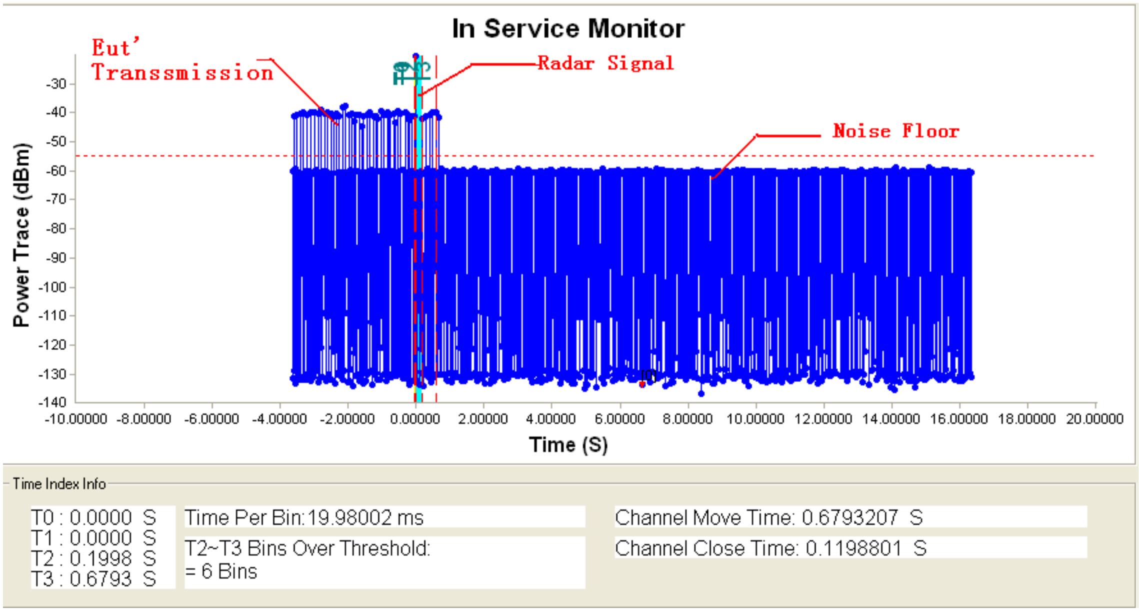
Note: T1 denotes the start of Channel Move Time upon the end of the last Radar burst.
T2 denotes the data transmission time of 200ms from T1.
T3 denotes the end of Channel Move Time.
T4 denotes the 10 second from T1 to observe the aggregate duration of transmissions.



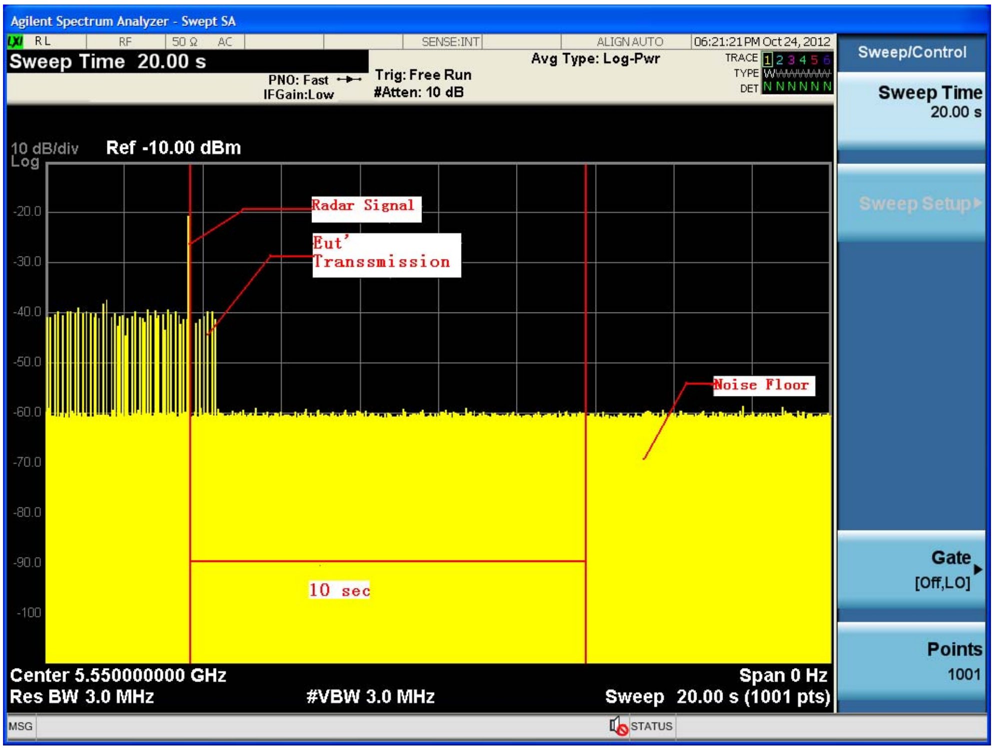
Note: An expanded plot for the device vacates the channel in the required 500ms

TX (N40 Mode)

Radar signal 4



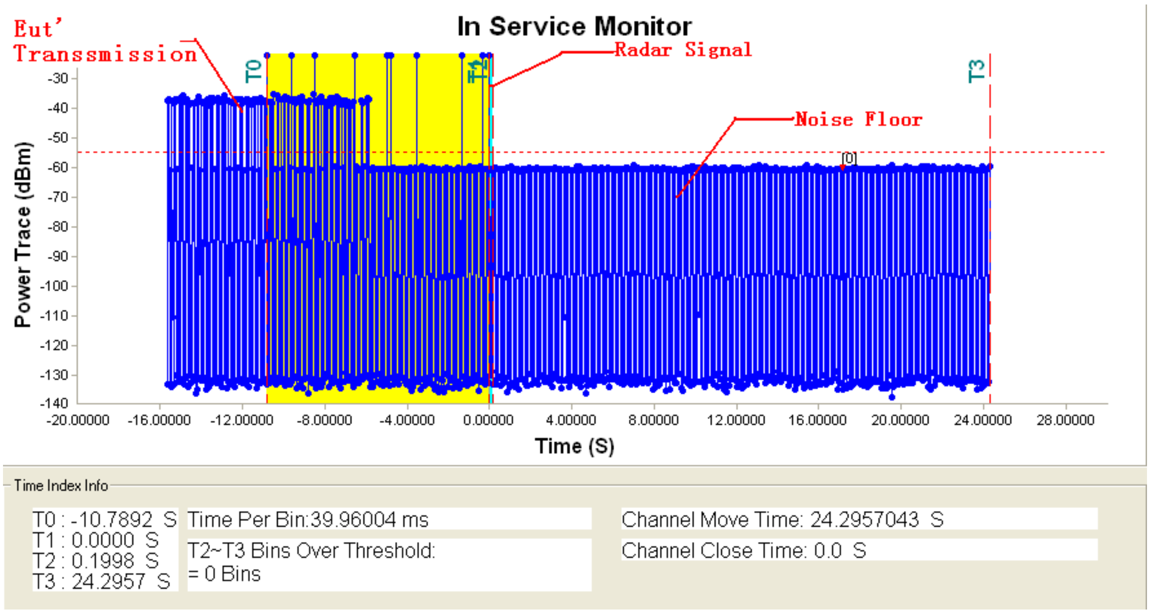
Note: T1 denotes the start of Channel Move Time upon the end of the last Radar burst.
T2 denotes the data transmission time of 200ms from T1.
T3 denotes the end of Channel Move Time.
T4 denotes the 10 second from T1 to observe the aggregate duration of transmissions.



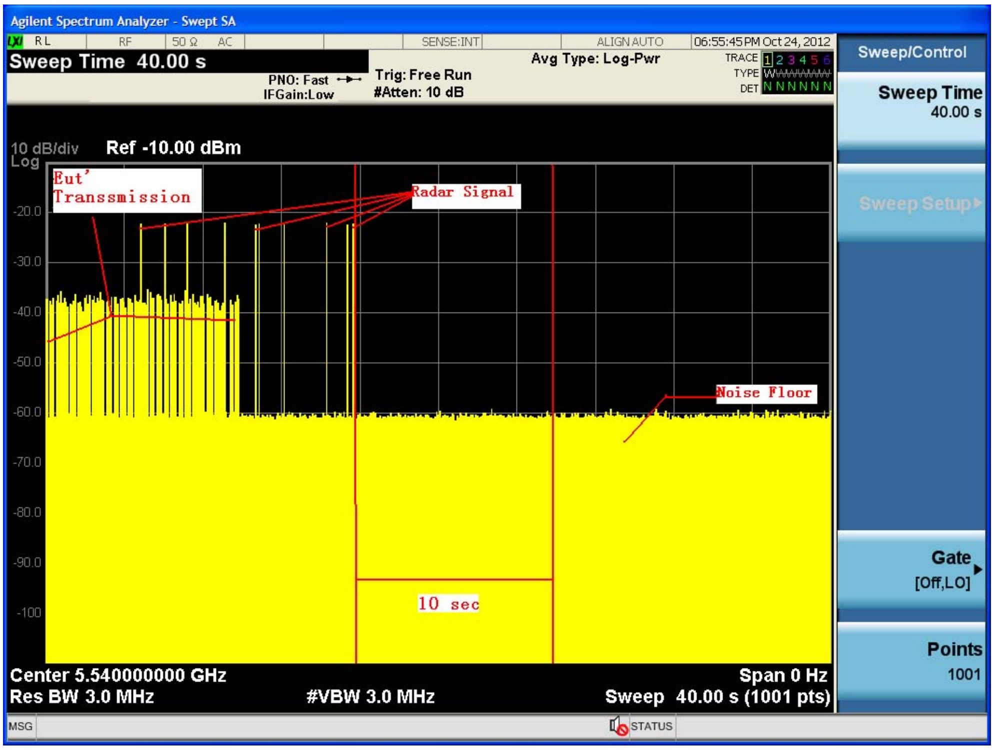
Note: An expanded plot for the device vacates the channel in the required 500ms

TX (N40 Mode)

Radar signal 5



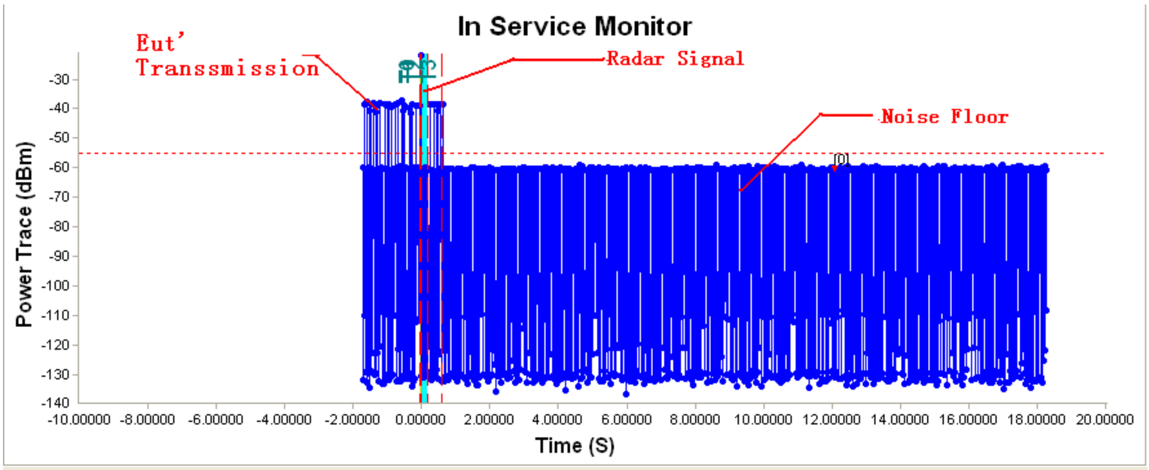
Note: T1 denotes the start of Channel Move Time upon the end of the last Radar burst.
T2 denotes the data transmission time of 200ms from T1.
T3 denotes the end of Channel Move Time.
T4 denotes the 10 second from T1 to observe the aggregate duration of transmissions.



Note: An expanded plot for the device vacates the channel in the required 500ms

TX (N40 Mode)

Radar signal 6



Time Index Info

T0 : 0.0000 S
T1 : 0.0000 S
T2 : 0.1998 S
T3 : 0.6394 S

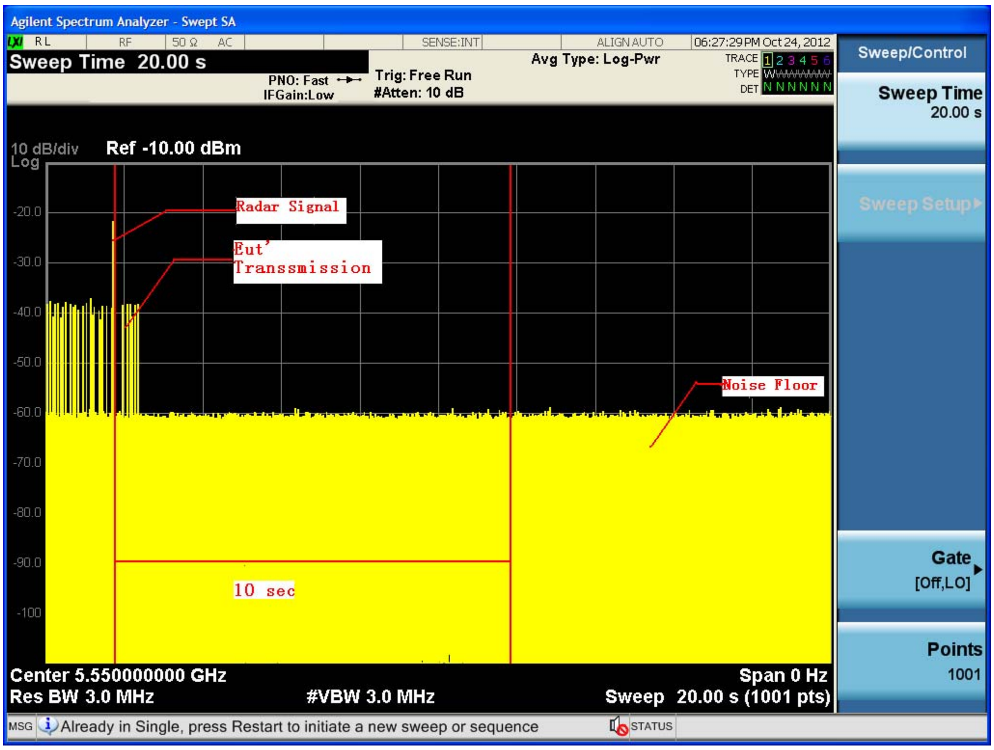
Time Per Bin:19.98002 ms

T2~T3 Bins Over Threshold:
= 6 Bins

Channel Move Time: 0.6393606 S

Channel Close Time: 0.1198801 S

Note: T1 denotes the start of Channel Move Time upon the end of the last Radar burst.
T2 denotes the data transmission time of 200ms from T1.
T3 denotes the end of Channel Move Time.
T4 denotes the 10 second from T1 to observe the aggregate duration of transmissions.



Note: An expanded plot for the device vacates the channel in the required 500ms

TX (N40 Mode)

Radar1 Statical Performances				
Trial #	Pluse per Burst	Pluse Width(us)	PRI(us)	Detection(Yes / No)
1	18	1.0u	1.428	YES
2	18	1.0u	1.428	YES
3	18	1.0u	1.428	YES
4	18	1.0u	1.428	YES
5	18	1.0u	1.428	YES
6	18	1.0u	1.428	YES
7	18	1.0u	1.428	YES
8	18	1.0u	1.428	YES
9	18	1.0u	1.428	YES
10	18	1.0u	1.428	YES
11	18	1.0u	1.428	YES
12	18	1.0u	1.428	YES
13	18	1.0u	1.428	YES
14	18	1.0u	1.428	NO
15	18	1.0u	1.428	YES
16	18	1.0u	1.428	YES
17	18	1.0u	1.428	YES
18	18	1.0u	1.428	YES
19	18	1.0u	1.428	YES
20	18	1.0u	1.428	YES
21	18	1.0u	1.428	YES
22	18	1.0u	1.428	YES
23	18	1.0u	1.428	YES
24	18	1.0u	1.428	YES
25	18	1.0u	1.428	YES
26	18	1.0u	1.428	YES
27	18	1.0u	1.428	YES
28	18	1.0u	1.428	YES
29	18	1.0u	1.428	YES
30	18	1.0u	1.428	YES
Detection Rate 97%				

Radar2 Statical Performances				
Trial #	Pluse per Burst	Pluse Width(us)	PRI(us)	Detection(Yes / No)
1	29	2.7u	170	YES
2	26	2.8u	190	YES
3	25	1.0u	224	YES
4	23	2.5u	207	YES
5	23	4.9u	158	YES
6	27	1.4u	208	YES
7	25	4.2u	178	YES
8	28	3.1u	210	No
9	27	2.0u	175	YES
10	27	1.3u	218	YES
11	26	1.4u	221	YES
12	26	4.5u	227	YES
13	25	4.5u	185	YES
14	24	3.3u	170	YES
15	27	2.4u	170	YES
16	24	4.0u	221	YES
17	23	3.3u	200	YES
18	25	2.4u	190	YES
19	28	4.5u	229	YES
20	19	1.2u	220	YES
21	24	4.8u	223	YES
22	27	3.0u	168	No
23	28	4.9u	200	YES
24	28	2.7u	157	YES
25	23	2.8u	160	YES
26	29	2.6u	198	YES
27	27	2.5u	224	YES
28	26	4.9u	205	YES
29	29	2.7u	160	YES
30	25	3.2u	210	YES
Detection Rate 93%				

Radar3 Statical Performances				
Trial #	Pluse per Burst	Pluse Width(s)	PRI(us)	Detection(Yes / No)
1	17	7.6u	369	YES
2	16	7.9u	366	YES
3	17	8.0u	445	YES
4	18	7.0u	442	YES
5	18	9.6u	435	YES
6	16	6.0u	213	YES
7	16	9.9u	482	YES
8	17	8.5u	436	YES
9	16	8.0u	463	YES
10	16	6.0u	492	YES
11	16	9.5u	387	YES
12	16	7.0u	405	YES
13	18	7.6u	364	YES
14	17	8.0u	360	YES
15	18	7.0u	364	YES
16	16	9.9u	366	YES
17	17	8.5u	258	YES
18	17	8.0u	269	YES
19	18	6.0u	436	YES
20	17	8.8u	447	YES
21	16	7.5u	269	YES
22	18	9.8u	431	YES
23	16	8.6u	330	YES
24	16	8.0u	230	YES
25	17	6.0u	430	NO
26	18	8.8u	447	YES
27	16	8.5u	286	YES
28	17	6.50u	206	YES
29	17	6.0u	210	YES
30	18	9.5u	485	YES
Detection Rate 97%				

Radar4 Statical Performances				
Trial #	Pluse per Burst	Pluse Width(us)	PRI(us)	Detection(Yes / No)
1	15	15.3u	216	YES
2	14	20.0u	210	YES
3	12	13.8u	482	YES
4	13	14.9u	436	YES
5	16	15.8u	447	YES
6	16	19.6u	258	YES
7	16	19.0u	270	YES
8	12	13.2u	482	NO
9	15	12.0u	330	YES
10	16	12.0u	328	YES
11	16	13.8u	325	YES
12	14	15.0u	445	YES
13	15	15.8u	442	YES
14	15	14.6u	332	YES
15	15	13.9u	470	YES
16	16	16.5u	442	YES
17	15	14.0u	390	NO
18	13	15.8u	440	YES
19	15	17.0u	423	YES
20	14	19.3u	477	YES
21	15	18.2u	206	YES
22	14	19.8u	470	YES
23	15	14.6u	330	YES
24	16	13.9u	491	YES
25	15	13.9u	408	YES
26	14	16.0u	460	YES
27	13	11.5u	490	YES
28	16	12.0u	447	YES
29	14	13.8u	435	YES
30	15	14.9u	375	YES
Detection Rate 93%				

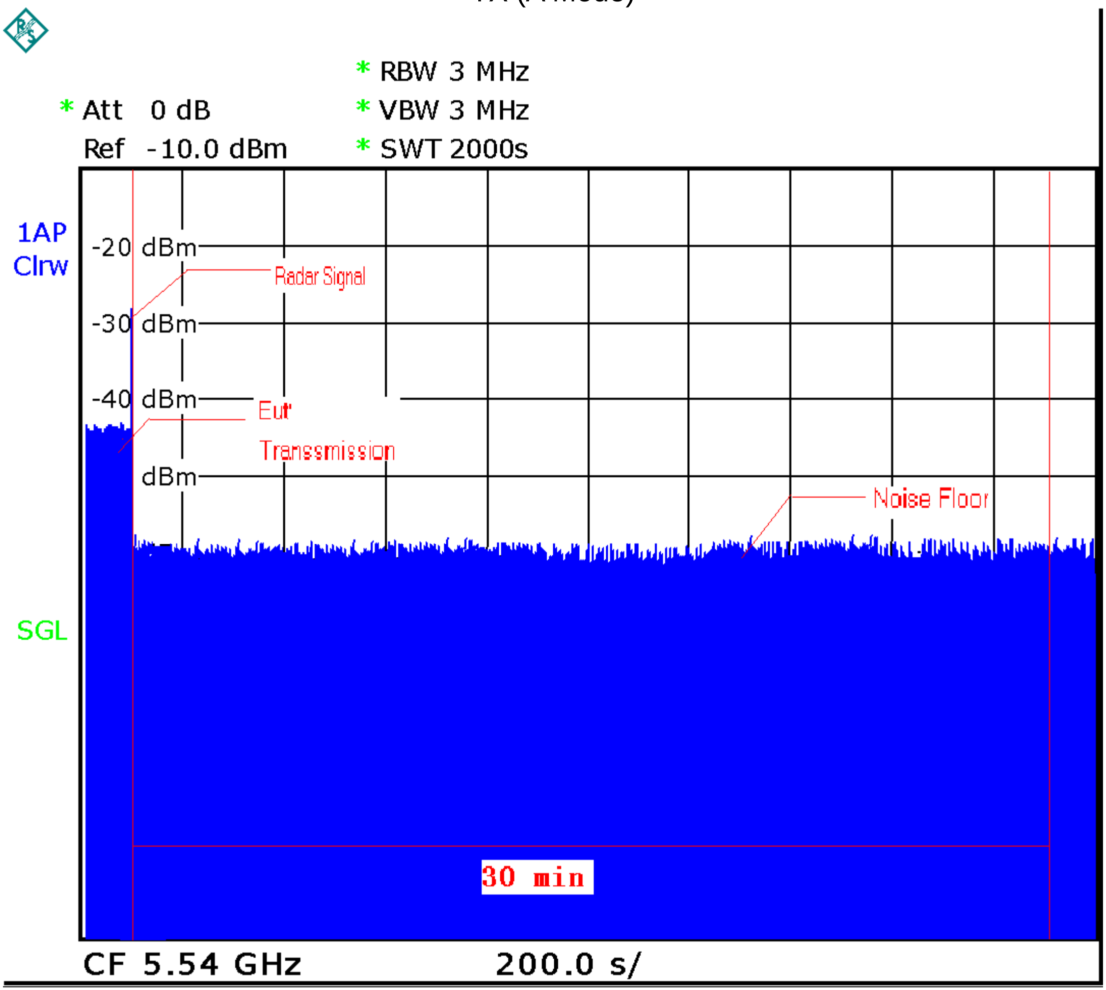
Radar5 Statical Performances		
Trial #	Test Signal name	Detection(Yes / No)
1	LP_Signal_01	Yes
2	LP_Signal_02	Yes
3	LP_Signal_03	Yes
4	LP_Signal_04	Yes
5	LP_Signal_05	Yes
6	LP_Signal_06	Yes
7	LP_Signal_07	Yes
8	LP_Signal_08	Yes
9	LP_Signal_09	Yes
10	LP_Signal_10	Yes
11	LP_Signal_11	Yes
12	LP_Signal_12	Yes
13	LP_Signal_13	Yes
14	LP_Signal_14	Yes
15	LP_Signal_15	Yes
16	LP_Signal_16	Yes
17	LP_Signal_17	Yes
18	LP_Signal_18	Yes
19	LP_Signal_19	Yes
20	LP_Signal_20	Yes
21	LP_Signal_21	Yes
22	LP_Signal_22	Yes
23	LP_Signal_23	Yes
24	LP_Signal_24	Yes
25	LP_Signal_25	Yes
26	LP_Signal_26	Yes
27	LP_Signal_27	Yes
28	LP_Signal_28	Yes
29	LP_Signal_29	Yes
30	LP_Signal_30	Yes
	Detection Rate	100%

Radar6 Statical Performances		
Trial #	Hoping Frequency Sequence Name	Detection(Yes / No)
1	HOP_FREQ_SEQ_01	Yes
2	HOP_FREQ_SEQ_02	Yes
3	HOP_FREQ_SEQ_03	Yes
4	HOP_FREQ_SEQ_04	Yes
5	HOP_FREQ_SEQ_05	Yes
6	HOP_FREQ_SEQ_06	Yes
7	HOP_FREQ_SEQ_07	Yes
8	HOP_FREQ_SEQ_08	Yes
9	HOP_FREQ_SEQ_09	Yes
10	HOP_FREQ_SEQ_10	Yes
11	HOP_FREQ_SEQ_11	Yes
12	HOP_FREQ_SEQ_12	Yes
13	HOP_FREQ_SEQ_13	Yes
14	HOP_FREQ_SEQ_14	Yes
15	HOP_FREQ_SEQ_15	No
16	HOP_FREQ_SEQ_16	Yes
17	HOP_FREQ_SEQ_17	Yes
18	HOP_FREQ_SEQ_18	Yes
19	HOP_FREQ_SEQ_19	Yes
20	HOP_FREQ_SEQ_20	Yes
21	HOP_FREQ_SEQ_21	Yes
22	HOP_FREQ_SEQ_22	Yes
23	HOP_FREQ_SEQ_23	Yes
24	HOP_FREQ_SEQ_24	Yes
25	HOP_FREQ_SEQ_25	Yes
26	HOP_FREQ_SEQ_26	Yes
27	HOP_FREQ_SEQ_27	Yes
28	HOP_FREQ_SEQ_28	Yes
29	HOP_FREQ_SEQ_29	Yes
30	HOP_FREQ_SEQ_30	Yes
Detection Rate		97%

6.2.5 NON- OCCUPANCY PERIOD

During the 30 minutes observation time, UUT did not make any transmissions on a channel after a radar signal was detected on that channel by either the Channel Availability Check or the In-Service Monitoring.

TX (A Mode)



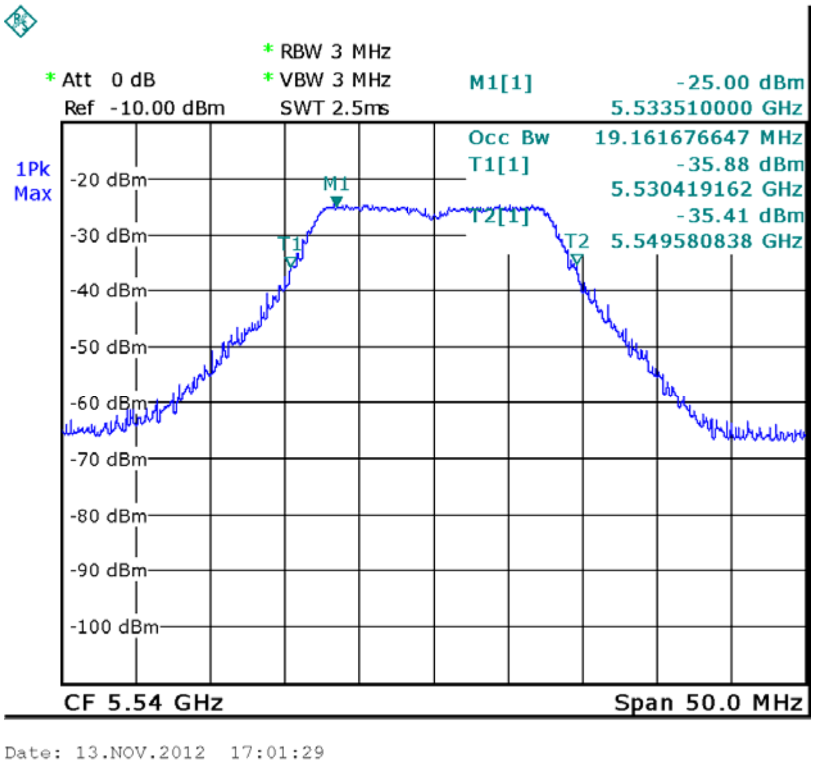
Date: 31.OCT.2012 21:21:44

6.2.6 UNIFORM SPREADING

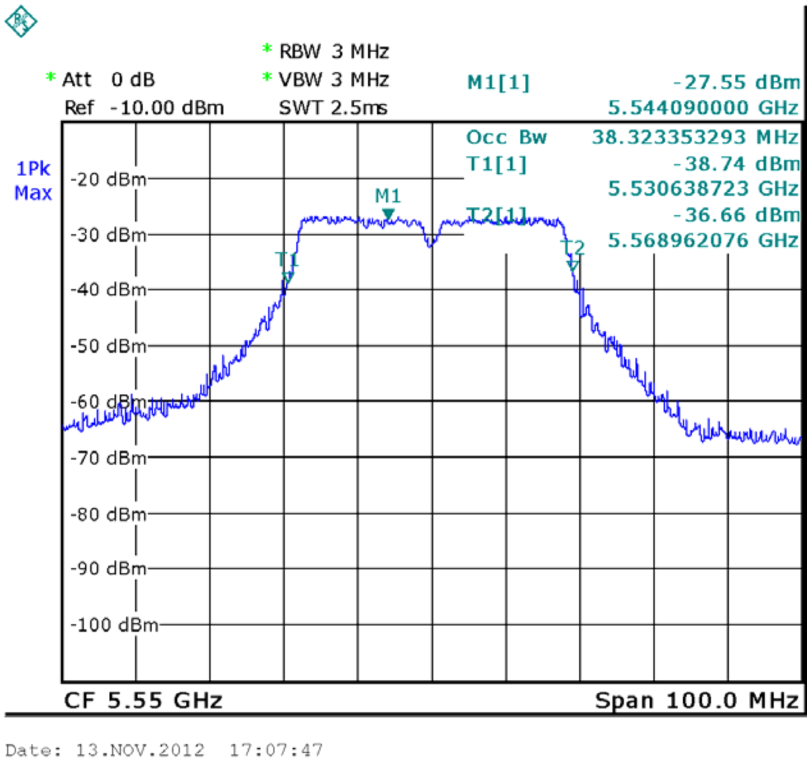
The intention of the uniform spreading is to provide, on aggregate, a uniform loading of the spectrum. The UUT using the bands 5250 to 5350MHz and 5470 to 5600 MHz channels so that the probability of selecting a given channel shall be the same for channels. The UUT will select channel by random mode and remember this channel when detect radar signal, so that will select unused channel by random mode.

6.2.7 U-NII DETECTION BANDWIDTH

TX (A Mode)
U-NII 99% Channel bandwidth



TX (N40MHz Mode)
U-NII 99% Channel bandwidth



A Mode

Detection Bandwith test tranmission 20M											
EUT FREQUENCY	5540M										
EUT power bandwith :	19.16MHz										
Detection Bandwith limit(80%of EUT 99% Power bandwith)								15.328			
Detection Bandwith(5550(FH)-5530(FL)				20							
Test Result:	PASS										
	DFS Detection Trials (1=Detection, 0= No Detection)										
Radar Freq (MHz)	1	2	3	4	5	6	7	8	9	10	Detection Rate(%)
5529	1	0	0	1	1	1	1	0	1	0	60
5530(FL)	1	1	1	1	1	1	1	1	1	1	100
5531	1	1	1	1	1	1	1	1	1	1	100
5532	1	1	1	1	1	1	1	1	1	1	100
5533	1	1	1	1	1	1	1	1	1	1	100
5534	1	1	1	1	1	1	1	1	1	1	100
5535	1	1	1	1	1	1	1	1	1	1	100
5536	1	1	1	1	1	1	1	1	1	1	100
5537	1	1	1	1	1	1	1	1	1	1	100
5538	1	1	1	1	1	1	1	1	1	1	100
5539	1	1	1	1	1	1	1	1	1	1	100
5540	1	1	1	1	1	1	1	1	1	1	100
5541	1	1	1	1	1	1	1	1	1	1	100
5542	1	1	1	1	1	1	1	1	1	1	100
5543	1	1	1	1	1	1	1	1	1	1	100
5544	1	1	1	1	1	1	1	1	1	1	100
5545	1	1	1	1	1	1	1	1	1	1	100
5546	1	1	1	1	1	1	1	1	1	1	100
5547	1	1	1	1	1	1	1	1	1	1	100
5548	1	1	1	1	1	1	1	1	1	1	100
5549	1	0	1	1	1	1	1	1	1	1	100
5550(FH)	1	1	1	1	1	0	1	1	1	1	100
5551	1	0	1	0	1	0	0	1	1	1	60

N40 Mode

Detection Bandwith test tranmission 40M											
EUT FREQUENCY	5550M										
EUT power bandwith :	38.32MHz										
Detection Bandwith limit(80%of EUT 99% Power bandwith)	30.66										
Detection Bandwith(5568(FH)-5530(FL)	38										
Test Result:	PASS										
	DFS Detection Trials (1=Detection, 0= No Detection)										
Radar Freq (MHz)	1	2	3	4	5	6	7	8	9	10	Detection Rate(%)
5529	1	1	0	0	1	1	1	0	1	0	50
5530(FL)	1	1	1	1	1	1	1	1	1	1	100
5531	1	1	1	1	1	1	1	1	1	1	100
5532	1	1	1	1	1	1	1	1	1	1	100
5533	1	1	1	1	1	1	1	1	1	1	100
5534	1	1	1	1	1	1	1	1	1	1	100
5535	1	1	1	1	1	1	1	1	1	1	100
5536	1	1	1	1	1	1	1	1	1	1	100
5537	1	1	1	1	1	1	1	1	1	1	100
5538	1	1	1	1	1	1	1	1	1	1	100
5539	1	1	1	1	1	1	1	1	1	1	100
5540	1	1	1	1	1	1	1	1	1	1	100
5541	1	1	1	1	1	1	1	1	1	1	100
5542	1	1	1	1	1	1	1	1	1	1	100
5543	1	1	1	1	1	1	1	1	1	1	100
5544	1	1	1	1	1	1	1	1	1	1	100
5545	1	1	1	1	1	1	1	1	1	1	100
5546	1	1	1	1	1	1	1	1	1	1	100
5547	1	1	1	1	1	1	1	1	1	1	100
5548	1	1	1	1	1	1	1	1	1	1	100
5549	1	1	1	1	1	1	1	1	1	1	100
5550	1	1	1	1	1	1	1	1	1	1	100
5551	1	1	1	1	1	1	1	1	1	1	100
5552	1	1	1	1	1	1	1	1	1	1	100
5553	1	1	1	1	1	1	1	1	1	1	100
5554	1	1	1	1	1	1	1	1	1	1	100
5555	1	1	1	1	1	1	1	1	1	1	100
5556	1	1	1	1	1	1	1	1	1	1	100
5557	1	1	1	1	1	1	1	1	1	1	100
5558	1	1	1	1	1	1	1	1	1	1	100
5559	1	1	1	1	1	1	1	1	1	1	100
5560	1	1	1	1	1	1	1	1	1	1	100
5561	1	1	1	1	1	1	1	1	1	1	100
5562	1	1	1	1	1	1	1	1	1	1	100
5563	1	1	1	1	1	1	1	1	1	1	100
5564	1	1	1	1	1	1	1	1	1	1	100
5565	1	1	1	1	1	1	1	1	1	1	100
5566	1	1	1	1	1	1	1	1	1	1	100
5567	1	1	1	1	1	1	1	1	1	1	100
5568	1	1	1	1	1	1	1	1	1	1	100
5569	1	0	1	0	0	0	0	1	0	1	40

6.2.8 TEST SETUP PHOTOS