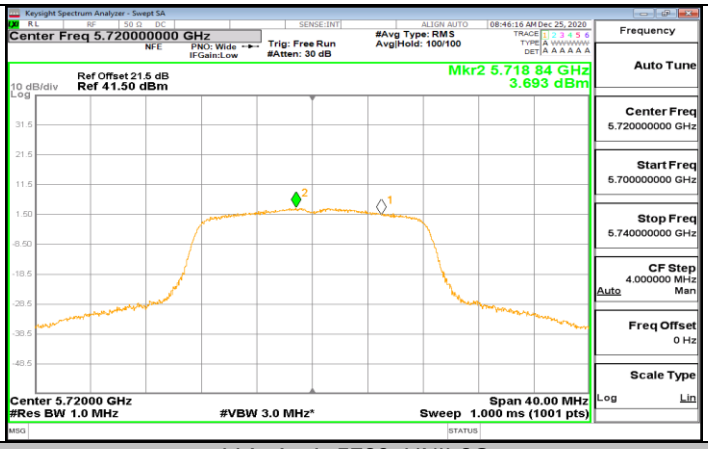

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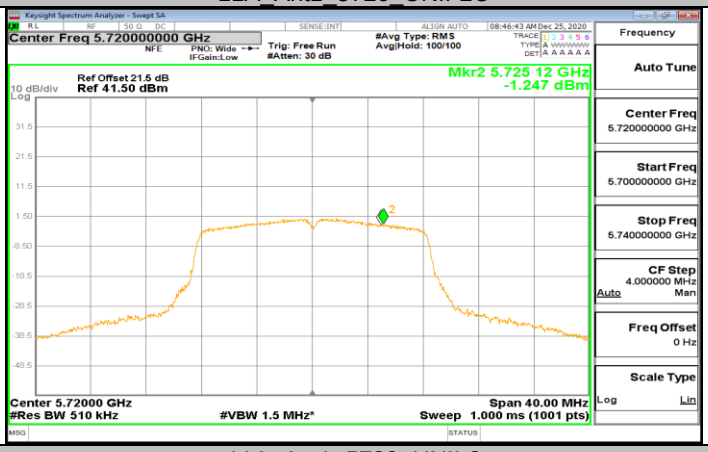

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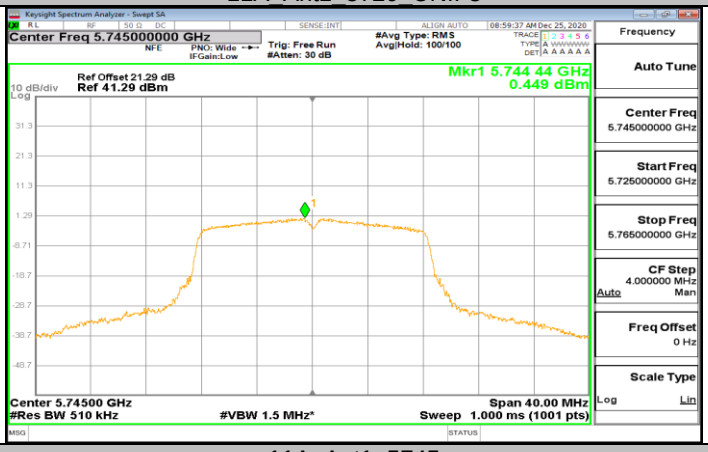

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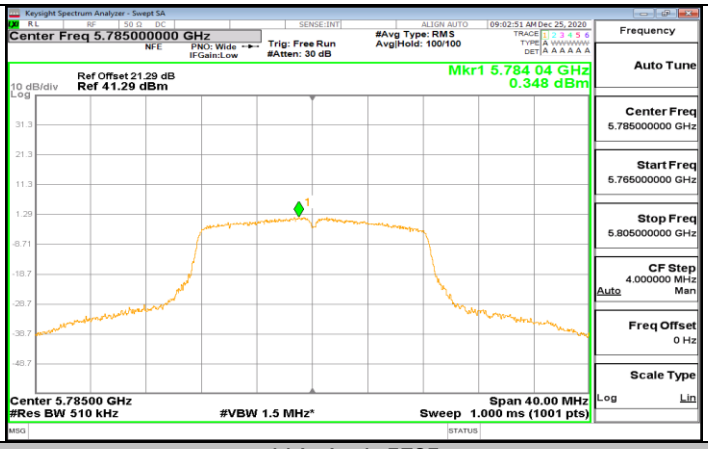

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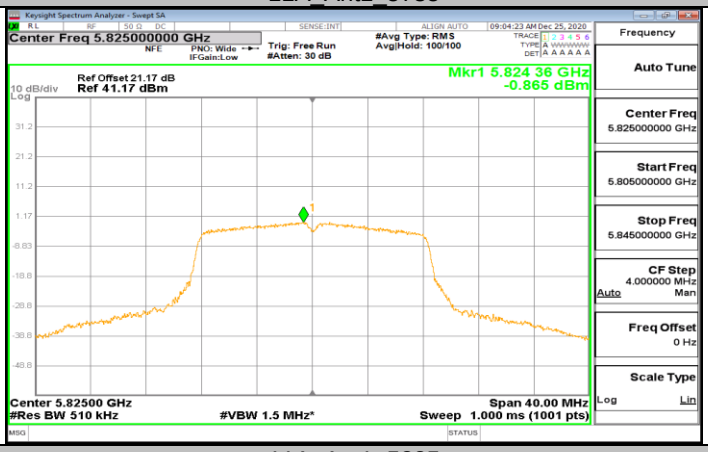

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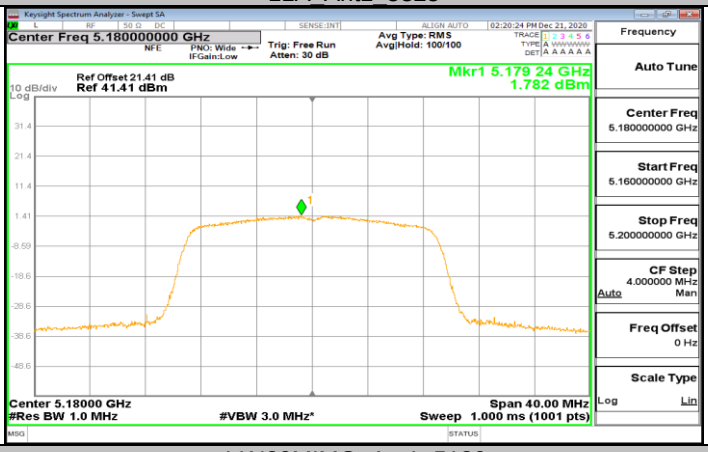

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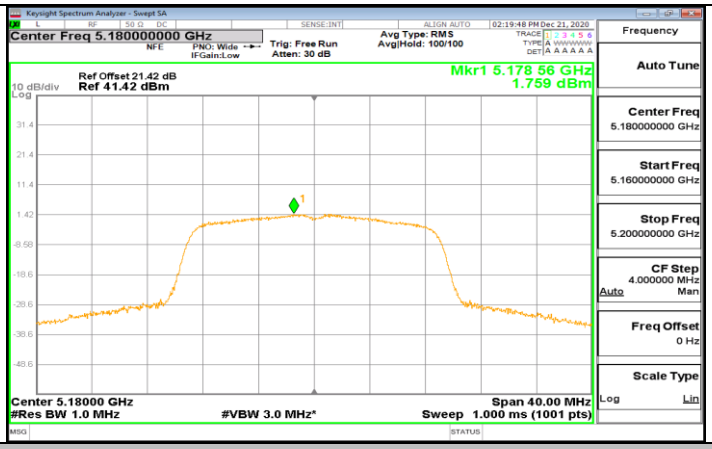

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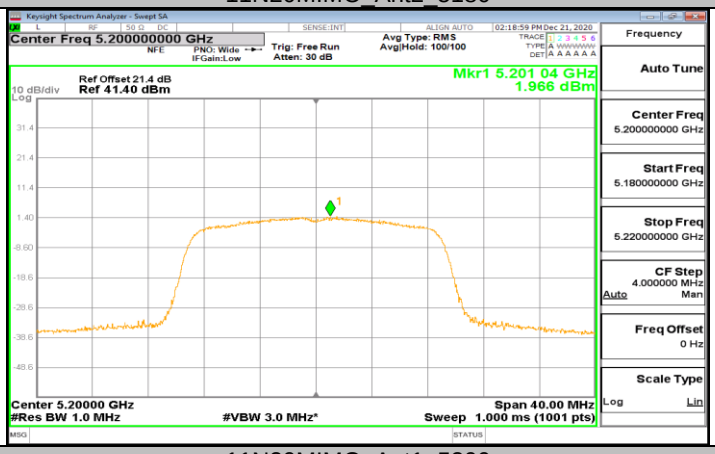

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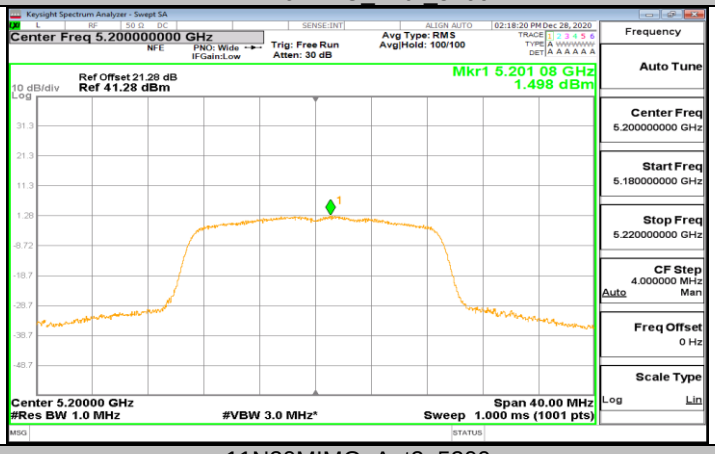

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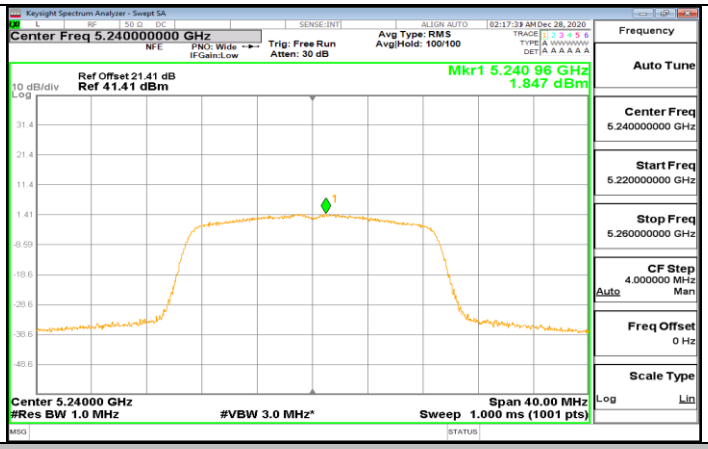

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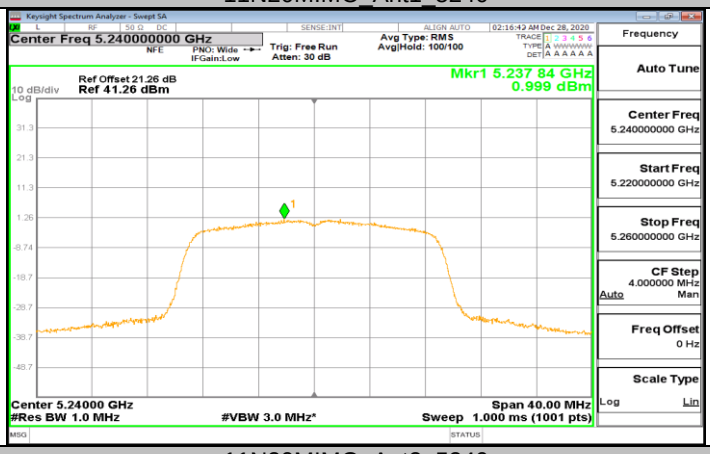

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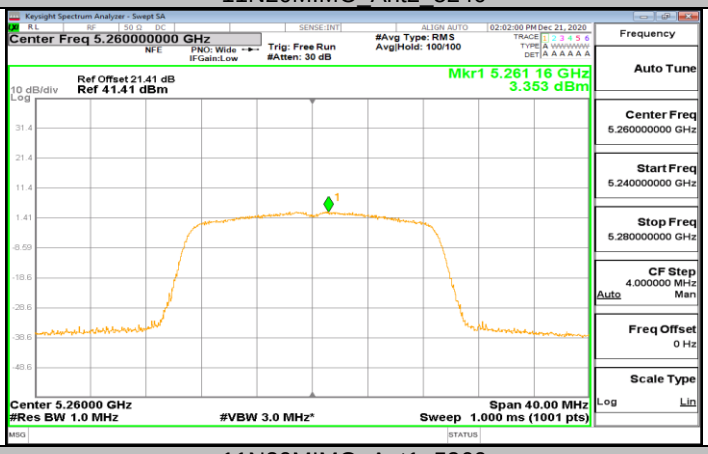

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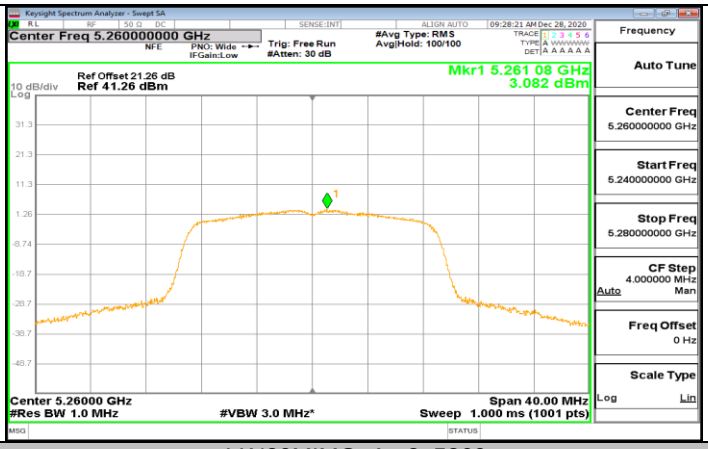

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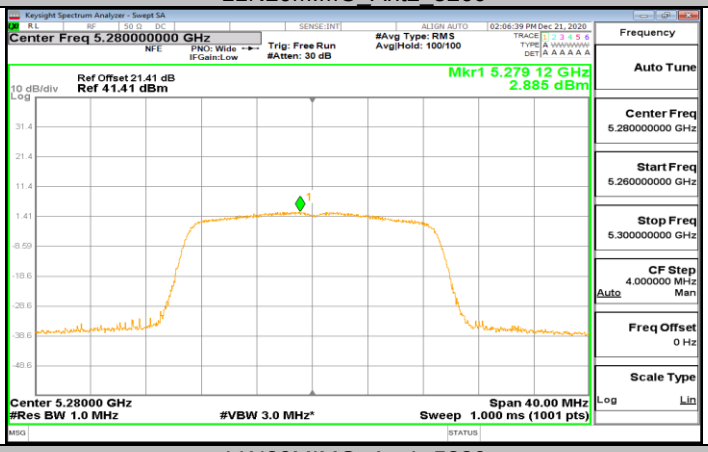

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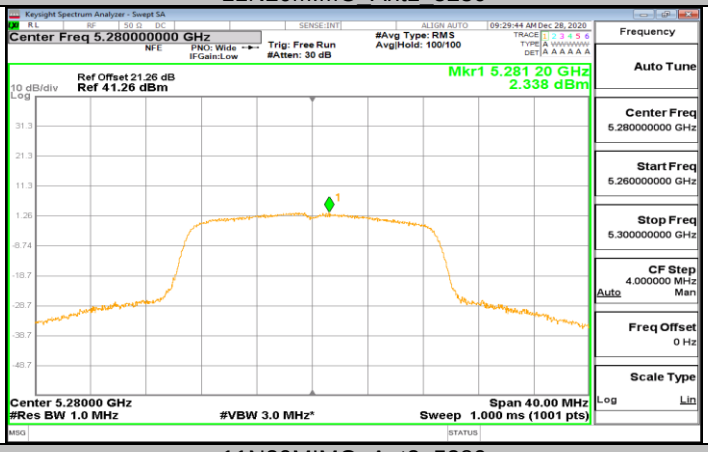

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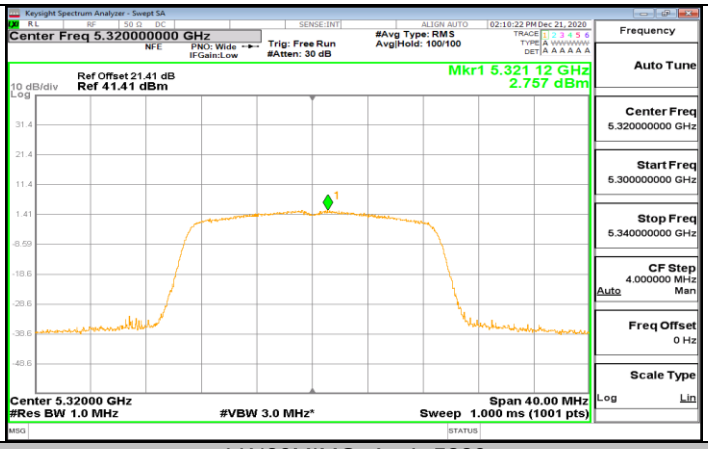

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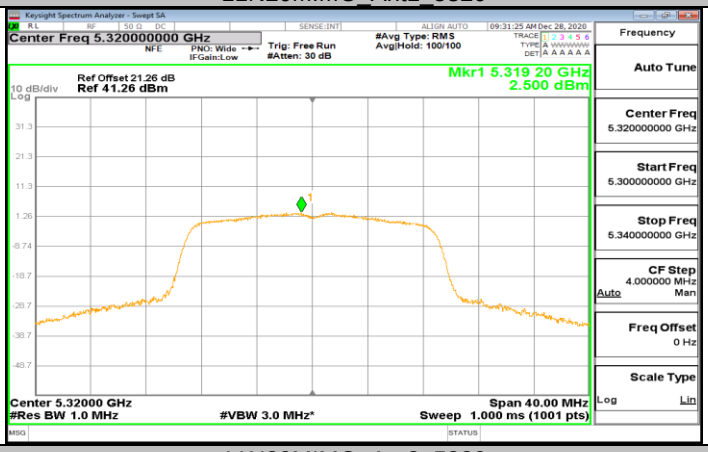

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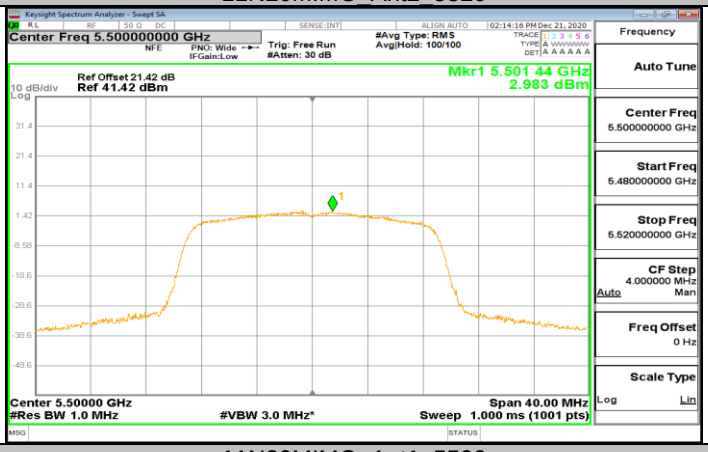

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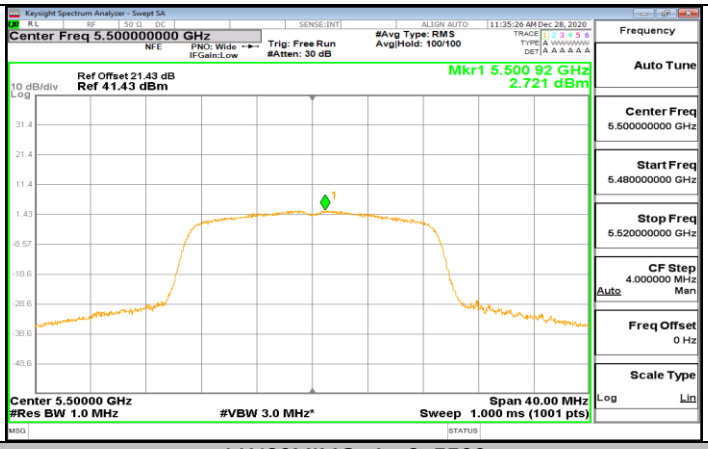

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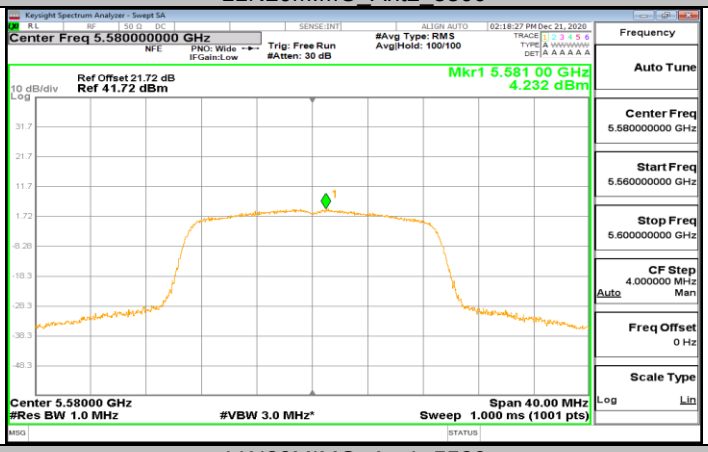

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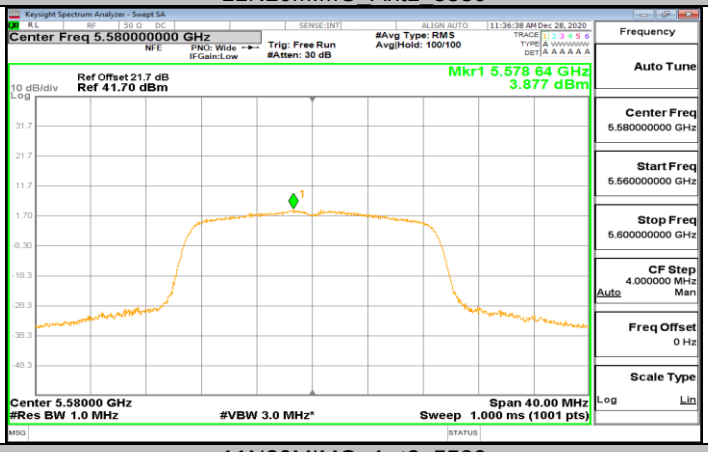

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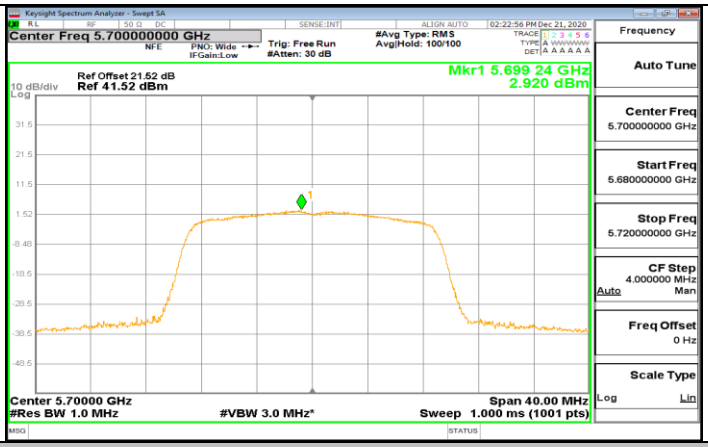

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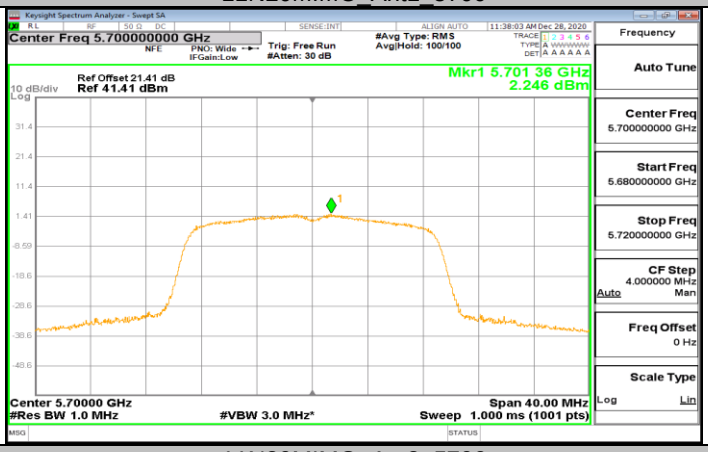

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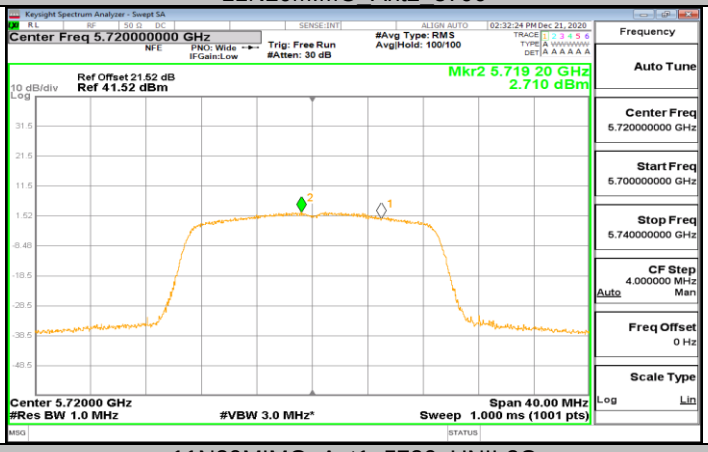

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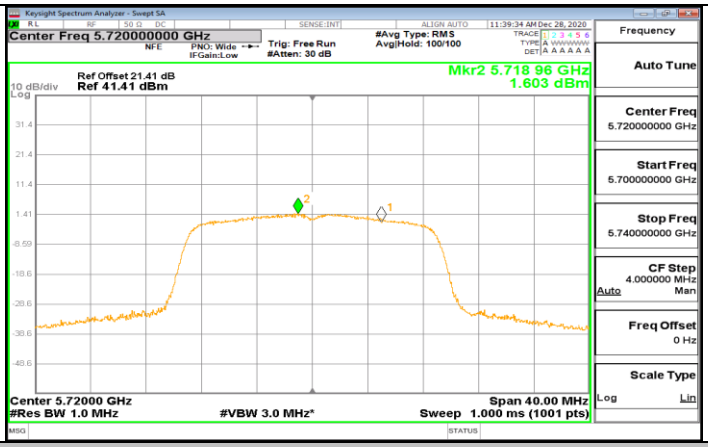
This report shall not be reproduced except in full, without the written approval of UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch.



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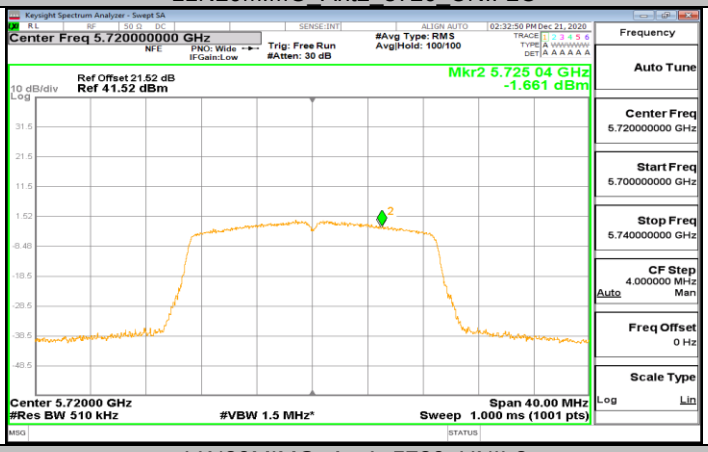

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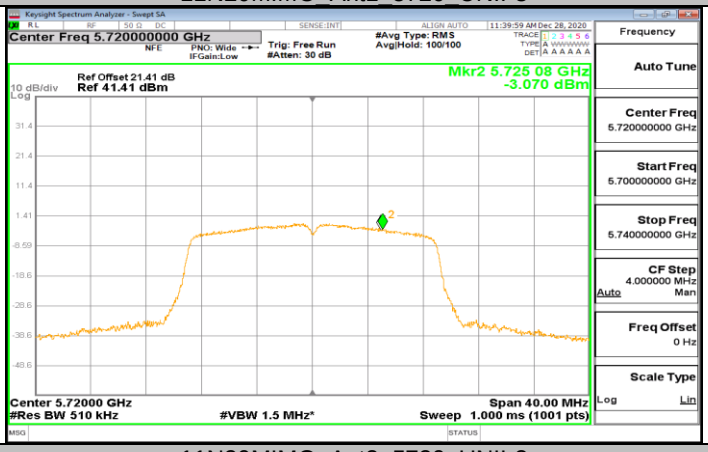

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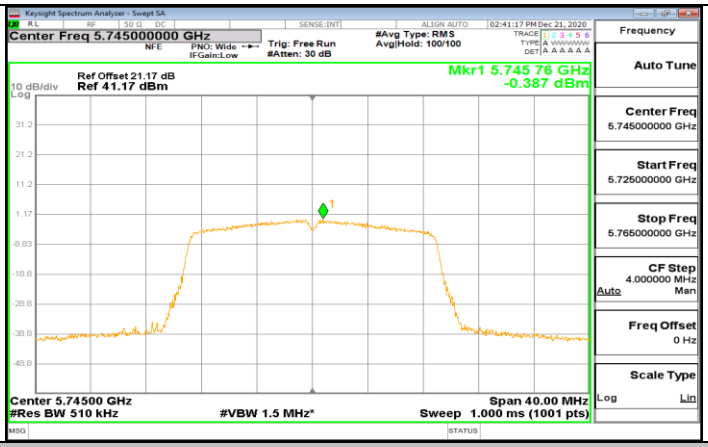

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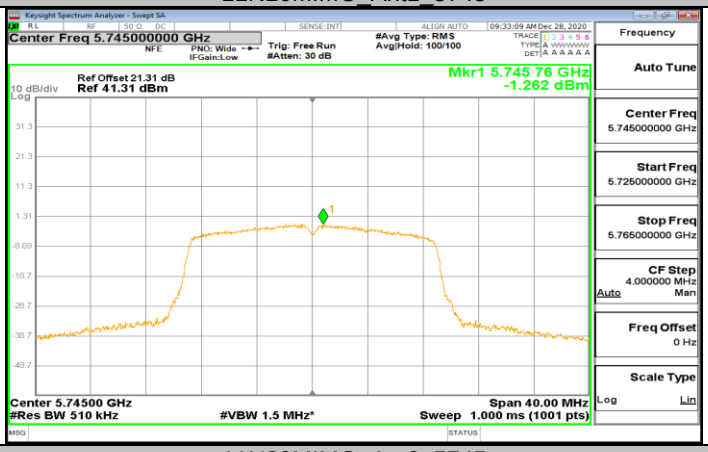

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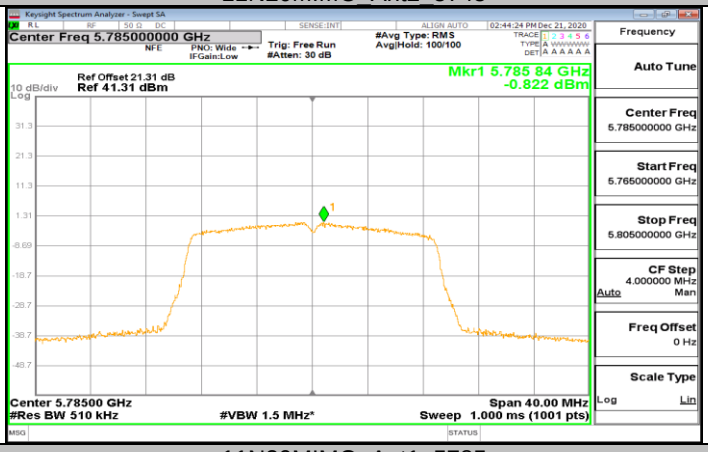

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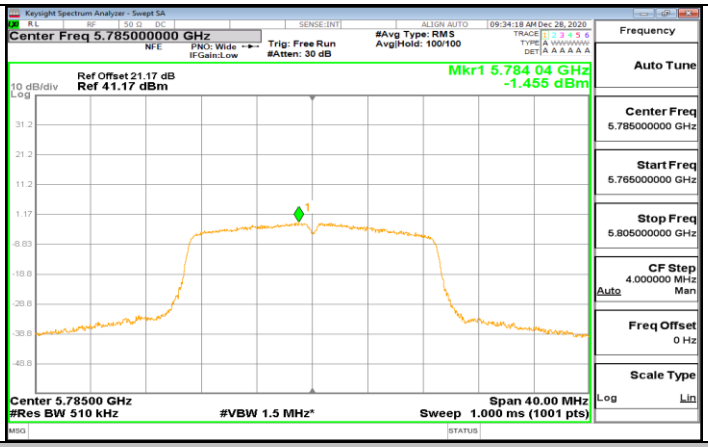

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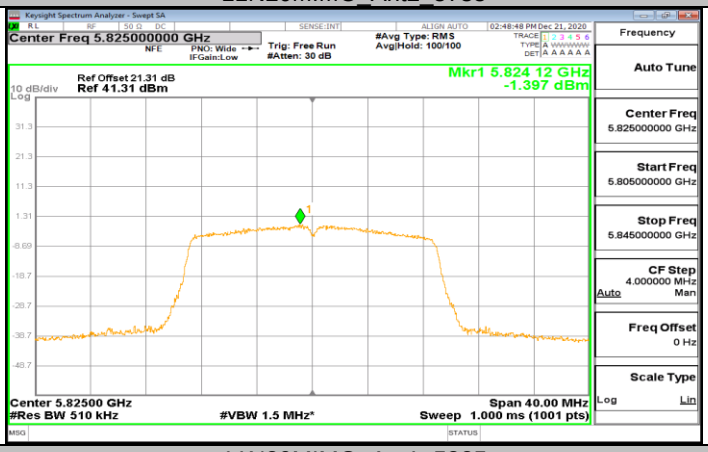

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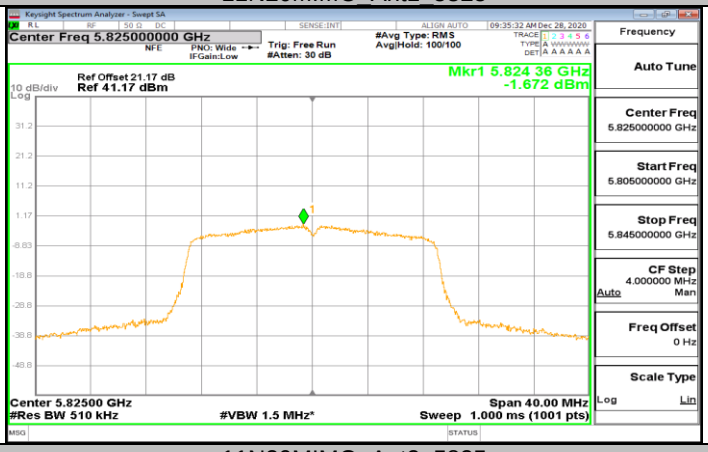

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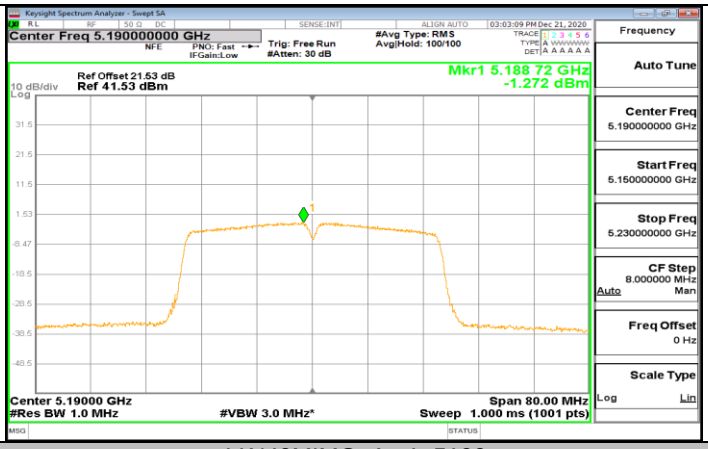

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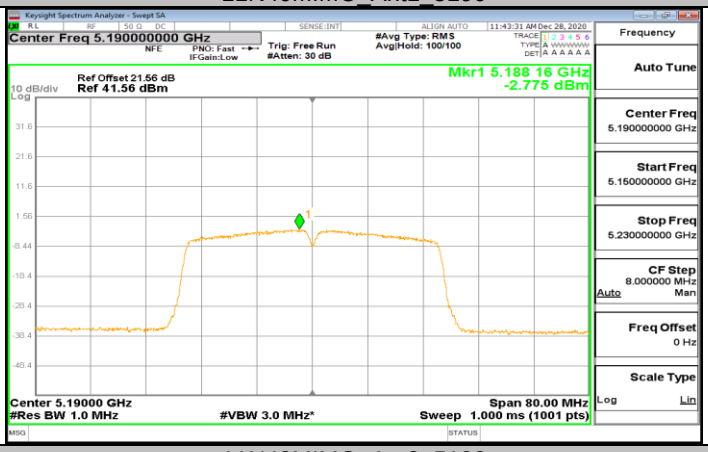

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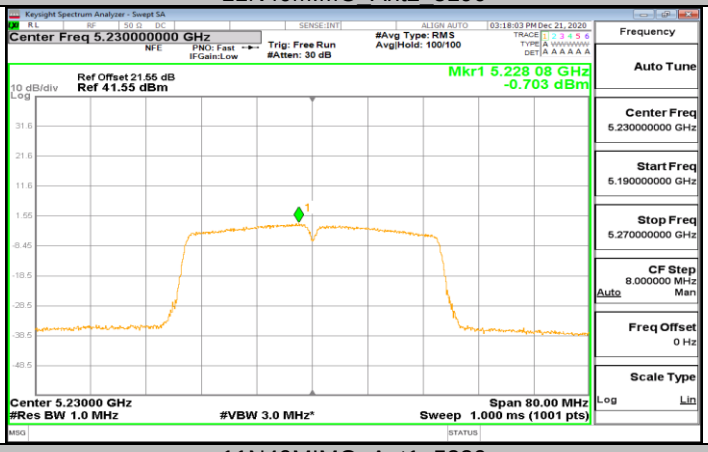

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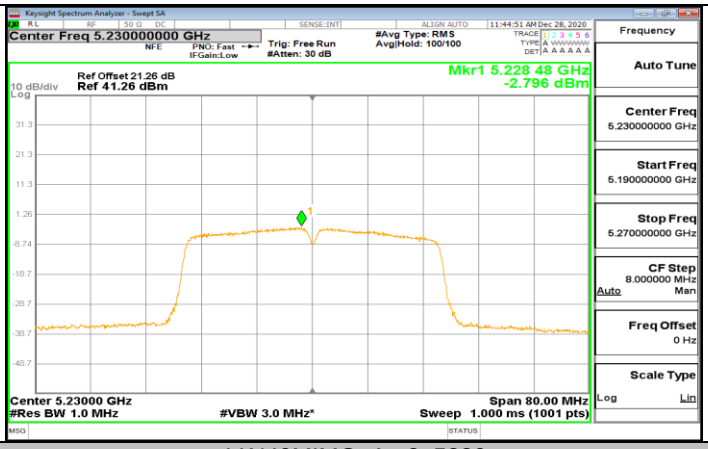

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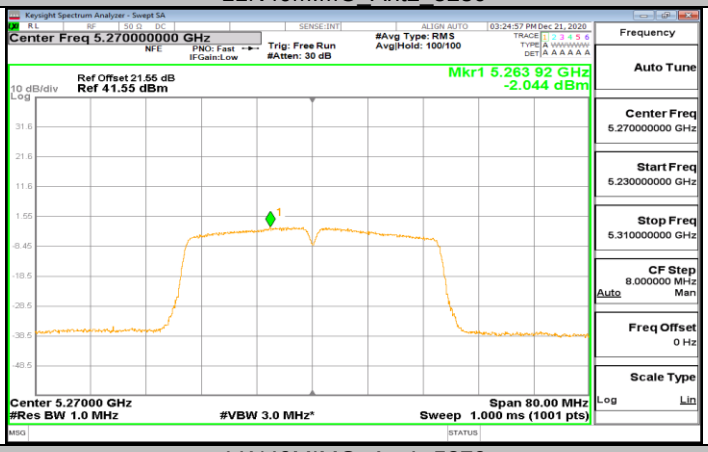

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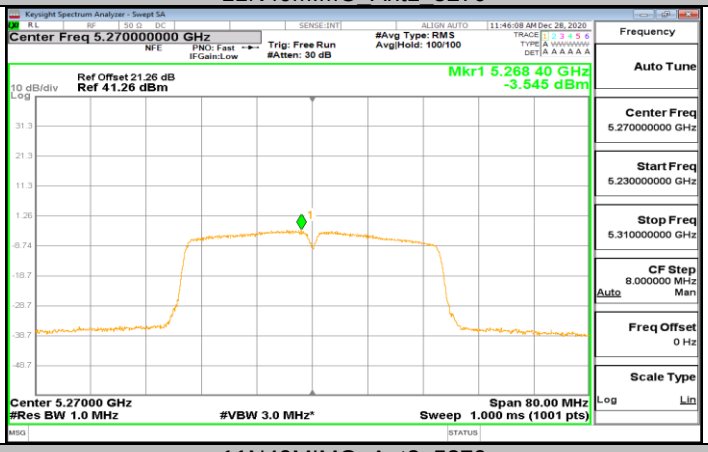

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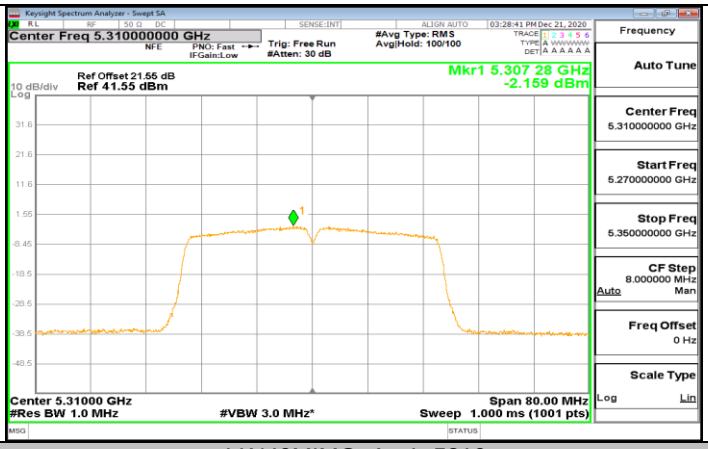

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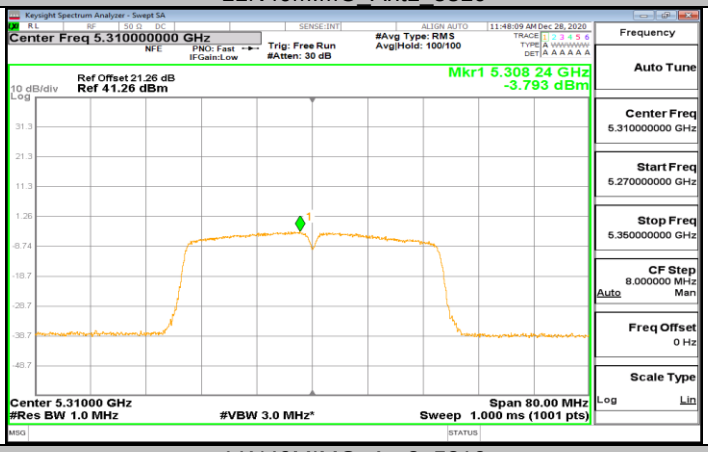

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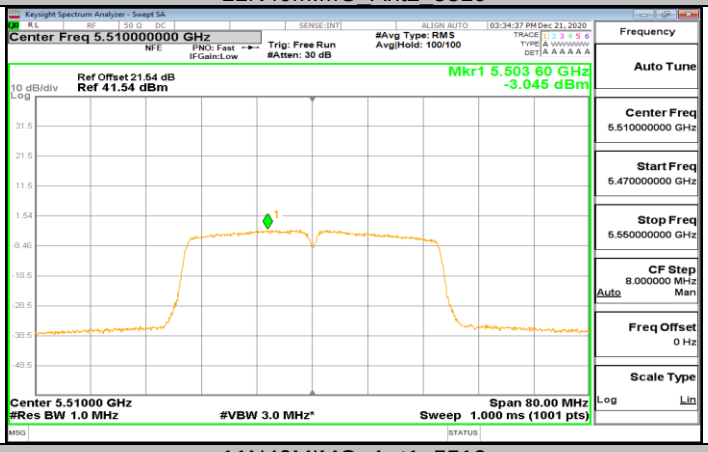

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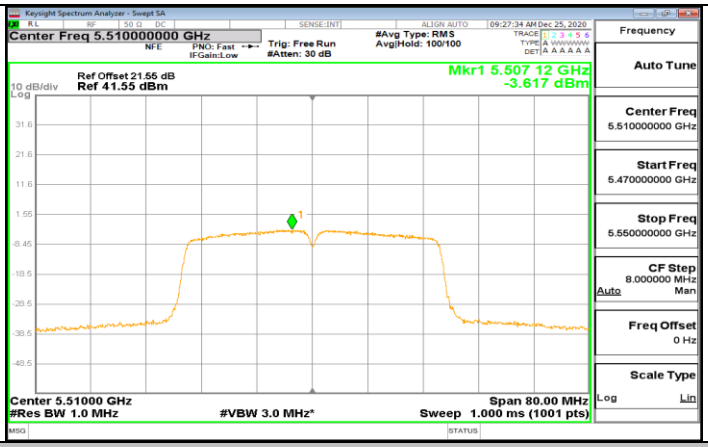

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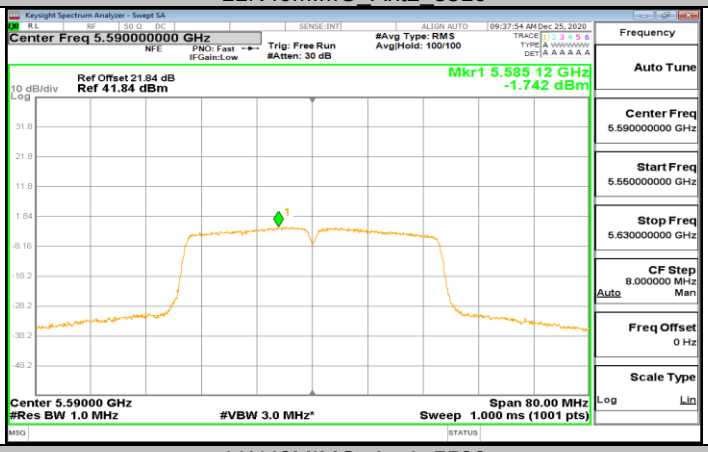

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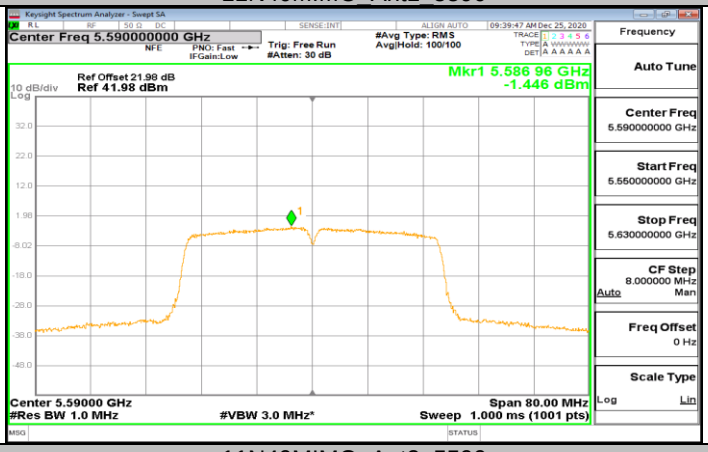

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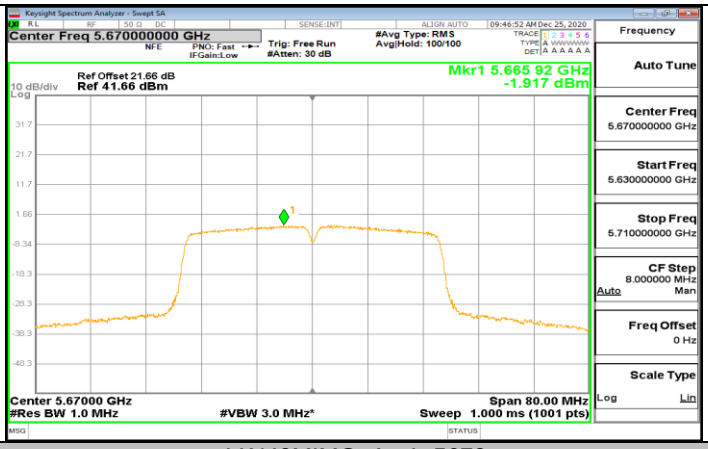

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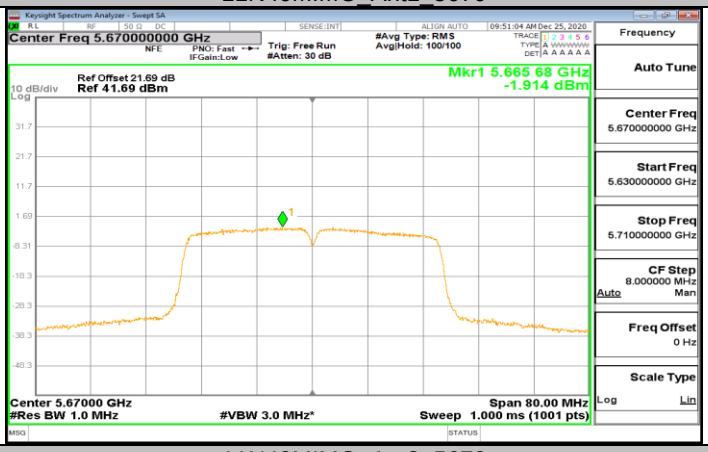

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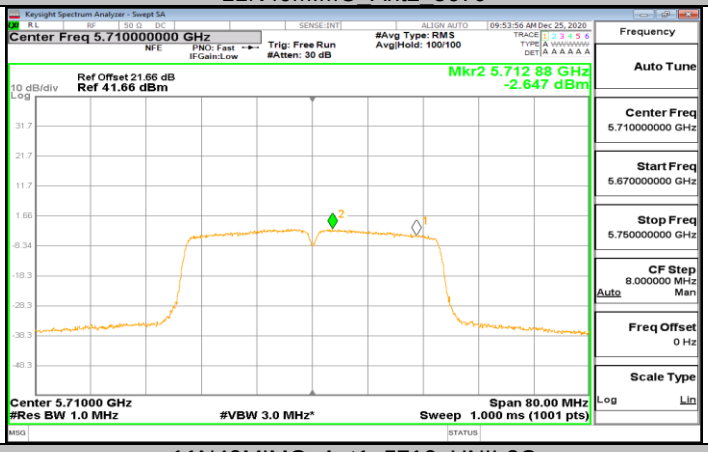

11N40MIMO_Ant1_5710_UNII-2C

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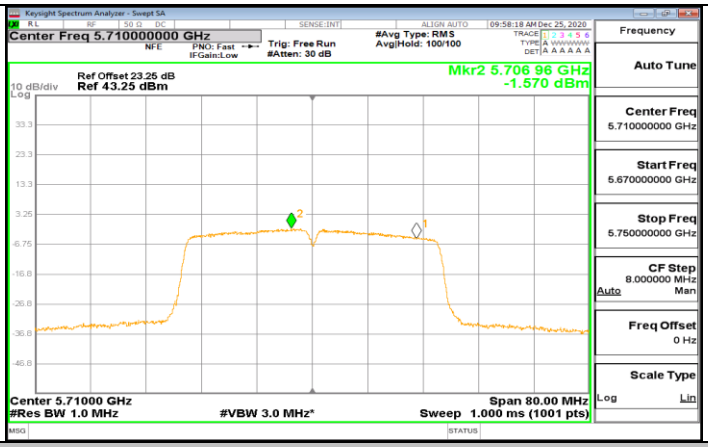

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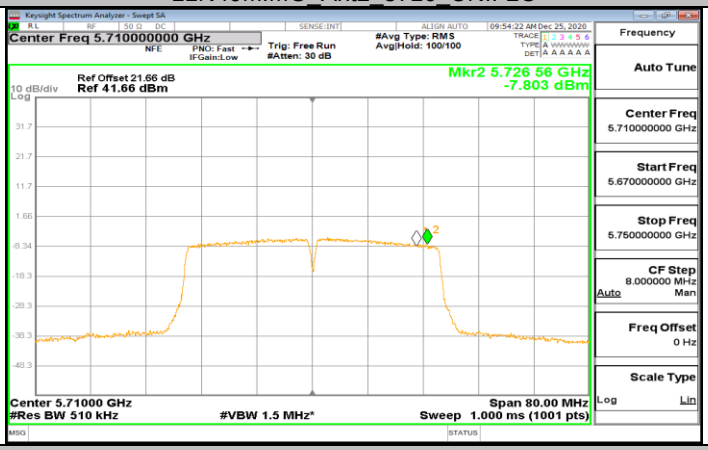

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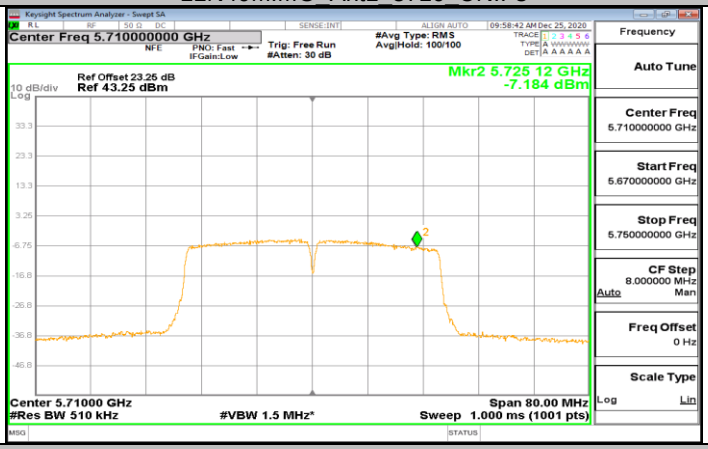

11N40MIMO_Ant2_5710_UNII-3

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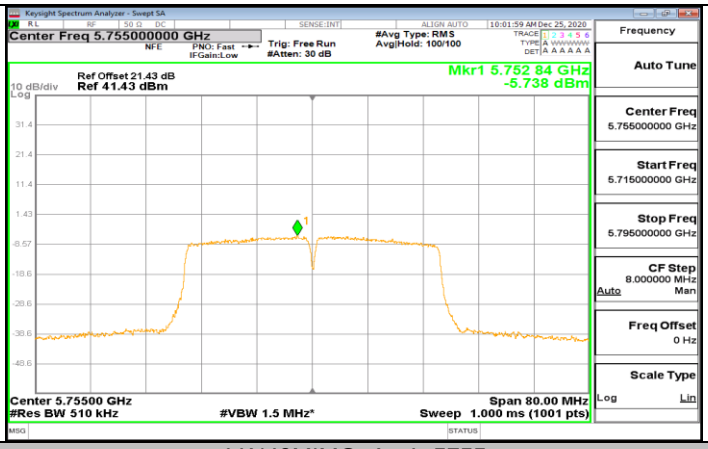

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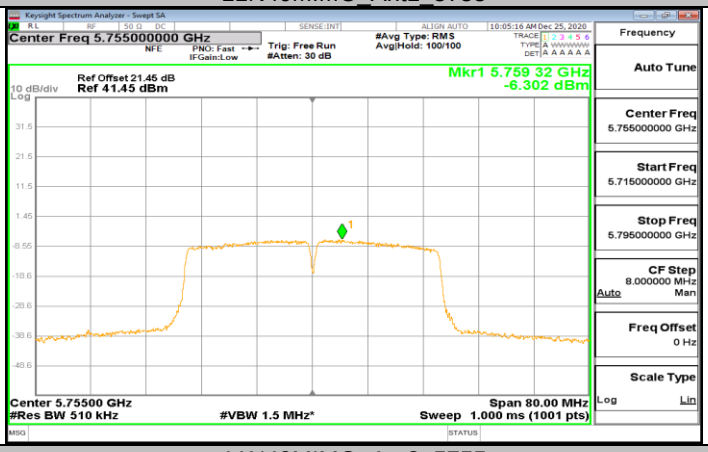
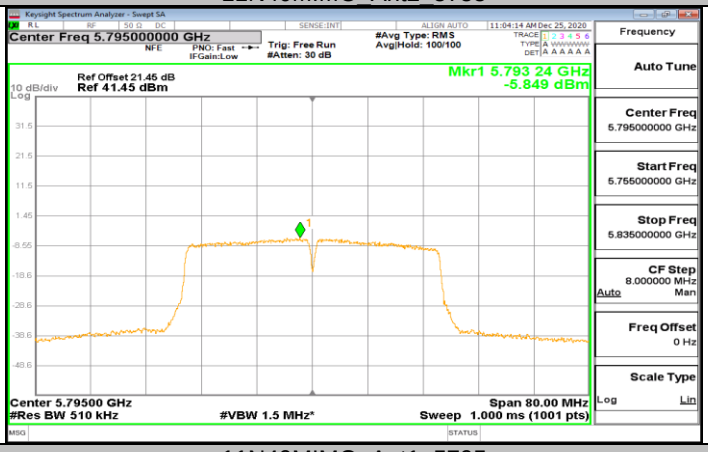


11N40MIMO_Ant2_5755



11N40MIMO_Ant1_5795

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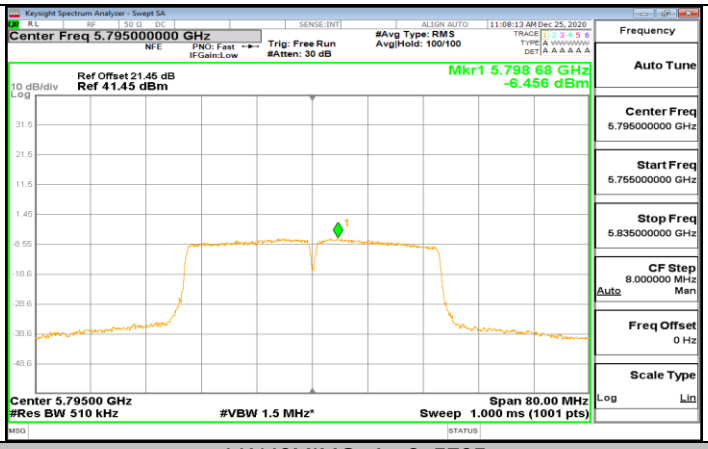

11N40MIMO_Ant2_5795

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Appendix D: Frequency Stability
Test Result

Frequency Error vs. Voltage									
802.11a:5200MHz									
Temp.	Volt.	0 Minute		2 Minute		5 Minute		10 Minute	
		Freq.Error (MHz)	Tolerance (ppm)	Freq.Error (MHz)	Tolerance (ppm)	Freq.Error (MHz)	Tolerance (ppm)	Freq.Error (MHz)	Tolerance (ppm)
TN	VL	5200.0023	0.45	5199.9833	-3.22	5200.0104	2.00	5200.0246	4.72
TN	VN	5200.0223	4.30	5199.9843	-3.01	5199.9941	-1.14	5200.0092	1.76
TN	VH	5200.0235	4.52	5199.9796	-3.93	5200.0030	0.57	5199.9969	-0.59
Frequency Error vs. Temperature									
802.11a:5200MHz									
Temp.	Volt.	0 Minute		2 Minute		5 Minute		10 Minute	
		Freq.Error (MHz)	Tolerance (ppm)	Freq.Error (MHz)	Tolerance (ppm)	Freq.Error (MHz)	Tolerance (ppm)	Freq.Error (MHz)	Tolerance (ppm)
40	VN	5200.0160	3.08	5199.9859	-2.71	5200.0237	4.55	5200.0192	3.69
30	VN	5200.0171	3.30	5200.0044	0.85	5200.0091	1.76	5199.9865	-2.59
20	VN	5199.9755	-4.72	5199.9770	-4.43	5199.9933	-1.29	5200.0162	3.12
10	VN	5200.0023	0.45	5200.0182	3.50	5199.9872	-2.46	5200.0031	0.59
0	VN	5199.9958	-0.81	5199.9899	-1.94	5199.9787	-4.09	5200.0240	4.62

Frequency Error vs. Voltage									
802.11a:5825MHz									
Temp.	Volt.	0 Minute		2 Minute		5 Minute		10 Minute	
		Freq.Error (MHz)	Tolerance (ppm)	Freq.Error (MHz)	Tolerance (ppm)	Freq.Error (MHz)	Tolerance (ppm)	Freq.Error (MHz)	Tolerance (ppm)
TN	VL	5825.0162	2.77	5824.9803	-3.38	5825.0192	3.30	5825.0006	0.10
TN	VN	5825.0191	3.29	5824.9842	-2.72	5825.0169	2.91	5825.0221	3.79
TN	VH	5825.0143	2.46	5824.9862	-2.37	5825.0209	3.59	5825.0234	4.01
Frequency Error vs. Temperature									
802.11a:5825MHz									
Temp.	Volt.	0 Minute		2 Minute		5 Minute		10 Minute	
		Freq.Error (MHz)	Tolerance (ppm)	Freq.Error (MHz)	Tolerance (ppm)	Freq.Error (MHz)	Tolerance (ppm)	Freq.Error (MHz)	Tolerance (ppm)
40	VN	5825.0065	1.12	5825.0028	0.49	5824.9948	-0.89	5824.9881	-2.05
30	VN	5825.0205	3.51	5824.9823	-3.03	5825.0127	2.19	5825.0127	2.18
20	VN	5824.9862	-2.37	5824.9996	-0.07	5825.0208	3.57	5824.9893	-1.84
10	VN	5824.9977	-0.39	5824.9836	-2.81	5824.9852	-2.54	5824.9755	-4.20
0	VN	5825.0059	1.00	5825.0173	2.97	5825.0090	1.55	5825.0247	4.24

Note: All antennas and test modes have been tested, only the worst data record in the report.

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Appendix E: Duty Cycle
Test Result

Mode	On Time (msec)	Period (msec)	Duty Cycle x (Linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/T Minimum VBW (kHz)	Final setting For VBW (kHz)
11A	1.39	1.43	0.9720	97.20	0.12	0.72	1
11N20MIMO	1.30	1.34	0.9701	97.01	0.13	0.77	1
11N40MIMO	0.65	0.68	0.9559	95.59	0.20	1.54	2

Note:
Duty Cycle Correction Factor=10log (1/x).
Where: x is Duty Cycle (Linear)
Where: T is On Time
If that calculated VBW is not available on the analyzer then the next higher value should be used.

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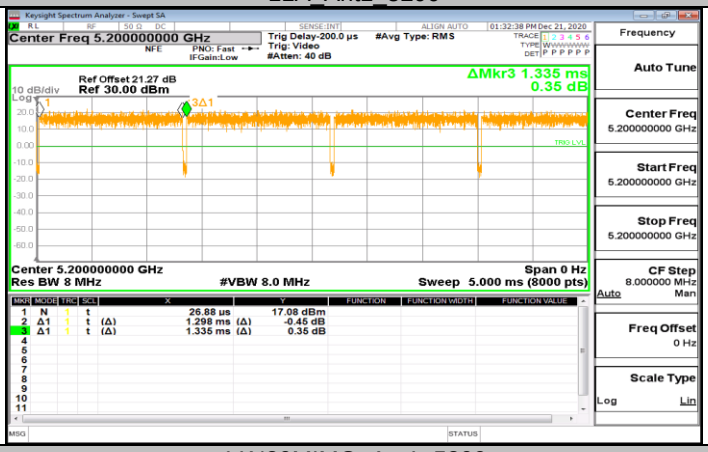
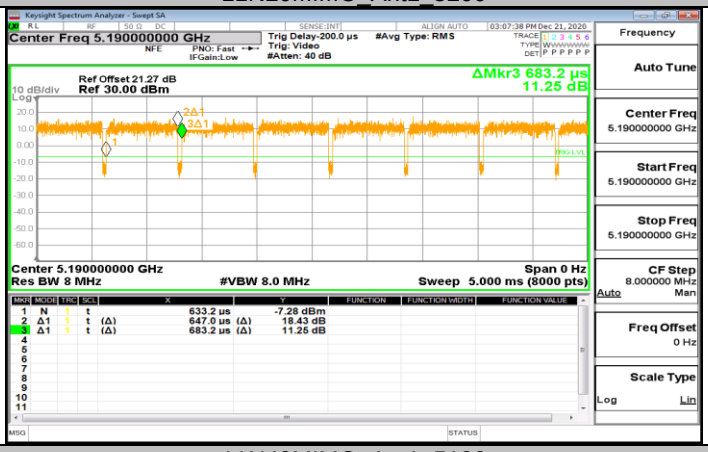
Test Graphs

11A_Ant1_5200



11N20MIMO_Ant1_5200



11N40MIMO_Ant1_5190

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Appendix F DYNAMIC FREQUENCY SELECTION

DFS In-Service Monitoring (5510 MHz; 22.000 dBm; 40 MHz)

Test according to FCC title 47 part 15 §15.407(h), KDB 905462 D02 U-NII DFS Compliance Procedures New Rules v02

Measurement Summary

DUT Frequency (MHz)	Radar Type No.	Type of Measurement value	Overall Result
5510.000000	0	First of all Transmitt Test	---
5510.000000	0	Channel Move Time	PASS
5510.000000	0	Channel Closing Transmission Time	PASS
5510.000000	0	Non-occupancy period	PASS

(continuation of the "Measurement Summary" table from column 4 ...)

DUT Frequency (MHz)	Overall Comment
5510.000000	not performed / not finished
5510.000000	
5510.000000	
5510.000000	

Channel Move Time Detailed Results

DUT Frequency (MHz)	Radar Type No.	CMT Tx Time (s)	CMT Limit (s)	CMT Result
5510.000000	0	0.483	10.000	PASS

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

DUT Frequency (MHz)	CMT Comment
5510.000000	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)
5510.000000	0	first 200 ms	951	65.364
5510.000000	0	remaining 10.0 second(s) period	712	44.244

(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
5510.000000	200.000	PASS	See Note 1.
5510.000000	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)
5510.000000	0	0	0	0.000	0.000

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

DUT Frequency (MHz)	NOP Result	NOP Comment
5510.000000	PASS	not performed because of Channel Closing Transmission Time / Channel Move Time Test failed

Transmitting Test Detailed Results

DUT Frequency (MHz)	Tx-Test Result	Tx-Test Comment
5510.000000	---	not performed / not finished

Radar level verification

Description / Formula	Value	Unit
IF(({DFS Mode(0/1/2)}=0)or({DFS Mode(0/1/2)}=1) , IF((dBm2W({Nominal Power[dBm]})>0.2) , -64 , IF(({Configured PSD[dBm]}<10) , -62 , -64))+ {Attenuation Vector Generator to DUT[dB]} , -50+ {Attenuation Vector Generator to COMP[dB]})+ {Radar Signal Level Offset[dB]}	Given setting / formula to calculate Vector Generator level	--
Configured DUT EIRP:	63.10	mW
Configured DUT PSD:	-2.00	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	-10.40	dBm
Configured overall pathloss from Vector Generator RF out to DUT connector of 'DUT to OSP'-cable	50.60	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	-61.00	dBm

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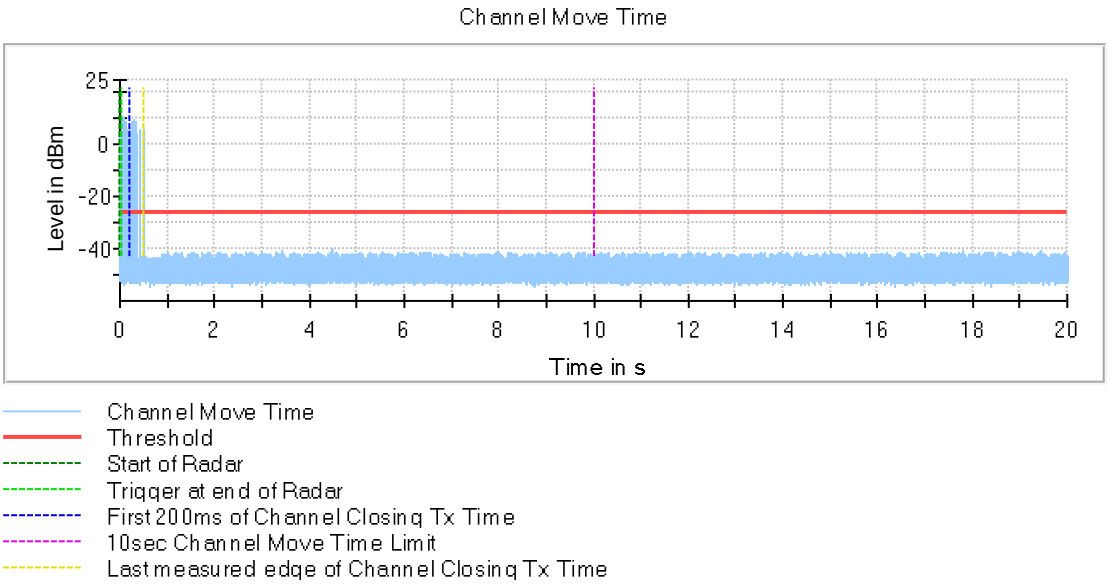
Additional Information

Note	Description
Note 1:	**Because of the radar pulse event at the beginning, the investigation of the trace begins with an offset of 28.7 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 µs**
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.)**



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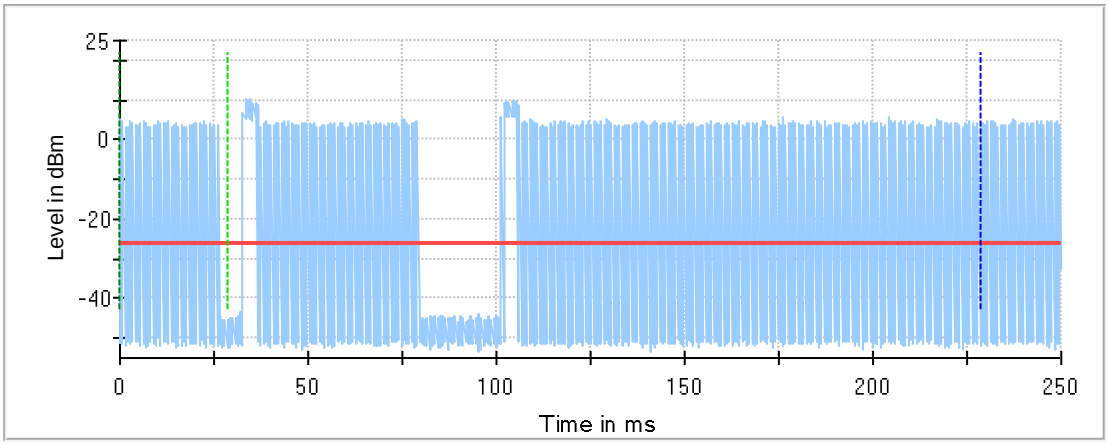
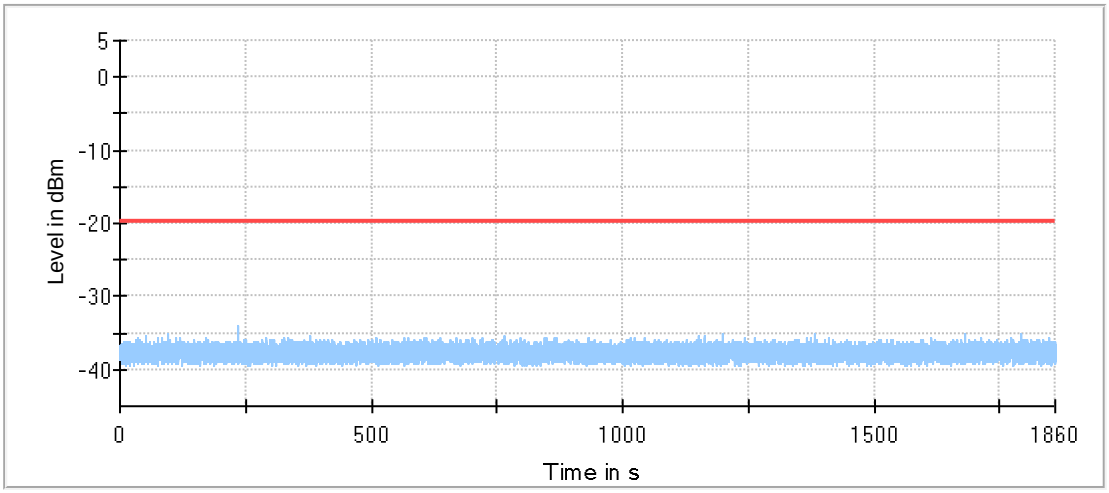
Channel Move Time first 200ms



Channel Move Time first 200ms
Start of Radar
First 200ms of Channel Closing Tx Time
Threshold
Trigger at end of Radar

Non-occupancy period



Non-occupancy period
Threshold

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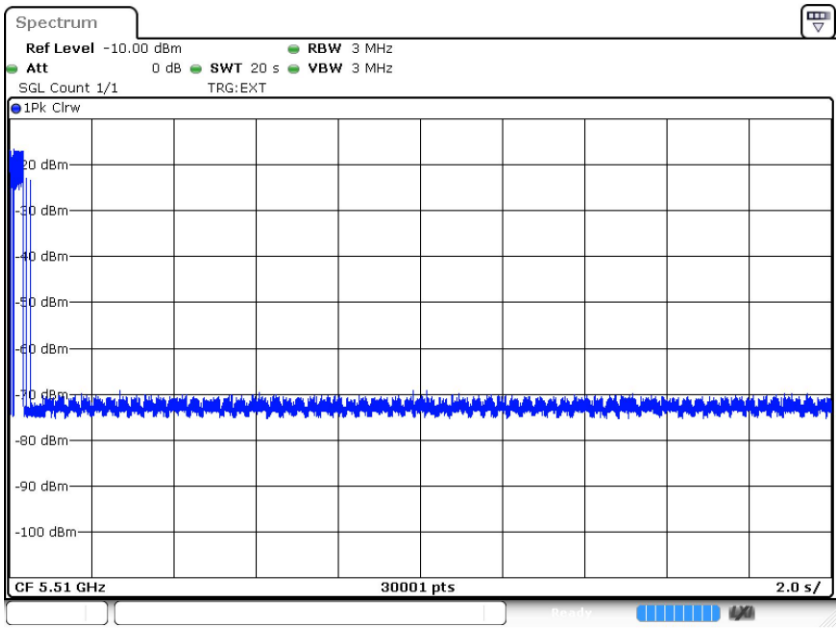
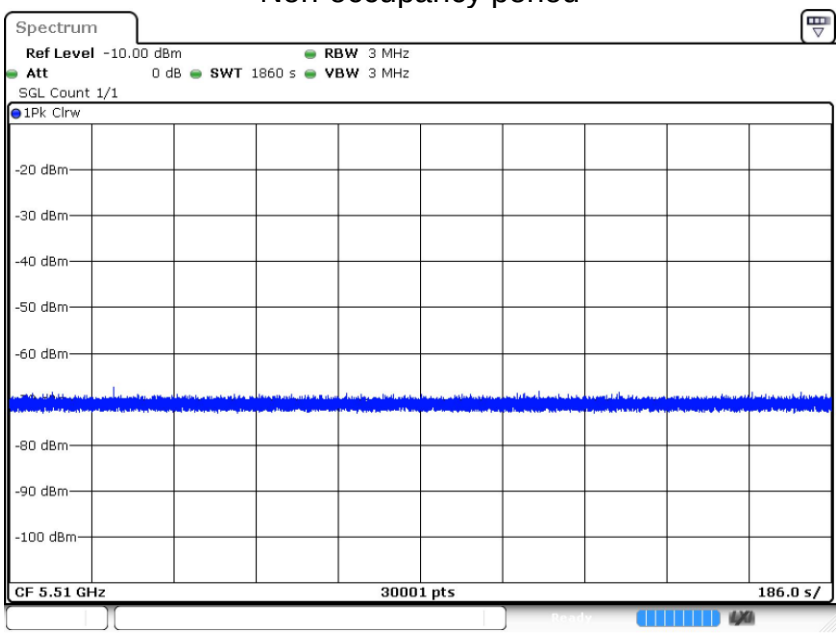
Channel Move Time



Date: 7.JAN.2021 04:35:00

Non-occupancy period



Date: 7.JAN.2021 05:15:32

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