



Channel	Straddle	Middle
Frequency (MHz)	5690	5775
6 dB Bandwidth (MHz)	3.400	76.560
26 dB Bandwidth (MHz)	6.760	82.800
99% Bandwidth (MHz)	76.074	76.056

Table 613 - 802.11ac / VHT80 MCS7x1 / SISO / Core 1

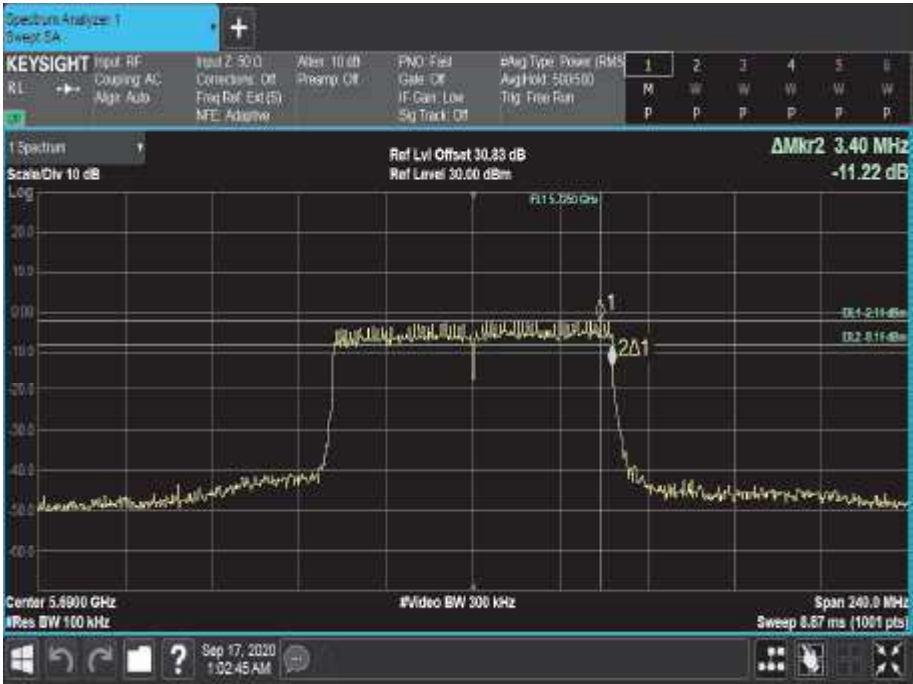


Figure 814 - 5690 MHz - 6 dB DTS Bandwidth

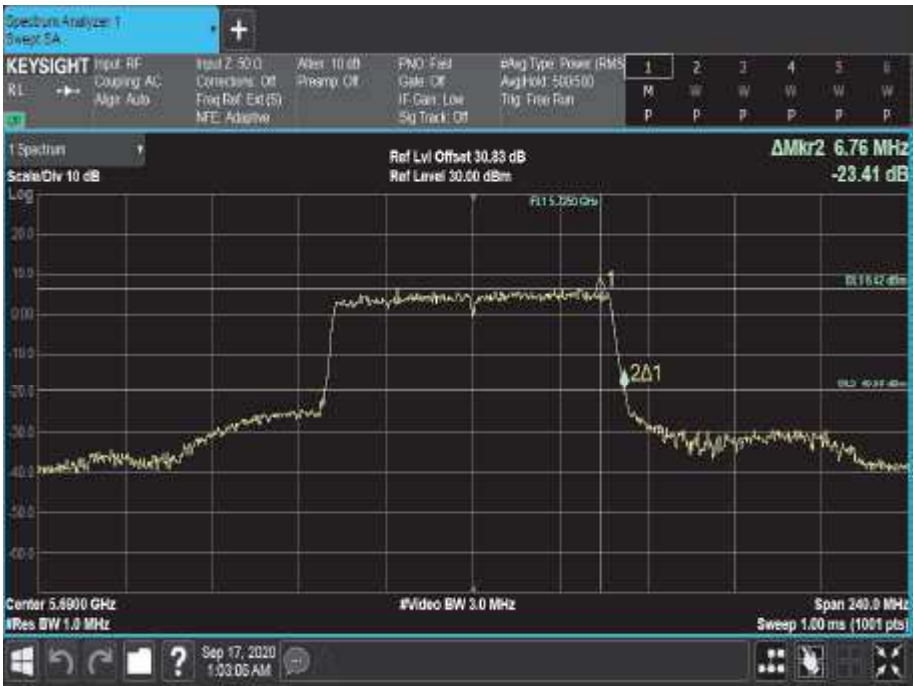


Figure 815 - 5690 MHz - 26 dB Emission Bandwidth

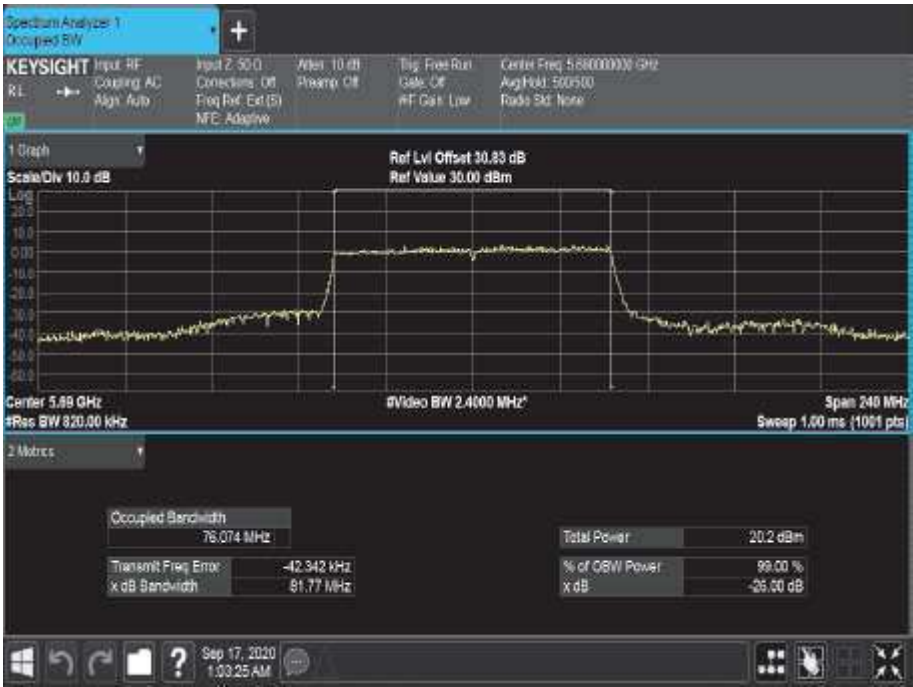


Figure 816 - 5690 MHz - 99% Occupied Bandwidth

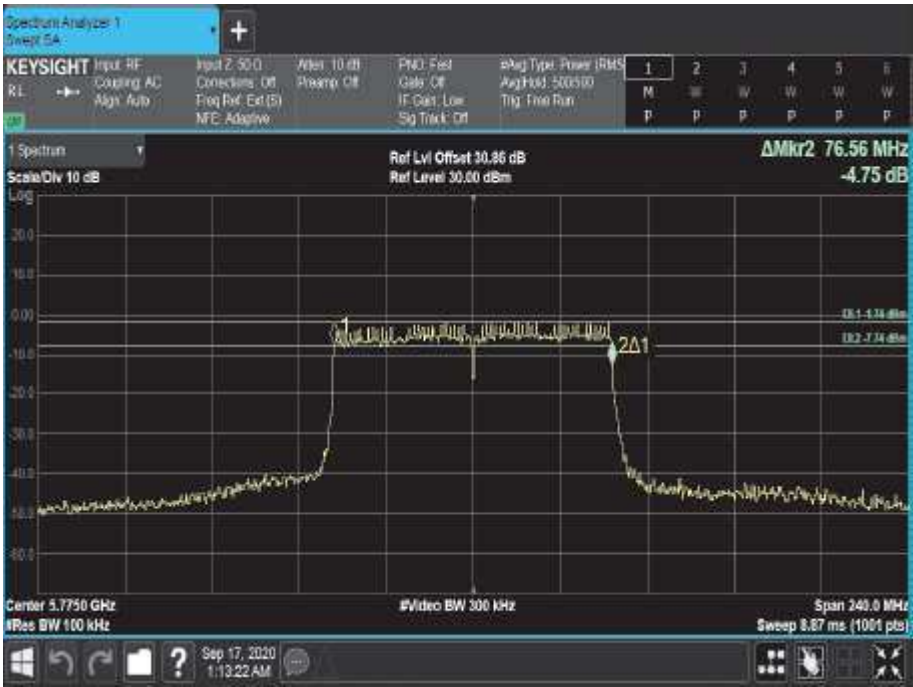


Figure 817 - 5775 MHz - 6 dB DTS Bandwidth

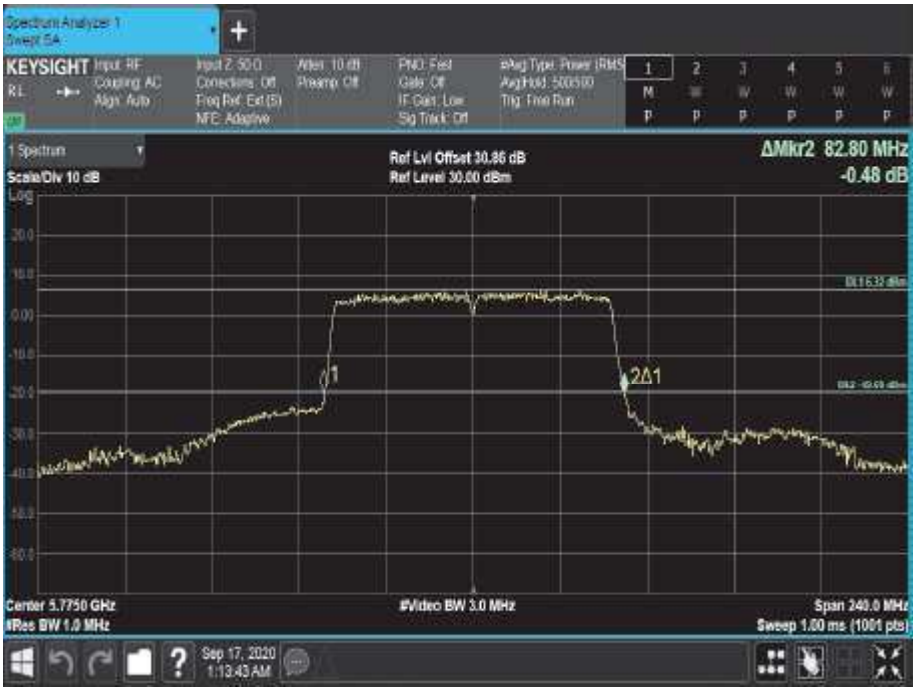


Figure 818 - 5775 MHz - 26 dB Emission Bandwidth

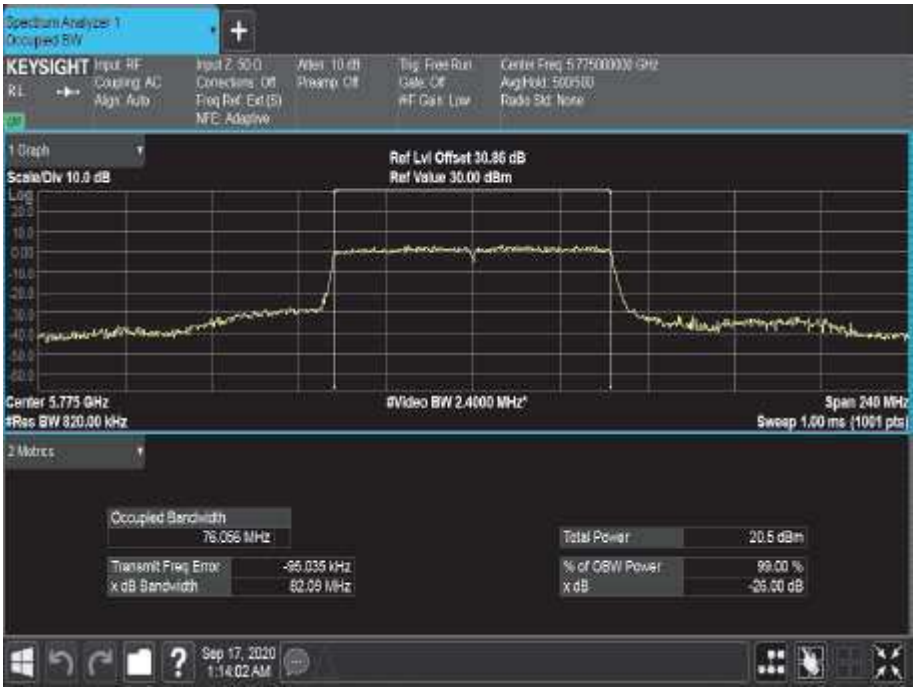


Figure 819 - 5775 MHz - 99% Occupied Bandwidth



Channel	Straddle	Middle
Frequency (MHz)	5690	5775
6 dB Bandwidth (MHz)	3.400	76.800
26 dB Bandwidth (MHz)	6.520	82.560
99% Bandwidth (MHz)	76.158	76.185

Table 614 - 802.11ac / VHT80 MCS7x1 / MIMO CDD / Cores 0+1

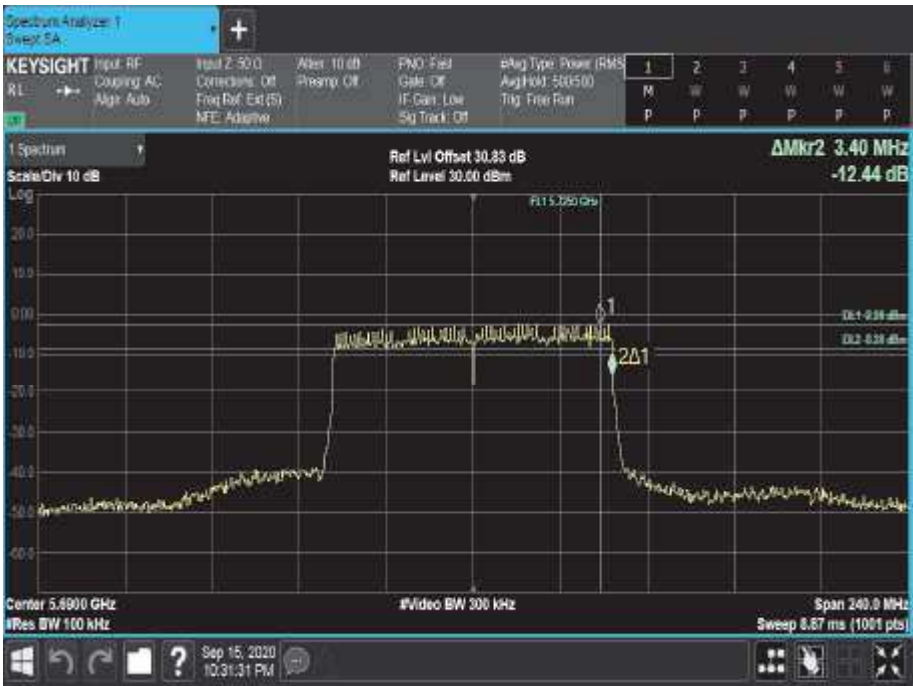


Figure 820 - 5690 MHz - 6 dB DTS Bandwidth



Figure 821 - 5690 MHz - 26 dB Emission Bandwidth

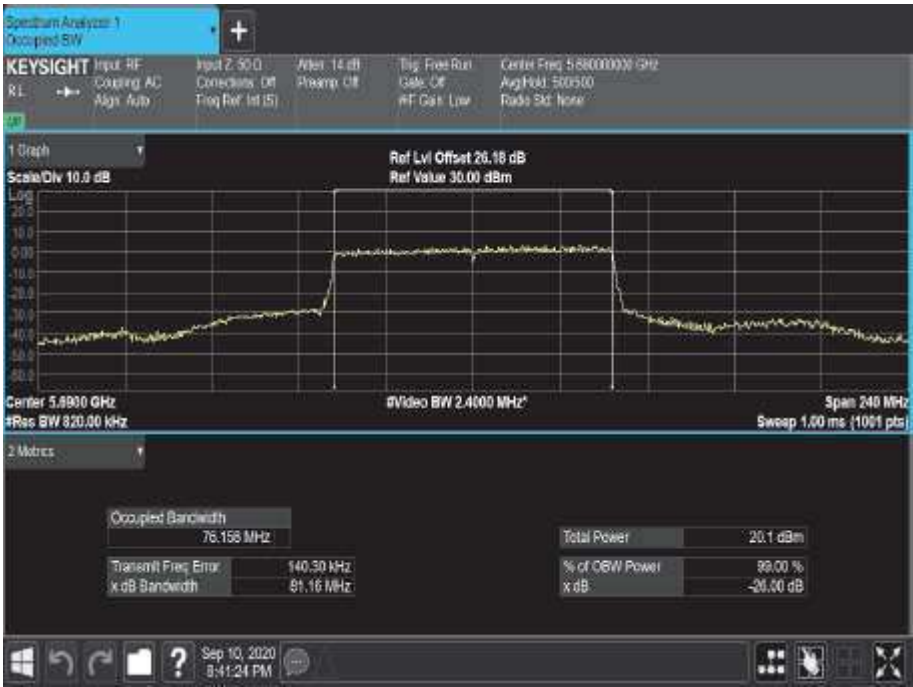


Figure 822 - 5690 MHz - 99% Occupied Bandwidth

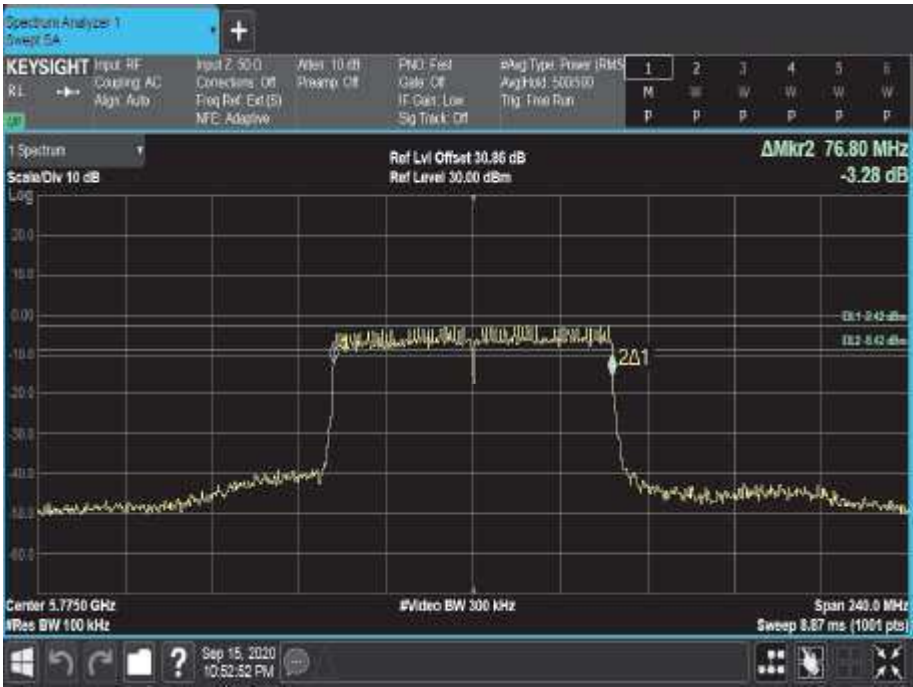


Figure 823 - 5775 MHz - 6 dB DTS Bandwidth

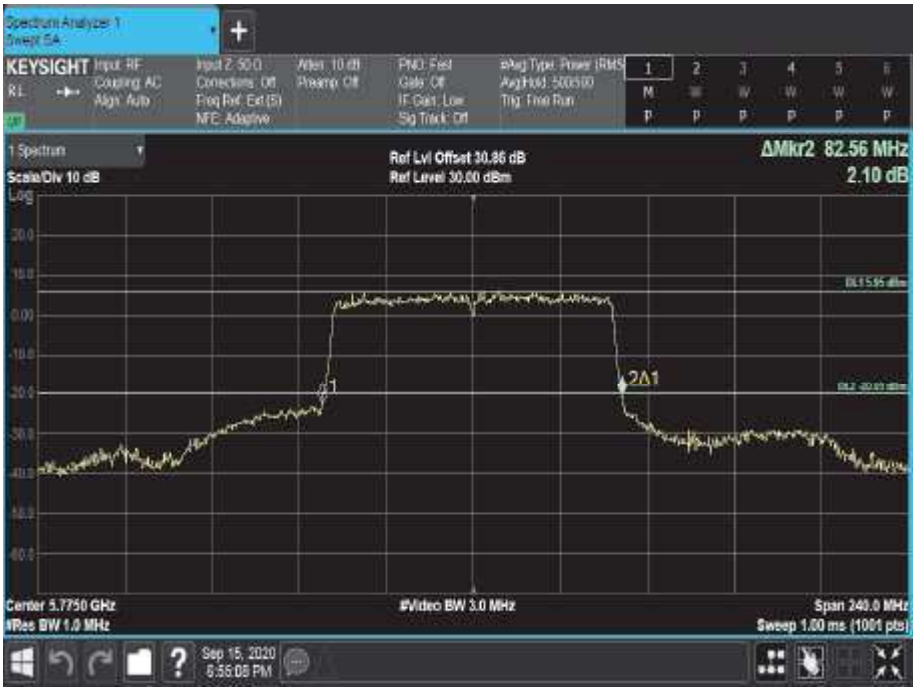


Figure 824 - 5775 MHz - 26 dB Emission Bandwidth

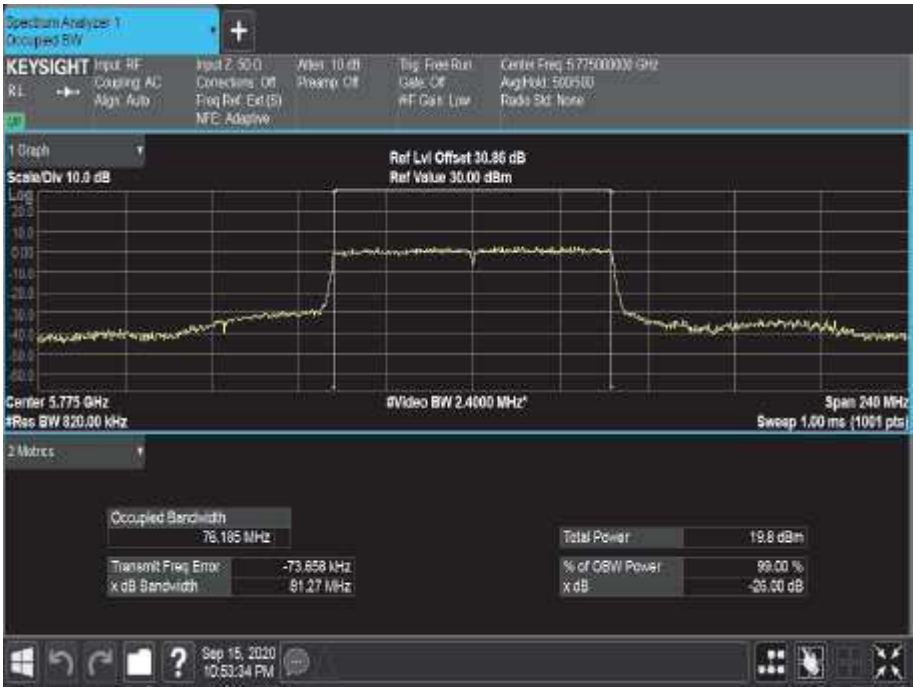


Figure 825 - 5775 MHz - 99% Occupied Band width



Channel	Straddle	Middle
Frequency (MHz)	5690	5775
6 dB Bandwidth (MHz)	3.400	76.800
26 dB Bandwidth (MHz)	6.280	82.320
99% Bandwidth (MHz)	76.066	76.132

Table 615 - 802.11ac / VHT80 MCS7x2 / MIMO SDM / Cores 0+1



Figure 826 - 5690 MHz - 6 dB DTS Bandwidth



Figure 827 - 5690 MHz - 26 dB Emission Bandwidth

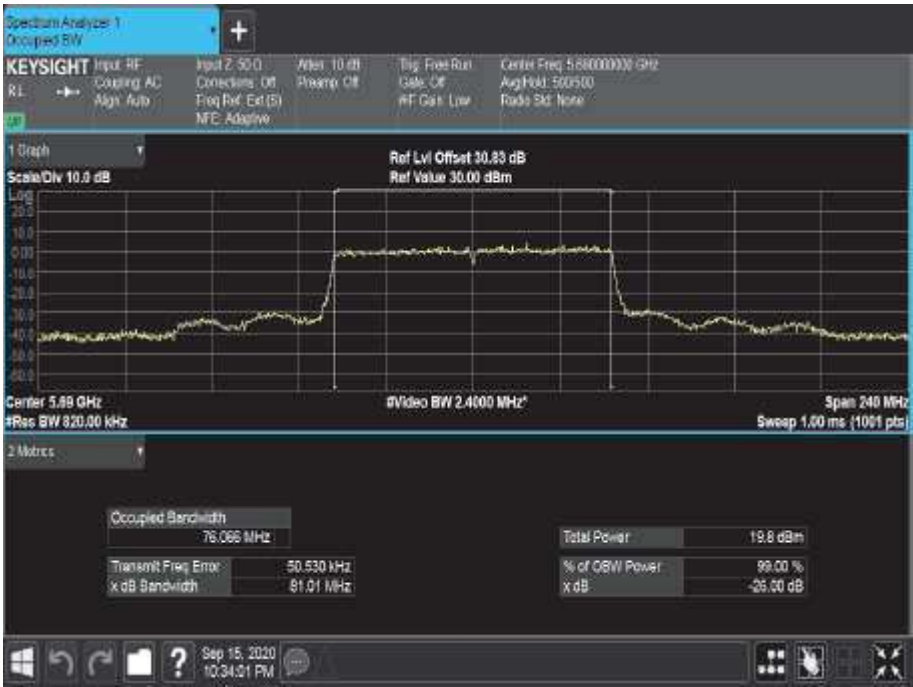


Figure 828 - 5690 MHz - 99% Occupied Bandwidth

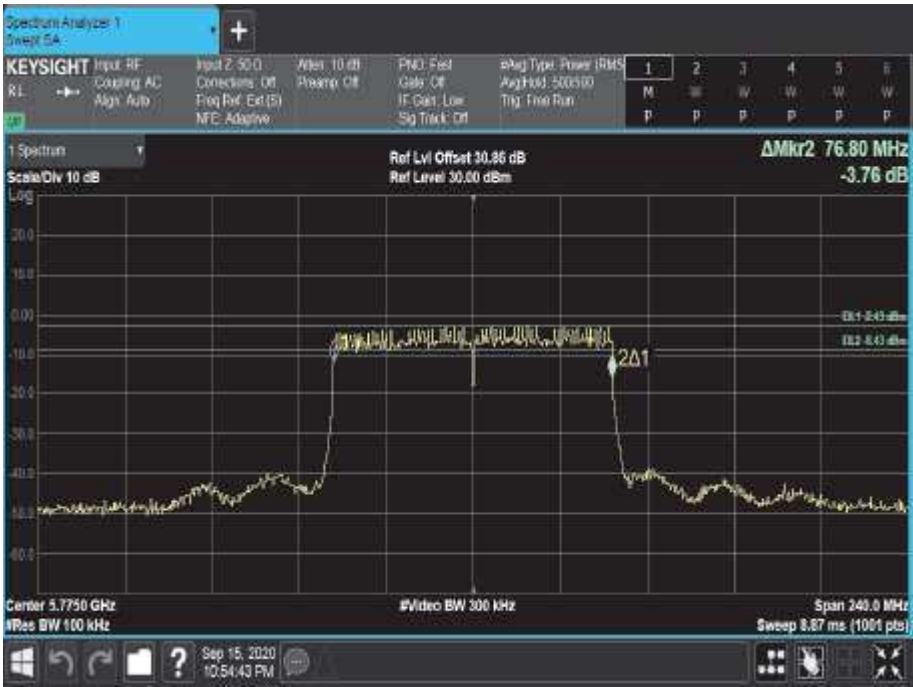


Figure 829 - 5775 MHz - 6 dB DTS Bandwidth



Figure 830 - 5775 MHz - 26 dB Emission Bandwidth

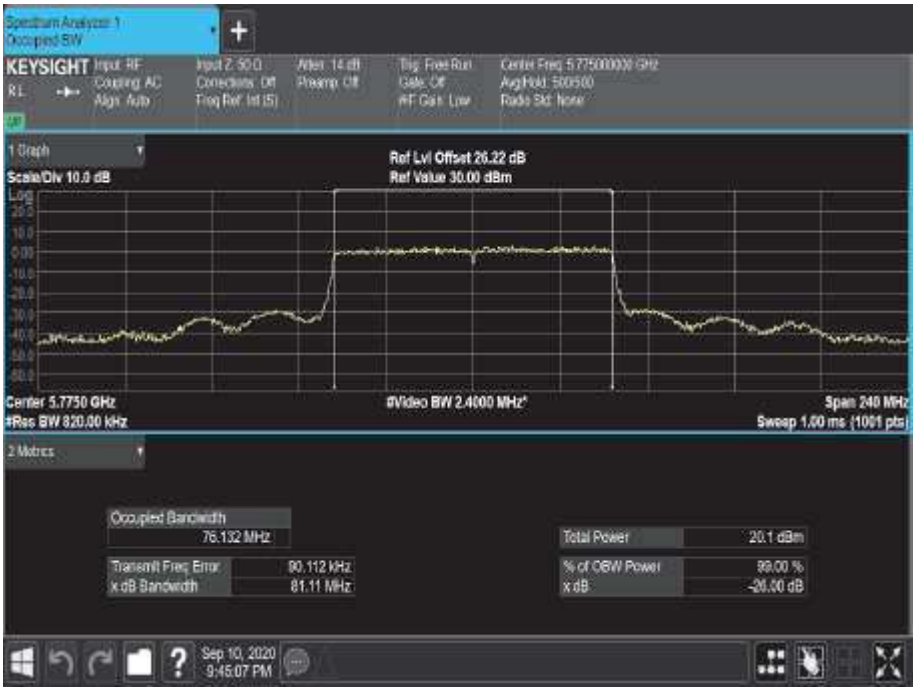


Figure 831 - 5775 MHz - 99% Occupied Bandwidth



Channel	Straddle	Middle
Frequency (MHz)	5690	5775
6 dB Bandwidth (MHz)	3.400	76.800
26 dB Bandwidth (MHz)	6.280	82.560
99% Bandwidth (MHz)	76.054	77.039

Table 616 - 802.11ac / VHT80 MCS7x1 / MIMO TxBF / Cores 0+1

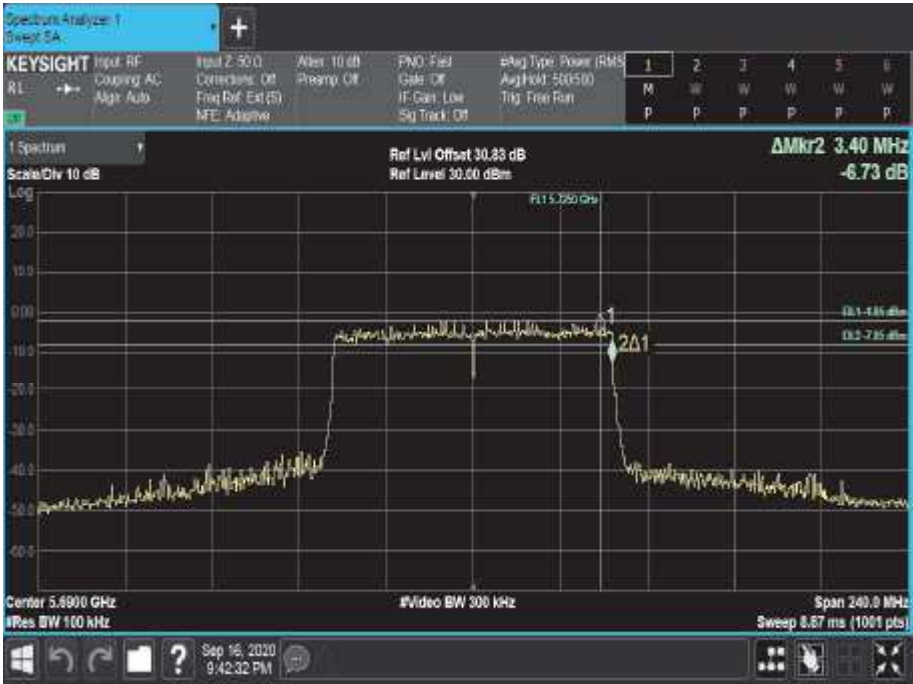


Figure 832 - 5690 MHz - 6 dB DTS Bandwidth



Figure 833 - 5690 MHz - 26 dB Emission Bandwidth

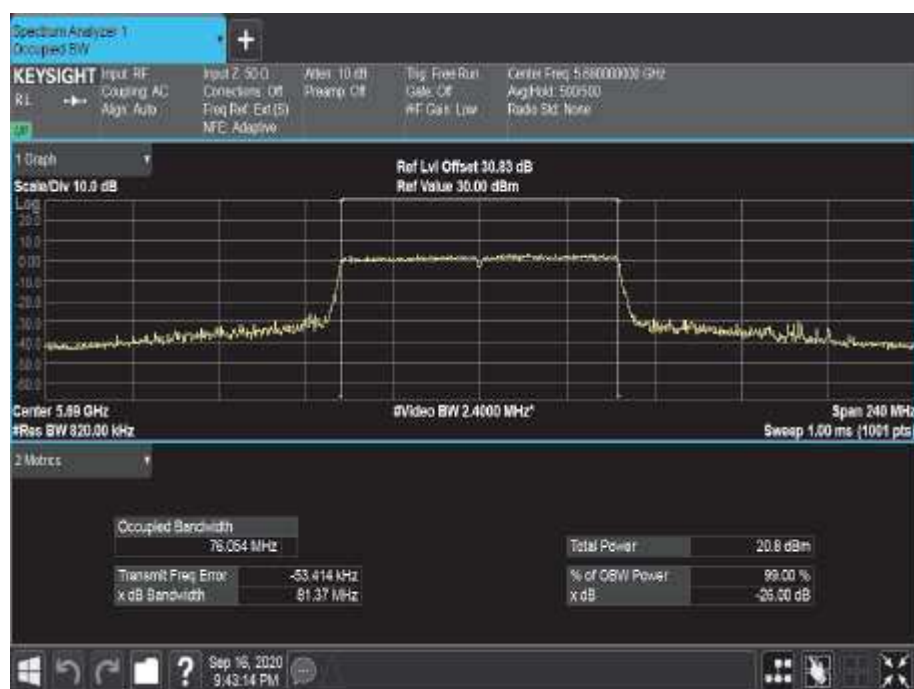


Figure 834 - 5690 MHz - 99% Occupied Bandwidth

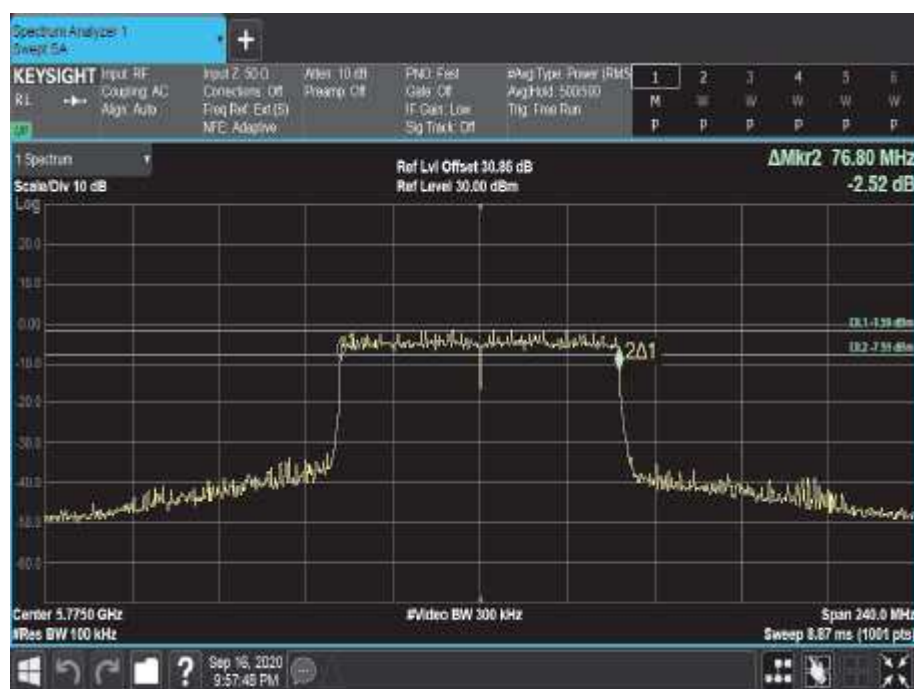


Figure 835 - 5775 MHz - 6 dB DTS Bandwidth

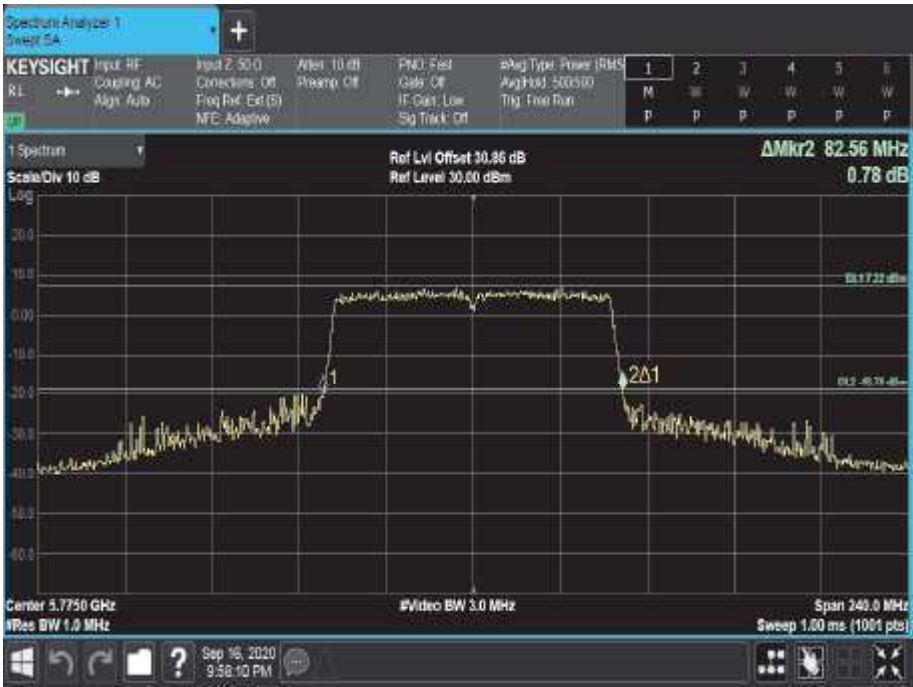


Figure 836 - 5775 MHz - 26 dB Emission Bandwidth

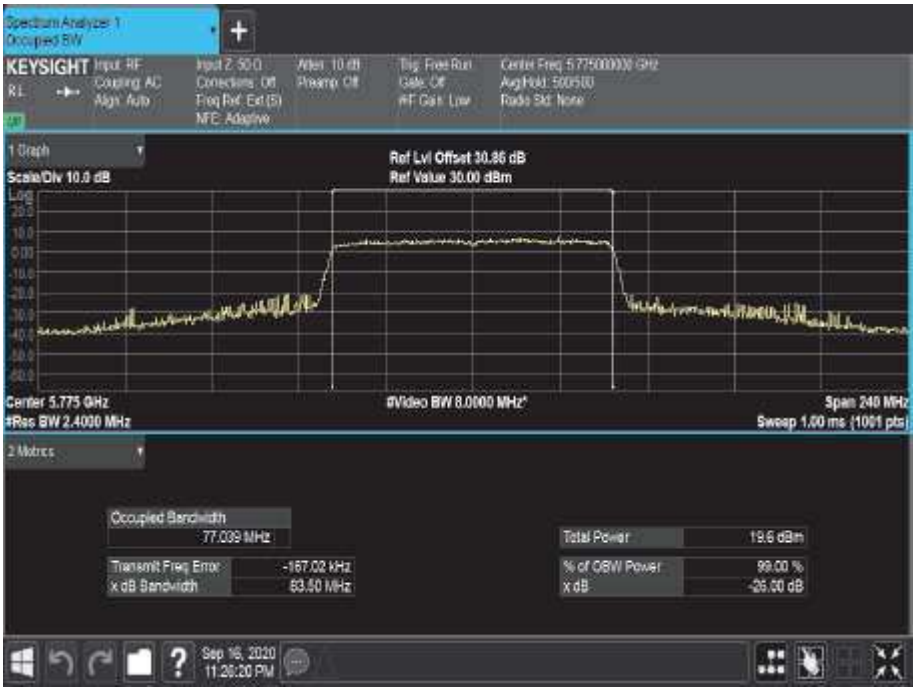


Figure 837 - 5775 MHz - 99% Occupied Bandwidth



Channel	Straddle	Middle
Frequency (MHz)	5690	5775
6 dB Bandwidth (MHz)	4.120	78.000
26 dB Bandwidth (MHz)	6.040	83.040
99% Bandwidth (MHz)	77.194	77.253

Table 617 - 802.11ax / HE80 MCS7x1 / SU / SISO / Core 1

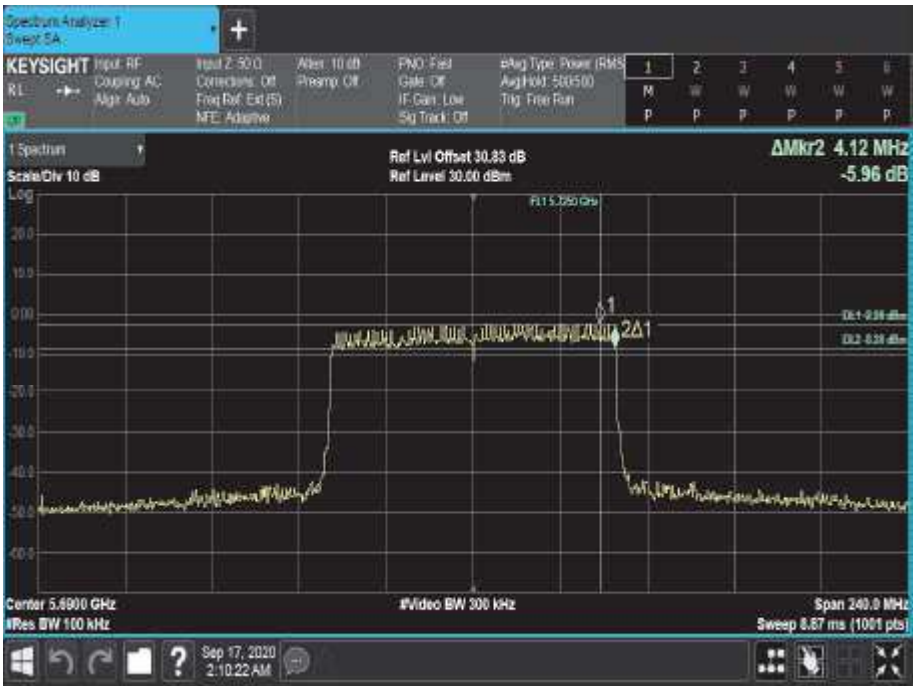


Figure 838 - 5690 MHz - 6 dB DTS Bandwidth

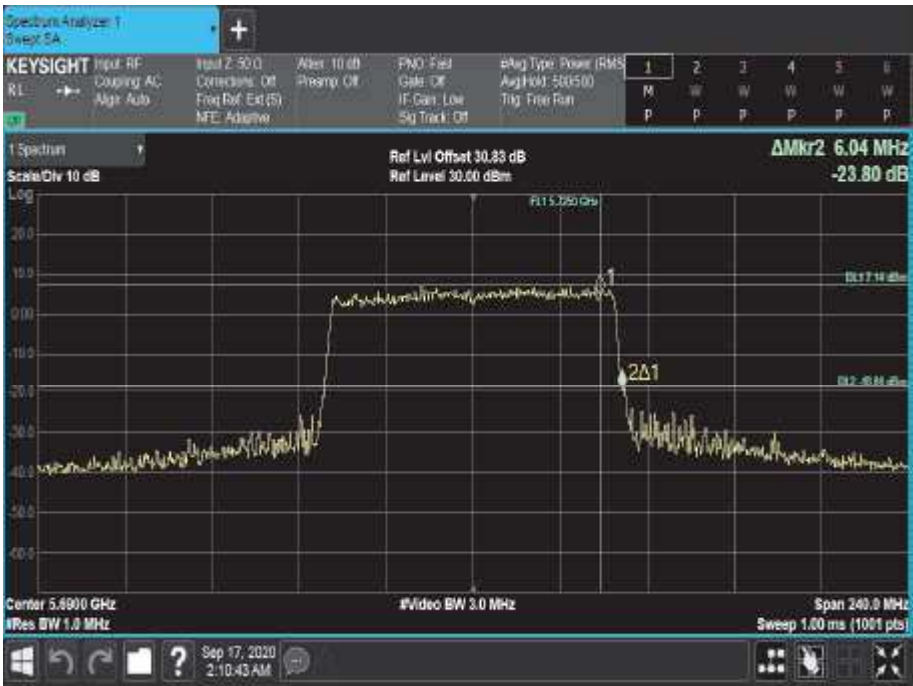


Figure 839 - 5690 MHz - 26 dB Emission Bandwidth

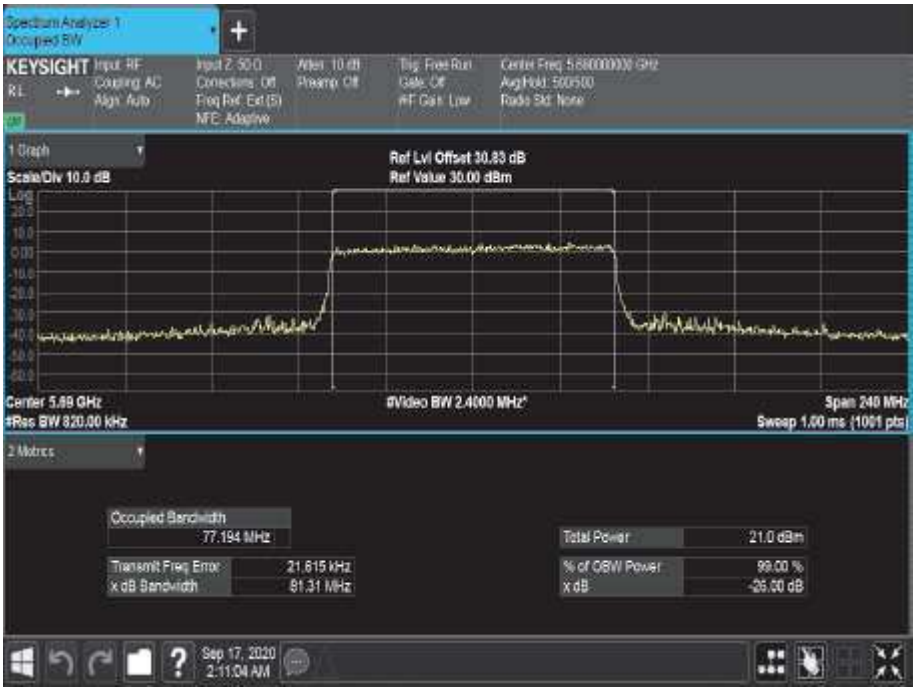


Figure 840 - 5690 MHz - 99% Occupied Bandwidth

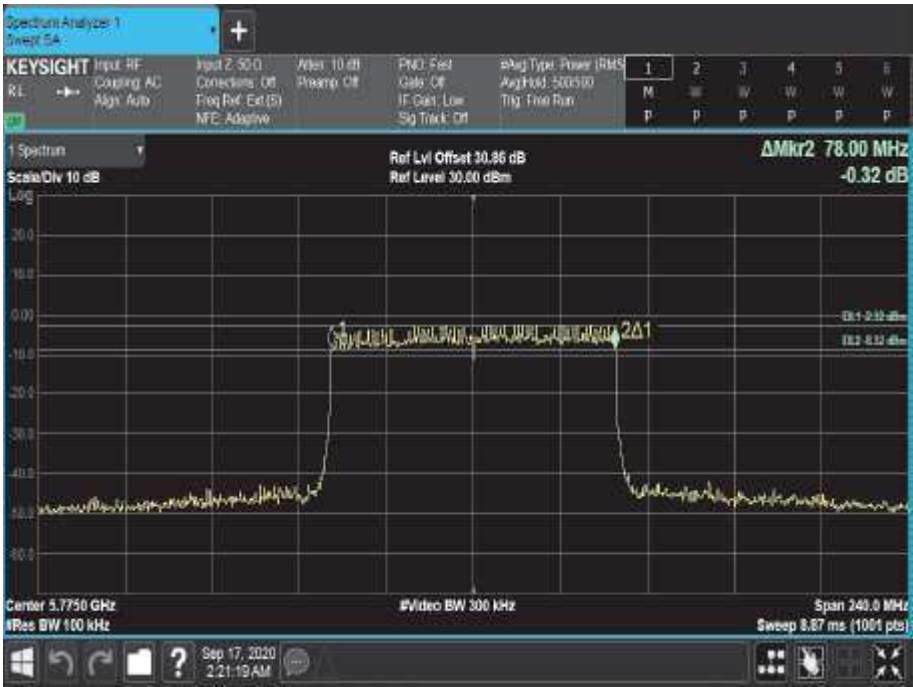


Figure 841 - 5775 MHz - 6 dB DTS Bandwidth

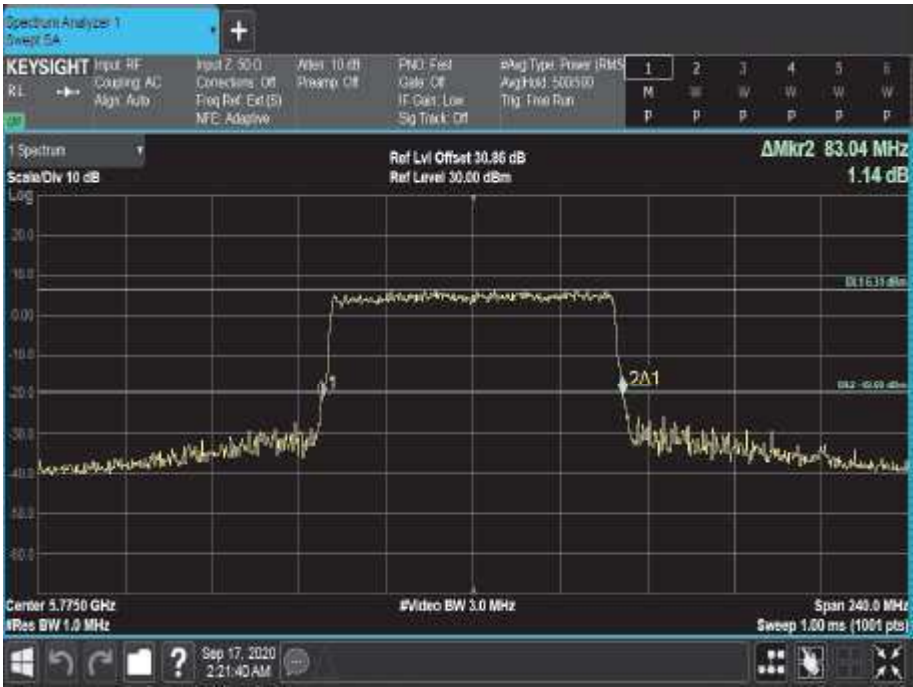


Figure 842 - 5775 MHz - 26 dB Emission Bandwidth

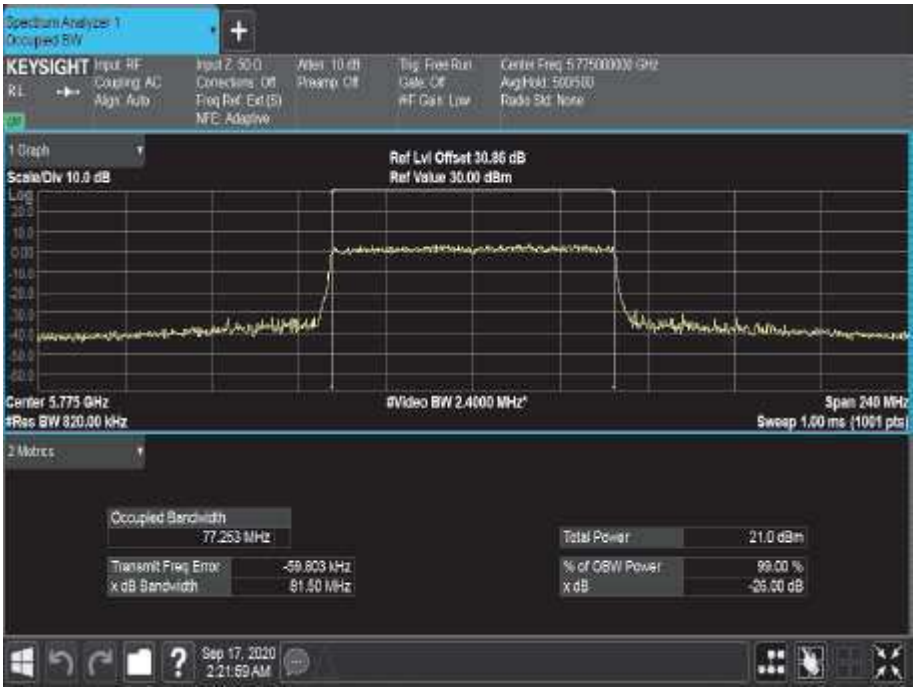


Figure 843 - 5775 MHz - 99% Occupied Bandwidth



Channel	Middle
Frequency (MHz)	5775
6 dB Bandwidth (MHz)	2.640
26 dB Bandwidth (MHz)	19.920
99% Bandwidth (MHz)	19.089

Table 618 - 802.11 ax / HE80 MCS7x1 / RU 26-0 / SISO / Core 1

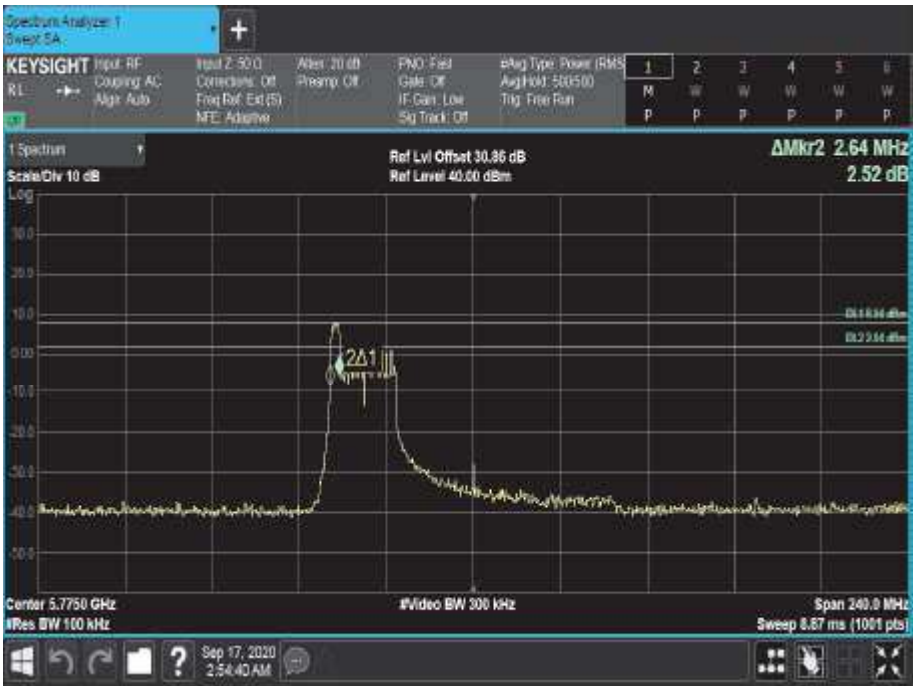


Figure 844 - 5775 MHz - 6 dB DTS Bandwidth

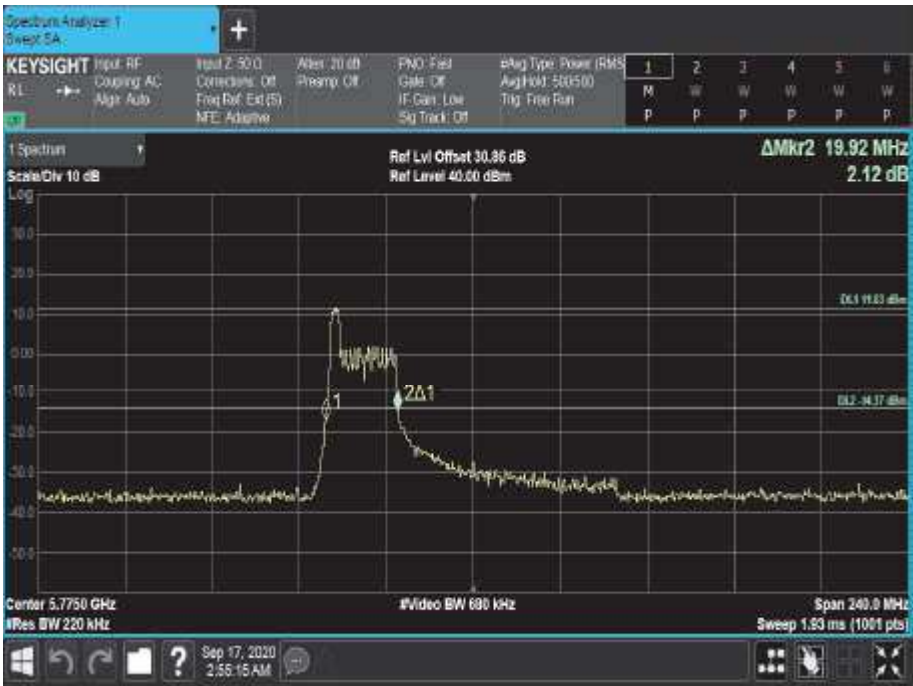


Figure 845 - 5775 MHz - 26 dB Emission Bandwidth

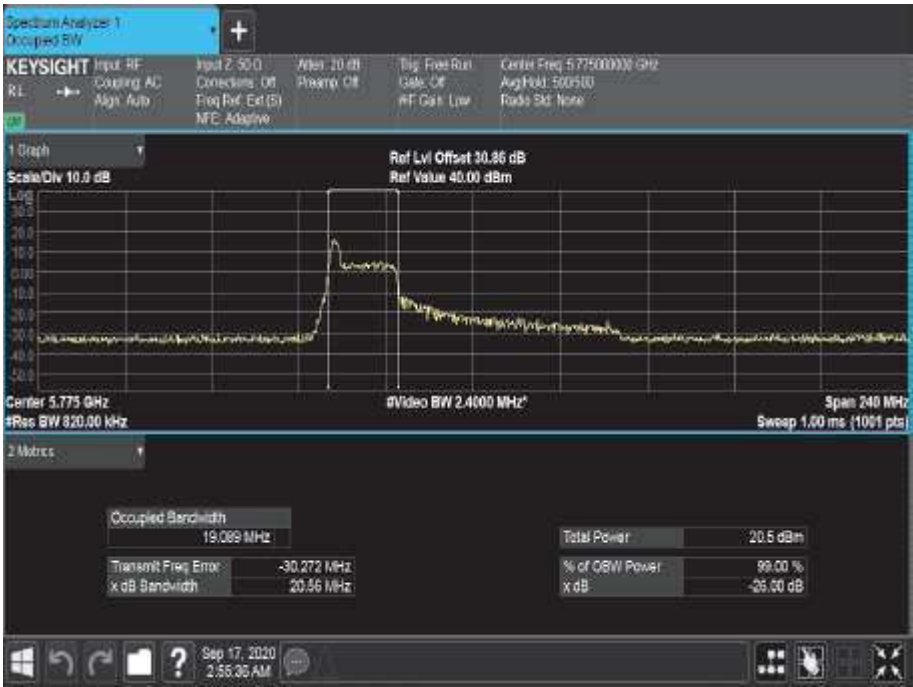


Figure 846 - 5775 MHz - 99% Occupied Bandwidth



Channel	Middle
Frequency (MHz)	5775
6 dB Bandwidth (MHz)	2.400
26 dB Bandwidth (MHz)	20.400
99% Bandwidth (MHz)	20.485

Table 619 - 802.11ax / HE80 MCS7x1 / RU 26-36 / SISO / Core 1

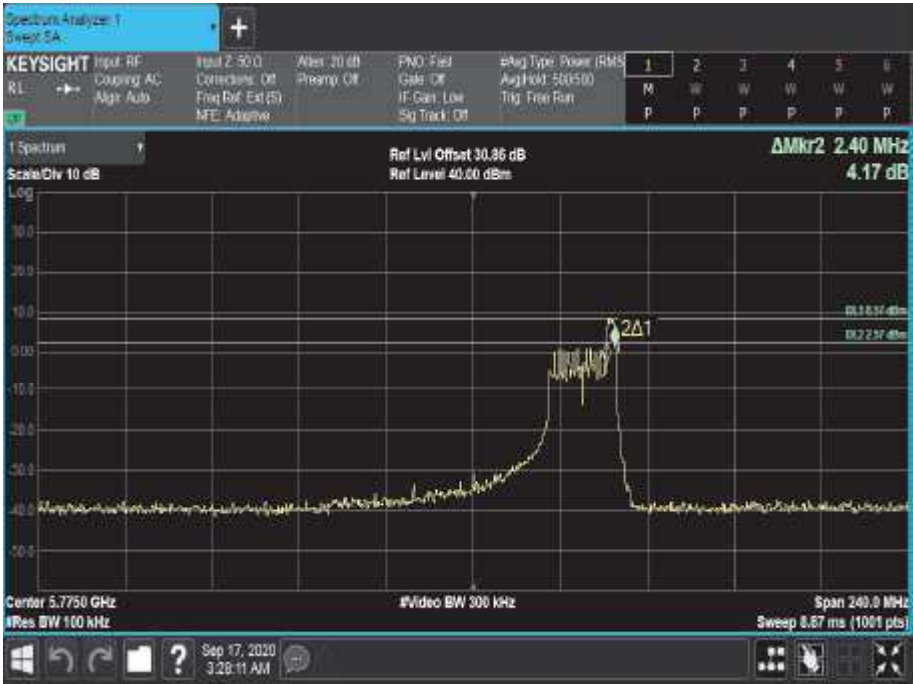


Figure 847 - 5775 MHz - 6 dB DTS Bandwidth

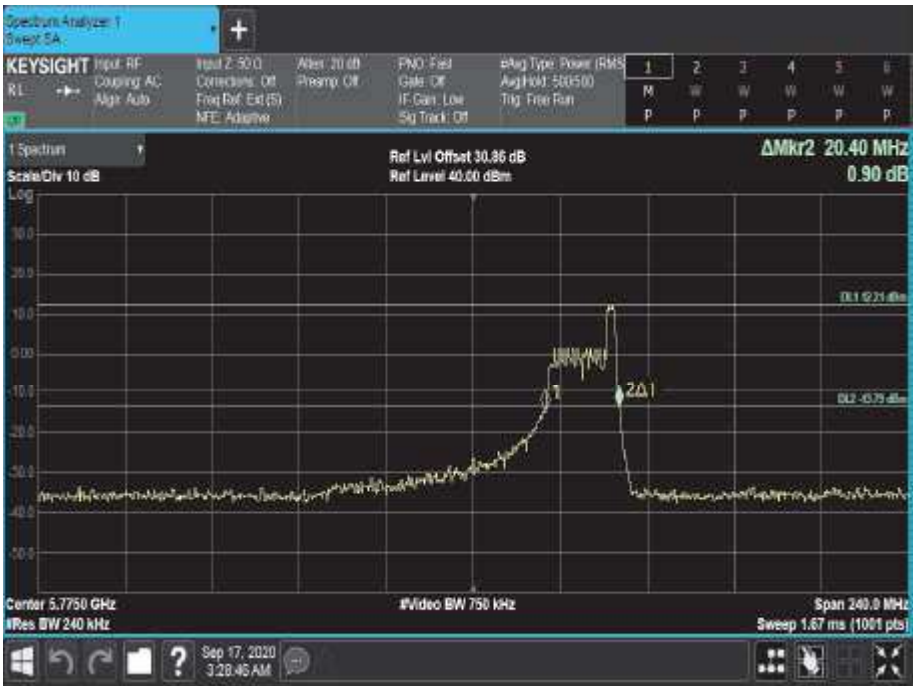


Figure 848 - 5775 MHz - 26 dB Emission Bandwidth

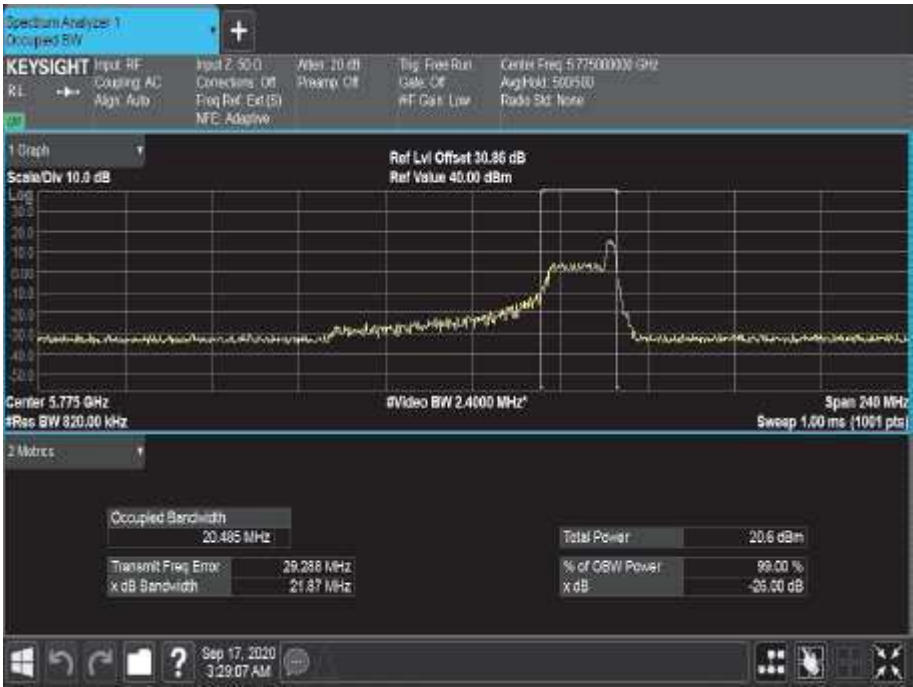


Figure 849 - 5775 MHz - 99% Occupied Bandwidth



Channel	Straddle	Middle
Frequency (MHz)	5690	5775
6 dB Bandwidth (MHz)	4.120	78.000
26 dB Bandwidth (MHz)	6.520	82.560
99% Bandwidth (MHz)	77.390	77.348

Table 620 - 802.11ax / HE80 MCS7x1 / SU / MIMO CDD / Cores 0+1

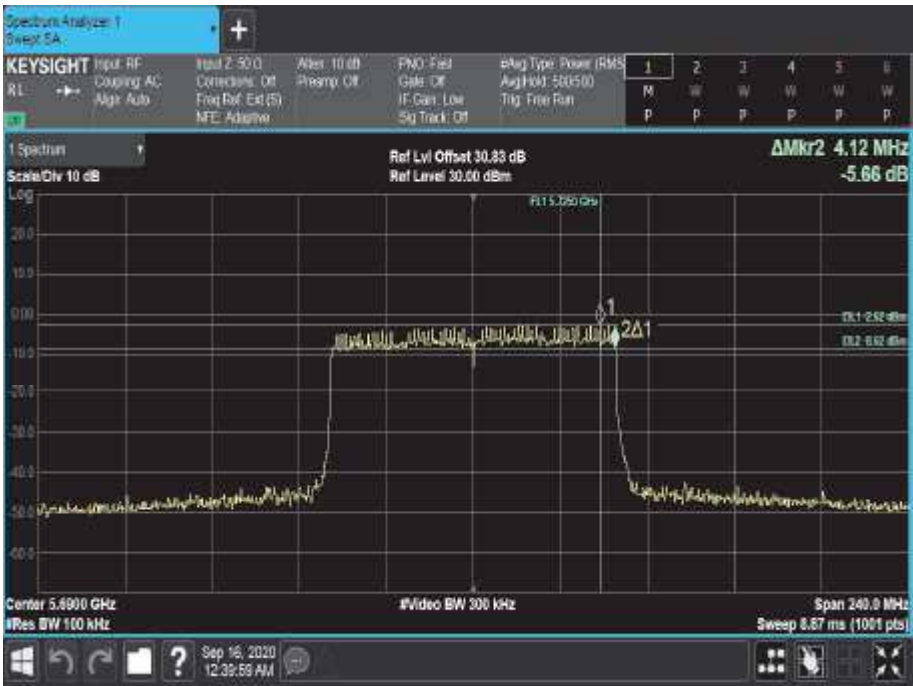


Figure 850 - 5690 MHz - 6 dB DTS Bandwidth

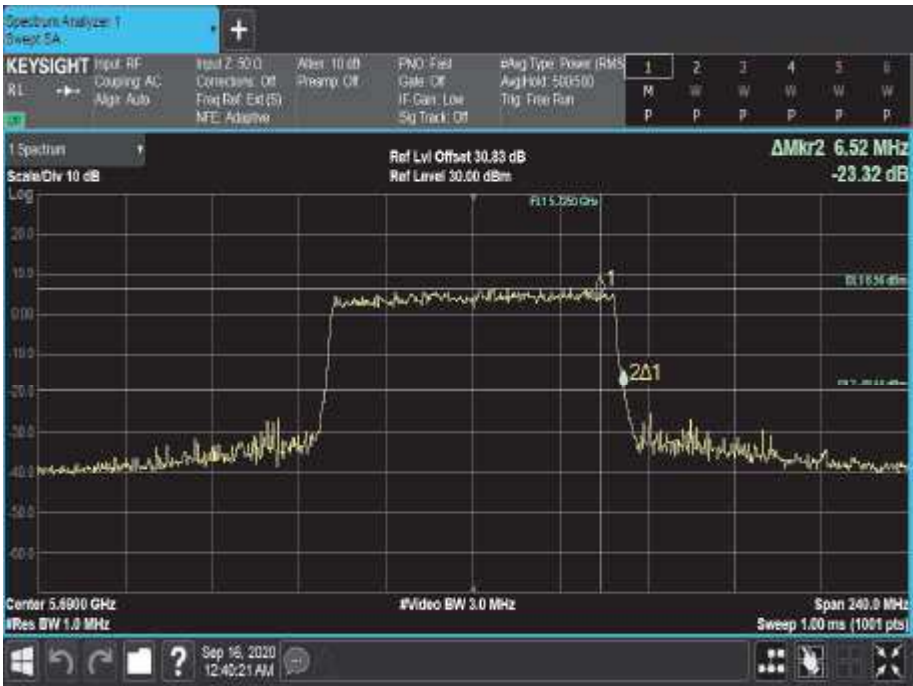


Figure 851 - 5690 MHz - 26 dB Emission Bandwidth

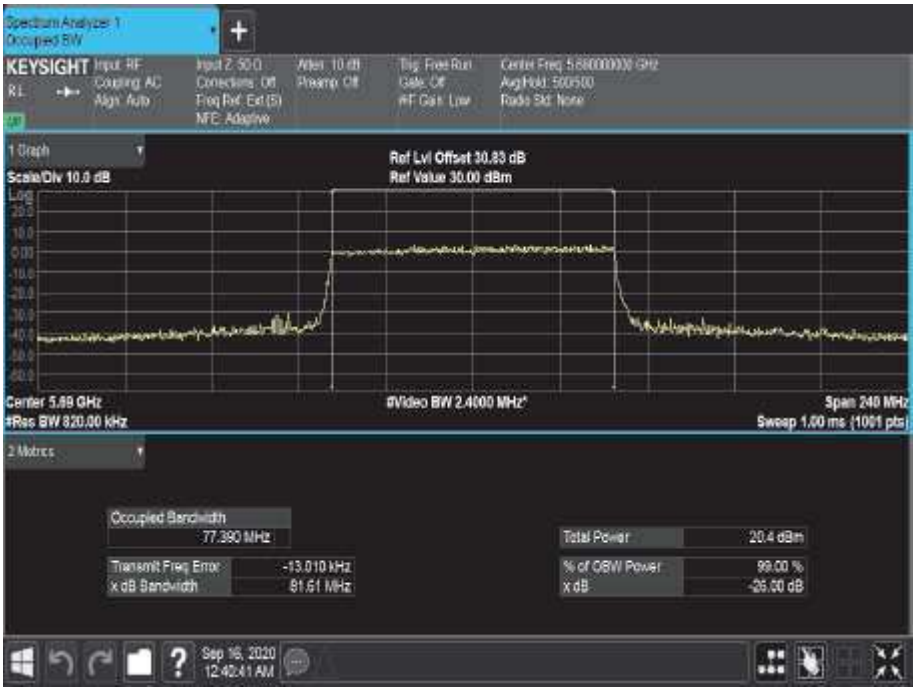


Figure 852 - 5690 MHz - 99% Occupied Bandwidth

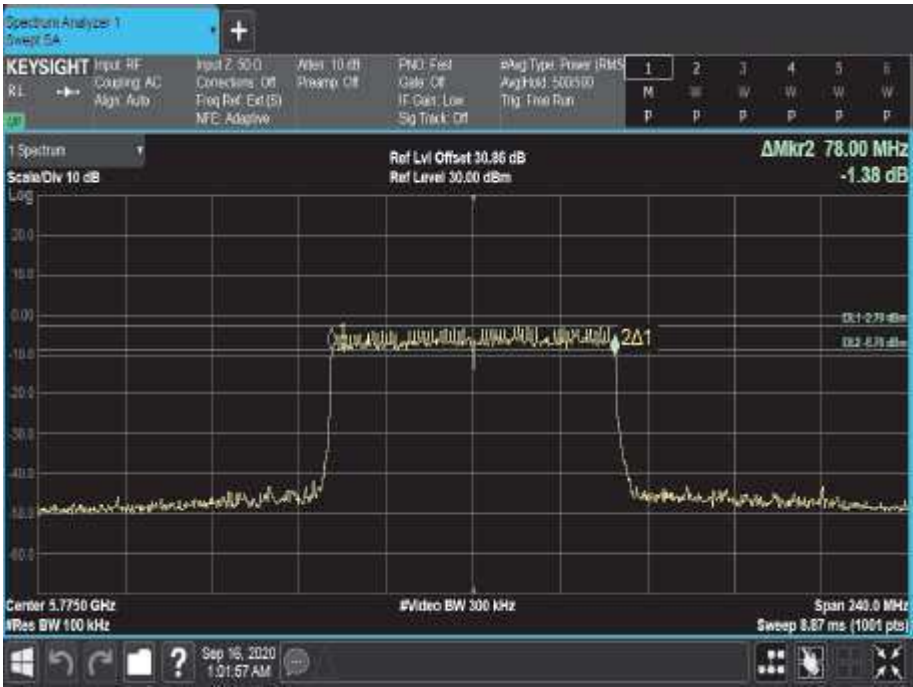


Figure 853 - 5775 MHz - 6 dB DTS Bandwidth

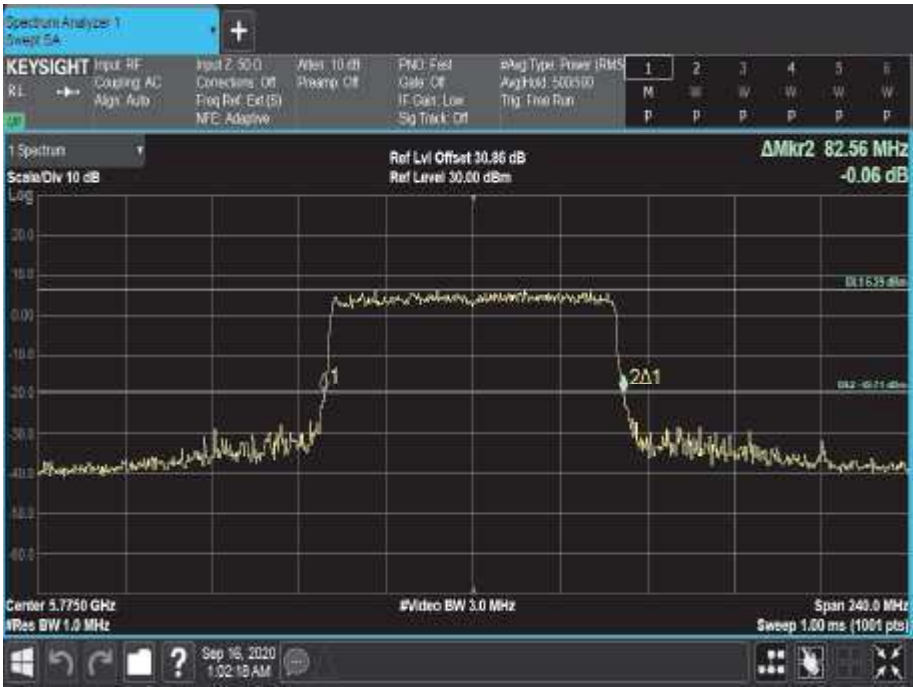


Figure 854 - 5775 MHz - 26 dB Emission Bandwidth

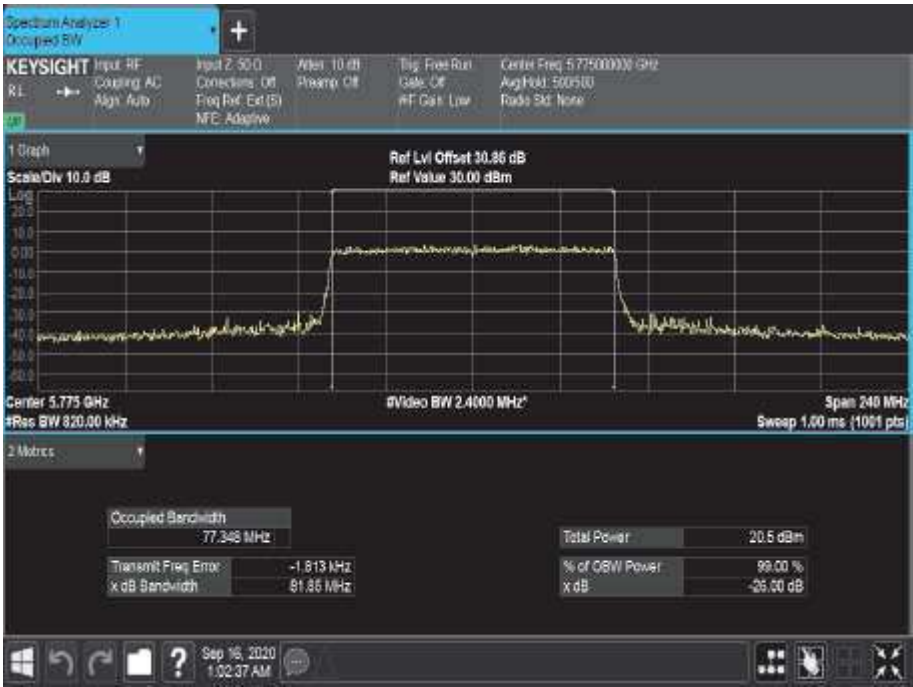


Figure 855 - 5775 MHz - 99% Occupied Bandwidth



Channel	Middle
Frequency (MHz)	5775
6 dB Bandwidth (MHz)	2.640
26 dB Bandwidth (MHz)	19.920
99% Bandwidth (MHz)	18.624

Table 621 - 802.11ax / HE80 MCS7x1 / RU 26-0 / MIMO CDD / Core s 0+1

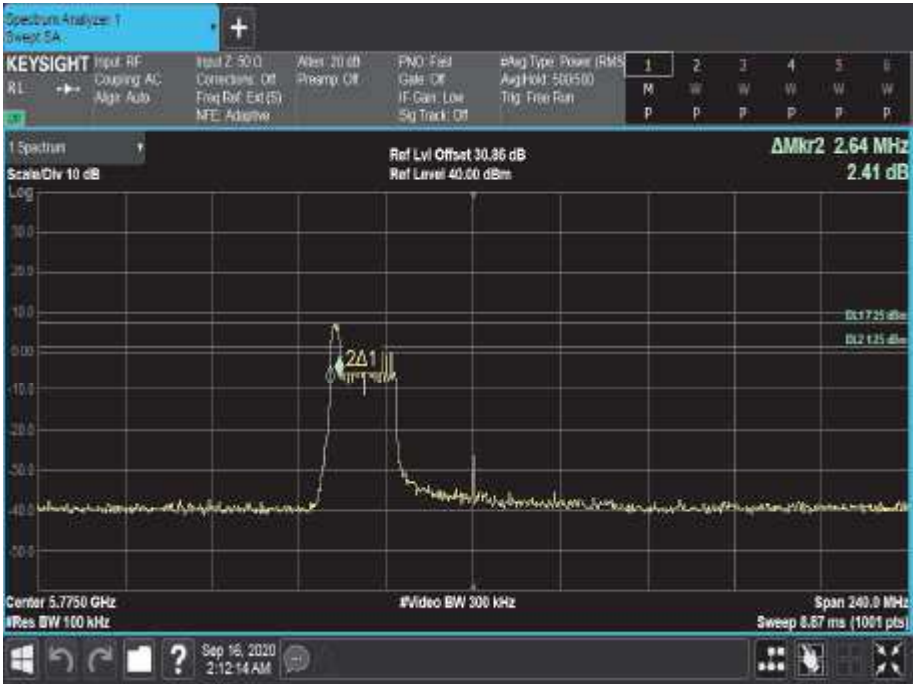


Figure 856 - 5775 MHz - 6 dB DTS Bandwidth



Figure 857 - 5775 MHz - 26 dB Emission Bandwidth

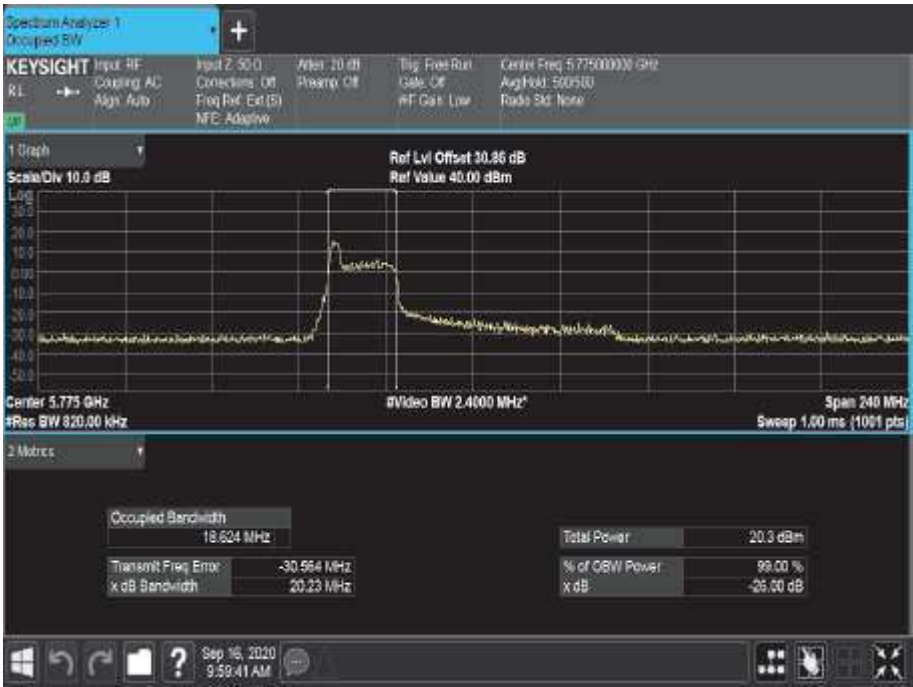


Figure 858 - 5775 MHz - 99% Occupied Bandwidth



Channel	Middle
Frequency (MHz)	577.5
6 dB Bandwidth (MHz)	2.400
26 dB Bandwidth (MHz)	19.680
99% Bandwidth (MHz)	18.633

Table 622 - 80.2.11ax / HE80 MCS7x1 / RU 26-36 / MIMO CDD / Cores 0+1

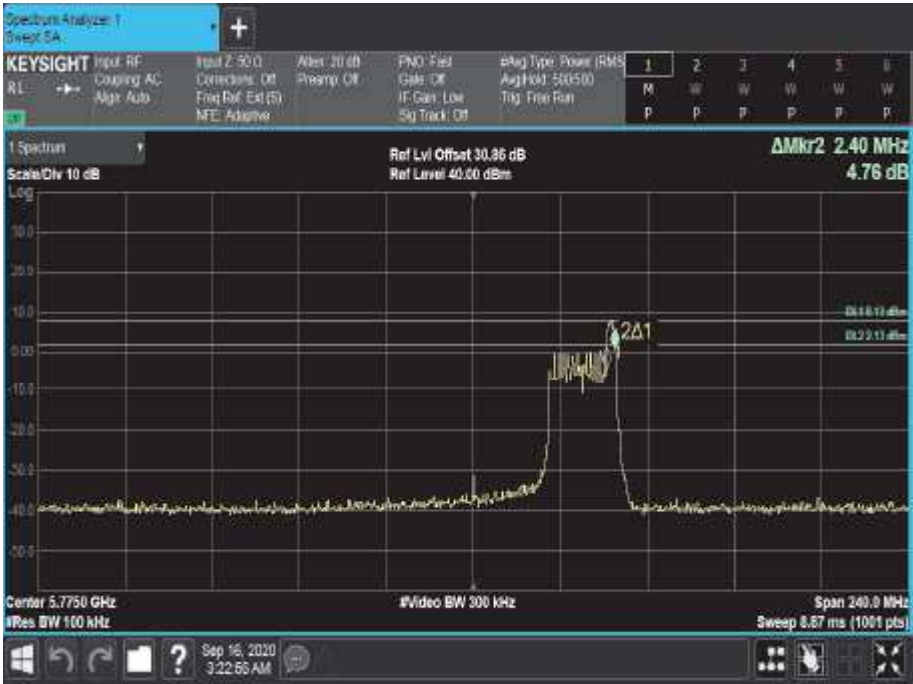


Figure 859 - 577.5 MHz - 6 dB DTS Bandwidth

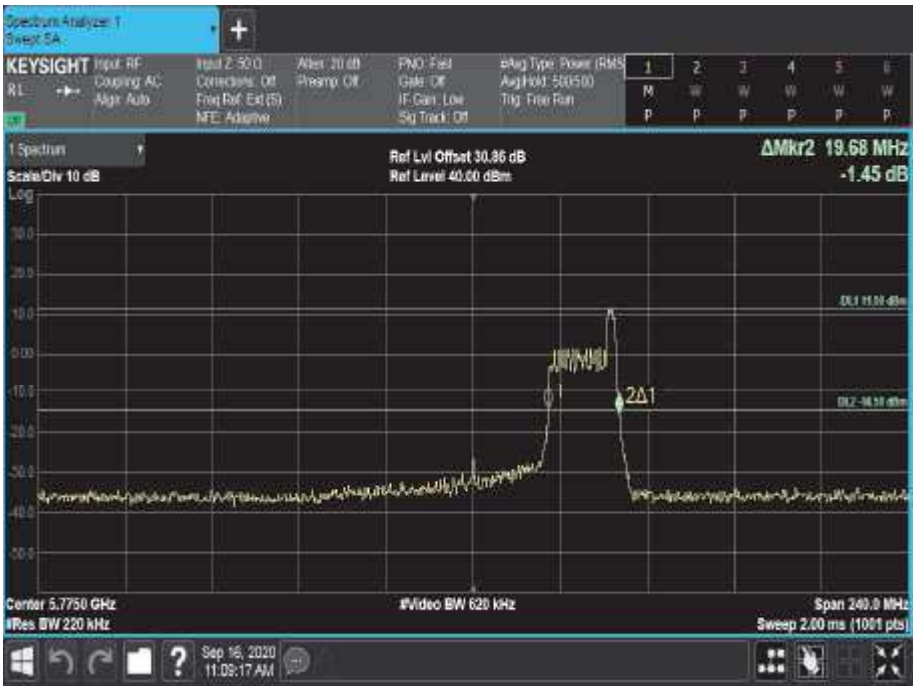


Figure 860 - 577.5 MHz - 26 dB Emission Bandwidth

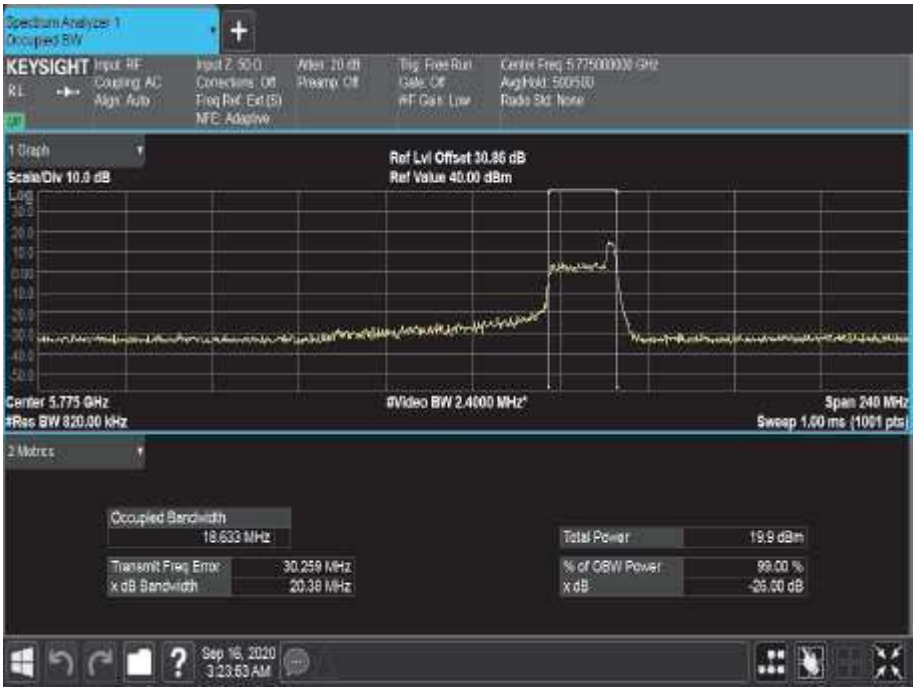


Figure 861 - 5775 MHz - 99% Occupied Bandwidth



Channel	Straddle	Middle
Frequency (MHz)	5690	5775
6 dB Bandwidth (MHz)	4.120	77.760
26 dB Bandwidth (MHz)	6.520	82.320
99% Bandwidth (MHz)	77.369	77.388

Table 623 - 80 2.11ax / HE80 MCS7x2 / SU / MIMO SDM / Cores 0+1

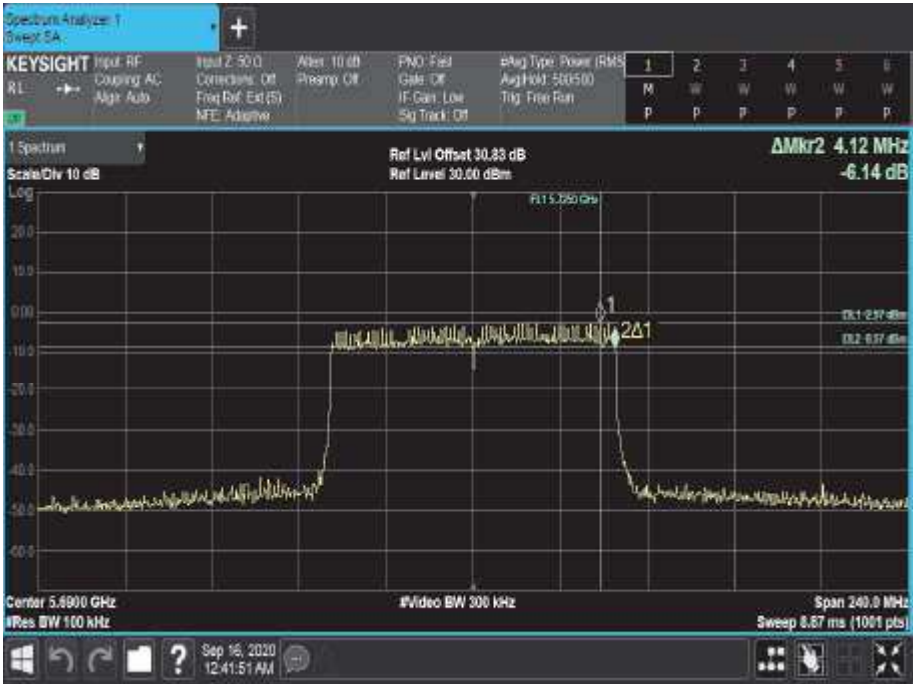


Figure 862 - 5690 MHz - 6 dB DTS Bandwidth



Figure 863 - 5690 MHz - 26 dB Emission Bandwidth

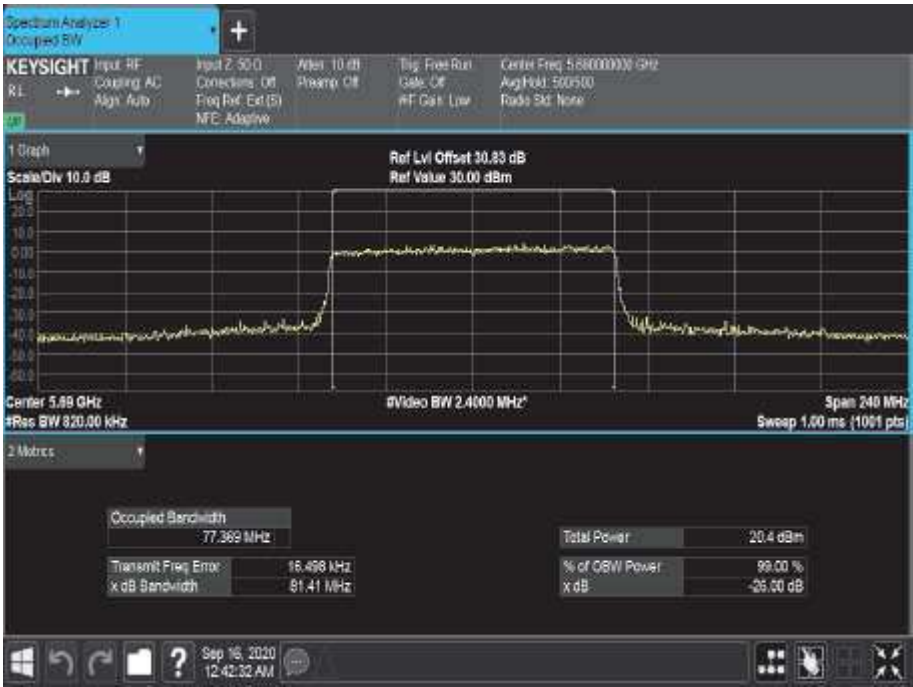


Figure 864 - 5690 MHz - 99% Occupied Bandwidth

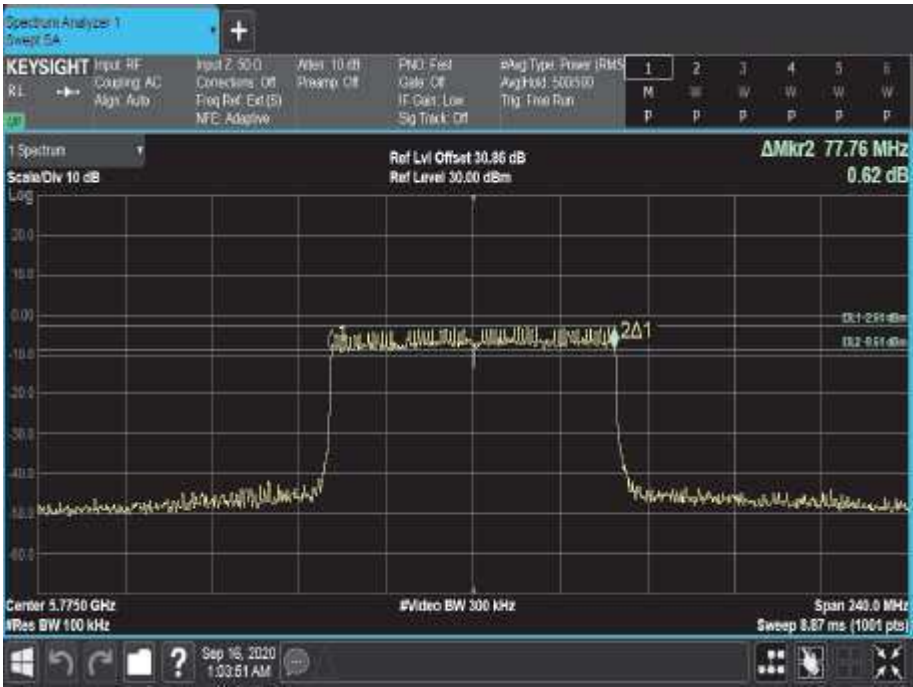


Figure 865 - 5775 MHz - 6 dB DTS Bandwidth

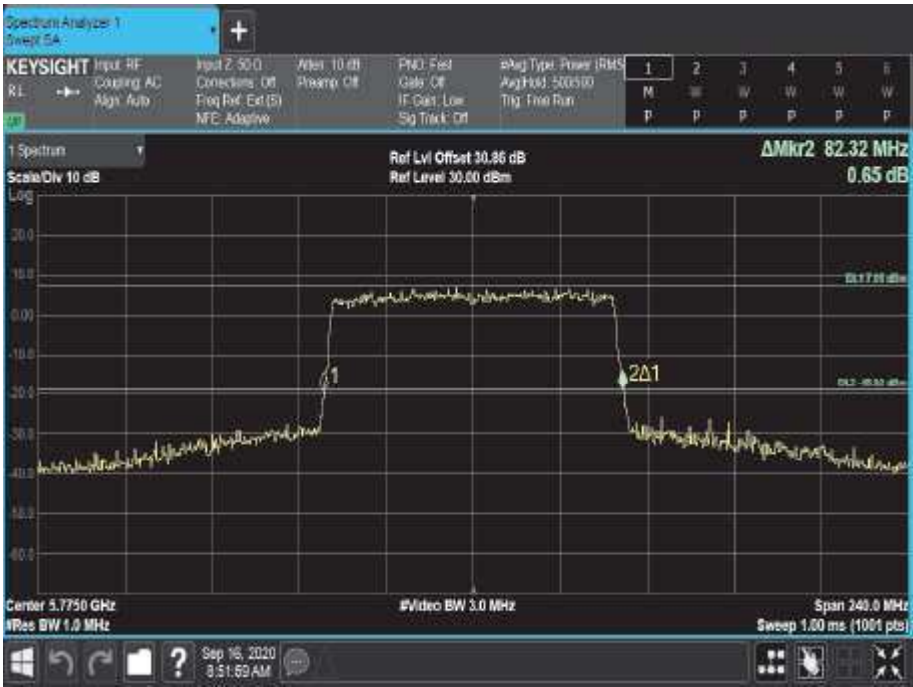


Figure 866 - 5775 MHz - 26 dB Emission Bandwidth

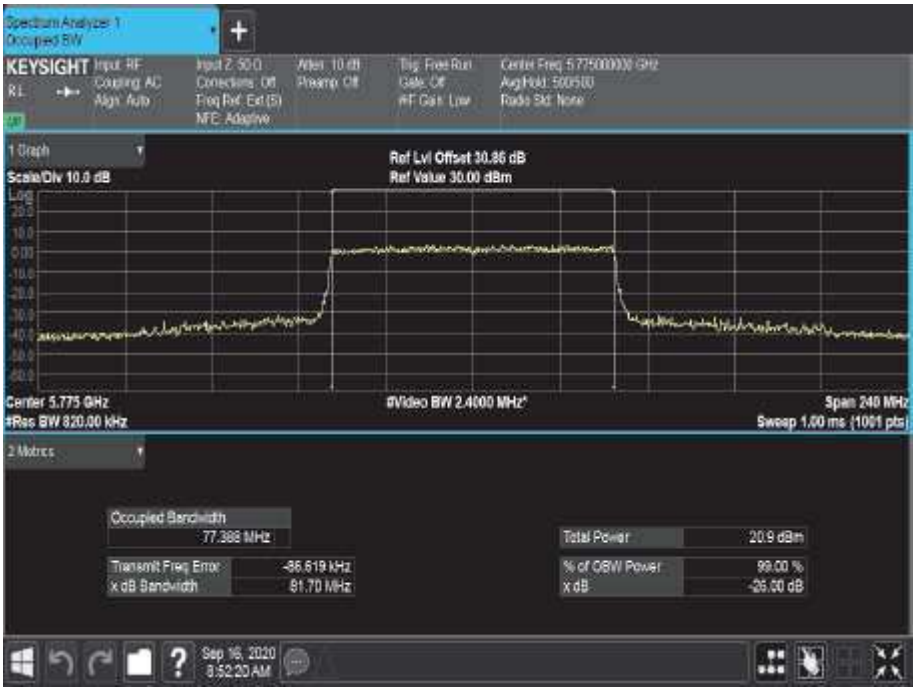


Figure 867 - 5775 MHz - 99% Occupied Bandwidth



Channel	Middle
Frequency (MHz)	5775
6 dB Bandwidth (MHz)	2.640
26 dB Bandwidth (MHz)	19.440
99% Bandwidth (MHz)	18.683

Table 624 - 802.11ax / HE80 MCS7x2 / RU 26-0 / MIMO SDM / Cores 0+1

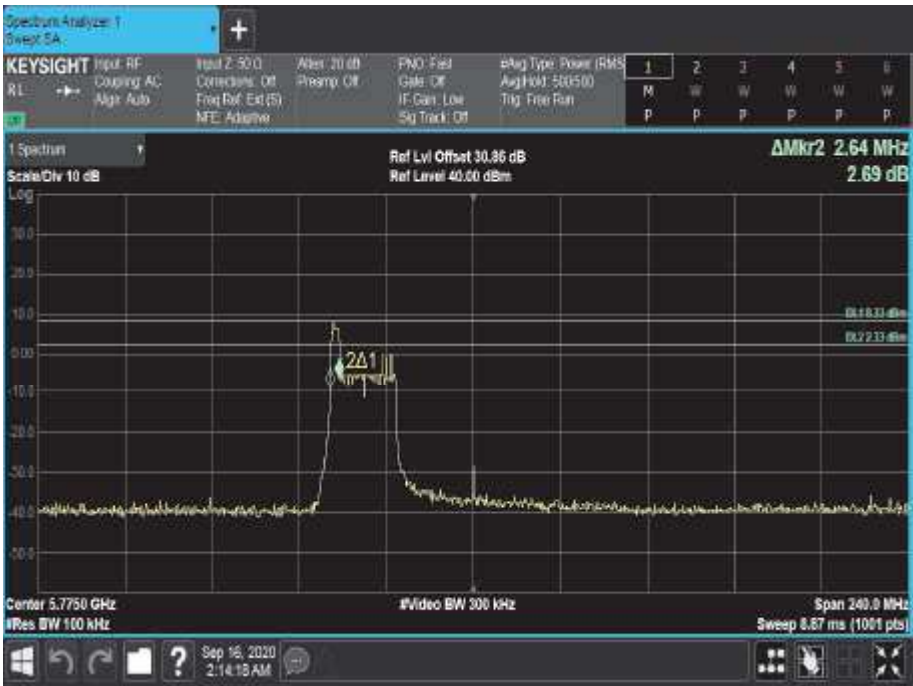


Figure 868 - 5775 MHz - 6 dB DTS Bandwidth

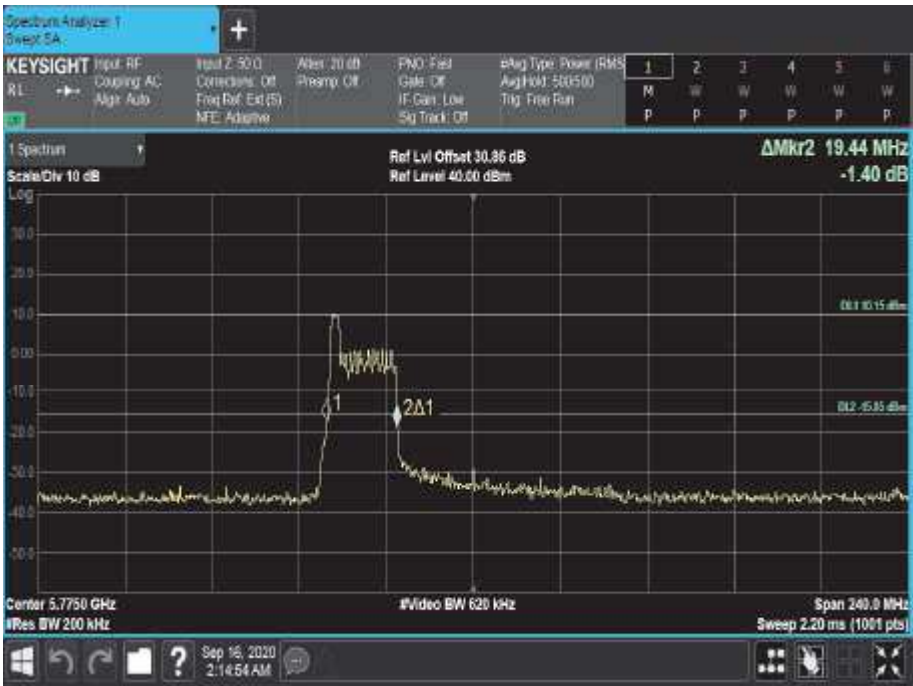


Figure 869 - 5775 MHz - 26 dB Emission Bandwidth

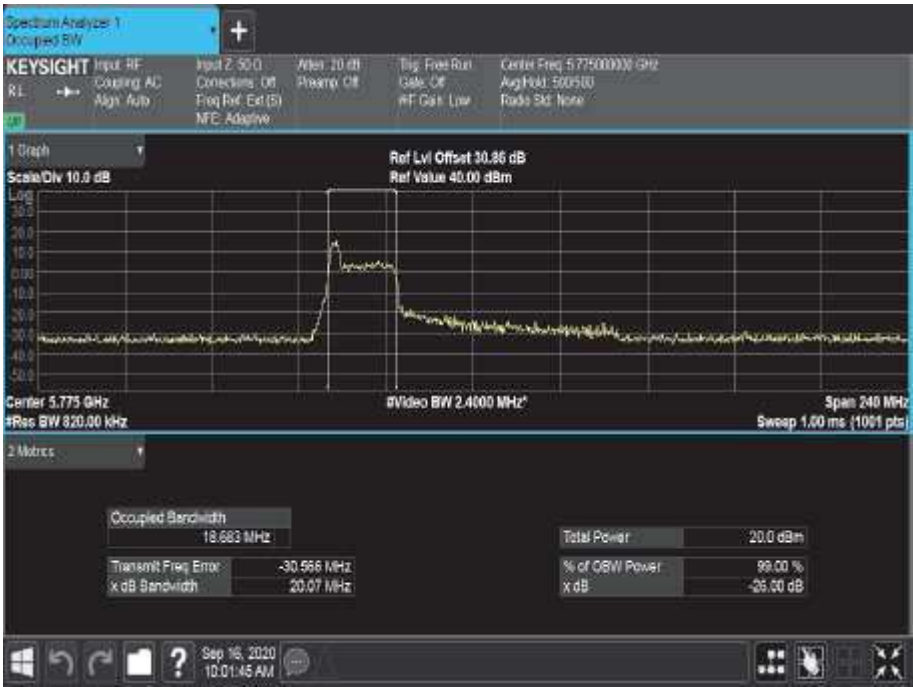


Figure 870 - 5775 MHz - 99% Occupied Bandwidth



Channel	Middle
Frequency (MHz)	5775
6 dB Bandwidth (MHz)	2.400
26 dB Bandwidth (MHz)	19.920
99% Bandwidth (MHz)	18.669

Table 625 - 802.11ax / HE80 MCS7x2 / RU 26-36 / MIMO SDM / Cores 0+1

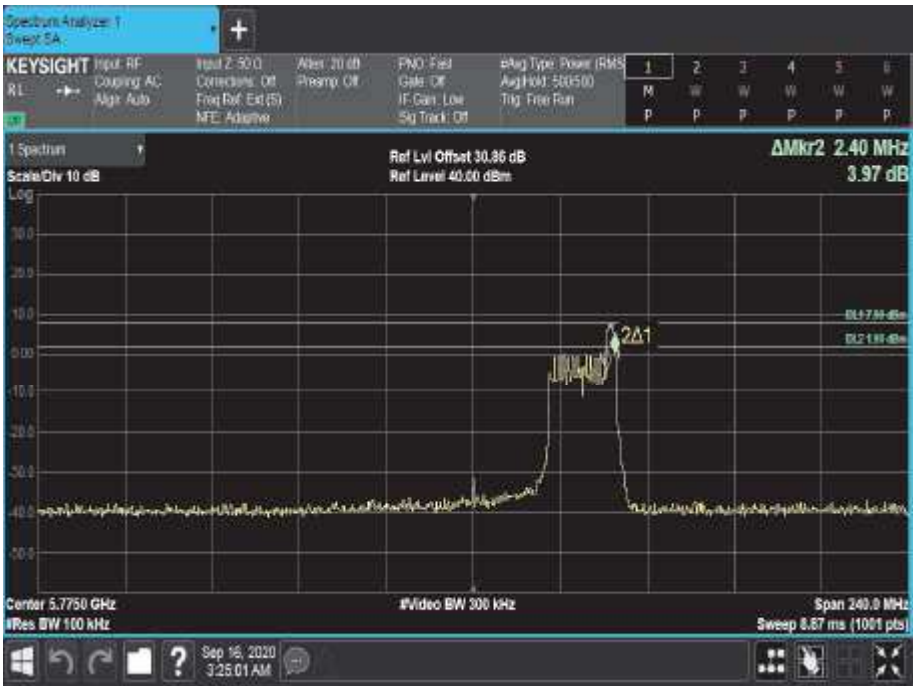


Figure 871 - 5775 MHz - 6 dB DTS Bandwidth

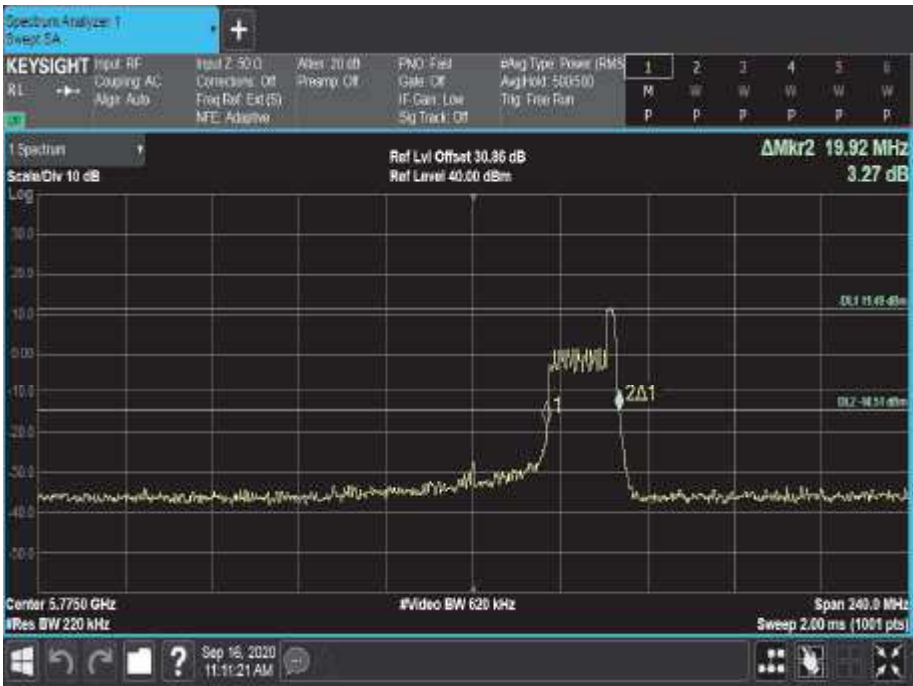


Figure 872 - 5775 MHz - 26 dB Emission Bandwidth

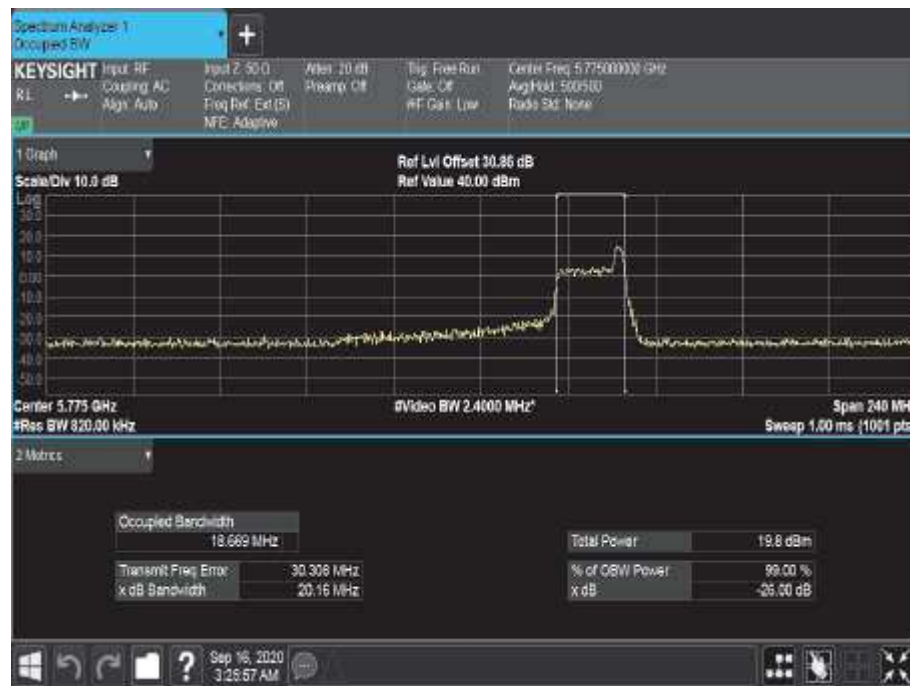


Figure 873 - 5775 MHz - 99% Occupied Bandwidth

FCC Part 15E, Limit Clause 15.407 and Industry Canada RSS-247, Limit Clause 6.2.1.1, 6.2.2.1, 6.2.3.1, 6.2.4.1

5150 MHz to 5250 MHz: None specified.
5250 MHz to 5350 MHz: None specified.
5470 MHz to 5725 MHz: None specified.
5725 MHz to 5850 MHz: > 500 kHz.

ISED RSS-247, Limit Clause 6.2.1.1, 6.2.2.1, 6.2.3.1 and 6.2.4.1

5150 MHz to 5250 MHz: None specified.
5250 MHz to 5350 MHz: None specified.
5470 MHz to 5725 MHz: None specified.
5725 MHz to 5850 MHz: The minimum 6 dB bandwidth shall be at least 500 kHz.



2.3.7 Test Location and Test Equipment Used

This test was carried out in RF Laboratory 1.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
10dB/1W SMA Attenuator DC-18GHz	Sealectro	60-674-1010-89	395	-	O/P Mon
Rubidium Standard	Rohde & Schwarz	XSRM	1316	6	08-Nov-2020
Frequency Standard	Spectracom	SecureSync 1200-0408-0601	4393	6	08-Nov-2020
Attenuator (10dB, 1W)	Sealectro	60-674-1010-89	1224	-	O/P Mon
Attenuator (20dB, 1W)	Sealectro	60-674-1020-89	1520	-	O/P Mon
1800-6000 MHz Power Splitter	Mini-Circuits	ZN2PD-63-S+	4055	-	O/P Mon
Powersplitter - 2 port	Mini-Circuits	ZN2PD-63-S+	4742	12	29-Nov-2020
Powersplitter - 2 port	Mini-Circuits	ZN2PD-63-S+	4743	12	23-Sep-2020
EXA Signal Analyser	Keysight Technologies	N9010B	4968	24	23-Dec-2021
USB Power Sensor	Boonton	RTP5006	5186	12	28-Nov-2020
PowerSplitter, 4 way	Mini-Circuits	ZN4PD1-63-S+	5236	-	O/P Mon
PowerSplitter, 2 way	Mini-Circuits	ZN2PD2-63-S+	5238	-	O/P Mon
USB Power Sensor	Boonton	RTP5006	5280	12	27-Apr-2021
3.5 mm 1m Cable	Junkosha	MWX221-01000DMS	5417	12	22-Jun-2021
3.5 mm 1m Cable	Junkosha	MWX221-01000DMS	5418	12	22-Jun-2021
3.5 mm 2m Cable	Junkosha	MWX221-02000DMS	5425	12	22-Jun-2021
3.5 mm 2m Cable	Junkosha	MWX221-02000DMS	5426	12	22-Jun-2021
Attenuator 5W 10dB DC-18GHz	Aaren	AT40A-4041-D18-10	5493	12	14-Apr-2021
MXA Signal Analyser	Keysight Technologies	N9020B	5529	24	04-Mar-2022
Attenuator 2W 10dB DC-10GHz	Telegartner	J01156A0031	5576	-	O/P Mon
Attenuator 2W 10dB DC-10GHz	Telegartner	J01156A0031	5580	-	O/P Mon
Multimeter	Iso-tech	IDM101	2424	12	12-Dec-2020
Hygrometer	Rotronic	I-1000	3220	12	25-Sep-2020
AC Programmable Power Supply	iTech	IT7324	5225	-	O/P Mon

Table 626

O/P Mon – Output Monitored using calibrated equipment



2.4 Authorised Band Edges

2.4.1 Specification Reference

FCC 47 CFR Part 15E, Clause 15.407 (b)
ISED RSS-247, Clause 6.2

2.4.2 Equipment Under Test and Modification State

A2337, S/N: C02D200EQ9MQ – Modulation State 0

2.4.3 Date of Test

02-August-2020 to 19-August-2020

2.4.4 Test Method

The test was performed in accordance with ANSI C63.10, clause 12.7.

For U-NII-2C channels, the limit line on the following plots equated to -27 dBm/MHz. EIRP and was converted to field strength at 3 m using the following formula:

Field Strength (dBµV/m at 3 m) = EIRP (dBm) + 95.2 dB

Authorised band edge measurements were performed, with the device operating in SISO and MIMO configurations, across the various modes supported by the device.

The measurements displayed within this report, have been limited to those modes which have been shown to be worst case.

Further measurements are held on file by TÜV SÜD and are available if required.

2.4.5 Environmental Conditions

Ambient Temperature	20.7-24.4 °C
Relative Humidity	45.0-70.0 %



2.4.6 Test Results

5 GHz WLAN

Mode	Data Rate MCS	Resource size	Resource Index	TX Frequency (MHz)	Band Edge Frequency (MHz)	Level (dBuV/m)
802.11a, Core 1	6 Mbps	-	-	5500	5470	59.19
802.11n, HT20 Core 1	MCS7	-	-	5500	5470	63.70
802.11ax HE20, Core 1	MCS7	SU	-	5500	5470	62.03
802.11ax HE20, Core 1	MCS7	52	37	5500	5470	57.97
802.11a, Core 1	6 Mbps	-	-	5700	5725	60.66
802.11n, HT20 Core 1	MCS7	-	-	5700	5725	63.20
802.11ax HE20, Core 1	MCS7	SU	-	5700	5725	63.29
802.11ax HE20, Core 1	MCS7	52	40	5700	5725	60.53
802.11a, Core 1	6 Mbps	-	-	5745	5725	58.15
802.11n HT 20, Core 1	MCS7	-	-	5745	5725	59.20
802.11ax HE20, Core 1	MCS7	SU	-	5745	5725	58.48
802.11ax HE20, Core 1	MCS7	26	0	5745	5725	55.80
802.11a, Core 1	6 Mbps	-	-	5825	5850	59.87
802.11n HT 20, Core 1	MCS7	-	-	5825	5850	59.60
802.11ax HE20, Core 1	MCS7	SU	-	5825	5850	59.00
802.11ax HE20, Core 1	MCS7	26	8	5825	5850	56.14

Table 627 – SISO Authorised Band Edge results

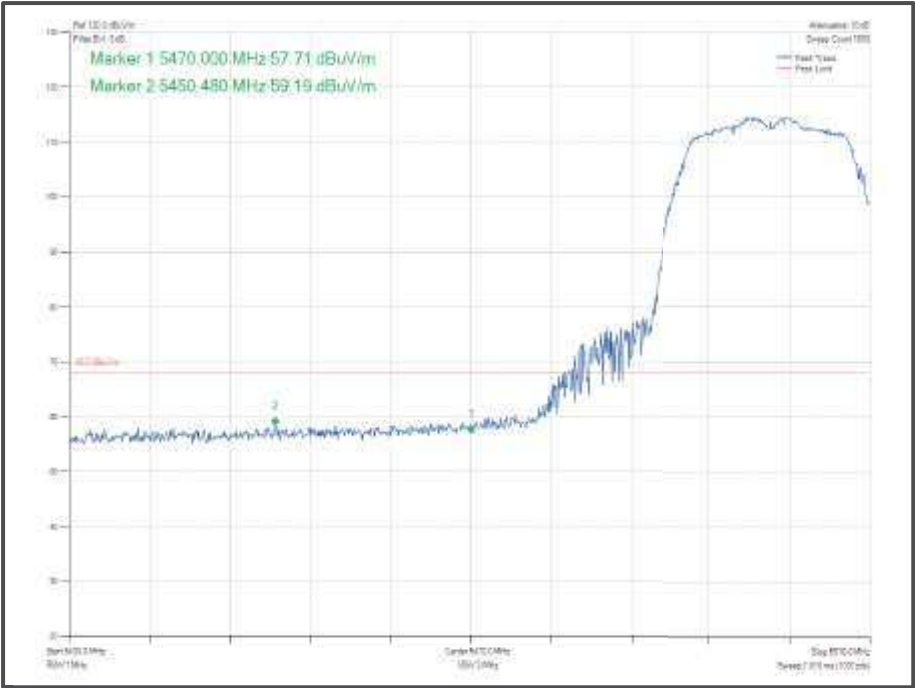


Figure 874 – 802.11 a, Core 1 – 5500 MHz
Band Edge Frequency 5470 MHz

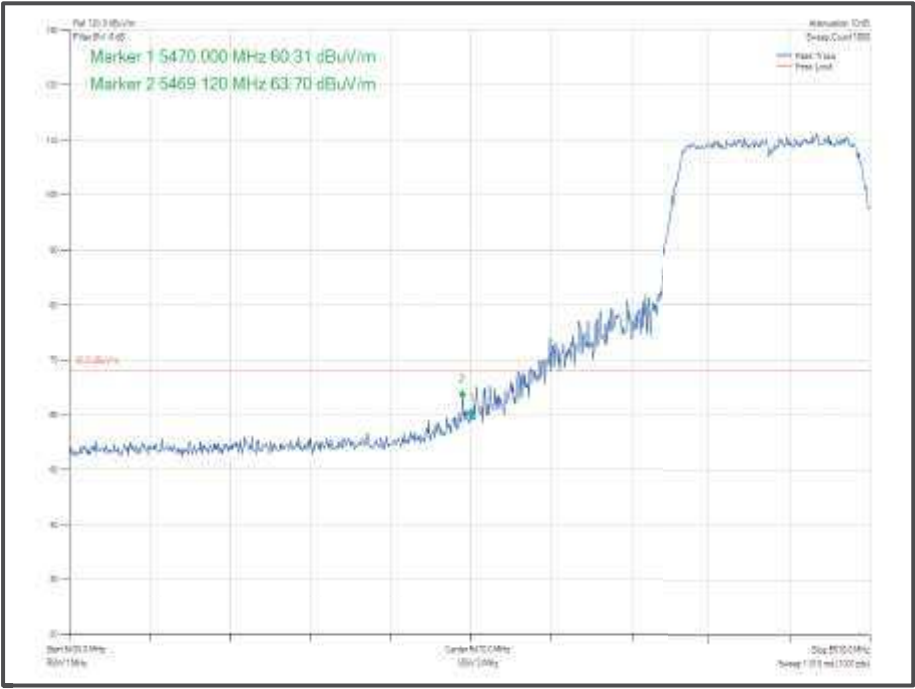


Figure 875 – 802.11 n HT20, Core 1 – 5500 MHz
Band Edge Frequency 5470 MHz

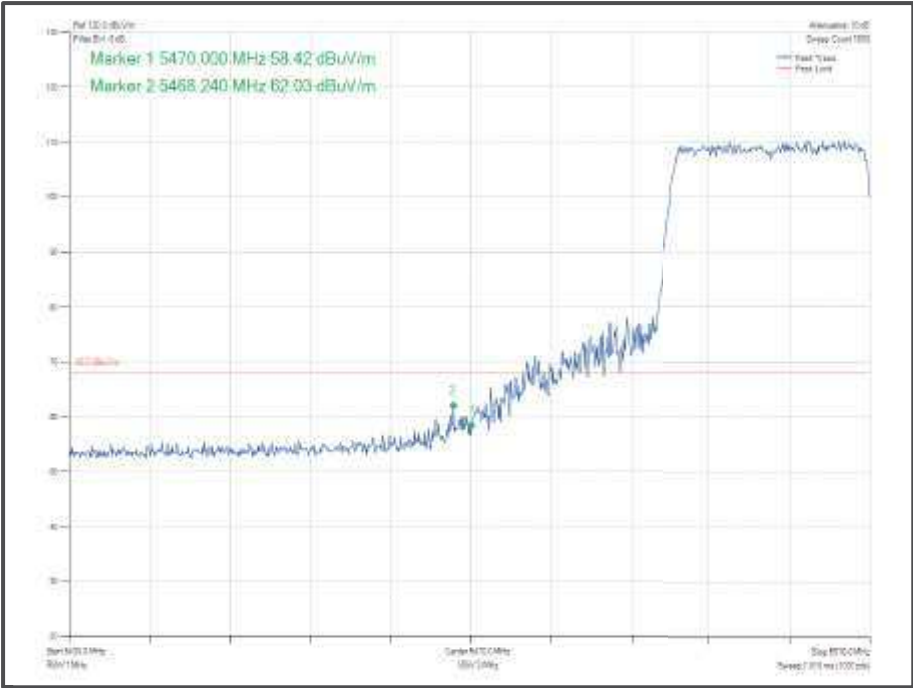


Figure 876- 802.11ax HE20, Core 1, SU – 5500 MHz
Band Edge Frequency 5470 MHz

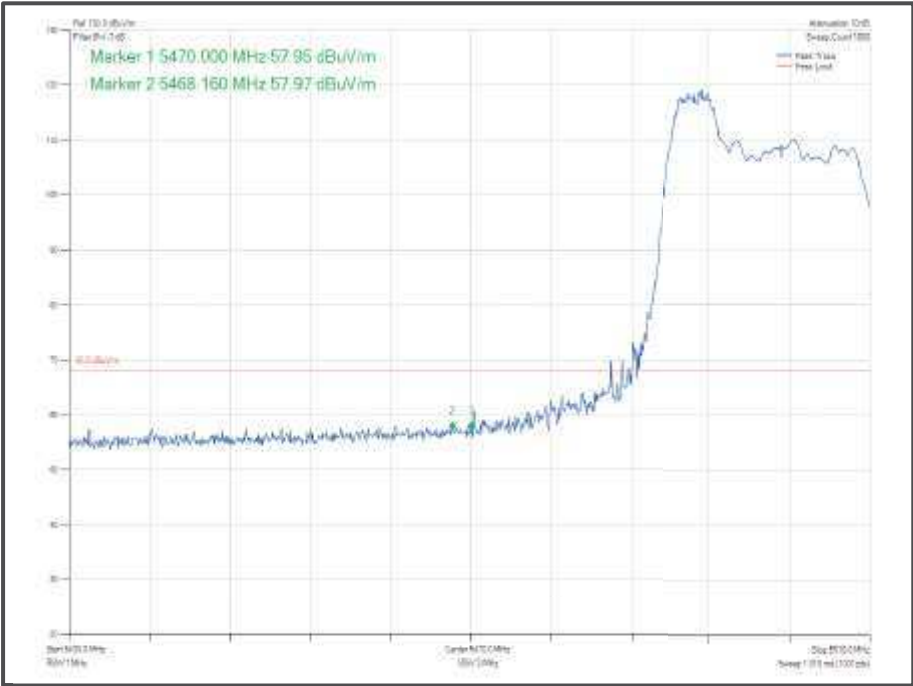


Figure 877- 802.11ax HE20, Core 1, 52-37- 5500 MHz
Band Edge Frequency 5470 MHz

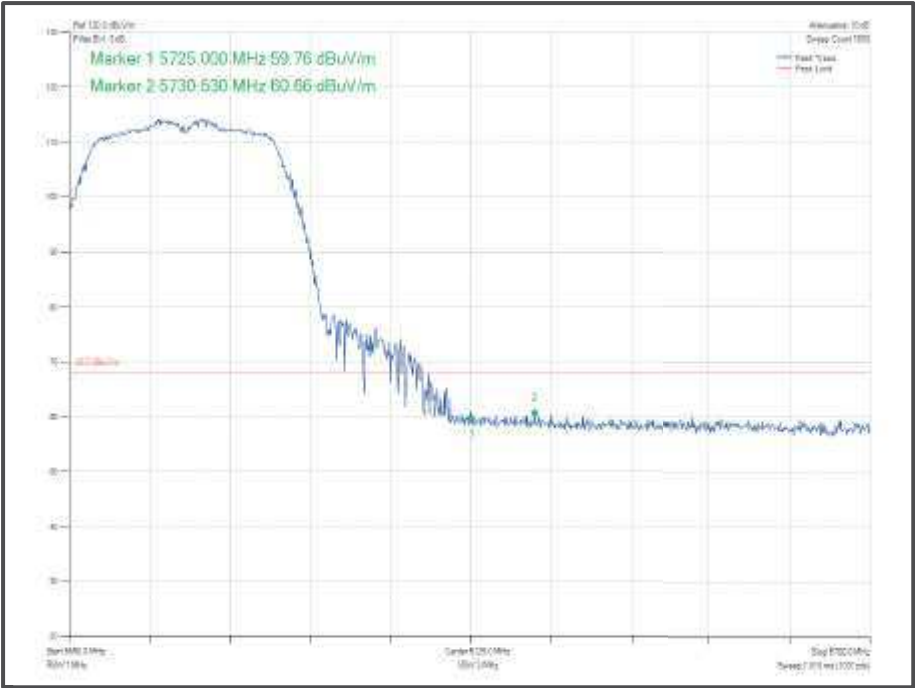


Figure 878 – 802.11 a, Core 1 – 5700 MHz
Band Edge Frequency 5725 MHz

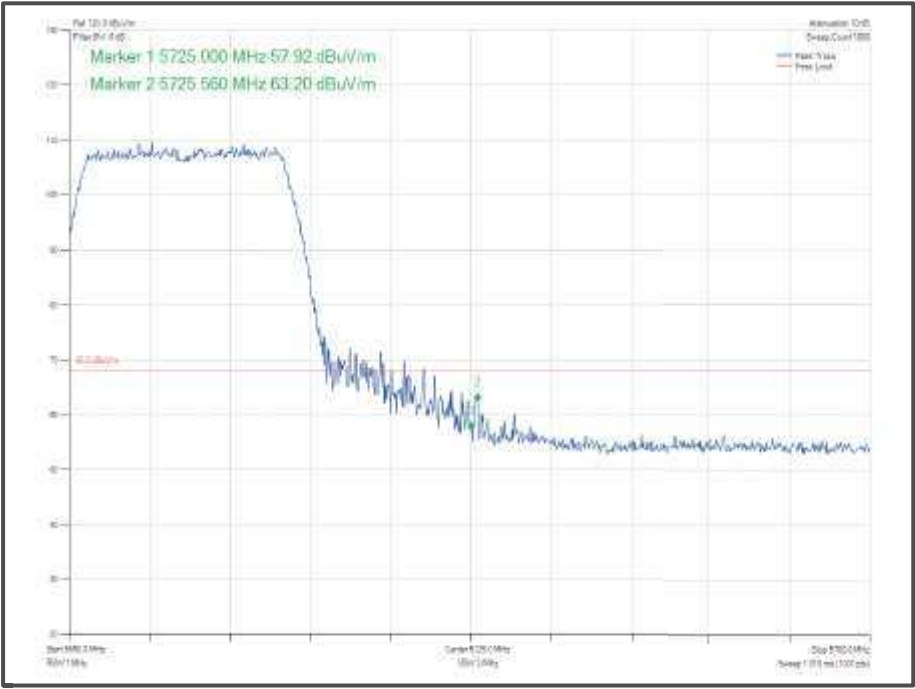


Figure 879 – 802.11 n HT20, Core 1 – 5700 MHz
Band Edge Frequency 5725 MHz

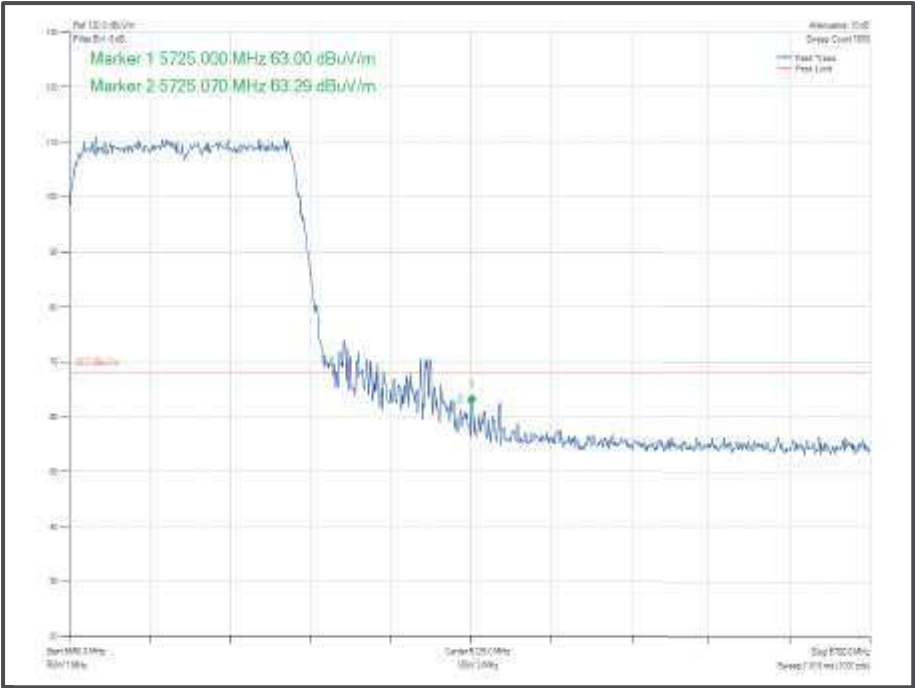


Figure 880- 802.11ax HE20, Core 1, SU – 5700 MHz
Band Edge Frequency 5725 MHz

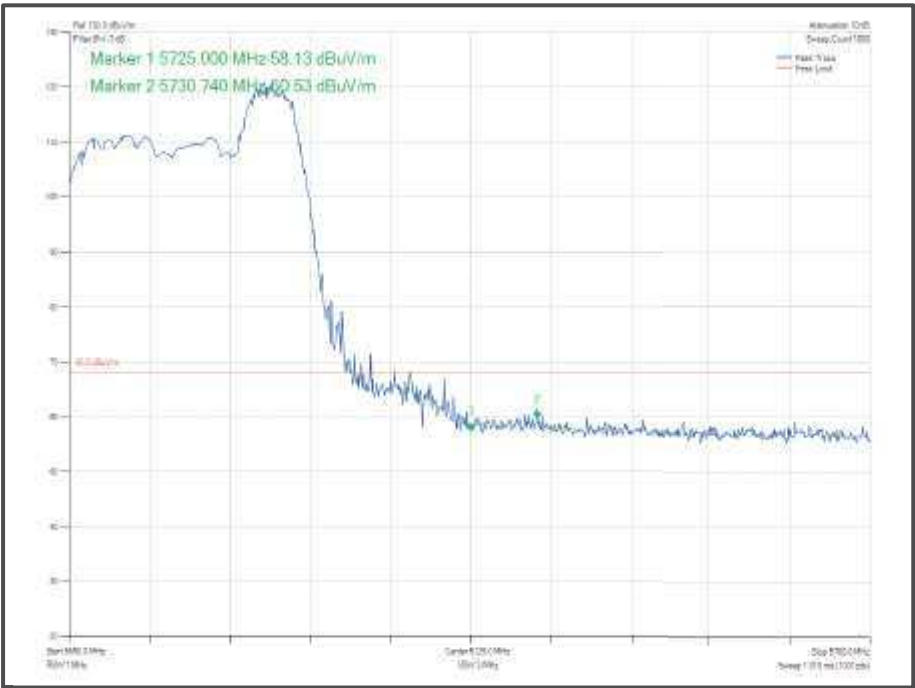


Figure 881- 802.11ax HE20, Core 1, 52-40 – 5700 MHz
Band Edge Frequency 5725 MHz

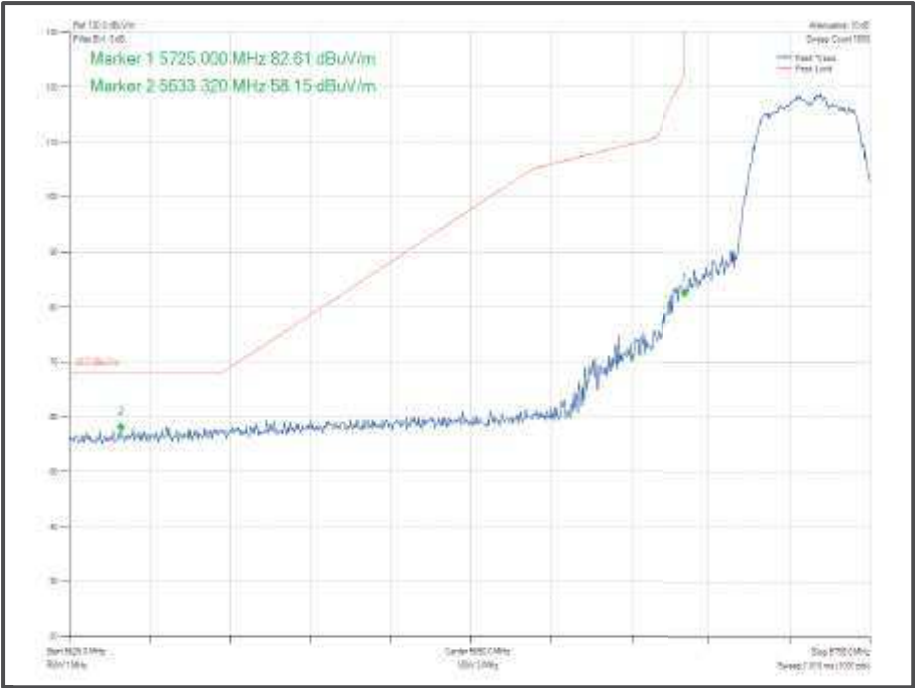


Figure 882 – 802.11 a, Core 1 – 5745 MHz
Band Edge Frequency 5725 MHz

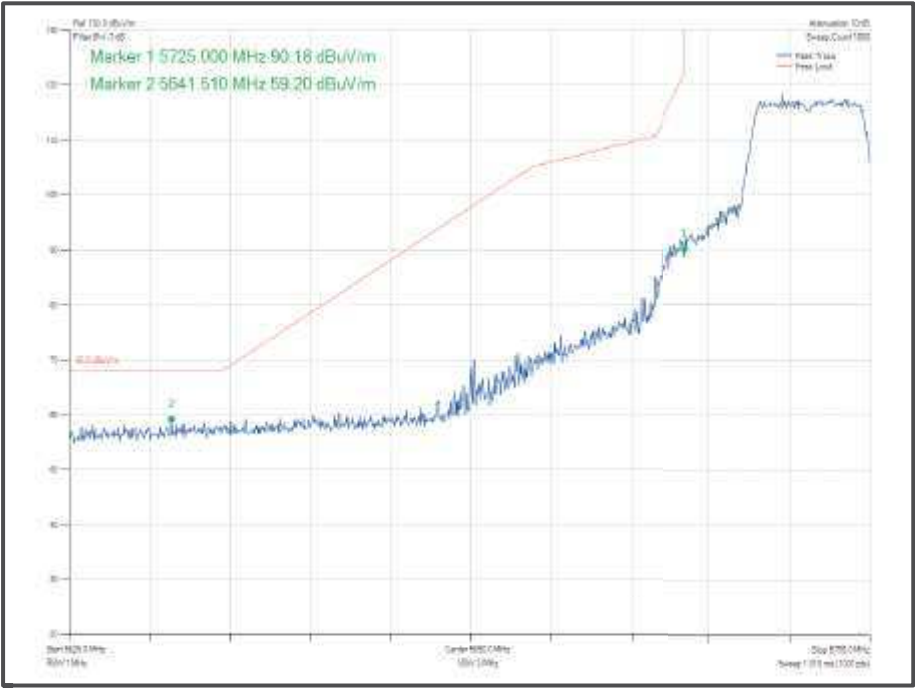


Figure 883 – 802.11 n HT20, Core 1 – 5745 MHz
Band Edge Frequency 5725 MHz

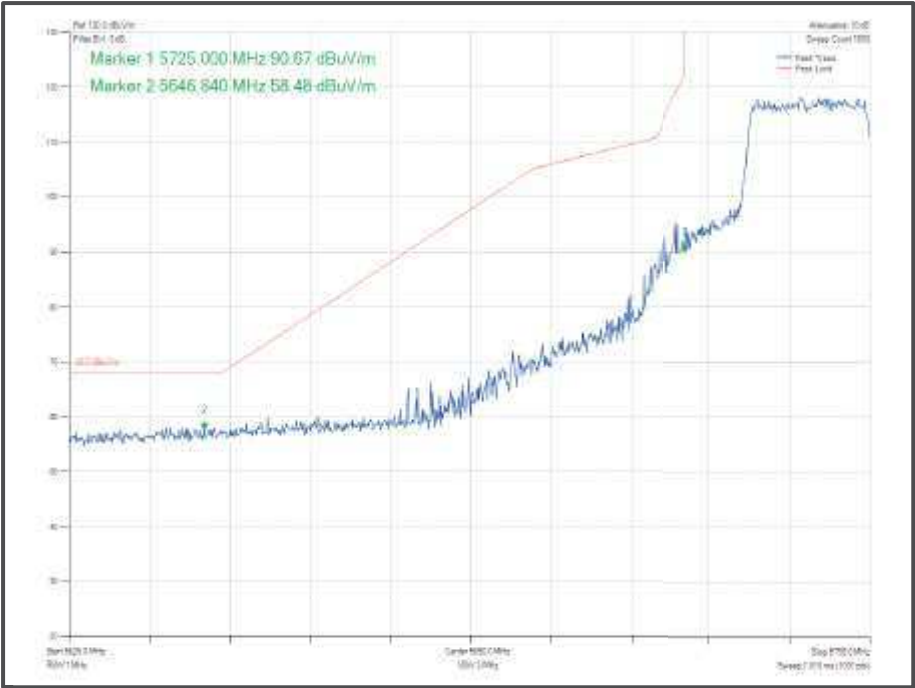


Figure 884- 802.11ax HE20, Core 1, SU – 5745 MHz
Band Edge Frequency 5735 MHz

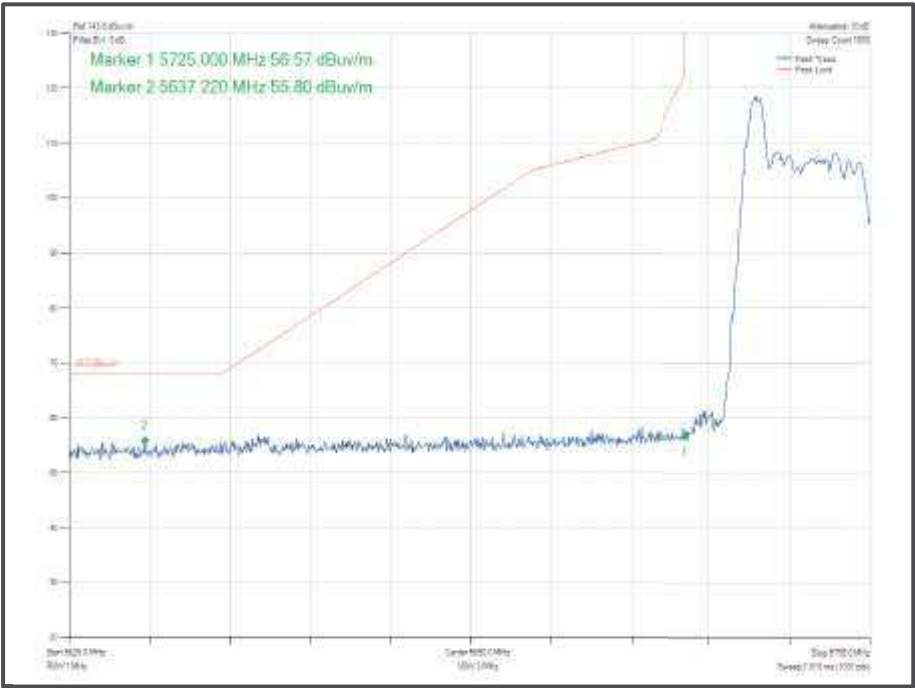


Figure 885- 802.11ax HE20, Core 1, 26-0 – 5745 MHz
Band Edge Frequency 5735 MHz

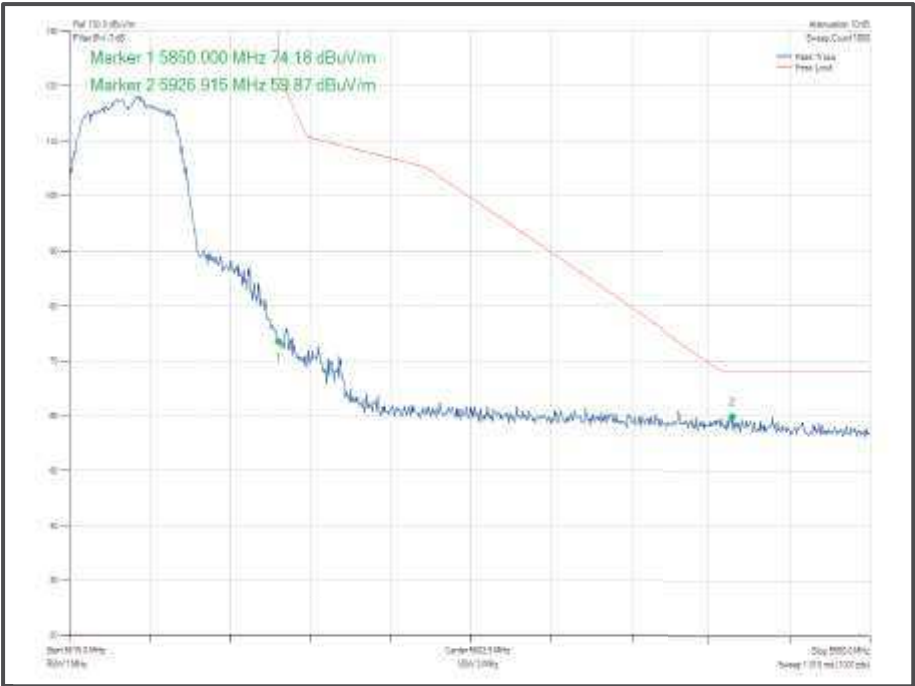


Figure 886 – 802.11 a, Core 1, - 58.25 MHz
Band Edge Frequency 5850 MHz

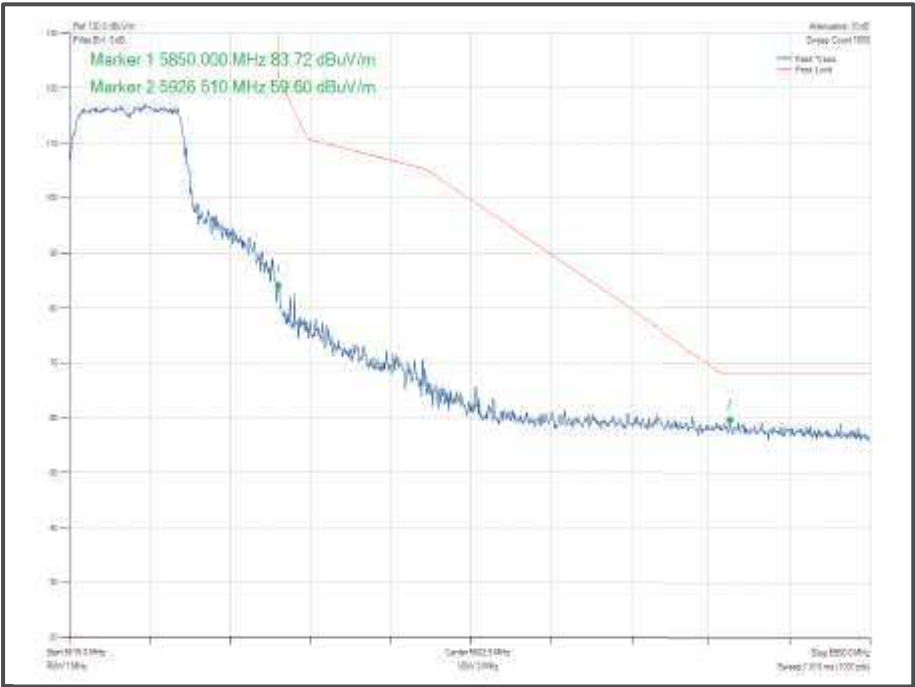


Figure 887 – 802.11 n HT20, Core 1 – 58.25 MHz
Band Edge Frequency 5850 MHz

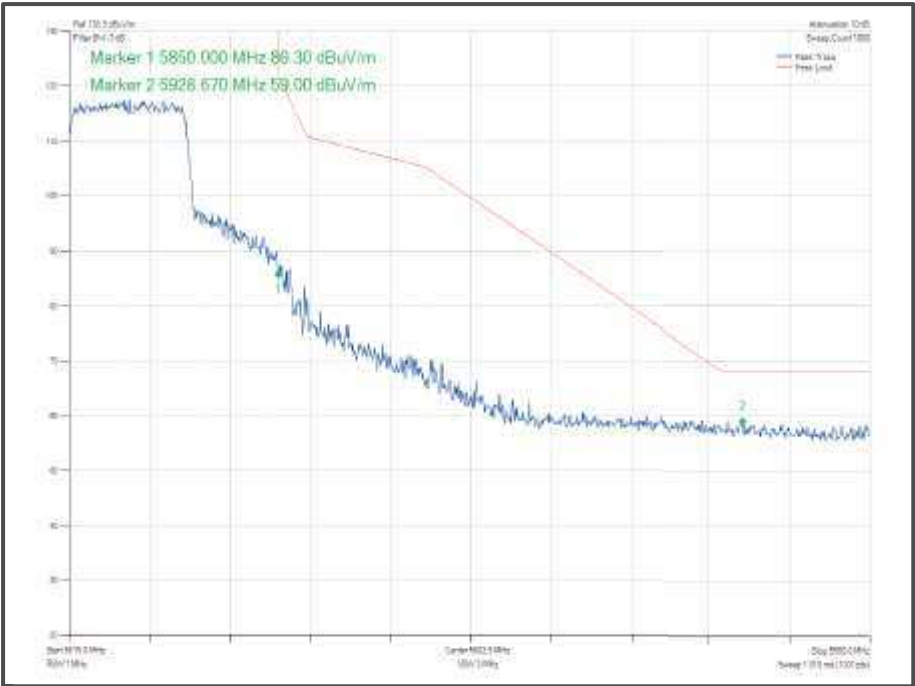


Figure 888- 802.11ax HE20, Core 1, SU – 5825 MHz
Band Edge Frequency 5850 MHz

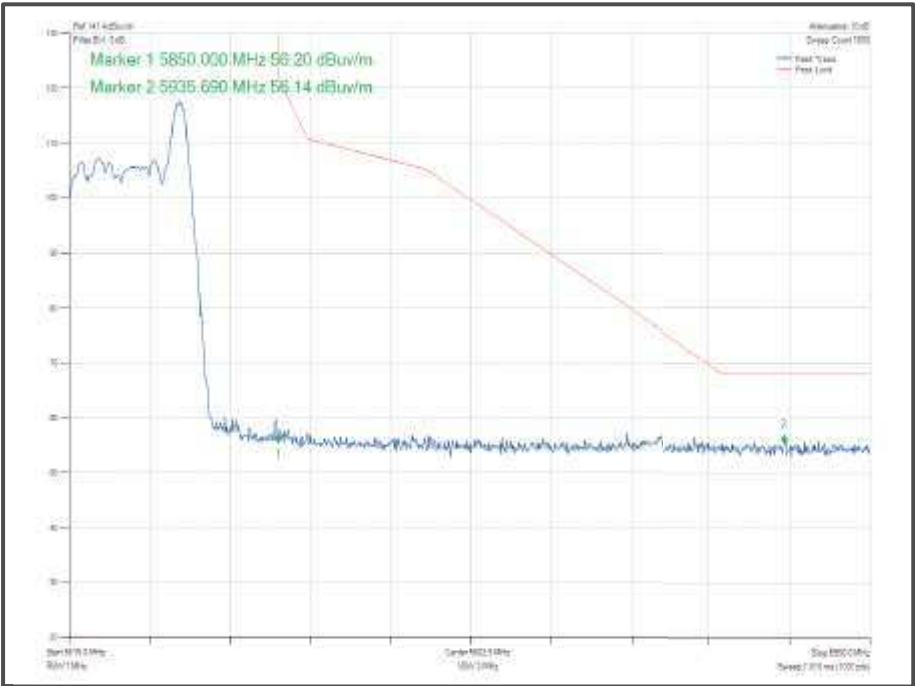


Figure 889- 802.11ax HE20, Core 1, 26-8 – 5825 MHz
Band Edge Frequency 5850 MHz



Mode	Data Rate/ MCS	Resource size	Resource Index	TX Frequency (MHz)	Band Edge Frequency (MHz)	Level (dBuV/m)
802.11n HT 20 CDD, Cores 0-1	MCS7	-	-	5500	5470	63.13
802.11n HT 20 SDM, Cores 0-1	MCS15	-	-	5500	5470	62.80
802.11ax HE20 CDD, Cores 0-1	MCS7	SU	-	5500	5470	58.60
802.11ax HE20 CDD, Cores 0-1	MCS7	52	37	5500	5470	57.14
802.11ax HE20 SDM, Cores 0-1	MCS7	SU	-	5500	5470	58.24
802.11ax HE20 SDM, Cores 0-1	MCS7	52	37	5500	5470	56.08
802.11n HT 20 CDD, Cores 0-1	MCS7	-	-	5700	5725	63.02
802.11n HT 20 SDM, Cores 0-1	MCS15	-	-	5700	5725	63.48
802.11ax HE20 CDD, Cores 0-1	MCS7	SU	-	5700	5725	59.32
802.11ax HE20 CDD, Cores 0-1	MCS7	52	40	5700	5725	59.91
802.11ax HE20 SDM, Cores 0-1	MCS7	SU	-	5700	5725	60.25
802.11ax HE20 SDM, Cores 0-1	MCS7	52	40	5700	5725	56.75
802.11n HT 20 CDD, Cores 0-1	MCS7	-	-	5745	5725	59.22
802.11n HT 20 SDM, Cores 0-1	MCS15	-	-	5745	5725	60.44
802.11ax HE20 CDD, Cores 0-1	MCS7	SU	-	5745	5725	58.46
802.11ax HE20 CDD, Cores 0-1	MCS7	26	0	5745	5725	55.97
802.11ax HE20 SDM, Cores 0-1	MCS7	SU	-	5745	5725	58.66
802.11ax HE20 SDM, Cores 0-1	MCS7	26	0	5745	5725	54.35
802.11n HT 20 CDD, Cores 0-1	MCS7	-	-	5825	5850	60.33
802.11n HT 20 SDM, Cores 0-1	MCS15	-	-	5825	5850	60.37
802.11ax HE20 CDD, Cores 0-1	MCS7	SU	-	5825	5850	60.81
802.11ax HE20 CDD, Cores 0-1	MCS7	26	8	5825	5850	56.85
802.11ax HE20 SDM, Cores 0-1	MCS7	SU	-	5825	5850	60.47
802.11ax HE20 SDM, Cores 0-1	MCS7	26	8	5825	5850	55.27

Table 628 – MIMO 2TX Authorised Band Edge Results

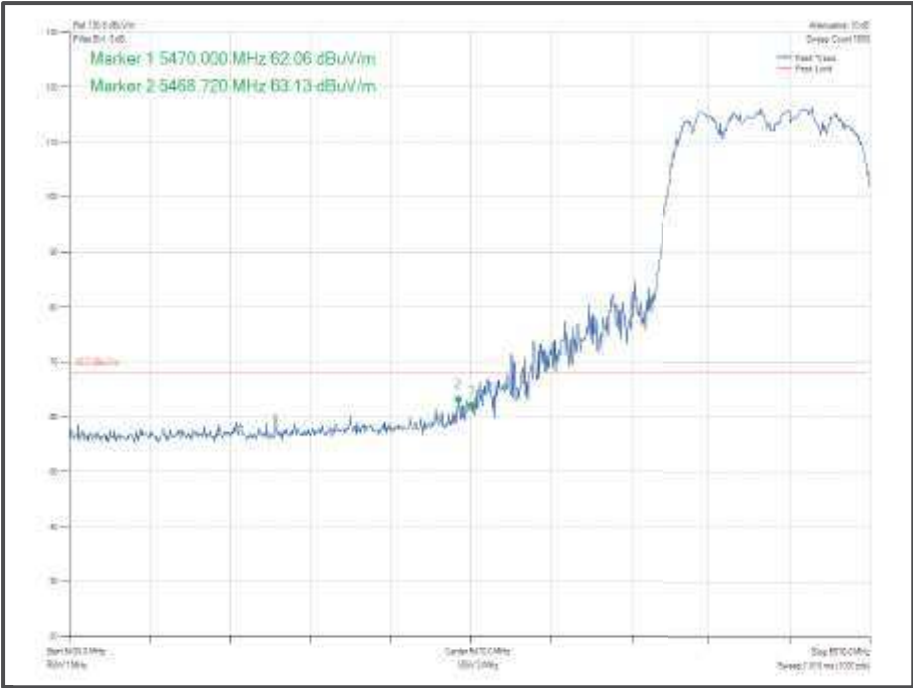


Figure 890 – 802.11 n HT20 CDD, Cores 0-1 – 5500 MHz
Band Edge Frequency 5470 MHz

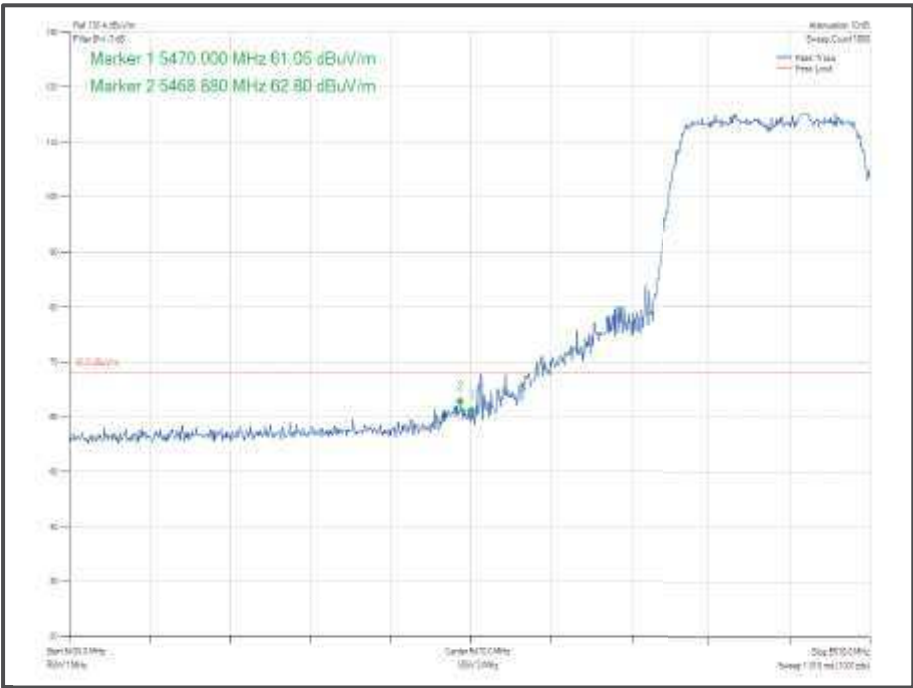


Figure 891 – 802.11 n HT20 SDM, Cores 0-1 – 5500 MHz
Band Edge Frequency 5470 MHz

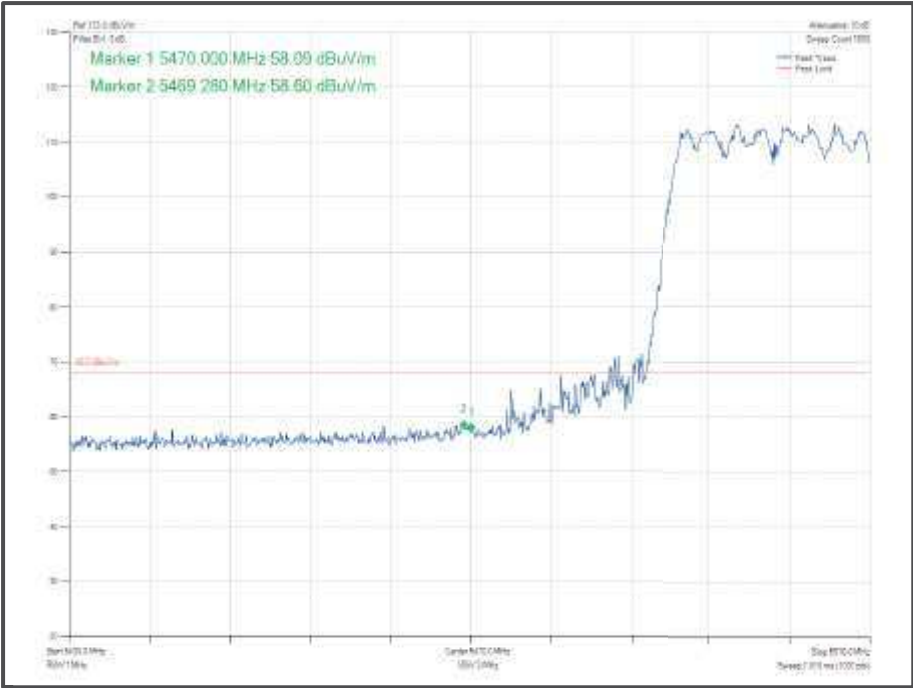


Figure 892 - - 802.11 ax HE20 CDD, Cores 0-1, SU – 5500 MHz
Band Edge Frequency 5470 MHz

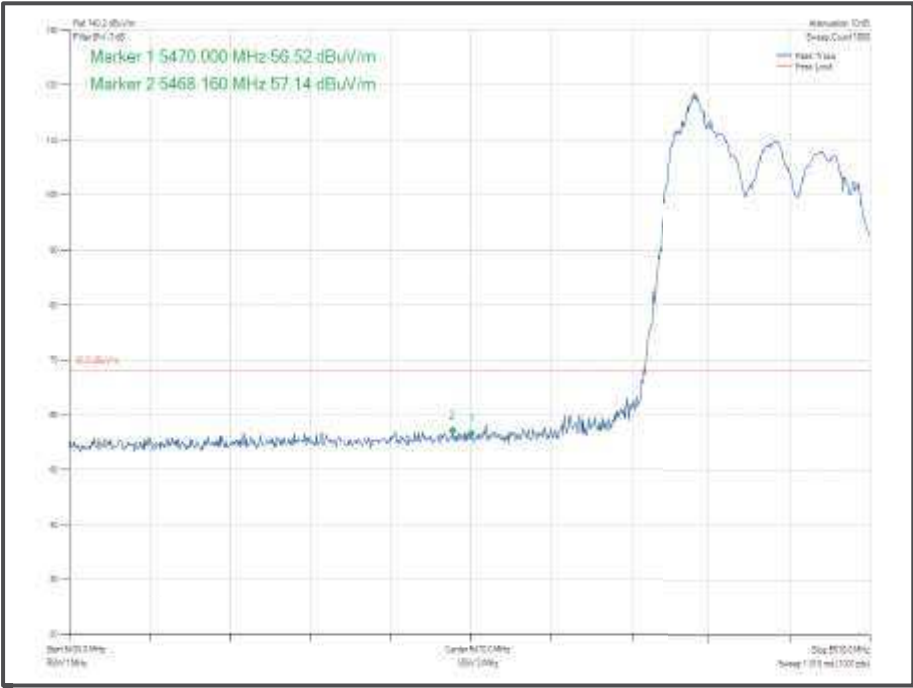


Figure 893 – 802.11 ax HE20 CDD, Cores 0-1 52-37- 5500 MHz
Band Edge Frequency 5470 MHz

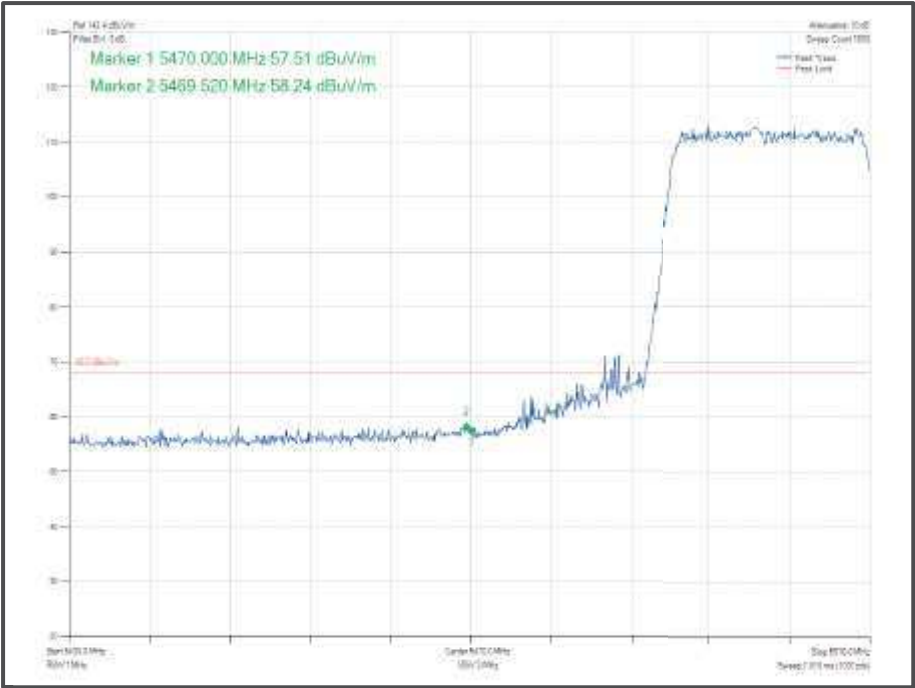


Figure 894 -- 802.11 ax HE20 SDM, Cores 0-1 SU – 5500 MHz
Band Edge Frequency 5470 MHz

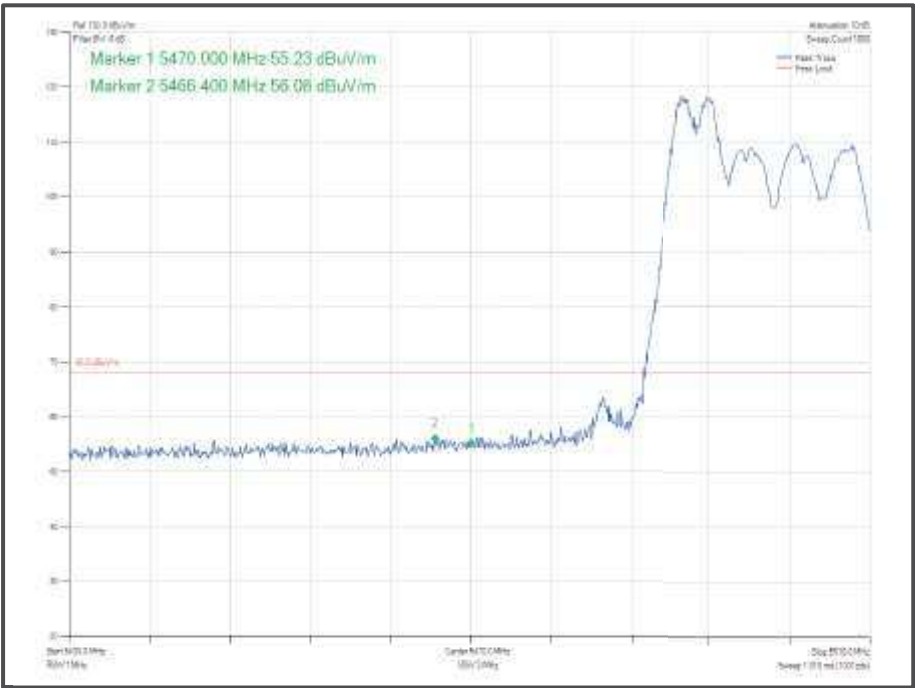


Figure 895 – 802.11 ax HE20 SDM, Cores 0-1 52-37 – 5500 MHz
Band Edge Frequency 5470 MHz

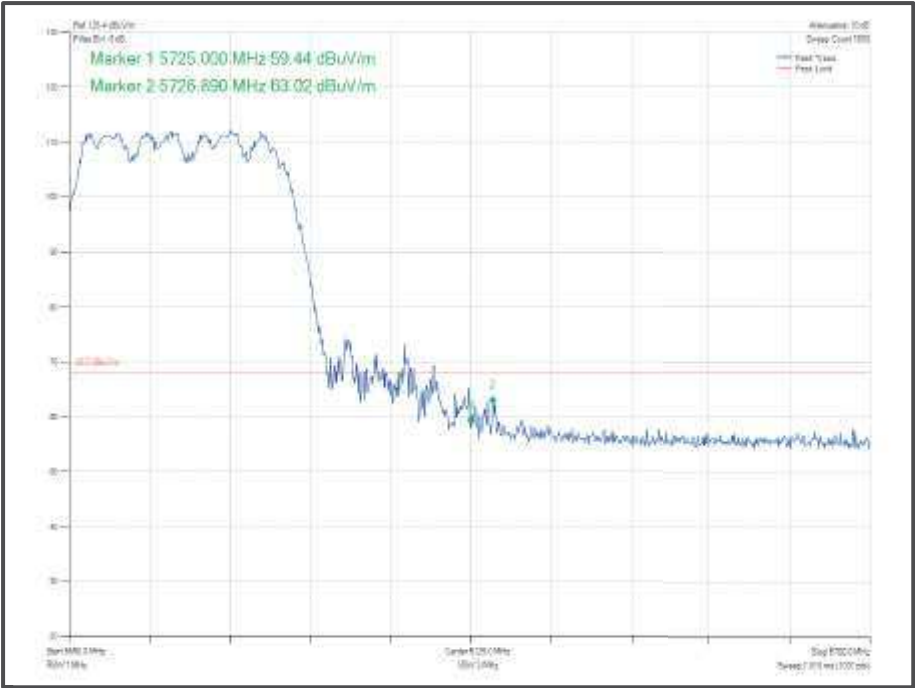


Figure 896 – 802.11n HT20 CDD, Cores 0-1 – 5700 MHz
Band Edge Frequency 5725 MHz

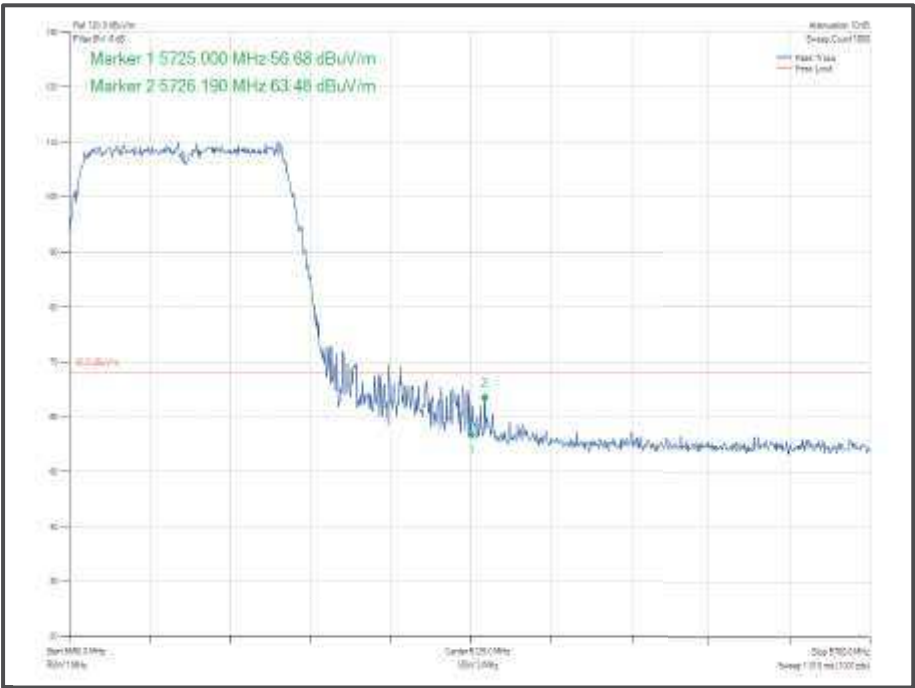


Figure 897 – 802.11n HT 20 SDM, Cores 0-1 – 5700 MHz
Band Edge Frequency 5725 MHz

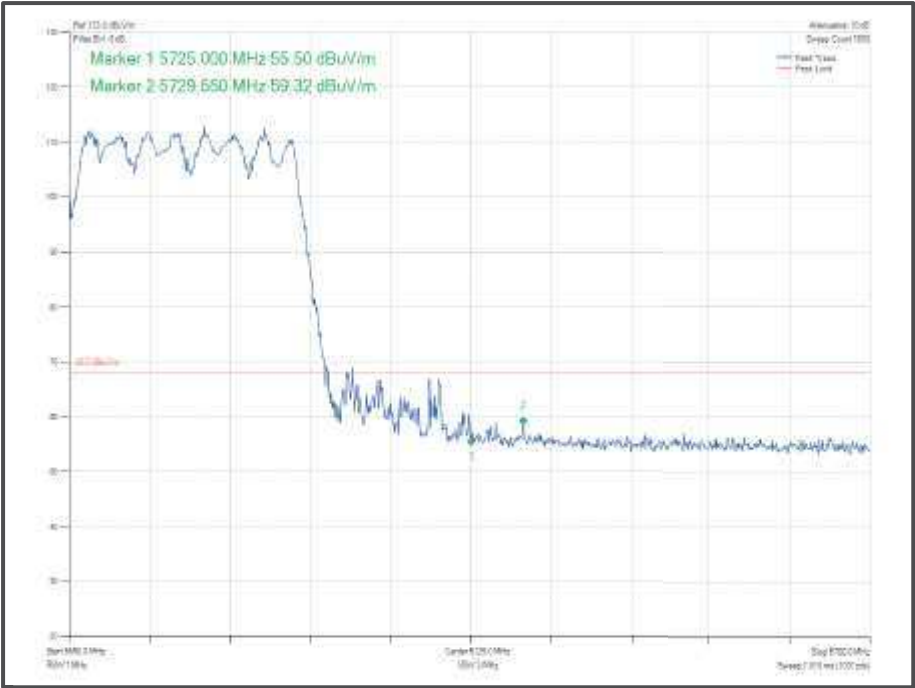


Figure 898 - - 80 2.11 ax HE20 CDD, Cores 0-1, SU – 5700 MHz
Band Edge Frequency 5725 MHz

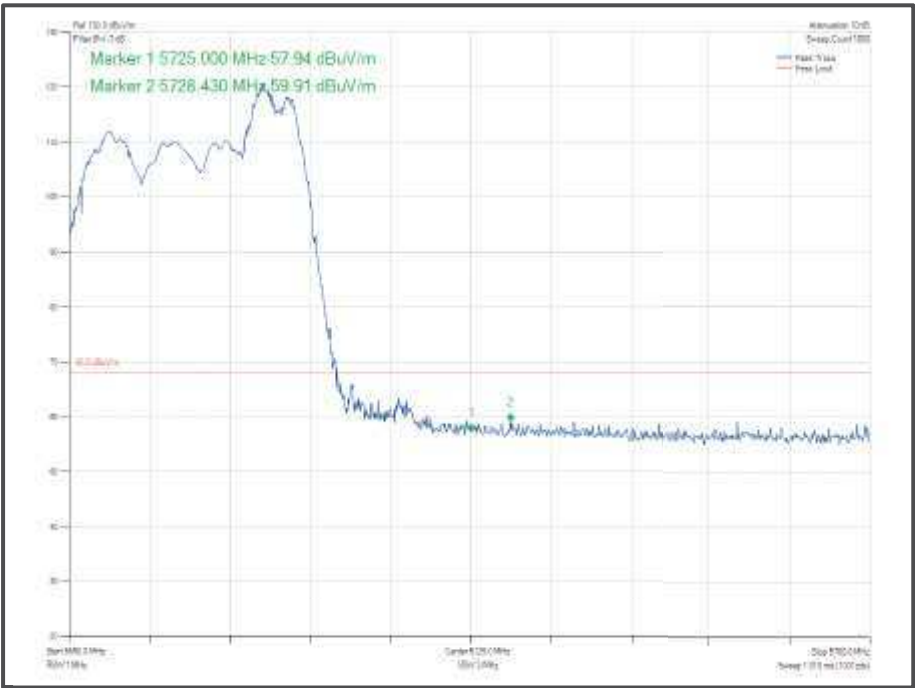


Figure 899 – 802.11 ax HE20 CDD, Cores 0-1, 52-40 – 5700 MHz
Band Edge Frequency 5725 MHz

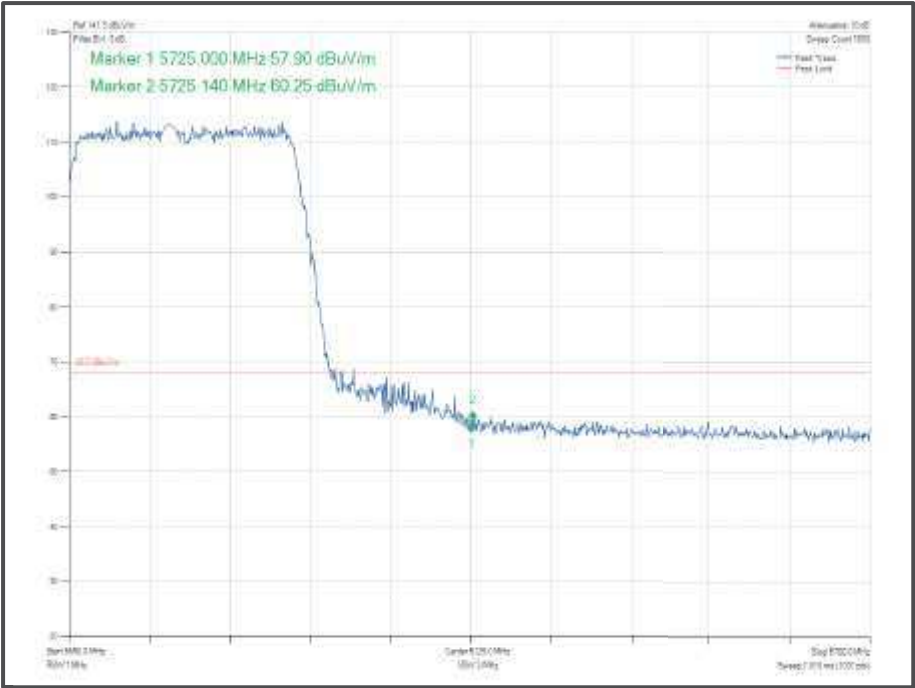


Figure 900 - - 802.11ax HE20 SDM, Cores 0-1, SU – 5700 MHz
Band Edge Frequency 5725 MHz

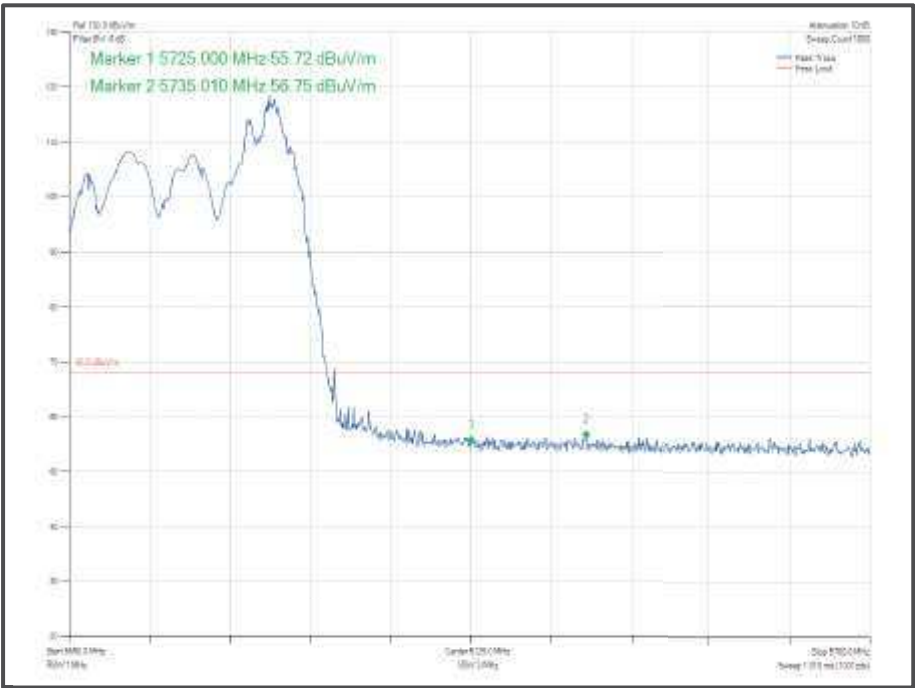


Figure 901 – 802.11ax HE20 SDM, Cores 0-1, 52-40 – 5700 MHz
Band Edge Frequency 5725 MHz

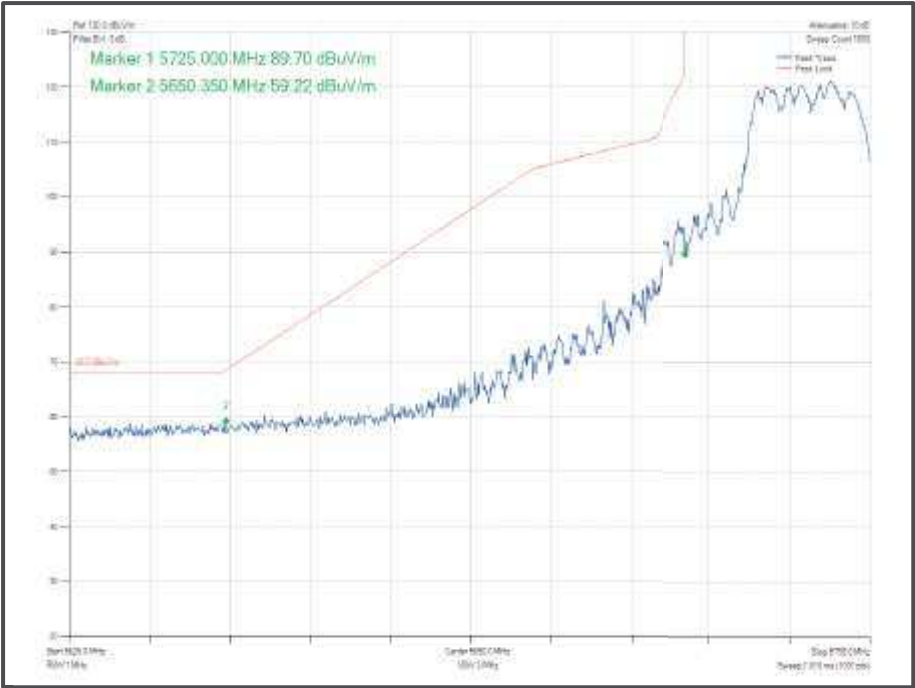


Figure 902 – 802.11n HT20 CDD, Cores 0-1 – 5745 MHz
Band Edge Frequency 5725 MHz

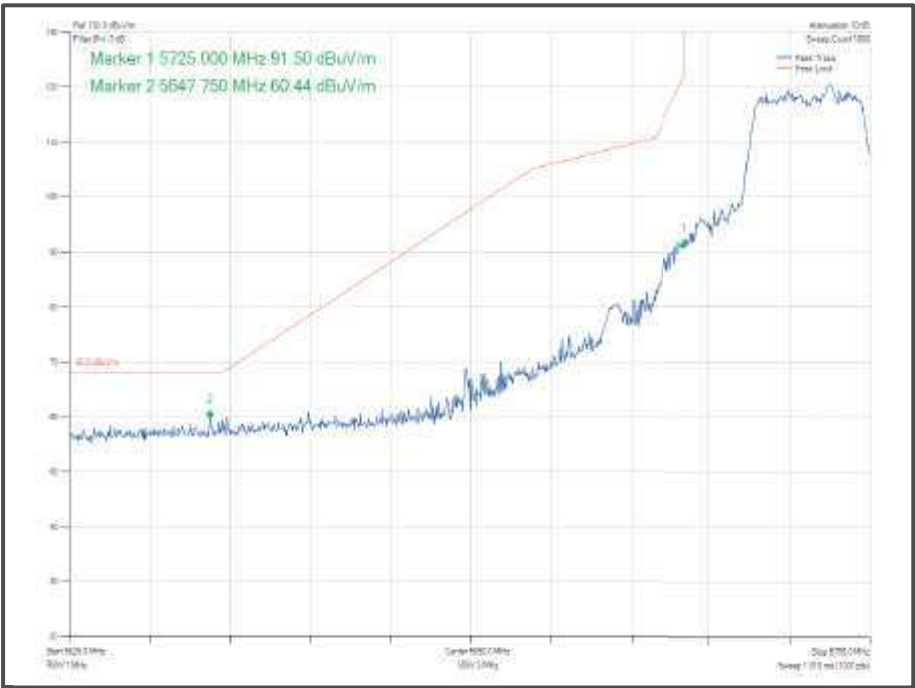


Figure 903 – 802.11n HT20 SDM, Cores 0-1 – 5745 MHz
Band Edge Frequency 5725 MHz

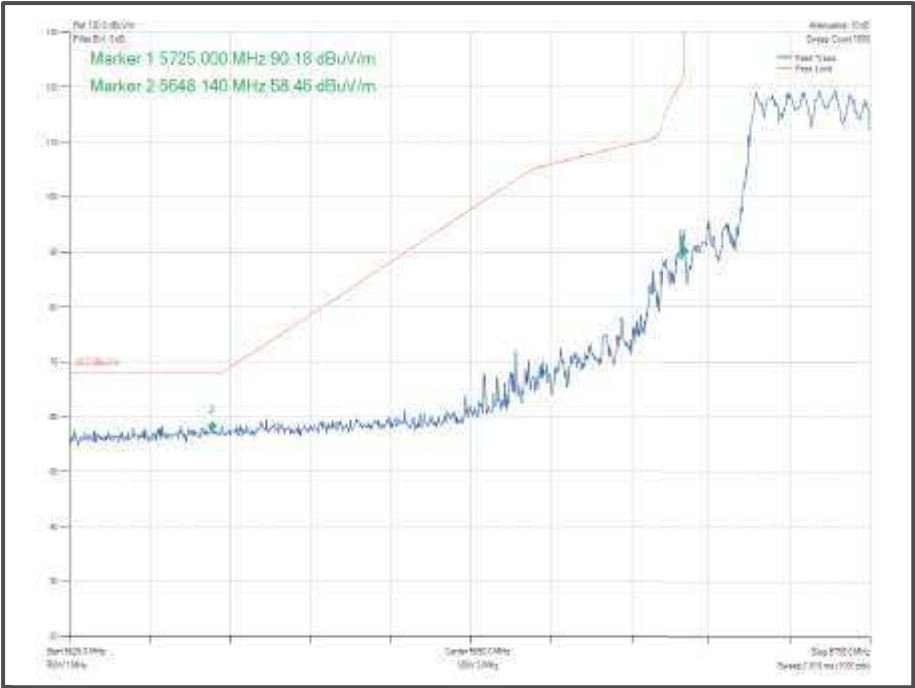


Figure 904 - - 80 2.11 ax HE20 CDD, Cores 0-1, SU – 5745 MHz
Band Edge Frequency 5725 MHz

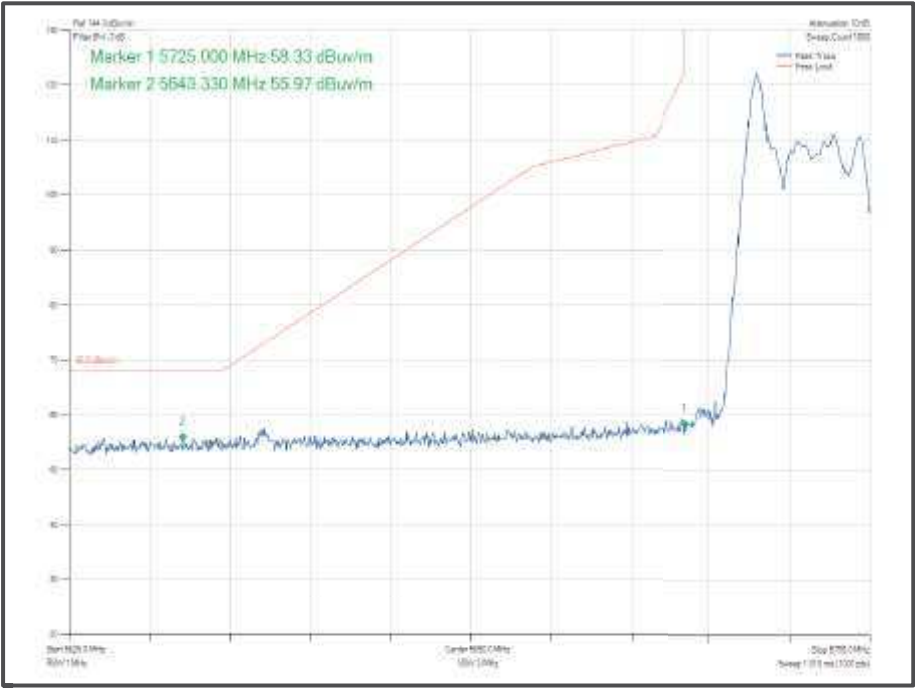


Figure 905 – 802.11 ax HE20 CDD, Cores 0-1, 26-0 – 5745 MHz
Band Edge Frequency 5725 MHz

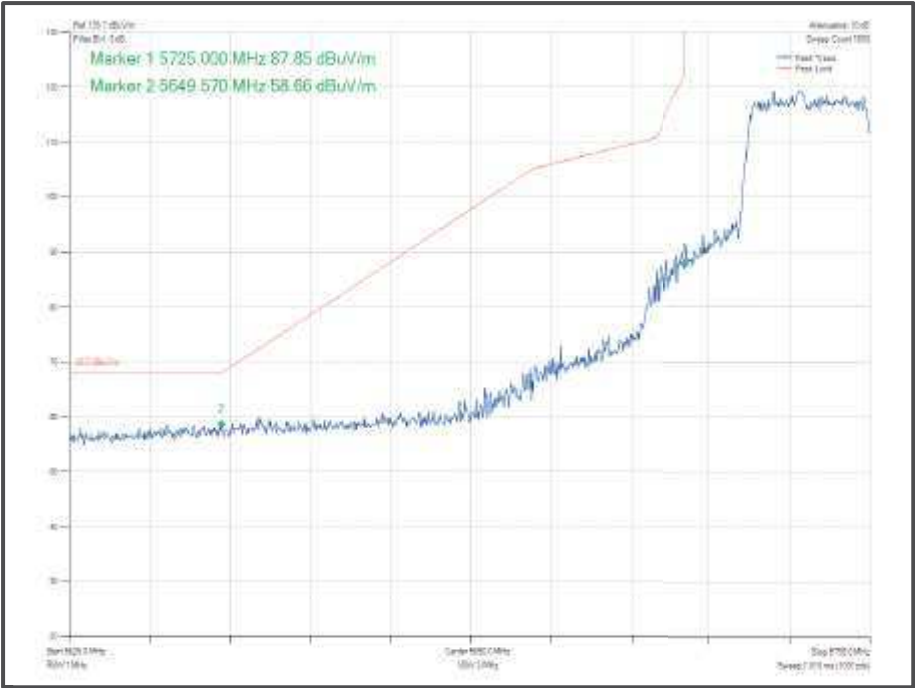


Figure 906 - - 802.11ax HE20 SDM, Cores 0-1, SU – 5745 MHz
Band Edge Frequency 5725 MHz

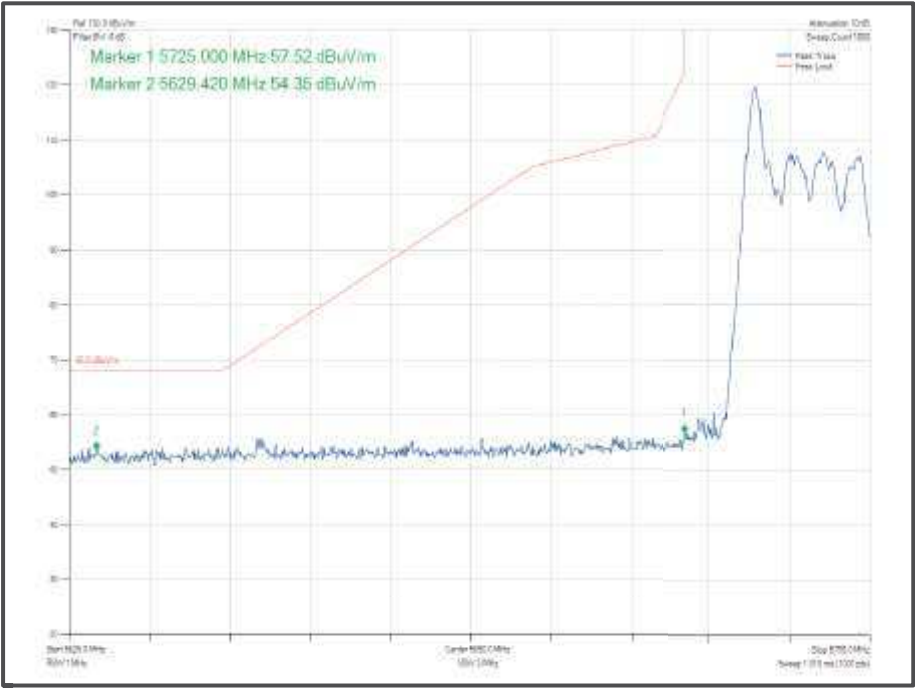


Figure 907 – 802.11 ax HE20 SDM, Cores 0-1, 26-0 – 5745 MHz
Band Edge Frequency 5725 MHz

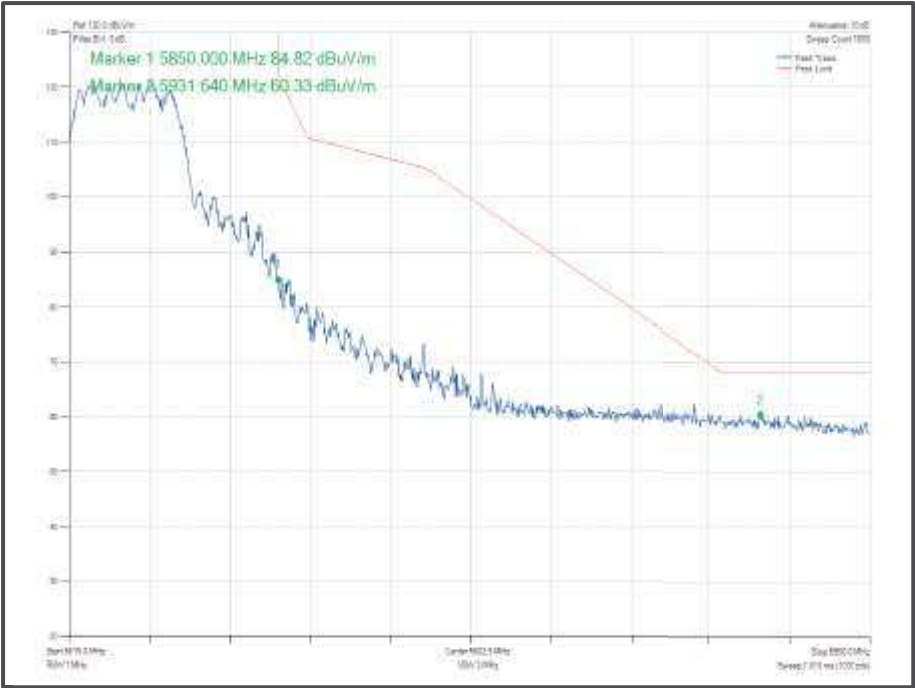


Figure 908 – 802.11 n HT20 CDD, Cores 0-1 – 5825 MHz
Band Edge Frequency 5850 MHz

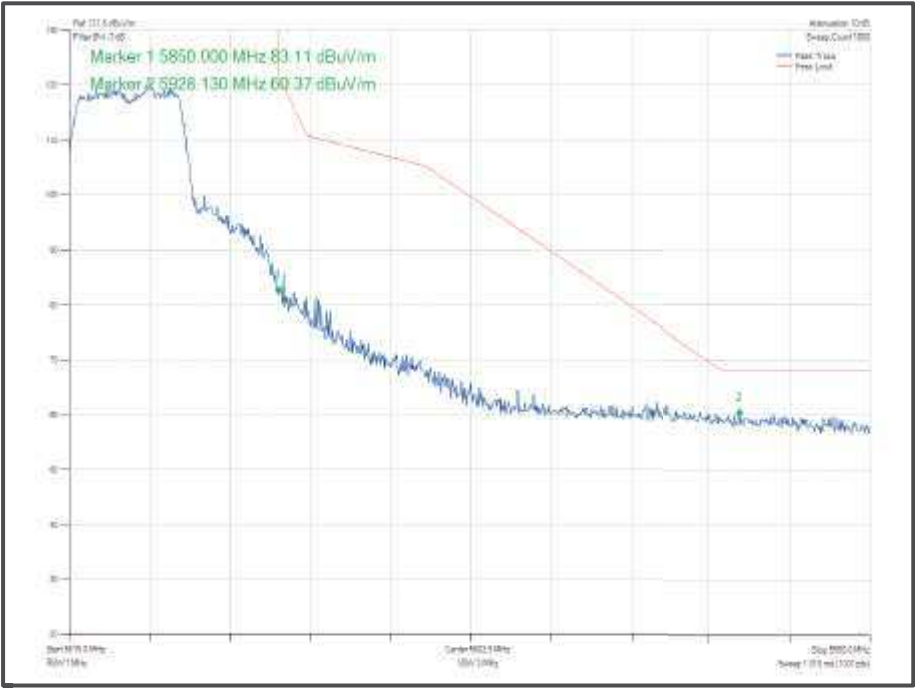


Figure 909 – 802.11 n HT20 SDM, Cores 0-1 – 5825 MHz
Band Edge Frequency 5850 MHz

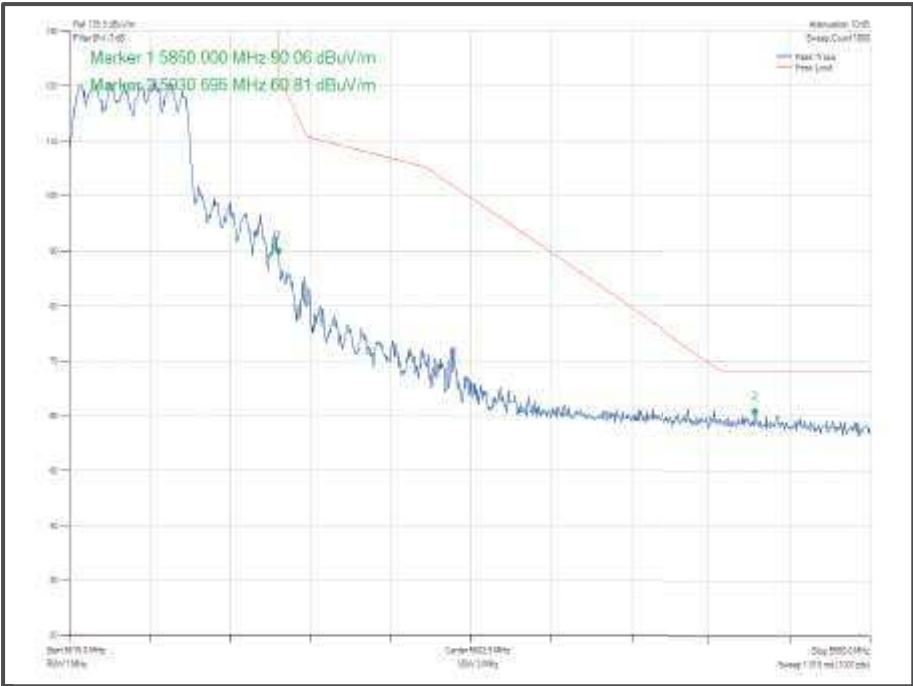


Figure 910 - - 802.11 ax HE20 CDD, Cores 0-1, SU – 5825 MHz
Band Edge Frequency 5850 MHz

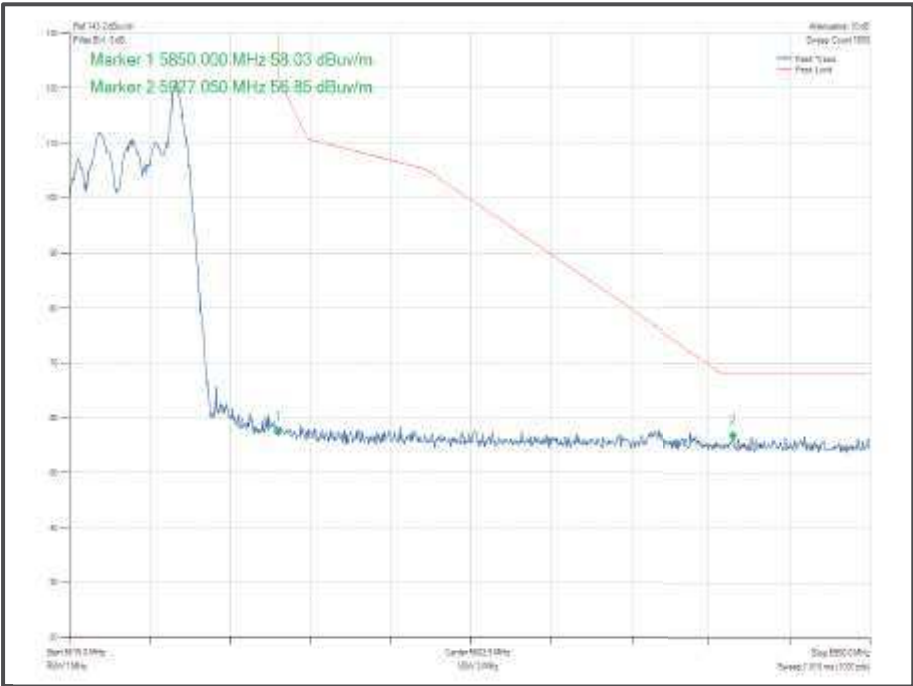


Figure 911 – 802.11 ax HE20 CDD, Cores 0-1, 26-8 – 5825 MHz
Band Edge Frequency 5850 MHz

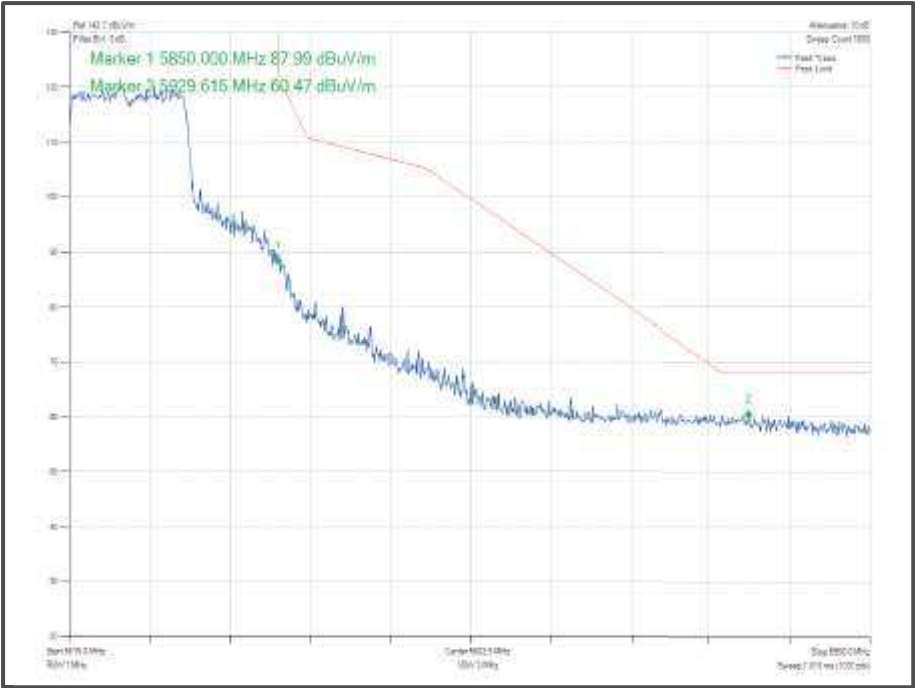


Figure 912 - - 802.11ax HE20 SDM, Cores 0-1, SU – 5825 MHz
Band Edge Frequency 5850 MHz

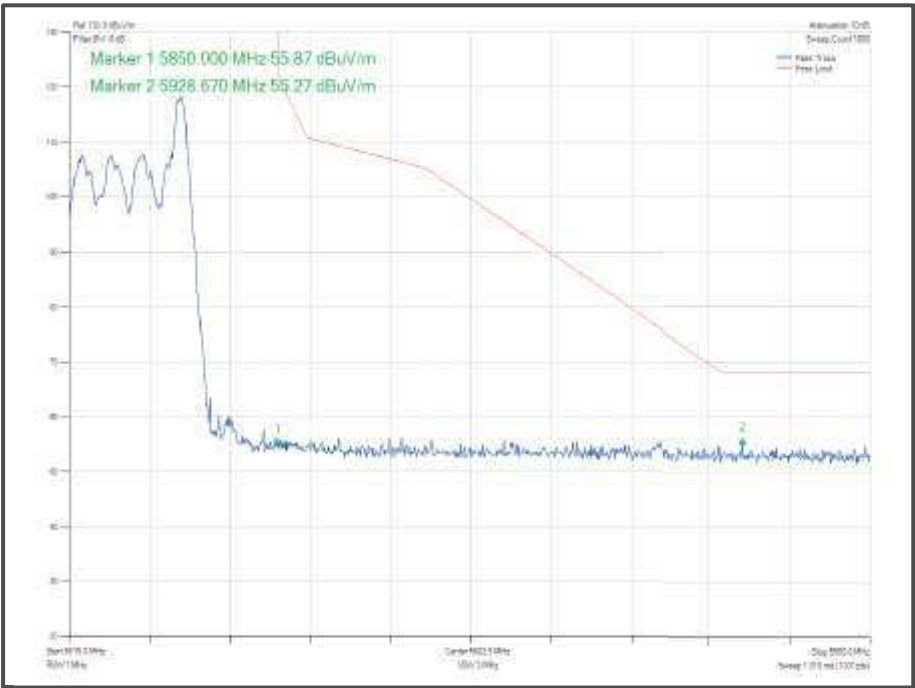


Figure 913 – 802.11 ax HE20 SDM, Cores 0-1, 26-8 – 5825 MHz
Band Edge Frequency 5850 MHz

Mode	Data Rate MCS	Resource size	Resource Index	TX Frequency (MHz)	Band Edge Frequency (MHz)	Level (dBuV/m)
802.11n HT40, Core 1	MCS7	-	-	5510	5470	63.55
802.11n HT40, Core 1	MCS7	-	-	5670	5725	63.37
802.11n HT40, Core 1	MCS7	-	-	5755	5725	61.58
802.11n HT40, Core 1	MCS7	-	-	5795	5850	60.49
802.11ax HE40, Core 1	MCS7	SU	-	5510	5470	63.03
802.11ax HE40, Core 1	MCS7	52	37	5510	5470	62.81
802.11ax HE40, Core 1	MCS7	SU	-	5670	5725	63.37
802.11ax HE40, Core 1	MCS7	52	44	5670	5725	58.93
802.11ax HE40, Core 1	MCS7	SU	-	5755	5725	62.30
802.11ax HE40, Core 1	MCS7	26	0	5755	5725	55.49
802.11ax HE40, Core 1	MCS7	SU	-	5795	5850	59.26
802.11ax HE40, Core 1	MCS7	26	17	5795	5850	55.98

Table 629 – SISO Authorised Band Edge Results

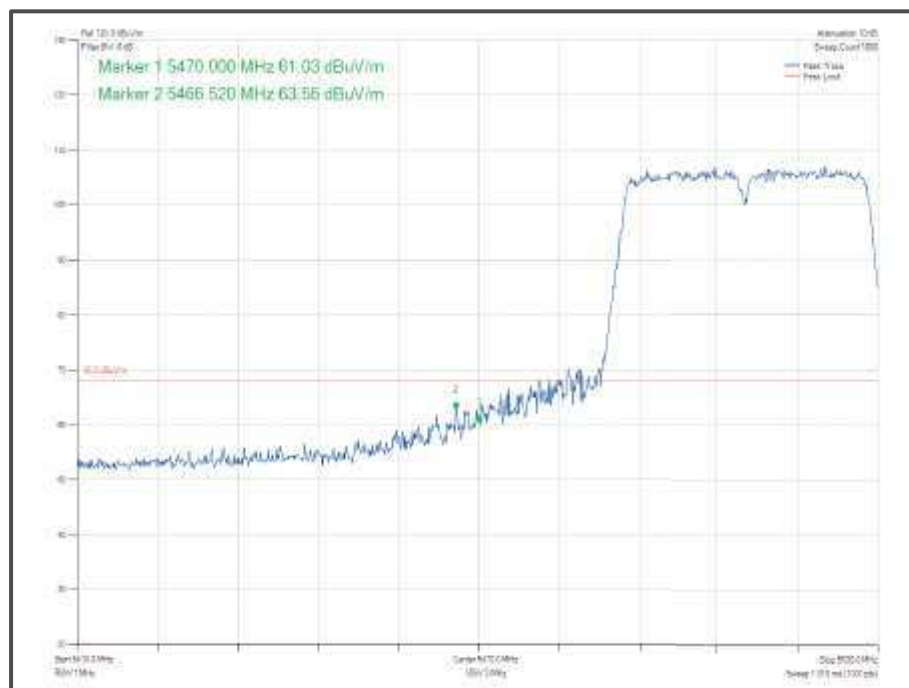


Figure 914 – 802.11n HT40, Core 1 – 5510 MHz
Band Edge Frequency 5470 MHz

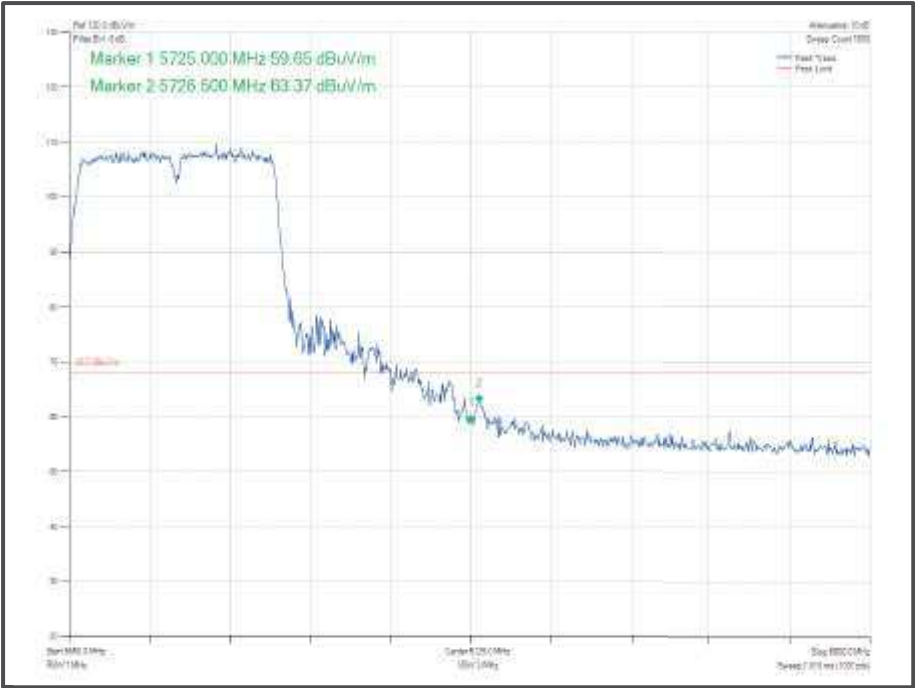


Figure 915 – 802.11 n HT 40, Core 1 – 5670 MHz
Band Edge Frequency 5725 MHz

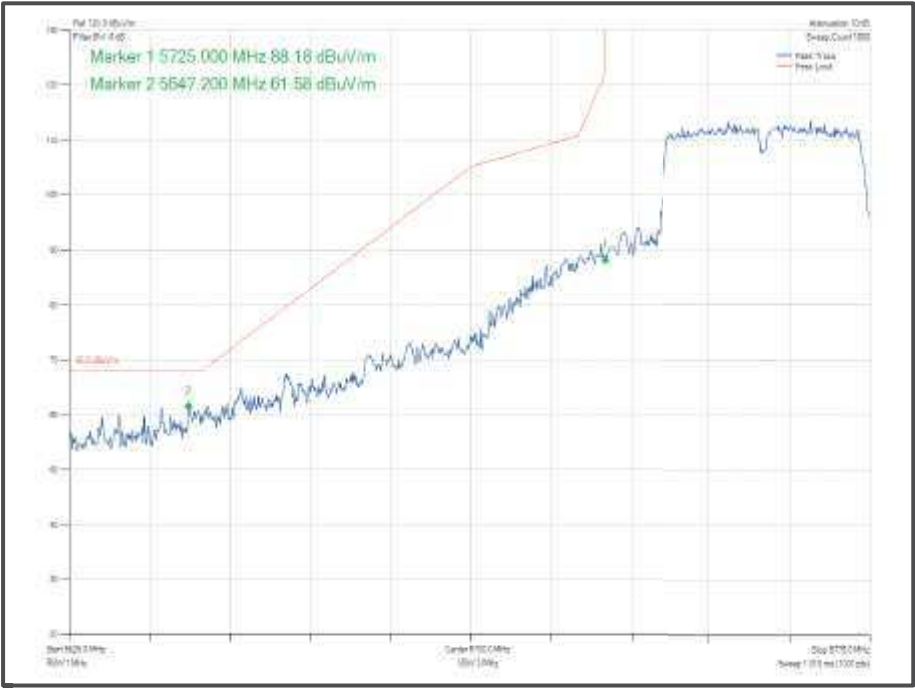


Figure 916 – 802.11 n HT40, Core 1 – 5755 MHz
Band Edge Frequency 5725 MHz

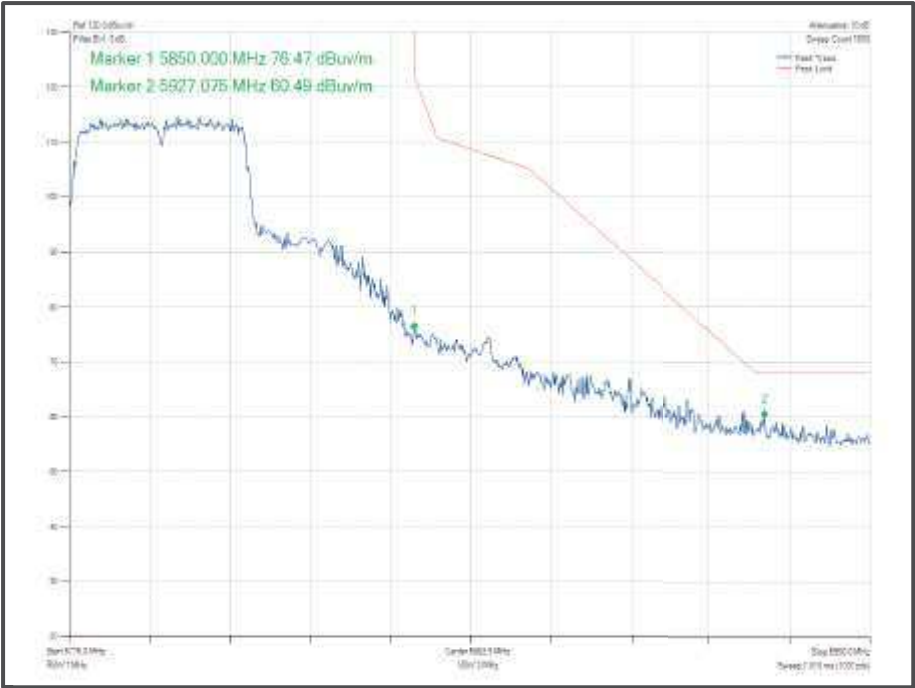


Figure 917 – 802.11 n HT40, Core 1 – 5795 MHz
Band Edge Frequency 5850 MHz

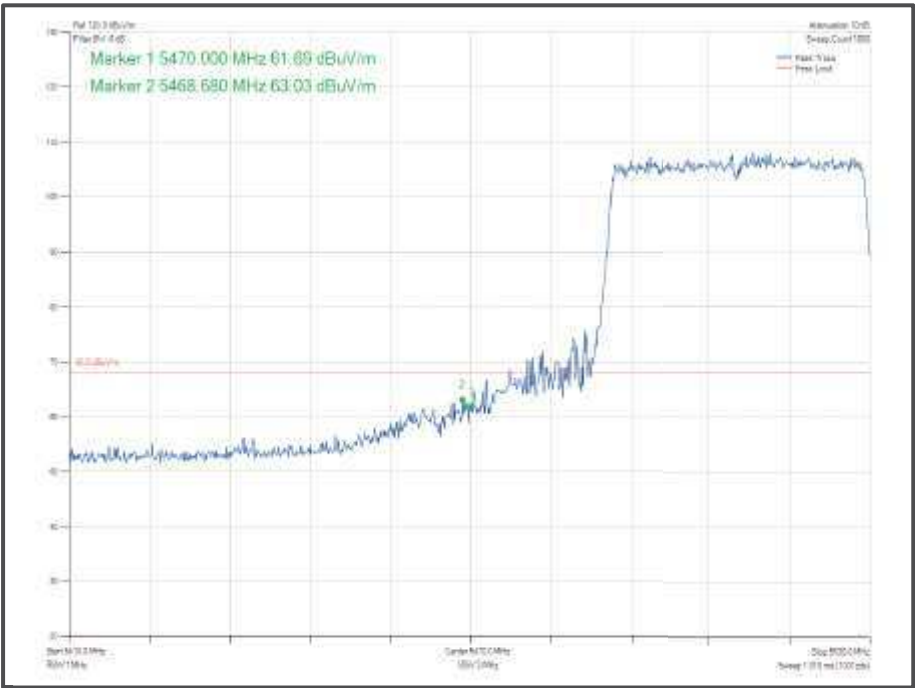


Figure 918 – 802.11 ax HE40, Core 1, SU – 5510 MHz
Band Edge Frequency 5470 MHz

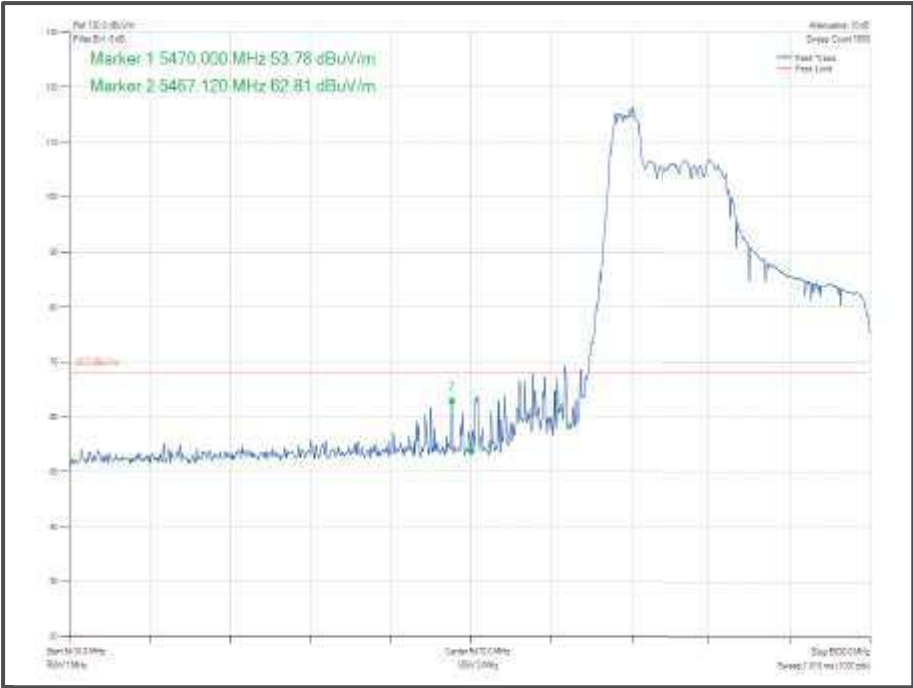


Figure 919 – 802.11 ax HE40, Core 1, 26-0 – 5510 MHz
Band Edge Frequency 5470 MHz

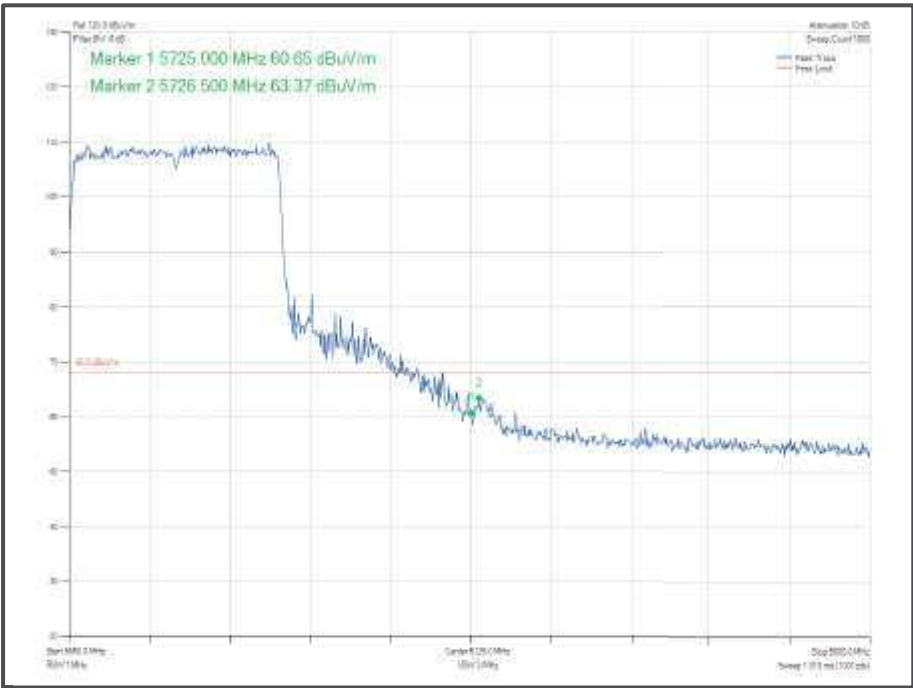


Figure 920 – 802.11 ax HE40, Core 1, SU – 5670 MHz
Band Edge Frequency 5725 MHz

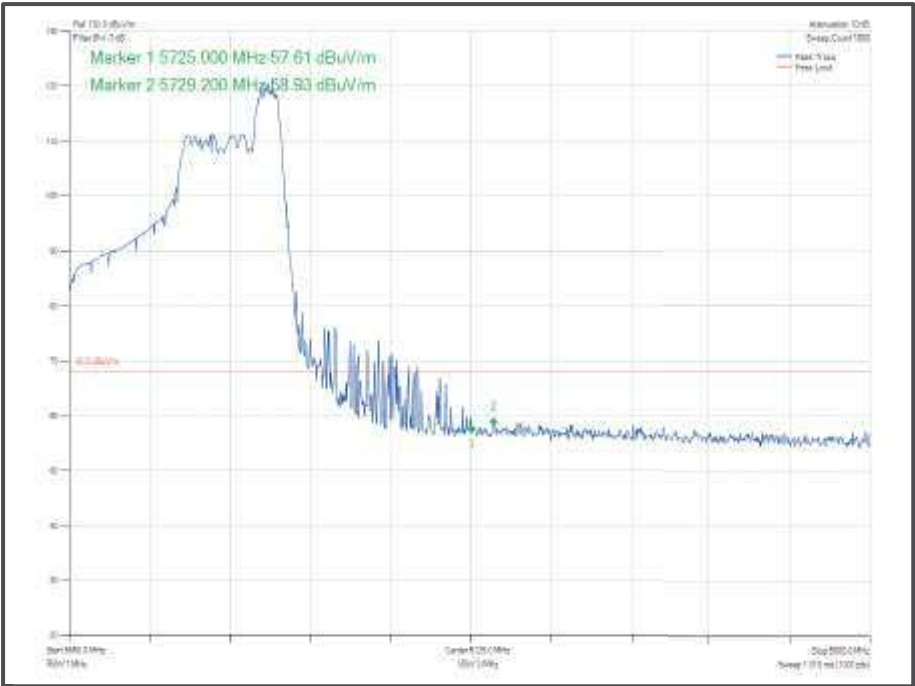


Figure 921 – 802.11 ax HE40, Core 1, 52-44 – 5670 MHz
Band Edge Frequency 5725 MHz

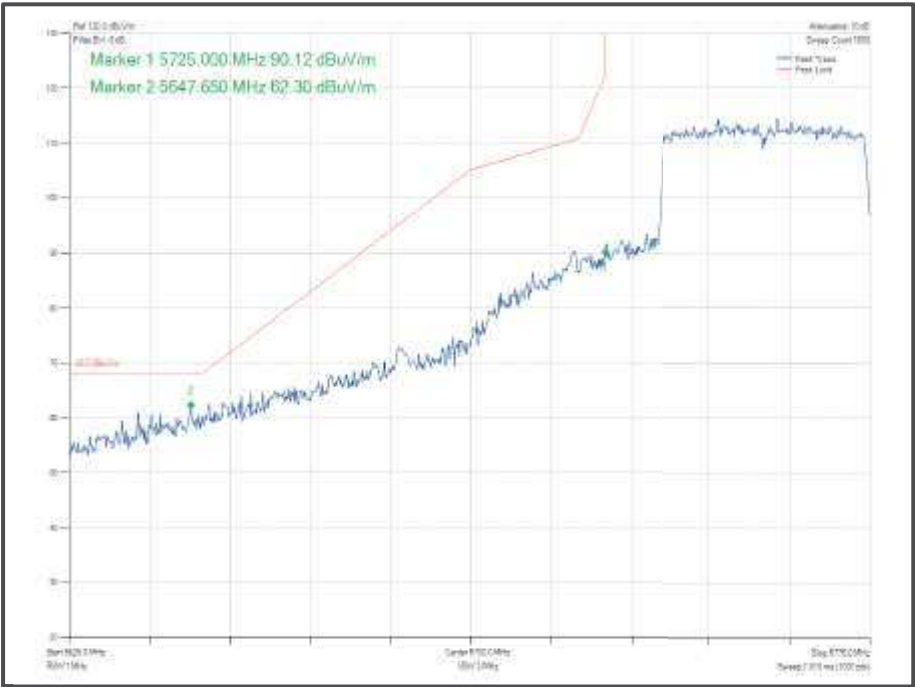


Figure 922 – 802.11 ax HE40, Core 1, SU – 5755 MHz
Band Edge Frequency 5725 MHz

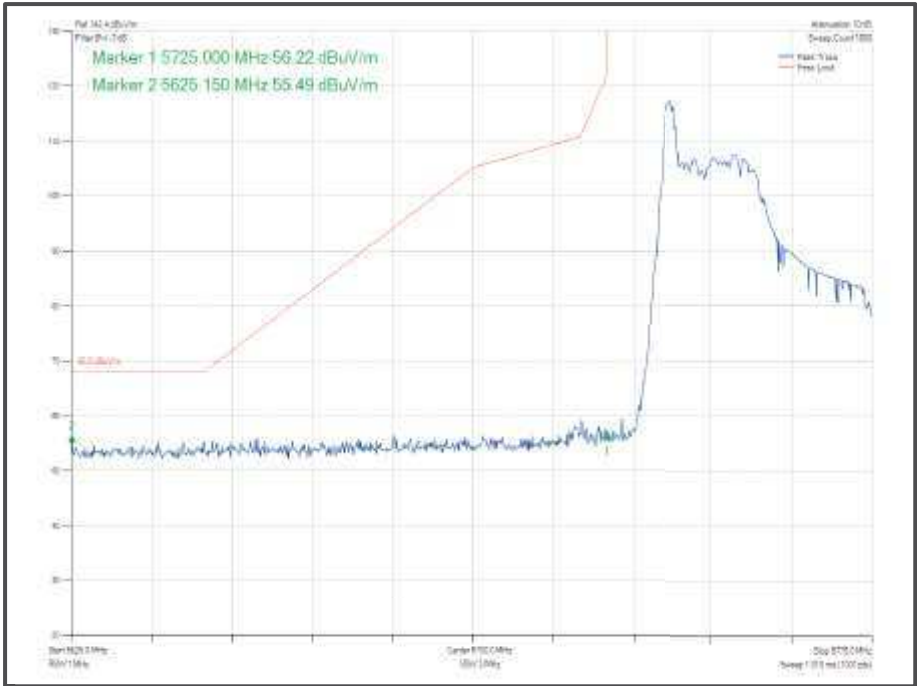


Figure 923 – 802.11 ax HE40, Core 1, 26-0 – 5755 MHz
Band Edge Frequency 5725 MHz

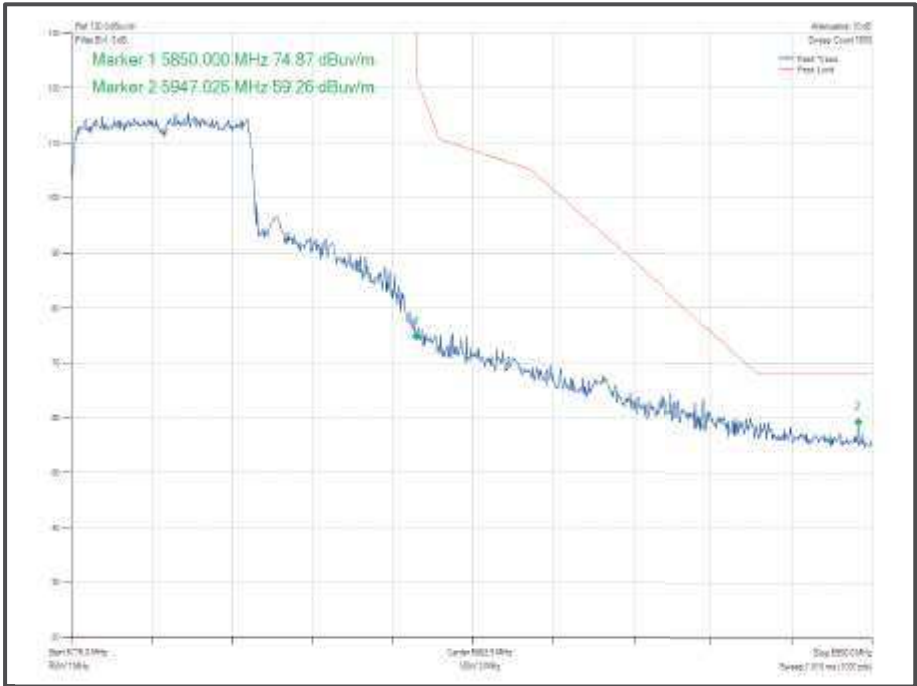


Figure 924 – 802.11 ax HE40, Core 1, SU – 5795 MHz
Band Edge Frequency 5850 MHz

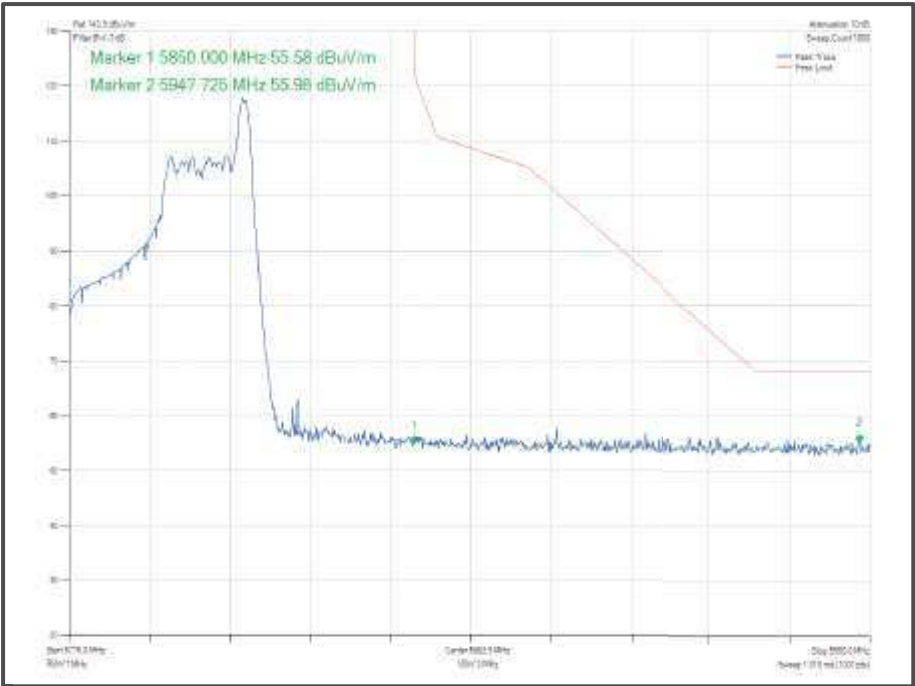


Figure 925 – 802.11 ax HE40, Core 1, 26-17 – 5795 MHz
Band Edge Frequency 5850 MHz



Mode	Data Rate/ MCS	Resource size	Resource Index	TX Frequency (MHz)	Band Edge Frequency (MHz)	Level (dBuV/m)
802.11n HT 40 CDD, Cores 0-1	MCS7	-	-	5510	5470	63.19
802.11n HT 40 SDM, Cores 0-1	MCS15	-	-	5510	5470	62.32
802.11ax HE40 CDD, Cores 0-1	MCS7	SU	-	5510	5470	58.34
802.11ax HE40 CDD, Cores 0-1	MCS7	52	37	5510	5470	61.05
802.11ax HE40 SDM, Cores 0-1	MCS7	SU	-	5510	5470	59.04
802.11ax HE40 SDM, Cores 0-1	MCS7	52	37	5510	5470	57.98
802.11n HT 40 CDD, Cores 0-1	MCS7	-	-	5670	5725	63.04
802.11n HT 40 SDM, Cores 0-1	MCS15	-	-	5670	5725	63.01
802.11ax HE40 CDD, Cores 0-1	MCS7	SU	-	5670	5725	60.32
802.11ax HE40 CDD, Cores 0-1	MCS7	52	44	5670	5725	55.68
802.11ax HE40 SDM, Cores 0-1	MCS7	SU	-	5670	5725	61.36
802.11ax HE40 SDM, Cores 0-1	MCS7	52	44	5670	5725	56.80
802.11n HT 40, CDD Cores 0-1	MCS7	-	-	5755	5725	62.33
802.11n HT 40, SDM Cores 0-1	MCS15	-	-	5755	5725	62.07
802.11ax HE40 CDD, Cores 0-1	MCS7	SU	-	5755	5725	57.52
802.11ax HE40 CDD, Cores 0-1	MCS7	26	0	5755	5725	55.50
802.11ax HE40 SDM, Cores 0-1	MCS7	SU	-	5755	5725	58.18
802.11ax HE40 SDM, Cores 0-1	MCS7	26	0	5755	5725	53.84
802.11n HT 40 CDD, Cores 0-1	MCS7	-	-	5795	5850	58.02
802.11n HT 40 SDM, Cores 0-1	MCS15	-	-	5795	5850	58.29
802.11ax HE40 CDD, Cores 0-1	MCS7	SU	-	5795	5850	57.08
802.11ax HE40 CDD, Cores 0-1	MCS7	26	17	5795	5850	56.54
802.11ax HE40 SDM, Cores 0-1	MCS7	SU	-	5795	5850	57.49
802.11ax HE40 SDM, Cores 0-1	MCS7	26	17	5795	5850	54.28

Table 630 – MIMO 2TX Authorised Band Edge Results

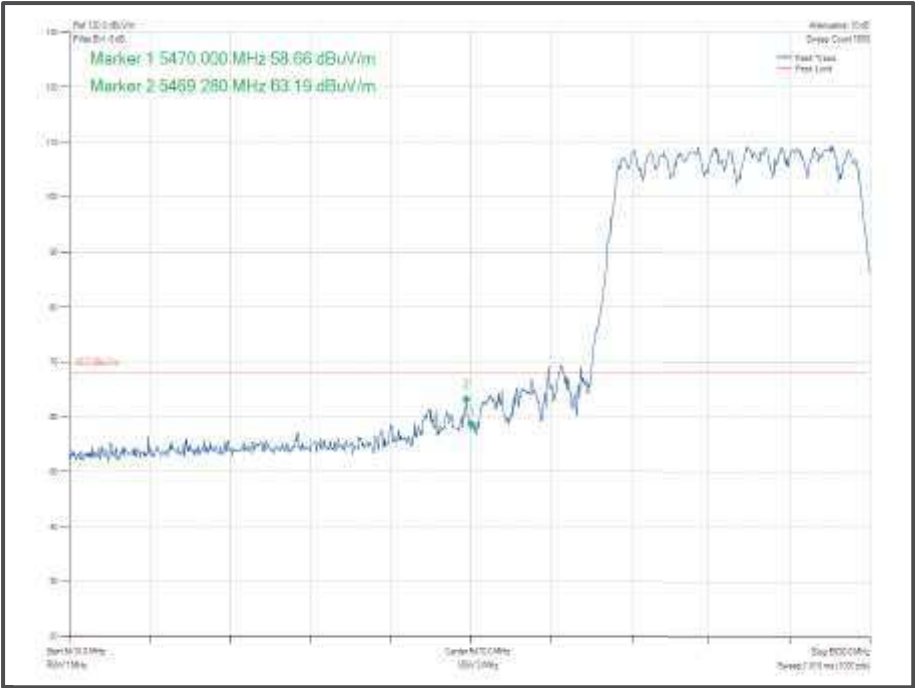


Figure 926 – 802.11 n HT40 CDD, Cores 0-1 – 5510 MHz
Band Edge Frequency 5470 MHz

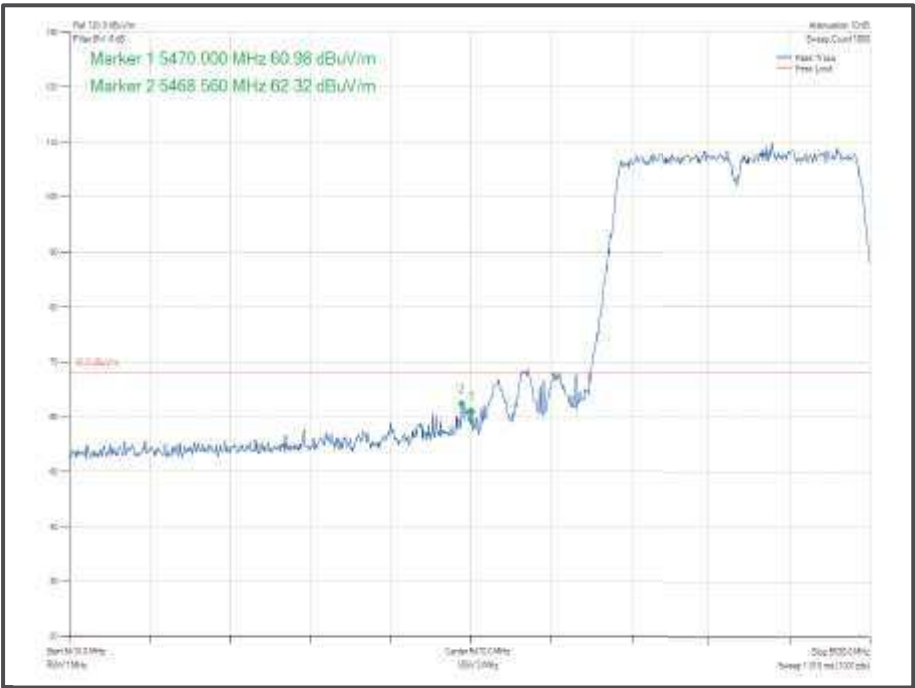


Figure 927 – 802.11 n HT40 SDM, Cores 0-1 – 5510 MHz
Band Edge Frequency 5470 MHz

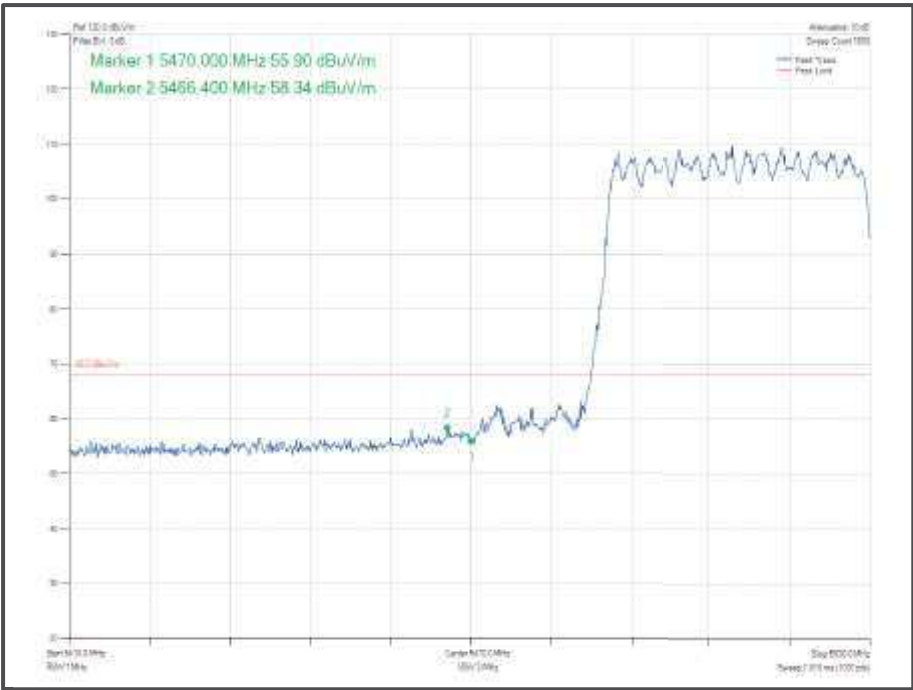


Figure 928 – 802.11 ax HE40 CDD, Cores 0-1, SU – 5510 MHz
Band Edge Frequency 5470 MHz

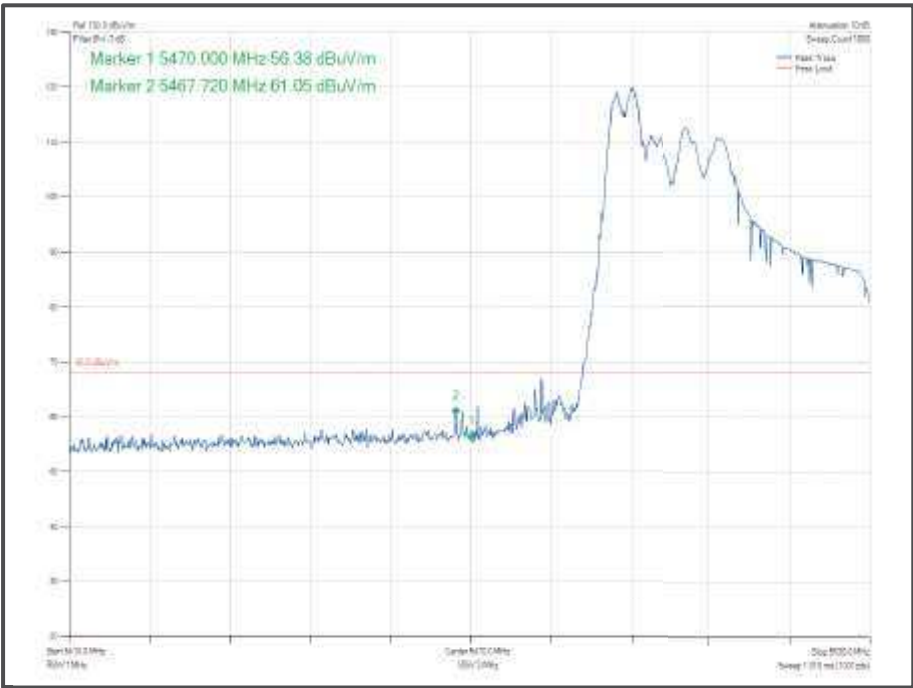


Figure 929 – 802.11 ax HE40 CDD, Cores 0-1, 26-0 – 5510 MHz
Band Edge Frequency 5470 MHz

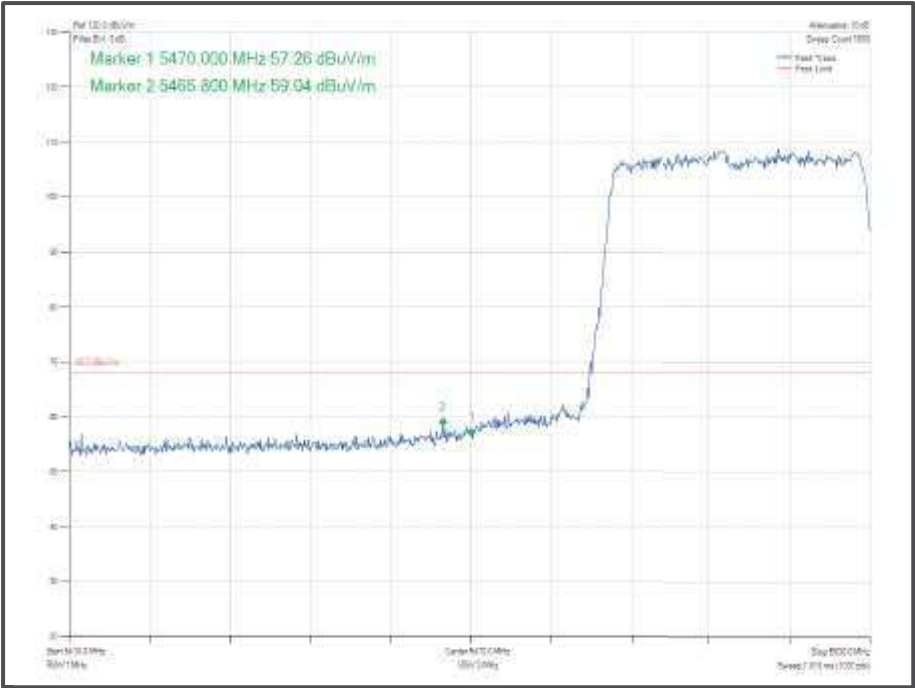


Figure 930 – 802.11ax HE40 SDM, Cores 0-1, SU – 5510 MHz
Band Edge Frequency 5470 MHz

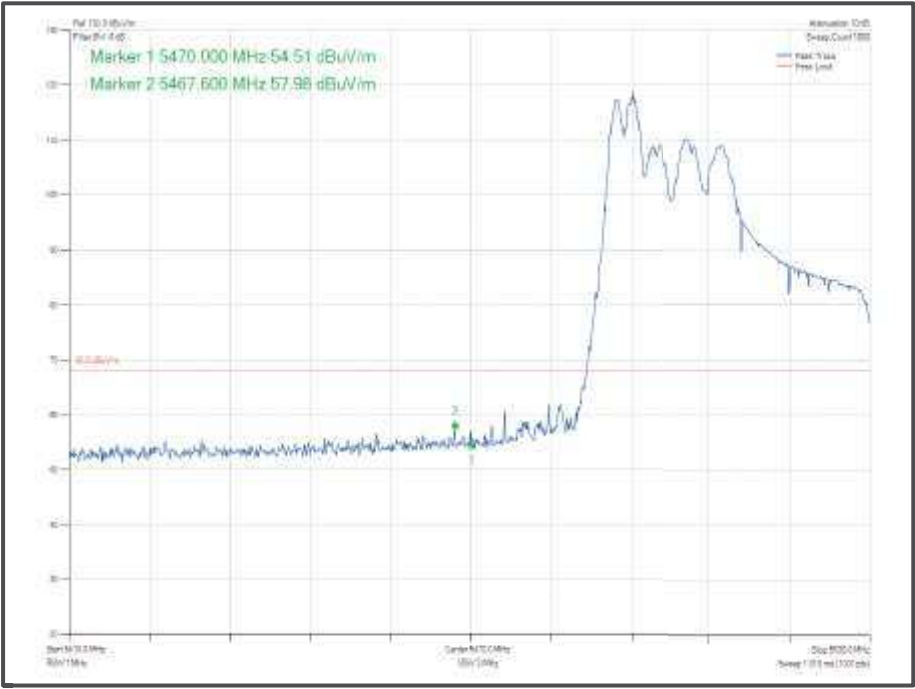


Figure 931 – 802.11ax HE40 SDM, Cores 0-1, 26-0 – 5510 MHz
Band Edge Frequency 5470 MHz

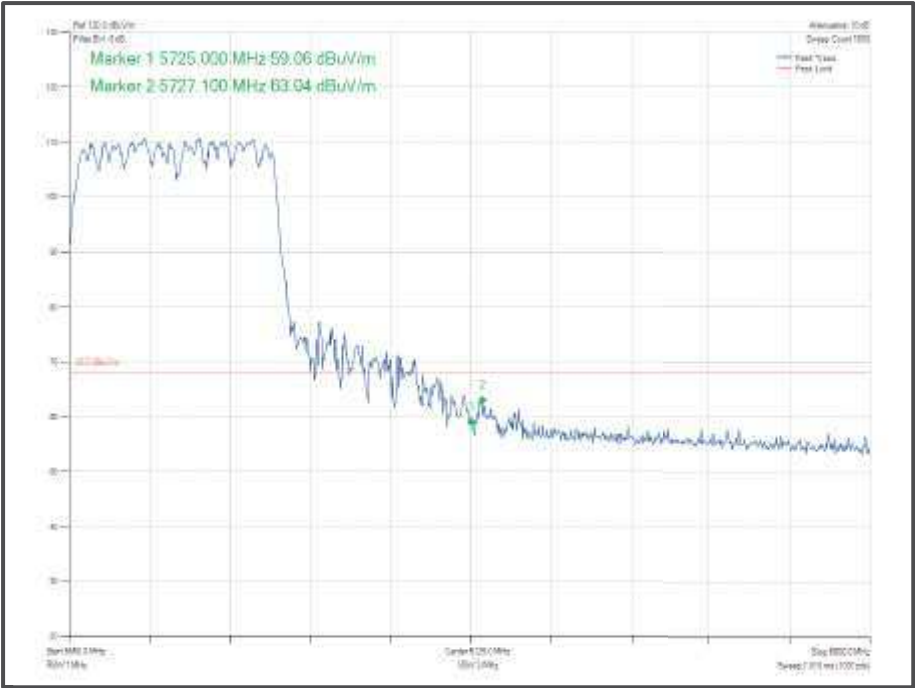


Figure 932 – 802.11n HT40 CDD, Cores 0-1 – 5670 MHz
Band Edge Frequency 5725 MHz

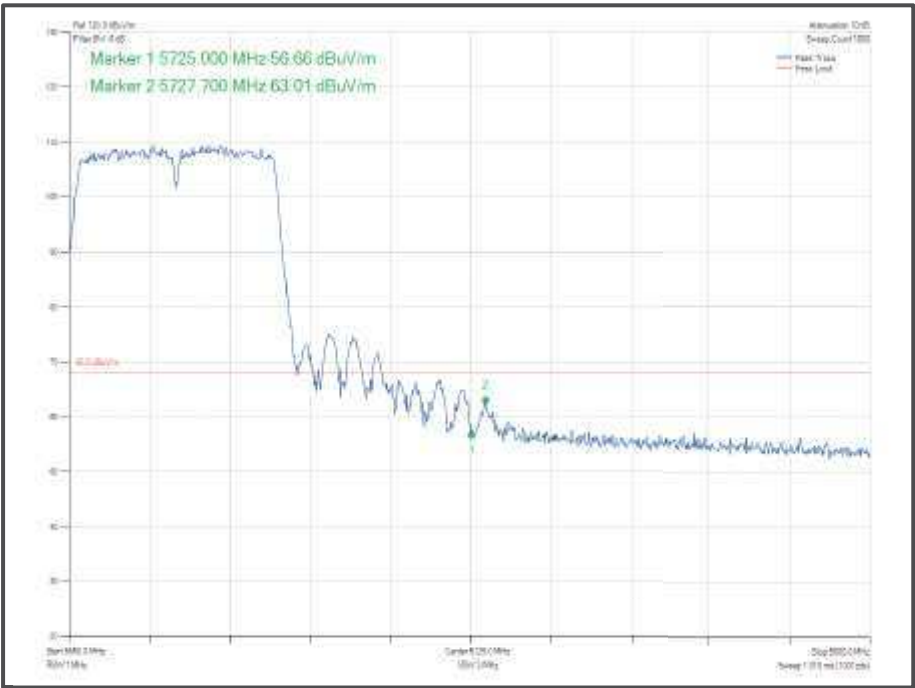


Figure 933 – 802.11n HT40 SDM, Cores 0-1 – 5670 MHz
Band Edge Frequency 5725 MHz

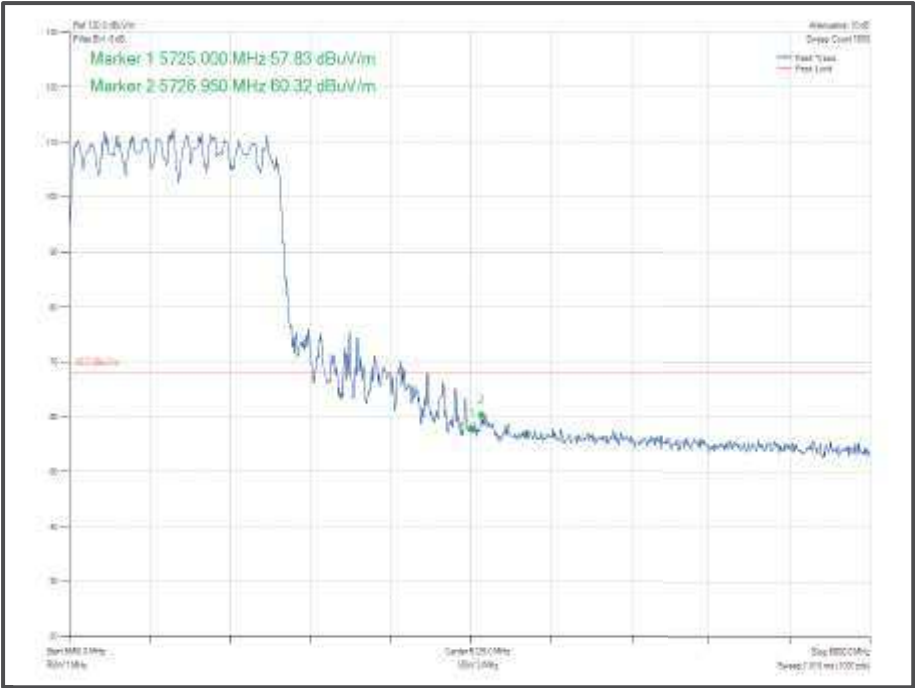


Figure 934 – 802.11ax HE40 CDD, Cores 0-1, SU – 5670 MHz
Band Edge Frequency 5725 MHz

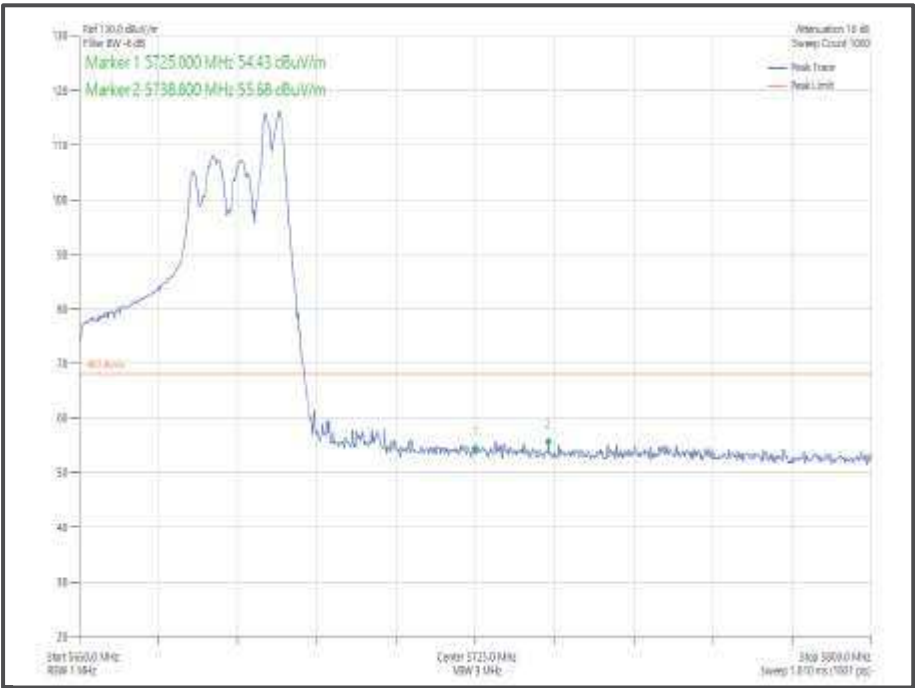


Figure 935 – 802.11ax HE40 CDD, Cores 0-1, 52-44 – 5670 MHz
Band Edge Frequency 5725 MHz

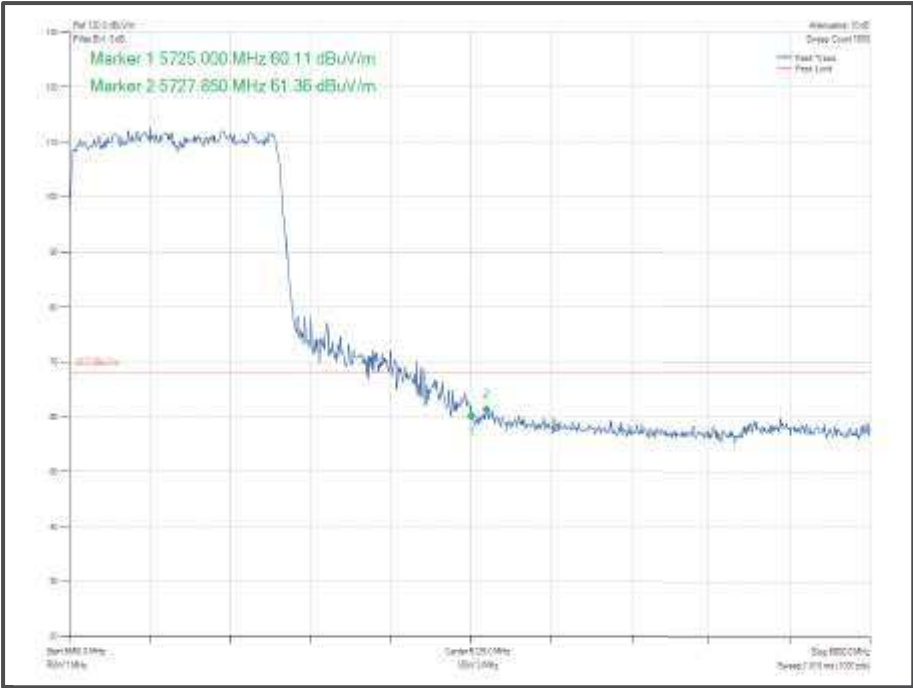


Figure 936 – 802.11ax HE40 SDM, Cores 0-1, SU – 5670 MHz
Band Edge Frequency 5725 MHz

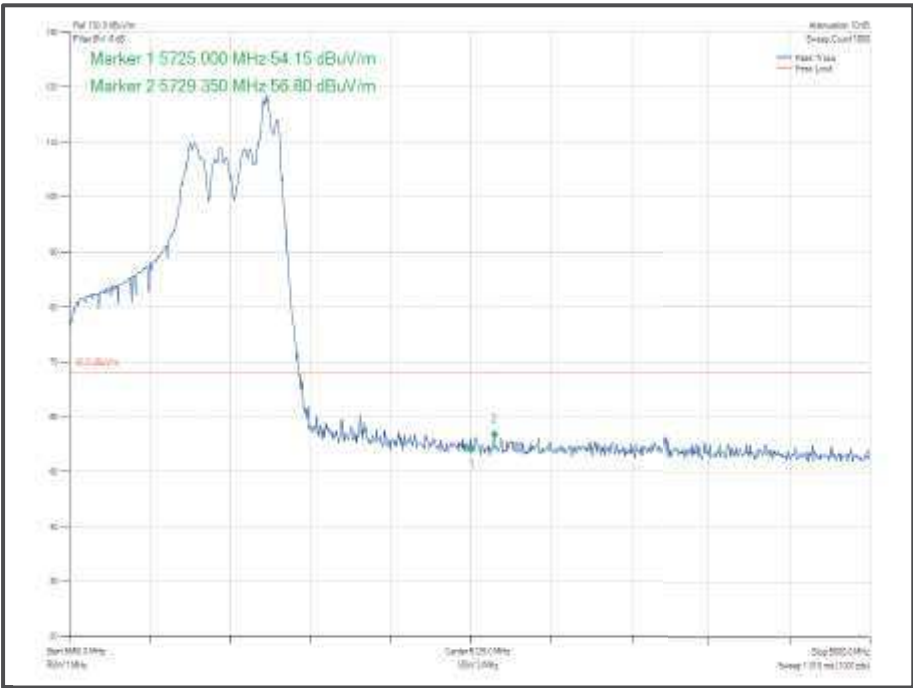


Figure 937 – 802.11ax HE40 SDM, Cores 0-1, 52-44 – 5670 MHz
Band Edge Frequency 5725 MHz

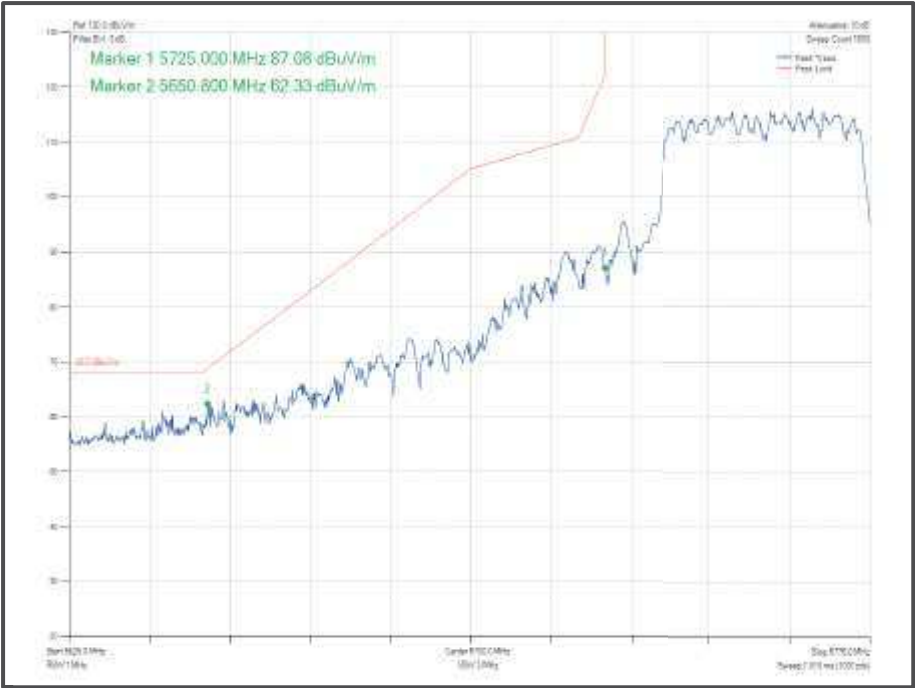


Figure 938 – 802.11 n HT40 CDD, Cores 0-1 – 5755 MHz
Band Edge Frequency 5725 MHz

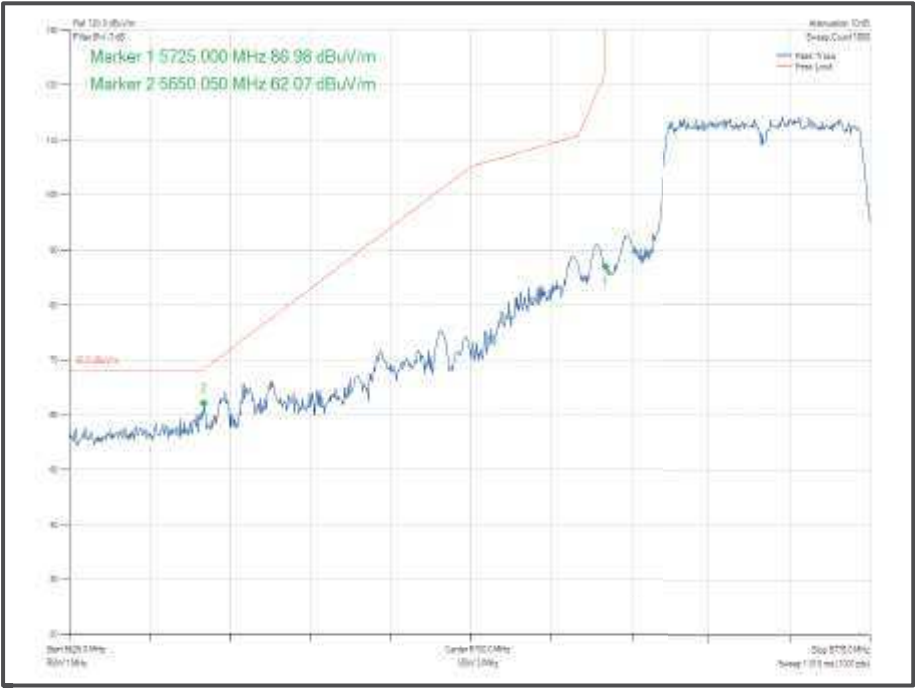


Figure 939 – 802.11 n HT40 SDM, Cores 0-1 – 5755 MHz
Band Edge Frequency 5725 MHz

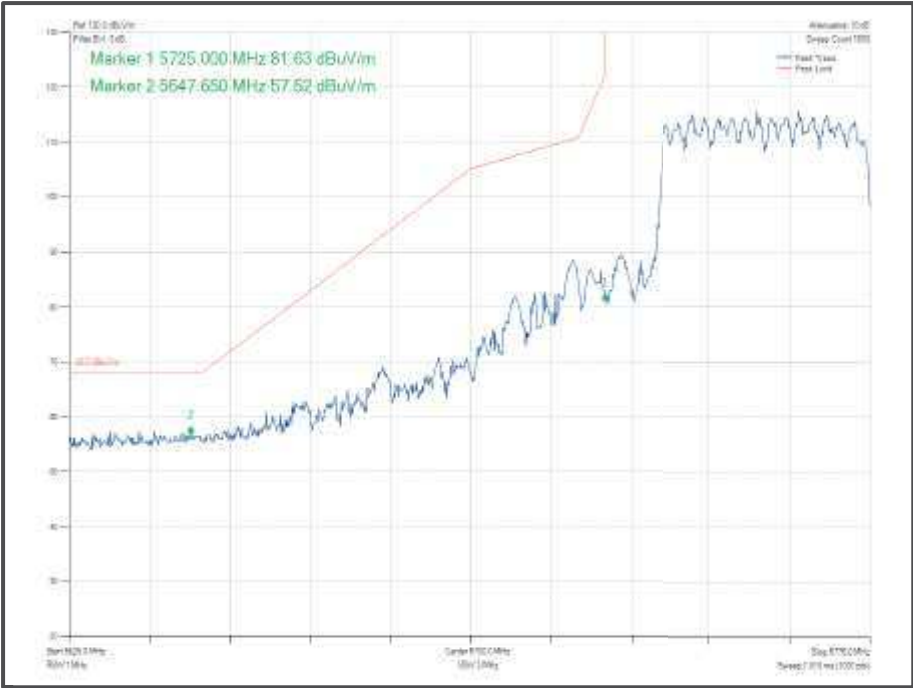


Figure 940 – 802.11 ax HE40 CDD, Cores 0-1, SU – 5755 MHz
Band Edge Frequency 5725 MHz

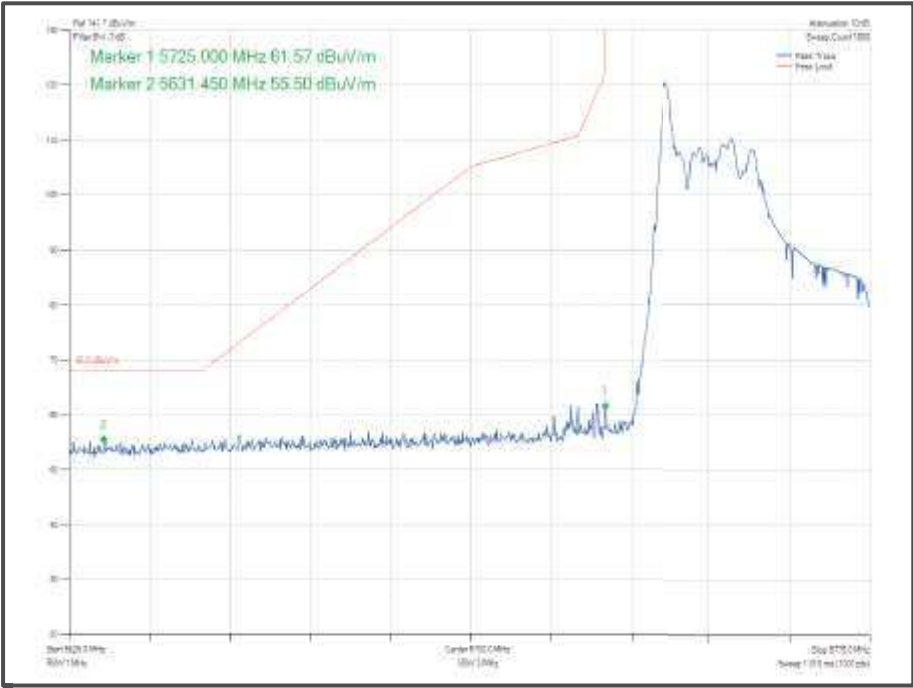


Figure 941 – 802.11 ax HE40 CDD, Cores 0-1, 26-0 – 5755 MHz
Band Edge Frequency 5725 MHz

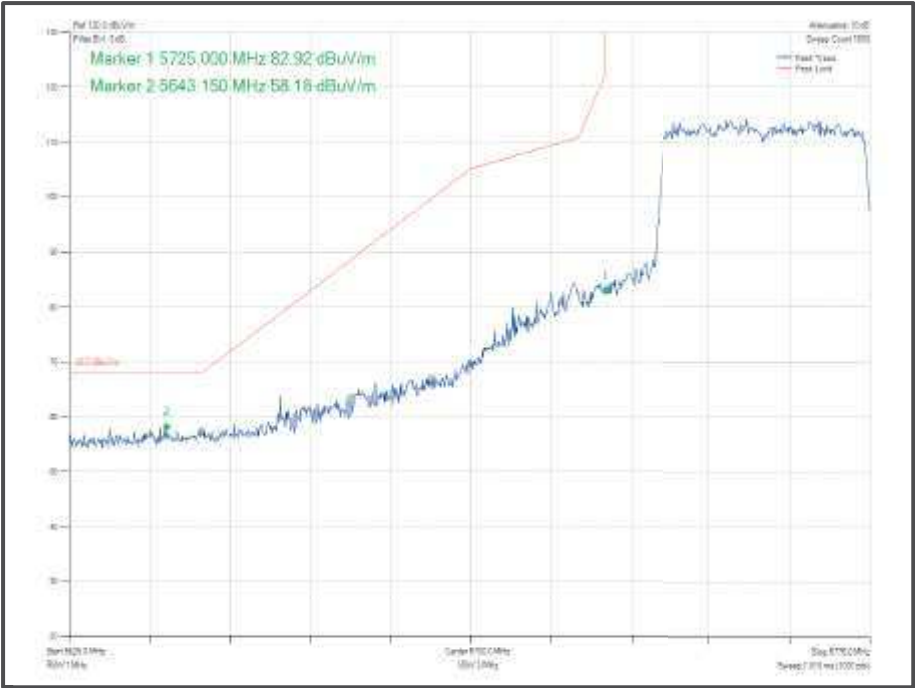


Figure 942 – 802.11ax HE40 SDM, Cores 0-1, SU – 5755 MHz
Band Edge Frequency 5725 MHz

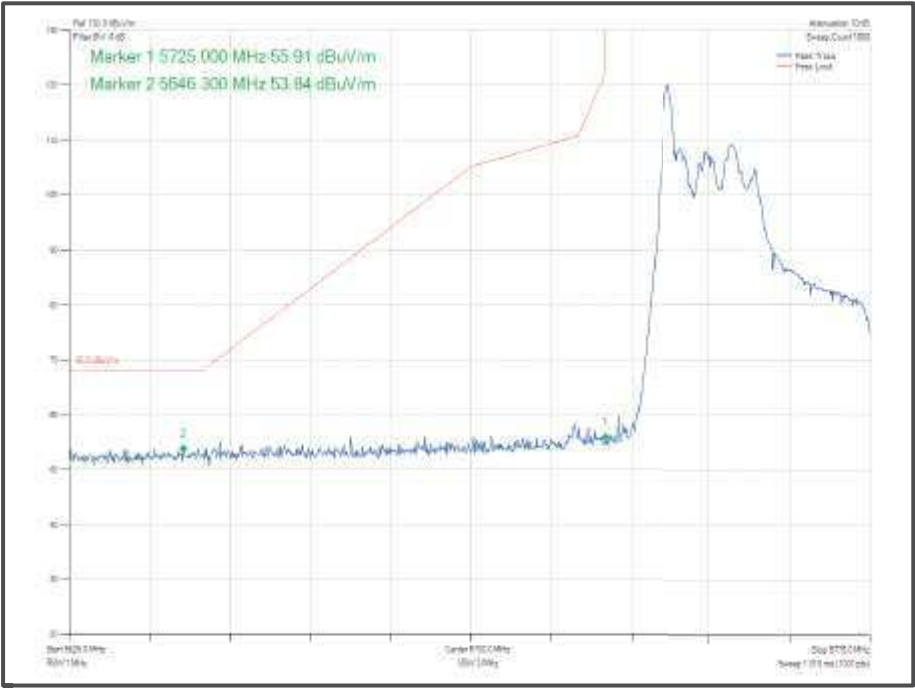


Figure 943 – 802.11ax HE40 SDM, Cores 0-1, 26-0 – 5755 MHz
Band Edge Frequency 5725 MHz

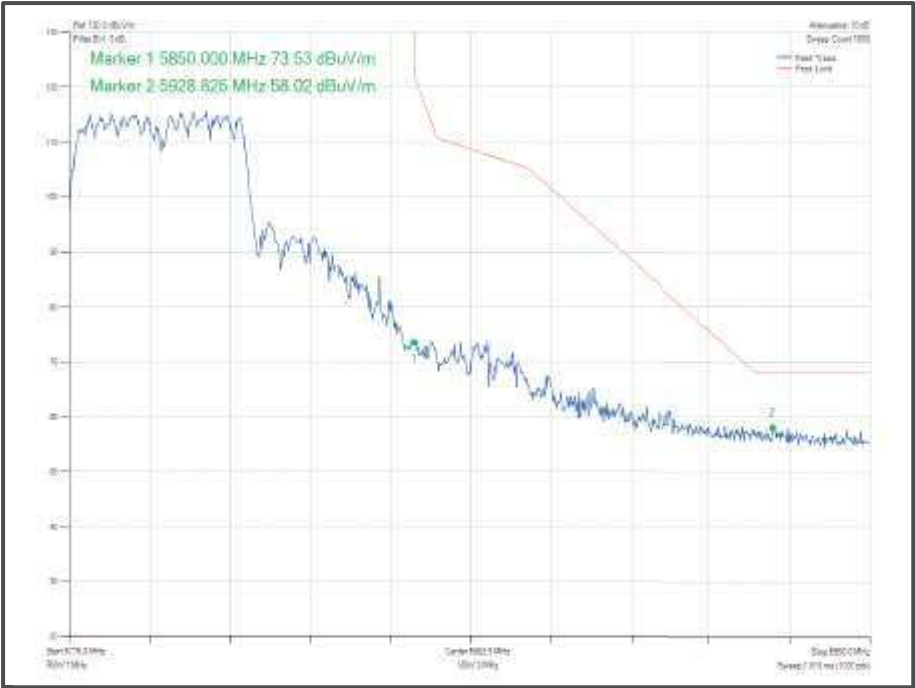


Figure 944 – 802.11n HT40 CDD, Cores 0-1 – 5795 MHz
Band Edge Frequency 5850 MHz

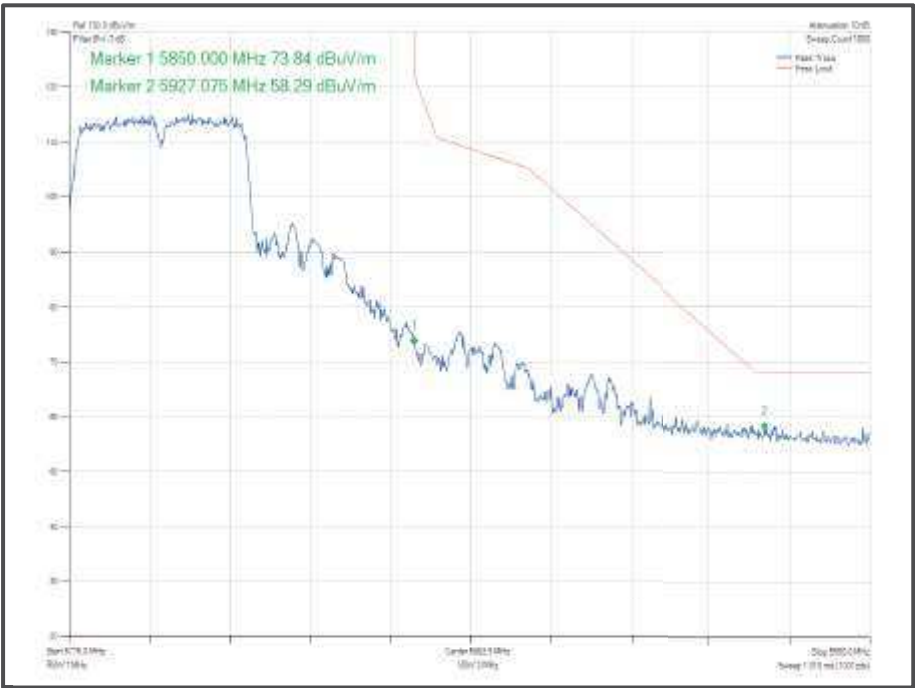


Figure 945 – 802.11n HT40 SDM, Cores 0-1 – 5795 MHz
Band Edge Frequency 5850 MHz

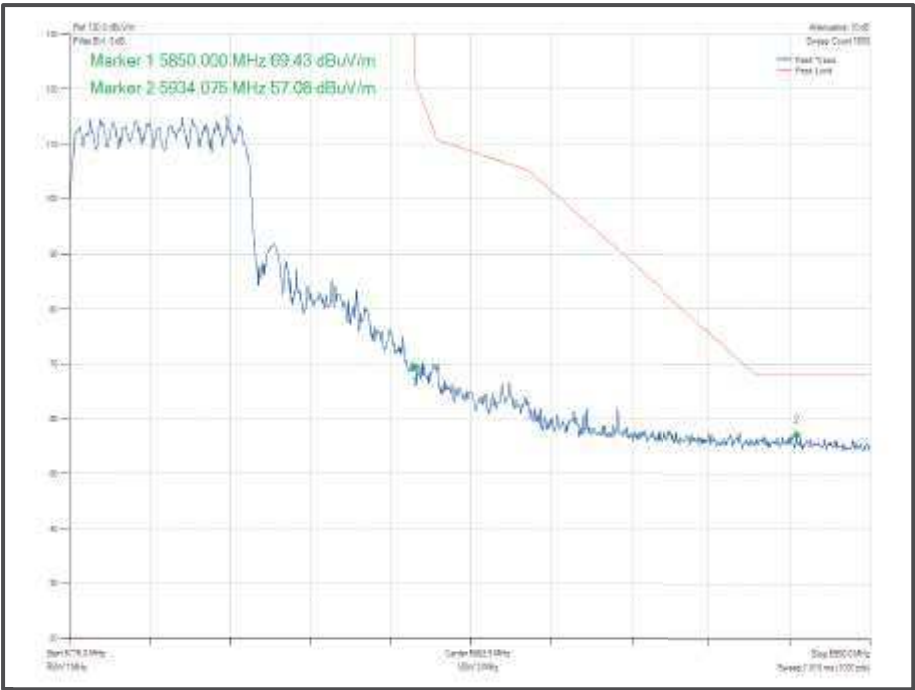


Figure 946 – 802.11 ax HE40 CDD, Cores 0-1, SU – 5795 MHz
Band Edge Frequency 5850 MHz

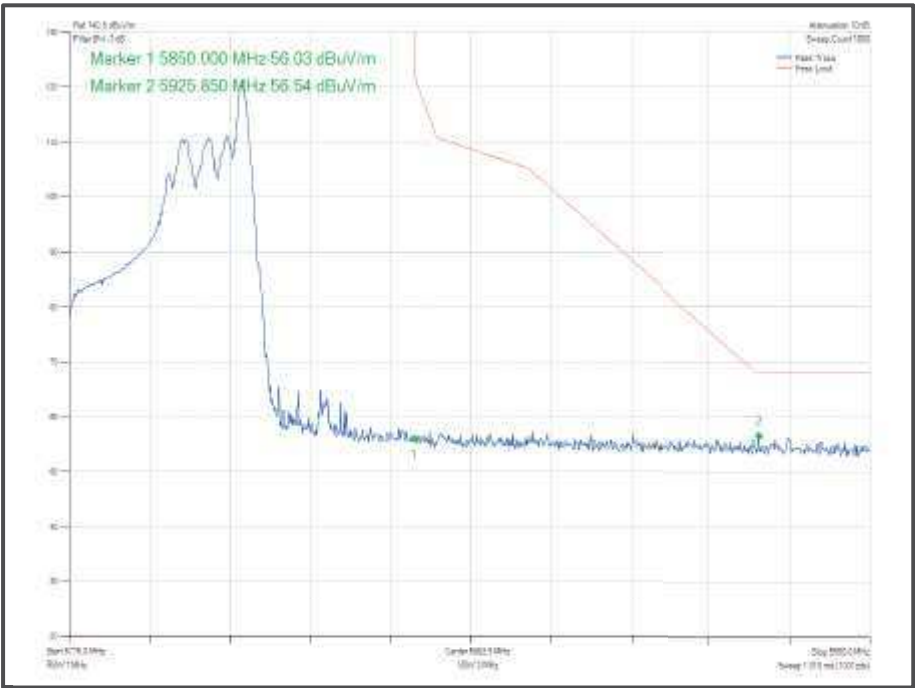


Figure 947 – 802.11 ax HE40 CDD, Cores 0-1, 26-17 – 5795 MHz
Band Edge Frequency 5850 MHz

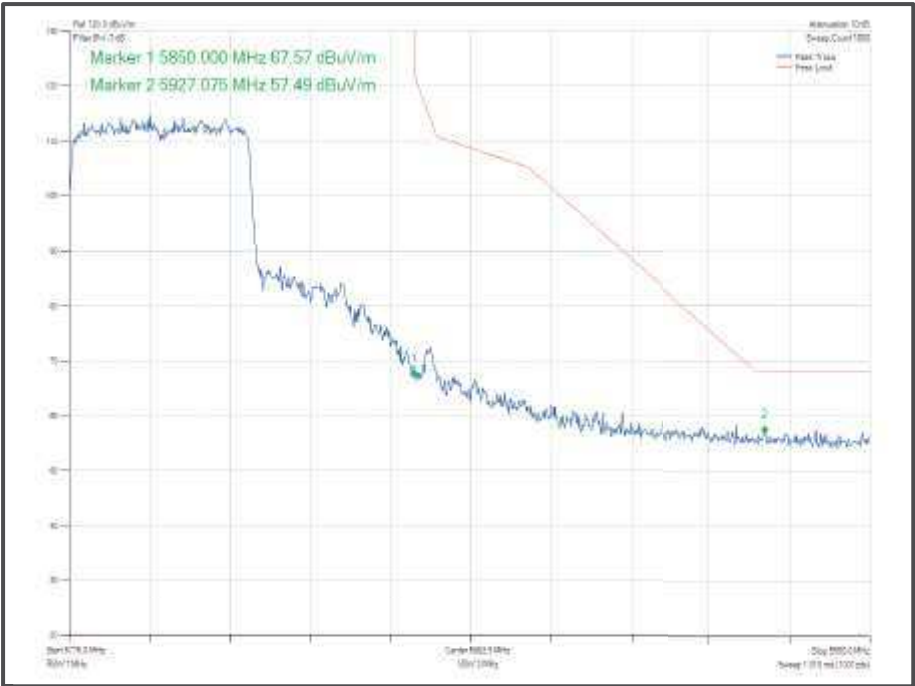


Figure 948 – 802.11 ax HE40 SDM, Cores 0-1, SU – 5795 MHz
Band Edge Frequency 5850 MHz

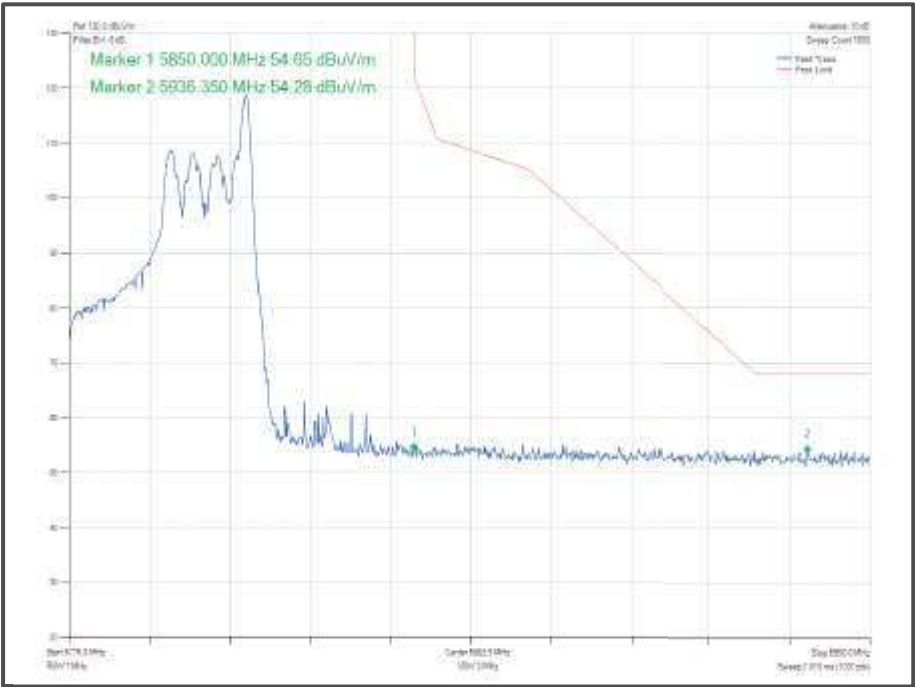


Figure 949 – 802.11 ax HE40 SDM, Cores 0-1, 26-17 – 5795 MHz
Band Edge Frequency 5850 MHz



Mode	DataRate MCS	Resource size	Resource Index	TX Frequency (MHz)	Band Edge Frequency (MHz)	Level (dBuV/m)
802.11ac VHT80, Core 1	MCS7x1	-	-	5530	5470	63.07
802.11ac VHT80, Core 1	MCS7x1	-	-	5610	5725	60.36
802.11ac VHT80, Core 1	MCS7x1	-	-	5775	5725	63.14
802.11ac VHT80, Core 1	MCS7x1	-	-	5775	5850	63.39
802.11ax HE80, Core 1	MCS7	SU	-	5530	5470	63.23
802.11ax HE80, Core 1	MCS7	52	37	5530	5470	55.61
802.11ax HE80, Core 1	MCS7	SU	-	5610	5725	62.44
802.11ax HE80, Core 1	MCS7	52	52	5610	5725	56.04
802.11ax HE80, Core 1	MCS7	SU	-	5775	5725	62.12
802.11ax HE80, Core 1	MCS7	26	0	5775	5725	55.39
802.11ax HE80, Core 1	MCS7	SU	-	5775	5850	61.74
802.11ax HE80, Core 1	MCS7	26	36	5775	5850	56.01

Table 631 – SISO Authorised Band Edge Results

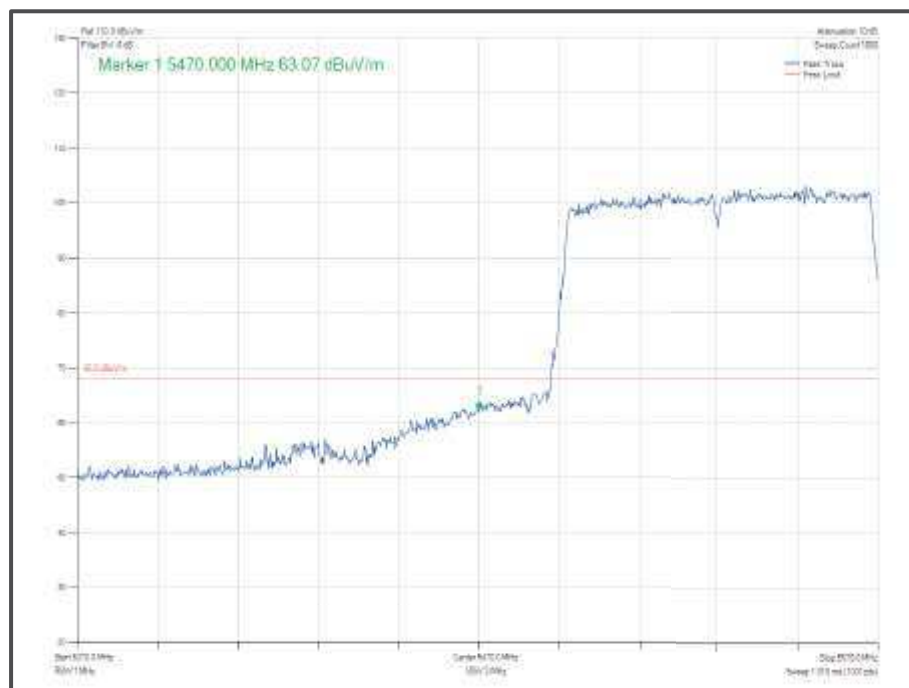


Figure 950 – 802.11ac VHT80 Core 1 – 5530 MHz
Band Edge Frequency 5470 MHz

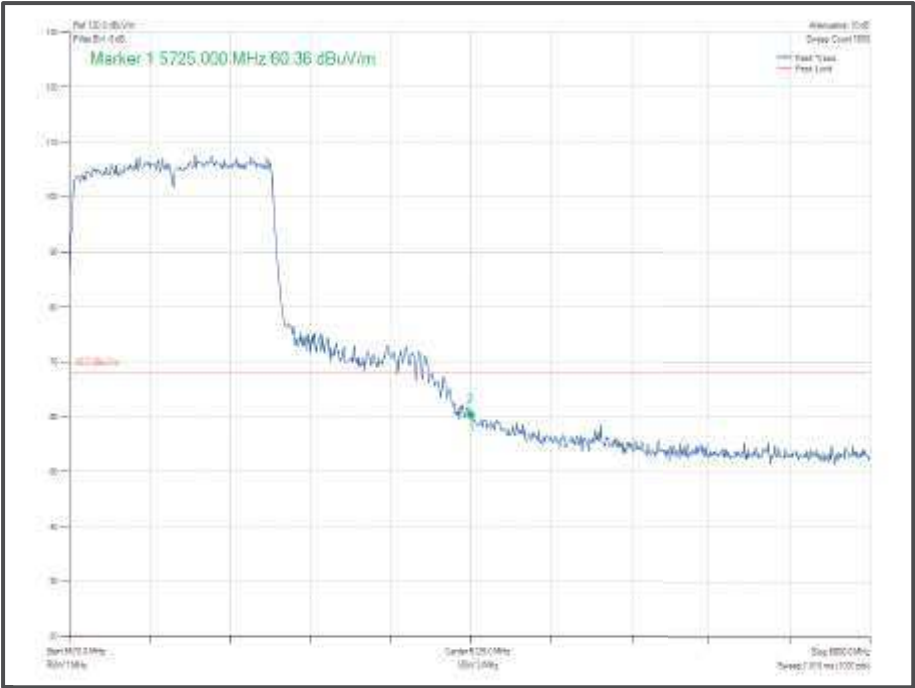


Figure 951 – 802.11 ac VHT80 Core 1 – 5610 MHz
Band Edge Frequency 5725 MHz

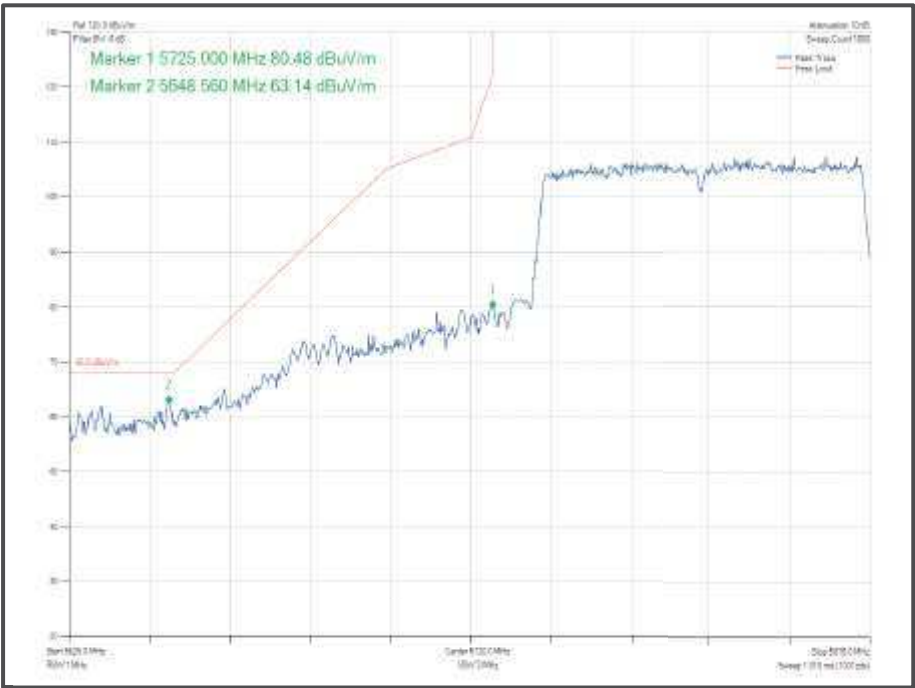


Figure 952 – 802.11 ac VHT80 Core 1 – 5775 MHz
Band Edge Frequency 5725 MHz

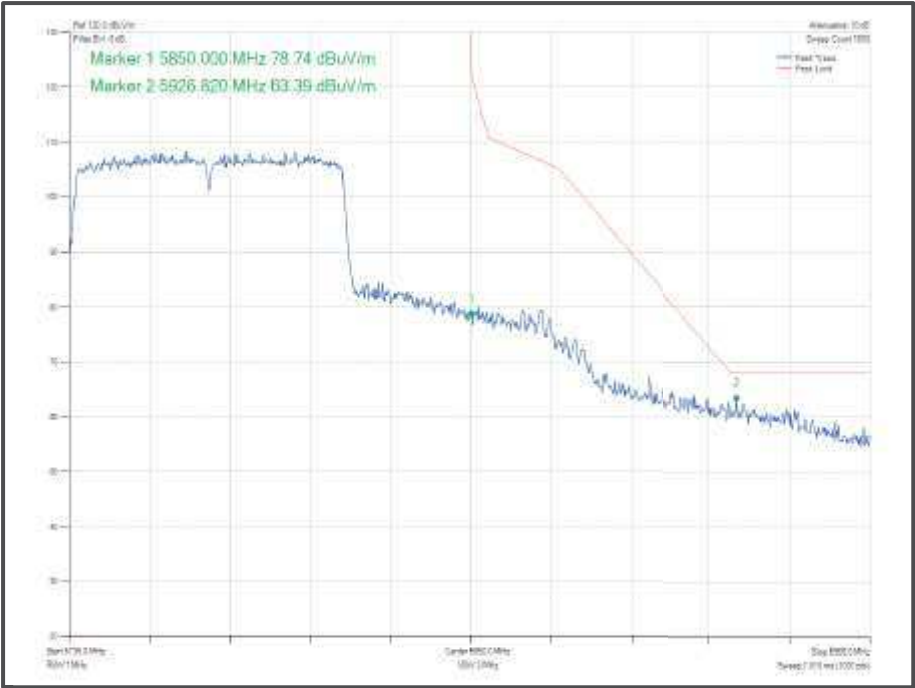


Figure 953 – 802.11ac VHT80 Core 1 – 5775 MHz
Band Edge Frequency 5850 MHz

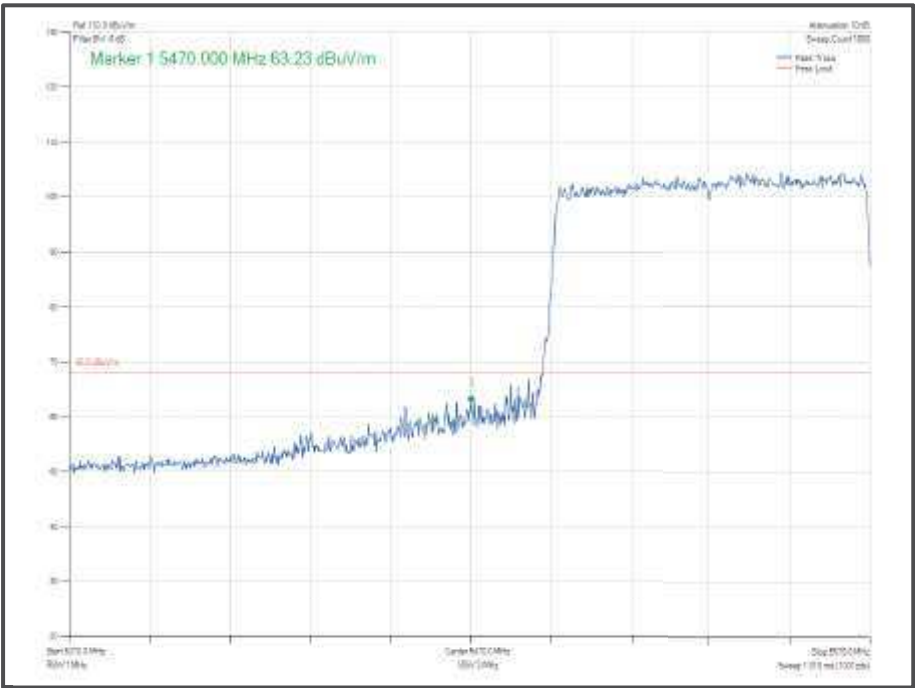


Figure 954 – 802.11ax HE80 Core 1 SU – 5530 MHz
Band Edge Frequency 5470 MHz

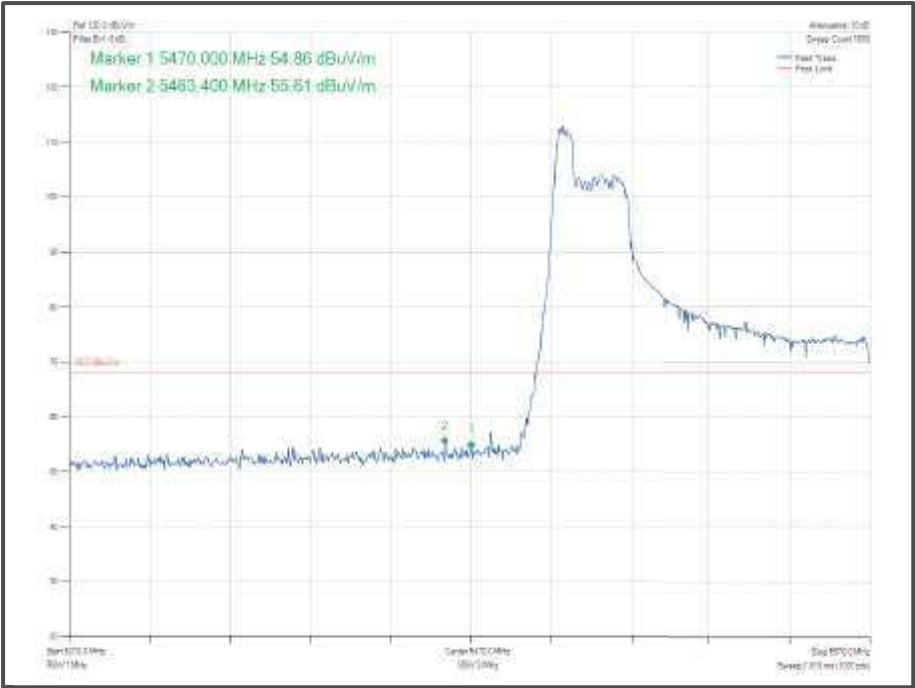


Figure 955 – 802.11 ax HE80 Core 1 52-37 - 5530 M Hz
Band Edge Frequency 5470 MHz

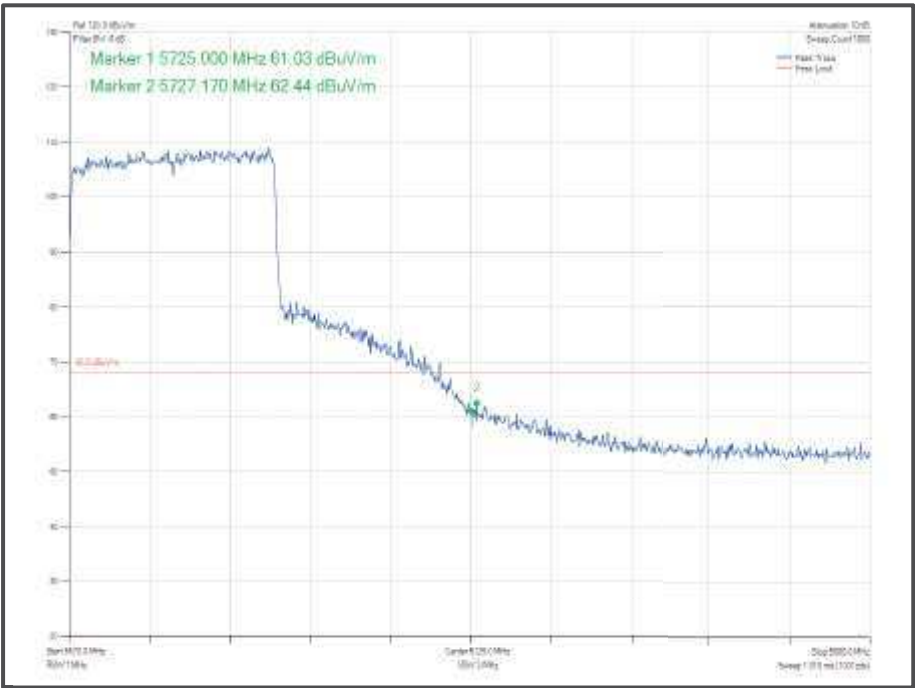


Figure 956 – 802.11 ax HE80 Core 1 SU – 5610 M Hz
Band Edge Frequency 5725 MHz

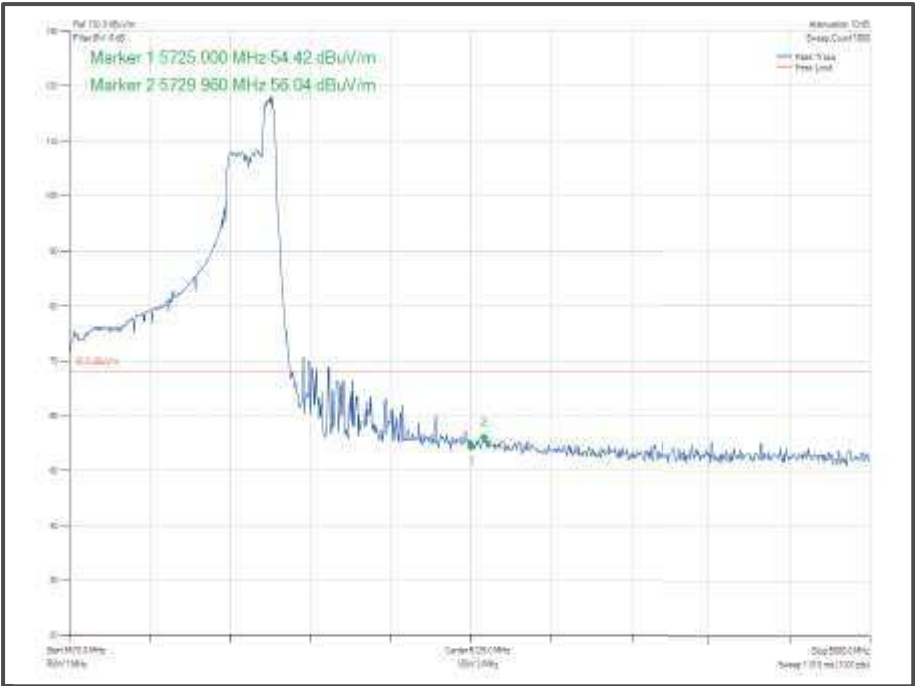


Figure 957 - - 802.11ax HE80 Core 1 26-36 – 5610 MHz
Band Edge Frequency 5725 MHz

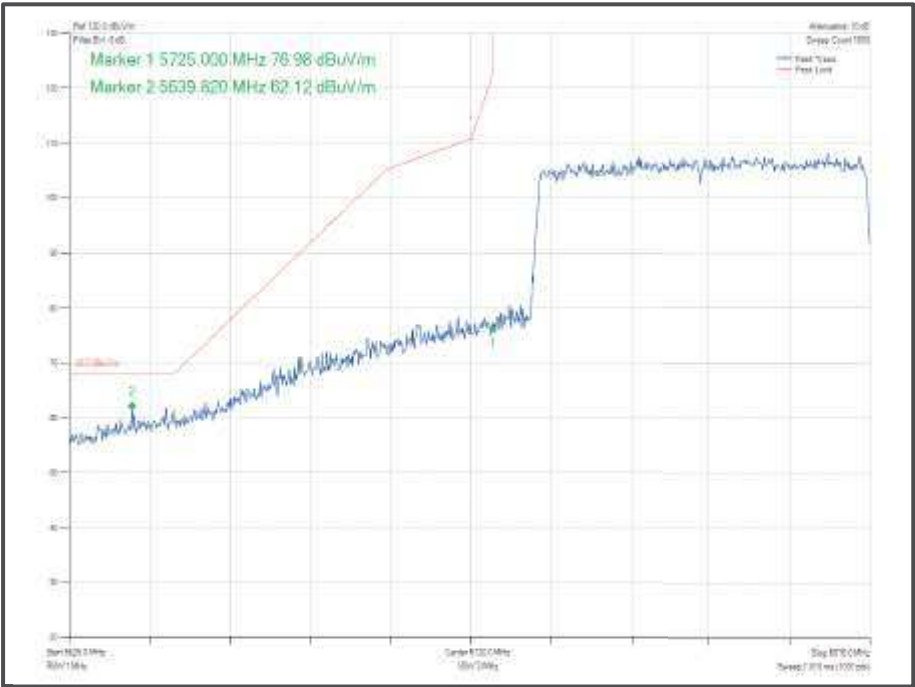


Figure 958 – 802.11 ax HE80 Core 1 SU – 5775 MHz
Band Edge Frequency 5725 MHz

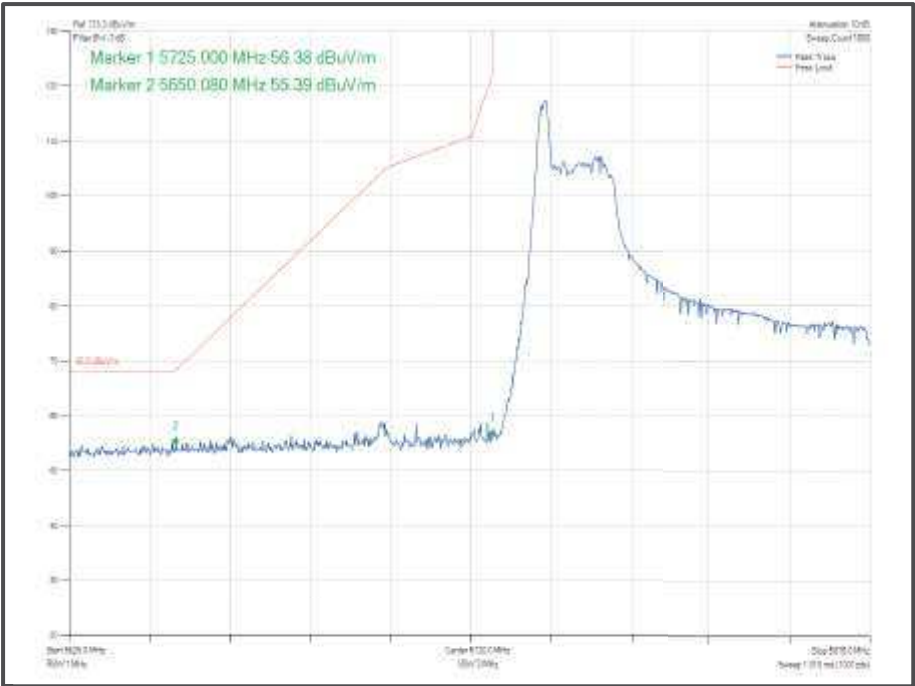


Figure 959 – 802.11 ax HE80 Core 1 26-0 – 5775 MHz
Band Edge Frequency 5725 MHz

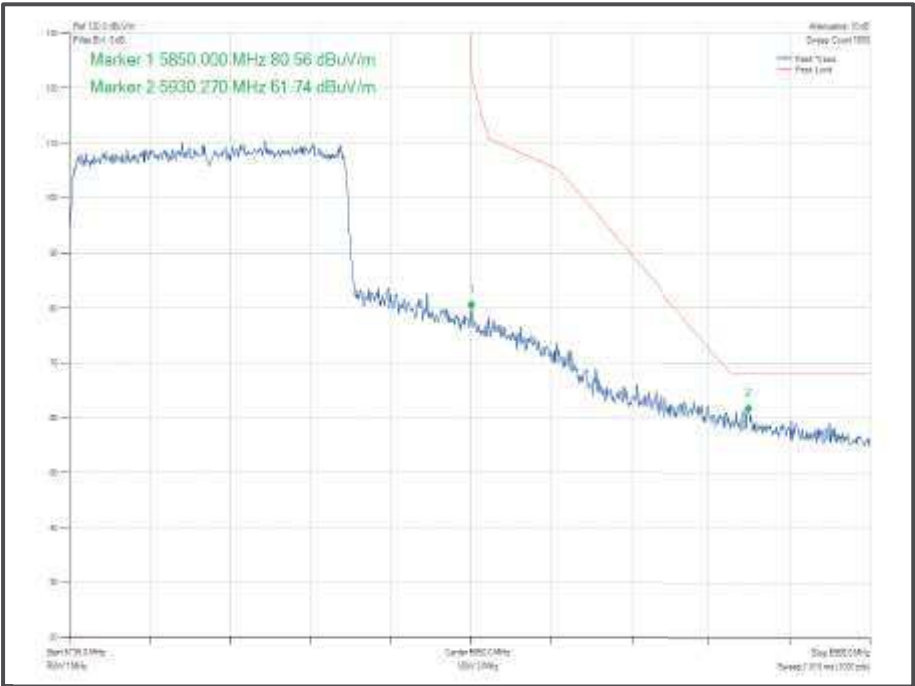


Figure 960 – 802.11 ax HE80 Core 1 SU – 5775 MHz
Band Edge Frequency 5850 MHz

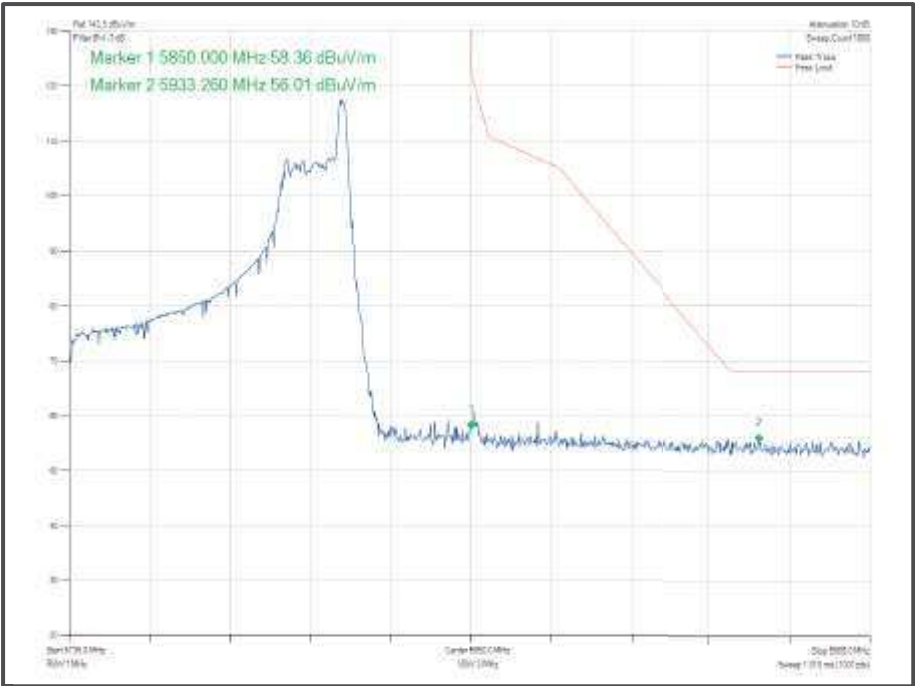


Figure 961 – 802.11 ax HE80 Core 1 26-36 – 5775 MHz
Band Edge Frequency 5850 MHz



Mode	DataRate/ MCS	Resource size	Resource Index	TX Frequency (MHz)	Band Edge Frequency (MHz)	Level (dBuV/m)
802.11ac VHT80 CDD, Cores 0-1	MCS7x1	-	-	5530	5470	62.34
802.11ac VHT80 SDM, Cores 0-1	MCS7x1	-	-	5530	5470	62.71
802.11ax HE80 CDD, Cores 0-1	MCS7	SU	-	5530	5470	57.83
802.11ax HE80 CDD, Cores 0-1	MCS7	52	37	5530	5470	55.51
802.11ax HE80 SDM, Cores 0-1	MCS7	SU	-	5530	5470	57.54
802.11ax HE80 SDM, Cores 0-1	MCS7	52	37	5530	5470	54.91
802.11ac VHT80 CDD, Cores 0-1	MCS7	-	-	5610	5725	63.43
802.11ac VHT80 SDM, Cores 0-1	MCS7	-	-	5610	5725	63.49
802.11ax HE80 CDD, Cores 0-1	MCS7	SU	-	5610	5725	61.88
802.11ax HE80 CDD, Cores 0-1	MCS7	52	52	5610	5725	57.65
802.11ax HE80 SDM, Cores 0-1	MCS7	SU	-	5610	5725	61.85
802.11ax HE80 SDM, Cores 0-1	MCS7	52	52	5610	5725	55.40
802.11ac VHT80 CDD, Cores 0-1	MCS7	-	-	5775	5725	63.18
802.11ac VHT80 SDM, Cores 0-1	MCS7	-	-	5775	5725	63.19
802.11ax HE80 CDD, Cores 0-1	MCS7	SU	-	5775	5725	61.38
802.11ax HE80 CDD, Cores 0-1	MCS7	26	0	5775	5725	56.12
802.11ax HE80 SDM, Cores 0-1	MCS7	SU	-	5775	5725	59.97
802.11ax HE80 SDM, Cores 0-1	MCS7	26	0	5775	5725	54.05
802.11ac VHT80 CDD, Cores 0-1	MCS7	-	-	5775	5850	61.84
802.11ac VHT80 SDM, Cores 0-1	MCS7	-	-	5775	5850	60.58
802.11ax HE80 CDD, Cores 0-1	MCS7	SU	-	5775	5850	58.45
802.11ax HE80 CDD, Cores 0-1	MCS7	26	36	5775	5850	55.62
802.11ax HE80 SDM, Cores 0-1	MCS7	SU	-	5775	5850	57.85
802.11ax HE80 SDM, Cores 0-1	MCS7	26	36	5775	5850	54.99

Table 632 – MIMO 2TX Authorised Band Edge Results

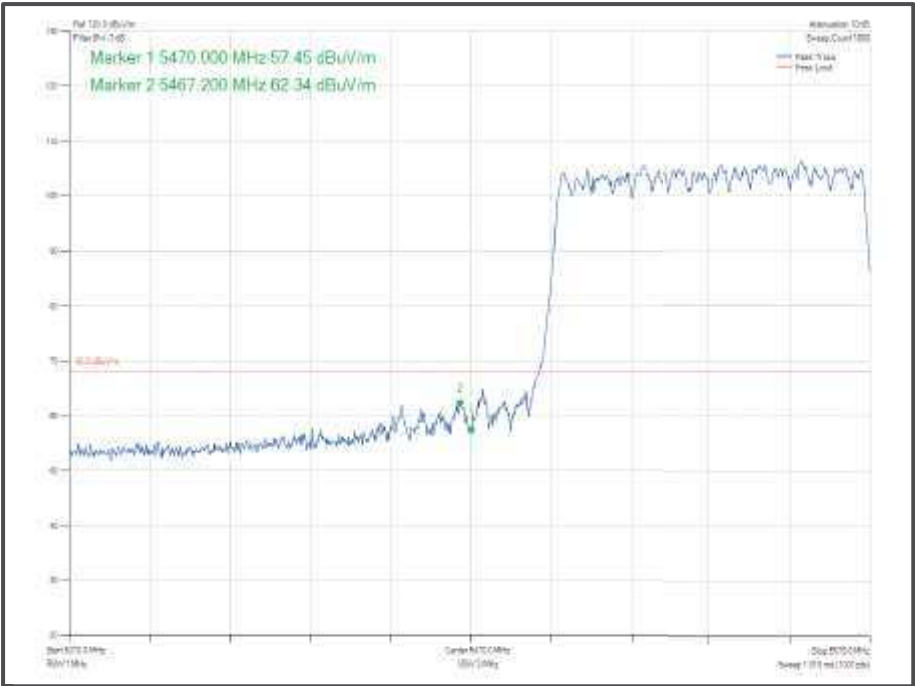


Figure 962 – 802.11 ac VHT80 CDD, Cores 0-1 – 5530 MHz
Band Edge Frequency 5470 MHz

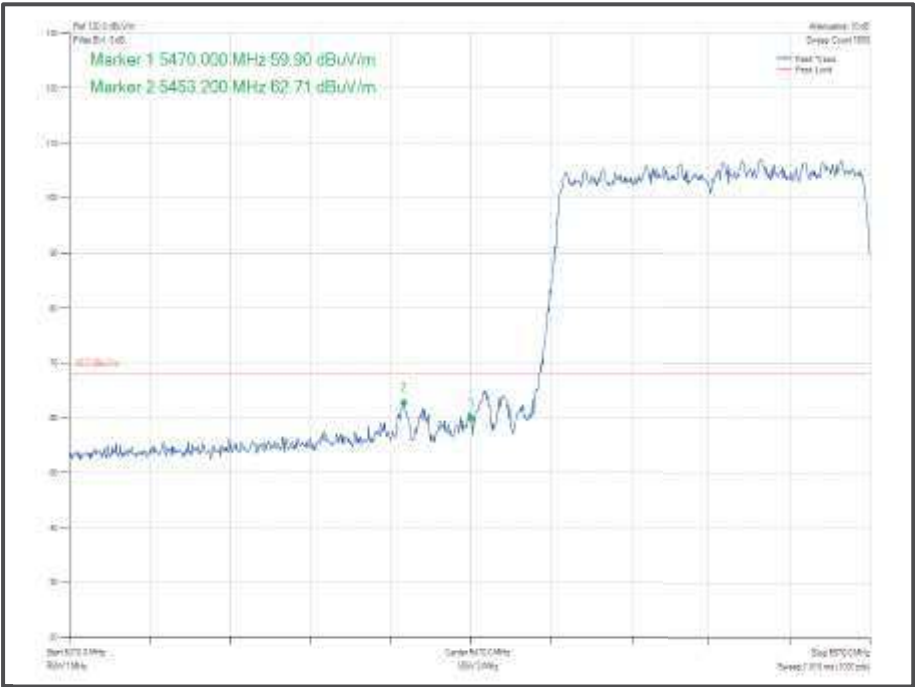


Figure 963 – 802.11 ac VHT80 SDM, Cores 0-1 – 5530 MHz
Band Edge Frequency 5470 MHz

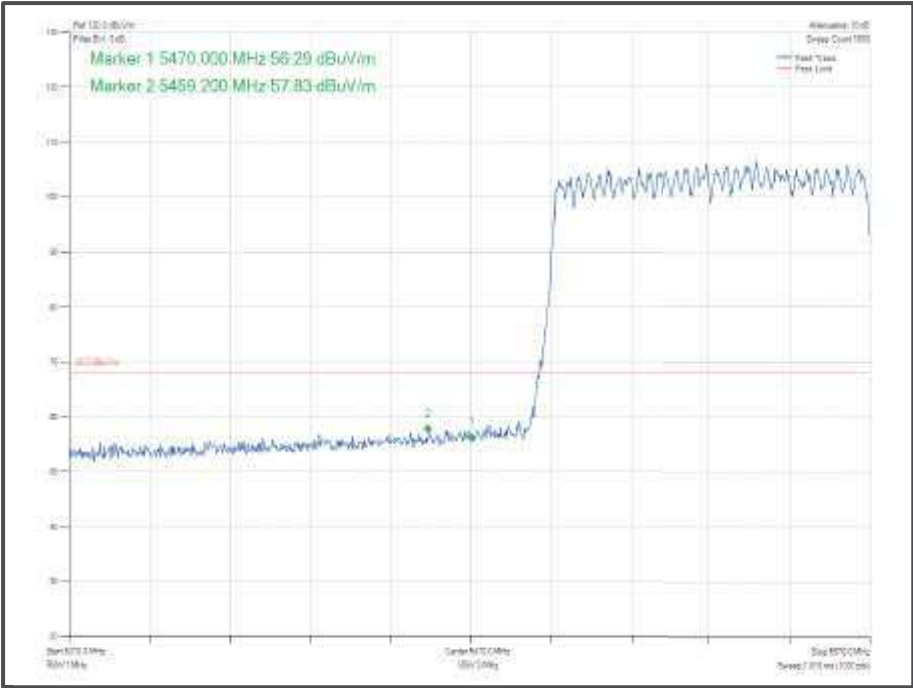


Figure 964 – 802.11 ax HE80 CDD, Cores 0-1, SU – 5530 MHz
Band Edge Frequency 5470 MHz

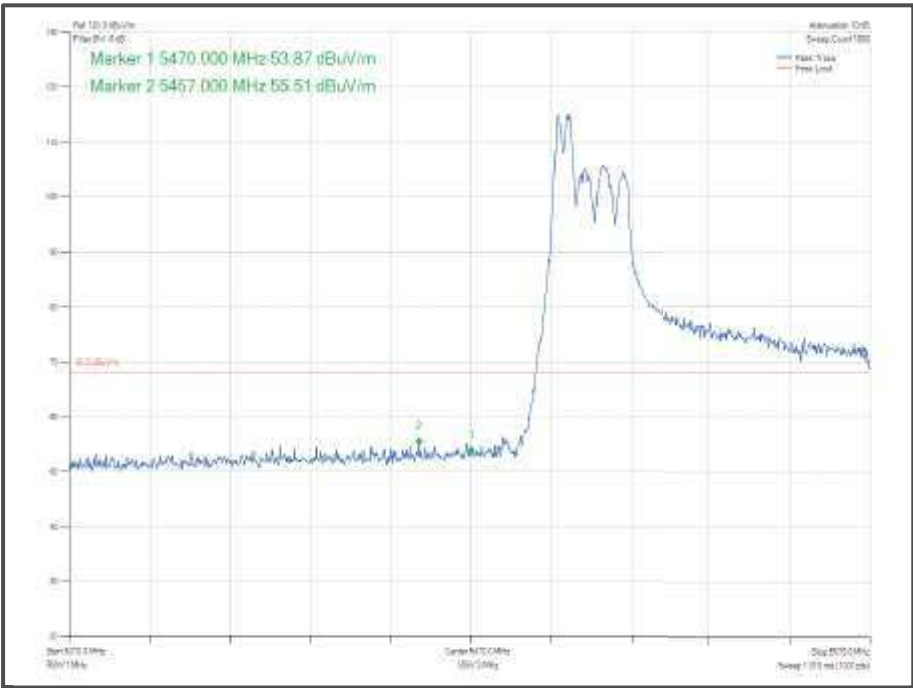


Figure 965 – 802.11 ax HE80 CDD, Cores 0-1, 26-0- 5530 MHz
Band Edge Frequency 5470 MHz

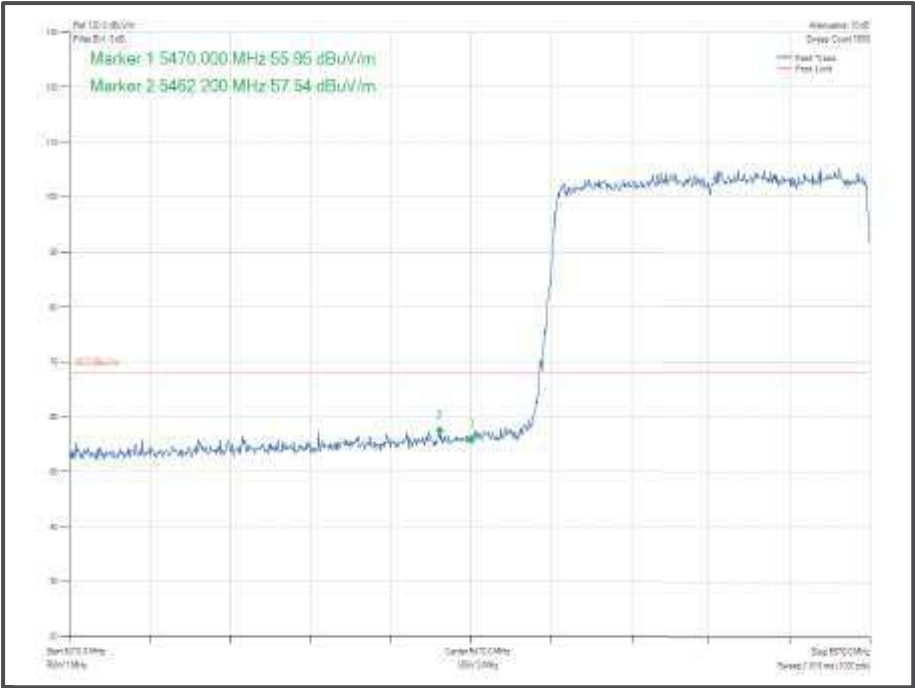


Figure 966 – 802.11 ax HE80 SDM, Cores 0-1, SU – 5530 MHz
Band Edge Frequency 5470 MHz

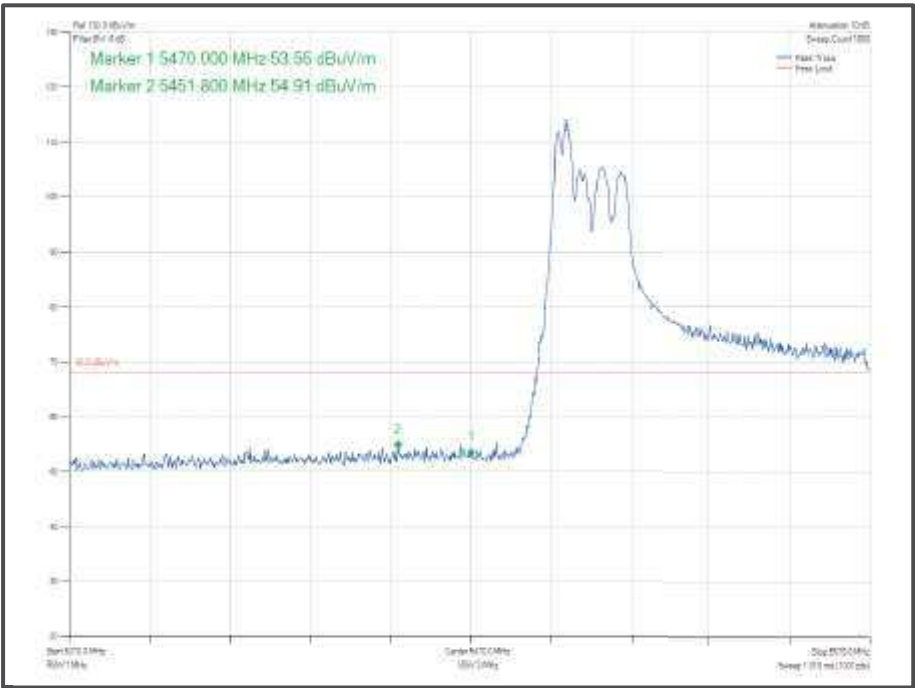


Figure 967 – 802.11 ax HE80 SDM, Cores 0-1, 26-0 – 5530 MHz
Band Edge Frequency 5470 MHz

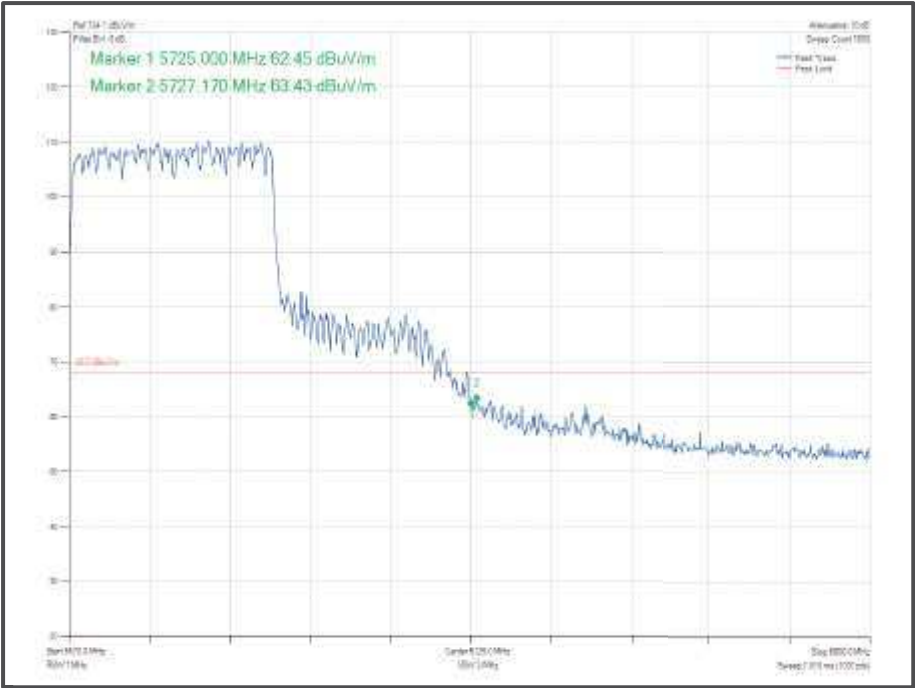


Figure 968 – 802.11ac VHT80 CDD, Cores 0-1 – 5610 M Hz
Band Edge Frequency 5725 MHz

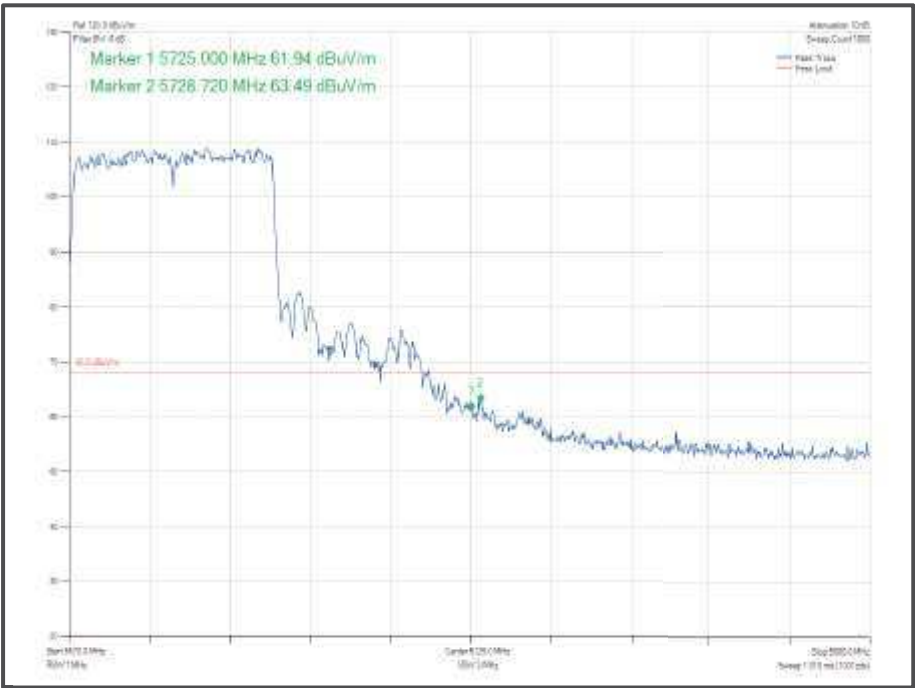


Figure 969 – 802.11ac VHT80 SDM, Cores 0-1 – 5610 M Hz
Band Edge Frequency 5725 MHz

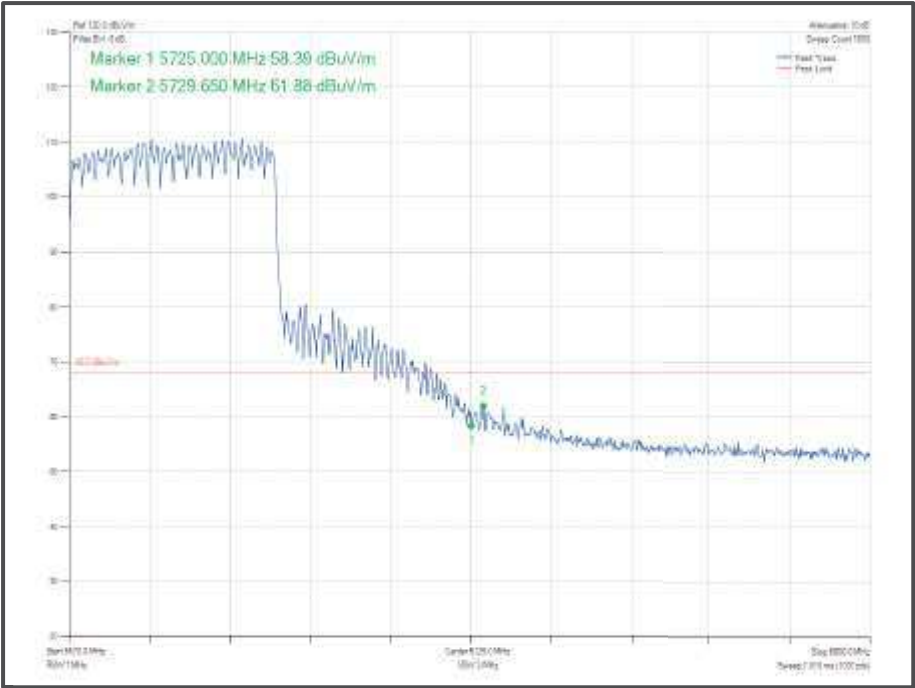


Figure 970 – 802.11 ax HE80 CDD, Cores 0-1, SU – 5610 MHz
Band Edge Frequency 5725 MHz

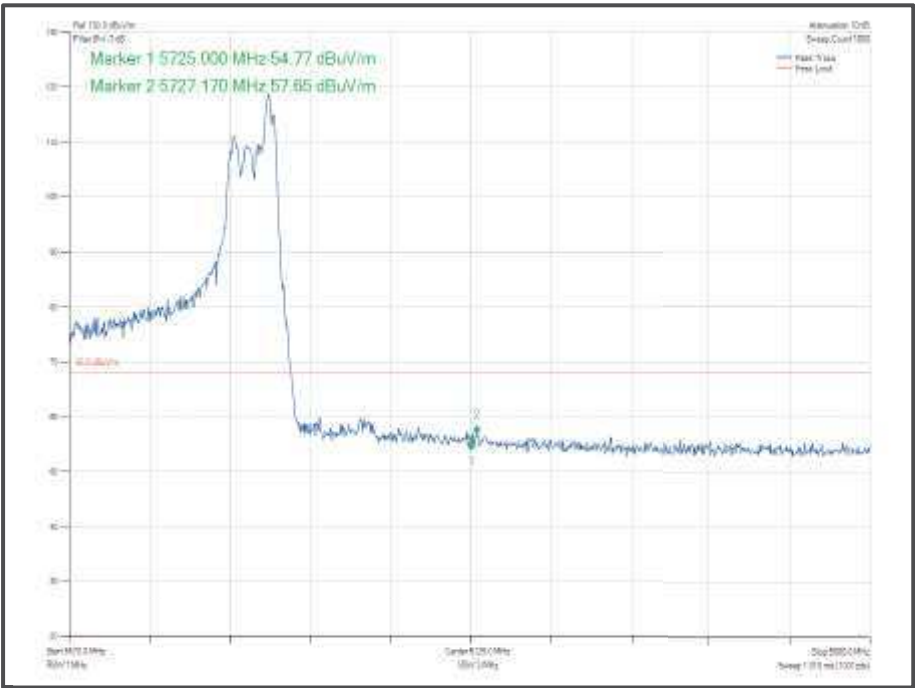


Figure 971 – 802.11 ax HE80 CDD, Cores 0-1, 52-52 - 5610 MHz
Band Edge Frequency 5725 MHz

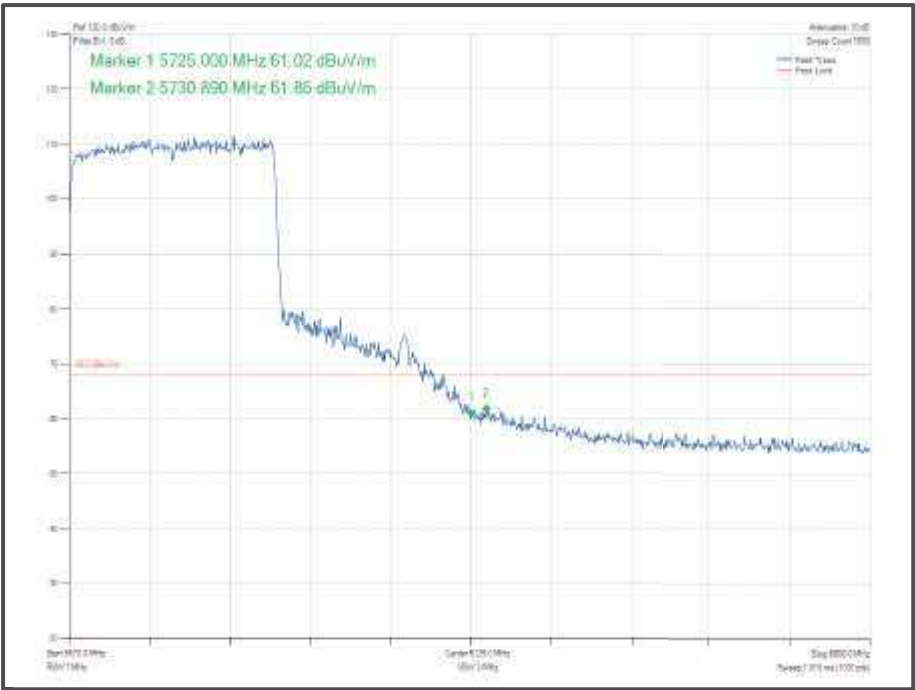


Figure 972 – 802.11 ax HE80 SDM, Cores 0-1, SU – 5610 MHz
Band Edge Frequency 5725 MHz

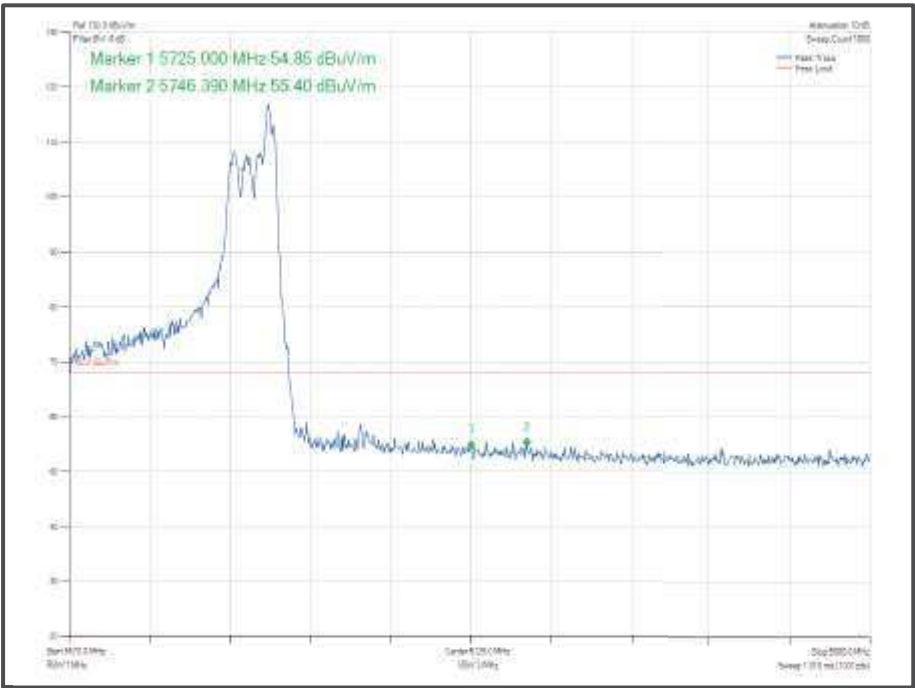


Figure 973 – 802.11 ax HE80 SDM, Cores 0-1, 52-52 – 5610 M Hz
Band Edge Frequency 5725 MHz

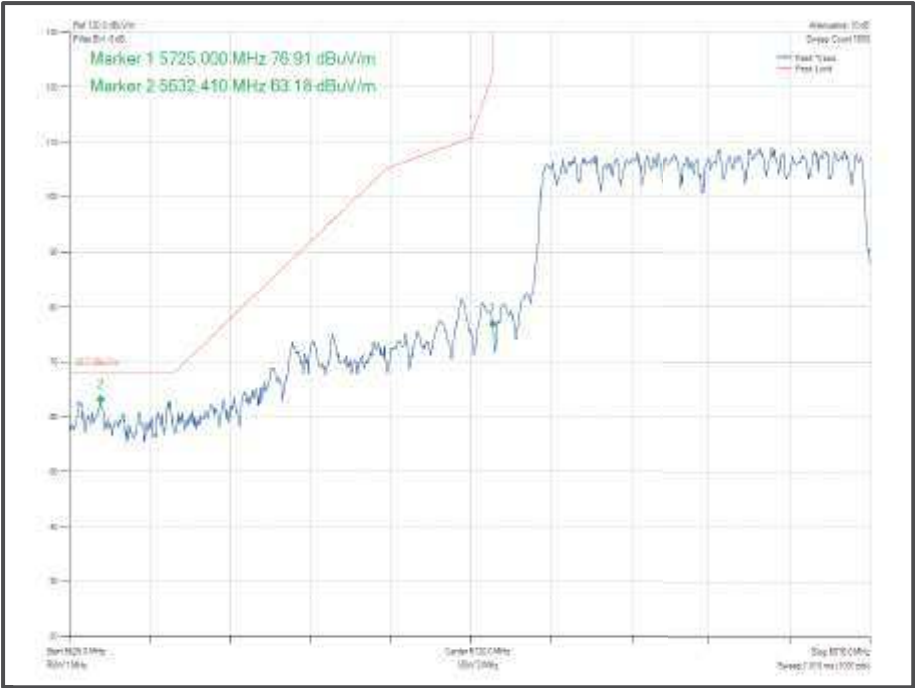


Figure 974 – 802.11 ac VHT80 CDD, Cores 0-1 – 5775 MHz
Band Edge Frequency 5725 MHz

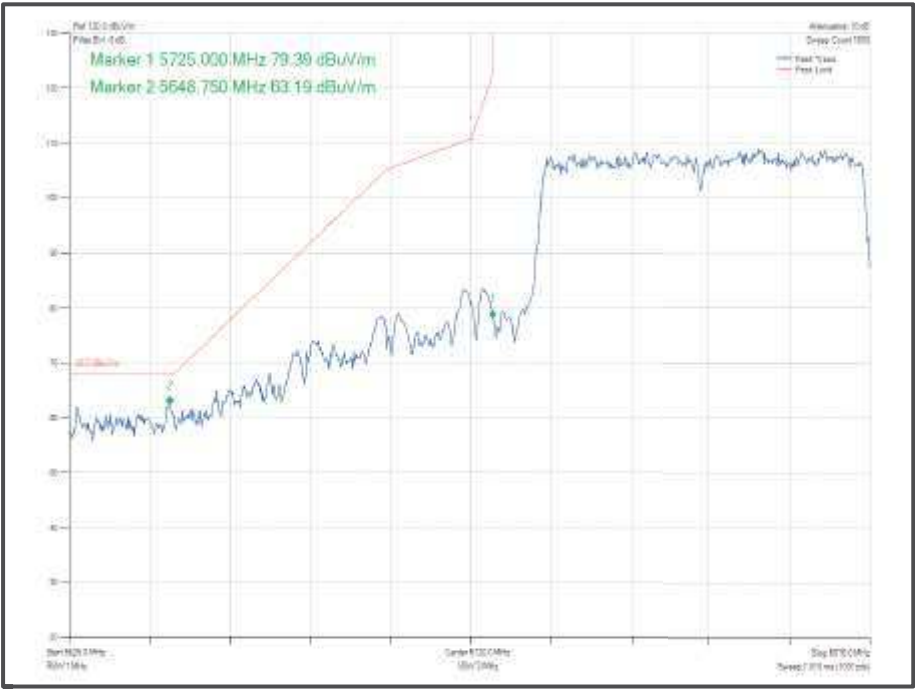


Figure 975 – 802.11 ac VHT80 SDM, Cores 0-1 – 5775 MHz
Band Edge Frequency 5725 MHz

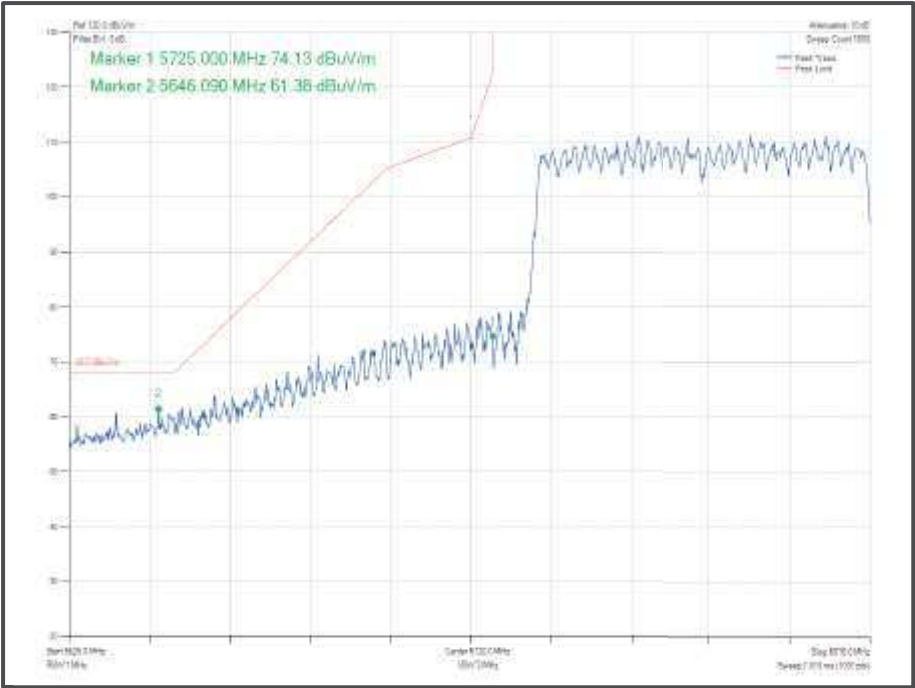


Figure 976 – 802.11 ax HE80 CDD, Cores 0-1, SU – 5775 MHz
Band Edge Frequency 5725 MHz

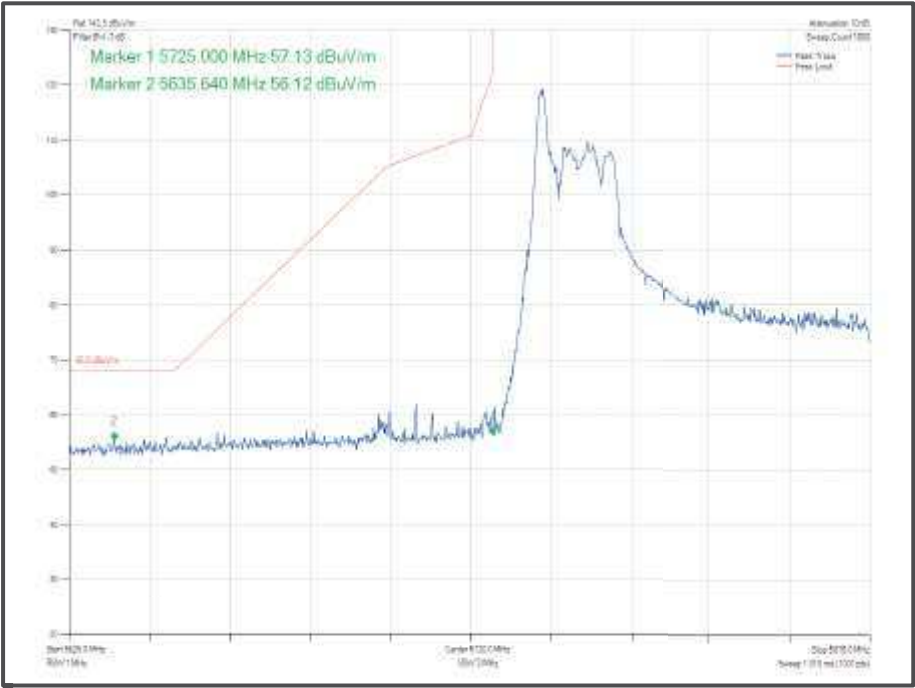


Figure 977 – 802.11 ax HE80 CDD, Cores 0-1, 26-0 – 5775 MHz
Band Edge Frequency 5725 MHz

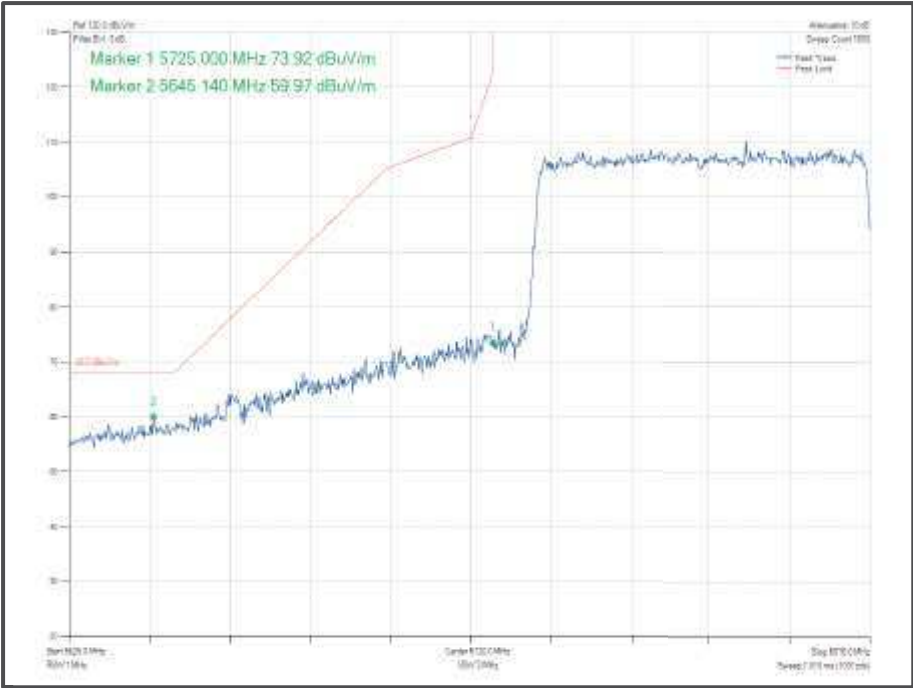


Figure 978 – 802.11ax HE80 SDM, Cores 0-1, SU – 5775 MHz
Band Edge Frequency 5725 MHz

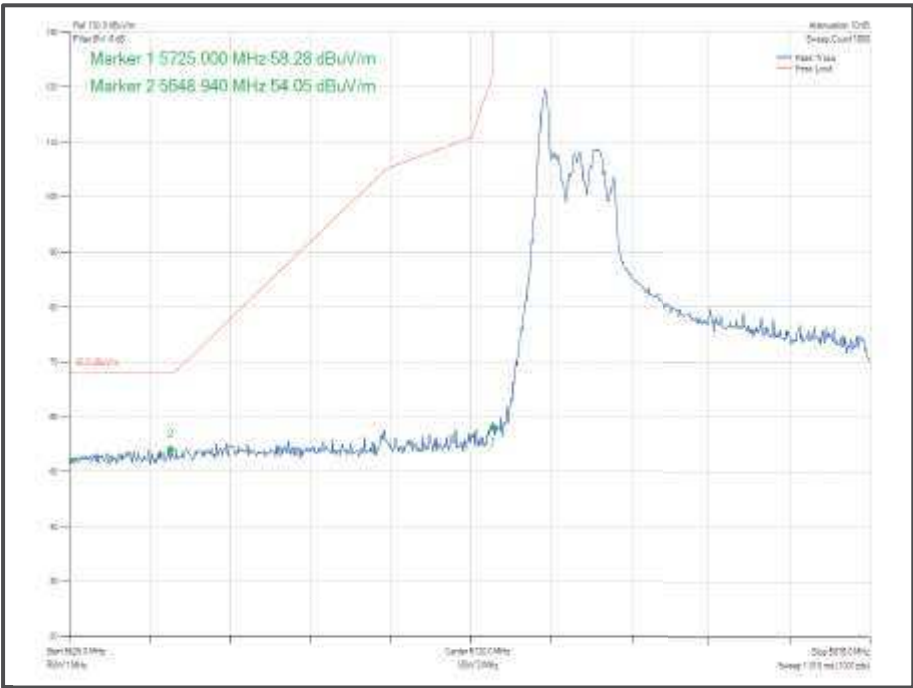


Figure 979 – 802.11ax HE80 SDM, Cores 0-1, 26-0 – 5775 MHz
Band Edge Frequency 5725 MHz

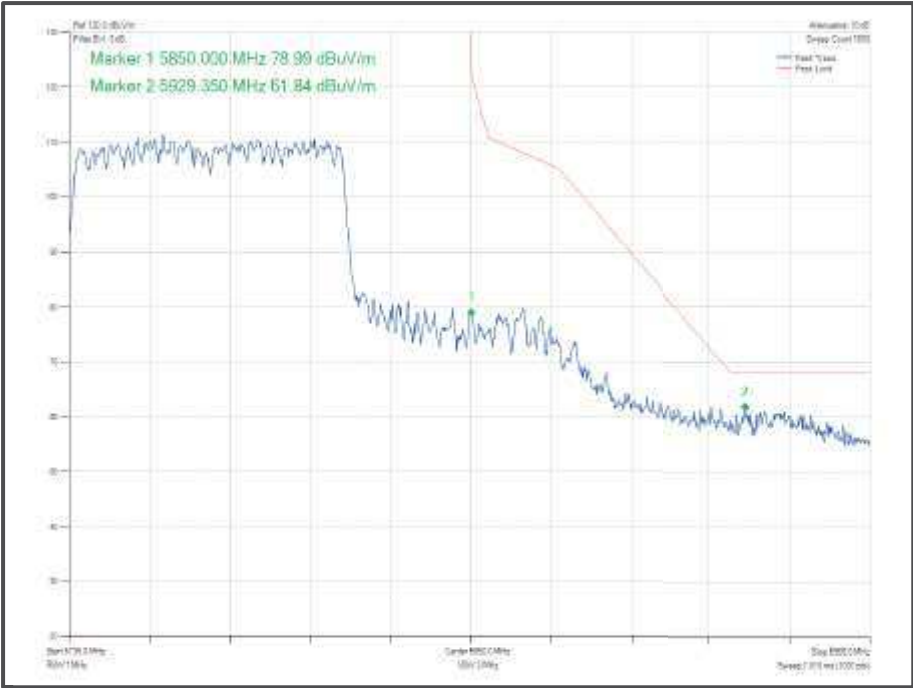


Figure 980 – 802.11ac VHT80 CDD, Cores 0-1 – 5775 M Hz
Band Edge Frequency 5850 MHz

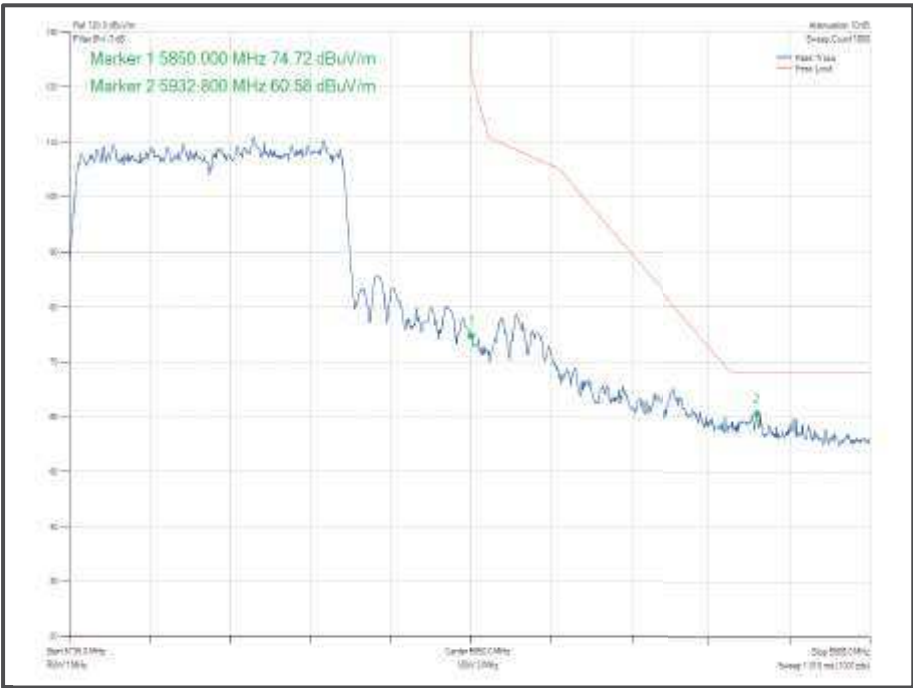


Figure 981 – 802.11ac VHT80 SDM, Cores 0-1 – 5775 M Hz
Band Edge Frequency 5850 MHz

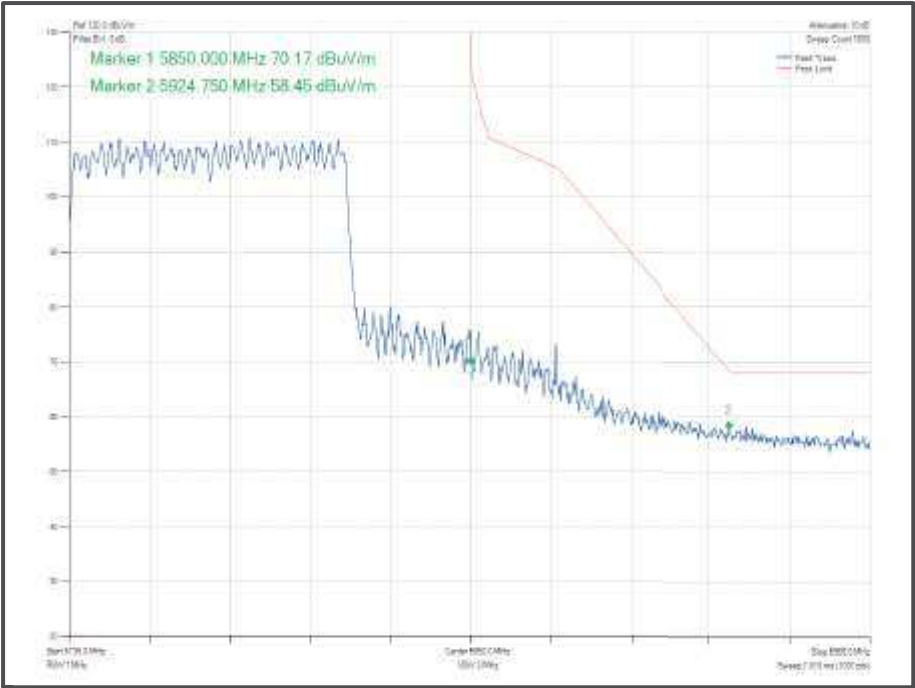


Figure 982 – 802.11 ax HE80 CDD, Cores 0-1, SU – 5775 MHz
Band Edge Frequency 5850 MHz

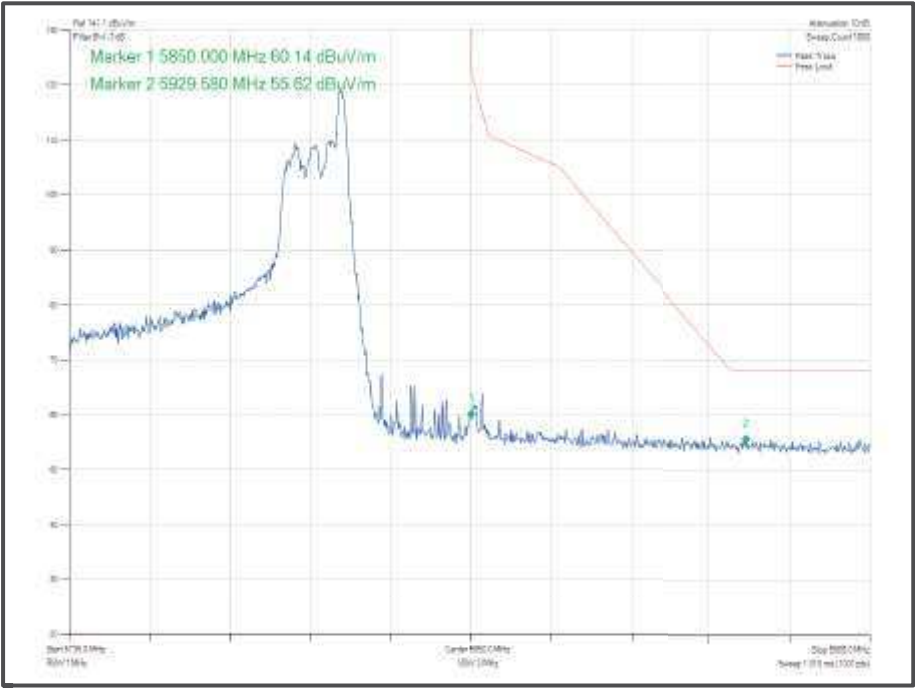


Figure 983 – 802.11 ax HE80 CDD, Cores 0-1, 26-36 – 5775 MHz
Band Edge Frequency 5850 MHz

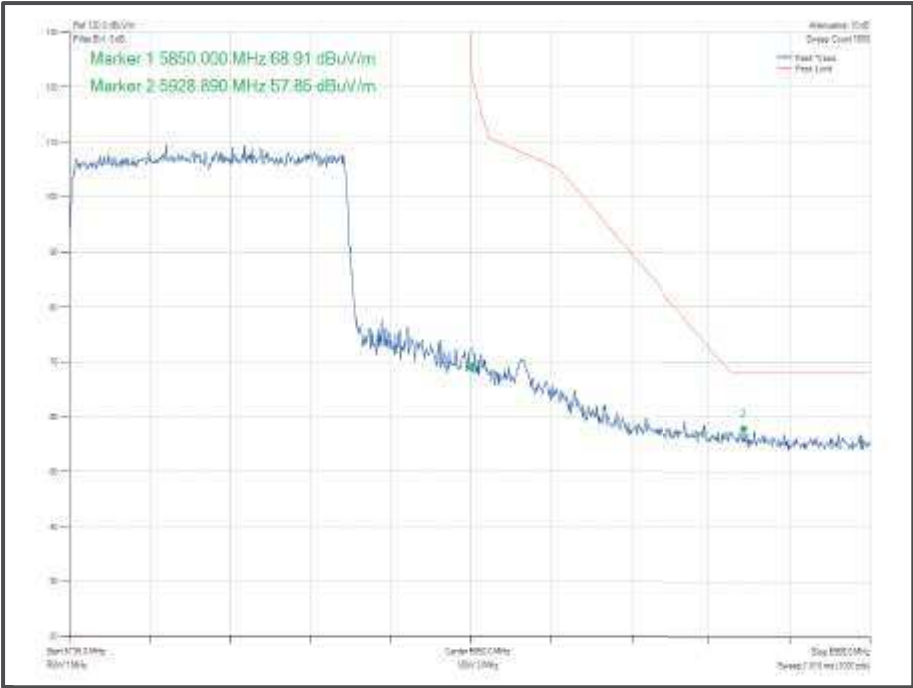


Figure 984 – 802.11ax HE80 SDM, Cores 0-1, SU – 5775 MHz
Band Edge Frequency 5850 MHz

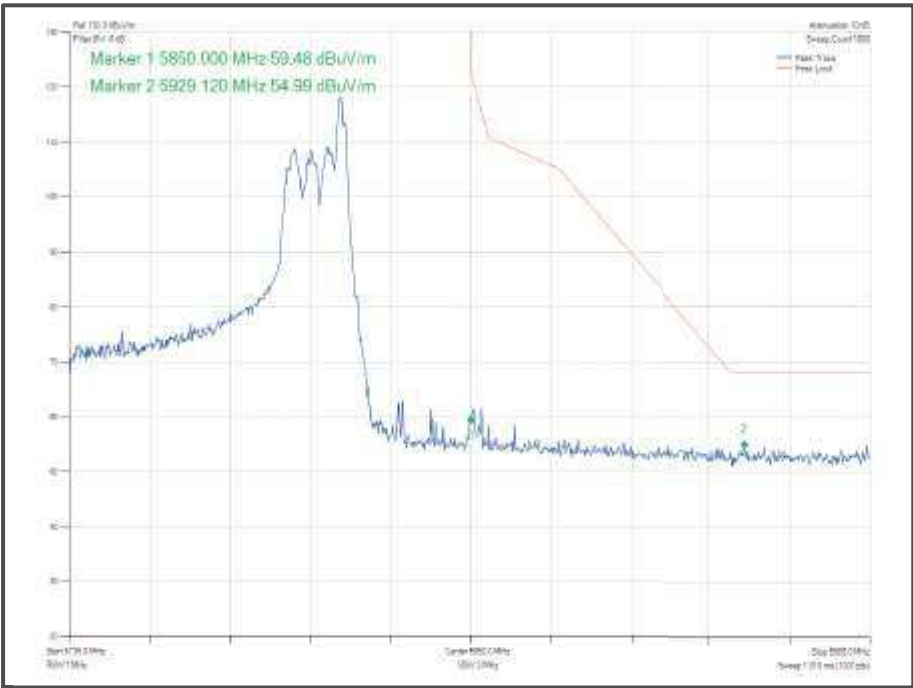


Figure 985 – 802.11ax HE80 SDM, Cores 0-1, 26-36 – 5775 M Hz
Band Edge Frequency 5850 MHz



FCC 47 CFR Part 15E, Limit Clause 15.407(b)(1)(2)(3)(4)

For transmitters operating in the 5.15-5.25 GHz band: ≤ -27 dBm/MHz outside 5150-5350 MHz.

For transmitters operating in the 5.25-5.35 GHz band: ≤ -27 dBm/MHz outside 5150-5350 MHz.

For transmitters operating in the 5.47-5.725 GHz band: ≤ -27 dBm/MHz outside 5470-5725 MHz

For transmitters operating in the 5.725-5.85 GHz band: All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

ISED RSS-247, Limit Clause 6.2.1.2, 6.2.2.2, 6.2.3.2 and 6.2.4.2

For transmitters with operating frequencies in the band 5150-5250 MHz, all emissions outside the band 5150-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p. Any unwanted emissions that fall into the band 5250-5350 MHz shall be attenuated below the channel power by at least 26 dB.

For transmitters with operating frequencies in the bands 5250-5350 MHz and 5470-5725 MHz, all emissions outside the band 5250-5350 MHz and 5470-5725 MHz shall not exceed -27 dBm/MHz e.i.r.p.

Devices operating in the band 5725-5850 MHz shall have e.i.r.p. of unwanted emissions comply with the following:

- a) 27 dBm/MHz at frequencies from the band edges decreasing linearly to 15.6 dBm/MHz at 5 MHz above or below the band edges;
- b) 15.6 dBm/MHz at 5 MHz above or below the band edges decreasing linearly to 10 dBm/MHz at 25 MHz above or below the band edges;
- c) 10 dBm/MHz at 25 MHz above or below the band edges decreasing linearly to -27 dBm/MHz at 75 MHz above or below the band edges; and
- d) -27 dBm/MHz at frequencies more than 75 MHz above or below the band edges.



2.4.7 Test Location and Test Equipment Used

This test was carried out in RF Chamber 11.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
EMI Test Receiver	Rohde & Schwarz	ESW44	5084	12	28-Nov-2020
8m N-Type RF Cable	Teledyne	PR90-088-8MTR	5092	12	06-Dec-2020
Screened Room (11)	Rainford	Rainford	5136	36	01-Nov-2021
Cable (18 GHz)	Rosenberger	LU7-071-1000	5102	12	06-Oct-2020
Cable (18 GHz)	Rosenberger	LU7-071-1000	5103	12	06-Oct-2020
Cable (18 GHz)	Rosenberger	LU7-071-1000	5104	12	09-Dec-2020
EmX Emissions Software	TUV SUD	EmX	5125	-	Software
Mast	Maturo	TAM 4.0-P	5158	-	TU
Mast and Turntable Controller	Maturo	Maturo NCD	5159	-	TU
Turntable	Maturo	TT 15WF	5160	-	TU
Horn Antenna (1-10GHz)	Schwarzeck	BBHA 9120 B	5215	12	10-Mar-2021
Pre Amp 1 -26.5 GHz	Agilent Technologies	8449B	5445	12	06-May-2021
Thermo-Hygro-Barometer	PCE Instruments	PCE-THB-40	5475	12	17-Mar-2021
Attenuator 5W 10dB DC-18GHz	Aaren	AT40A-4041-D18-10	5494	12	14-Apr-2021
2m SMA Cable	Junkosha	MWX221-02000AMSAMS/A	5518	12	01-Apr-2021
8m N Type Cable	Junkosha	MWX221-08000NMSNMS/B	5522	12	24-Mar-2021

Table 633

TU - Traceability Unscheduled

O/P Mon – Output Monitored using calibrated equipment



2.5 Restricted Band Edges

2.5.1 Specification Reference

FCC 47 CFR Part 15E, Clause 15.205
ISED RSS-GEN, Clause 8.10

2.5.2 Equipment Under Test and Modification State

A23 37, S/N:C02D200EQ9MQ – Modification State 0

2.5.3 Date of Test

02-August-2020 to 19-August-2020

2.5.4 Test Method

The test was performed in accordance with ANSI C63.10, clause 12.7.

Restricted Band Edge measurements were performed with the device operating in SISO and MIMO operation, across the various modes supported by the device.

The measurements displayed within this report have been limited to those modes which have been shown to be worst case.

Where duty cycle corrections were required for average results, these are included in the result tables but are not shown on the plots.

Further measurements are held on file by TÜV SÜD and are available if required.

2.5.5 Environmental Conditions

Ambient Temperature	20.7-24.4 °C
Relative Humidity	45.0-70.0 %



2.5.6 Test Results

5 GHz WLAN

Mode	Data Rate/ MCS	Resource Size	Resource Index	TX Frequency (MHz)	Band Edge Frequency (MHz)	Peak Level (dBμV/m)	Average Level (dBμV/m)
802.11a, Core 1	6 Mbps	-	-	5180	5150	59.62	48.93
802.11n HT 20, Core 1	MCS7	-	-	5180	5150	66.40	49.4
802.11ax HE20, Core 1	MCS7	SU	-	5180	5150	61.92	48.71
802.11ax HE20, Core 1	MCS7	26	0	5180	5150	55.42	44.56
802.11a, Core 1	6 Mbps	-	-	5320	5350	60.70	49.78
802.11n HT 20, Core 1	MCS7	-	-	5320	5350	63.76	51.09
802.11ax HE20, Core 1	MCS7	SU	-	5320	5350	63.10	50.34
802.11ax HE20, Core 1	MCS7	52	40	5320	5350	61.18	47.94
802.11a, Core 1	6 Mbps	-	-	5500	5460	58.76	48.04
802.11n HT 20, Core 1	MCS7	-	-	5500	5460	63.61	48.18
802.11ax HE20, Core 1	MCS7	SU	-	5500	5460	58.52	47.28
802.11ax HE20, Core 1	MCS7	52	37	5500	5460	57.74	46.78

Table 634 - SISO Restricted Band Edge Results

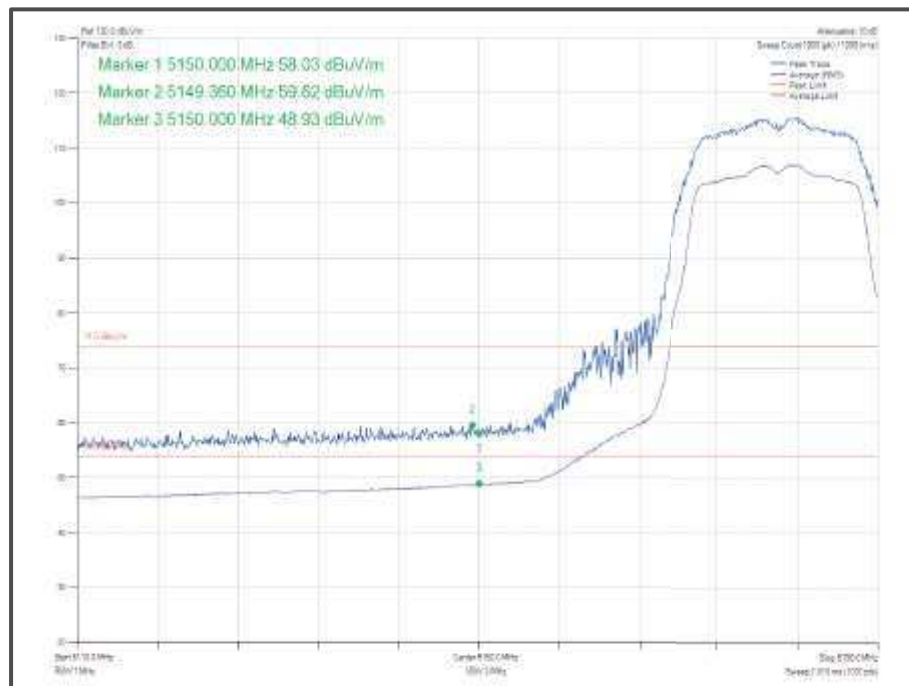


Figure 986 - 802.11a, Core 1 - 5180 MHz, Band Edge Frequency 5150 MHz

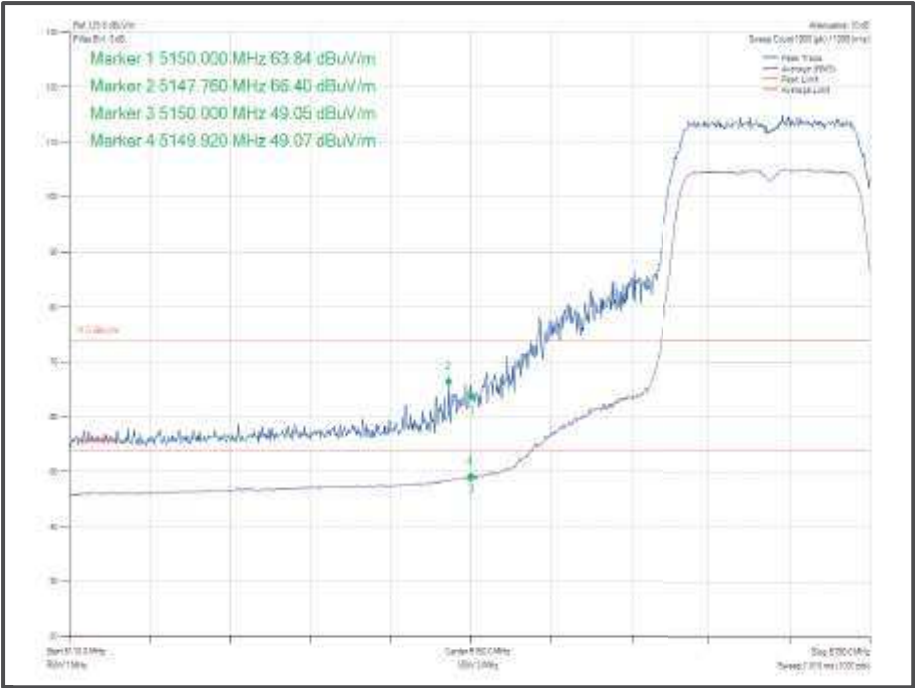


Figure 987 - 802.11n HT20, Core 1 - 5180 MHz, Band Edge Frequency 5150 MHz

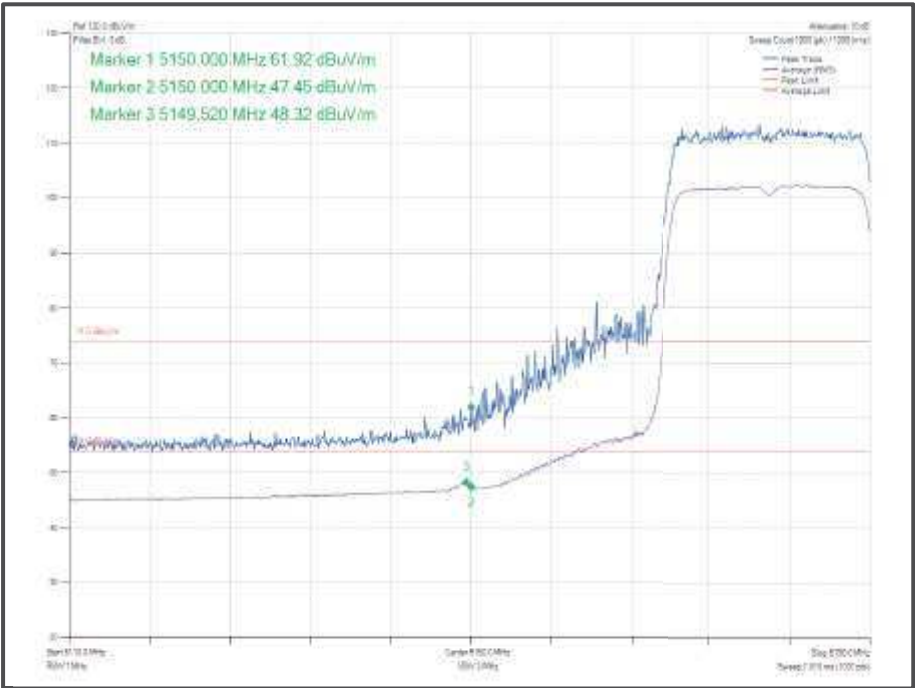


Figure 988 - 802.11ax HE20, Core 1, SU - 5180 MHz, Band Edge Frequency 5150 MHz

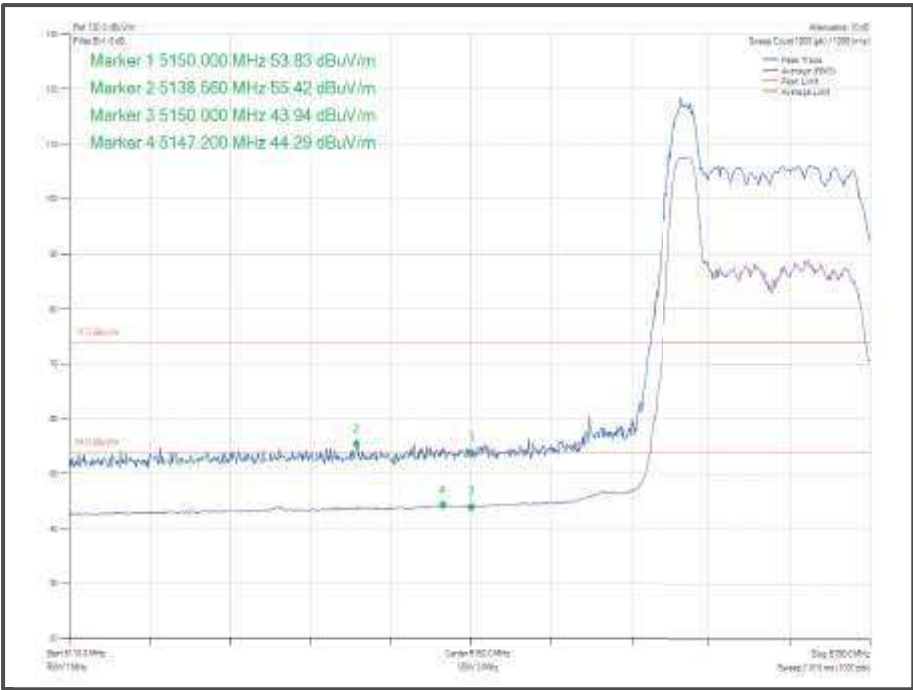


Figure 989 - 802.11ax HE20, Core 1, 26-0 - 5180 MHz, Band Edge Frequency 5150 MHz

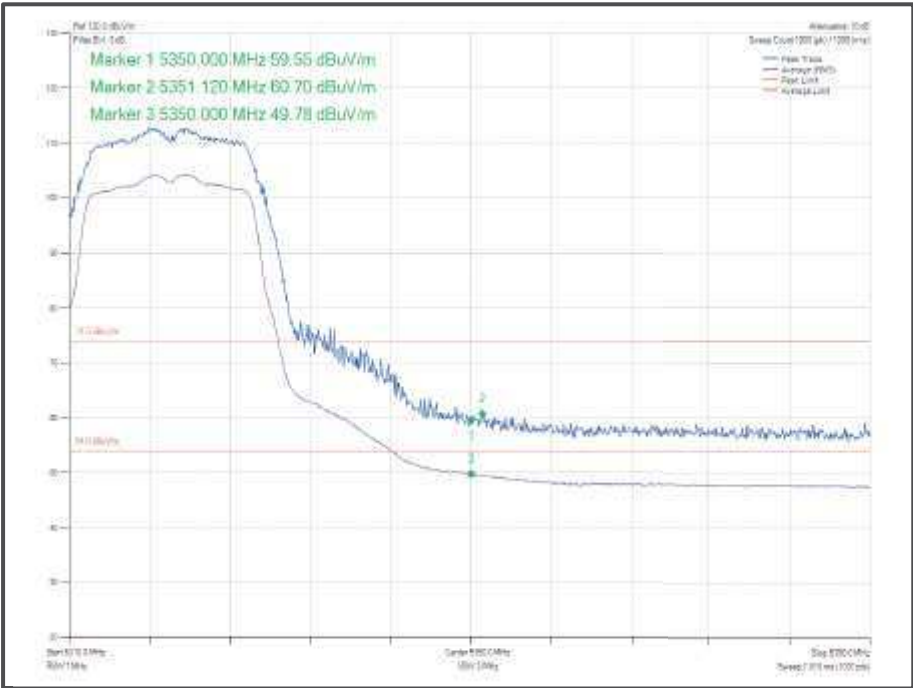


Figure 990 - 802.11a, Core 1 - 5320 MHz, Band Edge Frequency 5350 MHz

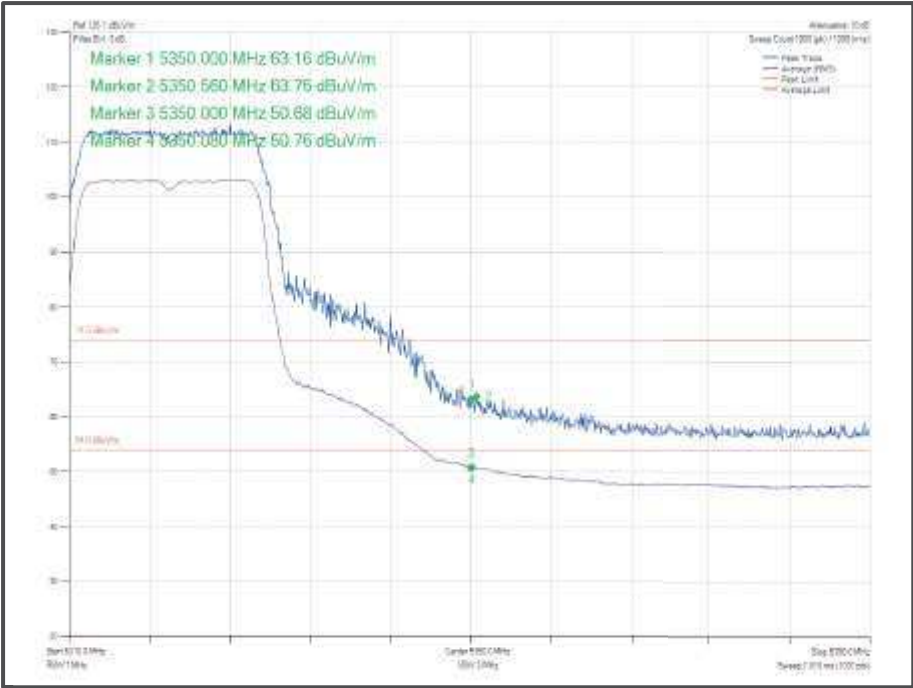


Figure 991 - 802.11n HT20, Core 1 - 5320 MHz, Band Edge Frequency 5350 MHz

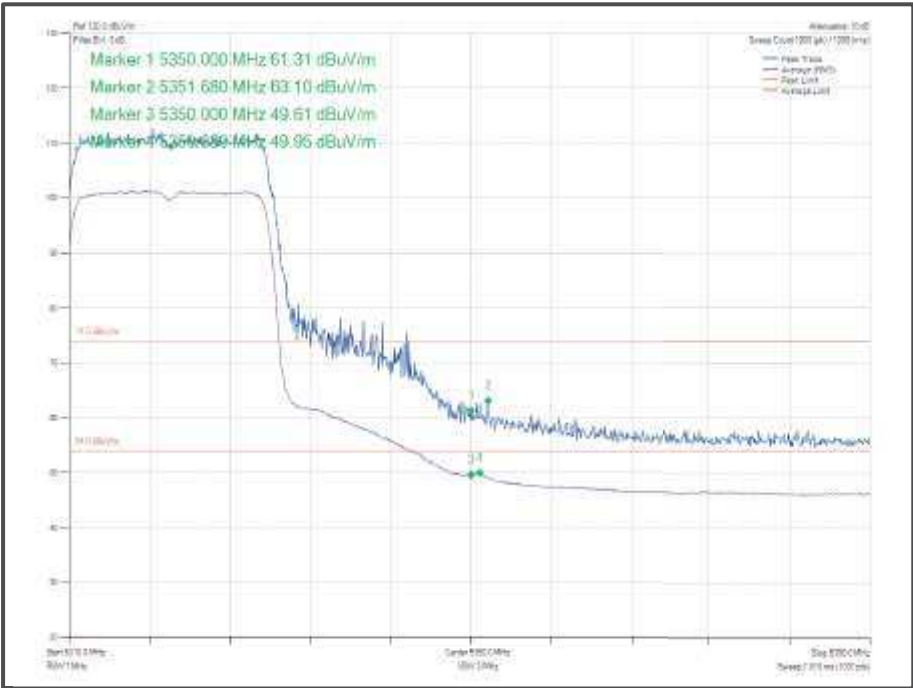


Figure 992 - 802.11ax HE20, Core 1, SU - 5320 MHz, Band Edge Frequency 5350 MHz

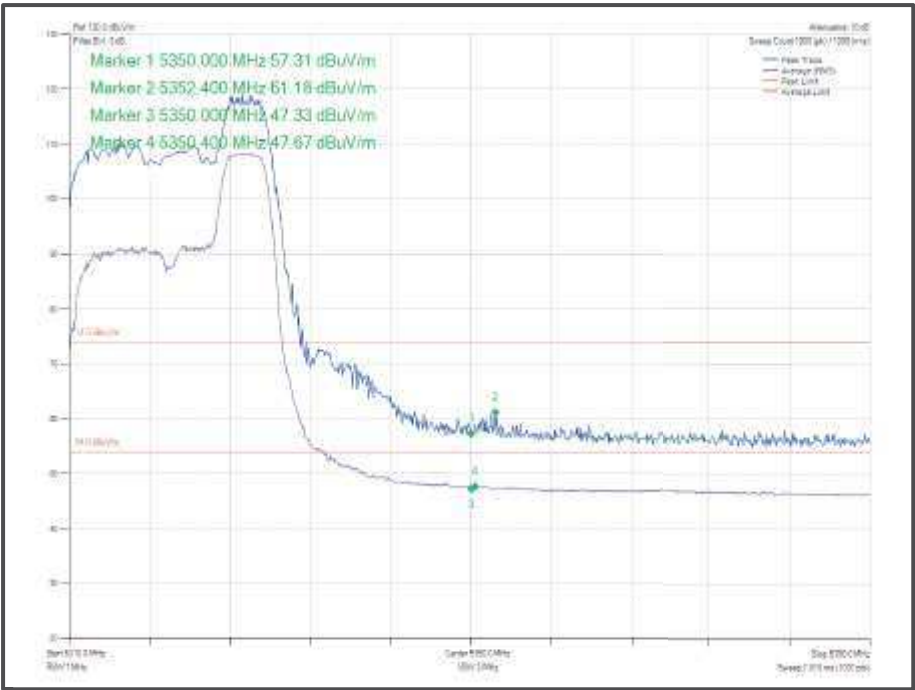


Figure 993 - 802.11ax HE20, Core 1, 52 40 - 53 20 MHz, Band Edge Frequency 5350 MHz

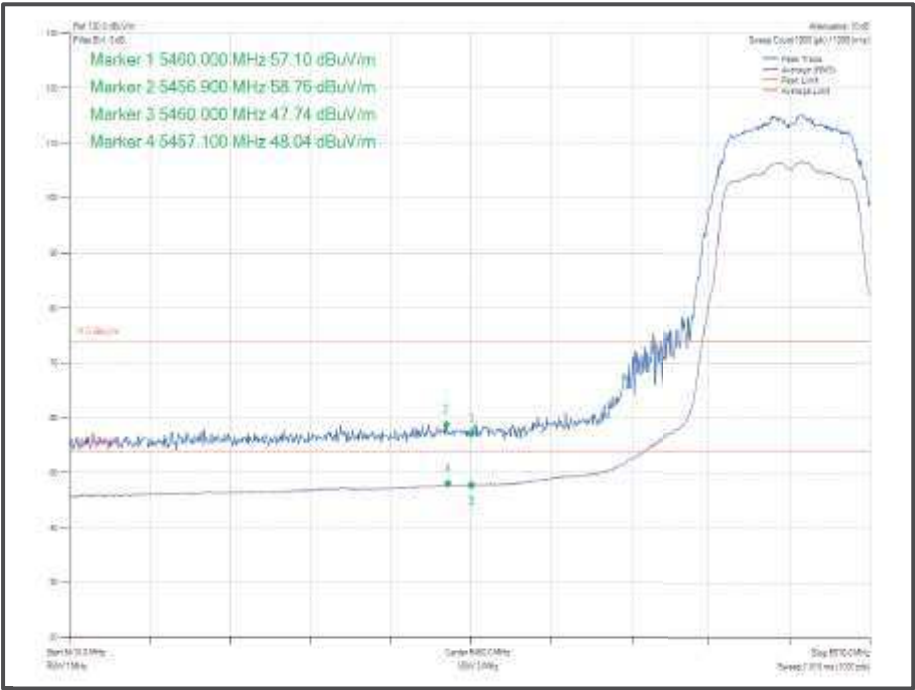


Figure 994 - 802.11a, Core 1 - 5500 MHz, Band Edge Frequency 5460 MHz

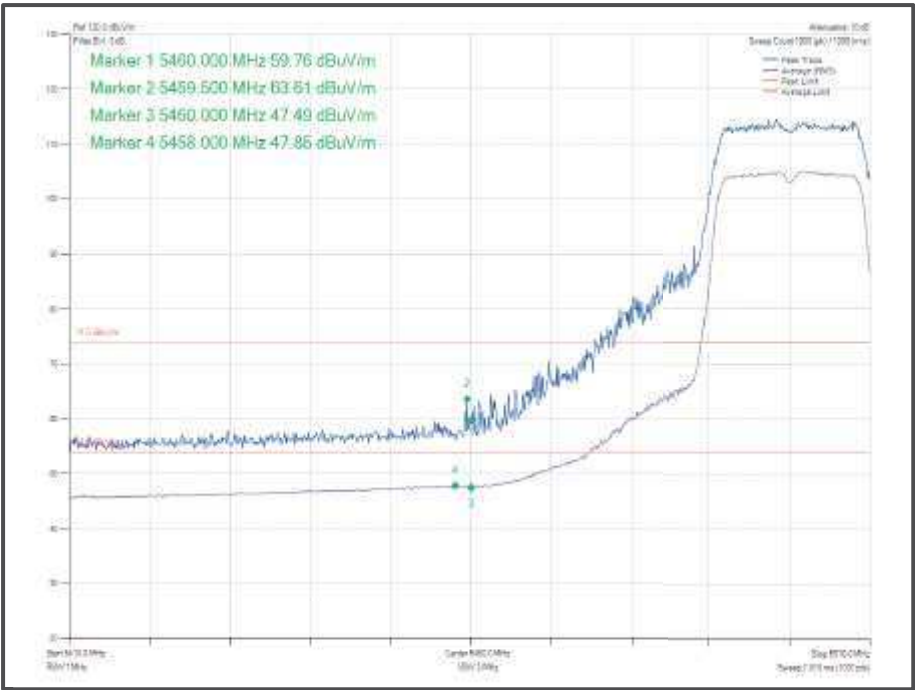


Figure 995 - 802.11n HT20, Core 1 - 5500 MHz, Band Edge Frequency 5460 MHz

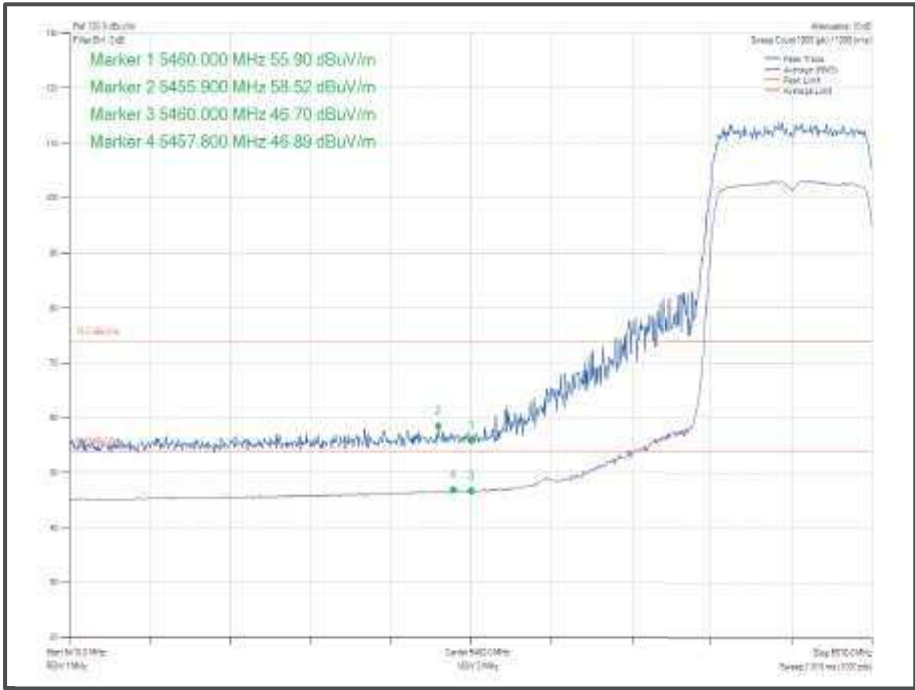


Figure 996 - 802.11ax HE20, Core 1, SU - 5500 MHz, Band Edge Frequency 5460 MHz

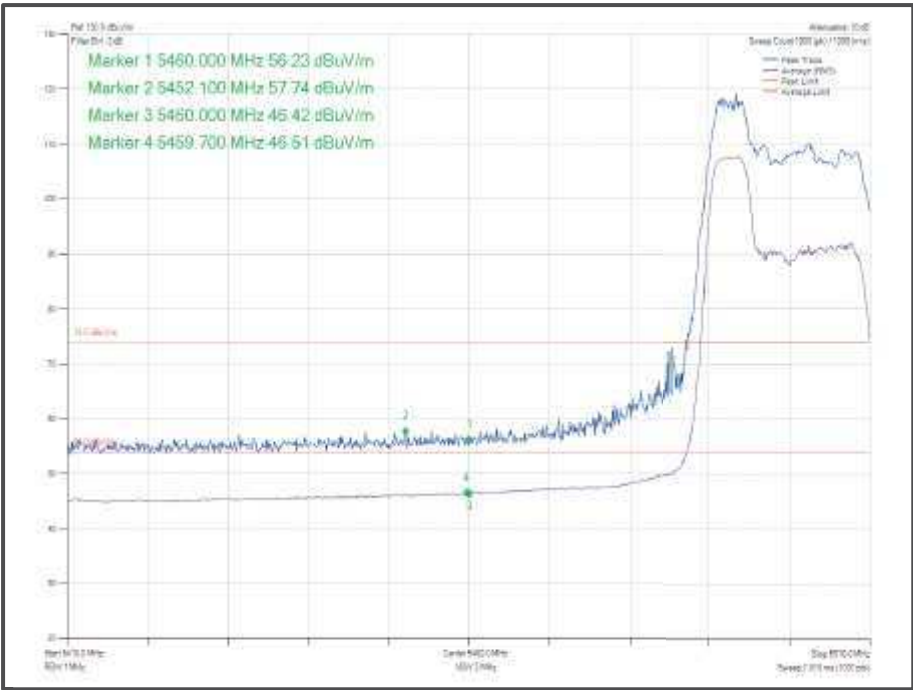


Figure 997 - 802.11ax HE20, Core 1, 52-37 - 5500 MHz, Band Edge Frequency 5460 MHz



Mode	Modulation Coding Scheme	Resource size	Resource Index	Frequency (MHz)	Band Edge Frequency (MHz)	Peak Level (dBμV/m)	Average Level (dBμV/m)
802.11n HT 20 CDD, Cores 0-1	MCS7	-	-	5180	5150	60.75	48.87
802.11n HT 20 SDM, Cores 0-1	MCS15	-	-	5180	5150	61.76	49.19
802.11ax HE20 CDD Cores 0-1	MCS7	SU	-	5180	5150	58.59	48.97
802.11ax HE20 CDD, Cores 0-1	MCS7	26	0	5180	5150	54.47	43.78
802.11ax HE20 SDM, Cores 0-1	MCS7	SU	-	5180	5150	58.38	48.03
802.11ax HE20 SDM, Cores 0-1	MCS7	26	0	5180	5150	54.34	43.52
802.11n HT 20 CDD, Cores 0-1	MCS7	-	-	5320	5350	64.23	50.92
802.11n HT 20 SDM, Cores 0-1	MCS15	-	-	5320	5350	62.10	50.74
802.11ax HE20 CDD, Cores 0-1	MCS7	SU	-	5320	5350	61.14	49.57
802.11ax HE20 CDD, Cores 0-1	MCS7	52	40	5320	5350	57.75	47.05
802.11ax HE20 SDM, Cores 0-1	MCS7	SU	-	5320	5350	60.41	49.11
802.11ax HE20 SDM, Cores 0-1	MCS7	52	40	5320	5350	57.10	45.86
802.11n HT 20 CDD, Cores 0-1	MCS7	-	-	5500	5460	59.08	48.25
802.11n HT 20 SDM, Cores 0-1	MCS15	-	-	5500	5460	59.49	48.36
802.11ax HE20 CDD, Cores 0-1	MCS7	SU	-	5500	5460	58.30	47.31
802.11ax HE20 CDD, Cores 0-1	MCS7	52	37	5500	5460	57.66	46.82
802.11ax HE20 SDM, Cores 0-1	MCS7	SU	-	5500	5460	57.80	47.36
802.11ax HE20 SDM, Cores 0-1	MCS7	52	37	5500	5460	55.87	45.06

Table 635 - MIMO 2TX Restricted Band Edge Results

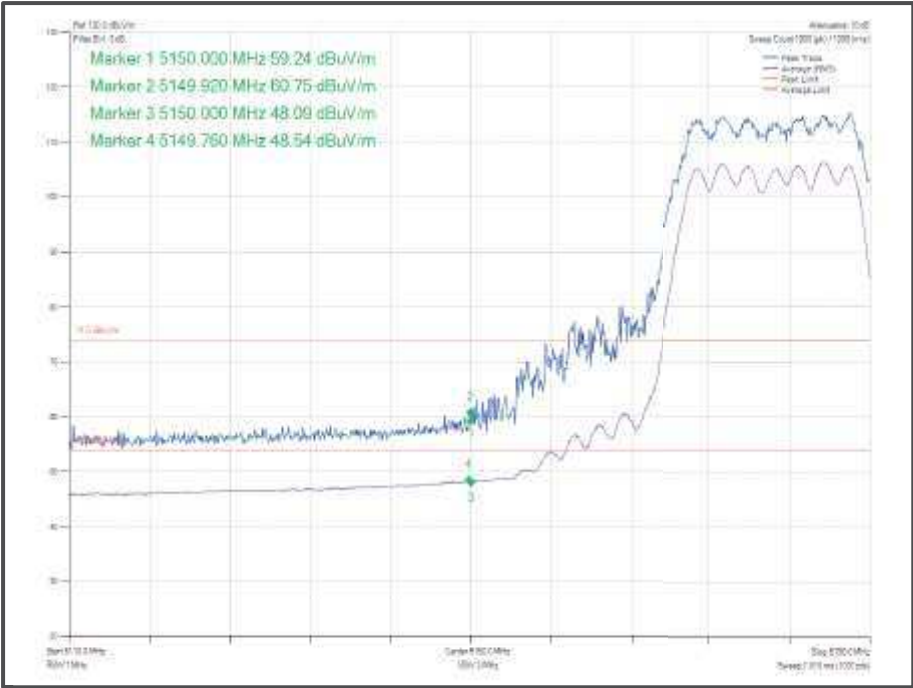


Figure 998 - 802.11n HT20 CDD, Cores 0-1 - 5180 MHz
Band Edge Frequency 5150 MHz

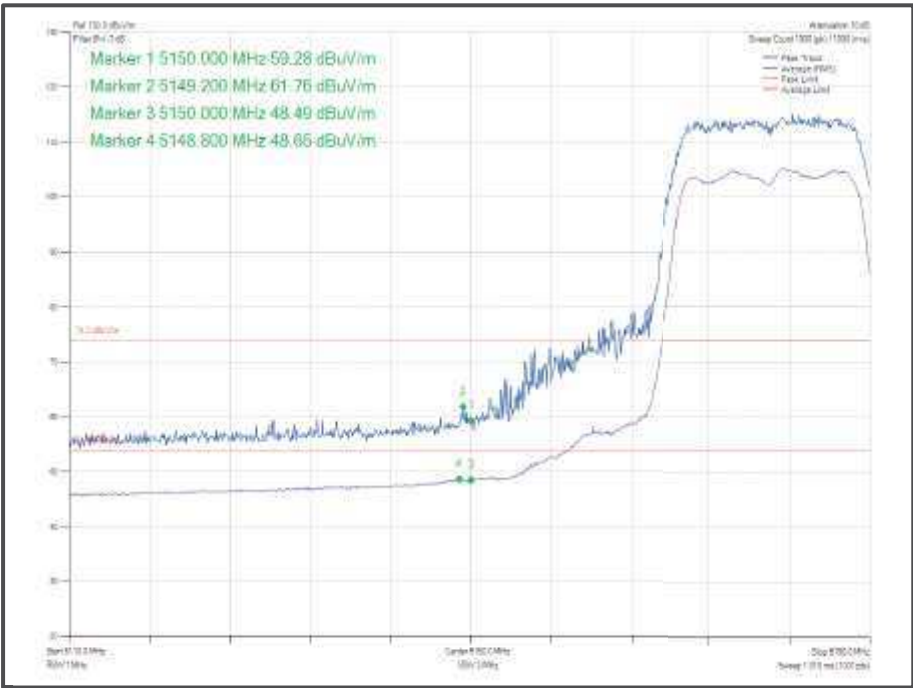


Figure 999 - 802.11n HT20 SDM, Cores 0-1 - 5180 MHz
Band Edge Frequency 5150 MHz

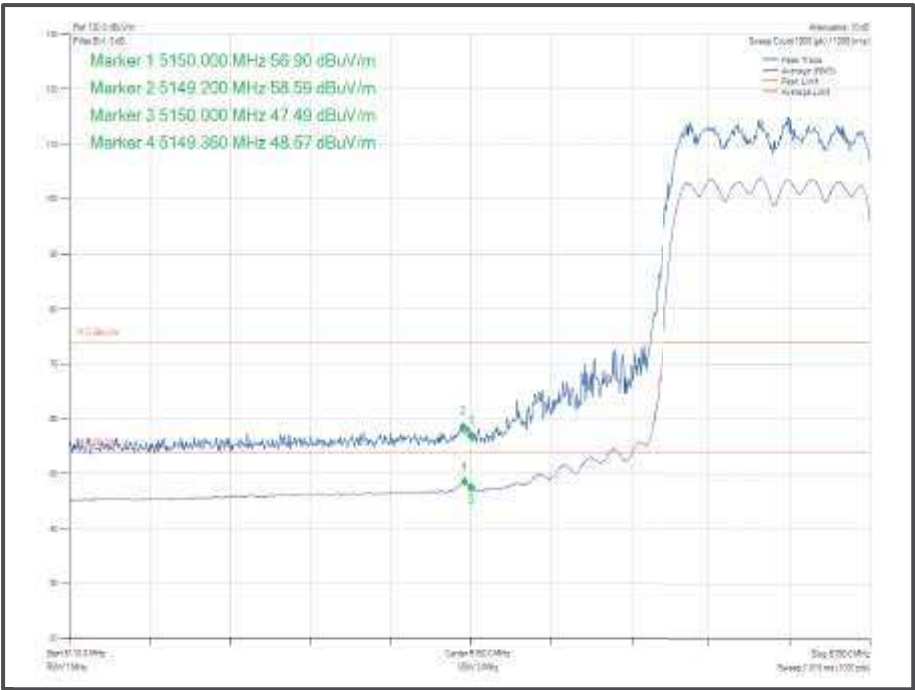


Figure 1000 - 802.11ax HE20 CDD, Cores 0-1 SU - 5180 MHz
Band Edge Frequency 5150 MHz

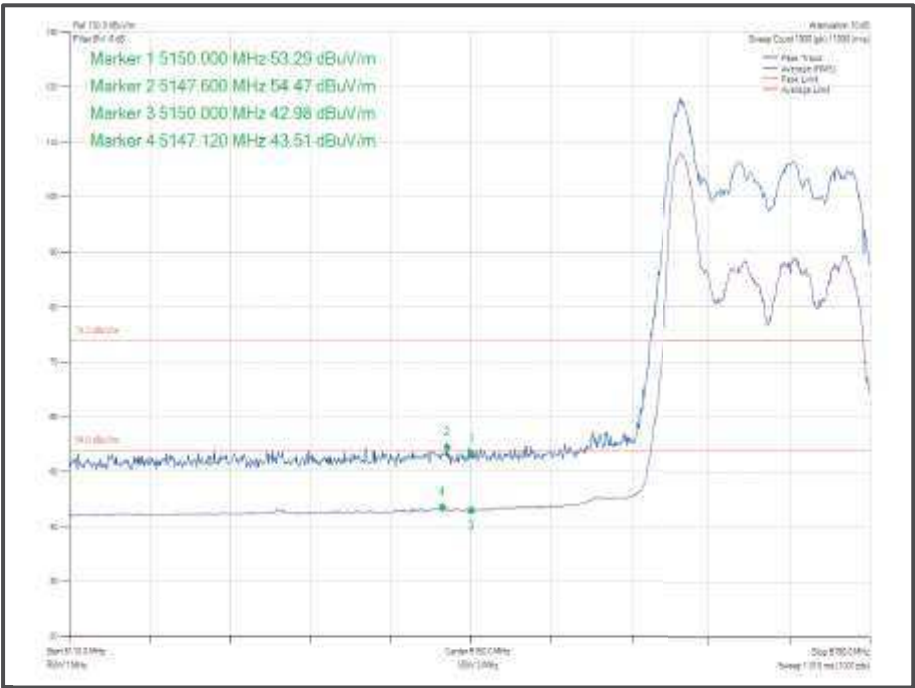


Figure 1001 - 802.11ax HE20 CDD, Cores 0-1, 26-0 - 5180 MHz
Band Edge Frequency 5150 MHz

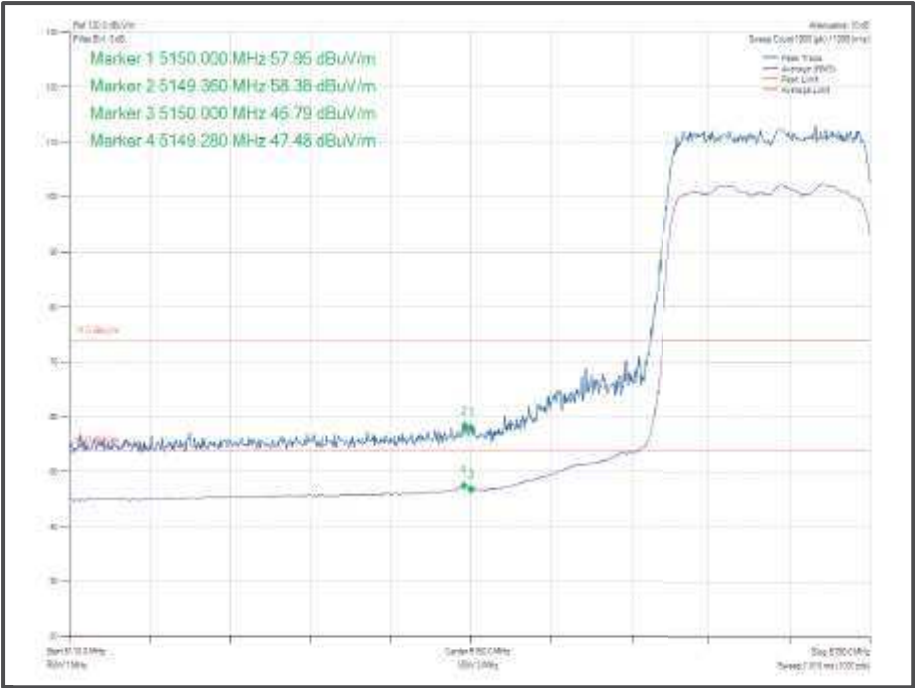


Figure 1002 - 802.11ax HE20 SDM, Cores 0-1, SU - 5180 MHz
Band Edge Frequency 5150 MHz

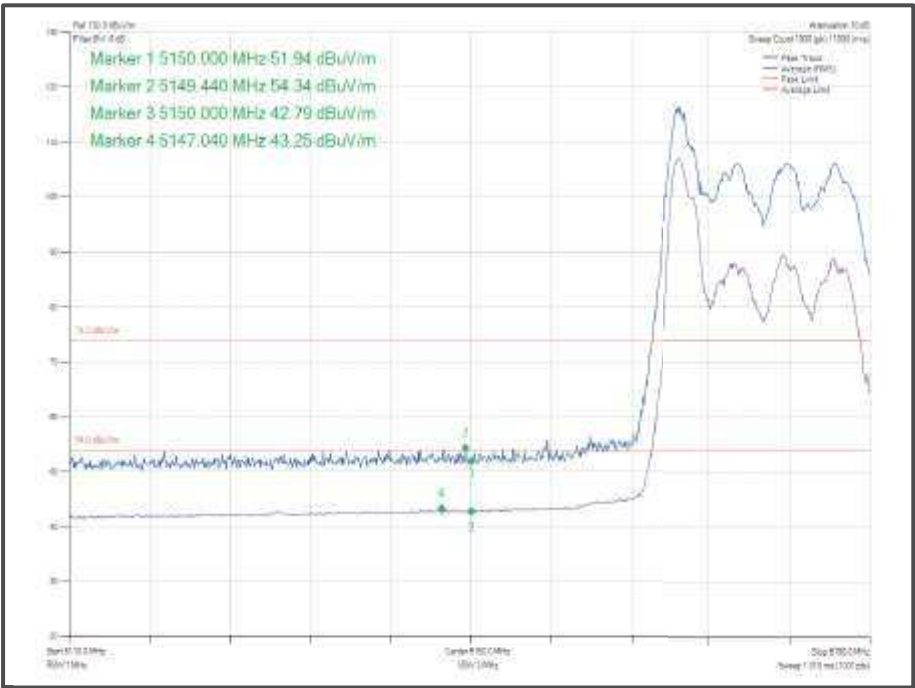


Figure 1003 - 802.11ax HE20 SDM, Cores 0-1, 26-0 - 5180 MHz
Band Edge Frequency 5150 MHz

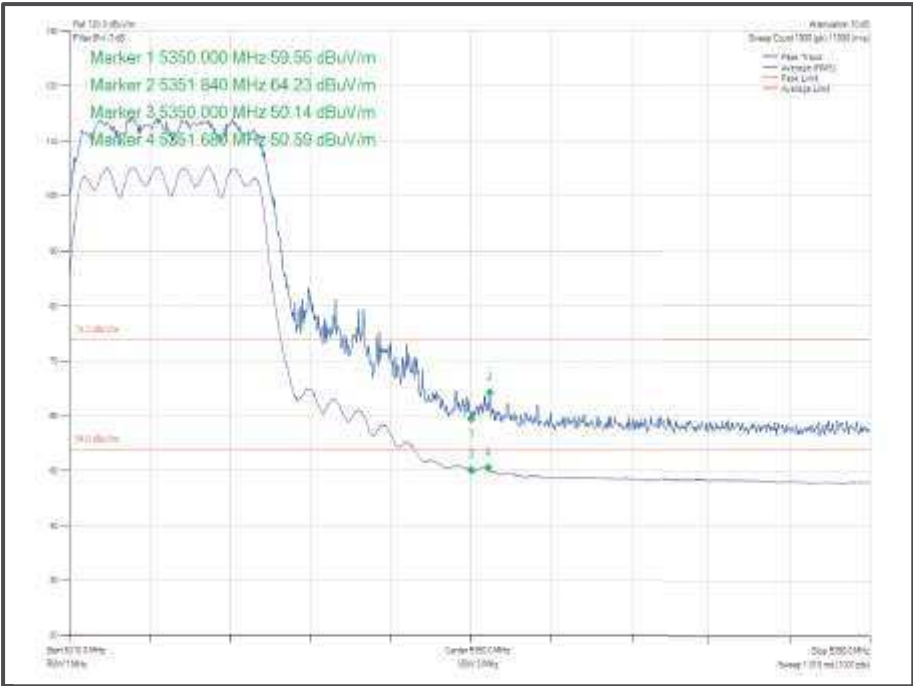


Figure 1004 - 802.11n HT20 CDD, Cores 0-1 - 5320 MHz
Band Edge Frequency 5350 MHz

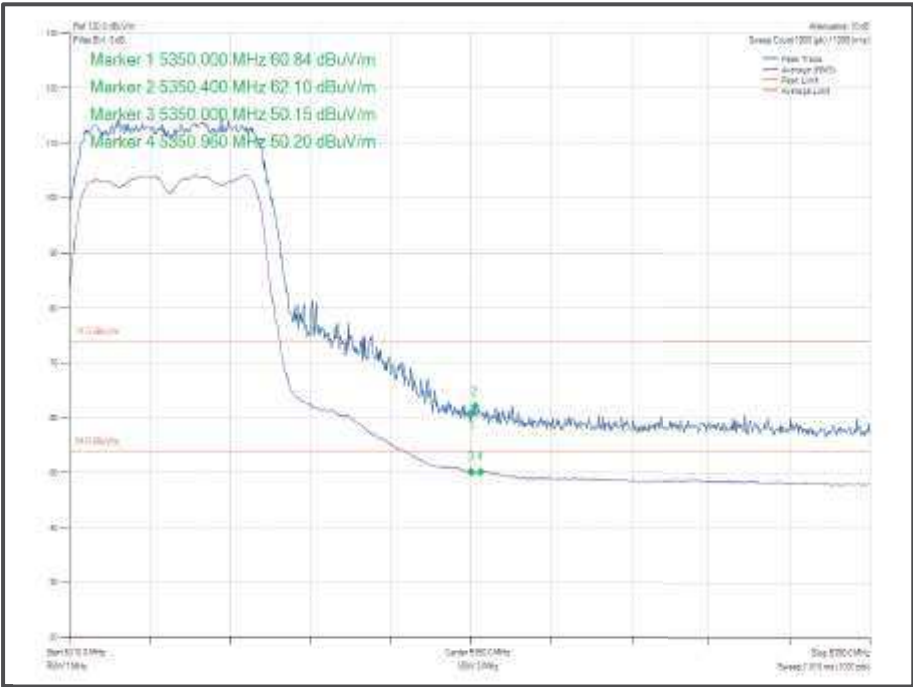


Figure 1005 - 802.11n HT20 SDM, Cores 0-1 - 5320 MHz
Band Edge Frequency 5350 MHz

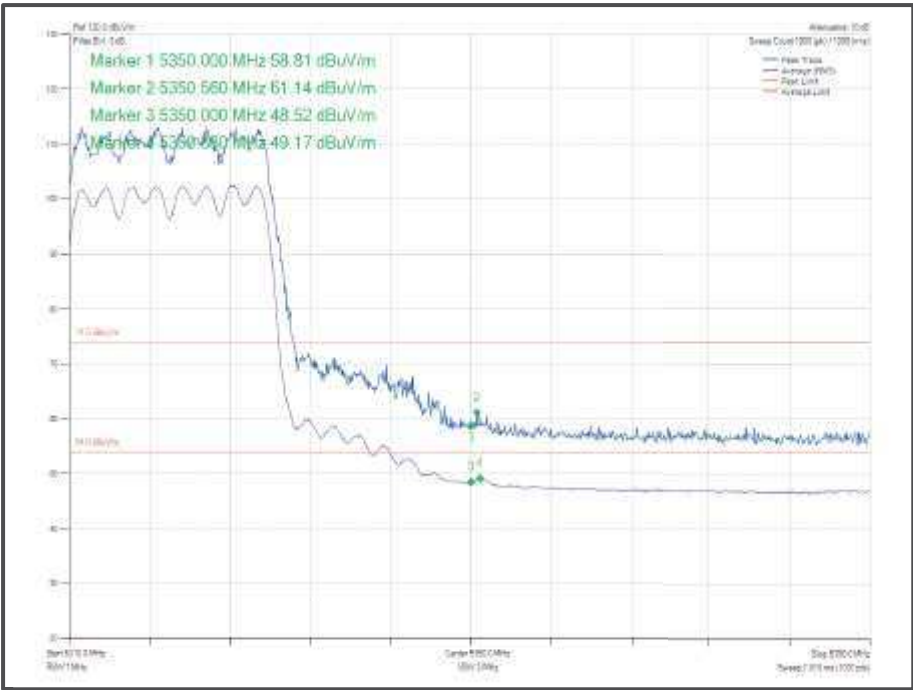


Figure 1006 - 802.11ax HE20 CDD, Cores 0-1, SU - 5320 MHz
Band Edge Frequency 5350 MHz

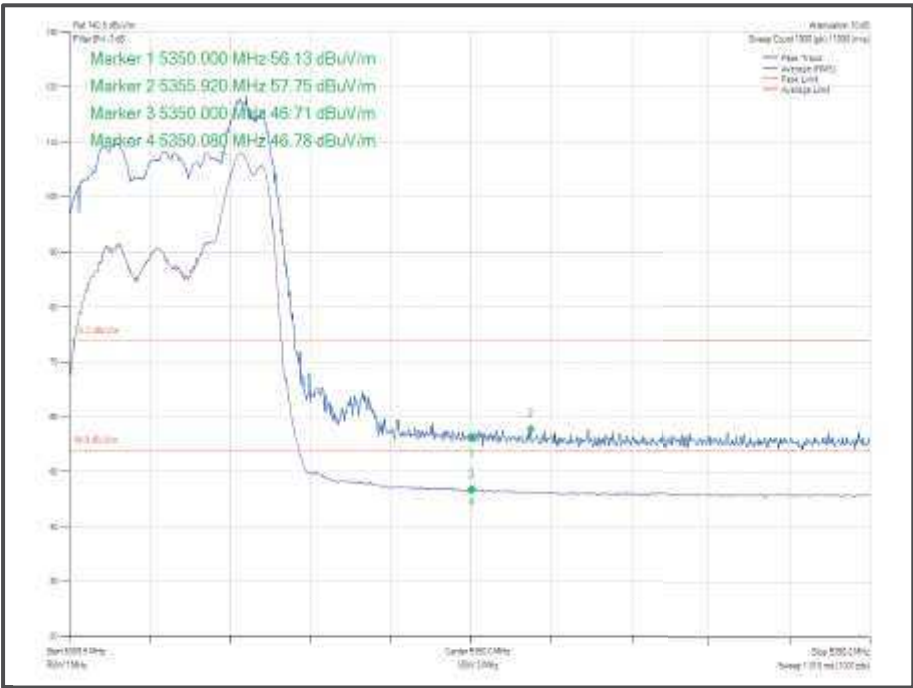


Figure 1007 - 802.11ax HE20 CDD, Cores 0-1, 52-40 - 5320 MHz
Band Edge Frequency 5350 MHz

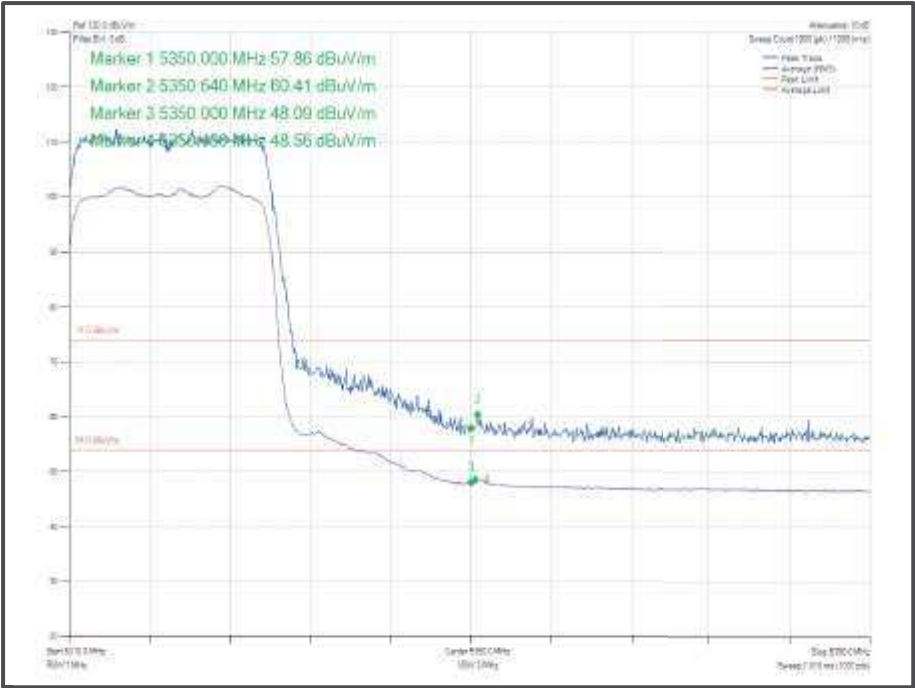


Figure 1008 - 802.11ax HE20 SDM, Cores 0-1, SU - 5320 MHz z
Band Edge Frequency 5350 MHz

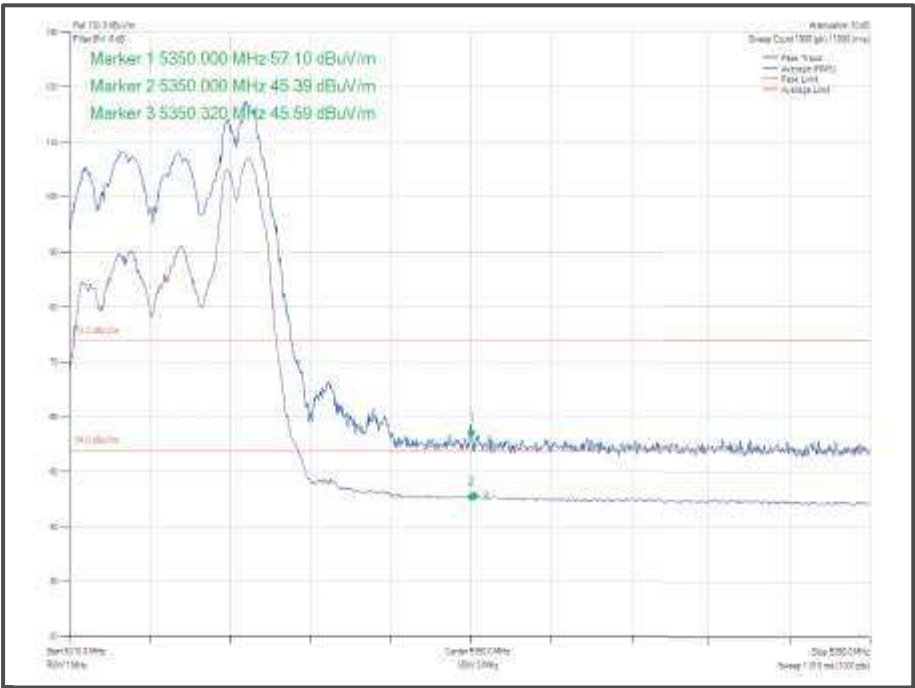


Figure 1009 - 802.11ax HE20 SDM, Cores 0-1, 52-40 - 5320 MHz
Band Edge Frequency 5350 MHz

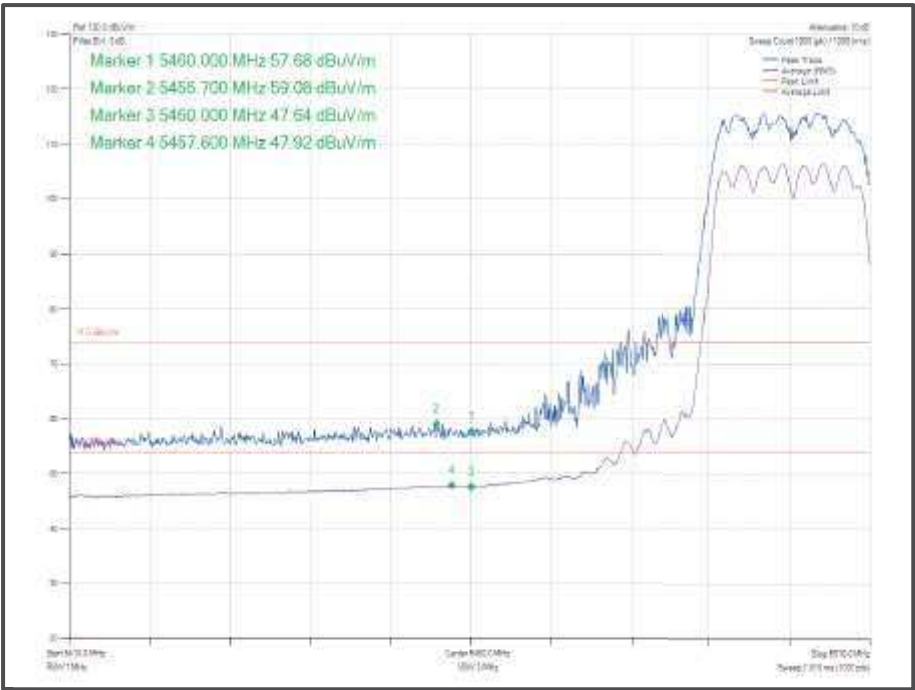


Figure 1010 - 802.11n HT20 CDD, Cores 0-1 - 5500 MHz
Band Edge Frequency 5460 MHz

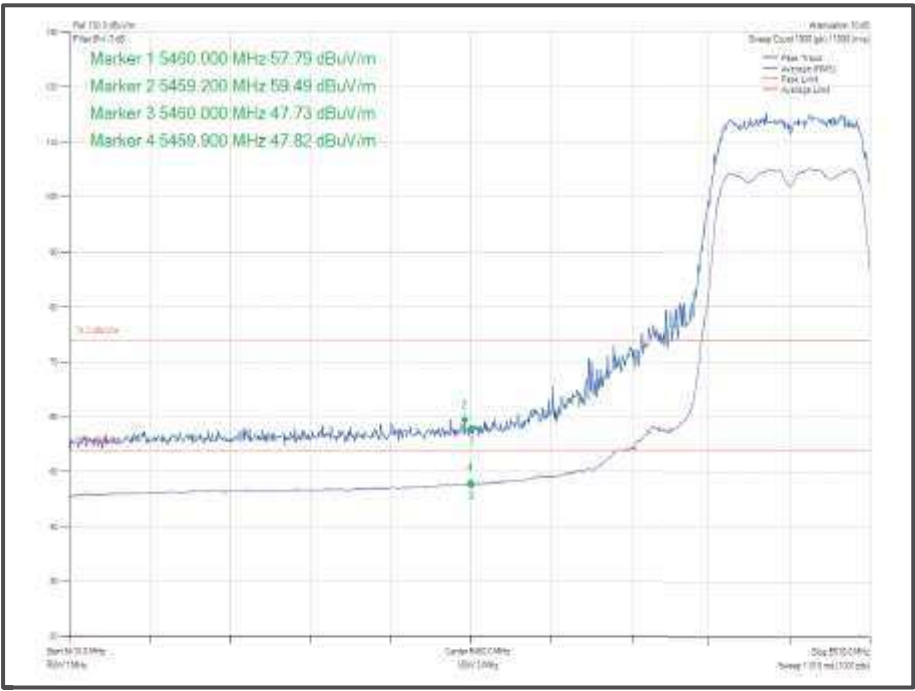


Figure 1011 - 802.11n HT20 SDM, Cores 0-1 - 5500 MHz
Band Edge Frequency 5460 MHz

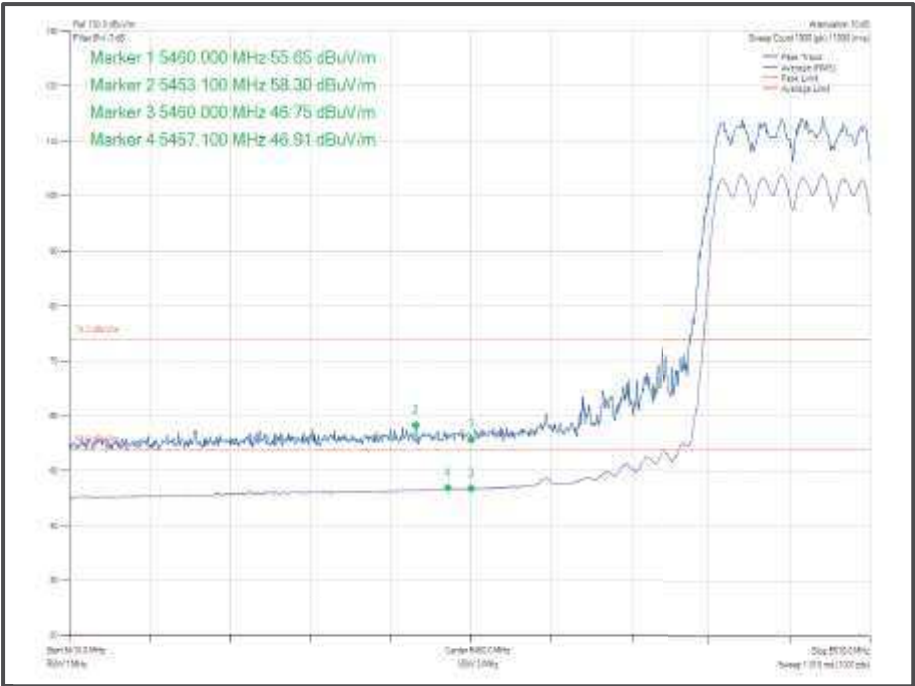


Figure 1012 - 802.11ax HE20 CDD, Cores 0-1, SU- 5500 MHz
Band Edge Frequency 5460 MHz

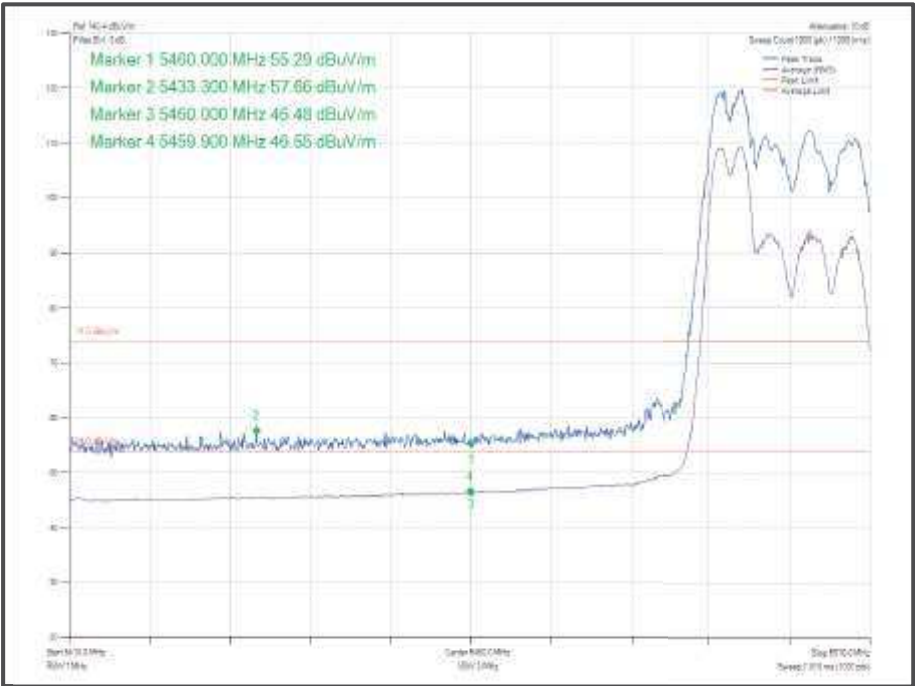


Figure 1013 - 802.11ax HE20 CDD, Cores 0-1, 52-37 - 5500 MHz
Band Edge Frequency 5460 MHz

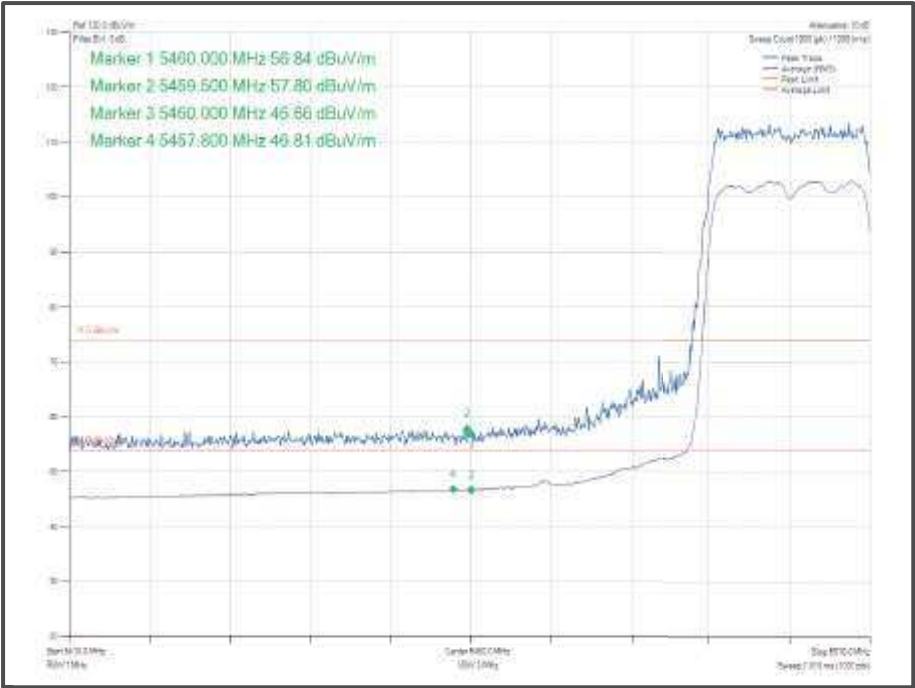


Figure 1014 - 802.11ax HE20 SDM, Cores 0-1, SU- 5500 MHz
Band Edge Frequency 5460 MHz

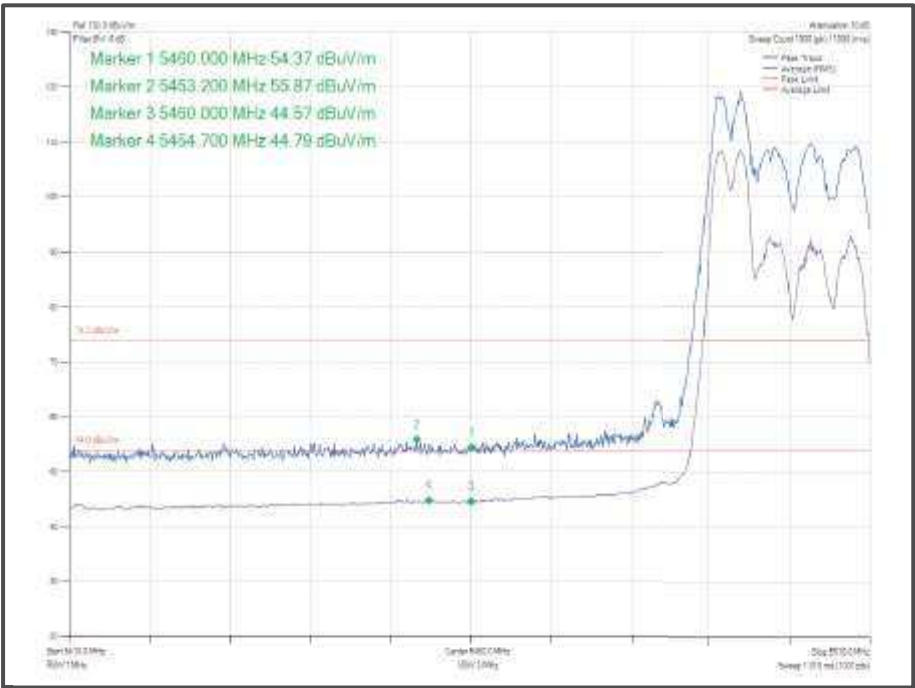


Figure 1015 - 802.11ax HE20 SDM, Cores 0-1, 52-37 - 5500 MHz
Band Edge Frequency 5460 MHz



Mode	Data Rate/ MCS	Resource Size	Resource Index	TX Frequency (MHz)	Band Edge Frequency (MHz)	Peak Level (dB μ V/m)	Average Level (dB μ V/m)
802.11n HT 40, Core 1	MCS7	-	-	5190	5150	69.36	51.33
802.11ax HE40, Core 1	MCS7	SU	-	5190	5150	64.22	49.29
802.11ax HE40, Core 1	MCS7	26	0	5190	5150	56.73	45.62
802.11n HT 40, Core 1	MCS7	-	-	5310	5350	64.29	51.38
802.11ax HE40, Core 1	MCS7	SU	-	5310	5350	63.93	51.43
802.11ax HE40, Core 1	MCS7	52	44	5310	5350	64.92	47.1
802.11n HT 40, Core 1	MCS7	-	-	5510	5460	66.98	51.21
802.11ax HE40, Core 1	MCS7	SU	-	5510	5460	62.56	48.15
802.11ax HE40, Core 1	MCS7	52	37	5510	5460	65.23	47.05

Table 636 - SISO Restricted Band Edge Results

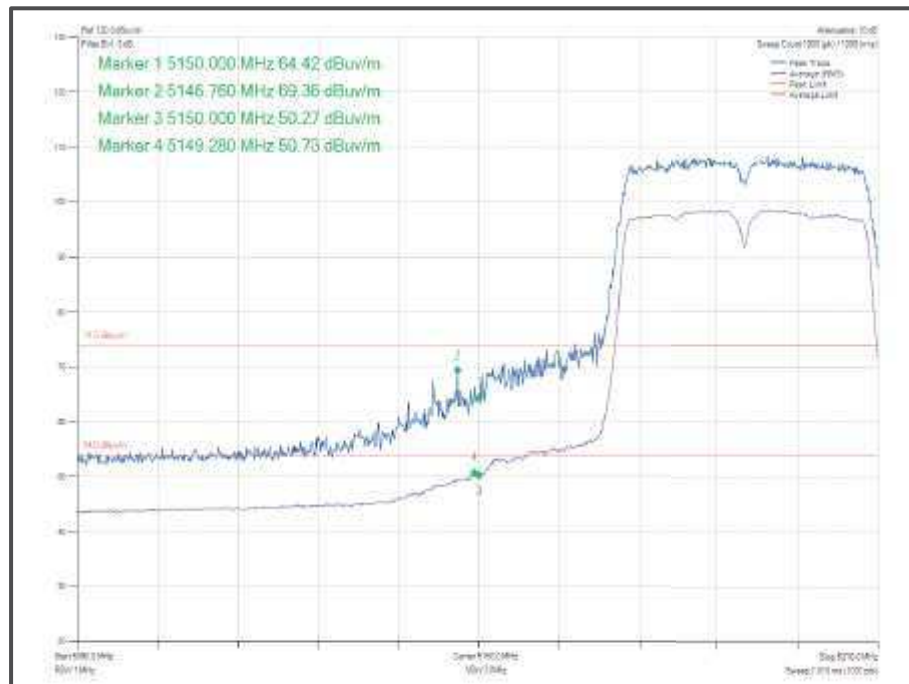


Figure 1016 - 802.11n HT40, Core 1 - 5190 MHz
Band Edge Frequency 5150 MHz

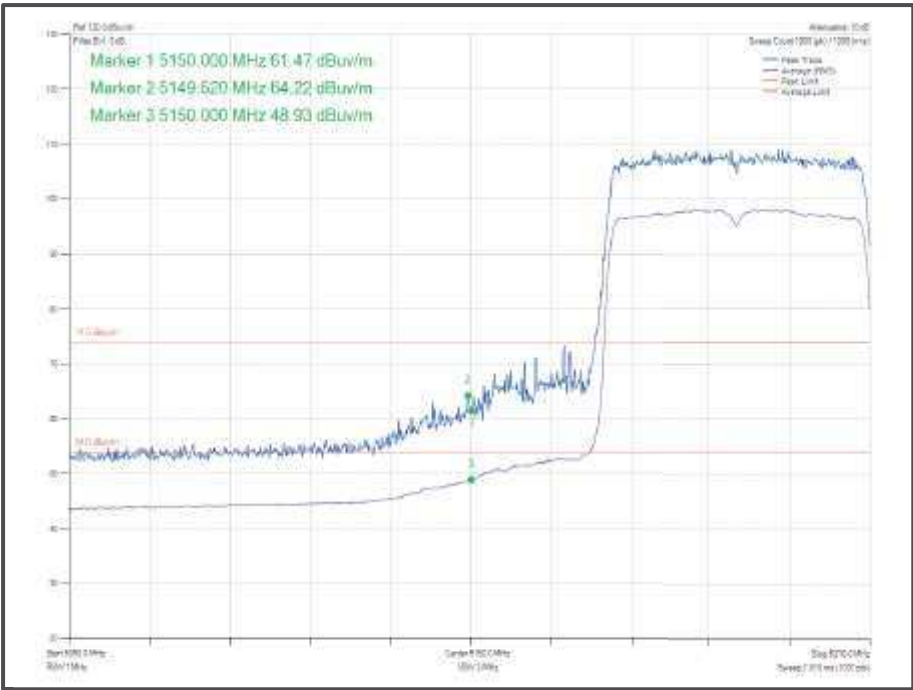


Figure 1017 - 802.11ax HE40, Core 1, SU - 5190 MHz
Band Edge Frequency 5150 MHz

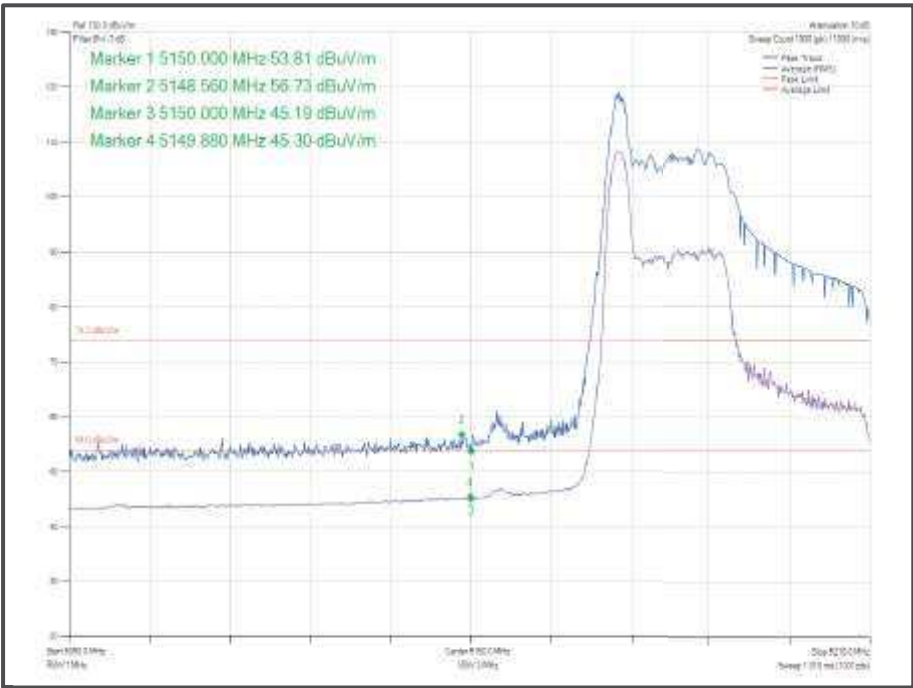


Figure 1018 - 802.11ax HE40, Core 1, 26-0 - 5190 MHz
Band Edge Frequency 5150 MHz

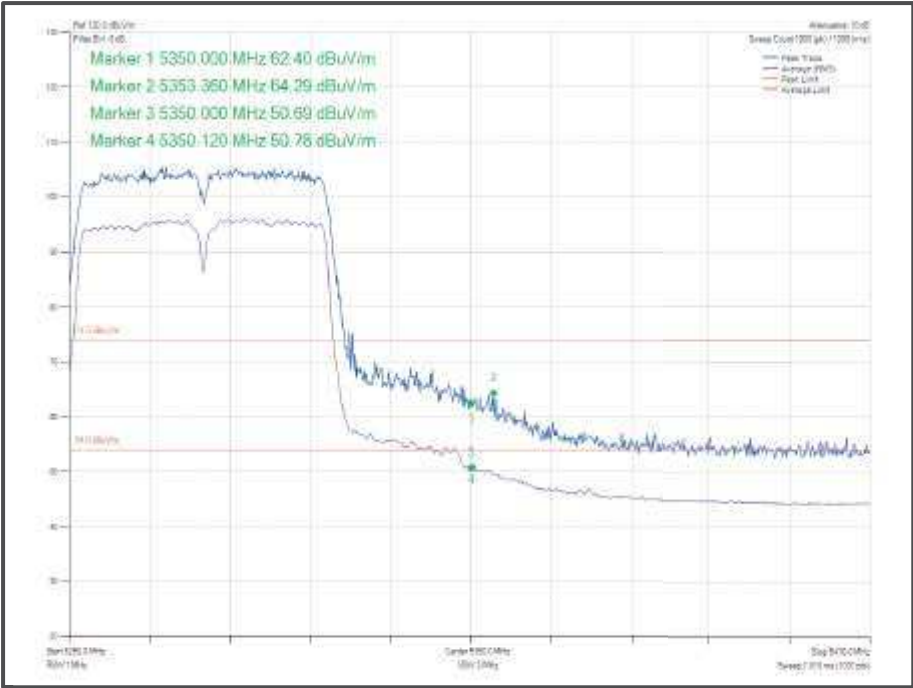


Figure 1019 - 802.11n HT40, Core 1 - 5310 MHz
Band Edge Frequency 5350 MHz

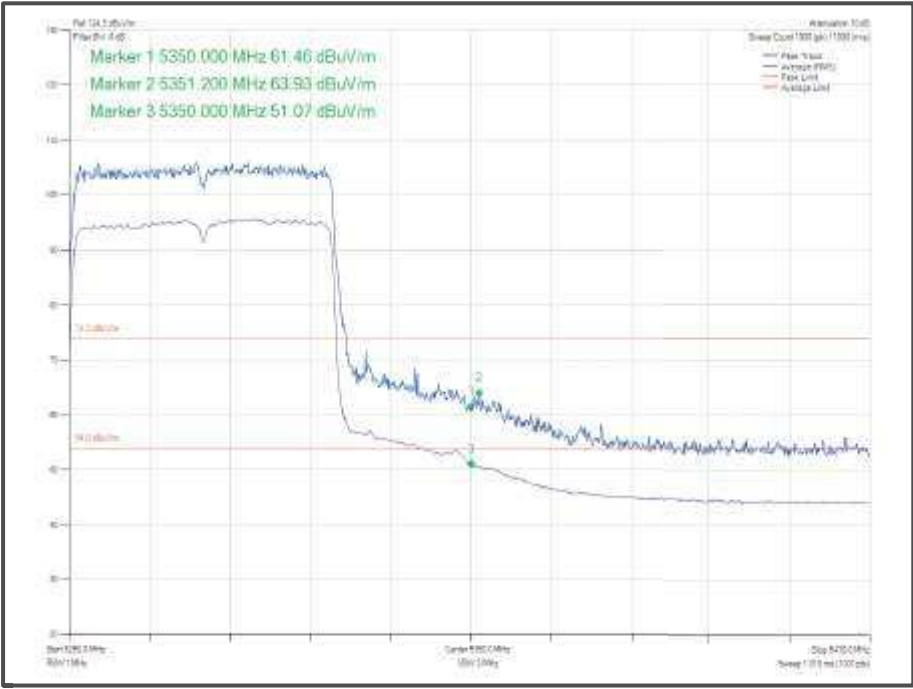


Figure 1020 - 802.11ax HE40, Core 1, SU - 5310 MHz
Band Edge Frequency 5350 MHz

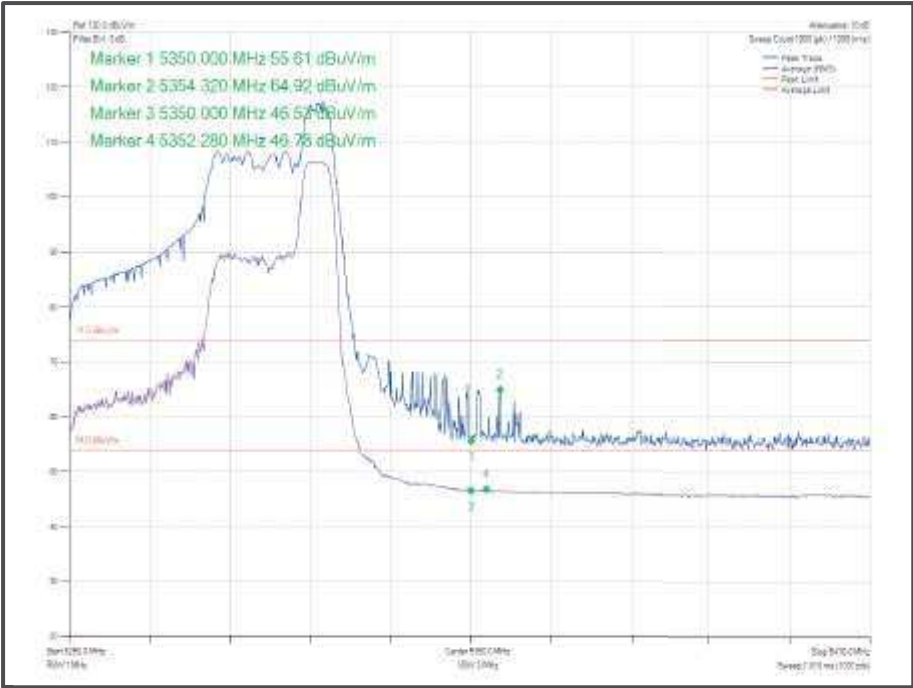


Figure 1021 - 802.11ax HE40, Core 1, 52-44 - 5310 MHz
Band Edge Frequency 5350 MHz

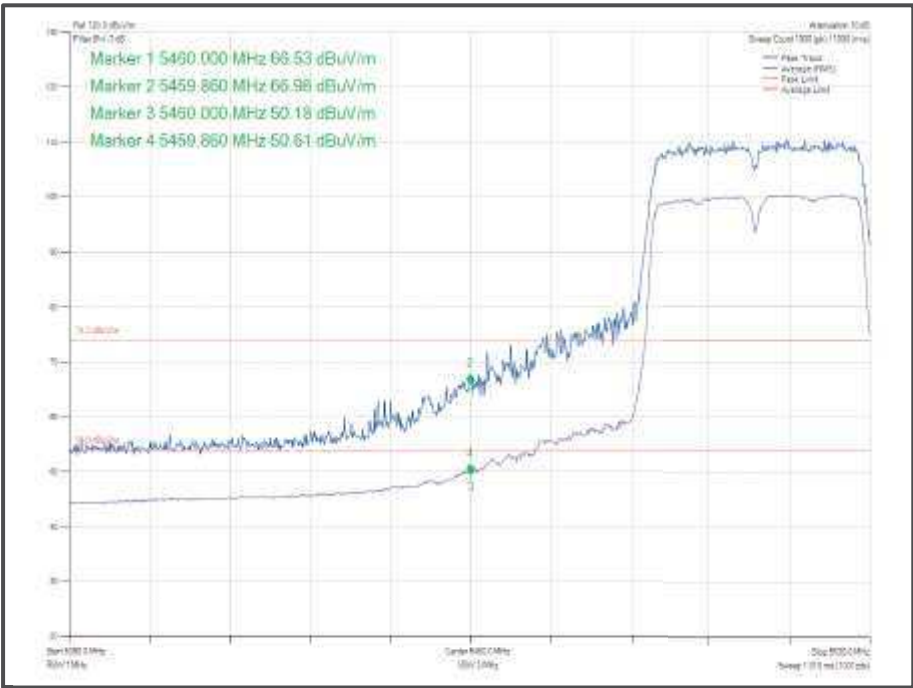


Figure 1022 - 802.11n HT40, Core 1 - 5510 MHz
Band Edge Frequency 5460 MHz

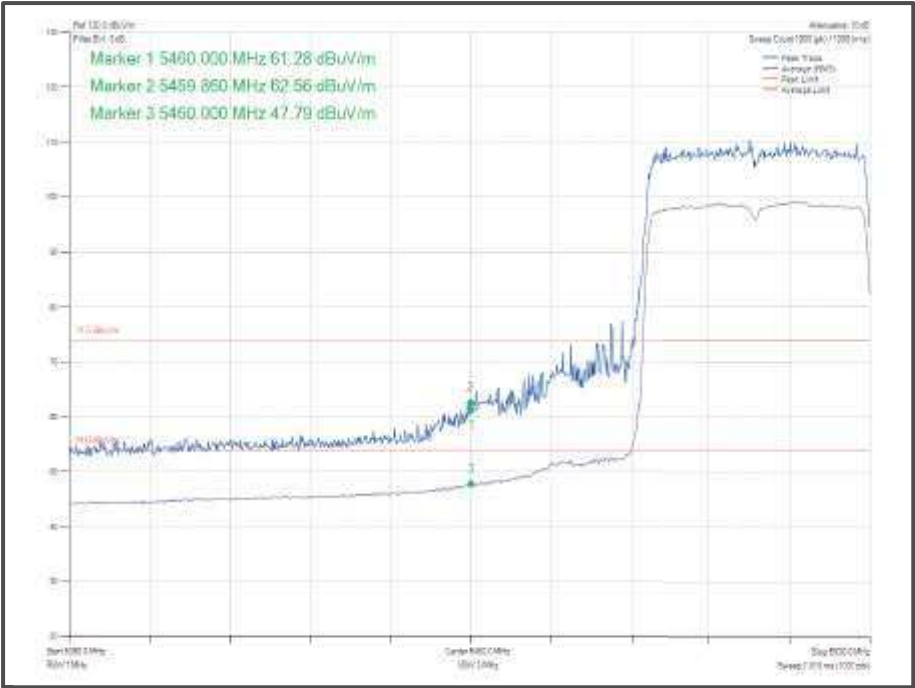


Figure 1023 - 802.11ax HE40, Core 1, SU - 55 10 MHz
Band Edge Frequency 5460 MHz

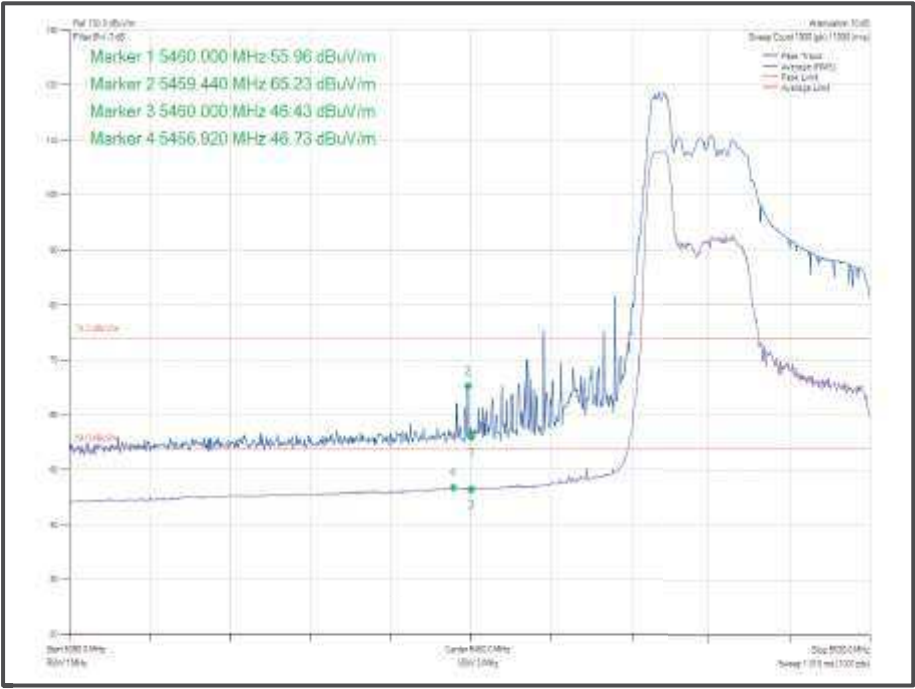


Figure 1024 - 802.11ax HE40, Core 1, 52-37 - 5510 MHz
Band Edge Frequency 5460 MHz



Mode	Data Rate/ MCS	Resource Size	Resource Index	TX Frequency (MHz)	Band Edge Frequency (MHz)	Peak Level (dBμV/m)	Average Level (dBμV/m)
802.11n HT 40 CDD, Cores 0-1	MCS7	-	-	5190	5150	60.13	49.17
802.11n HT 40 SDM, Cores 0-1	MCS15	-	-	5190	5150	60.13	48.15
802.11ax HE40 CDD, Cores 0-1	MCS7	SU	-	5190	5150	57.56	46.17
802.11ax HE40 CDD, Cores 0-1	MCS7	26	0	5190	5150	57.42	46.19
802.11ax HE40 SDM, Cores 0-1	MCS7	SU	-	5190	5150	57.13	46.17
802.11ax HE40 SDM, Cores 0-1	MCS7	26	0	5190	5150	54.83	43.15
802.11n HT 40 CDD, Cores 0-1	MCS7	-	-	5310	5350	62.52	50.47
802.11n HT 40 SDM, Cores 0-1	MCS15	-	-	5310	5350	62.67	50.1
802.11ax HE40 CDD, Cores 0-1	MCS7	SU	-	5310	5350	60.90	49.3
802.11ax HE40 CDD, Cores 0-1	MCS7	52	44	5310	5350	61.73	47.49
802.11ax HE40 SDM, Cores 0-1	MCS7	SU	-	5310	5350	60.33	48.95
802.11ax HE40 SDM, Cores 0-1	MCS7	52	44	5310	5350	57.17	45.95
802.11n HT 40 CDD, Cores 0-1	MCS7	-	-	5510	5460	61.16	48.31
802.11n HT 40 SDM, Cores 0-1	MCS15	-	-	5510	5460	60.60	48.31
802.11ax HE40 CDD, Cores 0-1	MCS7	SU	-	5510	5460	57.63	46.26
802.11ax HE40 CDD, Cores 0-1	MCS7	52	37	5510	5460	58.02	46.74
802.11ax HE40 SDM, Cores 0-1	MCS7	SU	-	5510	5460	56.74	46.17
802.11ax HE40 SDM, Cores 0-1	MCS7	52	37	5510	5460	55.80	45.16

Table 637 – MIMO 2TX Restricted Band Edge Results

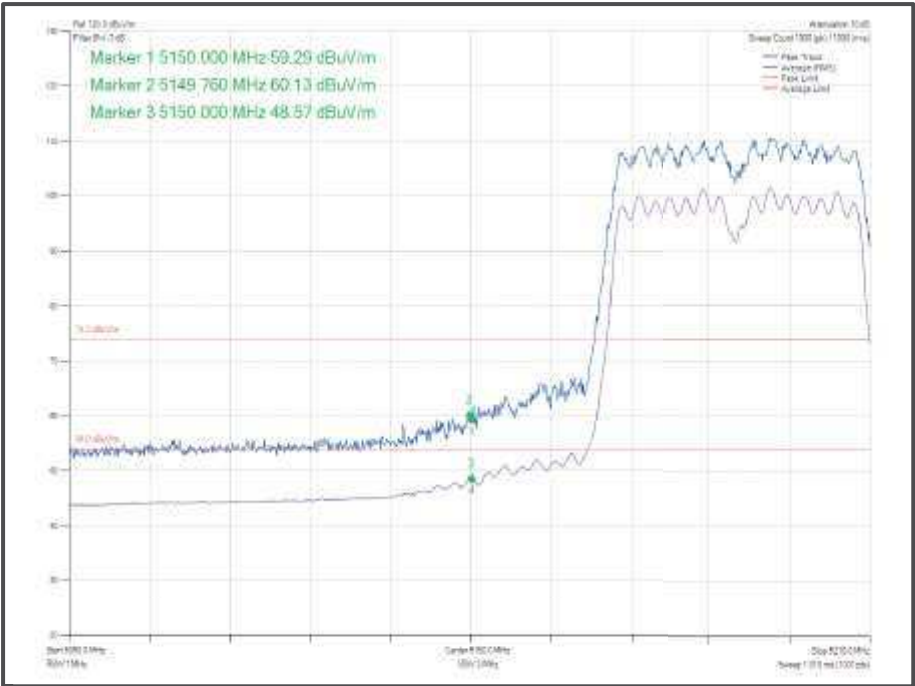


Figure 1025 - 802.11n HT40 CDD Cores 0-1 - 5190 MHz
Band Edge Frequency 5150 MHz

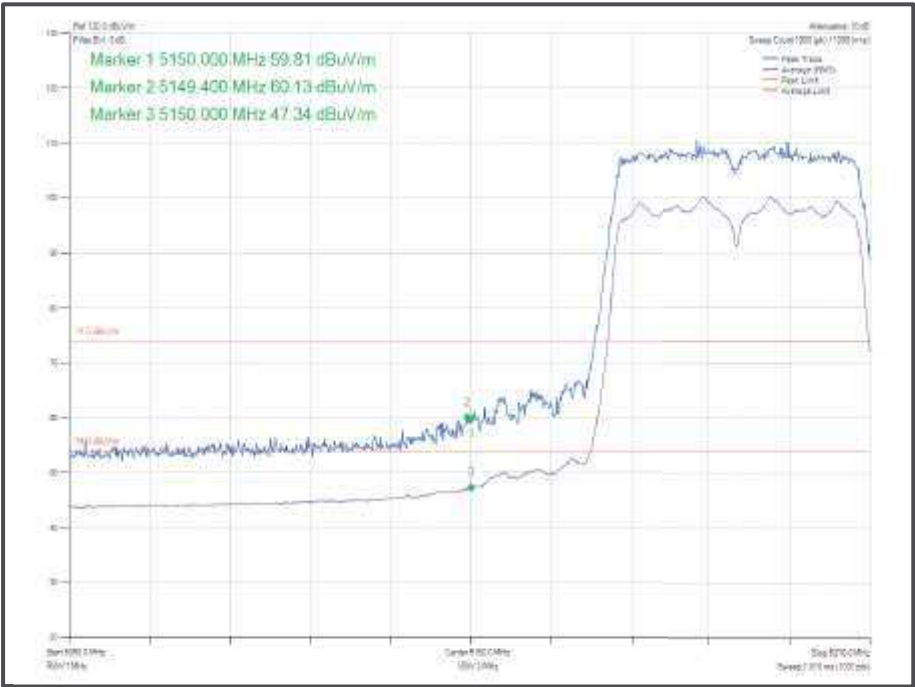


Figure 1026 - 802.11n HT40 SDM Cores 0-1 - 5190 MHz
Band Edge Frequency 5150 MHz

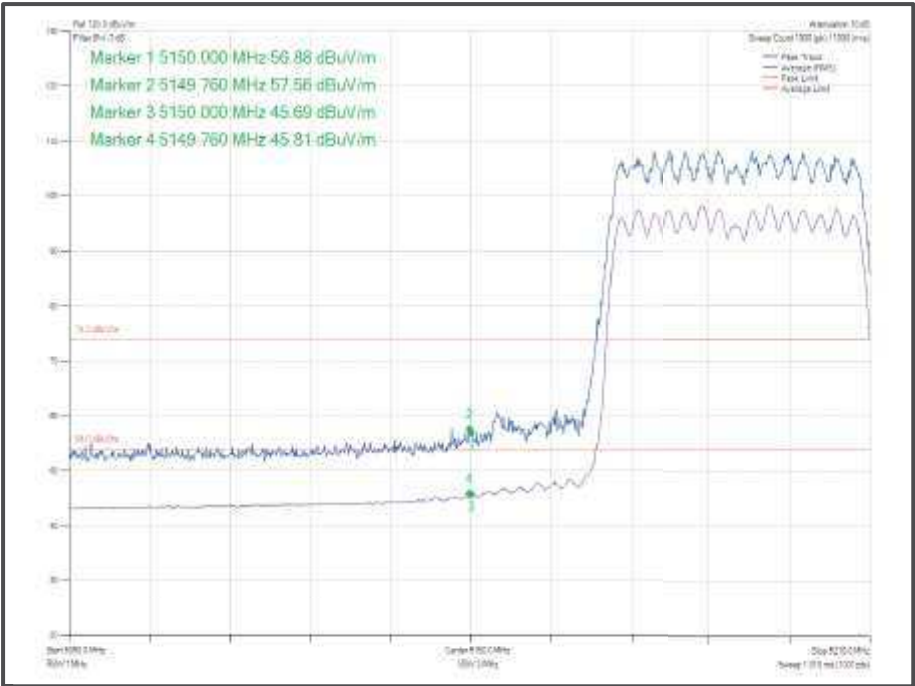


Figure 1027 - 802.11ax HE40 CDD, Cores 0-1, SU - 5190 MHz
Band Edge Frequency 5150 MHz

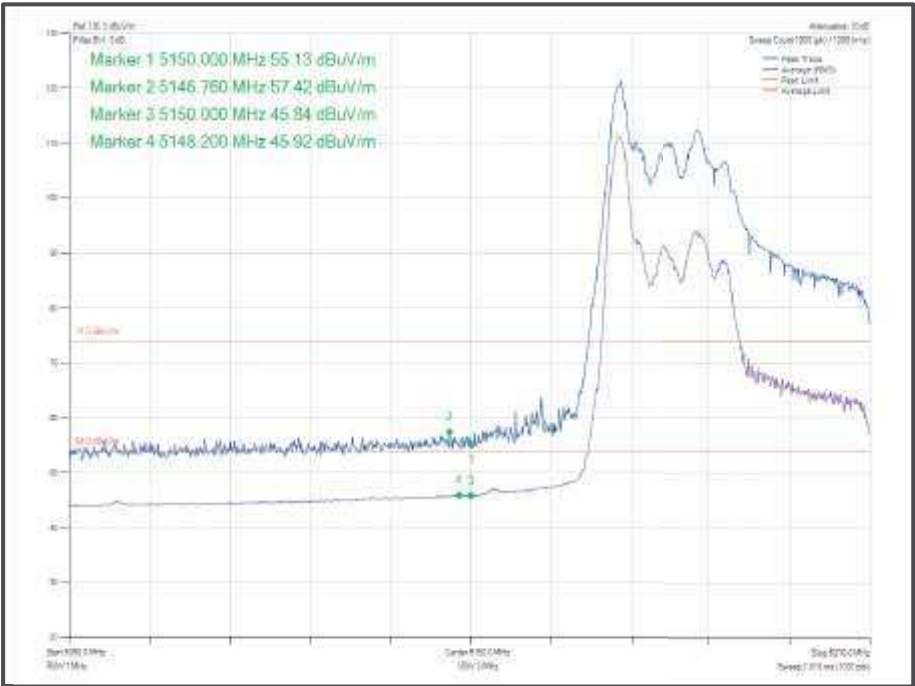


Figure 1028 - 802.11ax HE40 CDD, Cores 0-1, 26-0 - 5190 MHz
Band Edge Frequency 5150 MHz

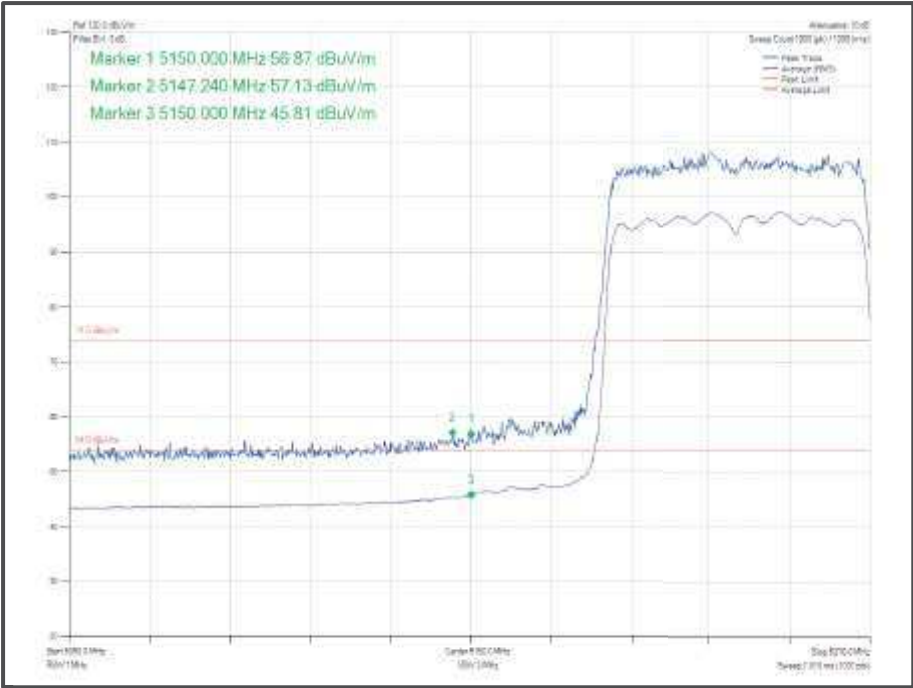


Figure 1029 802.11ax HE40 SDM, Cores 0-1, SU - 5190 MHz
Band Edge Frequency 5150 MHz

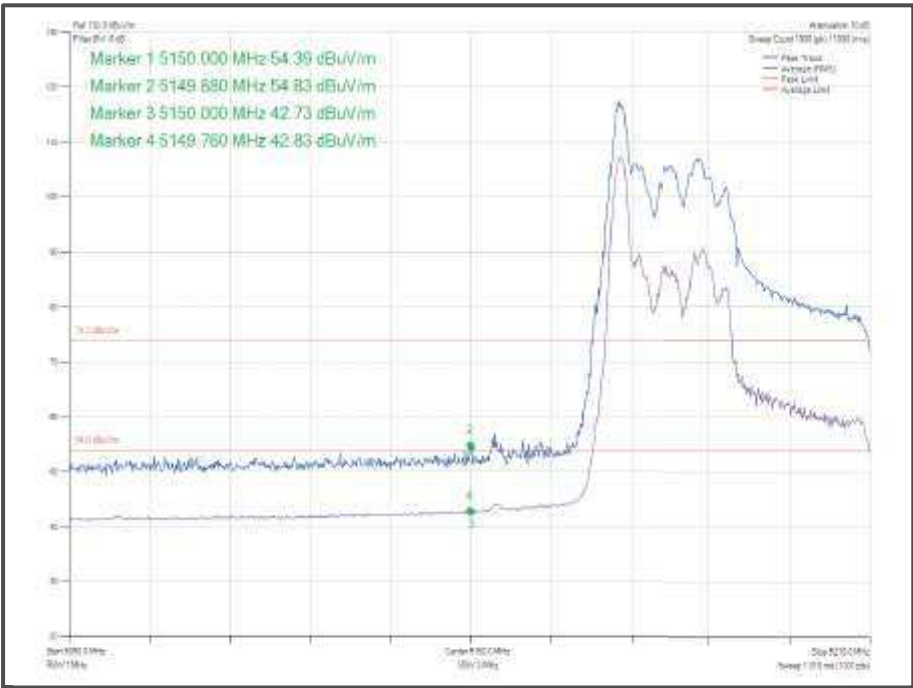


Figure 1030 - 802.11ax HE40 SDM, Cores 0-1, 26-0 - 5190 MHz
Band Edge Frequency 5150 MHz

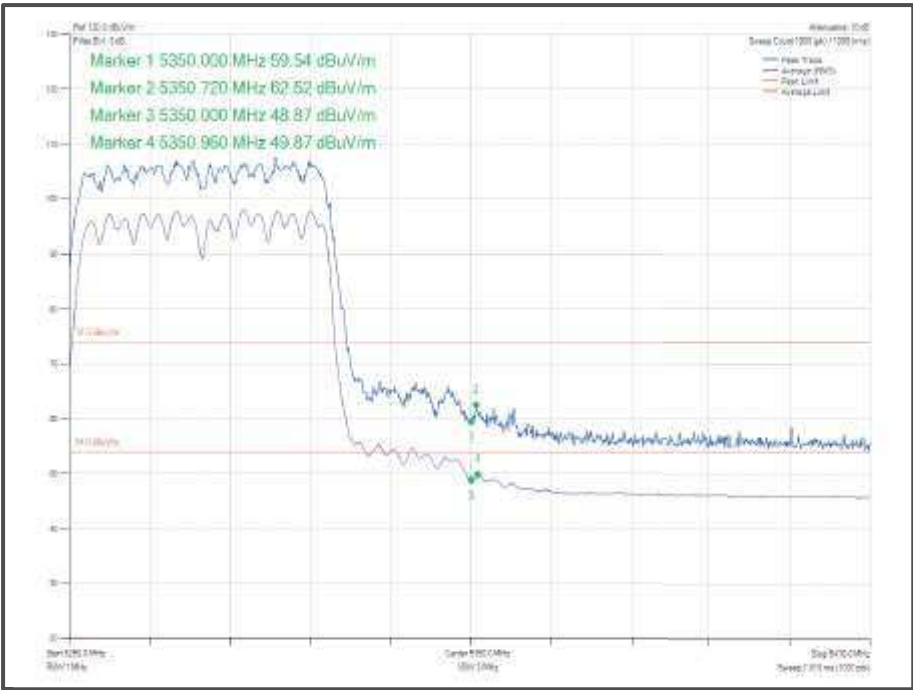


Figure 1031 - 802.11n HT40 CDD, Cores 0-1 - 5310 MHz
Band Edge Frequency 5350 MHz

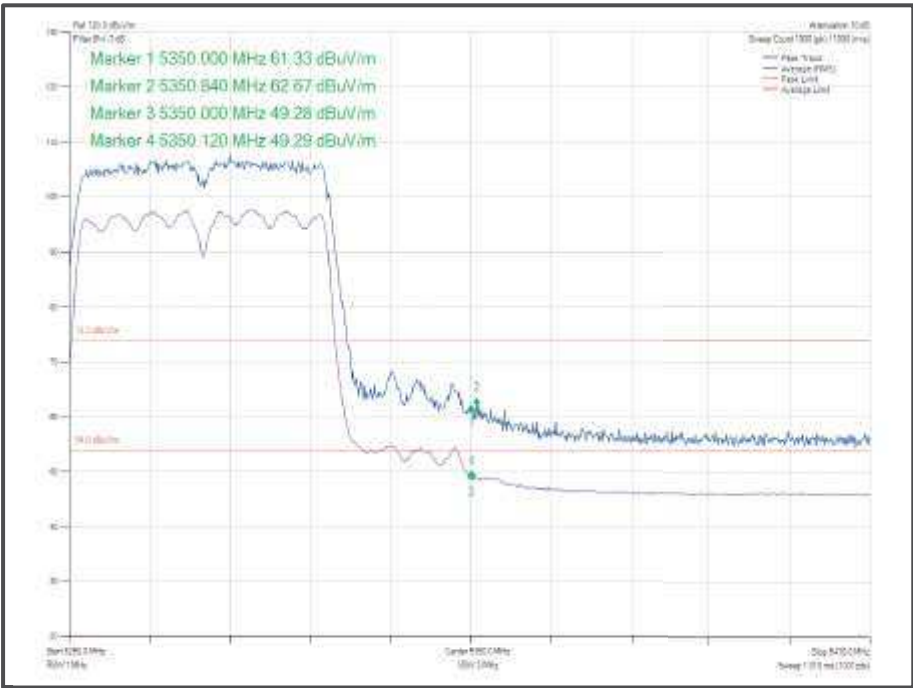


Figure 1032 - 802.11n HT40 SDM, Cores 0-1 - 5310 MHz
Band Edge Frequency 5350 MHz

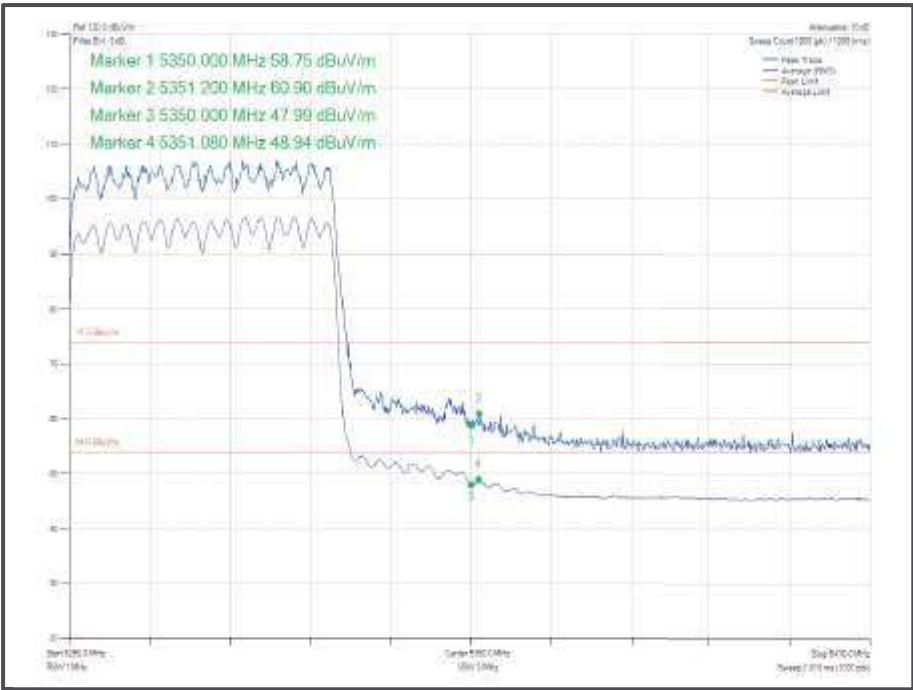


Figure 1033 - 80.211ax HE40 CDD, Cores 0-1, SU - 5310 MHz
Band Edge Frequency 5350 MHz

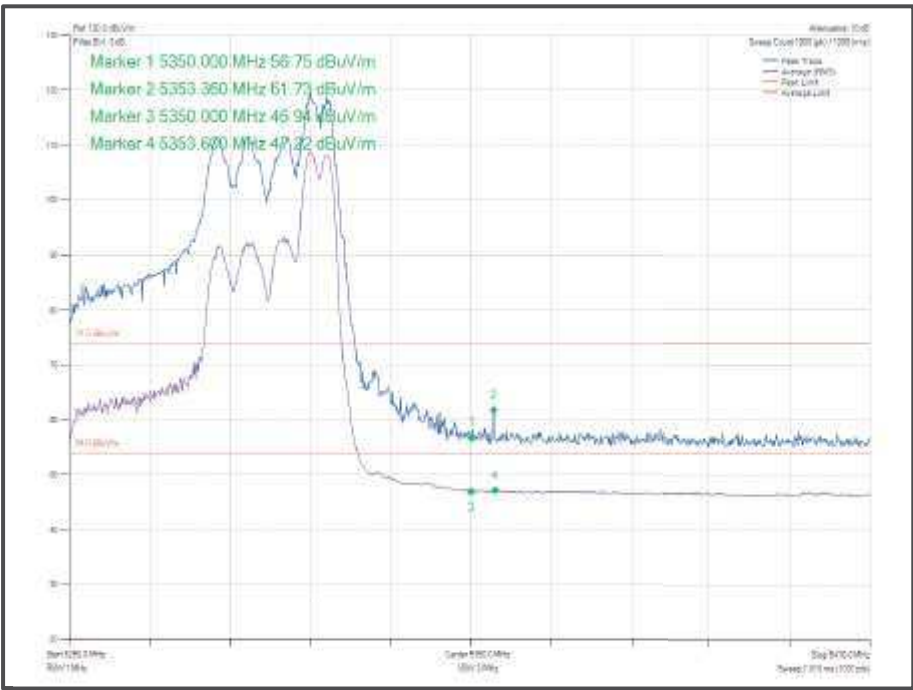


Figure 1034 - 80.211ax HE40 CDD, Cores 0-1, 52-44- 5310 MHz
Band Edge Frequency 5350 MHz

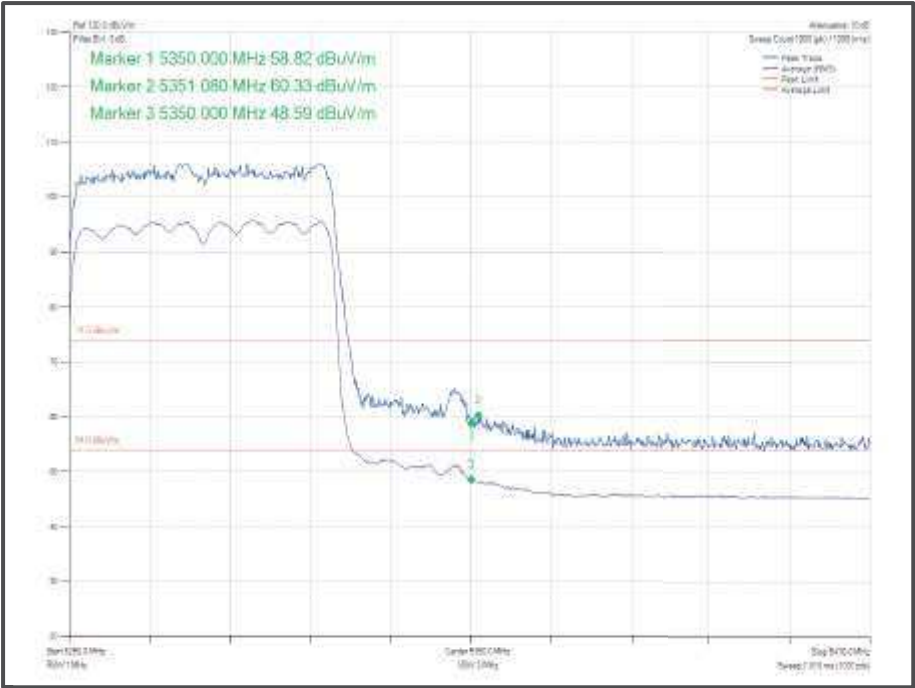


Figure 1035 - 80.2.11ax HE40 SDM, Cores 0-1, SU - 53.10 MHz
Band Edge Frequency 5350 MHz

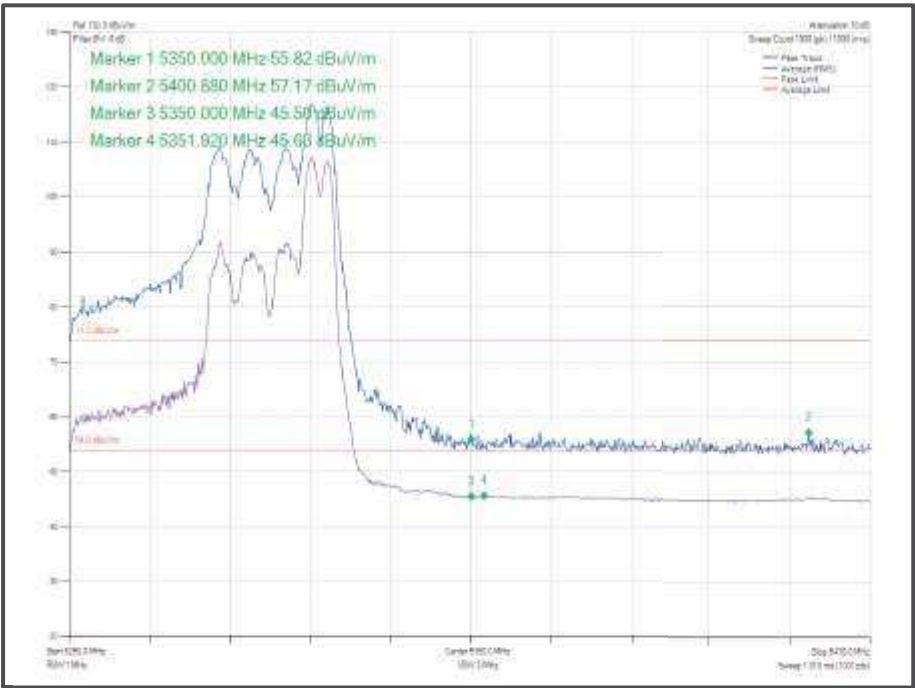


Figure 1036 - 80.2.11ax HE40 SDM, Cores 0-1, 52-44 - 53.10 MHz
Band Edge Frequency 5350 MHz

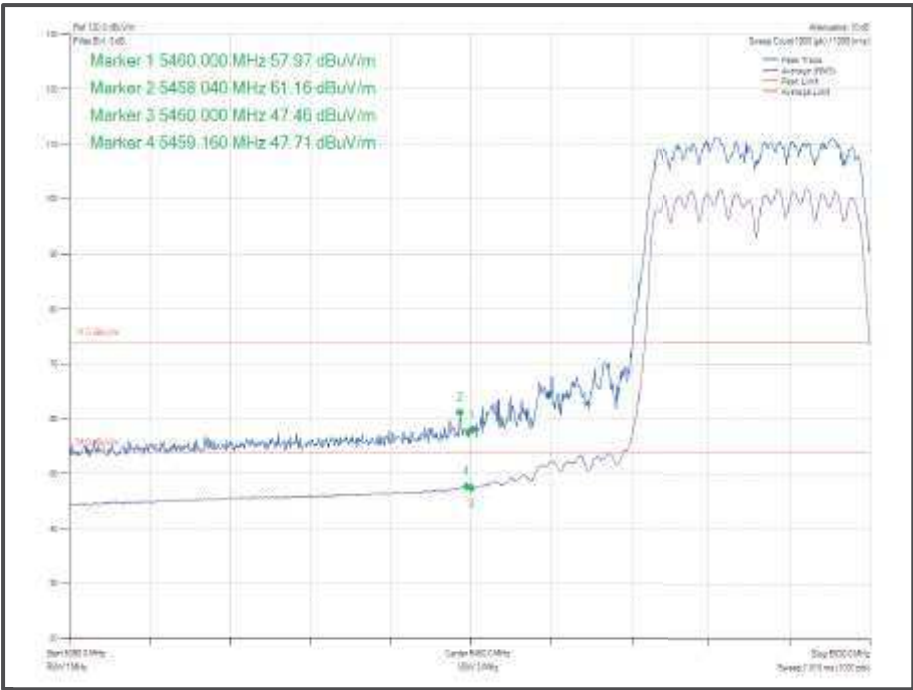


Figure 1037 - 802.11n HT40 CDD, Cores 0-1 - 5510 MHz
Band Edge Frequency 5460 MHz

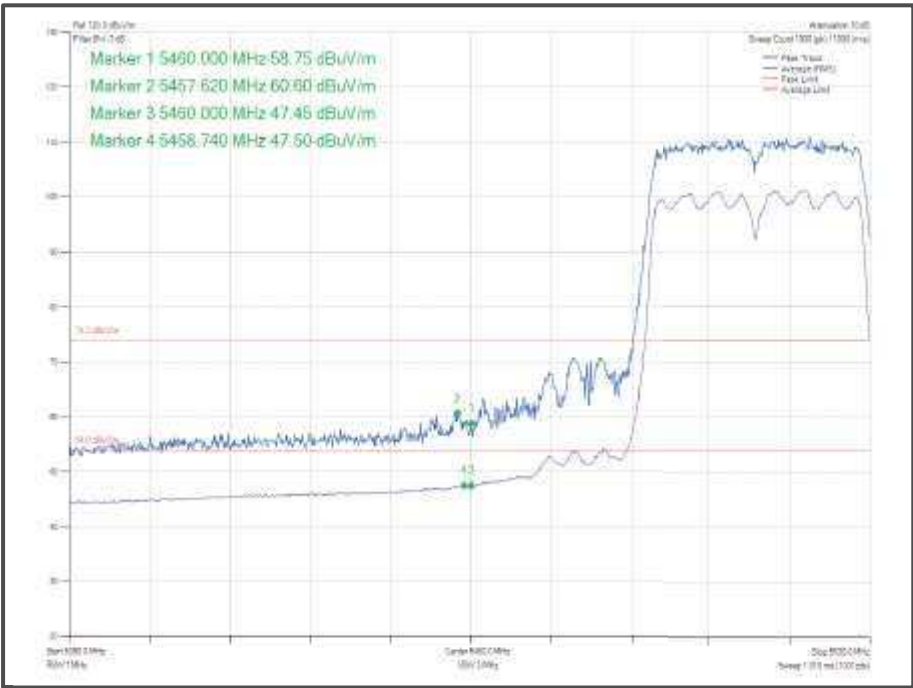


Figure 1038 - 802.11n HT40 SDM, Cores 0-1 - 5510 MHz
Band Edge Frequency 5460 MHz

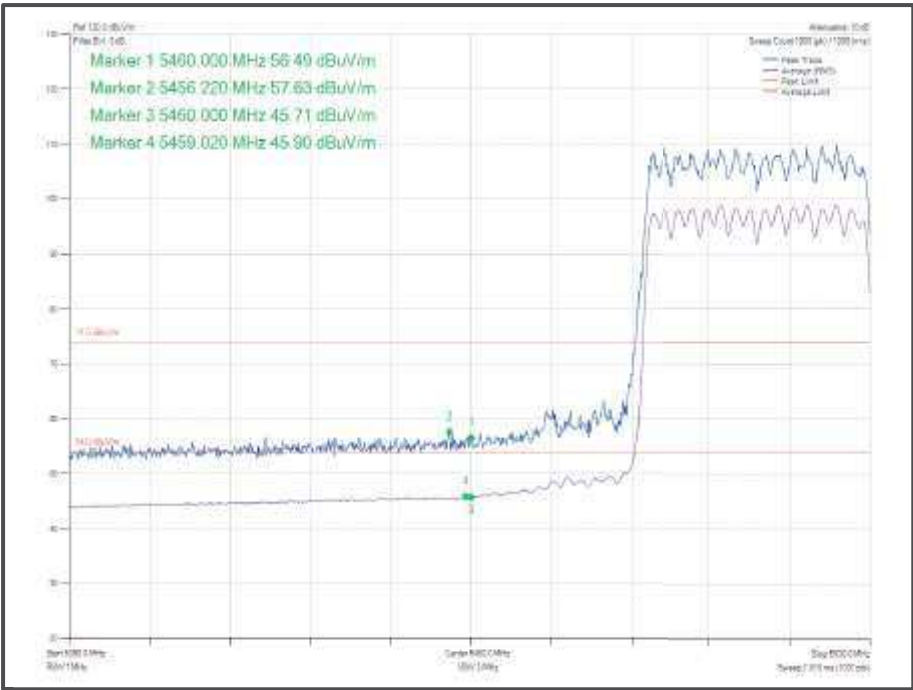


Figure 1039 - 802.11ax HE40 CDD, Cores 0-1, SU - 5510 MHz
Band Edge Frequency 5460 MHz

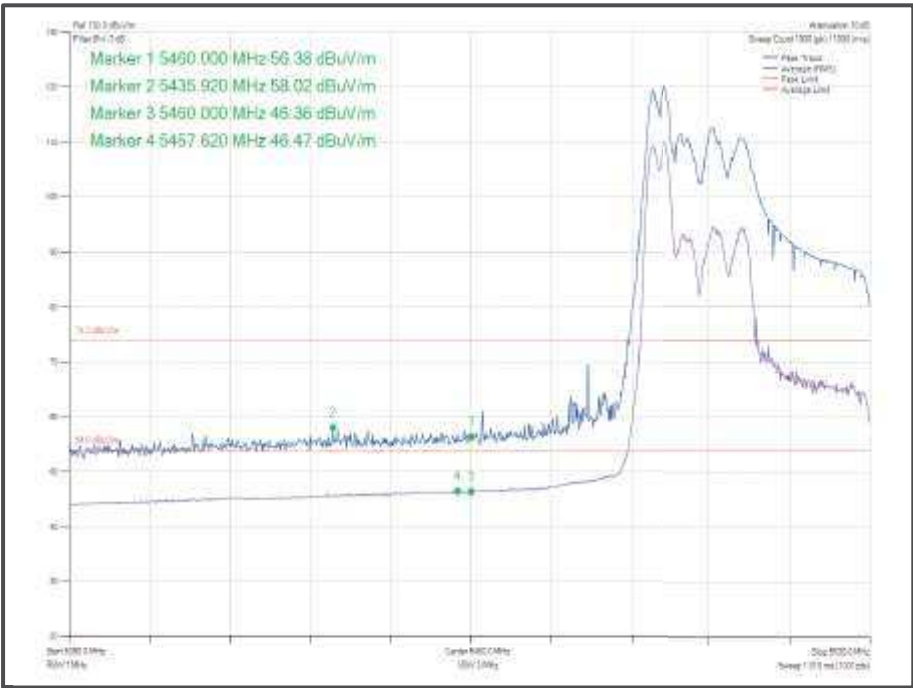


Figure 1040 - 802.11ax HE40 CDD, Cores 0-1, 26-0 - 5510 MHz
Band Edge Frequency 5460 MHz

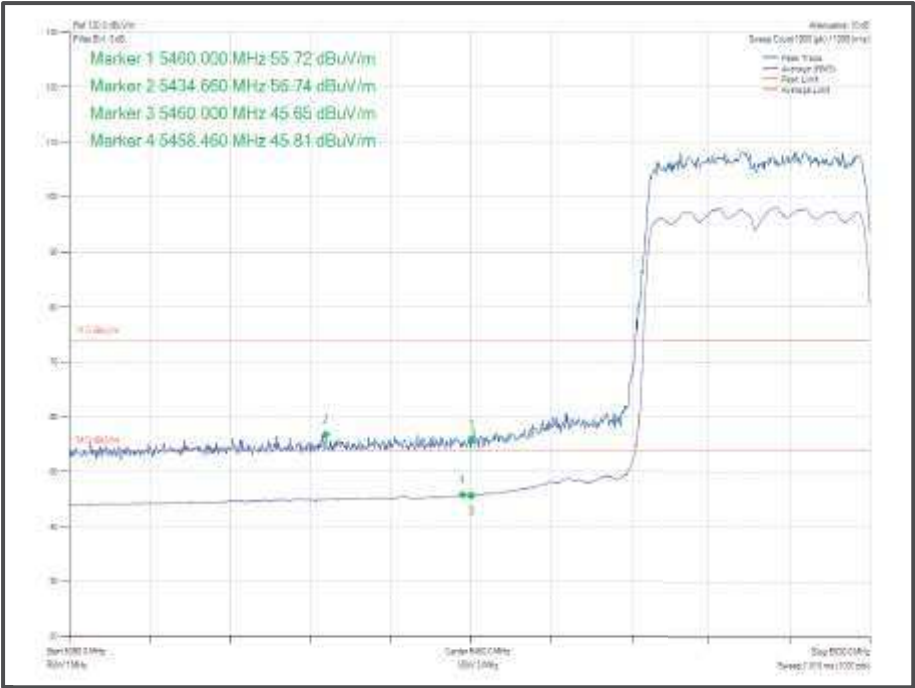


Figure 1041 - 802.11ax HE40 SDM, Cores 0-1, SU - 5510 MHz
Band Edge Frequency 5460 MHz

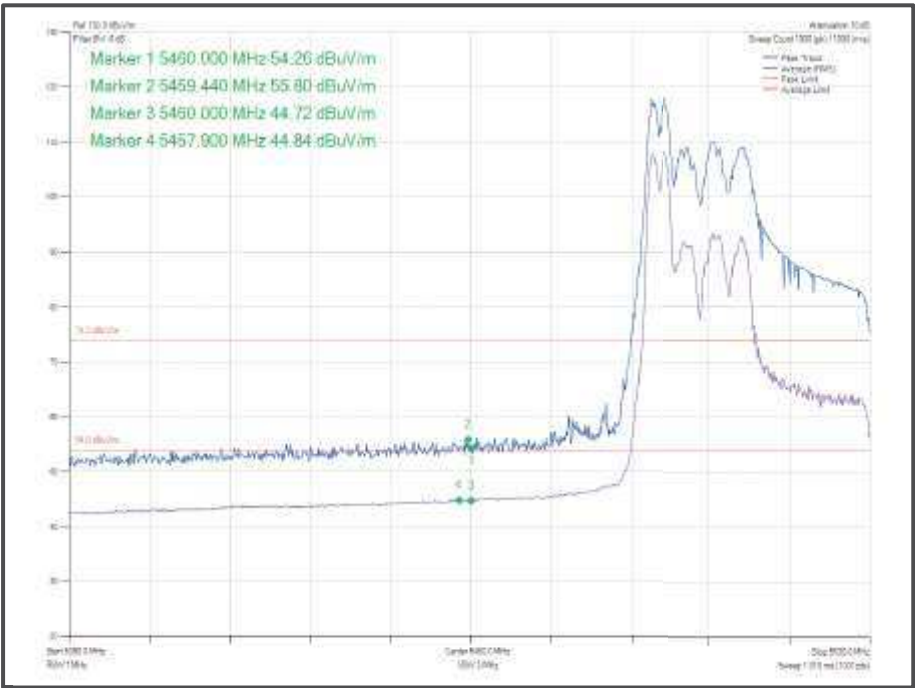


Figure 1042 - 802.11ax HE40 SDM, Cores 0-1, 26-0 - 5510 MHz
Band Edge Frequency 5460 MHz



Mode	Data Rate/MCS	Resource Size	Resource Index	TX Frequency (MHz)	Band Edge Frequency (MHz)	Peak Level (dBμV/m)	Average Level (dBμV/m)
802.11ac VHT80, Core 1	MCS7x1	-	-	5210	5150	67.97	52.02
802.11ac VHT80, Core 1	MCS7x1	-	-	5290	5350	65.16	52.03
802.11ac VHT80, Core 1	MCS7x1	-	-	5530	5460	65.94	49.76
802.11ax HE80, Core 1	MCS7	SU	-	5210	5150	65.09	51.11
802.11ax HE80, Core 1	MCS7	26	0	5210	5150	60.37	46.76
802.11ax HE80, Core 1	MCS7	SU	-	5290	5350	63.46	51.36
802.11ax HE80, Core 1	MCS7	52	52	5290	5350	54.49	43.52
802.11ax HE80, Core 1	MCS7	SU	-	5530	5460	65.97	49.39
802.11ax HE80, Core 1	MCS7	52	37	5530	5460	56.78	44.61

Table 638 - SISO Restricted Band Edge Results

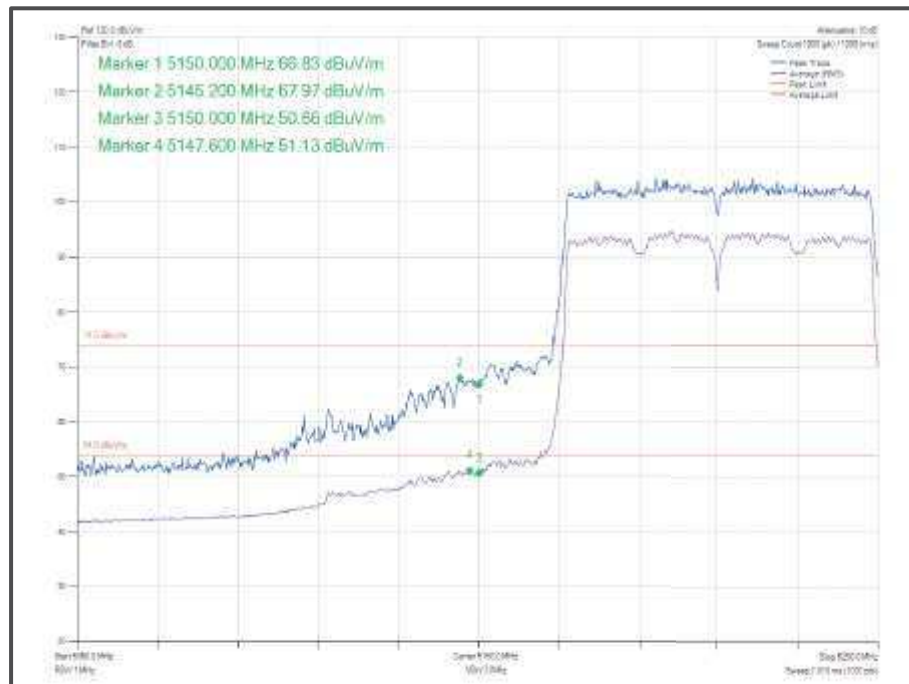


Figure 1043 - 802.11ac VHT80, Core 1 - 5210 MHz
Band Edge Frequency 5150 MHz

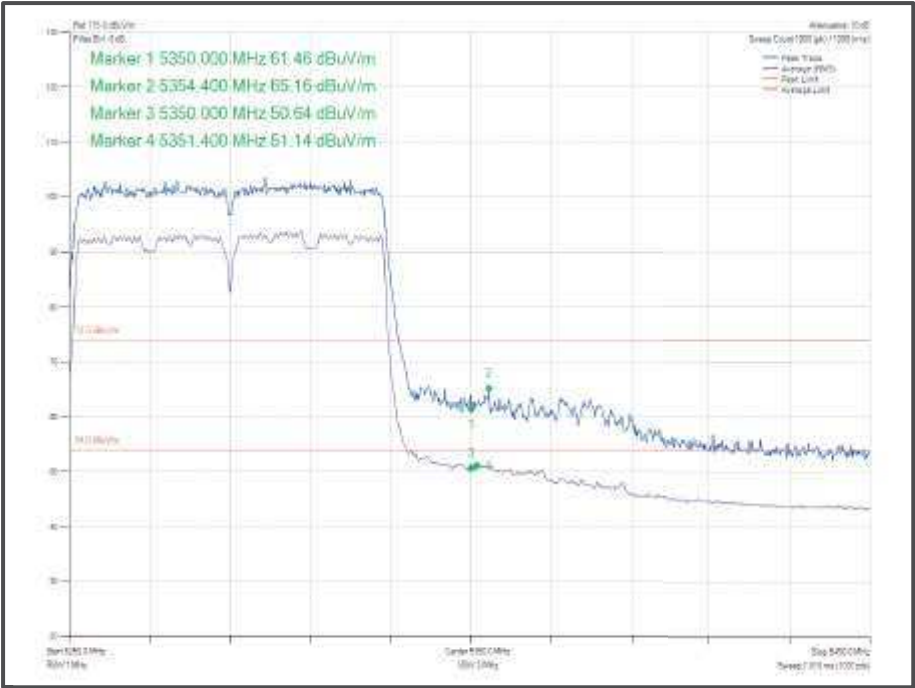


Figure 1044 - 802.11ac VHT80, Core 1 - 5290 MHz
Band Edge Frequency 5350 MHz

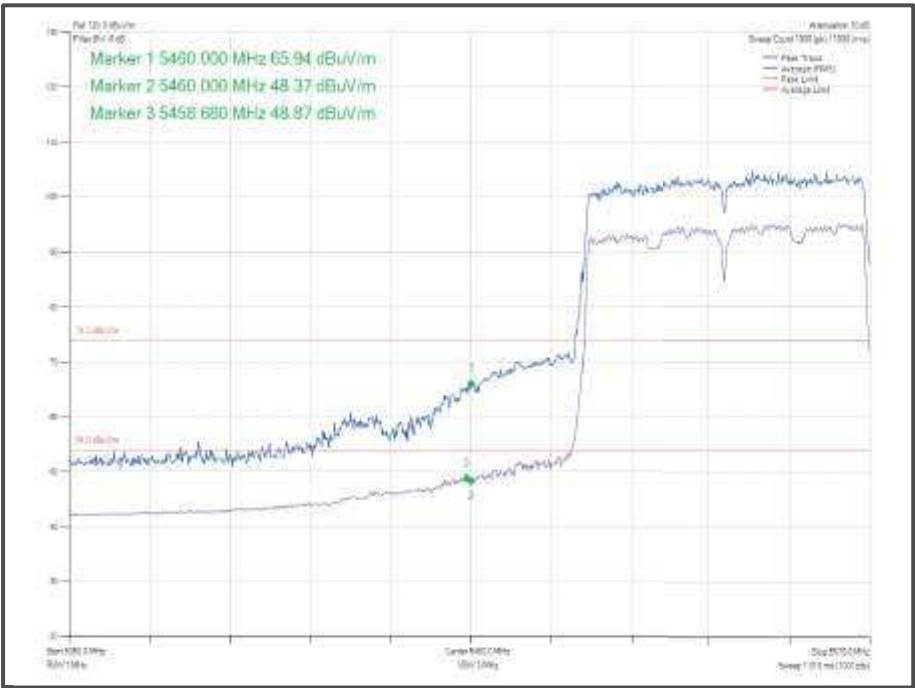


Figure 1045 - 802.11ac VHT80, Core 1 - 5530 MHz
Band Edge Frequency 5350 MHz

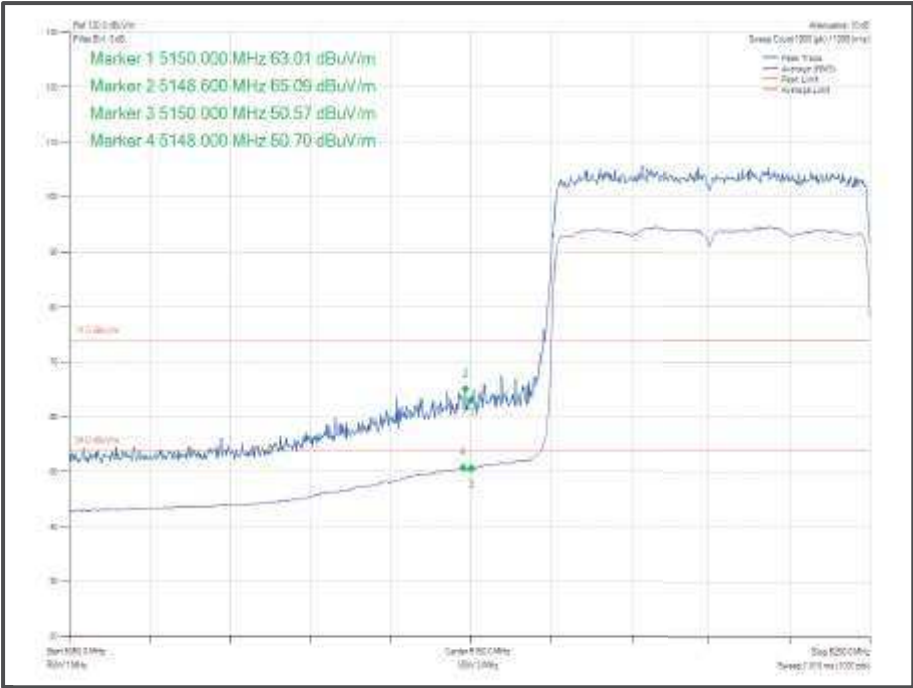


Figure 1046 - 802.11ax HE80, Core 1, SU - 52 10 MHz
Band Edge Frequency 5150 MHz

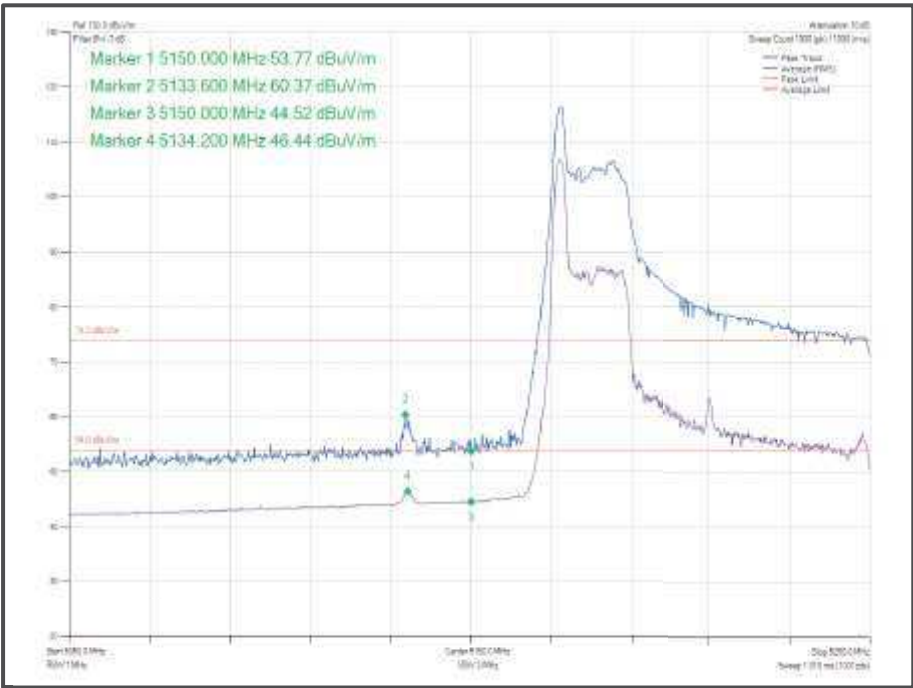


Figure 1047 - 802.11ax HE80, Core 1, 26-0 - 5210 MHz
Band Edge Frequency 5150 MHz

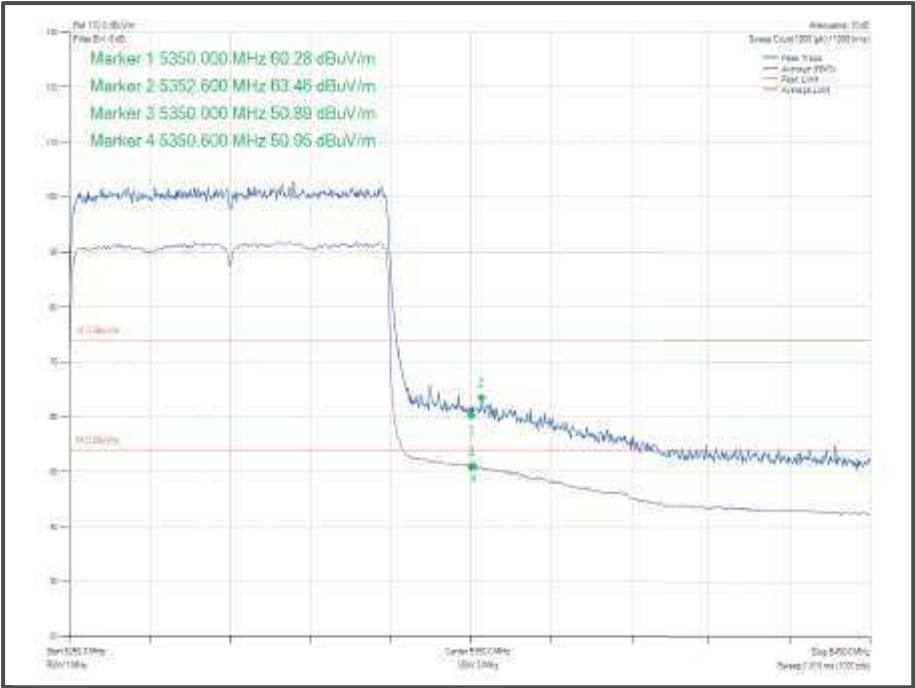


Figure 1048 - 802.11ax HE80, Core 1, SU - 52 90 MHz
Band Edge Frequency 5350 MHz

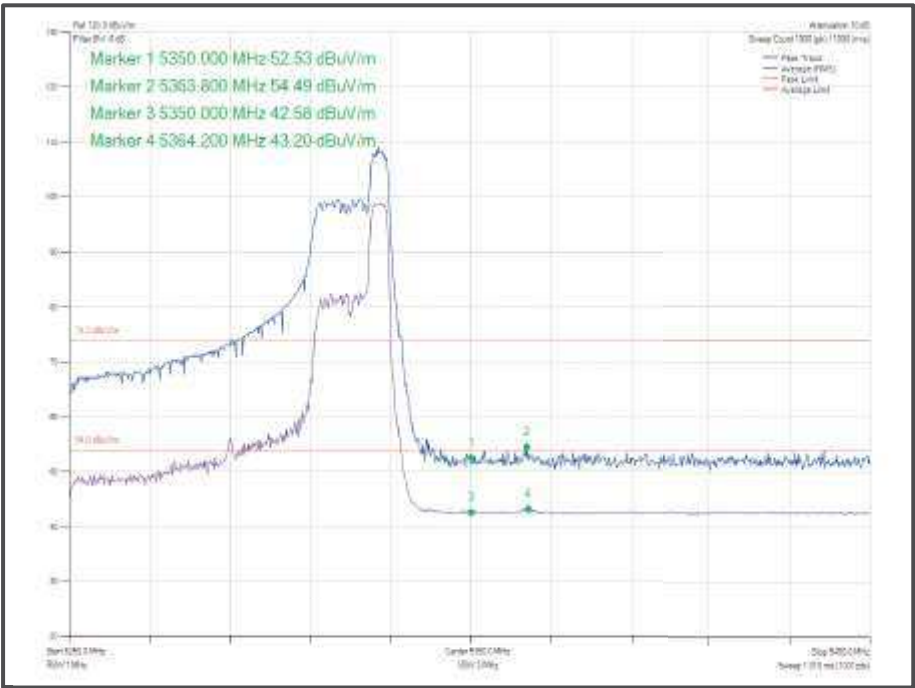


Figure 1049 - 802.11ax HE80, Core 1, 52-52 - 52 90 MHz
Band Edge Frequency 5350 MHz

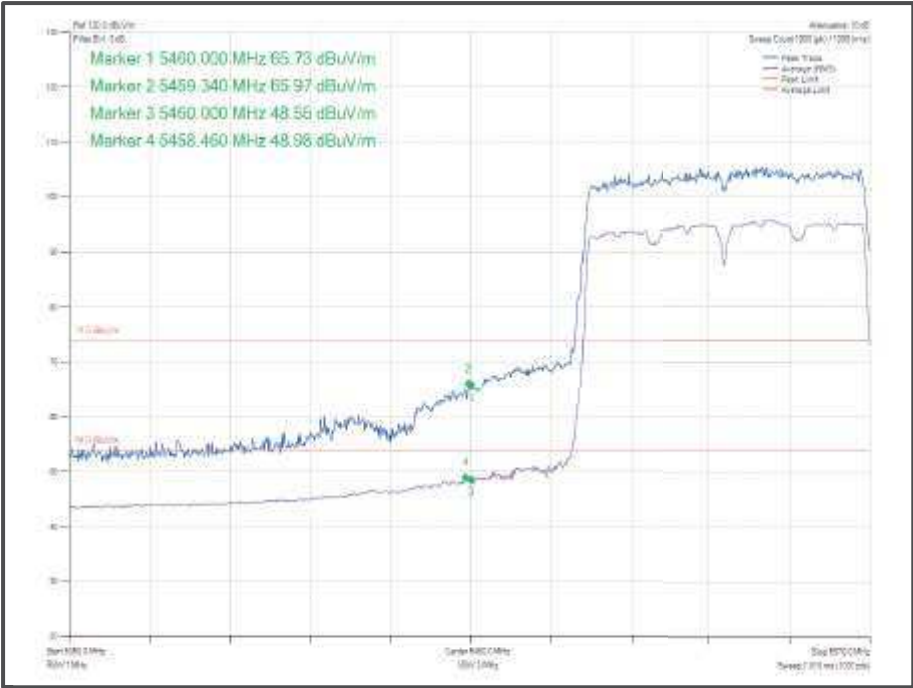


Figure 1050 - 802.11ax HE80, Core 1, SU - 5530 MHz
Band Edge Frequency 5350 MHz

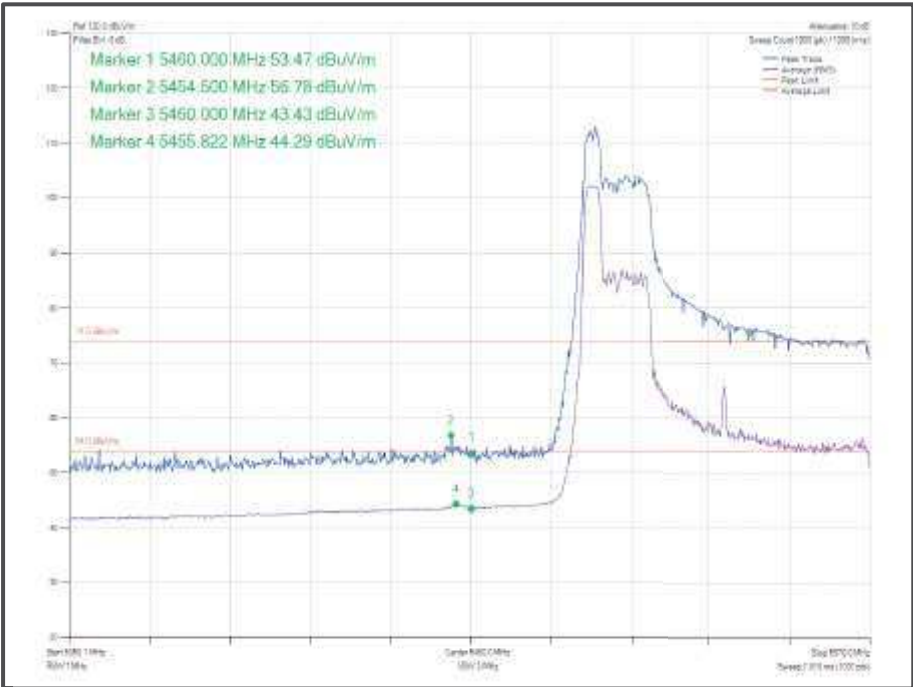


Figure 1051 - 802.11ax HE80, Core 1, 26-0 - 5530 MHz
Band Edge Frequency 5350 MHz



Mode	Data Rate/ MCS	Resource Size	Resource Index	TX Frequency (MHz)	Band Edge Frequency (MHz)	Peak Level (dB μ V/m)	Average Level (dB μ V/m)
802.11ac VHT80 CDD, Cores 0-1	MCS7x1	-	-	5210	5150	58.89	46.79
802.11ac VHT80 SDM, Cores 0-1	MCS7x1	-	-	5210	5150	58.45	47.10
802.11ax HE80 CDD, Cores 0-1	MCS7	SU	-	5210	5150	56.61	45.68
802.11ax HE80 CDD, Cores 0-1	MCS7	26	0	5210	5150	58.31	46.22
802.11ax HE80 SDM, Cores 0-1	MCS7	SU	-	5210	5150	56.14	45.47
802.11ax HE80 SDM, Cores 0-1	MCS7	26	0	5210	5150	58.21	45.12
802.11ac VHT80 CDD, Cores 0-1	MCS7	-	-	5290	5350	59.14	48.08
802.11ac VHT80 SDM, Cores 0-1	MCS7	-	-	5290	5350	60.08	48.07
802.11ax HE80 CDD, Cores 0-1	MCS7	SU	-	5290	5350	57.70	46.15
802.11ax HE80 CDD, Cores 0-1	MCS7	52	52	5290	5350	54.92	43.33
802.11ax HE80 SDM, Cores 0-1	MCS7	SU	-	5290	5350	56.48	45.27
802.11ax HE80 SDM, Cores 0-1	MCS7	52	52	5290	5350	54.02	43.12
802.11ac VHT80 CDD, Cores 0-1	MCS7	-	-	5530	5460	62.13	47.84
802.11ac VHT80 SDM, Cores 0-1	MCS7	-	-	5530	5460	62.68	48.75
802.11ax HE80 CDD, Cores 0-1	MCS7	SU	-	5530	5460	57.22	46.71
802.11ax HE80 CDD, Cores 0-1	MCS7	52	37	5530	5460	54.92	44.14
802.11ax HE80 SDM, Cores 0-1	MCS7	SU	-	5530	5460	57.42	46.61
802.11ax HE80 SDM, Cores 0-1	MCS7	52	37	5530	5460	54.70	44.03

Table 639 - MIMO 2TX Restricted Band Edge Results

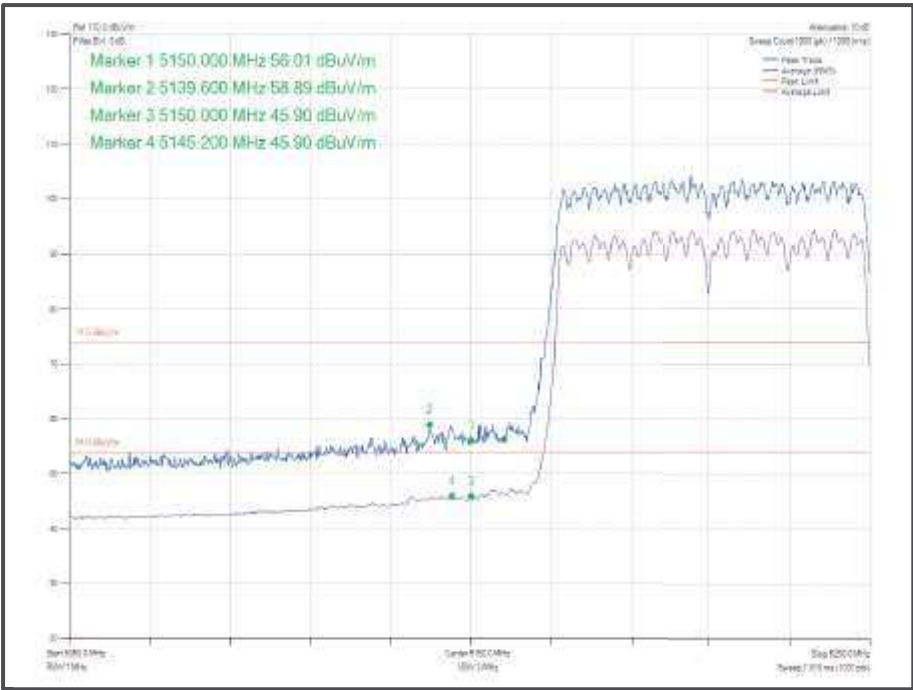


Figure 1052 - 802.11ac VHT80 CDD, Cores 0-1- 5210 MHz
Band Edge Frequency 5150 MHz

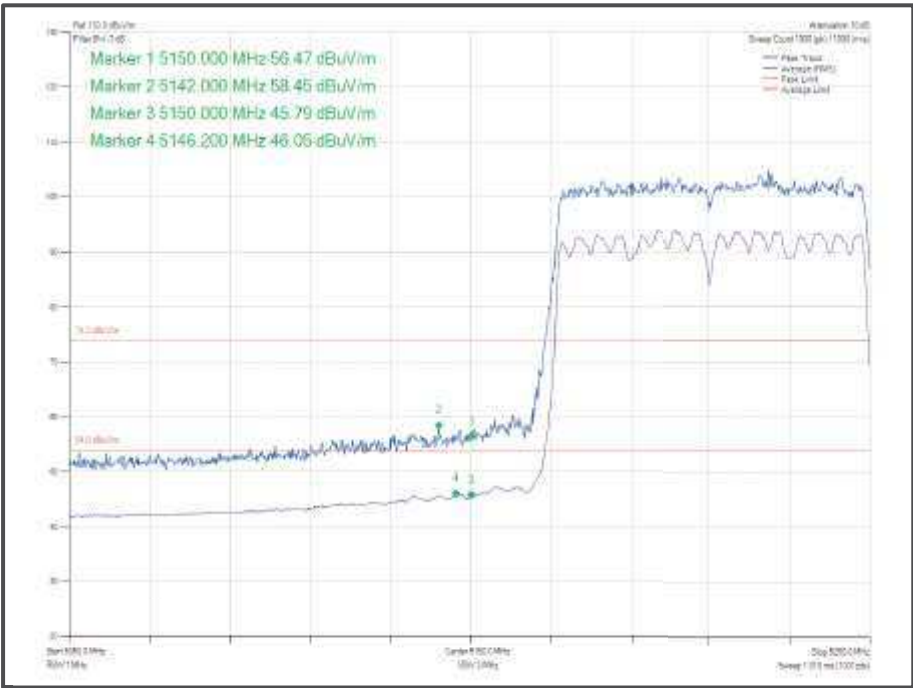


Figure 1053 - 802.11ac VHT80 SDM, Cores 0-1 - 5210 MHz
Band Edge Frequency 5150 MHz

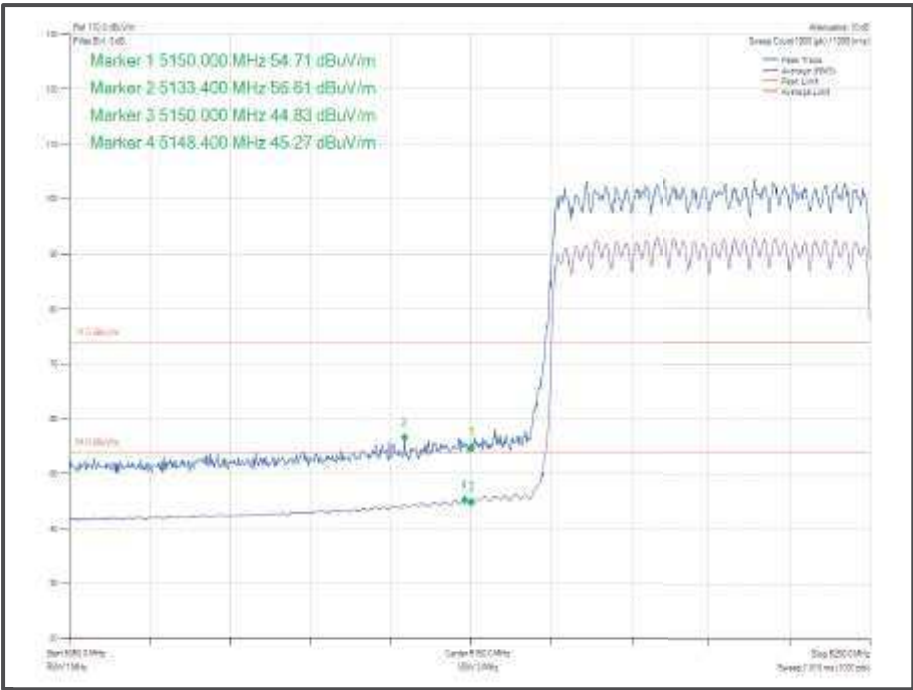


Figure 1054 - 802.11ax HE80 CDD, Cores 0-1, SU - 5210 MHz
Band Edge Frequency 5150 MHz

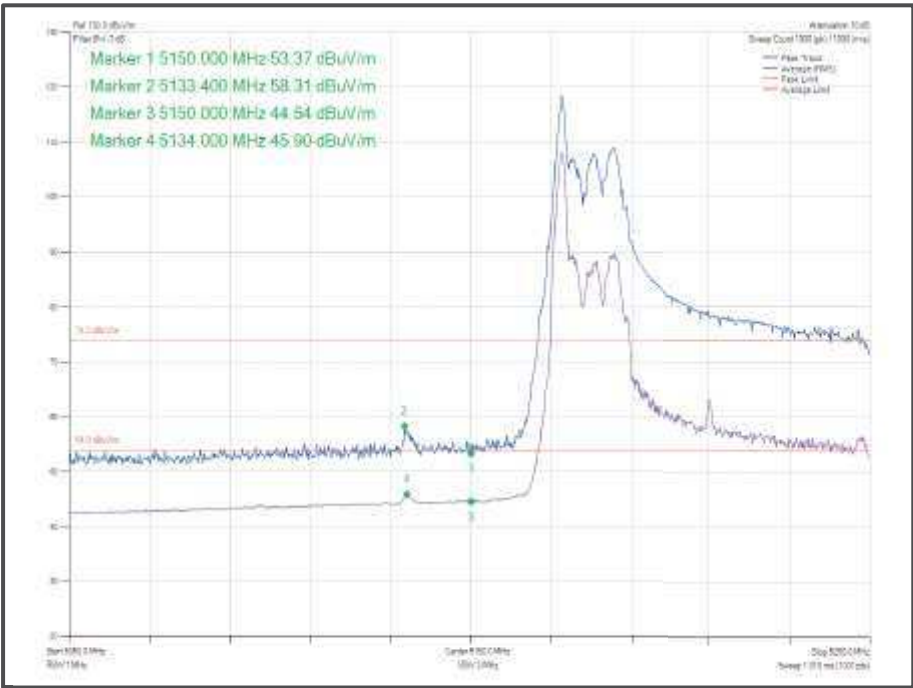


Figure 1055 - 802.11ax HE80 CDD, Cores 0-1, 26-0 - 5210 MHz
Band Edge Frequency 5150 MHz

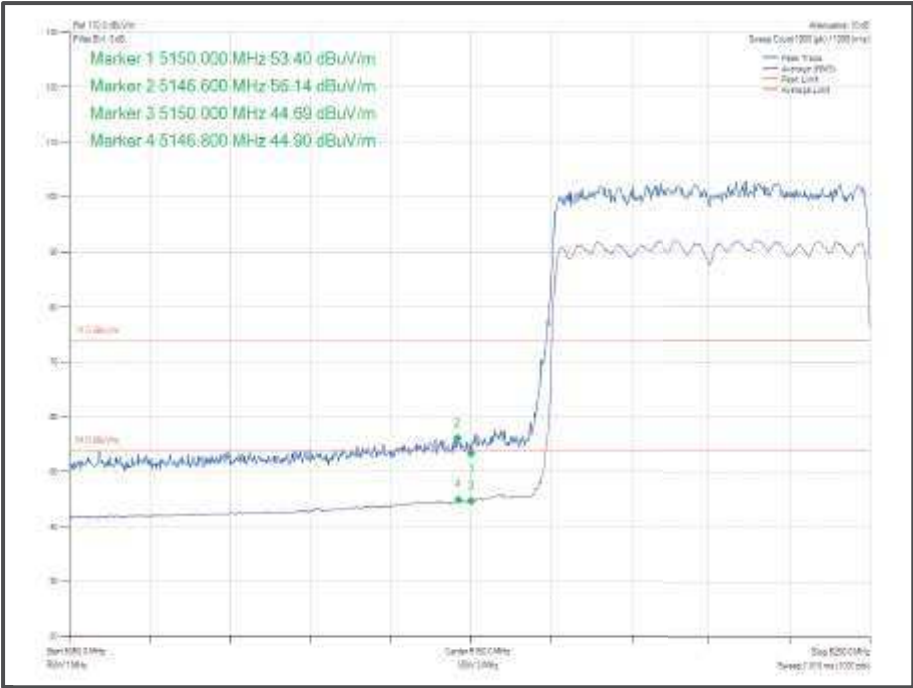


Figure 1056 - 802.11ax HE80 SDM, Cores 0-1, SU - 5210 MHz
Band Edge Frequency 5150 MHz

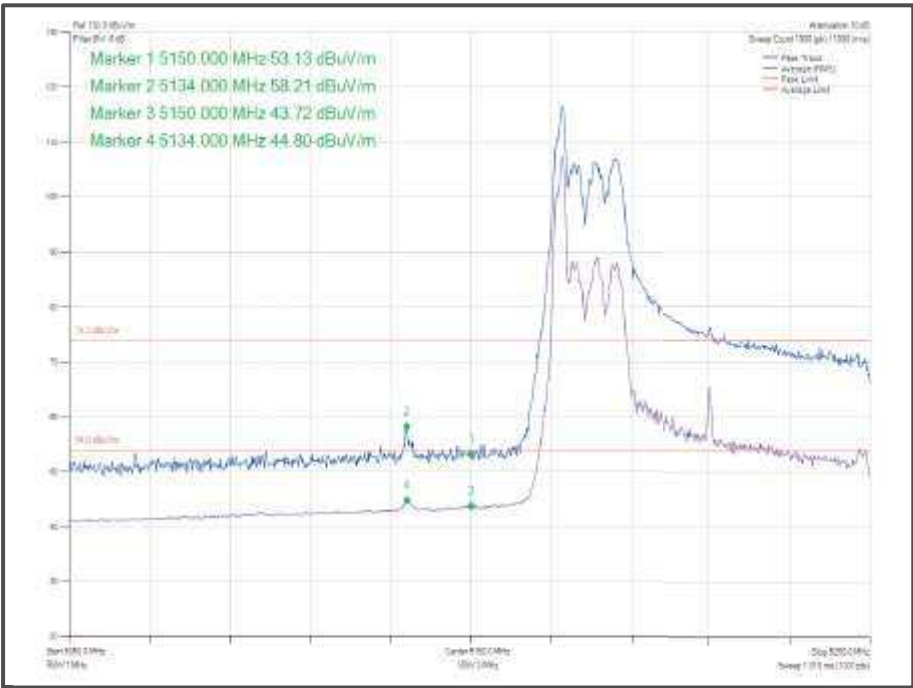


Figure 1057 - 802.11ax HE80 SDM, Cores 0-1, 26-0 - 5210 MHz
Band Edge Frequency 5150 MHz

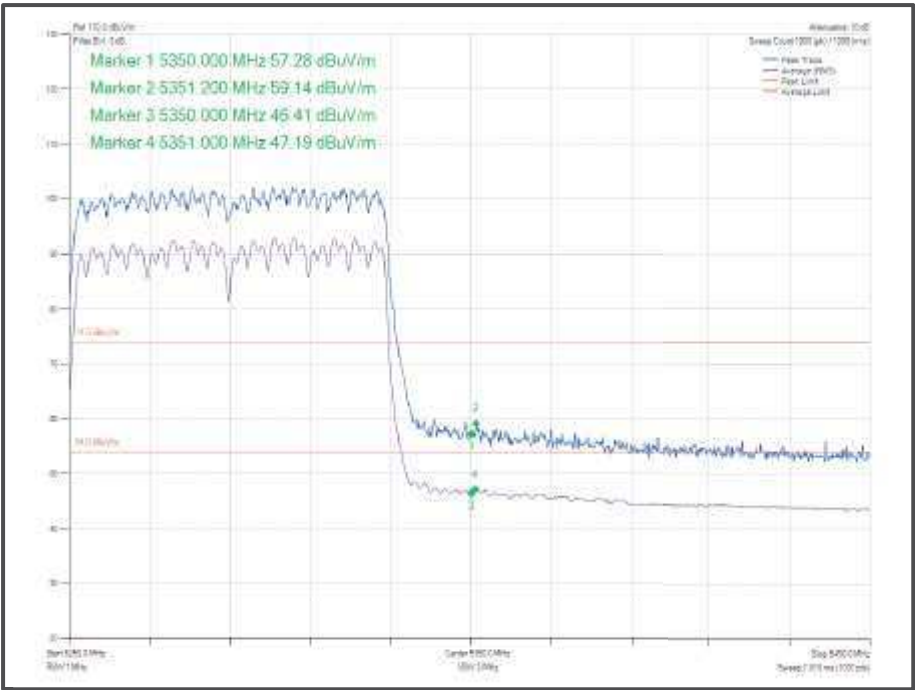


Figure 1058 - 802.11ac VHT80 CDD, Cores 0-1- 5290 MHz
Band Edge Frequency 5350 MHz

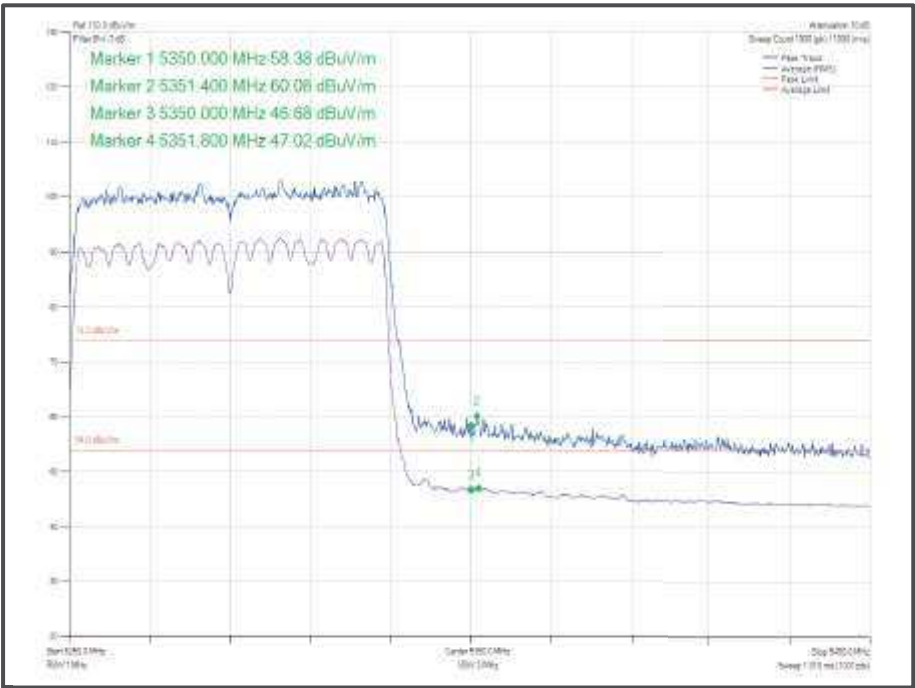


Figure 1059 - 802.11ac VHT80 SDM, Cores 0-1 - 5290 MHz
Band Edge Frequency 5350 MHz

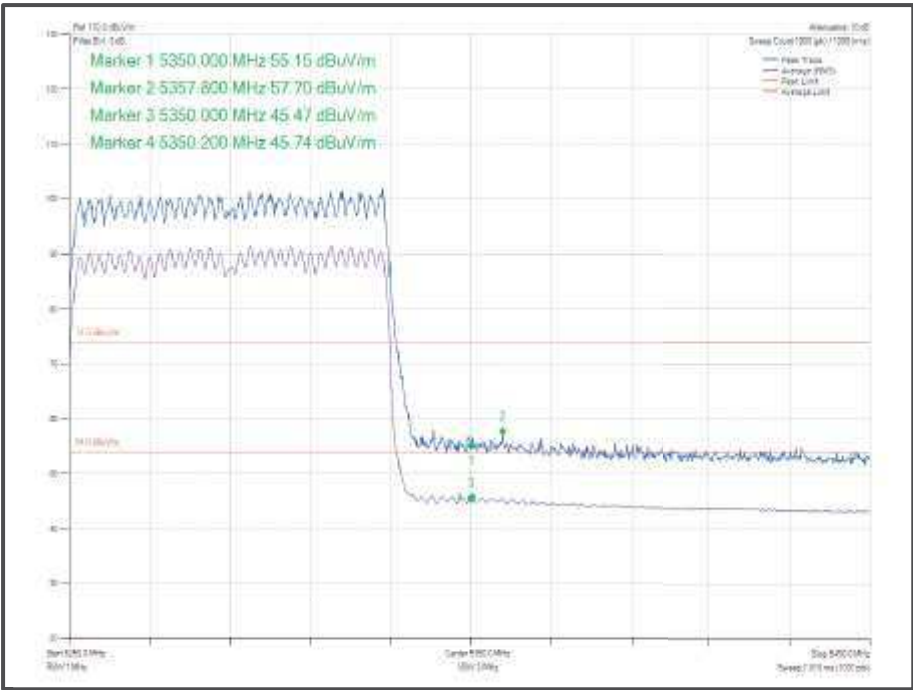


Figure 1060 - 802.11ax HE80 CDD, Cores 0-1, SU - 5290 MHz
Band Edge Frequency 5350 MHz

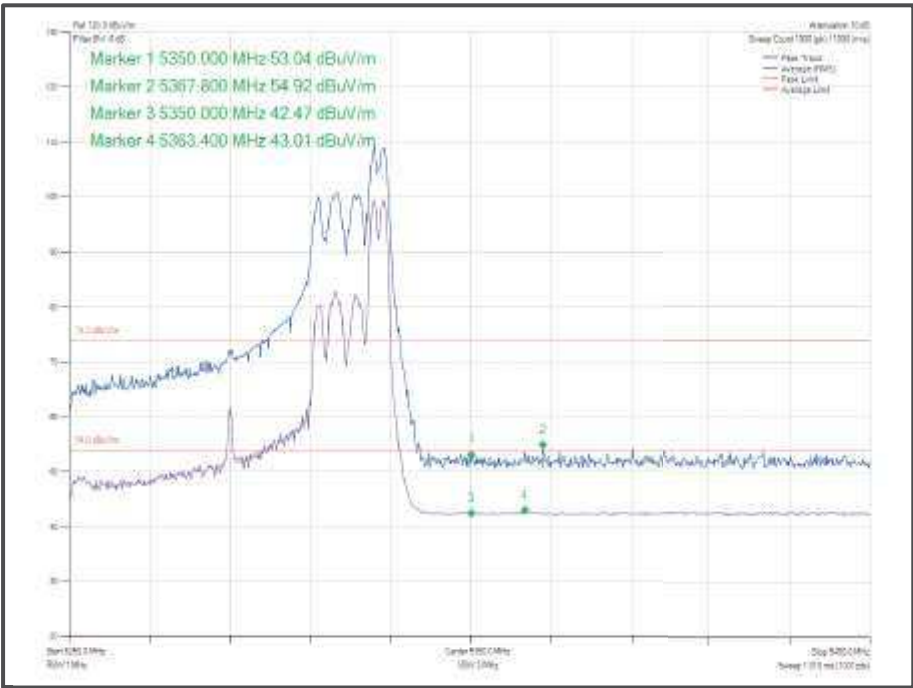


Figure 1061 - 802.11ax HE80 CDD, Cores 0-1, 52-52- 5290 MHz
Band Edge Frequency 5350 MHz

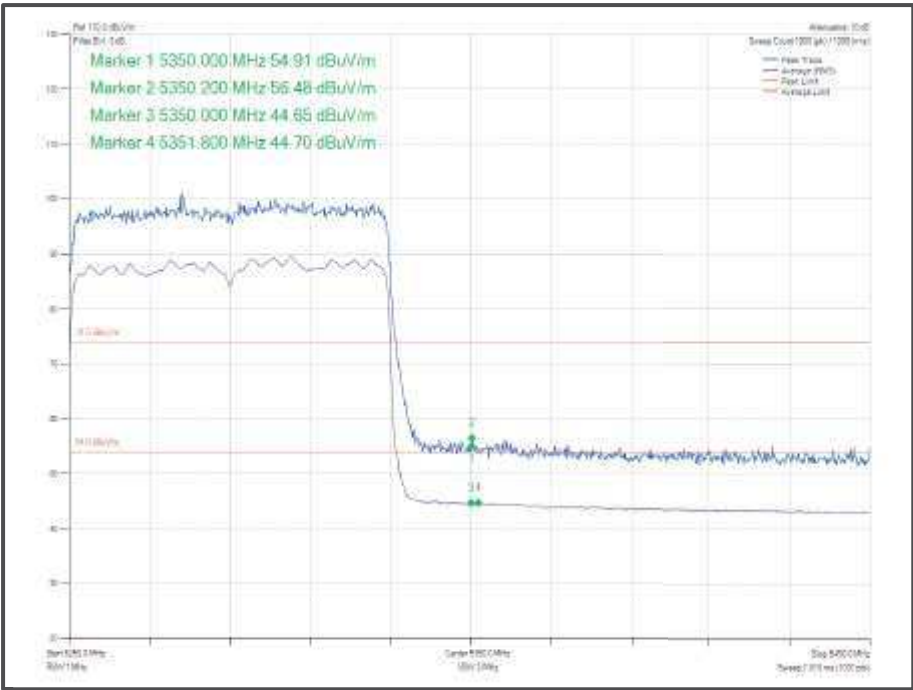


Figure 1062 - 80.2.11ax HE80 SDM, Cores 0-1, SU - 5290 MHz
Band Edge Frequency 5350 MHz

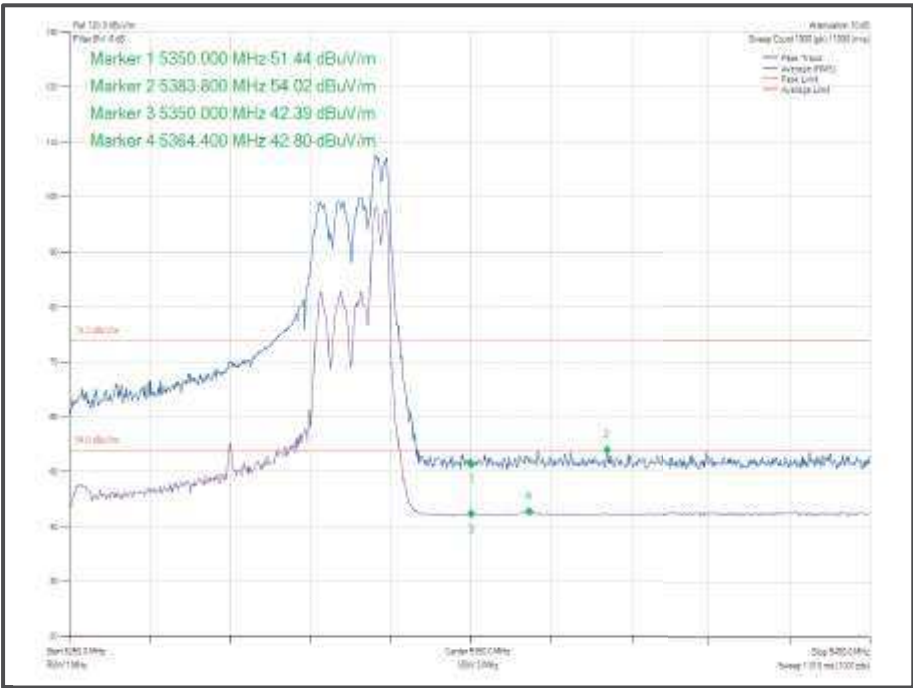


Figure 1063 - 80.2.11ax HE80 SDM, Cores 0-1, 52-52- 5290 MHz
Band Edge Frequency 5350 MHz

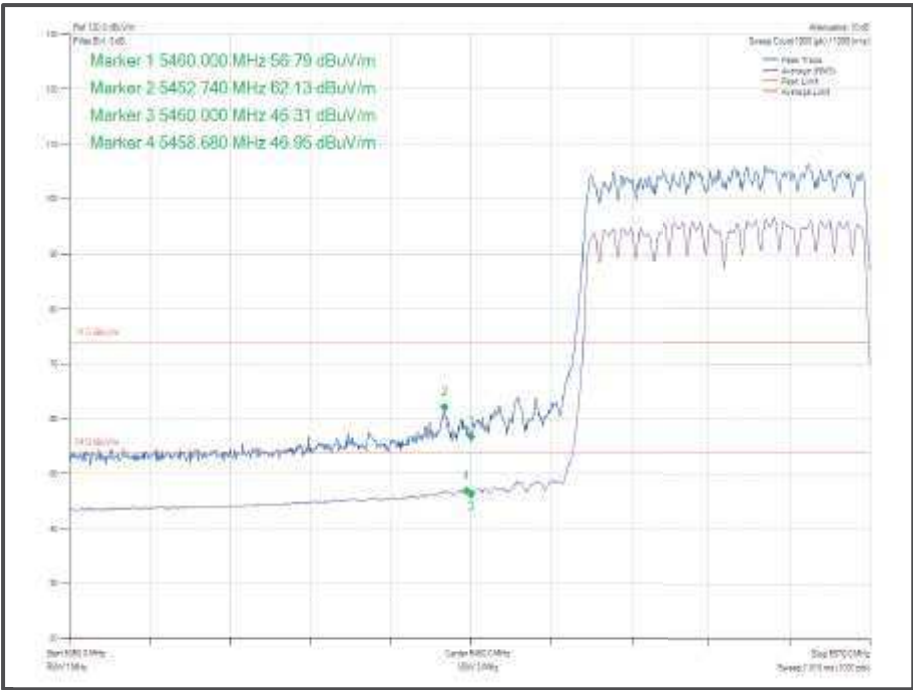


Figure 1064 - 802.11ac VHT80 CDD, Cores 0-1 - 5530 MHz
Band Edge Frequency 5460 MHz

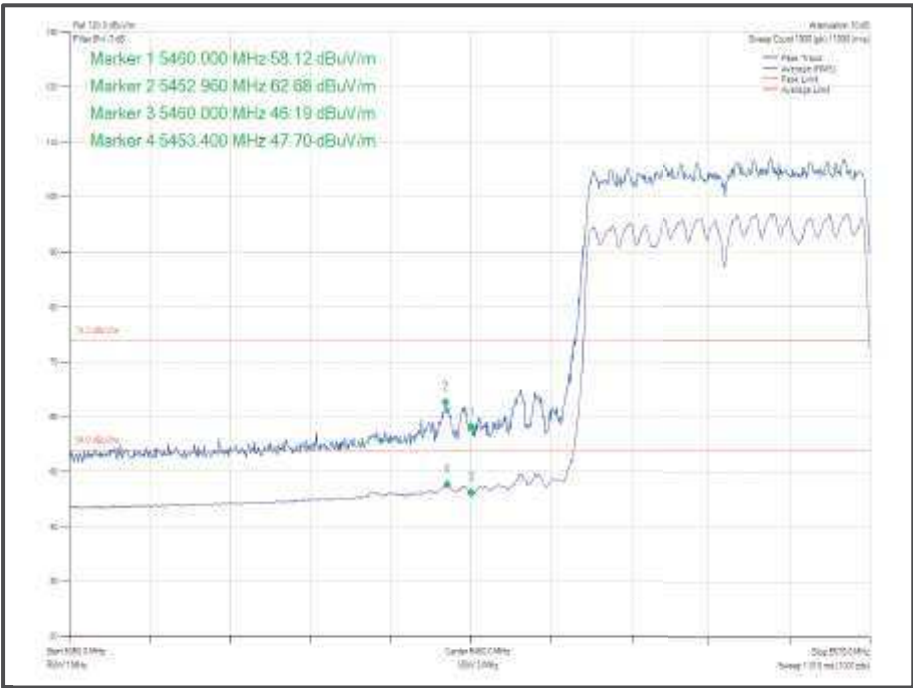


Figure 1065 - 802.11ac VHT80 SDM, Cores 0-1 - 5530 MHz
Band Edge Frequency 5460 MHz

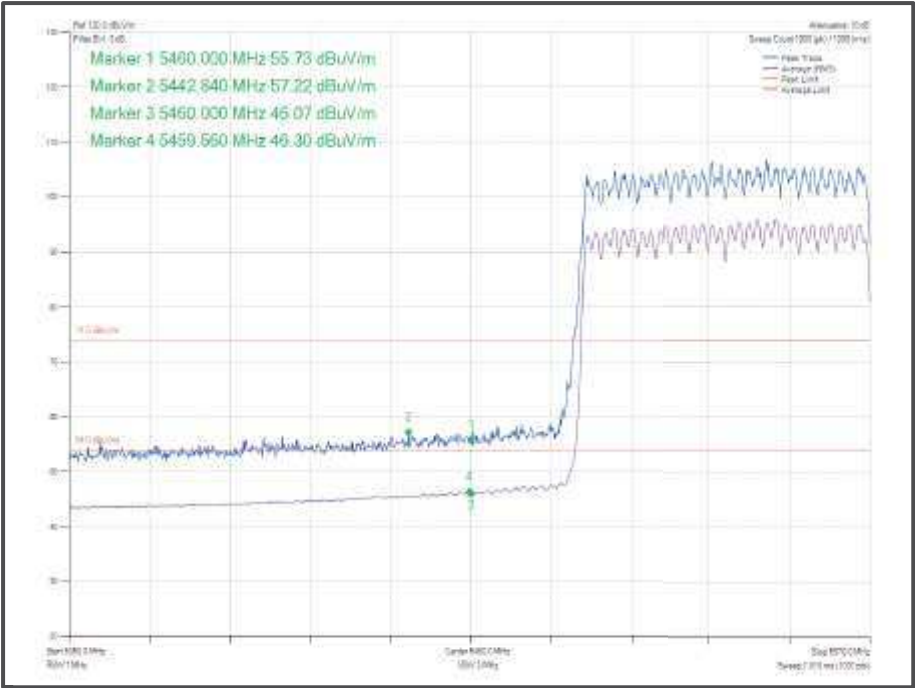


Figure 1066 - 802.11ax HE80 CDD, Cores 0-1, SU - 5530 MHz
Band Edge Frequency 5460 MHz

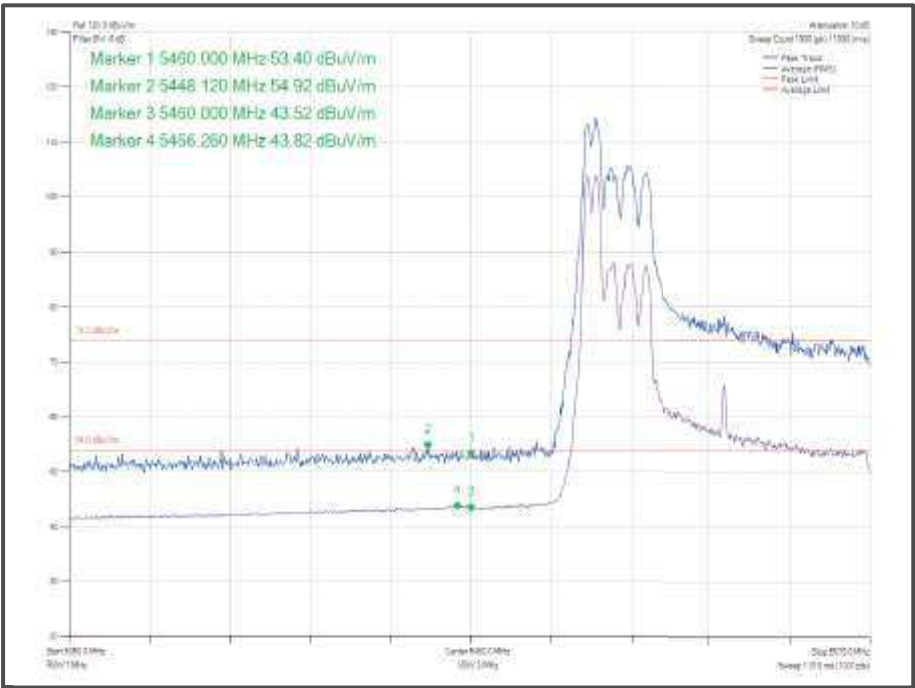


Figure 1067 - 802.11ax HE80 CDD, Cores 0-1, 52-37 - 5530 MHz
Band Edge Frequency 5460 MHz

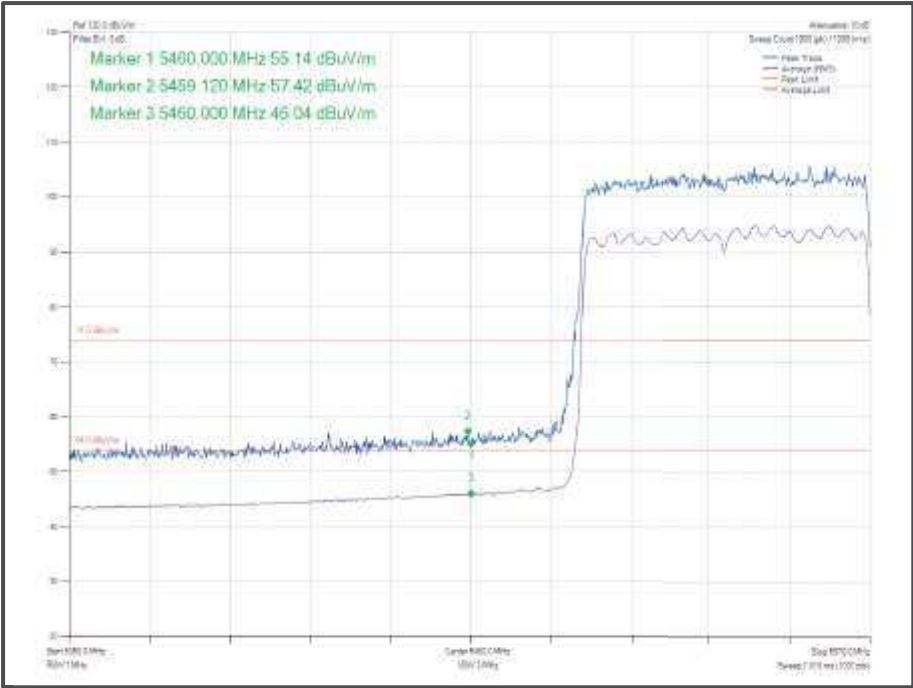


Figure 1068 - 802.11ax HE80 SDM, Cores 0-1, SU - 5530 MHz
Band Edge Frequency 5460 MHz

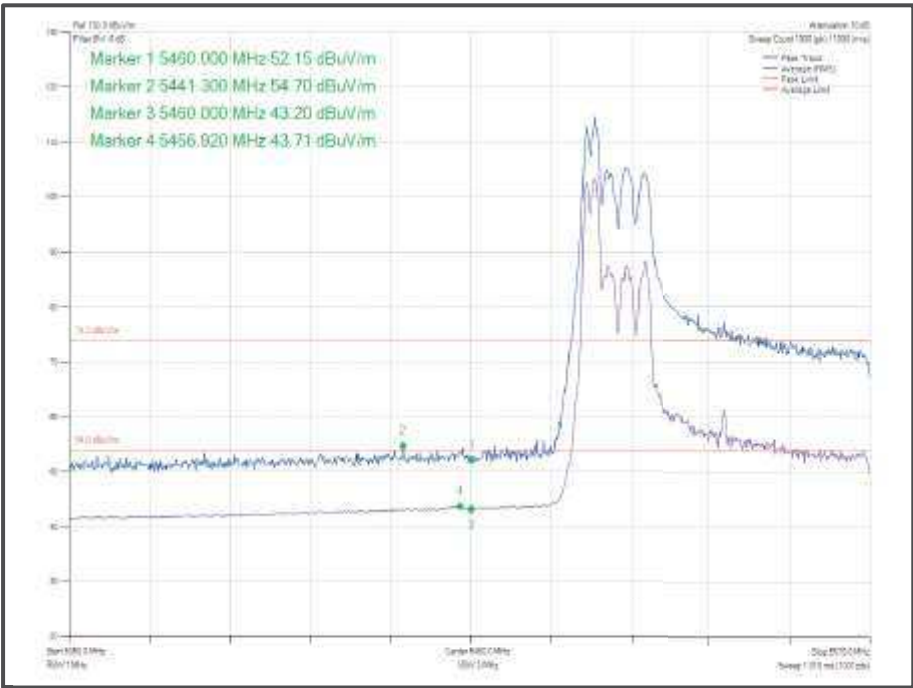


Figure 1069 - 802.11ax HE80 SDM, Cores 0-1, 52-37- 5530 MHz
Band Edge Frequency 5460 MHz



FCC 47 CFR Part 15, Limit Clause 15.205 and Industry Canada RSS-GEN Limit Clause 8.10

	Peak (dBµV/m)	Average (dBµV/m)
Restricted Bands of Operation	74	54

Table 640 - Restricted Band Edge Limit Table

2.5.7 Test Location and Test Equipment Used

This test was carried out in RF Chamber 11.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
EMI Test Receiver	Rohde & Schwarz	ESW44	5084	12	28-Nov-2020
Screened Room (11)	Rainford	Rainford	5136	36	01-Nov-2021
8m N-Type RF Cable	Teledyne	PR90-088-8MTR	5092	12	06-Dec-2020
Cable (18 GHz)	Rosenberger	LU7-071-1000	5102	12	06-Oct-2020
Cable (18 GHz)	Rosenberger	LU7-071-1000	5103	12	06-Oct-2020
Cable (18 GHz)	Rosenberger	LU7-071-1000	5104	12	09-Dec-2020
EmX Emissions Software	TUV SUD	EmX	5125	-	Software
Mast	Maturo	TAM 4.0-P	5158	-	TU
Mast and Turntable Controller	Maturo	Maturo NCD	5159	-	TU
Turntable	Maturo	TT 15WF	5160	-	TU
Horn Antenna (1-10GHz)	Schwarzeck	BBHA 9120 B	5215	12	10-Mar-2021
Thermo-Hygro-Barometer	PCE Instruments	PCE-THB-40	5475	12	17-Mar-2021
Attenuator 5W 10dB DC-18GHz	Aaren	AT40A-4041-D18-10	5494	12	14-Apr-2021
2m SMA Cable	Junkosha	MWX221-02000AMSAMS/A	5518	12	01-Apr-2021
8m N Type Cable	Junkosha	MWX221-08000NMSNMS/B	5522	12	24-Mar-2021

Table 641

TU - Traceability Unscheduled



2.6 Spurious Radiated Emissions

2.6.1 Specification Reference

FCC 47 CFR Part 15E, Clause 15.407 (b) and 15.205
ISED RSS-247, Clause 6.2
ISED RSS-GEN Clause 6.13

2.6.2 Equipment Under Test and Modification State

A2337, S/N: C02D200EQ9MQ - Modification State 0

2.6.3 Date of Test

29-August-2020 to 08-September-2020

2.6.4 Test Method

Testing was performed in accordance with ANSI C63.10, clause 6.3, 6.5, 6.6 and 12.7.

Tests were performed in HT20 CDD in 2TX MIMO mode on the Main Radio, with measurements undertaken from 30 MHz to 40 GHz, on channel 36 (5180 MHz) and channel 165 (5825 MHz).

For the purpose of this testing, spurious emissions were limited to 1 GHz to 40 GHz on all other test channels.

All testing was performed using the lowest data rate/modulation scheme for 802.11a, and MCS7 for 802.11n, ac and ax, since this was declared worst case by the customer.

Plots for average measurements were taken in accordance with ANSI C63.10, clause 12.7.7.2 with max-hold trace to characterize the EUT. Where emissions were detected, final average measurements were taken in accordance with ANSI C63.10, clauses 12.7.7.2

Where duty cycle corrections were required for average measurements on emissions temporally related to the fundamental, these are included in the result tables but are not shown on the plots.

Note the edges of the fundamental may be visible and in some cases appear to exceed the limit in these pre-scans. These band edge emissions were not measured in this section and are investigated fully in sections 2.4 and 2.5.

The plots shown are the characterization of the EUT. The limits on the plots represent the most stringent case for restricted bands, (54/74 dBuV/m @ 3 m and 64/84 dBuV/m @ 1m) when compared to -27 dBm/MHz EIRP outside restricted bands. The limits shown have been used as a threshold to determine where further measurements are necessary. Where results are within 10dB of the limits shown on the plots, further investigation was carried out and reported in results tables.

The following conversion can be applied to convert from dBuV/m to $\mu\text{V/m}$:
 $10^{(\text{Field Strength in dBuV/m}/20)}$

EIRP was converted to field strength at 3m using the following formula:
 $\text{Field Strength (dBuV/m at 3 m)} = \text{EIRP (dBm)} + 95.2 \text{ dB}$



2.6.7 Test Results

5 GHz WLAN

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
33.002	30.0	40.0	-10.0	Q-Peak	83	100	Vertical
33.396	19.1	40.0	-20.9	Q-Peak	321	138	Horizontal
65.562	33.6	40.0	-6.4	Q-Peak	282	106	Vertical
115.459	25.3	43.5	-18.2	Q-Peak	0	264	Horizontal
118.421	26.6	43.5	-16.9	Q-Peak	0	101	Vertical
281.267	32.3	46.0	-13.7	Q-Peak	214	113	Horizontal
282.393	23.8	46.0	-22.2	Q-Peak	309	165	Vertical
325.242	27.8	46.0	-18.2	Q-Peak	151	100	Vertical
328.517	31.4	46.0	-14.6	Q-Peak	199	116	Horizontal
10359.232	52.1	74.0	-21.9	Peak	71	140	Vertical

Table 642 - U-NII-1 - 5180 MHz (CH36), HT20, CDD, Core 0 + Core 1, 30 MHz to 40 GHz

No other emissions found within 6 dB of the limit.

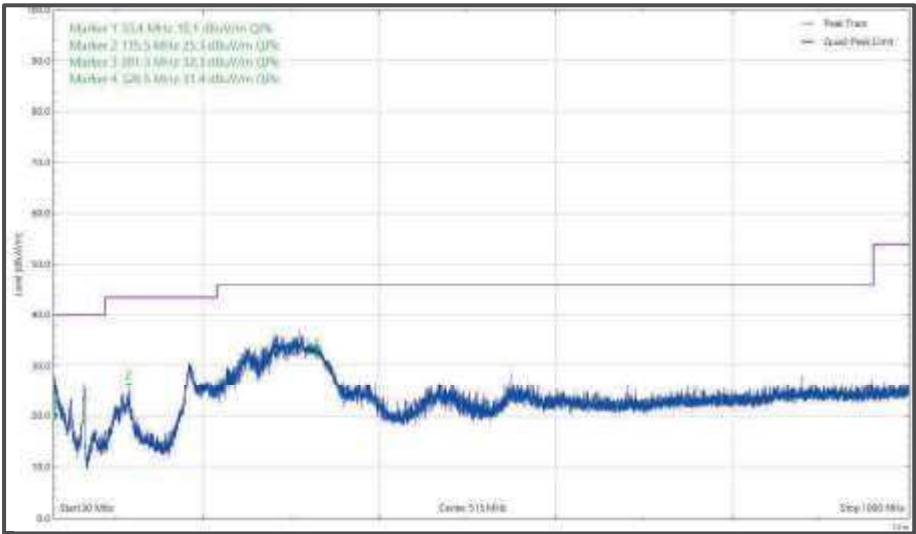


Figure 1071 - U-NII-1 - 5180 MHz (CH36), HT20, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

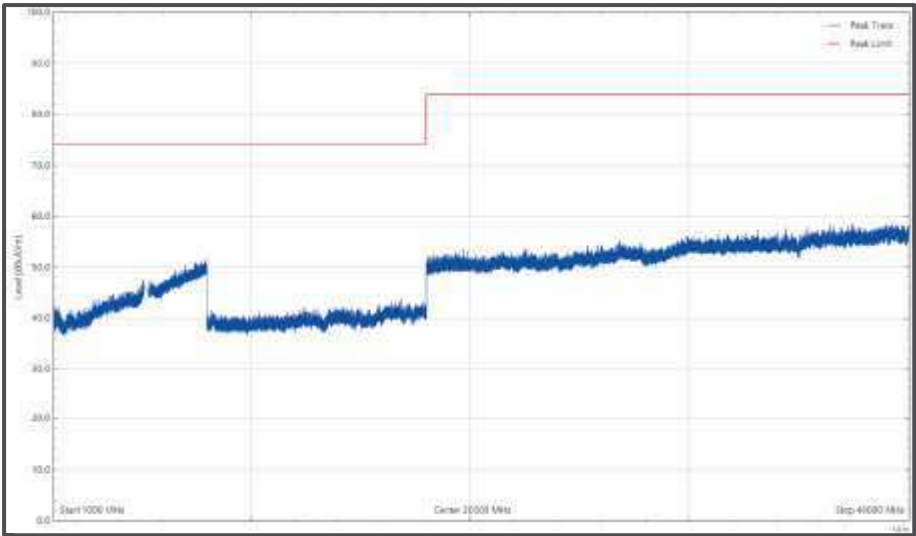


Figure 1072 - U-NII-1 - 5180 MHz (CH36), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal (Peak)

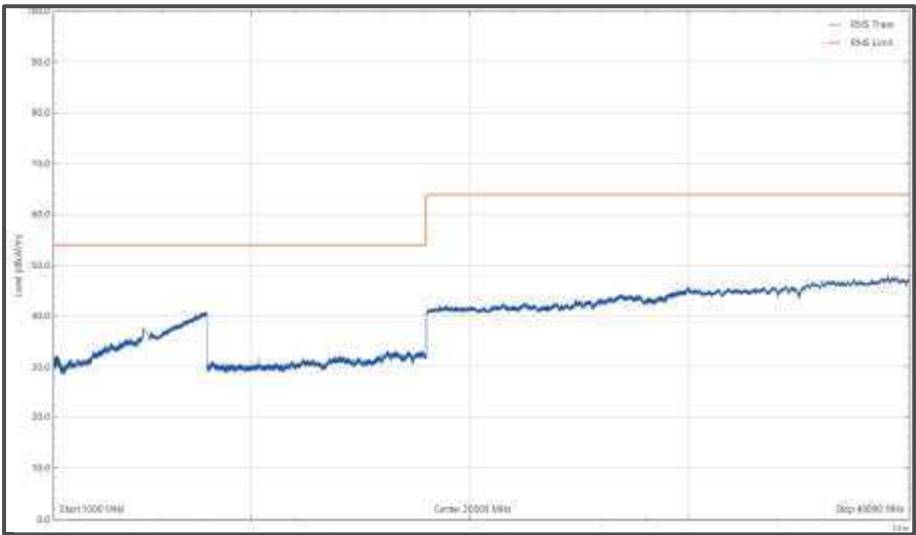


Figure 1073 - U-NII-1 - 5180 MHz (CH36), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal (RMS)

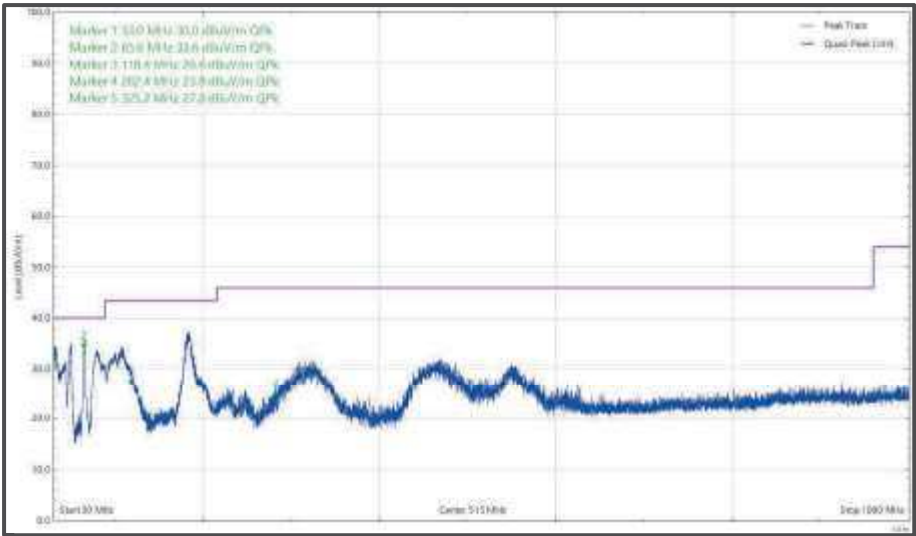


Figure 1074 - U-NII-1 - 5180 MHz (CH36), HT20, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

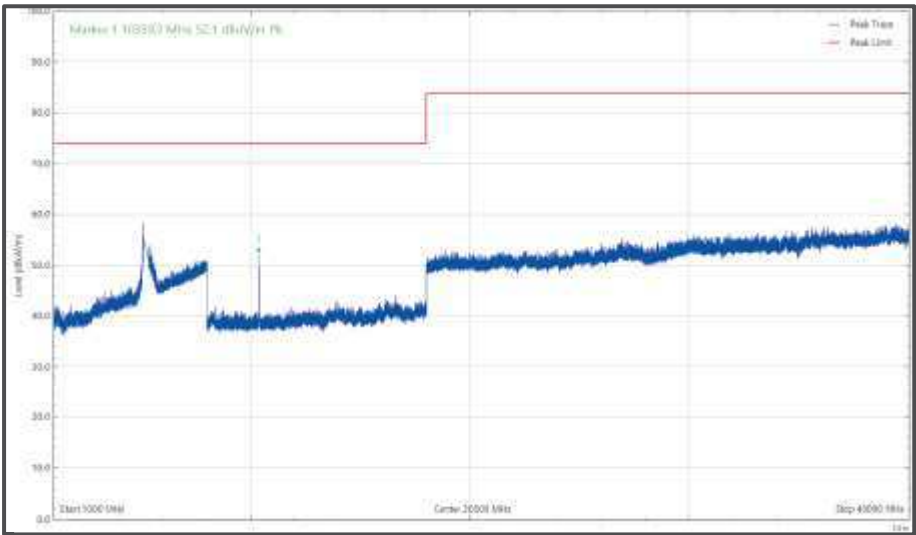


Figure 1075 - U-NII-1 - 5180 MHz (CH36), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical (Peak)

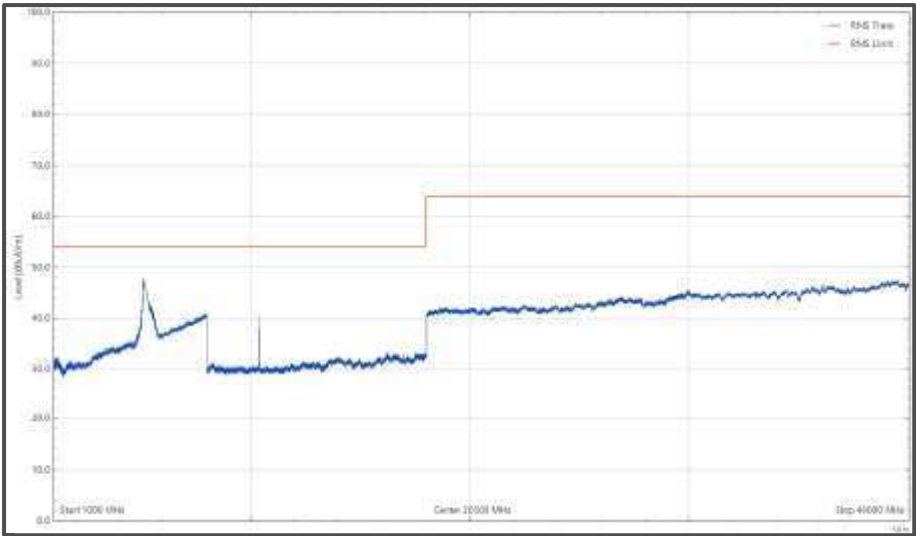


Figure 1076 - U-NII-1 - 5180 MHz (CH36), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical (RMS)



Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
10639.829	40.0	54.0	-14.0	RMS	81	399	Horizontal
10639.854	41.1	54.0	-13.2	RMS	56	243	Vertical

Table 643 - U-NII-2A - 5320 MHz (CH64), HT 20, CDD, Core 0 + Core 1, 1 to 40 GHz

No other emissions found within 6 dB of the limit.

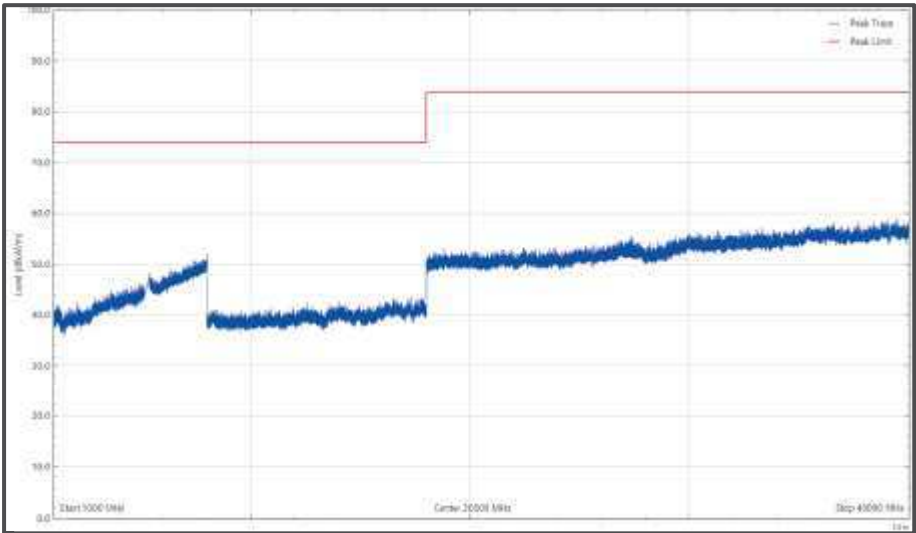


Figure 1077 - U-NII-2A - 5320 MHz (CH64), HT 20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal (Peak)

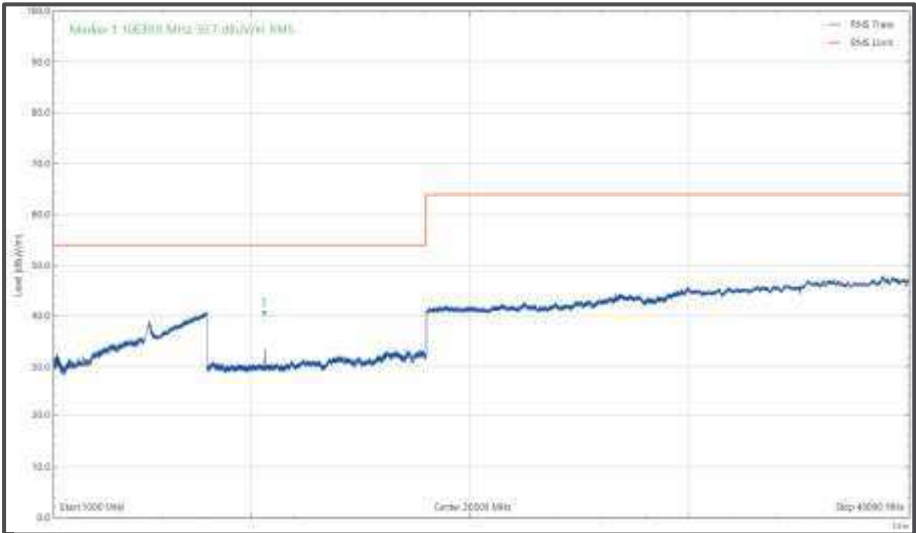


Figure 1078 - U-NII-2A - 5320 MHz (CH64), HT 20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal (RMS)

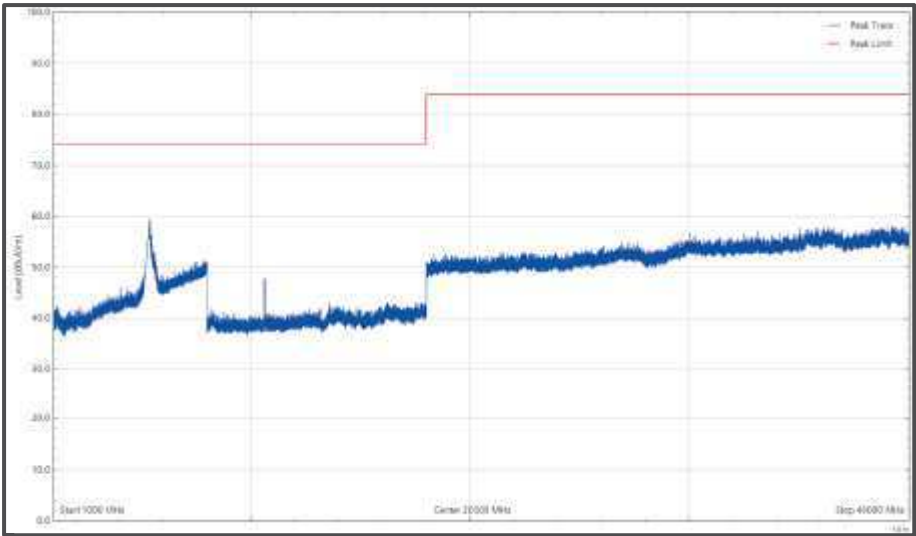


Figure 1079 - U-NII-2A - 53 20 MHz (CH64), HT 20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical (Peak)

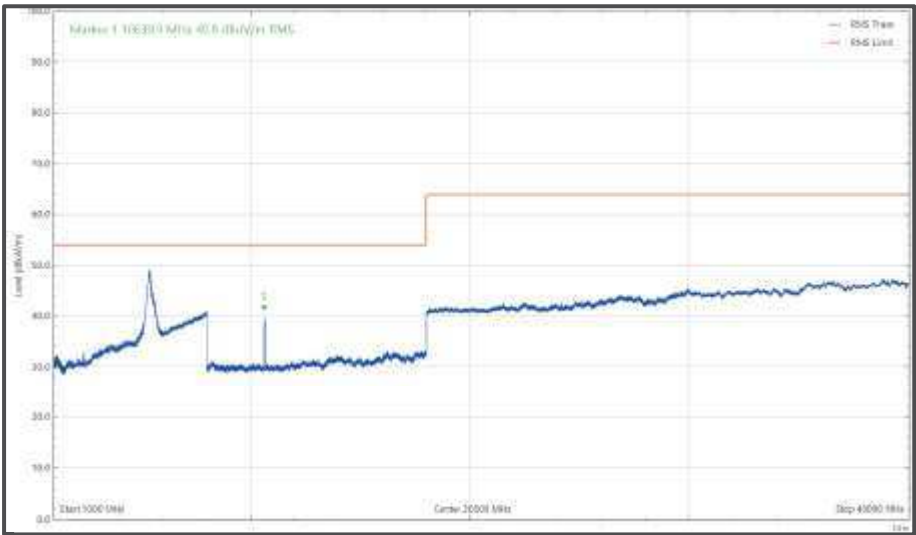


Figure 1080 - U-NII-2A - 53 20 MHz (CH64), HT 20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical (RMS)



Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
11000.095	41.2	54.0	-12.8	RMS	348	225	Vertical

Table 644 - U-NII-2C - 5500 MHz (CH100), HT20, CDD, Core 0 + Core 1, 1 to 40 GHz

No other emissions found within 6 dB of the limit.

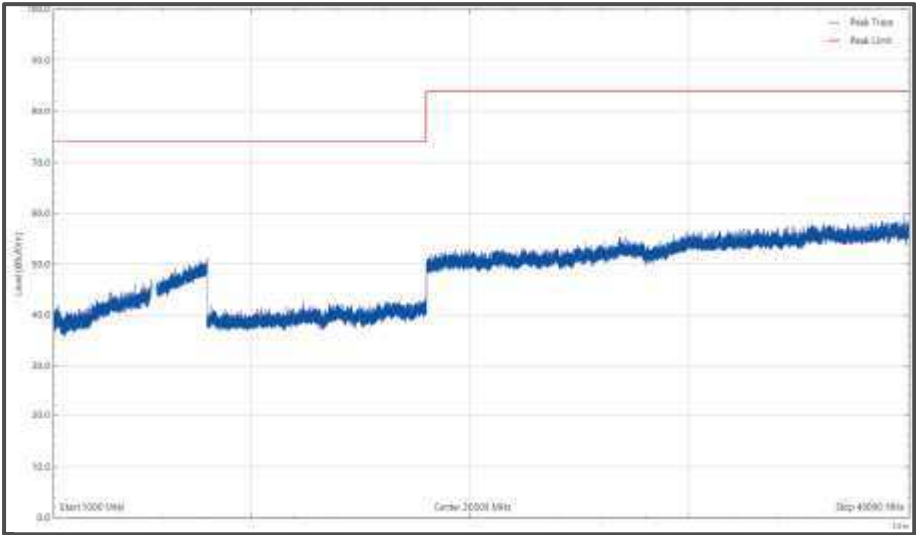


Figure 1081 - U-NII-2C - 5500 MHz (CH100), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal (Peak)

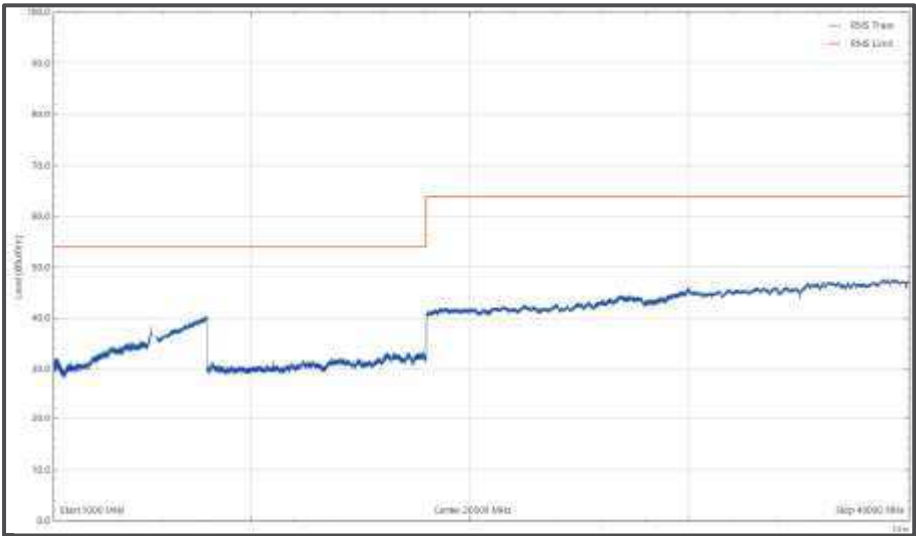


Figure 1082 - U-NII-2C - 5500 MHz (CH100), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal (RMS)

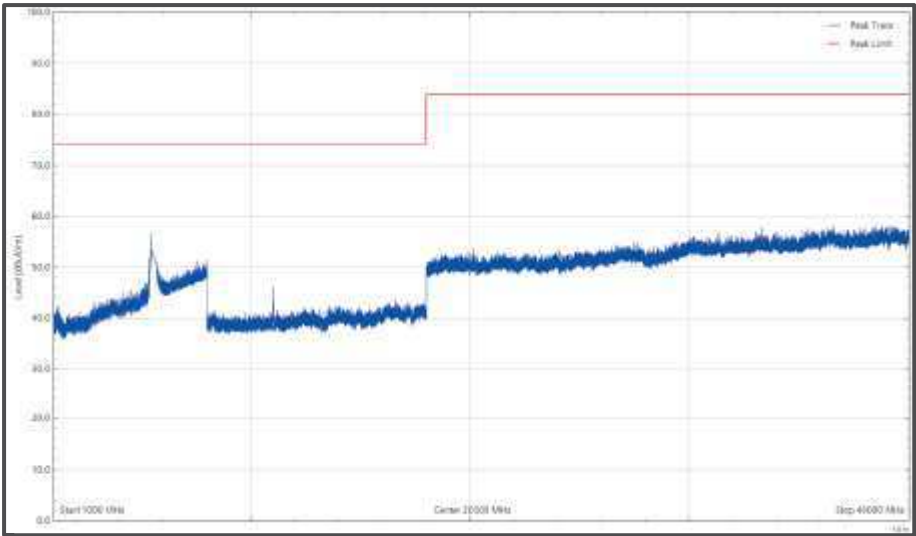


Figure 1083 - U-NII-2C - 5500 MHz (CH100), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical (Peak)

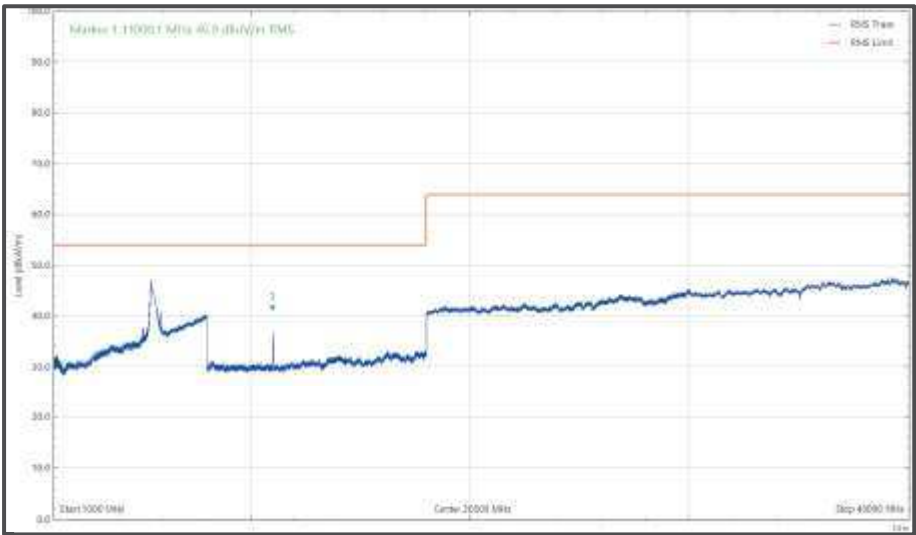


Figure 1084 - U-NII-2C - 5500 MHz (CH100), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical (RMS)



Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
11394.600	42.9	54.0	-11.1	RMS	352	245	Vertical
11394.645	33.5	54.0	-20.5	RMS	46	103	Horizontal

Table 645 - U-NII-2C - 5700 MHz (CH140), HT20, CDD, Core 0 + Core 1, 1 to 40 GHz

No other emissions found within 6 dB of the limit.

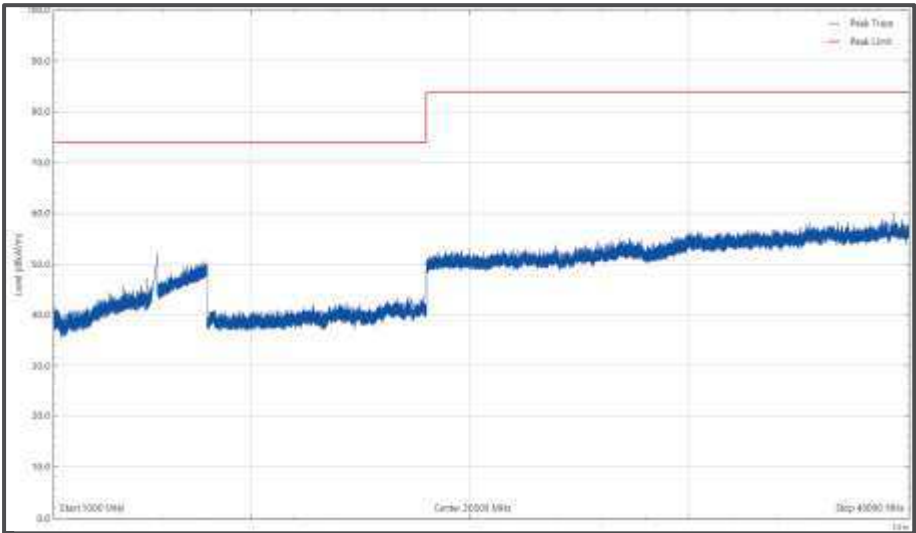


Figure 1085 - U-NII-2C - 5700 MHz (CH140), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal (Peak)

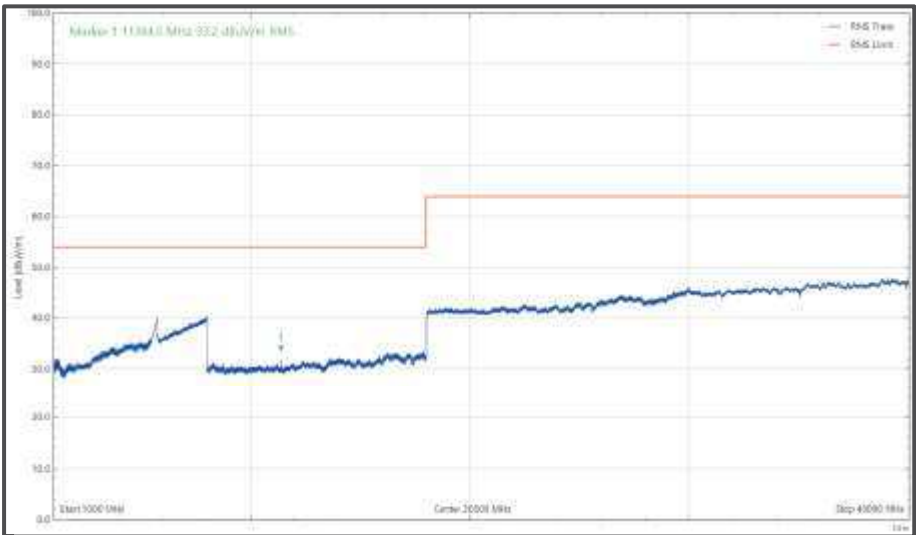


Figure 1086 - U-NII-2C - 5700 MHz (CH140), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal (RMS)

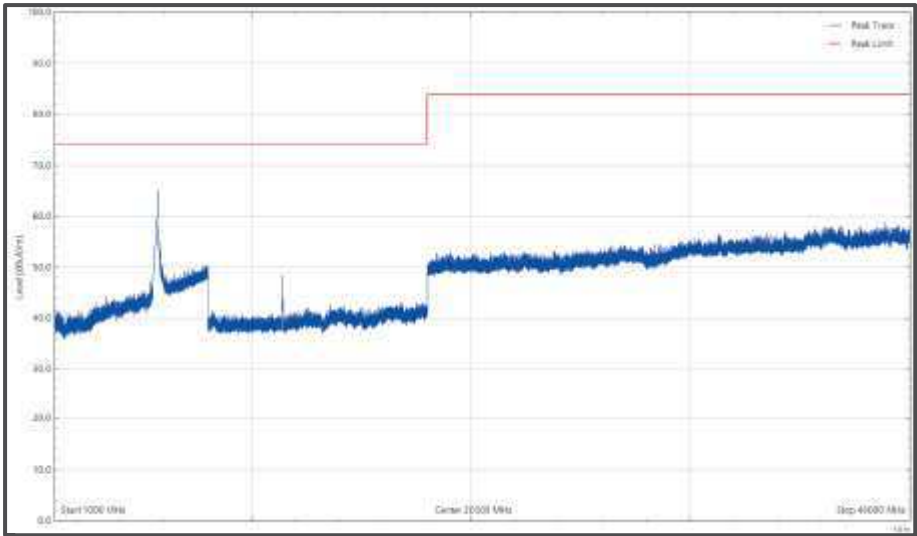


Figure 1087 - U-NII-2C - 5700 MHz (CH140), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical (Peak)

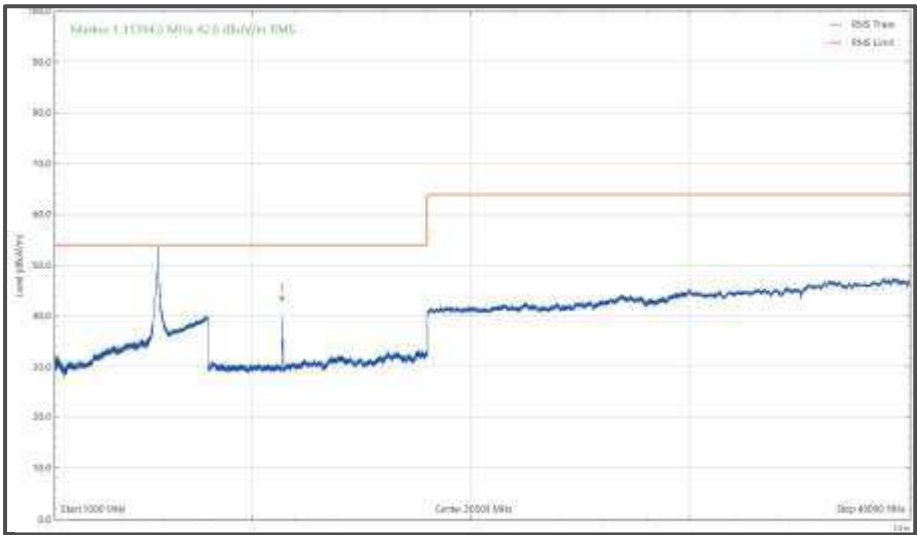


Figure 1088 - U-NII-2C - 5700 MHz (CH140), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical (RMS)



Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
11489.654	40.1	54.0	-13.9	RMS	353	248	Vertical

Table 646 - U-NII-3 - 5745 MHz (CH149), HT20, CDD, Core 0 + Core 1, 1 to 40 GHz

No other emissions found within 6 dB of the limit.

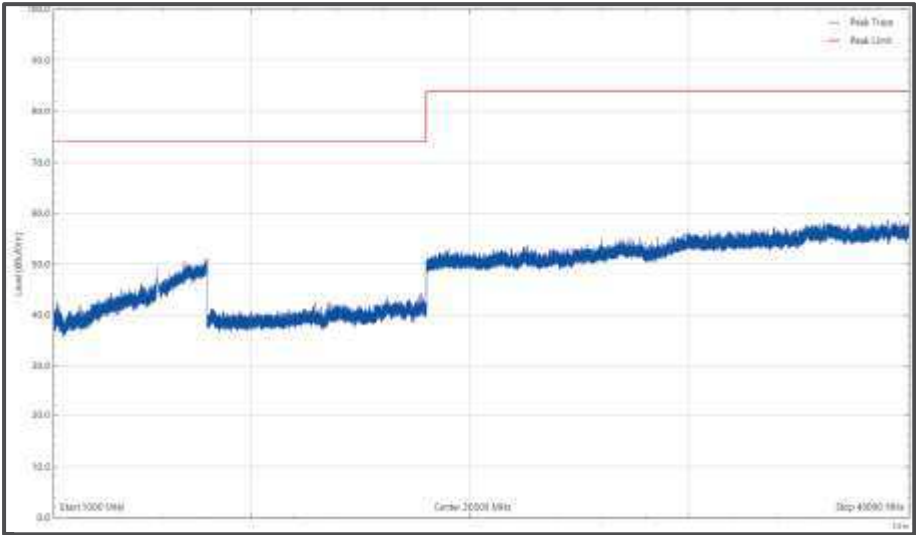


Figure 1089 - U-NII-3 - 5745 MHz (CH149), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal (Peak)

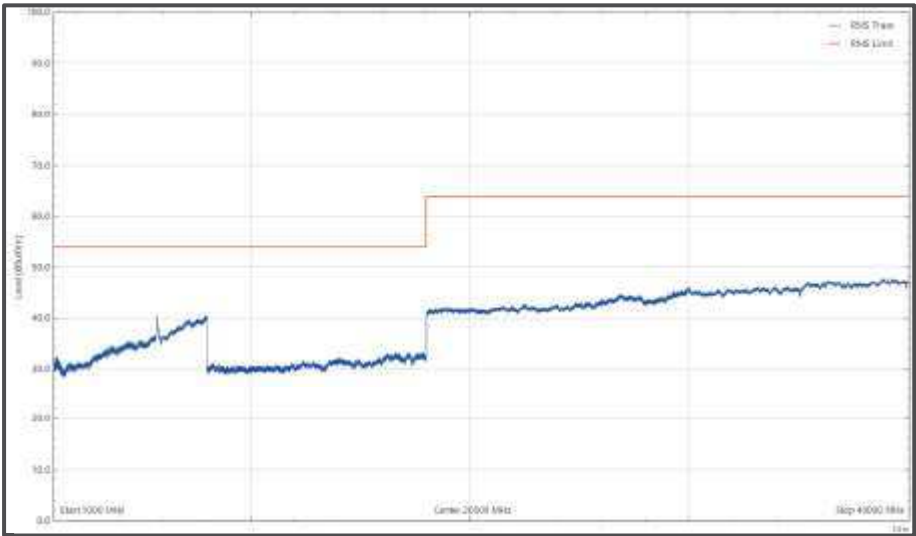


Figure 1090 - U-NII-3 - 5745 MHz (CH149), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal (RMS)

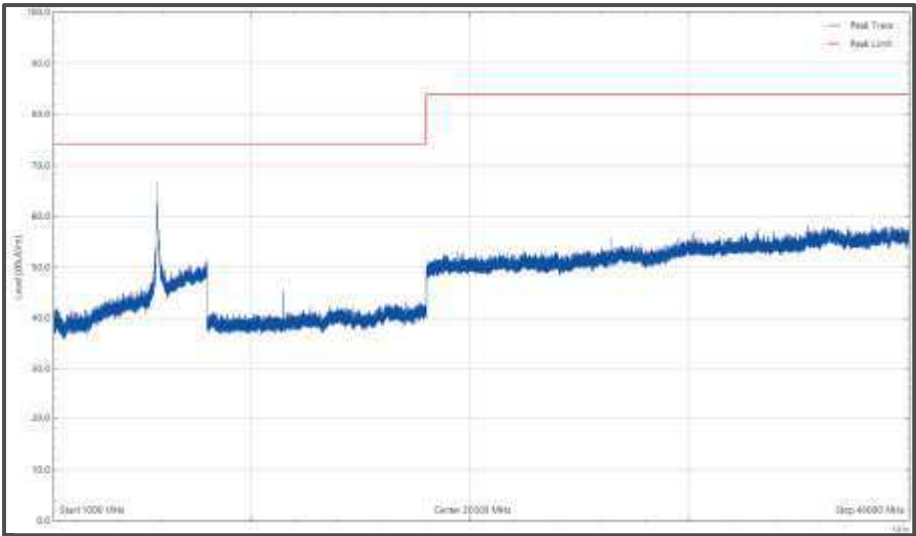


Figure 1091 - U-NII-3 - 5745 MHz (CH149), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical (Peak)

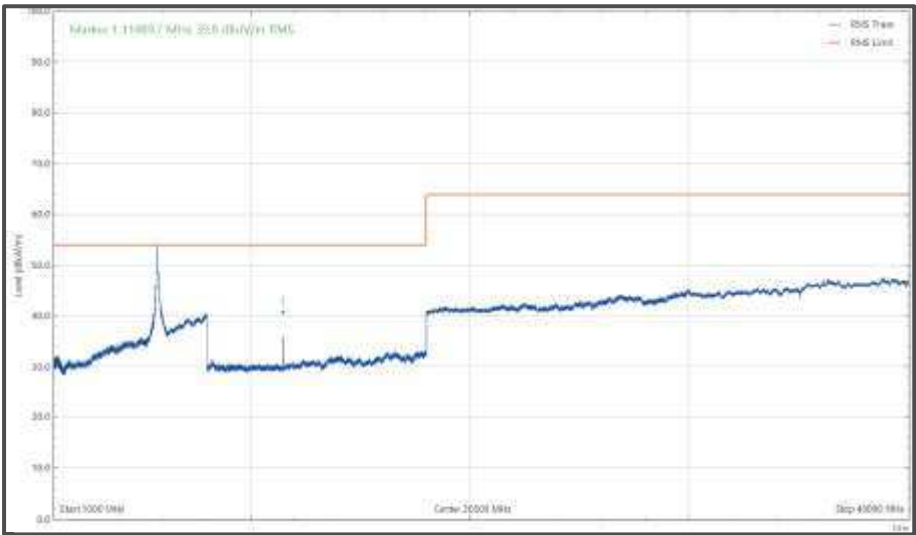


Figure 1092 - U-NII-3 - 5745 MHz (CH149), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical (RMS)

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
49.961	32.4	40.0	-7.6	Q-Peak	284	100	Vertical
67.904	32.9	40.0	-7.1	Q-Peak	279	100	Vertical
187.935	33.6	43.5	-9.9	Q-Peak	71	100	Vertical
189.322	31.3	43.5	-12.2	Q-Peak	308	184	Horizontal
286.117	34.6	46.0	-11.4	Q-Peak	208	113	Horizontal
298.121	31.9	46.0	-14.1	Q-Peak	312	101	Vertical
11649.700	41.9	54.0	-12.1	RMS	17	237	Vertical

Table 647 - U-NII-3 - 5825 MHz (CH165), HT20, CDD, Core 0 + Core 1, 30 MHz to 40 GHz

No other emissions found within 6 dB of the limit.

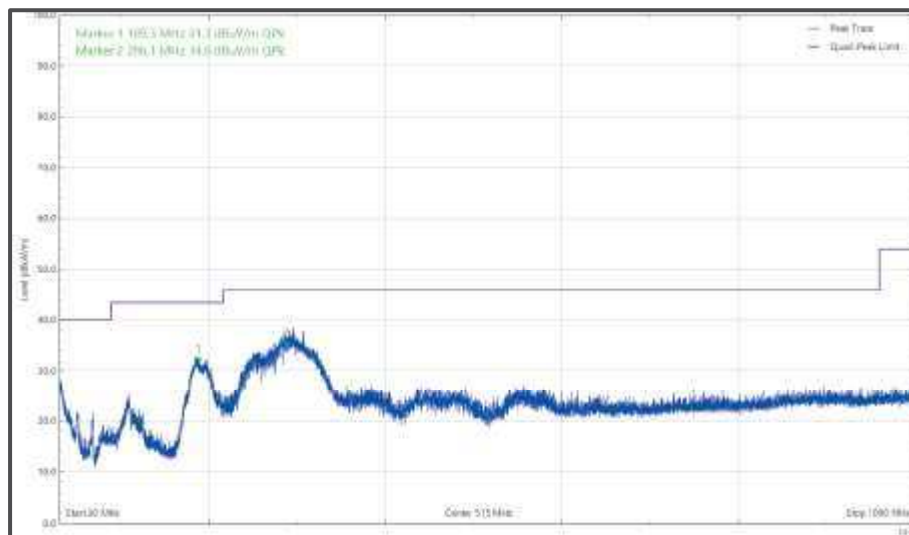


Figure 1093 - U-NII-3 - 5825 MHz (CH165), HT20, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

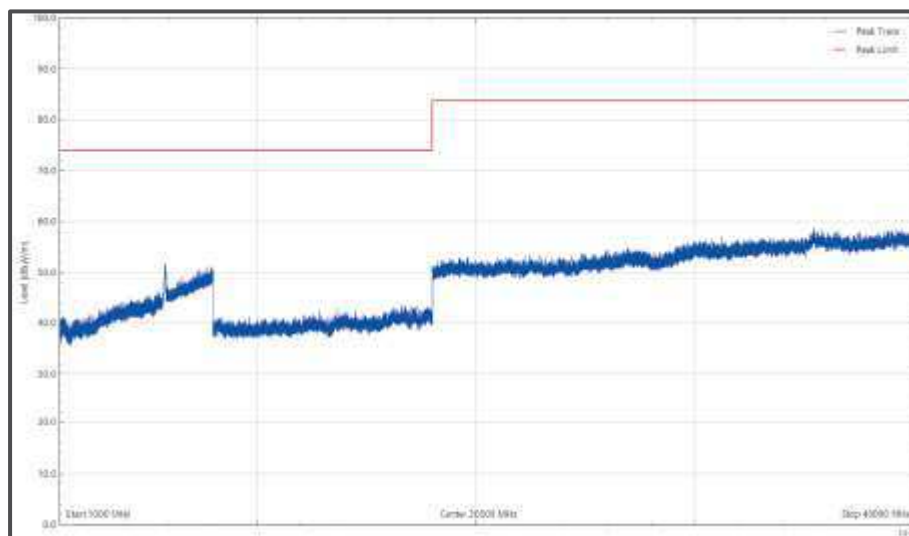


Figure 1094 - U-NII-3 - 5825 MHz (CH165), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal (Peak)

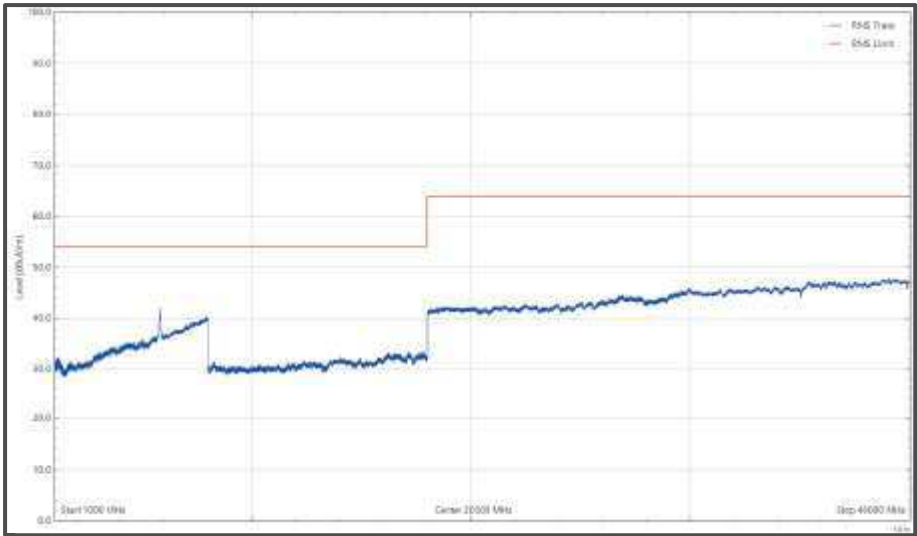


Figure 1095 - U-NII-3 - 5825 MHz (CH165), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal (RMS)

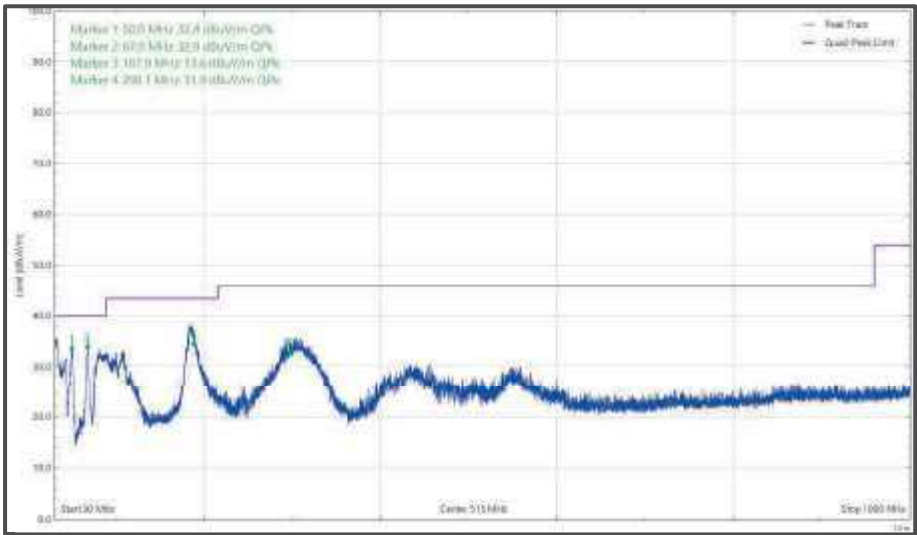


Figure 1096 - U-NII-3 - 5825 MHz (CH165), HT20, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

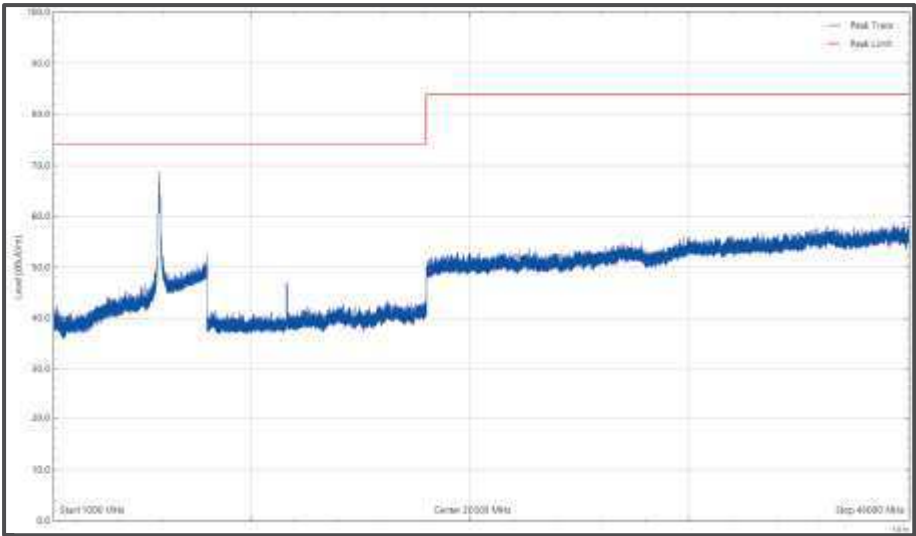


Figure 1097 - U-NII-3 - 5825 MHz (CH165), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical (Peak)

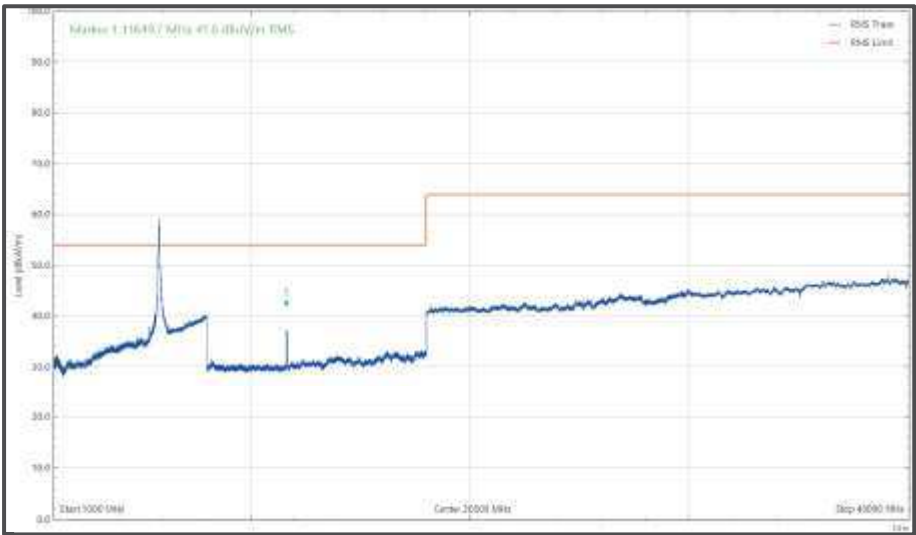


Figure 1098 - U-NII-3 - 5825 MHz (CH165), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical (RMS)



Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
31.680	32.0	40.0	-8.0	Q-Peak	7	107	Vertical
69.212	33.0	40.0	-7.0	Q-Peak	321	107	Vertical
186.950	32.3	43.5	-11.3	Q-Peak	47	102	Vertical
190.237	30.1	43.5	-13.4	Q-Peak	278	104	Horizontal
289.393	34.8	46.0	-11.3	Q-Peak	206	114	Horizontal
306.521	32.4	46.0	-13.6	Q-Peak	269	100	Vertical
10342.139	58.7	74.0	-15.3	Peak	72	120	Vertical

Table 648 - 5180 MHz (CH36), HE20, RU26-0, Core 0 + Core 1, 30 MHz to 40 GHz

No other emissions found within 6 dB of the limit.

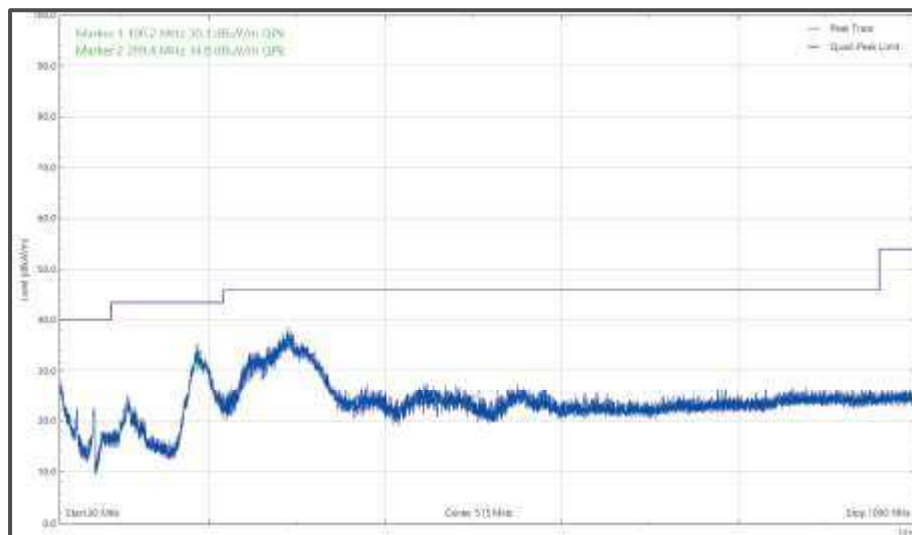


Figure 1099 - 5180 MHz (CH36), HE20, RU26-0, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

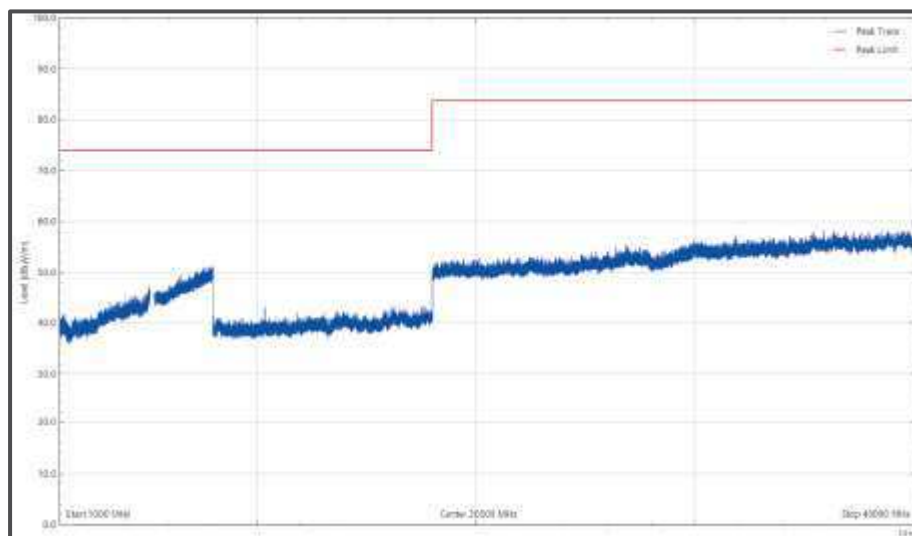


Figure 1100 - 5180 MHz (CH36), HE20, RU26-0, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal (Peak)

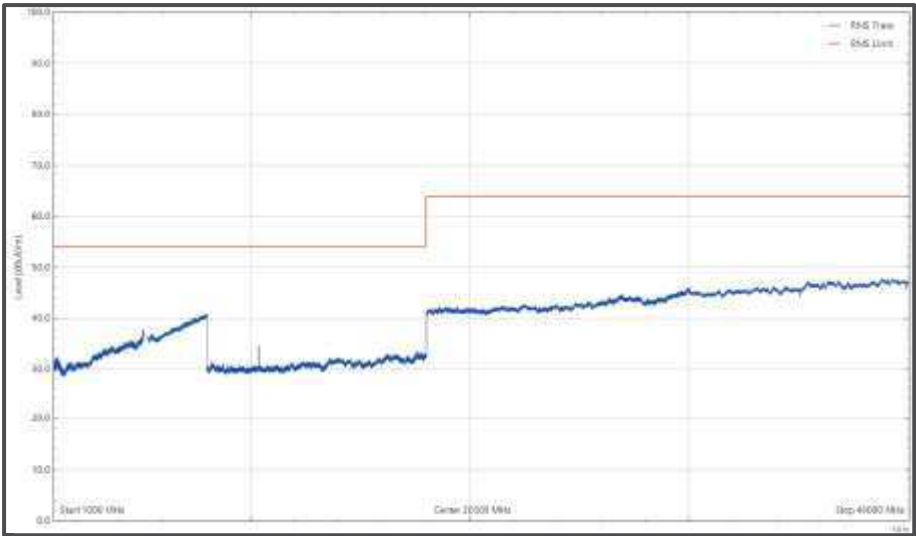


Figure 1101 - 51 80 MHz (CH36), HE20, RU26-0, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal (RMS)

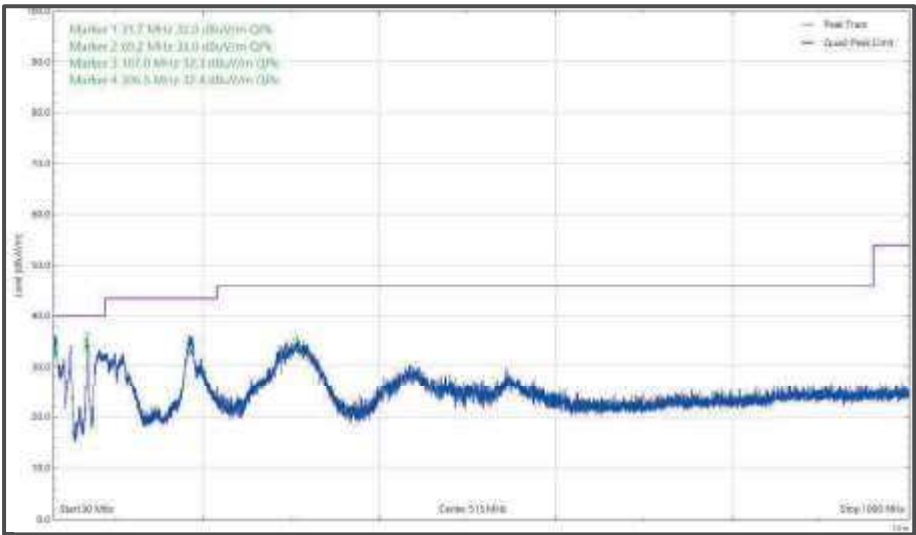


Figure 1102 - 51 80 MHz (CH36), HE20, RU26-0, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

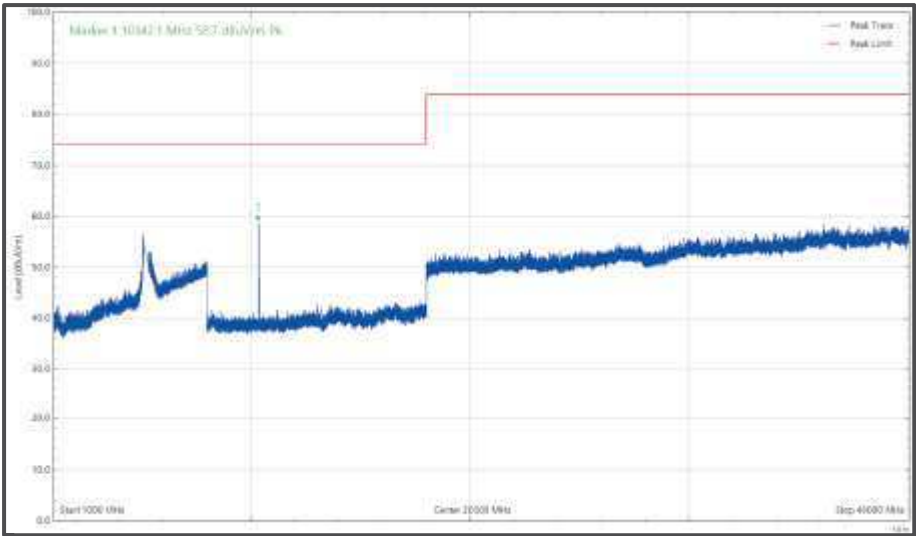


Figure 1103 - 51 80 MHz (CH36), HE20, RU26-0, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical (Peak)

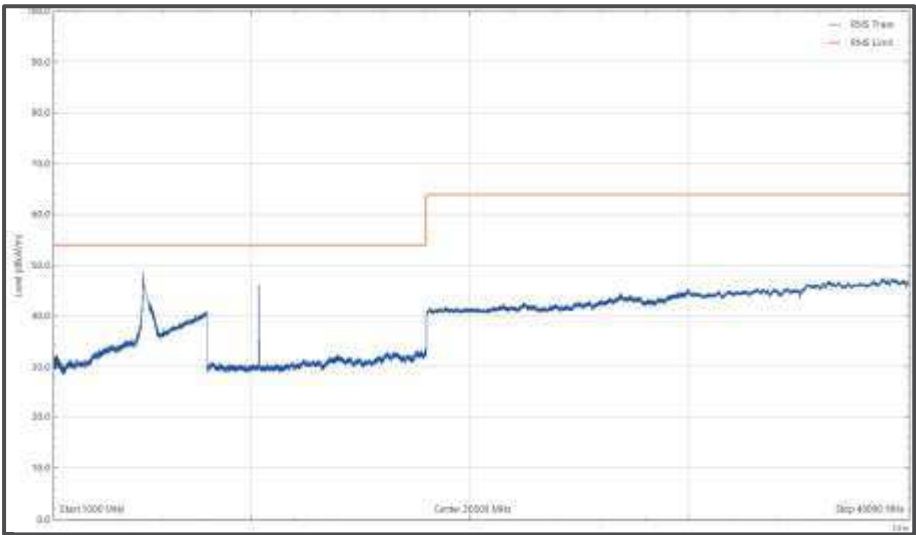


Figure 1104 - 51 80 MHz (CH36), HE20, RU26-0, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical (RMS)



Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
11472.514	40.6	54.0	-13.4	RMS	16	236	Vertical
11472.572	53.9	74.0	-20.1	Peak	352	258	Vertical

Table 649 - 5745 MHz (CH149), HE20, RU26-0, Core 0 + Core 1, 1 GHz to 40 GHz

No other emissions found within 6 dB of the limit.

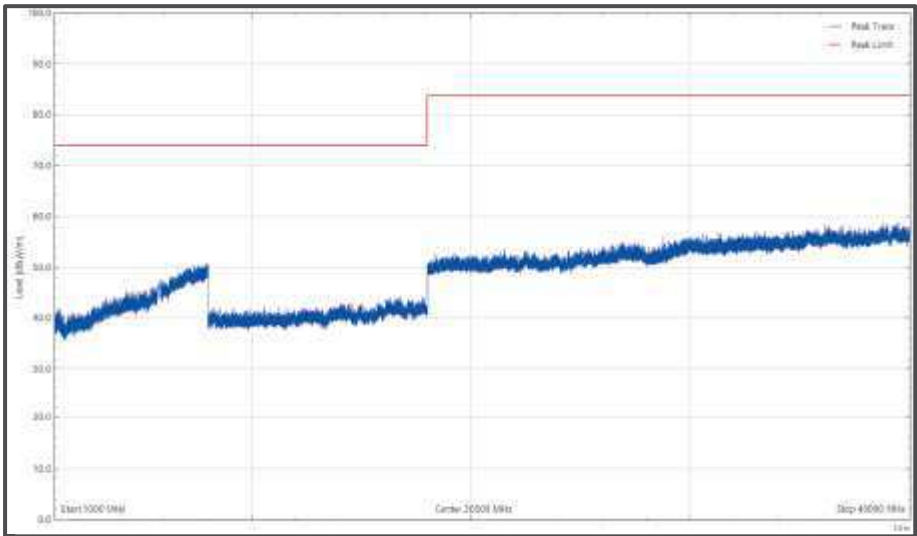


Figure 1105 - 5745 MHz (CH149), HE20, RU26-0, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal (Peak)

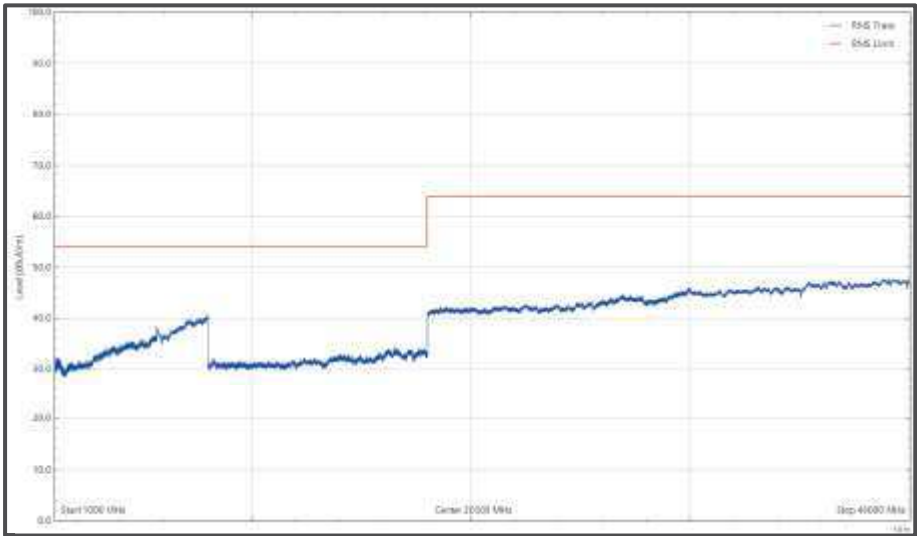


Figure 1106 - 5745 MHz (CH149), HE20, RU26-0, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal (RMS)

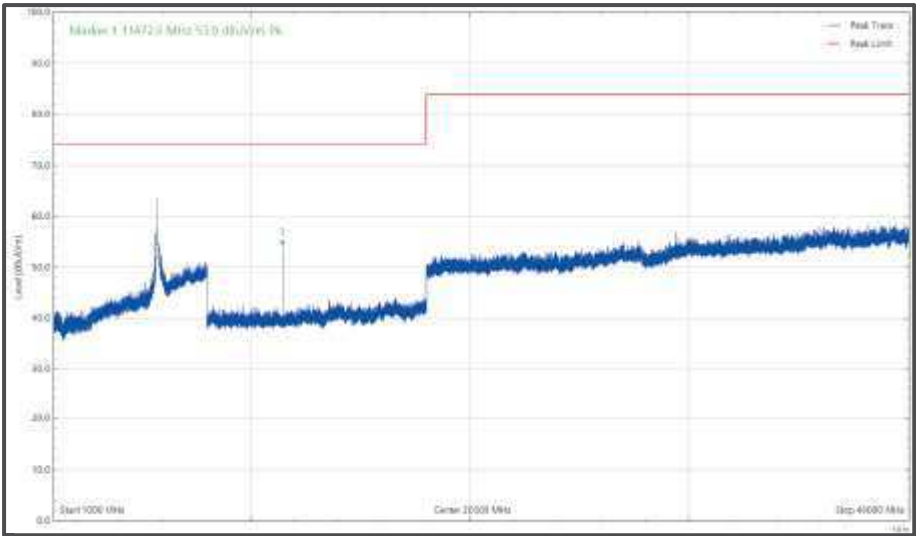


Figure 1107 - 5745 MHz (CH149), HE20, RU26-0, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical (Peak)

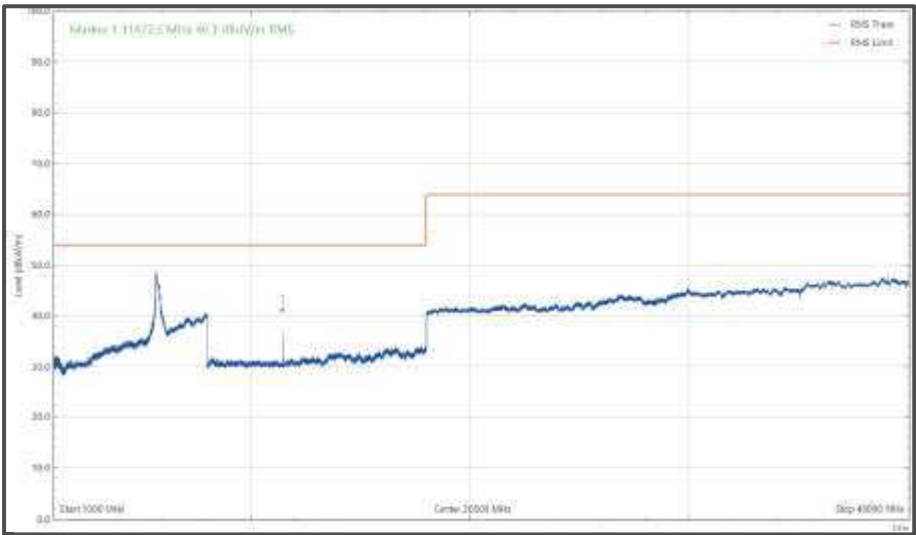


Figure 1108 - 5745 MHz (CH149), HE20, RU26-0, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical (RMS)



Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
31.930	32.1	40.0	-7.9	Q-Peak	51	107	Vertical
66.715	32.6	40.0	-7.4	Q-Peak	287	102	Vertical
107.254	30.2	43.5	-13.3	Q-Peak	281	102	Vertical
192.361	29.9	43.5	-13.6	Q-Peak	266	150	Horizontal
289.117	33.1	46.0	-12.9	Q-Peak	203	107	Horizontal
305.536	32.9	46.0	-13.1	Q-Peak	181	104	Vertical
11632.568	54.5	74.0	-19.5	Peak	17	244	Vertical
11632.594	40.3	54.0	-13.7	RMS	7	247	Vertical

Table 650 - 5825 MHz (CH165), HE20 , RU26-0, Core 0 + Core 1, 30 MHz to 18 GHz

No other emissions found within 6 dB of the limit.

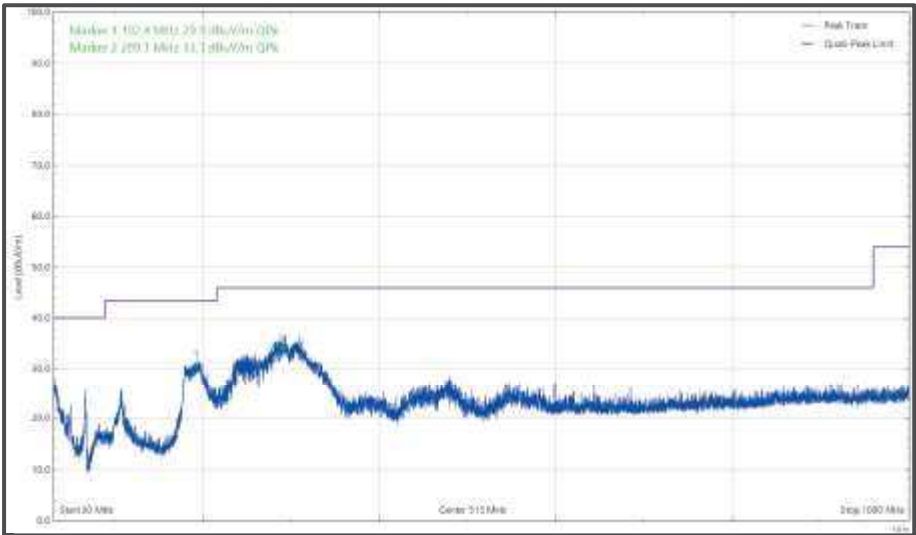


Figure 1109 - 5825 MHz (CH165), HE20 , RU26-0, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

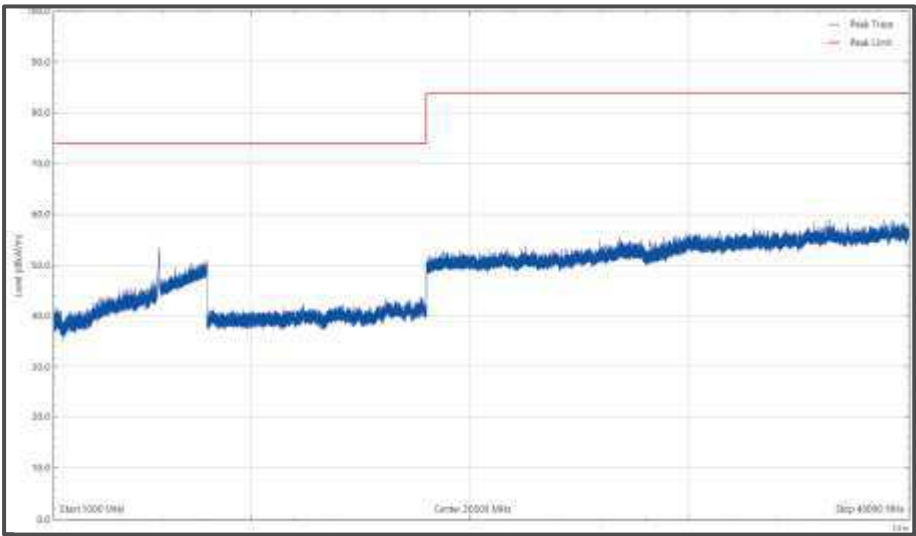


Figure 1110 - 5825 MHz (CH165), HE20 , RU26-0, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal (Peak)

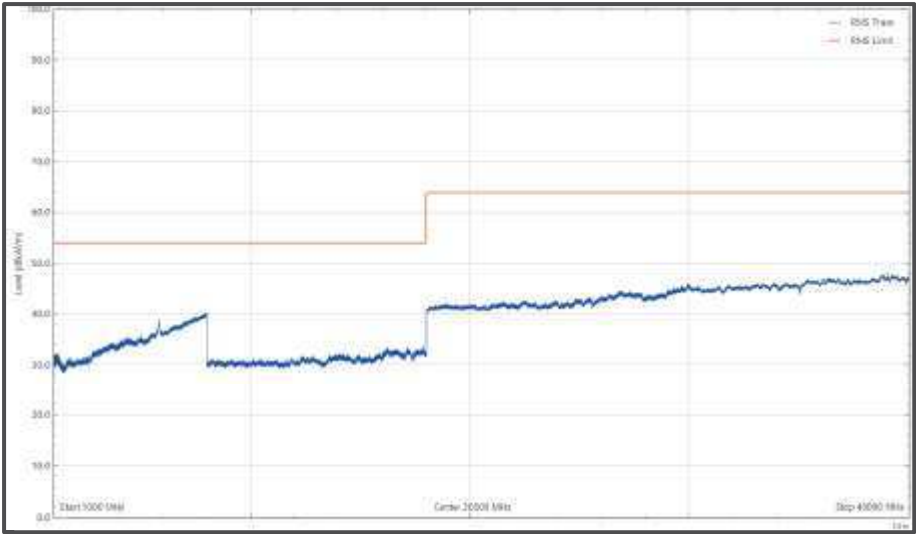


Figure 1111 - 5825 MHz (CH1 65), HE20, RU26-0, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal (RMS)

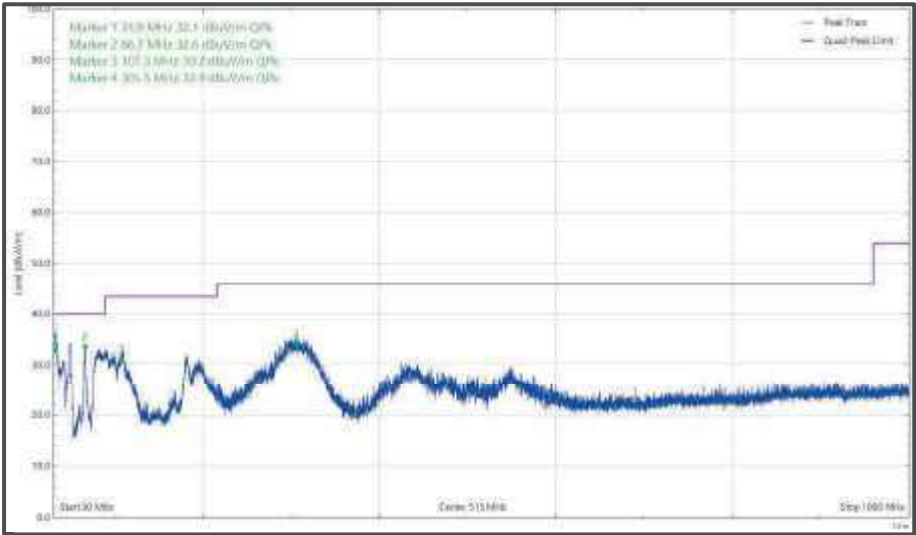


Figure 1112 - 5825 MHz (CH1 65), HE20, RU26-0, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

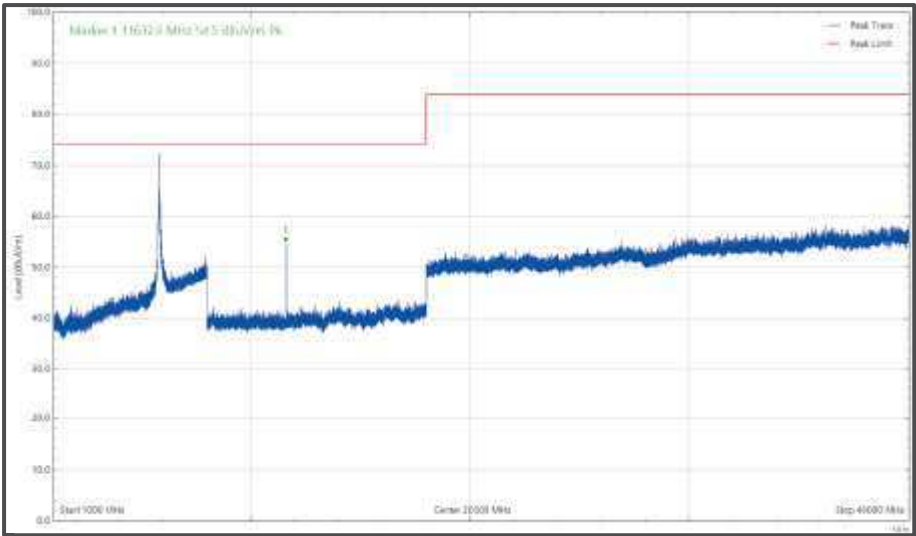


Figure 1113 - 58 25 MHz (CH1 65), HE20 , RU26-0, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical (Peak)

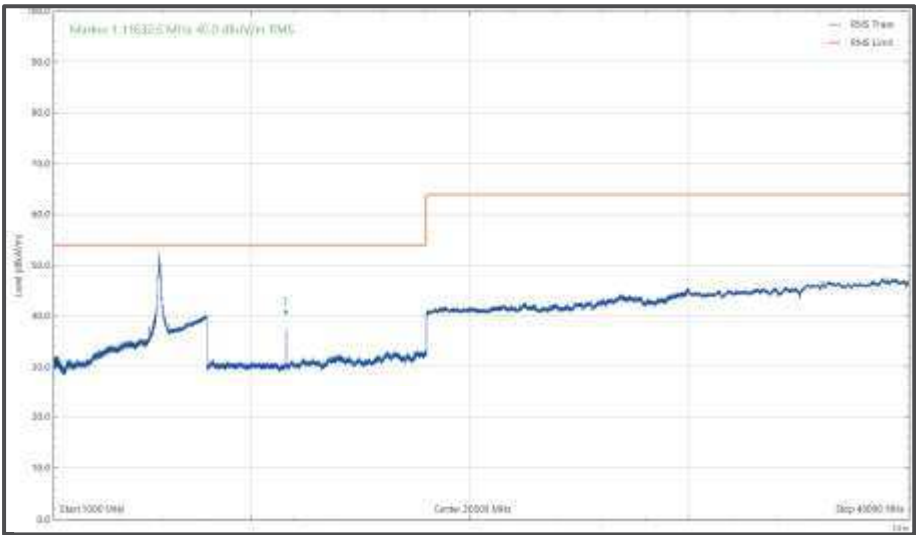


Figure 1114 - 58 25 MHz (CH1 65), HE20 , RU26-0, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical (RMS)



FCC 47 CFR Part 15, Limit Clause 15.407(b)(1)(2)(3)(4)

Emissions not falling within the restricted bands listed in FCC 47 CFR Part 15.209:

For transmitters operating in the 5.15-5.25 GHz band: ≤ -27 dBm/MHz outside 5150-5350 MHz.

For transmitters operating in the 5.25-5.35 GHz band: ≤ -27 dBm/MHz outside 5150-5350 MHz.

For transmitters operating in the 5.47-5.725 GHz band: ≤ -27 dBm/MHz outside 5470-5725 MHz

For transmitters operating in the 5.725-5.85 GHz band: All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

Emissions within the restricted bands listed in FCC 47 CFR Part 15.209:

Frequency (MHz)	Field Strength ($\mu\text{V/m}$)	Measurement Distance (m)
0.009 to 0.490	2400/F(kHz)	300
0.490 to 1.705	24000/F(kHz)	30
1.705 to 30	30	30
30 to 88	100	3
88 to 216	150	3
216 to 960	200	3
Above 960	500	3

Table 651 - Radiated Emissions Limit Table (FCC)



ISED RSS-247, Limit Clause 6.2.1.2, 6.2.2.2, 6.2.3.2 and 6.2.4.2 and ISED RSS-GEN, Limit Clause 8.9

Emissions not falling within the restricted bands listed in Industry Canada RSS-GEN, Clause 8.10:

For transmitters with operating frequencies in the band 5150-5250 MHz, all emissions outside the band 5150-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p. Any unwanted emissions that fall into the band 5250-5350 MHz shall be attenuated below the channel power by at least 26 dB.

For transmitters with operating frequencies in the bands 5250-5350 MHz and 5470-5725 MHz, all emissions outside the band 5250-5350 MHz and 5470-5725 MHz shall not exceed -27 dBm/MHz e.i.r.p.

Devices operating in the band 5725-5850 MHz shall have e.i.r.p. of unwanted emissions comply with the following:

- a) 27 dBm/MHz at frequencies from the band edges decreasing linearly to 15.6 dBm/MHz at 5 MHz above or below the band edges;
- b) 15.6 dBm/MHz at 5 MHz above or below the band edges decreasing linearly to 10 dBm/MHz at 25 MHz above or below the band edges;
- c) 10 dBm/MHz at 25 MHz above or below the band edges decreasing linearly to -27 dBm/MHz at 75 MHz above or below the band edges; and
- d) -27 dBm/MHz at frequencies more than 75 MHz above or below the band edges.

Emissions not falling within the restricted bands listed in Industry Canada RSS-GEN, Clause 8.10:

Frequency (MHz)	Field Strength ($\mu\text{V/m}$)
0.009 to 0.490	2400/F(kHz)
0.490 to 1.705	24000/F(kHz)
1.705 to 30	30
30 to 88	100
88 to 216	150
216 to 960	200
Above 960	500

Table 652 - Radiated Emissions Limit Table (ISED)



2.6.8 Test Location and Test Equipment Used

This test was carried out in RF Chamber 11.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
Screened Room (11)	Rainford	Rainford	5136	36	01-Nov-2021
Power Supply Unit	Farnell	LB30-4	158	12	O/P Mon
Antenna 18-40GHz (Double Ridge Guide)	Link Microtek Ltd	AM180HA-K-TU2	230	24	27-Jul-2022
Antenna with permanent attenuator (Bilog)	Schaffner	CBL6143	287	24	15-Jul-2020
Antenna 18-40GHz (Double Ridge Guide)	Q-Par Angus Ltd	QSH 180K	1511	24	02-Oct-2021
Multimeter	Iso-tech	IDM101	2419	12	28-Nov-2020
8 - 18 GHz pre-amp	Wright Technologies	PS06-0061/PS06-0060	4971	6	05-Nov-2020
Band Reject Filter - 2.425 GHz	Wainwright	WRCGV14-2390-2400-2450-2460-50SS	5066	12	01-Oct-2020
Band Reject Filter - 2.4585 GHz	Wainwright	WRCGV14-2423.5-2433.5-2483.5-2493.5-50SS	5068	12	01-Oct-2020
Band Reject Filter - 5.795 GHz	Wainwright	WRCJV10-5725-5755-5835-5865-50SS	5070	12	26-Sep-2020
Band Reject Filter - 5.22 GHz	Wainwright	WRCJV12-5120-5150-5290-5320-50SS	5072	12	24-Sep-2020
Band Reject Filter - 5.28 GHz	Wainwright	WRCJV12-5180-5210-5350-5380-50SS	5074	12	24-Sep-2020
Band Reject Filter - 5.775 GHz	Wainwright	WRCJV10-5700-5735-5815-5850-50SS	5076	12	01-Oct-2020
Band Reject Filter - 5.570 GHz	Wainwright	WRCJV10-5440-5490-5650-5700-50SS	5078	12	02-Oct-2020
Band Reject Filter - 5.690 GHz	Wainwright	WRCJV8-5635-5670-5710-5745-50SS	5080	12	25-Sep-2020
EMI Test Receiver	Rohde & Schwarz	ESW44	5084	12	28-Nov-2020
Cable (18 GHz)	Rosenberger	LU7-071-1000	5102	12	06-Oct-2020
Cable (18 GHz)	Rosenberger	LU7-071-1000	5103	12	06-Oct-2020
Cable (18 GHz)	Rosenberger	LU7-071-1000	5104	12	09-Dec-2020
Cable (18 GHz)	Rosenberger	LU7-071-1000	5105	12	06-Oct-2020
EmX Emissions Software	TUV SUD	EmX	5125	-	Software
Mast	Maturo	TAM 4.0-P	5158	-	TU
Mast and Turntable Controller	Maturo	Maturo NCD	5159	-	TU
Turntable	Maturo	TT 15WF	5160	-	TU



Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
Horn Antenna (1-10GHz)	Schwarbeck	BBHA 9120 B	5215	12	10-Mar-2021
DRG Horn Antenna (7.5-18GHz)	Schwarbeck	HWRD750	5216	12	10-Mar-2021
Horn Antenna (15-40GHz)	Schwarbeck	BBHA 9170	5217	12	12-Oct-2020
Preamplifier (30dB 18-40GHz)	Schwarbeck	BBV 9721	5218	12	12-Oct-2020
3 GHz High pass filter	Wainwright	WHKX12-2580-3000-18000-80SS	5220	12	25-Mar-2021
Pre Amp 1 -26.5 GHz	Agilent Technologies	8449B	5445	12	06-May-2021
Thermo-Hygro-Barometer	PCE Instruments	PCE-THB-40	5475	12	17-Mar-2021
Attenuator 5W 10dB DC-18GHz	Aaren	AT40A-4041-D18-10	5494	12	14-Apr-2021
1m K-Type Cable	Junkosha	MWX241-01000KMSKMS/A	5512	12	03-Apr-2021
2m SMA Cable	Junkosha	MWX221-02000AMSAMS/A	5518	12	01-Apr-2021
8m N Type Cable	Junkosha	MWX221-08000NMSNMS/B	5522	12	24-Mar-2021
2m K Type Cable	Junkosha	MWX241-02000KMSKMS/A	5524	12	03-Apr-2021
7 GHz High pass Filter	Wainwright	WHKX12-5850-6800-18000-80SS	5550	12	23-May-2021
1200 MHz Low Pass Filter (02)	Mini-Circuits	VLF-1200+	5560	12	23-May-2021
8 - 18 GHz Amplifier	Wright Technologies	APS06-0061	5595	12	25-Aug-2021

Table 653

TU - Traceability Unscheduled
O/P Mon – Output Monitored using calibrated equipment



2.7 Channel Move Time, Channel Closing Transmission Time and Non-Occupancy Period

2.7.1 Specification Reference

FCC 47 CFR Part 15E, Clause 15.407 (h)(2)(iii)(iv)
ISED RSS-247, Clause 6.3.2(c)(d)(e)

2.7.2 Equipment Under Test and Modification State

A2337, S/N: C02D100AQ9MQ - Modification State 0

2.7.3 Date of Test

16-September-2020 to 28-September-2020

2.7.4 Test Method

This test was performed in accordance with FCC KDB 905462 D02, clause 7.8.3.

A computer was connected via an Ethernet cable to the Master device and used iPerf to communicate to the Client device.

Radar Pulse Type 0 was then transmitted, and the spectrum monitored. The transmissions from the UUT were observed for a period of 12 seconds after the final injected Radar Pulse.

It was checked that all transmissions stopped within the 10 second period defined from the point of the end of the final Radar pulse + 10 seconds. In addition, the aggregate on time during the first 200ms and the following 9.8 seconds of the Channel Move Time was computed by the Aeroflex DFS Software.

The markers on the trace data correspond to the following time periods:

Red - End Of Radar Burst, (T0)
Purple - End Of 200ms Period, (T0 + 200 ms)
Orange - End Of Channel Move Time, (T0 + 10 seconds)

To verify the non-occupancy period, the PXI digitiser was replaced with a Spectrum Analyser. The external trigger from the Aeroflex DFS test system was used to trigger a 30-minute sweep from the moment the radar burst sequence was injected. It was verified that no transmissions occurred on the test channel during this time period.

2.7.5 Environmental Conditions

Ambient Temperature	23.7 °C
Relative Humidity	56.2 - 58.0 %



2.7.6 Test Results

5 GHz WLAN

802.11ac VHT80

The equipment was set up as shown in the diagram below. The EUT was configured to run iPerf, transmitting UDP to the client laptop. The channel loading was set to >17% by adjusting the bandwidth specified in the iPerf UDP transfer.

To calibrate the level of the radar at the input to the companion device, the companion device was replaced by the spectrum analyser and the output of the PXI RF generator adjusted to give -62 dBm.

Radar Type	Pulse Width (µs)	PRI (µs)	Number of Pulses
0	1	1428	18

Table 654 - Radar Pulse Type 0 Characteristics

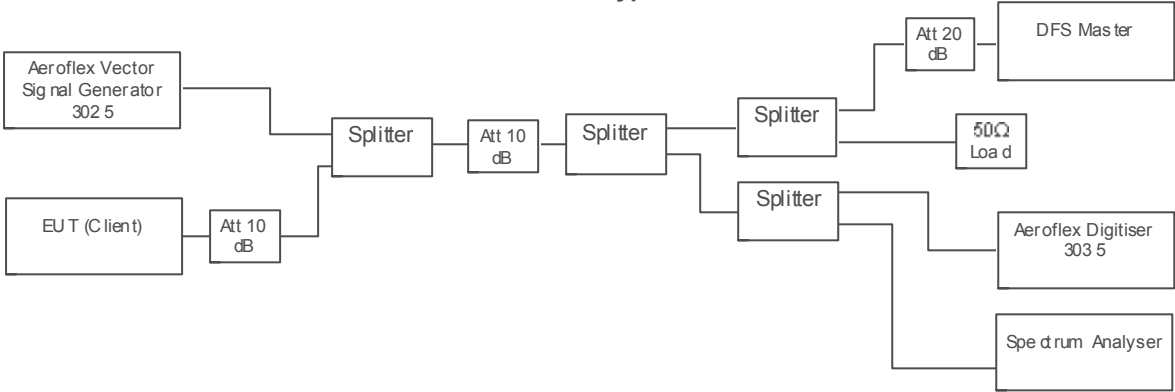


Figure 1115 - Test Equipment Setup Diagram for Client without Radar Detection with Injection at the Master



Figure 1116 - Verification of Radar Type 0

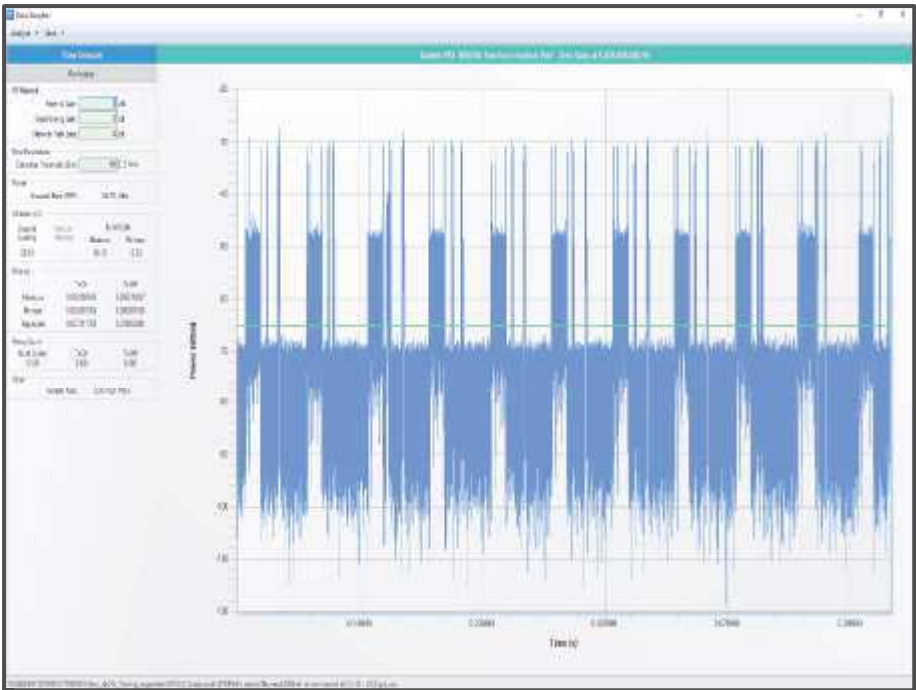


Figure 1117 - Channel Loading

The channel loading was 25.51 %

Maximum Transmit Power	Value (Notes 1 and 2)
≥ 200 milliwatt	-64 dBm
< 200 milliwatt	-62 dBm
Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna.	
Note 2: Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response.	

Table 655 - DFS Detection Thresholds for Master Devices and Client Devices with Radar Detection

Test Parameter	Result
Channel Move Time	113.26 ms
Channel Closing Time (Aggregate Time During 200 ms)	1.32 ms
Channel Closing Time (Aggregate Time During 200 ms to 10 s)	0 ms
Channel Closing Time (Aggregate Time During 10 s)	1.32 ms
Transmission Observed During Non-Occupancy Period	No

Table 656 - In-Service Monitoring Test Results

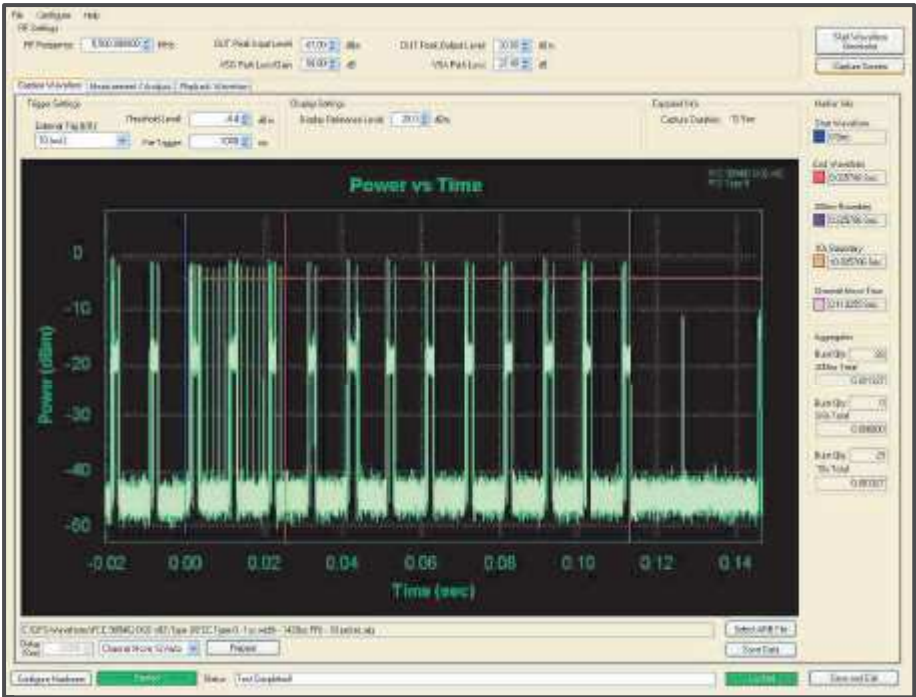


Figure 1118 - First 200 ms of Channel Shutdown Period

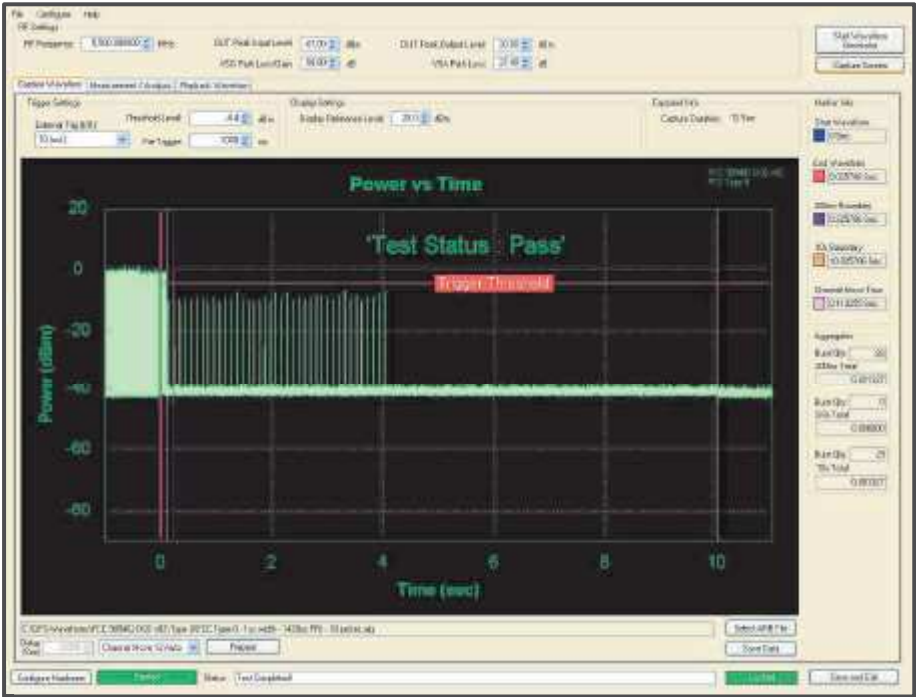


Figure 1119 - First 12 s of Channel Shutdown Period

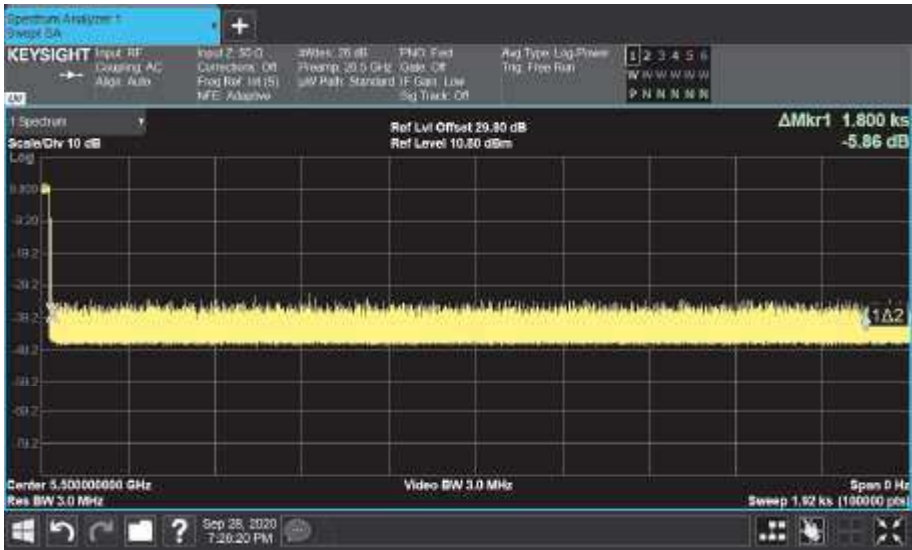


Figure 1120 - 30 minute Non-Occupancy Period



5 GHz WLAN - Client to Client

802.11ac VHT80

The equipment was set up as shown in the diagram below. The EUT was configured to run iPerf, transmitting UDP to the client laptop. The channel loading was set to >17% by adjusting the bandwidth specified in the iPerf UDP transfer.

To calibrate the level of the radar at the input to the companion device, the companion device was replaced by the spectrum analyser and the output of the PXI RF generator adjusted to give -62 dBm.

Radar Type	Pulse Width (µs)	PRI (µs)	Number of Pulses
0	1	1428	18

Table 657 - Radar Pulse Type 0 Characteristics

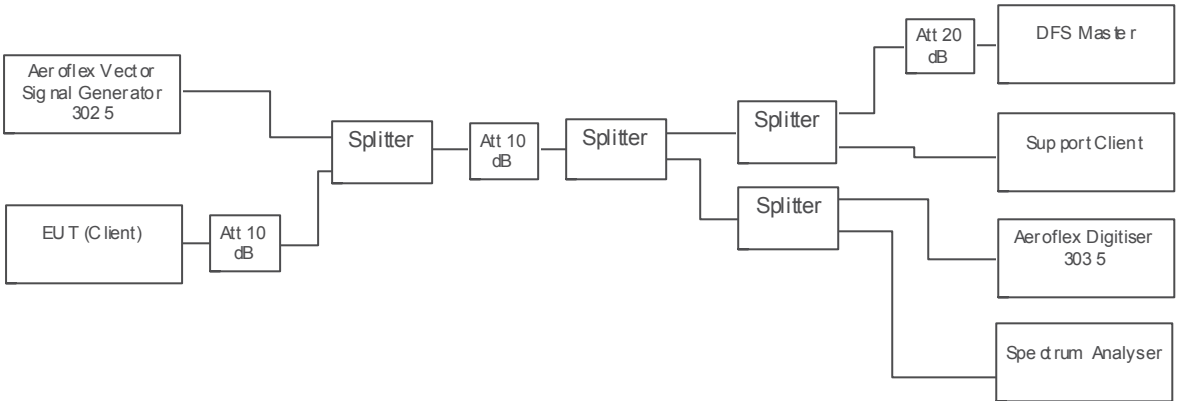


Figure 1121 - Test Equipment Setup Diagram for Client without Radar Detection with Injection at the Master (Client-to-Client mode)

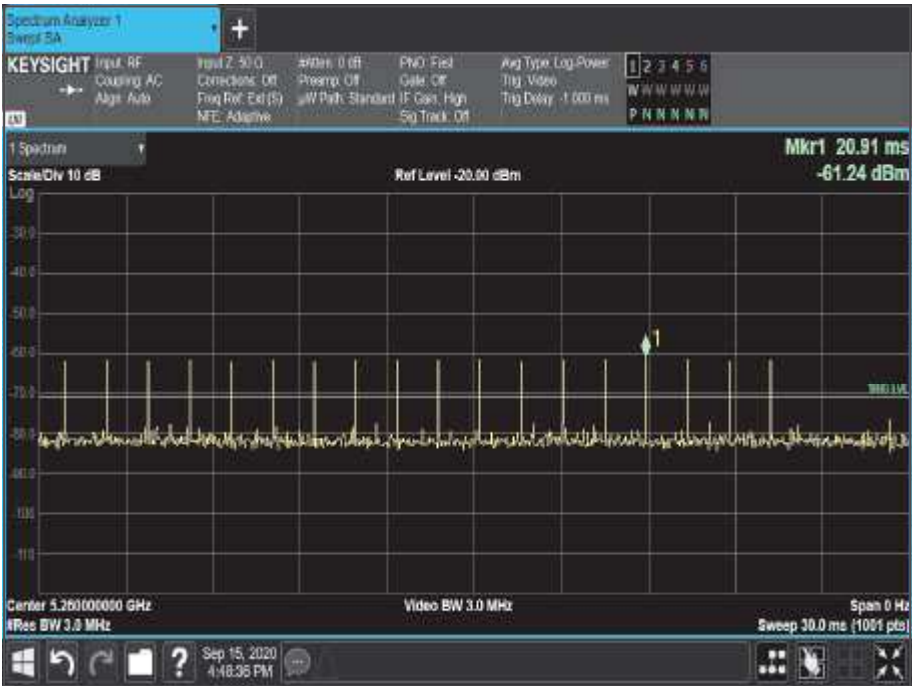


Figure 1122 - Verification of Radar Type 0

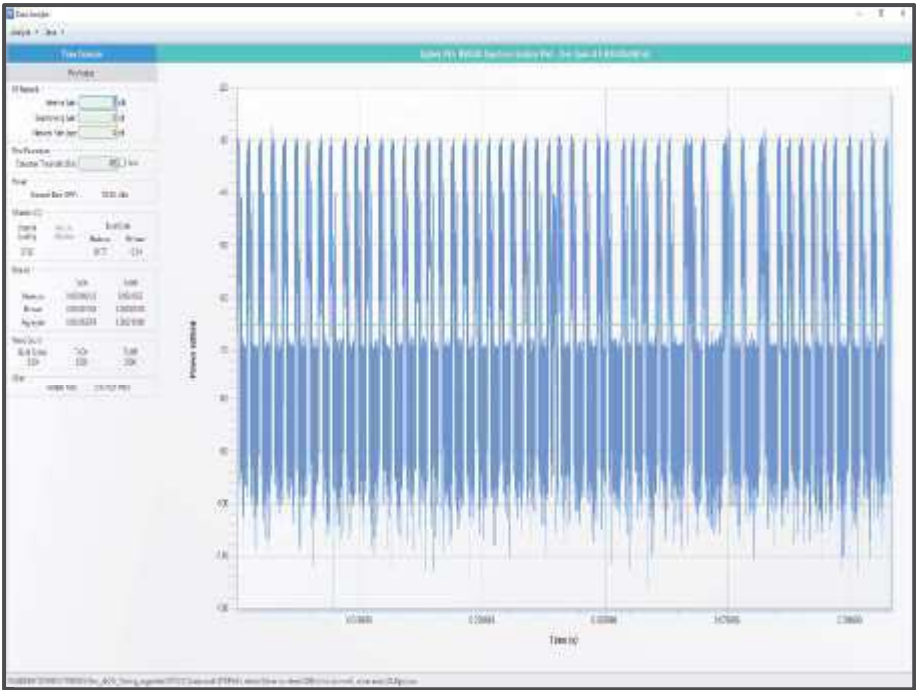


Figure 1123 - Channel Loading

The channel loading was 37.92 %

Maximum Transmit Power	Value (Notes 1 and 2)
≥ 200 milliwatt	-64 dBm
< 200 milliwatt	-62 dBm
Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna.	
Note 2: Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response.	

Table 658 - DFS Detection Thresholds for Master Devices and Client Devices with Radar Detection

Test Parameter	Result
Channel Move Time	0.029 s
Channel Closing Time (Aggregate Time During 200 ms)	14.86 ms
Channel Closing Time (Aggregate Time During 200 ms to 10 s)	0 ms
Channel Closing Time (Aggregate Time During 10 s)	14.86 ms
Transmission Observed During Non-Occupancy Period	No

Table 659 - In-Service Monitoring Test Results

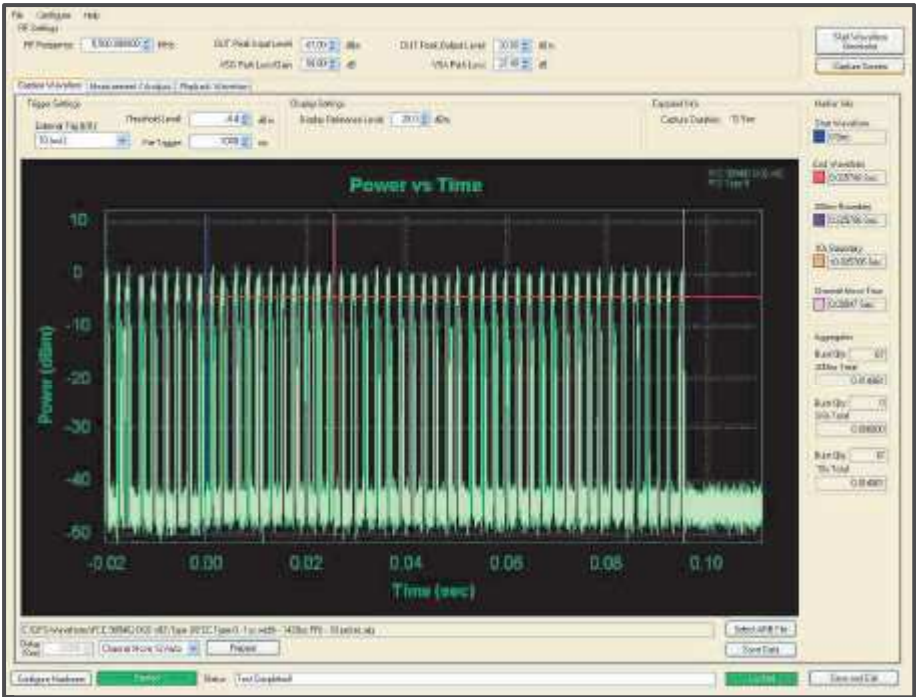


Figure 1124 - First 200 ms of Channel Shutdown Period

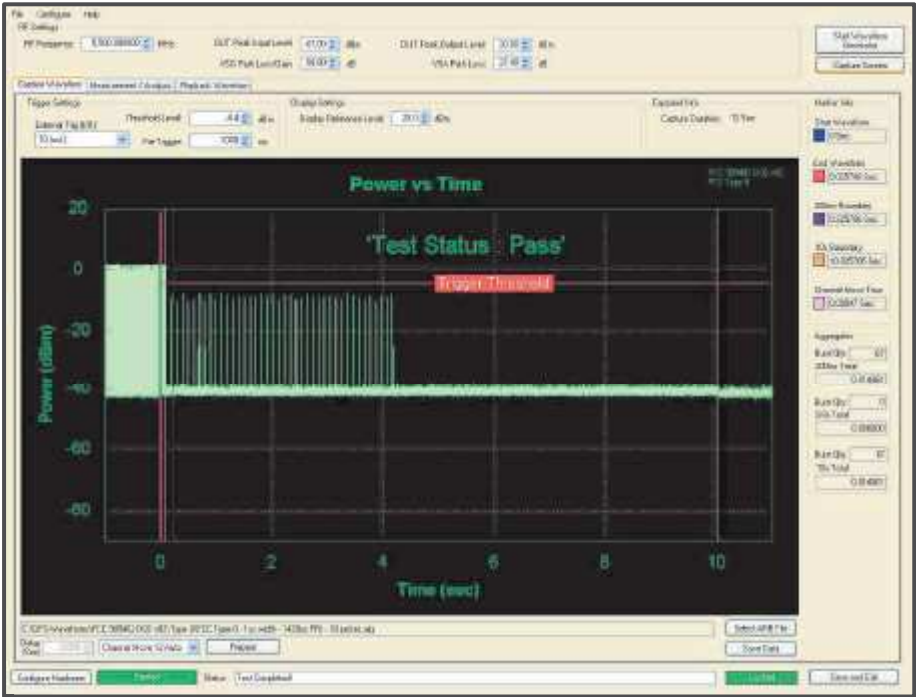


Figure 1125 - First 12 s of Channel Shutdown Period

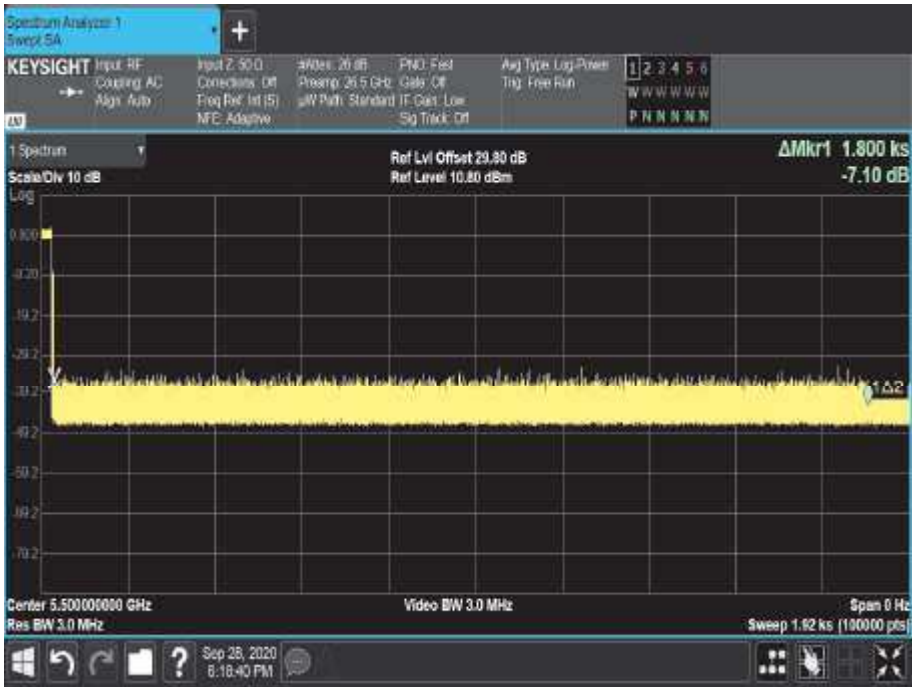


Figure 1126 - 30 minute Non-Occupancy Period



FCC 47 CFR Part 15, Limit Clause 15.407 (h)(2)(iii)

Channel Move Time	<10 seconds
Channel Closing Time (Aggregate Time During 200ms)	<200 ms
Channel Closing Time (Aggregate Time During + 200ms to 10s)	<60 ms

Table 660 - Channel Move Time and Channel Closing Transmission Time Limit

FCC 47 CFR Part 15, Limit Clause 15.407 (h)(2)(iv)

Non-occupancy Period	> 30 minutes
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Table 661 - Non-Occupancy Limit

ISED RSS-247, Limit Clause 6.3.2

Devices shall comply with the following requirements, however, the requirement for in-service monitoring does not apply to slave devices without radar detection.

In-service monitoring: an LE-LAN device shall be able to monitor the operating channel to check that a co-channel radar has not moved or started operation within range of the LE-LAN device. During in-service monitoring, the LE-LAN radar detection function continuously searches for radar signals between normal LE-LAN transmissions.

Channel availability check time: the device shall check whether there is a radar system already operating on the channel before it initiates a transmission on a channel and when it moves to a channel. The device may start using the channel if no radar signal with a power level greater than the interference threshold value specified in Section 6.3.1 above is detected within 60 seconds. This requirement only applies in the master operational mode.

Channel move time: after a radar signal is detected, the device shall cease all transmissions on the operating channel within 10 seconds.

Channel closing transmission time: is comprised of 200 ms starting at the beginning of the channel move time plus any additional intermittent control signals required to facilitate a channel move (an aggregate of 60 ms) over the remaining 10-second period of the channel move time.

Non-occupancy period: a channel that has been flagged as containing a radar signal, either by a channel availability check or in-service monitoring, is subject to a 30-minute non-occupancy period where the channel cannot be used by the LE-LAN device. The non-occupancy period starts from the time that the radar signal is detected.



2.7.7 Test Location and Test Equipment Used

This test was carried out in RF Laboratory 1.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
Load (50ohm/30W)	Weinschel	50T-054	285	12	23-Jul-2021
Directional Coupler	Hewlett Packard	11692D	451	-	O/P Mon
Hygrometer	Rotronic	I-1000	3220	12	25-Sep-2020
Network Analyser	Rohde & Schwarz	ZVA 40	3548	12	11-Dec-2020
PXI RF Digitizer	Aeroflex	3035	4012	24	30-Sep-2020
1 Metre SMA Cable	Rhophase	3PS-1801A-1000-3PS	4099	12	22-Jun-2021
Calibration Unit	Rohde & Schwarz	ZV-Z54	4368	12	28-Nov-2020
1 metre K-Type Cable	Florida Labs	KMS-180SP-39.4-KMS	4520	12	12-Nov-2020
Cable (18 GHz)	Rosenberger	LU7-036-2000	5036	12	06-Oct-2020
Power Splitter, 2 way	Mini-Circuits	ZN2PD2-63-S+	5237	-	O/P Mon
Power Splitter, 2 way	Mini-Circuits	ZN2PD2-63-S+	5239	-	O/P Mon
Cable 2.92m	Junkosha	MWX241-01000KMS	5412	12	22-Jun-2021
Signal Analyzer	Keysight Technologies	PXA N9030B	5432	12	05-Dec-2020
Attenuator 5W 10dB DC-18GHz	Aaren	AT40A-4041-D18-10	5487	12	14-Apr-2021
Attenuator 5W 20dB DC-18GHz	Aaren	AT40A-4041-D18-20	5496	12	14-Apr-2021
Attenuator 5W 20dB DC-18GHz	Aaren	AT40A-4041-D18-20	5498	12	14-Apr-2021
Attenuator 2W 10dB DC-10GHz	Telegartner	J01156A0031	5575	-	O/P Mon
Attenuator 2W 10dB DC-10GHz	Telegartner	J01156A0031	5578	-	O/P Mon
Attenuator 2W 10dB DC-10GHz	Telegartner	J01156A0031	5581	-	O/P Mon

Table 662

O/P Mon – Output Monitored using calibrated equipment



3 Measurement Uncertainty

For a 95% confidence level, the measurement uncertainties for defined systems are:

Test Name	Measurement Uncertainty
Maximum Conducted Output Power	± 3.2 dB
Maximum Conducted Power Spectral Density	± 3.2 dB
Emission Bandwidth	± 1.18 MHz
Authorised Band Edges	± 6.3 dB
Restricted Band Edges	± 6.3 dB
Spurious Radiated Emissions	30 MHz to 1 GHz: ± 5.2 dB 1 GHz to 40 GHz: ± 6.3 dB
Channel Move Time, Channel Closing Transmission Time and Non-Occupancy Period	Time: ± 0.47 % Power: ± 1.29 dB

Table 663

Measurement Uncertainty Decision Rule

Determination of conformity with the specification limits is based on the decision rule according to IEC Guide 115: 2007, clause 4.4.3 and 4.5.1.