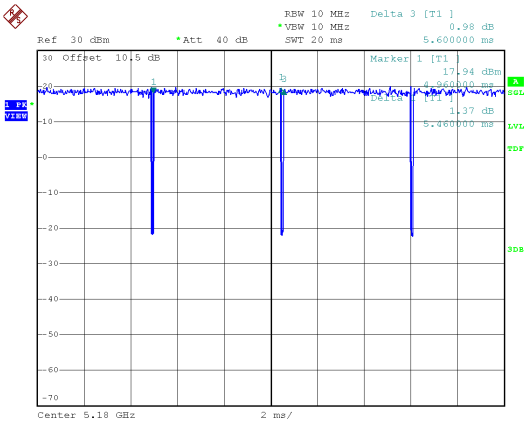
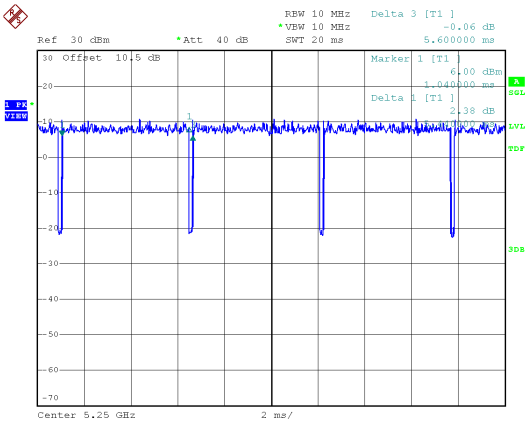
Beamforming

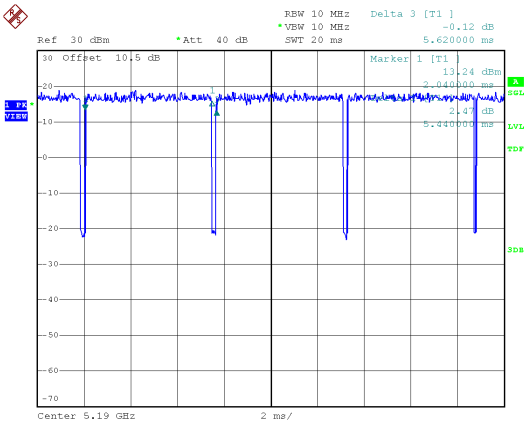
Modulation Type: 802.11ax HE20



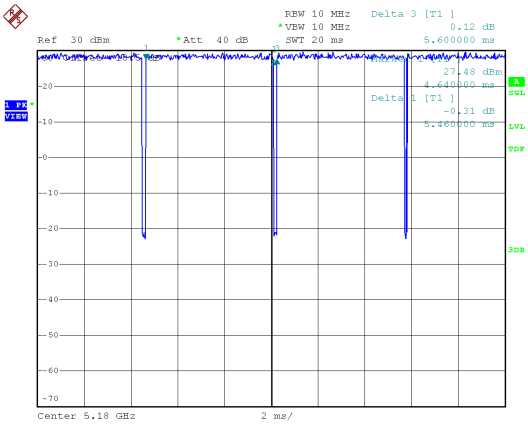
Modulation Type: 802.11ax HE160



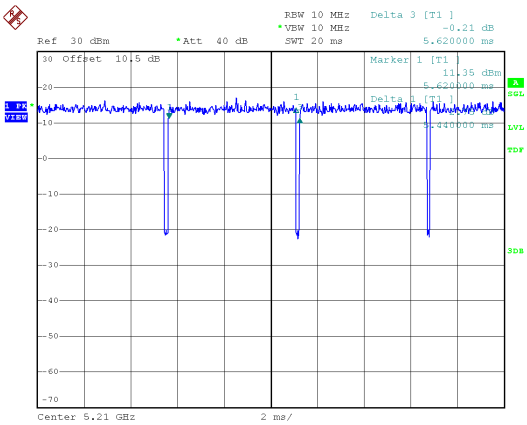
Modulation Type: 802.11ax HE40



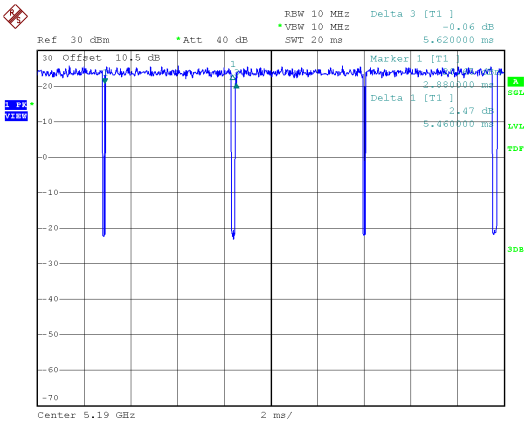
Modulation Type: 802.11be EHT20



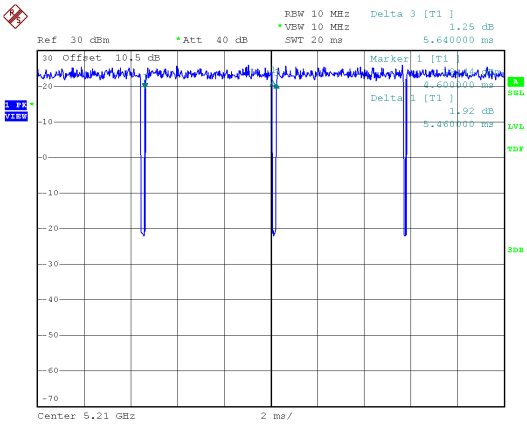
Modulation Type: 802.11ax HE80



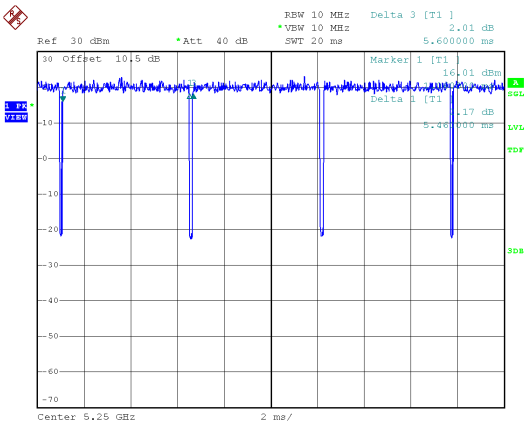
Modulation Type: 802.11be EHT40



Modulation Type: 802.11be EHT80



Modulation Type: 802.11be EHT160



8. 6dB Bandwidth & 99% Occupied Bandwidth

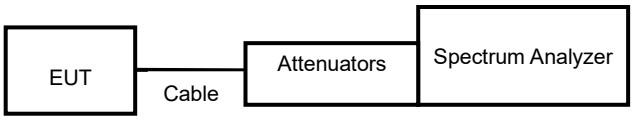
8.1. Test Limit

FCC §15.407
The minimum 6 dB bandwidth shall be at least 500 kHz.

8.2. Test Procedure

Reference to 789033 D02 General UNII Test Procedures New Rules v01: The transmitter output is connected to a spectrum analyzer with the RBW set to100KHz, the VBW >= 3 x RBW, peak detector and max hold.

8.3. Test Setup Layout



8.4. Test Result and Data

In the 5.8G Band

Modulation Type	Channel	Frequency (MHz)	6dB Bandwidth(MHz)		Minimum Limit (MHz)
			ANT A	ANT D	
11a	149	5745	15.33	15.03	0.50
11a	157	5785	16.05	15.03	0.50
11a	165	5825	16.32	15.00	0.50
11be EHT20	149	5745	18.15	15.03	0.50
11be EHT20	157	5785	18.57	15.03	0.50
11be EHT20	165	5825	18.93	14.19	0.50
11be EHT40	151	5755	38.16	38.04	0.50
11be EHT40	159	5795	37.92	38.22	0.50
11be EHT80	155	5775	77.88	73.92	0.50

In the 5.8G Band

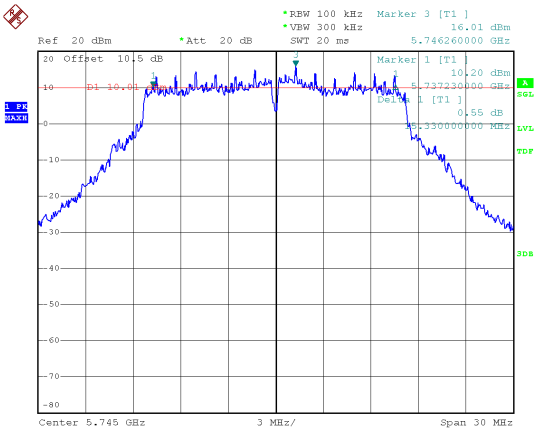
Modulation Type	Channel	Frequency (MHz)	99% Bandwidth(MHz)	
			ANT A	ANT D
11a	149	5745	16.98	17.01
11a	157	5785	17.04	17.16
11a	165	5825	17.10	17.22
11be EHT20	149	5745	19.11	18.81
11be EHT20	157	5785	19.14	18.78
11be EHT20	165	5825	19.17	18.84
11be EHT40	151	5755	38.40	38.76
11be EHT40	159	5795	38.40	38.88
11be EHT80	155	5775	77.64	78.24

UNII Emission Bandwidth Result (Extends across 5725MHz band)						
Modulation Type	Data Rate / MCS	Frequency (MHz)	6dB Bandwidth(MHz)		99% Bandwidth(MHz)	
			ANT A	ANT D	ANT A	ANT D
11a	6 Mbps	5720	3.00	2.50	5.00	5.00
11be EHT20	NSS1-MCS0	5720	4.50	3.63	4.88	4.75
11be EHT40	NSS1-MCS0	5710	4.00	4.13	5.50	5.50
11be EHT80	NSS1-MCS0	5690	4.13	4.00	6.63	6.63

6dB Bandwidth, ANT A

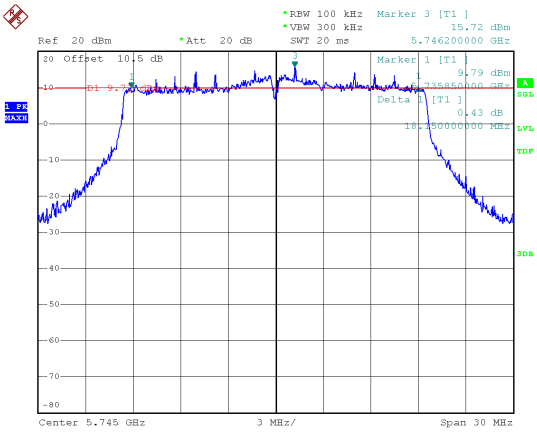
Modulation Type: 802.11a (6Mbps)

CH149

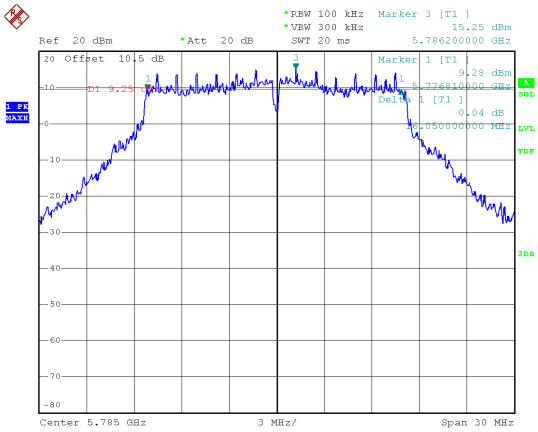


Modulation Type: 802.11be EHT20 (7.3Mbps)

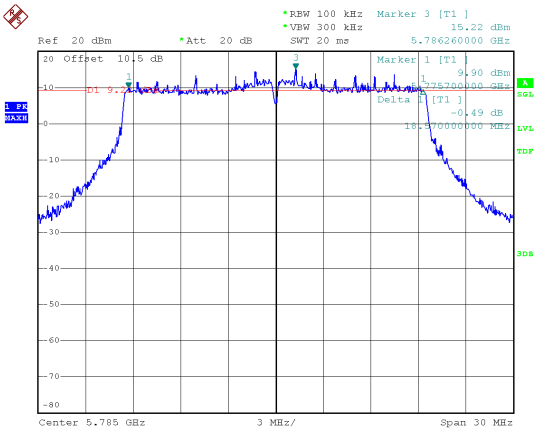
CH149



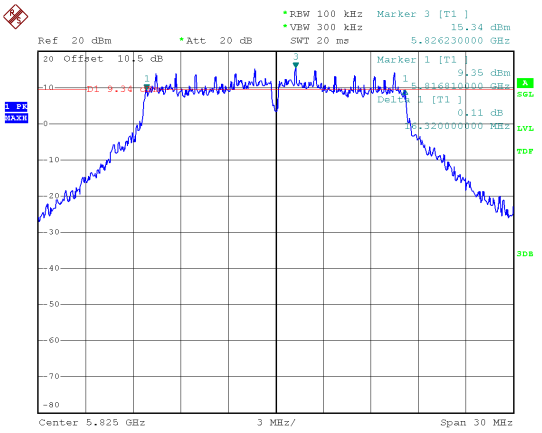
CH157



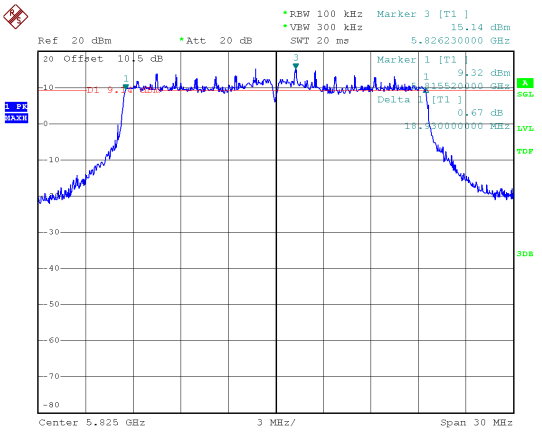
CH157



CH165



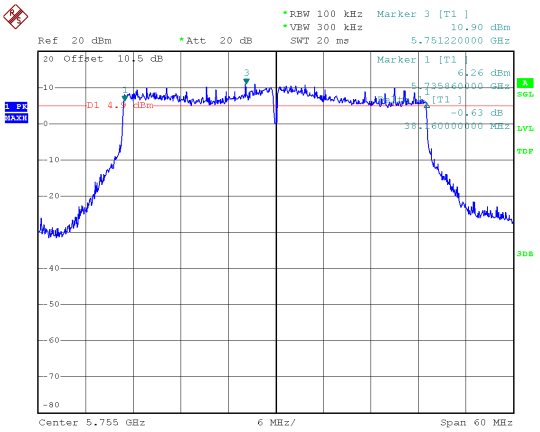
CH165



6dB Bandwidth, ANT A

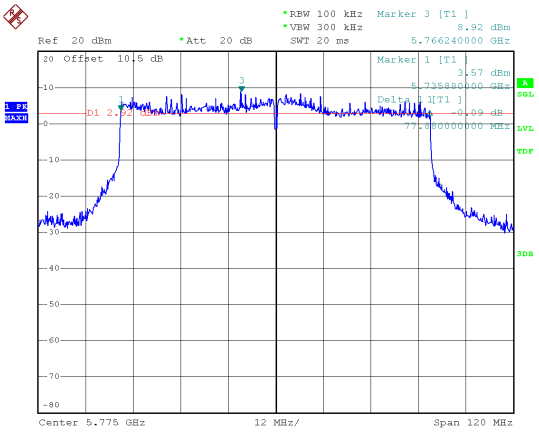
Modulation Type: 802.11be EHT40 (14.6Mbps)

CH151

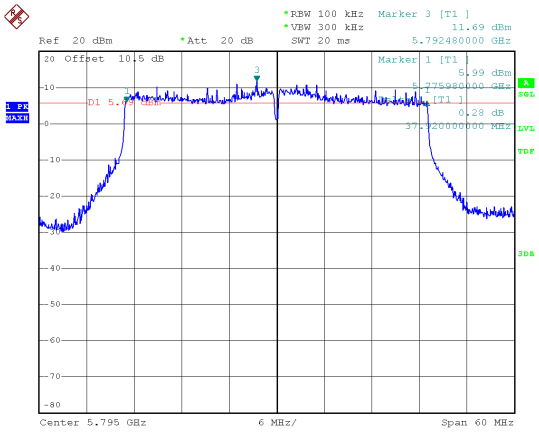


Modulation Type: 802.11be EHT80 (30.6Mbps)

CH155



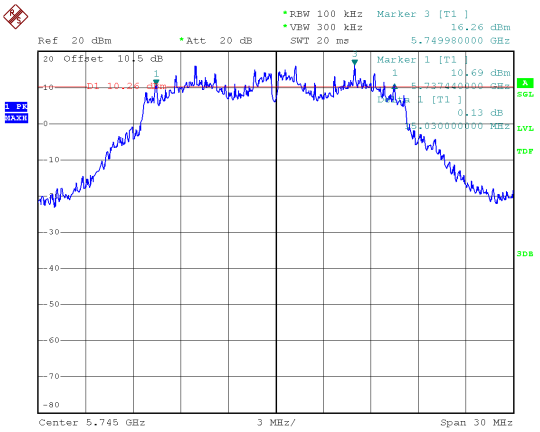
CH159



6dB Bandwidth, ANT D

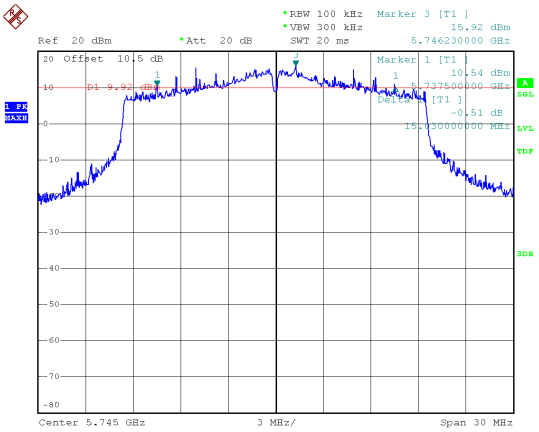
Modulation Type: 802.11a (6Mbps)

CH149

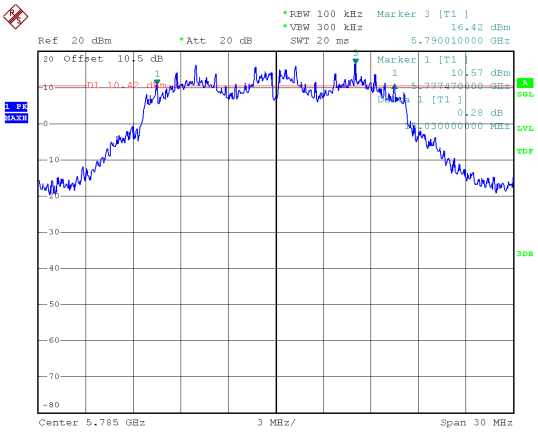


Modulation Type: 802.11be EHT20 (7.3Mbps)

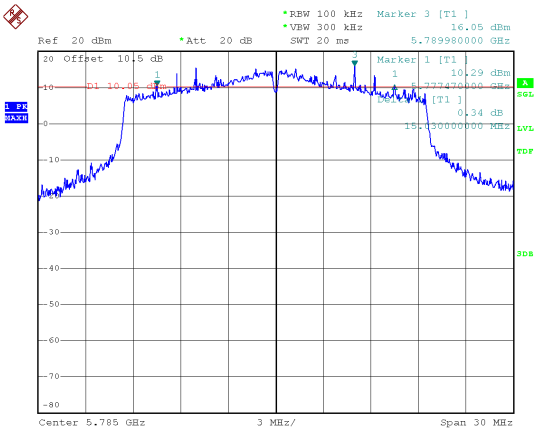
CH149



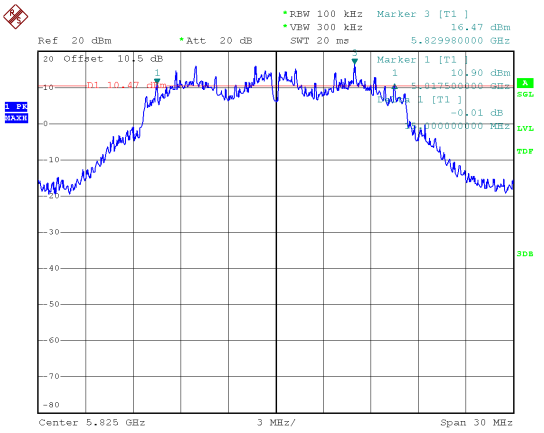
CH157



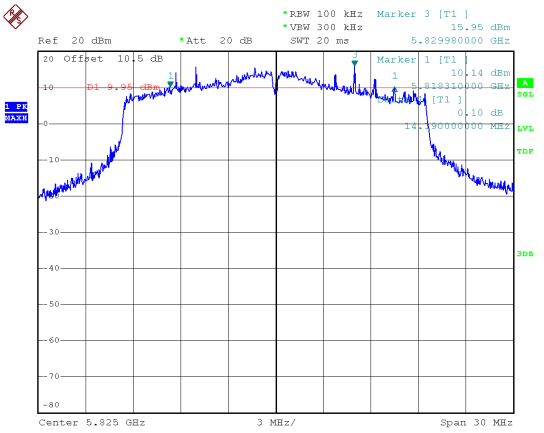
CH157



CH165



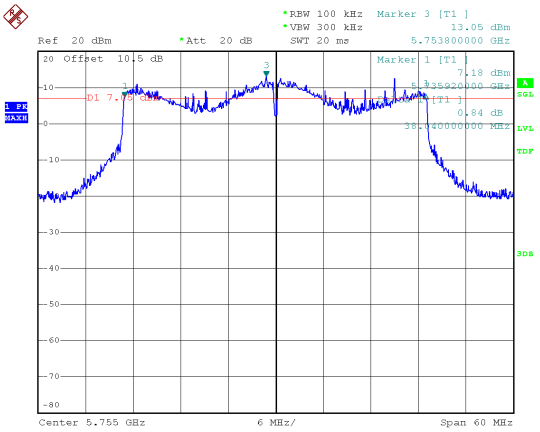
CH165



6dB Bandwidth, ANT D

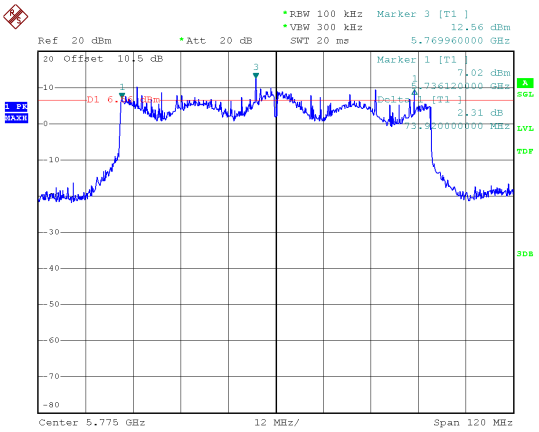
Modulation Type: 802.11be EHT40 (14.6Mbps)

CH151

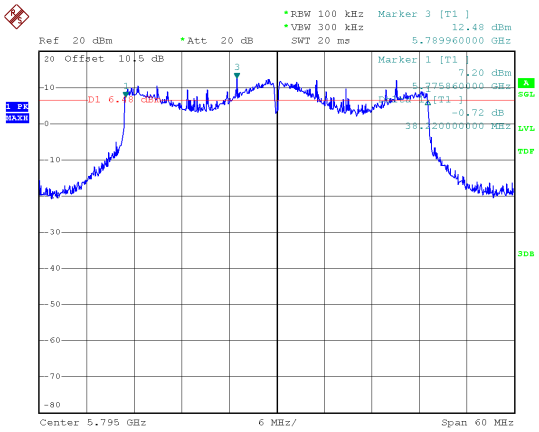


Modulation Type: 802.11be EHT80 (30.6Mbps)

CH155



CH159

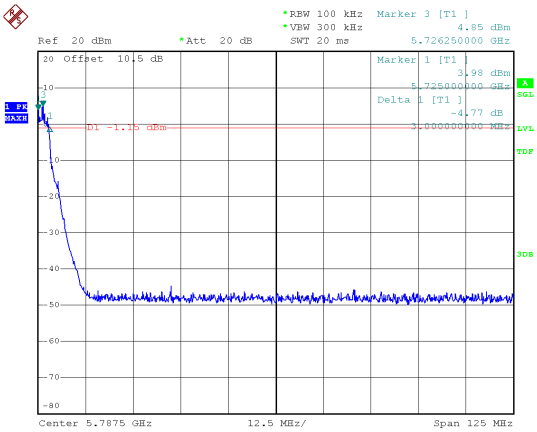


6dB Bandwidth, ANT A

Extends across 5725MHz Band, Straddle Channel

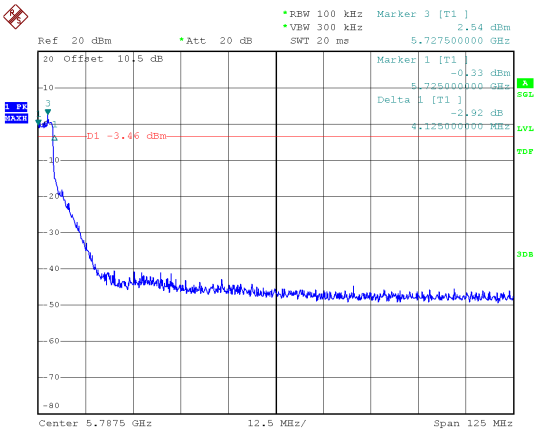
Modulation Type: 802.11a (6Mbps)

CH144



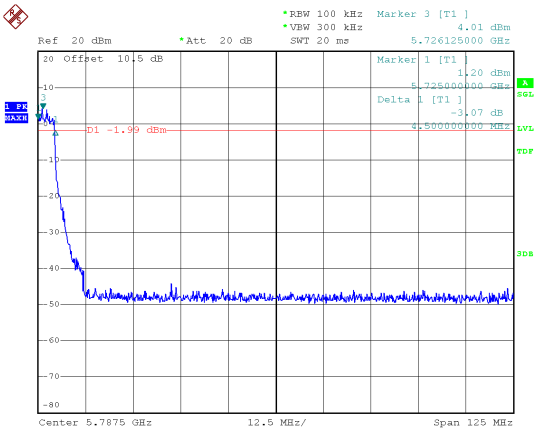
Modulation Type: 802.11be EHT80 (30.6Mbps)

CH138



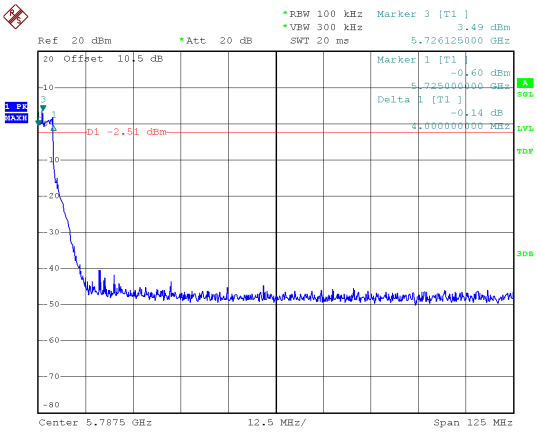
Modulation Type: 802.11be EHT20 (7.3Mbps)

CH144



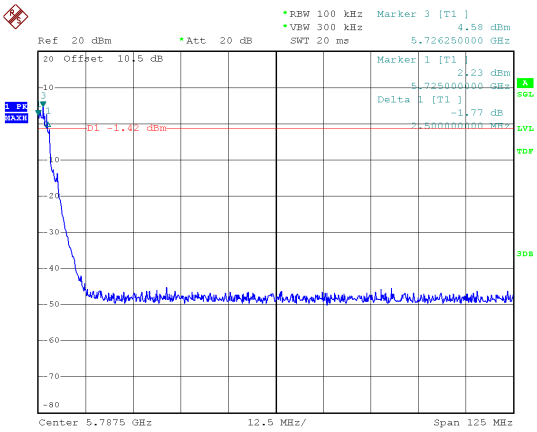
Modulation Type: 802.11be EHT40 (14.6Mbps)

CH142

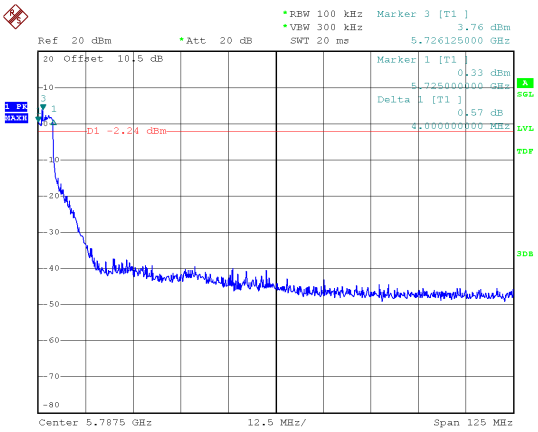


6dB Bandwidth, ANT D
Extends across 5725MHz Band, Straddle Channel

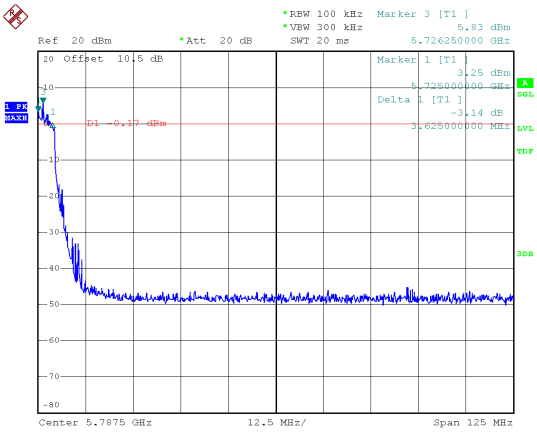
Modulation Type: 802.11a (6Mbps)
CH144



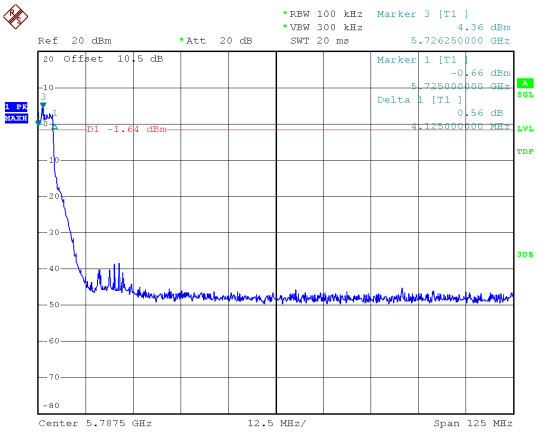
Modulation Type: 802.11be EHT80 (30.6Mbps)
CH138



Modulation Type: 802.11be EHT20 (7.3Mbps)
CH144



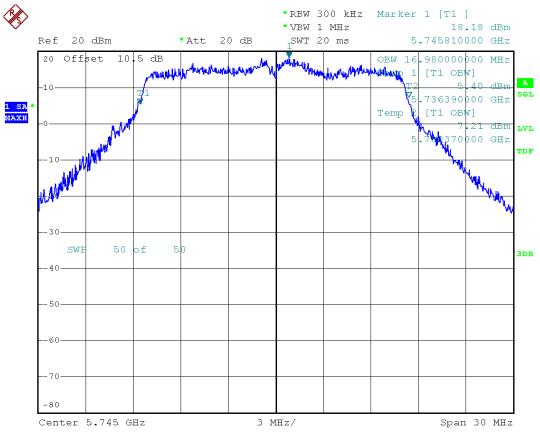
Modulation Type: 802.11be EHT40 (14.6Mbps)
CH142



99% Occupied Bandwidth, ANT A

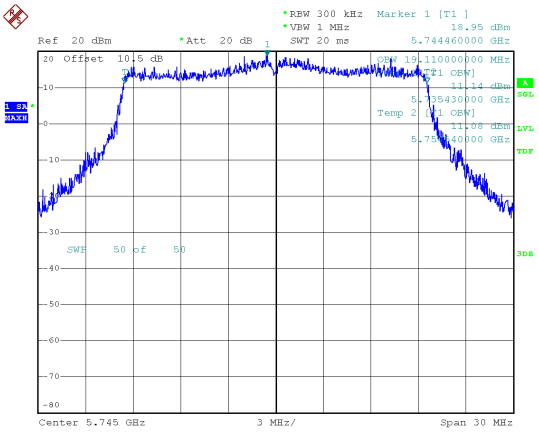
Modulation Type: 802.11a (6Mbps)

CH149

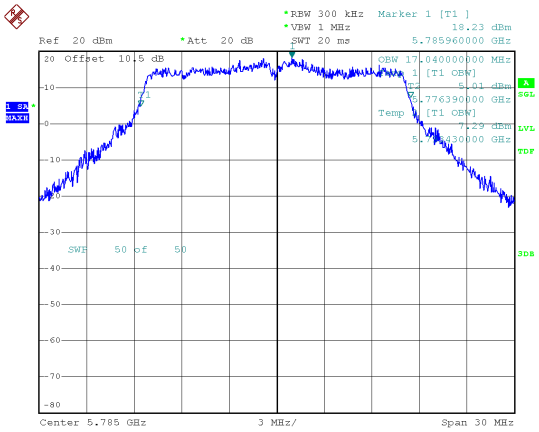


Modulation Type: 802.11be EHT20 (7.3Mbps)

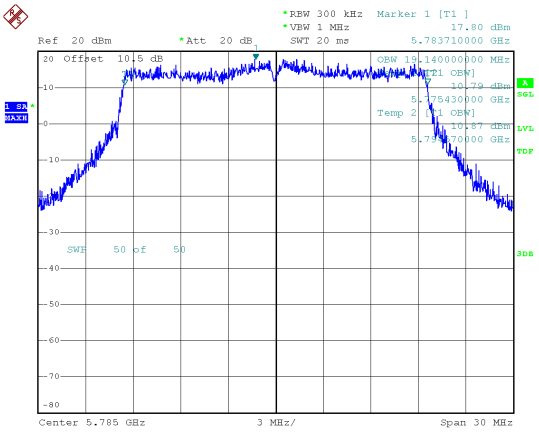
CH149



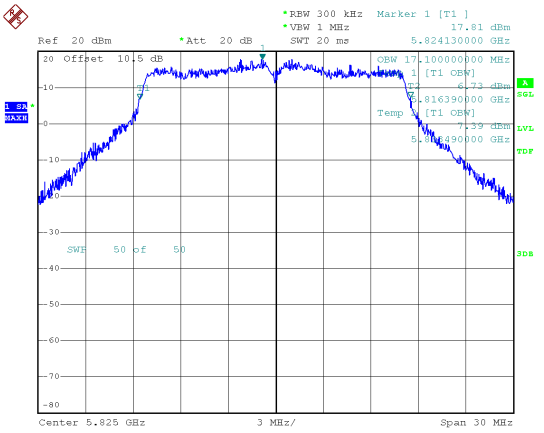
CH157



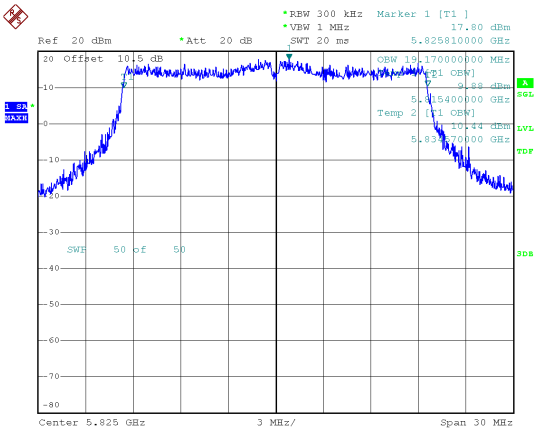
CH157



CH165



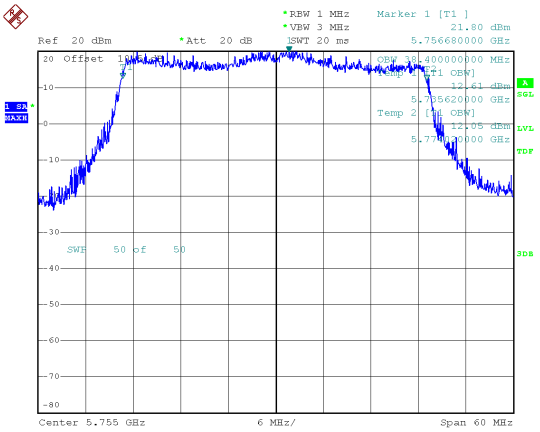
CH165



99% Occupied Bandwidth, ANT A

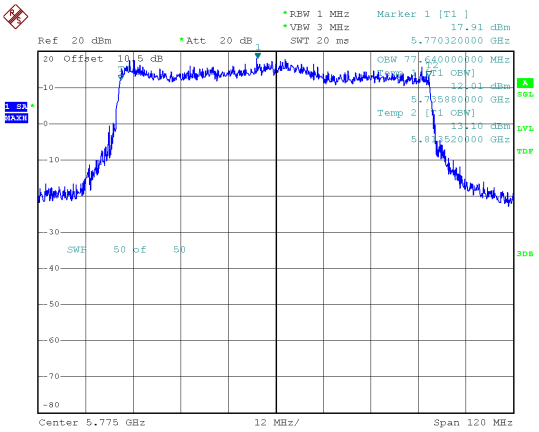
Modulation Type: 802.11be EHT40 (14.6Mbps)

CH151

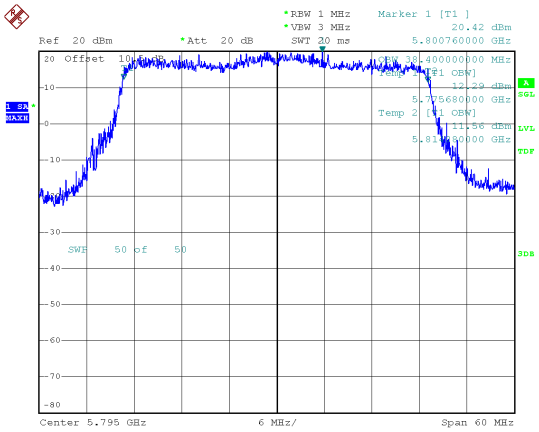


Modulation Type: 802.11be EHT80 (30.6Mbps)

CH155



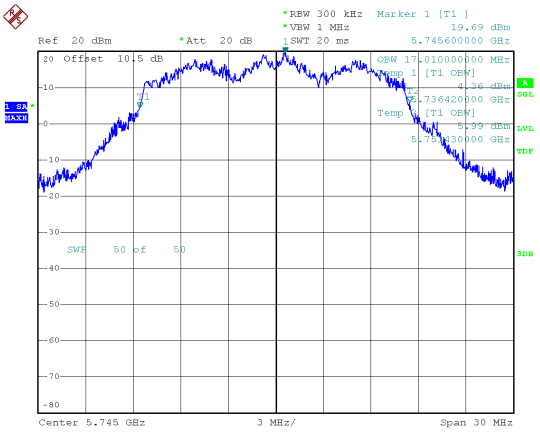
CH159



99% Occupied Bandwidth, ANT D

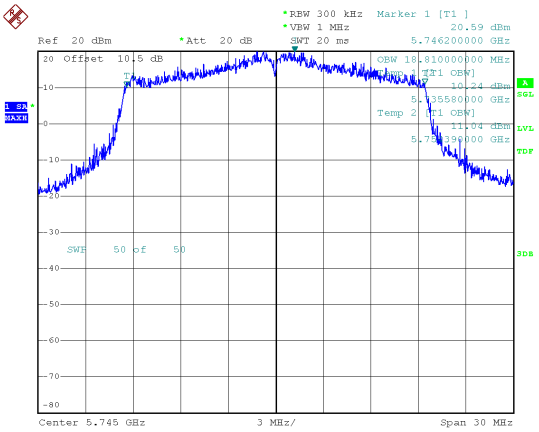
Modulation Type: 802.11a (6Mbps)

CH149

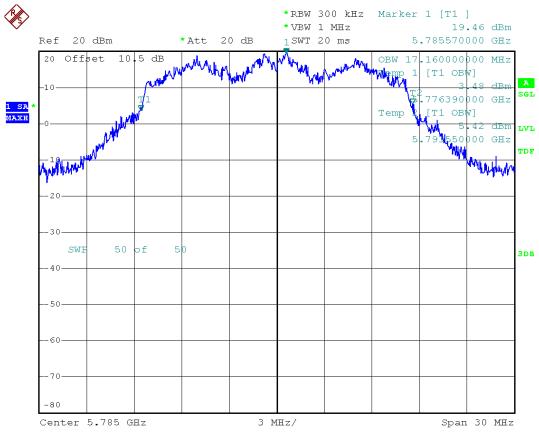


Modulation Type: 802.11be EHT20 (7.3Mbps)

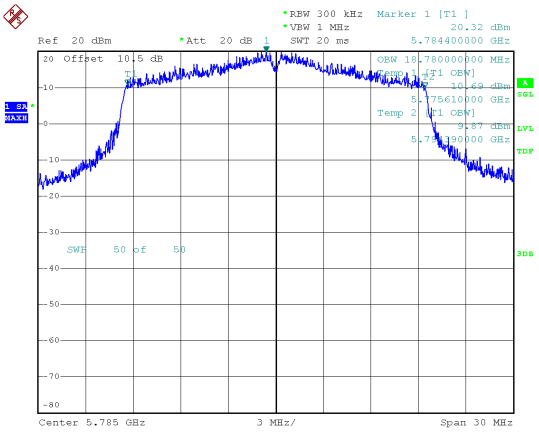
CH149



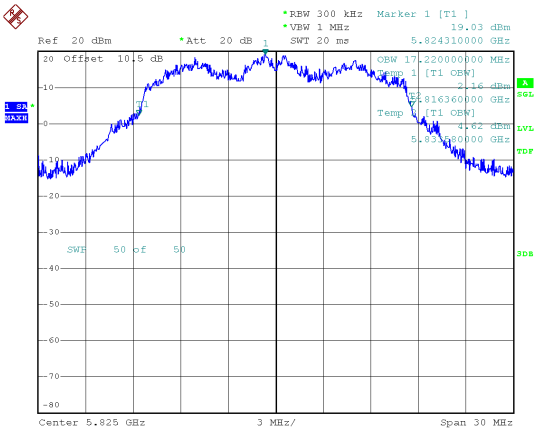
CH157



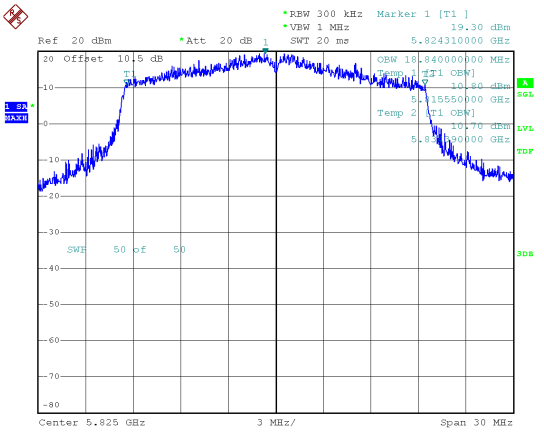
CH157



CH165



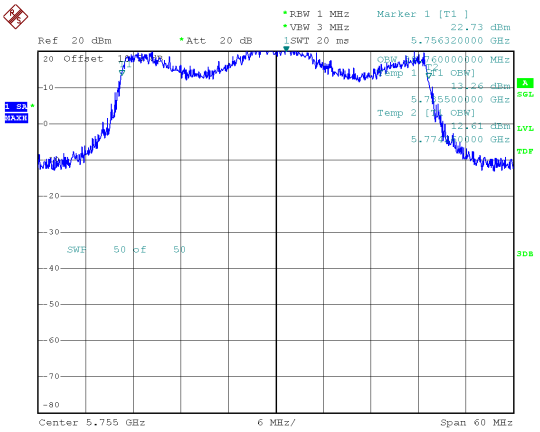
CH165



99% Occupied Bandwidth, ANT D

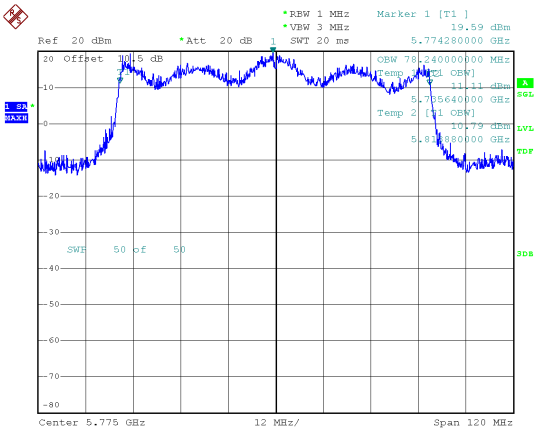
Modulation Type: 802.11be EHT40 (14.6Mbps)

CH151

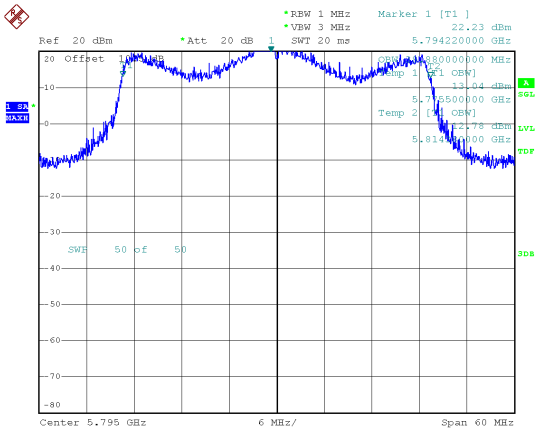


Modulation Type: 802.11be EHT80 (30.6Mbps)

CH155

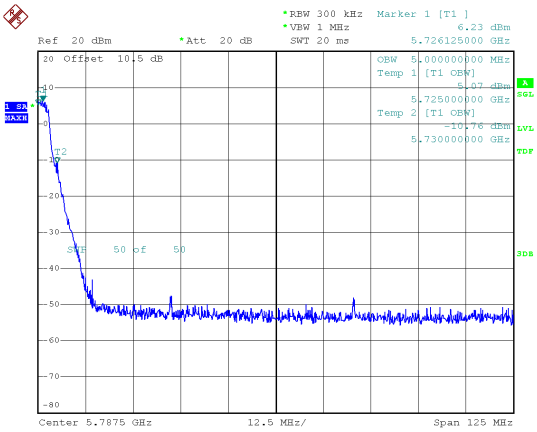


CH159

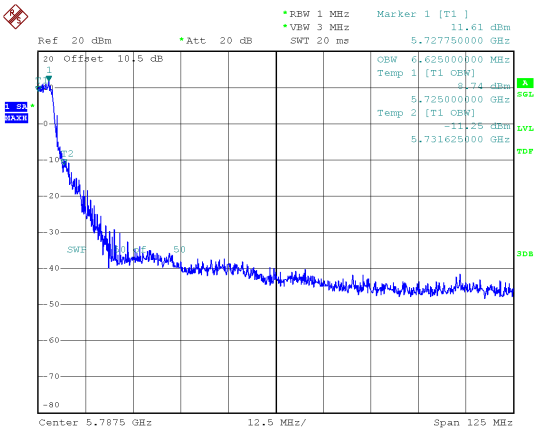


99% Occupied Bandwidth, ANT A
Extends across 5725MHz Band, Straddle Channel

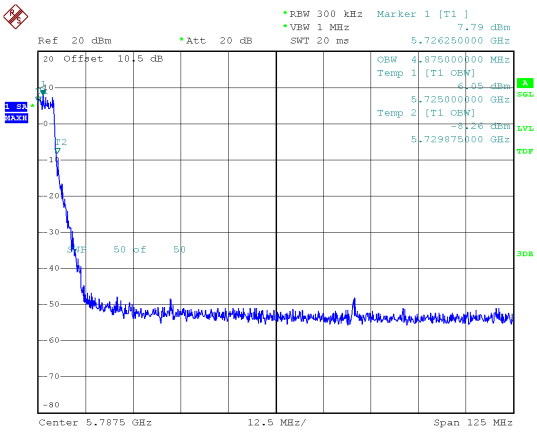
Modulation Type: 802.11a (6Mbps)
CH144



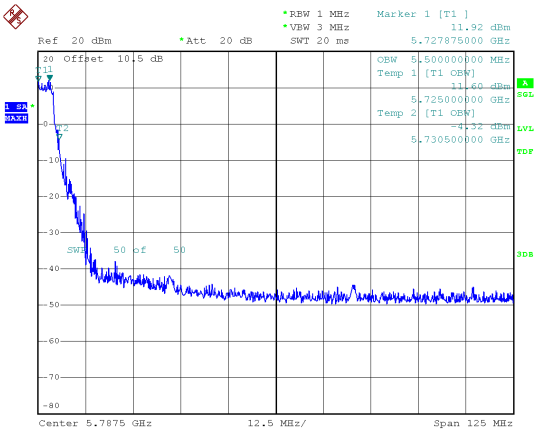
Modulation Type: 802.11be EHT80 (30.6Mbps)
CH138



Modulation Type: 802.11be EHT20 (7.3Mbps)
CH144

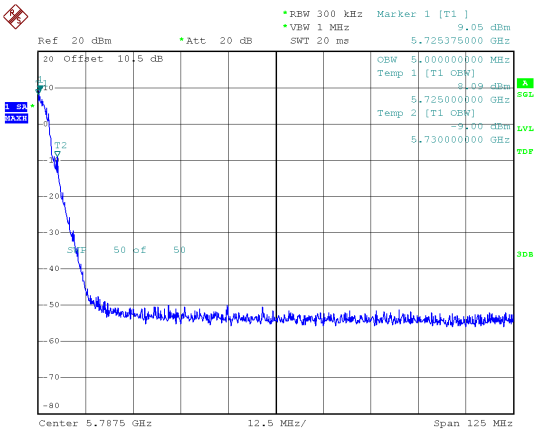


Modulation Type: 802.11be EHT40 (14.6Mbps)
CH142

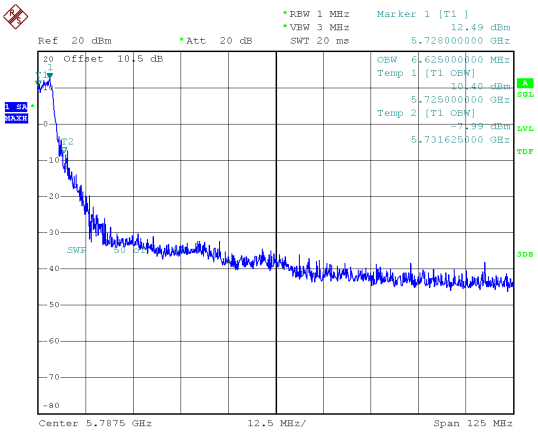


99% Occupied Bandwidth, ANT D
Extends across 5725MHz Band, Straddle Channel

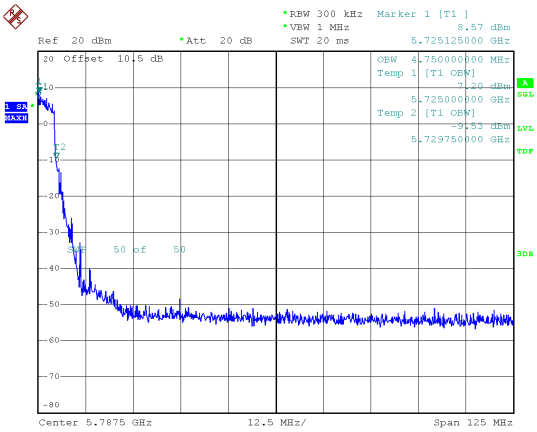
Modulation Type: 802.11a (6Mbps)
CH144



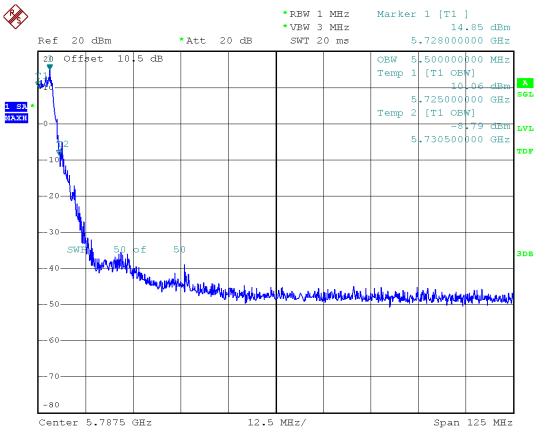
Modulation Type: 802.11be EHT80 (30.6Mbps)
CH138



Modulation Type: 802.11be EHT20 (7.3Mbps)
CH144



Modulation Type: 802.11be EHT40 (14.6Mbps)
CH142



9. 26dB Bandwidth & 99% Occupied Bandwidth

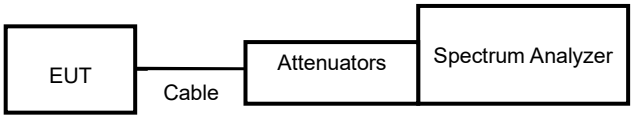
9.1. Test Limit

None; for reporting purposes only.

9.2. Test Procedure

Reference to 789033 D02 General UNII Test Procedures New Rules v01: The transmitter output is connected to a spectrum analyzer with the RBW = approximately 1% of the emission bandwidth, the VBW >= 3 x RBW, peak detector and max hold.

9.3. Test Setup Layout



9.4. Test Result and Data

In the 5.2G Band

Mode	Channel	Frequency (MHz)	26dB Bandwidth(MHz)	
			ANT A	ANT D
11a	36	5180	22.9	22.75
11a	40	5200	22.65	22.6
11a	48	5240	22.25	22.3
11be EHT20	36	5180	23.35	22.9
11be EHT20	40	5200	24.15	23.2
11be EHT20	48	5240	23.85	23.15
11be EHT40	38	5190	44.8	45.4
11be EHT40	46	5230	45.1	44.6
11be EHT80	42	5210	85.6	86.72

In the 5.3G Band

Mode	Channel	Frequency (MHz)	26dB Bandwidth(MHz)	
			ANT A	ANT D
11a	52	5260	22.1	22.45
11a	60	5300	22.15	22.55
11a	64	5320	22.2	22.6
11be EHT20	52	5260	23.8	22.8
11be EHT20	60	5300	23.25	23.05
11be EHT20	64	5320	23.3	23.3
11be EHT40	54	5270	44.8	45.2
11be EHT40	62	5310	44.8	44.7
11be EHT80	58	5290	86.08	87.52

In the 5.5G Band

Mode	Channel	Frequency (MHz)	26dB Bandwidth(MHz)	
			ANT A	ANT D
11a	100	5500	21.9	22.05
11a	120	5600	22.5	21.95
11a	140	5700	22.4	21.7
11be EHT20	100	5500	22.25	23.05
11be EHT20	120	5600	21.65	22.45
11be EHT20	140	5700	22.4	21.5
11be EHT40	102	5510	44.6	45.2
11be EHT40	118	5590	45	44.3
11be EHT40	134	5670	44.8	44.6
11be EHT80	106	5530	84.8	87.36
11be EHT80	122	5610	86.4	86.72
11be EHT160	114	5570	174.48	175.68

UNII Emission Bandwidth Result (Within 5470-5725MHz band)				
Modulation Type	Data Rate / MCS	Frequency (MHz)	26dB Bandwidth(MHz)	
			ANT A	ANT D
11a	6 Mbps	5720	16.32	15.56
11be EHT20	NSS1-MCS0	5720	16.58	16.06
11be EHT40	NSS1-MCS0	5710	37.49	37.49
11be EHT80	NSS1-MCS0	5690	78.80	78.29

UNII Emission Bandwidth Result (Within 5150-5250MHz band)				
Modulation Type	Data Rate / MCS	Frequency (MHz)	26dB Bandwidth(MHz)	
			ANT A	ANT D
11be EHT160	NSS1-MCS0	5250	88.10	89.80

UNII Emission Bandwidth Result (Extends across 5250MHz band)				
Modulation Type	Data Rate / MCS	Frequency (MHz)	26dB Bandwidth(MHz)	
			ANT A	ANT D
11be EHT160	NSS1-MCS0	5250	79.00	77.90

In the 5.2G Band

Modulation Type	Channel	Frequency (MHz)	99% Bandwidth(MHz)	
			ANT A	ANT D
11a	36	5180	17.10	16.98
11a	40	5200	17.13	16.98
11a	48	5240	17.04	16.89
11be EHT20	36	5180	19.32	19.08
11be EHT20	40	5200	19.32	19.11
11be EHT20	48	5240	19.29	19.14
11be EHT40	38	5190	38.04	38.52
11be EHT40	46	5230	38.04	38.28
11be EHT80	42	5210	77.16	77.76

In the 5.3G Band

Modulation Type	Channel	Frequency (MHz)	99% Bandwidth(MHz)	
			ANT A	ANT D
11a	52	5260	17.04	16.95
11a	60	5300	17.04	16.98
11a	64	5320	17.04	16.92
11be EHT20	52	5260	19.32	19.08
11be EHT20	60	5300	19.41	19.17
11be EHT20	64	5320	19.26	19.17
11be EHT40	54	5270	37.92	38.34
11be EHT40	62	5310	38.16	38.28
11be EHT80	58	5290	77.28	77.64

In the 5.5G Band

Modulation Type	Channel	Frequency (MHz)	99% Bandwidth(MHz)	
			ANT A	ANT D
11a	100	5500	16.95	16.95
11a	120	5600	17.01	16.92
11a	140	5700	16.98	16.86
11be EHT20	100	5500	18.96	19.14
11be EHT20	120	5600	18.90	19.05
11be EHT20	140	5700	19.02	18.87
11be EHT40	102	5510	38.52	38.40
11be EHT40	118	5590	38.64	38.46
11be EHT40	134	5670	38.52	38.64
11be EHT80	106	5530	78.00	77.76
11be EHT80	122	5610	78.00	77.76
11be EHT160	114	5570	158.16	158.16

UNII Emission Bandwidth Result (Within 5470-5725MHz band)				
Modulation Type	Data Rate / MCS	Frequency (MHz)	99% Bandwidth(MHz)	
			ANT A	ANT D
11a	6 Mbps	5720	13.52	13.52
11be EHT20	NSS1-MCS0	5720	14.54	14.54
11be EHT40	NSS1-MCS0	5710	34.43	34.17
11be EHT80	NSS1-MCS0	5690	73.70	73.44

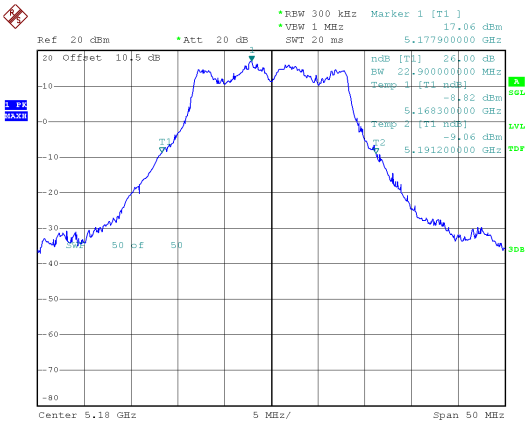
UNII Emission Bandwidth Result (Within 5150-5250MHz band)				
Modulation Type	Data Rate / MCS	Frequency (MHz)	99% Bandwidth(MHz)	
			ANT A	ANT D
11be EHT160	NSS1-MCS0	5250	78.80	79.50

UNII Emission Bandwidth Result (Extends across 5250MHz band)				
Modulation Type	Data Rate / MCS	Frequency (MHz)	99% Bandwidth(MHz)	
			ANT A	ANT D
11be EHT160	NSS1-MCS0	5250	78.90	79.10

26dB Bandwidth, ANT A

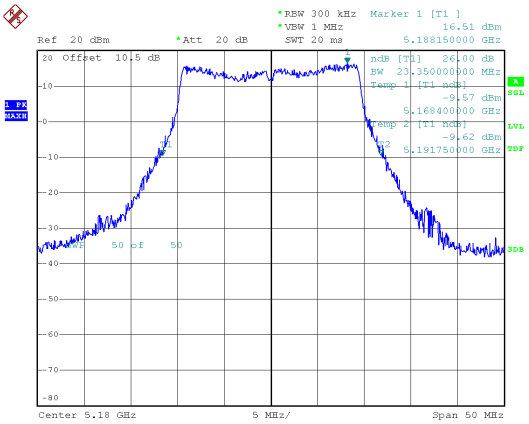
Modulation Type: 802.11a (6Mbps)

CH36

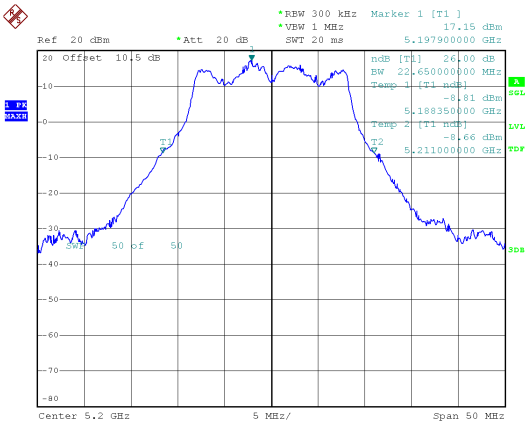


Modulation Type: 802.11be EHT20 (7.3Mbps)

CH36



CH40



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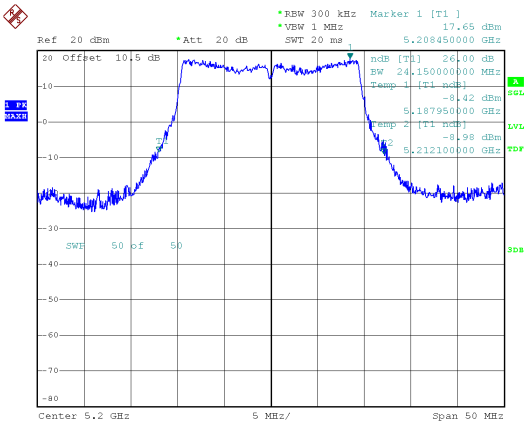
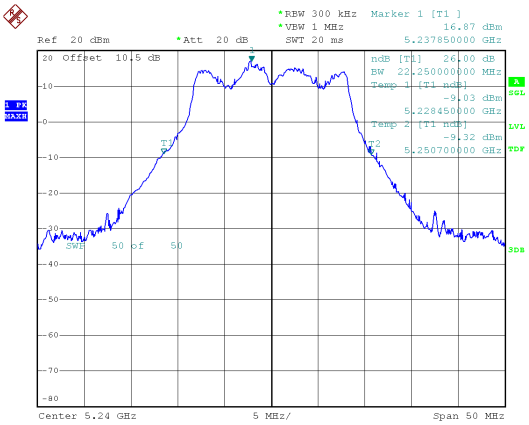


CH48



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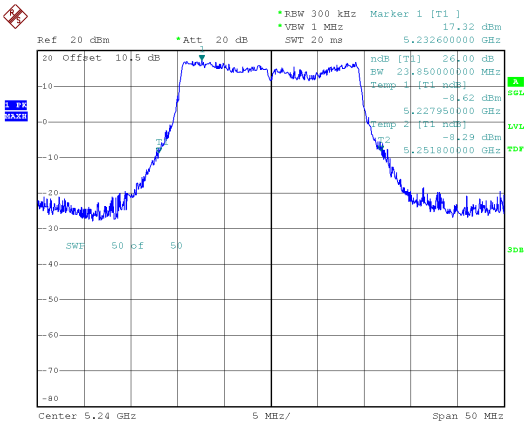
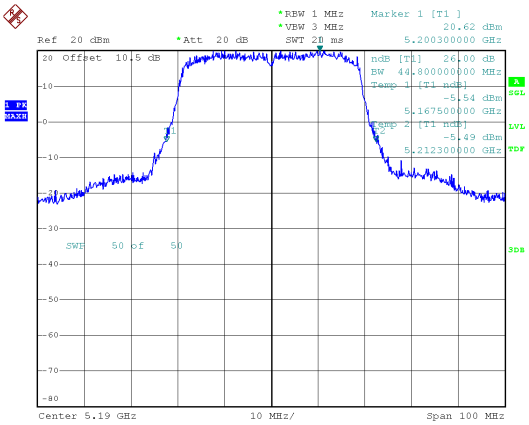
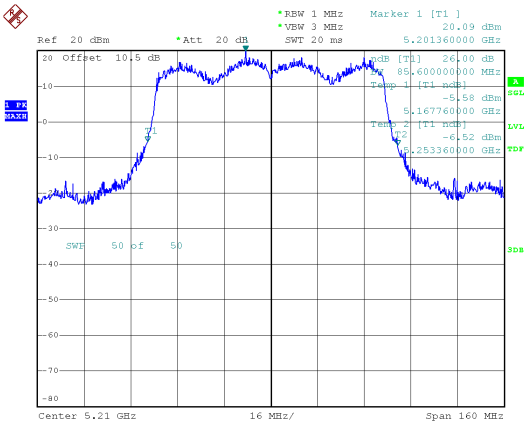


26dB Bandwidth, ANT A

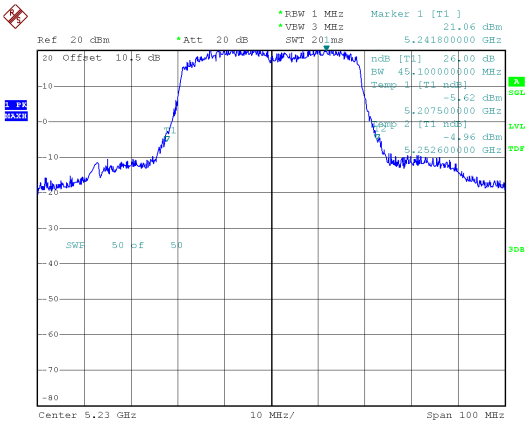
Modulation Type: 802.11be EHT40 (14.6Mbps)
CH38



Modulation Type: 802.11be EHT80 (30.6Mbps)
CH42



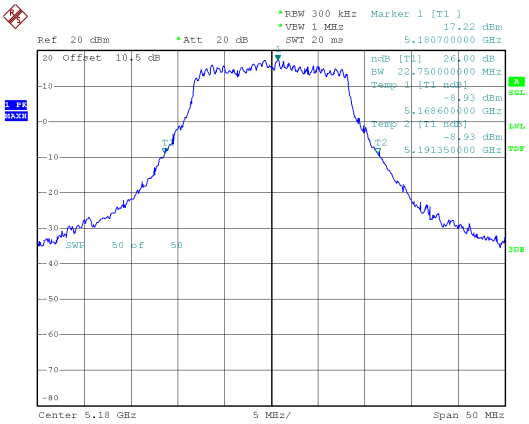
CH46



26dB Bandwidth, ANT D

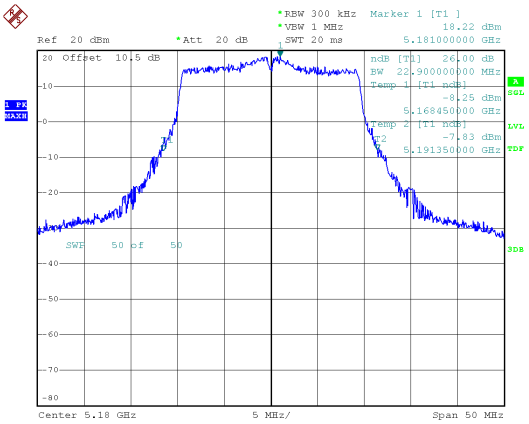
Modulation Type: 802.11a (6Mbps)

CH36

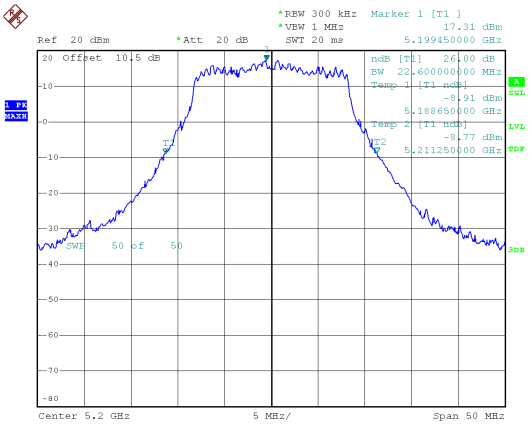


Modulation Type: 802.11be EHT20 (7.3Mbps)

CH36



CH40



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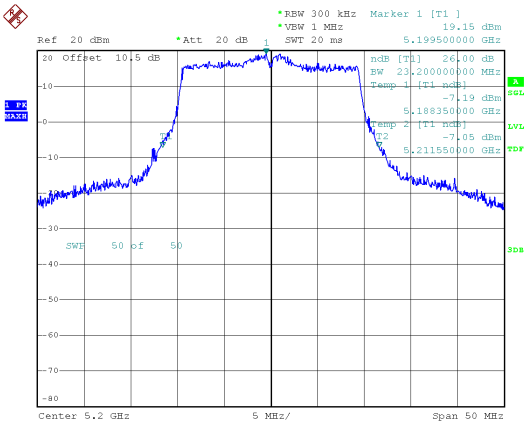
CH40



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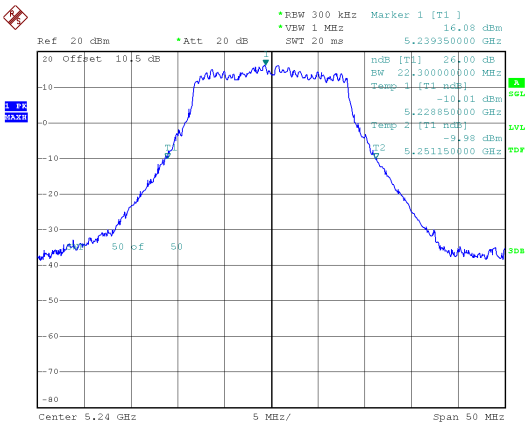
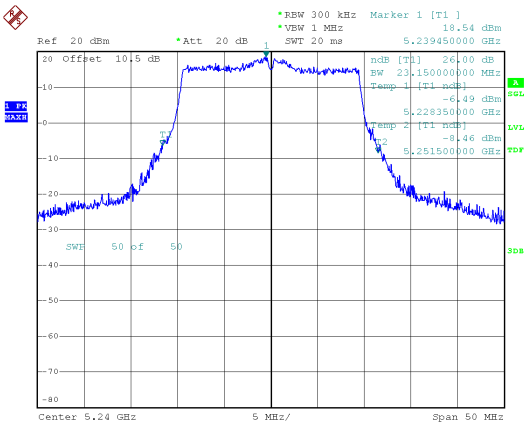
CH40

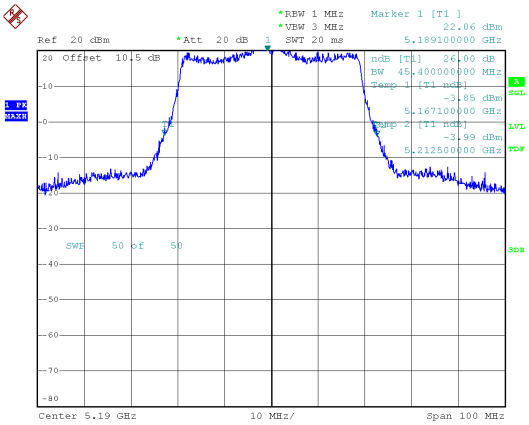


CH40

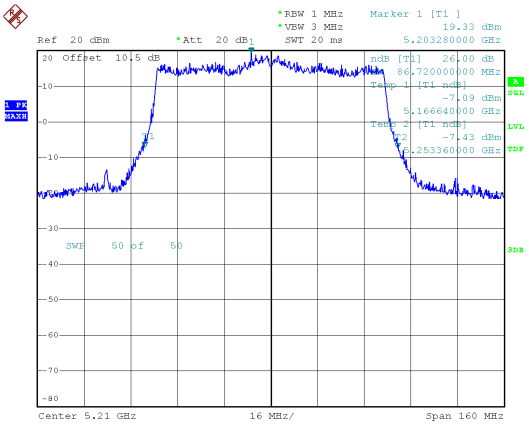


26dB Bandwidth, ANT D

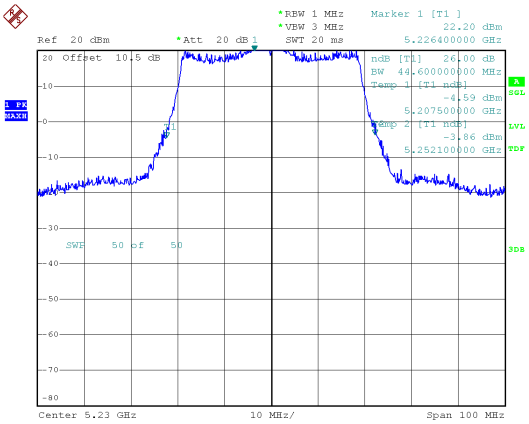
Modulation Type: 802.11be EHT40 (14.6Mbps)
CH38



Modulation Type: 802.11be EHT80 (30.6Mbps)
CH42



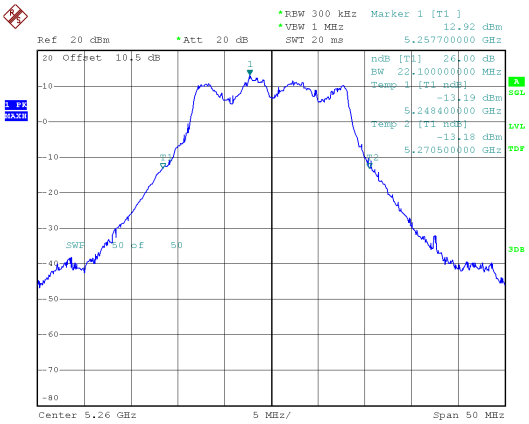
CH46



26dB Bandwidth,ANT A

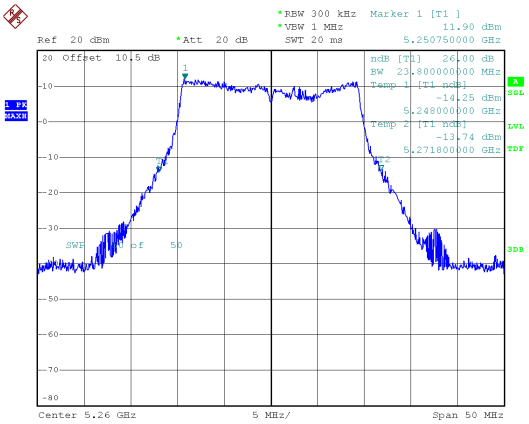
Modulation Type: 802.11a (6Mbps)

CH52

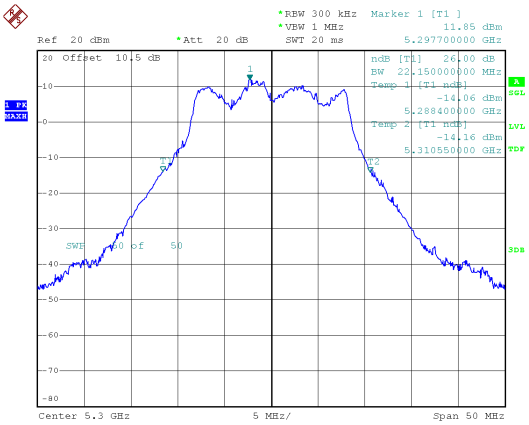


Modulation Type: 802.11be EHT20 (7.3Mbps)

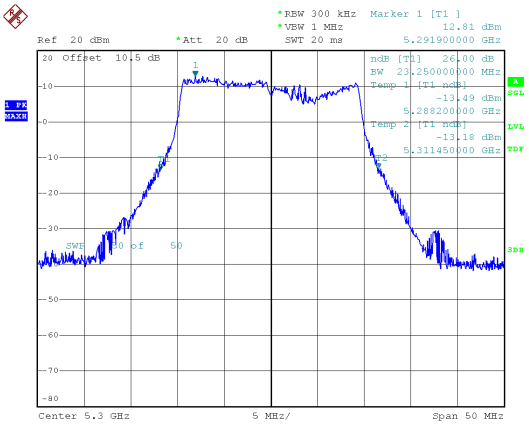
CH52



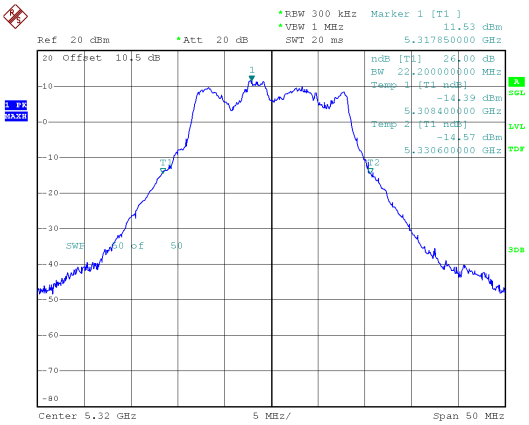
CH60



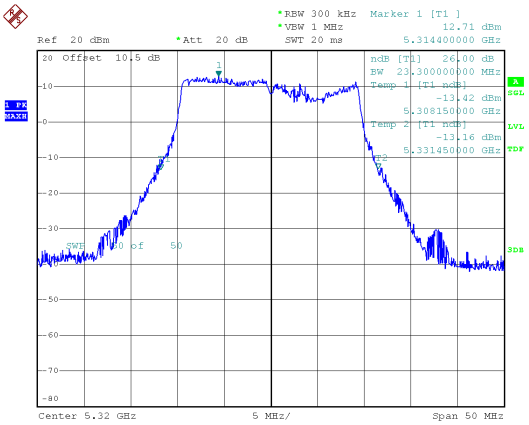
CH60



CH64



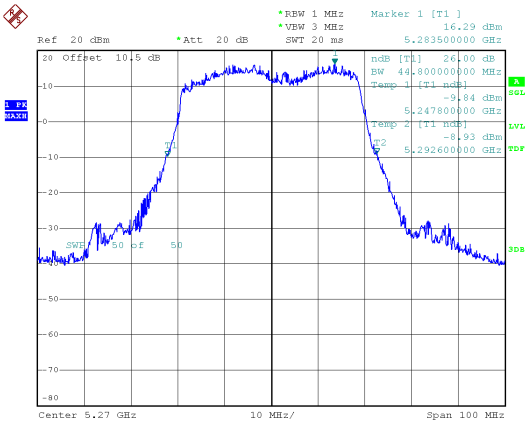
CH64



26dB Bandwidth,ANT A

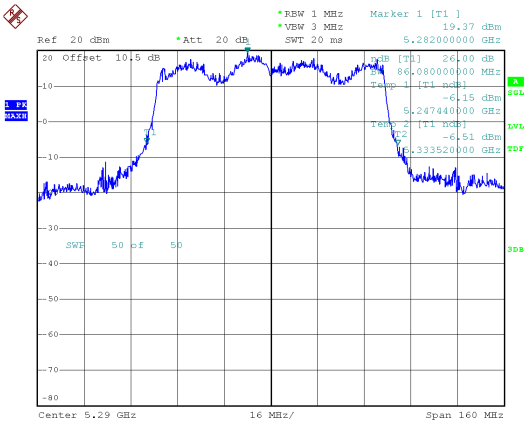
Modulation Type: 802.11be EHT40 (14.6Mbps)

CH54

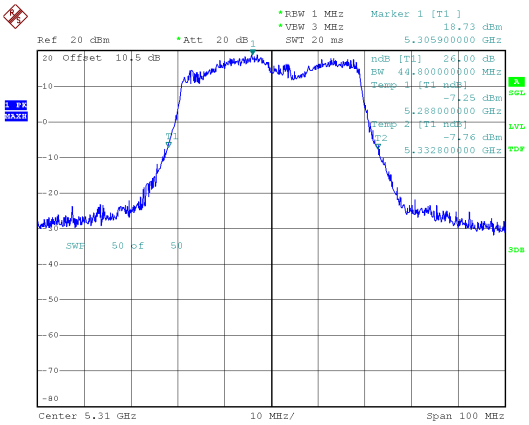


Modulation Type: 802.11be EHT80 (30.6Mbps)

CH58



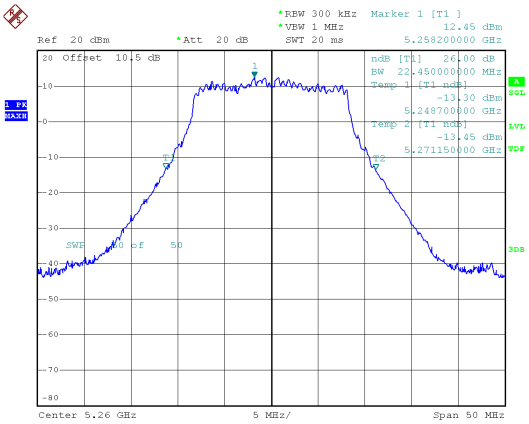
CH62



26dB Bandwidth,ANT D

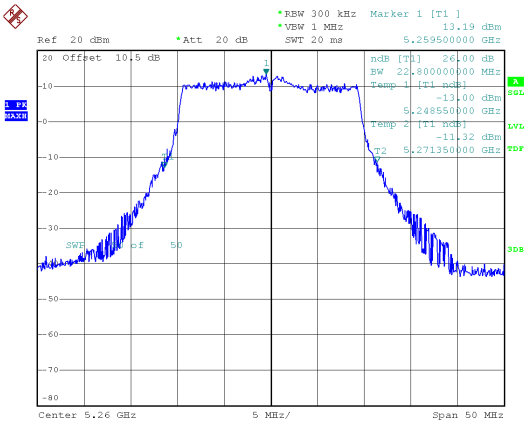
Modulation Type: 802.11a (6Mbps)

CH52

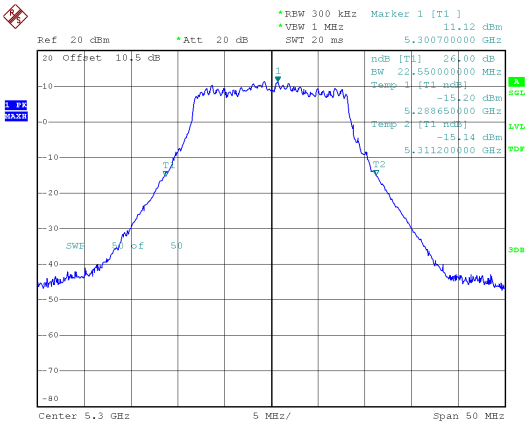


Modulation Type: 802.11be EHT20 (7.3Mbps)

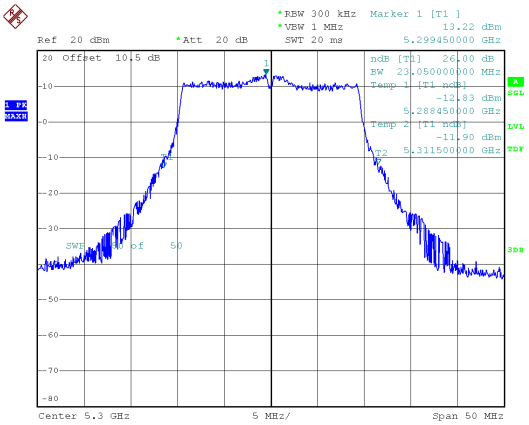
CH52



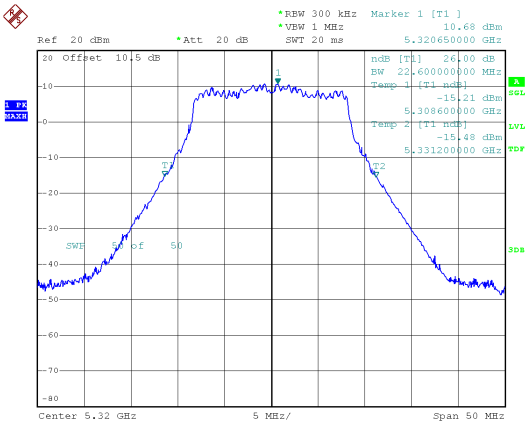
CH60



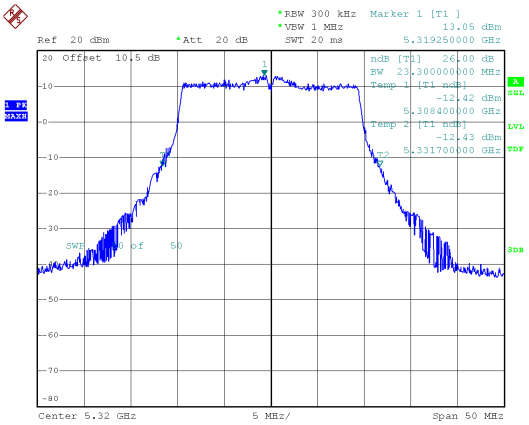
CH60



CH64



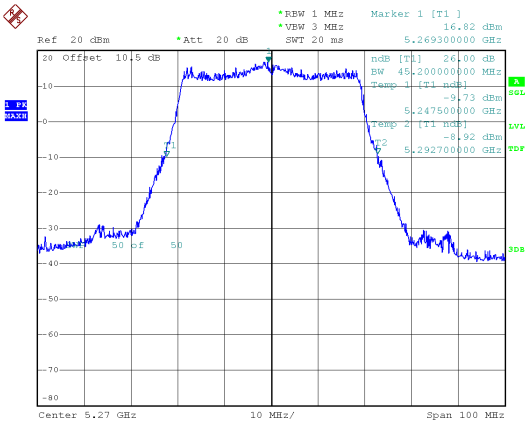
CH64



26dB Bandwidth,ANT D

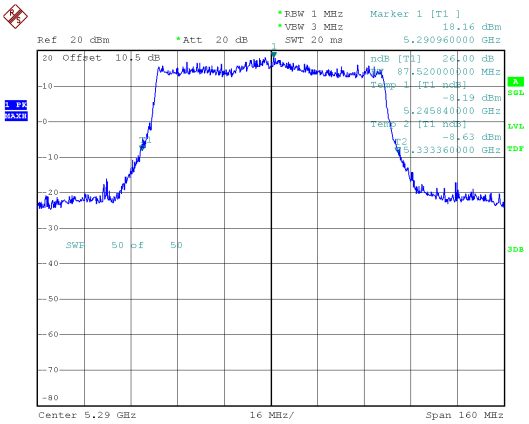
Modulation Type: 802.11be EHT40 (14.6Mbps)

CH54

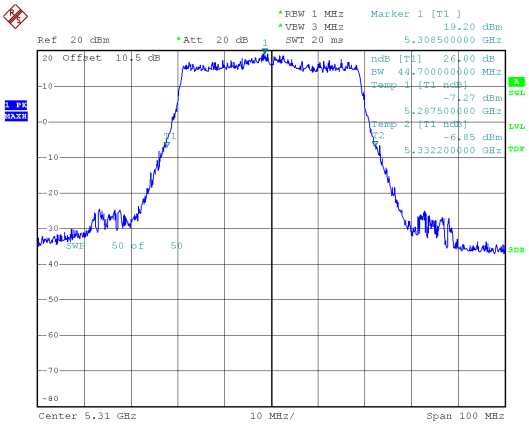


Modulation Type: 802.11be EHT80 (30.6Mbps)

CH58



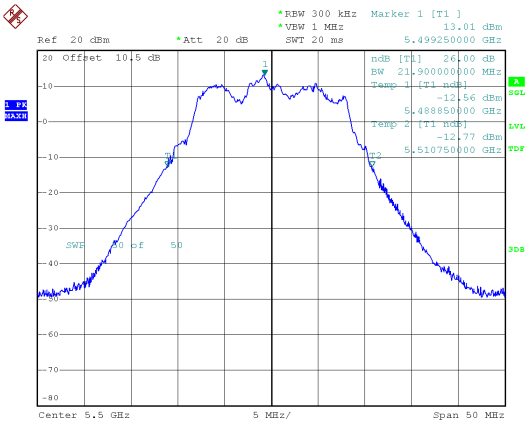
CH62



26dB Bandwidth, ANT A

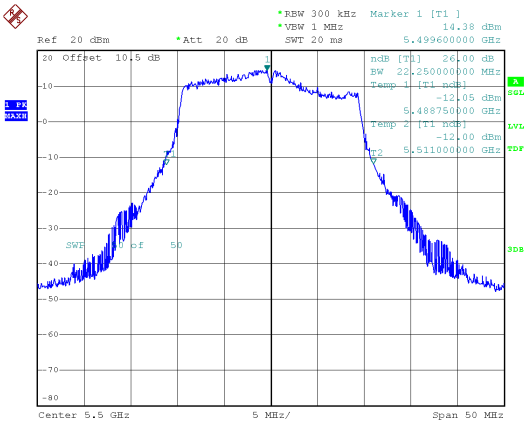
Modulation Type: 802.11a (6Mbps)

CH100

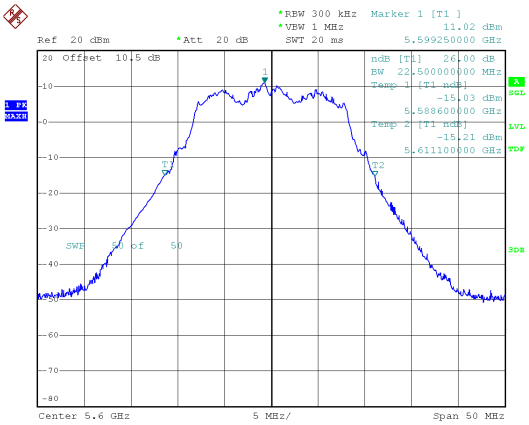


Modulation Type: 802.11be EHT20 (7.3Mbps)

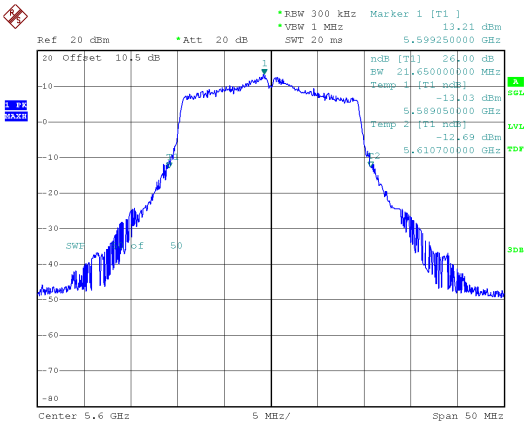
CH100



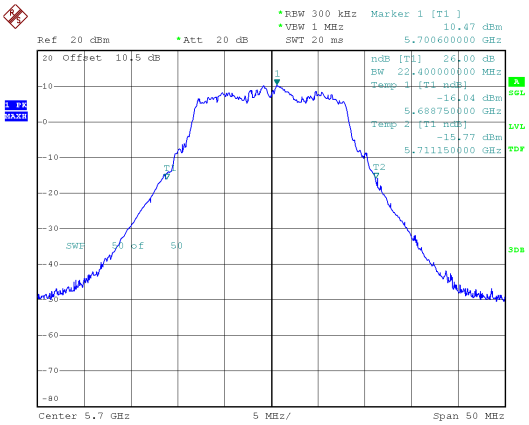
CH120



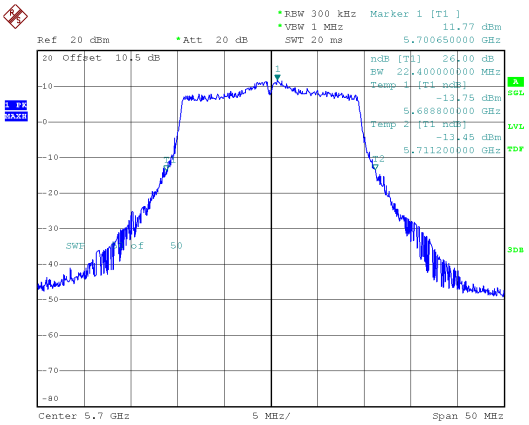
CH120



CH140

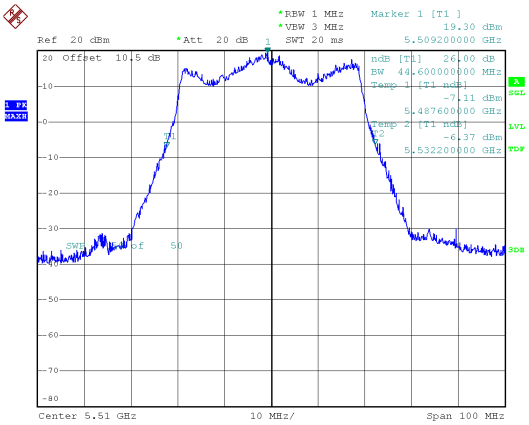


CH140

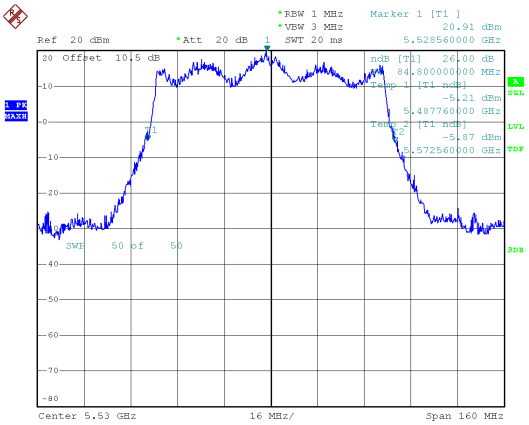


26dB Bandwidth, ANT A

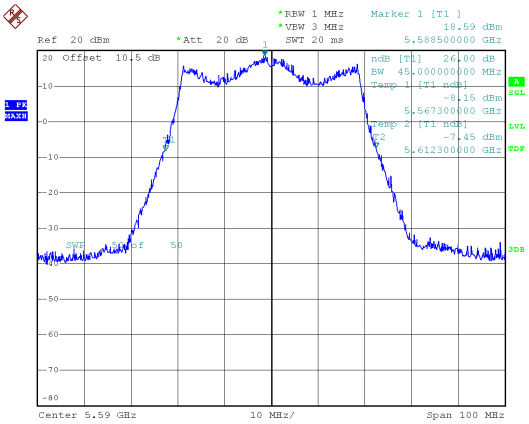
Modulation Type: 802.11be EHT40 (14.6Mbps)
CH102



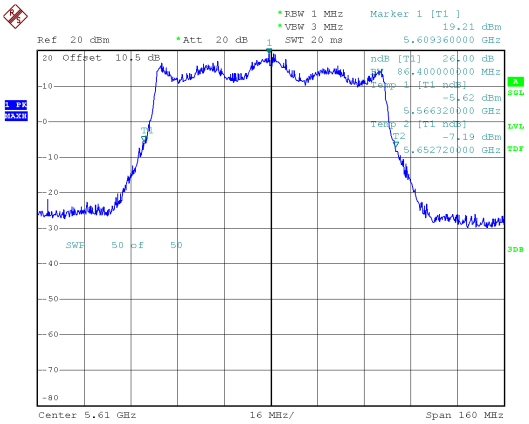
Modulation Type: 802.11be EHT80 (30.6Mbps)
CH106



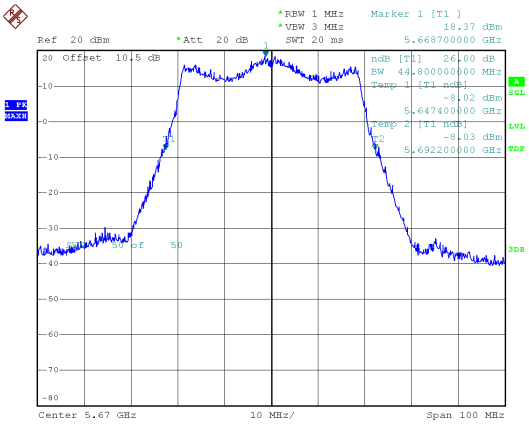
CH118



CH122

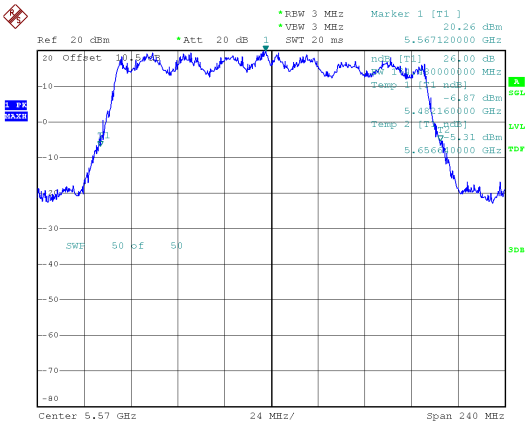


CH134



26dB Bandwidth, ANT A

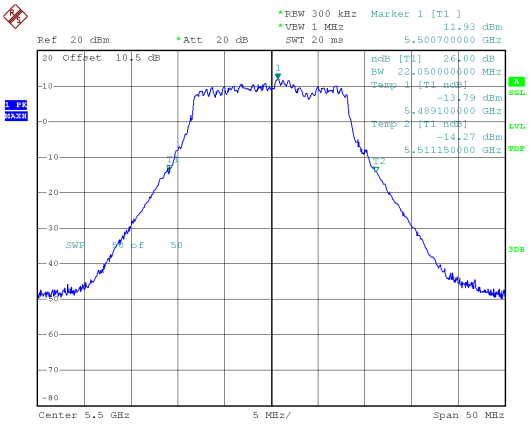
Modulation Type: 802.11be EHT160 (61.3Mbps)
CH114



26dB Bandwidth, ANT D

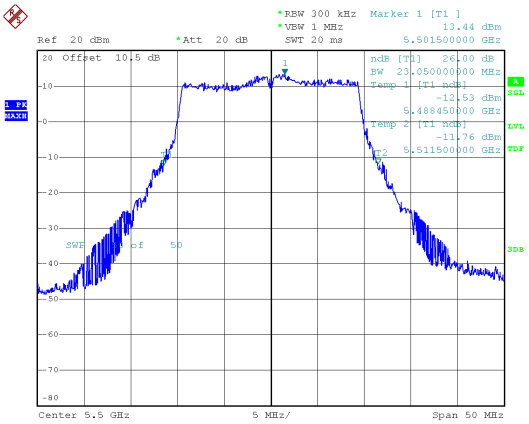
Modulation Type: 802.11a (6Mbps)

CH100

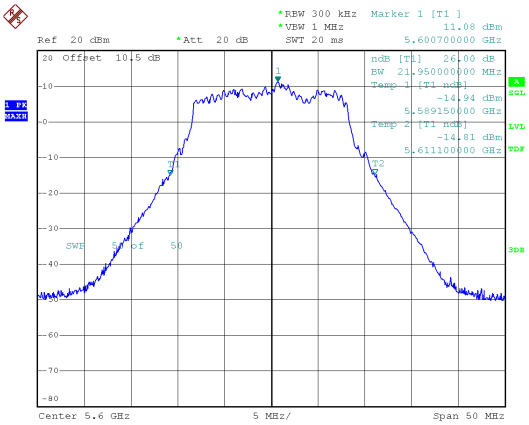


Modulation Type: 802.11be EHT20 (7.3Mbps)

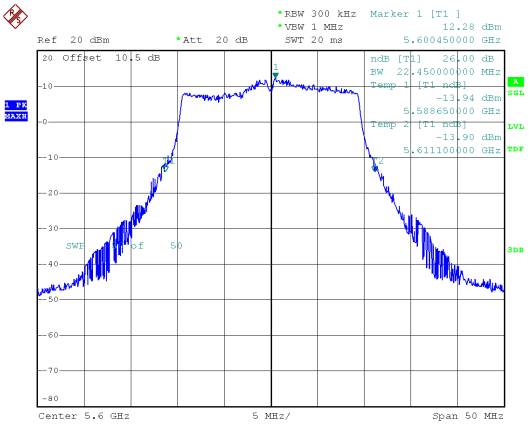
CH100



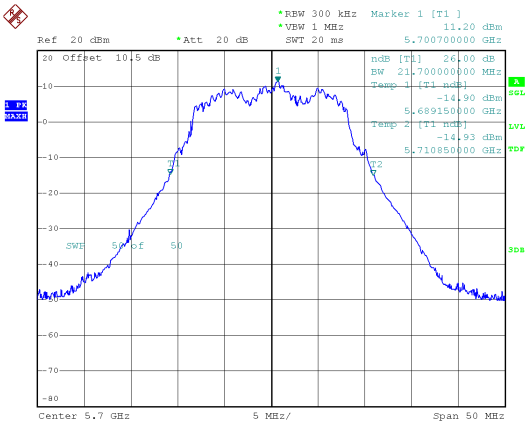
CH120



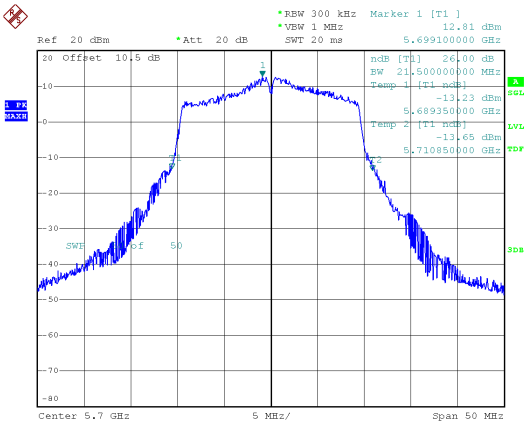
CH120



CH140

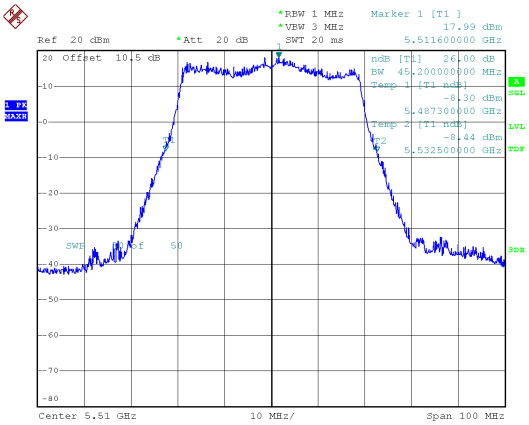


CH140

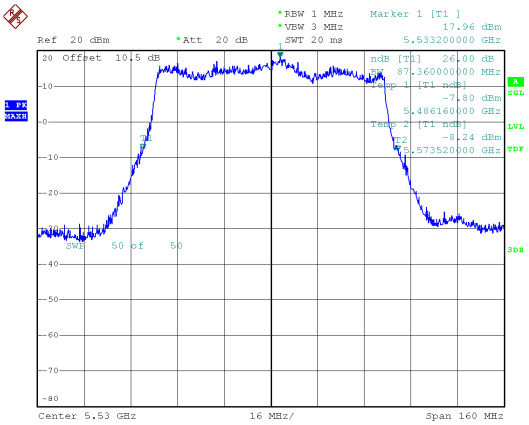


26dB Bandwidth, ANT D

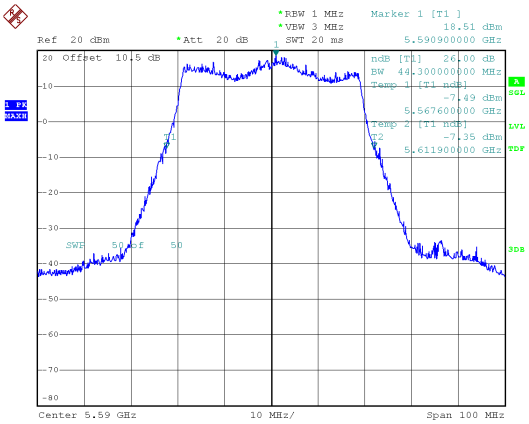
Modulation Type: 802.11be EHT40 (14.6Mbps)
CH102



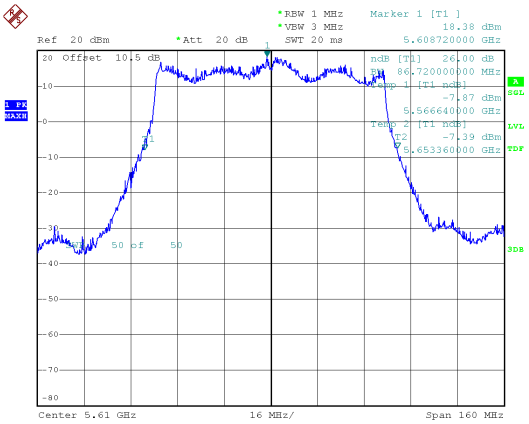
Modulation Type: 802.11be EHT80 (30.6Mbps)
CH106



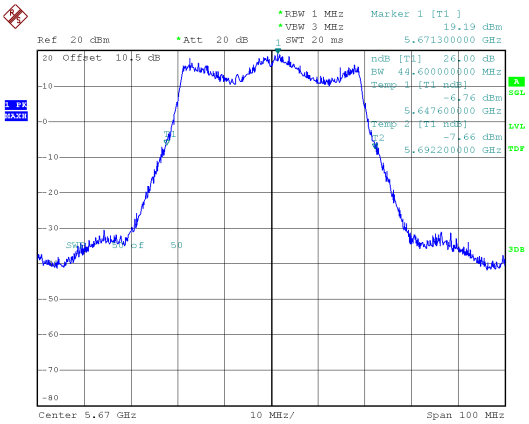
CH118



CH122

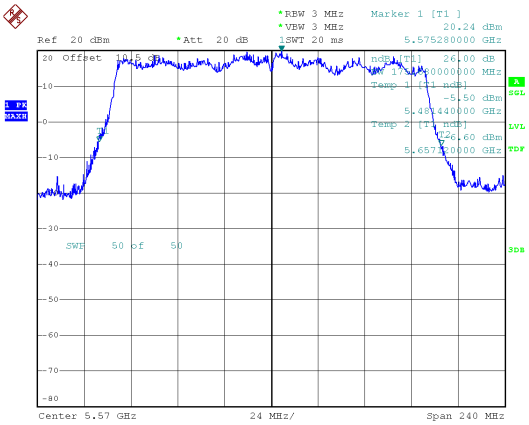


CH134

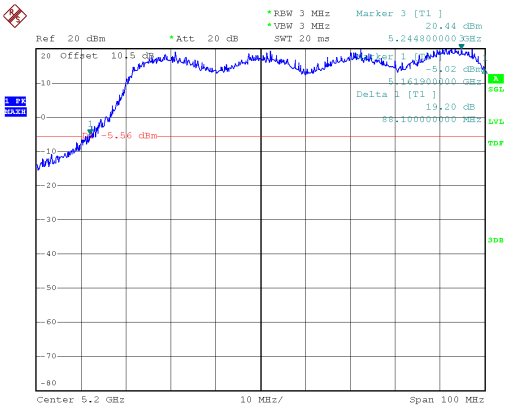


26dB Bandwidth, ANT D

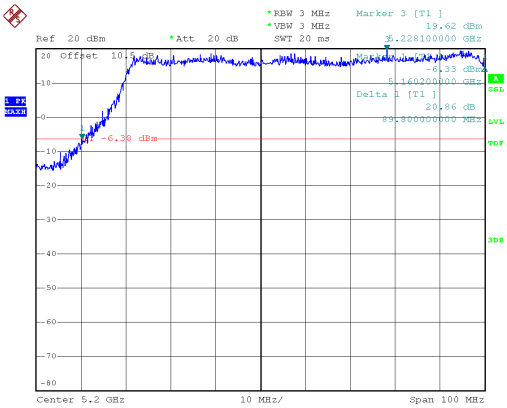
Modulation Type: 802.11be EHT160 (61.3Mbps)
CH114



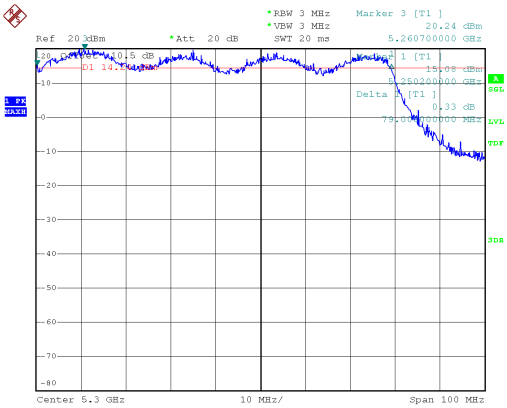
26dB Bandwidth, ANT A
Within 5150-5250MHz Band, Straddle Channel
Modulation Type: 802.11be EHT160
CH50



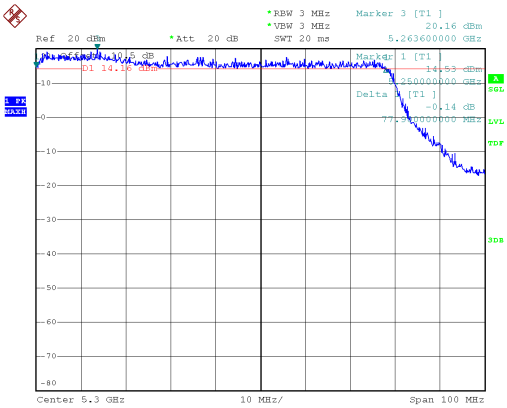
26dB Bandwidth, ANT D
Within 5150-5250MHz Band, Straddle Channel
Modulation Type: 802.11be EHT160
CH50



26dB Bandwidth, ANT A
Within 5250-5350MHz Band, Straddle Channel
Modulation Type: 802.11be EHT160
CH50

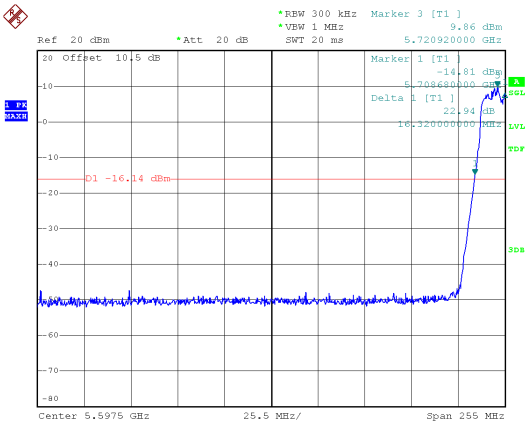


26dB Bandwidth, ANT D
Within 5250-5350MHz Band, Straddle Channel
Modulation Type: 802.11be EHT160
CH50

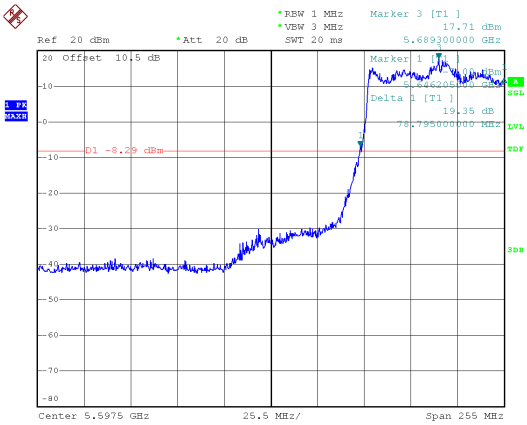


26dB Bandwidth, ANT A
Within 5470-5725MHz Band, Straddle Channel

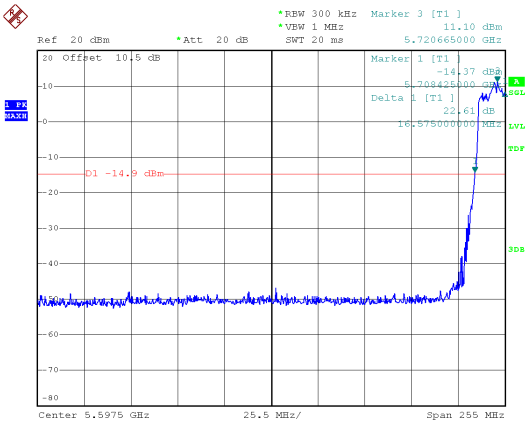
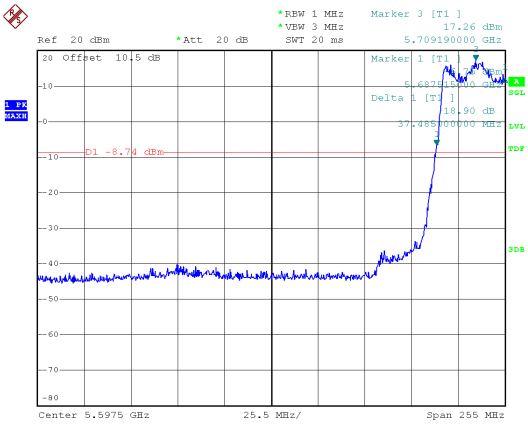
Modulation Type: 802.11a (6Mbps)
CH144



Modulation Type: 802.11be EHT80 (30.6Mbps)
CH138



Modulation Type: 802.11be EHT20 (7.3Mbps)
CH144



Modulation Type: 802.11be EHT40 (14.6Mbps)
CH142