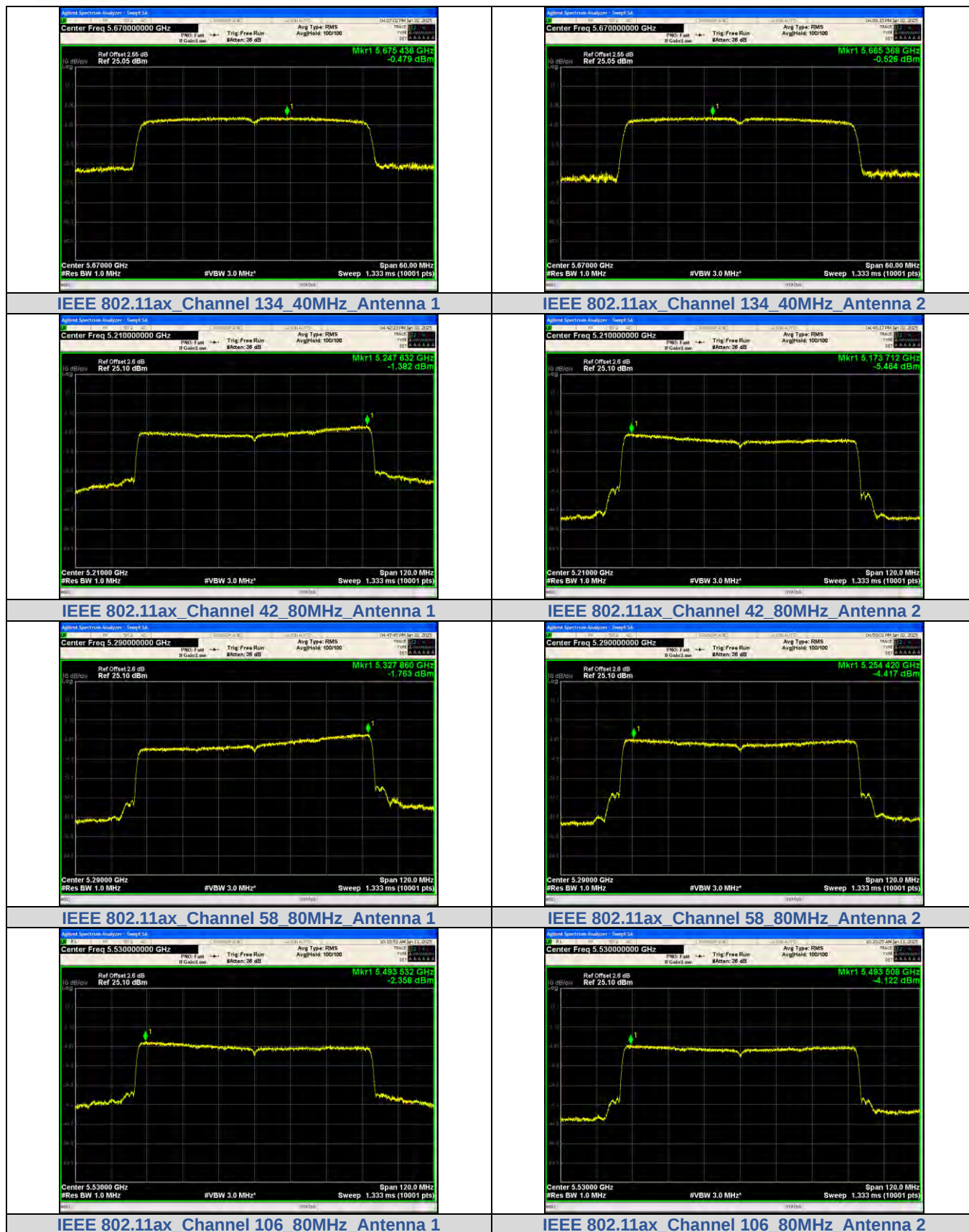


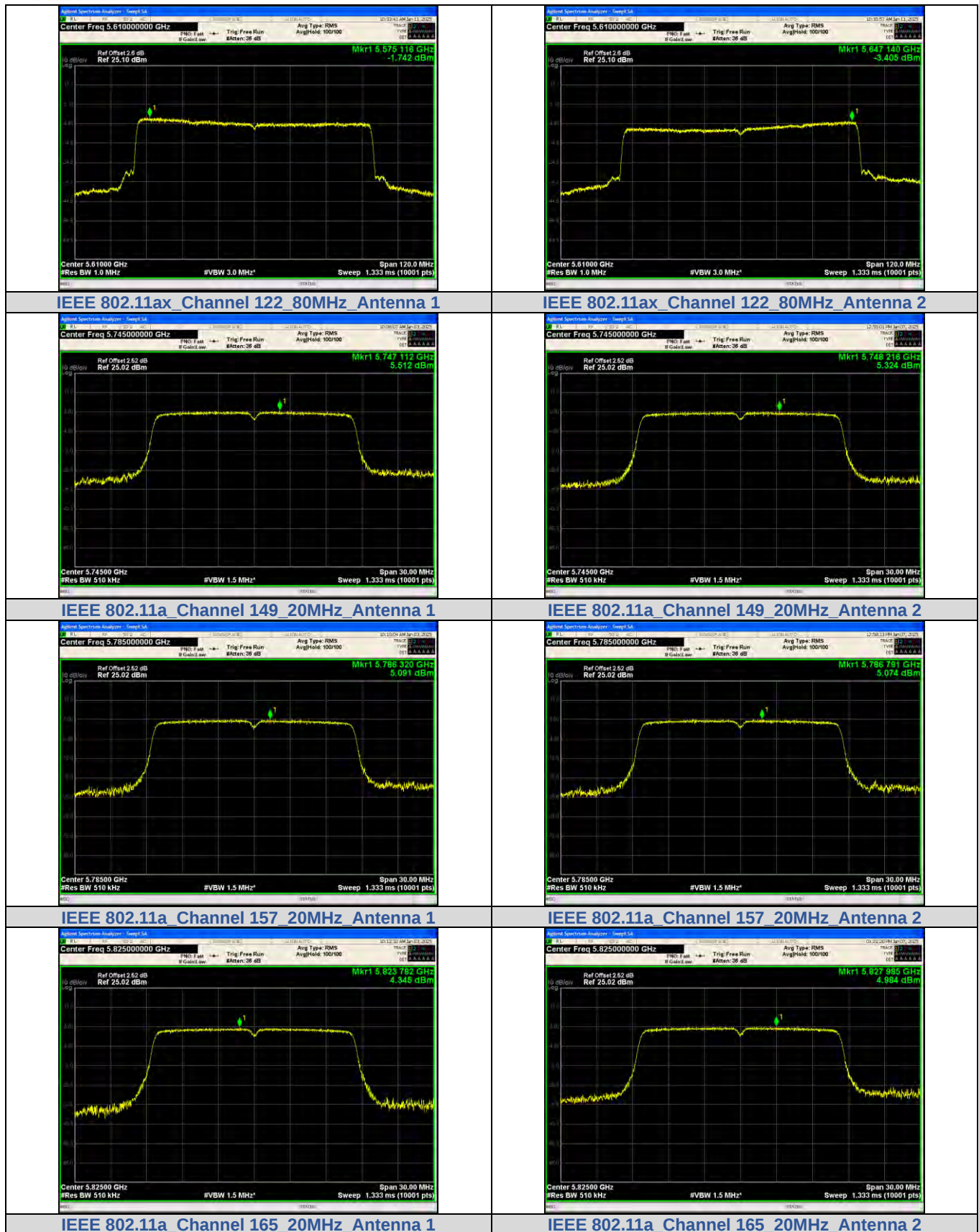


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Tel.: (86)755-27521059 Fax: (86)755-27521011 Http://www.sz-ctc.org.cn

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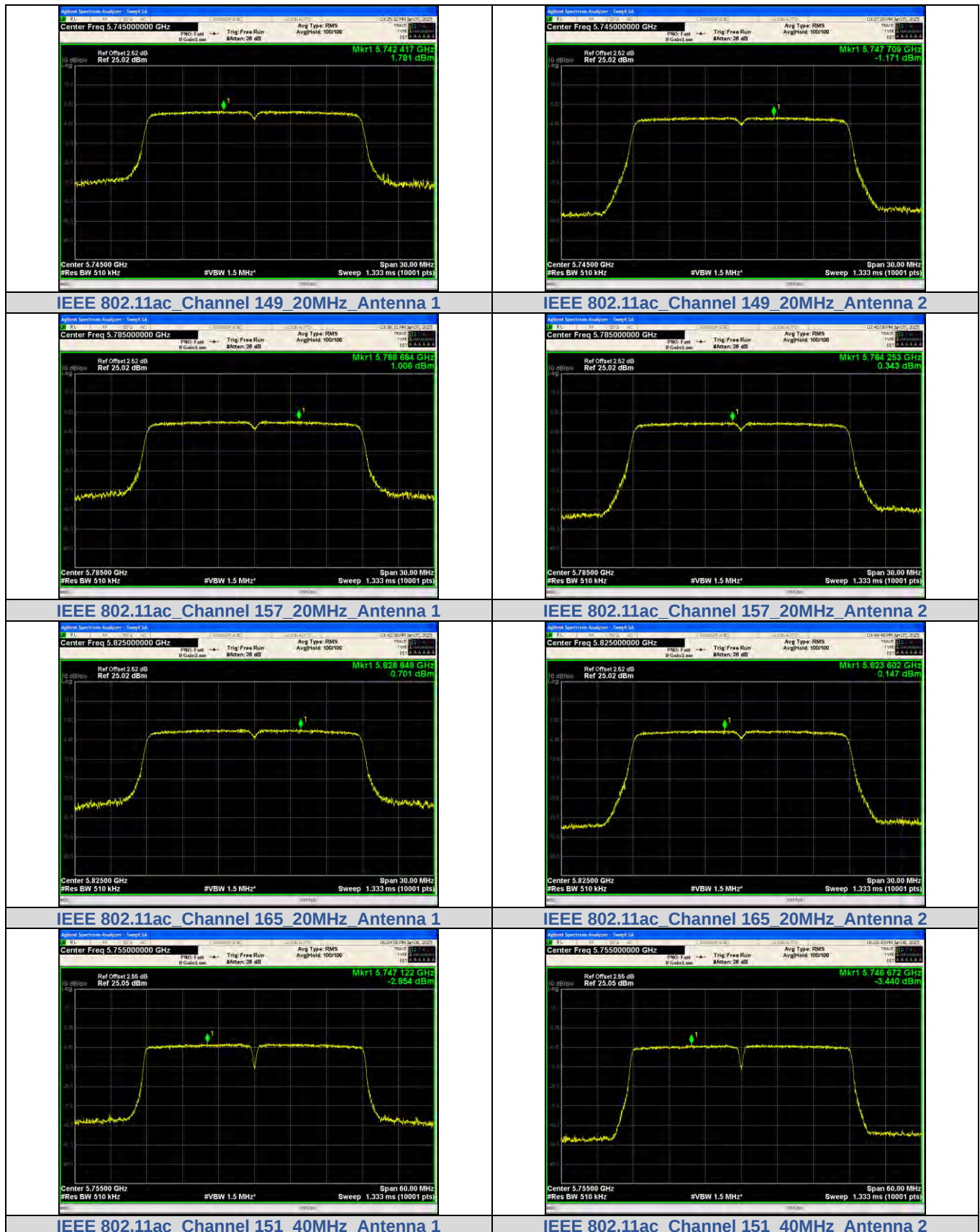


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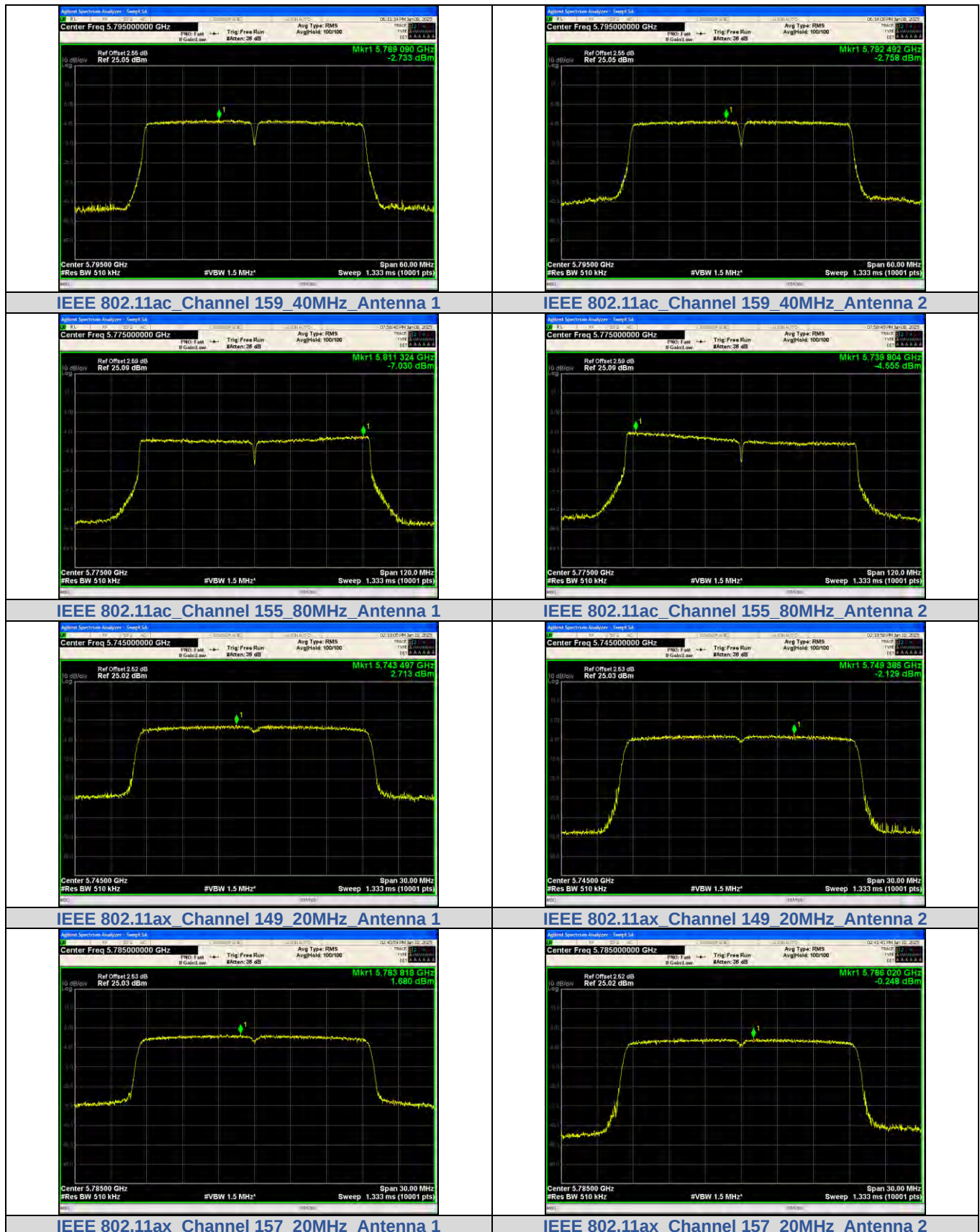


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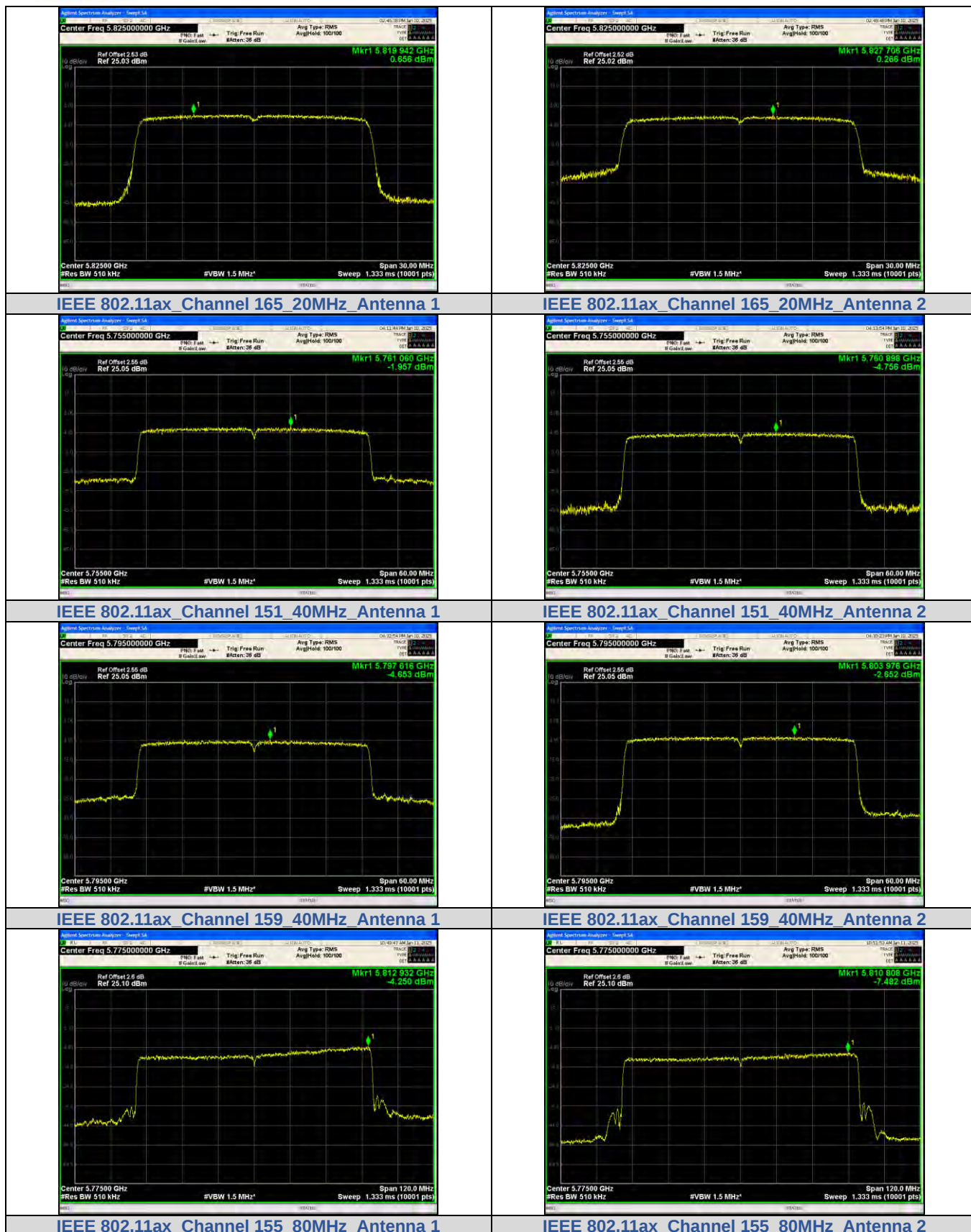


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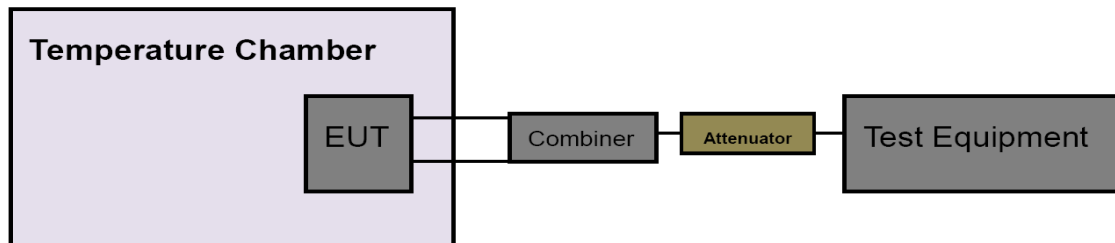
3.7. Frequency Stability

Limit

FCC CFR Title 47 Part 15 Subpart E Section 15.407(g) / RSS-Gen 6.11

Test Item	Limit	Frequency Range (MHz)
Frequency Stability	Specified in the user's manual, the transmitter center frequency tolerance shall be ± 20 ppm maximum for the 5 GHz band (IEEE 802.11n specification)	5150~5250
		5250~5350
		5500~5700
		5725~5850

Test Configuration



Test Procedure

The EUT was directly connected to the Spectrum Analyzer and antenna output port as show in the block diagram above.

- (1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- (2) Set analyzer center frequency to transmitting frequency.
- (3) Set the span to encompass the entire emissions bandwidth (EBW) of the signal.
- (4) Set the RBW to: 8MHz, VBW=8MHz with peak detector and max hold settings.
- (5) The test extreme voltage is to change the primary supply voltage from 12Vdc to 19Vdc percent of the nominal value.
- (6) Extreme temperature is 0°C~40°C

NOTE: The EUT was set to continuously transmitting in continuously un-modulation transmitting mode.

Test Mode

Please refer to the clause 2.4.

**Test Result**

Voltage								
Test Mode	Antenna	Freq. (MHz)	Voltage [Vdc]	Temp. (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
20M Bandwidth	Ant1	5180	NV	NT	23620	4.560	20	PASS
			LV	NT	23620	4.560	20	PASS
			HV	NT	23620	4.560	20	PASS
	Ant2	5180	NV	NT	23660	4.568	20	PASS
			LV	NT	23660	4.568	20	PASS
			HV	NT	23660	4.568	20	PASS
	Ant1	5200	NV	NT	22330	4.294	20	PASS
			LV	NT	22330	4.294	20	PASS
			HV	NT	22330	4.294	20	PASS
	Ant2	5200	NV	NT	22390	4.306	20	PASS
			LV	NT	22390	4.306	20	PASS
			HV	NT	22390	4.306	20	PASS
	Ant1	5240	NV	NT	21540	4.111	20	PASS
			LV	NT	21540	4.111	20	PASS
			HV	NT	21540	4.111	20	PASS
	Ant2	5240	NV	NT	21470	4.097	20	PASS
			LV	NT	21470	4.097	20	PASS
			HV	NT	21470	4.097	20	PASS
	Ant1	5260	NV	NT	23110	4.394	20	PASS
			LV	NT	23110	4.394	20	PASS
			HV	NT	23110	4.394	20	PASS
	Ant2	5260	NV	NT	26570	4.994	20	PASS
			LV	NT	23120	4.395	20	PASS
			HV	NT	23120	4.395	20	PASS
	Ant1	5280	NV	NT	23120	4.395	20	PASS
			LV	NT	25440	4.818	20	PASS
			HV	NT	25440	4.818	20	PASS
	Ant2	5280	NV	NT	25480	4.826	20	PASS
			LV	NT	25480	4.826	20	PASS
			HV	NT	25480	4.826	20	PASS
	Ant1	5320	NV	NT	26570	4.994	20	PASS
			LV	NT	26570	4.994	20	PASS
			HV	NT	26570	4.994	20	PASS
	Ant2	5320	NV	NT	26400	4.962	20	PASS
			LV	NT	26400	4.962	20	PASS
			HV	NT	26400	4.962	20	PASS
	Ant1	5500	NV	NT	19940	3.625	20	PASS
			LV	NT	19940	3.625	20	PASS
			HV	NT	19940	3.625	20	PASS
	Ant2	5500	NV	NT	19860	3.611	20	PASS
			LV	NT	19860	3.611	20	PASS
			HV	NT	19860	3.611	20	PASS
	Ant1	5580	NV	NT	22680	4.065	20	PASS
			LV	NT	22680	4.065	20	PASS
			HV	NT	22680	4.065	20	PASS
	Ant2	5580	NV	NT	22240	3.986	20	PASS
			LV	NT	22240	3.986	20	PASS
			HV	NT	22240	3.986	20	PASS
	Ant1	5700	NV	NT	20690	3.630	20	PASS
			LV	NT	20690	3.630	20	PASS
			HV	NT	20690	3.630	20	PASS
	Ant2	5700	NV	NT	22240	3.986	20	PASS
			LV	NT	20420	3.582	20	PASS
			HV	NT	20420	3.582	20	PASS

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	Ant1	5745	NV	NT	22030	3.835	20	PASS
			LV	NT	22030	3.835	20	PASS
			HV	NT	22030	3.835	20	PASS
	Ant2	5745	NV	NT	22580	3.930	20	PASS
			LV	NT	22580	3.930	20	PASS
			HV	NT	22580	3.930	20	PASS
	Ant1	5785	NV	NT	26540	4.588	20	PASS
			LV	NT	26540	4.588	20	PASS
			HV	NT	26120	4.515	20	PASS
	Ant2	5785	NV	NT	26120	4.515	20	PASS
			LV	NT	26120	4.515	20	PASS
			HV	NT	26120	4.515	20	PASS
	Ant1	5825	NV	NT	21560	3.701	20	PASS
			LV	NT	21560	3.701	20	PASS
			HV	NT	21560	3.701	20	PASS
	Ant2	5825	NV	NT	22420	3.849	20	PASS
			LV	NT	22420	3.849	20	PASS
			HV	NT	22420	3.849	20	PASS
40M Bandwidth	Ant1	5190	NV	NT	22480	4.331	20	PASS
			LV	NT	22480	4.331	20	PASS
			HV	NT	22480	4.331	20	PASS
	Ant2	5190	NV	NT	26850	5.173	20	PASS
			LV	NT	26850	5.173	20	PASS
			HV	NT	26850	5.173	20	PASS
	Ant1	5230	NV	NT	22580	4.317	20	PASS
			LV	NT	22580	4.317	20	PASS
			HV	NT	22580	4.317	20	PASS
	Ant2	5230	NV	NT	25470	4.870	20	PASS
			LV	NT	25470	4.870	20	PASS
			HV	NT	25470	4.870	20	PASS
	Ant1	5270	NV	NT	21520	4.083	20	PASS
			LV	NT	21520	4.083	20	PASS
			HV	NT	21520	4.083	20	PASS
	Ant2	5270	NV	NT	21270	4.036	20	PASS
			LV	NT	21270	4.036	20	PASS
			HV	NT	21270	4.036	20	PASS
	Ant1	5310	NV	NT	23870	4.495	20	PASS
			LV	NT	23870	4.495	20	PASS
			HV	NT	23870	4.495	20	PASS
	Ant2	5310	NV	NT	23990	4.518	20	PASS
			LV	NT	23990	4.518	20	PASS
			HV	NT	23990	4.518	20	PASS
	Ant1	5510	NV	NT	27450	4.982	20	PASS
			LV	NT	27450	4.982	20	PASS
			HV	NT	27450	4.982	20	PASS
	Ant2	5510	NV	NT	25640	4.653	20	PASS
			LV	NT	25640	4.653	20	PASS
			HV	NT	25640	4.653	20	PASS
	Ant1	5550	NV	NT	26250	4.730	20	PASS
			LV	NT	26250	4.730	20	PASS
			HV	NT	26250	4.730	20	PASS
	Ant2	5550	NV	NT	26140	4.710	20	PASS
			LV	NT	26140	4.710	20	PASS
			HV	NT	26140	4.710	20	PASS
	Ant1	5670	NV	NT	20030	3.558	20	PASS
			LV	NT	20030	3.558	20	PASS
			HV	NT	20030	3.558	20	PASS
	Ant2	5670	NV	NT	19890	3.533	20	PASS
			LV	NT	19890	3.533	20	PASS

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	Ant1	5755	HV	NT	19890	3.533	20	PASS
			NV	NT	30690	5.333	20	PASS
			LV	NT	30690	5.333	20	PASS
	Ant2	5755	HV	NT	20440	3.552	20	PASS
			NV	NT	20440	3.552	20	PASS
			LV	NT	20440	3.552	20	PASS
	Ant1	5795	HV	NT	30690	5.333	20	PASS
			NV	NT	22030	3.802	20	PASS
			LV	NT	22030	3.802	20	PASS
	Ant2	5795	HV	NT	22560	3.893	20	PASS
			NV	NT	22560	3.893	20	PASS
			LV	NT	22030	3.802	20	PASS
80M Bandwidth	Ant1	5210	HV	NT	22560	3.893	20	PASS
			NV	NT	26540	5.094	20	PASS
			LV	NT	26540	5.094	20	PASS
	Ant2	5210	HV	NT	26540	5.094	20	PASS
			NV	NT	30610	5.875	20	PASS
			LV	NT	30610	5.875	20	PASS
	Ant1	5290	HV	NT	30610	5.875	20	PASS
			NV	NT	24690	4.667	20	PASS
			LV	NT	26450	5.000	20	PASS
	Ant2	5290	HV	NT	24690	4.667	20	PASS
			NV	NT	24690	4.667	20	PASS
			LV	NT	24690	4.667	20	PASS
	Ant1	5530	HV	NT	24690	4.667	20	PASS
			NV	NT	36410	6.584	20	PASS
			LV	NT	36410	6.584	20	PASS
	Ant2	5530	HV	NT	36410	6.584	20	PASS
			NV	NT	36410	6.584	20	PASS
			LV	NT	18960	3.429	20	PASS
	Ant1	5610	HV	NT	18960	3.429	20	PASS
			NV	NT	25700	4.581	20	PASS
			LV	NT	25700	4.581	20	PASS
	Ant2	5610	HV	NT	25700	4.581	20	PASS
			NV	NT	25700	4.581	20	PASS
			LV	NT	25700	4.581	20	PASS
	Ant1	5775	HV	NT	25700	4.581	20	PASS
			NV	NT	26900	4.658	20	PASS
			LV	NT	26900	4.658	20	PASS
	Ant2	5775	HV	NT	27540	4.769	20	PASS
			NV	NT	27540	4.769	20	PASS
			LV	NT	27540	4.769	20	PASS
			HV	NT	26900	4.658	20	PASS
			NV	NT	26900	4.658	20	PASS
			LV	NT	26900	4.658	20	PASS



Test Mode	Antenna	Freq. (MHz)	Temperature					Verdict
			Voltage [Vdc]	Temp. (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	
20M Bandwidth	Ant1	5180	NV	0	22480	4.340	20	PASS
			NV	10	22480	4.340	20	PASS
			NV	20	22480	4.340	20	PASS
			NV	30	22480	4.340	20	PASS
			NV	40	22480	4.340	20	PASS
	Ant2	5180	NV	0	23660	4.568	20	PASS
			NV	10	23660	4.568	20	PASS
			NV	20	23660	4.568	20	PASS
			NV	30	23660	4.568	20	PASS
			NV	40	23660	4.568	20	PASS
	Ant1	5200	NV	0	22330	4.294	20	PASS
			NV	10	22330	4.294	20	PASS
			NV	20	22330	4.294	20	PASS
			NV	30	22330	4.294	20	PASS
			NV	40	22330	4.294	20	PASS
	Ant2	5200	NV	0	22390	4.306	20	PASS
			NV	10	22390	4.306	20	PASS
			NV	20	22390	4.306	20	PASS
			NV	30	22390	4.306	20	PASS
			NV	40	22390	4.306	20	PASS
	Ant1	5240	NV	0	21540	4.111	20	PASS
			NV	10	21540	4.111	20	PASS
			NV	20	21540	4.111	20	PASS
			NV	30	21540	4.111	20	PASS
			NV	40	21540	4.111	20	PASS
	Ant2	5240	NV	0	21470	4.097	20	PASS
			NV	10	21470	4.097	20	PASS
			NV	20	21470	4.097	20	PASS
			NV	30	21470	4.097	20	PASS
			NV	40	21470	4.097	20	PASS
	Ant1	5260	NV	0	23110	4.394	20	PASS
			NV	10	23110	4.394	20	PASS
			NV	20	23110	4.394	20	PASS
			NV	30	23110	4.394	20	PASS
			NV	40	23110	4.394	20	PASS
	Ant2	5260	NV	0	23120	4.395	20	PASS
			NV	10	23120	4.395	20	PASS
			NV	20	23120	4.395	20	PASS
			NV	30	23120	4.395	20	PASS
			NV	40	23120	4.395	20	PASS
	Ant1	5280	NV	0	25440	4.818	20	PASS
			NV	10	25440	4.818	20	PASS
			NV	20	25440	4.818	20	PASS
			NV	30	25440	4.818	20	PASS
			NV	40	25440	4.818	20	PASS
	Ant2	5280	NV	0	25480	4.826	20	PASS
			NV	10	25480	4.826	20	PASS
			NV	20	25480	4.826	20	PASS
			NV	30	25480	4.826	20	PASS
			NV	40	25480	4.826	20	PASS
	Ant1	5320	NV	0	26570	4.994	20	PASS
			NV	10	26570	4.994	20	PASS
			NV	20	26570	4.994	20	PASS
			NV	30	26570	4.994	20	PASS
			NV	40	26570	4.994	20	PASS
	Ant2	5320	NV	0	26400	4.962	20	PASS
			NV	10	26400	4.962	20	PASS
			NV	20	26400	4.962	20	PASS
			NV	30	26400	4.962	20	PASS
			NV	40	26400	4.962	20	PASS
	Ant1	5500	NV	0	19940	3.625	20	PASS

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			NV	10	19940	3.625	20	PASS
			NV	20	19940	3.625	20	PASS
			NV	30	19940	3.625	20	PASS
			NV	40	19940	3.625	20	PASS
	Ant2	5500	NV	0	19860	3.611	20	PASS
			NV	10	19860	3.611	20	PASS
			NV	20	19860	3.611	20	PASS
			NV	30	19860	3.611	20	PASS
	Ant1	5580	NV	40	19860	3.611	20	PASS
			NV	0	22680	4.065	20	PASS
			NV	10	22680	4.065	20	PASS
			NV	20	22680	4.065	20	PASS
	Ant2	5580	NV	30	22680	4.065	20	PASS
			NV	40	22680	4.065	20	PASS
	Ant2	5580	NV	0	22240	3.986	20	PASS
			NV	10	22240	3.986	20	PASS
	Ant1	5700	NV	20	22240	3.986	20	PASS
			NV	30	22240	3.986	20	PASS
			NV	40	22240	3.986	20	PASS
			NV	0	20690	3.630	20	PASS
	Ant2	5700	NV	10	20690	3.630	20	PASS
			NV	20	20690	3.630	20	PASS
			NV	30	20690	3.630	20	PASS
			NV	40	20690	3.630	20	PASS
	Ant1	5745	NV	0	20420	3.582	20	PASS
			NV	10	20420	3.582	20	PASS
			NV	20	20420	3.582	20	PASS
			NV	30	20420	3.582	20	PASS
	Ant2	5745	NV	40	20420	3.582	20	PASS
			NV	0	22030	3.835	20	PASS
	Ant1	5785	NV	10	22030	3.835	20	PASS
			NV	20	22030	3.835	20	PASS
	Ant2	5785	NV	30	22030	3.835	20	PASS
			NV	40	22030	3.835	20	PASS
			NV	0	22580	3.930	20	PASS
			NV	10	22580	3.930	20	PASS
	Ant1	5825	NV	20	22580	3.930	20	PASS
			NV	30	22580	3.930	20	PASS
			NV	40	22580	3.930	20	PASS
			NV	0	26540	4.588	20	PASS
	Ant2	5825	NV	10	26540	4.588	20	PASS
			NV	20	26540	4.588	20	PASS
			NV	30	26540	4.588	20	PASS
			NV	40	26540	4.588	20	PASS
	Ant1	5825	NV	0	26120	4.515	20	PASS
			NV	10	26120	4.515	20	PASS
			NV	20	26120	4.515	20	PASS
			NV	30	26120	4.515	20	PASS
	Ant2	5825	NV	40	26120	4.515	20	PASS
			NV	0	21560	3.701	20	PASS
	Ant1	5825	NV	10	21560	3.701	20	PASS
			NV	20	21560	3.701	20	PASS
	Ant2	5825	NV	30	21560	3.701	20	PASS
			NV	40	21560	3.701	20	PASS
			NV	0	22420	3.849	20	PASS
			NV	10	22420	3.849	20	PASS
	Ant1	5825	NV	20	22420	3.849	20	PASS
			NV	30	22420	3.849	20	PASS
			NV	40	22420	3.849	20	PASS
			NV	0	22420	3.849	20	PASS



40M Bandwidth	Ant1	5190	NV	0	22480	4.331	20	PASS
			NV	10	22480	4.331	20	PASS
			NV	20	22480	4.331	20	PASS
			NV	30	22480	4.331	20	PASS
			NV	40	22480	4.331	20	PASS
	Ant2	5190	NV	0	26850	5.173	20	PASS
			NV	10	26850	5.173	20	PASS
			NV	20	26850	5.173	20	PASS
			NV	30	26850	5.173	20	PASS
			NV	40	26850	5.173	20	PASS
	Ant1	5230	NV	0	22580	4.317	20	PASS
			NV	10	22580	4.317	20	PASS
			NV	20	22580	4.317	20	PASS
			NV	30	22580	4.317	20	PASS
			NV	40	22580	4.317	20	PASS
	Ant2	5230	NV	0	25470	4.870	20	PASS
			NV	10	25470	4.870	20	PASS
			NV	20	25470	4.870	20	PASS
			NV	30	25470	4.870	20	PASS
			NV	40	25470	4.870	20	PASS
	Ant1	5270	NV	0	21520	4.083	20	PASS
			NV	10	21520	4.083	20	PASS
			NV	20	21520	4.083	20	PASS
			NV	30	21520	4.083	20	PASS
			NV	40	21520	4.083	20	PASS
	Ant2	5270	NV	0	21270	4.036	20	PASS
			NV	10	21270	4.036	20	PASS
			NV	20	21270	4.036	20	PASS
			NV	30	21270	4.036	20	PASS
			NV	40	21270	4.036	20	PASS
	Ant1	5310	NV	0	23870	4.495	20	PASS
			NV	10	23870	4.495	20	PASS
			NV	20	23870	4.495	20	PASS
			NV	30	23870	4.495	20	PASS
			NV	40	23870	4.495	20	PASS
	Ant2	5310	NV	0	23990	4.518	20	PASS
			NV	10	23990	4.518	20	PASS
			NV	20	23990	4.518	20	PASS
			NV	30	23990	4.518	20	PASS
			NV	40	23990	4.518	20	PASS
	Ant1	5510	NV	0	27450	4.982	20	PASS
			NV	10	27450	4.982	20	PASS
			NV	20	27450	4.982	20	PASS
			NV	30	27450	4.982	20	PASS
			NV	40	27450	4.982	20	PASS
	Ant2	5510	NV	0	25640	4.653	20	PASS
			NV	10	25640	4.653	20	PASS
			NV	20	25640	4.653	20	PASS
			NV	30	25640	4.653	20	PASS
			NV	40	25640	4.653	20	PASS
	Ant1	5550	NV	0	26250	4.730	20	PASS
			NV	10	26250	4.730	20	PASS
			NV	20	26250	4.730	20	PASS
			NV	30	26250	4.730	20	PASS
			NV	40	26250	4.730	20	PASS
	Ant2	5550	NV	0	26140	4.710	20	PASS
			NV	10	26140	4.710	20	PASS
			NV	20	26140	4.710	20	PASS
			NV	30	26140	4.710	20	PASS
			NV	40	26140	4.710	20	PASS
	Ant1	5670	NV	0	25950	4.577	20	PASS
			NV	10	25950	4.577	20	PASS
			NV	20	25950	4.577	20	PASS
			NV	30	25950	4.577	20	PASS

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	Ant2	5670	NV	40	25950	4.577	20	PASS
			NV	0	22100	3.898	20	PASS
			NV	10	22100	3.898	20	PASS
			NV	20	22100	3.898	20	PASS
			NV	30	22100	3.898	20	PASS
	Ant1	5755	NV	40	22100	3.898	20	PASS
			NV	0	30690	5.333	20	PASS
			NV	10	30690	5.333	20	PASS
			NV	20	30690	5.333	20	PASS
			NV	30	30690	5.333	20	PASS
	Ant2	5755	NV	40	30690	5.333	20	PASS
			NV	0	20440	3.552	20	PASS
			NV	10	20440	3.552	20	PASS
			NV	20	20440	3.552	20	PASS
			NV	30	20440	3.552	20	PASS
	Ant1	5795	NV	40	20440	3.552	20	PASS
			NV	0	22030	3.802	20	PASS
			NV	10	22030	3.802	20	PASS
			NV	20	22030	3.802	20	PASS
			NV	30	22030	3.802	20	PASS
	Ant2	5795	NV	40	22030	3.802	20	PASS
			NV	0	22560	3.893	20	PASS
			NV	10	22560	3.893	20	PASS
			NV	20	22560	3.893	20	PASS
			NV	30	22560	3.893	20	PASS
			NV	40	22560	3.893	20	PASS

80M Bandwidth	Ant1	5210	NV	0	26540	5.094	20	PASS
			NV	10	26540	5.094	20	PASS
			NV	20	26540	5.094	20	PASS
			NV	30	26540	5.094	20	PASS
			NV	40	26540	5.094	20	PASS
	Ant2	5210	NV	0	30610	5.875	20	PASS
			NV	10	30610	5.875	20	PASS
			NV	20	30610	5.875	20	PASS
			NV	30	30610	5.875	20	PASS
			NV	40	30610	5.875	20	PASS
	Ant1	5290	NV	0	26450	5.000	20	PASS
			NV	10	26450	5.000	20	PASS
			NV	20	26450	5.000	20	PASS
			NV	30	26450	5.000	20	PASS
			NV	40	26450	5.000	20	PASS
	Ant2	5290	NV	0	24690	4.667	20	PASS
			NV	10	24690	4.667	20	PASS
			NV	20	24690	4.667	20	PASS
			NV	30	24690	4.667	20	PASS
			NV	40	24690	4.667	20	PASS
	Ant1	5530	NV	0	36410	6.584	20	PASS
			NV	10	36410	6.584	20	PASS
			NV	20	36410	6.584	20	PASS
			NV	30	36410	6.584	20	PASS
			NV	40	36410	6.584	20	PASS
	Ant2	5530	NV	0	18960	3.429	20	PASS
			NV	10	18960	3.429	20	PASS
			NV	20	18960	3.429	20	PASS
			NV	30	18960	3.429	20	PASS
			NV	40	18960	3.429	20	PASS
	Ant1	5610	NV	0	19300	3.440	20	PASS
			NV	10	19300	3.440	20	PASS
			NV	20	19300	3.440	20	PASS
			NV	30	19300	3.440	20	PASS
			NV	40	19300	3.440	20	PASS
	Ant2	5610	NV	0	25700	4.581	20	PASS
			NV	10	25700	4.581	20	PASS
			NV	20	25700	4.581	20	PASS

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			NV	30	25700	4.581	20	PASS
			NV	40	25700	4.581	20	PASS
	Ant1	5775	NV	0	26900	4.658	20	PASS
			NV	10	26900	4.658	20	PASS
			NV	20	26900	4.658	20	PASS
			NV	30	26900	4.658	20	PASS
			NV	40	26900	4.658	20	PASS
	Ant2	5775	NV	0	27540	4.769	20	PASS
			NV	10	27540	4.769	20	PASS
			NV	20	27540	4.769	20	PASS
			NV	30	27540	4.769	20	PASS
			NV	40	27540	4.769	20	PASS



3.8. Antenna Requirement

Requirement

FCC CFR Title 47 Part 15 Subpart C Section 15.203

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

Test Result

The directional gain of the antenna is 6.48dBi, please refer to the EUT internal photographs antenna photo.



3.9. Dynamic Frequency Selection

Requirement

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

Requirement	Operational Mode		
	Master	Client Without Radar Detection	Client With Radar Detection
Non-Occupancy Period	Yes	Not required	Yes
DFS Detection Threshold	Yes	Not required	Yes
Channel Availability Check Time	Yes	Not required	Not required
U-NII Detection Bandwidth	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
DFS Detection Threshold	Yes	Not required
Channel Closing Transmission Time	Yes	Yes
Channel Move Time	Yes	Yes
U-NII Detection Bandwidth	Yes	Not required

Additional requirements for devices with multiple bandwidth modes	Master Device or Client with Radar Detection	Client Without Radar Detection
U-NII Detection Bandwidth and Statistical Performance Check	All BW modes must be tested	Not required
Channel Move Time and Channel Closing Transmission Time	Test using widest BW mode available	Test using the widest BW mode available for the link
All other tests	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.

**Limit****1. DFS Detection Thresholds**

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 0dBi 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.

2. DFS Response Requirements

Table 4: DFS Response Requirement Values

Parameter	Value
Non-occupancy period	Minimum 30 minutes
Channel Availability Check Time	60 seconds
Channel Move Time	10 seconds See Note 1.
Channel Closing Transmission Time	200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period. See Notes 1 and 2.
U-NII Detection Bandwidth	Minimum 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 facilitating 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.

Radar Test Waveforms

This section provides the parameters for required test waveforms, minimum percentage of successful detections, and the minimum number of trials that must be used for determining DFS conformance. Step intervals of 0.1 microsecond for Pulse Width, 1 microsecond for PRI, 1 MHz for chirp width and 1 for the number of pulses will be utilized for the random determination of specific test waveforms.



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	$\text{Roundup} \left\{ \left(\frac{1}{360} \right) \cdot \left(\frac{19 \cdot 10^6}{\text{PRI}_{\mu\text{sec}}} \right) \right\}$	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.

For example if in Short Pulse Radar Type 1 Test B a PRI of 3066 μsec is selected, the number of pulses

$$\left\{ \left(\frac{1}{360} \right) \cdot \left(\frac{19 \cdot 10^6}{3066} \right) \right\}$$

would be Round up $\{17.2\} = \text{Round up } \{17.2\} = 18$.

Table 5a - Pulse Repetition Intervals Values for Test A

Pulse Repetition Frequency Number	Pulse Repetition Frequency (Pulses Per Second)	Pulse Repetition Interval (Microseconds)
1	1930.5	518
2	1858.7	538
3	1792.1	558
4	1730.1	578
5	1672.2	598
6	1618.1	618
7	1567.4	638
8	1519.8	658

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Pulse Repetition Frequency Number	Pulse Repetition Frequency (Pulses Per Second)	Pulse Repetition Interval (Microseconds)
9	1474.9	678
10	1432.7	698
11	1392.8	718
12	1355	738
13	1319.3	758
14	1285.3	778
15	1253.1	798
16	1222.5	818
17	1193.3	838
18	1165.6	858
19	1139	878
20	1113.6	898
21	1089.3	918
22	1066.1	938
23	326.2	3066

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

The parameters for this waveform are randomly chosen. Thirty unique waveforms are required for the Long Pulse Radar Type waveforms. If more than 30 waveforms are used for the Long Pulse Radar Type waveforms, then each additional waveform must also be unique and not repeated from the previous waveforms.

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

For the Frequency Hopping Radar Type, the same Burst parameters are used for each wave form. The hopping sequence is different for each wave form and a 100-length segment is selected from the hopping sequence defined by the following algorithm:

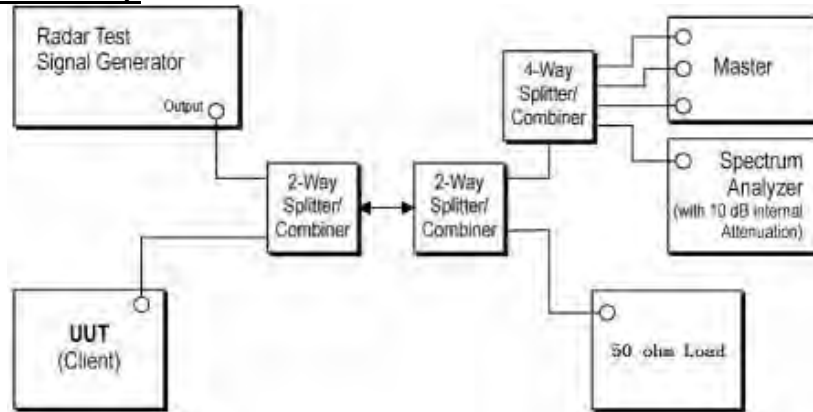
The first frequency in a hopping sequence is selected randomly from the group of 475 integer frequencies from 5250–5724MHz. Next, the frequency that was just chosen is removed from the group and a frequency is randomly selected from the remaining 474 frequencies in the group. This process continues until all 475 frequencies are chosen for the set. For selection of a random frequency, the frequencies remaining within the group are always treated as equally likely.

Calibration of Radar Waveform

Radar Waveform Calibration Procedure

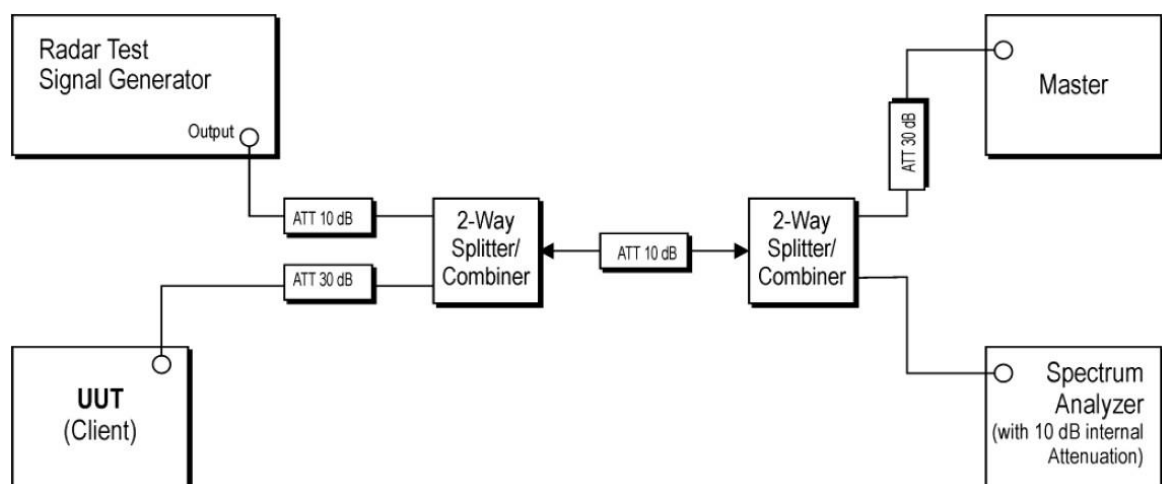
- 1) A 50 ohm load is connected in place of the spectrum analyzer, and the spectrum analyzer is connected to place of the master.
- 2) The interference Radar Detection Threshold Level is $-62\text{dBm} + 3.47\text{dBi} + 1\text{dB} = -57.53\text{dBm}$ that had been taken into account the output power range and antenna gain.
- 3) The following equipment setup was used to calibrate the conducted radar waveform. A vector signal generator was utilized to establish the test signal level for radar type 0. 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 used. The spectrum analyzer resolution bandwidth (RBW) and video bandwidth (VBW) were set to 3 MHz. The spectrum analyzer had offset -1.0dB to compensate RF cable loss 1.0dB.
- 4) The vector signal generator amplitude was set so that the power level measured at the spectrum analyzer was $-62\text{dBm} + 3.47\text{dBi} + 1\text{dB} = -57.53\text{dBm}$. Capture the spectrum analyzer plots on short pulse radar waveform.

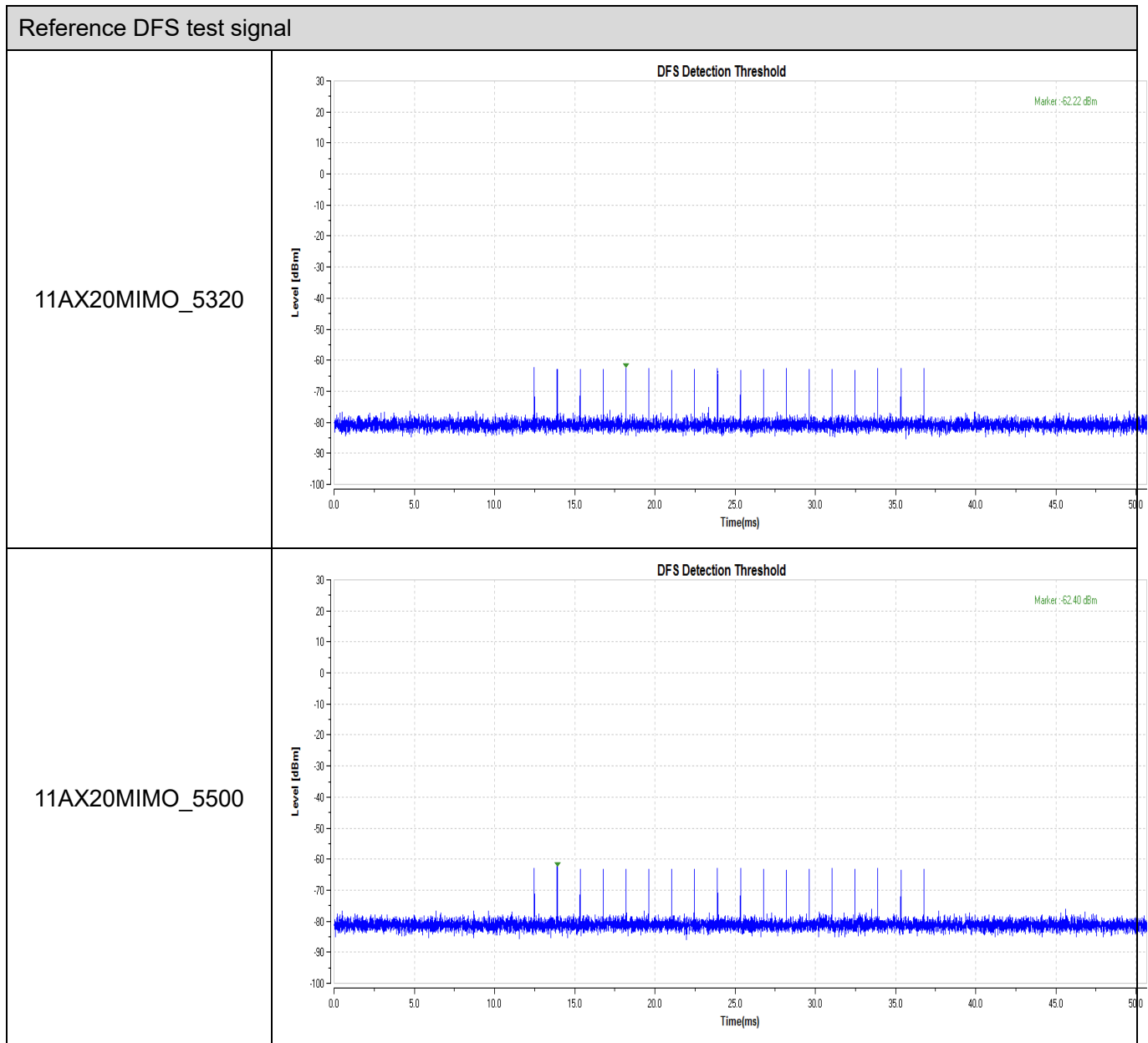
Conducted Calibration Setup



Test Configuration

Setup for Client with injection at the Master



**Radar Waveform Calibration Result****Test Procedure**

1. The radar pulse generator is setup to provide a pulse at frequency that the master and client are operating. A type 0 radar pulse with a 1us pulse width and a 1428us PRI is used for the testing.
2. The vector signal generator is adjusted to provide the radar burst (18 pulses) at the level of approximately -61dBm at the antenna port of the master device
3. A trigger is provided from the pulse generator to the DFS monitoring system in order to capture the traffic and the occurrence of the radar pulse.
4. EUT will associate with the master at channel. The file "iperf.exe" specified by the FCC is streamed from the PC 2 through the master and the client device to the PC 1 and played in full motion video using Media Player Classic Ver. 6.4.8.6 in order to properly load the network for the entire period of the test.
5. When radar burst with a level equal to the DFS Detection Threshold +1dB is generated on the operating channel of the U-NII device. At time T0 the radar waveform generator sends a burst of

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pulse of the radar waveform at Detection Threshold +1dB.

6. Observe the transmissions of the EUT at the end of the radar Burst on the Operating Channel Measure and record the transmissions from the UUT during the observation time (Channel Move Time). One 15 seconds plot is reported for the Short Pulse Radar Type 0. The plot for the Short Pulse Radar Types start at the end of the radar burst. The Channel Move Time will be calculated based on the zoom in 600ms plot of the Short Pulse Radar Type
7. Measurement of the aggregate duration of the Channel Closed Transmission Time method. With the spectrum analyzer set to zero span tuned to the center frequency of the EUT operating channel at the radar simulated frequency, peak detection, and max hold, the dwell time per bin is given by: $Dwell (0.3ms) = S (12000ms) / B (4000)$; where Dwell is the dwell time per spectrum analyzer sampling bin, S is sweep time and B is the number of spectrum analyzer sampling bins. An upper bound of the aggregate duration of the intermittent control signals of Channel Closing Transmission Time is calculated by: $C (ms) = N \times Dwell (0.3ms)$; where C is the Closing Time, N is the number of spectrum analyzer sampling bins (intermittent control signals) showing a U-NII transmission and Dwell is the dwell time per bin.
8. Measurement the EUT for more than 30 minutes following the channel move time to verify that no transmission or beacons occur on this channel.

Test Mode

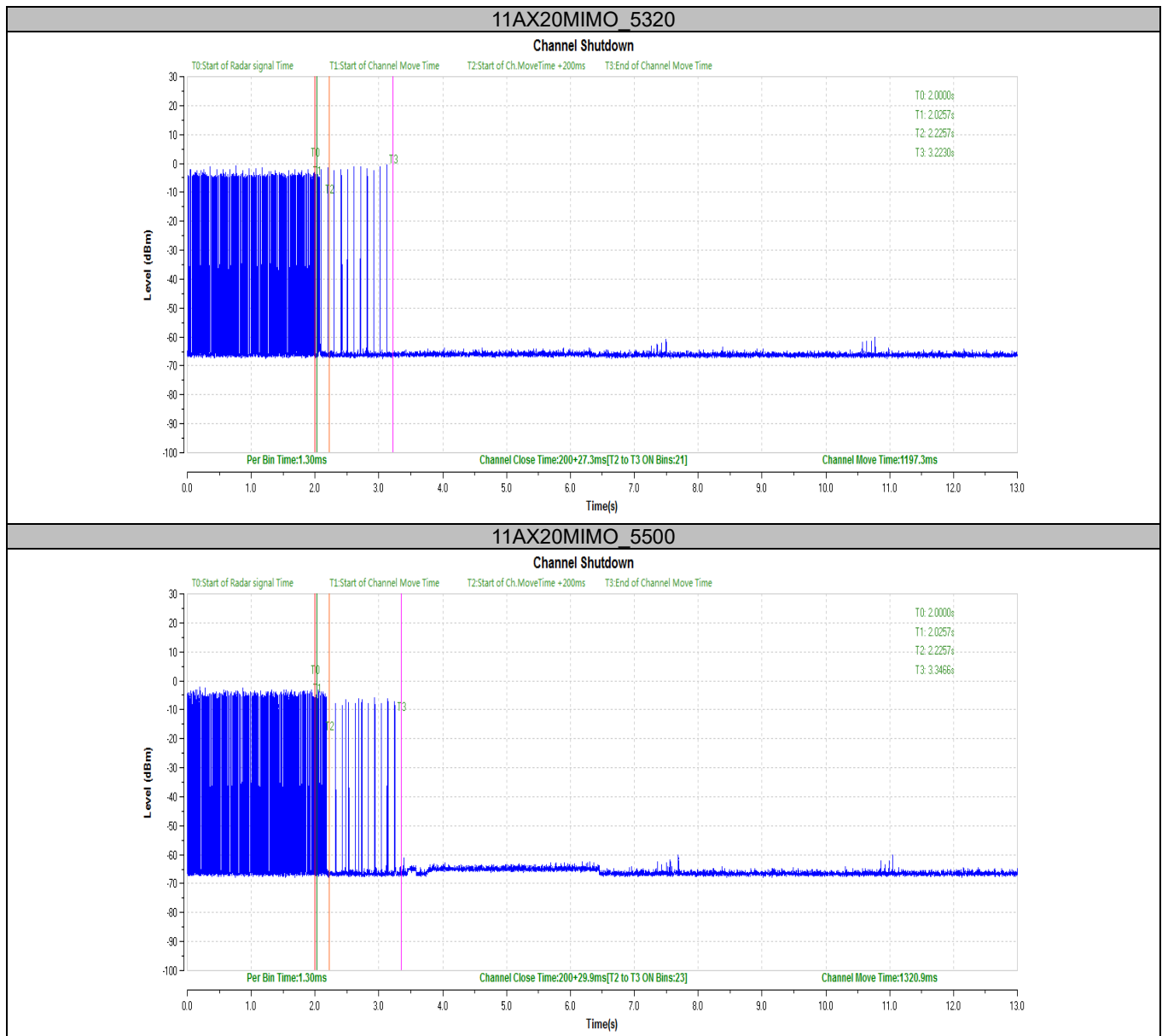
Please refer to the clause 2.4.

**Test Result**☒ **Passed**☐ **Not Applicable**

The product in this report belongs to Client Without Radar Detection.

Test Mode	Frequency[MHz]	CCTT[ms]	Limit[ms]	CMT[ms]	Limit[ms]	Verdict
11AX20MIMO	5320	227.3	200+60	1197.3	10000	PASS
	5500	229.9	200+60	1320.9	10000	PASS

Test Mode	Frequency[MHz]	Result	Limit[s]	Verdict
11AX20MIMO	5320	see test graph	≥1800	PASS
11AX20MIMO	5500	see test graph	≥1800	PASS



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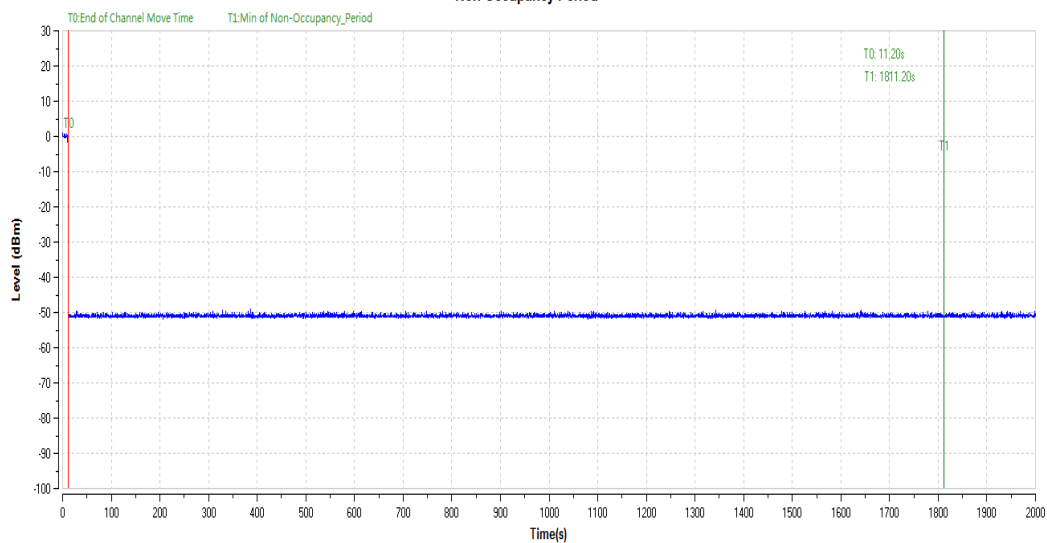
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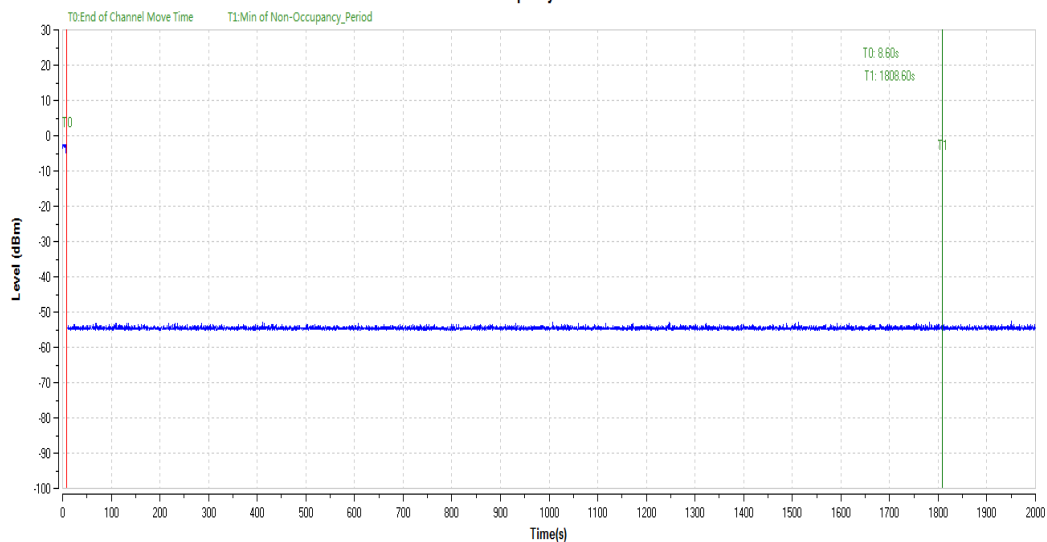
11AX20MIMO 5320

Non-Occupancy Period



11AX20MIMO 5500

Non-Occupancy Period



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

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