

FCC PART 15E DFS TEST REPORT FOR CERTIFICATION
On Behalf of

DEI Sales Inc. dba Definitive Technology

JMDD Module

Model Number: JMDD

FCC ID: IPUJMDD

Prepared for:	DEI Sales Inc. dba Definitive Technology
	One Viper Way Vista, California 92081, United States
Prepared By:	EST Technology Co., Ltd.
	Chilingxiang, Qishantou, Santun, Houjie, Dongguan, Guangdong, China
	Tel: 86-769-83081888-808

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Date of Test:	September 10 ~ November 13, 2018
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EST Technology Co., Ltd.

Applicant:	DEI Sales Inc. dba Definitive Technology		
Address:	One Viper Way Vista, California 92081, United States		
Manufacturer:	DEI Sales Inc. dba Definitive Technology		
Address:	One Viper Way Vista, California 92081, United States		
E.U.T:	JMDD Module		
Model Number:	JMDD		
Power Supply:	DC 4.0V From base board; base board use DC 12V From adapter input AC 100-240V ~ 50/60Hz.		
Test Voltage:	AC 120V/60Hz AC 240V/60Hz		
Trade Name:	POLK	Serial No.:	-----
Date of Receipt:	September 07, 2018	Date of Test:	September 10 ~ November 13, 2018
Test Specification:	FCC Rules and Regulations Part 15 Subpart E:2018 ANSI C63.10:2013		
Test Result:	The device described above is tested by EST Technology Co., Ltd. The measurement results were contained in this test report and EST Technology Co., Ltd. was assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliance with the FCC Rules and Regulations Part 15 Subpart E requirements. This report applies to above tested sample only and shall not be reproduced in part without written approval of EST Technology Co., Ltd. Date: November 15, 2018		
Prepared by:	Reviewed by:	Approved by:	
 _____ Ring / Assistant	 _____ Tony / Engineer	 _____ Iceman Hu / Manager	
Other Aspects:	None.		
<i>Abbreviations: OK/P=passed fail/F=failed n.a/N=not applicable E.U.T=equipment under tested</i>			
<i>This test report is based on a single evaluation of one sample of above mentioned products ,It is not permitted to be duplicated in extracts without written approval of EST Technology Co., Ltd.</i>			

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

Product Name	:	JMDD Module
FCC ID	:	IPUJMDD
Model Number	:	JMDD
Operation frequency	:	UNII Band I: IEEE 802.11a: 5180 ~ 5240MHz; IEEE 802.11n HT20: 5180 ~ 5240MHz; IEEE 802.11n HT40: 5190 ~ 5230MHz; IEEE 802.11ac VHT20: 5180 ~ 5240MHz; IEEE 802.11ac VHT40: 5190 ~ 5230MHz; IEEE 802.11ac VHT80: 5210MHz. UNII Band II: IEEE 802.11a: 5260 ~ 5320MHz; IEEE 802.11n HT20: 5260 ~ 5320MHz; IEEE 802.11n HT40: 5270 ~ 5310MHz; IEEE 802.11ac VHT20: 5260 ~ 5320MHz; IEEE 802.11ac VHT40: 5270 ~ 5310MHz; IEEE 802.11ac VHT80: 5290MHz. UNII Band III: IEEE 802.11a: 5500 ~ 5700MHz; IEEE 802.11n HT20: 5500 ~ 5700MHz; IEEE 802.11n HT40: 5510 ~ 5670MHz; IEEE 802.11ac VHT20: 5500 ~ 5700MHz; IEEE 802.11ac VHT40: 5510 ~ 5670MHz; IEEE 802.11ac VHT80: 5530MHz. UNII Band IV: IEEE 802.11a: 5745 ~ 5825MHz; IEEE 802.11n HT20: 5745 ~ 5825MHz; IEEE 802.11n HT40: 5755 ~ 5795MHz; IEEE 802.11ac VHT20: 5745 ~ 5825MHz; IEEE 802.11ac VHT40: 5755 ~ 5795MHz; IEEE 802.11ac VHT80: 5775MHz.
Number of channel	:	UNII Band I: IEEE 802.11a / n HT20 / ac VHT20: 4 Channels; IEEE 802.11n HT40 / ac VHT40: 2 Channels; IEEE 802.11ac VHT80: 1 Channel. UNII Band II: IEEE 802.11a / n HT20 / ac VHT20: 4 Channels; IEEE 802.11n HT40 / ac VHT40: 2 Channels; IEEE 802.11ac VHT80: 1 Channel. UNII Band III: IEEE 802.11a / n HT20 / ac VHT20: 8 Channels; IEEE 802.11n HT40 / ac VHT40: 3 Channels; IEEE 802.11ac VHT80: 1 Channel. UNII Band IV: IEEE 802.11a / n HT20 / ac VHT20: 5 Channels; IEEE 802.11n HT40 / ac VHT40: 2 Channels; IEEE 802.11ac VHT80: 1 Channel.

Modulation	:	OFDM(QPSK, BPSK, 16-QAM, 64-QAM, 256-QAM)		
Transmit Data Rate	:	IEEE 802.11a: 54, 48, 36, 24, 18, 12, 9, 6Mbps; IEEE 802.11n HT20: 14.4, 28.9, 43.3, 57.8, 86.7, 115.6, 130.0, 144.4 Mbps; IEEE 802.11ac VHT20: 14.4, 28.8, 43.4, 57.8, 86.6, 115.6, 130, 144.4, 173.4 Mbps; IEEE 802.11n HT40: 30, 60, 90, 120, 180, 240, 270, 300 Mbps; IEEE 802.11ac VHT40: 30, 60, 90, 120, 180, 240, 270, 300, 360, 400 Mbps; IEEE 802.11ac VHT80: 65, 130, 195, 260, 390, 520, 585, 650, 780, 866.6 Mbps.		
Channels Spacing	:	IEEE 802.11a: 20MHz; IEEE 802.11n HT20: 20MHz; IEEE 802.11n HT40: 40MHz; IEEE 802.11ac VHT20: 20MHz; IEEE 802.11ac VHT40: 40MHz; IEEE 802.11ac VHT80: 80MHz.		
Antenna	:	PIFA antenna		
		Frequency Range	Antenna 0	Antenna 1
		2400~2483.5 MHz	4.03 dBi	4.10 dBi
		5150~5250 MHz	/	2.39 dBi
		5250~5350 MHz	/	1.65 dBi
		5470~5725 MHz	/	2.97 dBi
		5725~5850 MHz	/	3.90 dBi
		2.4G Directional gain: 6.66dBi 5G(Band I) Directional gain: 5.64dBi 5G(Band II) Directional gain: 5.43dBi 5G(Band III) Directional gain: 6.78dBi 5G(Band IV) Directional gain: 6.74dBi Directional gain = $10\log[(10^{G1/20} + 10^{G2/20})^2 / N_{ANT}]$ dBi Note: KDB 662911 D01 Multiple Transmitter Output v02r01		
		Note: Bluetooth uses Antenna 0 11a,b,g,n,ac uses Antenna 1 / Antenna 2 11n,ac uses MIMO		
Hardware Version	:	40-JMDDAC-RFF4G		
Software Version	:	OIM6		
Sample Type	:	Prototype production		

2. SUMMARY OF TEST

2.1. Test methodology.

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

FCC KDB 905462 D03 Client Without DFS New Rules v01r02

2.2. Summary of test result

Description of Test Item	Standard	Results
Dynamic Frequency Selection	FCC Part 15:407 (h) (i) (j)	PASS

2.3. Test Facilities

EMC Lab	:	Certificated by CNAS, CHINA Registration No.: L5288 Date of registration: November 13, 2017 Certificated by FCC, USA Designation Number: CN1215 Test Firm Registration Number: 722932 Date of registration: November 21, 2017 Certificated by A2LA, USA Registration No.: 4366.01 Date of registration: November 07, 2017 Certificated by Industry Canada CAB identifier No.: CN0035 Date of registration: January 04, 2019 Certificated by VCCI, Japan Registration No.: R-13663; C-14103 Date of registration: July 25, 2017 This Certificate is valid until: July 24, 2020 Certificated by TUV Rheinland, Germany Registration No.: UA 50413872 0001 Date of registration: July 31, 2018 Certificated by TUV/PS, Shenzhen Registration No.: SCN1017 Date of registration: January 27, 2011 Certificated by Intertek ETL SEMKO Registration No.: 2011-RTL-L2-64 Date of registration: April 28, 2011 Certificated by Nemko, Hong Kong Registration No.: 175193 Date of registration: May 4, 2011
Name of Firm	:	EST Technology Co., Ltd.
Site Location	:	Chilingxiang, Qishantou, Santun, Houjie, Dongguan, Guangdong, China

2.4. Measurement uncertainty

Test Item	Uncertainty
Uncertainty for Conduction emission test	2.54dB
Uncertainty for Radiation Emission test (9Khz-30MHz)	3.11
Uncertainty for Radiation Emission test (30MHz-1GHz)	3.62
Uncertainty for Radiation Emission test (1GHz to 18GHz)	4.86
Uncertainty for spurious emissions test (18GHz to 40GHz)	4.67
Uncertainty for radio frequency	7×10^{-8}
Uncertainty for conducted RF Power	0.20dB
Uncertainty for Power density test	0.26dB
Temperature	$\pm 0.6^{\circ}\text{C}$
Humidity	$\pm 4.0\%$
Volatage DC	$\pm 1.0\%$
Volatage (AC, <10KHz)	$\pm 1.5\%$

Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

2.5. Assistant equipment used for test

2.5.1. Adapter

M/N : S018BAC1200150
 Input : AC 100-240V ~ 50/60Hz
 Output : DC 12V

2.5.2. Router (Master)

Manufacturer : LINKSYS
 M/N : WRT3200ACM
 FCC ID : Q87-WRT3200ACM
 IC : 3839A-WRT3200ACM
 S/N : 1981060A621419
 MAC : 6038E0B87B20
 Max Gain : 3.81 dBi

2.5.3. Notebook

Manufacturer : Lenovo
 M/N : Thinkpad X250
 S/N : 2014AP6082

2.6. Test mode

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.

Band	Mode	Frequency (MHz)
UNII Band II	IEEE 802.11a	5260
	IEEE 802.11n HT40	5270
	IEEE 802.11ac VHT80:	5290
UNII Band III	IEEE 802.11a	5700
	IEEE 802.11n HT40	5670
	IEEE 802.11ac VHT80:	5530

2.7. Test Equipment

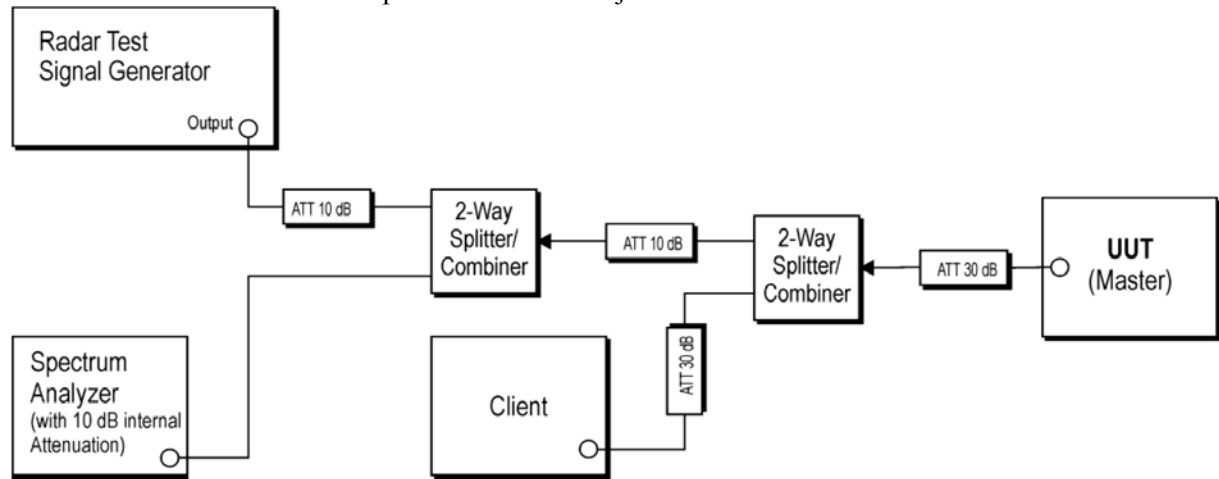
2.7.1. Measurement equipment used.

Equipment	Manufacturer	Model No.	Serial No.	Calibration Body	Last Cal.	Next Cal.
TS 8997	Rohde & Schwarz	/	/	/	/	/
Open Switch and Control Unit	Rohde & Schwarz	OSP-B157WB	101309	CEPREI	June 15,18	1 Year
Signal and Spectrum Analyzer	Rohde & Schwarz	FSV	103173	CEPREI	June 15,18	1 Year
Signal Generator	Rohde & Schwarz	SMB100A	108752	CEPREI	June 15,18	1 Year
Vector Signal Generator	Rohde & Schwarz	SMBV100A	260753	CEPREI	June 15,18	1 Year
Test Software	Rohde & Schwarz	WMS32	V10.40.00	N/A	N/A	N/A

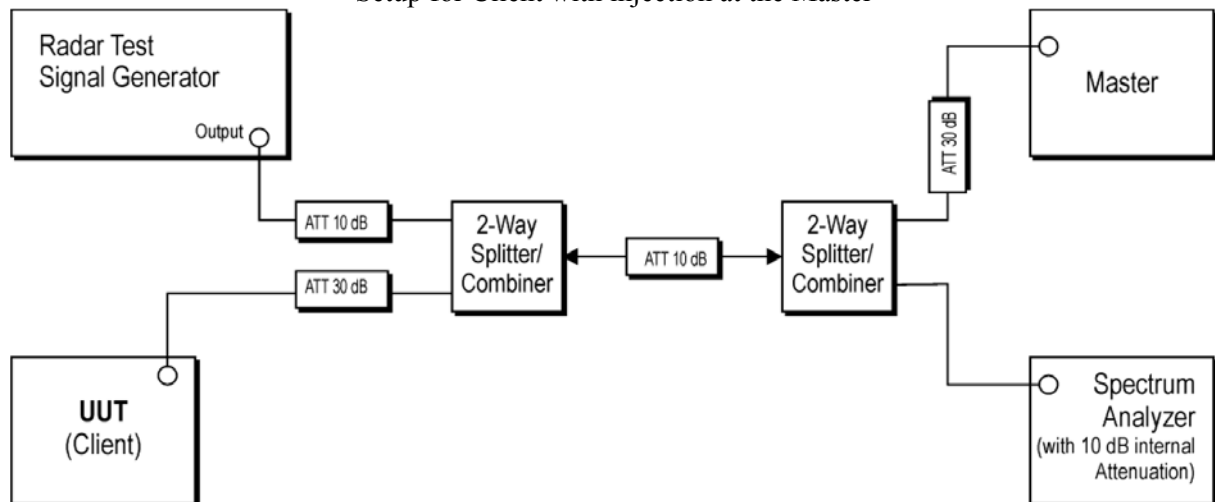
3. SETUP OF EQUIPMENT UNDER TEST

3.1. Setup Configuration Of EUT

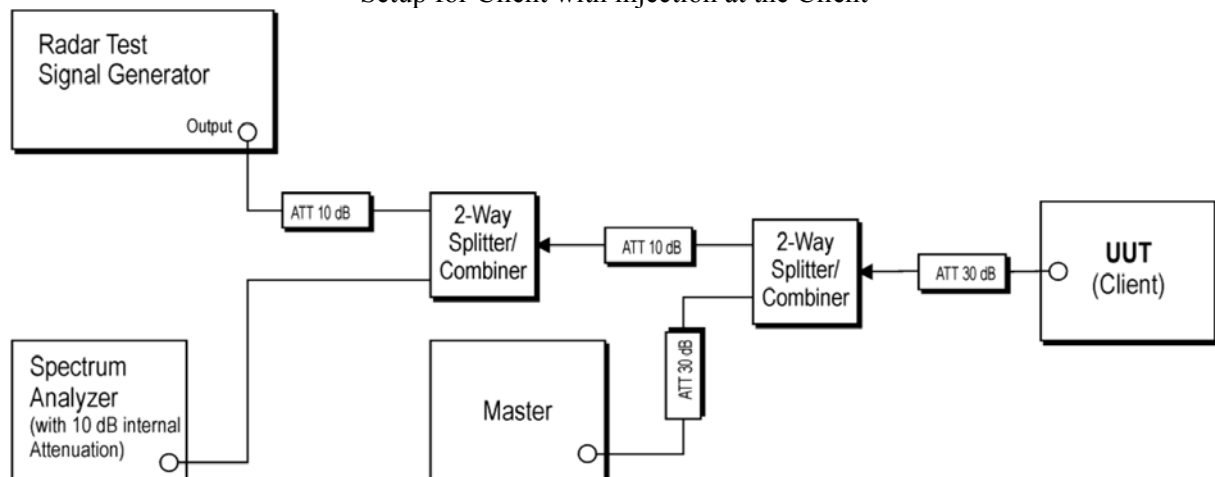
Setup for Master with injection at the Master



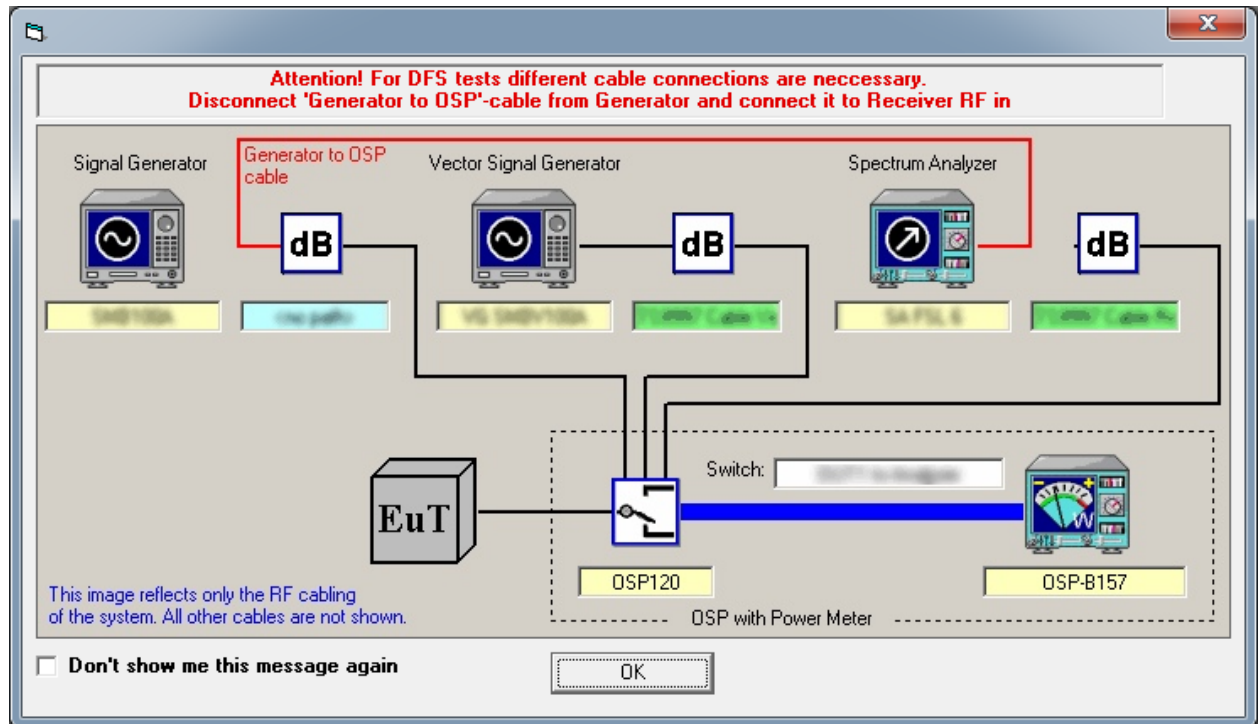
Setup for Client with injection at the Master



Setup for Client with injection at the Client



3.2. Setup Configuration Of TS8997



4. DYNAMIC FREQUENCY SELECTION REQUIREMENTS

4.1. Applicable standard

According to 15.407

4.2. Operation Modes and Requirement Test Item.

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.

Table 1: Applicability of DFS Requirements Prior to Use of a Channel

Requirement	Operational Mode		
	Master	Client Without Radar Detection	Client With Radar Detection
<i>Non-Occupancy Period</i>	Yes	Not required	Yes
<i>DFS Detection Threshold</i>	Yes	Not required	Yes
<i>Channel Availability Check Time</i>	Yes	Not required	Not required
<i>U-NII Detection Bandwidth</i>	Yes	Not required	Yes

Table 2: Applicability of DFS requirements during normal operation

Requirement	Operational Mode	
	Master Device or Client with Radar Detection	Client Without Radar Detection
<i>DFS Detection Threshold</i>	Yes	Not required
<i>Channel Closing Transmission Time</i>	Yes	Yes
<i>Channel Move Time</i>	Yes	Yes
<i>U-NII Detection Bandwidth</i>	Yes	Not required

Additional requirements for devices with multiple bandwidth modes	Master Device or Client with Radar Detection	Client Without Radar Detection
<i>U-NII Detection Bandwidth and Statistical Performance Check</i>	All BW modes must be tested	Not required
<i>Channel Move Time and Channel Closing Transmission Time</i>	Test using widest BW mode available	Test using the widest BW mode available for the link
<i>All other tests</i>	Any single BW mode	Not required
Note: Frequencies selected for statistical performance check (Section 7.8.4) should include several frequencies within the radar detection bandwidth and frequencies near the edge of the radar detection bandwidth. For 802.11 devices it is suggested to select frequencies in each of the bonded 20 MHz channels and the channel center frequency.		

4.3. Conformance Limit

Table 3: DFS Detection Thresholds for Master Devices
and Client Devices with Radar Detection

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
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.	

Table 4: DFS Response Requirement Values

Parameter	Value
<i>Non-occupancy period</i>	Minimum 30 minutes
<i>Channel Availability Check Time</i>	60 seconds
<i>Channel Move Time</i>	10 seconds See Note 1.
<i>Channel Closing Transmission Time</i>	200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period. See Notes 1 and 2.
<i>U-NII Detection Bandwidth</i>	Minimum 100% of the U- NII 99% transmission power bandwidth. See Note 3.
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. 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. 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.	

Table 5 – Short Pulse Radar Test Waveforms

Radar Type	Pulse Width (μsec)	PRI (μsec)	Number of Pulses	Minimum Percentage of Successful Detection	Minimum Number of 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 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	$\text{Roundup} \left\{ \left(\frac{1}{360} \right), \left(\frac{19 \cdot 10^6}{\text{PRI}_{\mu\text{sec}}} \right) \right\}$	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
Note 1: Short Pulse Radar Type 0 should be used for the detection bandwidth test, channel move time, and channel closing time tests.					

Table 6 – 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

Table 7 – 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

4.4. Transmitter Output Power

Band	Mode	Max Output Power (dBm)	Antenna Gain (dBi)	Max Eirp	
				dBm	mW
UNII Band II	IEEE 802.11a	14.62	5.43	20.05	101.16
	IEEE 802.11n HT40	15.38	5.43	20.81	120.50
	IEEE 802.11ac VHT80	14.46	5.43	19.89	97.50
UNII Band III	IEEE 802.11a	14.84	6.78	21.62	145.21
	IEEE 802.11n HT40	15.07	6.78	21.85	153.11
	IEEE 802.11ac VHT80	14.82	6.78	21.60	144.54

4.5. Operation Modes and Requirement Test Item.

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

4.6. Test Result

DFS In-Service Monitoring (IEEE 802.11a 5260 MHz)

Measurement Summary

DUT Frequency (MHz)	Radar Type No.	Type of Measurement value	Overall Result	Overall Comment
5260.000000	0	First of all Transmitt Test	PASS	DUT is transmitting
5260.000000	0	Channel Move Time	PASS	
5260.000000	0	Channel Closing Transmission Time	PASS	
5260.000000	0	Non-occupancy period	PASS	

Channel Move Time Detailed Results

DUT Frequency (MHz)	Radar Type No.	CMT Tx Time (s)	CMT Limit (s)	CMT Result
5260.000000	0	1.377	10.000	PASS

(continuation of the "Channel Move Time Detailed Results" table from column 5 ...)

DUT Frequency (MHz)	CMT Comment
5260.000000	Tx Time value is last trailing edge found within sweep. See Note 1.

Channel Closing Transmission Time Detailed Results

DUT Frequency (MHz)	Radar Type No.	CCTT Type of Value	CCTT No. of Pulses found	CCTT Tx Time (ms)
5260.000000	0	first 200 ms	797	8.880
5260.000000	0	remaining 10.0 second(s) period	3491	38.848

(continuation of the "Channel Closing Transmission Time Detailed Results" table from column 5 ...)

DUT Frequency (MHz)	CCTT Tx Time Limit (ms)	CCTT Result	CCTT Comment
5260.000000	200.000	PASS	See Note 1.
5260.000000	60.000	PASS	See Note 1.

Non-occupancy period Detailed Results

DUT Frequency (MHz)	Radar Type No.	NOP No. of Pulses found	NOP No. of Pulses Limit	NOP Tx Time (s)	NOP Tx Time Limit (s)
5260.000000	0	0	0	0.000	0.000

(continuation of the "Non-occupancy period Detailed Results" table from column 6 ...)

DUT Frequency (MHz)	NOP Result
5260.000000	PASS

Transmitting Test Detailed Results

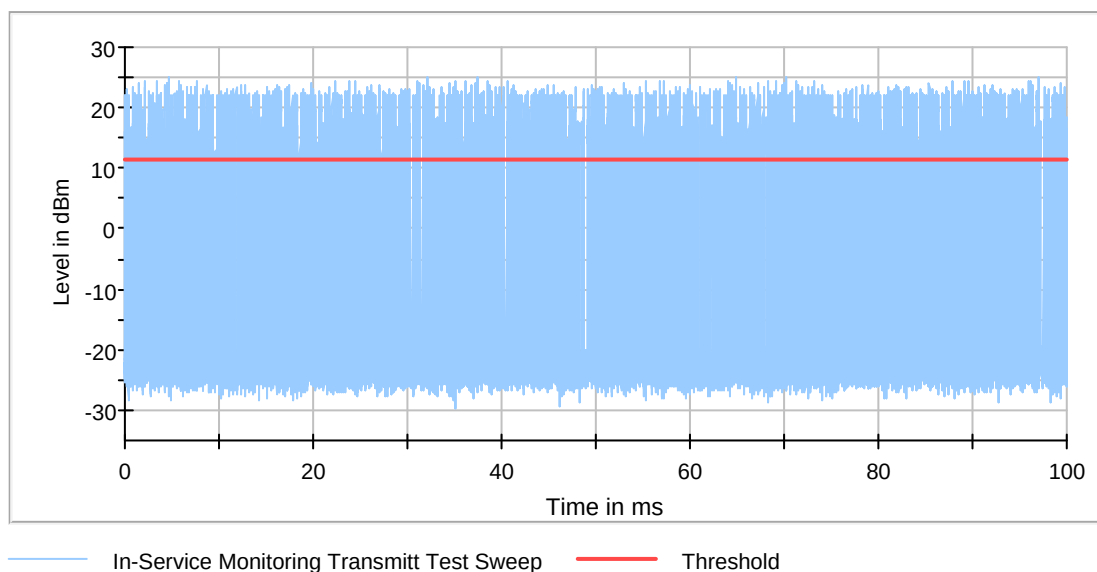
DUT Frequency (MHz)	Tx-Test DutyCycle (%)	Tx-Test DutyCycle Limit	Tx-Test No. of Pulses found	Tx-Test Result	Tx-Test Comment
5260.000000	29.407	>=17 %	794	PASS	

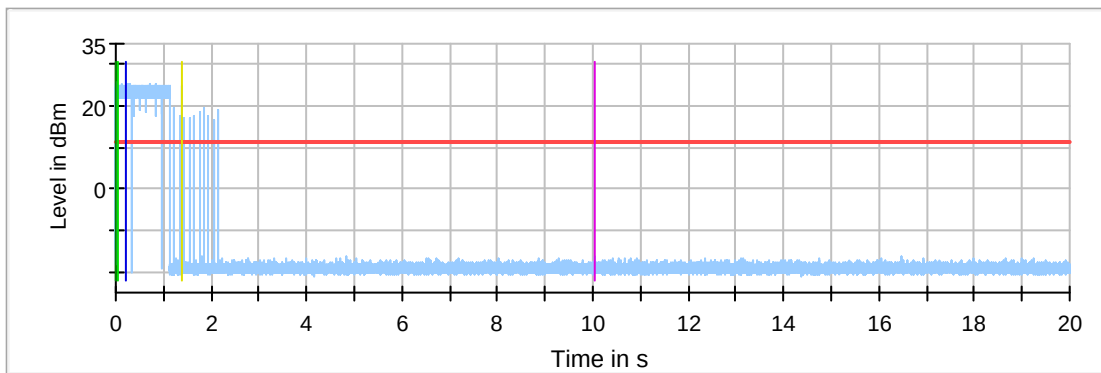
Additional Information

Note	Description
Note 1:	Because of the radar pulse event at the beginning, the investigation of the trace begins with an offset of 26.7 ms conforming to the end of the Radar burst.
Note 2:	Channel move time (CMT) / channel closing transmission time (CCTT) measurement was made with hi resolution video sweep using OSP DAQ channel
Note 3:	Because of the substantially higher sampling rate of the video signal the results for CCTT and CMT are more accurate than in the graphics visible. Reached timing accuracy of the video trace: approx 4 μ s
Note 4:	The Non-Occupancy Period trace starts at the end of the Channel move time trace (20.000 secs.) Labeling of the x-axis (time) is relative to its beginning (0 secs.)

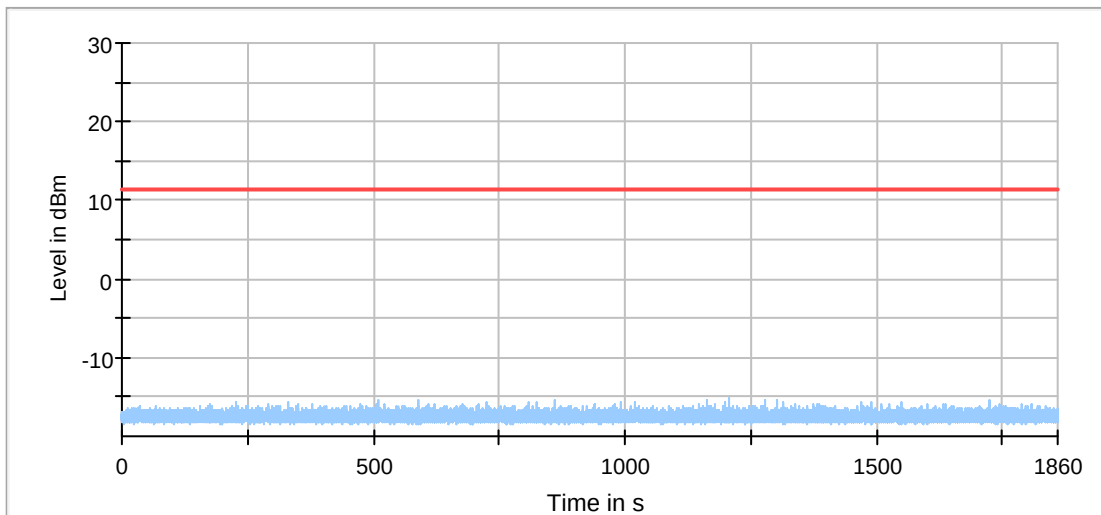
Radar level verification

Description	Value	Unit
Configured DUT EIRP:	31.62	mW
Configured DUT PSD:	7.00	dBm/MHz
Requirement of the Detection threshold value for this given values acc. to FCC clause 5.2 / Table 3	-62	dBm
Vector Generator level setting	11.95	dBm
Configured overall pathlost from Vector Generator RF out to DUT connector of 'DUT to OSP'-cable	74.23	dB
Given additional level added to the amplitude of the waveform to account for variations in measurement equipment acc. to FCC clause 5.2 / Table 3 / Note 2	1.00	dB
This results in the following radar signal level at the DUT	-62.28	dBm





- In-Service Monitoring Channel Move Time
- Threshold
- Start of Radar
- Trigger at end of Radar
- First 200ms of Channel Closing Tx Time
- 10sec Channel Move Time Limit
- Last measured edge of Channel Closing Tx Time



- In-Service Monitoring Non-occupancy period
- Threshold

DFS In-Service Monitoring (IEEE 802.11a 5700 MHz)

Measurement Summary

DUT Frequency (MHz)	Radar Type No.	Type of Measurement value	Overall Result	Overall Comment
5700.000000	0	First of all Transmitt Test	PASS	DUT is transmitting
5700.000000	0	Channel Move Time	PASS	
5700.000000	0	Channel Closing Transmission Time	PASS	
5700.000000	0	Non-occupancy period	PASS	

Channel Move Time Detailed Results

DUT Frequency (MHz)	Radar Type No.	CMT Tx Time (s)	CMT Limit (s)	CMT Result
5700.000000	0	1.104	10.000	PASS

(continuation of the "Channel Move Time Detailed Results" table from column 5 ...)

DUT Frequency (MHz)	CMT Comment
5700.000000	Tx Time value is last trailing edge found within sweep. See Note 1.

Channel Closing Transmission Time Detailed Results

DUT Frequency (MHz)	Radar Type No.	CCTT Type of Value	CCTT No. of Pulses found	CCTT Tx Time (ms)
5700.000000	0	first 200 ms	16	0.128
5700.000000	0	remaining 10.0 second(s) period	78	0.624

(continuation of the "Channel Closing Transmission Time Detailed Results" table from column 5 ...)

DUT Frequency (MHz)	CCTT Tx Time Limit (ms)	CCTT Result	CCTT Comment
5700.000000	200.000	PASS	See Note 1.
5700.000000	60.000	PASS	See Note 1.

Non-occupancy period Detailed Results

DUT Frequency (MHz)	Radar Type No.	NOP No. of Pulses found	NOP No. of Pulses Limit	NOP Tx Time (s)	NOP Tx Time Limit (s)
5700.000000	0	0	0	0.000	0.000

(continuation of the "Non-occupancy period Detailed Results" table from column 6 ...)

DUT Frequency (MHz)	NOP Result
5700.000000	PASS

Transmitting Test Detailed Results

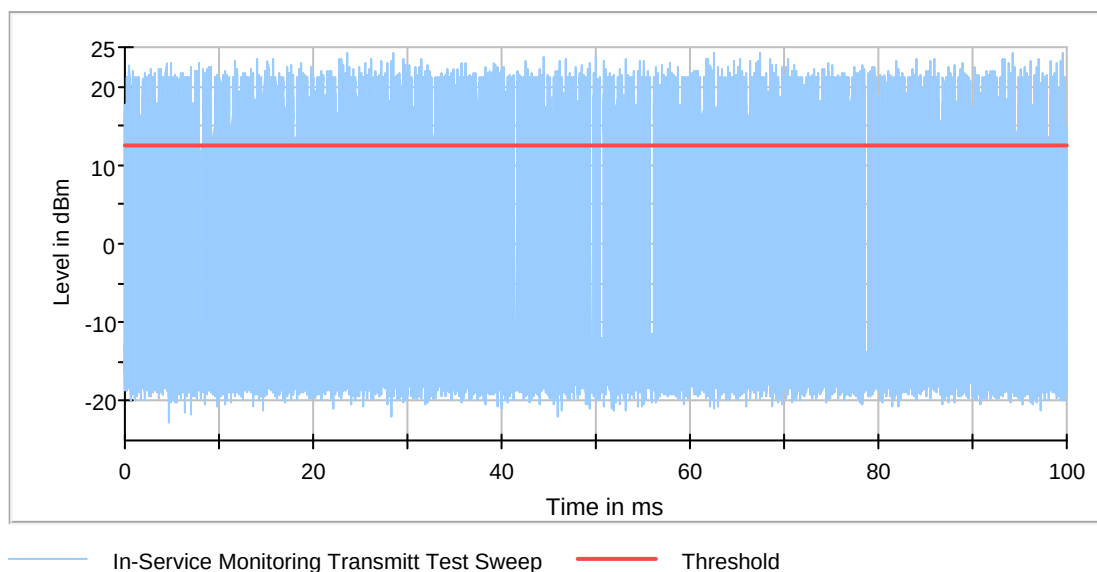
DUT Frequency (MHz)	Tx-Test DutyCycle (%)	Tx-Test DutyCycle Limit	Tx-Test No. of Pulses found	Tx-Test Result	Tx-Test Comment
5700.000000	28.337	>=17 %	811	PASS	

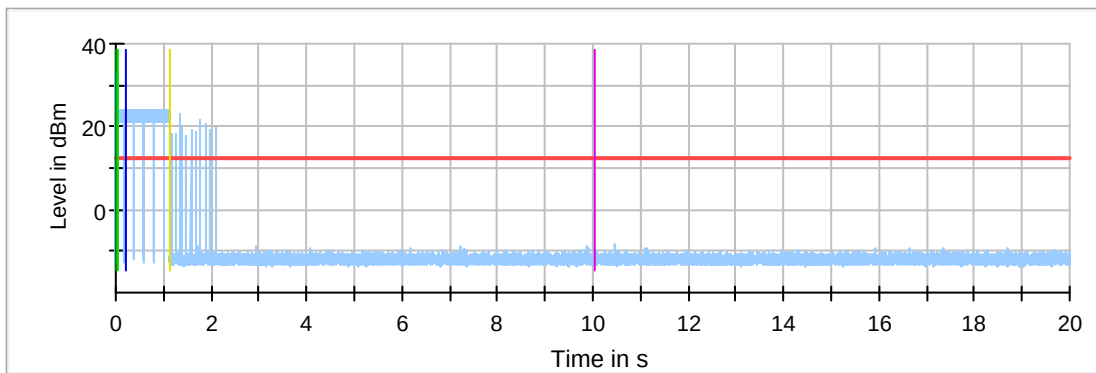
Additional Information

Note	Description
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Note 3:	Because of the substantially higher sampling rate of the video signal the results for CCTT and CMT are more accurate than in the graphics visible. Reached timing accuracy of the video trace: approx 4 μ s
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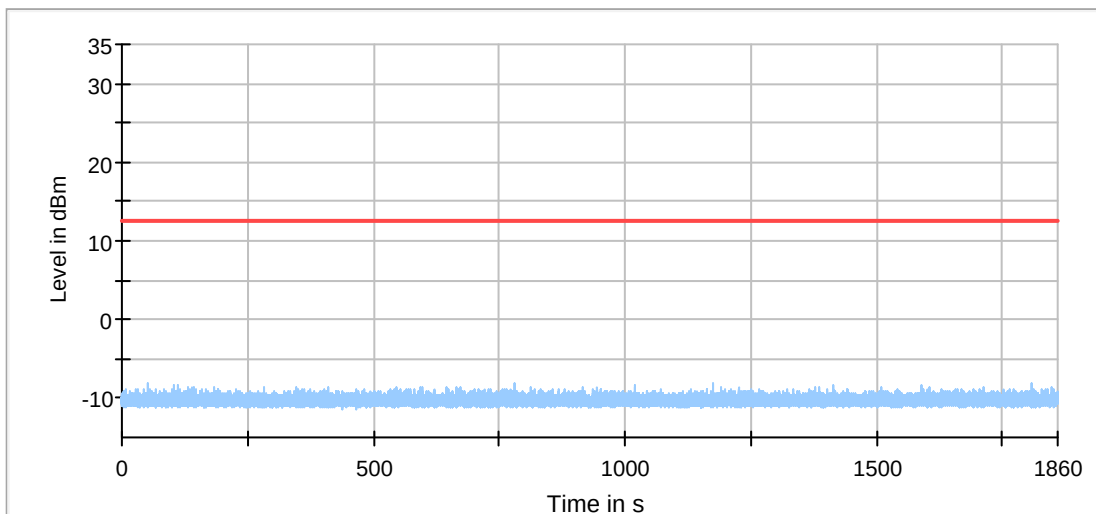
Radar level verification

Description	Value	Unit
Configured DUT EIRP:	31.62	mW
Configured DUT PSD:	7.00	dBm/MHz
Requirement of the Detection threshold value for this given values acc. to FCC clause 5.2 / Table 3	-62	dBm
Vector Generator level setting	12.28	dBm
Configured overall pathlost from Vector Generator RF out to DUT connector of 'DUT to OSP'-cable	74.73	dB
Given additional level added to the amplitude of the waveform to account for variations in measurement equipment acc. to FCC clause 5.2 / Table 3 / Note 2	1.00	dB
This results in the following radar signal level at the DUT	-62.45	dBm





- In-Service Monitoring Channel Move Time
- Threshold
- Start of Radar
- Trigger at end of Radar
- First 200ms of Channel Closing Tx Time
- 10sec Channel Move Time Limit
- Last measured edge of Channel Closing Tx Time



- In-Service Monitoring Non-occupancy period
- Threshold

DFS In-Service Monitoring (IEEE 802.11n HT40 5270 MHz)

Measurement Summary

DUT Frequency (MHz)	Radar Type No.	Type of Measurement value	Overall Result	Overall Comment
5270.000000	0	First of all Transmitt Test	PASS	DUT is transmitting
5270.000000	0	Channel Move Time	PASS	
5270.000000	0	Channel Closing Transmission Time	PASS	
5270.000000	0	Non-occupancy period	PASS	

Channel Move Time Detailed Results

DUT Frequency (MHz)	Radar Type No.	CMT Tx Time (s)	CMT Limit (s)	CMT Result
5270.000000	0	0.128	10.000	PASS

(continuation of the "Channel Move Time Detailed Results" table from column 5 ...)

DUT Frequency (MHz)	CMT Comment
5270.000000	Tx Time value is last trailing edge found within sweep. See Note 1.

Channel Closing Transmission Time Detailed Results

DUT Frequency (MHz)	Radar Type No.	CCTT Type of Value	CCTT No. of Pulses found	CCTT Tx Time (ms)
5270.000000	0	first 200 ms	169	1.604
5270.000000	0	remaining 10.0 second(s) period	0	0.000

(continuation of the "Channel Closing Transmission Time Detailed Results" table from column 5 ...)

DUT Frequency (MHz)	CCTT Tx Time Limit (ms)	CCTT Result	CCTT Comment
5270.000000	200.000	PASS	See Note 1.
5270.000000	60.000	PASS	See Note 1.

Non-occupancy period Detailed Results

DUT Frequency (MHz)	Radar Type No.	NOP No. of Pulses found	NOP No. of Pulses Limit	NOP Tx Time (s)	NOP Tx Time Limit (s)
5270.000000	0	0	0	0.000	0.000

(continuation of the "Non-occupancy period Detailed Results" table from column 6 ...)

DUT Frequency (MHz)	NOP Result	NOP Comment
5270.000000	PASS	not performed because of Channel Closing Transmission Time / Channel Move Time Test failed

Transmitting Test Detailed Results

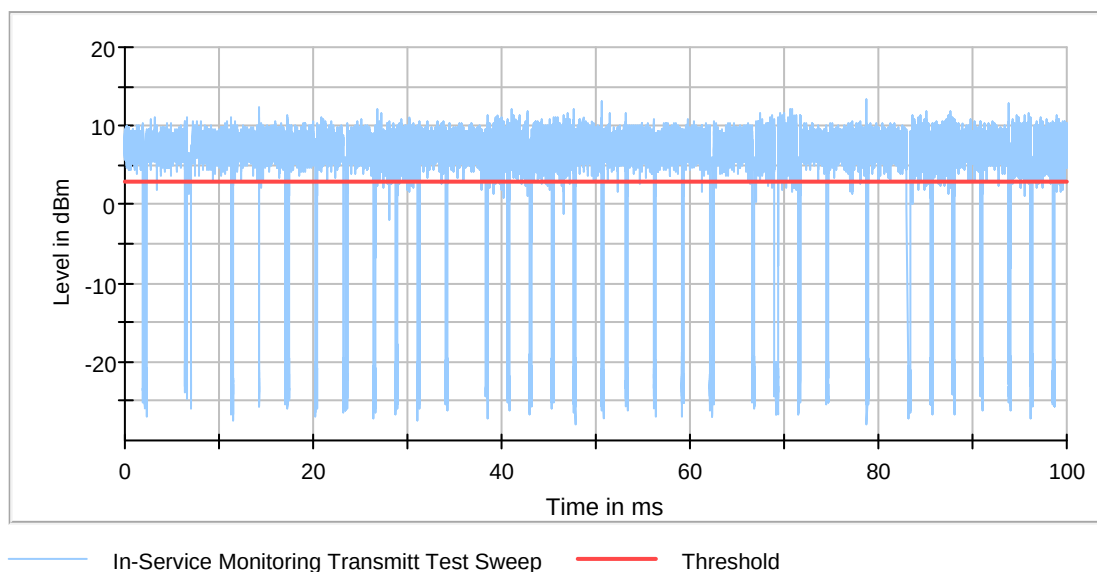
DUT Frequency (MHz)	Tx-Test DutyCycle (%)	Tx-Test DutyCycle Limit	Tx-Test No. of Pulses found	Tx-Test Result	Tx-Test Comment
5270.000000	92.307	>=17 %	207	PASS	

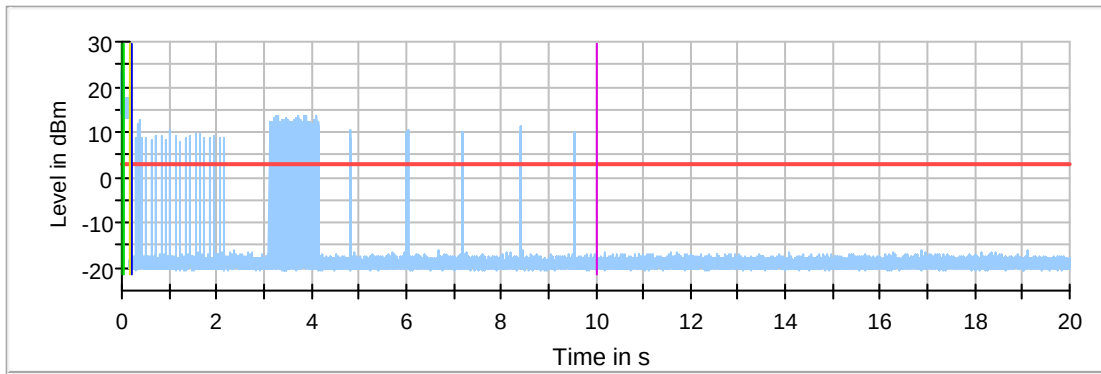
Additional Information

Note	Description
Note 1:	Because of the radar pulse event at the beginning, the investigation of the trace begins with an offset of 26.7 ms conforming to the end of the Radar burst.
Note 2:	Channel move time (CMT) / channel closing transmission time (CCTT) measurement was made with hi resolution video sweep using OSP DAQ channel
Note 3:	Because of the substantially higher sampling rate of the video signal the results for CCTT and CMT are more accurate than in the graphics visible. Reached timing accuracy of the video trace: approx 4 μ s
Note 4:	The Non-Occupancy Period trace starts at the end of the Channel move time trace (20.000 secs.) Labeling of the x-axis (time) is relative to its beginning (0 secs.)

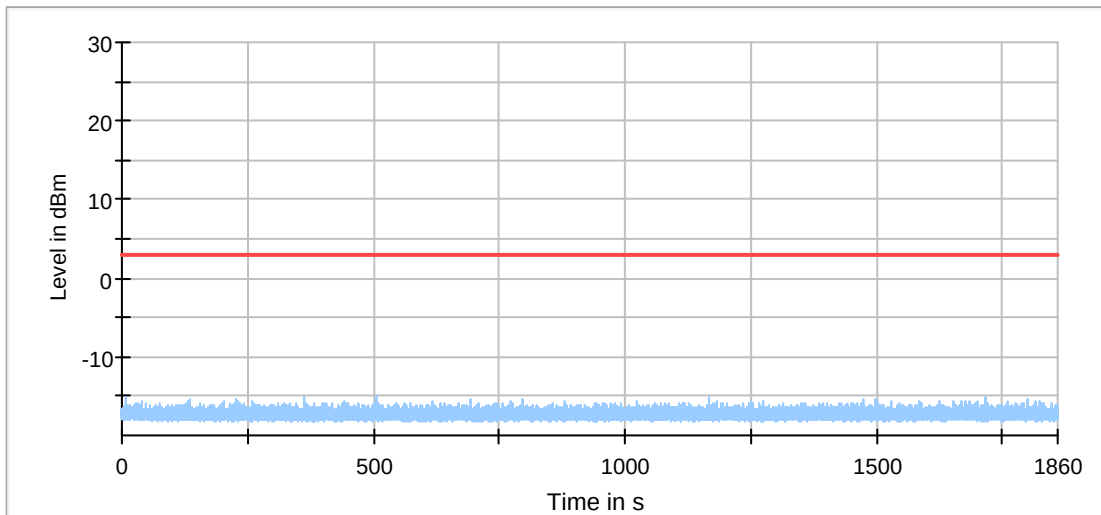
Radar level verification

Description	Value	Unit
Configured DUT EIRP:	31.62	mW
Configured DUT PSD:	7.00	dBm/MHz
Requirement of the Detection threshold value for this given values acc. to FCC clause 5.2 / Table 3	-62	dBm
Vector Generator level setting	12.15	dBm
Configured overall pathlost from Vector Generator RF out to DUT connector of 'DUT to OSP'-cable	74.24	dB
Given additional level added to the amplitude of the waveform to account for variations in measurement equipment acc. to FCC clause 5.2 / Table 3 / Note 2	1.00	dB
This results in the following radar signal level at the DUT	-62.09	dBm





- In-Service Monitoring Channel Move Time
- Threshold
- Start of Radar
- Trigger at end of Radar
- First 200ms of Channel Closing Tx Time
- 10sec Channel Move Time Limit
- Last measured edge of Channel Closing Tx Time



- In-Service Monitoring Non-occupancy period
- Threshold

DFS In-Service Monitoring (IEEE 802.11n HT40 5670 MHz)

Measurement Summary

DUT Frequency (MHz)	Radar Type No.	Type of Measurement value	Overall Result	Overall Comment
5670.000000	0	First of all Transmitt Test	PASS	DUT is transmitting
5670.000000	0	Channel Move Time	PASS	
5670.000000	0	Channel Closing Transmission Time	PASS	
5670.000000	0	Non-occupancy period	PASS	

Channel Move Time Detailed Results

DUT Frequency (MHz)	Radar Type No.	CMT Tx Time (s)	CMT Limit (s)	CMT Result
5670.000000	0	0.000	10.000	PASS

(continuation of the "Channel Move Time Detailed Results" table from column 5 ...)

DUT Frequency (MHz)	CMT Comment
5670.000000	Tx Time value is last trailing edge found within sweep. See Note 1.

Channel Closing Transmission Time Detailed Results

DUT Frequency (MHz)	Radar Type No.	CCTT Type of Value	CCTT No. of Pulses found	CCTT Tx Time (ms)
5670.000000	0	first 200 ms	0	0.000
5670.000000	0	remaining 10.0 second(s) period	0	0.000

(continuation of the "Channel Closing Transmission Time Detailed Results" table from column 5 ...)

DUT Frequency (MHz)	CCTT Tx Time Limit (ms)	CCTT Result	CCTT Comment
5670.000000	200.000	PASS	See Note 1.
5670.000000	60.000	PASS	See Note 1.

Non-occupancy period Detailed Results

DUT Frequency (MHz)	Radar Type No.	NOP No. of Pulses found	NOP No. of Pulses Limit	NOP Tx Time (s)	NOP Tx Time Limit (s)
5670.000000	0	0	0	0.000	0.000

(continuation of the "Non-occupancy period Detailed Results" table from column 6 ...)

DUT Frequency (MHz)	NOP Result
5670.000000	PASS

Transmitting Test Detailed Results

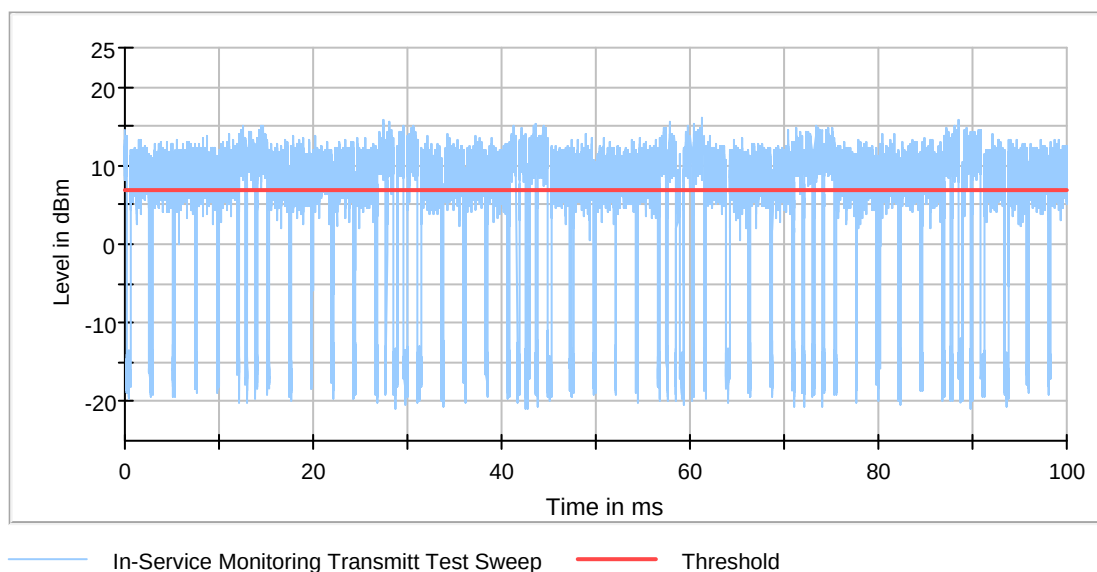
DUT Frequency (MHz)	Tx-Test DutyCycle (%)	Tx-Test DutyCycle Limit	Tx-Test No. of Pulses found	Tx-Test Result	Tx-Test Comment
5670.000000	78.557	>=17 %	1892	PASS	

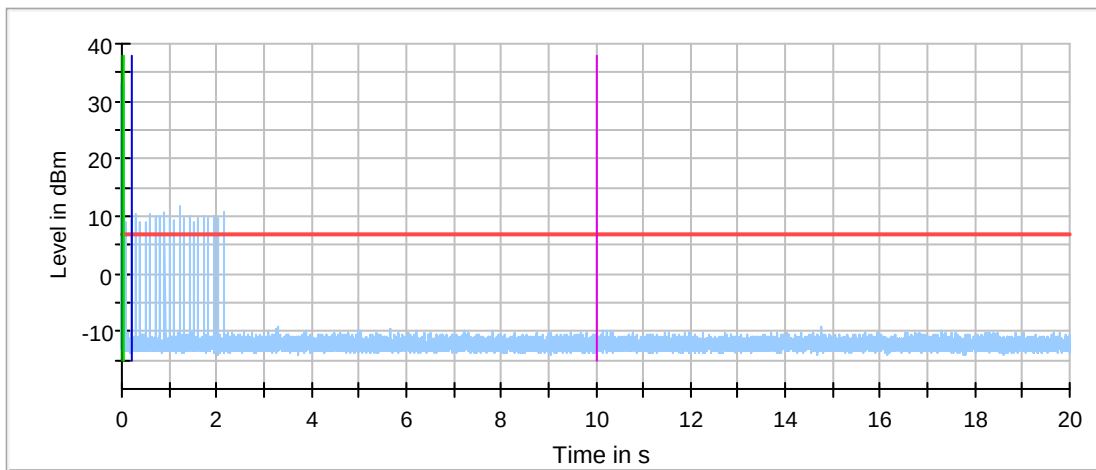
Additional Information

Note	Description
Note 1:	Because of the radar pulse event at the beginning, the investigation of the trace begins with an offset of 26.7 ms conforming to the end of the Radar burst.
Note 2:	Channel move time (CMT) / channel closing transmission time (CCTT) measurement was made with hi resolution video sweep using OSP DAQ channel
Note 3:	Because of the substantially higher sampling rate of the video signal the results for CCTT and CMT are more accurate than in the graphics visible. Reached timing accuracy of the video trace: approx 4 μ s
Note 4:	The Non-Occupancy Period trace starts at the end of the Channel move time trace (20.000 secs.) Labeling of the x-axis (time) is relative to its beginning (0 secs.)

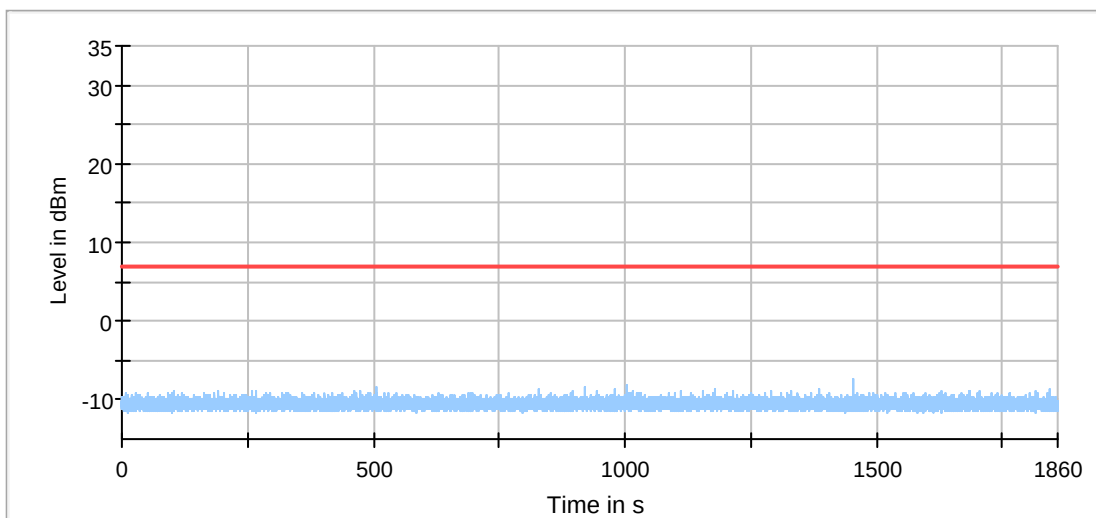
Radar level verification

Description	Value	Unit
Configured DUT EIRP:	31.62	mW
Configured DUT PSD:	7.00	dBm/MHz
Requirement of the Detection threshold value for this given values acc. to FCC clause 5.2 / Table 3	-62	dBm
Vector Generator level setting	12.45	dBm
Configured overall pathlost from Vector Generator RF out to DUT connector of 'DUT to OSP'-cable	75.15	dB
Given additional level added to the amplitude of the waveform to account for variations in measurement equipment acc. to FCC clause 5.2 / Table 3 / Note 2	1.00	dB
This results in the following radar signal level at the DUT	-62.70	dBm





— In-Service Monitoring Channel Move Time — Threshold
— Start of Radar — Trigger at end of Radar
— First 200ms of Channel Closing Tx Time — 10sec Channel Move Time Limit



— In-Service Monitoring Non-occupancy period — Threshold

DFS In-Service Monitoring (IEEE 802.11ac VHT80 5290 MHz)

Measurement Summary

DUT Frequency (MHz)	Radar Type No.	Type of Measurement value	Overall Result	Overall Comment
5290.000000	0	First of all Transmitt Test	PASS	DUT is transmitting
5290.000000	0	Channel Move Time	PASS	
5290.000000	0	Channel Closing Transmission Time	PASS	
5290.000000	0	Non-occupancy period	PASS	

Channel Move Time Detailed Results

DUT Frequency (MHz)	Radar Type No.	CMT Tx Time (s)	CMT Limit (s)	CMT Result
5290.000000	0	0.052	10.000	PASS

(continuation of the "Channel Move Time Detailed Results" table from column 5 ...)

DUT Frequency (MHz)	CMT Comment
5290.000000	Tx Time value is last trailing edge found within sweep. See Note 1.

Channel Closing Transmission Time Detailed Results

DUT Frequency (MHz)	Radar Type No.	CCTT Type of Value	CCTT No. of Pulses found	CCTT Tx Time (ms)
5290.000000	0	first 200 ms	1	0.008
5290.000000	0	remaining 10.0 second(s) period	0	0.000

(continuation of the "Channel Closing Transmission Time Detailed Results" table from column 5 ...)

DUT Frequency (MHz)	CCTT Tx Time Limit (ms)	CCTT Result	CCTT Comment
5290.000000	200.000	PASS	See Note 1.
5290.000000	60.000	PASS	See Note 1.

Non-occupancy period Detailed Results

DUT Frequency (MHz)	Radar Type No.	NOP No. of Pulses found	NOP No. of Pulses Limit	NOP Tx Time (s)	NOP Tx Time Limit (s)
5290.000000	0	0	0	0.000	0.000

(continuation of the "Non-occupancy period Detailed Results" table from column 6 ...)

DUT Frequency (MHz)	NOP Result
5290.000000	PASS

Transmitting Test Detailed Results

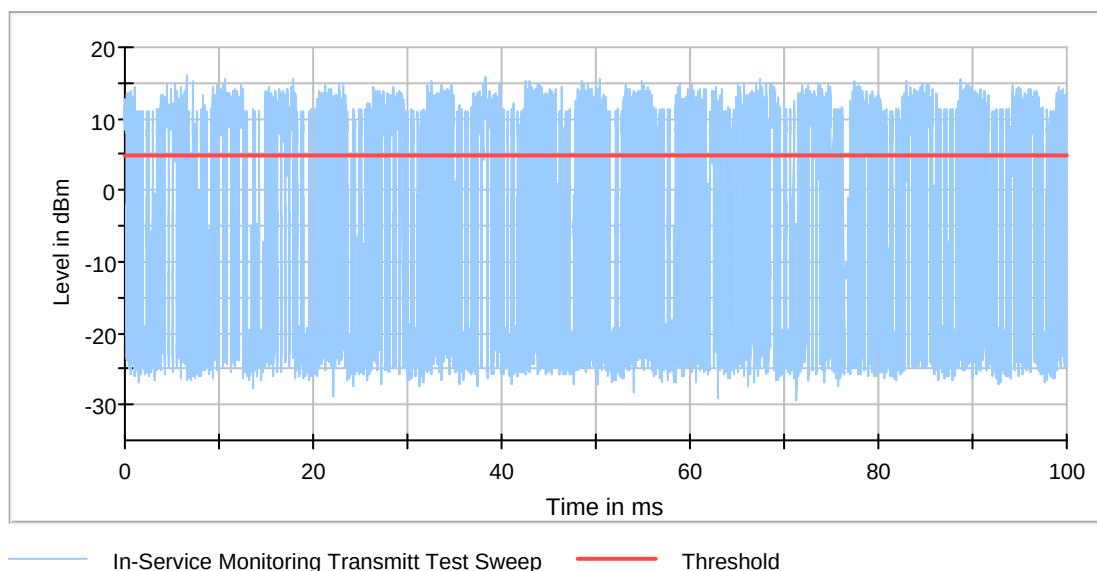
DUT Frequency (MHz)	Tx-Test DutyCycle (%)	Tx-Test DutyCycle Limit	Tx-Test No. of Pulses found	Tx-Test Result	Tx-Test Comment
5290.000000	41.643	>=17 %	581	PASS	

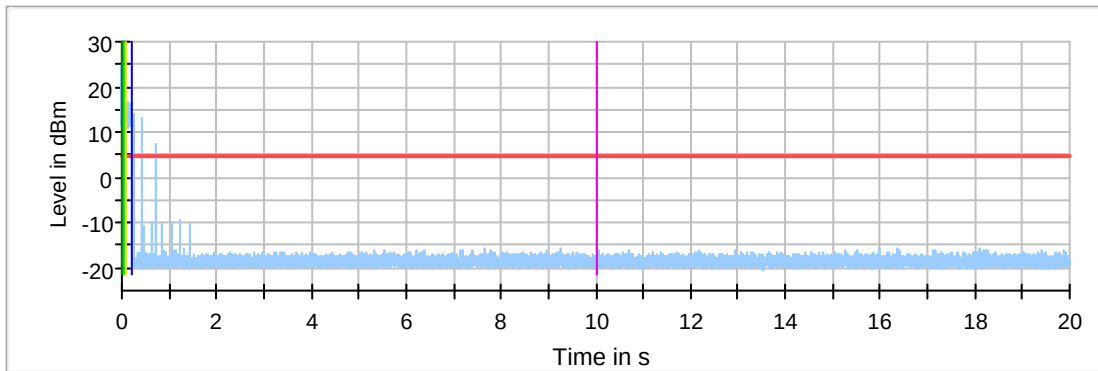
Additional Information

Note	Description
Note 1:	Because of the radar pulse event at the beginning, the investigation of the trace begins with an offset of 26.7 ms conforming to the end of the Radar burst.
Note 2:	Channel move time (CMT) / channel closing transmission time (CCTT) measurement was made with hi resolution video sweep using OSP DAQ channel
Note 3:	Because of the substantially higher sampling rate of the video signal the results for CCTT and CMT are more accurate than in the graphics visible. Reached timing accuracy of the video trace: approx 4 μ s
Note 4:	The Non-Occupancy Period trace starts at the end of the Channel move time trace (20.000 secs.) Labeling of the x-axis (time) is relative to its beginning (0 secs.)

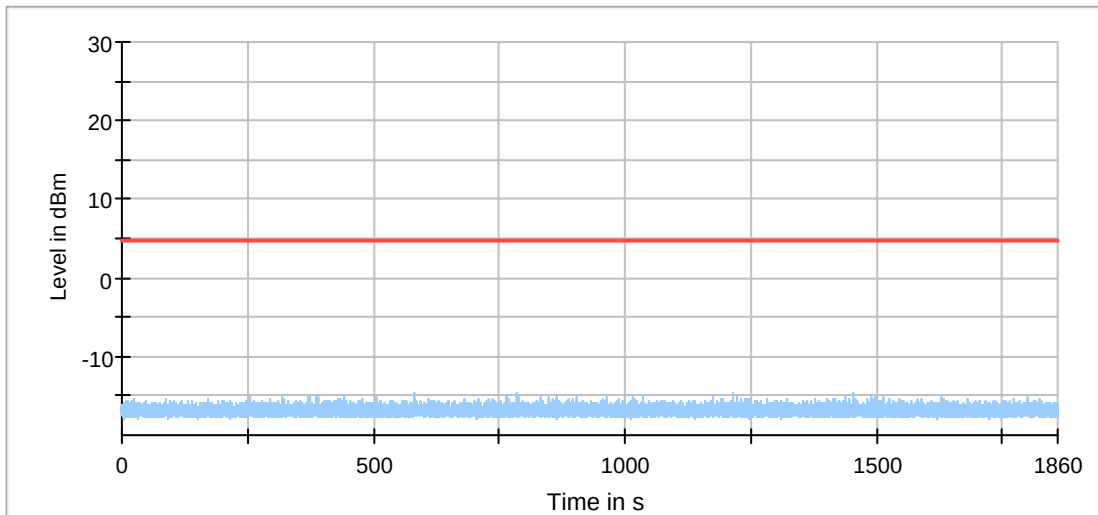
Radar level verification

Description	Value	Unit
Configured DUT EIRP:	31.62	mW
Configured DUT PSD:	7.00	dBm/MHz
Requirement of the Detection threshold value for this given values acc. to FCC clause 5.2 / Table 3	-62	dBm
Vector Generator level setting	12.48	dBm
Configured overall pathloss from Vector Generator RF out to DUT connector of 'DUT to OSP'-cable	75.22	dB
Given additional level added to the amplitude of the waveform to account for variations in measurement equipment acc. to FCC clause 5.2 / Table 3 / Note 2	1.00	dB
This results in the following radar signal level at the DUT	-62.74	dBm





- In-Service Monitoring Channel Move Time
- Threshold
- Start of Radar
- Trigger at end of Radar
- First 200ms of Channel Closing Tx Time
- 10sec Channel Move Time Limit
- Last measured edge of Channel Closing Tx Time



- In-Service Monitoring Non-occupancy period
- Threshold

DFS In-Service Monitoring (IEEE 802.11ac VHT 5530 MHz)

Measurement Summary

DUT Frequency (MHz)	Radar Type No.	Type of Measurement value	Overall Result	Overall Comment
5530.000000	0	First of all Transmitt Test	PASS	DUT is transmitting
5530.000000	0	Channel Move Time	PASS	
5530.000000	0	Channel Closing Transmission Time	PASS	
5530.000000	0	Non-occupancy period	PASS	

Channel Move Time Detailed Results

DUT Frequency (MHz)	Radar Type No.	CMT Tx Time (s)	CMT Limit (s)	CMT Result
5530.000000	0	0.000	10.000	PASS

(continuation of the "Channel Move Time Detailed Results" table from column 5 ...)

DUT Frequency (MHz)	CMT Comment
5530.000000	Tx Time value is last trailing edge found within sweep. See Note 1.

Channel Closing Transmission Time Detailed Results

DUT Frequency (MHz)	Radar Type No.	CCTT Type of Value	CCTT No. of Pulses found	CCTT Tx Time (ms)
5530.000000	0	first 200 ms	0	0.000
5530.000000	0	remaining 10.0 second(s) period	0	0.000

(continuation of the "Channel Closing Transmission Time Detailed Results" table from column 5 ...)

DUT Frequency (MHz)	CCTT Tx Time Limit (ms)	CCTT Result	CCTT Comment
5530.000000	200.000	PASS	See Note 1.
5530.000000	60.000	PASS	See Note 1.

Non-occupancy period Detailed Results

DUT Frequency (MHz)	Radar Type No.	NOP No. of Pulses found	NOP No. of Pulses Limit	NOP Tx Time (s)	NOP Tx Time Limit (s)
5530.000000	0	0	0	0.000	0.000

(continuation of the "Non-occupancy period Detailed Results" table from column 6 ...)

DUT Frequency (MHz)	NOP Result
5530.000000	PASS

Transmitting Test Detailed Results

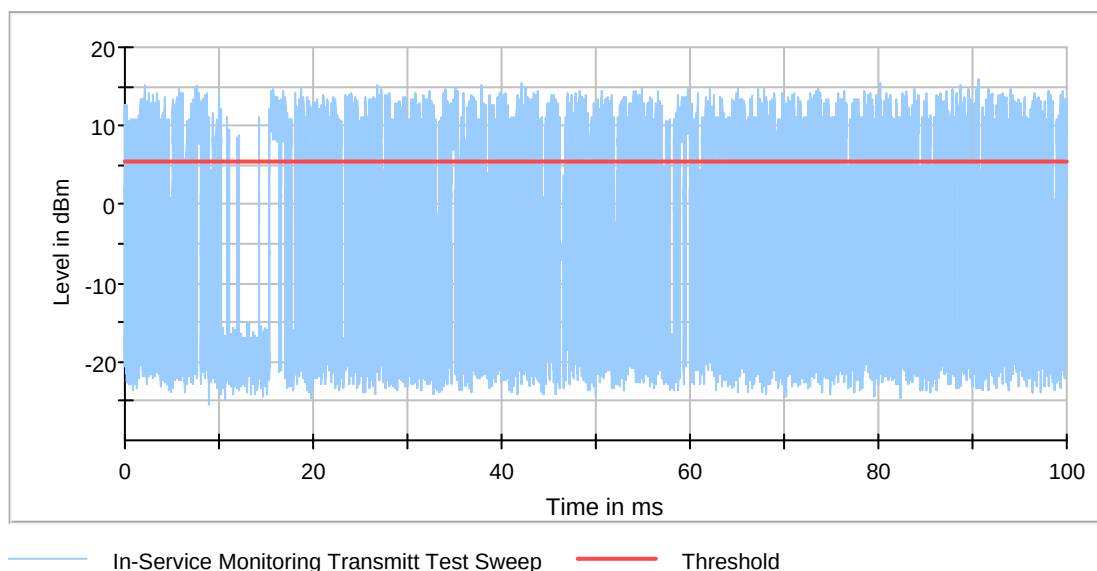
DUT Frequency (MHz)	Tx-Test DutyCycle (%)	Tx-Test DutyCycle Limit	Tx-Test No. of Pulses found	Tx-Test Result	Tx-Test Comment
5530.000000	34.097	>=17 %	603	PASS	

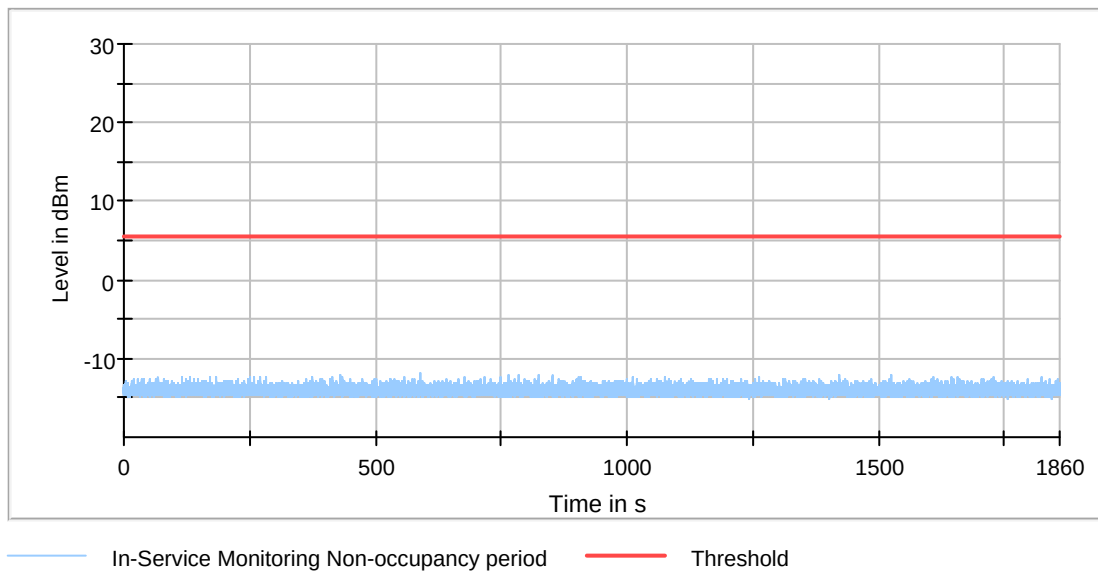
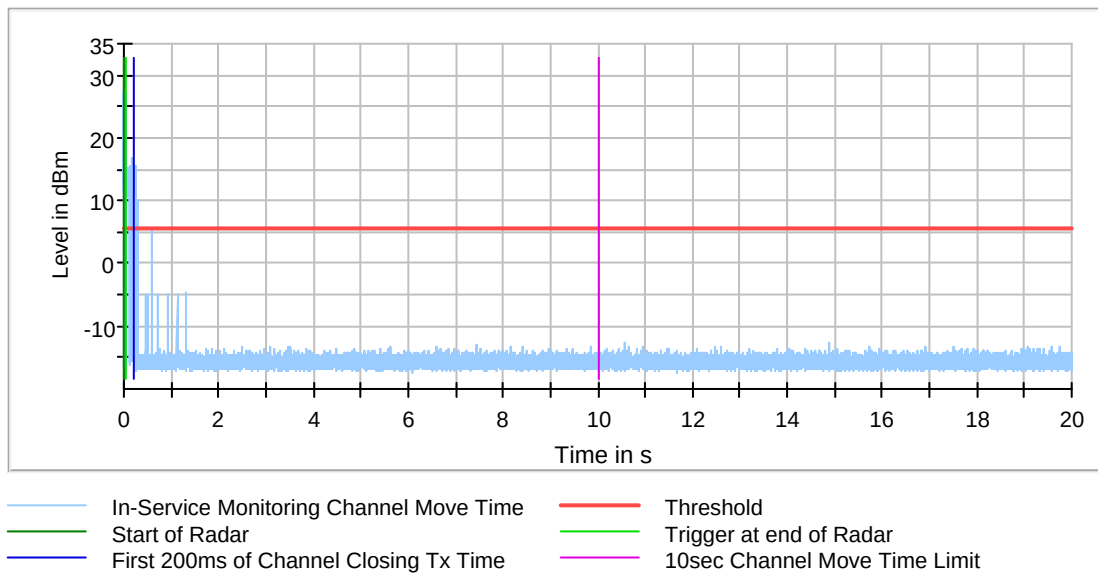
Additional Information

Note	Description
Note 1:	Because of the radar pulse event at the beginning, the investigation of the trace begins with an offset of 26.7 ms conforming to the end of the Radar burst.
Note 2:	Channel move time (CMT) / channel closing transmission time (CCTT) measurement was made with hi resolution video sweep using OSP DAQ channel
Note 3:	Because of the substantially higher sampling rate of the video signal the results for CCTT and CMT are more accurate than in the graphics visible. Reached timing accuracy of the video trace: approx 4 μ s
Note 4:	The Non-Occupancy Period trace starts at the end of the Channel move time trace (20.000 secs.) Labeling of the x-axis (time) is relative to its beginning (0 secs.)

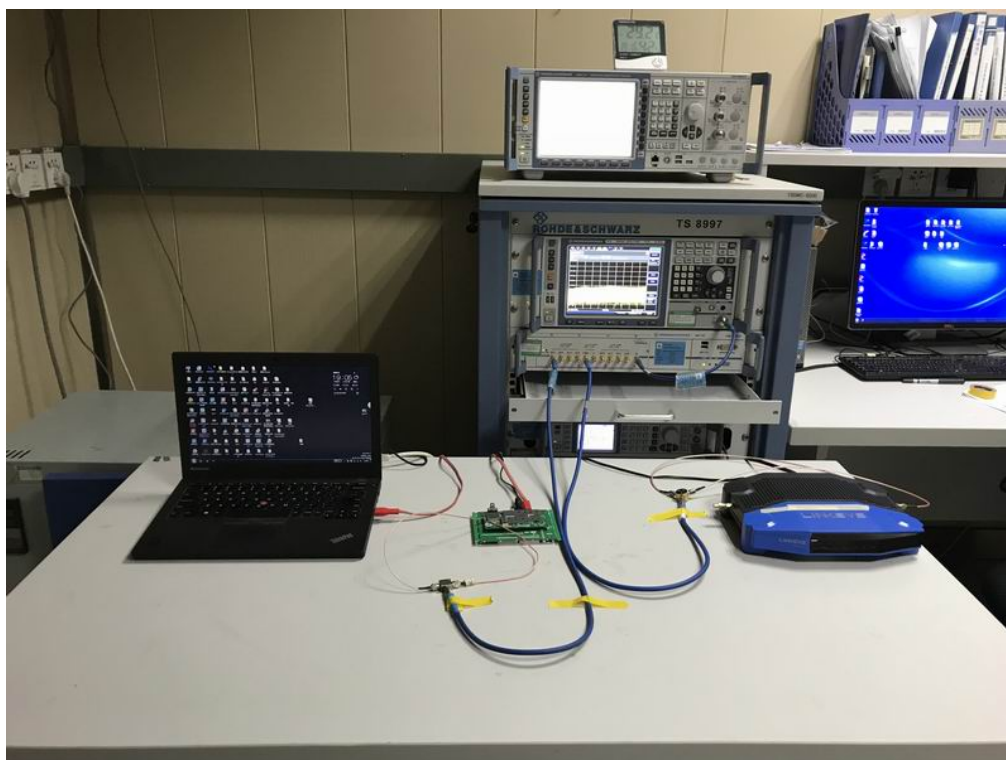
Radar level verification

Description	Value	Unit
Configured DUT EIRP:	31.62	mW
Configured DUT PSD:	7.00	dBm/MHz
Requirement of the Detection threshold value for this given values acc. to FCC clause 5.2 / Table 3	-62	dBm
Vector Generator level setting	11.11	dBm
Configured overall pathloss from Vector Generator RF out to DUT connector of 'DUT to OSP'-cable	73.84	dB
Given additional level added to the amplitude of the waveform to account for variations in measurement equipment acc. to FCC clause 5.2 / Table 3 / Note 2	1.00	dB
This results in the following radar signal level at the DUT	-60.73	dBm





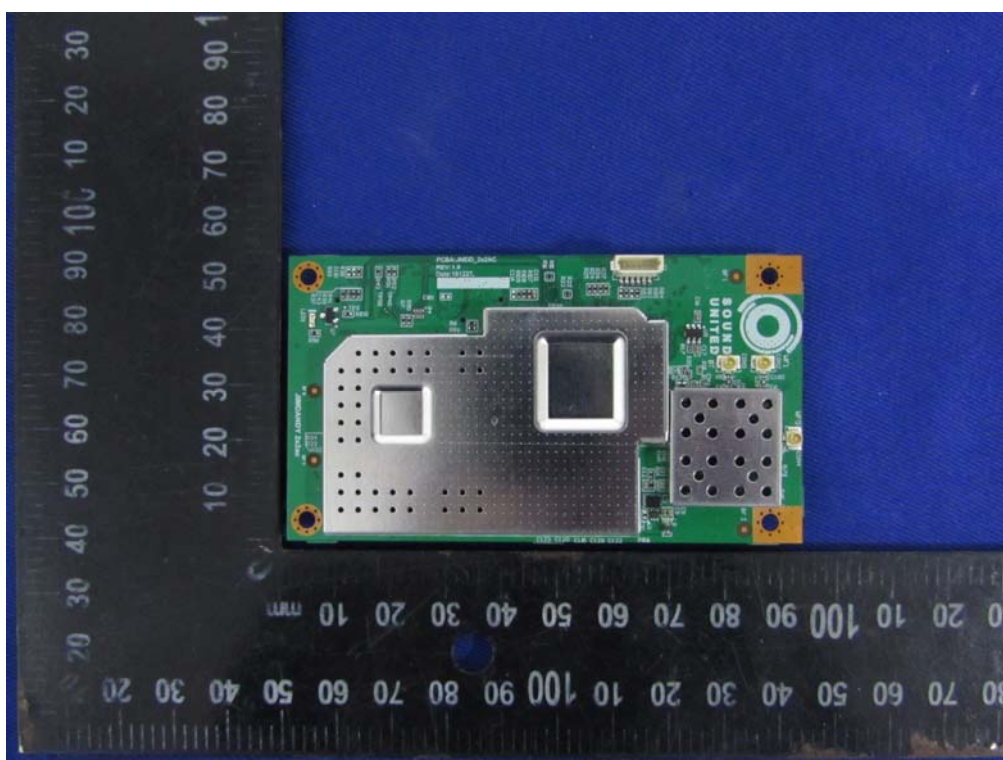
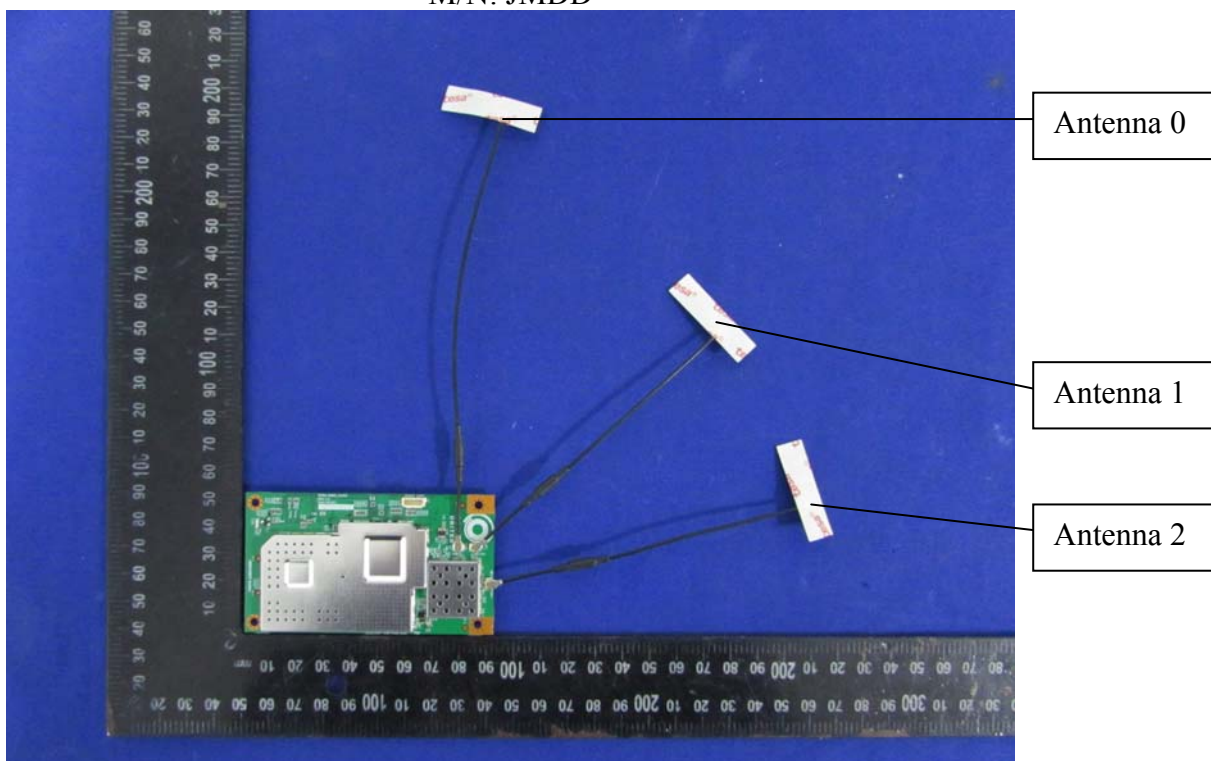
5. TEST SETUP PHOTOS



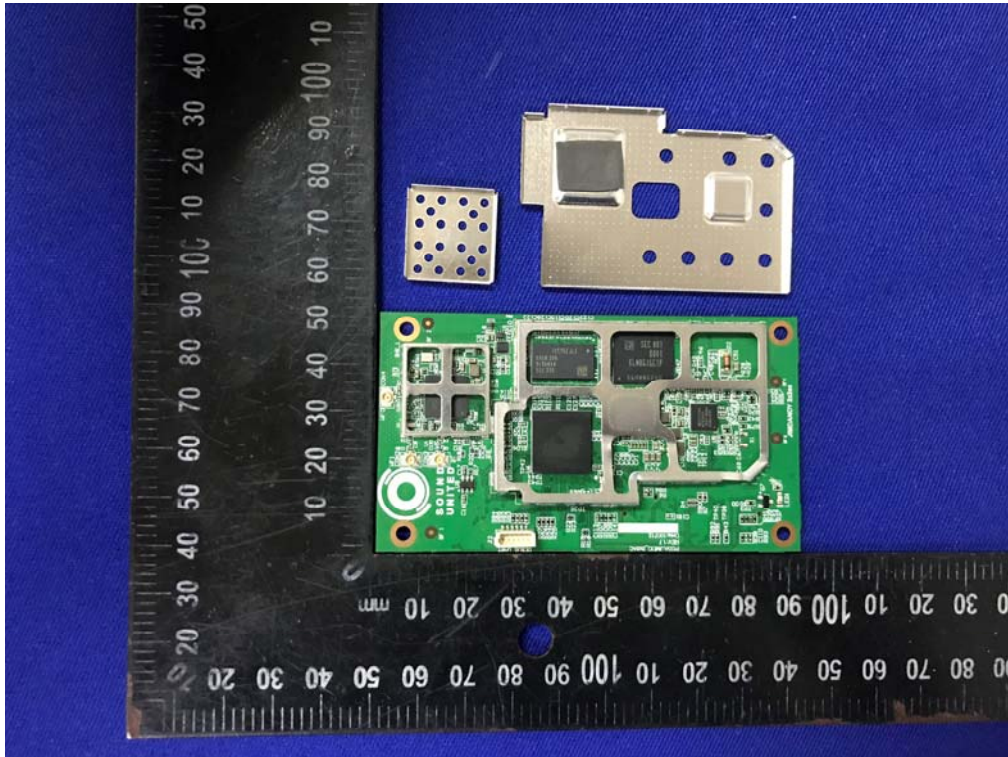
6. PHOTOS OF EUT

External Photos

M/N: JMDD



Internal Photos
M/N: JMDD



Internal Photos
M/N: JMDD

