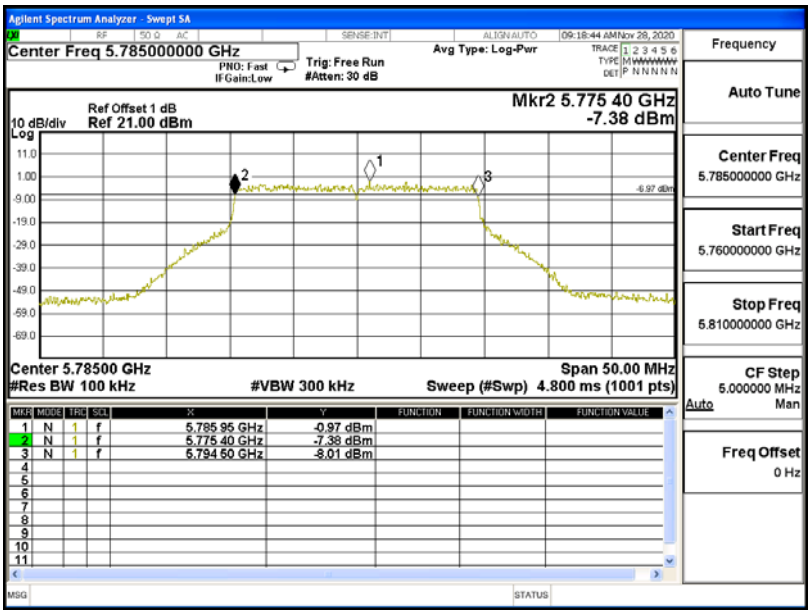
Product : Notebook Computers
Test Item : Occupied Bandwidth Data
Test Mode : Mode 23: MIMO: Transmit (802.11ax-20BW_17.2Mbps) (5785MHz)

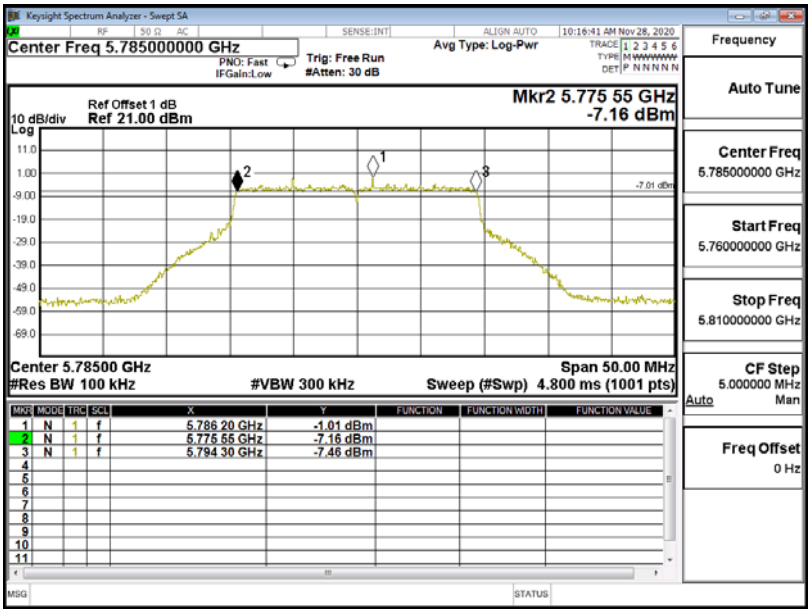
Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
157	5785	19100	>500	Pass

Figure Channel 157: (Chain A)



Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
157	5785	18750	>500	Pass

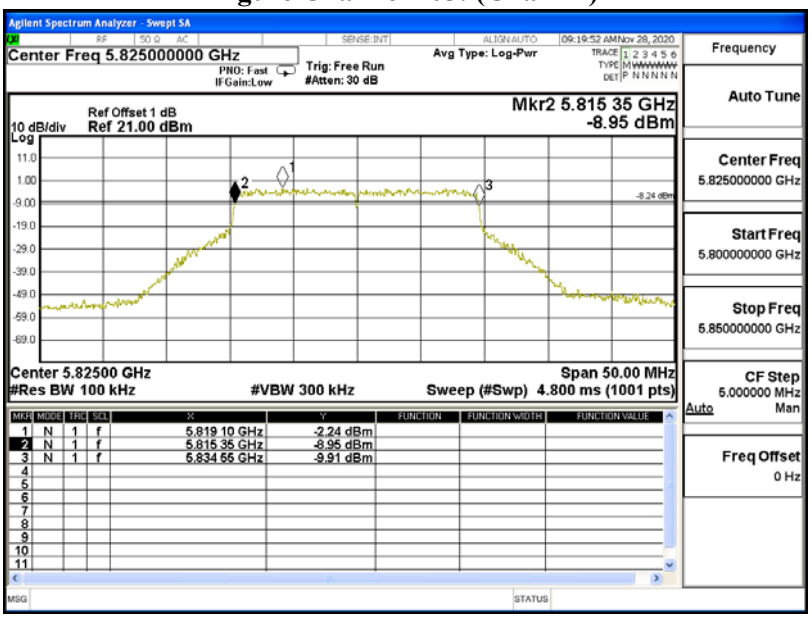
Figure Channel 157: (Chain B)



Product : Notebook Computers
Test Item : Occupied Bandwidth Data
Test Mode : Mode 23: MIMO: Transmit (802.11ax-20BW_17.2Mbps) (5825MHz)

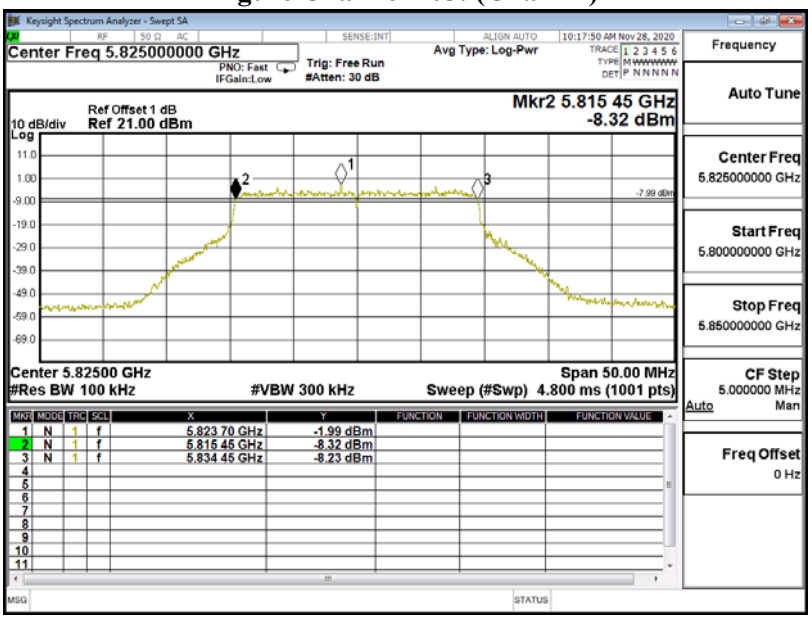
Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
165	5825	19200	>500	Pass

Figure Channel 165: (Chain A)



Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
165	5825	19000	>500	Pass

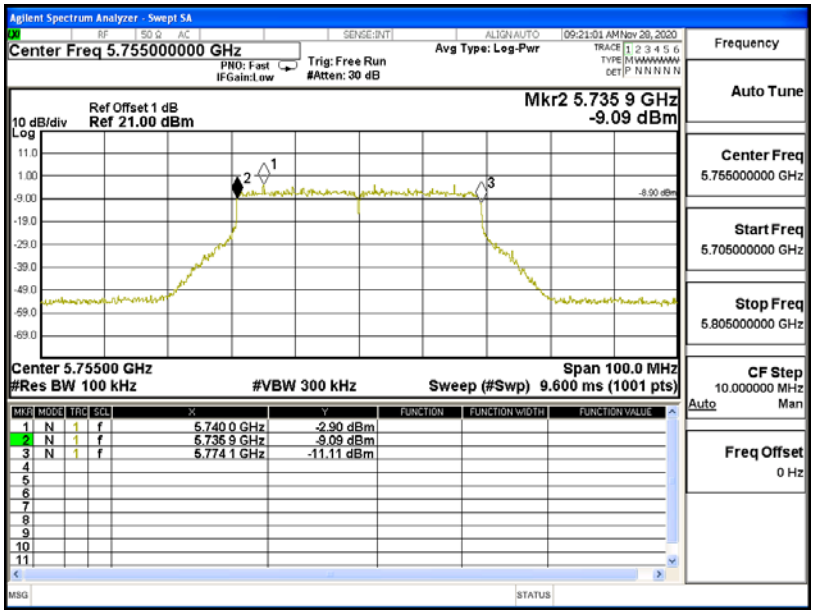
Figure Channel 165: (Chain B)



Product : Notebook Computers
Test Item : Occupied Bandwidth Data
Test Mode : Mode 24: MIMO: Transmit (802.11ax-40BW_34.4Mbps) (5755MHz)

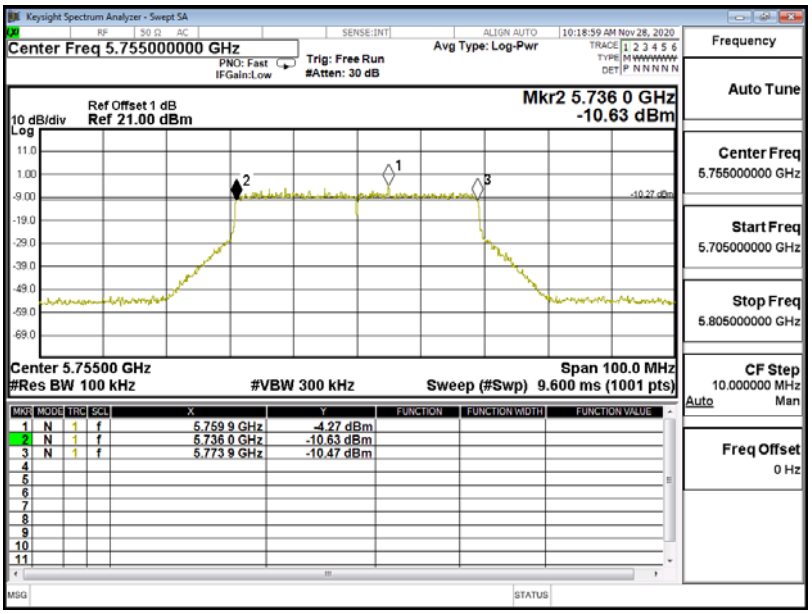
Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
151	5755	38200	>500	Pass

Figure Channel 151: (Chain A)



Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
151	5755	37900	>500	Pass

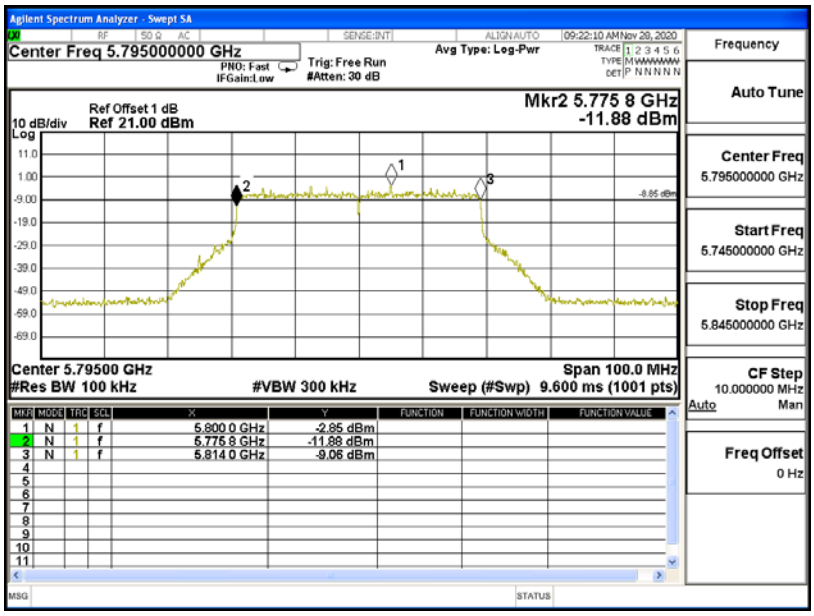
Figure Channel 151: (Chain B)



Product : Notebook Computers
Test Item : Occupied Bandwidth Data
Test Mode : Mode 24: MIMO: Transmit (802.11ax-40BW_34.4Mbps) (5795MHz)

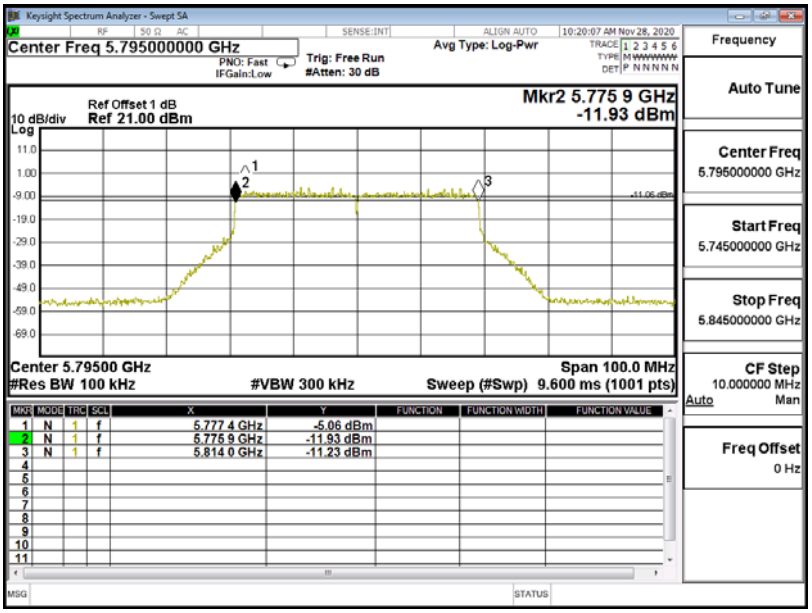
Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
159	5795	38200	>500	Pass

Figure Channel 159: (Chain A)



Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
159	5795	38100	>500	Pass

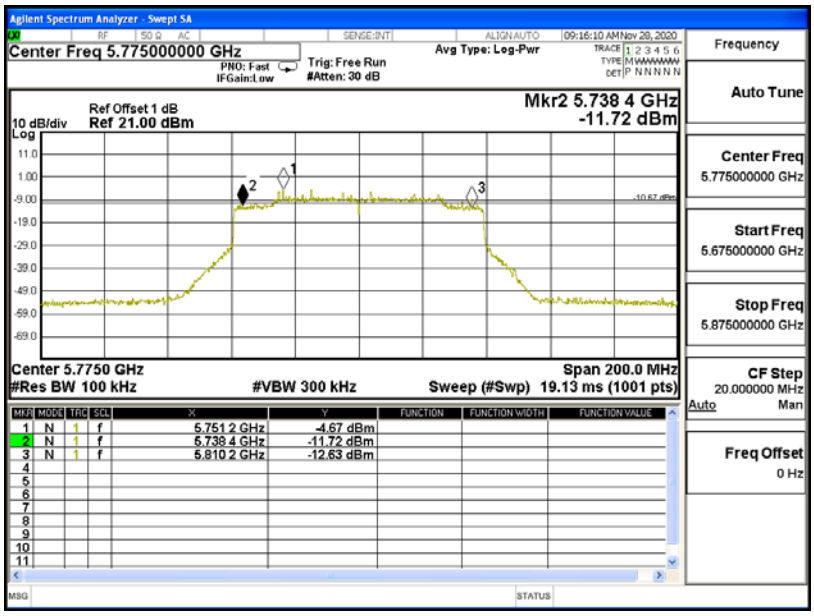
Figure Channel 159: (Chain B)



Product : Notebook Computers
Test Item : Occupied Bandwidth Data
Test Mode : Mode 25: MIMO: Transmit (802.11ax-80BW_72.1Mbps) (5775MHz)

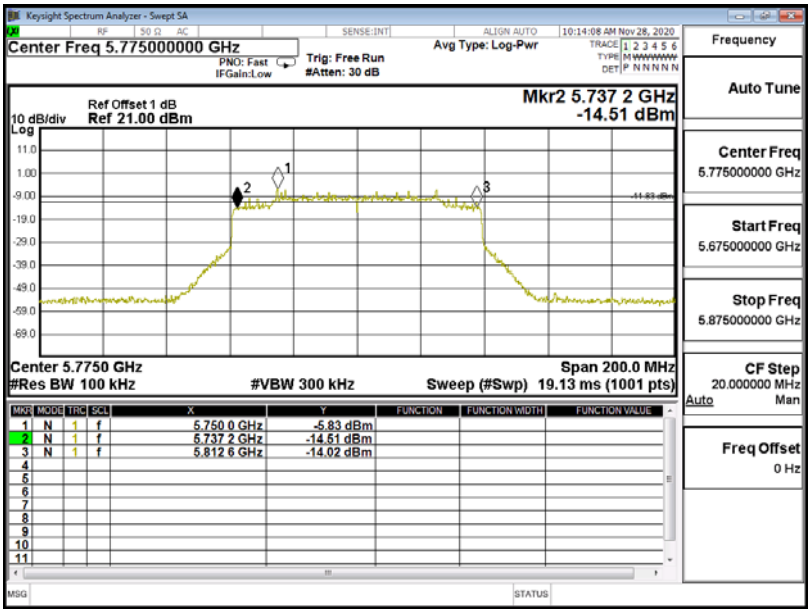
Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
155	5775	71800	>500	Pass

Figure Channel 155: (Chain A)



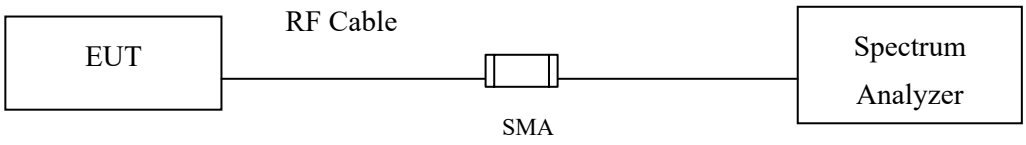
Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
155	5775	75400	>500	Pass

Figure Channel 155: (Chain B)



8. Duty Cycle

8.1. Test Setup



8.2. Test Procedure

The EUT was setup according to ANSI C63.10 2013; tested according to test procedure of KDB789033 for compliance to FCC 47CFR 15.407 requirements.

8.3. Test Result of Duty Cycle

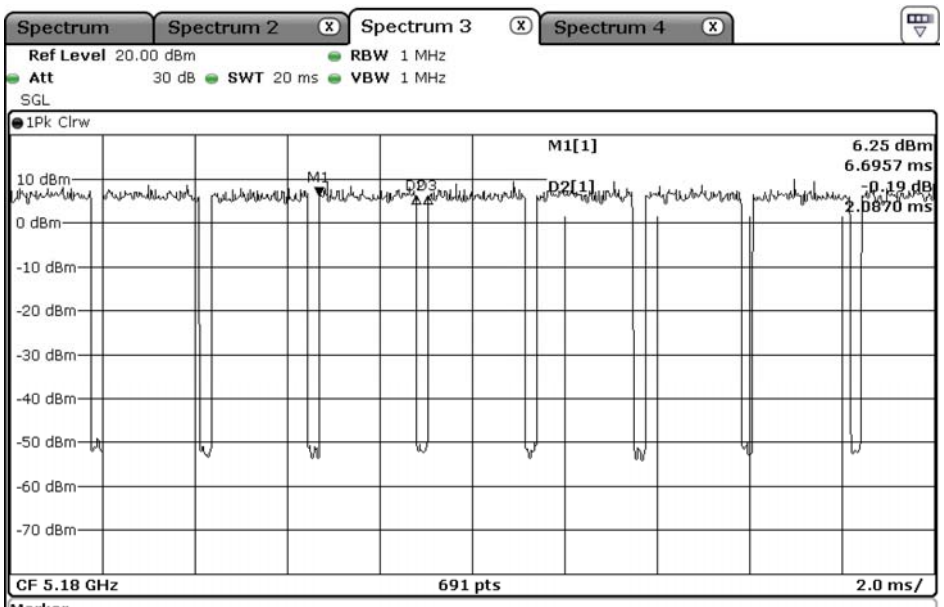
Product : Notebook Computers
Test Item : Duty Cycle
Test Mode : Transmit

Duty Cycle Formula:
Duty Cycle = Ton / (Ton + Toff)
Duty Factor = 10 Log (1/Duty Cycle)

Results: SISO A

5GHz band	Ton (ms)	Ton + Toff (ms)	Duty Cycle (%)	Duty Factor (dB)
802.11 a	2.0870	2.3478	88.89	0.51
802.11 n20	24.6960	25.1010	98.39	0.07
802.11 n40	17.8480	18.1450	98.36	0.07
802.11 ac80	10.8913	11.2609	96.72	0.14
802.11 ac160	5.5362	5.7971	95.50	0.20
802.11 ax20	24.8040	25.1740	98.53	0.06
802.11 ax40	18.6160	18.8840	98.58	0.06
802.11 ax80	8.8333	9.2464	95.53	0.20
802.11 ax160	4.5217	4.7826	94.54	0.24
802.11 ax20-26/0-RU	3.9348	4.0652	96.79	0.14
802.11 ax20-52/37-RU	3.8913	4.0652	95.72	0.19
802.11 ax20-106/53-RU	3.9565	4.0870	96.81	0.14
802.11 ax40-242/61-RU	3.9565	4.0652	97.33	0.12
802.11 ax80-484/65-RU	3.9348	4.0652	96.79	0.14
802.11 ax160-996/67-RU	3.9783	4.0652	97.86	0.09

802.11a - SISOA

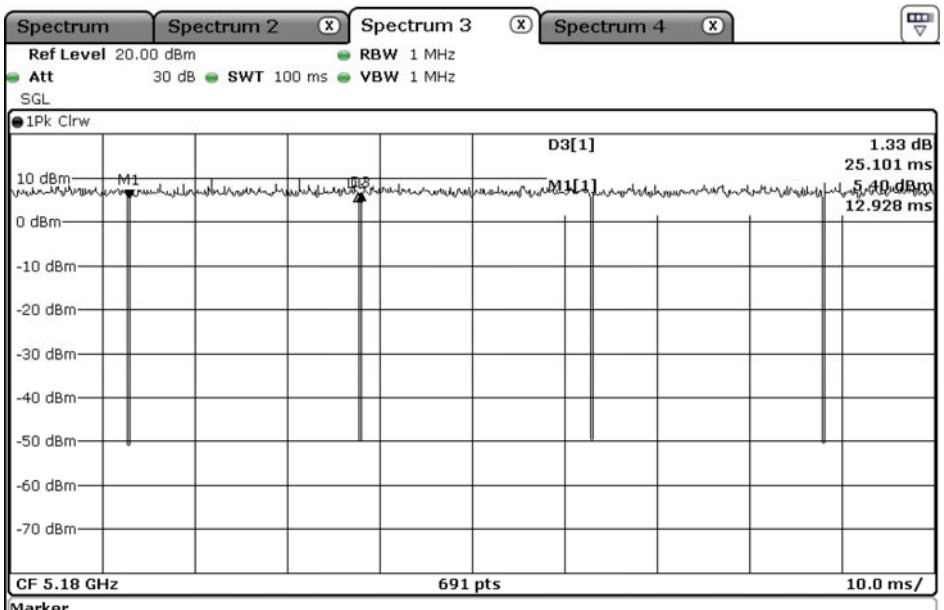


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	6.6957 ms	6.25 dBm		
D2	M1	1	2.087 ms	-0.19 dB		
D3	M1	1	2.3478 ms	0.03 dB		

Date: 14.NOV.2020 15:32:26

802.11 n20 - SISOA

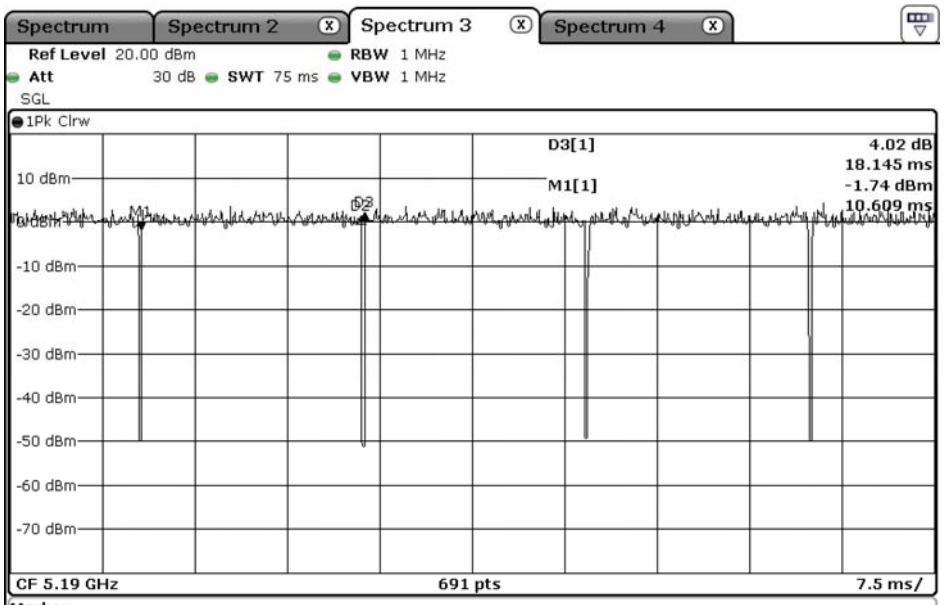


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	12.928 ms	5.40 dBm		
D2	M1	1	24.696 ms	1.08 dB		
D3	M1	1	25.101 ms	1.33 dB		

Date: 14.NOV.2020 15:33:37

802.11 n40 - SISOA

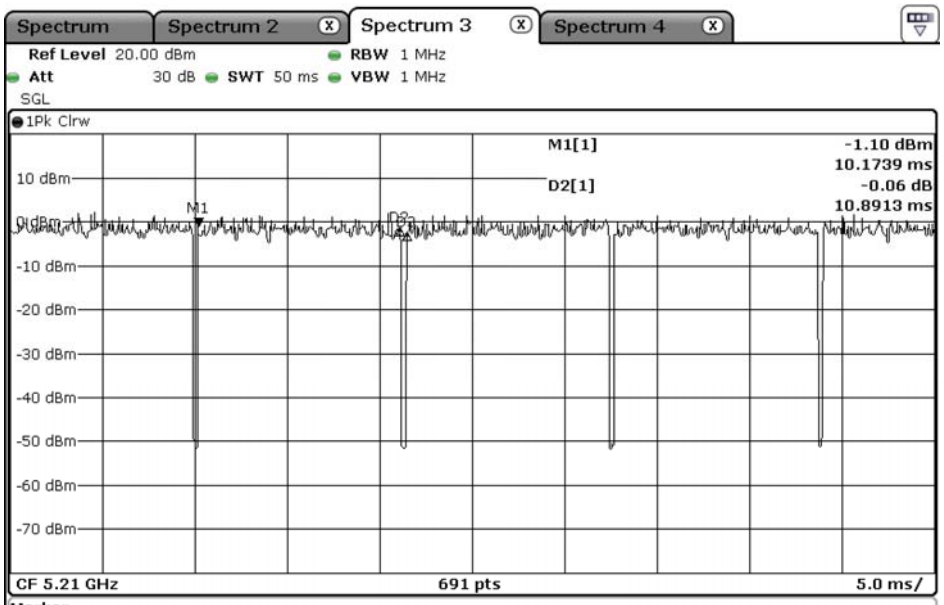


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	10.609 ms	-1.74 dBm		
D2	M1	1	17.848 ms	3.07 dB		
D3	M1	1	18.145 ms	4.02 dB		

Date: 14.NOV.2020 15:34:38

802.11 ac80 - SISOA

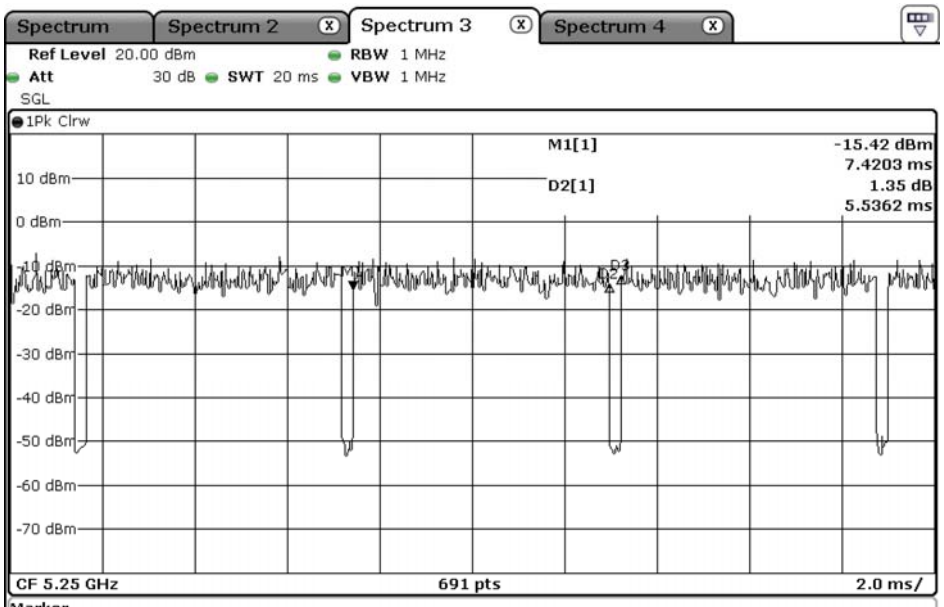


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	10.1739 ms	-1.10 dBm		
D2	M1	1	10.8913 ms	-0.06 dB		
D3	M1	1	11.2609 ms	-1.30 dB		

Date: 14.NOV.2020 15:35:21

802.11 ac160 - SISOA

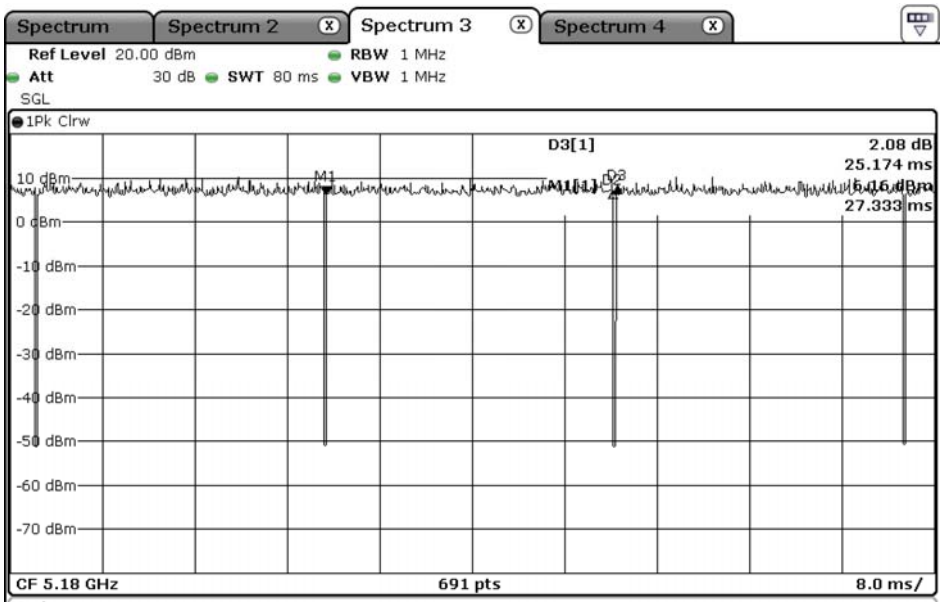


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	7.4203 ms	-15.42 dBm		
D2	M1	1	5.5362 ms	1.35 dB		
D3	M1	1	5.7971 ms	3.20 dB		

Date: 14.NOV.2020 15:42:29

802.11 ax20 - SISOA

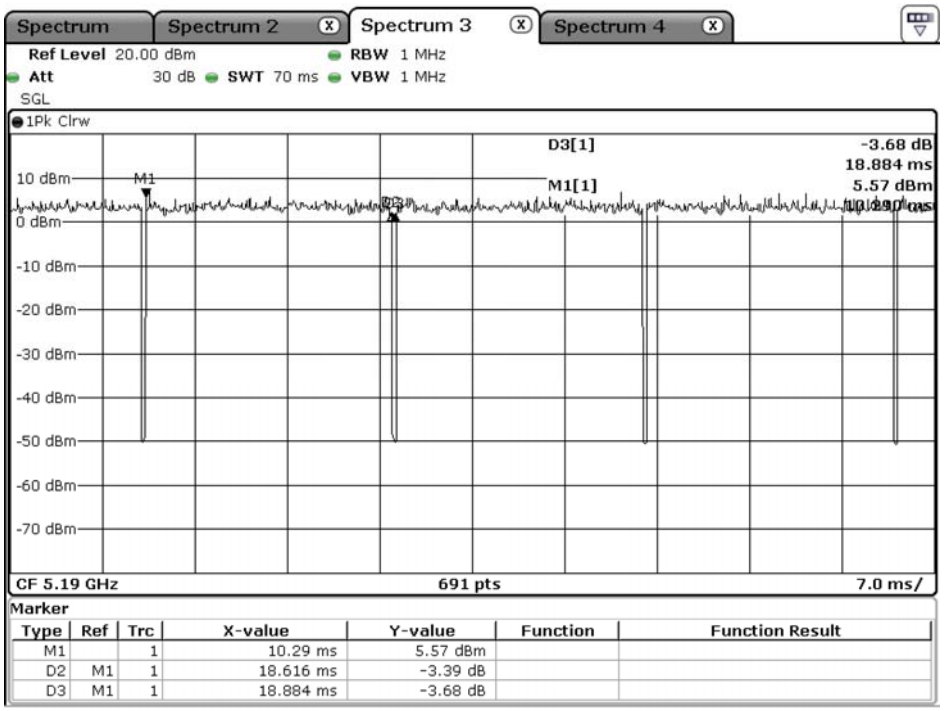


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	27.333 ms	6.16 dBm		
D2	M1	1	24.804 ms	0.96 dB		
D3	M1	1	25.174 ms	2.08 dB		

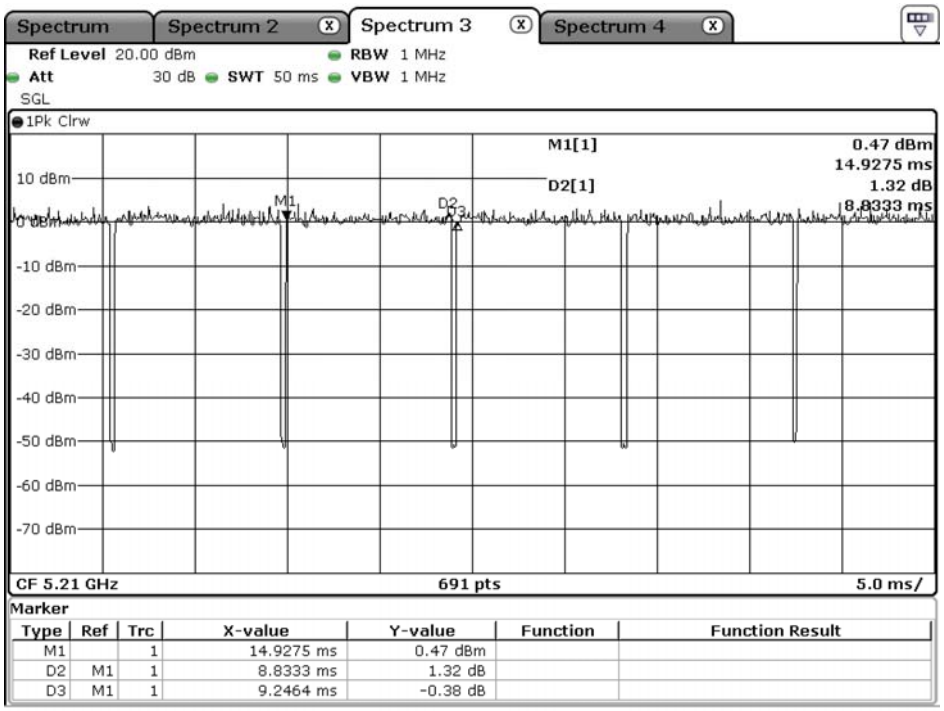
Date: 14.NOV.2020 15:36:38

802.11 ax40 - SISOA



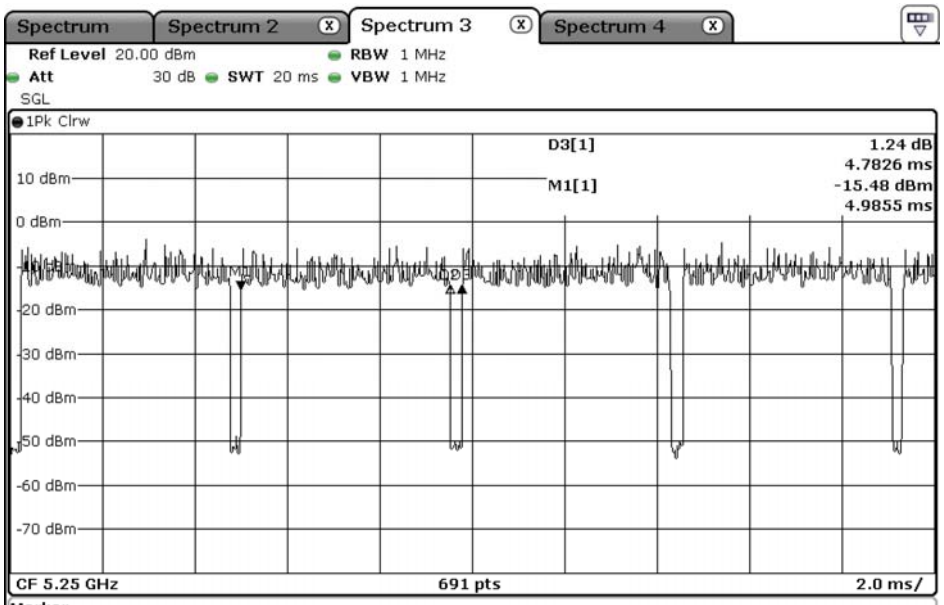
Date: 14.NOV.2020 15:39:15

802.11 ax80 - SISOA



Date: 14.NOV.2020 15:40:40

802.11 ax160 - SISOA

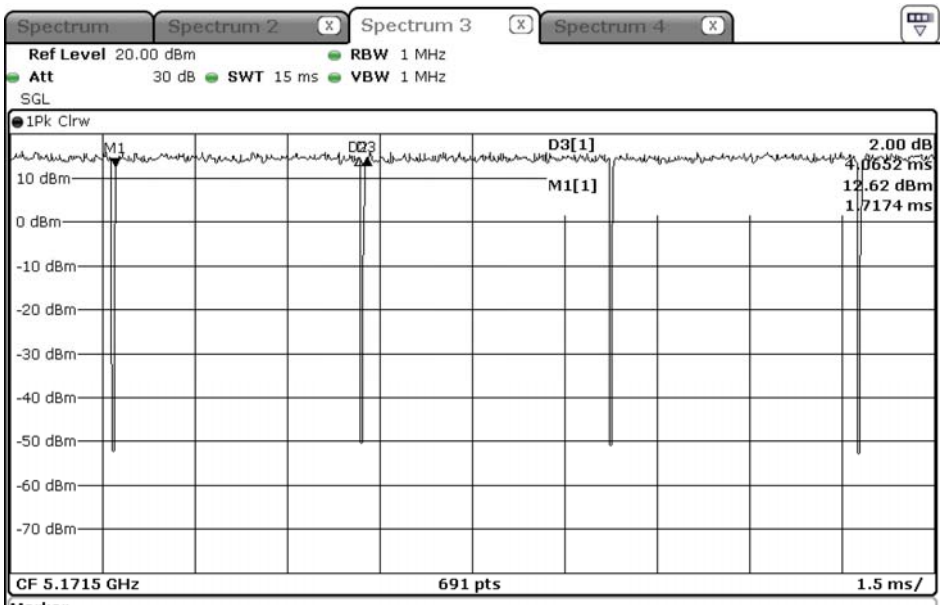


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	4.9855 ms	-15.48 dBm		
D2	M1	1	4.5217 ms	1.19 dB		
D3	M1	1	4.7826 ms	1.24 dB		

Date: 14.NOV.2020 15:41:44

802.11 ax20-26/0-RU - SISOA

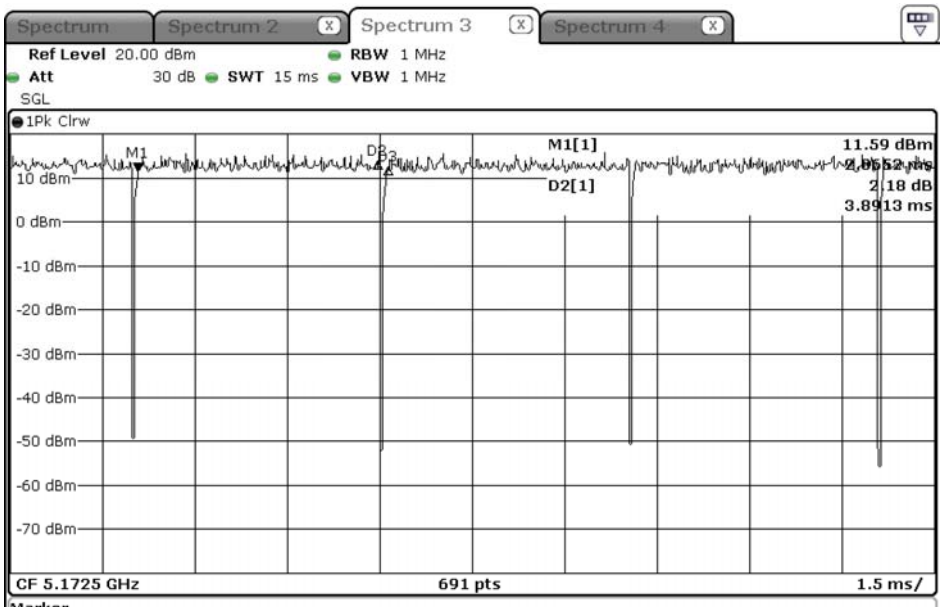


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.7174 ms	12.62 dBm		
D2	M1	1	3.9348 ms	1.96 dB		
D3	M1	1	4.0652 ms	2.00 dB		

Date: 17.NOV.2020 13:36:36

802.11 ax20-52/37-RU - SISOA

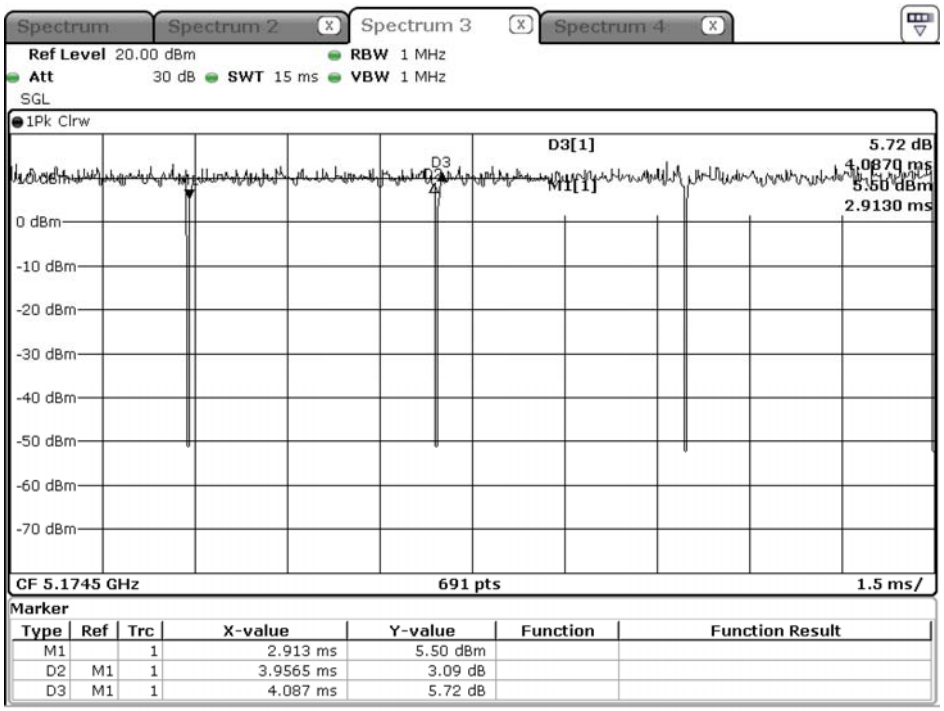


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.0652 ms	11.59 dBm		
D2	M1	1	3.8913 ms	2.18 dB		
D3	M1	1	4.0652 ms	1.06 dB		

Date: 17.NOV.2020 13:35:21

802.11 ax20-106/53-RU - SISOA

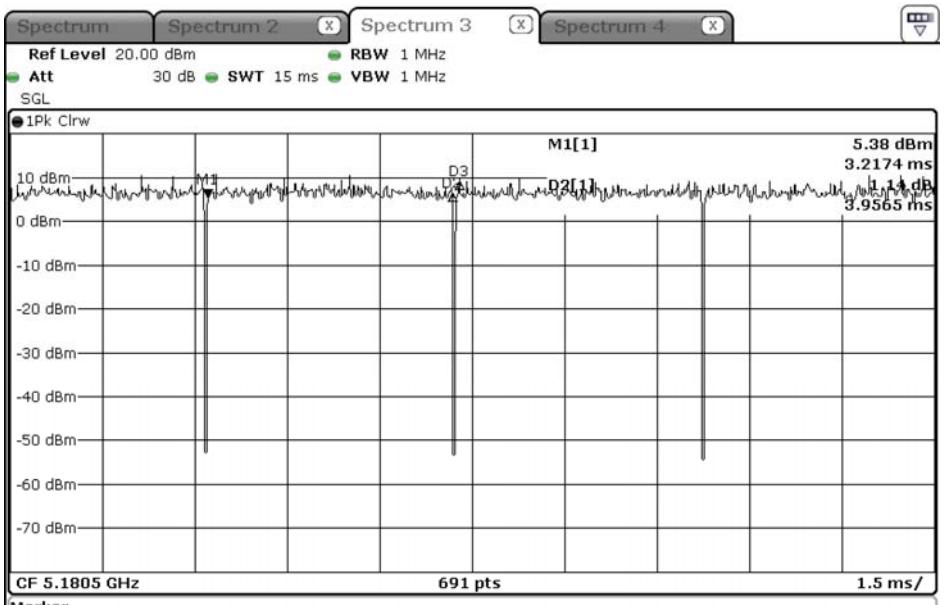


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.913 ms	5.50 dBm		
D2	M1	1	3.9565 ms	3.09 dB		
D3	M1	1	4.087 ms	5.72 dB		

Date: 17.NOV.2020 13:34:30

802.11 ax40-242/61-RU - SISOA

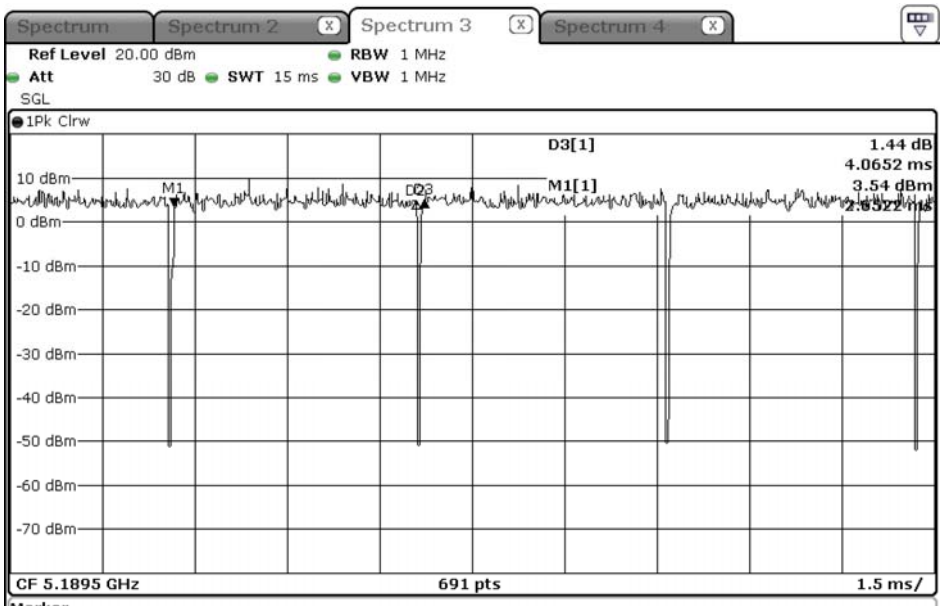


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	3.2174 ms	5.38 dBm		
D2	M1	1	3.9565 ms	1.14 dB		
D3	M1	1	4.0652 ms	3.83 dB		

Date: 17.NOV.2020 13:33:36

802.11 ax80-484/65-RU - SISOA

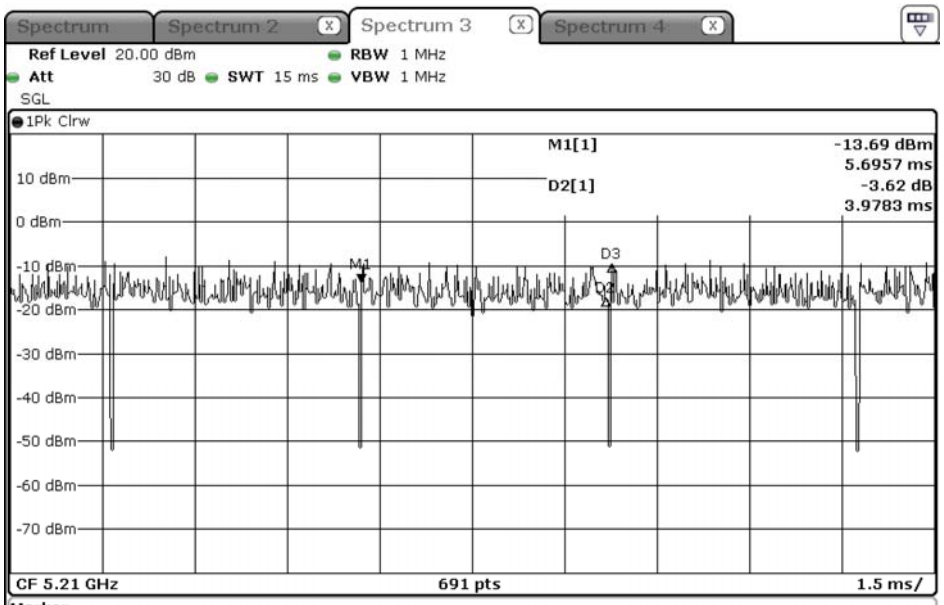


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.6522 ms	3.54 dBm		
D2	M1	1	3.9348 ms	1.36 dB		
D3	M1	1	4.0652 ms	1.44 dB		

Date: 17.NOV.2020 13:32:52

802.11 ax160-996/67-RU - SISOA



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.6957 ms	-13.69 dBm		
D2	M1	1	3.9783 ms	-3.62 dB		
D3	M1	1	4.0652 ms	4.27 dB		

Date: 17.NOV.2020 13:31:03

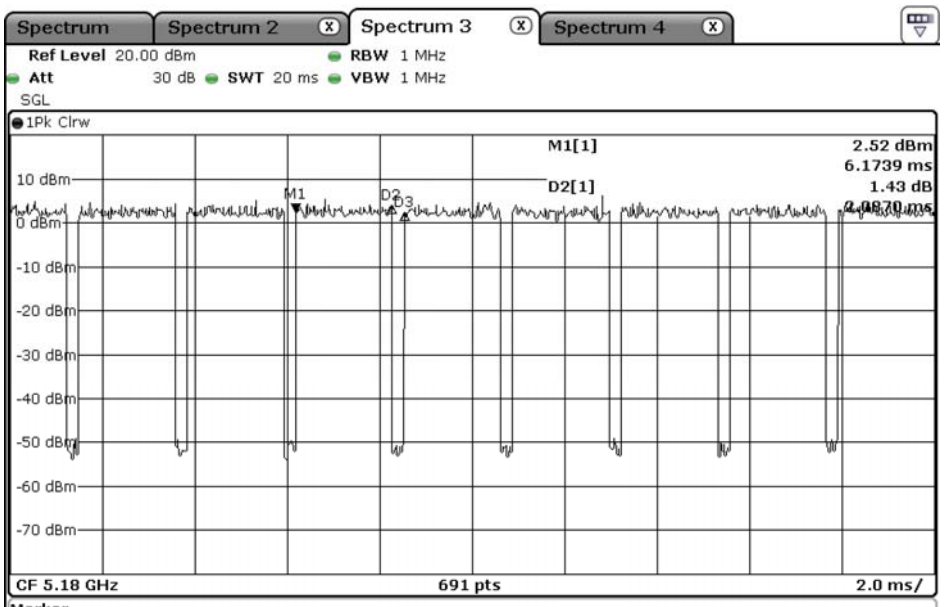
Product : Notebook Computers
Test Item : Duty Cycle
Test Mode : Transmit

Duty Cycle Formula:
Duty Cycle = Ton / (Ton + Toff)
Duty Factor = 10 Log (1/Duty Cycle)

Results: SISO B

5GHz band	Ton (ms)	Ton + Toff (ms)	Duty Cycle (%)	Duty Factor (dB)
802.11 a	2.0870	2.3478	88.89	0.51
802.11 n20	24.6990	24.8410	99.43	0.02
802.11 n40	17.8990	18.3480	97.55	0.11
802.11 ac80	11.0145	11.3913	96.69	0.15
802.11 ac160	5.5652	5.8188	95.64	0.19
802.11 ax20	24.6090	25.1230	97.95	0.09
802.11 ax40	18.6090	18.9930	97.98	0.09
802.11 ax80	8.8188	9.2536	95.30	0.21
802.11 ax160	4.5217	4.7826	94.54	0.24
802.11 ax20-26/0-RU	3.9275	4.0580	96.78	0.14
802.11 ax20-52/37-RU	3.9275	4.0580	96.78	0.14
802.11 ax20-106/53-RU	3.9710	4.0580	97.86	0.09
802.11 ax40-242/61-RU	3.9275	4.0145	97.83	0.10
802.11 ax80-484/65-RU	3.9275	4.0580	96.78	0.14
802.11 ax160-996/67-RU	3.9058	4.0580	96.25	0.17

802.11a - SISOB

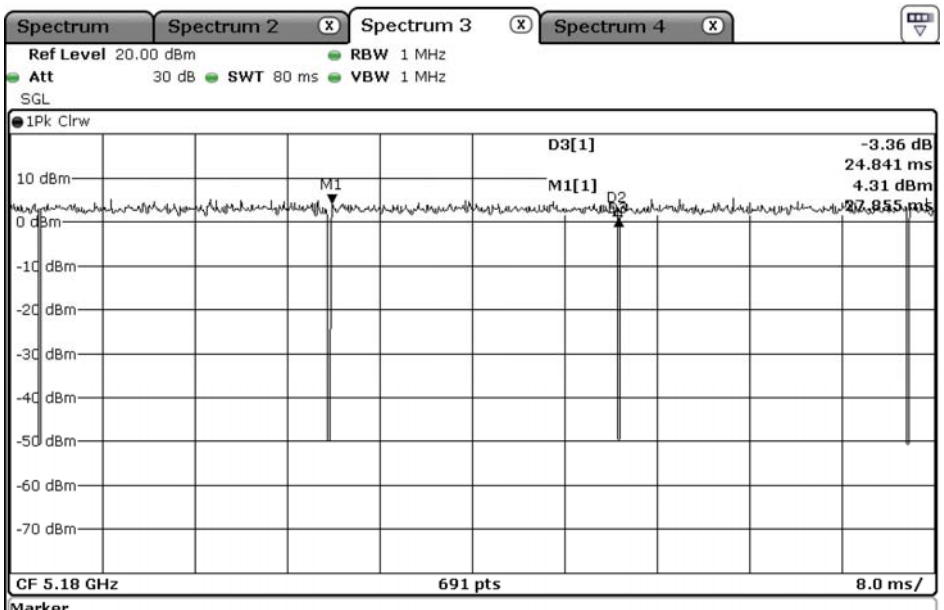


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	6.1739 ms	2.52 dBm		
D2	M1	1	2.087 ms	1.43 dB		
D3	M1	1	2.3478 ms	-0.02 dB		

Date: 21.NOV.2020 06:21:35

802.11 n20 - SISOB

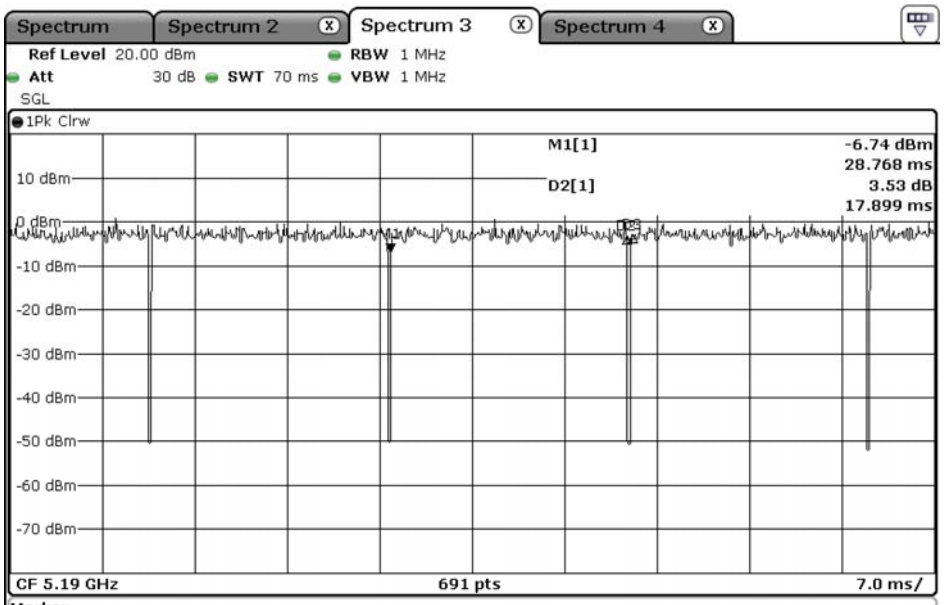


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	27.855 ms	4.31 dBm		
D2	M1	1	24.696 ms	-1.19 dB		
D3	M1	1	24.841 ms	-3.36 dB		

Date: 21.NOV.2020 06:22:52

802.11 n40 - SISOB

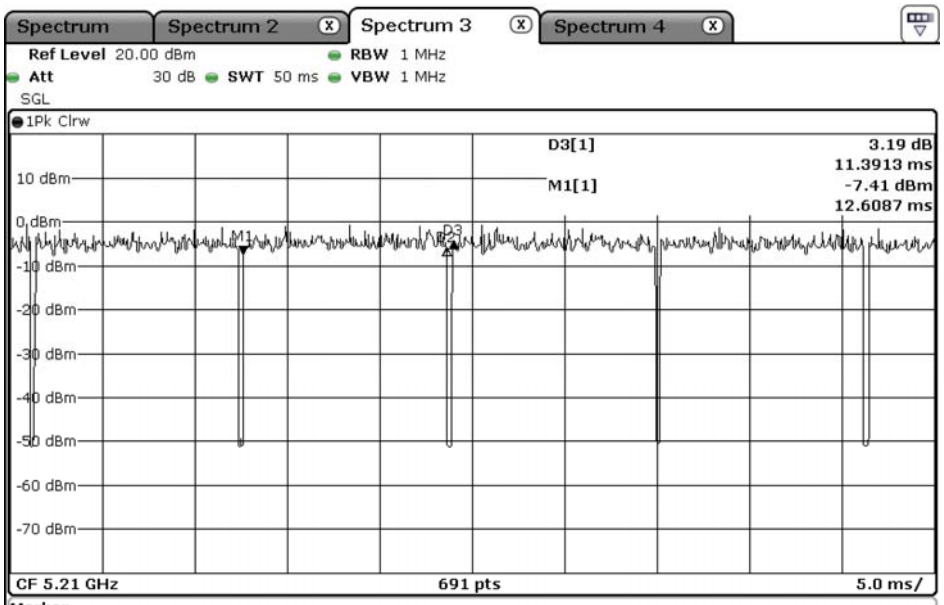


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	28.768 ms	-6.74 dBm		
D2	M1	1	17.899 ms	3.53 dB		
D3	M1	1	18.348 ms	3.86 dB		

Date: 21.NOV.2020 06:23:36

802.11 ac80 - SISOB

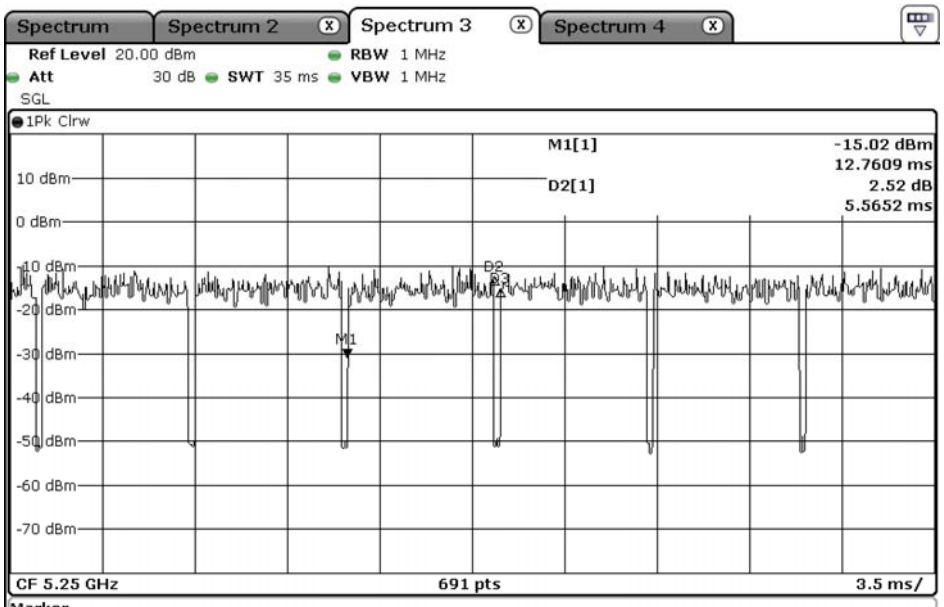


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	12.6087 ms	-7.41 dBm		
D2	M1	1	11.0145 ms	1.59 dB		
D3	M1	1	11.3913 ms	3.19 dB		

Date: 21.NOV.2020 06:24:18

802.11 ac160 - SISOB

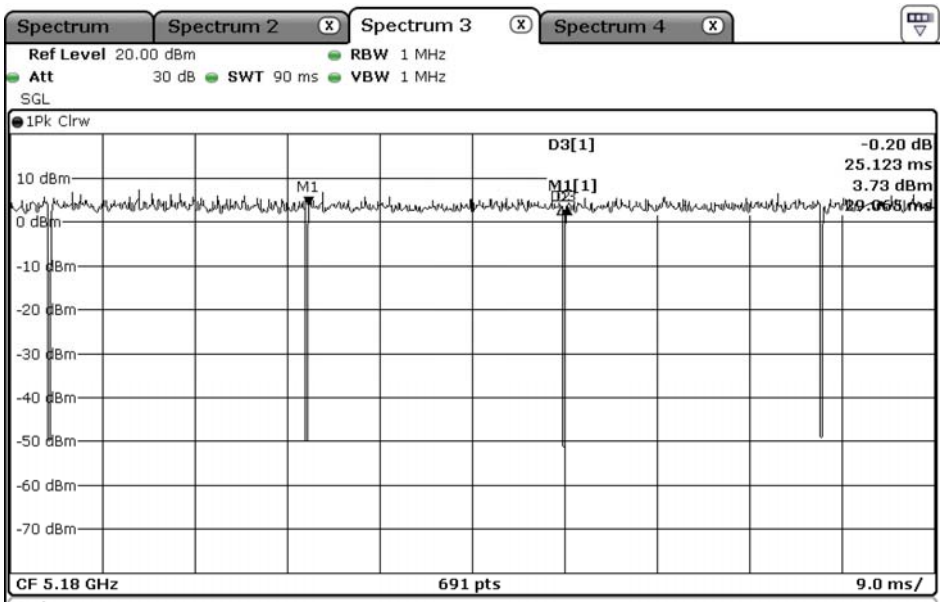


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	12.7609 ms	-15.02 dBm		
D2	M1	1	5.5652 ms	2.52 dB		
D3	M1	1	5.8188 ms	-0.12 dB		

Date: 21.NOV.2020 06:24:57

802.11 ax20 - SISOB

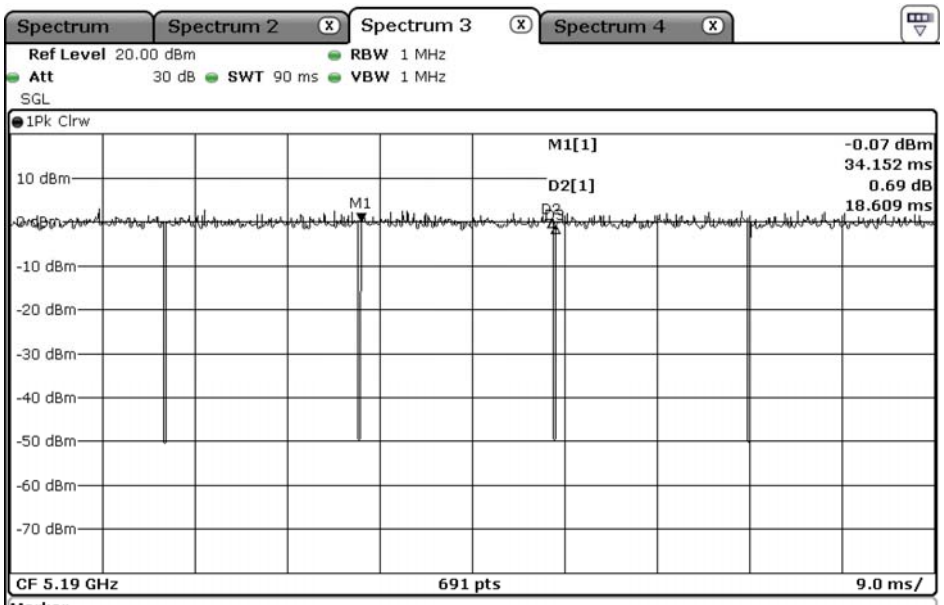


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	29.065 ms	3.73 dBm		
D2	M1	1	24.609 ms	-0.31 dB		
D3	M1	1	25.123 ms	-0.20 dB		

Date: 21.NOV.2020 06:26:16

802.11 ax40 - SISOB

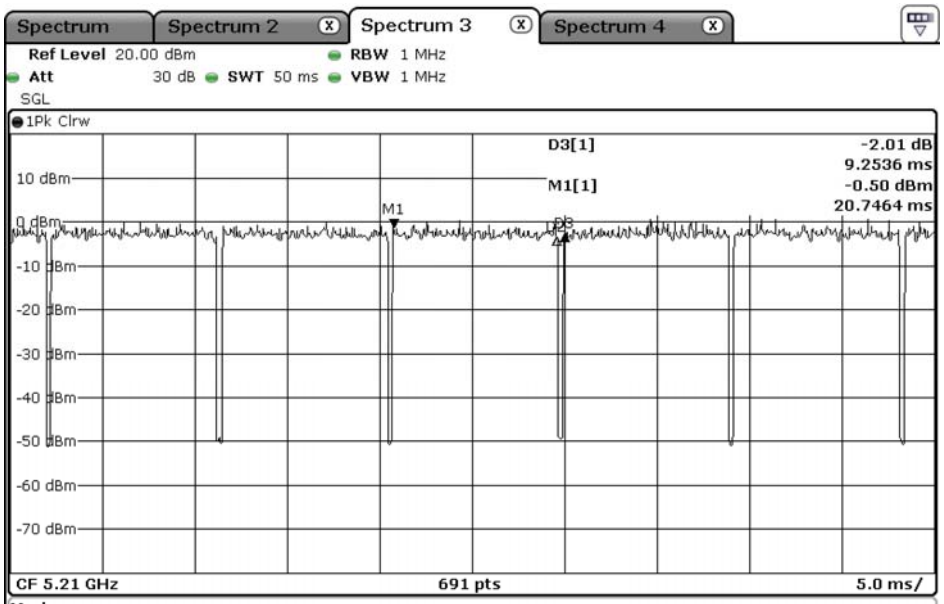


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	34.152 ms	-0.07 dBm		
D2	M1	1	18.609 ms	0.69 dB		
D3	M1	1	18.993 ms	-0.80 dB		

Date: 21.NOV.2020 06:26:51

802.11 ax80 - SISOB

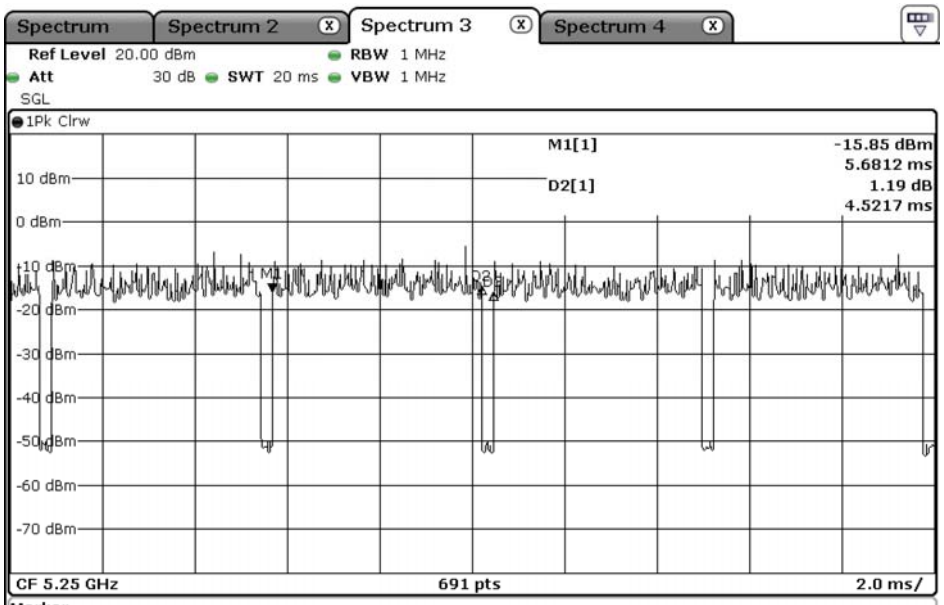


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	20.7464 ms	-0.50 dBm		
D2	M1	1	8.8188 ms	-2.92 dB		
D3	M1	1	9.2536 ms	-2.01 dB		

Date: 21.NOV.2020 06:27:30

802.11 ax160 - SISOB

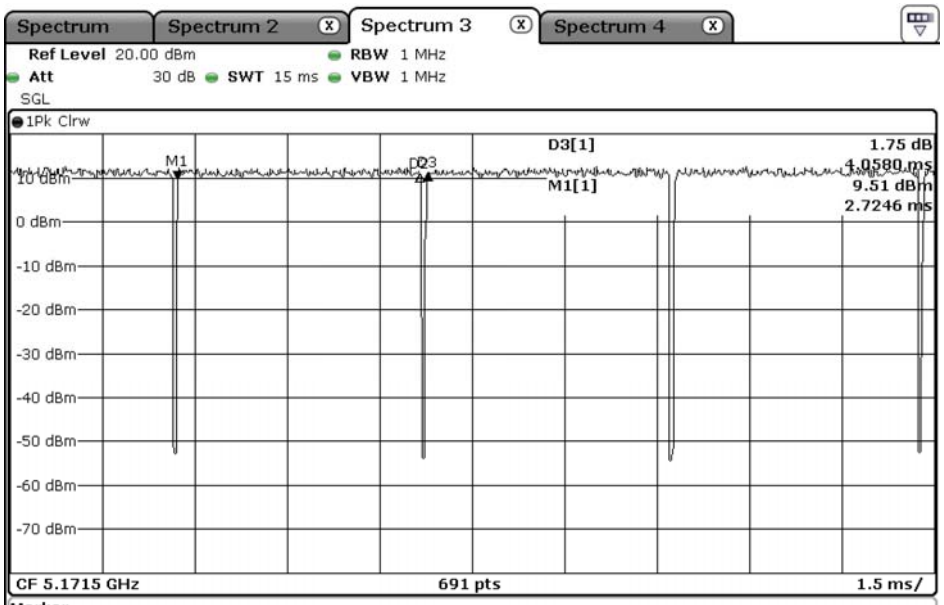


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.6812 ms	-15.85 dBm		
D2	M1	1	4.5217 ms	1.19 dB		
D3	M1	1	4.7826 ms	-0.01 dB		

Date: 21.NOV.2020 06:28:12

802.11 ax20-26/0-RU - SISOB

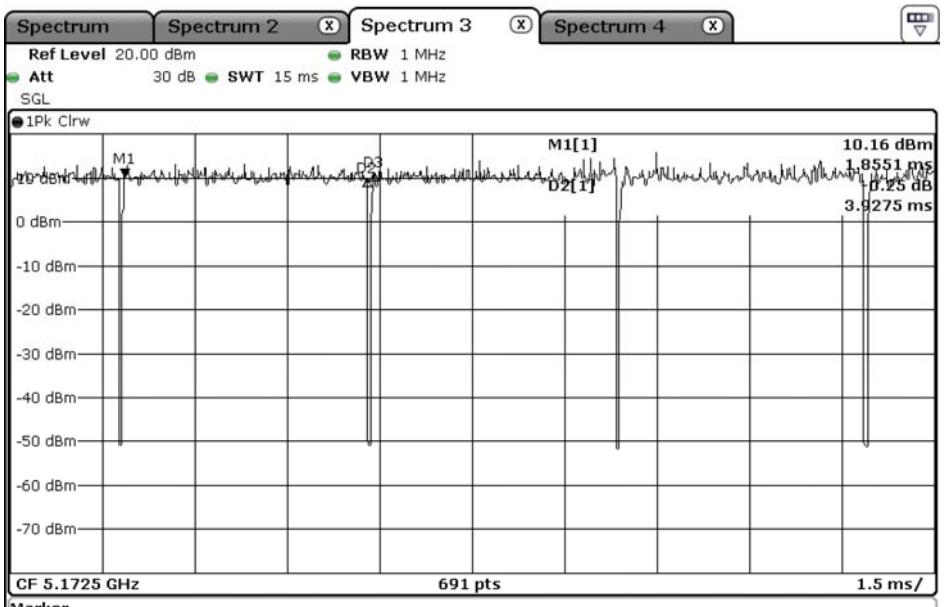


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.7246 ms	9.51 dBm		
D2	M1	1	3.9275 ms	1.36 dB		
D3	M1	1	4.058 ms	1.75 dB		

Date: 21.NOV.2020 06:33:07

802.11 ax20-52/37-RU - SISOB

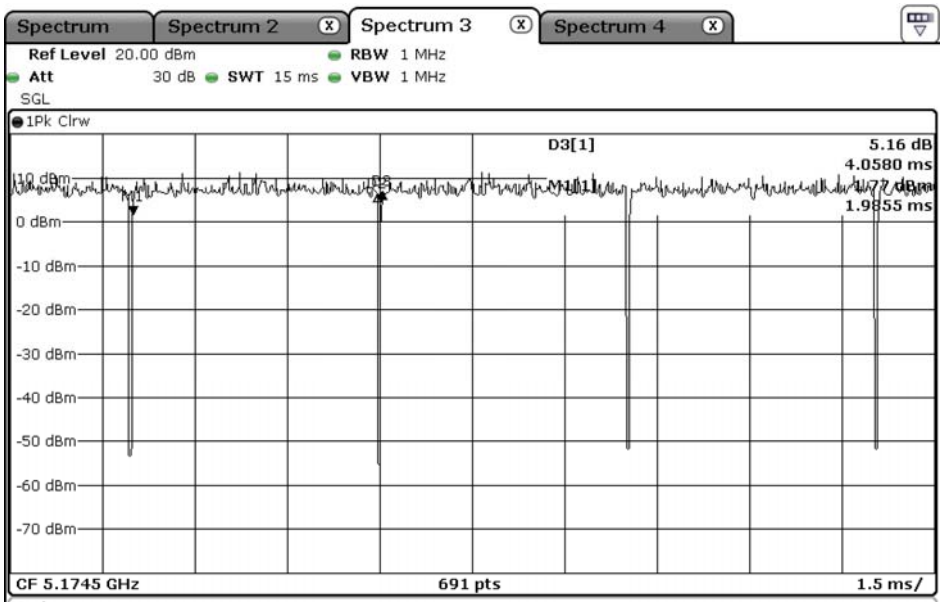


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.8551 ms	10.16 dBm		
D2	M1	1	3.9275 ms	-0.25 dB		
D3	M1	1	4.058 ms	1.03 dB		

Date: 21.NOV.2020 06:33:52

802.11 ax20-106/53-RU - SISOB

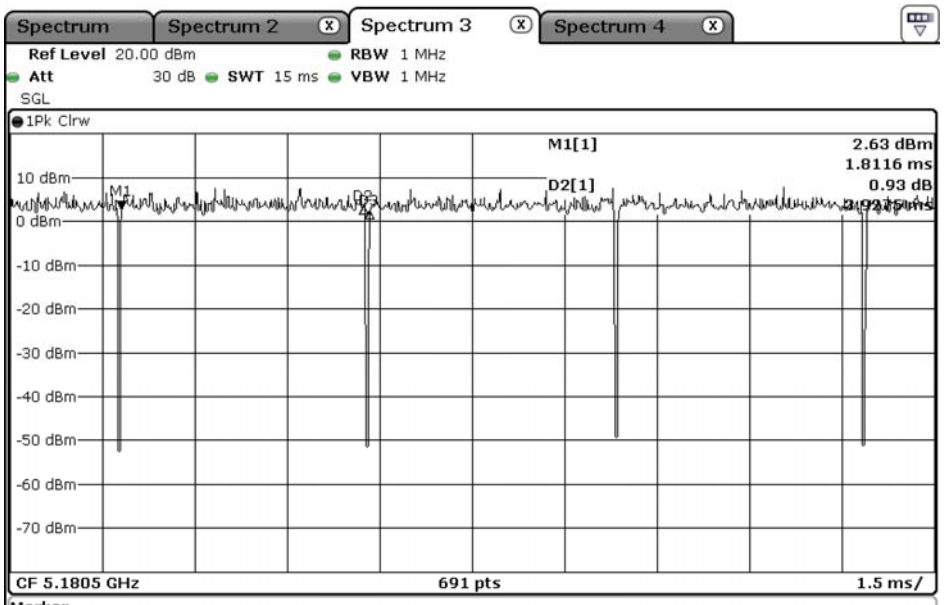


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.9855 ms	1.77 dBm		
D2	M1	1	3.971 ms	4.74 dB		
D3	M1	1	4.058 ms	5.16 dB		

Date: 21.NOV.2020 06:34:36

802.11 ax40-242/61-RU - SISOB

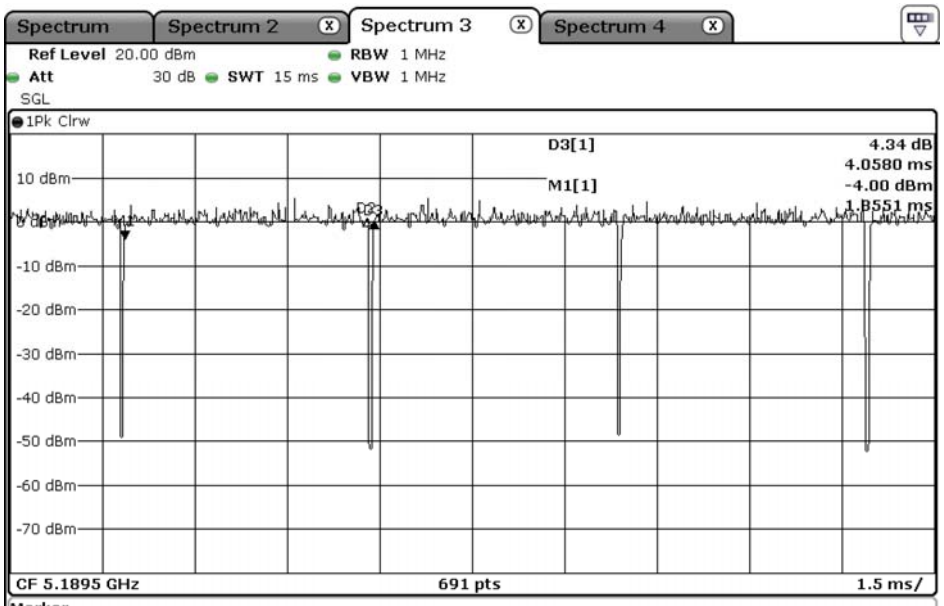


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.8116 ms	2.63 dBm		
D2	M1	1	3.9275 ms	0.93 dB		
D3	M1	1	4.0145 ms	-0.09 dB		

Date: 21.NOV.2020 06:31:27

802.11 ax80-484/65-RU - SISOB

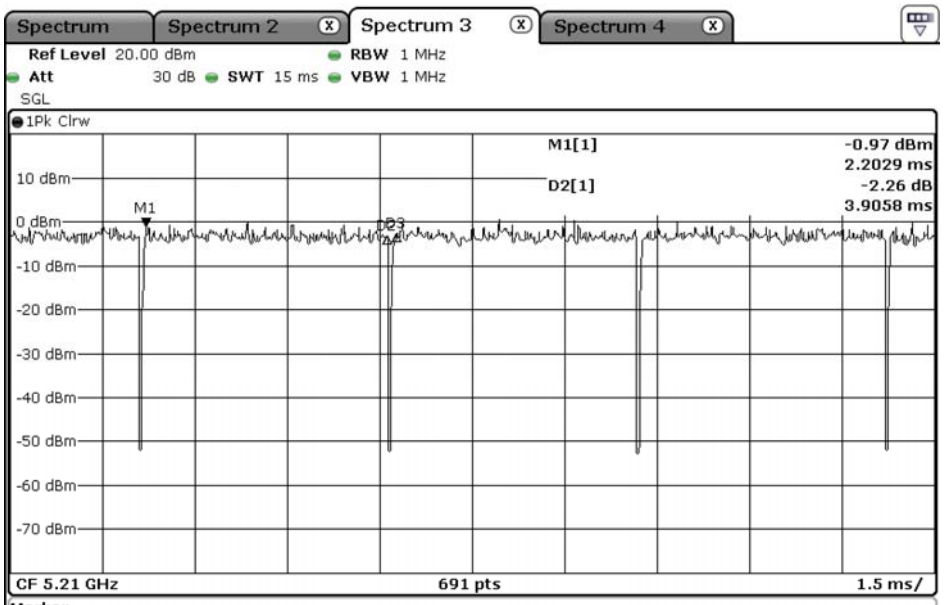


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.8551 ms	-4.00 dBm		
D2	M1	1	3.9275 ms	4.91 dB		
D3	M1	1	4.058 ms	4.34 dB		

Date: 21.NOV.2020 06:30:44

802.11 ax160-996/67-RU - SISOB



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.2029 ms	-0.97 dBm		
D2	M1	1	3.9058 ms	-2.26 dB		
D3	M1	1	4.058 ms	-1.54 dB		

Date: 21.NOV.2020 06:29:35

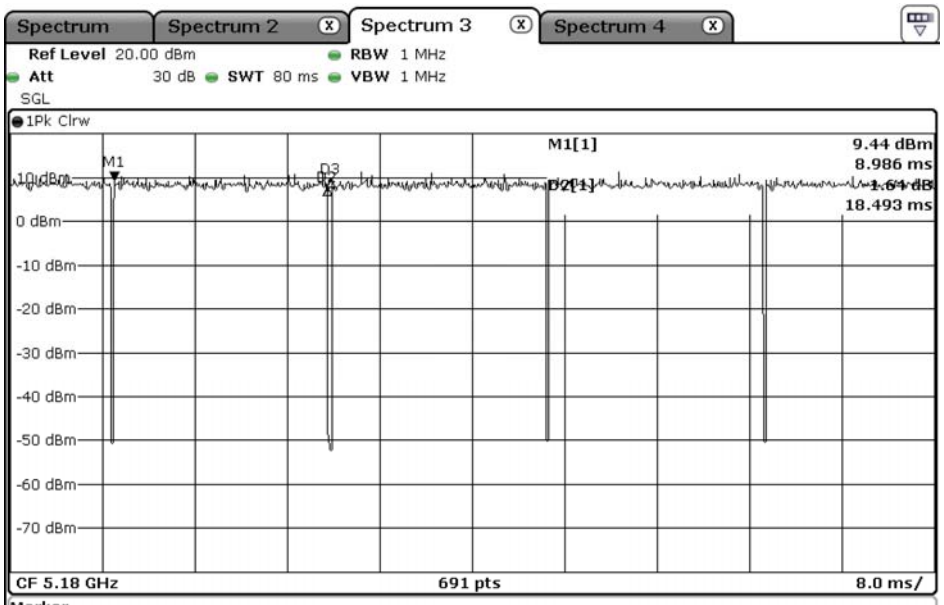
Product : Notebook Computers
Test Item : Duty Cycle
Test Mode : Transmit

Duty Cycle Formula:
Duty Cycle = Ton / (Ton + Toff)
Duty Factor = 10 Log (1/Duty Cycle)

Results: MIMO

5GHz band	Ton (ms)	Ton + Toff (ms)	Duty Cycle (%)	Duty Factor (dB)
802.11 n20	18.4930	18.7830	98.46	0.07
802.11 n40	8.8406	9.2899	95.16	0.22
802.11 ac80	5.4493	5.8406	93.30	0.30
802.11 ac160	2.9657	3.0290	97.91	0.09
802.11 ax20	18.6960	19.0290	98.25	0.08
802.11 ax40	9.3333	9.6812	96.41	0.16
802.11 ax80	4.4638	4.8406	92.22	0.35
802.11 ax160	2.2319	2.5507	87.50	0.58
802.11 ax20-26/0-RU	3.9130	4.0217	97.30	0.12
802.11 ax20-52/37-RU	3.9348	4.0435	97.31	0.12
802.11 ax20-106/53-RU	3.9348	4.0435	97.31	0.12
802.11 ax40-242-61-RU	3.9565	4.0435	97.85	0.09
802.11 ax80-484-65-RU	3.9565	4.0652	97.33	0.12
802.11 ax160-996-67-RU	3.9565	4.0435	97.85	0.09

802.11 n20 - MIMO

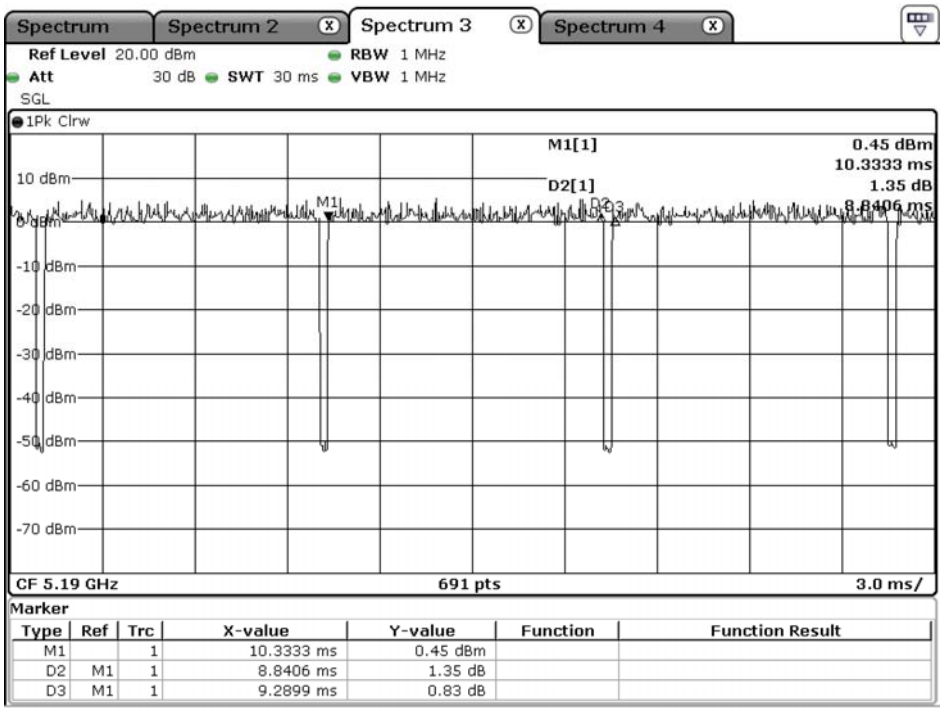


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	8.986 ms	9.44 dBm		
D2	M1	1	18.493 ms	-1.64 dB		
D3	M1	1	18.783 ms	0.07 dB		

Date: 14.NOV.2020 19:33:54

802.11 n40 - MIMO

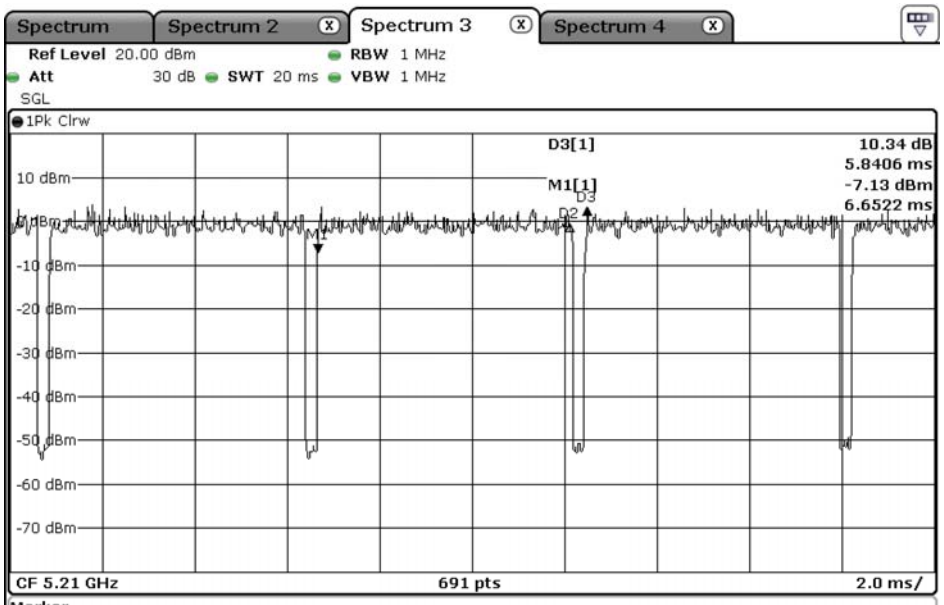


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	10.3333 ms	0.45 dBm		
D2	M1	1	8.8406 ms	1.35 dB		
D3	M1	1	9.2899 ms	0.83 dB		

Date: 14.NOV.2020 19:35:17

802.11 ac80 - MIMO

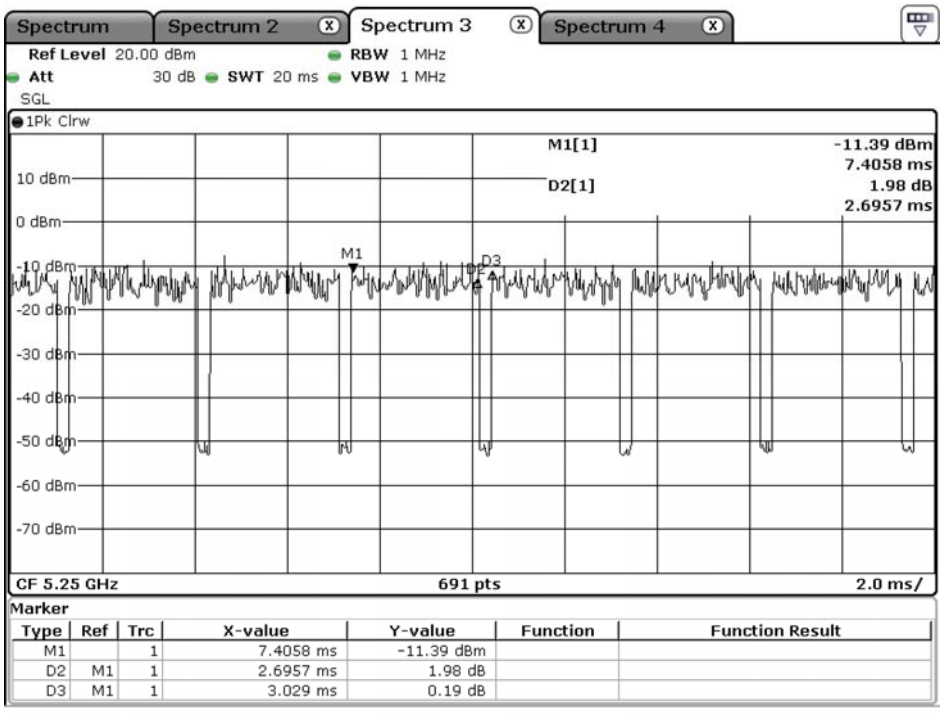


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	6.6522 ms	-7.13 dBm		
D2	M1	1	5.4493 ms	4.68 dB		
D3	M1	1	5.8406 ms	10.34 dB		

Date: 14.NOV.2020 19:36:04

802.11 ac160 - MIMO

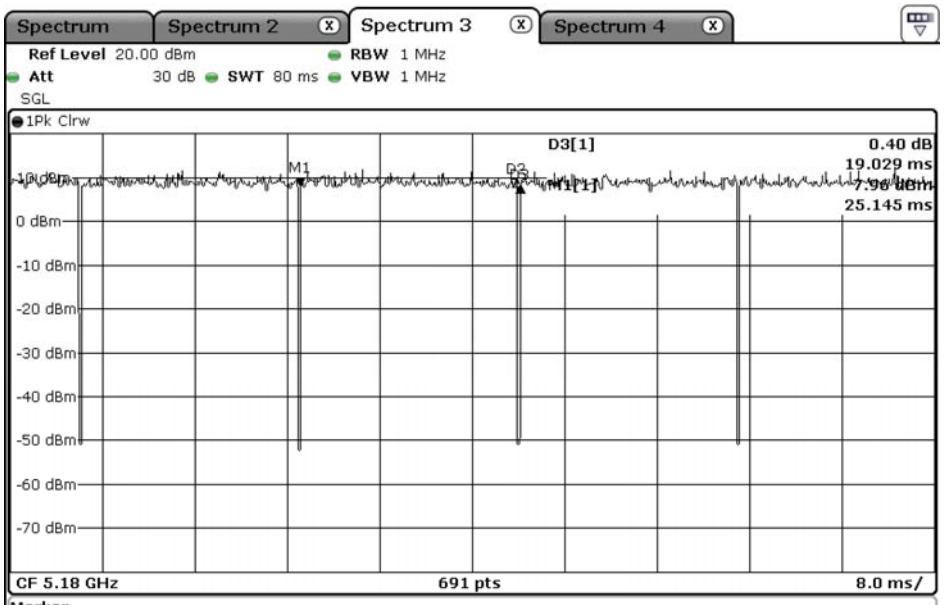


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	7.4058 ms	-11.39 dBm		
D2	M1	1	2.6957 ms	1.98 dB		
D3	M1	1	3.029 ms	0.19 dB		

Date: 14.NOV.2020 19:36:53

802.11 ax20 - MIMO

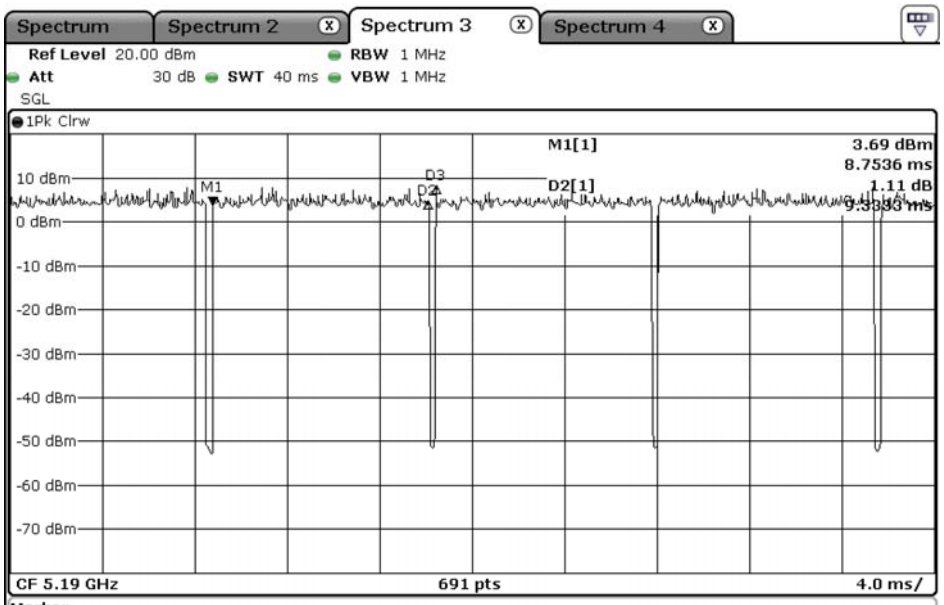


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	25.145 ms	7.96 dBm		
D2	M1	1	18.696 ms	1.71 dB		
D3	M1	1	19.029 ms	0.40 dB		

Date: 14.NOV.2020 19:37:41

802.11 ax40 - MIMO

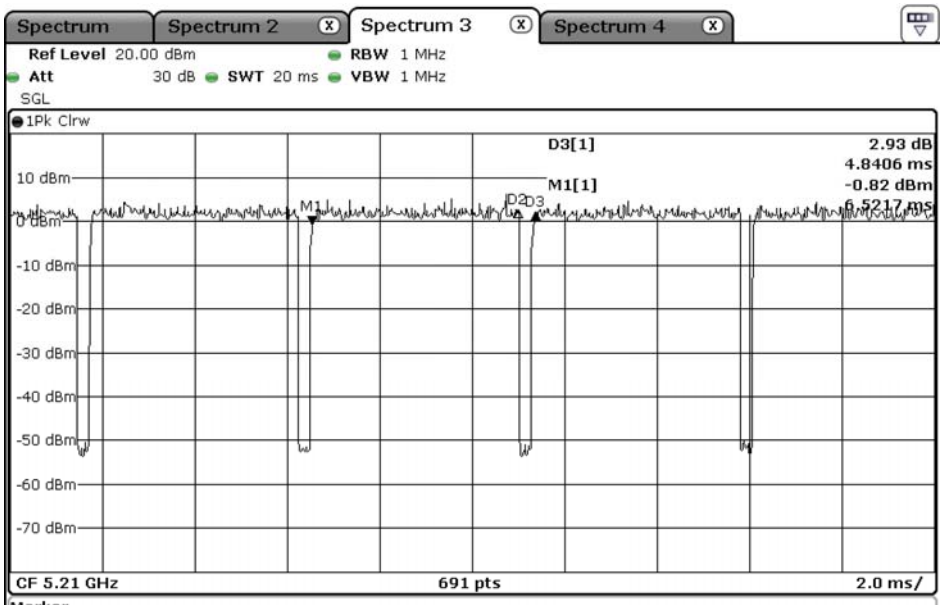


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	8.7536 ms	3.69 dBm		
D2	M1	1	9.3333 ms	1.11 dB		
D3	M1	1	9.6812 ms	4.55 dB		

Date: 14.NOV.2020 19:38:32

802.11 ax80 - MIMO

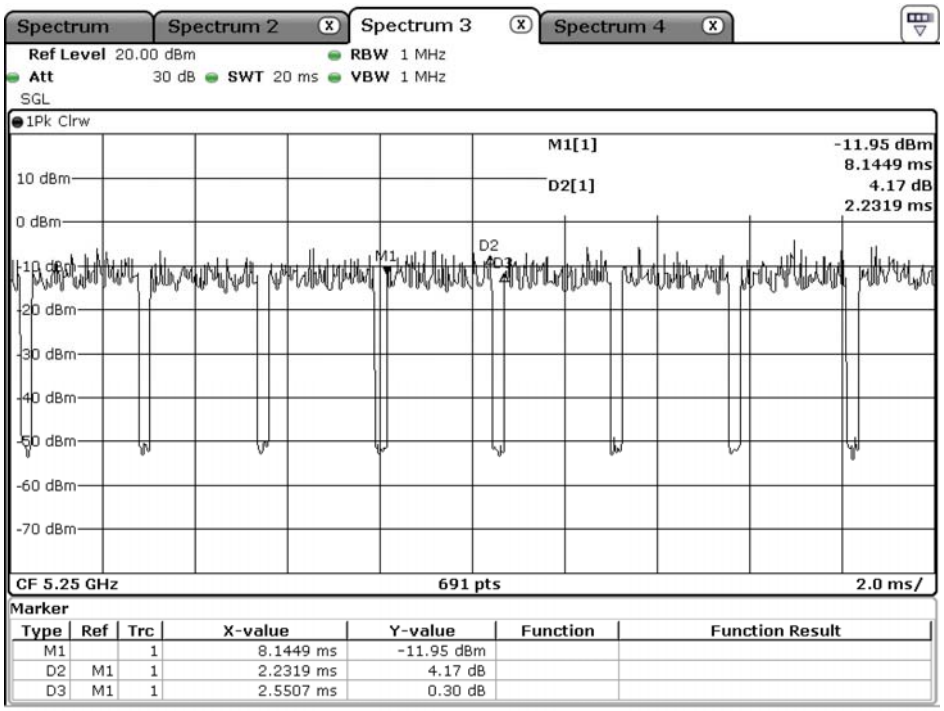


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	6.5217 ms	-0.82 dBm		
D2	M1	1	4.4638 ms	3.45 dB		
D3	M1	1	4.8406 ms	2.93 dB		

Date: 14.NOV.2020 19:39:14

802.11 ax160 - MIMO

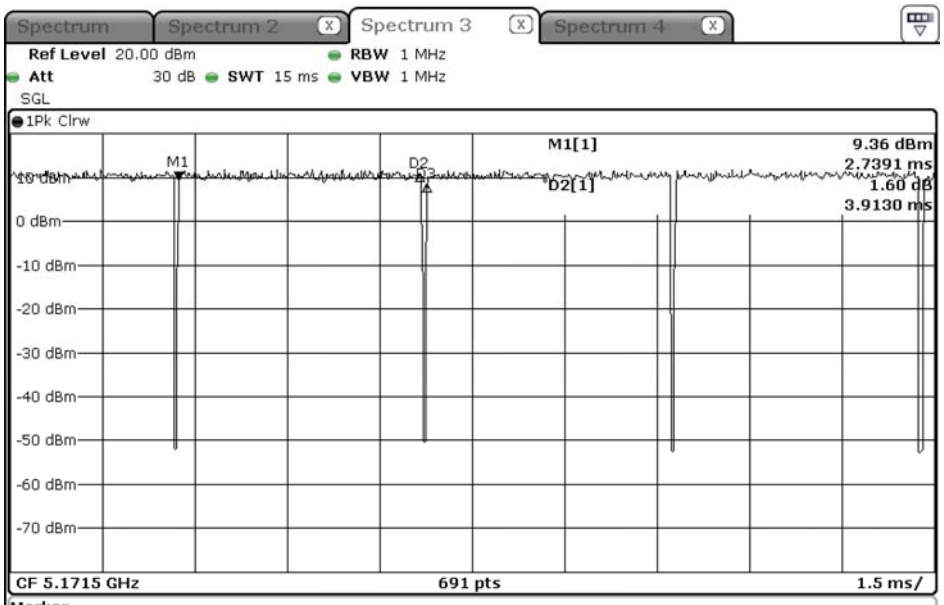


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	8.1449 ms	-11.95 dBm		
D2	M1	1	2.2319 ms	4.17 dB		
D3	M1	1	2.5507 ms	0.30 dB		

Date: 14.NOV.2020 19:39:50

802.11 ax20-26/0-RU - MIMO

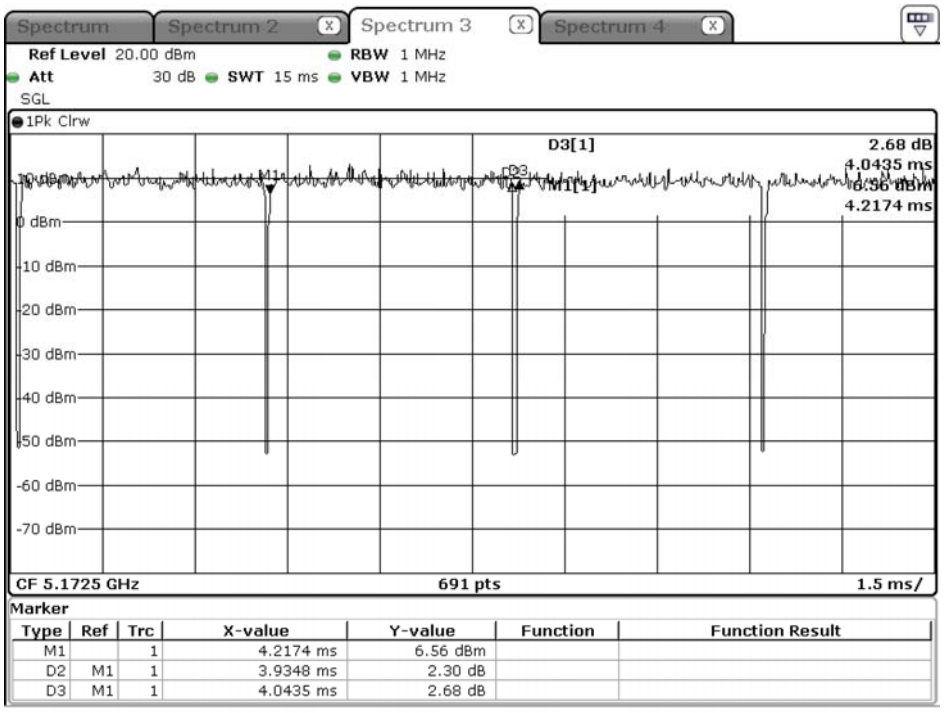


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.7391 ms	9.36 dBm		
D2	M1	1	3.913 ms	1.60 dB		
D3	M1	1	4.0217 ms	-0.86 dB		

Date: 17.NOV.2020 13:21:38

802.11 ax20-52/37-RU - MIMO

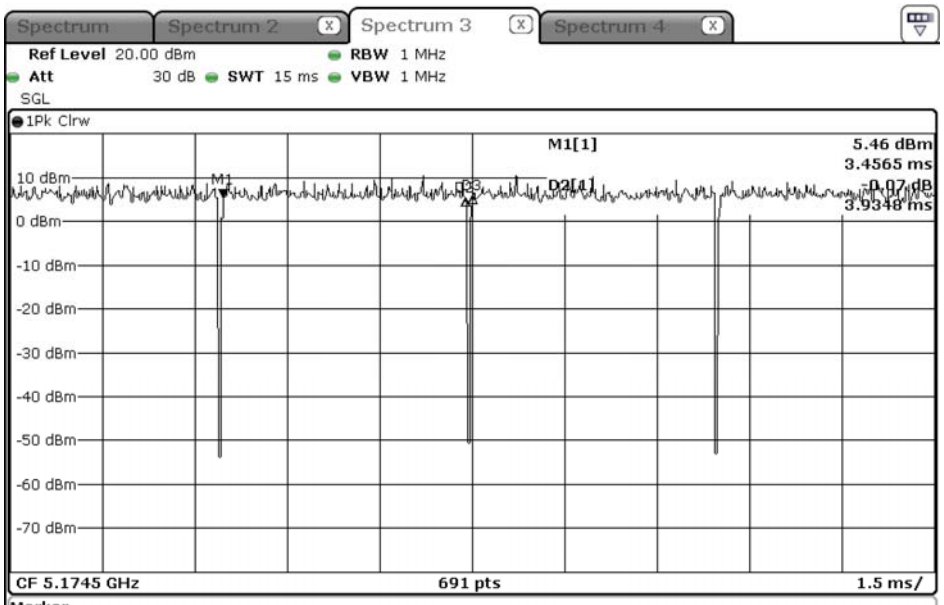


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	4.2174 ms	6.56 dBm		
D2	M1	1	3.9348 ms	2.30 dB		
D3	M1	1	4.0435 ms	2.68 dB		

Date: 17.NOV.2020 13:22:35

802.11 ax20-106/53-RU - MIMO

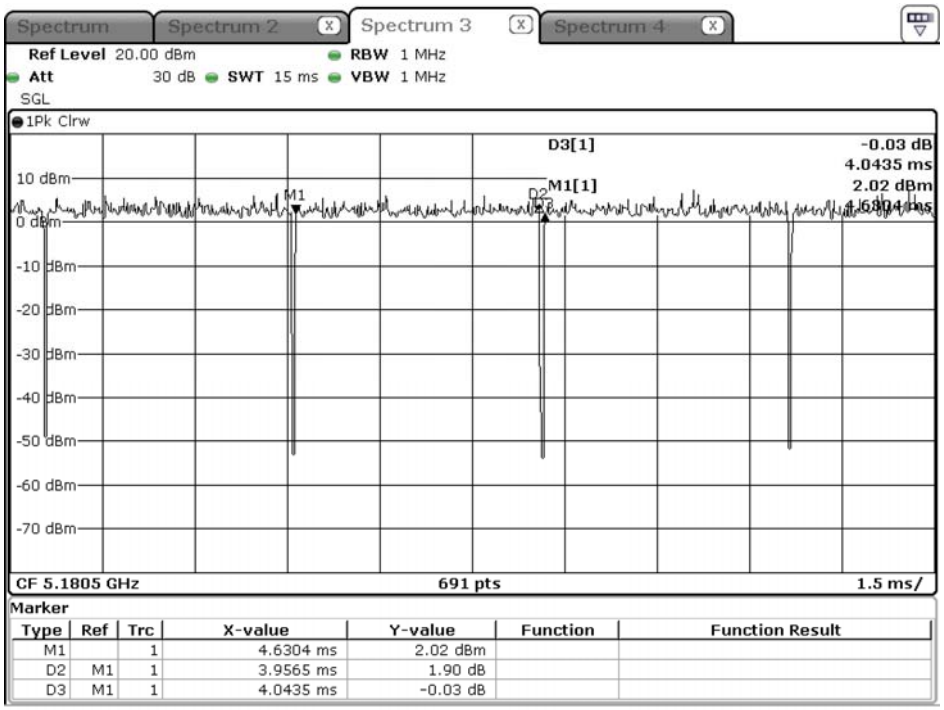


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	3.4565 ms	5.46 dBm		
D2	M1	1	3.9348 ms	-0.07 dB		
D3	M1	1	4.0435 ms	0.43 dB		

Date: 17.NOV.2020 13:23:41

802.11 ax40-242/61-RU - MIMO

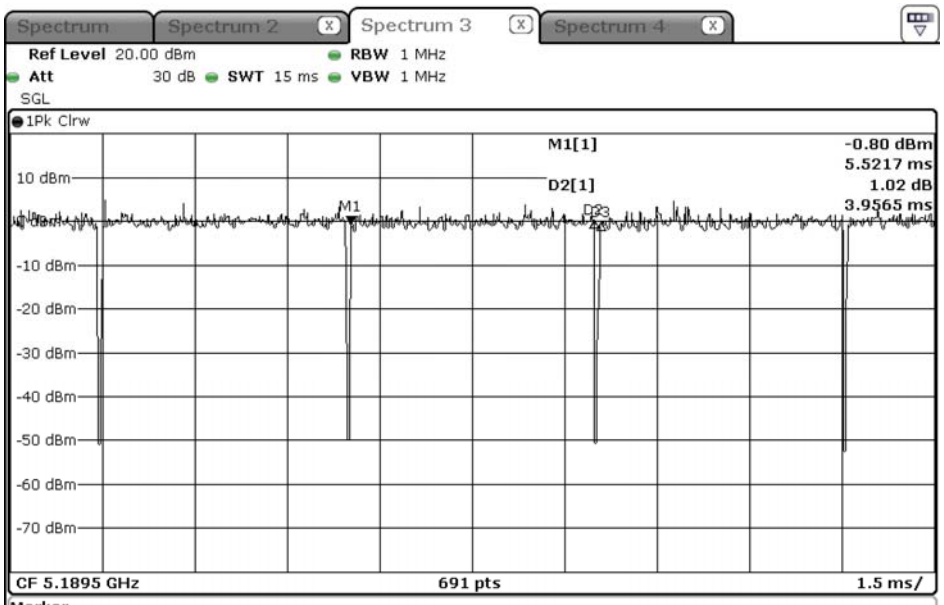


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	4.6304 ms	2.02 dBm		
D2	M1	1	3.9565 ms	1.90 dB		
D3	M1	1	4.0435 ms	-0.03 dB		

Date: 17.NOV.2020 13:24:28

802.11 ax80-484/65-RU - MIMO

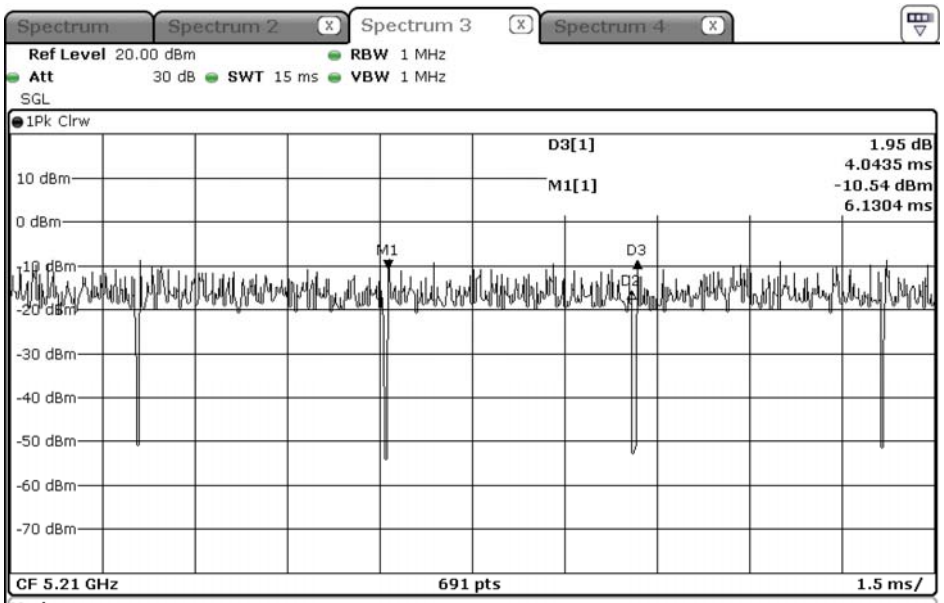


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.5217 ms	-0.80 dBm		
D2	M1	1	3.9565 ms	1.02 dB		
D3	M1	1	4.0652 ms	0.60 dB		

Date: 17.NOV.2020 13:26:07

802.11 ax160-996/67-RU - MIMO



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	6.1304 ms	-10.54 dBm		
D2	M1	1	3.9565 ms	-5.10 dB		
D3	M1	1	4.0435 ms	1.95 dB		

Date: 17.NOV.2020 13:29:20

9. EMI Reduction Method During Compliance Testing

No modification was made during testing.