FCC DFS Test Report

Equipment	:	**Sophos Wireless Access Point AP100**
Brand Name	:	**Sophos**
Model No.	:	**AP 100**
FCC ID	:	**2ACTO-AP100**
Standard	:	**47 CFR FCC Part 15.407**
Applicant	:	**Sophos Ltd** The Pentagon, Abingdon, OX14 3YP, United Kingdom
Manufacturer	:	**Edimax Technology Co., Ltd.** No.3, Wu-Chuan 3rd Road, Wu-Ku Industrial Park, New Taipei City 24891, Taiwan R.O.C.
Operate Mode	:	**Master**

The product sample received on Feb. 27, 2015 and completely tested on Mar. 03, 2016. We, SPORTON, would like to declare that the tested sample has been evaluated in accordance with the procedures given in FCC 06-96 Appendix and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.

Reviewed by:

Kevin Liang / Assistant Manager

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1190

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APPENDIX A. TEST PHOTOS

Summary of Test Result

Conformance Test Specifications (FCC 06-96 Appendix)					
Report Clause	**Ref. Std. Clause**	**Description**	**Measured**	**Limit**	**Result**
3.3	7.8.1	DFS: UNII Detection Bandwidth Measurement	VHHT20: 18.414 MHz VHHT40: 37.056 MHz VHHT80: 75.939 MHz	80% of the 99% BW for type5 100% of the 99% BW for type0	Complied
3.4	7.8.2.1	DFS: Initial Channel Availability Check Time	CAC = 60 sec	CAC ≥ 60 sec	Complied
3.4	7.8.2.2	DFS: Radar Burst at the Beginning of the Channel Availability Check Time	Detect Radar Signal	Detection Threshold: -64 dBm	Complied
3.4	7.8.2.3	DFS: Radar Burst at the End of the Channel Availability Check Time	Detect Radar Signal	Detection Threshold: -64 dBm	Complied
3.5	7.8.3	DFS: In-Service Monitoring for Channel Move Time (CMT)	CMT < 10sec	CMT ≤ 10sec	Complied
3.5	7.8.3	DFS: In-Service Monitoring for Channel Closing Transmission Time (CCTT)	CCTT < 60 ms	CCTT ≤ 60 ms starting at CMT 200ms	Complied
3.5	7.8.3	DFS: In-Service Monitoring for Non-Occupancy Period (NOP)	NOP > 30 min	NOP ≥ 30 min	Complied
3.6	7.8.4	DFS: Statistical Performance Check	All Pd > Table 5 - 7 (KDB 905462)	Table 5 - 7 (KDB 905462)	Complied
3.1.4	5.8.1	DFS: Uniform Spreading	Manufacturer attestation using a Gaussian random algorithm of the spectrum with uniform spreading	Uniform Spreading for DFS Band	Complied
3.1.5	8.1	User Access Restrictions	Manufacturer attestation NOT accessible to user	DFS controls	Complied

Revision History

Report No.	Version	Description	Issued Date
FZ462324-01	Rev. 01	Initial issue of report	Oct. 07, 2014
FZ462324-05	Rev. 01	Update new rule and increase the test Radar 1.	Mar. 25, 2016

1 General Description

1.1 Information

1.1.1 RF General Information

IEEE Std. 802.11	Channel Bandwidth (MHz)
a, n (HT20) / ac (VHT20)	20
n (HT40) / ac (VHT40)	40
ac (VHT80)	80
802.11 a/n uses a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM modulation. 802.11ac uses a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM, 256QAM modulation.	

1.1.2 Antenna Information

Antenna Category	
☒	External antenna (antenna permanently attached)
	☒ Temporary RF connector provided
	☐ No temporary RF connector provided Transmit chains bypass antenna and soldered temporary RF connector provided for connected measurement. In case of conducted measurements the transmitter shall be connected to the measuring equipment via a suitable attenuator and correct for all losses in the RF path.

Antenna General Information			
No.	Ant. Cat.	Ant. Type	Gain (dBi)
1	External	Dipole	2.58
2			2.58
3			2.58
For radiated tests, the DFS test should be performed with lowest antenna gain (regardless of antenna type). Then Ant. No. 1 shall be performed the radiated DFS test.			

1.2 Support Equipment

Support Equipment				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
1	USB Dongle	NETGEAR	A6200	PY312200200
2	NoteBook	DELL	Latitude E5510	-
3	Adapter	DELL	FA90PS0-00	-
4	NoteBook	DELL	Latitude E5550	-
5	Adapter	DELL	LA65NM130	-
6	Switch Hub	SMC	GR2700	-

1.3 Testing Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- FCC KDB 905462 D02 UNII DFS Compliance Procedures New Rules v01r02
- 47 CFR FCC Part 15.407

1.4 Testing Location Information

Testing Location						
☒	HWA YA	ADD :	No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C.			
		TEL :	886-3-327-3456	FAX :	886-3-327-0973	
Test Condition		**Test Site No.**		**Test Engineer**		**Test Environment**
DFS Site		DF01-HY		Ben		25°C / 60%
DFS Site (Add Radar 1)		DF01-HY		Isaac		23°C / 62%

1.5 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2)

Measurement Uncertainty	
Test Item	**Uncertainty**
Radio frequency	± 8.7 X 10^{-7}
RF output power, conducted	±0.6 dB
All emissions, conducted	±0.8 dB
All emissions, radiated	±2.8 dB
Temperature	±0.8 °C
Humidity	±3 %
DC and low frequency voltages	±3 %
Time	±1.4 %

2 Test Configuration of EUT

2.1 DFS and TPC Information

The DFS Related Operating Mode(s) of the Equipment			
☒ Master			
☐ Cilent with radar detection			
☐ Client without radar detection			
Software/Firmware Version		9.353-4	
Power-on Cycle. (Master VHT80)		100.5 sec	
Communication Mode		☒ IP Based (Load Based)	☐ Frame Based
IEEE Std. 802.11	**Frequency Range (MHz)**	**TPC (Transmit Power Control)**	**Active Scan**
a / n (HT20) / ac (VHT20) n (HT40) / ac (VHT40) ac (VHT80)	☒ 5250-5350	Yes	Yes
	☒ 5470-5725	Yes	Yes
	☐ 5600-5650	-	-

2.2 The Worst Case Measurement Configuration

The Worst Case Mode for Following Conformance Tests	
Tests Item	Dynamic Frequency Selection (DFS)
Test Condition	Conducted measurement at transmit chains The EUT shall be configured to operate at the highest transmitter output power setting. If more than one antenna assembly is intended for this power setting, the gain of the antenna assembly with the lowest gain shall be used.
Modulation Mode	VHT20, VHT40, VHT80
Modulation modes consist of below configuration: 11a: IEEE 802.11a, HT20/HT40/VHT20/VHT40/VHT80: IEEE 802.11n	

3 Dynamic Frequency Selection (DFS) Test Result

3.1 General DFS Information

3.1.1 DFS Parameters

Table D.1: DFS 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 periods. See Notes 1 and 2.
U-NII Detection Bandwidth	Minimum 100% of the U-NII 99% transmission power bandwidth. See Note 3.
Note 1: Channel Move Time and the Channel Closing Transmission Time should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst. 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 0 should be used. For each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.	

Table D.2: Interference threshold values	
Maximum Transmit Power	**Value (See Notes 1, 2, and 3)**
EIRP ≥ 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
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. Note3: EIRP is based on the highest antenna gain. For MIMO devices refer to KDB Publication 662911 D01.	

3.1.2 Applicability of DFS Requirements Prior to Use of a Channel

Requirement	DFS 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
U-NII Detection Bandwidth	Yes	Not required	Yes

3.1.3 Applicability of DFS Requirements during Normal Operation

Requirement	DFS 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

3.1.4 Uniform Spreading

Manufacturer Declare the Uniform Spreading	
☒	For the 5250-5350 MHz and 5470-5725 MHz bands, the Master device provides, on aggregate, uniform loading of the spectrum across all devices by selecting an operating channel among the available channels using a Gaussian random algorithm.

3.1.5 User Access Restrictions

User Access Restrictions	
☒	DFS controls (hardware or software) related to radar detection are NOT accessible to the user. Manufacturer statement confirming that information regarding the parameters of the detected Radar Waveforms is not available to the end user.

3.1.6 Channel Loading/Data Streaming

☒	IP Based (Load Based) - stream the test file from the Master to the Client.	
	☐	The client device is link with the master device and plays the WAV audio file from master device to client device. Test file download in NTIA website (http://ntiacsd.ntia.doc.gov/dfs/)
	☐	The client device is link with the master device and plays the MPEG file (6 1/2 Magic Hours) from master device to client device. Test file download in NTIA website (http://ntiacsd.ntia.doc.gov/dfs/)
	☒	Alternative streaming e.g., FTP with about 17 to 20% loading and submit proposal to FCC.
☐	Frame Based - stream the test file from the Master to the Client.	
	☐	fixed talk/listen ratio, set the ratio to 45%/55%

3.2 Radar Test Waveform Calibration

3.2.1 Short Pulse Radar Test Waveforms

Radar Type	Pulse Width (μsec)	PRI (μsec)	Number of Pulses	Minimum Percentage of Successful Detection	Minimum Trials
0	1	1428	18	See Note 1	See Note 1
1	1	Test A: 15 unique PRI values randomly selected from the list of 23 PRI values in Table 5a	$\text{Roundup}\left\{\left(\frac{1}{360}\right)\cdot\left(\frac{19\cdot 10^6}{\text{PRI}_{\mu\text{sec}}}\right)\right\}$	60%	30
		Test B: 15 unique PRI values randomly selected within the range of 518-3066 μsec, with a minimum increment of 1 μsec, excluding PRI values selected in Test A			
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
Note 1: Short Pulse Radar Type 0 should be used for the detection bandwidth test, channel move time, and channel closing time tests.					

A minimum of 30 unique waveforms are required for each of the Short Pulse Radar Types 2 through 4. 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. If more than 30 waveforms are used for Short Pulse Radar Type 1, then each additional waveform is generated with Test B and must also be unique and not repeated from the previous waveforms in Tests A or B.

3.2.2 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 Trials
5	50-100	5-20	1000-2000	1-3	8-20	80%	30

Each waveform is defined as follows:

- The transmission period for the Long Pulse Radar test signal is 12 seconds.
- There are a total of 8 to 20 Bursts in the 12 second period, with the number of Bursts being randomly chosen. This number is Burst_Count.
- Each Burst consists of 1 to 3 pulses, with the number of pulses being randomly chosen. Each Burst within the 12 second sequence may have a different number of pulses.
- The pulse width is between 50 and 100 microseconds, with the pulse width being randomly chosen. Each pulse within a Burst will have the same pulse width. Pulses in different Bursts may have different pulse widths.
- Each pulse has a linear frequency modulated chirp between 5 and 20 MHz, with the chirp width being randomly chosen. Each pulse within a Burst will have the same chirp width. Pulses in different Bursts may have different chirp widths. The chirp is centered on the pulse. For example, with a radar frequency of 5300 MHz and a 20 MHz chirped signal, the chirp starts at 5290 MHz and ends at 5310 MHz.
- If more than one pulse is present in a Burst, the time between the pulses will be between 1000 and 2000 microseconds, with the time being randomly chosen. If three pulses are present in a Burst, the time between the first and second pulses is chosen independently of the time between the second and third pulses.
- The 12 second transmission period is divided into even intervals. The number of intervals is equal to Burst_Count. Each interval is of length (12,000,000 / Burst_Count) microseconds. Each interval contains one Burst. The start time for the Burst, relative to the beginning of the interval, is between 1 and [(12,000,000 / Burst_Count) – (Total Burst Length) + (One Random PRI Interval)] microseconds, with the start time being randomly chosen. The step interval for the start time is 1 microsecond. The start time for each Burst is chosen independently.

3.2.3 Frequency Hopping Radar Test Waveform

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

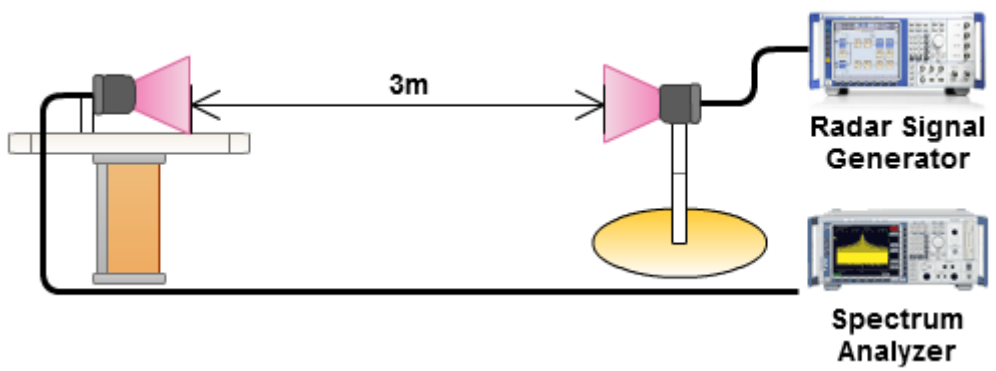
The FCC Type 6 waveform uses a static waveform with 100 bursts in the instruments ARB. In addition, the RF list mode is operated with a list containing 100 frequencies from a randomly generated list and it had be ensured that at least one of the random frequencies falls into the UNII Detection Bandwidth of the DUT. Each burst from the waveform file initiates a trigger pulse at the beginning that switches the RF list from one item to the next one.

3.2.4 DFS Threshold Level

DFS Threshold Level	
DFS Threshold level: -64 dBm	☐ at the antenna connector
	☒ in front of the antenna
The Interference **Radar Detection Threshold Level** is -64 dBm. That had been taken into account the output power range and antenna gain.	

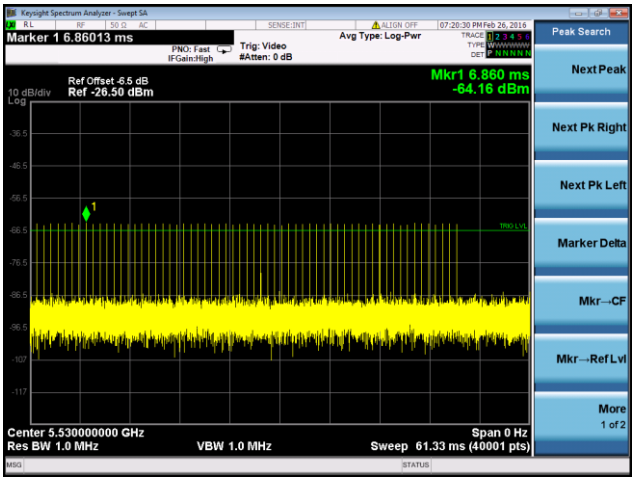
3.2.5 Calibration Setup

Radiated Calibration Setup

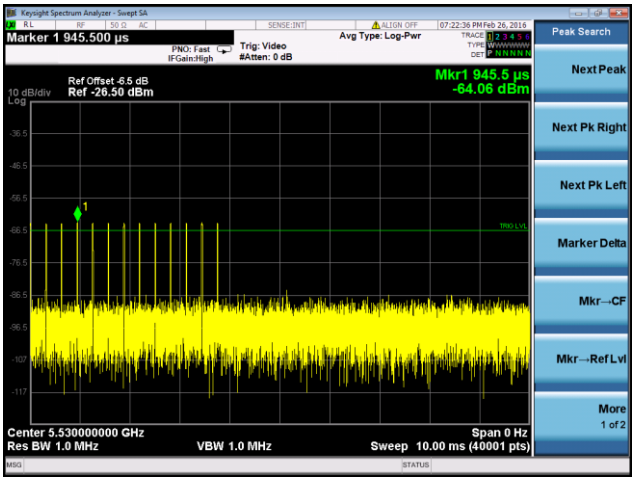


Calibration Plots

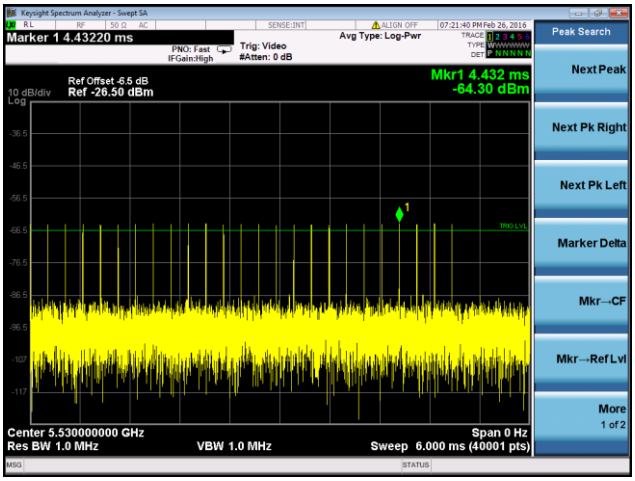
Radar #1 DFS detection threshold level



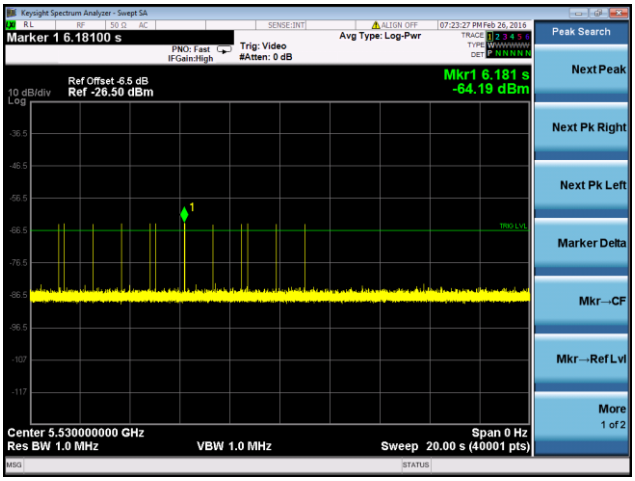
Radar #4 DFS detection threshold level



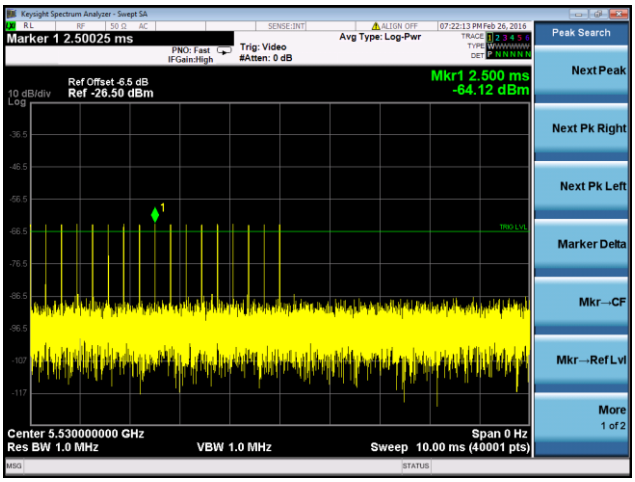
Radar #2 DFS detection threshold level



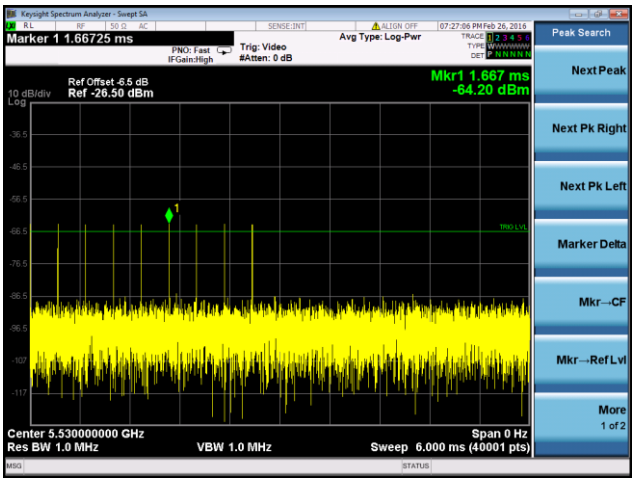
Radar #5 DFS detection threshold level



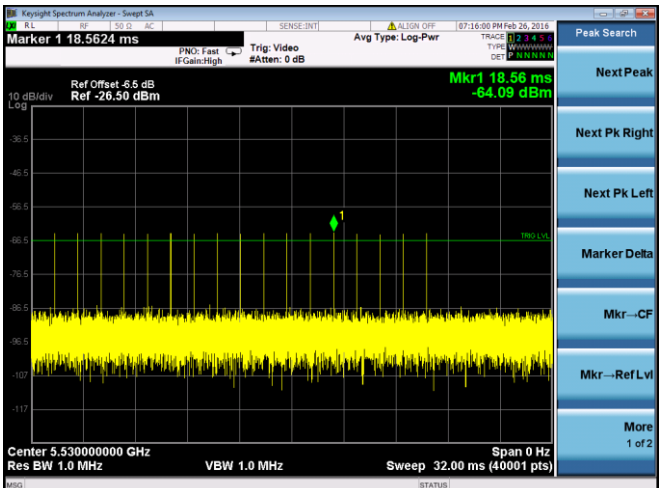
Radar #3 DFS detection threshold level



Radar #6 DFS detection threshold level



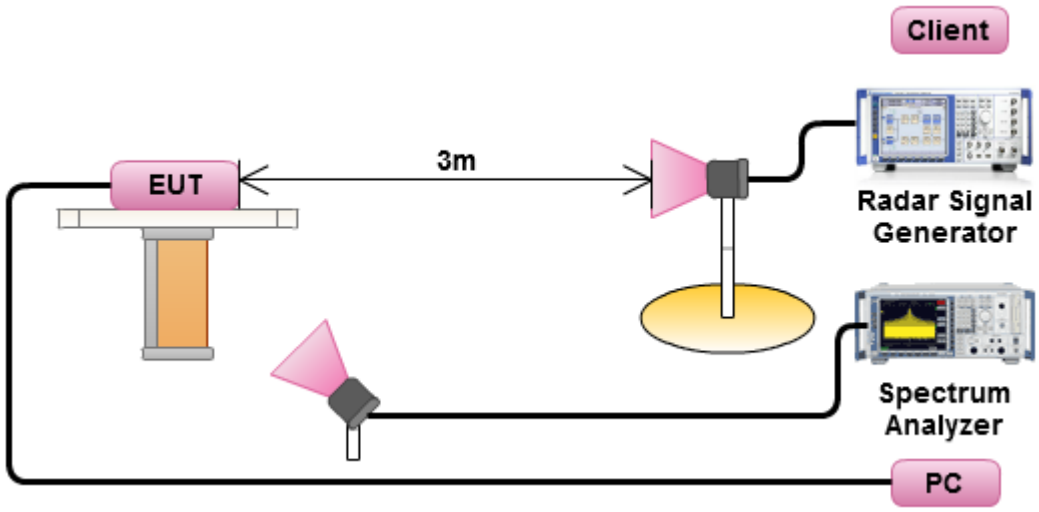
Radar #0 DFS detection threshold level



3.2.6 Test Setup

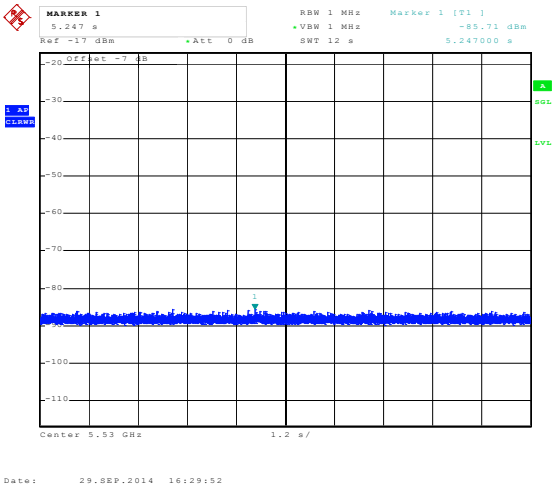
A spectrum analyzer is used as a monitor to verify that the EUT has vacated the Channel within the (Channel Closing Transmission Time and Channel Move Time, and does not transmit on a Channel during the Non-Occupancy Period after the detection and Channel move.

Master Radiated Measurement

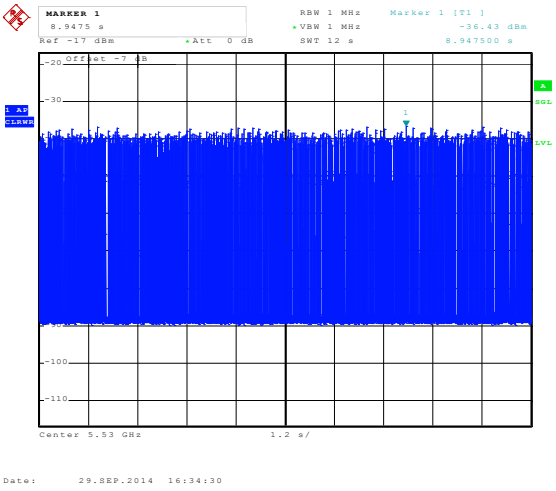


Verification that when the EUT is “off” that the RF energy emitted Plots

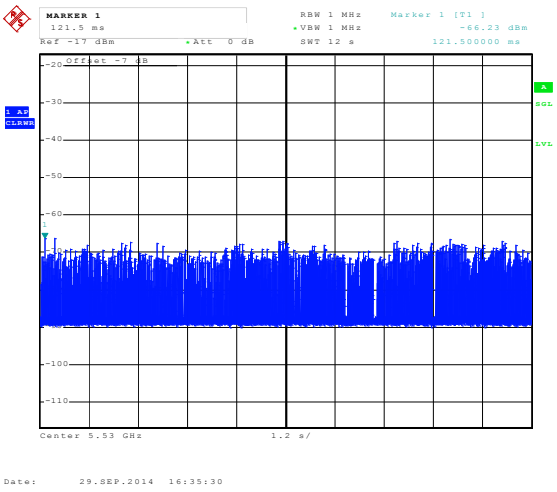
Without Data Traffic Plot (Noise Plot)



Master (EUT) Data Traffic Plot



Client Data Traffic Plot



3.3 UNII Detection Bandwidth

3.3.1 UNII Detection Bandwidth Limit

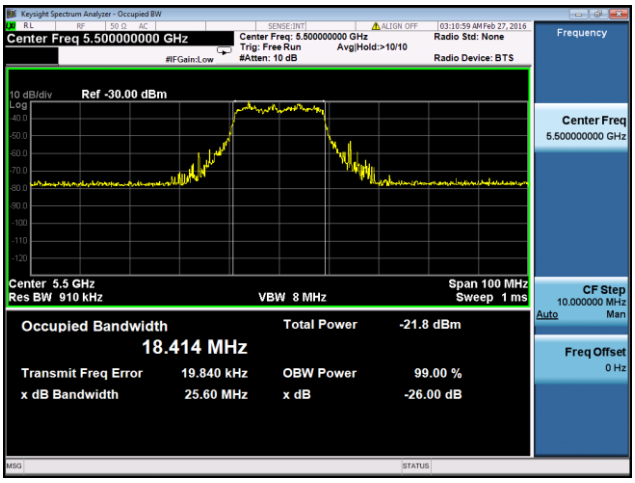
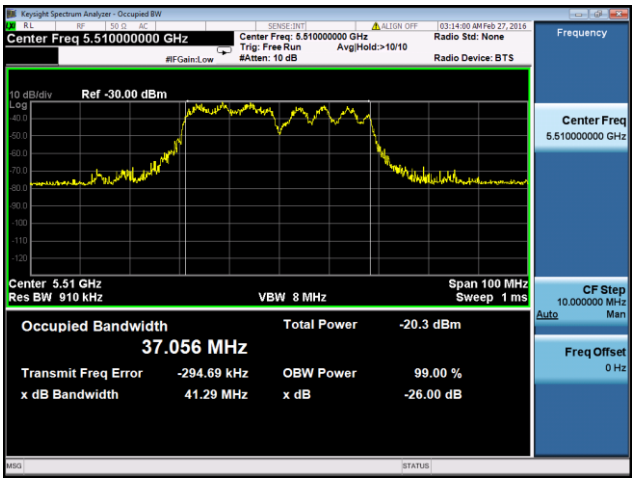
Channel Bandwidth (MHz)	99% Power Bandwidth (MHz)
20	18.414
40	37.056
80	75.939
During the U-NII Detection Bandwidth detection test, any one of radar types 0 - and radar type 5 can be used and for each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.	

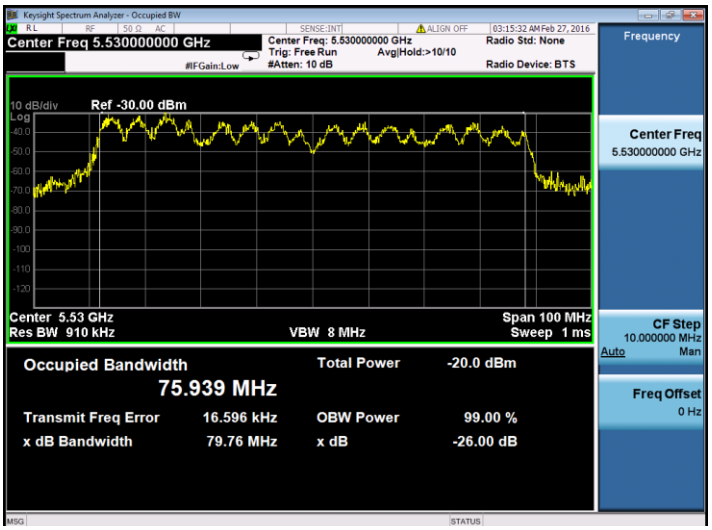
3.3.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.3.3 Test Procedures

Test Method
☒ Refer as KDB 905462 D02, clause 7.8.1 for UNII Detection Bandwidth test. During the U-NII Detection Bandwidth detection test, radar type 0 and 5 are is used and for each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic. The EUT is set up as a standalone device (no associated Client and no traffic). The radar frequency is increased in 1 MHz steps, repeating the above test sequence, until the detection rate falls below 90%. The highest frequency at which detection is greater than or equal to 99% is denoted as F_H. The radar frequency is decreased in 1 MHz steps, repeating the above test sequence, until the detection rate falls below 90%. The lowest frequency at which detection is greater than or equal to 99% is denoted as F_L. UNII Detection Bandwidth = F_H - F_L.

Emission Bandwidth Plots	
VHT20	VHT40
	

VHT80


Keysight Spectrum Analyzer - Occupied BW
Center Freq 5.530000000 GHz
Center Freq: 5.530000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 10 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
03:15:32 AM Feb 27, 2016
Frequency
10 dB/div
Ref -30.00 dBm
Center 5.53 GHz
Res BW 910 kHz
VBW 8 MHz
Span 100 MHz
Sweep 1 ms
Center Freq
5.530000000 GHz
CF Step
10.000000 MHz
Auto
Man
Freq Offset
0 Hz
Occupied Bandwidth
75.939 MHz
Total Power -20.0 dBm
Transmit Freq Error 16.596 kHz
OBW Power 99.00 %
x dB Bandwidth 79.76 MHz
x dB -26.00 dB

3.3.4 Test Result of UNII Detection Bandwidth

Channel Bandwidth 20MHz

UNII Detection Bandwidth Result												
Radar Type	0											
Channel Bandwidth (MHz)	20											
Radar Freq. (MHz)	**DFS Detection Trials (1=Detection, 0= No Detection)**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Detection Rate (%)**	**Detection Bandwidth (MHz)**
5490	1	1	1	1	1	1	1	1	1	1	100	21
5495	1	1	1	1	1	1	1	1	1	1	100	
5500	1	1	1	1	1	1	1	1	1	1	100	
5505	1	1	1	1	1	1	1	1	1	1	100	
5510	1	1	1	1	1	1	1	1	1	1	100	
Limit (MHz)												**18.414**
Result												**Complied**

Channel Bandwidth 40MHz

UNII Detection Bandwidth Result												
Radar Type	0											
Channel Bandwidth (MHz)	40											
Radar Freq. (MHz)	DFS Detection Trials (1=Detection, 0= No Detection)											
	1	2	3	4	5	6	7	8	9	10	Detection Rate (%)	Detection Bandwidth (MHz)
5490	1	1	1	1	1	1	1	1	1	1	100	41
5495	1	1	1	1	1	1	1	1	1	1	100	
5500	1	1	1	1	1	1	1	1	1	1	100	
5505	1	1	1	1	1	1	1	1	1	1	100	
5510	1	1	1	1	1	1	1	1	1	1	100	
5515	1	1	1	1	1	1	1	1	1	1	100	
5520	1	1	1	1	1	1	1	1	1	1	100	
5525	1	1	1	1	1	1	1	1	1	1	100	
5530	1	1	1	1	1	1	1	1	1	1	100	
Limit (MHz)												37.056
Result												Complied

Channel Bandwidth 80MHz

UNII Detection Bandwidth Result												
Radar Type	0											
Channel Bandwidth (MHz)	80											
Radar Freq. (MHz)	**DFS Detection Trials (1=Detection, 0= No Detection)**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Detection Rate (%)**	**Detection Bandwidth (MHz)**
5490	1	1	1	1	1	1	1	1	1	1	100	81
5495	1	1	1	1	1	1	1	1	1	1	100	
5500	1	1	1	1	1	1	1	1	1	1	100	
5505	1	1	1	1	1	1	1	1	1	1	100	
5510	1	1	1	1	1	1	1	1	1	1	100	
5515	1	1	1	1	1	1	1	1	1	1	100	
5520	1	1	1	1	1	1	1	1	1	1	100	
5525	1	1	1	1	1	1	1	1	1	1	100	
5530	1	1	1	1	1	1	1	1	1	1	100	
5535	1	1	1	1	1	1	1	1	1	1	100	
5540	1	1	1	1	1	1	1	1	1	1	100	
5545	1	1	1	1	1	1	1	1	1	1	100	
5550	1	1	1	1	1	1	1	1	1	1	100	
5555	1	1	1	1	1	1	1	1	1	1	100	
5560	1	1	1	1	1	1	1	1	1	1	100	
5565	1	1	1	1	1	1	1	1	1	1	100	
5570	1	1	1	1	1	1	1	1	1	1	100	
Limit (MHz)												**75.939**
Result												**Complied**

Channel Bandwidth 20MHz

UNII Detection Bandwidth Result												
Radar Type	5											
Channel Bandwidth (MHz)	20											
Radar Freq. (MHz)	DFS Detection Trials (1=Detection, 0= No Detection)											
	1	2	3	4	5	6	7	8	9	10	Detection Rate (%)	Detection Bandwidth (MHz)
5494	0	0	0	1	0	0	0	0	0	0	10	15
5495	1	0	0	1	1	1	1	0	1	0	60	
5496	1	1	1	1	1	1	1	1	1	1	100	
5497	1	1	1	1	1	1	1	1	1	1	100	
5498	1	1	1	1	1	1	1	1	1	1	100	
5499	1	1	1	1	1	1	1	1	1	1	100	
5500	1	1	1	1	1	1	1	1	1	1	100	
5505	1	1	1	1	1	1	1	1	1	1	100	
5510	1	1	1	1	1	1	1	1	1	1	100	
Limit (MHz)												14.7312
Result												Complied

Channel Bandwidth 40MHz

UNII Detection Bandwidth Result												
Radar Type	5											
Channel Bandwidth (MHz)	40											
Radar Freq. (MHz)	DFS Detection Trials (1=Detection, 0= No Detection)											
	1	2	3	4	5	6	7	8	9	10	Detection Rate (%)	Detection Bandwidth (MHz)
5494	0	0	1	0	0	1	0	1	0	1	40	36
5495	1	1	1	1	1	1	1	1	1	1	100	
5496	1	1	1	1	1	1	1	1	1	1	100	
5497	1	1	1	1	1	1	1	1	1	1	100	
5498	1	1	1	1	1	1	1	1	1	1	100	
5499	1	1	1	1	1	1	1	1	1	1	100	
5500	1	1	1	1	1	1	1	1	1	1	100	
5505	1	1	1	1	1	1	1	1	1	1	100	
5510	1	1	1	1	1	1	1	1	1	1	100	
5515	1	1	1	1	1	1	1	1	1	1	100	
5520	1	1	1	1	1	1	1	1	1	1	100	
5525	1	1	1	1	1	1	1	1	1	1	100	
5530	1	1	1	1	1	1	1	1	1	1	100	
Limit (MHz)												29.6448
Result												Complied

Channel Bandwidth 80MHz

UNII Detection Bandwidth Result												
Radar Type	5											
Channel Bandwidth (MHz)	80											
Radar Freq. (MHz)	**DFS Detection Trials (1=Detection, 0= No Detection)**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Detection Rate (%)**	**Detection Bandwidth (MHz)**
5495	1	1	1	0	1	1	0	1	0	1	70	75
5496	1	1	1	1	1	1	1	1	1	1	100	
5497	1	1	1	1	1	1	1	1	1	1	100	
5498	1	1	1	1	1	1	1	1	1	1	100	
5499	1	1	1	1	1	1	1	1	1	1	100	
5500	1	1	1	1	1	1	1	1	1	1	100	
5505	1	1	1	1	1	1	1	1	1	1	100	
5510	1	1	1	1	1	1	1	1	1	1	100	
5515	1	1	1	1	1	1	1	1	1	1	100	
5520	1	1	1	1	1	1	1	1	1	1	100	
5525	1	1	1	1	1	1	1	1	1	1	100	
5530	1	1	1	1	1	1	1	1	1	1	100	
5535	1	1	1	1	1	1	1	1	1	1	100	
5540	1	1	1	1	1	1	1	1	1	1	100	
5545	1	1	1	1	1	1	1	1	1	1	100	
5550	1	1	1	1	1	1	1	1	1	1	100	
5555	1	1	1	1	1	1	1	1	1	1	100	
5560	1	1	1	1	1	1	1	1	1	1	100	
5565	1	1	1	1	1	1	1	1	1	1	100	
5570	1	1	1	1	1	1	1	1	1	1	100	
Limit (MHz)												**60.7512**
Result												**Complied**

3.4 Channel Availability Check (CAC)

3.4.1 Channel Availability Check Limit

Channel Availability Check Limit	
☒	The EUT shall perform a Channel Availability Check to ensure that there is no radar operating on the channel. After power-up sequence, receive at least 1 minute (60 sec) on the intended operating frequency.

3.4.2 Measuring Instruments

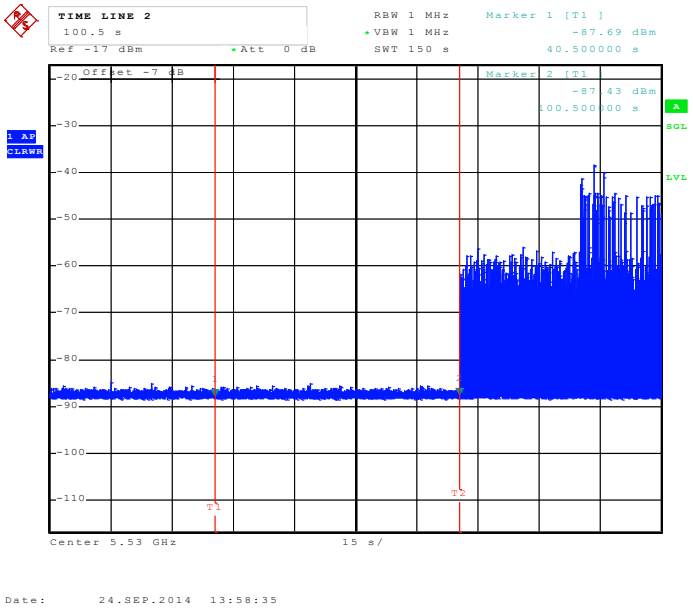
Refer a test equipment and calibration data table in this test report.

3.4.3 Test Procedures

Test Method	
☒	Refer as KDB 905462 D02, clause 7.8.2.1 for Initial Channel Availability Check Time. The EUT does not emit beacon, control, or data signals on the test Channel until the power-up sequence has been completed and the UNII device checks for Radar Waveforms for one minute on the test Channel. This test does not use any Radar Waveforms.
☒	Refer as KDB 905462 D02, clause 7.8.2.2 for Radar Burst at the Beginning of the Channel Availability Check Time. To verify successful radar detection on the selected Channel during a period equal to the Beginning of the Channel Availability Check Time.
☒	Refer as KDB 905462 D02, clause 7.8.2.3 for Radar Burst at the End of the Channel Availability Check Time. To verify successful radar detection on the selected Channel during a period equal to the End of the Channel Availability Check Time.

3.4.4 Test Result of Channel Availability Check Time

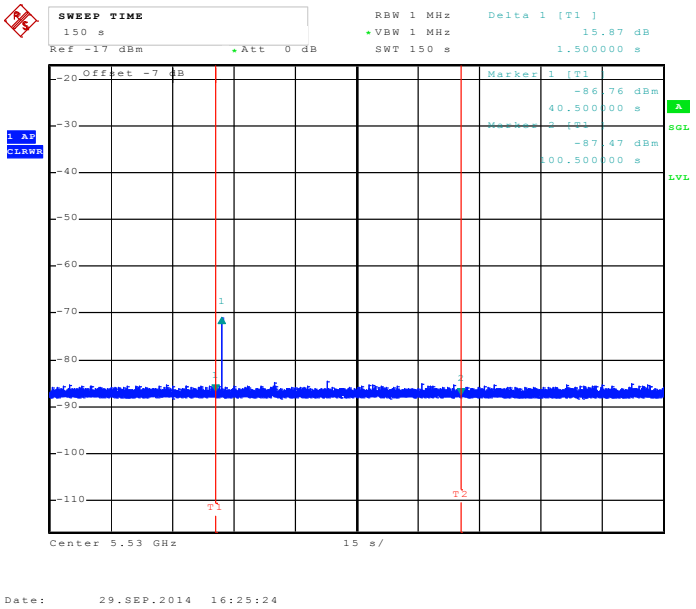
Initial Channel Availability Check Time Result					
Modulation Mode	**Freq. (MHz)**	**Radar Test Signal**	**Power-on Cycle. (sec)**	**CAC Time (sec)**	**Observation Time (min)**
VHT80	5530	N/A	100.5	60	2.5
Result 150s Timing Plot			**Complied**		



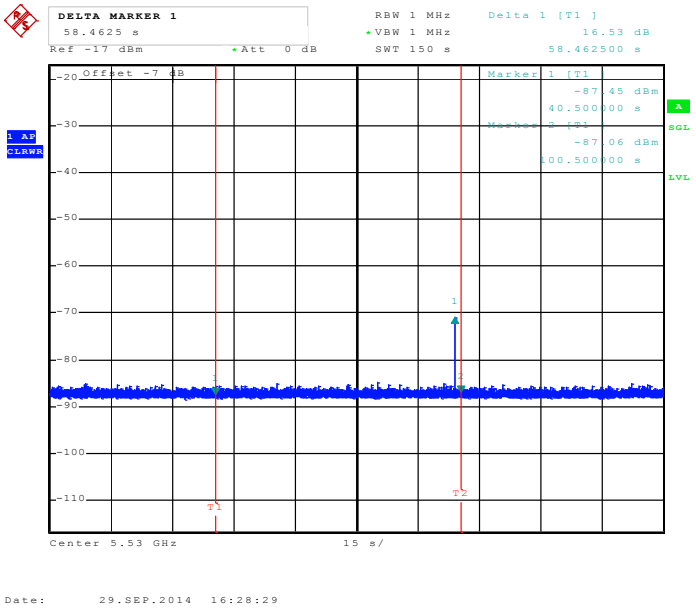
Note 1 : This test does not use any Radar Waveforms.
Note 2 : In the beginning, the EUT started in 80MHz.

Channel Availability Check Time Result					
Modulation Mode	**Freq. (MHz)**	**Radar Type Signal**	**Beginning CAC of Timing of radar burst (sec)**	**End CAC of Timing of radar burst (sec)**	**DFS Triggered (Yes/No)**
VHT20	5500	1	6	54	Yes
Result			**Complied**		

Beginning CAC of 150s Timing Plot



End CAC of 150s Timing Plot



3.5 In-service Monitoring

3.5.1 In-service Monitoring Limit

In-service Monitoring Limit	
Channel Move Time	10 sec
Channel Closing Transmission Time	200 ms + an aggregate of 60 ms over remaining 10 sec periods.
Non-occupancy period	Minimum 30 minutes

3.5.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

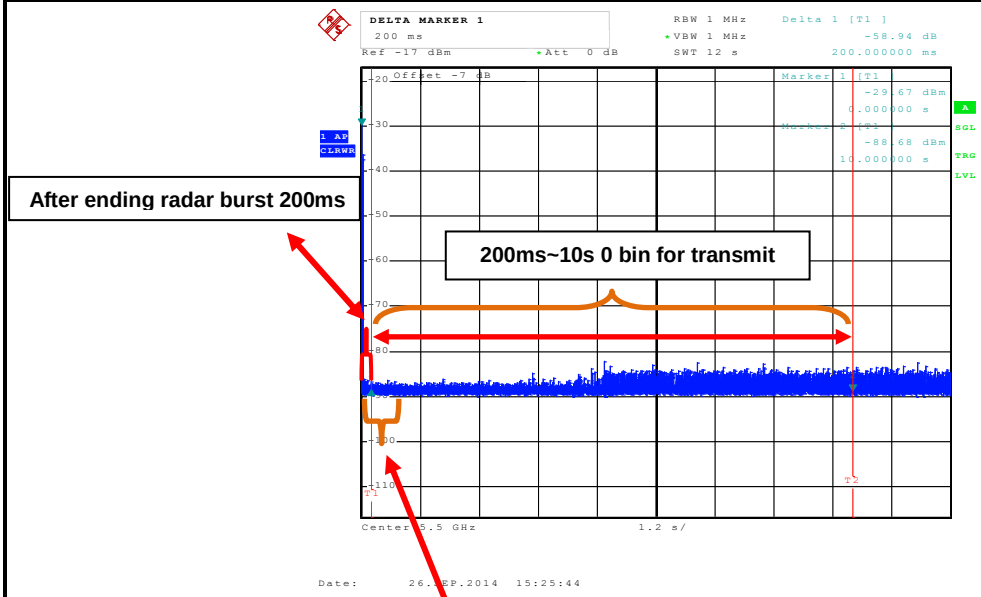
3.5.3 Test Procedures

	Test Method
☒	Refer as KDB 905462 D02, clause 7.8.3 verified during In-Service Monitoring; Channel Closing Transmission Time, Channel Move Time. Client Device will associate with the EUT. Observe the transmissions of the EUT at the end of the radar Burst on the Operating Channel for duration greater than 10 seconds. Measure and record the transmissions from the EUT during the observation time (Channel Move Time). Compare the Channel Move Time and Channel Closing Transmission Time limits.
☒	Refer as KDB 905462 D02, clause 8.3 verified during In-Service Monitoring; Channel Closing Transmission Time, Channel Move Time. One 10 sec plot needs to be reported for the Short Pulse Radar Types 0 in a 12 sec plot. And zoom-in a 600 ms plot verified channel closing time for the aggregate transmission time starting from 200ms after the end of the radar signal to the completion of the channel move.
☒	Refer as KDB 905462 D02, clause 7.8.3 verified during In-Service Monitoring; Non-Occupancy Period. Client Device will associate with the EUT. Observe the transmissions of the EUT at the end of the radar Burst on the Operating Channel for duration greater than 10 seconds. Measure and record the transmissions from the EUT during the observation time (Non-Occupancy Period). Compare the Non-Occupancy Period limits.

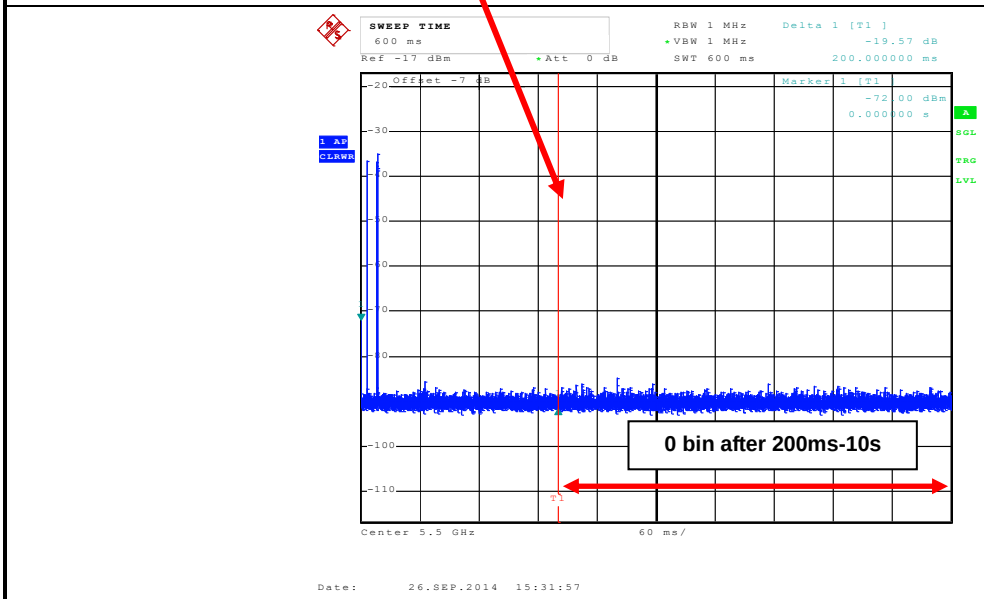
3.5.4 Test Result of In-service Monitoring

Channel Closing Transmission Time and Channel Move Time Result								
Modulation Mode	Freq. (MHz)	Radar Type	Channel Closing Transmission Time				Channel Move Time	
			Tx Time in 0-0.2s	Tx Limit in 0-0.2s	Tx Time in 0.2s-10s	Tx Limit in 0.2s-10s	Movie Time in 0s-10s	Limit
VHT20	5500	1	< 200ms	200ms	0ms	60ms	0 s	10 s
Total 8001 sample bin in 0-12s			transmission time bins: 0 [200ms~8000ms]					

12 sec Timing Plot

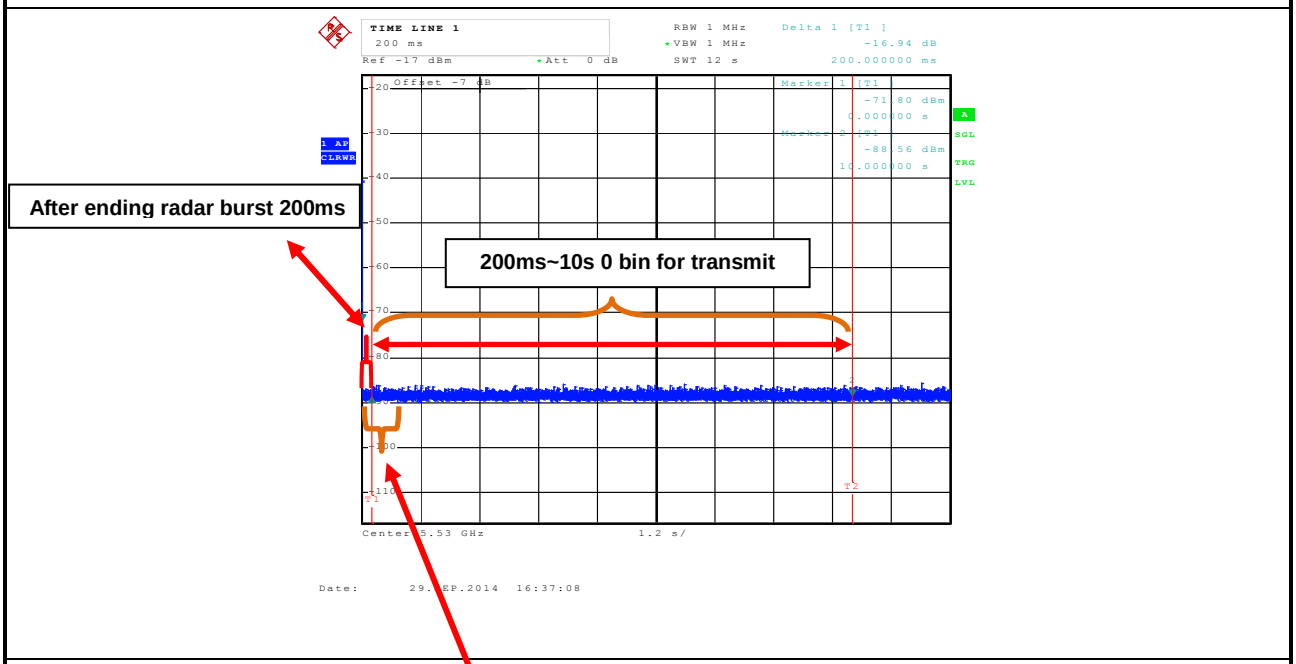


Zoom-in 600ms Timing Plot

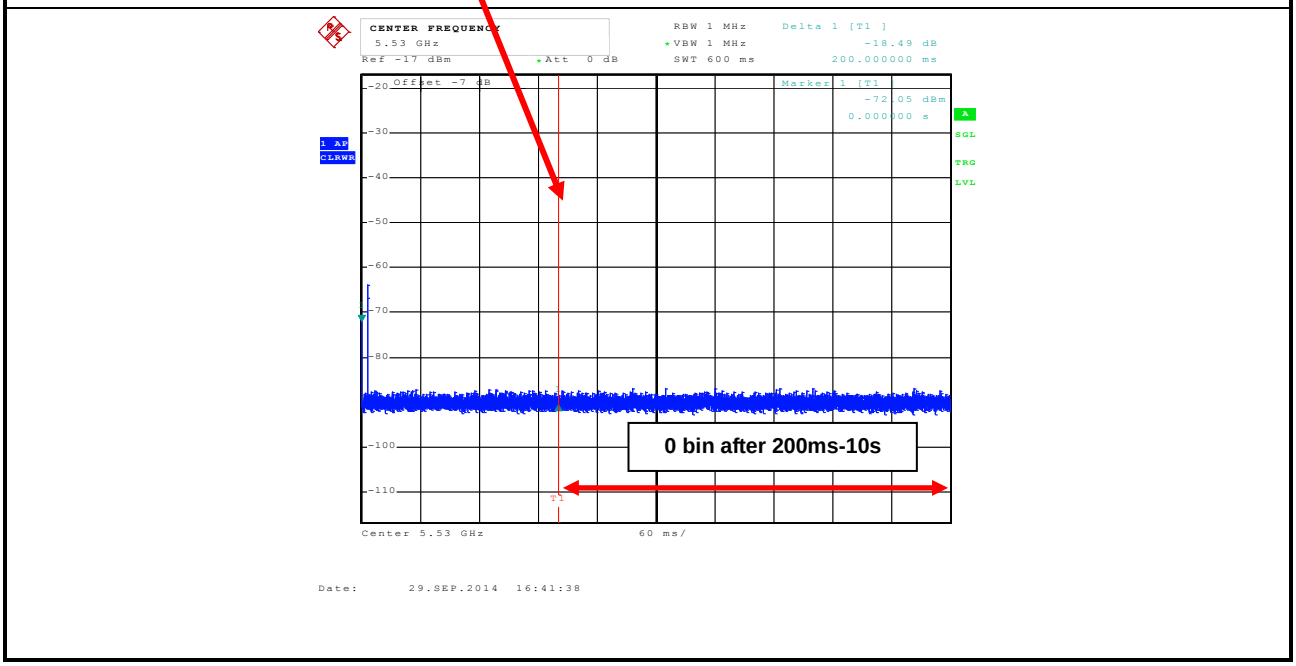


Channel Closing Transmission Time and Channel Move Time Result								
Modulation Mode	Freq. (MHz)	Radar Type	Channel Closing Transmission Time				Channel Move Time	
			Tx Time in 0-0.2s	Tx Limit in 0-0.2s	Tx Time in 0.2s-10s	Tx Limit in 0.2s-10s	Movie Time in 0s-10s	Limit
VHT80	5530	1	< 200ms	200ms	0ms	60ms	0ms	10s
Total 8001 sample bin in 0-12s			transmission time bins: 0 [200ms~10s]					

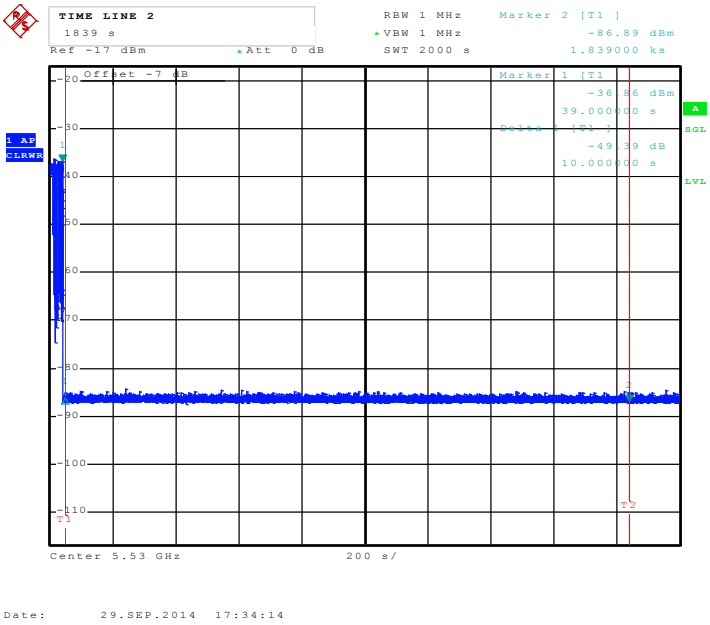
12 sec Timing Plot



Zoom-in 600ms Timing Plot



Non-Occupancy Period Result				
Modulation Mode	Freq. (MHz)	Non-Occupancy Period		
		Measured	Limit	Result
VHT20	5530	>30min	30min	Complied
2000 sec Timing Plot				



3.6 Statistical Performance Check

3.6.1 Statistical Performance Check Limit

Radar Type	Minimum Percentage of Successful Detection (Pd)	Minimum Trials
1	60%	30
2	60%	30
3	60%	30
4	60%	30
Aggregate (Radar Types 1-4)	80%	120
5	80%	30
6	70%	30

The percentage of successful detection is calculated by:

$$\frac{TotalWaveformDetections}{TotalWaveformTrails} \times 100 = \text{Probability of Detection Radar Waveform}$$

In addition an aggregate minimum percentage of successful detection across all Short Pulse Radar Types 1-4 is required and is calculated as follows:

$$\frac{Pd1 + Pd2 + Pd3 + Pd4}{4}$$

3.6.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.6.3 Test Procedures

Test Method
☒ Refer as KDB 905462 D02, clause 7.8.4 for Statistical Performance Check test. Stream the MPEG test file from the Master Device to the Client Device on the test Channel for the entire period of the test. Observe the transmissions of the UUT at the end of the Burst on the Operating Channel for duration greater than 10 seconds for Short Pulse Radar Types 1-4 and 6 to ensure detection occurs. Then Observe the transmissions of the UUT at the end of the Burst on the Operating Channel for duration greater than 22 seconds for Long Pulse Radar Type 5 to ensure detection occurs. The device can utilize a test mode to demonstrate when detection occurs to prevent the need to reset the device between trial runs.

3.6.4 Test Result of Statistical Performance Check

Statistical Performance Check Result – VHT20					
Radar Signal (#)	**Test Trail #**	**Detect Trail #**	**Pd (%)**	**Limit Pd (%)**	**Result**
1	30	30	100	60	Complied
2	30	27	90	60	Complied
3	30	29	96.67	60	Complied
4	30	29	96.67	60	Complied
Aggregate 1 - 4	120	115	95.83	80	Complied
5	30	30	100	80	Complied
6	30	29	96.67	70	Complied

Statistical Performance Check Result – VHT40					
Radar Signal (#)	**Test Trail #**	**Detect Trail #**	**Pd (%)**	**Limit Pd (%)**	**Result**
1	30	30	100	60	Complied
2	30	30	100	60	Complied
3	30	30	100	60	Complied
4	30	29	96.67	60	Complied
Aggregate 1 - 4	120	119	99.17	80	Complied
5	30	30	100	80	Complied
6	30	30	100	70	Complied

Statistical Performance Check Result – VHT80					
Radar Signal (#)	**Test Trail #**	**Detect Trail #**	**Pd (%)**	**Limit Pd (%)**	**Result**
1	30	30	100	60	Complied
2	30	30	100	60	Complied
3	30	30	100	60	Complied
4	30	30	100	60	Complied
Aggregate 1 - 4	120	120	100	80	Complied
5	30	30	100	80	Complied
6	30	30	100	70	Complied

3.6.5 Detection Data Sheet for Radar Types 1, 5, and 6

Radar Type	1			2		
Trail #	**VHT20**	**VHT40**	**VHT80**	**VHT20**	**VHT40**	**VHT80**
1	1	1	1	1	1	1
2	1	1	1	1	1	1
3	1	1	1	1	1	1
4	1	1	1	1	1	1
5	1	1	1	1	1	1
6	1	1	1	1	1	1
7	1	1	1	1	1	1
8	1	1	1	1	1	1
9	1	1	1	0	1	1
10	1	1	1	1	1	1
11	1	1	1	1	1	1
12	1	1	1	0	1	1
13	1	1	1	1	1	1
14	1	1	1	1	1	1
15	1	1	1	1	1	1
16	1	1	1	1	1	1
17	1	1	1	1	1	1
18	1	1	1	1	1	1
19	1	1	1	1	1	1
20	1	1	1	1	1	1
21	1	1	1	1	1	1
22	1	1	1	1	1	1
23	1	1	1	1	1	1
24	1	1	1	1	1	1
25	1	1	1	1	1	1
26	1	1	1	0	1	1
27	1	1	1	1	1	1
28	1	1	1	1	1	1
29	1	1	1	1	1	1
30	1	1	1	1	1	1
Pd (%)	100	100	100	90	100	100
Note 1: 1=Detection ;0=No Detection						

Radar Type	3			4		
Trail #	**VHT20**	**VHT40**	**VHT80**	**VHT20**	**VHT40**	**VHT80**
1	1	1	1	1	1	1
2	1	1	1	1	1	1
3	1	1	1	1	1	1
4	1	1	1	1	1	1
5	1	1	1	1	1	1
6	1	1	1	1	1	1
7	1	1	1	1	1	1
8	1	1	1	1	1	1
9	1	1	1	1	1	1
10	1	1	1	1	1	1
11	1	1	1	1	1	1
12	1	1	1	1	1	1
13	1	1	1	1	1	1
14	1	1	1	1	1	1
15	1	1	1	1	1	1
16	0	1	1	1	1	1
17	1	1	1	1	1	1
18	1	1	1	1	0	1
19	1	1	1	1	1	1
20	1	1	1	1	1	1
21	1	1	1	1	1	1
22	1	1	1	1	1	1
23	1	1	1	0	1	1
24	1	1	1	1	1	1
25	1	1	1	1	1	1
26	1	1	1	1	1	1
27	1	1	1	1	1	1
28	1	1	1	1	1	1
29	1	1	1	1	1	1
30	1	1	1	1	1	1
Pd (%)	96.67	100	100	96.67	96.67	100
Note 1: 1=Detection ;0=No Detection						

Radar Type	5			6		
Trail #	**VHT20**	**VHT40**	**VHT80**	**VHT20**	**VHT40**	**VHT80**
1	1	1	1	1	1	1
2	1	1	1	1	1	1
3	1	1	1	1	1	1
4	1	1	1	1	1	1
5	1	1	1	1	1	1
6	1	1	1	1	1	1
7	1	1	1	1	1	1
8	1	1	1	1	1	1
9	1	1	1	1	1	1
10	1	1	1	1	1	1
11	1	1	1	1	1	1
12	1	1	1	1	1	1
13	1	1	1	1	1	1
14	1	1	1	1	1	1
15	1	1	1	1	1	1
16	1	1	1	1	1	1
17	1	1	1	1	1	1
18	1	1	1	1	1	1
19	1	1	1	0	1	1
20	1	1	1	1	1	1
21	1	1	1	1	1	1
22	1	1	1	1	1	1
23	1	1	1	1	1	1
24	1	1	1	1	1	1
25	1	1	1	1	1	1
26	1	1	1	1	1	1
27	1	1	1	1	1	1
28	1	1	1	1	1	1
29	1	1	1	1	1	1
30	1	1	1	1	1	1
Pd (%)	100	100	100	96.67	100	100
Note 1: 1=Detection ;0=No Detection						

3.6.6 Parameter Data Sheet for Radar Type 1 ~ 6

Data Sheet for Radar Type 1

Radar Type	1		
Trail #	**Pulse Width (us)**	**PRI (us)**	**Pulses / Burst**
1	1	858	62
2	1	918	58
3	1	518	102
4	1	598	89
5	1	898	59
6	1	678	78
7	1	758	70
8	1	738	72
9	1	558	95
10	1	938	57
11	1	718	74
12	1	778	68
13	1	658	81
14	1	3066	18
15	1	638	83
16	1	1188	45
17	1	1813	30
18	1	2630	21
19	1	1233	43
20	1	2154	25
21	1	2632	21
22	1	2389	23
23	1	1140	47
24	1	1566	34
25	1	990	54
26	1	854	62
27	1	2116	25
28	1	2175	25
29	1	2598	21
30	1	2834	19

Data Sheet for Radar Type 2

Radar Type	2		
Trail #	**Pulse Width (us)**	**PRI (us)**	**Pulses / Burst**
1	2.6	211	25
2	1.1	160	23
3	4.9	215	29
4	3	171	26
5	2.6	223	25
6	3.9	181	27
7	2.6	224	25
8	4.8	227	29
9	2.1	184	25
10	3.5	174	27
11	5	156	29
12	1.3	179	23
13	3.1	186	26
14	2.4	189	25
15	3.8	162	27
16	2.6	150	25
17	1.5	176	23
18	3.8	219	27
19	1.5	197	23
20	4.8	158	29
21	1.3	220	23
22	2.6	169	25
23	3.8	203	27
24	1.4	155	23
25	2.1	207	25
26	2.5	175	25
27	4.5	193	29
28	4.8	192	29
29	3.3	190	26
30	3.1	188	26

Data Sheet for Radar Type 3

Radar Type	3		
Trail #	**Pulse Width (us)**	**PRI (us)**	**Pulses / Burst**
1	7.6	312	17
2	6.1	225	16
3	9.9	280	18
4	8	427	17
5	7.6	477	17
6	8.9	227	18
7	7.6	444	17
8	9.8	476	18
9	7.1	419	16
10	8.5	313	17
11	10	486	18
12	6.3	405	16
13	8.1	466	17
14	7.4	394	17
15	8.8	374	18
16	7.6	307	17
17	6.5	335	16
18	8.8	422	18
19	6.5	240	16
20	9.8	203	18
21	6.3	336	16
22	7.6	362	17
23	8.8	460	18
24	6.4	308	16
25	7.1	200	16
26	7.5	206	17
27	9.5	286	18
28	9.8	378	18
29	8.3	324	17
30	8.1	472	17

Data Sheet for Radar Type 4

Radar Type	4		
Trail #	**Pulse Width (us)**	**PRI (us)**	**Pulses / Burst**
1	14.6	312	13
2	11.3	225	12
3	19.7	280	16
4	15.6	427	14
5	14.7	477	14
6	17.4	227	15
7	14.7	444	14
8	19.6	476	16
9	13.6	419	13
10	16.7	313	15
11	19.9	486	16
12	11.8	405	12
13	15.6	466	14
14	14.3	394	13
15	17.3	374	15
16	14.5	307	13
17	12.1	335	12
18	17.2	422	15
19	12.1	240	12
20	19.6	203	16
21	11.8	336	12
22	14.6	362	14
23	17.3	460	15
24	11.9	308	12
25	13.6	200	13
26	14.3	206	13
27	18.9	286	16
28	19.5	378	16
29	16.1	324	14
30	15.8	472	14

Data Sheet for Radar Type 5

Statistical Performance Check Result						
Radar Test Signal (#)		5		**Trail #**	1	
Burst Offset (us)	**Pulse Width (us)**	**Chirp Width (MHz)**	**Number of Pulses per Burst**	**PRI-1 (us)**	**PRI-2 (us)**	**PRI-3 (us)**
591291	70	11	2	1208	1481	-
815216	51.8	5	1	1896	-	-
117197	97.9	20	3	1255	1463	1169
340497	75.4	13	2	1776	1116	-
563700	70.6	11	2	1361	1483	-
786312	85.5	16	3	1168	1155	1192
89901	70.6	11	2	1078	1126	-
312423	97.5	20	3	1237	1833	1540
536877	64.5	9	1	1698	-	-
759212	81.4	15	2	1575	1490	-
62185	99.2	20	3	1350	1982	1902
285880	54.7	6	1	1722	-	-
508479	75.7	13	2	1594	1682	-

Statistical Performance Check Result						
Radar Test Signal (#)		5		Trail #	2	
Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
1190042	68.2	10	2	1790	1952	-
56652	84.7	16	3	1714	1515	1061
419783	69.6	11	2	1458	1500	-
783608	56.5	7	1	1533	-	-
1144211	84.2	15	3	1322	1988	1910
11992	56.5	7	1	1411	-	-
374471	97.5	20	3	1353	1981	1974
738925	54.4	6	1	1365	-	-

Statistical Performance Check Result						
Radar Test Signal (#)		5		Trail #	3	
Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
439705	70	11	2	1001	1246	-
583092	84.7	16	3	1198	1120	1552
132117	55.3	6	1	1264	-	-
277048	64.5	9	1	1871	-	-
421122	68.6	10	2	1381	1894	-
564997	93.7	18	3	1306	1111	1754
113465	96.8	19	3	1996	1535	1742
258948	78.3	14	2	1239	1166	-
403936	76.7	13	2	1221	1107	-
545928	86.2	16	3	1947	1800	1806
96115	72.3	12	2	1504	1176	-
241508	64.6	9	1	1382	-	-
384855	95.4	19	3	1598	1117	1511
528969	85.4	16	3	1631	1870	1152
78179	73.2	12	2	1729	1649	-
223000	77.7	13	2	1815	1238	-
368464	65.7	10	1	1941	-	-
510325	90.2	17	3	1899	1935	1819
60248	98.9	20	3	1194	1675	1570
205316	79.6	14	2	1245	1375	-

Statistical Performance Check Result						
Radar Test Signal (#)		5		Trail #	4	
Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
501575	51	5	1	1542	-	-
707132	98.7	20	3	1613	1219	1066
60818	91.5	18	3	1072	1397	1549
267493	87	16	3	1253	1748	1762
475767	66.3	10	1	1987	-	-
680475	86.6	16	3	1785	1777	1797
35313	95.2	19	3	1482	1137	1844
242662	73.5	12	2	1059	1475	-
449288	98	20	3	1180	1480	1096
657034	74.6	12	2	1324	1427	-
9842	92.4	18	3	1133	1753	1378
217141	82	15	2	1236	1259	-
422905	87.8	17	3	1803	1842	1900
631115	72.9	12	2	1559	1726	-

Statistical Performance Check Result						
Radar Test Signal (#)		5		Trail #	5	
Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
902081	100	20	3	1258	1396	1493
206352	67.1	10	2	1492	1179	-
429145	92.5	18	3	1410	1150	1042
653709	60.9	8	1	1399	-	-
877441	52	5	1	1193	-	-
178469	91.8	18	3	1686	1403	1569
402251	73.8	12	2	1067	1218	-
625039	69.2	11	2	1841	1229	-
847087	87.9	17	3	1073	1416	1755
151064	95.2	19	3	1197	1512	1756
374324	76.8	13	2	1437	1879	-
596338	90.1	17	3	1352	1925	1666
820999	80.4	14	2	1586	1132	-

Statistical Performance Check Result						
Radar Test Signal (#)		5		Trail #	6	
Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
94587	82.8	15	2	1332	1689	-
265527	61.5	8	1	1764	-	-
435227	91.9	18	3	1301	1024	1167
605381	90.8	18	3	1277	1091	1354
73476	94	19	3	1185	1805	1109
244588	57.6	7	1	1487	-	-
414781	67.8	10	2	1026	1554	-
586578	53.4	6	1	1110	-	-
52576	71.4	11	2	1583	1653	-
222476	93.3	18	3	1791	1766	1296
393218	68.4	10	2	1678	1890	-
562777	98.2	20	3	1510	1605	1418
31603	82	15	2	1300	1523	-
201756	98.6	20	3	1020	1070	1990
372162	73.3	12	2	1999	1709	-
542921	80.3	14	2	1205	1908	-
10620	52	5	1	1445	-	-

Statistical Performance Check Result						
Radar Test Signal (#)		5		Trail #	7	
Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
236763	93.9	19	3	1325	1401	1265
458923	90.3	17	3	1962	1647	1876
683506	76.8	13	2	1499	1242	-
906848	72.4	12	2	1595	1013	-
209338	85.5	16	3	1048	1368	1438
433316	56	6	1	1646	-	-
654365	85.2	16	3	1784	1878	1389
880256	54.8	6	1	1659	-	-
181618	88.1	17	3	1927	1928	1307
405781	57.1	7	1	1664	-	-
629680	55.8	6	1	1039	-	-
852332	81.8	15	2	1050	1038	-
154801	60.7	8	1	1557	-	-

Statistical Performance Check Result						
Radar Test Signal (#)		5		Trail #	8	
Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
244340	96.4	19	3	1226	1572	2000
390950	60.1	8	1	1346	-	-
534907	76.3	13	2	1441	1284	-
82690	56.2	6	1	1273	-	-
227993	62.4	8	1	1031	-	-
372695	62	8	1	1940	-	-
517788	56	6	1	1889	-	-
64471	83.9	15	3	1106	1311	1930
209097	98.4	20	3	1260	1022	1606
354143	74.3	12	2	1178	1917	-
499561	70	11	2	1069	1249	-
46749	69.5	11	2	1773	1652	-
191589	78.6	14	2	1347	1603	-
336486	73.9	12	2	1177	1608	-
481767	74.1	12	2	1153	1089	-
28998	62.7	9	1	1944	-	-
173769	70.1	11	2	1224	1672	-
317895	93.3	18	3	1217	1015	1957
464152	50.5	5	1	1929	-	-
11067	89	17	3	1945	1615	1847

Statistical Performance Check Result						
Radar Test Signal (#)		5		Trail #	9	
Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
283763	85.8	16	3	1451	1023	1821
548478	51.3	5	1	1960	-	-
809743	86.6	16	3	1998	1989	1778
1077369	63.2	9	1	1270	-	-
251895	57.9	7	1	1730	-	-
514624	97.4	20	3	1488	1953	1309
780737	55.4	6	1	1002	-	-
1044449	56.6	7	1	1654	-	-
218719	86	16	3	1683	1425	1787
483655	55.9	6	1	1417	-	-
747738	50.5	5	1	1641	-	-

Statistical Performance Check Result						
Radar Test Signal (#)		5		Trail #	10	
Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
695151	61.9	8	1	1713	-	-
128132	71.6	11	2	1320	1648	-
309769	60.6	8	1	1862	-	-
489296	97	20	3	1244	1669	1873
672580	58.2	7	1	1954	-	-
105804	71.9	12	2	1694	1351	-
286805	75.7	13	2	1869	1591	-
467329	86.1	16	3	1161	1266	1887
650589	61.2	8	1	1544	-	-
83455	74.3	12	2	1934	1415	-
264701	68.2	10	2	1422	1478	-
444952	95.5	19	3	1657	1214	1610
628454	65.9	10	1	1276	-	-
61315	56.8	7	1	1335	-	-
242712	52.9	5	1	1881	-	-
424295	56.8	7	1	1634	-	-

Statistical Performance Check Result						
Radar Test Signal (#)		5		Trail #	11	
Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
483494	82.2	15	2	1691	1029	-
31130	61.1	8	1	1623	-	-
175309	92.1	18	3	1303	1697	1836
320742	68	10	2	1362	1450	-
466659	63.9	9	1	1426	-	-
13250	55.3	6	1	1823	-	-
157701	92.9	18	3	1232	1191	1763
302865	75	12	2	1571	1312	-
446764	95	19	3	1254	1650	1207
591996	73.6	12	2	1550	1846	-
140621	63	9	1	1121	-	-
283899	98.4	20	3	1343	1977	1926
430680	65.1	9	1	1725	-	-
575746	56.5	7	1	1761	-	-
122072	99.4	20	3	1241	1118	1973
266724	98	20	3	1588	1304	1028
410761	92.5	18	3	1484	1733	1473
556827	73.8	12	2	1574	1310	-
104794	58	7	1	1380	-	-
248823	97.9	20	3	1443	1326	1376

Statistical Performance Check Result						
Radar Test Signal (#)		5		Trail #	12	
Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
878323	68	10	2	1562	1223	-
1201036	77	13	2	1576	1195	-
193430	65.9	10	1	1019	-	-
515373	90.9	18	3	1728	1142	1206
837168	94.4	19	3	1333	1997	1685
1162414	57.1	7	1	1479	-	-
153280	89.3	17	3	1447	1536	1062
476708	64.6	9	1	1156	-	-
798519	67.6	10	2	1975	1319	-

Statistical Performance Check Result						
Radar Test Signal (#)		5		Trail #	13	
Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
721573	55.9	6	1	1087	-	-
72983	70.6	11	2	1516	1373	-
280517	56.4	7	1	1822	-	-
488047	54.9	6	1	1667	-	-
692783	90.5	17	3	1636	1670	1736
47463	73.3	12	2	1462	1435	-
253983	95.6	19	3	1681	1897	1538
460713	94	19	3	1555	1620	1780
667923	87.9	17	3	1140	1812	1329
21923	86.7	16	3	1095	1456	1097
229477	56.6	7	1	1581	-	-
436459	78.8	14	2	1308	1289	-
642305	85.7	16	3	1299	1852	1315
852309	51.9	5	1	1250	-	-

Statistical Performance Check Result						
Radar Test Signal (#)		5		Trail #	14	
Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
237287	84.6	16	3	1314	1508	1611
480167	58.8	7	1	1472	-	-
721239	77.4	13	2	1092	1904	-
963224	71	11	2	1139	1671	-
208121	54.6	6	1	1673	-	-
449554	74.9	12	2	1469	1738	-
691801	70.3	11	2	1233	1263	-
934484	52.9	5	1	1687	-	-
177771	92.1	18	3	1433	1826	1355
419126	98.9	20	3	1915	1407	1428
662911	55.1	6	1	1125	-	-
902272	88.9	17	3	1635	1045	1643

Statistical Performance Check Result						
Radar Test Signal (#)		5		Trail #	15	
Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
104782	55.1	6	1	1331	-	-
274485	95.2	19	3	1288	1262	1779
446644	51.1	5	1	1157	-	-
615134	73.6	12	2	1965	1963	-
83697	56.7	7	1	1637	-	-
254526	66	10	1	1563	-	-
424104	78.2	14	2	1872	1746	-
596368	57.3	7	1	1323	-	-
62396	89.1	17	3	1882	1328	1370
233528	53	5	1	1432	-	-
404155	56.6	7	1	1824	-	-
572746	93.4	18	3	1699	1269	1507
41534	74.7	12	2	1498	1593	-
211866	83.3	15	2	1585	1892	-
383319	53.8	6	1	1460	-	-
553954	53.9	6	1	1727	-	-
20589	54.5	6	1	1356	-	-

Statistical Performance Check Result						
Radar Test Signal (#)		5		Trail #	16	
Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
249549	87.2	16	3	1529	1868	1392
473814	51.3	5	1	1772	-	-
696747	69.1	11	2	1145	1305	-
919852	82.3	15	2	1614	1012	-
222458	75	13	2	1477	1898	-
445510	81.4	15	2	1625	1760	-
669234	82	15	2	1290	1173	-
891674	66.9	10	2	1526	1801	-
194770	86.2	16	3	1172	1980	1227
417571	84.6	16	3	1932	1394	1079
640275	89.8	17	3	1601	1071	1880
862582	97.4	20	3	1985	1745	1316
167886	52.9	5	1	1294	-	-

Statistical Performance Check Result						
Radar Test Signal (#)		5		Trail #	17	
Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
564844	78.5	14	2	1406	1829	-
888379	57.6	7	1	1820	-	-
1208797	99.8	20	3	1248	1692	1645
202812	51.5	5	1	1298	-	-
525477	68.1	10	2	1088	1213	-
848768	50.3	5	1	1558	-	-
1169382	92.8	18	3	1580	1573	1114
162951	64.2	9	1	1854	-	-
485678	79.9	14	2	1011	1387	-

Statistical Performance Check Result						
Radar Test Signal (#)		5		Trail #	18	
Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
452762	90.6	17	3	1885	1390	1371
636546	50.5	5	1	1103	-	-
69136	78.3	14	2	1485	1175	-
250688	62.9	9	1	1768	-	-
431876	81.6	15	2	1211	1044	-
613696	52.2	5	1	1684	-	-
46710	84	15	3	1704	1338	1209
227355	96.3	19	3	1920	1674	1384
409287	71.3	11	2	1292	1421	-
590397	71.1	11	2	1818	1060	-
24536	66.3	10	1	1055	-	-
205244	98.5	20	3	1712	1448	1291
387827	54.9	6	1	1043	-	-
566988	97.5	20	3	1749	1158	1404
2150	86.1	16	3	1607	1867	1436
183641	56.5	7	1	1721	-	-

Statistical Performance Check Result						
Radar Test Signal (#)		5		Trail #	19	
Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
649004	80.2	14	2	1476	1792	-
972632	63.8	9	1	1837	-	-
1294265	69.1	11	2	1455	1715	-
287125	56.7	7	1	1234	-	-
609502	70.5	11	2	1127	1633	-
931751	81.5	15	2	1629	1783	-
1253215	88.5	17	3	1147	1810	1604
247305	60	8	1	1363	-	-
568977	86.1	16	3	1212	1662	1696

Statistical Performance Check Result						
Radar Test Signal (#)		5		Trail #	20	
Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
400523	74.5	12	2	1775	1082	-
544232	99.1	20	3	1564	1074	1442
92772	93.7	18	3	1995	1235	1293
238062	73.1	12	2	1006	1337	-
383830	65.2	9	1	1068	-	-
529131	53.4	6	1	1021	-	-
75357	61.2	8	1	1553	-	-
219129	90.3	17	3	1807	1912	1551
365634	57.2	7	1	1565	-	-
510479	60.8	8	1	1909	-	-
57360	68.5	10	2	1626	1163	-
202693	54	6	1	1340	-	-
347847	62.1	8	1	1408	-	-
490344	99.8	20	3	1556	1877	1230
39483	79.7	14	2	1701	1622	-
184461	82.9	15	2	1302	1164	-
328025	89.9	17	3	1520	1638	1769
475199	63.2	9	1	1336	-	-
21678	68.6	10	2	1502	1256	-
166512	81	14	2	1398	1420	-

Statistical Performance Check Result						
Radar Test Signal (#)		5		Trail #	21	
Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
694608	54.5	6	1	1034	-	-
1016456	73.6	12	2	1590	1115	-
8551	60.1	8	1	1933	-	-
331564	63.7	9	1	1505	-	-
653496	95.1	19	3	1405	1075	1220
975332	88	17	3	1628	1744	1202
1297079	86.6	16	3	1271	1914	1921
291425	73.6	12	2	1188	1924	-
614597	57.5	7	1	1916	-	-

Statistical Performance Check Result						
Radar Test Signal (#)		5		Trail #	22	
Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
648947	59.4	8	1	1464	-	-
872834	59.1	7	1	1077	-	-
174442	62	8	1	1104	-	-
397033	68.2	10	2	1747	1711	-
619847	76.8	13	2	1972	1816	-
844713	57	7	1	1706	-	-
146857	53.2	6	1	1367	-	-
369203	90.4	17	3	1731	1446	1170
592949	73.2	12	2	1201	1710	-
817479	56.1	6	1	1377	-	-
119201	67.7	10	2	1130	1171	-
342999	55.1	6	1	1007	-	-
566579	58.1	7	1	1090	-	-

Statistical Performance Check Result						
Radar Test Signal (#)		5		Trail #	23	
Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
601322	97.7	20	3	1345	1186	1735
69798	86.6	16	3	1578	1884	1521
240236	67.6	10	2	1861	1813	-
411573	52.4	5	1	1913	-	-
581299	68	10	2	1719	1414	-
49079	64	9	1	1828	-	-
218917	89.4	17	3	1765	1548	1453
389991	73.8	12	2	1690	1216	-
560724	80.6	14	2	1327	1280	-
27969	68.2	10	2	1893	1857	-
198477	69.9	11	2	1474	1501	-
368635	79	14	2	1619	1964	-
539754	81.5	15	2	1395	1160	-
7017	50.9	5	1	1366	-	-
177018	88.9	17	3	1080	1978	1740
347849	80	14	2	1339	1850	-
518155	78.1	13	2	1503	1848	-

Statistical Performance Check Result						
Radar Test Signal (#)		5		Trail #	24	
Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
1303061	77.3	13	2	1858	1937	-
296120	66.9	10	2	1452	1703	-
618053	87.6	17	3	1461	1679	1471
941705	82.8	15	2	1058	1582	-
1262467	97.9	20	3	1561	1786	1369
256754	51.6	5	1	1225	-	-
579778	56.4	7	1	1349	-	-
900681	85.8	16	3	1708	1025	1781
1223080	85.3	16	3	1357	1971	1057

Statistical Performance Check Result						
Radar Test Signal (#)		5		Trail #	25	
Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
177128	92.7	18	3	1040	1064	1252
441120	76.5	13	2	1567	1231	-
703834	92.6	18	3	1739	1434	1457
968288	66.7	10	2	1774	1737	-
144880	57.1	7	1	1532	-	-
408948	50.9	5	1	1907	-	-
672738	75.9	13	2	1054	1383	-
935219	96.5	19	3	1802	1341	1046
112148	75.9	13	2	1951	1400	-
376130	73.5	12	2	1053	1677	-
638910	96.2	19	3	1531	1865	1268

Statistical Performance Check Result						
Radar Test Signal (#)		5		Trail #	26	
Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
826712	92.6	18	3	1834	1000	1983
72998	69.9	11	2	1849	1518	-
314688	72.5	12	2	1489	1958	-
555527	84.2	15	3	1831	1182	1967
797115	83.8	15	3	1843	1348	1459
43224	78.8	14	2	1412	1979	-
284734	91	18	3	1295	1086	1705
526386	92.2	18	3	1003	1723	1148
767431	89.3	17	3	1660	1724	1200
13435	95.4	19	3	1439	1190	1942
255680	56.1	6	1	1358	-	-
497683	64.3	9	1	1759	-	-

Statistical Performance Check Result						
Radar Test Signal (#)		5		Trail #	27	
Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
466662	60.4	8	1	1883	-	-
616742	95.2	19	3	1991	1243	1334
142355	78.8	14	2	1016	1100	-
295519	50.7	5	1	1051	-	-
446771	67.6	10	2	1527	1874	-
599225	75.4	13	2	1809	1486	-
123039	99.9	20	3	1010	1970	1741
275129	85	16	3	1330	1318	1943
428981	61.1	8	1	1968	-	-
580996	66.7	10	2	1644	1065	-
104670	82.7	15	2	1313	1261	-
257432	71.4	11	2	1027	1037	-
410696	62.9	9	1	1162	-	-
561441	81.3	15	2	1939	1630	-
86077	63.9	9	1	1122	-	-
239011	61.1	8	1	1047	-	-
390966	68.9	11	2	1204	1402	-
544078	53.1	6	1	1950	-	-
66876	85.1	16	3	1468	1129	1959

Statistical Performance Check Result						
Radar Test Signal (#)		5		Trail #	28	
Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
208292	75.1	13	2	1577	1919	-
354271	65.3	9	1	1286	-	-
495997	83.9	15	3	1955	1534	1969
45716	85.5	16	3	1624	1587	1386
191235	57.3	7	1	1105	-	-
334080	94.4	19	3	1901	1992	1495
481017	53.3	6	1	2000	-	-
27921	99	20	3	1379	1789	1592
172578	69.1	11	2	1922	1830	-
318204	60.7	8	1	1839	-	-
463599	64.3	9	1	1423	-	-
10138	96.6	19	3	1680	1440	1702
154700	90	17	3	1798	1009	1196
298982	86.6	16	3	1413	1524	1596
445818	62.1	8	1	1287	-	-
589319	82.1	15	2	1159	1856	-
137185	71.5	11	2	1621	1119	-
281563	78.3	14	2	1888	1860	-
427881	50.1	5	1	1359	-	-
572624	58.3	7	1	1825	-	-

Statistical Performance Check Result						
Radar Test Signal (#)		5		Trail #	29	
Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
159228	71	11	2	1700	1429	-
352518	76	13	2	1895	1181	-
544323	88.6	17	3	1364	1961	1903
737838	85	16	3	1757	1281	1372
135567	75.8	13	2	1099	1174	-
328212	87.2	16	3	1285	1014	1984
522698	51.1	5	1	1994	-	-
715290	71.3	11	2	1525	1528	-
111884	52.4	5	1	1210	-	-
305327	64.8	9	1	1966	-	-
497761	79.9	14	2	1938	1811	-
691696	73.2	12	2	1661	1143	-
87610	86.1	16	3	1993	1282	1665
281813	60.2	8	1	1041	-	-
474637	81.1	14	2	1617	1017	-

Statistical Performance Check Result						
Radar Test Signal (#)		5		Trail #	30	
Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
713761	99.1	20	3	1466	1853	1864
68606	76.6	13	2	1948	1018	-
276396	59.6	8	1	1030	-	-
482744	71.4	11	2	1513	1793	-
691089	56.4	7	1	1743	-	-
43150	64.2	9	1	1752	-	-
250293	76.4	13	2	1251	1579	-
457068	80.8	14	2	1838	1782	-
665070	74.2	12	2	1093	1247	-
17534	96.8	19	3	1855	1771	1135
224742	70.1	11	2	1658	1283	-
430908	92.7	18	3	1618	1514	1795
638128	84.8	16	3	1430	1279	1509
847663	50.7	5	1	1519	-	-

Data Sheet for Radar Type 6

Radar Type	6				
Frequency List (MHz)	0	1	2	3	4
0	5533	5351	5644	5590	5360
5	5512	5492	5261	5335	5616
10	5520	5376	5256	5614	5601
15	5559	5471	5628	5711	5632
20	5721	5574	5653	5569	5317
25	5434	5406	5382	5511	5557
30	5428	5314	5484	5508	5555
35	5506	5578	5722	5680	5324
40	5579	5635	5333	5474	5540
45	5402	5453	5522	5550	5667
50	5689	5322	5716	5306	5325
55	5523	5651	5457	5475	5600
60	5535	5456	5714	5570	5345
65	5328	5571	5295	5259	5303
70	5336	5588	5526	5417	5379
75	5673	5654	5257	5583	5447
80	5509	5517	5596	5449	5279
85	5372	5507	5458	5286	5334
90	5355	5399	5358	5444	5326
95	5719	5269	5630	5443	5341

4 Test Equipment and Calibration Data

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Last Cal.	Calibration Due Date
Spectrum Analyzer	R&S	FSP7	100645	9kHz ~ 7GHz	Apr. 17, 2014	Apr. 16, 2015
Vector Signal Generator	R&S	SMU200A	102098	100kHz ~ 6GHz	Nov. 03, 2013	Nov. 02, 2014
Horn Antenna	ETS	3115	6744	1GHz ~ 18GHz	May 05, 2014	May 04, 2015
Horn Antenna	COM-POWER	AH-118	10094	1GHz ~ 18GHz	Apr. 21, 2014	Apr. 20, 2015
RF Cable-3m	HUBER+SUHNER	SUCOFLEX_104	302338	1GHz ~ 26.5GHz	Dec. 03, 2013	Dec. 02, 2014
RF Cable-8m	HUBER+SUHNER	SUCOFLEX_104	MY17172/4	0.05GHz ~ 26.5GHz	Dec. 03, 2013	Dec. 02, 2014

Add Radar 1

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Last Cal.	Calibration Due Date
Spectrum Analyzer	Keysight	N9010A	MY55150165	9KHz~7GHz	Nov. 03, 2015	Nov. 02, 2016
Signal Generator	Keysight	N5182B	MY53051912	9KHz ~ 6GHz	Oct. 13, 2015	Oct. 12, 2016
Horn Antenna	COM-POWER	AH-118	10091	1GHz ~ 18GHz	Apr. 15, 2015	Apr. 14, 2016
Horn Antenna	COM-POWER	AH-118	711064	1GHz ~ 18GHz	Nov. 14, 2015	Nov. 13, 2016