

FCC 47 CFR PART 15 SUBPART E

DFS TEST REPORT

For

Tablet PC

MODEL No.: MS-ND14

FCC ID: I4L-MSND14

Trade Mark: MSI

REPORT NO.: ES160614022E5

ISSUE DATE: July 20, 2016

Prepared for

Micro Star International Co Ltd

No. 69, Lide St., Zhonghe Dist., New Taipei City, Taiwan

Prepared by

EMTEK(SHENZHEN) CO., LTD.

Bldg 69, Majialong Industry Zone, Nanshan District,
Shenzhen, Guangdong, China

TEL: 86-755-26954280

FAX: 86-755-26954282

TABLE OF CONTENTS

1. TEST RESULT CERTIFICATION	3
2. EUT DESCRIPTION.....	4
3. SUMMARY OF TEST RESULT	5
4. TEST METHODOLOGY.....	6
4.1 GENERAL DESCRIPTION OF APPLIED STANDARDS.....	6
4.2 MEASUREMENT EQUIPMENT USED	6
4.3 DESCRIPTION OF TEST MODES	6
5. FACILITIES AND ACCREDITATIONS	10
5.1 FACILITIES	10
5.2 EQUIPMENT	10
5.3 LABORATORY ACCREDITATIONS AND LISTINGS	10
6. SETUP OF EQUIPMENT UNDER TEST	11
6.1 SETUP CONFIGURATION OF EUT	11
6.2 CALIBRATION OF DFS DETECTION THRESHOLD LEVEL:.....	11
6.3 SUPPORT EQUIPMENT	12
7. DYNAMIC FREQUENCY SELECTION REQUIREMENTS.....	13
7.1 APPLICABLE STANDARD	13
7.2 CONFORMANCE LIMIT	13
7.3 TEST CONFIGURATION	13
7.4 TEST PARAMETERS OF DFS TEST SIGNAL	14
7.5 TRANSMITTER OUTPUT POWER	15
7.6 OPERATION MODES AND REQUIREMENT TEST ITEMS	16
7.7 TEST PROCEDURE.....	16
8. TEST RESULT.....	17
8.1 DETAILED TEST RESULTS	17
8.2 RADAR WAVEFORM	18
8.3 IN-SERVICE MONITORING	22

1. TEST RESULT CERTIFICATION

Applicant:	Micro Star International Co Ltd No. 69, Lide St., Zhonghe Dist., New Taipei City, Taiwan
Manufacturer:	MSI ELECTRONICS(KUNSHAN)CO., LTD. No.88 East Qianjin Road, Kunshan city, Jiangsu province, China
Product Description:	Tablet PC
Model Number:	MS-ND14
File Number:	ES160614022E5
Date of Test:	June 15, 2016 to July 20, 2016

Measurement Procedure Used:

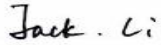
APPLICABLE STANDARDS	
STANDARD	TEST RESULT
FCC 06-96 FCC 47 CFR Part 15, Subpart E	PASS


The above equipment was tested by EMTEK(SHENZHEN) CO., LTD.. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10 (2013) and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements of FCC Rules Part 2 and Part 15.407.

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

Date of Test : June 15, 2016 to July 20, 2016

Prepared by : 
Joe Xia/Editor

Reviewer : 
Jack Li/Supervisor

Approve & Authorized Signer : 
Lisa Wang/Manager

2. EUT DESCRIPTION

Characteristics	Description			
Device Type	Wifi 5G Device			
IEEE 802.11 WLAN Mode Supported	<input checked="" type="checkbox"/> 802.11a(20MHz channel bandwidth) <input checked="" type="checkbox"/> 802.11n(20MHz channel bandwidth) <input checked="" type="checkbox"/> 802.11n(40MHz channel bandwidth)			
Data Rate	<input checked="" type="checkbox"/> 802.11a:6, 9, 12, 18, 24, 36, 48, 54Mbps; <input checked="" type="checkbox"/> 802.11n(HT20): MCS0-MCS8; <input checked="" type="checkbox"/> 802.11n(HT40): MCS0-MCS8;			
SISO Mode	1TX1RX			
Modulation	<input checked="" type="checkbox"/> OFDM with BPSK/QPSK/16QAM/64QAM for 802.11a/g/n;			
Operating Frequency Range	Band	Mode	Frequency Range(MHz)	Number of channels
	UNII Band I	802.11a/n(HT20)	5180-5240	4
		802.11n(HT40)	5190-5230	2
	UNII Band II-A	802.11a/n(HT20)	5260-5320	4
		802.11n(HT40)	5270-5310	2
	UNII Band II-C	802.11a/n(HT20)	5500-5700	11
802.11n(HT40)		5510-5670	5	
Transmit Power Max	15.40dBm			
Antenna Type	PCB Antenna			
Smart system	<input checked="" type="checkbox"/> SISO for 802.11a/n <input type="checkbox"/> MIMO for 802.11n/ac			
Antenna Gain	-2.55 dBi			
Power supply	<input checked="" type="checkbox"/> DC supply: DC 7.6V from Li-on battery			
	<input checked="" type="checkbox"/> Adapter: Model:ADP-18TB C AC INPUT:100-240V,50-60Hz,0.6A DC OUTPUT:12v,1.5A			

Note: for more details, please refer to the User's manual of the EUT.

3. SUMMARY OF TEST RESULT

FCC Part Clause	Test Parameter	Verdict	Remark
15.407 (h) (i) (j)	Dynamic Frequency Selection	PASS	
<p>NOTE1: N/A (Not Applicable)</p> <p>NOTE2: According to FCC OET KDB 905462 D02 UNII DFS Compliance Procedures New Rules v02, In addition, the radiated test is also performed to ensure the emissions emanating from the device cabinet also comply with the applicable limits.</p>			

4. TEST METHODOLOGY

4.1 GENERAL DESCRIPTION OF APPLIED STANDARDS

According to its specifications, the EUT must comply with the requirements of the following standards:
 FCC 06-96
 FCC 47 CFR Part 15, Subpart E
 FCC KDB 905462 D02 UNII DFS Compliance Procedures New Rules v02

4.2 MEASUREMENT EQUIPMENT USED

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.
Vector Signal Generator	Agilent	N5182B	My53050553	05/16/2016
Analog Signal Generator	Agilent	N5171B	My53050878	05/16/2016
Signal Analyzer	Agilent	N9010A	My53470879	05/16/2016
Power Analyzer	Agilent	PS-X10-100	N/A	05/16/2016
Test Accessories	Agilent	PS-X10-100	N/A	05/16/2016

Remark: Each piece of equipment is scheduled for calibration once a year.

4.3 DESCRIPTION OF TEST MODES

The EUT has been tested under its typical operating condition.

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

Test of channel included the lowest and middle and highest frequency to perform the test, then record on this report.

Those data rates (802.11a: 6 Mbps; 802.11n (HT20): MCS0; 802.11n (HT20): MCS15; 802.11n (HT40): MCS0; 802.11n (HT40): MCS15;) were used for all test.

Pre-defined engineering program for regulatory testing used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

Wifi 5G with UNII Band I

Frequency and Channel list for 802.11a/n(HT20):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	44	5220		
40	5200	48	5240		

Frequency and Channel list for 802.11n(HT40):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
38	5190				
46	5230				

Test Frequency and Channel for 802.11a/n(HT20):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	40	5200	48	5240

Test Frequency and channel for 802.11n(VHT40):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
38	5190	N/A	N/A	46	5230

Wifi 5G with UNII Band II-A

Frequency and Channel list for 802.11a/n(HT20):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
52	5260	60	5300		
56	5280	64	5320		

Frequency and Channel list for 802.11n(VHT40):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
54	5270				
62	5310				

Test Frequency and Channel for 802.11a/n(HT20):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
52	5260	56	5280	64	5320

Test Frequency and channel for 802.11n(HT40):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
54	5270	N/A	N/A	62	5310

Wifi 5G with UNII Band II-C

Frequency and Channel list for 802.11a/n(HT20):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
100	5500	116	5580	132	5660
104	5520	120	5600	136	5680
108	5540	124	5620	140	5700
112	5560	128	5640		

Frequency and Channel list for 802.11n(VHT40):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
102	5510	126	5630		
110	5550	134	5670		
118	5590				

Test Frequency and Channel for 802.11a/n(HT20):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
100	5500	120	5600	140	5700

Test Frequency and channel for 802.11n(VHT40):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
102	5510	118	5590	134	5670

5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at

Bldg 69, Majialong Industry Zone District, Nanshan District, Shenzhen, China

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with preselectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

5.3 LABORATORY ACCREDITATIONS AND LISTINGS

Site Description

EMC Lab.

: Accredited by CNAS, 2013.10.29

The certificate is valid until 2016.10.28

The Laboratory has been assessed and proved to be in compliance with CNAS-CL01:2006 (identical to ISO/IEC 17025:2005)

The Certificate Registration Number is L2291.

Accredited by TUV Rheinland Shenzhen 2015.4

The Laboratory has been assessed according to the requirements ISO/IEC 17025.

Accredited by FCC, April 17, 2013

The Certificate Registration Number is 709623.

Accredited by FCC, July 24, 2013

The Certificate Registration Number is 406365.

Accredited by Industry Canada, November 29, 2012

The Certificate Registration Number is 4480A.

Name of Firm

: EMTEK(SHENZHEN) CO., LTD..

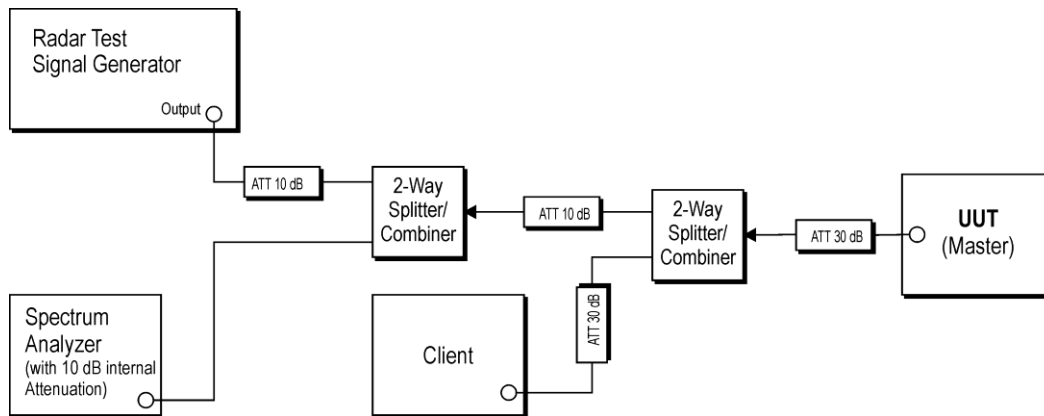
Site Location

: Bldg 69, Majialong Industry Zone,
Nanshan District, Shenzhen, Guangdong, China

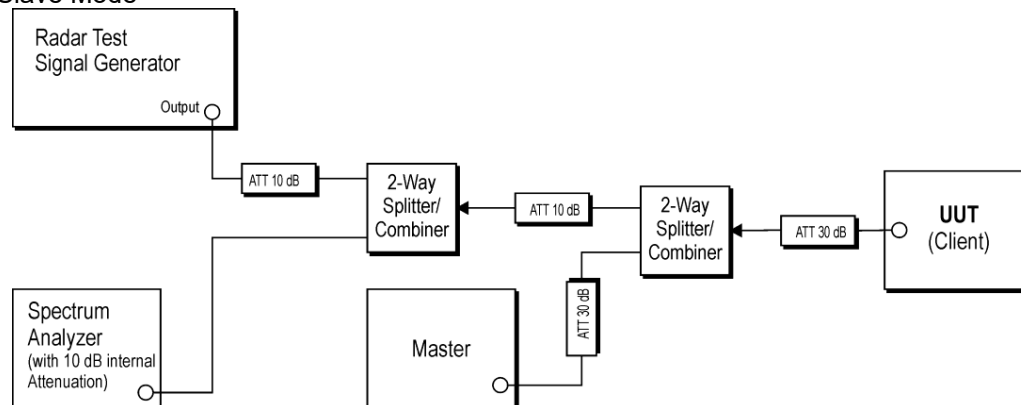
6. SETUP OF EQUIPMENT UNDER TEST

6.1 SETUP CONFIGURATION OF EUT

Master Modes



Slave Mode



6.2 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 analyzer 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.

6.3 SUPPORT EQUIPMENT

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
1.	Notebook	ASUS	P45V	N/A	
2.	Wireless Access Point	Cisco	AIR-CAP3702E-A-K9	FTX182276Q D	

Notes:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

7. DYNAMIC FREQUENCY SELECTION REQUIREMENTS

7.1 APPLICABLE STANDARD

According to 15.407

7.2 CONFORMANCE LIMIT

The dynamic frequency selection requirement

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 100% of the U-NII 99% transmission power bandwidth. See Note 3.
<p>Note 1: <i>Channel Move Time</i> and the <i>Channel Closing Transmission Time</i> should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst.</p> <p>Note 2: The <i>Channel Closing Transmission Time</i> is comprised of 200 milliseconds starting at the beginning of the <i>Channel Move Time</i> plus any additional intermittent control signals required to facilitate a <i>Channel</i> 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.</p> <p>Note 3: During the <i>U-NII Detection Bandwidth</i> detection test, radar type 0 should be used. For each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.</p>	

The following table lists the DFS The detection threshold values

Maximum Transmit Power	Value (See Notes 1, 2, and 3)
EIRP \geq 200 milliwatt	-64 dBm
EIRP < 200 milliwatt and power spectral density < 10 dBm/MHz	-62 dBm
EIRP < 200 milliwatt that do not meet the power spectral density requirement	-64 dBm
<p>Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna.</p> <p>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.</p> <p>Note3: EIRP is based on the highest antenna gain. For MIMO devices refer to KDB Publication 662911 D01.</p>	

7.3 TEST CONFIGURATION

Conducted measurements shall be used for DFS test

7.4 TEST PARAMETERS OF DFS TEST SIGNAL

The following table lists the parameters of radar test signals

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

Long Pulse Radar Test Waveform

Radar Type	Pulse Width (µsec)	Chirp Width (MHz)	PRI (µsec)	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

Frequency Hopping Radar Test Waveform

Radar Type	Pulse Width (µsec)	PRI (µsec)	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

7.5 TRANSMITTER OUTPUT POWER

Temperature: 25°C

Test Date: July 15, 2016

Humidity: 55 % RH

Mode	Band	Max Power	
		Conducted Output Power	E.I.R.P
802.11a	5250MHz-5350MHz	15.40dBm(34.67mW)	12.85dBm(19.28mW)
	5470MHz-5725MHz	13.48dBm(22.28mW)	10.93dBm(12.39mW)

7.6 OPERATION MODES AND REQUIREMENT TEST ITEMS

The manufacture shall state whether the EUT is capable of operating as a Master or a Slave modes,if the EUT is capable of operating in more than one operational mode then every operating mode shall be assessed separately.

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

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 Transmission Time	Yes	Yes	Yes
Channel Move Time	Yes	Yes	Yes
U-NII Detection Bandwidth	Yes	Not required	Yes

7.7 TEST PROCEDURE

According to KDB 905462 D02v02 Section 7.

8. TEST RESULT

8.1 DETAILED TEST RESULTS

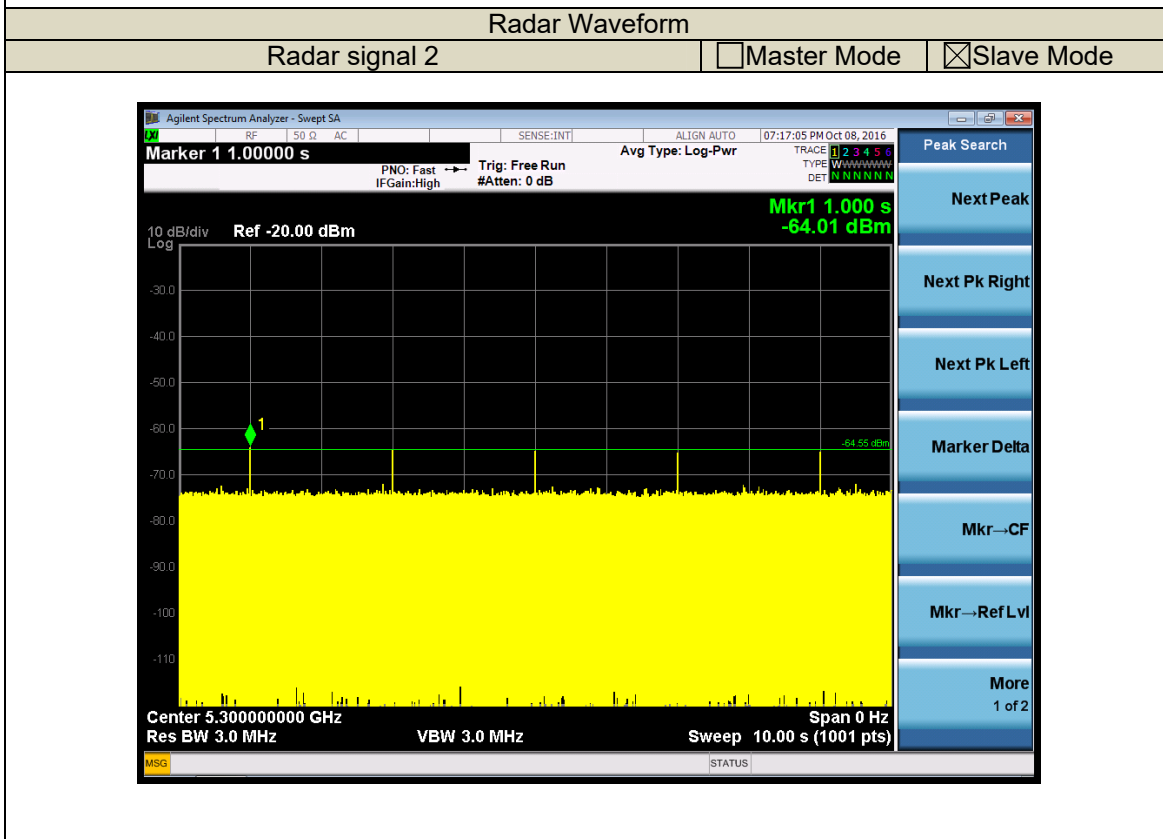
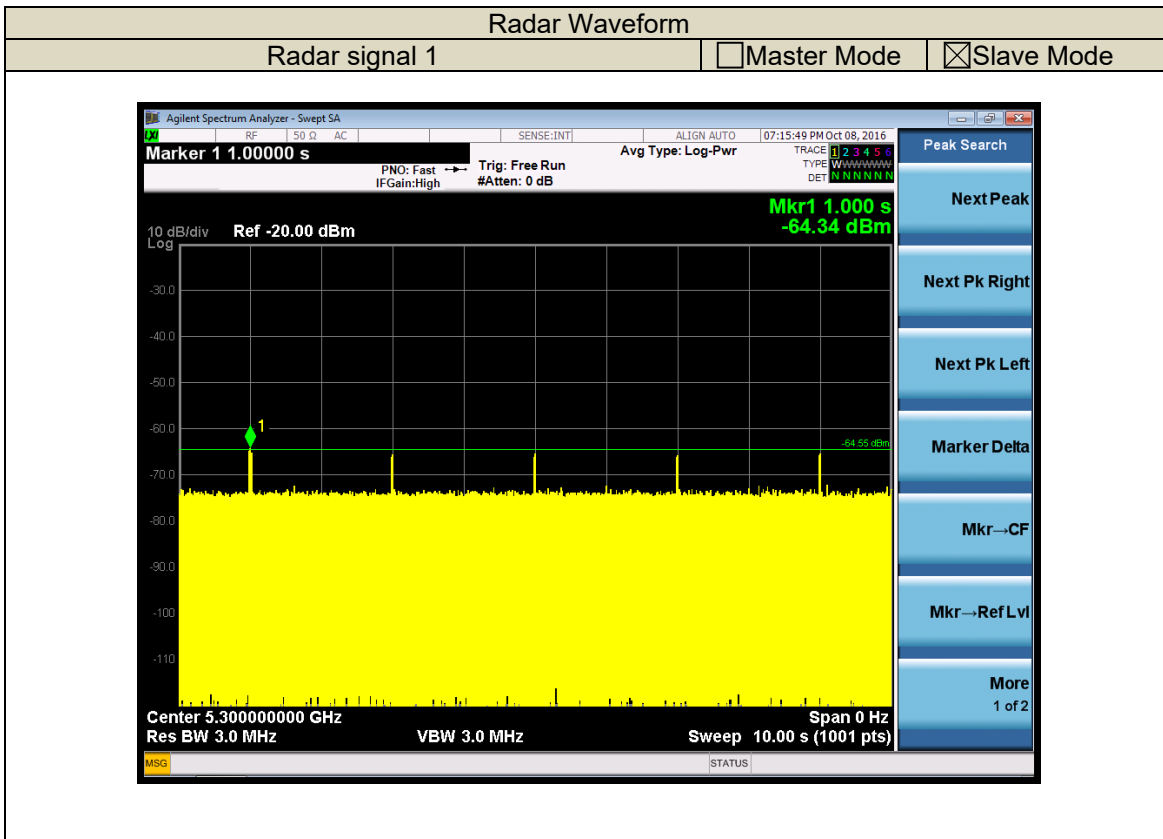
Clause	MODES	Test Parameter	Remark	Verdict
15.407	<input type="checkbox"/> Master	DFS Detection Threshold	N/A	N/A
15.407		Channel Availability Check Time	N/A	N/A
15.407		Channel Move Time	N/A	N/A
15.407		Channel Closing Transmission Time	N/A	N/A
15.407		Non-Occupancy Period	N/A	N/A
15.407		Uniform Spreading	N/A	N/A
15.407		U-NII Detection Bandwidth	N/A	N/A
15.407	<input checked="" type="checkbox"/> Slave	Radar Detection Threshold	N/A	N/A
15.407		Channel Move Time	Applicable	PASS
15.407		Channel Closing Transmission Time	Applicable	PASS
15.407		Non-Occupancy Period	N/A	N/A
15.407		U-NII Detection Bandwidth	N/A	N/A

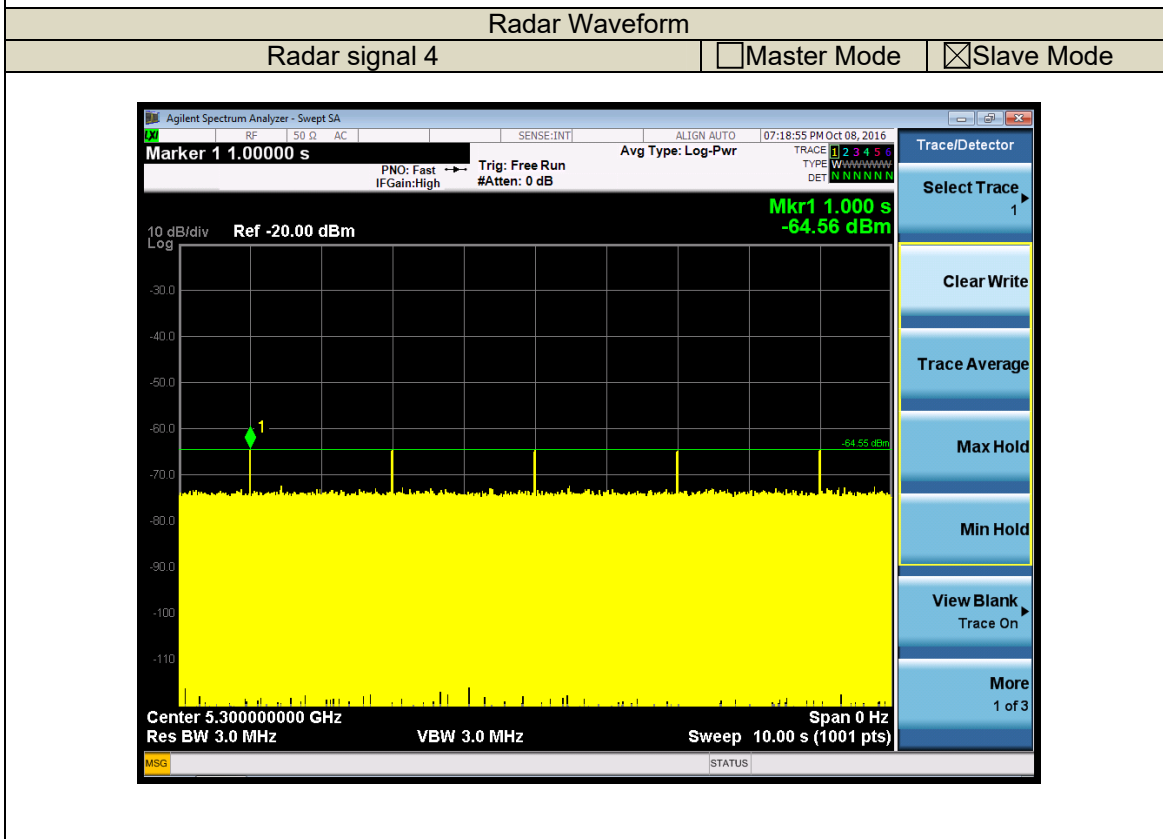
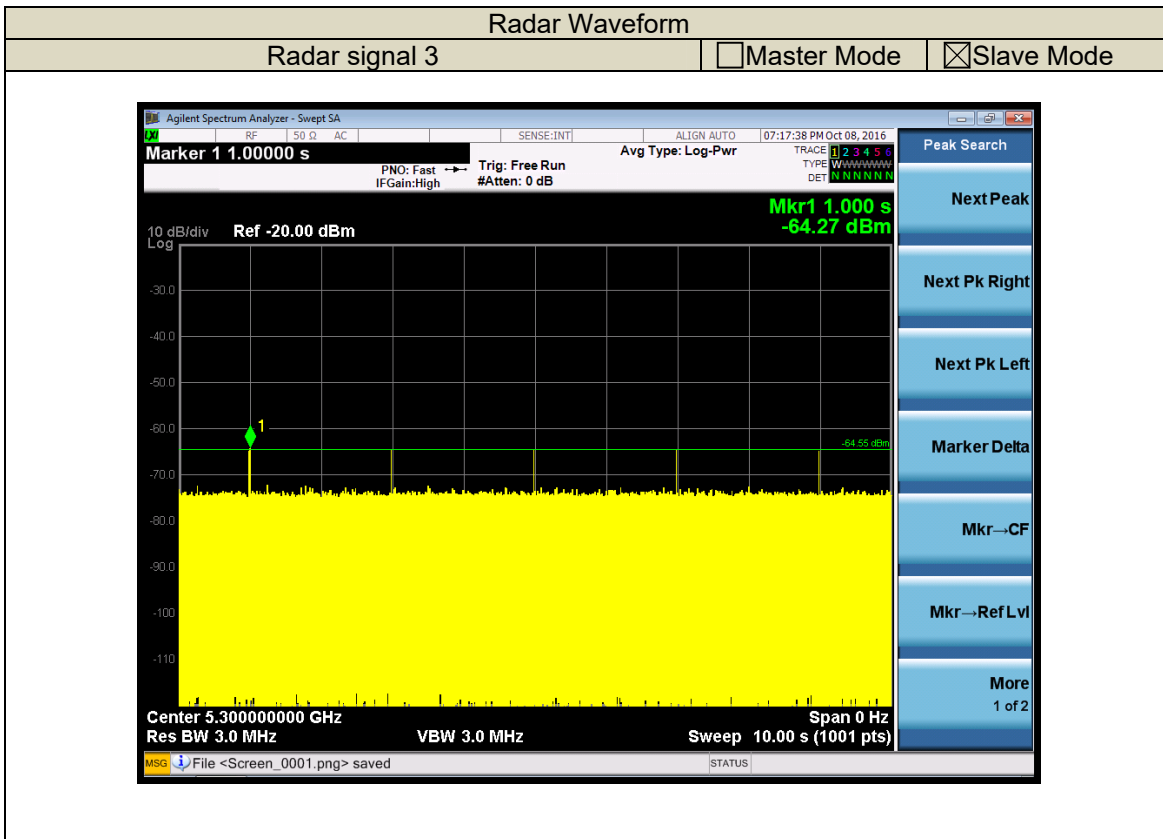
8.2 RADAR WAVEFORM

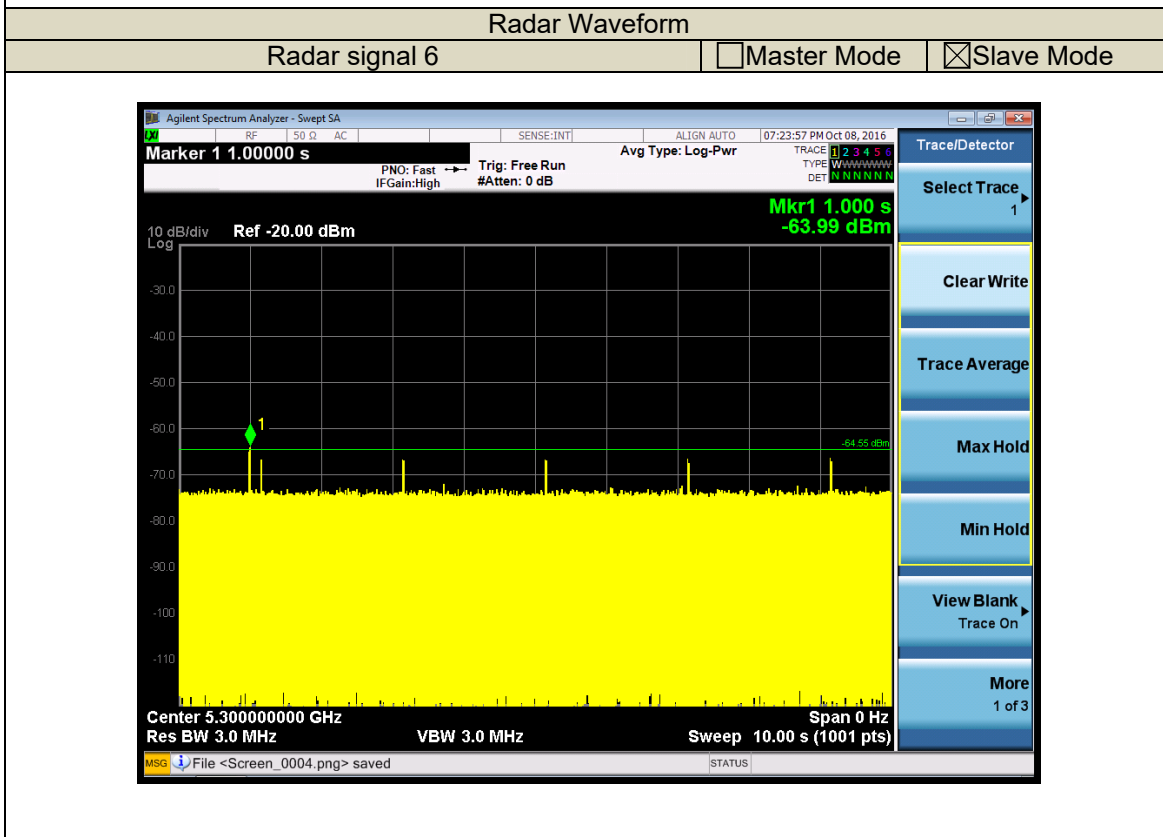
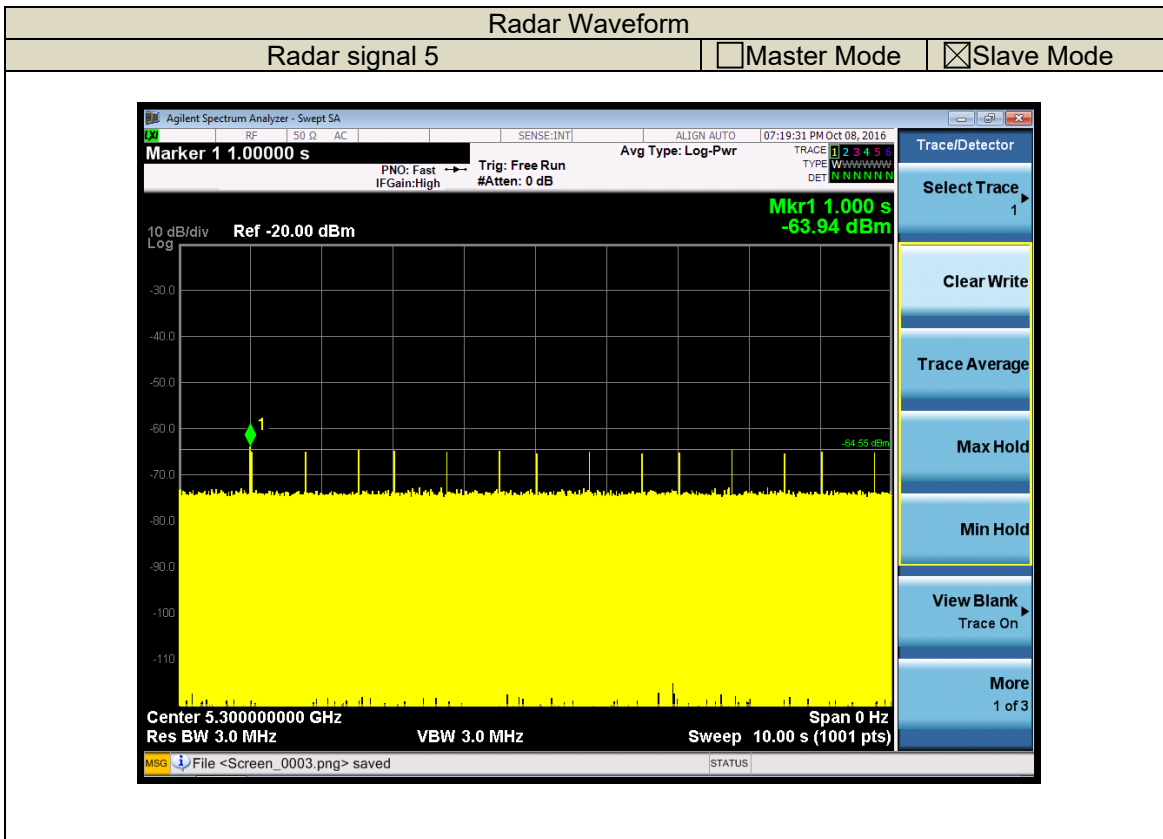
Calibration:

For a radar waveform level of -62dBm, required radar waveform level is -64.55 dBm (= -62-2.55).

Note: Maximum Transmit Power is more than 200 milliwatt and power spectral density < 10 dBm/MHz in this report, so detection threshold level is -64.55dBm.







8.3 IN-SERVICE MONITORING

Radar test singal type 1					Detection(Y/N)
Trial ID	Pulse Width(us)	PRI(us)	Number of Pulses	Waveform Length(us)	
0	1.0	1428.0	18	25704.0	Y
1	1.0	1428.0	18	25704.0	Y
2	1.0	1428.0	18	25704.0	Y
3	1.0	1428.0	18	25704.0	N
4	1.0	1428.0	18	25704.0	Y
5	1.0	1428.0	18	25704.0	Y
6	1.0	1428.0	18	25704.0	Y
7	1.0	1428.0	18	25704.0	Y
8	1.0	1428.0	18	25704.0	Y
9	1.0	1428.0	18	25704.0	Y
10	1.0	1428.0	18	25704.0	N
11	1.0	1428.0	18	25704.0	Y
12	1.0	1428.0	18	25704.0	Y
13	1.0	1428.0	18	25704.0	Y
14	1.0	1428.0	18	25704.0	Y
15	1.0	1428.0	18	25704.0	N
16	1.0	1428.0	18	25704.0	Y
17	1.0	1428.0	18	25704.0	Y
18	1.0	1428.0	18	25704.0	Y
19	1.0	1428.0	18	25704.0	Y
20	1.0	1428.0	18	25704.0	Y
21	1.0	1428.0	18	25704.0	Y
22	1.0	1428.0	18	25704.0	Y
23	1.0	1428.0	18	25704.0	N
24	1.0	1428.0	18	25704.0	Y
25	1.0	1428.0	18	25704.0	Y
26	1.0	1428.0	18	25704.0	Y
27	1.0	1428.0	18	25704.0	Y
28	1.0	1428.0	18	25704.0	Y
29	1.0	1428.0	18	25704.0	Y
Detection Rate					86.7%

Radar test singal type 2					Detection(Y/N)
Trial ID	Pulse Width(us)	PRI(us)	Number of Pulses	Waveform Length(us)	
0	3.2	195.0	26	5070.0	Y
1	1.1	153.0	23	3519.0	Y
2	2.1	172.0	24	4128.0	Y
3	4.8	225.0	29	6525.0	N
4	3.9	208.0	28	5824.0	N
5	2.9	188.0	26	4888.0	Y
6	3.2	194.0	26	5044.0	Y
7	2.5	179.0	25	4475.0	Y
8	3.1	193.0	26	5018.0	Y
9	1.2	155.0	23	3565.0	Y
10	3.9	207.0	27	5589.0	Y
11	4.6	221.0	29	6409.0	Y
12	3.2	194.0	26	5044.0	Y
13	2.2	175.0	25	4375.0	Y
14	4.5	220.0	29	6380.0	Y
15	3.0	190.0	26	4940.0	N
16	5.0	229.0	29	6641.0	Y
17	2.4	178.0	25	4450.0	Y
18	2.9	188.0	26	4888.0	Y
19	2.3	175.0	25	4375.0	Y
20	3.7	204.0	27	5508.0	Y
21	2.2	175.0	25	4375.0	Y
22	4.9	228.0	29	6612.0	Y
23	2.9	188.0	26	4888.0	N
24	2.5	181.0	25	4525.0	Y
25	1.1	153.0	23	3519.0	Y
26	3.8	206.0	27	5562.0	Y
27	4.7	223.0	29	6467.0	Y
28	2.4	179.0	25	4475.0	Y
29	4.2	214.0	28	5992.0	Y
Detection Rate					86.7%

Radar test singal type 3					Detection(Y/N)
Trial ID	Pulse Width(us)	PRI(us)	Number of Pulses	Waveform Length(us)	
0	8.2	367.0	17	6239.0	Y
1	6.1	211.0	16	3376.0	Y
2	7.1	283.0	16	4528.0	Y
3	9.8	480.0	18	8640.0	Y
4	8.9	416.0	18	7488.0	N
5	7.9	343.0	17	5831.0	Y
6	8.2	364.0	17	6188.0	Y
7	7.5	310.0	17	5270.0	Y
8	8.1	361.0	17	6137.0	Y
9	6.2	219.0	16	3504.0	Y
10	8.9	415.0	18	7470.0	N
11	9.6	467.0	18	8406.0	Y
12	8.2	366.0	17	6222.0	Y
13	7.2	294.0	16	4704.0	Y
14	9.5	462.0	18	8316.0	Y
15	8.0	350.0	17	5950.0	Y
16	10.0	497.0	18	8946.0	N
17	7.4	305.0	17	5185.0	Y
18	7.9	342.0	17	5814.0	Y
19	7.3	296.0	16	4736.0	Y
20	8.7	403.0	18	7254.0	Y
21	7.2	293.0	16	4688.0	Y
22	9.9	493.0	18	8874.0	Y
23	7.9	343.0	17	5831.0	Y
24	7.5	317.0	17	5389.0	Y
25	6.1	211.0	16	3376.0	Y
26	8.8	409.0	18	7362.0	Y
27	9.7	473.0	18	8514.0	Y
28	7.4	308.0	17	5236.0	Y
29	9.2	439.0	18	7902.0	Y
Detection Rate					90%

Radar test singal type 4					Detection(Y/N)
Trial ID	Pulse Width(us)	PRI(us)	Number of Pulses	Waveform Length(us)	
0	16.0	367.0	14	5138.0	Y
1	11.3	211.0	12	2532.0	Y
2	13.5	293.0	13	3679.0	Y
3	19.4	480.0	16	7680.0	Y
4	17.5	416.0	15	6240.0	N
5	15.3	343.0	14	4802.0	Y
6	15.9	364.0	14	5096.0	Y
7	14.3	310.0	13	4030.0	Y
8	15.8	361.0	14	5054.0	N
9	11.5	219.0	12	2628.0	Y
10	17.4	415.0	15	6225.0	Y
11	19.0	467.0	16	7472.0	Y
12	16.0	366.0	14	5124.0	Y
13	13.8	294.0	13	3822.0	Y
14	18.9	462.0	16	7392.0	Y
15	15.5	350.0	14	4900.0	Y
16	19.9	497.0	16	7952.0	Y
17	14.1	14.1	13	3965.0	Y
18	15.2	15.2	14	4788.0	Y
19	13.8	13.8	13	3848.0	Y
20	17.1	17.1	15	6045.0	N
21	13.8	13.8	13	3809.0	Y
22	19.8	19.8	16	7888.0	Y
23	15.3	15.3	14	4802.0	Y
24	14.5	14.5	13	4121.0	Y
25	11.3	11.3	12	2532.0	Y
26	17.3	17.3	15	6135.0	N
27	19.2	19.2	16	7568.0	Y
28	14.2	14.2	13	4004.0	Y
29	18.2	18.2	15	6585.0	Y
Detection Rate					86.7%

Radar test singal type 5				Detection(Y/N)
Trial ID	Number of Bursts	Burst Period(s)	Waveform Length(s)	
0	15	0.8000000	12.0000000	Y
1	8	1.5000000	12.0000000	N
2	11	1.0909091	12.0000000	Y
3	20	0.6000000	12.0000000	Y
4	17	0.7058824	12.0000000	Y
5	14	0.8571429	12.0000000	Y
6	15	0.8000000	12.0000000	Y
7	12	1.0000000	12.0000000	Y
8	14	0.8571429	12.0000000	Y
9	8	1.5000000	12.0000000	N
10	17	0.7058824	12.0000000	Y
11	19	0.6135789	12.0000000	Y
12	15	0.8000000	12.0000000	Y
13	12	1.0000000	12.0000000	N
14	19	0.6135789	12.0000000	Y
15	14	0.8571429	12.0000000	Y
16	20	0.6000000	12.0000000	Y
17	12	1.0000000	12.0000000	Y
18	14	0.8571429	12.0000000	Y
19	12	1.0000000	12.0000000	Y
20	16	0.7500000	12.0000000	Y
21	12	1.0000000	12.0000000	Y
22	20	0.6000000	12.0000000	Y
23	14	0.8571429	12.0000000	Y
24	13	0.9230769	12.0000000	Y
25	8	1.5000000	12.0000000	Y
26	17	0.7058824	12.0000000	Y
27	19	0.6135789	12.0000000	Y
28	12	1.0000000	12.0000000	Y
29	18	0.6666667	12.0000000	Y
Detection Rate				90%

Radar test singal type 6							Detection(Y/N)
Trial ID	Pulse Width(us)	PRI(us)	Pluses per Hop	Hopping Rate(KHz)	Hopping Sequence Length(ms)	Visible Frequency Number	
0	1.0	333.3	9	0.3333	300	19	Y
1	1.0	333.3	9	0.3333	300	14	Y
2	1.0	333.3	9	0.3333	300	16	N
3	1.0	333.3	9	0.3333	300	16	Y
4	1.0	333.3	9	0.3333	300	15	N
5	1.0	333.3	9	0.3333	300	19	Y
6	1.0	333.3	9	0.3333	300	16	Y
7	1.0	333.3	9	0.3333	300	23	Y
8	1.0	333.3	9	0.3333	300	16	Y
9	1.0	333.3	9	0.3333	300	16	Y
10	1.0	333.3	9	0.3333	300	16	N
11	1.0	333.3	9	0.3333	300	13	Y
12	1.0	333.3	9	0.3333	300	12	N
13	1.0	333.3	9	0.3333	300	18	Y
14	1.0	333.3	9	0.3333	300	17	Y
15	1.0	333.3	9	0.3333	300	18	Y
16	1.0	333.3	9	0.3333	300	15	Y
17	1.0	333.3	9	0.3333	300	18	Y
18	1.0	333.3	9	0.3333	300	23	Y
19	1.0	333.3	9	0.3333	300	23	Y
20	1.0	333.3	9	0.3333	300	14	Y
21	1.0	333.3	9	0.3333	300	15	Y
22	1.0	333.3	9	0.3333	300	11	Y
23	1.0	333.3	9	0.3333	300	17	Y
24	1.0	333.3	9	0.3333	300	14	Y
25	1.0	333.3	9	0.3333	300	17	Y
26	1.0	333.3	9	0.3333	300	17	Y
27	1.0	333.3	9	0.3333	300	14	Y
28	1.0	333.3	9	0.3333	300	20	Y
29	1.0	333.3	9	0.3333	300	16	Y
Detection Rate							86.7%

