LABCODE: 500069-0

FCC PART 15.407(H)

DYNAMIC FREQUENCY SELECTION

TEST REPORT

For

IDX Company, Ltd.

6-28-11 Shukugawara, Tama-ku, Kawasaki-shi Kanagawa-ken, Japan

FCC ID: OFJCW-3-130701

Report Type:	**Product Type:**
Original Report	Wireless Video Transmission System(TX Unit)

Test Engineer:	Ares Liu
Report Number:	R2DG130719004-DFS
Report Date:	2013-09-11
Reviewed By:	Ivan Cao RF Leader
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Dongguan) No.69 Pulongcun, Puxinhu Industrial Zone, Tangxia, Dongguan, Guangdong, China Tel: +86-769-86858888 Fax: +86-769-86858891 www.baclcorp.com.cn

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *IDX Company, Ltd*'s product, model number: *CW-3 (FCC ID: OFJCW-3-130701) or* ("EUT") in this report is a *Wireless Video Transmission System(TX Unit),* which was a client device, and measured approximately: 10.6 cm (L) x 7.5cm (W) x0.7 cm (H), rated input voltage: DC 12 V from adapter. The operating frequency ranges are 5250~5350 MHz and 5470~5725 MHz.

Adapter information: KUANTEN
Model: SSA301F120200JP
Input: 100-240Vac, 50/60Hz, 0.8A
Output: 12Vdc, 2A

** All measurement and test data in this report was gathered from production sample serial number: 130719004 (Assigned by BACL, Dongguan). The EUT was received on 2013-07-31.*

Objective

This report is prepared on behalf of *IDX Company, Ltd* in accordance with FCC CFR47 §15.407 (h) and FCC 06-96 Appendix.

The objective is to determine compliance with FCC rules for DFS Detection Threshold, Channel Availability Check Time, Uniform Spreading U-NII Detection Bandwidth, Channel Closing Transmission Time, and Channel Move time.

Related Submittal(s)/Grant(s)

No related submittal(s).

Test Methodology

FCC CFR 47 Part2, Part15.407 (h)

FCC 06-96 Appendix "COMPLIANCE MEASUREMENT PROCEDURES FOR UNLICENSED NATIONAL INFORMATION INFRASTRUCTURE DEVICES OPERATING IN THE 5250-5350 MHz AND 5470-5725 MHz BANDS INCORPORATING DYNAMIC FREQUENCY SELECTION"

All emissions measurement was performed and Bay Area Compliance Laboratories Corp. (Dongguan).

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Dongguan) to collect test data is located on the No.69 Pulongcun, Puxinhu Industrial Zone, Tangxia, Dongguan, Guangdong, China

Test site at Bay Area Compliance Laboratories Corp. (Dongguan) has been fully described in reports submitted to the Federal Communications Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 02, 2012. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2003.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 273710. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, Bay Area Compliance Laboratories Corp. (Dongguan) is an ISO/IEC 17025 accredited laboratory, and is accredited by National Voluntary Laboratory Accredited Program (Lab Code 500069-0).

The current scope of accreditations can be found at http://ts.nist.gov/standards/scopes/5000690.htm

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The EUT was configured for testing in an engineering mode which was provided by the manufacturer.

The operating frequency ranges are 5250~5350 MHz and 5470~5725 MHz, the frequencies are 5270 MHz, 5310 MHz for 5250~5350 MHz band, 5510 MHz, 5550 MHz, 5670 MHz for 5470~5725 MHz band, which was provided by the manufacturer.

EUT Exercise Software

The test was performed under "*AppCom_3.0.3.16*" which was provided by the manufacturer.

Equipment Modifications

Added the Copper Foil attached better with the two PCB, and coverd the chip of convert board.

Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
Acer	Laptop	MS2332	LXRHD010021070397F2000
Cuanbo	HDMI To SDI Converter	CHS-3G	N/A
SANSUNG	Monitor	S22C330H	ZXDCHTHD101491K
IDX	Wireless Video Transmission System(RX Unit)	CW-1	N/A

External Cable

Cable Description	Length (m)	From Port	To
Shielded HDMI Cable	2.0	Laptop	HDMI To SDI Converter
Shielded HDMI Cable	2.0	Wireless Video Transmission System(RX Unit)	Monitor
SDI Cable	1.0	HDMI To SDI Converter	EUT

SUMMARY OF TEST RESULTS

The following result table represents the list of measurements required under the CFR47 §47 Part15.407 (h) and FCC 06-96.

Items	Description of Test	Result
Detection Bandwidth	UNII Detection Bandwidth	Not applicable
Performance Requirements Check	Initial Channel Availability Check Time (CAC)	Not applicable
	Radar Burst at the Beginning of the CAC	Not applicable
	Radar Burst at the End of the CAC	Not applicable
In-Service Monitoring	Channel Move Time	Compliant
	Channel Closing Transmission Time	Compliant
	Non-Occupancy Period	Compliant
Radar Detection	Statistical Performance Check	Not applicable

Note:

1) Not applicable: the EUT is a client unit without radar detection.
2) The EUT was tested with the certified master device (FCC ID: OFJCW-1-12061202).

APPLICABLE STANDARDS

DFS Requirement

FCC CFR47 §15.407 (h) and FCC 06-96 Appendix.

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 Bandwidth	Yes	Not Required	Yes

Table 2: Applicability of DFS requirements during normal operation

Requirement	Operational Mode		
	Master	Client (Without DFS)	Client (With DFS)
DFS Detection Threshold	Yes	Not Required	Yes
Channel Closing Transmission Time	Yes	Yes	Yes
Channel Move Time	Yes	Yes	Yes
U-NII Detection Bandwidth	Yes	Not Required	Yes

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

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 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 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.

Table 5: Short Pulse Radar Test Waveforms

Radar Type	Pulse Width (Microseconds)	PRI (Microseconds)	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 6: Long Pulse Radar Test Signal

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

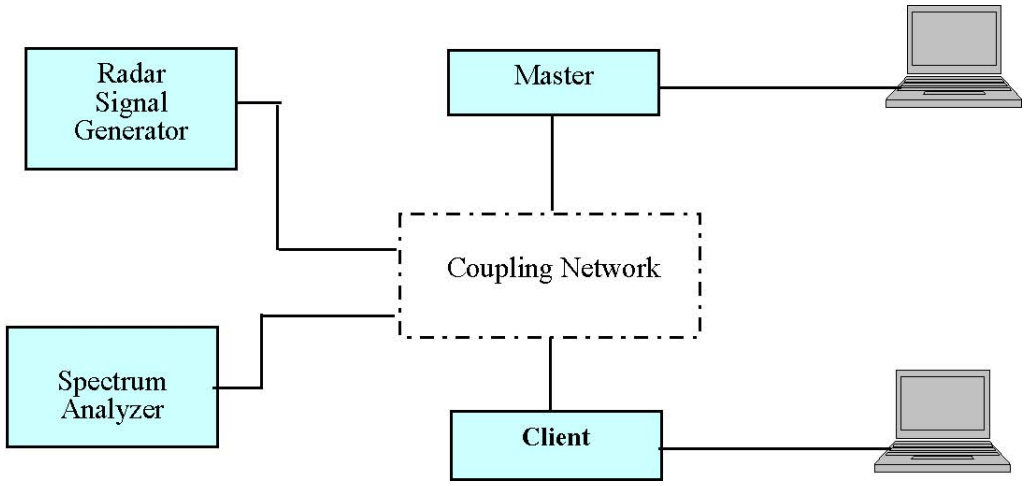
Table 7: Frequency Hopping Radar Test Signal

Radar Type	Pulse Width (usec)	PRI (usec)	Pulses per Hop	Hopping Rate (kHz)	Hopping Sequence Length (msec)	Minimum Percentage of Successful Detection	Minimum Number of Trials
6	1	333	9	0.333	300	70%	30

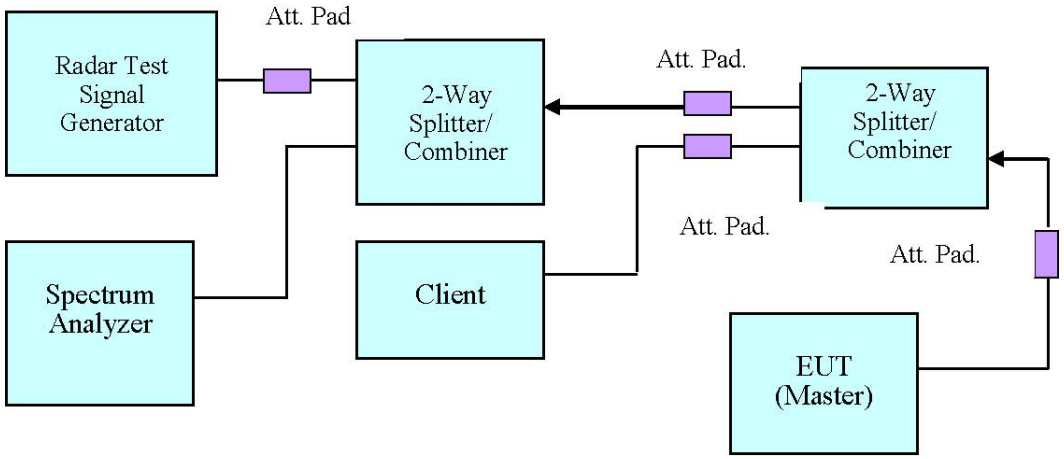
DFS Measurement System

BACL DFS measurement system consists of two subsystems: (1) The radar signal generating subsystem and (2) the traffic monitoring subsystem.

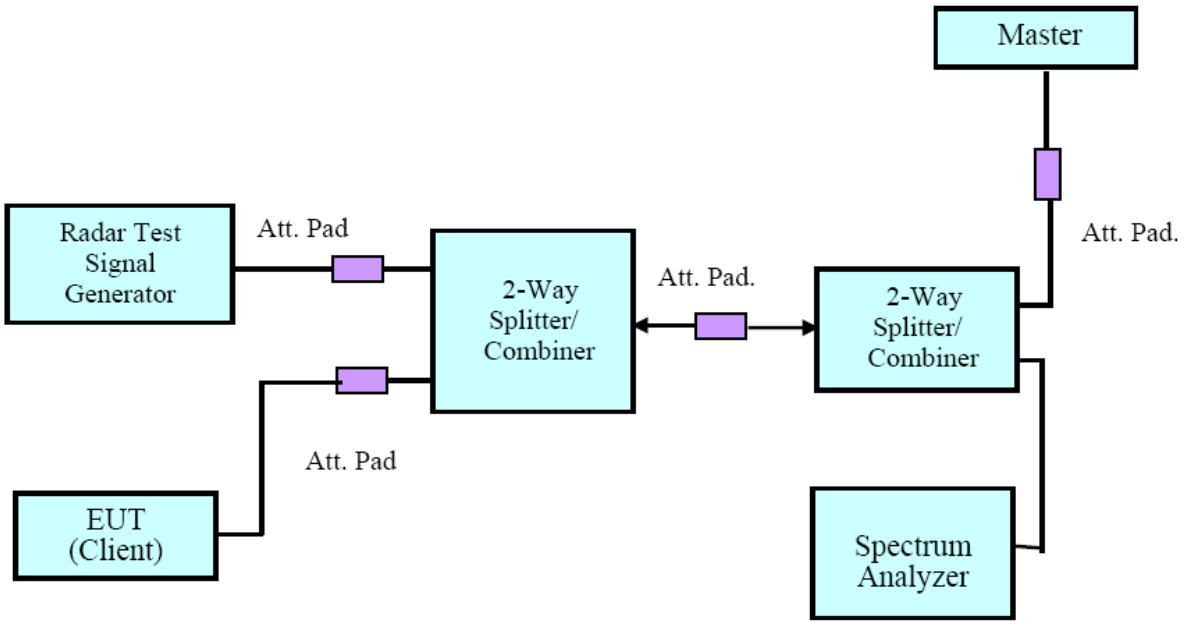
System Block Diagram



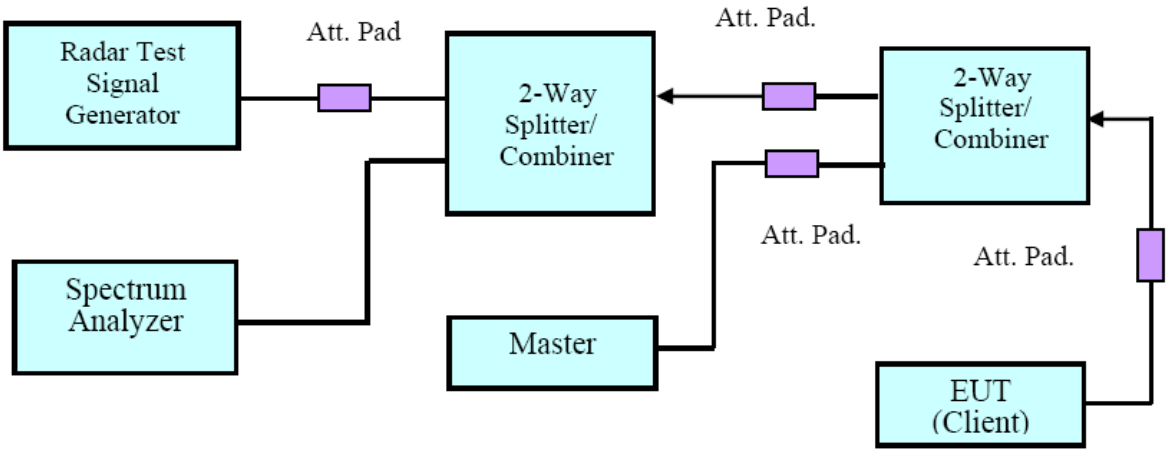
Conducted Method



Setup for Master with injection at the Master

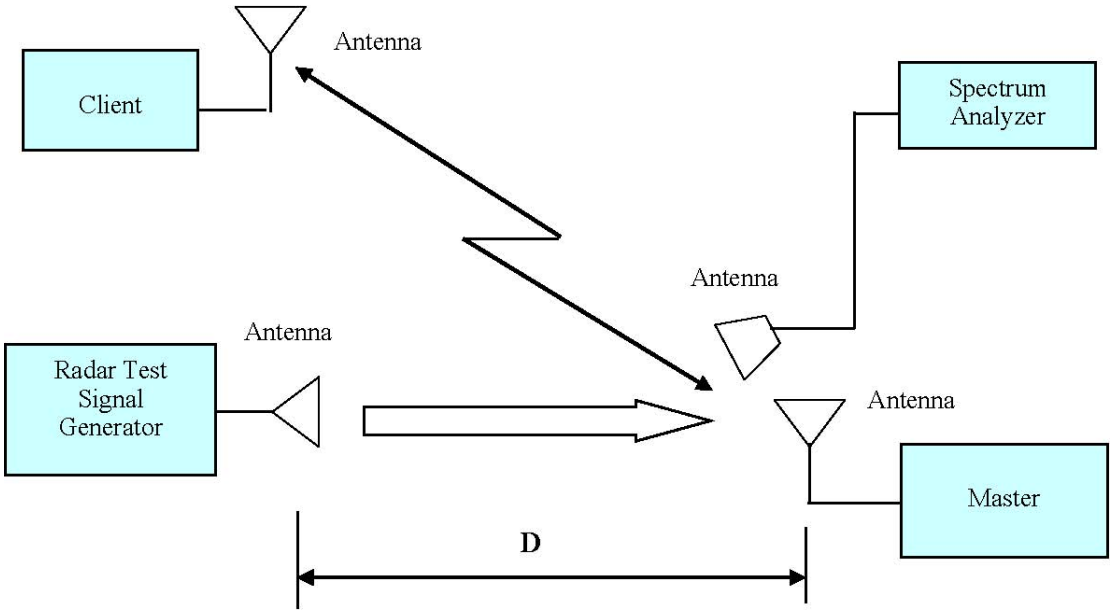


Setup for Client with injection at the Master



Setup for Client with injection at the Client

4.5 Radiated Method



4.6 Test Procedure

A spectrum analyzer is used as a monitor verifies that the EUT status including Channel Closing Transmission Time and Channel Move Time, and does not transmit on a Channel during the Non-Occupancy Period after the diction and Channel move. It is also used to monitor EUT transmissions during the Channel Availability Check Time.

TEST RESULTS

Description of EUT

The EUT operates in 5230-5350 MHz and 5470-5725 MHz range.

The rated output power of EUT is <23 dBm (EIRP), Therefore the required interference threshold level is -62 dBm, the required radiated threshold at antenna port is -62dBm.

The calibrated radiated DFS detection threshold level is set to -62 dBm.

WLAN traffic is generated by streaming the video file TestFile.mpg, this file is used by IP and Frame based systems for loading the test channel during the In-service compliance testing of the U-NII device. The file is streamed from the Access Point to the Client in full motion video mode using the media player with the V2.61 Codec package.

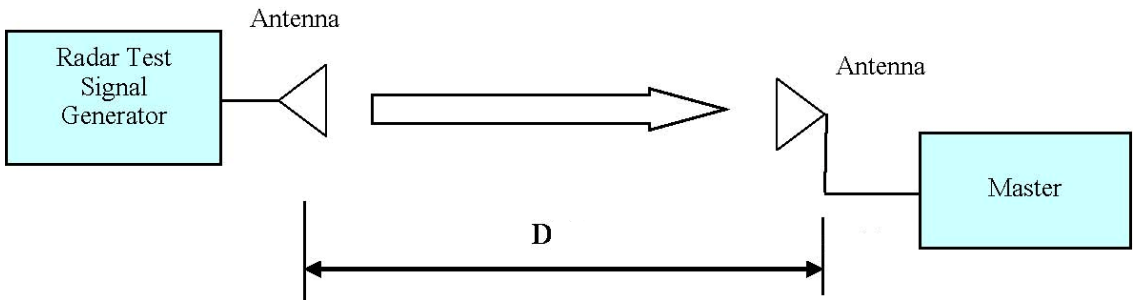
The EUT will not work on 5600-5650MHz band.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
National Instruments	NI PXI-1042 8-Slot chassis	PXI-1042	VOBX40FBD	N/A	N/A
National Instruments	Arbitrary Waveform Generator	PXI-5421	N/A	N/A	N/A
National Instruments	RF Upconverter	PXI-5610	N/A	N/A	N/A
ASCOR	Upconverter	AS-7202	N/A	N/A	N/A
Agilent	Spectrum Analyzer	E4440A	SG43360054	2013-03-13	2014-03-13
Ditorn	Splitter/Combiner	D3C4080	SN2244	N/A	N/A
TDK RF	horn antenna	HRN-0118	130 084	2012-9-6	2015-9-5
ETS LINDGREN	horn antenna	3115	000 527 35	2012-9-6	2015-9-5

* Statement of Traceability: Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to National Primary Standards and International System of Units (SI).

Radar Waveform Calibration



Note: the calibration distance(D) was 3meter.

Test Environmental Conditions

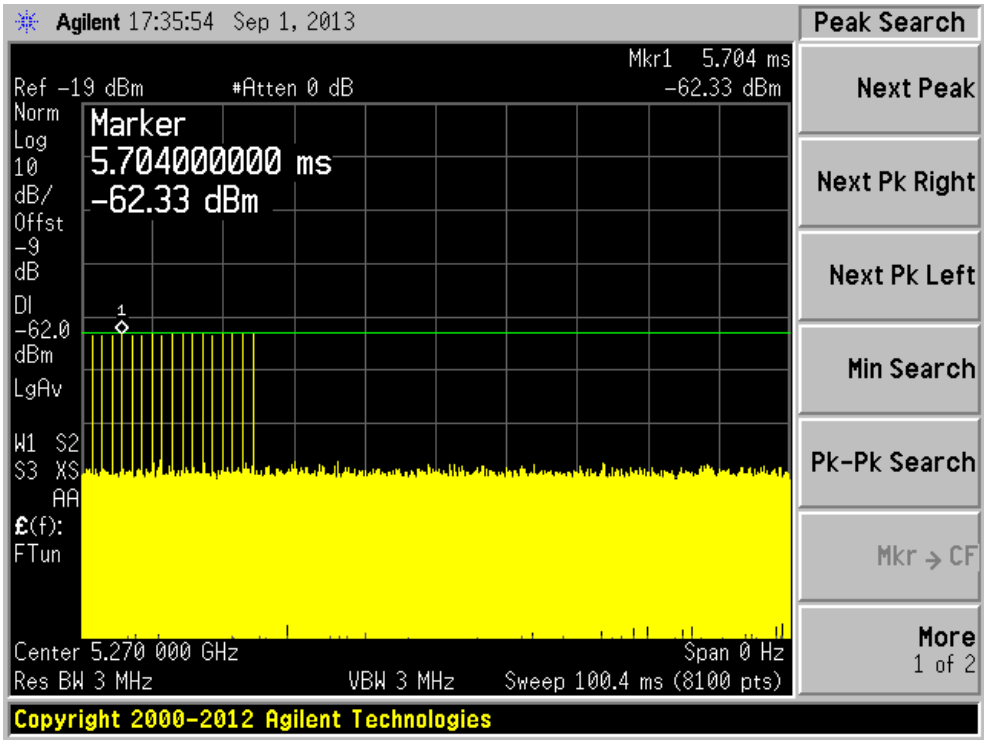
Temperature:	27.3 ° C
Relative Humidity:	65 %
ATM Pressure:	99 kPa

The testing was performed by Ares Liu on 2013-09-01.

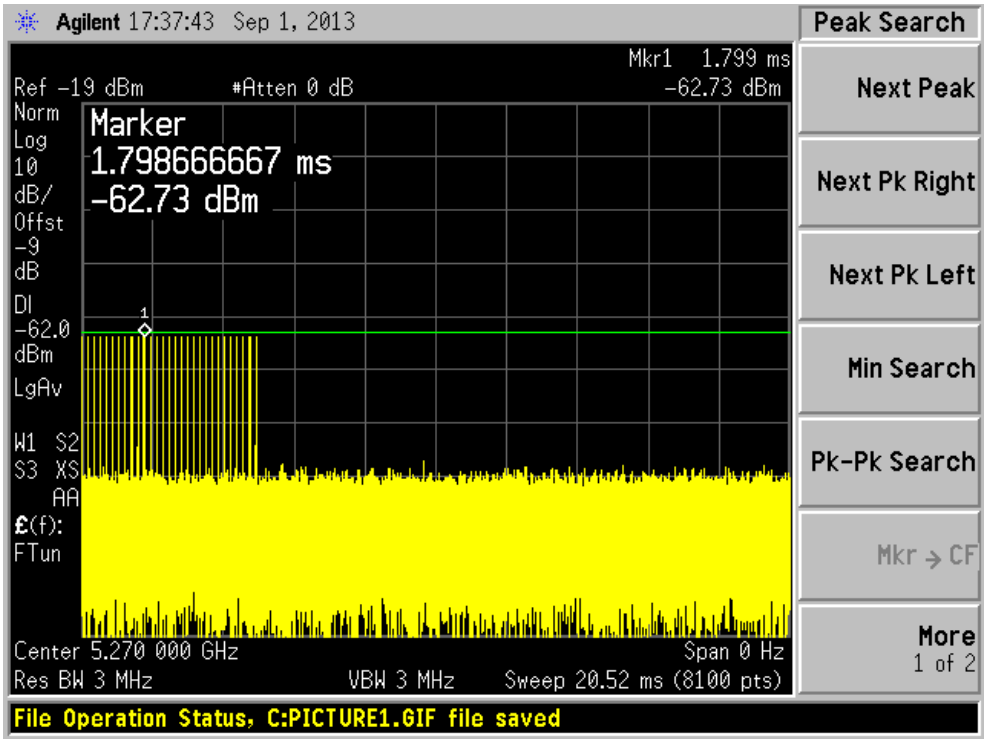
Plots of Radar Waveforms

5270 MHz:

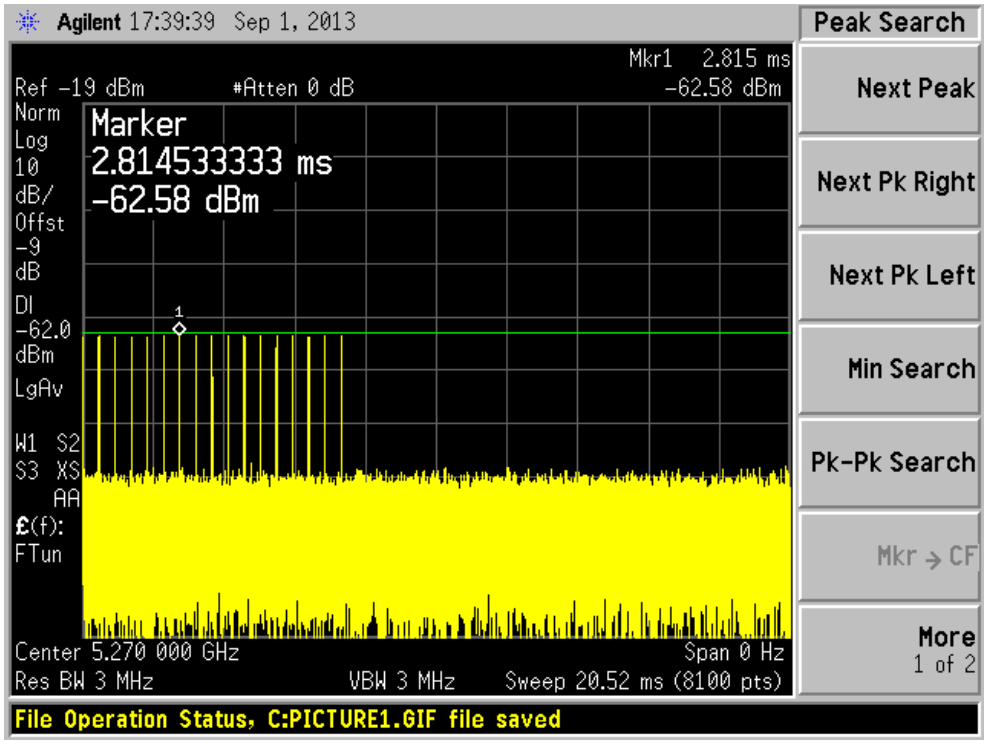
Radar Type 1



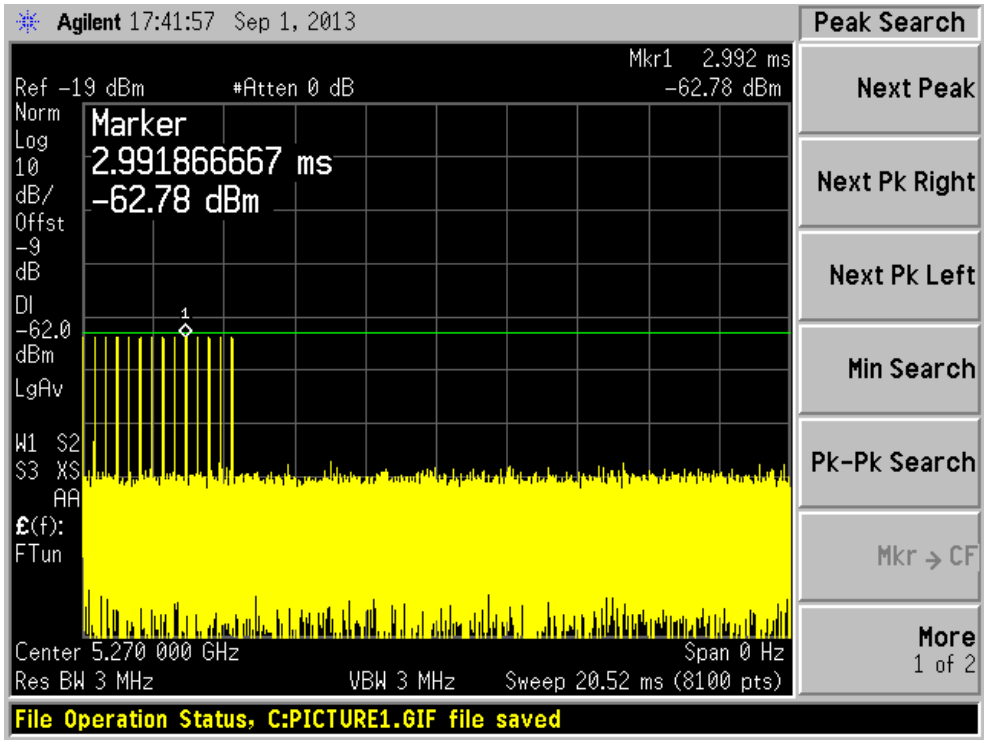
Radar Type 2



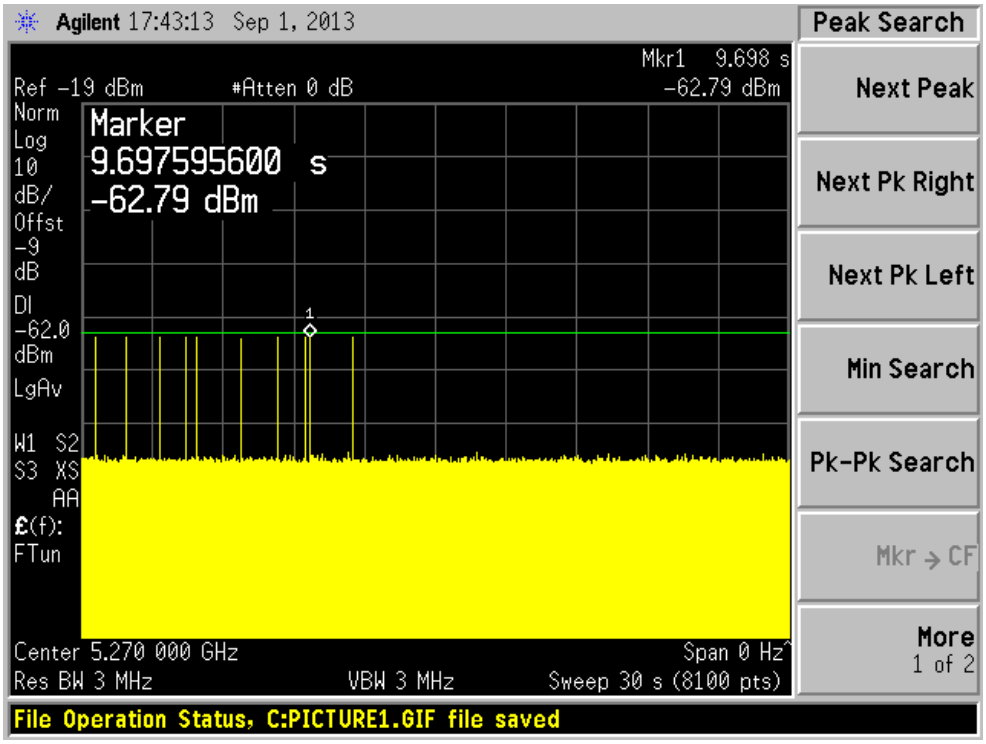
Radar Type 3



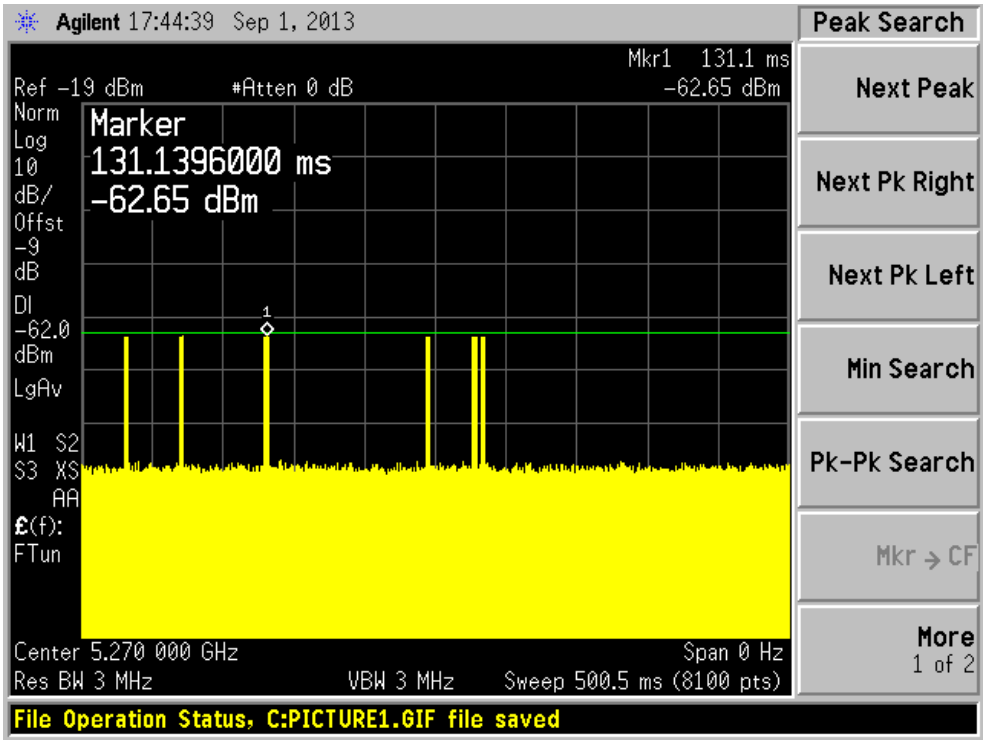
Radar Type 4



Radar Type 5

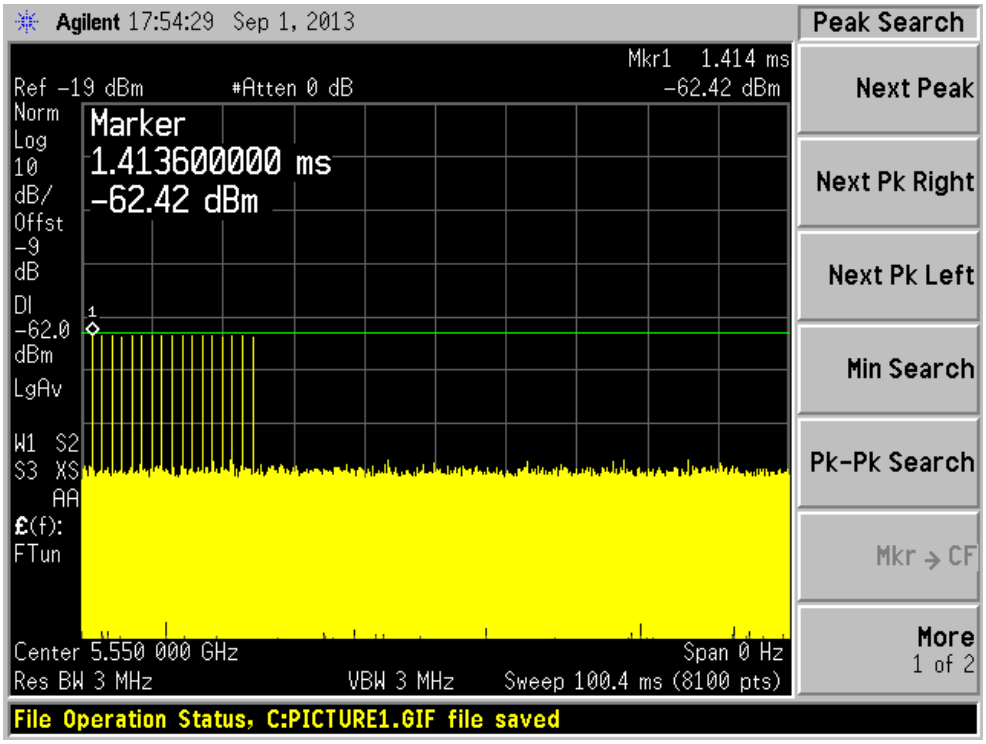


Radar Type 6

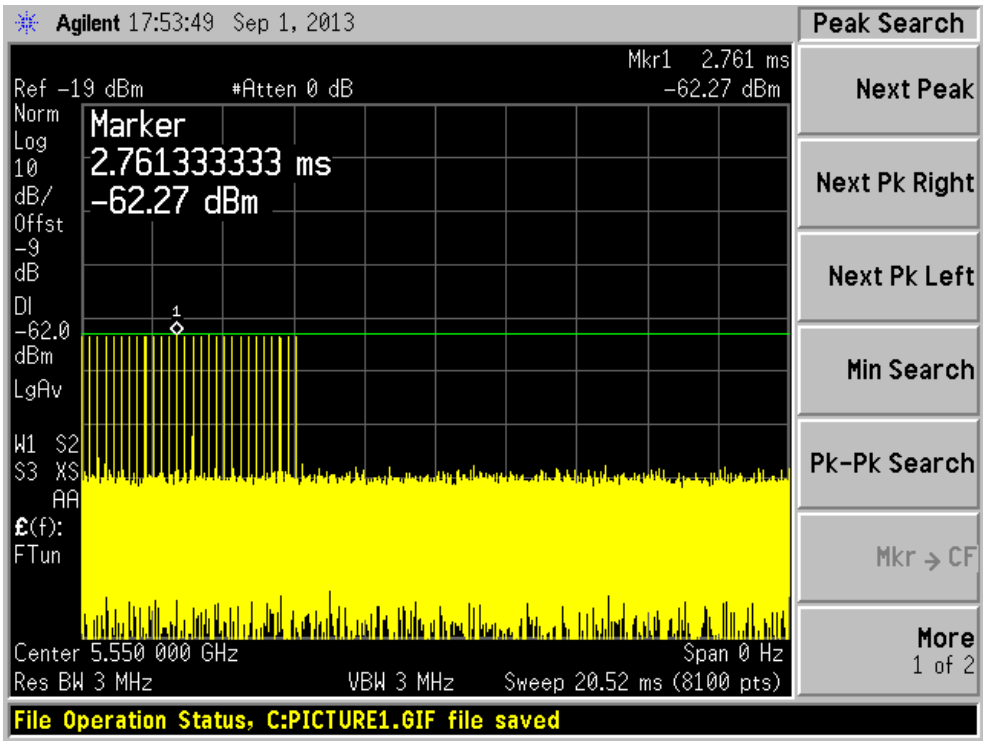


5550 MHz:

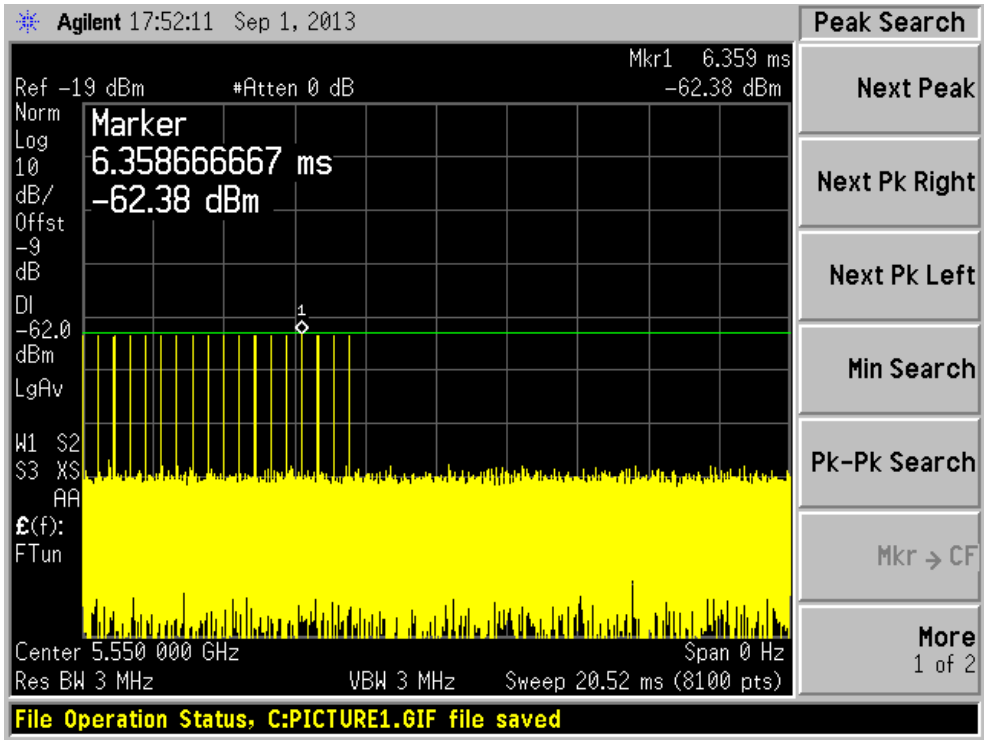
Radar Type 1



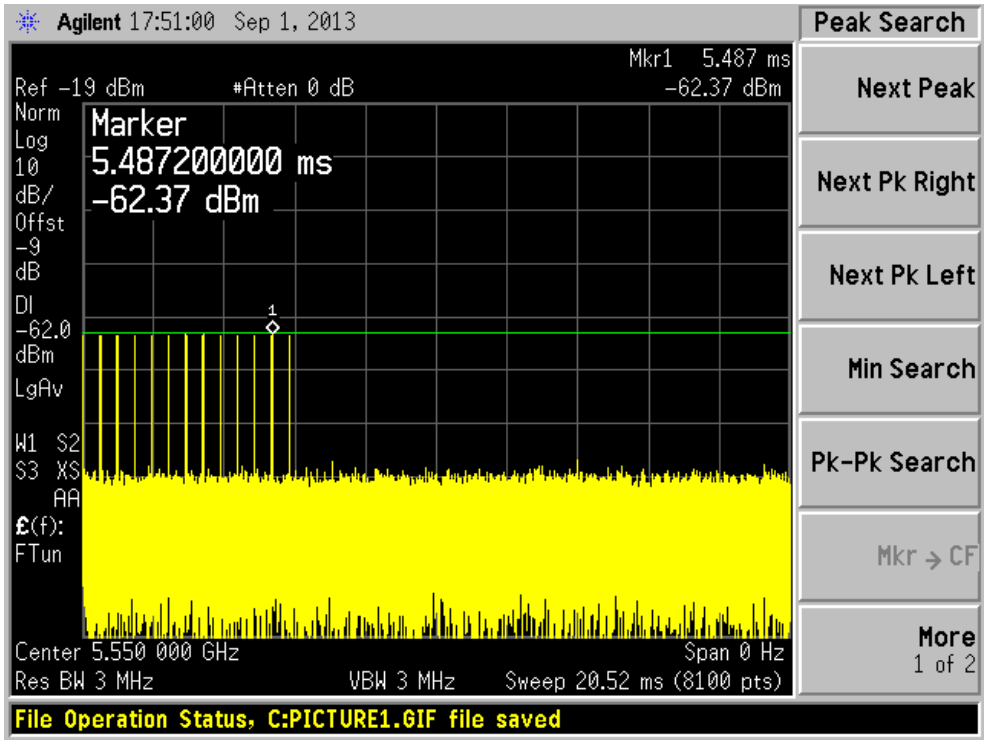
Radar Type 2



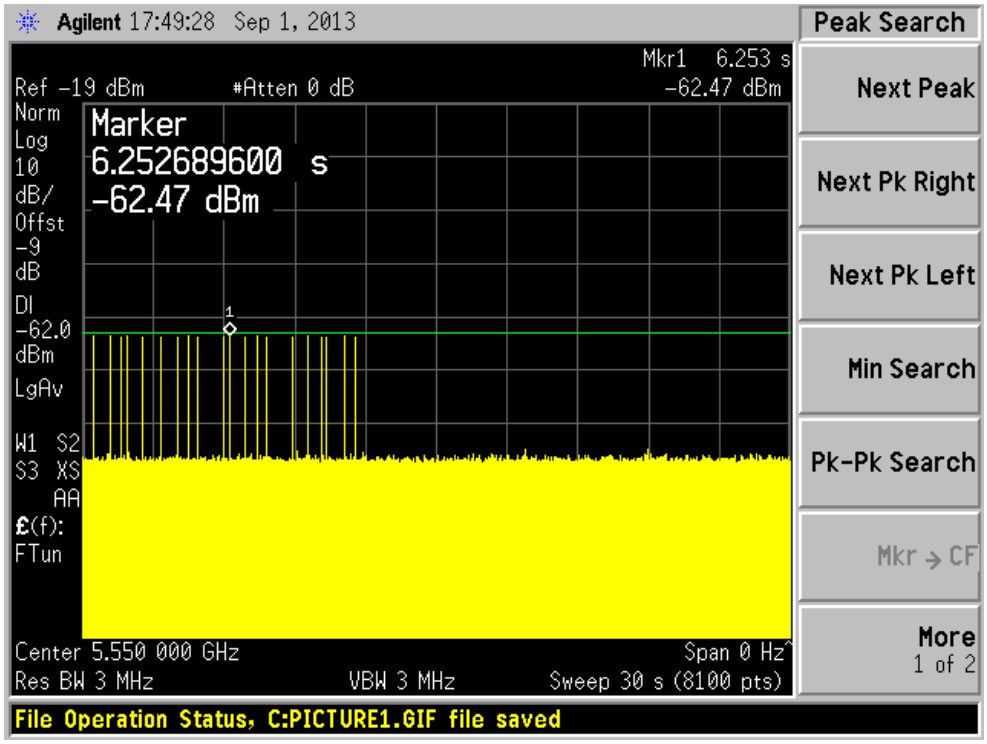
Radar Type 3



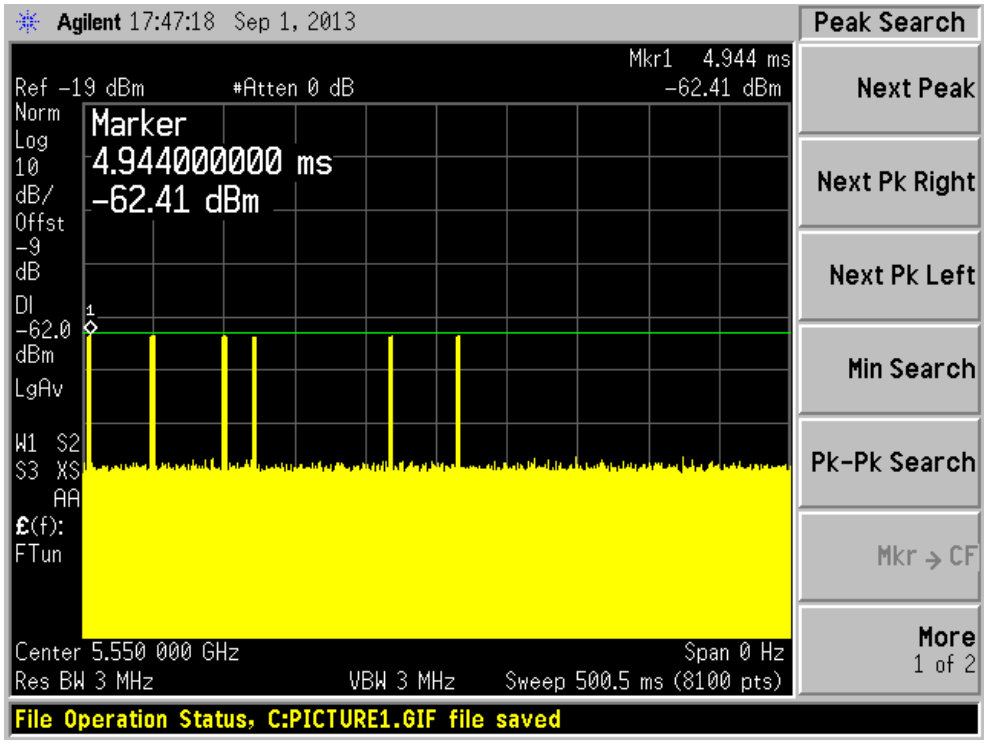
Radar Type 4



Radar Type 5



Radar Type 6



CHANNEL MOVE TIME AND CHANNEL CLOSING TRANSMISSION TIME

Test Procedure

Perform one of the type1 to type 4 short pulse radar waveform, BACL use type 1 radar signal, repeat using a long pulse radar type5 waveform.
The aggregate channel closing transmission time is calculated as follows:

Aggregate Transmission Time = N*Dwell Time

N is the number of spectrum analyzer bins showing a device transmission Dwell Time is the dwell time per bin (i.e. Dwell Time = S/B, S is the sweep time and B is the number of bin, i.e. 8192)

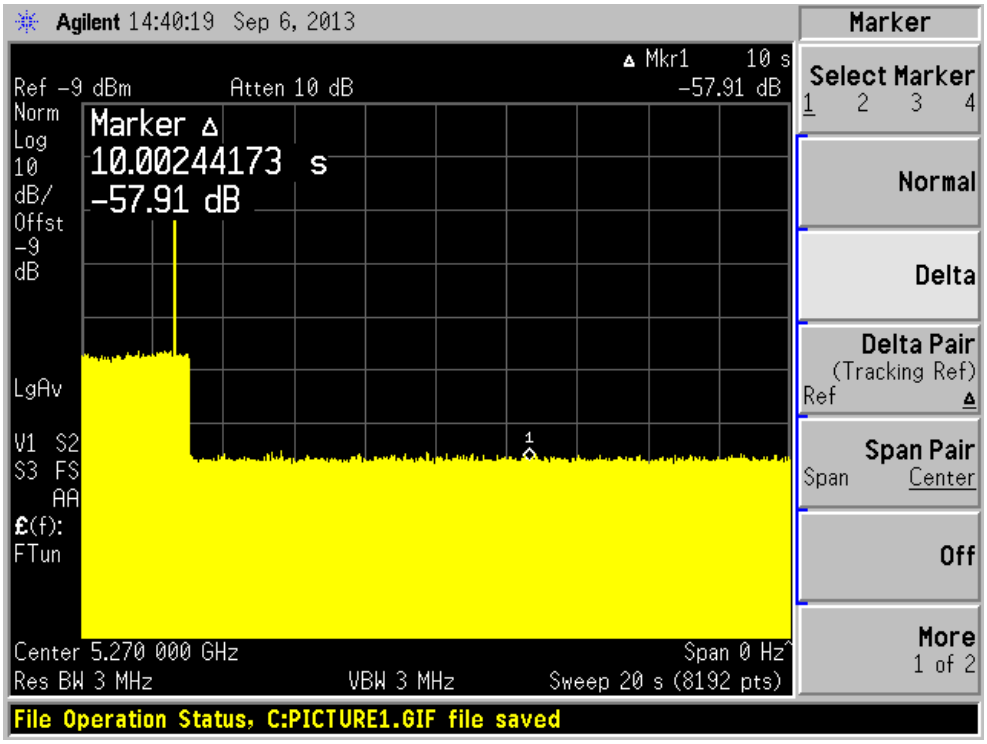
Test Results

Frequency (MHz)	Bandwidth (MHz)	Radar Type	Results
5270	40	Type 1	Compliant
		Type 5	Compliant
5550	40	Type 1	Compliant
		Type 5	Compliant

Please refer to the following tables and plots.

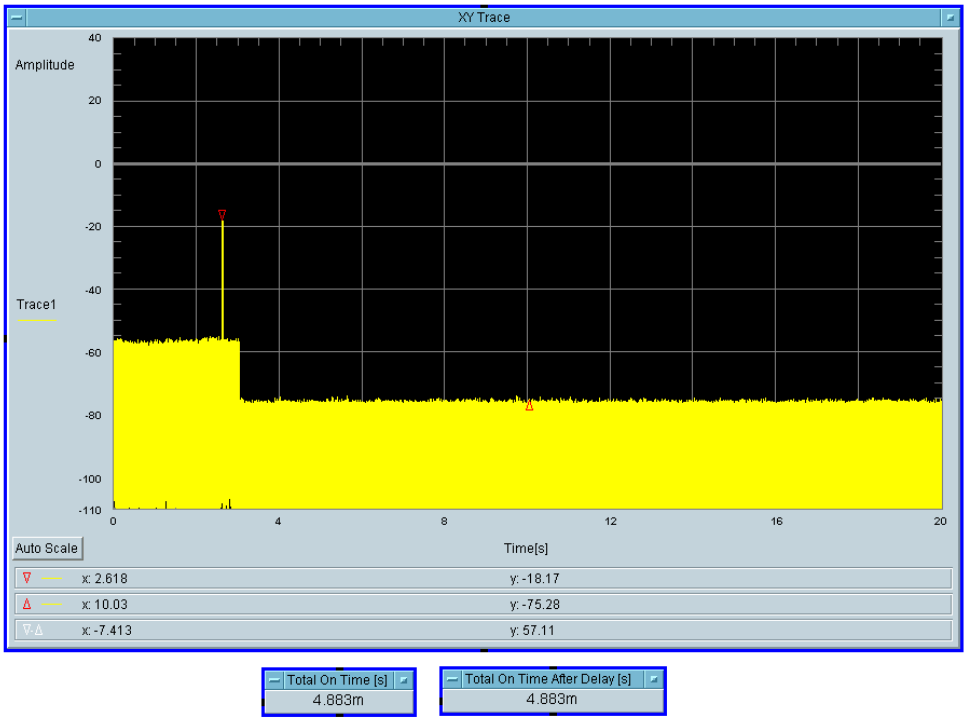
5270 MHz

Type 1 radar channel move time result:

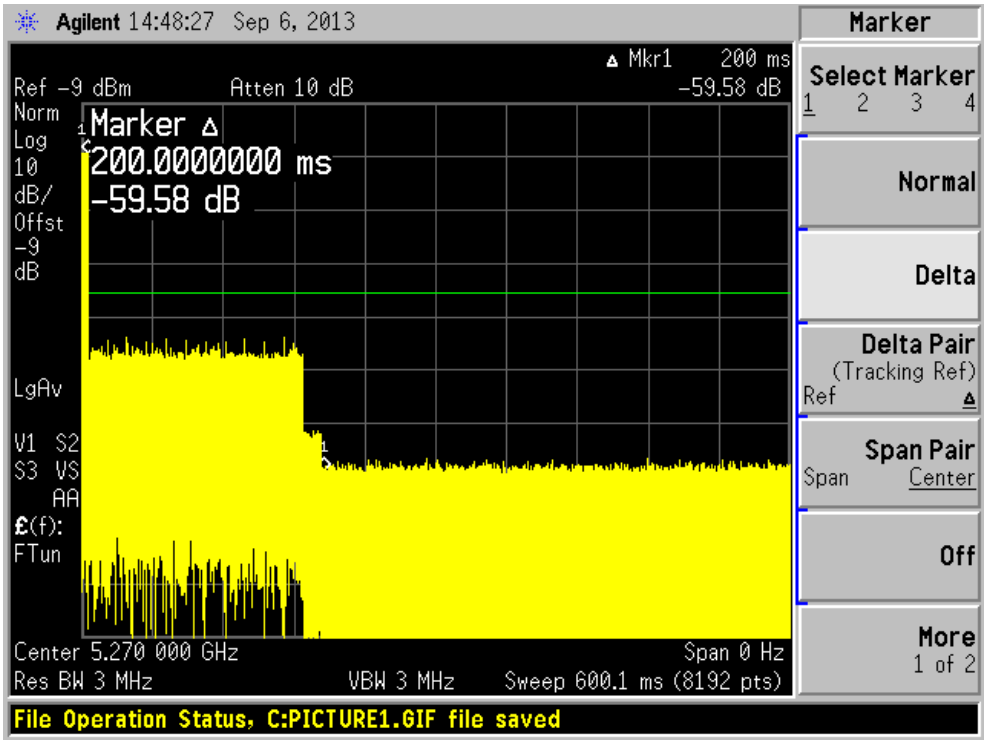


Type1 radar channel closing transmission time result:

Aggregate Transmission Time (ms)	Limit (ms)	Margin (ms)
4.883	60	55.117

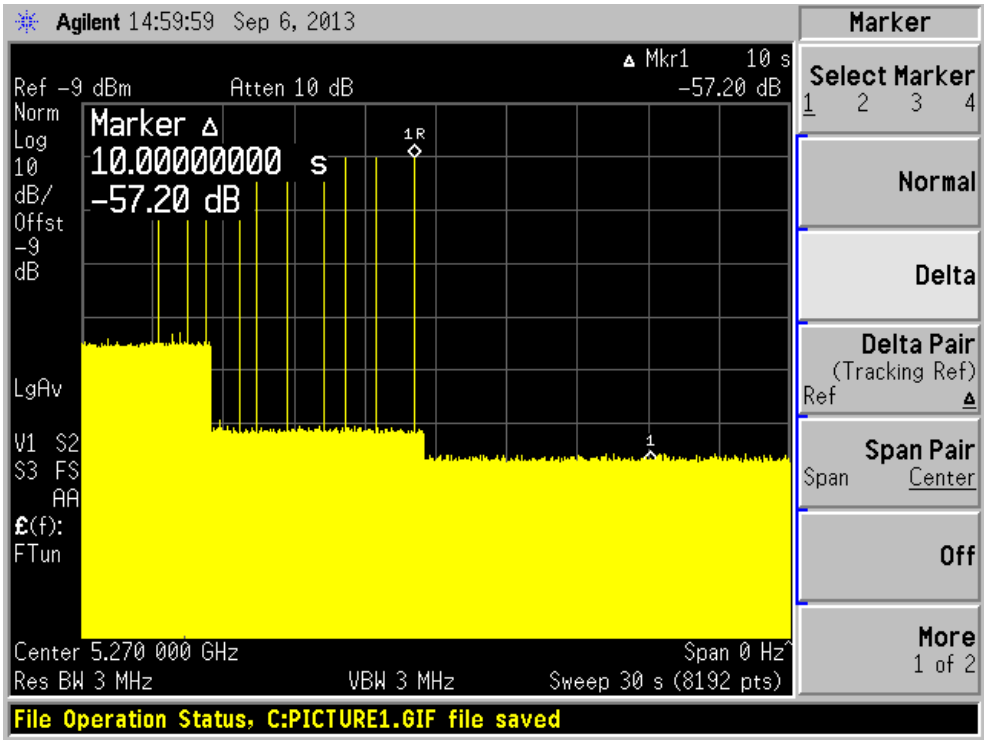


Type 1 radar 600ms result:



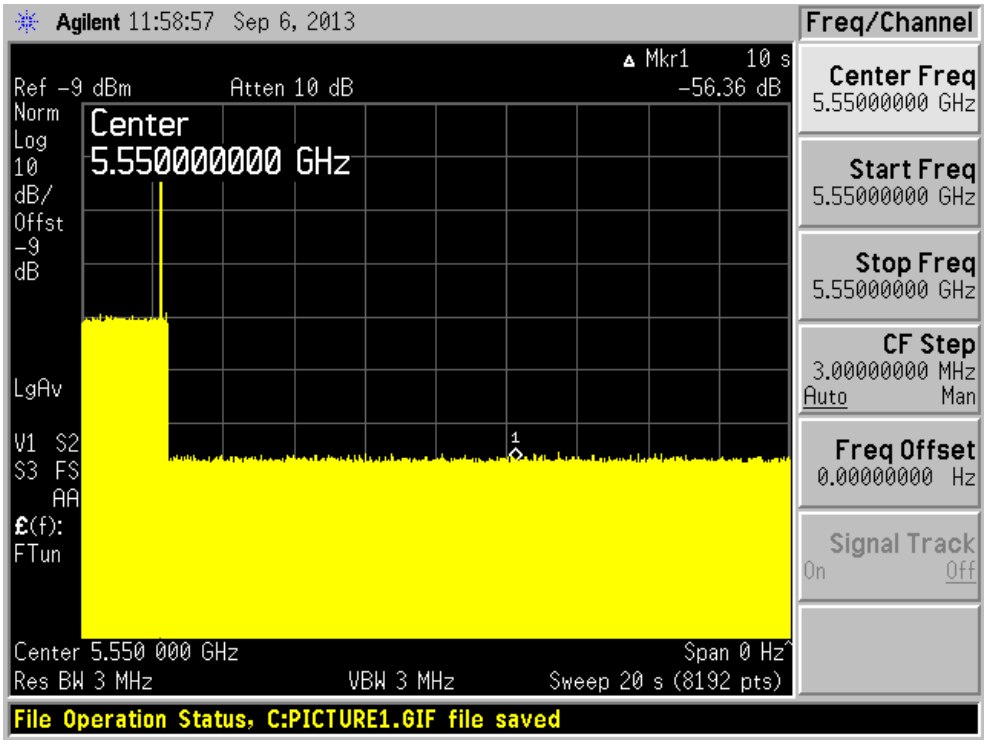
Type 5 radar channel move time result:

The traffic ceases period to the end of the radar waveform, therefore it also ceases period to 10 seconds after of the end of the radar waveform.



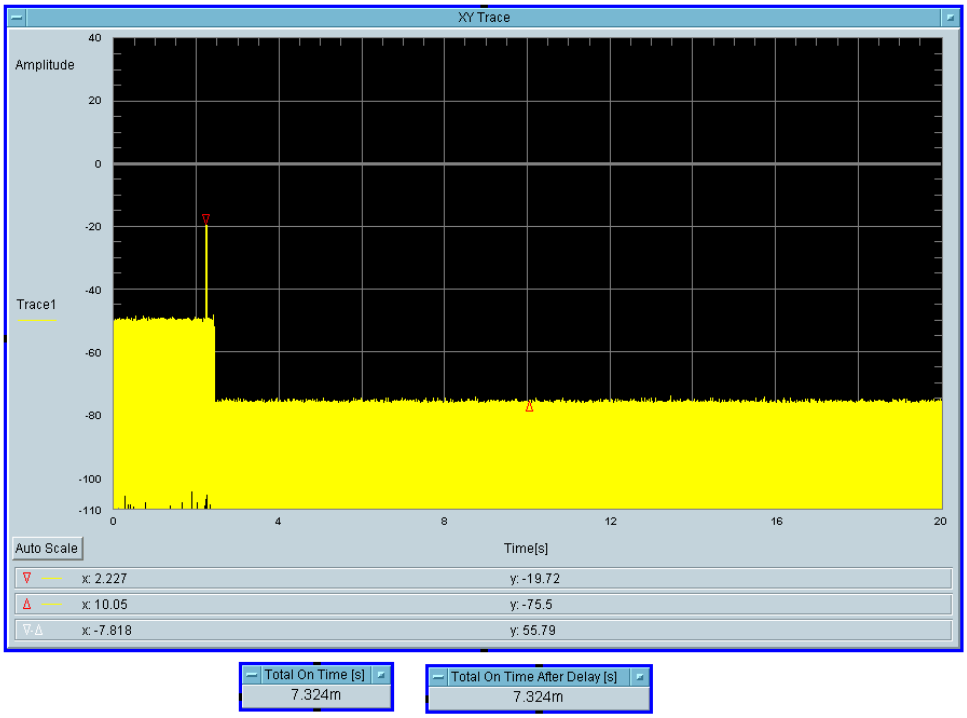
5550 MHz

Type 1 radar channel move time result:

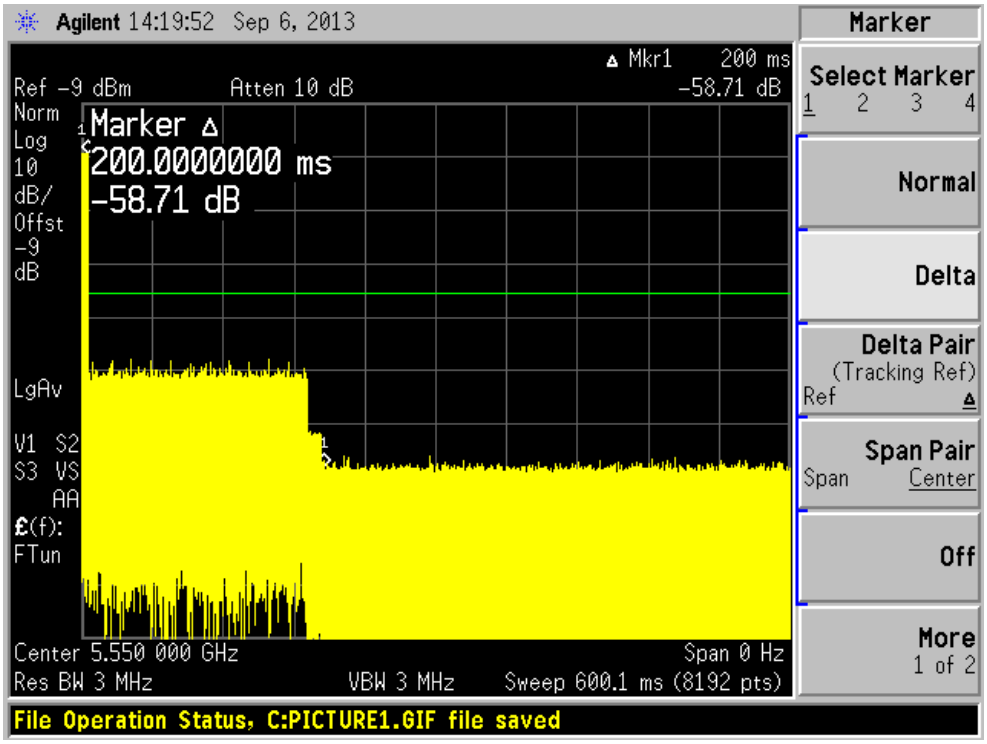


Type1 radar channel closing transmission time result:

Aggregate Transmission Time (ms)	Limit (ms)	Margin (ms)
7.324	60	52.676

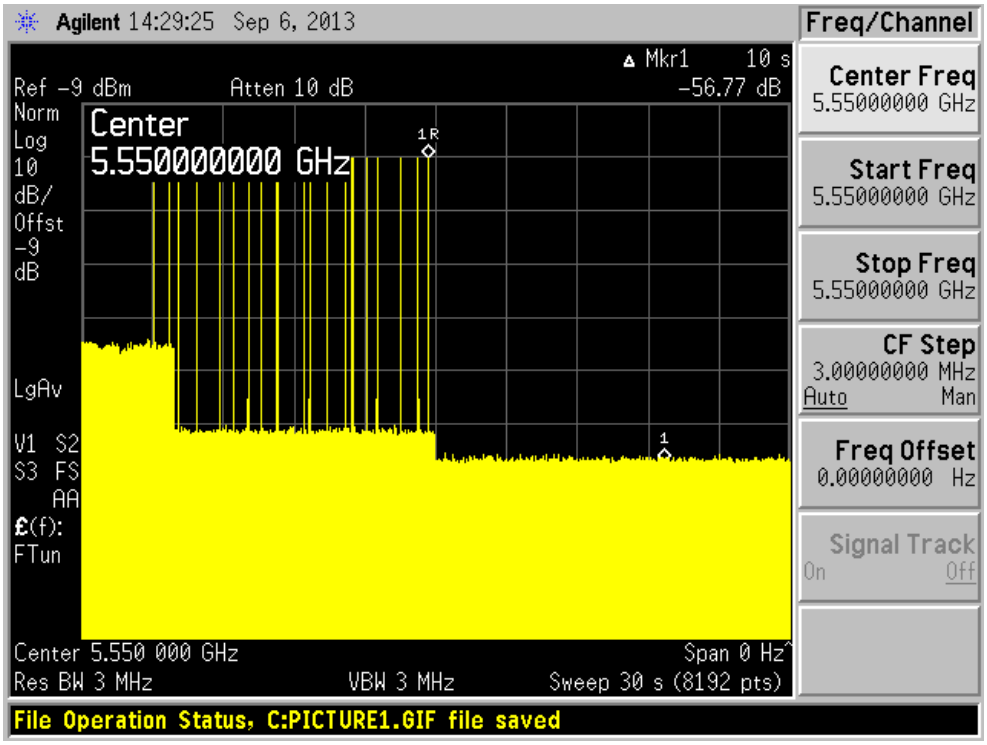


Type 1 radar 600ms result:



Type 5 radar channel move time result:

The traffic ceases period to the end of the radar waveform, therefore it also ceases period to 10 seconds after of the end of the radar waveform.



NON-OCCUPANCY PERIOD

Test Procedure

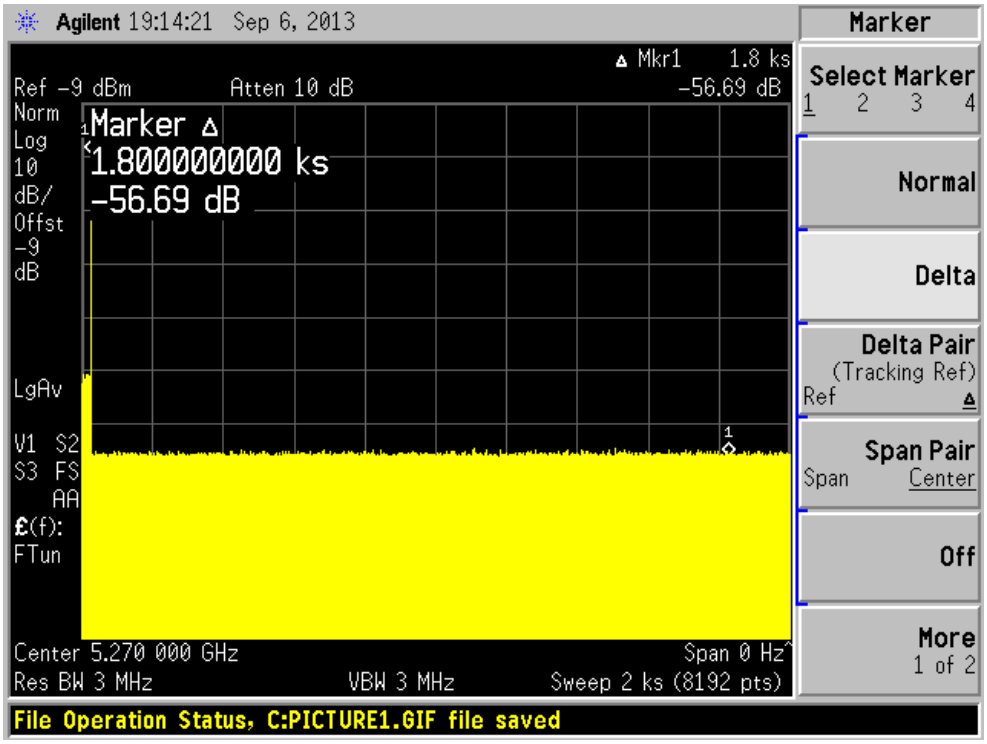
Measure the EUT for more than 30 minutes following the channel close/move time to very that the EUT does not resume any transmissions on this channel. Provide one plot to demonstrate no transmission on the channel for the non-occupancy period (30 minutes observation time)

Test Result

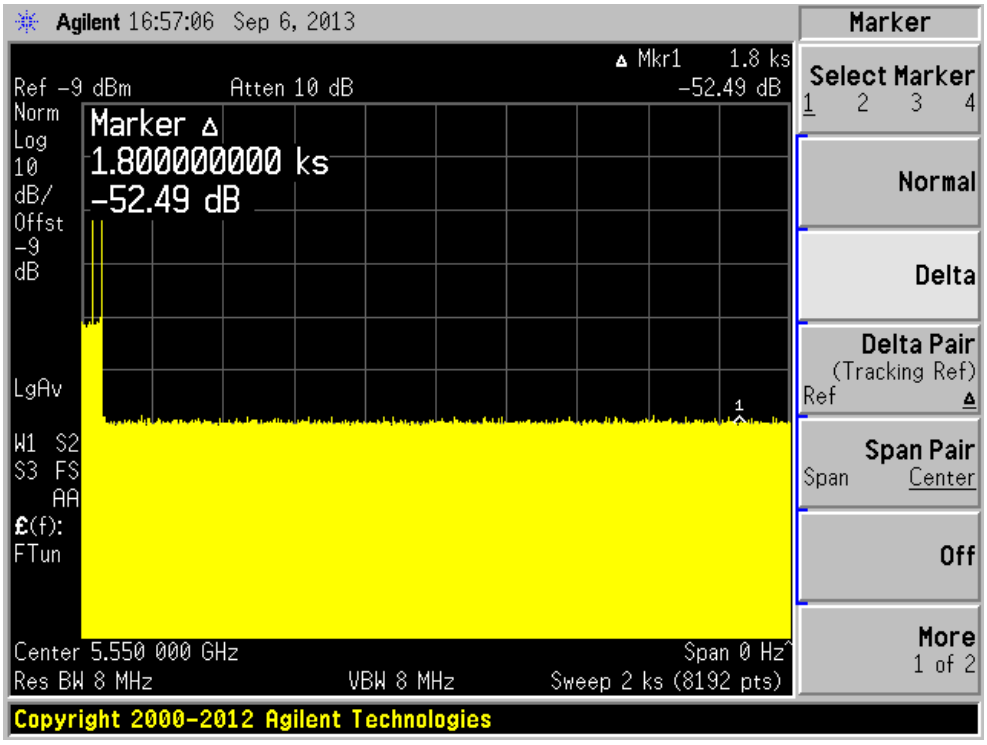
Frequency(MHz)	Bandwidth (MHz)	Spectrum Analyzer Display
5270	40	No transmission within 30 minutes
5550	40	No transmission within 30 minutes

Please refer to the following plots.

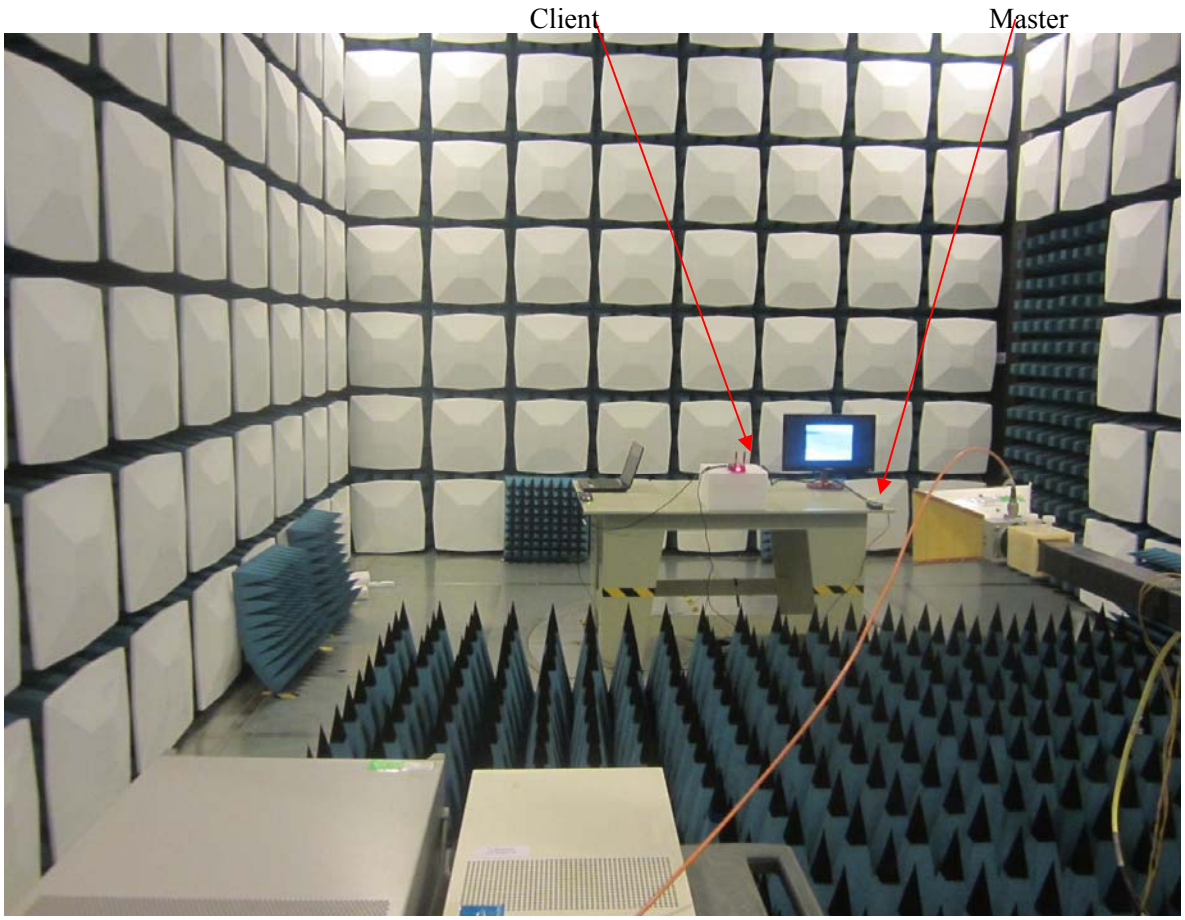
5270 MHz



5550 MHz



APPENDIX A - TEST SETUP PHOTOGRAPHS



******* END OF REPORT *******