EN301893 DFS Test Report

Product Name	:	WIRELESS-ABGN 3X3 NETWORK MINI PCIE ADAPTER
Model No.	:	WLE350NX

Applicant	:	Compex Systems Pte Ltd
Address	:	135 Joo Seng Road, #08-01 PM Industrial Building Singapore 368363

Date of Receipt	:	04/02/2013
Test Date	:	05/02/2013~08/04/2013
Issued Date	:	08/04/2013
Report No.	:	132S008R-RFCE-DFS-P32V01
Report Version	:	V1.0

DFS Test Report

Issued Date: 08/04/2013
Report No.: 132S008R-RFCE-DFS-P32V01

QuieTek

Product Name	:	WIRELESS-ABGN 3X3 NETWORK MINI PCIE ADAPTER
Applicant	:	Compex Systems Pte Ltd
Address	:	135 Joo Seng Road, #08-01 PM Industrial Building Singapore 368363
Manufacturer	:	Compex Systems Pte Ltd
Address	:	135 Joo Seng Road, #08-01 PM Industrial Building Singapore 368363
Model No.	:	WLE350NX
EUT Voltage	:	DC: 3.3V
Trade Name	:	COMPEX
Applicable Standard	:	ETSI EN 301 893 V1.7.1 (2012-06) Clause 4.7
Test Result	:	Pass
Performed Location	:	SuZhou EMC laboratory No.99 Hongye Rd., Suzhou Industrial Park Loufeng Hi-Tech Development Zone., SuZhou, China TEL: +86-512-6251-5088 / FAX: +86-512-6251-5098
Operation Mode (5250~5350, 5470~5725MHz)	:	☒Master device ☐ Slaver device with radar detection function ☐ Slaver device without radar detection function
Max/Min Antenna Gain	:	7dBi/2dBi
EIRP Density (Max)	:	15.29dBm/MHz (Total 13.45dBm/MHz for three streams)

Documented By : Alice Ni
(Alice Ni)

Reviewed By : Jame Yuan
(Jame Yuan)

Approved By : Robin Wu
(Robin Wu)

Laboratory Information

We, QuieTek Corporation, are an independent EMC and safety consultancy that was established the whole facility in our laboratories. The test facility has been accredited/accepted(audited or listed) by the following related bodies in compliance with ISO 17025, EN 45001 and specified testing scope:

Taiwan R.O.C.	**:**	**BSMI, NCC, TAF**
Germany	**:**	**TUV Rheinland**
Norway	**:**	**Nemko, DNV**
USA	**:**	**FCC, NVLAP**
Japan	**:**	**VCCI**
China	**:**	**CNAS**

The related certificate for our laboratories about the test site and management system can be downloaded from QuieTek Corporation's Web Site :http://www.quietek.com/tw/ctg/cts/accreditations.htm
The address and introduction of QuieTek Corporation's laboratories can be founded in our Web site : http://www.quietek.com/
If you have any comments, Please don't hesitate to contact us. Our contact information is as below:

HsinChu Testing Laboratory :
No.75-2, 3rd Lin, Wangye Keng, Yonghxing Tsuen, Qionglin Shiang, Hsinchu County 307, Taiwan, R.O.C.
TEL:+886-3-592-8858 / FAX:+886-3-592-8859 E-Mail : service@quietek.com

LinKou Testing Laboratory :
No.5-22, Ruishukeng, Linkou Dist., New Taipei City 24451, Taiwan, R.O.C.
TEL : 886-2-8601-3788 / FAX : 886-2-8601-3789 E-Mail : service@quietek.com

Suzhou Testing Laboratory :
No.99 Hongye Rd., Suzhou Industrial Park Loufeng Hi-Tech Development Zone., SuZhou, China
TEL : +86-512-6251-5088 / FAX : 86-512-6251-5098 E-Mail : service@quietek.com

TABLE OF CONTENTS

1. General Information

The UUT operates in the following bands: 5150-5350,5470-5725MHz

The UUT is Master Device that has radar interference detection function. The highest gain antenna assembly utilized with the EUT has a maximum gain of 7dBi in 5GHz frequency band, and the antenna with lowest gain was used to test. The 50-ohm Tx/Rx antenna port is connected to the test system to perform conducted tests.
The detection threshold value was set as -62dBm + 10 – E.I.R.P spectral density (dBm/MHz) + G (dBi), however the DFS threshold level shall not be lower than -64dBm assuming a 0dBi receive antenna gain. So we set -64dBm level as extreme case.

Antenna	Manufacturer	Peak Gain
Panel Antenna	A*STAR Institute for Infocomm Research	3dBi for 2.4GHz, 5dBi for 5GHz
Dipole Antenna 1#	SmartAnt Telecom Co., Ltd.	4.5dBi for 2.4GHz, 7dBi for 5GHz
Dipole Antenna 2#	Kunshan Wavelink Electronic Co., Ltd.	2dBi for 2.4GHz and 5GHz

The UUT utilizes 802.11a/n IP based architecture. One nominal channel bandwidth, 20 MHz and 40MHz are implemented.

The slaver device is Intel WiFi module 5100.

The test set-up is using **Set-up A** which UUT is a RLAN device operating in master mode, and test items as follows requirements:

Requirement	**DFS Operational mode**		
	Master	**Slave without radar detection**	**Slave with radar detection**
Channel Availability Check	√	Not required	☐√ (see note 2)
Off-Channel CAC (see note 1)	√	Not required	☐√ (see note 2)
In-Service Monitoring	√	Not required	√
Channel Shutdown	√	√	√
Non-Occupancy Period	√	Not required	√
Uniform Spreading	√	Not required	Not required

NOTE 1: Where implemented by the manufacturer.
NOTE 2: A slave with radar detection is not required to perform a CAC or *Off-Channel CAC* at initial use of the channel but only after the slave has detected a radar signal on the *Operating Channel* by *In-Service Monitoring.*

2. Test Equipment

Dynamic Frequency Selection (DFS) / TR-8

Instrument	Manufacturer	Type No.	Serial No	Cal. Date
Spectrum Analyzer	Agilent	N9020A	MY49100159	2013-03-30
Vector Signal Generator	Agilent	E4438C	102168	2013-03-30

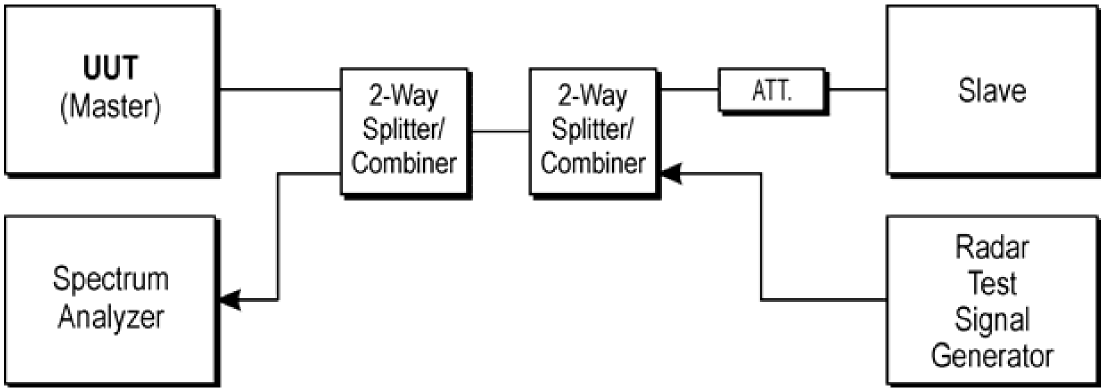
Instrument	Manufacturer	Type No.	Serial No
Splitter/Combiner (Qty: 2)	Mini-Circuits	ZAPD-50W 4.2-6.0 GHz	NN256400424
Splitter/Combiner (Qty: 2)	MCLI	PS3-7	4463/4464
ATT (Qty: 1)	Mini-Circuits	VAT-30+	30912
Laptop PC	Dell	N80V	8BN0AS226971468
RF Cable (Qty: 6)	Mini-Circuits	N/A	DFS-1~6

Software	Manufacturer	Function
Pulse Building	Agilent	Radar Signal Generation Software
DFS Tool	Agilent	DFS Test Software

3. Test Setup

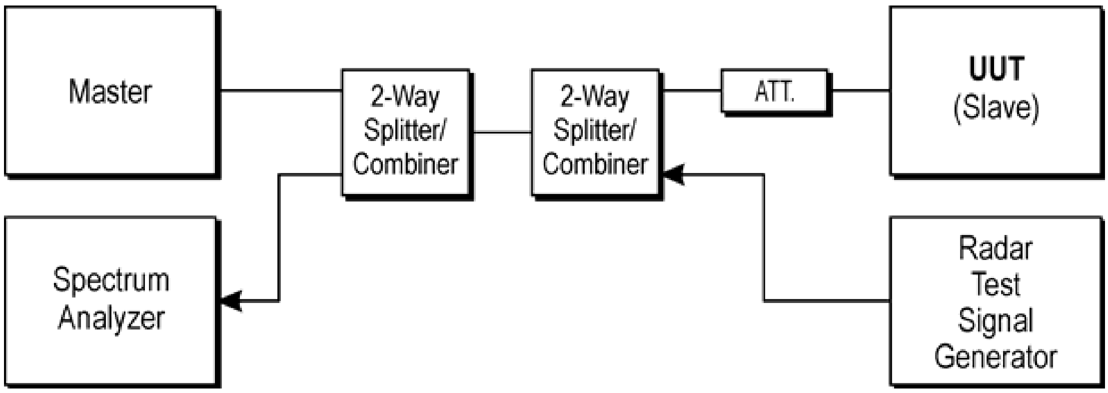
Set-up A

Set-up A is a set-up whereby the UUT is a RLAN device operating in master mode. Radar test signals are injected into the UUT. This set-up also contains a RLAN device operating in slave mode which is associated with the UUT.



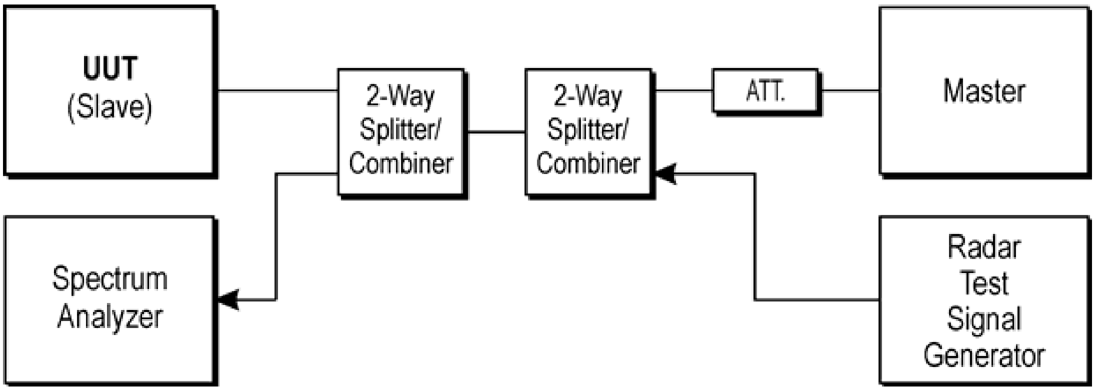
Set-up B

Set-up B is a set-up whereby the UUT is a RLAN device operating in slave mode, with or without Radar Interference Detection function. This set-up also contains a RLAN device operating in master mode. The radar test signals are injected into the master device. The UUT (slave device) is associated with the master device.

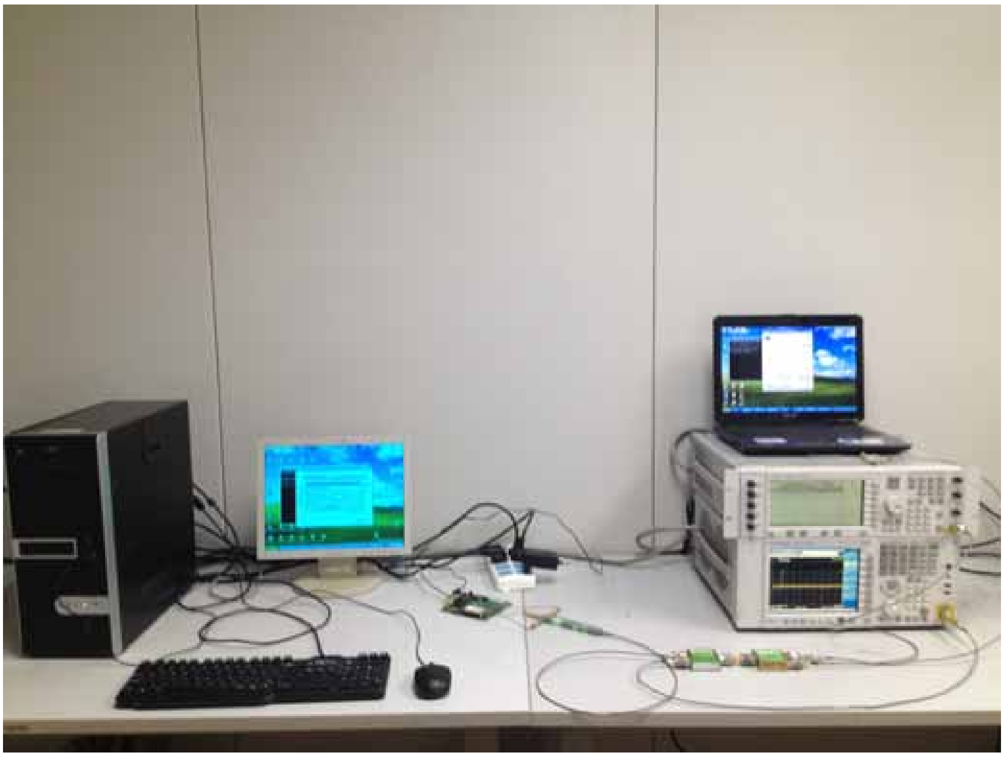


Set-up C

The UUT is a RLAN device operating in slave mode with Radar Interference Detection function. Radar test signals are injected into the slave device. This set-up also contains a RLAN device operating in master mode. The UUT (slave device) is associated with the master device.



DFS Set-up Photo: Master and Spectrum Analyzer



4. Test Items Description

4.1. Channel Availability Check

4.1.1. Definition

The *Channel Availability Check (CAC)* is defined as a mechanism by which a RLAN device checks a channel for the presence of radar signals. This mechanism is used for identifying *Available Channels*.

There shall be no transmissions by the device within the channel being checked during this process.

If no radars have been detected, the channel becomes an *Available Channel.*

NOTE: For devices that support multiple Nominal Channel Bandwidths, the *Channel Availability Check* may be performed once using the widest Nominal Channel Bandwidth. All narrower channels within the tested bandwidth become *Available Channels* providing no radar was detected.

4.1.2. Limit

The *Channel Availability Check* shall be performed during a continuous period in time (*Channel Availability Check Time*) which shall not be less than the value defined in table D.1.

During the *Channel Availability Check*, the RLAN shall be capable of detecting any of the radar test signals that fall within the ranges given by table D.4 with a level above the *Radar Detection Threshold* defined in table D.2.

The minimum required detection probability is defined in table D.5.

4.1.3. Conformance

Conformance tests for this requirement are defined in ETSI EN301893 V1.7.1 clause 5.3.8.

4.2. Off-Channel CAC (Off-Channel Channel Availability Check) (Optional)

4.2.1. Definition

Off-Channel CAC is defined as an optional mechanism by which a RLAN monitors channel(s), different from the *Operating Channel*, for the presence of radar signals. The *Off-Channel CAC* may be used in addition to the *Channel Availability Check* defined in clause 4.7.2.1, for identifying *Available Channels*.

Off-Channel CAC is performed by a number of non-continuous checks spread over a period in time. This time, which is required to determine the presence of radar signals, is defined as the *Off-Channel CAC Time*.

If no radars have been detected, the channel becomes an *Available Channel.*

4.2.2. Limit

Where implemented, the *Off-Channel CAC Time* shall be declared by the manufacturer. However, the declared *Off-Channel CAC Time* shall not be greater than the values specified in table D.1. During the *Off-Channel CAC,* the RLAN shall be capable of detecting any of the radar test signals that fall within the ranges given by table D.4 with a level above the *Radar Detection Threshold* defined in table D.2.

The minimum required detection probability is defined in table D.5.

4.2.3. Conformance

Conformance tests for this requirement are defined in ETSI EN301893 V1.7.1 clause 5.3.8.

4.3. In-Service Monitoring

4.3.1. Definition

The *In-Service Monitoring* is defined as the process by which a RLAN monitors the *Operating Channel* for the presence of radar signals.

4.3.2. Limit

The *In-Service Monitoring* shall be used to monitor an *Operating Channel*.

The *In-Service-Monitoring* shall start immediately after the RLAN has started transmissions on a channel.

During the *In-Service Monitoring*, the RLAN shall be capable of detecting any of the radar test signals that fall within the ranges given by table D.4 with a level above the *Radar Detection Threshold* defined in table D.2.

The minimum required detection probability associated to a given radar test signal is defined in table D.5.

4.3.3. Conformance

Conformance tests for this requirement are defined in ETSI EN301893 V1.7.1 clause 5.3.8.

4.4. Channel Shutdown

4.4.1. Definition

The *Channel Shutdown* is defined as the process initiated by the RLAN device on the *Operating Channel*. This process shall start immediately after a radar signal has been detected on the *Operating Channel*.

The master device shall instruct all associated slave devices to stop transmitting on this channel, which they shall do within the *Channel Move Time*.

Slave devices with a Radar Interference Detection function, shall stop their own transmissions on an Operating Channel within the *Channel Move Time* upon detecting a radar signal within this channel.

The aggregate duration of all transmissions of the RLAN device on this channel during the *Channel Move Time* shall be limited to the *Channel Closing Transmission Time.* The aggregate duration of all transmissions shall not include quiet periods in between transmissions.

NOTE: For equipment having simultaneous transmissions on multiple (adjacent or non-adjacent) operating channels, only the channel(s) containing the freque ncy on which radar was detected is subject to the *Channel Shutdown* requirement. The equipment is allowed to continue transmissions on other *Operating Channels* .

4.4.2. Limit

The *Channel Move Time* shall not exceed the limit defined in table D.1.

The *Channel Closing Transmission Time* shall not exceed the limit defined in table D.1.

4.4.3. Conformance

Conformance tests for this requirement are defined in ETSI EN301893 V1.7.1 clause 5.3.8.

4.5. Non-Occupancy Period

4.5.1. Definition

The *Non-Occupancy Period* is defined as the time during which the RLAN device shall not make any transmissions on a channel after a radar signal was detected on that channel.

NOTE 1: For equipment having simultaneous transmissions on multiple (adjacent or non-adjacent) operating channels, only the channel(s) containing the freque ncy on which radar was detected is subject to the *Non-Occupancy Period* requirement. The equipment is allowed to continue transmissions on other *Operating Channels* .

NOTE 2: After the *Non-Occupancy Period*, the channel needs to be identified again as an *Available Channel* before the RLAN device may start transmitting again on this channel.

4.5.2. Limit

The *Non-Occupancy Period* shall not be less than the value defined in table D.1.

4.5.3. Conformance

Conformance tests for this requirement are defined in ETSI EN301893 V1.7.1 clause 5.3.8.

4.6. Uniform Spreading

4.6.1. Definition

The *Uniform Spreading* is a mechanism to be used by the RLAN to provide, on aggregate, a uniform loading of the spectrum across all devices. The *Uniform Spreading* is limited to the channels being declared as part of the channel plan.

NOTE: The required spreading may be achieved by various means. These means include network management functions controlling large numbers of RLAN devices as well as the channel selection function in an individual RLAN device.

4.6.2. Limit

Each of the declared channel plans (combination of centre frequencies and declared nominal bandwidths) shall make use of at least 60 % of the spectrum available in the applicable sub-band(s).

Each of the *Usable Channels* shall be used with approximately equal probability. RLAN equipment for which the declared channel plan includes channels whose nominal bandwidth falls completely or partly within the band 5 600 MHz to 5 650 MHz may omit these channels from the list of *Usable Channels* at initial power up or at initial installation. Channels being used by other RLAN equipment may be omitted from the list of *Usable Channels*.

5. Radar Wave Parameters

Table D.1: DFS requirement values

Parameter	Value
Channel Availability Check Time	60 s (see note 1)
Minimum Off-Channel CAC Time	6 minutes (see note 2)
Maximum Off-Channel CAC Time	4 hours (see note 2)
Channel Move Time	10 s
Channel Closing Transmission Time	1 s
Non-Occupancy Period	30 minutes
NOTE 1: For channels whose nominal bandwidth falls completely or partly within the band 5 600 MHz to 5 650 MHz, the *Channel Availability Check Time* shall be 10 minutes. NOTE 2: For channels whose nominal bandwidth falls completely or partly within the band 5 600 MHz to 5 650 MHz, the Maximum *Off-Channel CAC Time* shall be 24 hours.	

Table D.2: Interference threshold values

EIRP Spectral Density dBm/MHz	Value (see notes 1 and 2)
10	-62 dBm
NOTE 1: This is the level at the input of the receiver of a RLAN device with a maximum EIRP density of 10 dBm/MHz and assuming a 0 dBi receive antenna. For devices employing different EIRP spectral density and/or a different receive antenna gain G (dBi) the DFS threshold level at the receiver input follows the following relationship: DFS Detection Threshold (dBm) = -62 + 10 - EIRP Spectral Density (dBm/MHz) + G (dBi), however the DFS threshold level shall not be lower than -64 dBm assuming a 0 dBi receive antenna gain. NOTE 2: Slave devices with a maximum EIRP of less than 23 dBm do not have to implement radar detection.	

Table D.3: Parameters of the reference DFS test signal

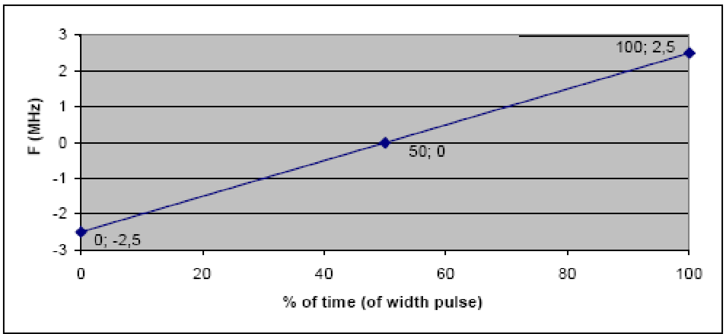
Pulse width W [μs]	Pulse repetition frequency PRF [pps]	Pulses per burst [PPB]
1	700	18

Table D.4: Parameters of radar test signals

Radar test signal # (see notes 1 to 3)	Pulse width W [µs]		Pulse repetition frequency PRF (PPS)		Number of different PRFs	Pulses per burst for each PRF (PPB) (see note 5)
	Min	Max	Min	Max		
1	0.5	5	200	1000	1	10 (see note 6)
2	0.5	15	200	1600	1	15 (see note 6)
3	0.5	15	2300	4000	1	25
4	20	30	2000	4000	1	20
5	0.5	2	300	400	2/3	10 (see note 6)
6	0.5	2	400	1200	2/3	15 (see note 6)

NOTE 1: Radar test signals 1 to 4 are constant PRF based signals. See figure D.1. These radar test signals are intended to simulate also radars using a packet based Staggered PRF. See figure D.2.

NOTE 2: Radar test signal 4 is a modulated radar test signal. The modulation to be used is a chirp modulation with a ±2,5 MHz frequency deviation which is described below.



NOTE 3: Radar test signals 5 and 6 are single pulse based Staggered PRF radar test signals using 2 or 3 different PRF values. For radar test signal 5, the difference between the PRF values chosen shall be between 20 PPS and 50 PPS. For radar test signal 6, the difference between the PRF values chosen shall be between 80 PPS and 400 PPS. See figure D.3.

NOTE 4: Apart for the Off-Channel CAC testing, the radar test signals above shall only contain a single burst of pulses. See figures D.1, D.3 and D.4.

For the Off-Channel CAC testing, repetitive bursts shall be used for the total duration of the test. See figures D.2 and D.5. See also clauses 4.7.2.2, 5.3.8.2.1.3.1 and 5.3.8.2.1.3.2.

NOTE 5: The total number of pulses in a burst is equal to the number of pulses for a single PRF multiplied by the number of different PRFs used.

NOTE 6: For the CAC and Off-Channel CAC requirement s, the minimum number of pulses (for each PRF) for any of the radar test signals to be detected in the band 5 600 MHz to 5 650 MHz shall be 18.

Table D.5: Detection probability

Parameter	Detection Probability (Pd)	
	Channels whose nominal bandwidth falls partly or completely within the 5 600 MHz to 5 650 MHz band	Other channels
CAC, Off-Channel CAC	99,99 %	60 %
In-Service Monitoring	60 %	60 %
NOTE: Pd gives the probability of detection per simulated radar burst and represents a minimum level of detection performance under defined conditions. Therefore Pd does not represent the overall detection probability for any particular radar under real life conditions.		

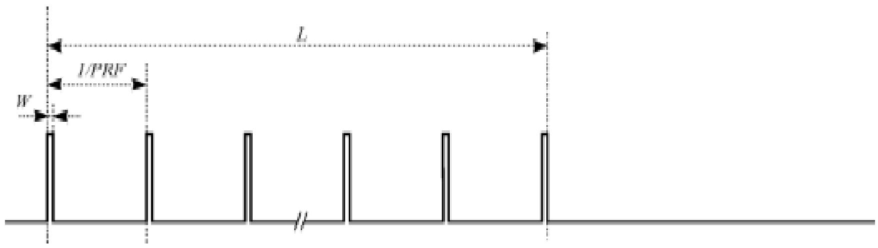


Figure D.1: General structure of a single burst / constant PRF based radar test signal

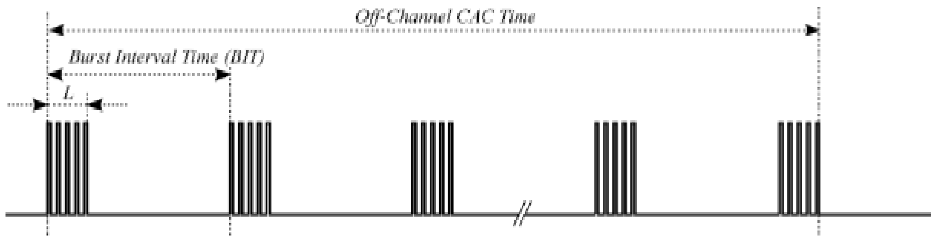


Figure D.2: General structure of a multiple burst / constant PRF based radar test signal

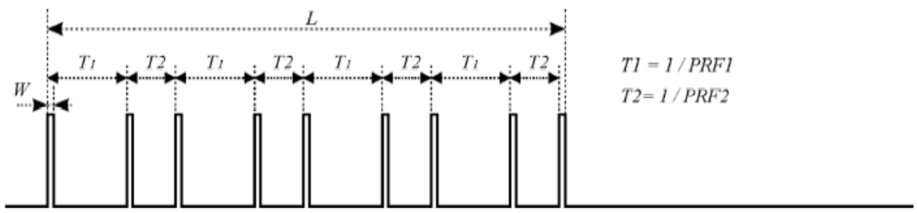


Figure D.3: General structure of a single burst / single pulse based staggered PRF radar test signal

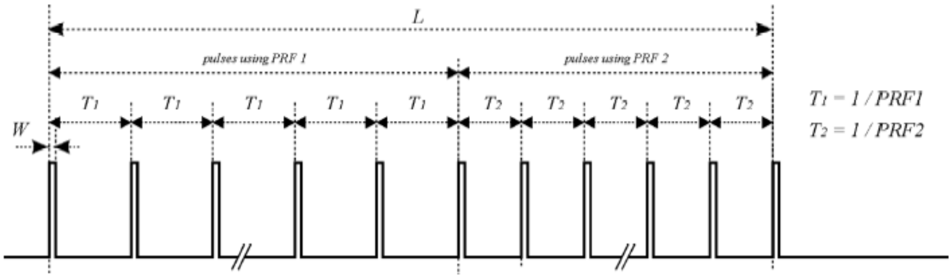


Figure D.4: General structure of a single burst / packet based staggered PRF radar test signal

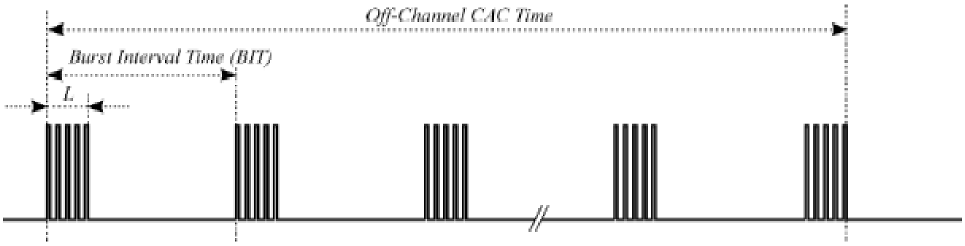


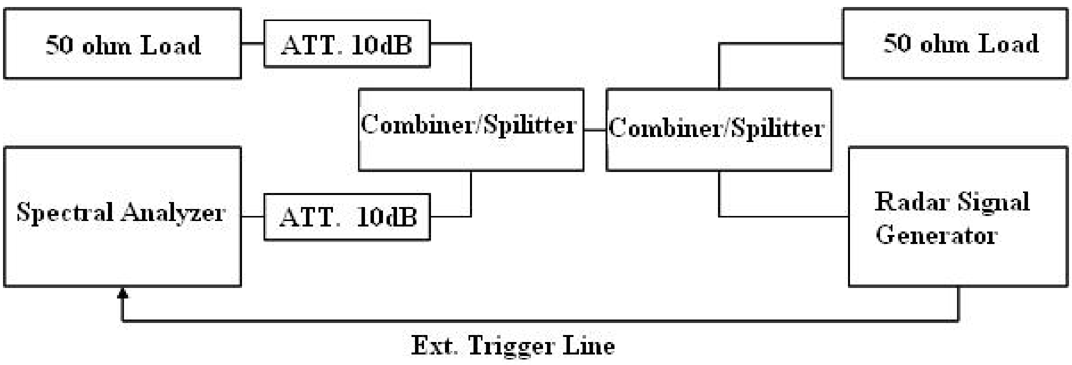
Figure D.5: General structure of a multiple burst / packet based staggered PRF based radar test signal

6. Radar Waveform Calibration

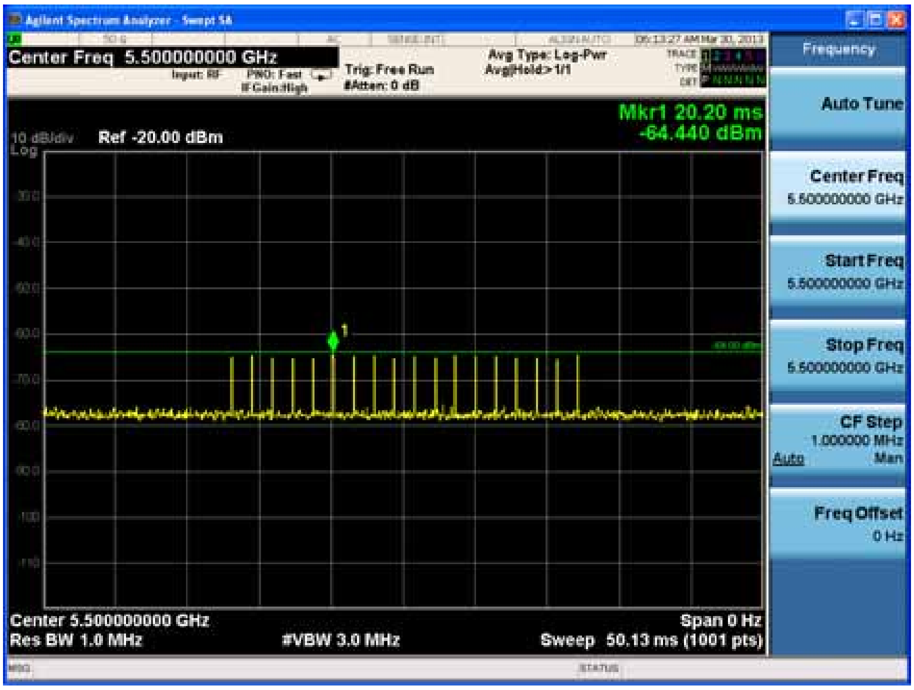
The following equipment setup was used to calibrate the conducted radar waveform. A spectrum analyzer was used to establish the test signal level for each radar type. During this process there were no transmissions by either the master or client device. The spectrum analyzer was switched to the zero spans (time domain) at the frequency of the radar waveform generator. Peak detection was utilized. The spectrum analyzer resolution bandwidth (RBW) and video bandwidth (VBW) were set to 1 MHz and 3 MHz.

The signal generator amplitude was set so that the power level measured at the spectrum analyzer was -55dBm due to the interference threshold level is not required.

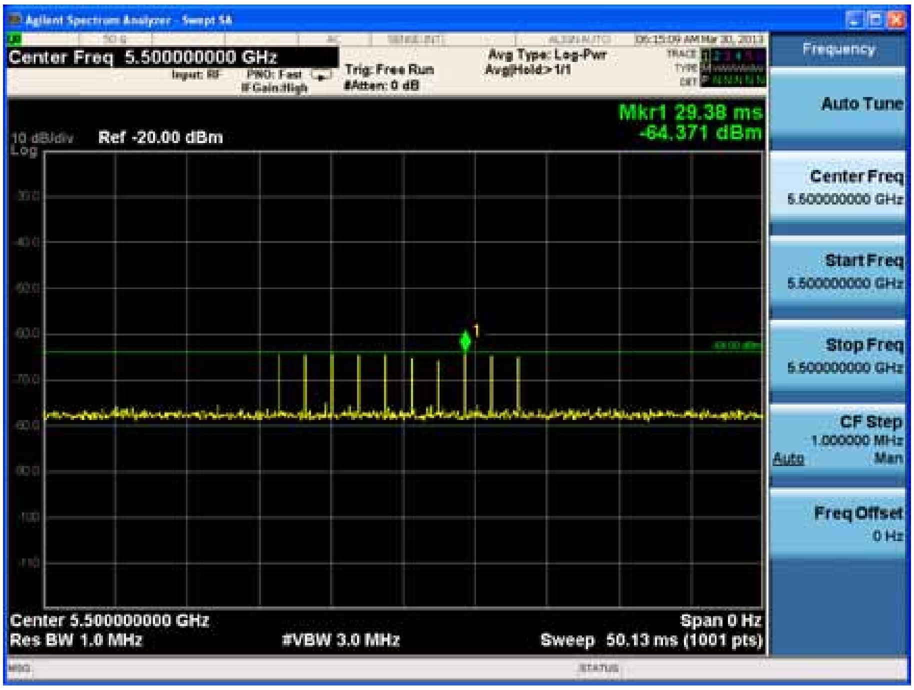
Conducted Calibration Setup



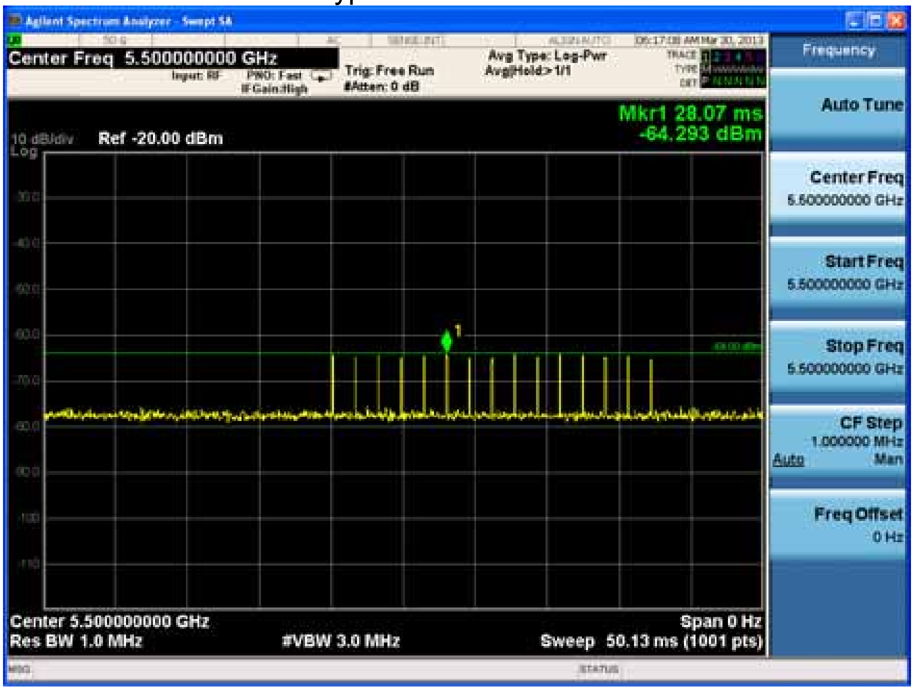
Radar Type 0 Calibration Plot



Radar Type 1 Calibration Plot

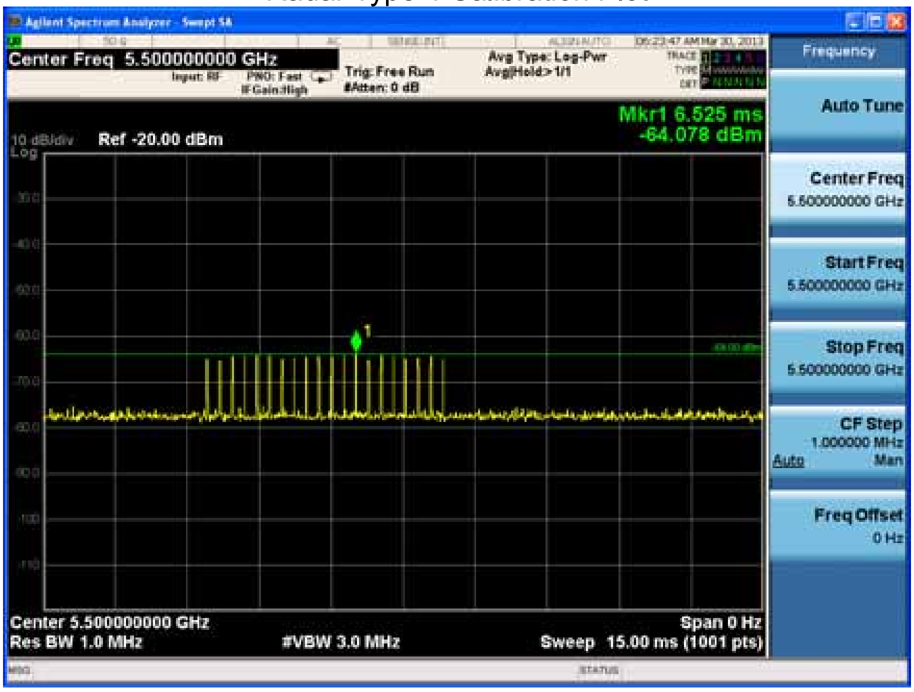


Radar Type 2 Calibration Plot

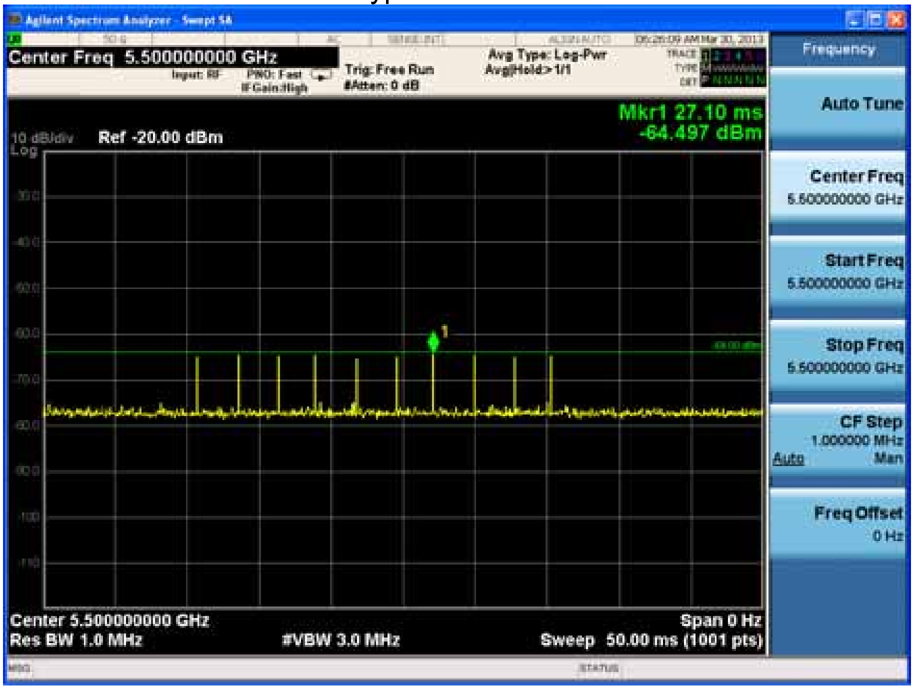


Radar Type 3 Calibration Plot

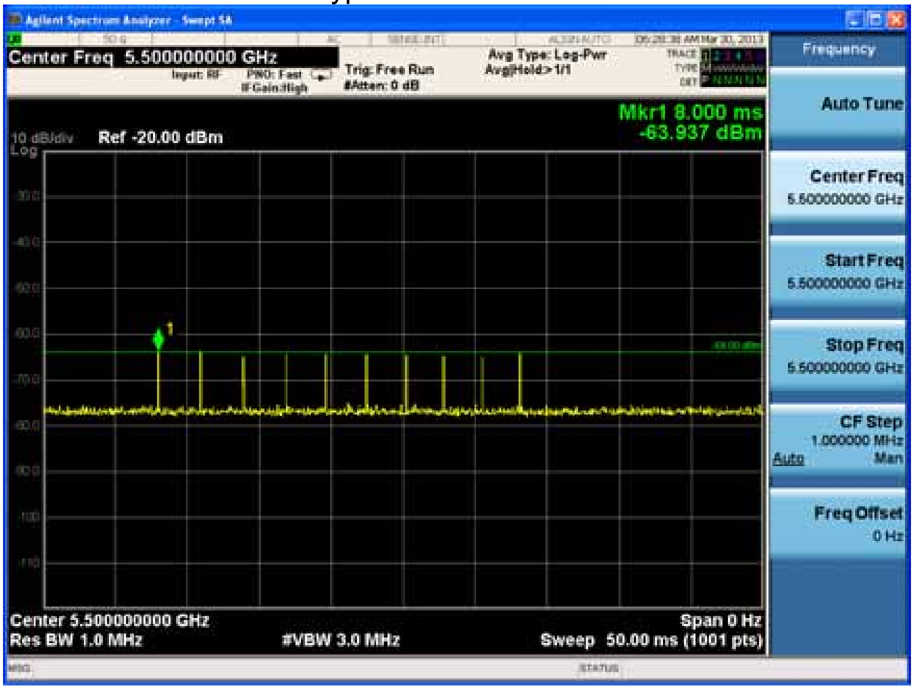
Radar Type 4 Calibration Plot



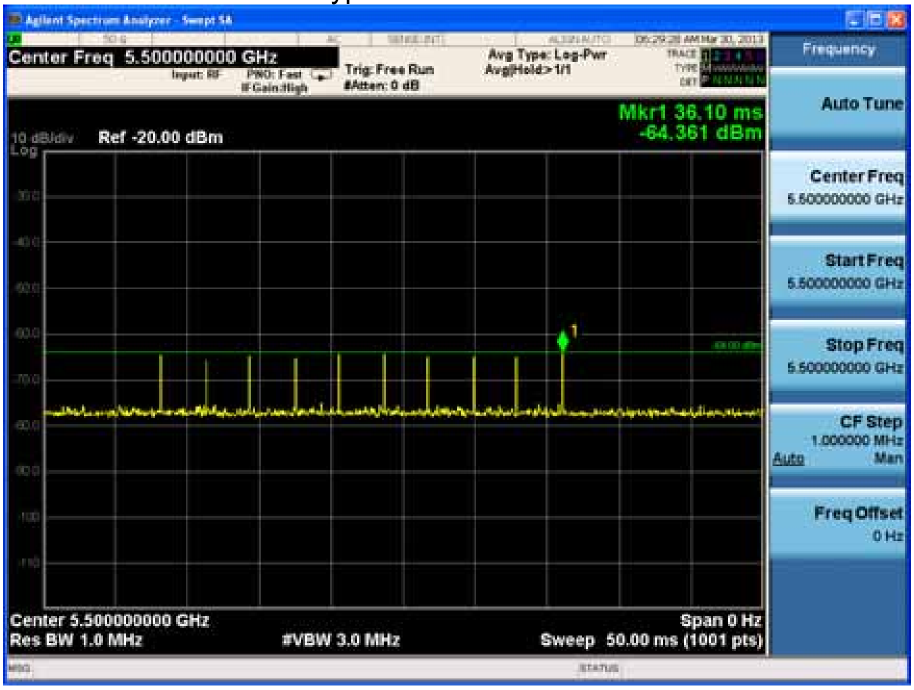
Radar Type 5 Calibration Plot



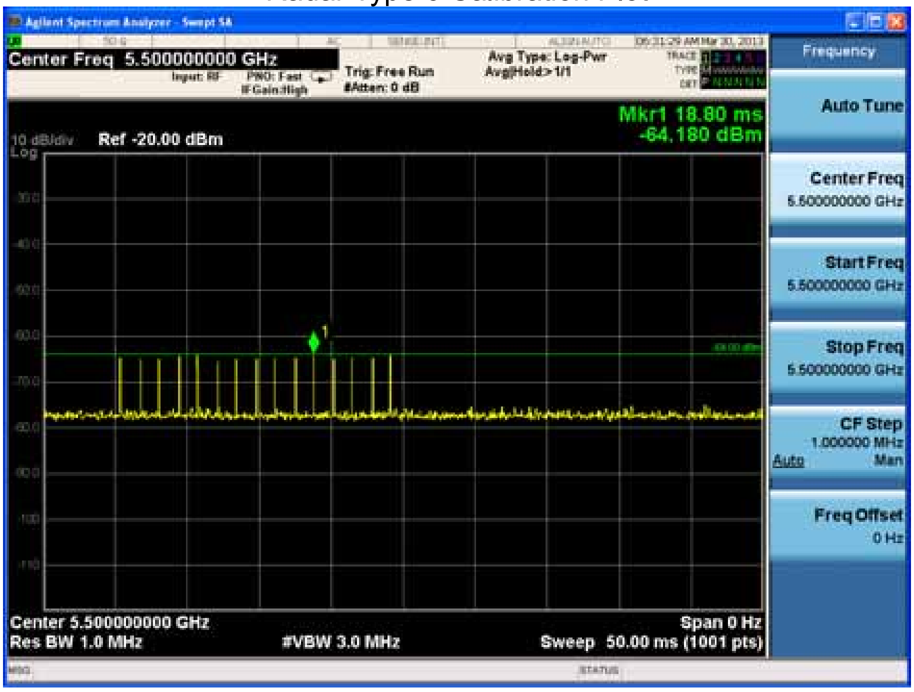
Radar Type 5AABB Calibration Plot



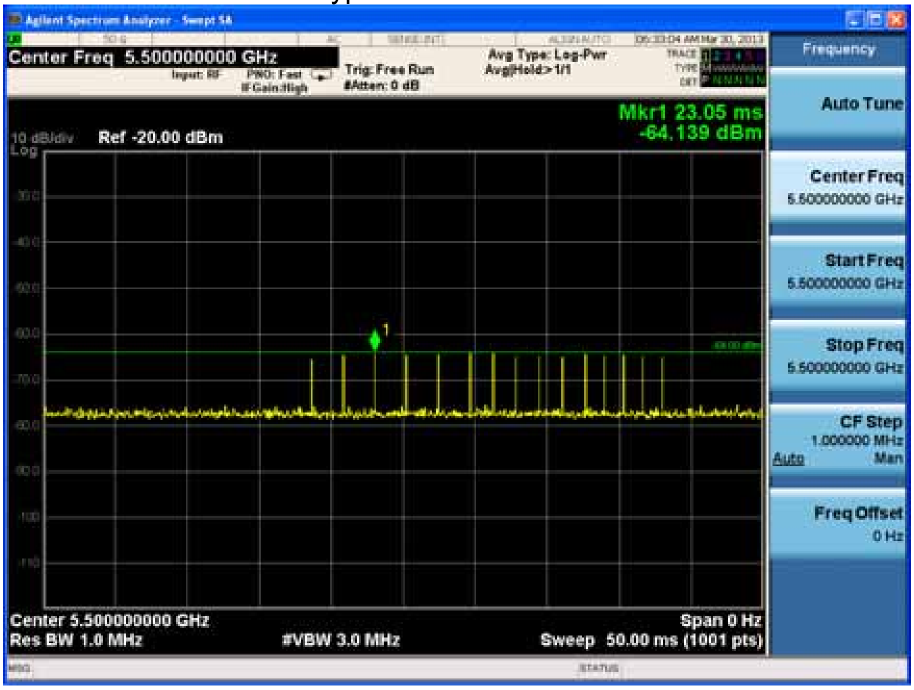
Radar Type 5ABAB Calibration Plot



Radar Type 6 Calibration Plot



Radar Type 6AABB Calibration Plot



Radar Type 6ABAB Calibration Plot

7. Test Procedure

For a UUT with antenna connector(s) and using dedicated external antenna(s), or for a UUT with integral antenna(s) but with a temporary antenna connector(s) provided, conducted measurements shall be used.
When performing DFS testing on smart antenna systems, a power splitter/combiner shall be used to combine all the receive chains (antenna inputs) into a single test point. The insertion loss of the splitter/combiner shall be taken into account.

The UUT shall be configured to operate at the highest transmitter output power setting.

If the UUT has a Radar Interference Detection function, the output power of the signal generator producing the radar test signals, as selected using clause 5.3.8.1.1, shall (unless otherwise specified) provide a received signal power at the antenna connector of the UUT with a level equal to applicable *Radar Detection Threshold* level defined in table D.2.
Parameter G [dBi] in table D.2 corresponds to the gain of the antenna assembly stated by the manufacturer. If more then one antenna assembly is intended for this power setting, the gain of the antenna assembly with the lowest gain shall be used.

NOTE: Beam forming gain (Y) of smart antenna systems, operating in a mode where beam forming is active, is ignored in order to test the worse case.

The centre frequencies of the radar test signals used in the test procedures below shall fall within the central 80 % of the Occupied Channel Bandwidth of the RLAN channel under test.
About details of each test items, please refer to ETSI EN301893 V1.7.1 Clause 5.3.8.2.1.1 ~ 5.3.8.2.1.5.

8. Test Result

8.1.1. Channel Available Check

8.1.1.1. Test result with a radar burst at the beginning of the Channel Availability Check Time

802.11a channel 60 5300MHz

802.11n (40MHz) channel 62 5310MHz

802.11a channel 100 5500MHz

802.11n (40MHz) channel 102 5510MHz

802.11a channel 124 5620MHz

802.11n (40MHz) channel 126 5630MHz

Test Item	Limit	Results
Channel Availability Check Time 5470~5600MHz, 5650~5725MHz	60 s	Pass
Channel Availability Check Time (5600~5650MHz)	10 minutes	Pass

8.1.1.2. Test result with radar burst at the end of the Channel Availability Check Time

802.11a channel 60 5300MHz

802.11n (40MHz) channel 62 5310MHz

802.11a channel 100 5500MHz

802.11n (40MHz) channel 102 5510MHz

802.11a channel 124 5620MHz

802.11n (40MHz) channel 126 5630MHz

Test Item	Limit	Results
Channel Availability Check Time 5470~5600MHz, 5650~5725MHz	60 s	Pass
Channel Availability Check Time (5600~5650MHz)	10 minutes	Pass

8.1.2. Radar Detection Threshold (during the Channel Availability Check)

802.11a channel 100 5500MHz

Radar Wave Type	Detection Threshold	Trail Number	Detection Result	Limit	Note
Type 1	-64dBm	20	100%	60%	Pass
Type 2	-64dBm	20	100%	60%	Pass
Type 3	-64dBm	20	100%	60%	Pass
Type 4	-64dBm	20	100%	60%	Pass
Type 5	-64dBm	20	100%	60%	Pass
Type 5AABB	-64dBm	20	100%	60%	Pass
Type 5ABAB	-64dBm	20	100%	60%	Pass
Type 6	-64dBm	20	100%	60%	Pass
Type 6AABB	-64dBm	20	100%	60%	Pass
Type 6ABAB	-64dBm	20	100%	60%	Pass

802.11n (40MHz) channel 102 5510MHz

Radar Wave Type	Detection Threshold	Trail Number	Detection Result	Limit	Note
Type 1	-64dBm	20	100%	60%	Pass
Type 2	-64dBm	20	100%	60%	Pass
Type 3	-64dBm	20	100%	60%	Pass
Type 4	-64dBm	20	100%	60%	Pass
Type 5	-64dBm	20	100%	60%	Pass
Type 5AABB	-64dBm	20	100%	60%	Pass
Type 5ABAB	-64dBm	20	100%	60%	Pass
Type 6	-64dBm	20	100%	60%	Pass
Type 6AABB	-64dBm	20	100%	60%	Pass
Type 6ABAB	-64dBm	20	100%	60%	Pass

802.11a channel 124 5620MHz

Radar Wave Type	Detection Threshold	Trail Number	Detection Result	Limit	Note
Type 1	-54dBm	20	100%	99.99%	Pass
Type 2	-54dBm	20	100%	99.99%	Pass
Type 5	-54dBm	20	100%	99.99%	Pass
Type 5AABB	-54dBm	20	100%	99.99%	Pass
Type 5ABAB	-54dBm	20	100%	99.99%	Pass
Type 6	-54dBm	20	100%	99.99%	Pass
Type 6AABB	-54dBm	20	100%	99.99%	Pass
Type 6ABAB	-54dBm	20	100%	99.99%	Pass

802.11n (40MHz) channel 126 5630MHz

Radar Wave Type	Detection Threshold	Trail Number	Detection Result	Limit	Note
Type 1	-54dBm	20	100%	99.99%	Pass
Type 2	-54dBm	20	100%	99.99%	Pass
Type 5	-54dBm	20	100%	99.99%	Pass
Type 5AABB	-54dBm	20	100%	99.99%	Pass
Type 5ABAB	-54dBm	20	100%	99.99%	Pass
Type 6	-54dBm	20	100%	99.99%	Pass
Type 6AABB	-54dBm	20	100%	99.99%	Pass
Type 6ABAB	-54dBm	20	100%	99.99%	Pass

8.1.3. Off-Channel CAC

8.1.3.1. Radar Detection Threshold (during Off-Channel CAC)

This device didn't support Off-Channel CAC mechanism, so it was not performed.

8.1.3.2. Detection Probability (Pd)

This device didn't support Off-Channel CAC mechanism, so it was not performed.

8.1.4. In-Service Monitoring

802.11a channel 100 5500MHz

Radar Wave Type	Detection Threshold	Trail Number	Detection Result	Limit	Note
Type 1	-64dBm	20	100%	60%	Pass
Type 2	-64dBm	20	100%	60%	Pass
Type 3	-64dBm	20	100%	60%	Pass
Type 4	-64dBm	20	100%	60%	Pass
Type 5	-64dBm	20	100%	60%	Pass
Type 5AABB	-64dBm	20	100%	60%	Pass
Type 5ABAB	-64dBm	20	100%	60%	Pass
Type 6	-64dBm	20	100%	60%	Pass
Type 6AABB	-64dBm	20	100%	60%	Pass
Type 6ABAB	-64dBm	20	100%	60%	Pass

802.11n (40MHz) channel 102 5510MHz

Radar Wave Type	Detection Threshold	Trail Number	Detection Result	Limit	Note
Type 1	-64dBm	20	100%	60%	Pass
Type 2	-64dBm	20	100%	60%	Pass
Type 3	-64dBm	20	100%	60%	Pass
Type 4	-64dBm	20	100%	60%	Pass
Type 5	-64dBm	20	100%	60%	Pass
Type 5AABB	-64dBm	20	100%	60%	Pass
Type 5ABAB	-64dBm	20	100%	60%	Pass
Type 6	-64dBm	20	100%	60%	Pass
Type 6AABB	-64dBm	20	100%	60%	Pass
Type 6ABAB	-64dBm	20	100%	60%	Pass

8.1.5. Channel Shutdown and Non-Occupancy period

8.1.5.1. Channel Closing Transmission Time and Channel Move Time

802.11a channel 60 5300MHz

802.11n (40MHz) channel 62 5310MHz

802.11a channel 100 5500MHz

802.11n (40MHz) channel 102 5510MHz

Test Item	Limit	Results
Channel Move Time	10 s	Pass
Channel Closing Transmission Time	1 s	Pass

8.1.5.2. Non-Occupancy Period

802.11a channel 60 5300MHz

802.11n (40MHz) channel 62 5310MHz

802.11a channel 100 5500MHz

802.11n (40MHz) channel 102 5510MHz

Test Item	Limit	Results
Non-Occupancy Period	30 minutes	Pass

8.2. Uniform Spreading

The working channel is selected by software control mechanism to ensure that each of declared channels makes use of at least 60 % of the spectrum available in the applicable sub-bands. Each of the Usable Channels is used with approximately equal probability.

8.3. User Access Restriction

The manufacturer doesn't allow user to disable or alter the DFS detect function through neither hardware nor software. User website will not support fixed operation channel configuration in DFS band.