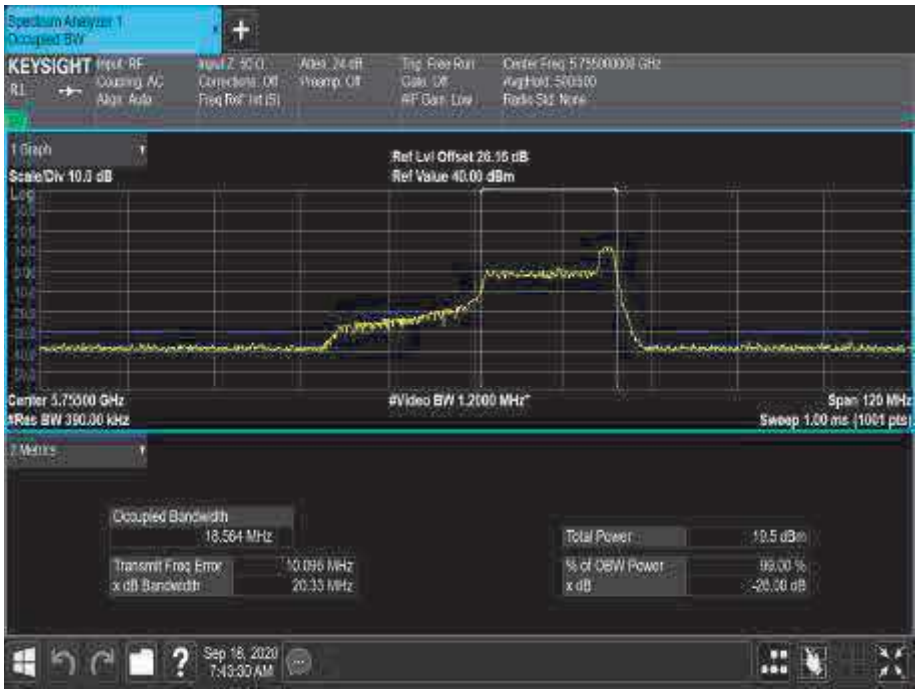

Figure 666 - 5755 MHz - 99% Occupied Bandwidth

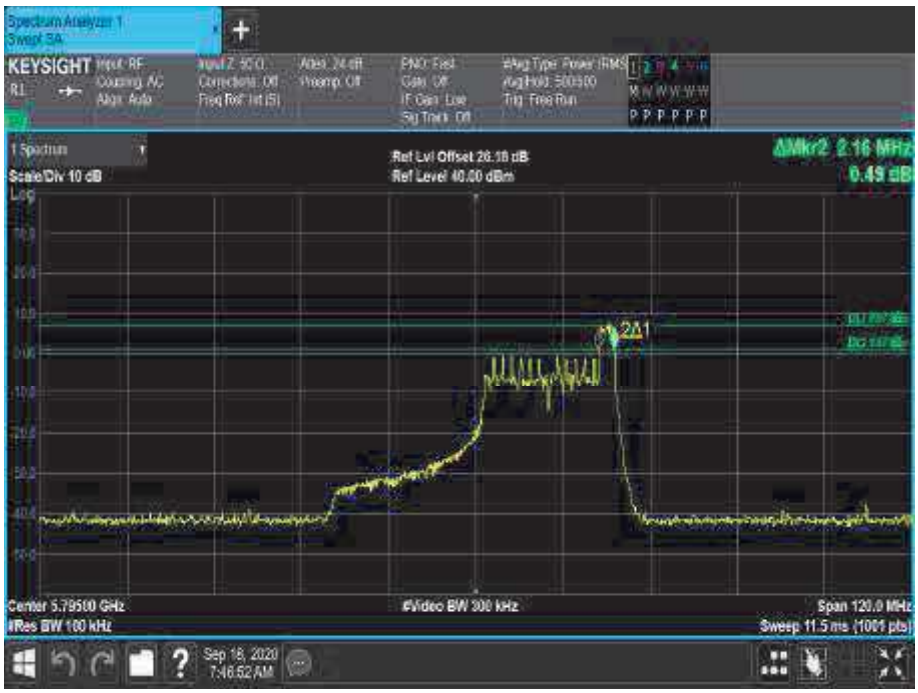

Figure 667 - 5795 MHz - 6 dB DTS Bandwidth

Figure 668 - 5795 MHz - 26 dB Emission Bandwidth

Figure 669 - 5795 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	81.840
99% Bandwidth (MHz)	76.132	76.108

Table 577 - 802.11ac / VHT80 MCS7x1 / SISO / Core 1

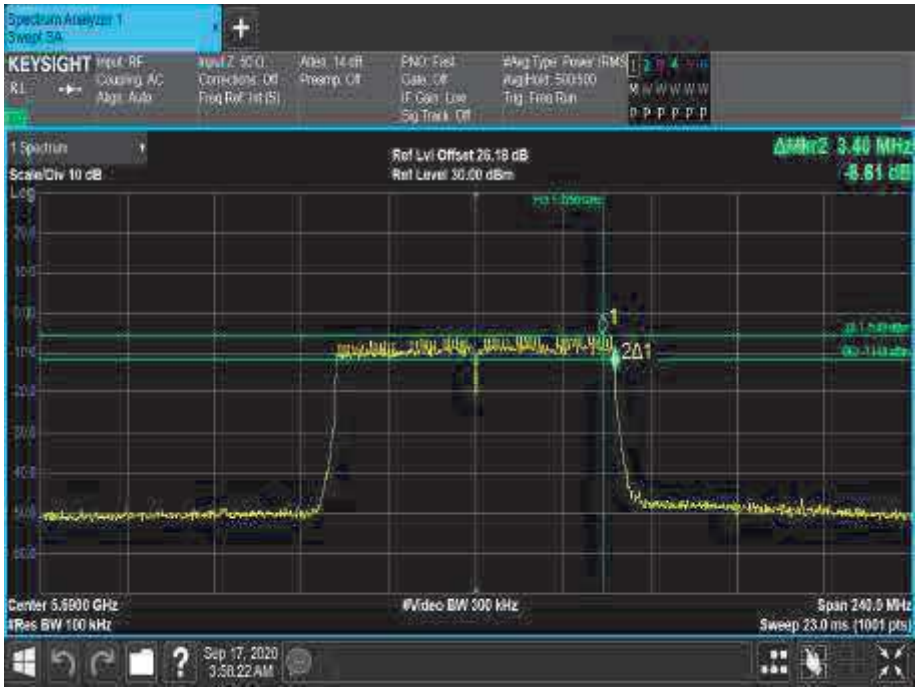

Figure 670 - 5690 MHz - 6 dB DTS Bandwidth

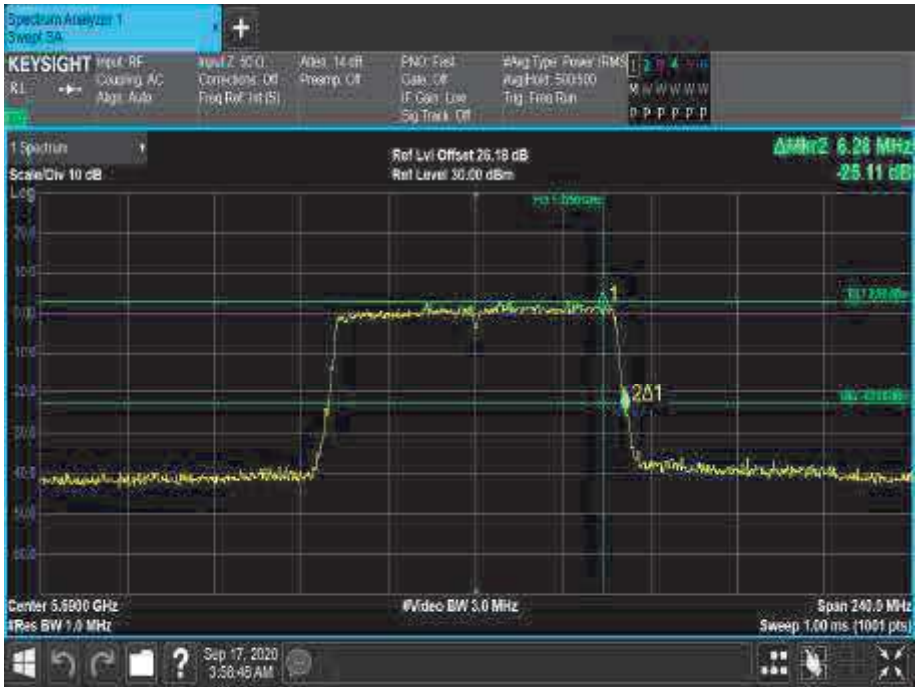

Figure 671 - 5690 MHz - 26 dB Emission Bandwidth

Figure 672 - 5690 MHz - 99% Occupied Bandwidth

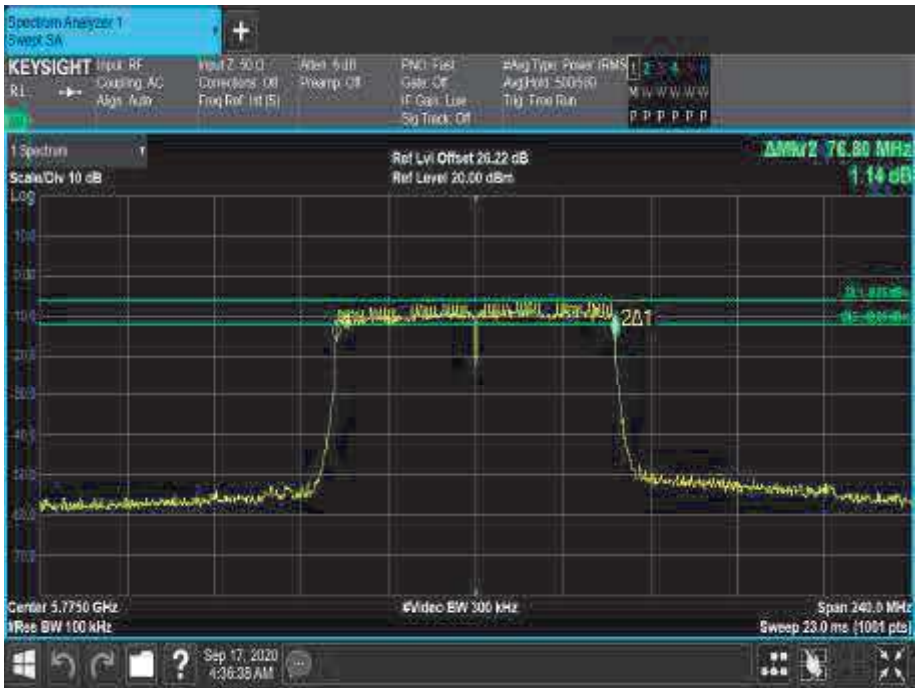

Figure 673 - 5775 MHz - 6 dB DTS Bandwidth

Figure 674 - 5775 MHz - 26 dB Emission Bandwidth

Figure 675 - 5775 MHz - 99% Occupied Bandwidth

Channel	Straddle	Middle
Frequency (MHz)	5690	5775
6 dB Bandwidth (MHz)	3.400	76.800
26 dB Bandwidth (MHz)	7.000	82.800
99% Bandwidth (MHz)	76.160	76.125

Table 578 - 802.11ac / VHT80 MCS7x1 / MIMO CDD / Cores 0+1

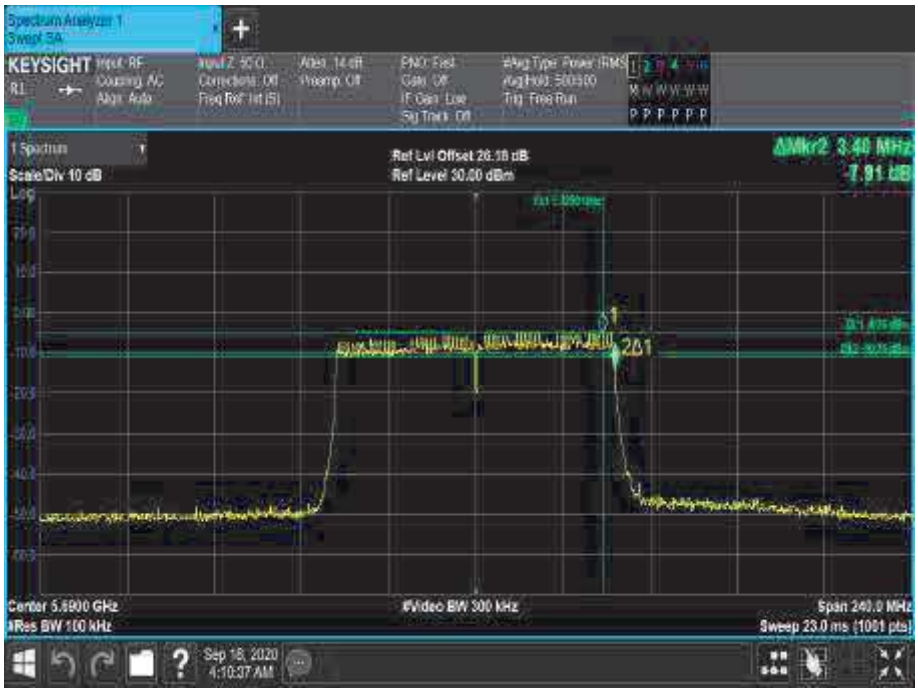

Figure 676 - 5690 MHz - 6 dB DTS Bandwidth

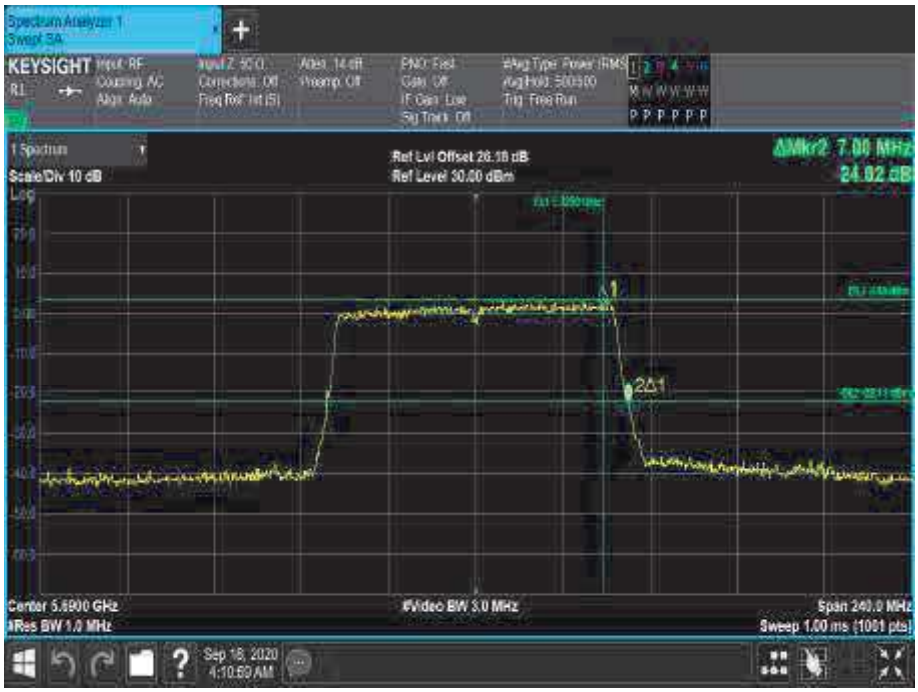

Figure 677 - 5690 MHz - 26 dB Emission Bandwidth

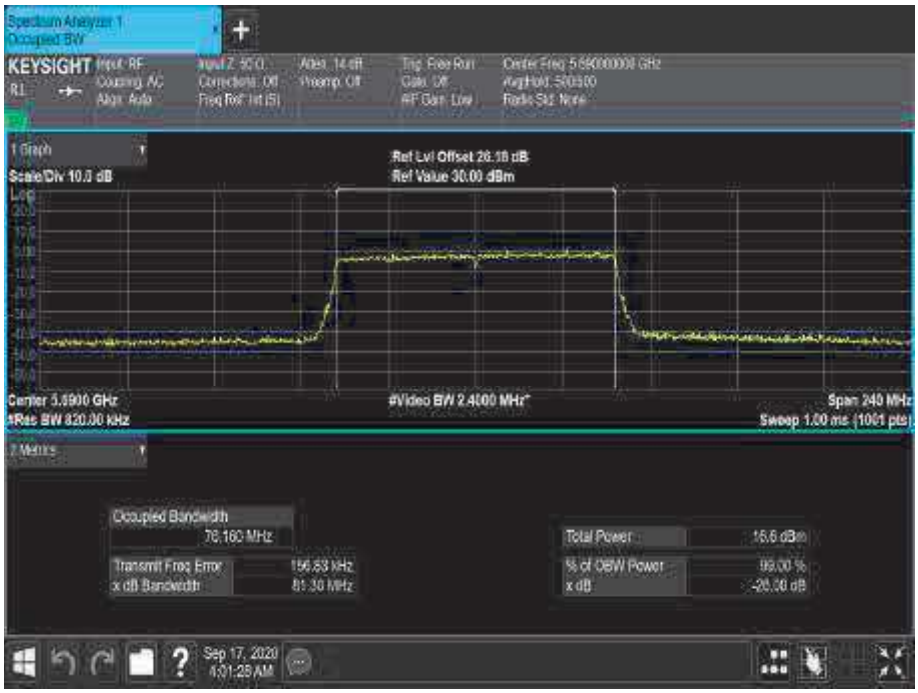

Figure 678 - 5690 MHz - 99% Occupied Bandwidth

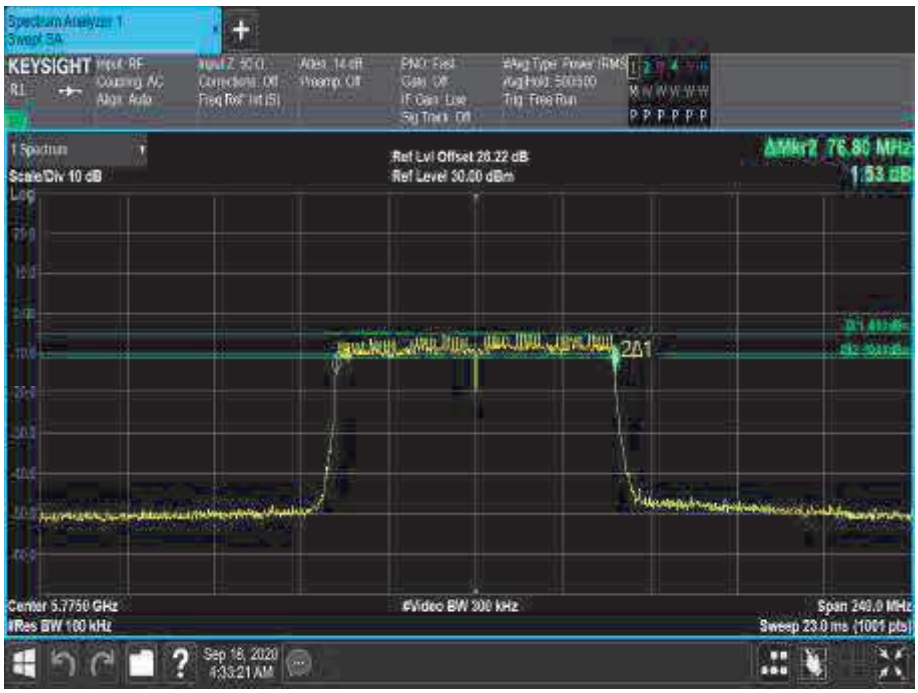

Figure 679 - 5775 MHz - 6 dB DTS Bandwidth

Figure 680 - 5775 MHz - 26 dB Emission Bandwidth

Figure 681 - 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	82.080
99% Bandwidth (MHz)	76.074	75.987

Table 579 - 802.11ac / VHT80 MCS7x2 / MIMO SDM / Cores 0+1

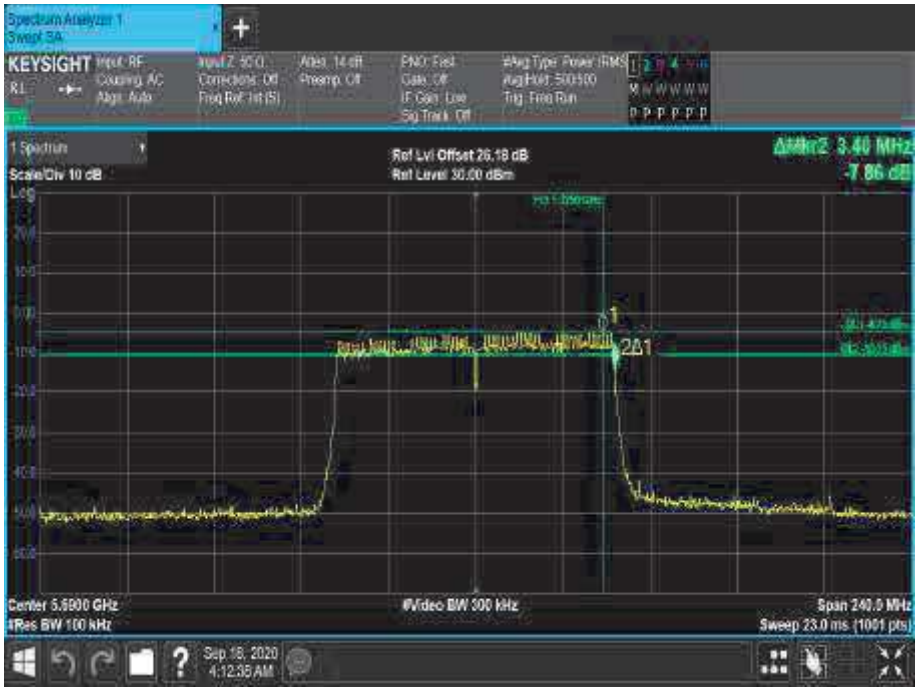

Figure 682 - 5690 MHz - 6 dB DTS Bandwidth

Figure 683 - 5690 MHz - 26 dB Emission Bandwidth

Figure 684 - 5690 MHz - 99% Occupied Bandwidth

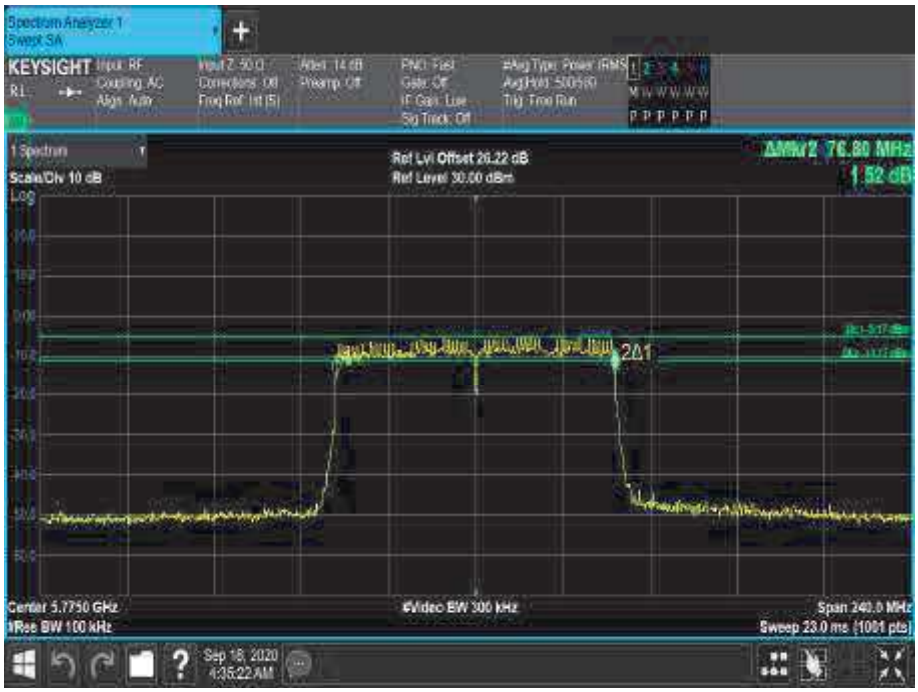

Figure 685 - 5775 MHz - 6 dB DTS Bandwidth

Figure 686 - 5775 MHz - 26 dB Emission Bandwidth

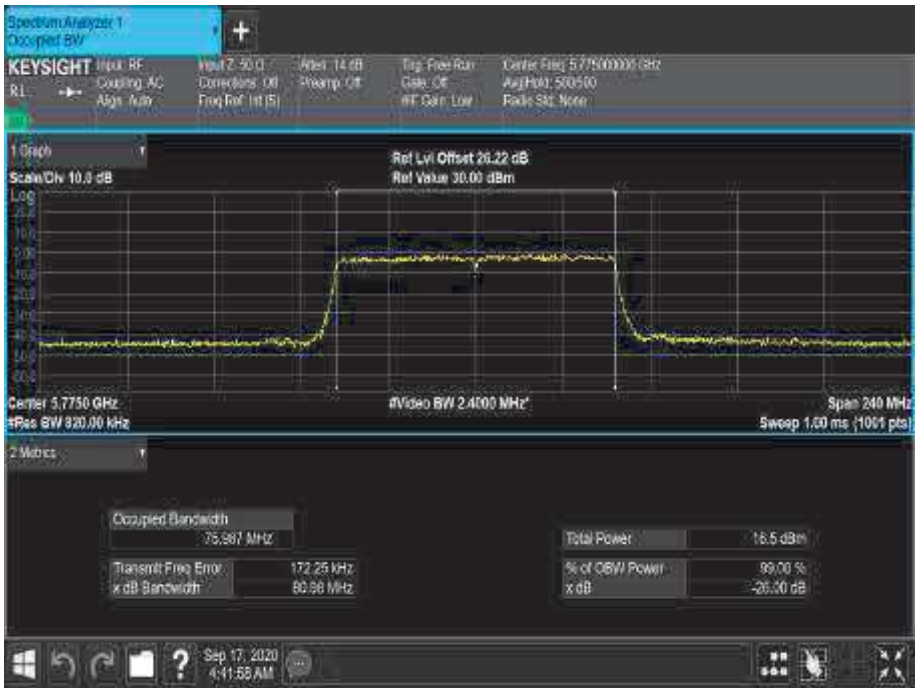

Figure 687 - 5775 MHz - 99% Occupied Bandwidth

Channel	Straddle	Middle
Frequency (MHz)	5690	5775
6 dB Bandwidth (MHz)	3.400	76.800
26 dB Bandwidth (MHz)	6.760	82.080
99% Bandwidth (MHz)	76.042	76.004

Table 580 - 802.11ac / VHT80 MCS7x1 / MIMO TxBF / Cores 0+1

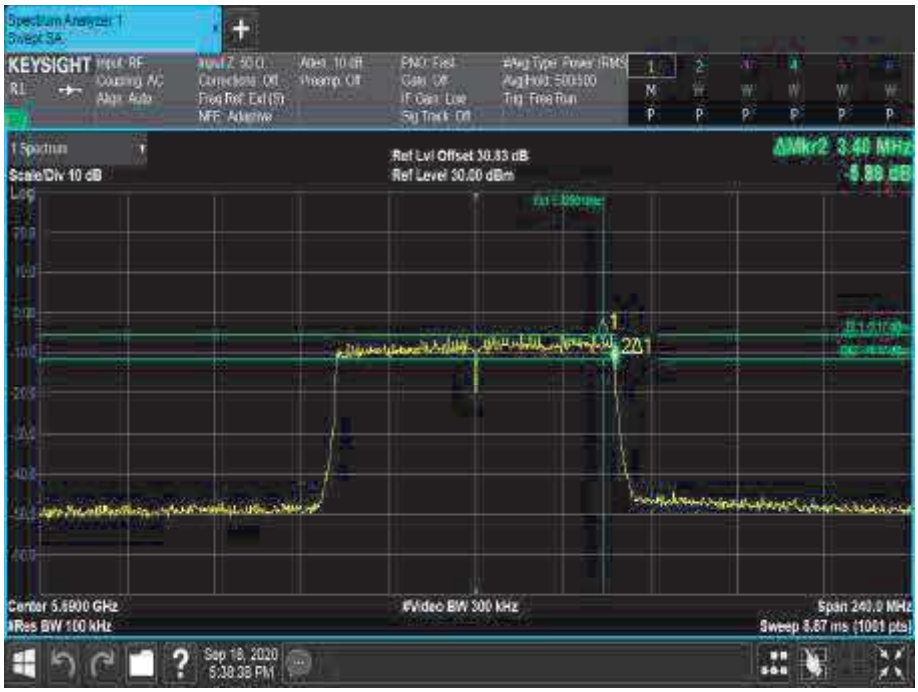

Figure 688 - 5690 MHz - 6 dB DTS Bandwidth

Figure 689 - 5690 MHz - 26 dB Emission Bandwidth

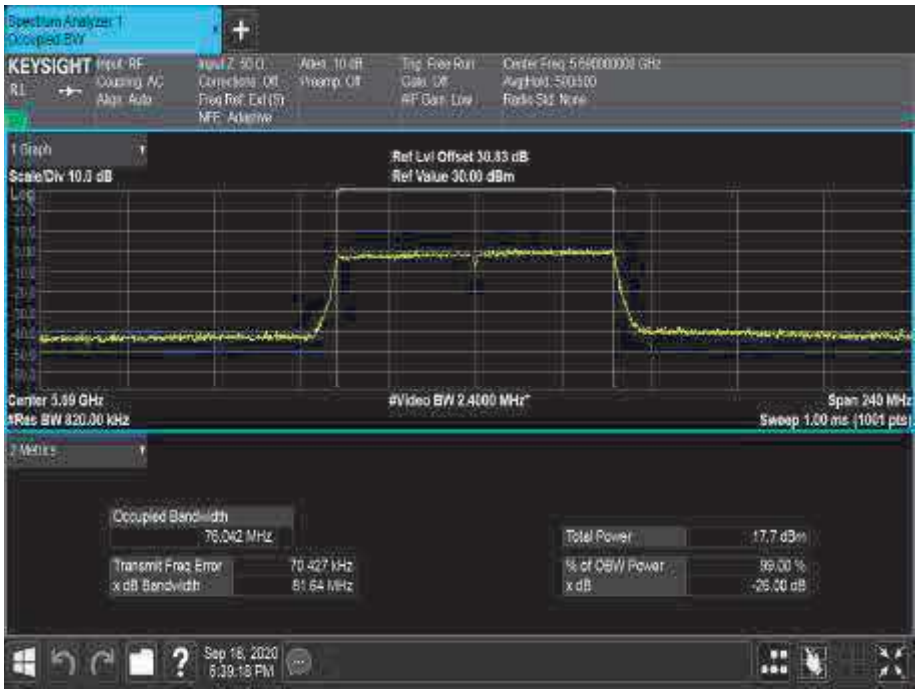

Figure 690 - 5690 MHz - 99% Occupied Bandwidth

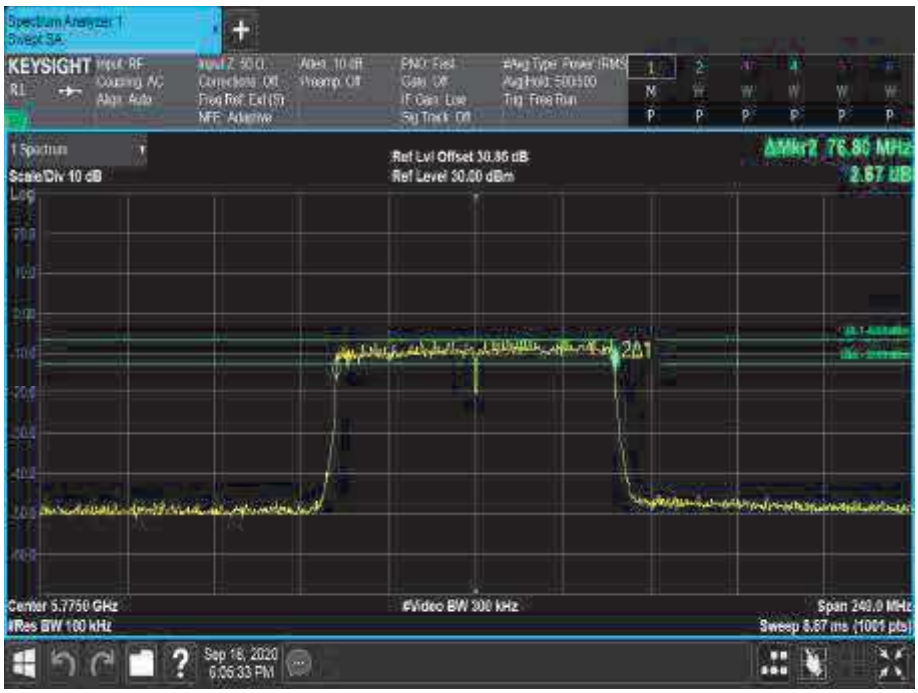

Figure 691 - 5775 MHz - 6 dB DTS Bandwidth

Figure 692 - 5775 MHz - 26 dB Emission Bandwidth

Figure 693 - 5775 MHz - 99% Occupied Bandwidth

Channel	Straddle	Middle
Frequency (MHz)	5690	5775
6 dB Bandwidth (MHz)	4.120	78.240
26 dB Bandwidth (MHz)	6.760	82.560
99% Bandwidth (MHz)	77.445	77.341

Table 581 - 802.11ax / HE80 MCS7x1 / SU / SISO / Core 1

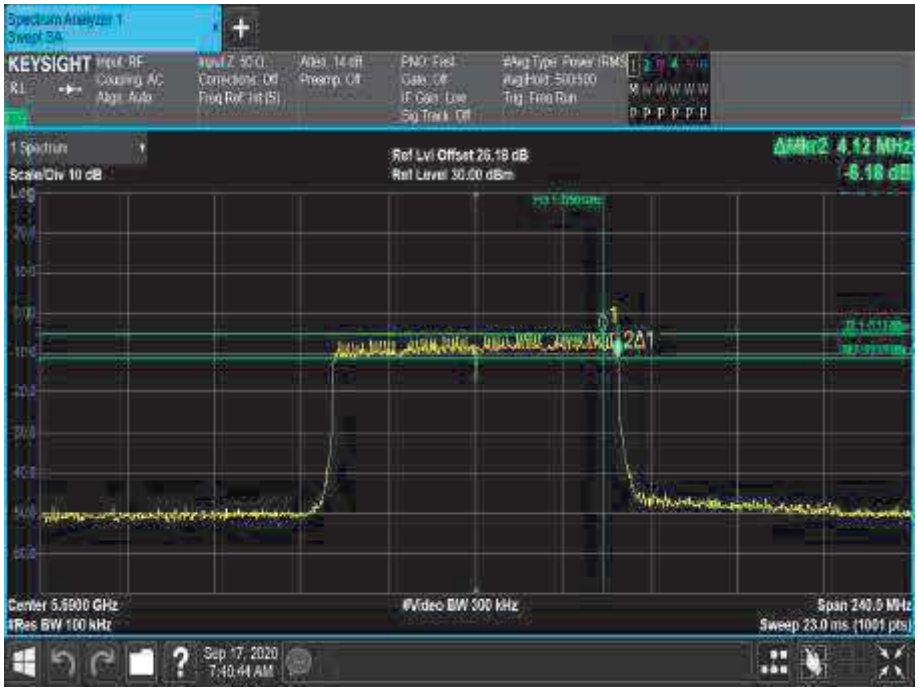

Figure 694 - 5690 MHz - 6 dB DTS Bandwidth

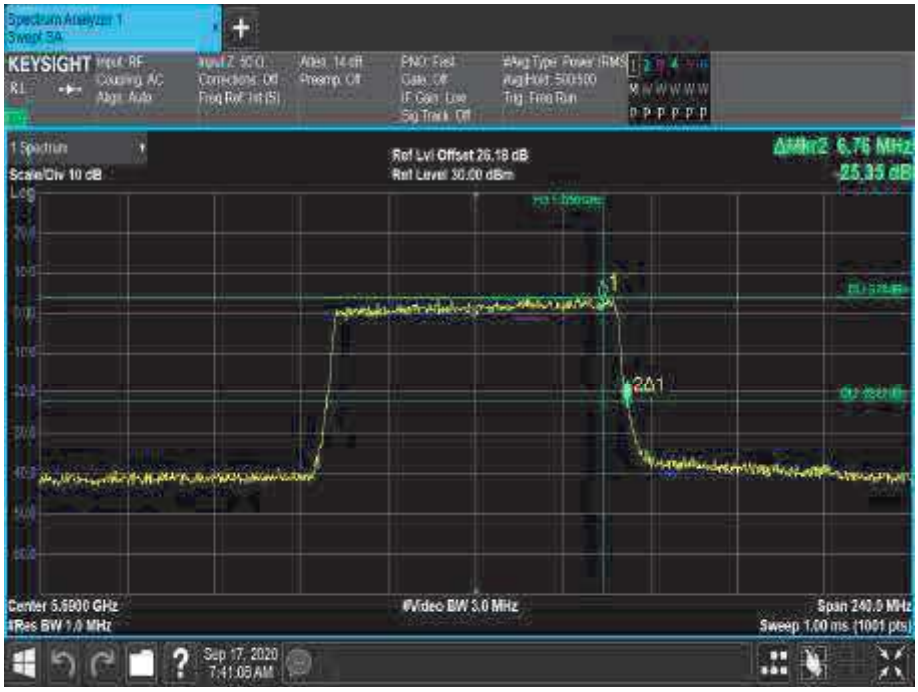

Figure 695 - 5690 MHz - 26 dB Emission Bandwidth

Figure 696 - 5690 MHz - 99% Occupied Bandwidth

Figure 697 - 5775 MHz - 6 dB DTS Bandwidth

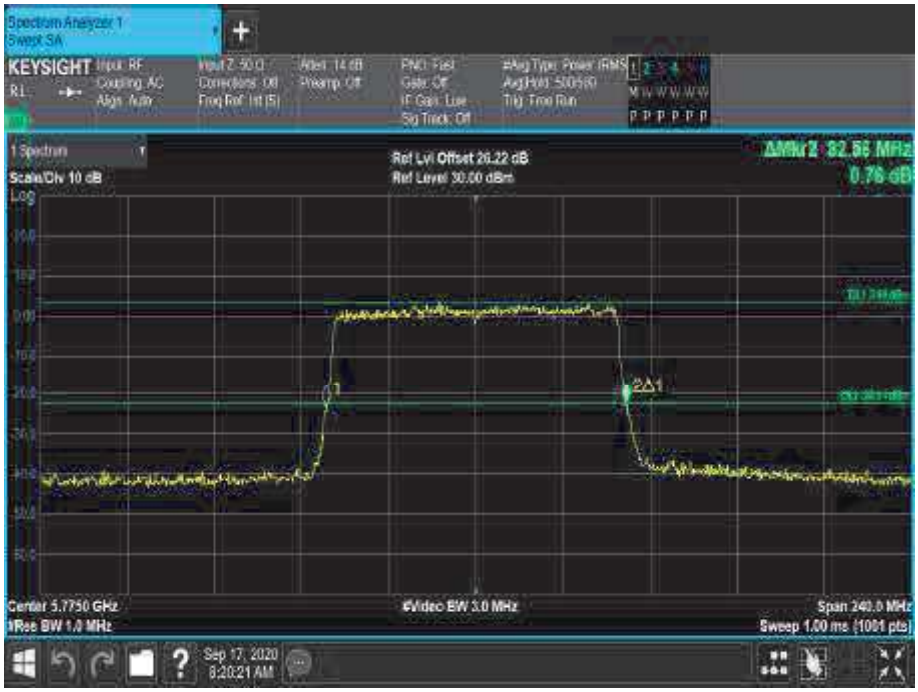

Figure 698 - 5775 MHz - 26 dB Emission Bandwidth

Figure 699 - 5775 MHz - 99% Occupied Bandwidth

Channel	Middle
Frequency (MHz)	5775
6 dB Bandwidth (MHz)	2.640
26 dB Bandwidth (MHz)	19.680
99% Bandwidth (MHz)	18.530

Table 582 - 802.11ax / HE80 MCS7x1 / RU 26-0 / SISO / Core 1

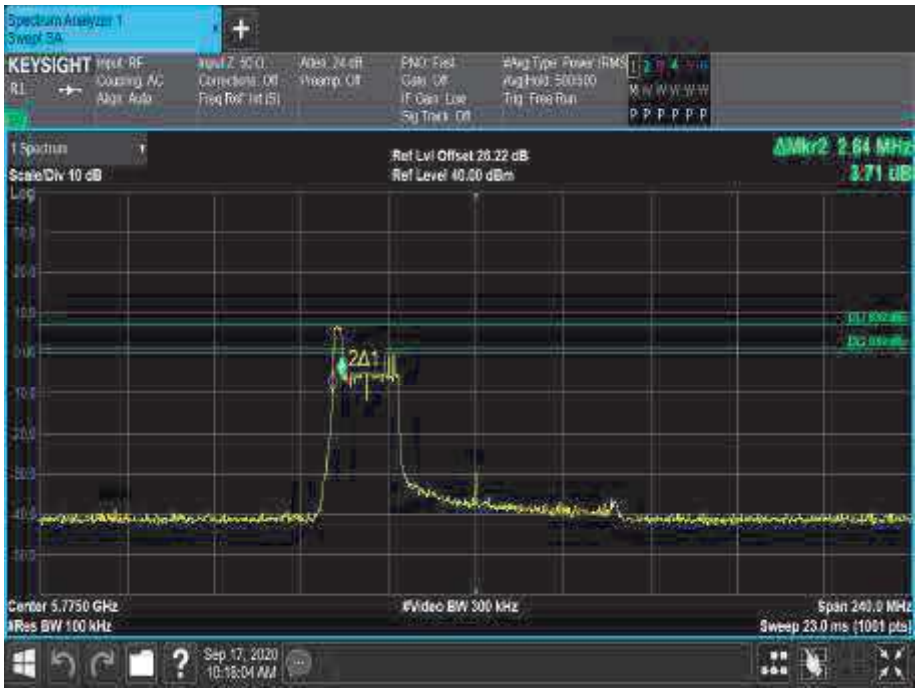

Figure 700 - 5775 MHz - 6 dB DTS Bandwidth

Figure 701 - 5775 MHz - 26 dB Emission Bandwidth

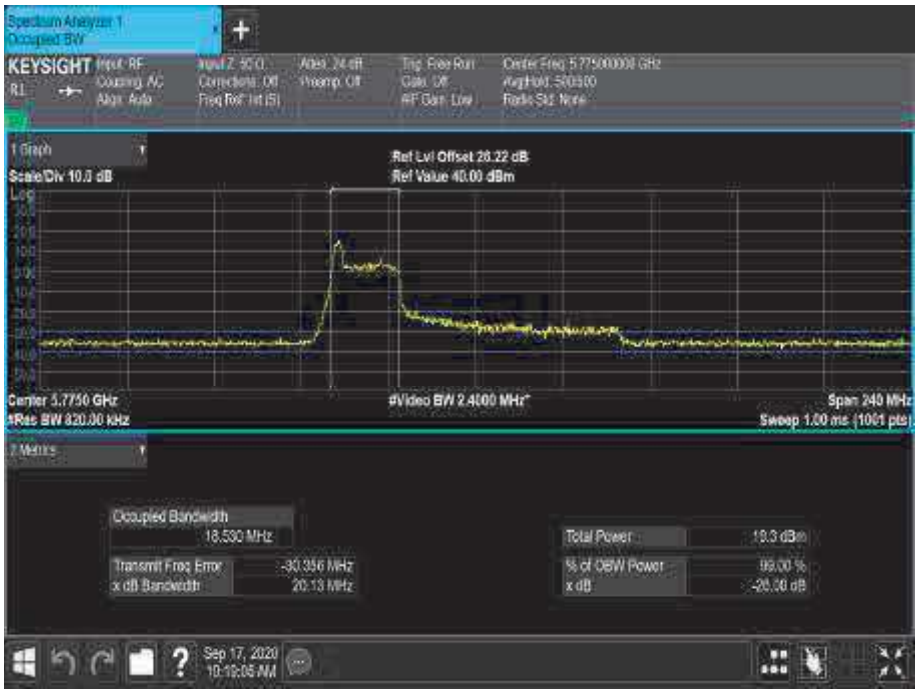

Figure 702 - 5775 MHz - 99% Occupied Bandwidth

Channel	Middle
Frequency (MHz)	5775
6 dB Bandwidth (MHz)	2.640
26 dB Bandwidth (MHz)	19.680
99% Bandwidth (MHz)	18.505

Table 583 - 802.11ax / HE80 MCS7x1 / RU 26-36 / SISO / Core 1

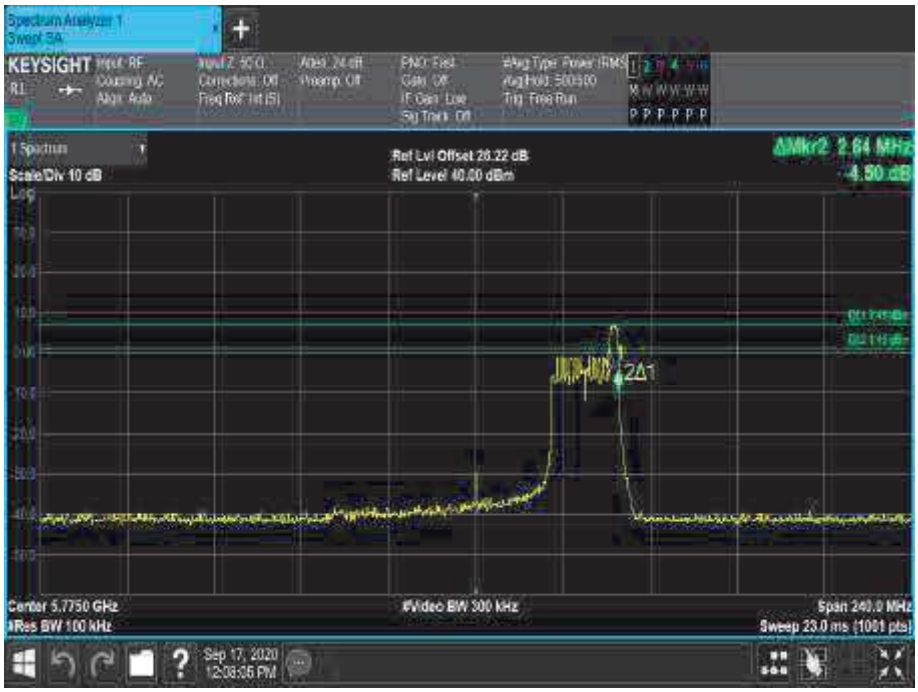

Figure 703 - 5775 MHz - 6 dB DTS Bandwidth

Figure 704 - 5775 MHz - 26 dB Emission Bandwidth

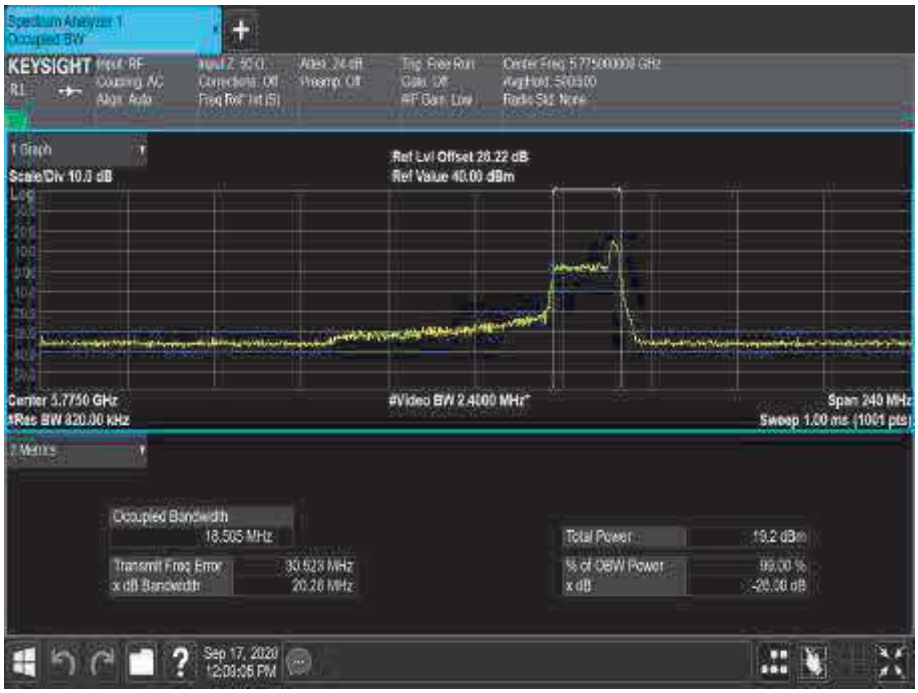

Figure 705 - 5775 MHz - 99% Occupied Bandwidth

Channel	Straddle	Middle
Frequency (MHz)	5690	5775
6 dB Bandwidth (MHz)	4.120	78.000
26 dB Bandwidth (MHz)	6.520	82.320
99% Bandwidth (MHz)	77.311	77.212

Table 584 - 802.11ax / HE80 MCS7x1 / SU / MIMO CDD / Cores 0+1

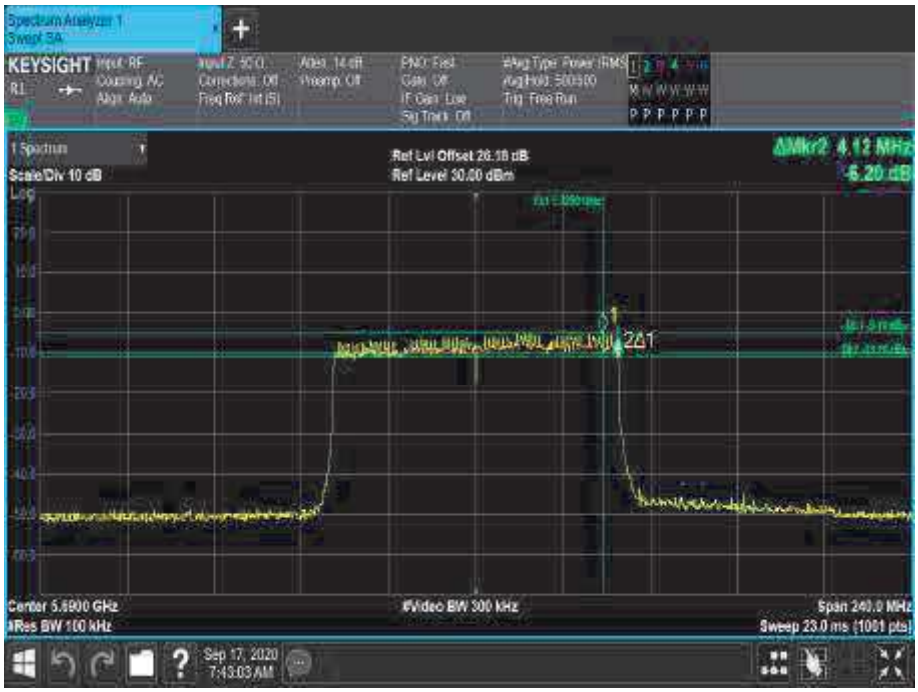

Figure 706 - 5690 MHz - 6 dB DTS Bandwidth

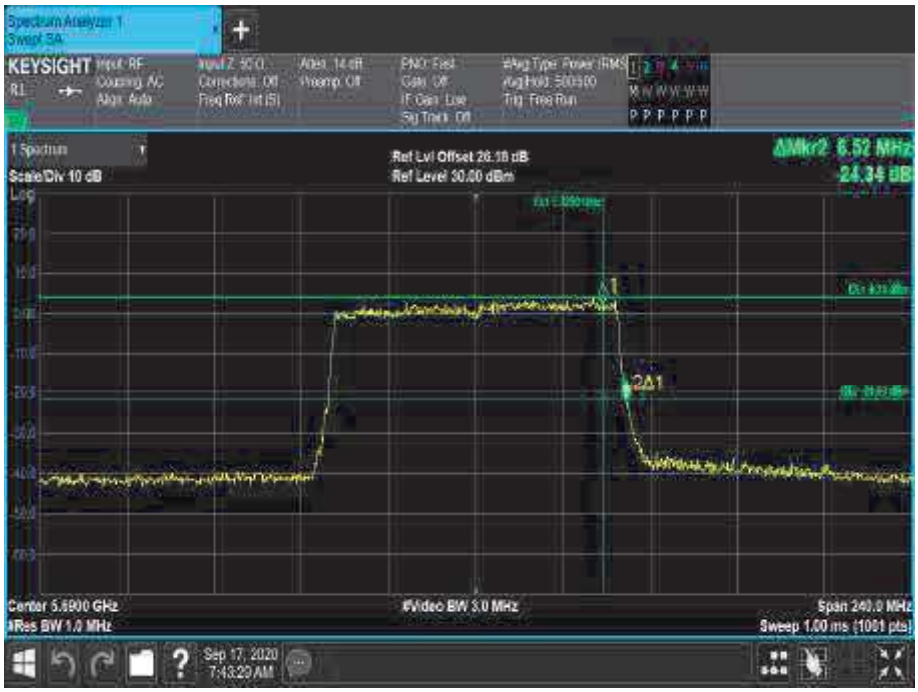

Figure 707 - 5690 MHz - 26 dB Emission Bandwidth

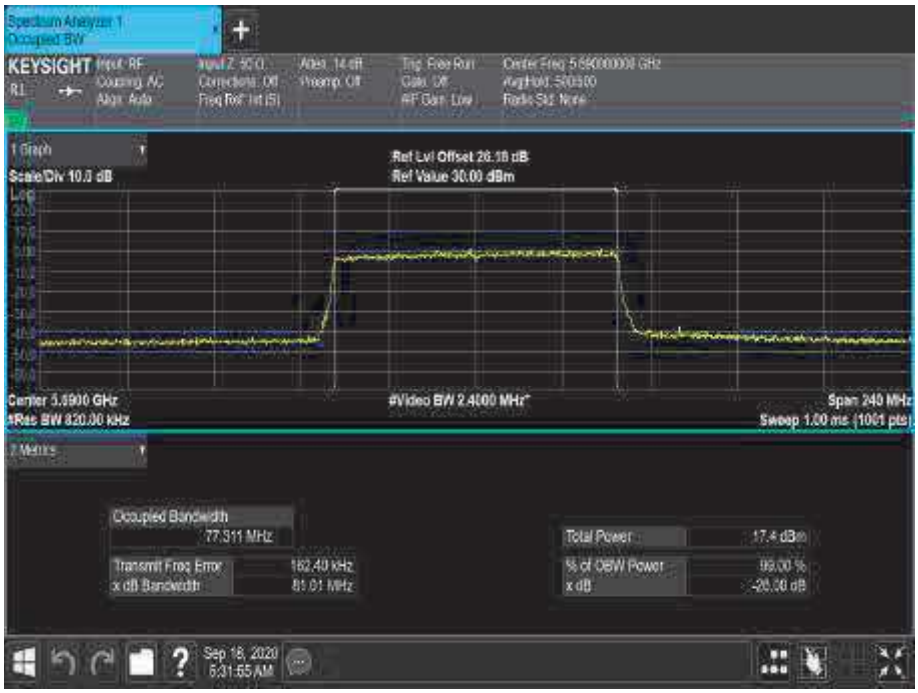

Figure 708 - 5690 MHz - 99% Occupied Bandwidth

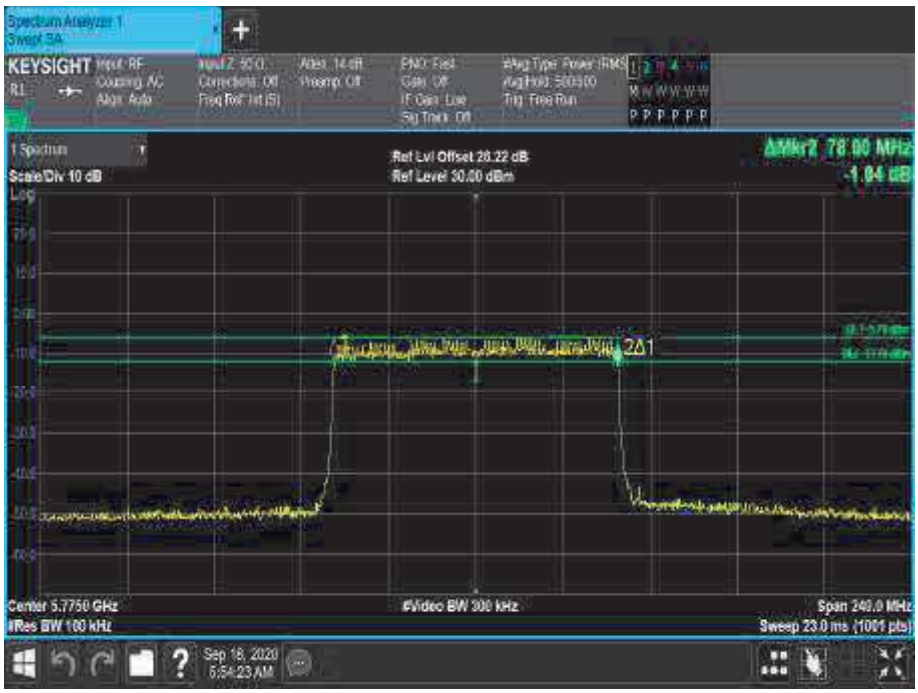

Figure 709 - 5775 MHz - 6 dB DTS Bandwidth

Figure 710 - 5775 MHz - 26 dB Emission Bandwidth

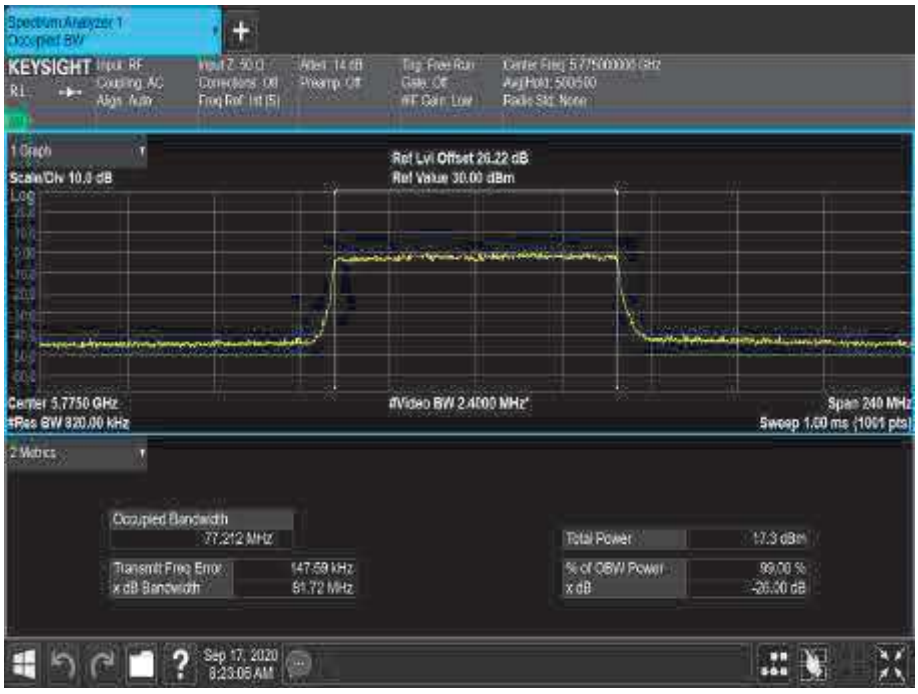

Figure 711 - 5775 MHz - 99% Occupied Bandwidth

Channel	Middle
Frequency (MHz)	5775
6 dB Bandwidth (MHz)	2.640
26 dB Bandwidth (MHz)	19.680
99% Bandwidth (MHz)	19.420

Table 585 - 802.11ax / HE80 MCS7x1 / RU 26-0 / MIMO CDD / Cores 0+1

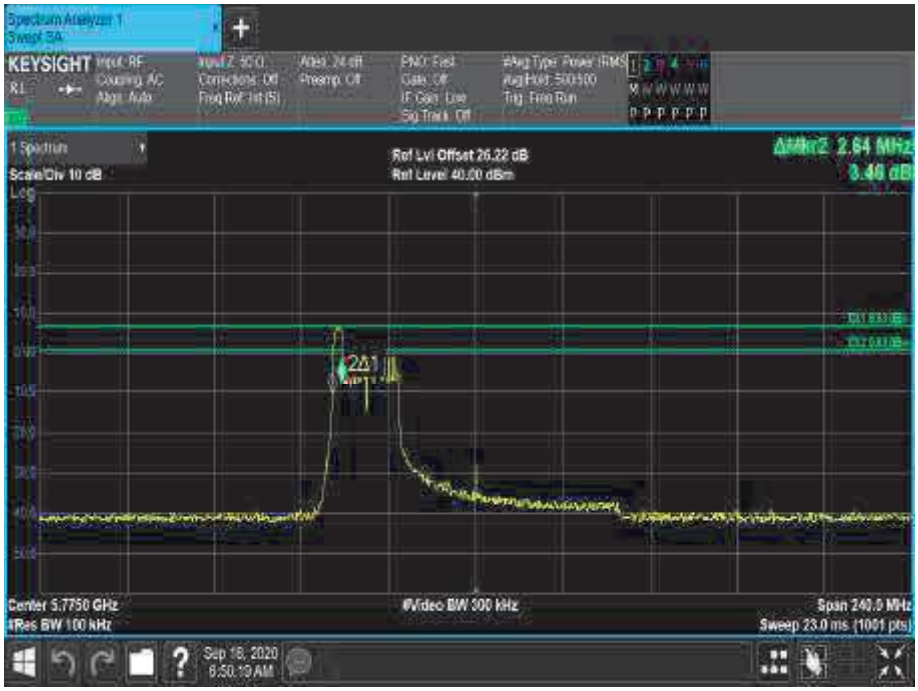

Figure 712 - 5775 MHz - 6 dB DTS Bandwidth

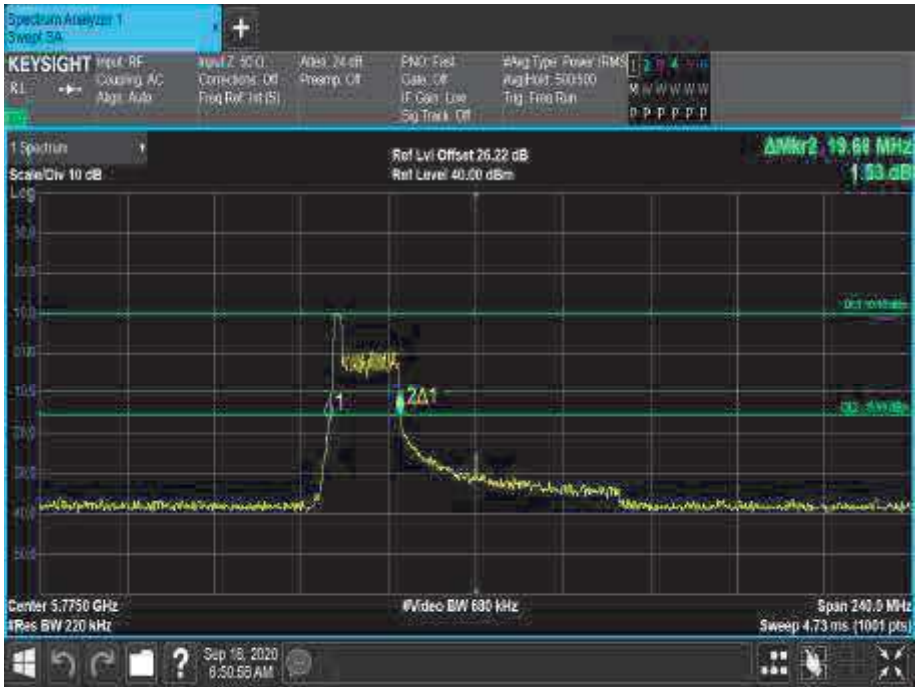

Figure 713 - 5775 MHz - 26 dB Emission Bandwidth

Figure 714 - 5775 MHz - 99% Occupied Bandwidth

Channel	Middle
Frequency (MHz)	5775
6 dB Bandwidth (MHz)	2.640
26 dB Bandwidth (MHz)	20.640
99% Bandwidth (MHz)	19.788

Table 586 - 802.11ax / HE80 MCS7x1 / RU 26-36 / MIMO CDD / Cores 0+1

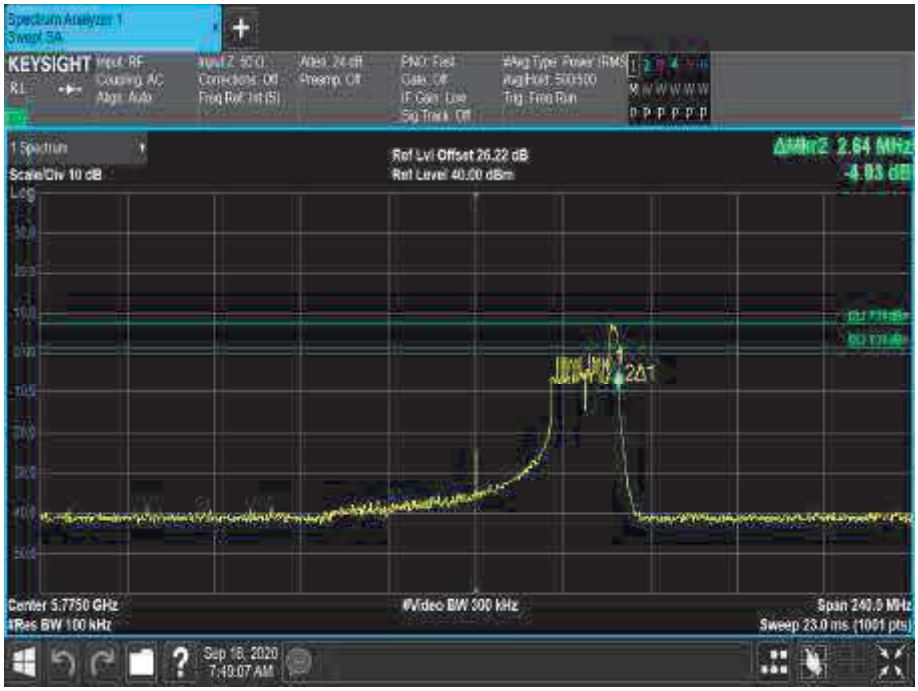

Figure 715 - 5775 MHz - 6 dB DTS Bandwidth

Figure 716 - 5775 MHz - 26 dB Emission Bandwidth

Figure 717 - 5775 MHz - 99% Occupied Bandwidth

Channel	Straddle	Middle
Frequency (MHz)	5690	5775
6 dB Bandwidth (MHz)	4.120	78.240
26 dB Bandwidth (MHz)	6.520	82.320
99% Bandwidth (MHz)	77.369	77.341

Table 587 - 802.11ax / HE80 MCS7x2 / SU / MIMO SDM / Cores 0+1

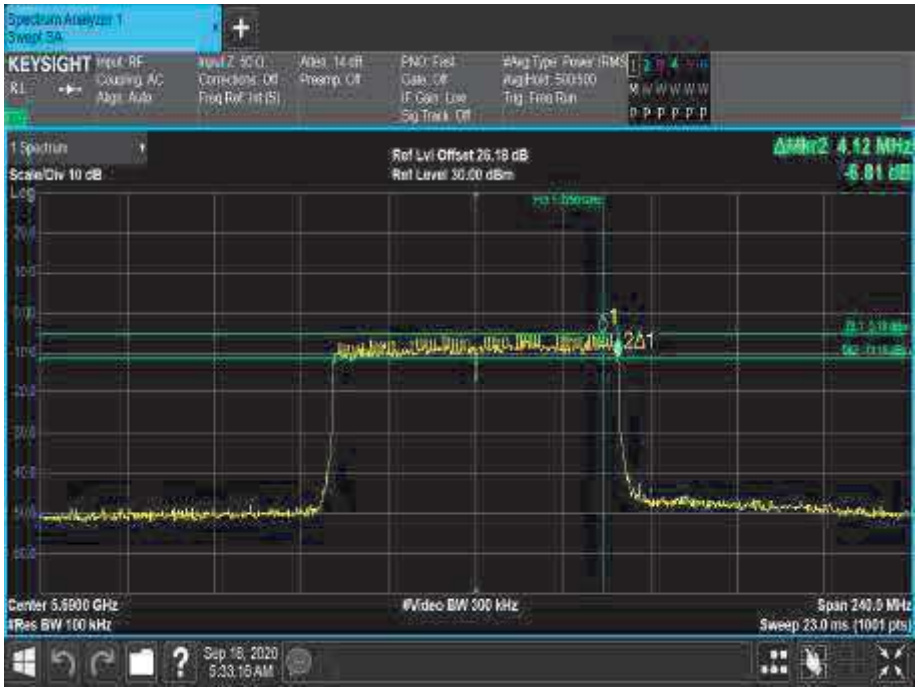

Figure 718 - 5690 MHz - 6 dB DTS Bandwidth

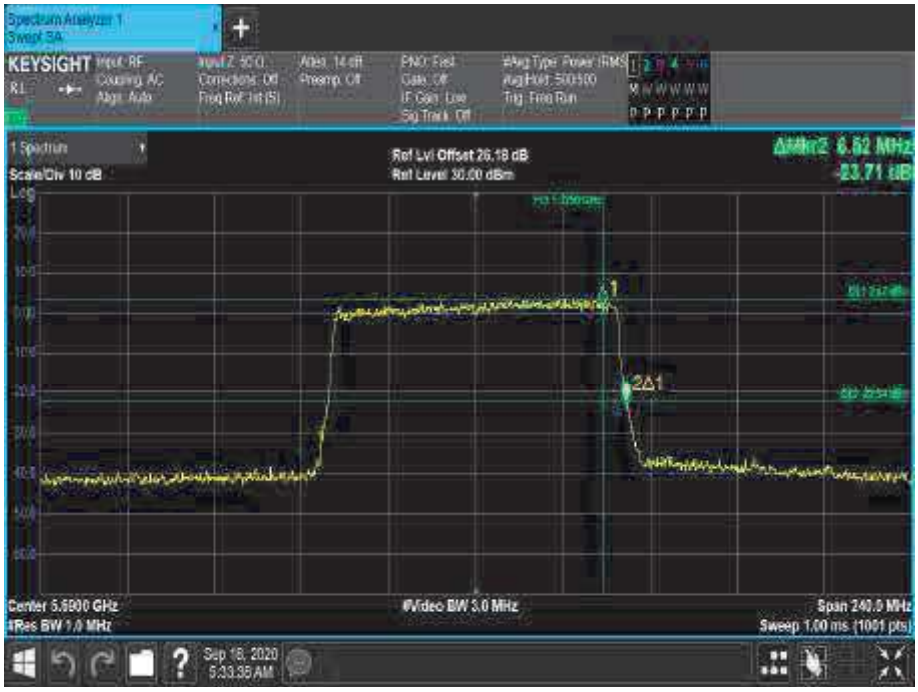

Figure 719 - 5690 MHz - 26 dB Emission Bandwidth

Figure 720 - 5690 MHz - 99% Occupied Bandwidth

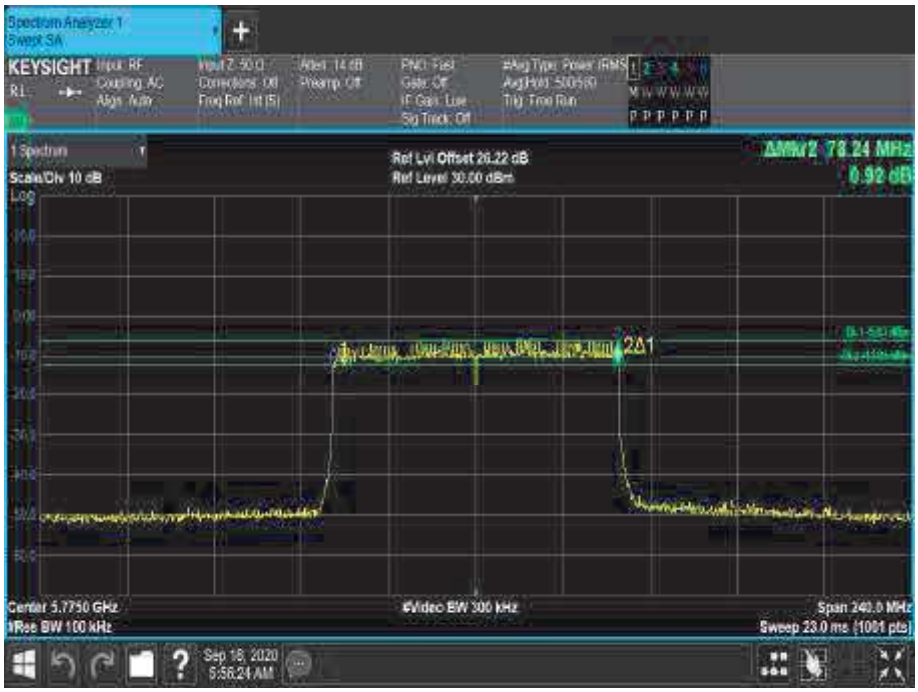

Figure 721 - 5775 MHz - 6 dB DTS Bandwidth

Figure 722 - 5775 MHz - 26 dB Emission Bandwidth

Figure 723 - 5775 MHz - 99% Occupied Bandwidth

Channel	Middle
Frequency (MHz)	5775
6 dB Bandwidth (MHz)	2.640
26 dB Bandwidth (MHz)	19.680
99% Bandwidth (MHz)	19.320

Table 588 - 802.11ax / HE80 MCS7x2 / RU 26-0 / MIMO SDM / Cores 0+1

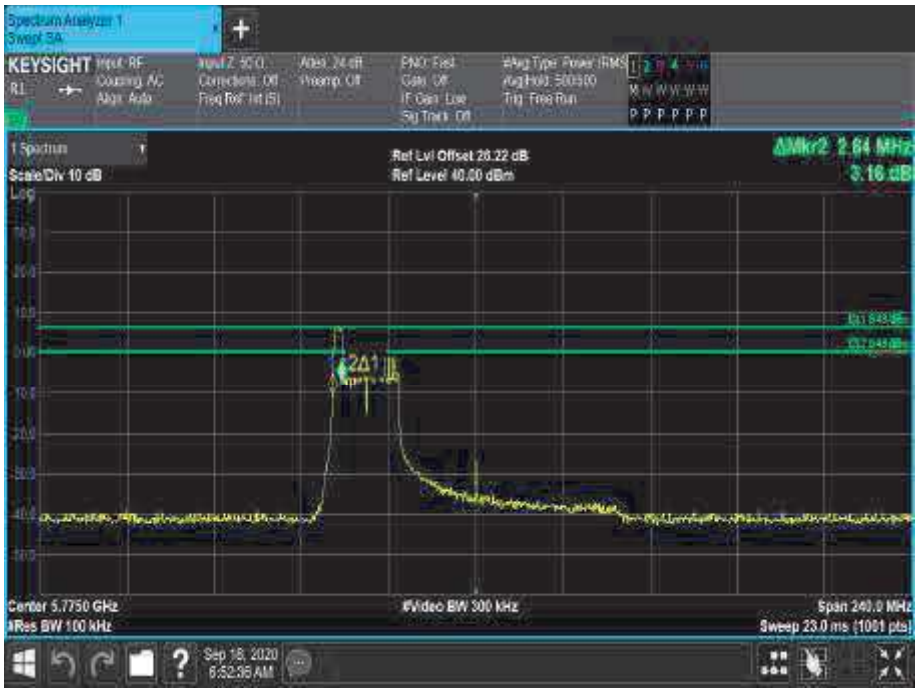

Figure 724 - 5775 MHz - 6 dB DTS Bandwidth

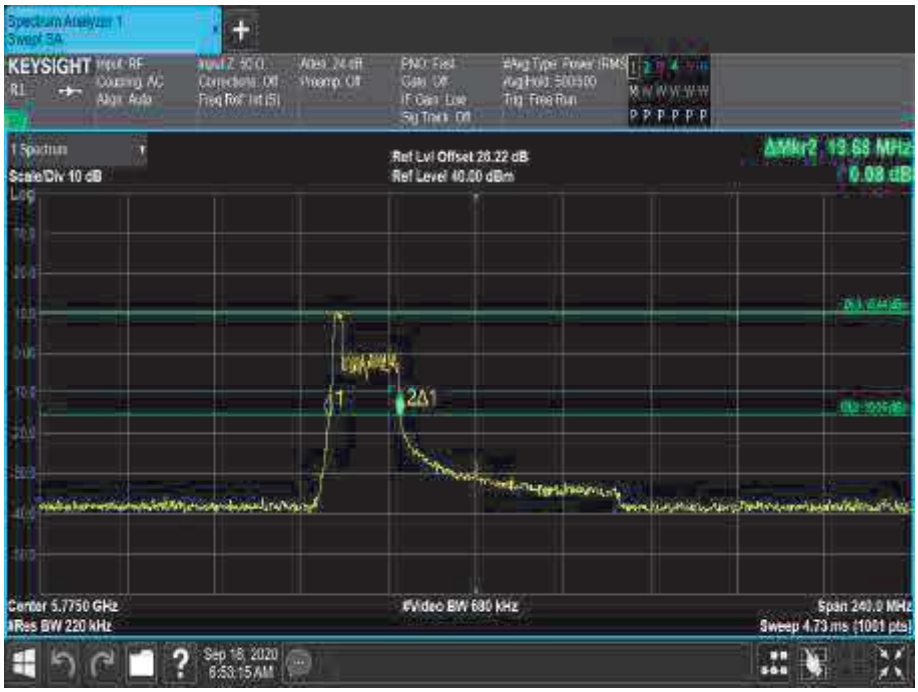

Figure 725 - 5775 MHz - 26 dB Emission Bandwidth

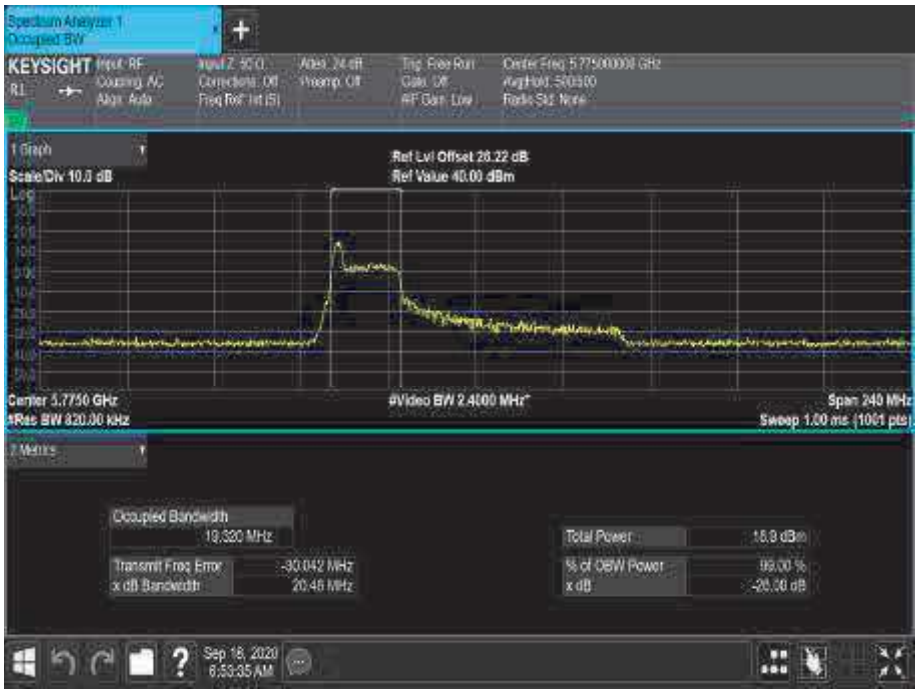

Figure 726 - 5775 MHz - 99% Occupied Bandwidth

Channel	Middle
Frequency (MHz)	5775
6 dB Bandwidth (MHz)	2.640
26 dB Bandwidth (MHz)	20.640
99% Bandwidth (MHz)	20.027

Table 589 - 802.11ax / HE80 MCS7x2 / RU 26-36 / MIMO SDM / Cores 0+1

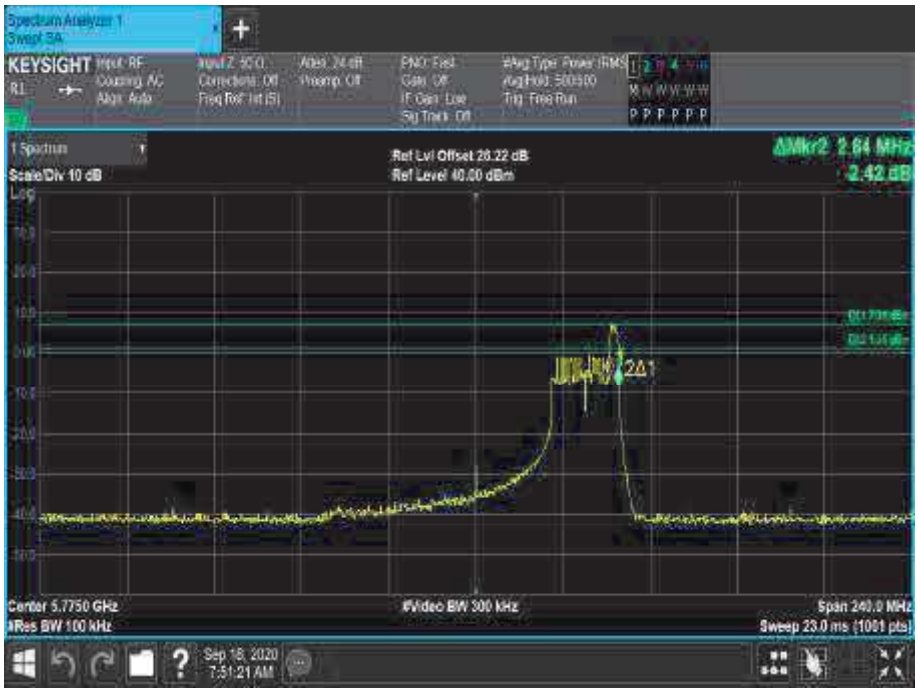

Figure 727 - 5775 MHz - 6 dB DTS Bandwidth

Figure 728 - 5775 MHz - 26 dB Emission Bandwidth

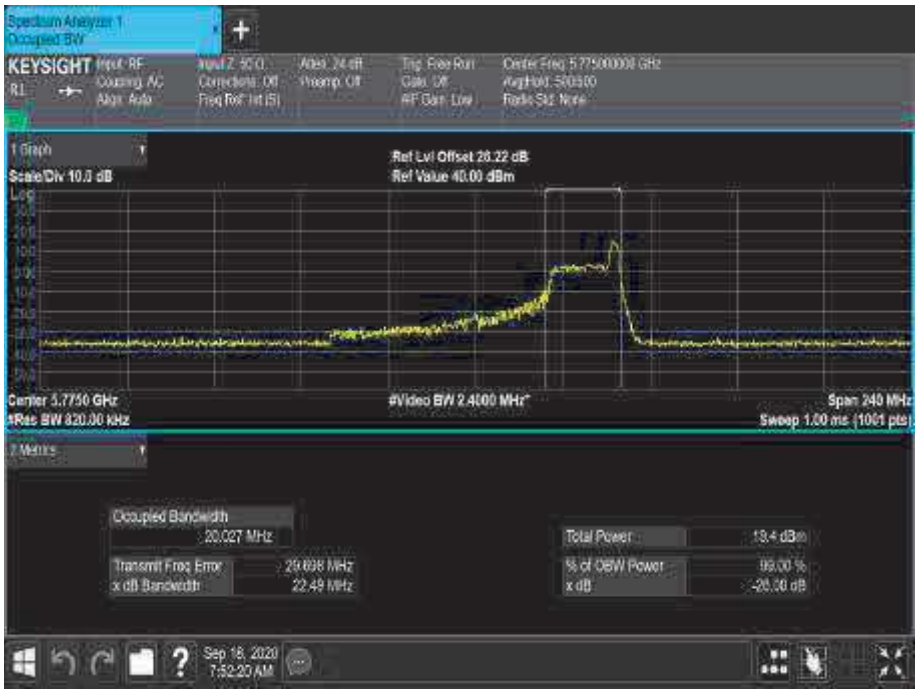

Figure 729 - 5775 MHz - 99% Occupied Bandwidth

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
Power splitter - 2 port	Mini-Circuits	ZN2PD-63-S+	4742	12	29-Nov-2020
Power splitter - 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
Power Splitter, 4 way	Mini-Circuits	ZN4PD1-63-S+	5236	-	O/P Mon
Power Splitter, 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 590

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

A2338, S/N: C02CX02PQC36 - Modification State 0

2.4.3 Date of Test

19-July-2020 to 14-August-2020

2.4.4 Test Method

The test was performed in accordance with ANSI C63.10, clause 6.6.

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	19.9-22.4°C
Relative Humidity	39.8-63.4%

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	59.87
802.11n, HT20 Core 1	MCS7	-	-	5500	5470	64.14
802.11ax HE20, Core 1	MCS7	SU	-	5500	5470	63.64
802.11ax HE20, Core 1	MCS7	52	37	5500	5470	58.92
802.11a, Core 1	6 Mbps	-	-	5700	5725	60.94
802.11n, HT20 Core 1	MCS7	-	-	5700	5725	64.16
802.11ax HE20, Core 1	MCS7	SU	-	5700	5725	63.48
802.11ax HE20, Core 1	MCS7	52	40	5700	5725	61.55
802.11a, Core 1	6 Mbps	-	-	5745	5725	56.38
802.11n HT20, Core 1	MCS7	-	-	5745	5725	57.23
802.11ax HE20, Core 1	MCS7	SU	-	5745	5725	56.96
802.11ax HE20, Core 1	MCS7	26	0	5745	5725	55.90
802.11a, Core 1	6 Mbps	-	-	5825	5850	57.80
802.11n HT20, Core 1	MCS7	-	-	5825	5850	57.39
802.11ax HE20, Core 1	MCS7	SU	-	5825	5850	57.56
802.11ax HE20, Core 1	MCS7	26	8	5825	5850	56.31

Table 591 - SISO Authorised Band Edge results

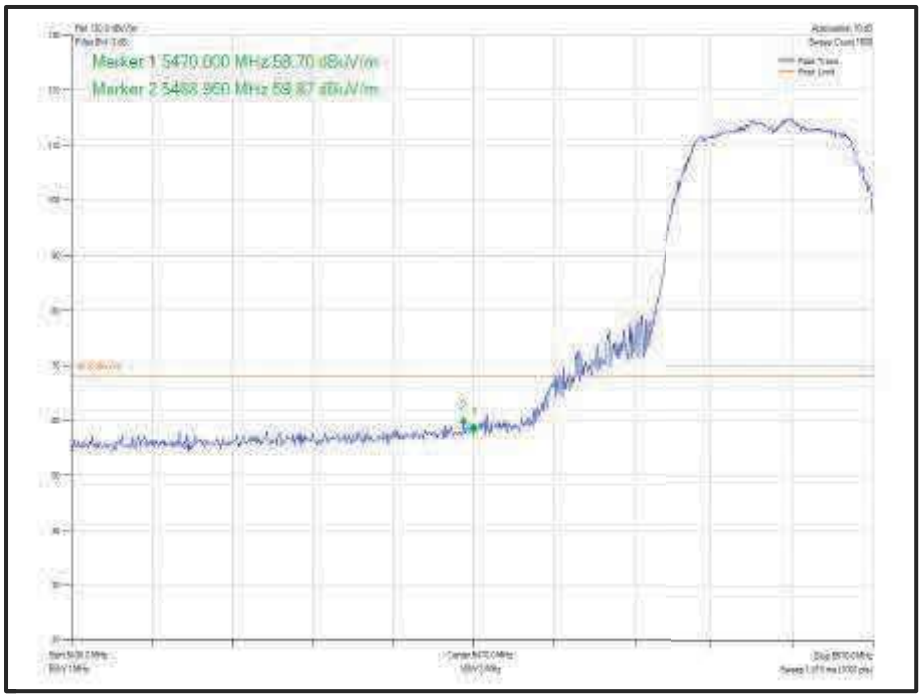

Figure 730 - 802.11a, Core 1 - 5500 MHz
Band Edge Frequency 5470 MHz

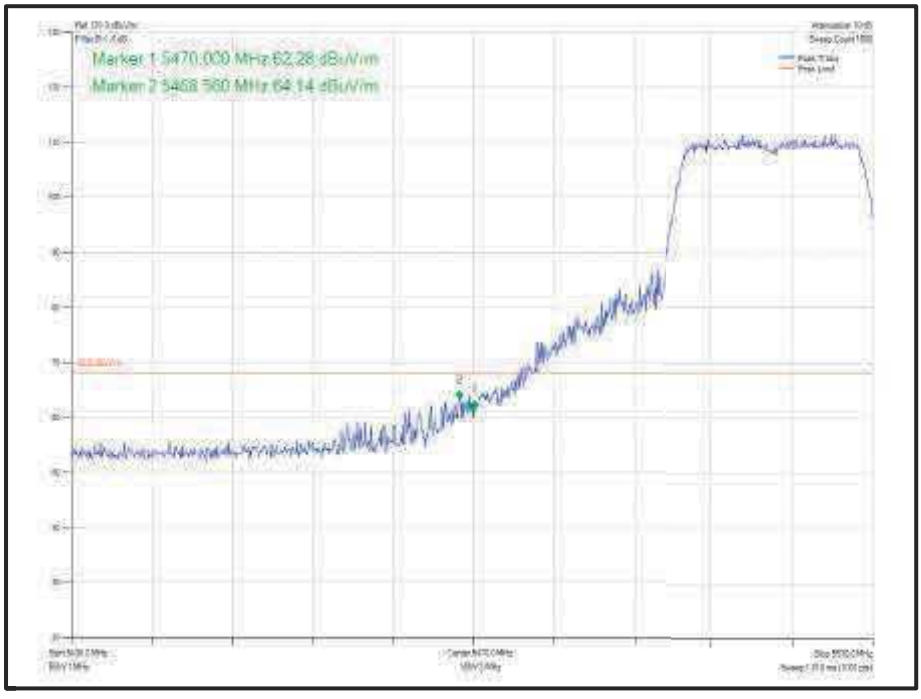

Figure 731 - 802.11n HT20, Core 1 - 5500 MHz
Band Edge Frequency 5470 MHz

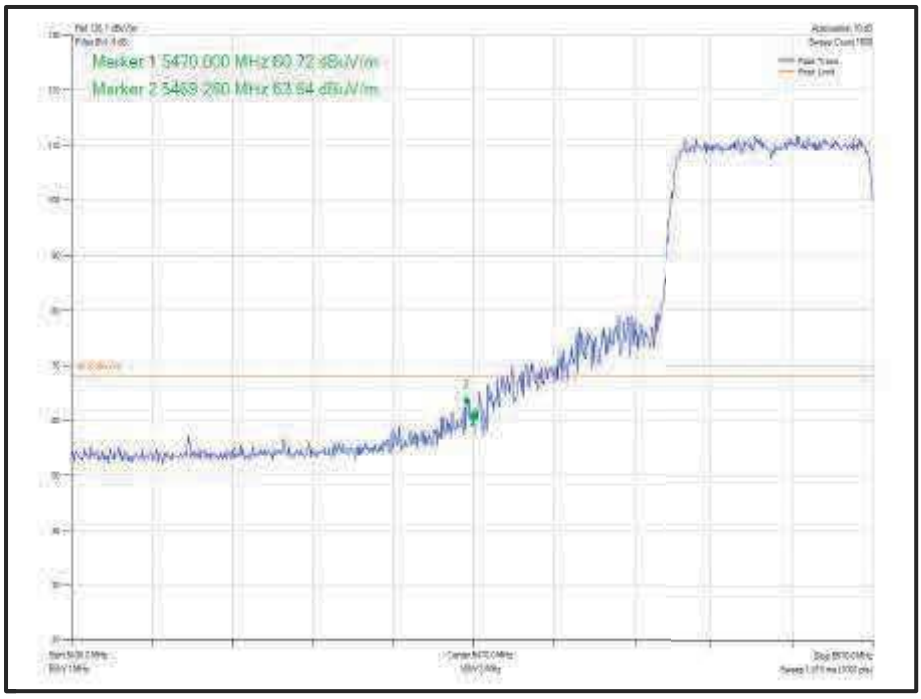

Figure 732 - 802.11ax HE20, Core 1, SU - 5500 MHz Band Edge Frequency 5470 MHz

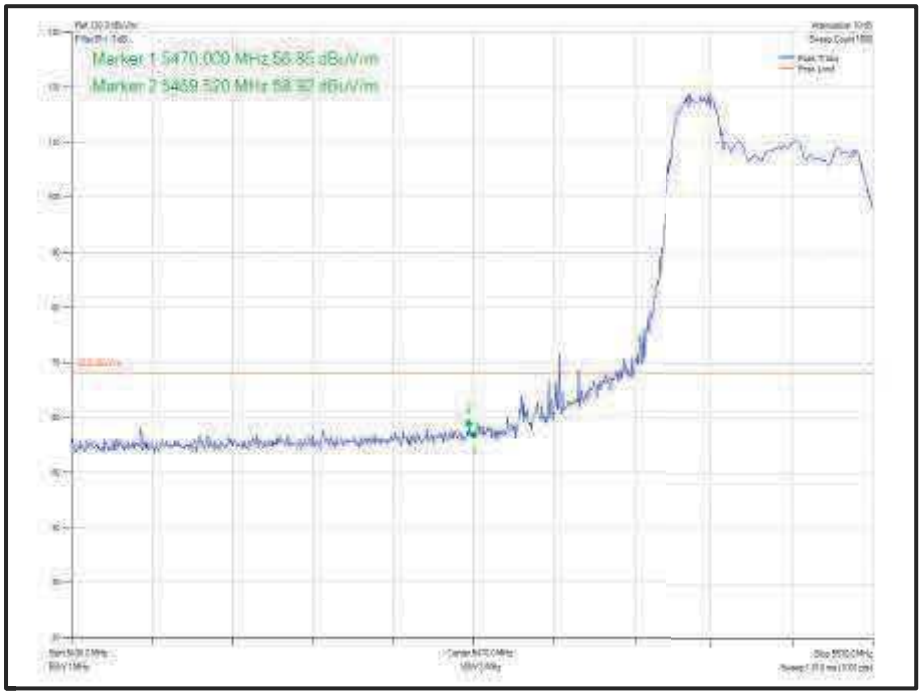

Figure 733 - 802.11ax HE20, Core 1, 52-37 - 5500 MHz Band Edge Frequency 5470 MHz

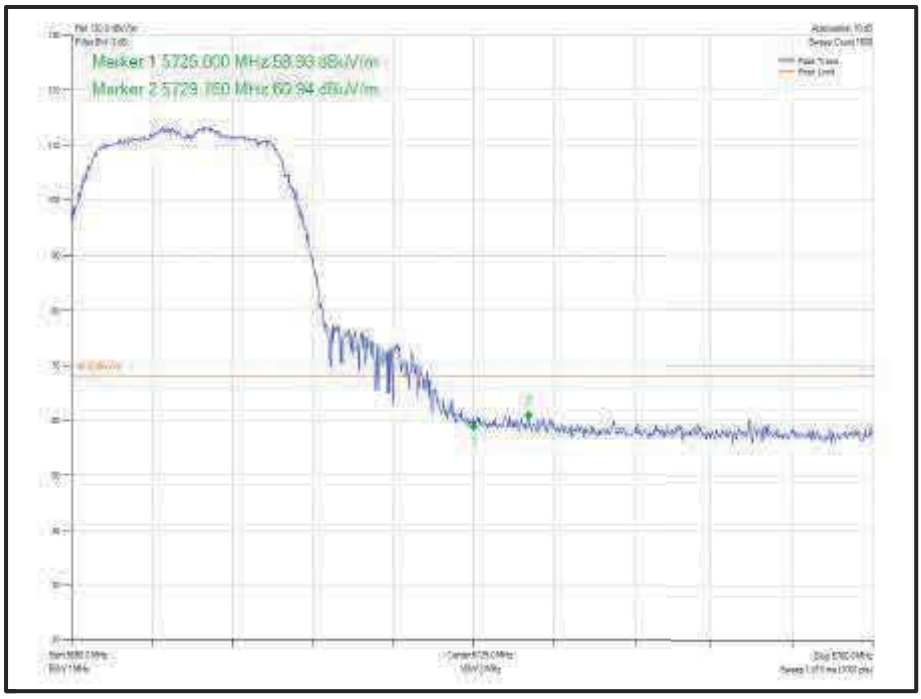

Figure 734 - 802.11a, Core 1 - 5700 MHz
Band Edge Frequency 5725 MHz

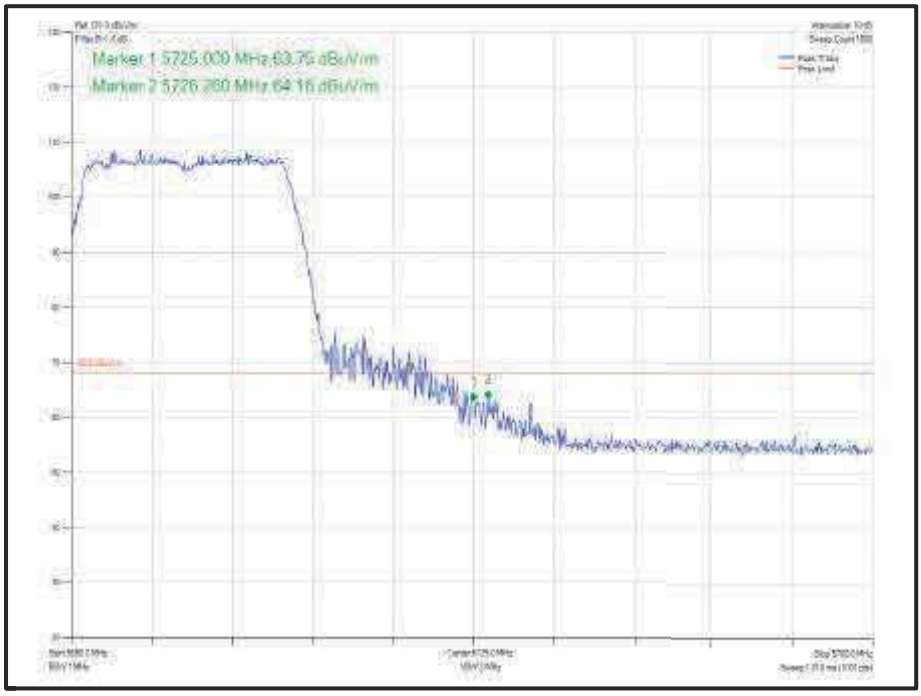

Figure 735 - 802.11n HT20, Core 1 - 5700 MHz
Band Edge Frequency 5725 MHz

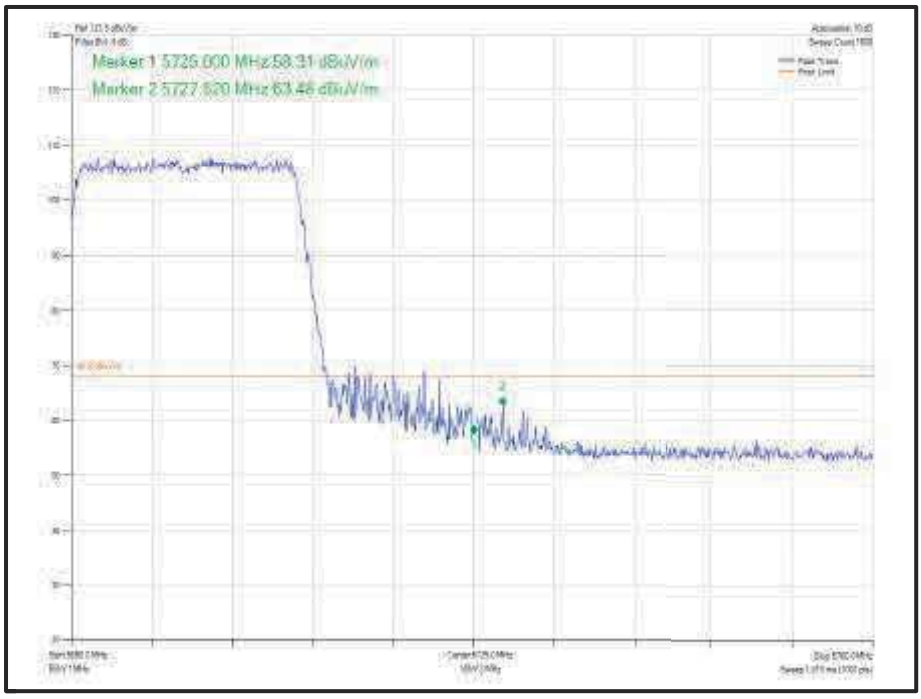

Figure 736 - 802.11ax HE20, Core 1, SU - 5700 MHz
Band Edge Frequency 5725 MHz

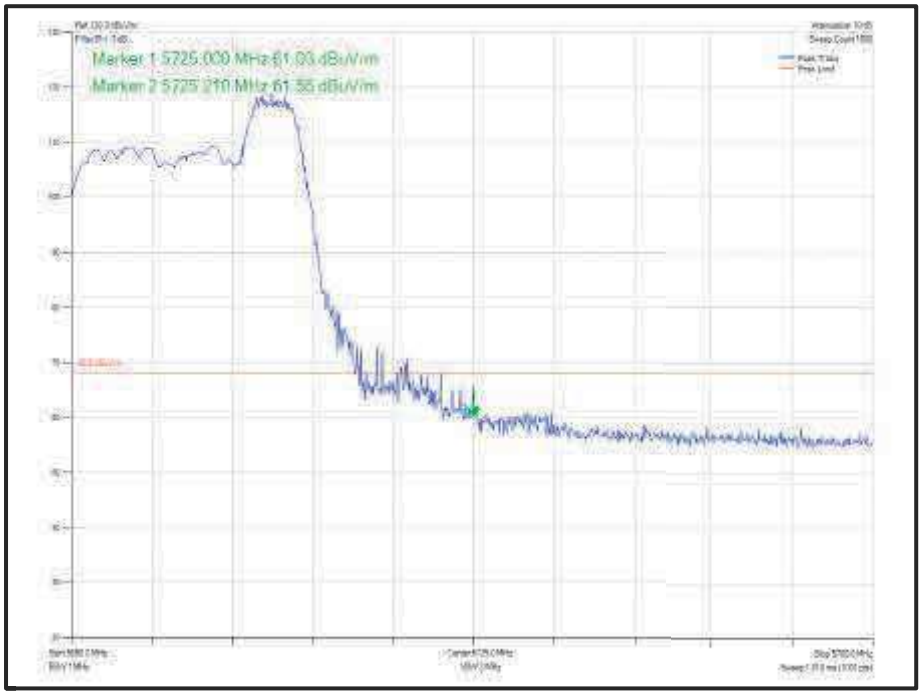

Figure 737 - 802.11ax HE20, Core 1, 52-40 - 5700 MHz
Band Edge Frequency 5725 MHz

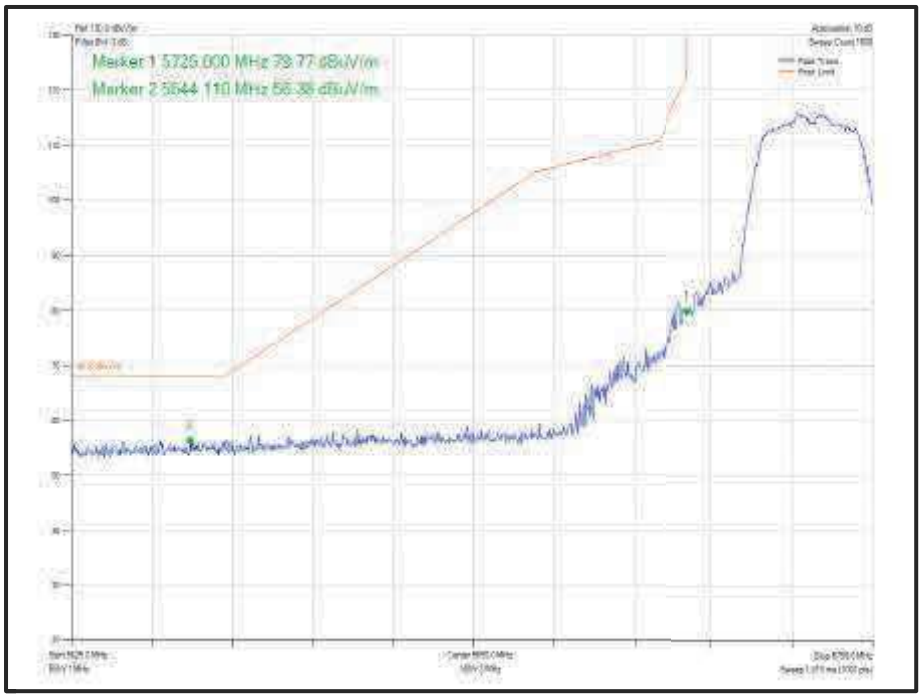

Figure 738 - 802.11a, Core 1 - 5745 MHz
Band Edge Frequency 5725 MHz

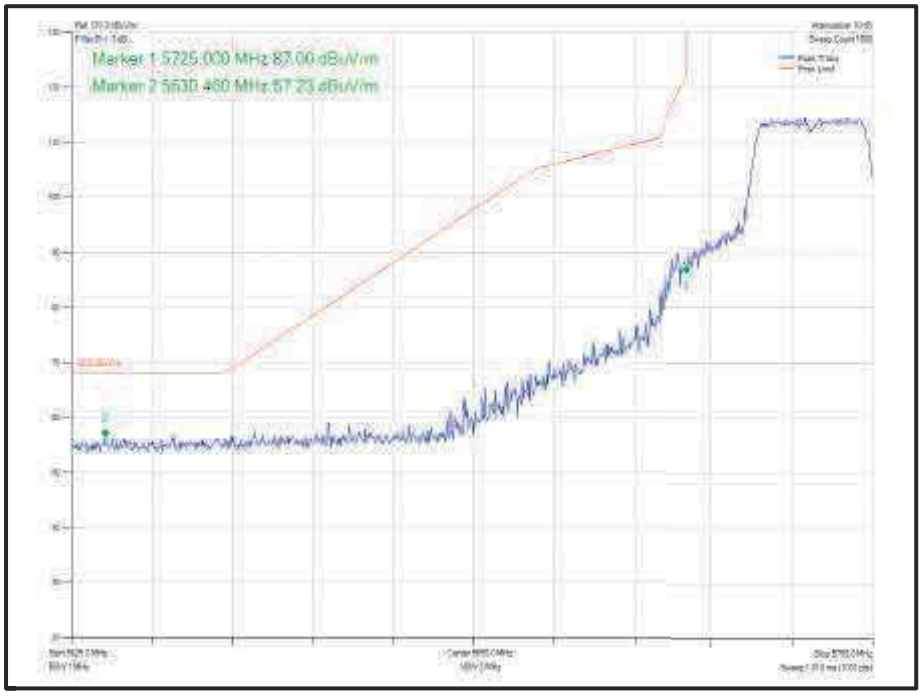

Figure 739 - 802.11n HT20, Core 1 - 5745 MHz
Band Edge Frequency 5725 MHz

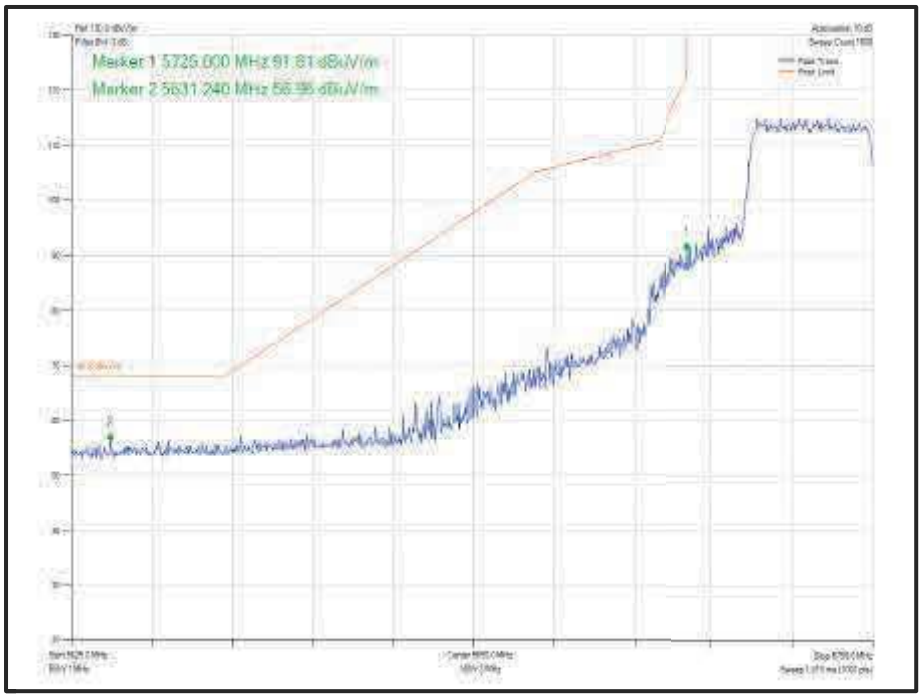

Figure 740 - 802.11ax HE20, Core 1, SU - 5745 MHz
Band Edge Frequency 5735 MHz

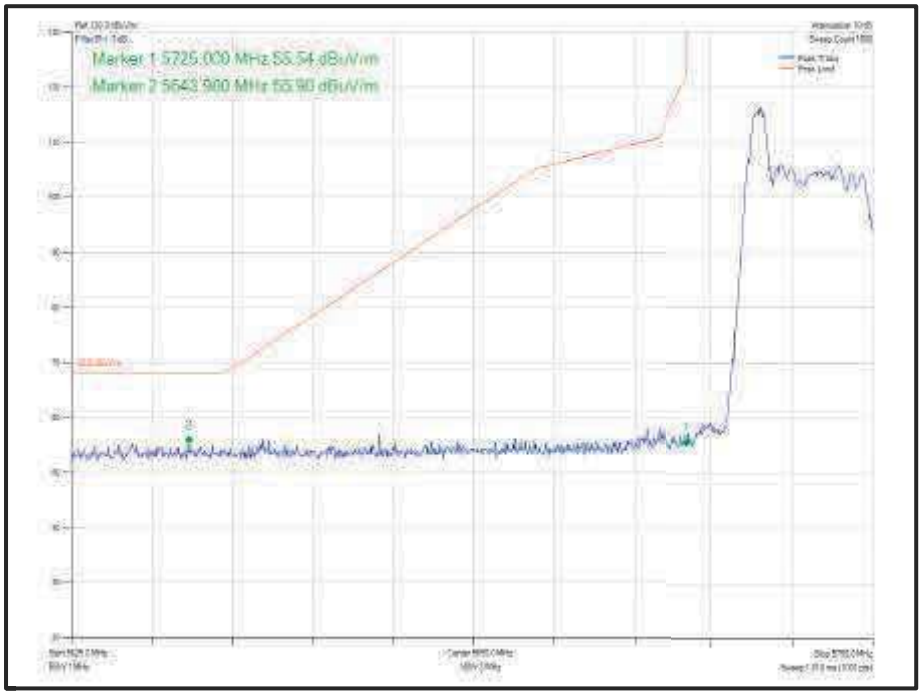

Figure 741 - 802.11ax HE20, Core 1, 26-0 - 5745 MHz
Band Edge Frequency 5735 MHz

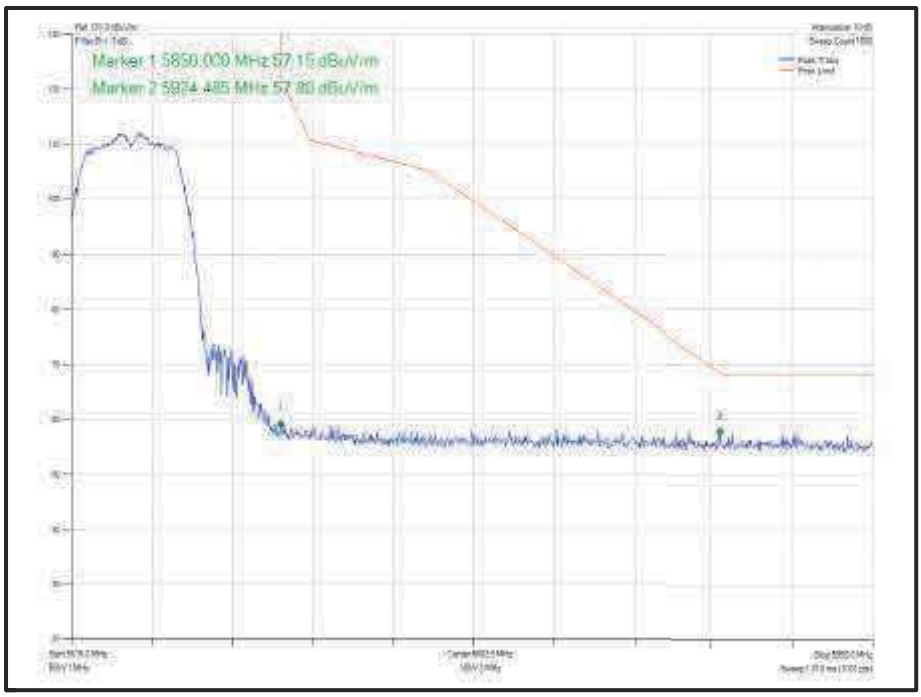

Figure 742 - 802.11a, Core 1, - 5825 MHz
Band Edge Frequency 5850 MHz

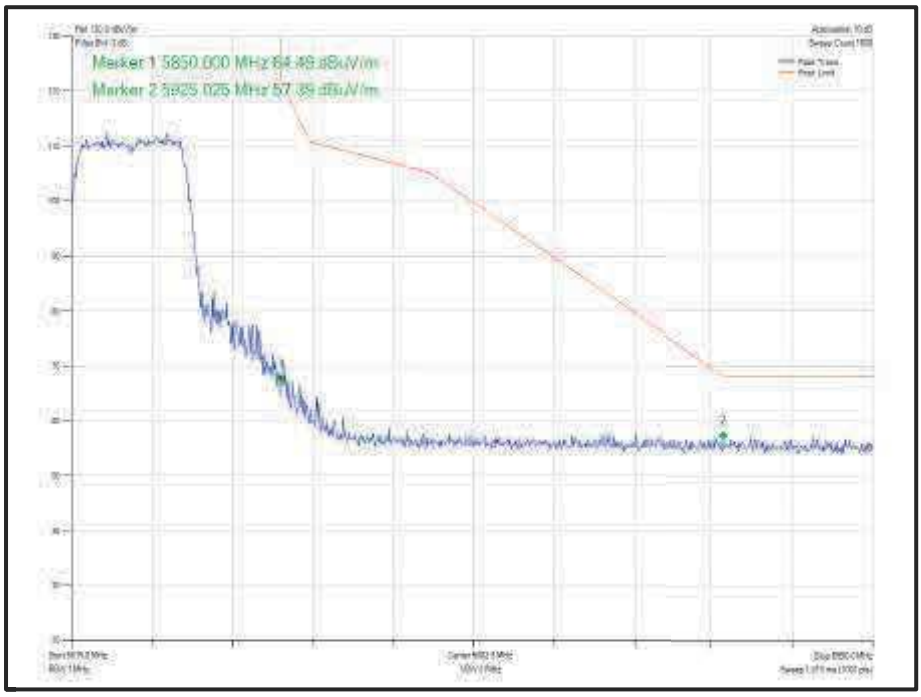

Figure 743 - 802.11n HT20, Core 1 - 5825 MHz
Band Edge Frequency 5850 MHz

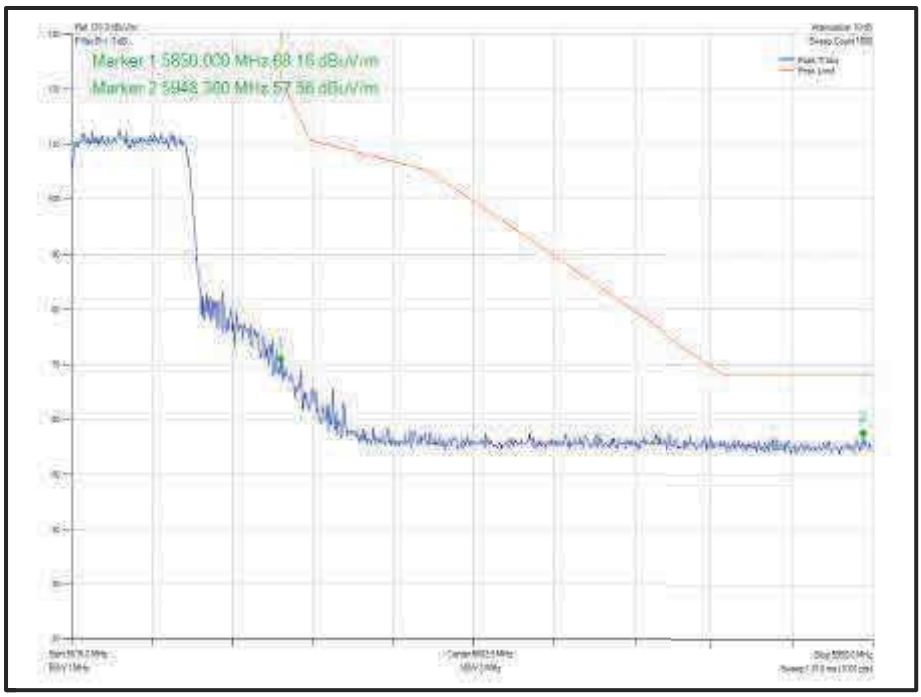

Figure 744 - 802.11ax HE20, Core 1, SU - 5825 MHz Band Edge Frequency 5850 MHz

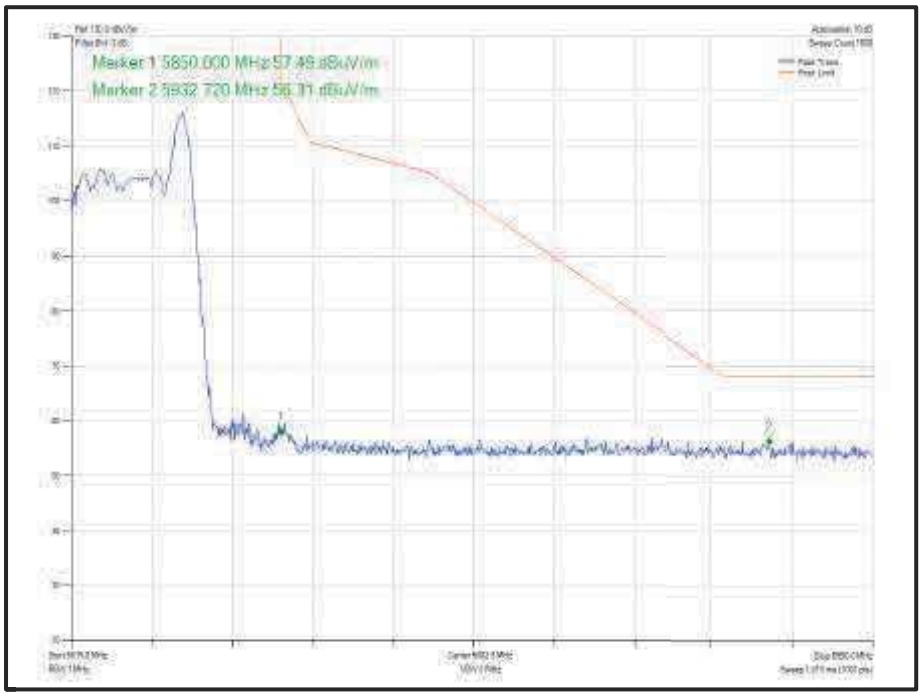

Figure 745 - 802.11ax HE20, Core 1, 26-8 - 5825 MHz Band Edge Frequency 5850 MHz

Mode	Data Rate/ MCS	Resource size	Resource Index	TX Frequency (MHz)	Band Edge Frequency (MHz)	Level (dBuV/m)
802.11n HT20 CDD, Cores 0-1	MCS7	-	-	5500	5470	64.14
802.11n HT20 SDM, Cores 0-1	MCS7	-	-	5500	5470	63.44
802.11ax HE20 CDD, Cores 0-1	MCS7	SU	-	5500	5470	63.64
802.11ax HE20 CDD, Cores 0-1	MCS7	52	37	5500	5470	62.35
802.11ax HE20 SDM, Cores 0-1	MCS7	SU	-	5500	5470	63.27
802.11ax HE20 SDM, Cores 0-1	MCS7	52	37	5500	5470	61.30
802.11n HT20 CDD, Cores 0-1	MCS7	-	-	5700	5725	66.33
802.11n HT20 SDM, Cores 0-1	MCS7	-	-	5700	5725	66.65
802.11ax HE20 CDD, Cores 0-1	MCS7	SU	-	5700	5725	61.74
802.11ax HE20 CDD, Cores 0-1	MCS7	52	40	5700	5725	60.22
802.11ax HE20 SDM, Cores 0-1	MCS7	SU	-	5700	5725	62.61
802.11ax HE20 SDM, Cores 0-1	MCS7	52	40	5700	5725	59.15
802.11n HT20 CDD, Cores 0-1	MCS7	-	-	5745	5725	59.62
802.11n HT20 SDM, Cores 0-1	MCS7	-	-	5745	5725	58.61
802.11ax HE20 CDD, Cores 0-1	MCS7	SU	-	5745	5725	60.28
802.11ax HE20 CDD, Cores 0-1	MCS7	26	0	5745	5725	55.64
802.11ax HE20 SDM, Cores 0-1	MCS7	SU	-	5745	5725	58.68
802.11ax HE20 SDM, Cores 0-1	MCS7	26	0	5745	5725	55.64
802.11n HT20 CDD, Cores 0-1	MCS7	-	-	5825	5850	58.40
802.11n HT20 SDM, Cores 0-1	MCS7	-	-	5825	5850	58.24
802.11ax HE20 CDD, Cores 0-1	MCS7	SU	-	5825	5850	58.54
802.11ax HE20 CDD, Cores 0-1	MCS7	26	8	5825	5850	56.98
802.11ax HE20 SDM, Cores 0-1	MCS7	SU	-	5825	5850	58.09
802.11ax HE20 SDM, Cores 0-1	MCS7	26	8	5825	5850	56.87

Table 592 - MIMO 2TX Authorised Band Edge Results

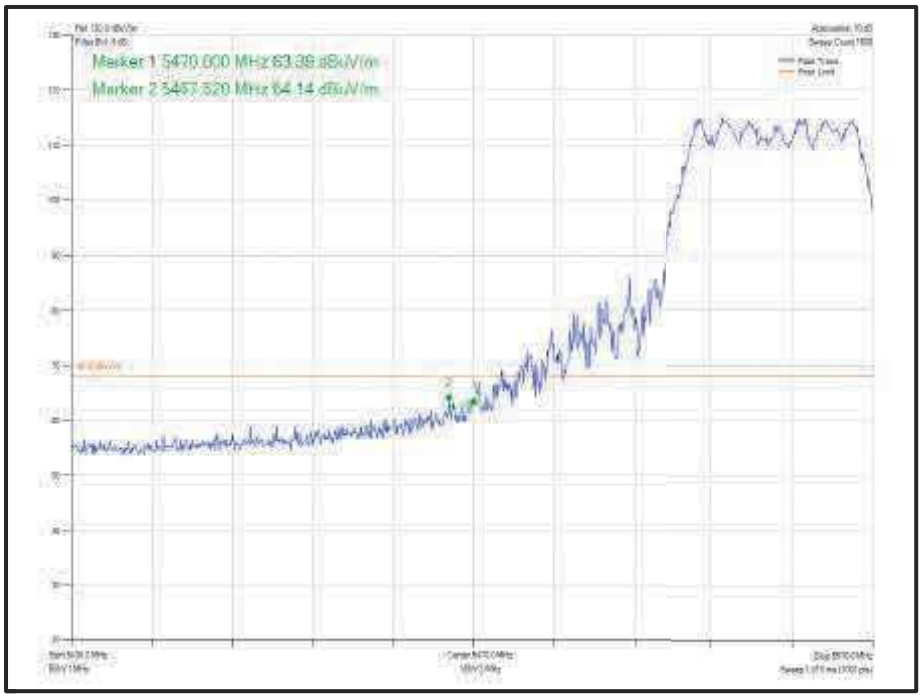

Figure 746 - 802.11n HT20 CDD, Cores 0-1 - 5500 MHz Band Edge Frequency 5470 MHz

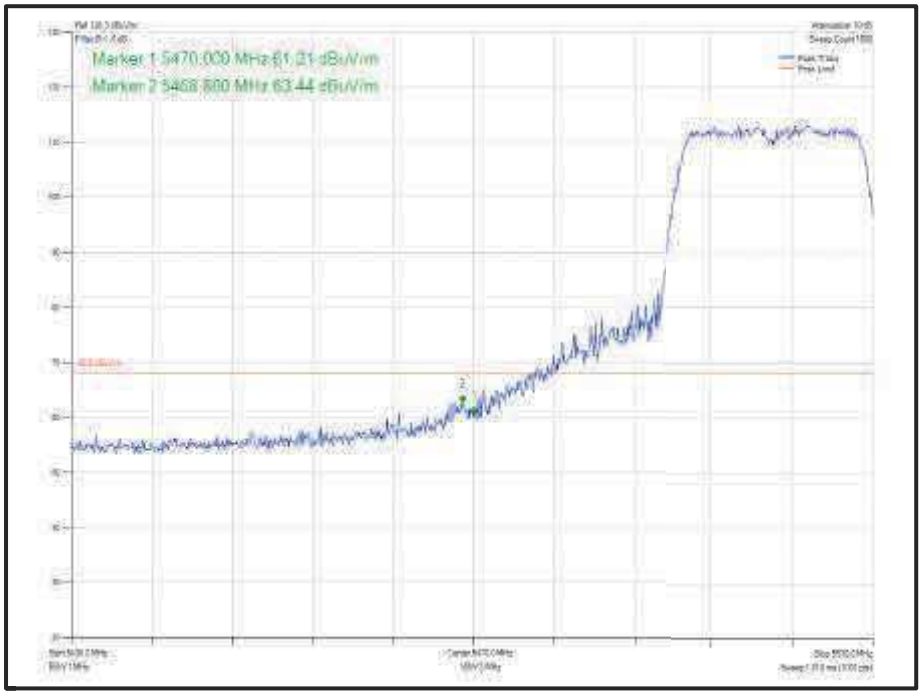

Figure 747 - 802.11n HT20 SDM, Cores 0-1 - 5500 MHz Band Edge Frequency 5470 MHz

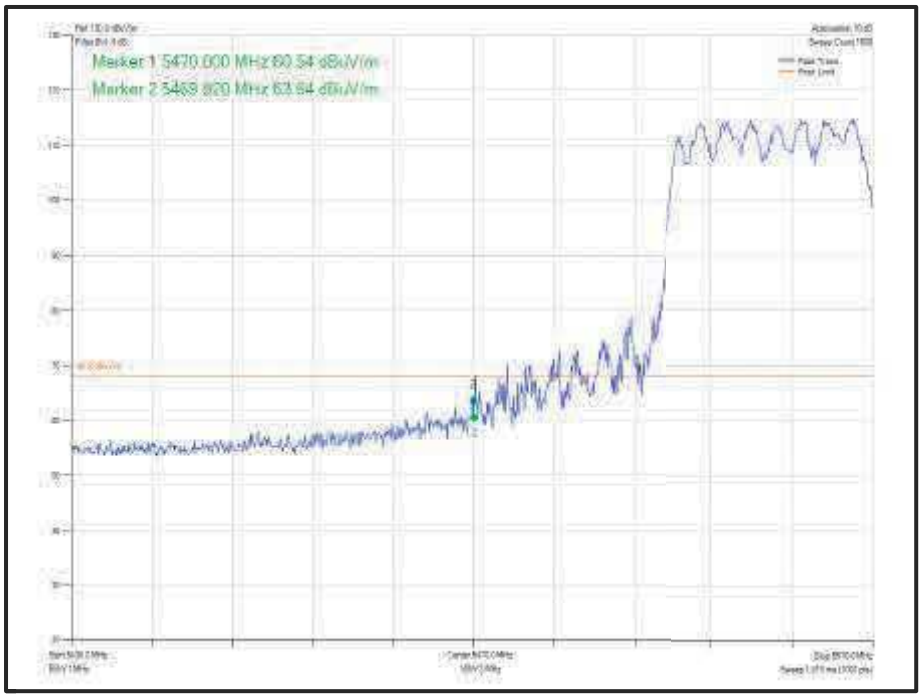

Figure 748 - 802.11ax HE20 CDD, Cores 0-1, SU - 5500 MHz Band Edge Frequency 5470 MHz

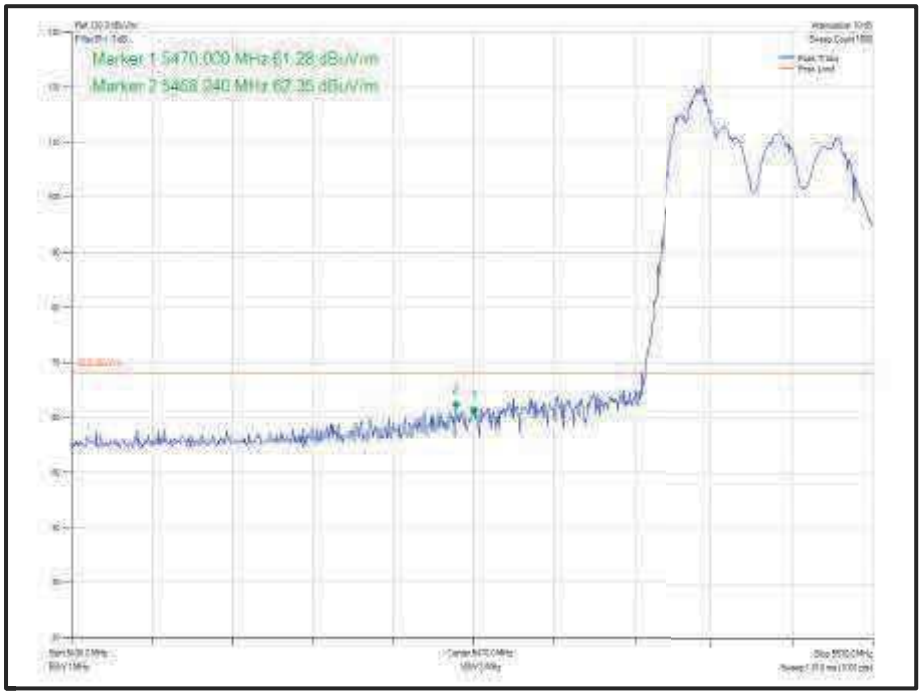

Figure 749 - 802.11ax HE20 CDD, Cores 0-1 52-37 - 5500 MHz Band Edge Frequency 5470 MHz

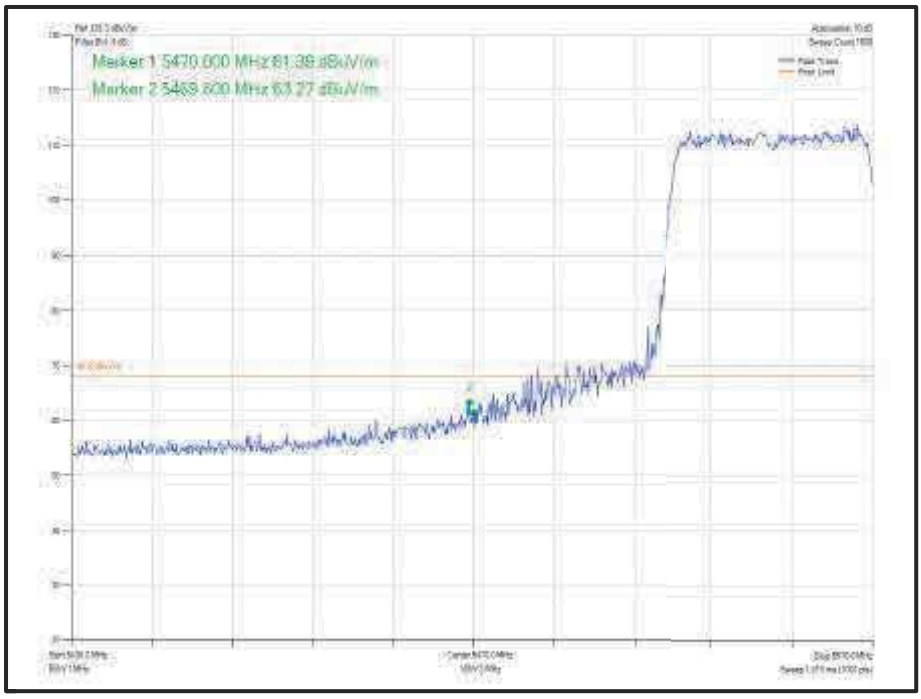

Figure 750 - - 802.11ax HE20 SDM, Cores 0-1 SU - 5500 MHz Band Edge Frequency 5470 MHz

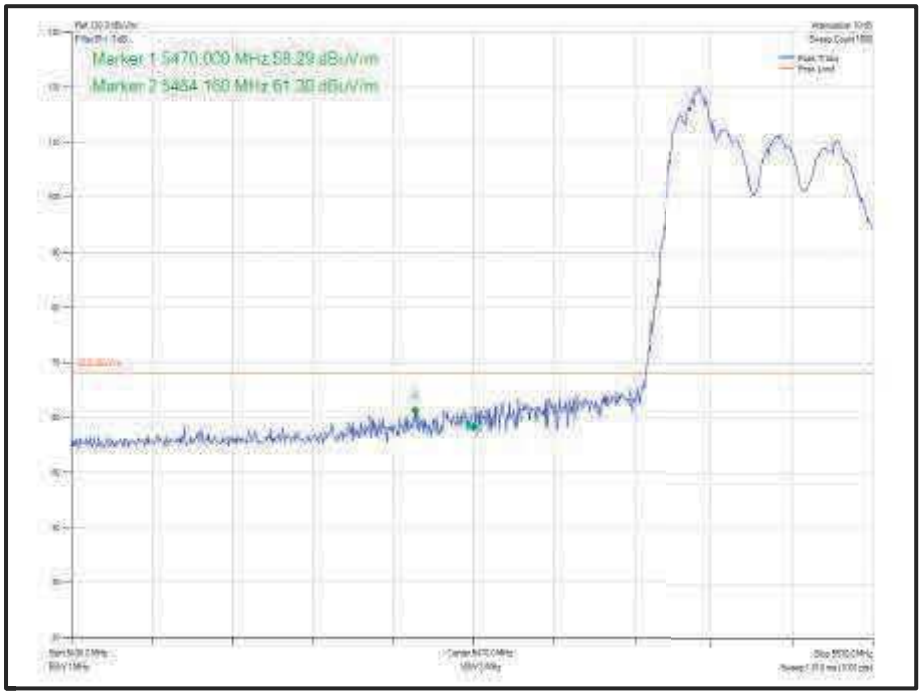

Figure 751 - 802.11ax HE20 SDM, Cores 0-1 52-37 - 5500 MHz Band Edge Frequency 5470 MHz

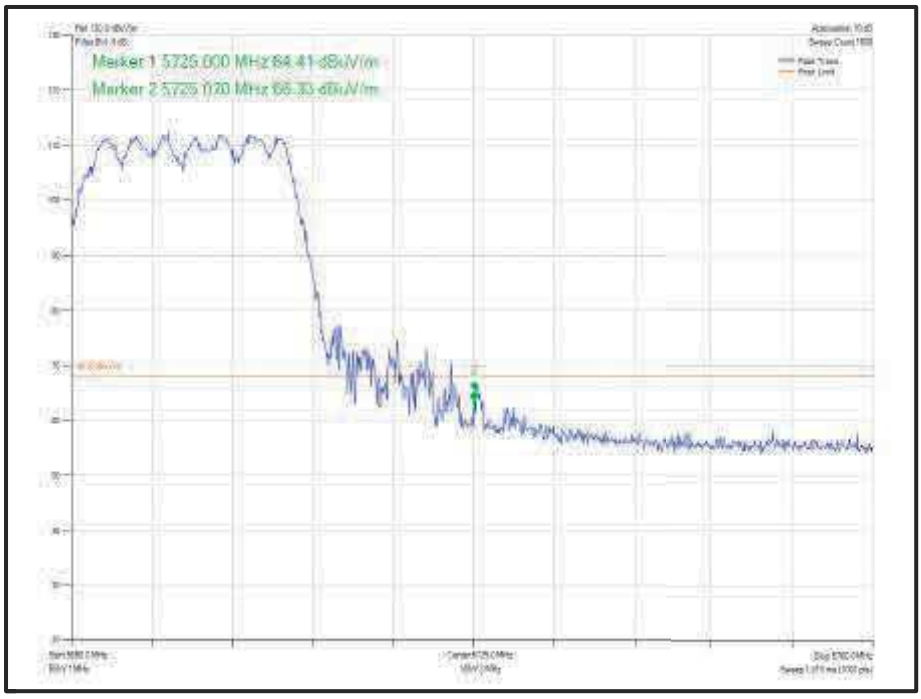

Figure 752 - 802.11n HT20 CDD, Cores 0-1 - 5700 MHz Band Edge Frequency 5725 MHz

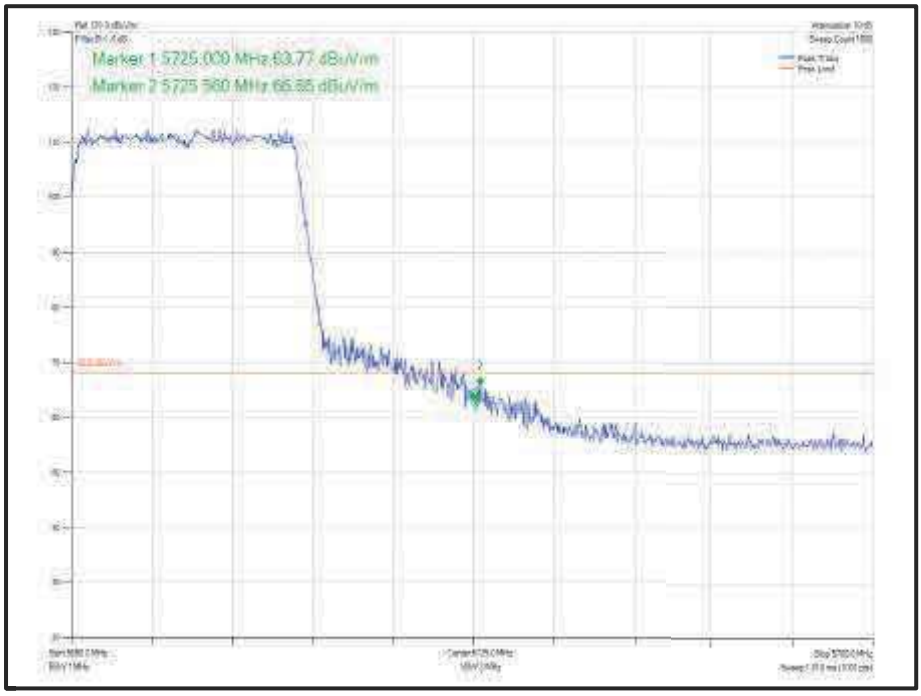

Figure 753 - 802.11n HT20 SDM, Cores 0-1 - 5700 MHz Band Edge Frequency 5725 MHz

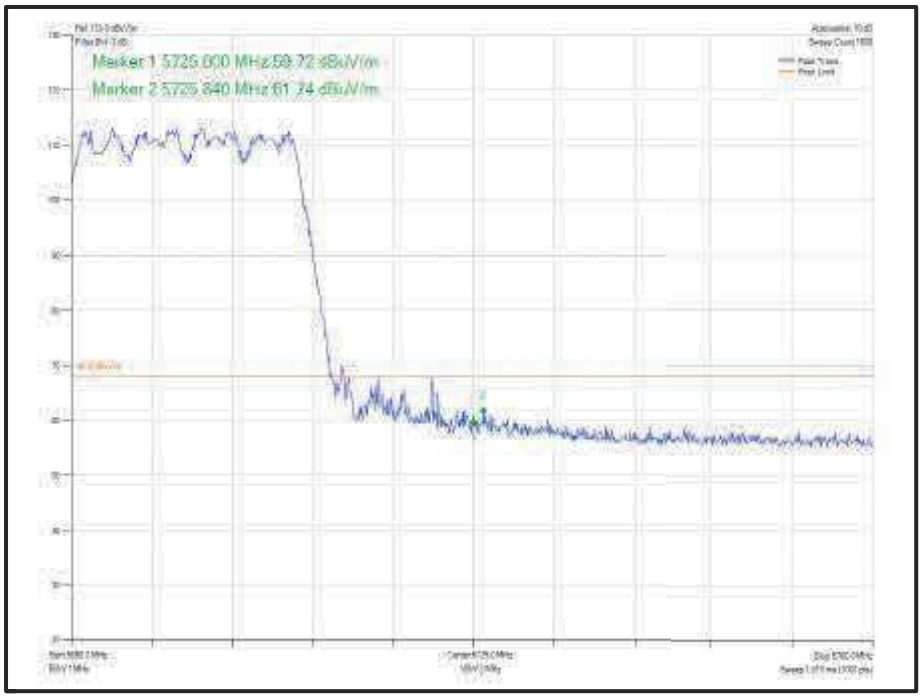

Figure 754 - 802.11ax HE20 CDD, Cores 0-1, SU - 5700 MHz Band Edge Frequency 5725 MHz

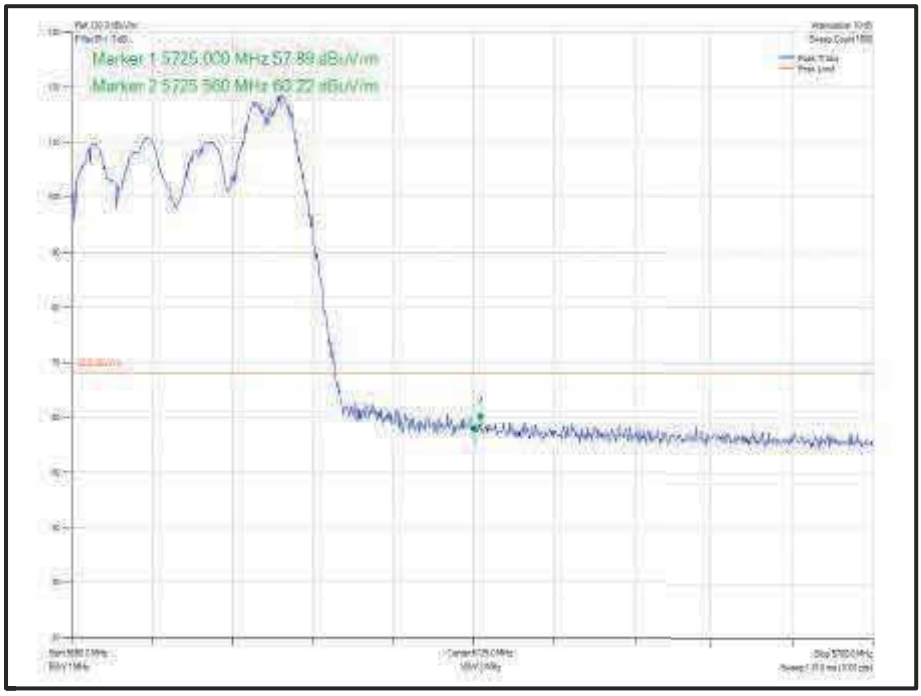

Figure 755 - 802.11ax HE20 CDD, Cores 0-1, 52-40 - 5700 MHz Band Edge Frequency 5725 MHz

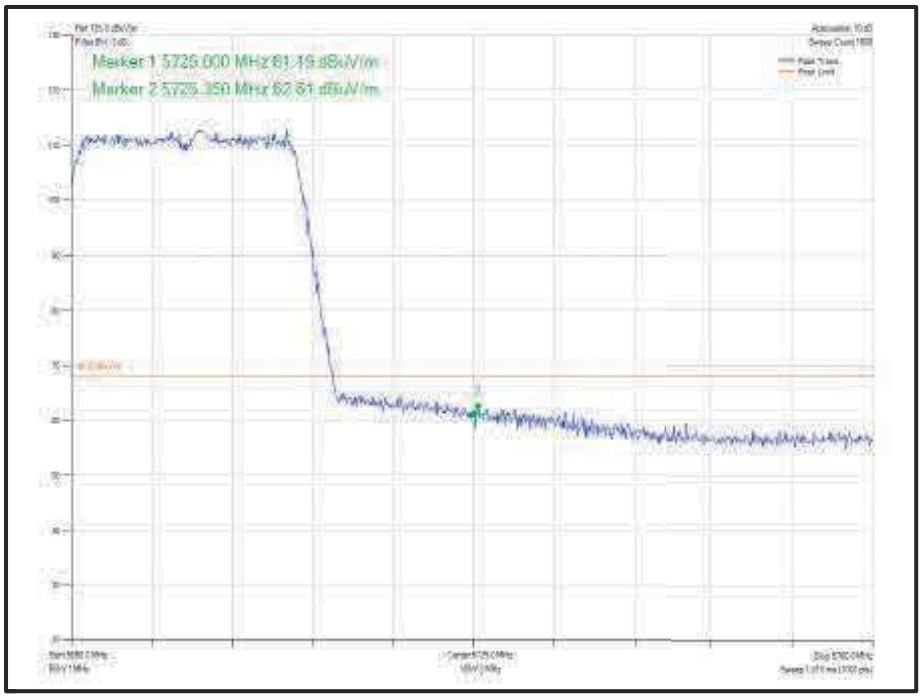

Figure 756 - 802.11ax HE20 SDM, Cores 0-1, SU - 5700 MHz Band Edge Frequency 5725 MHz

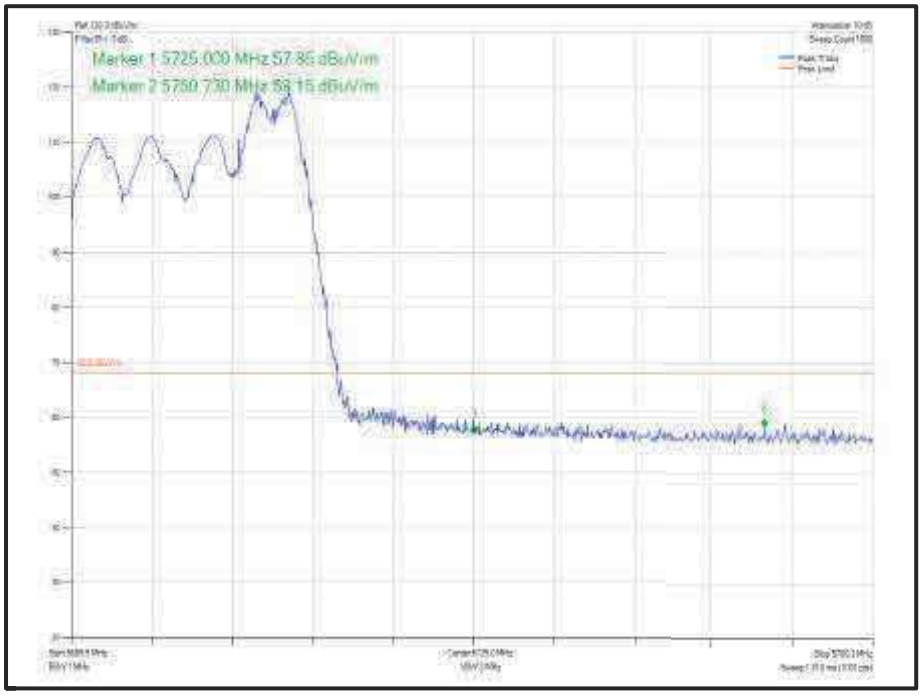

Figure 757 - 802.11ax HE20 SDM, Cores 0-1, 26-8 - 5700 MHz Band Edge Frequency 5725 MHz

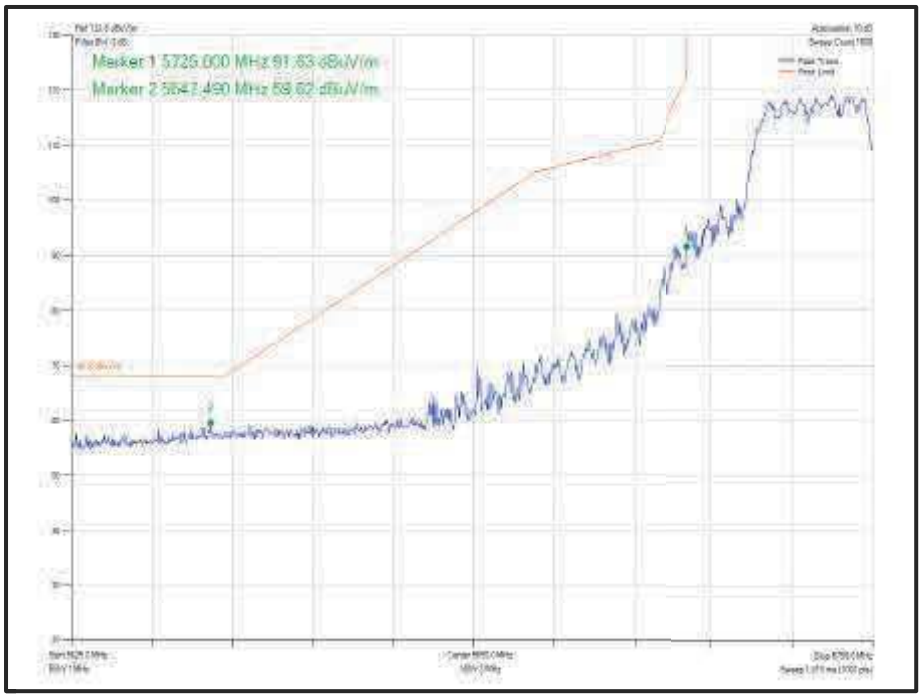

Figure 758 - 802.11n HT20 CDD, Cores 0-1 - 5745 MHz Band Edge Frequency 5725 MHz

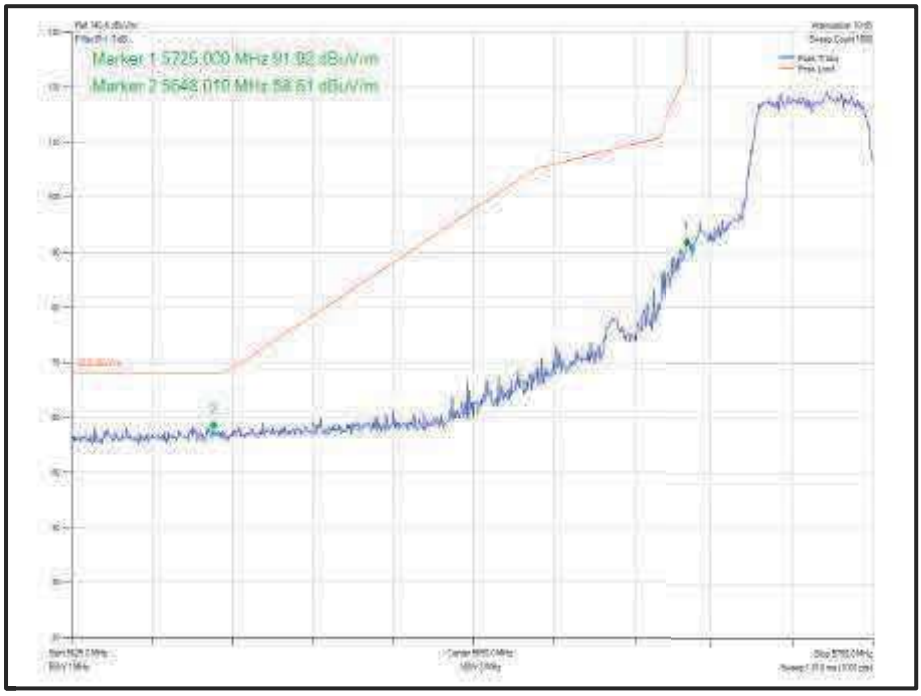

Figure 759 - 802.11n HT20 SDM, Cores 0-1 - 5745 MHz Band Edge Frequency 5725 MHz

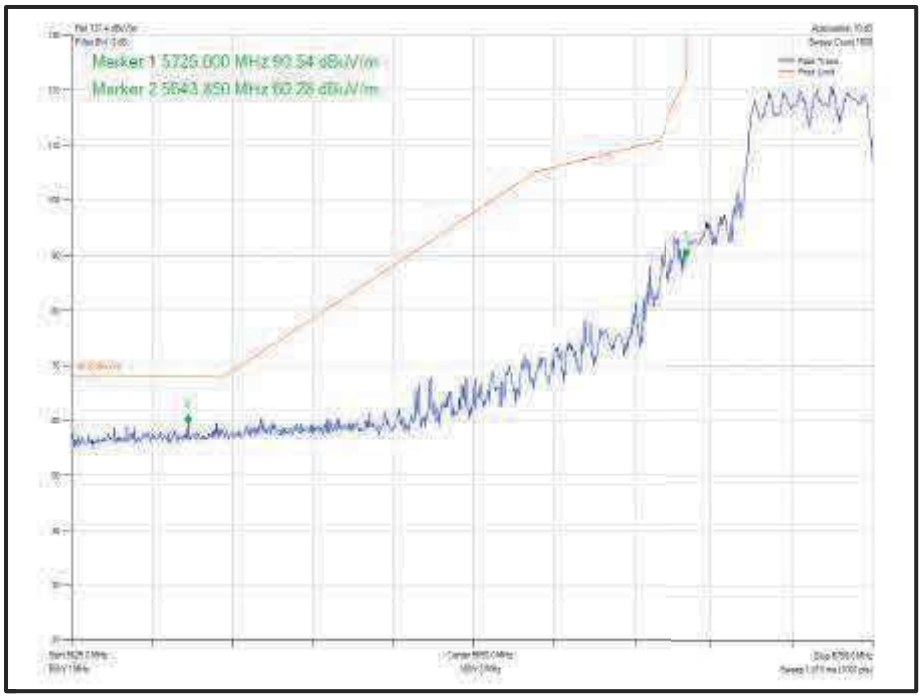

Figure 760 - 802.11ax HE20 CDD, Cores 0-1, SU - 5745 MHz Band Edge Frequency 5725 MHz

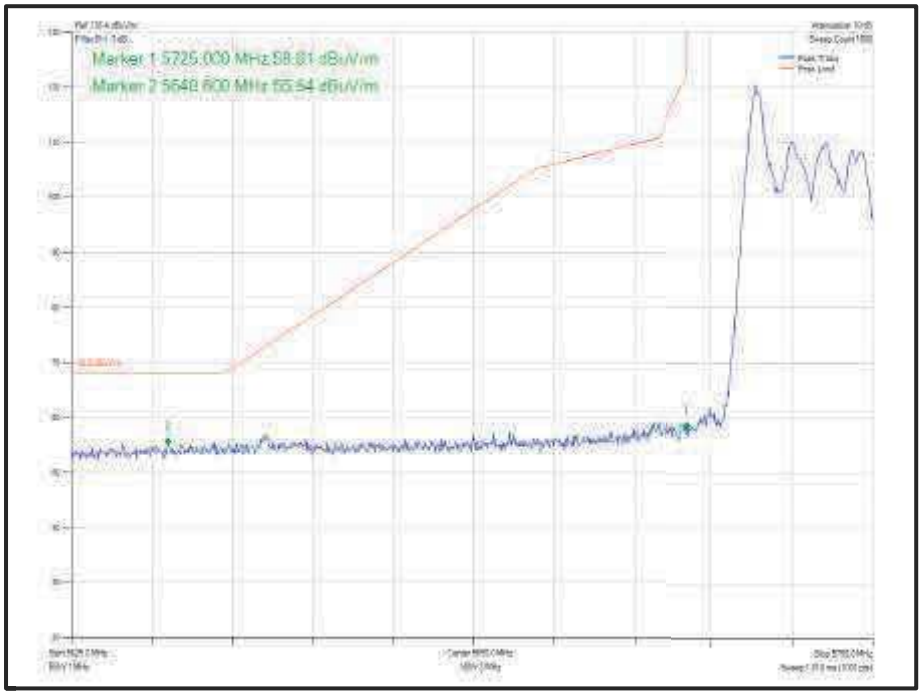

Figure 761 - 802.11ax HE20 CDD, Cores 0-1, 26-0 - 5745 MHz Band Edge Frequency 5725 MHz

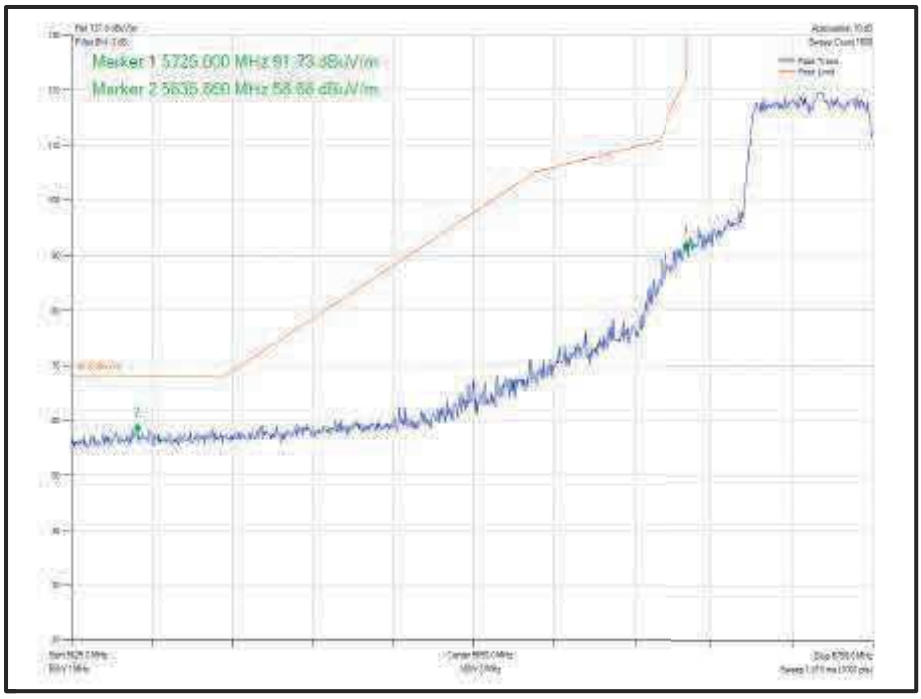

Figure 762 - 802.11ax HE20 SDM, Cores 0-1, SU - 5745 MHz Band Edge Frequency 5725 MHz

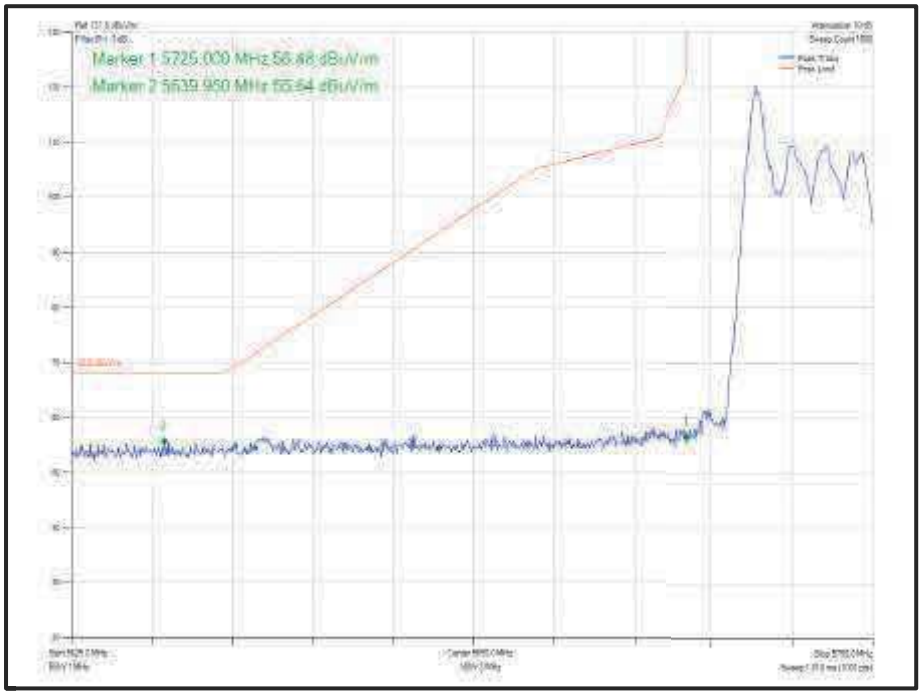

Figure 763 - 802.11ax HE20 SDM, Cores 0-1, 26-0 - 5745 MHz Band Edge Frequency 5725 MHz

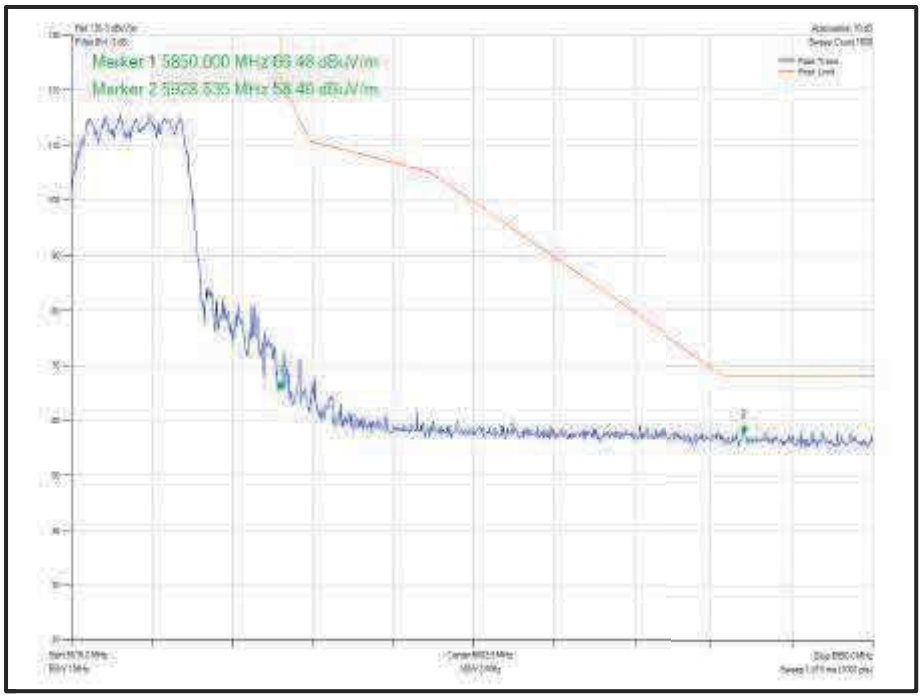

Figure 764 - 802.11n HT20 CDD, Cores 0-1 - 5825 MHz Band Edge Frequency 5850 MHz

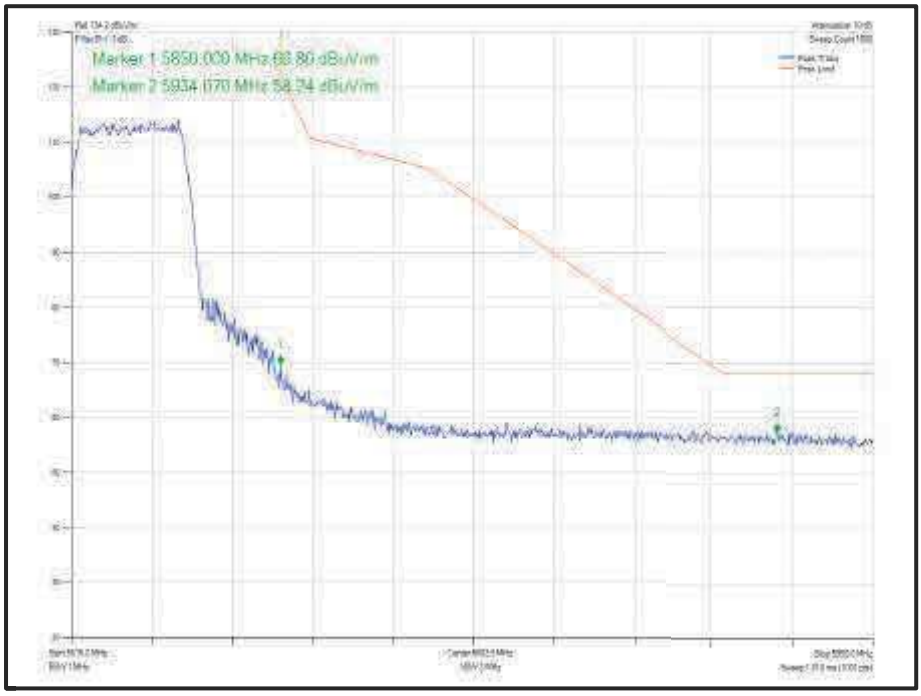

Figure 765 - 802.11n HT20 SDM, Cores 0-1 - 5825 MHz Band Edge Frequency 5850 MHz

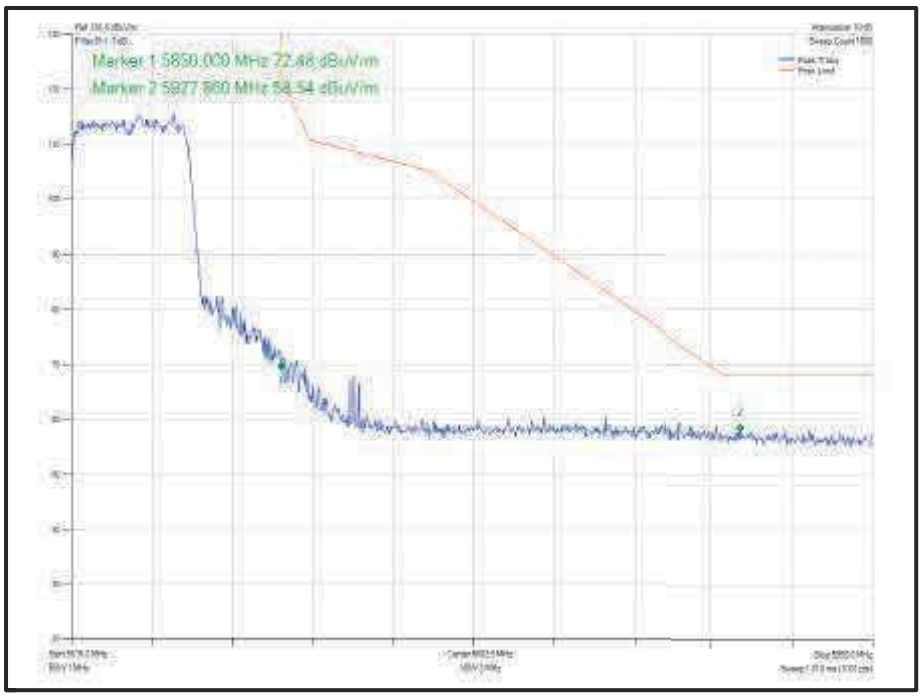

Figure 766 - 802.11ax HE20 CDD, Cores 0-1, SU - 5825 MHz Band Edge Frequency 5850 MHz

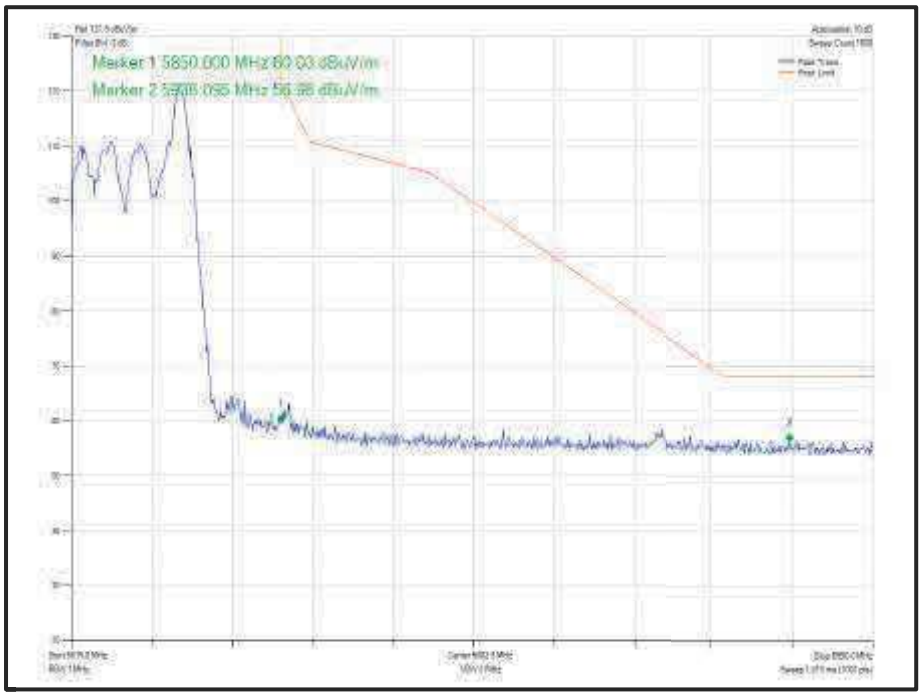

Figure 767 - 802.11ax HE20 CDD, Cores 0-1, 26-8 - 5825 MHz Band Edge Frequency 5850 MHz

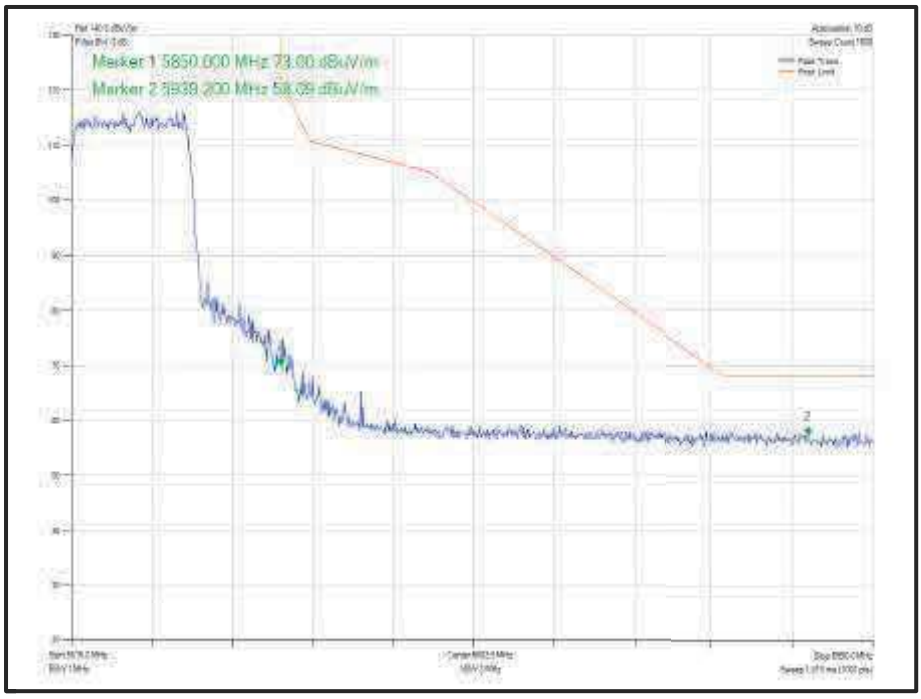

Figure 768 - 802.11ax HE20 SDM, Cores 0-1, SU - 5825 MHz Band Edge Frequency 5850 MHz

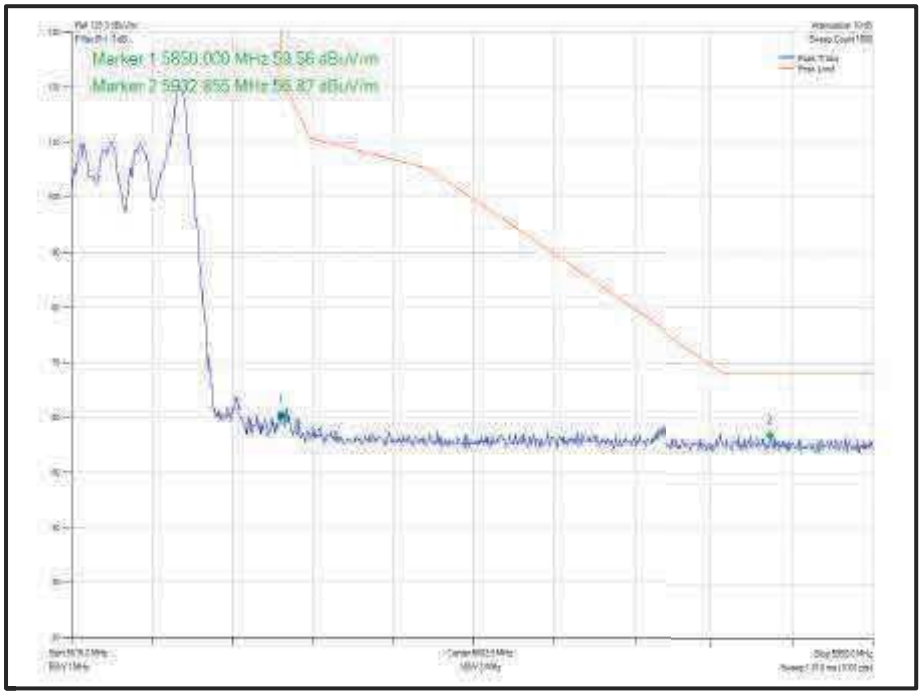

Figure 769 - 802.11ax HE20 SDM, Cores 0-1, 26-8 - 5825 MHz Band Edge Frequency 5850 MHz

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	63.01
802.11n HT40, Core 1	MCS7	-	-	5670	5725	63.25
802.11n HT40, Core 1	MCS7	-	-	5755	5725	62.50
802.11n HT40, Core 1	MCS7	-	-	5795	5850	58.99
802.11ax HE40, Core 1	MCS7	SU	-	5510	5470	63.05
802.11ax HE40, Core 1	MCS7	52	37	5510	5470	62.29
802.11ax HE40, Core 1	MCS7	SU	-	5670	5725	63.03
802.11ax HE40, Core 1	MCS7	52	44	5670	5725	56.31
802.11ax HE40, Core 1	MCS7	SU	-	5755	5725	61.81
802.11ax HE40, Core 1	MCS7	26	0	5755	5725	53.28
802.11ax HE40, Core 1	MCS7	SU	-	5795	5850	57.26
802.11ax HE40, Core 1	MCS7	26	17	5795	5850	54.04

Table 593 - SISO Authorised Band Edge Results

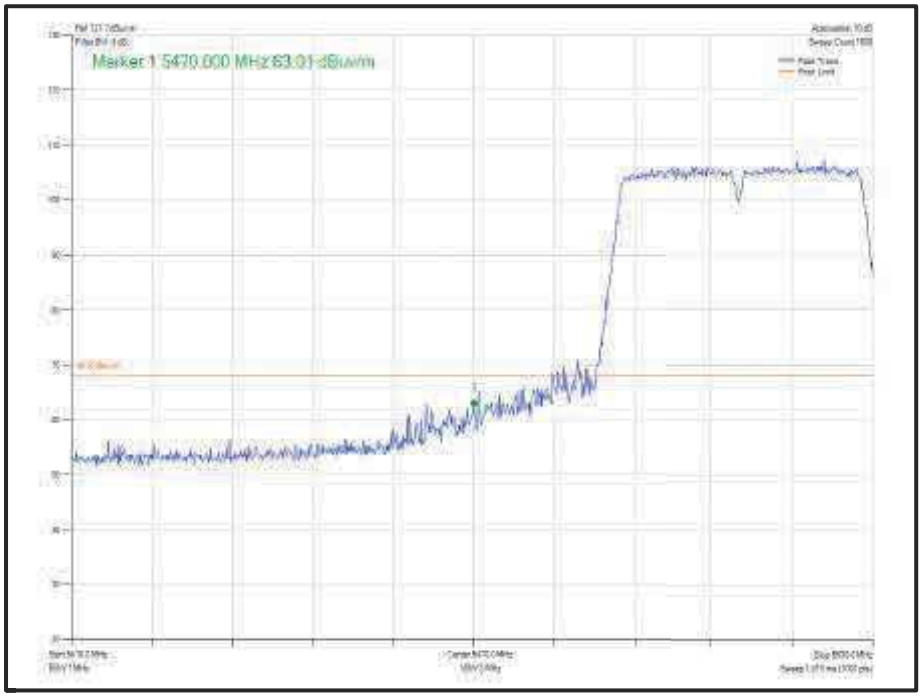

Figure 770 - 802.11n HT40, Core 1 - 5510 MHz Band Edge Frequency 5470 MHz

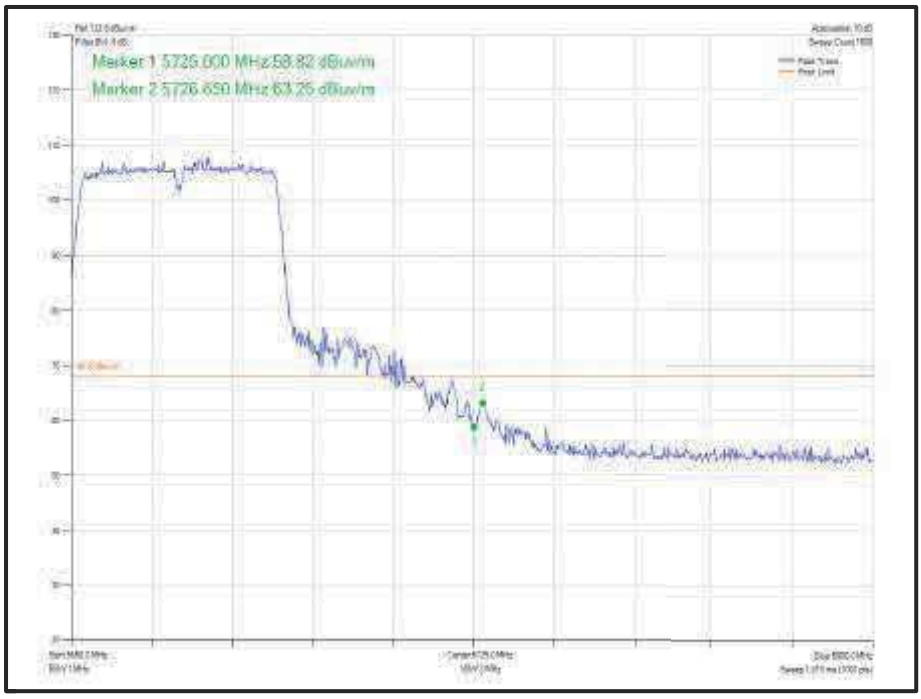

Figure 771 - 802.11n HT40, Core 1 - 5670 MHz
Band Edge Frequency 5725 MHz

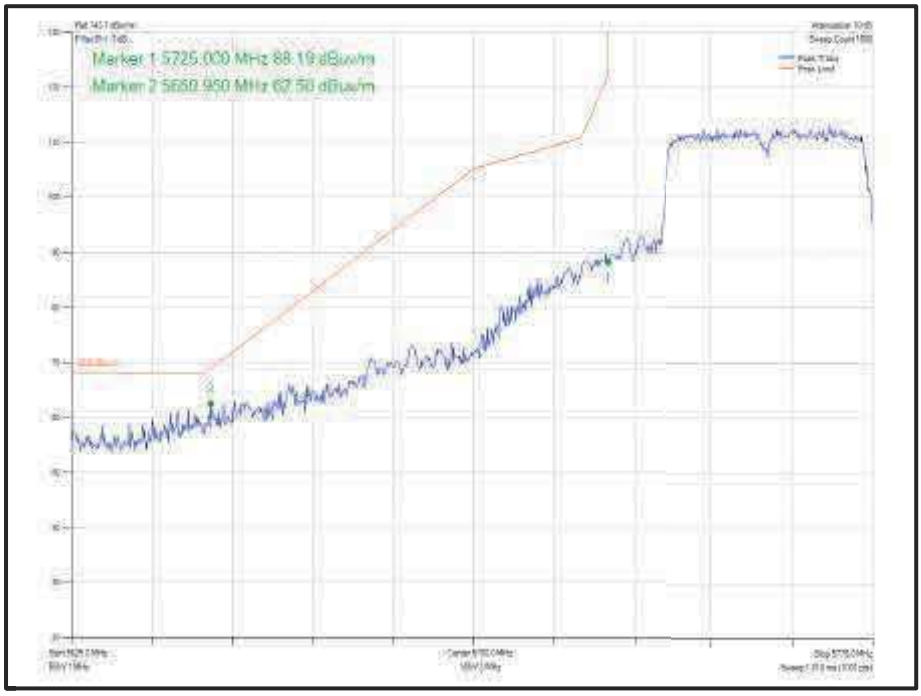

Figure 772 - 802.11n HT40, Core 1 - 5755 MHz
Band Edge Frequency 5725 MHz

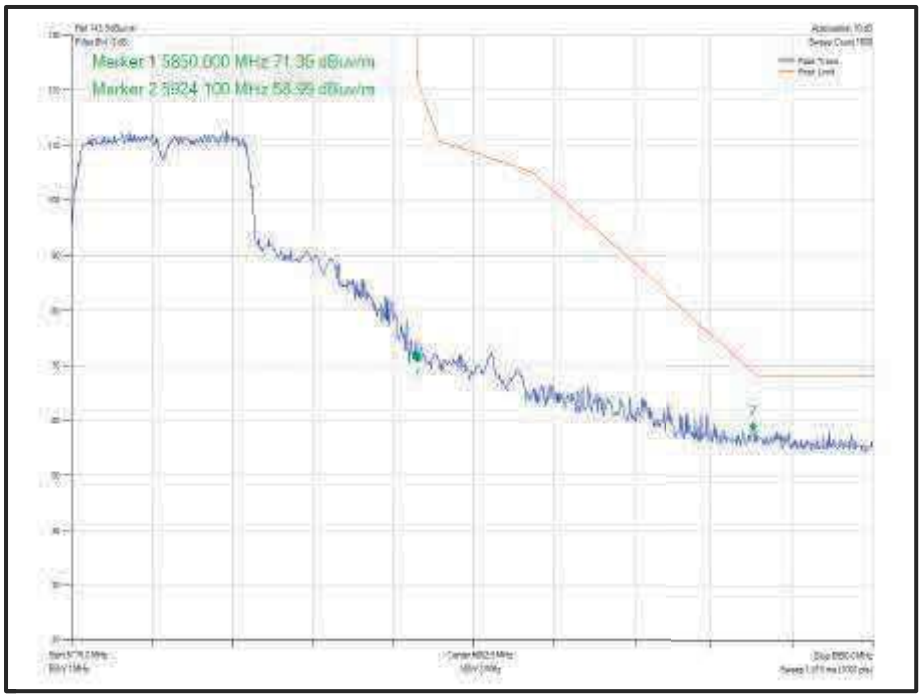

Figure 773 - 802.11n HT40, Core 1 - 5795 MHz
Band Edge Frequency 5850 MHz

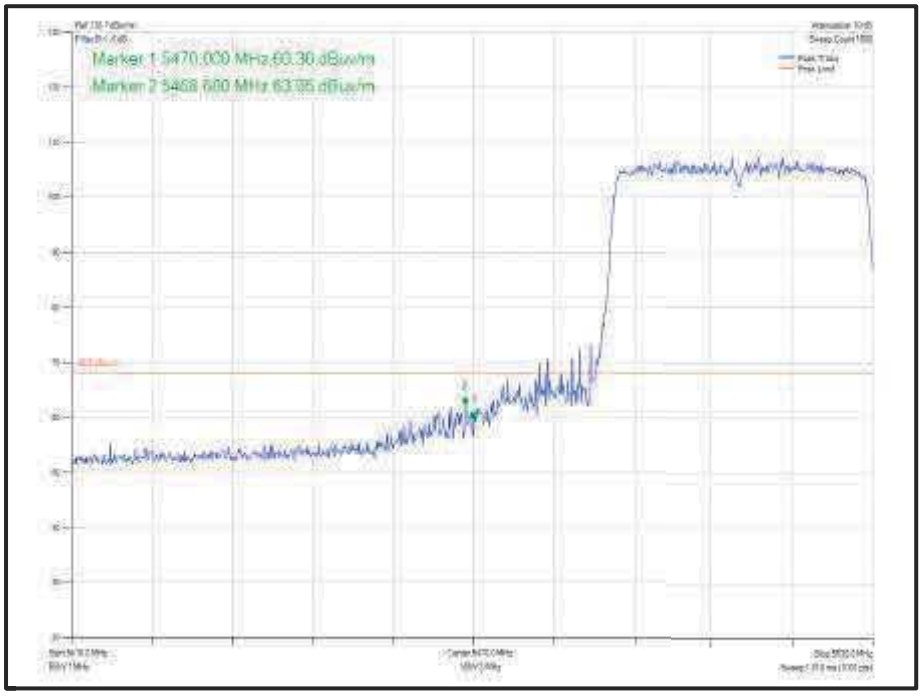

Figure 774 - 802.11ax HE40, Core 1, SU - 5510 MHz
Band Edge Frequency 5470 MHz

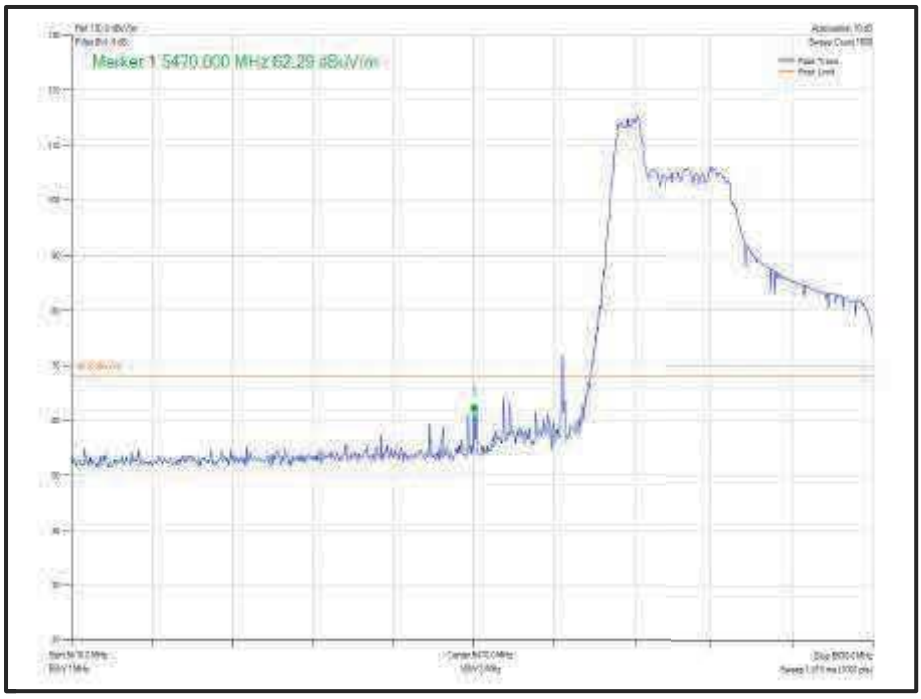

Figure 775 - 802.11ax HE40, Core 1, 52-37 - 5510 MHz
Band Edge Frequency 5470 MHz

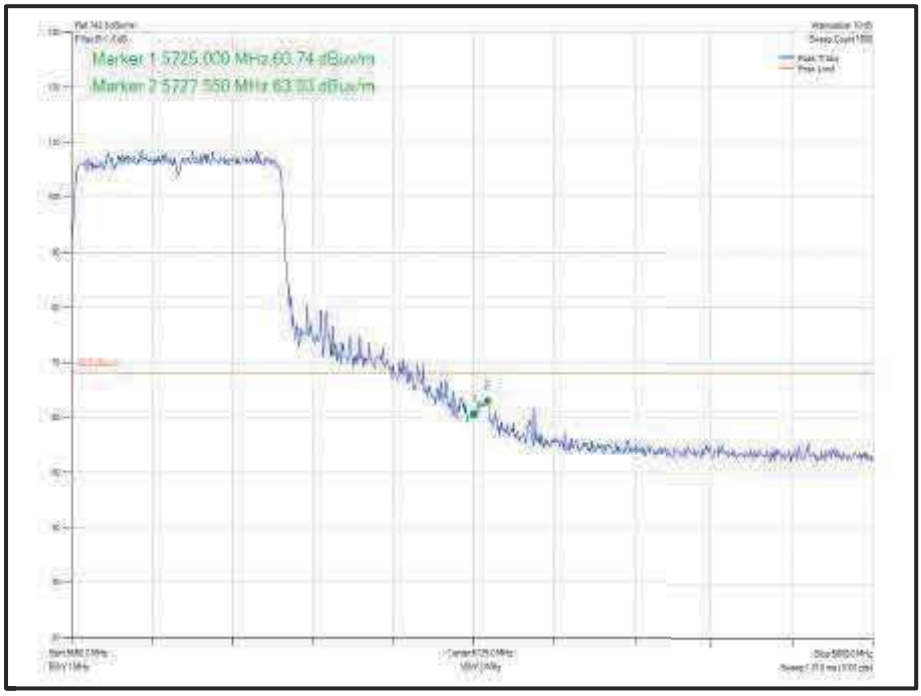

Figure 776 - 802.11ax HE40, Core 1, SU - 5670 MHz
Band Edge Frequency 5725 MHz

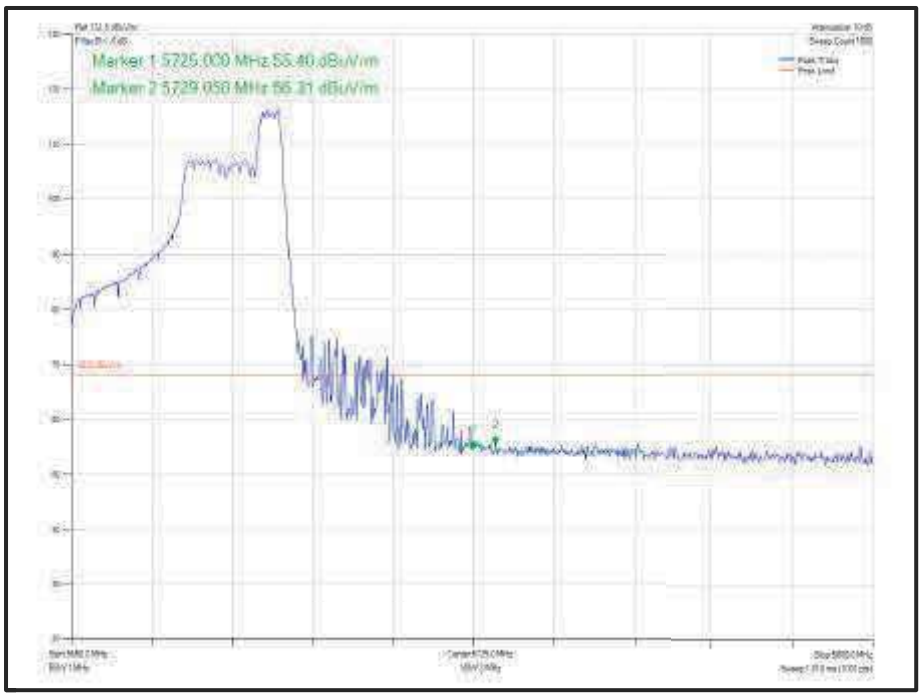

Figure 777 - 802.11ax HE40, Core 1, 26-17 - 5670 MHz
Band Edge Frequency 5725 MHz

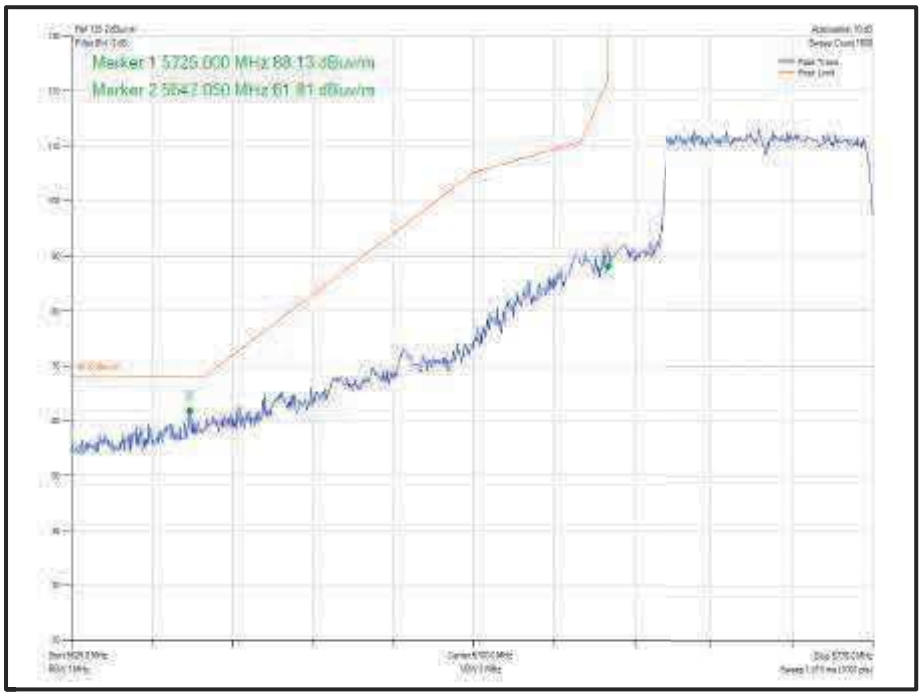

Figure 778 - 802.11ax HE40, Core 1, SU - 5755 MHz
Band Edge Frequency 5725 MHz

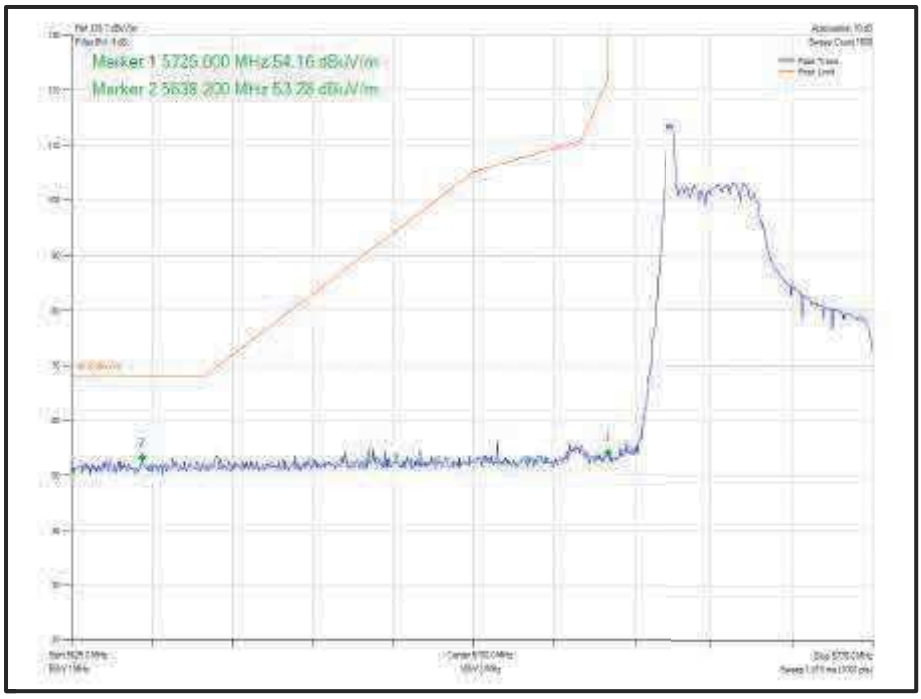

Figure 779 - 802.11ax HE40, Core 1, 26-0 - 5755 MHz
Band Edge Frequency 5725 MHz

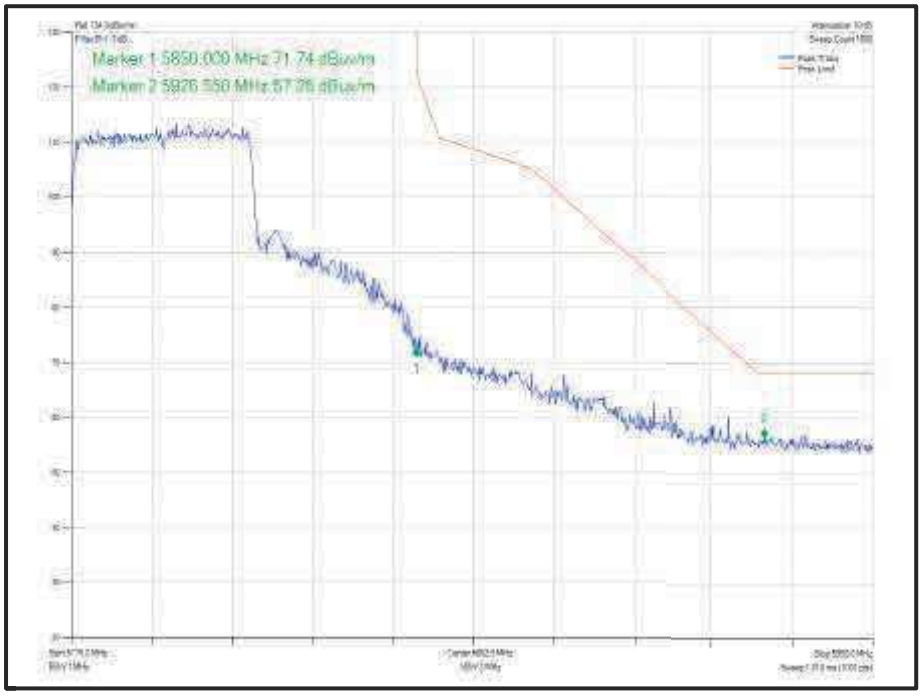

Figure 780 - 802.11ax HE40, Core 1, SU - 5795 MHz
Band Edge Frequency 5850 MHz

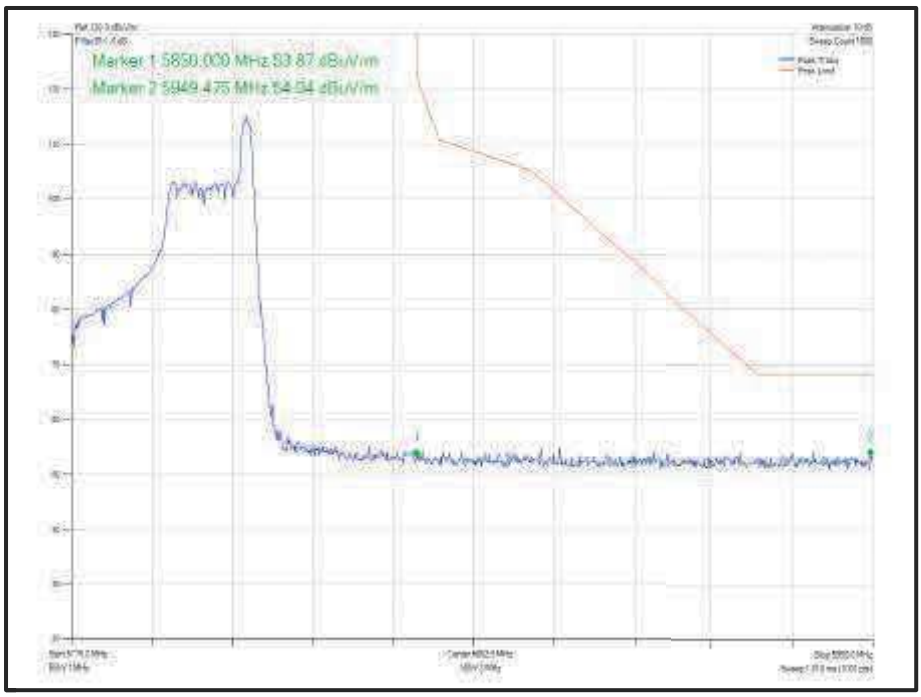

Figure 781 - 802.11ax HE40, Core 1, 26-17 - 5795 MHz
Band Edge Frequency 5850 MHz

Mode	Data Rate/ MCS	Resource size	Resource Index	TX Frequency (MHz)	Band Edge Frequency (MHz)	Level (dBuV/m)
802.11n HT40 CDD, Cores 0-1	MCS7	-	-	5510	5470	61.54
802.11n HT40 SDM, Cores 0-1	MCS7	-	-	5510	5470	62.01
802.11ax HE40 CDD, Cores 0-1	MCS7	SU	-	5510	5470	59.56
802.11ax HE40 CDD, Cores 0-1	MCS7	52	37	5510	5470	57.97
802.11ax HE40 SDM, Cores 0-1	MCS7	SU	-	5510	5470	59.71
802.11ax HE40 SDM, Cores 0-1	MCS7	52	37	5510	5470	57.73
802.11n HT40 CDD, Cores 0-1	MCS7	-	-	5670	5725	63.63
802.11n HT40 SDM, Cores 0-1	MCS7	-	-	5670	5725	63.63
802.11ax HE40 CDD, Cores 0-1	MCS7	SU	-	5670	5725	63.12
802.11ax HE40 CDD, Cores 0-1	MCS7	52	44	5670	5725	56.66
802.11ax HE40 SDM, Cores 0-1	MCS7	SU	-	5670	5725	63.57
802.11ax HE40 SDM, Cores 0-1	MCS7	52	44	5670	5725	56.80
802.11n HT40, CDD Cores 0-1	MCS7	-	-	5755	5725	61.58
802.11n HT40, SDM Cores 0-1	MCS7	-	-	5755	5725	62.71
802.11ax HE40 CDD, Cores 0-1	MCS7	SU	-	5755	5725	63.39
802.11ax HE40 CDD, Cores 0-1	MCS7	26	0	5755	5725	53.77
802.11ax HE40 SDM, Cores 0-1	MCS7	SU	-	5755	5725	62.60
802.11ax HE40 SDM, Cores 0-1	MCS7	26	0	5755	5725	54.79
802.11n HT40 CDD, Cores 0-1	MCS7	-	-	5795	5850	63.02
802.11n HT40 SDM, Cores 0-1	MCS7	-	-	5795	5850	60.83
802.11ax HE40 CDD, Cores 0-1	MCS7	SU	-	5795	5850	60.93
802.11ax HE40 CDD, Cores 0-1	MCS7	26	17	5795	5850	54.68
802.11ax HE40 SDM, Cores 0-1	MCS7	SU	-	5795	5850	60.60
802.11ax HE40 SDM, Cores 0-1	MCS7	26	17	5795	5850	54.38

Table 594 - MIMO 2TX Authorised Band Edge Results

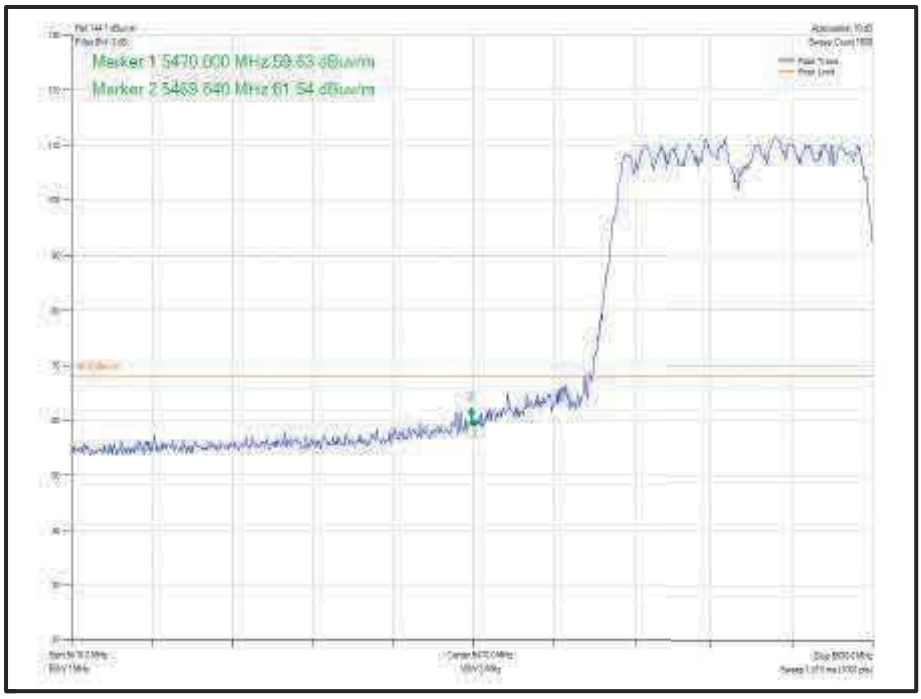

Figure 782 - 802.11n HT40 CDD, Cores 0-1 - 5510 MHz Band Edge Frequency 5470 MHz

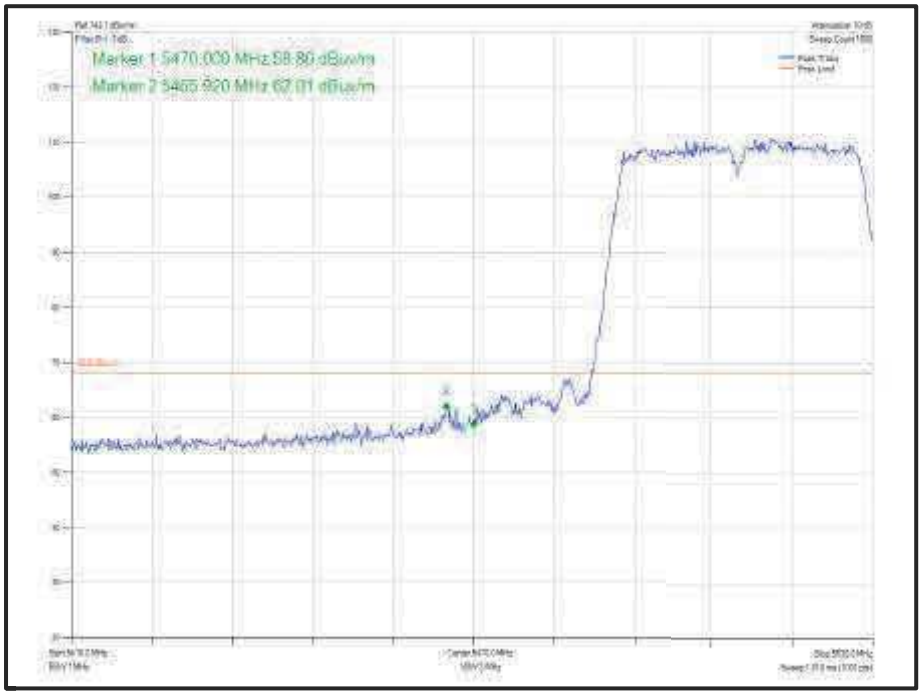

Figure 783 - 802.11n HT40 SDM, Cores 0-1 - 5510 MHz Band Edge Frequency 5470 MHz

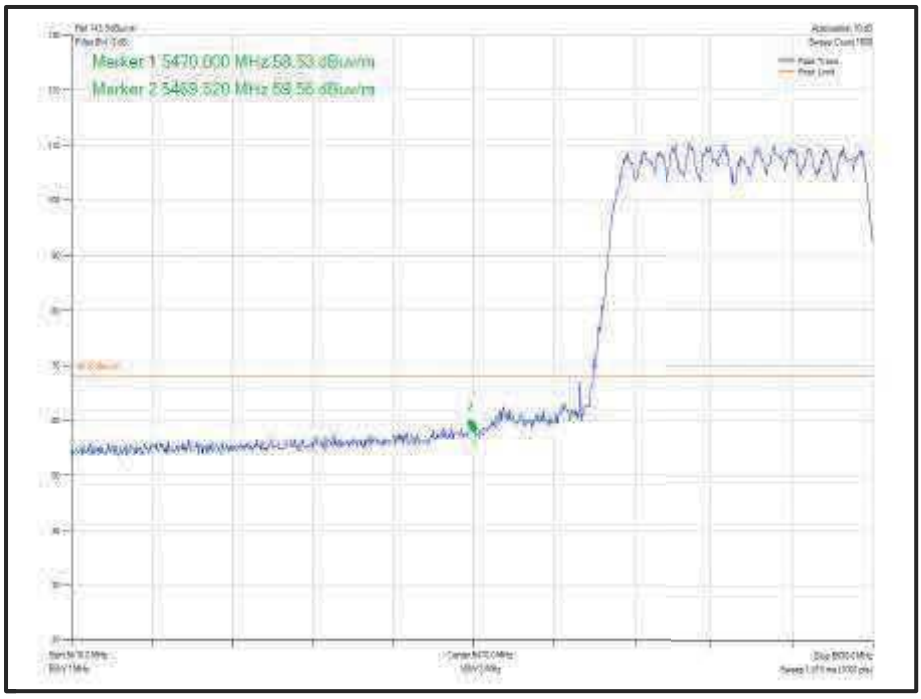

Figure 784 - 802.11ax HE40 CDD, Cores 0-1, SU - 5510 MHz Band Edge Frequency 5470 MHz

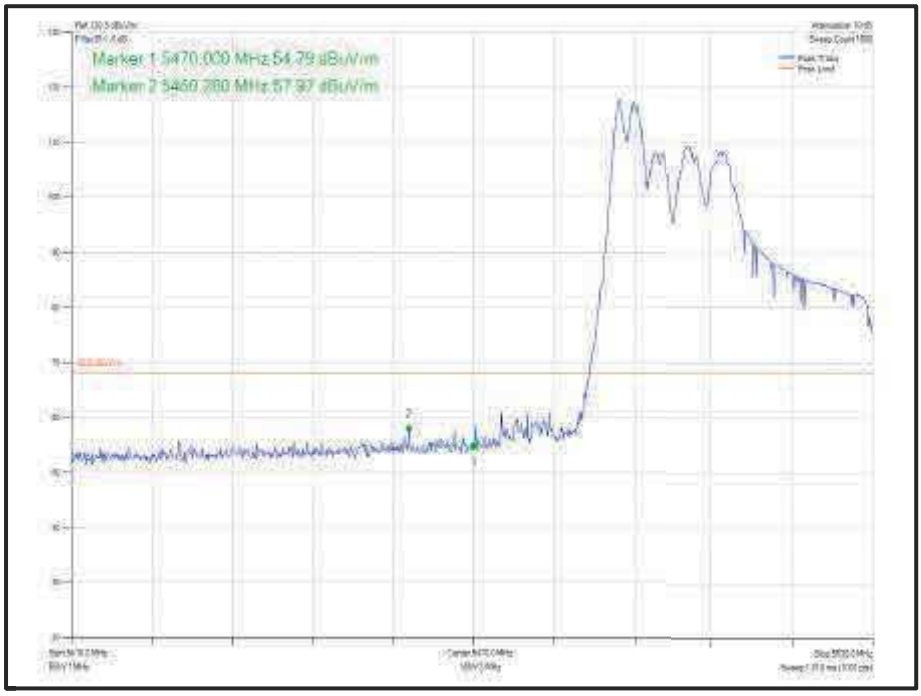

Figure 785 - 802.11ax HE40 CDD, Cores 0-1, 52-37 - 5510 MHz Band Edge Frequency 5470 MHz

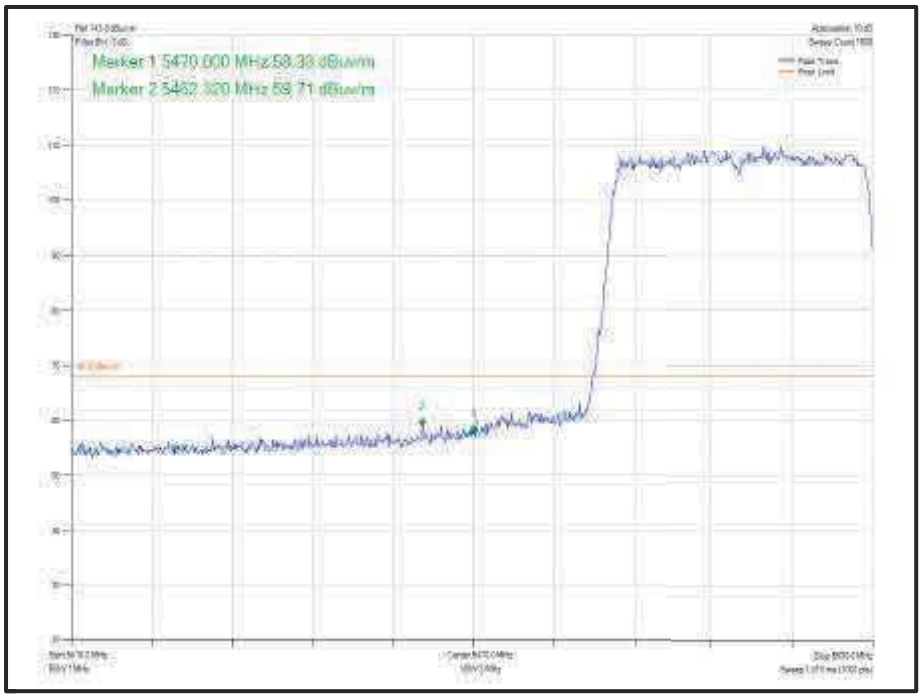

Figure 786 - 802.11ax HE40 SDM, Cores 0-1, SU - 5510 MHz Band Edge Frequency 5470 MHz

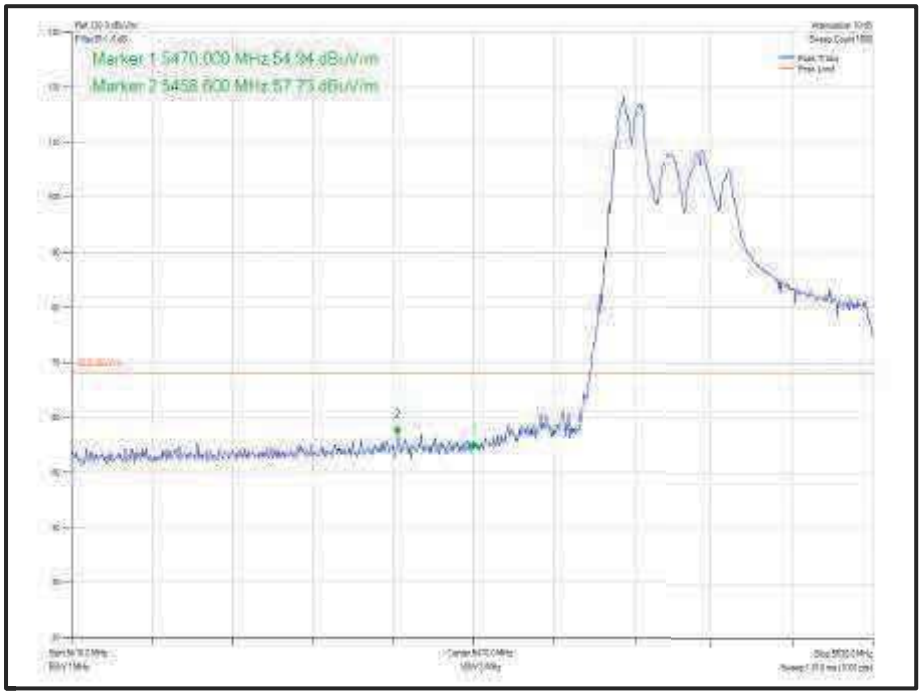

Figure 787 - 802. 11ax HE40 SDM, Cores 0-1, 26-0 - 5510 MHz Band Edge Frequency 5470 MHz

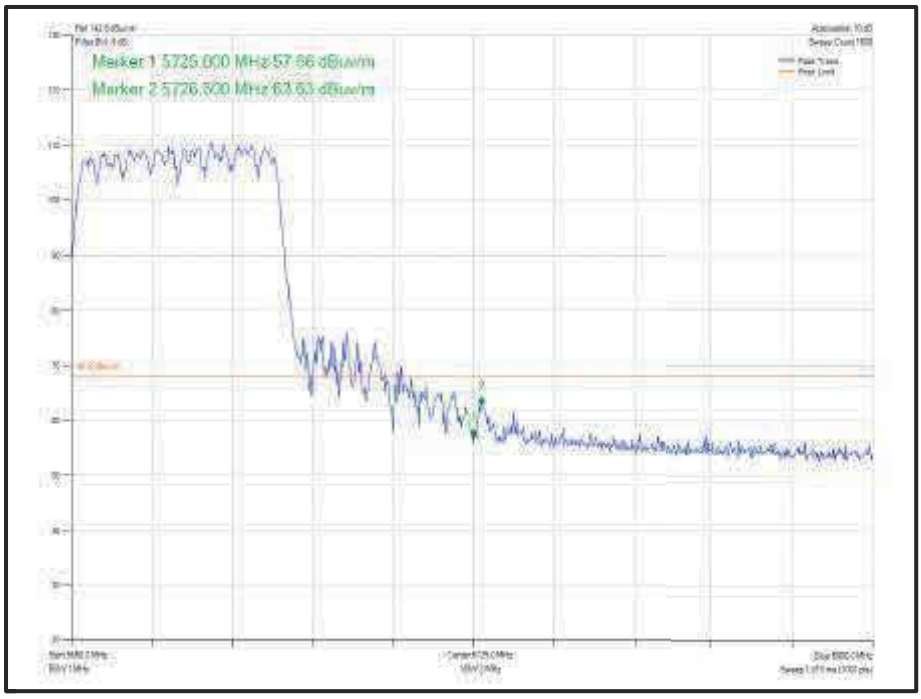

Figure 788 - 802.11n HT40 CDD, Cores 0-1 - 5670 MHz Band Edge Frequency 5725 MHz

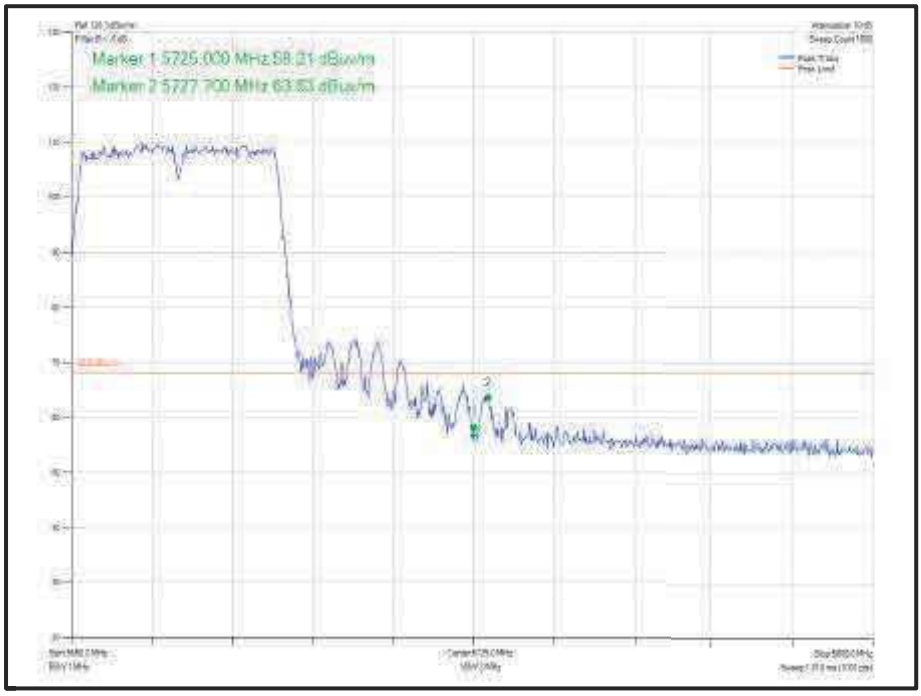

Figure 789 - 802.11n HT40 SDM, Cores 0-1 - 5670 MHz Band Edge Frequency 5725 MHz

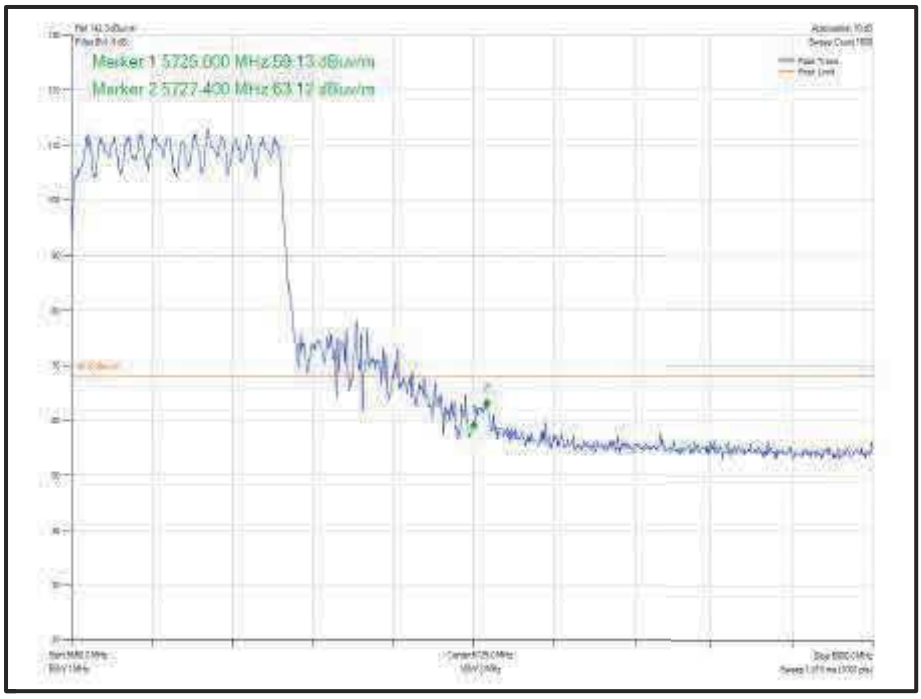

Figure 790 - 802.11ax HE40 CDD, Cores 0-1, SU - 5670 MHz Band Edge Frequency 5725 MHz

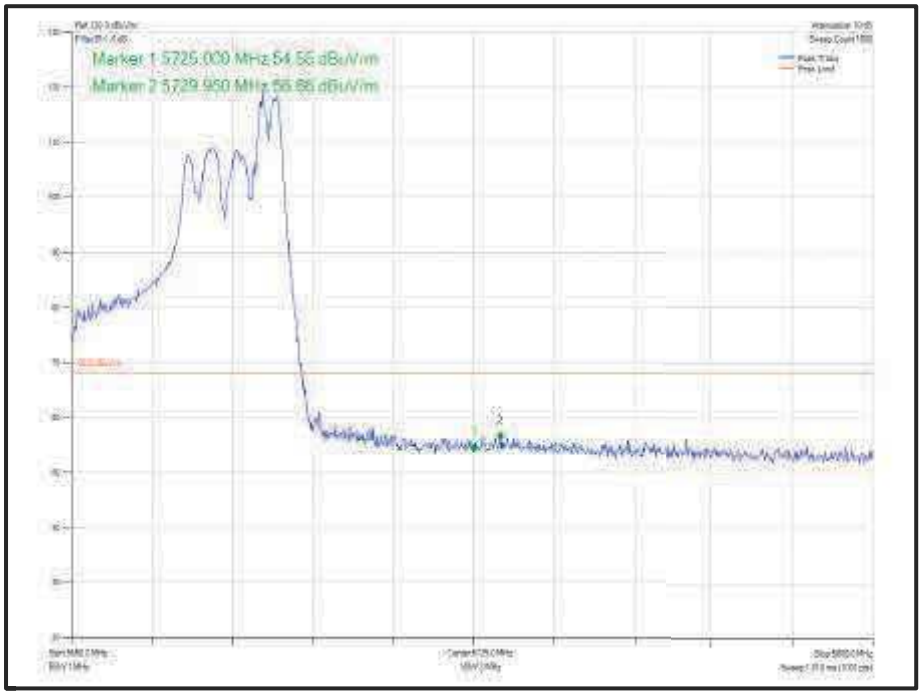

Figure 791 - 802.11ax HE40 CDD, Cores 0-1, 52-44 - 5670 MHz Band Edge Frequency 5725 MHz

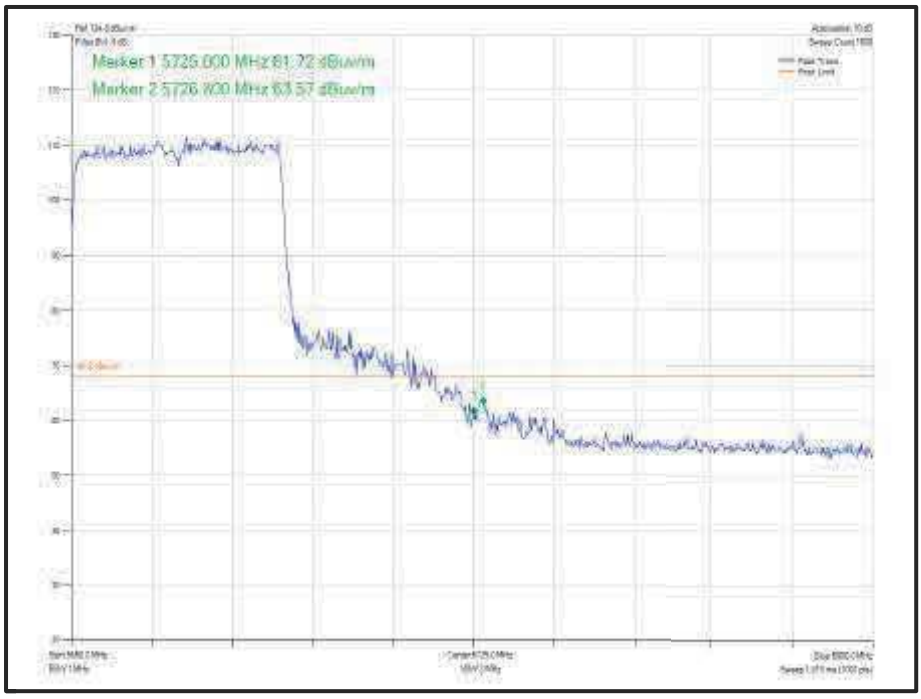

Figure 792 - 802.11ax HE40 SDM, Cores 0-1, SU - 5670 MHz Band Edge Frequency 5725 MHz

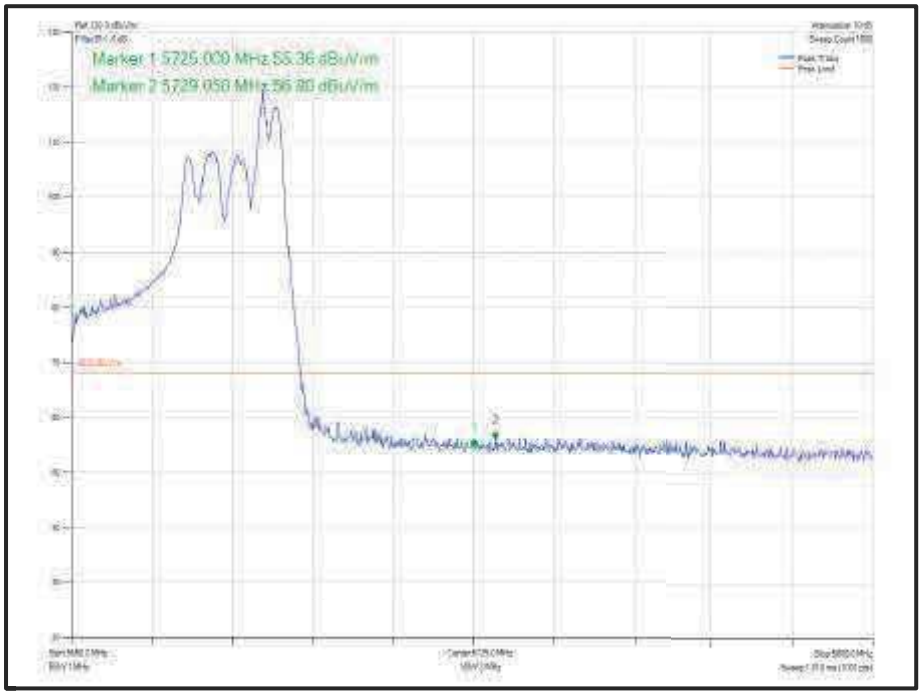

Figure 793 - 802.11ax HE40 SDM, Cores 0-1, 52-44 - 5670 MHz Band Edge Frequency 5725 MHz

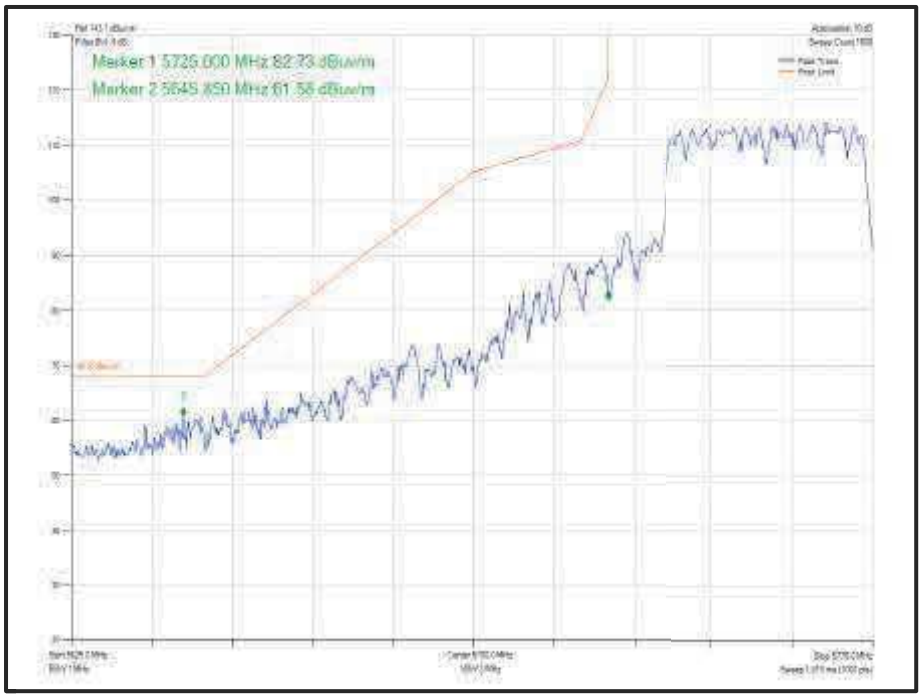

Figure 794 - 802.11n HT40 CDD, Cores 0-1 - 5755 MHz Band Edge Frequency 5725 MHz

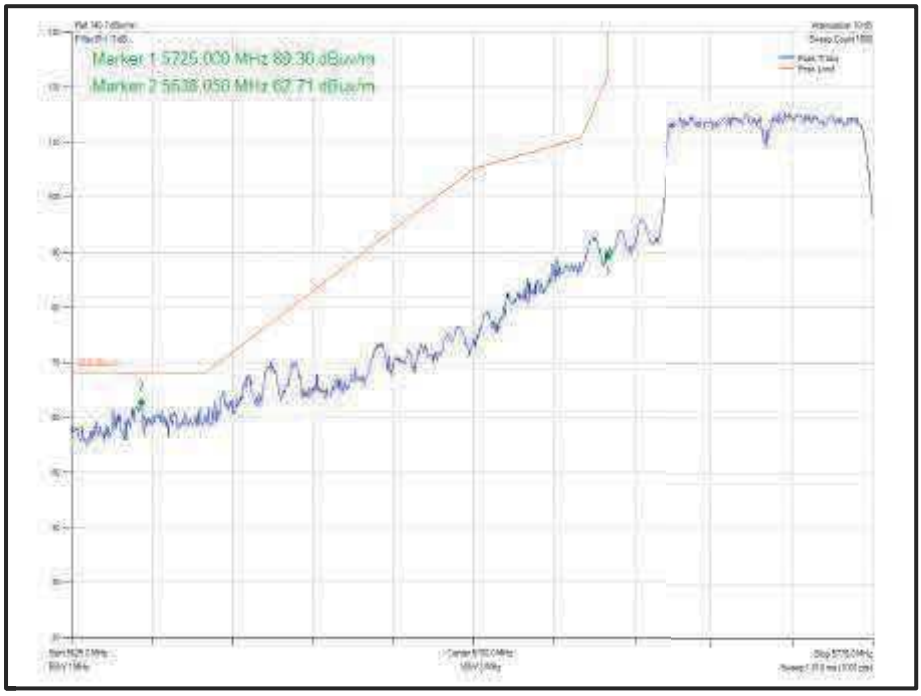

Figure 795 - 802.11n HT40 SDM, Cores 0-1 - 5755 MHz Band Edge Frequency 5725 MHz

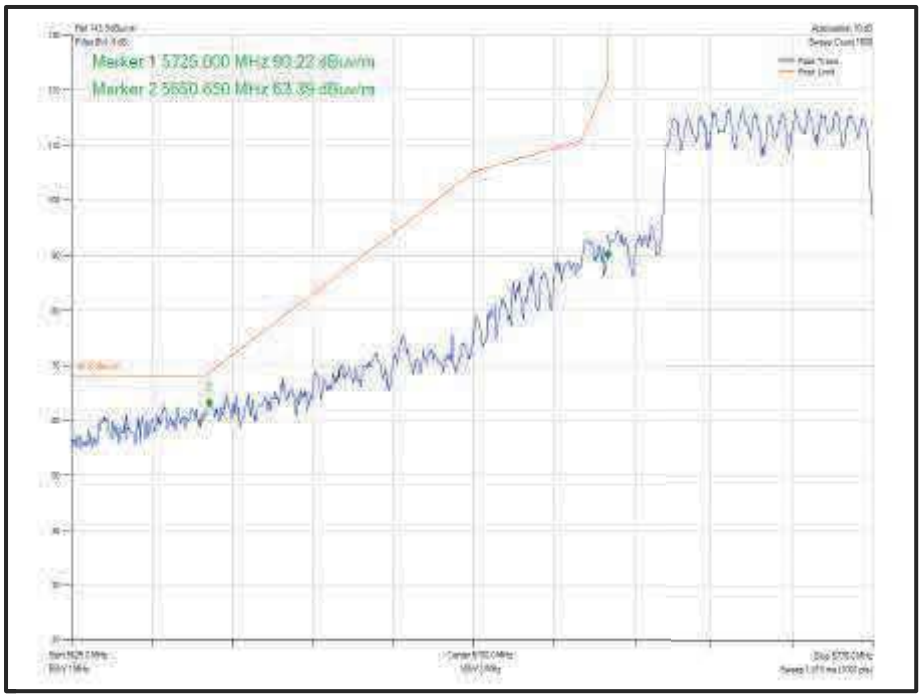

Figure 796 - 802.11ax HE40 CDD, Cores 0-1, SU - 5755 MHz Band Edge Frequency 5725 MHz

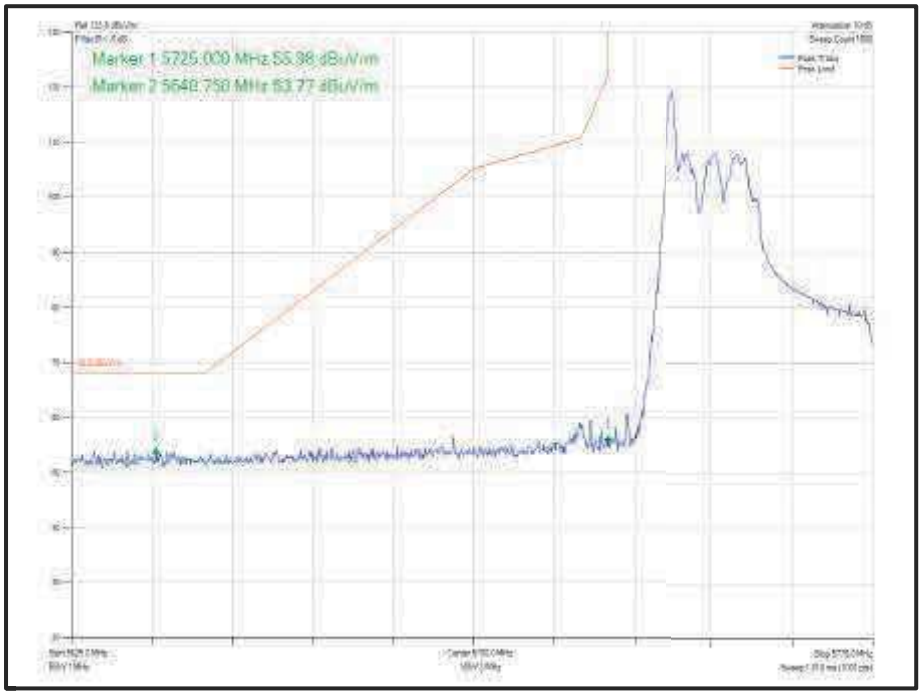

Figure 797 - 802.11ax HE40 CDD, Cores 0-1, 26-0 - 5755 MHz Band Edge Frequency 5725 MHz

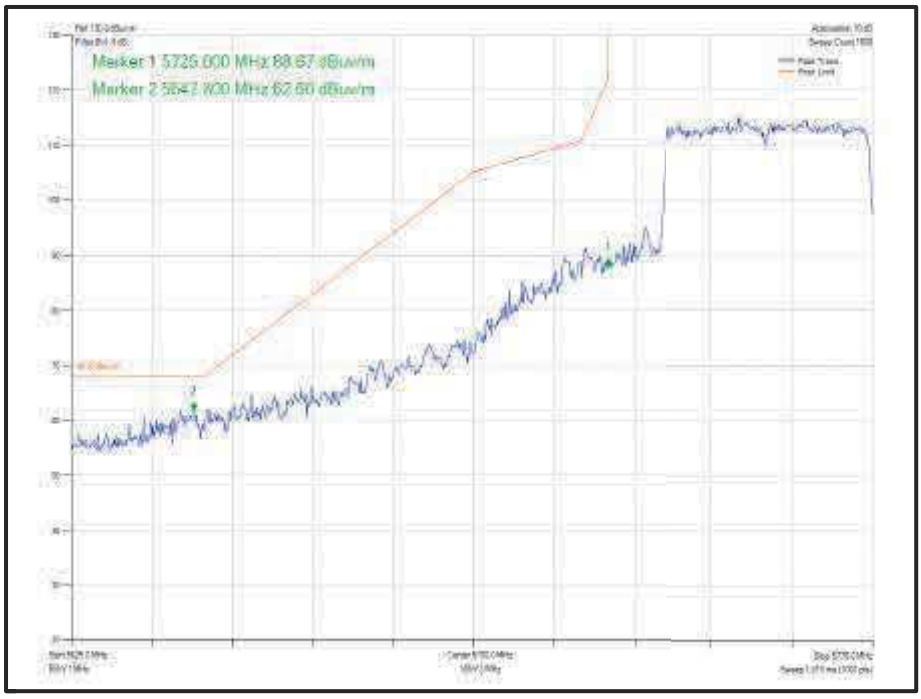

Figure 798 - 802.11ax HE40 SDM, Cores 0-1, SU - 5755 MHz Band Edge Frequency 5725 MHz

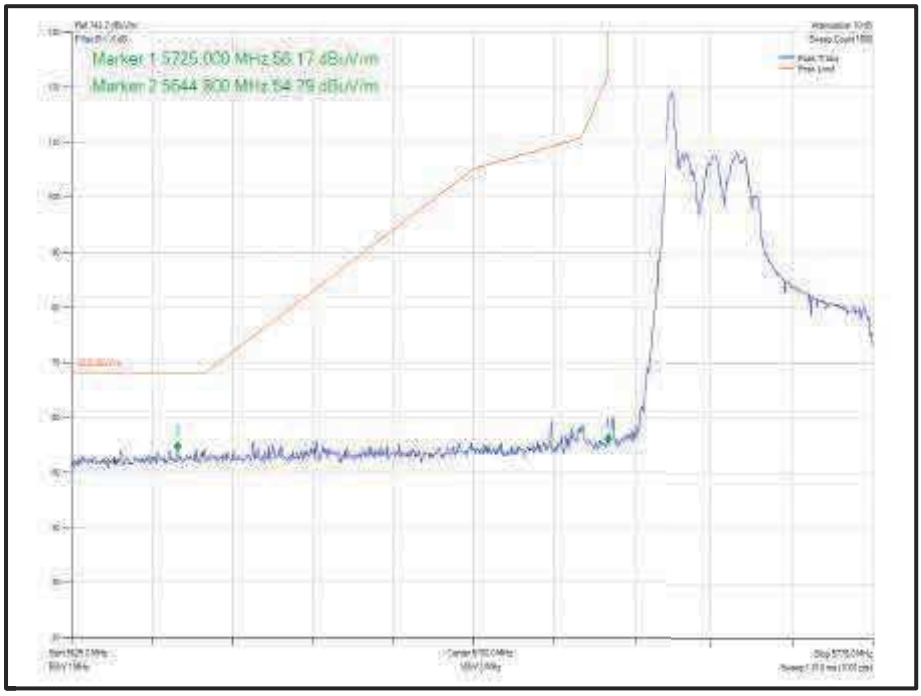

Figure 799 - 802.11ax HE40 SDM, Cores 0-1, 26-0 - 5755 MHz Band Edge Frequency 5725 MHz

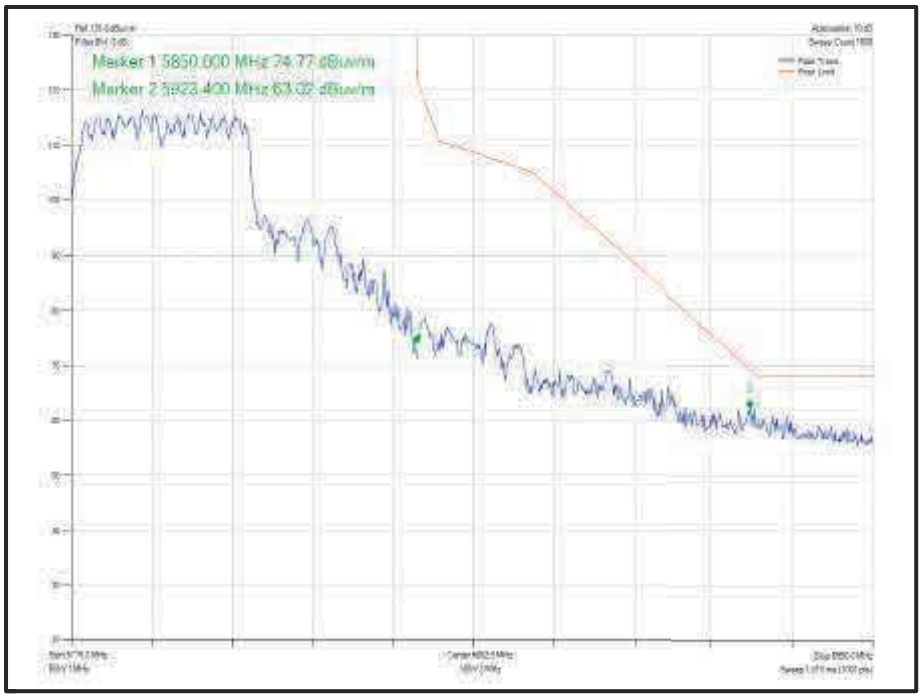

Figure 800 - 802.11n HT40 CDD, Cores 0-1 - 5795 MHz Band Edge Frequency 5850 MHz

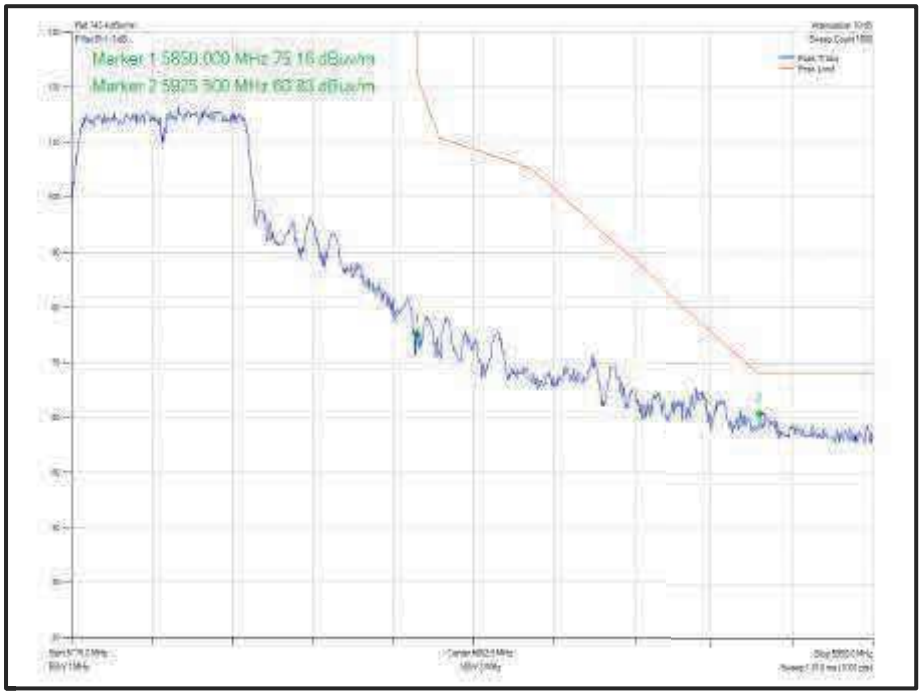

Figure 801 - 802.11n HT40 SDM, Cores 0-1 - 5795 MHz Band Edge Frequency 5850 MHz

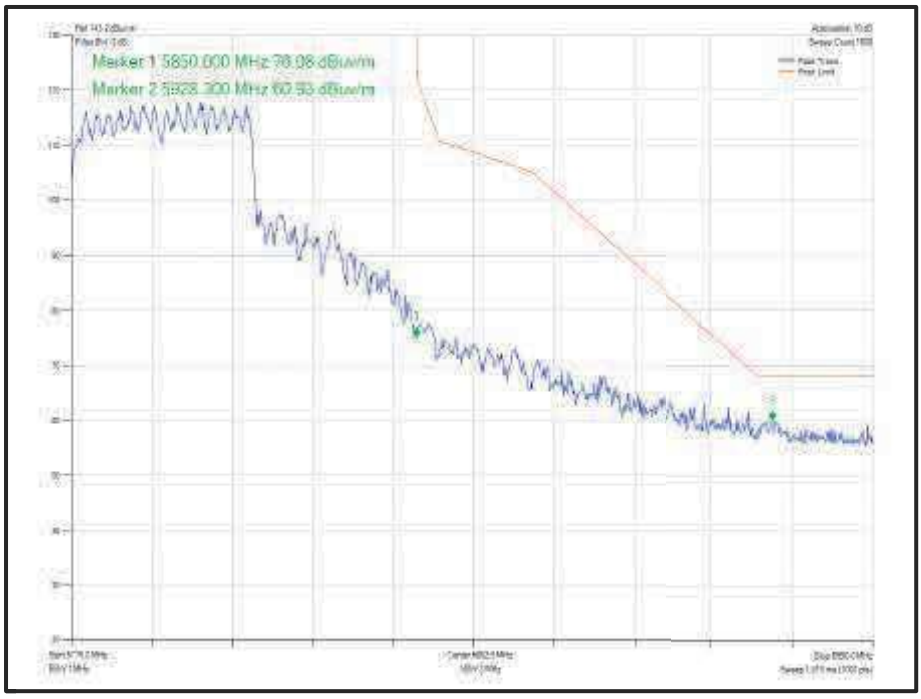

Figure 802 - 802.11ax HE40 CDD, Cores 0-1, SU - 5795 MHz Band Edge Frequency 5850 MHz

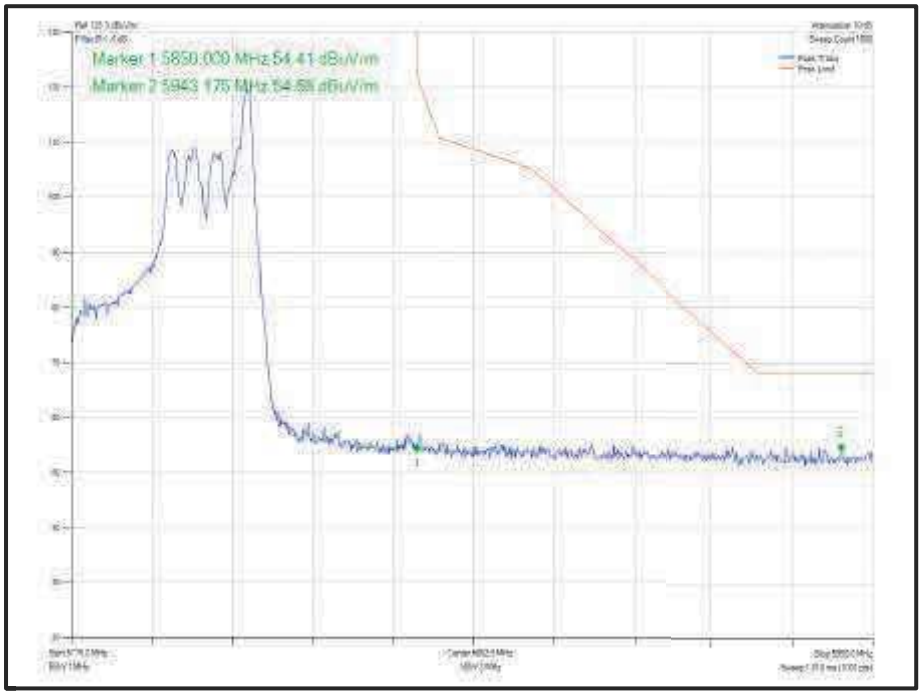

Figure 803 - 802.11ax HE40 CDD, Cores 0-1, 26-17 - 5795 MHz Band Edge Frequency 5850 MHz

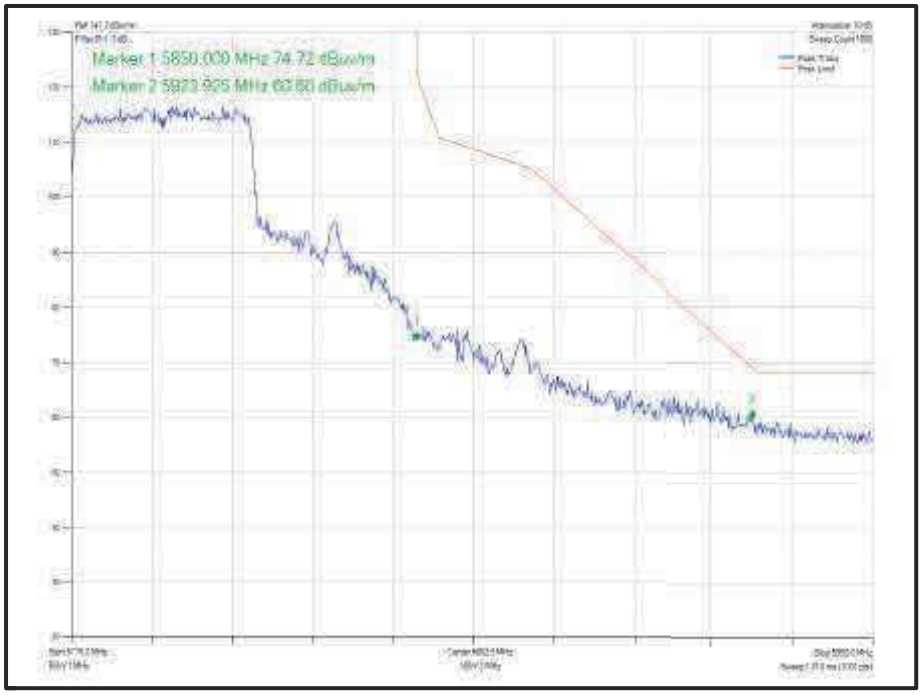

Figure 804 - 802.11ax HE40 SDM, Cores 0-1, SU - 5795 MHz Band Edge Frequency 5850 MHz

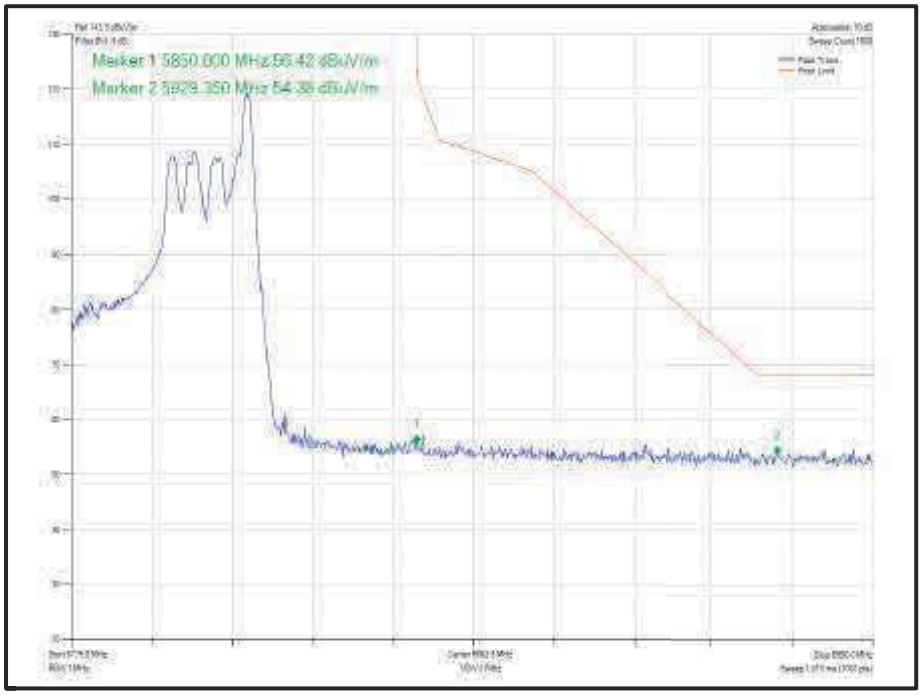

Figure 805 - 802.11ax HE40 SDM, Cores 0-1, 26-17 - 5795 MHz Band Edge Frequency 5850 MHz

Mode	Data Rate /MCS	Resource size	Resource Index	TX Frequency (MHz)	Band Edge Frequency (MHz)	Level (dBuV/m)
802.11ac VHT80, Core 1	MCS7x1	-	-	5530	5470	63.65
802.11ac VHT80, Core 1	MCS7x1	-	-	5610	5725	63.41
802.11ac VHT80, Core 1	MCS7x1	-	-	5775	5725	63.21
802.11ac VHT80, Core 1	MCS7x1	-	-	5775	5850	61.72
802.11ax HE80, Core 1	MCS7	SU	-	5530	5470	63.61
802.11ax HE80, Core 1	MCS7	52	37	5530	5470	63.62
802.11ax HE80, Core 1	MCS7	SU	-	5610	5725	63.30
802.11ax HE80, Core 1	MCS7	52	52	5610	5725	57.56
802.11ax HE80, Core 1	MCS7	SU	-	5775	5725	63.62
802.11ax HE80, Core 1	MCS7	26	0	5775	5725	55.72
802.11ax HE80, Core 1	MCS7	SU	-	5775	5850	63.15
802.11ax HE80, Core 1	MCS7	26	36	5775	5850	55.82

Table 595 - SISO Authorised Band Edge Results

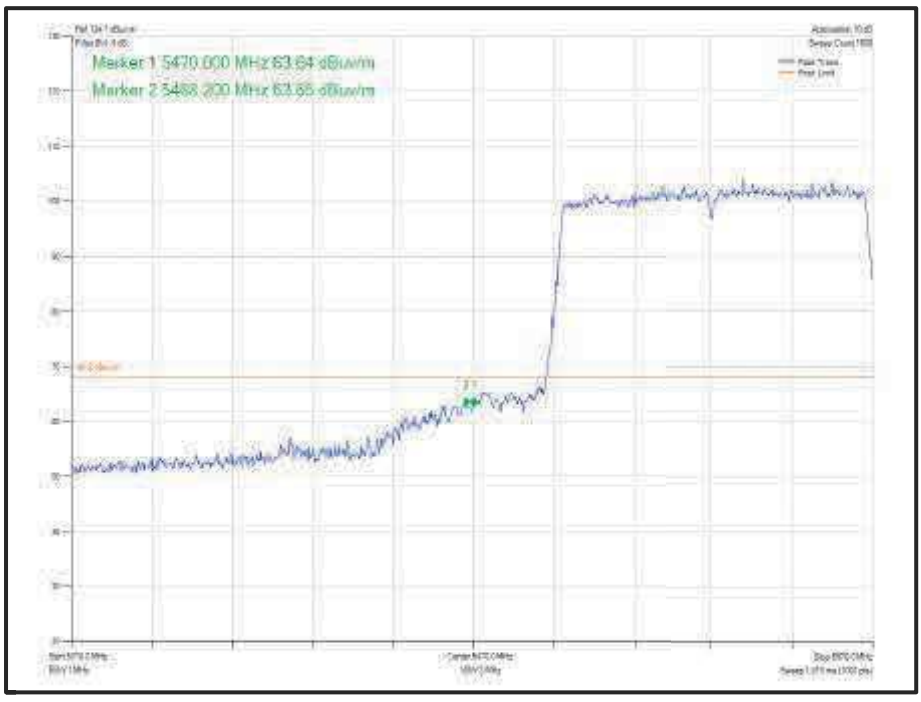

Figure 806 - 802.11ac VHT80 Core 1 - 5530 MHz Band Edge Frequency 5470 MHz

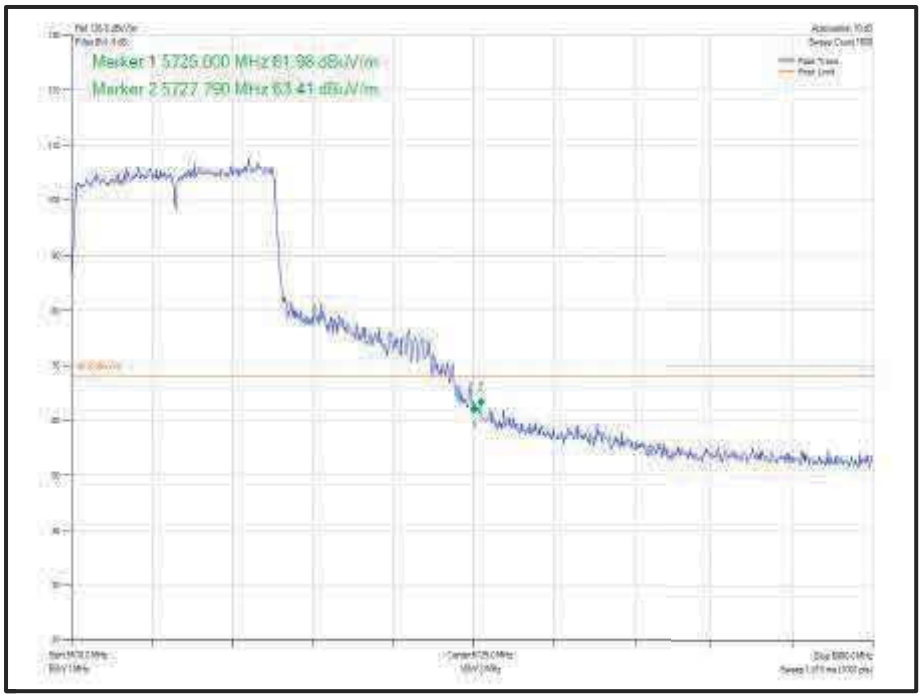

Figure 807 - 802.11ac VHT80 Core 1 - 5610 MHz Band Edge Frequency 5725 MHz

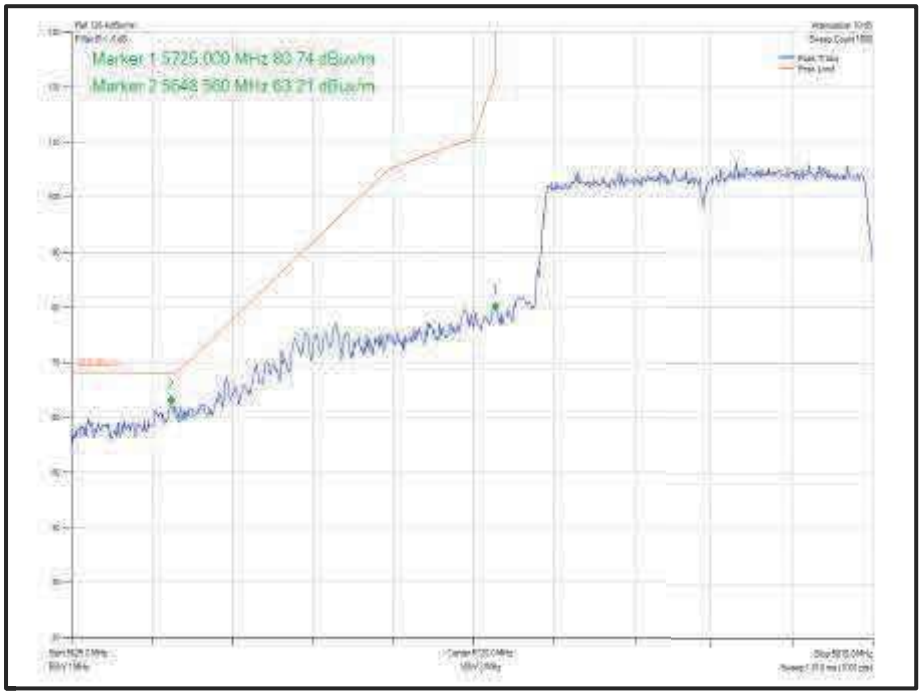

Figure 808 - 802.11ac VHT80 Core 1 - 5775 MHz Band Edge Frequency 5725 MHz

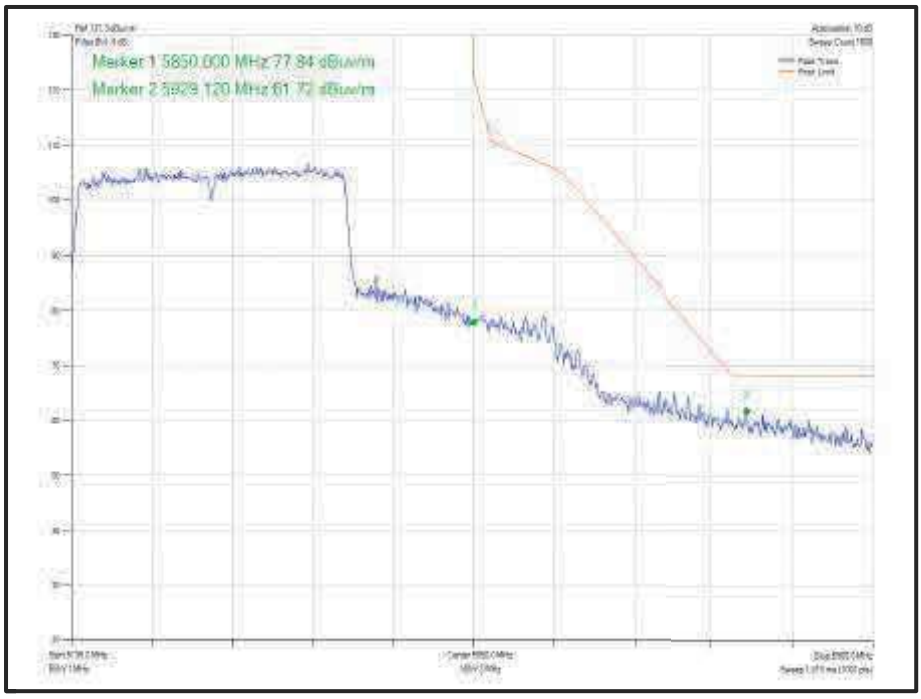

Figure 809 - 802.11ac VHT80 Core 1 - 5775 MHz Band Edge Frequency 5850 MHz

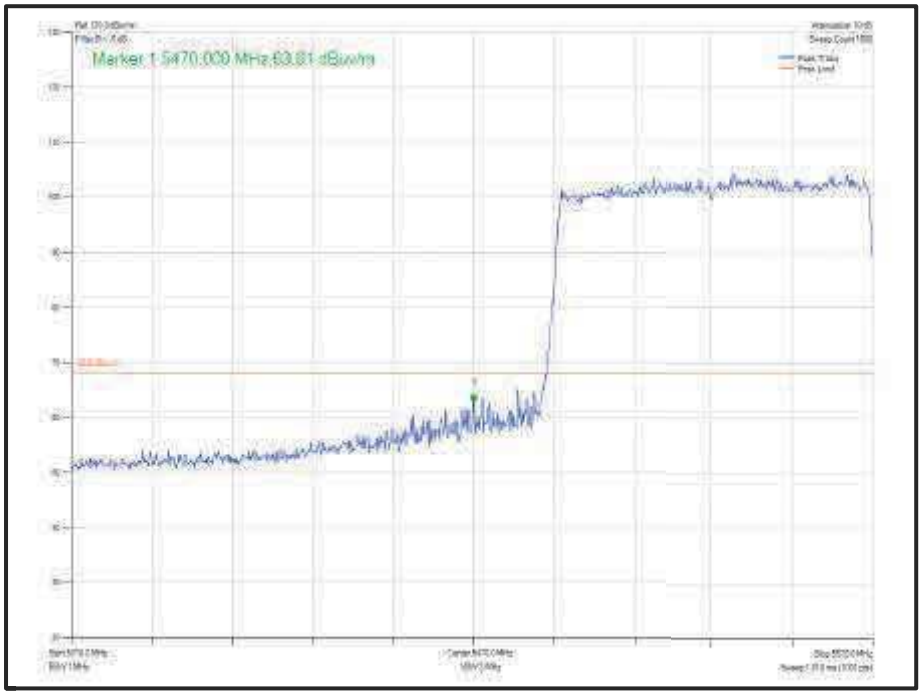

Figure 810 - 802.11ax HE80 Core 1 SU - 5530 MHz Band Edge Frequency 5470 MHz

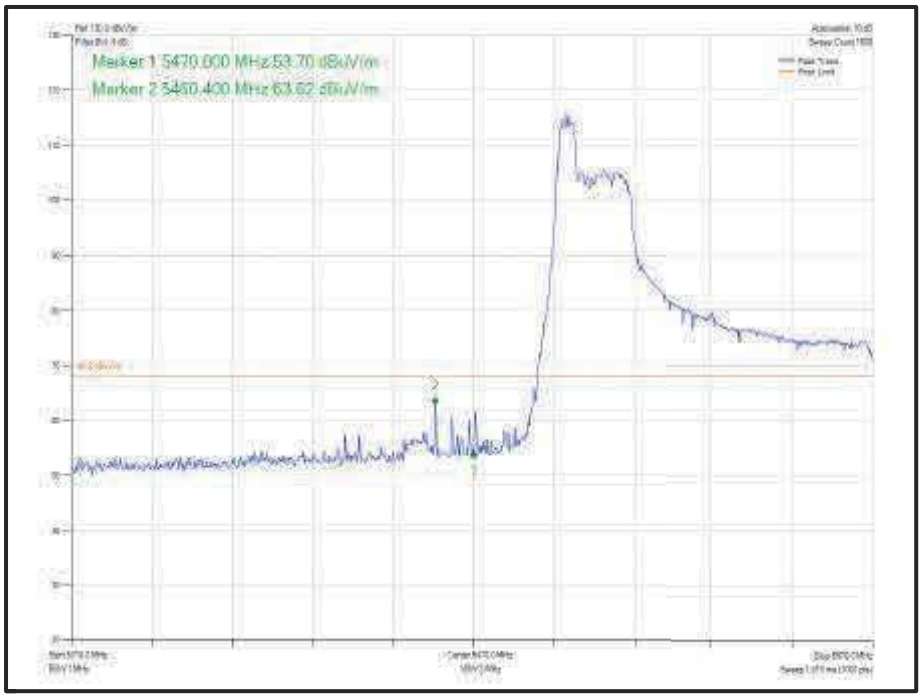

Figure 811 - 802.11ax HE80 Core 1 52-37- 5530 MHz
Band Edge Frequency 5470 MHz

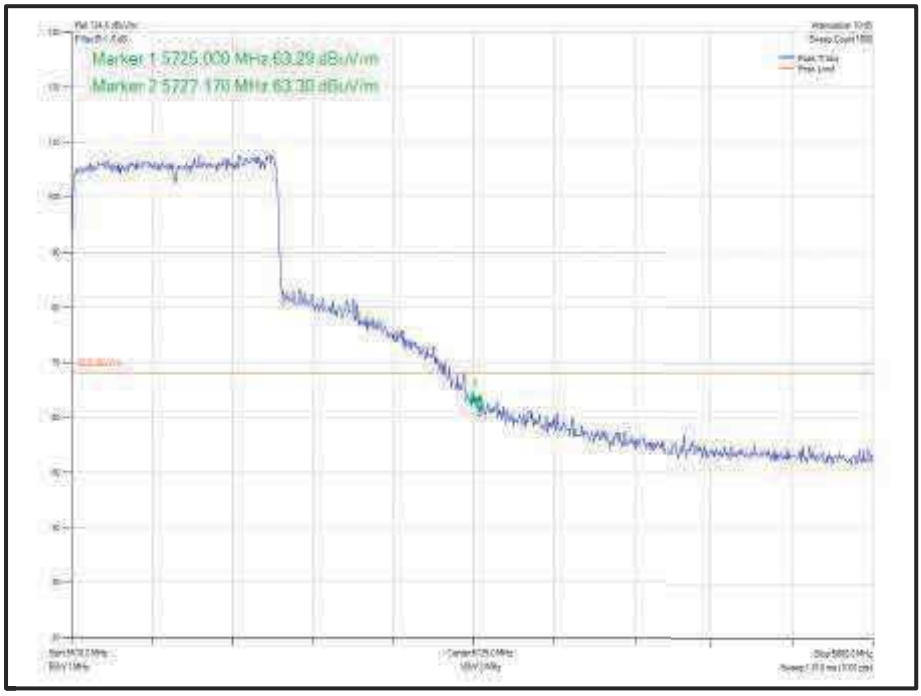

Figure 812 - - 802.11ax HE80 Core 1 SU - 5610 MHz
Band Edge Frequency 5725 MHz

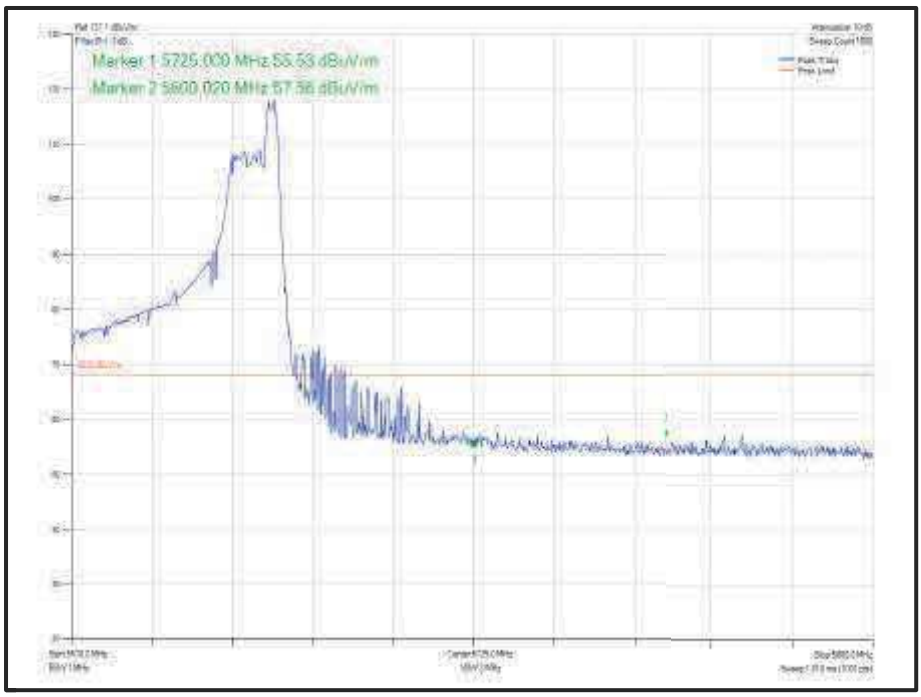

Figure 813 - - 802.11ax HE80 Core 1 52-52 - 5610 MHz Band Edge Frequency 5725 MHz

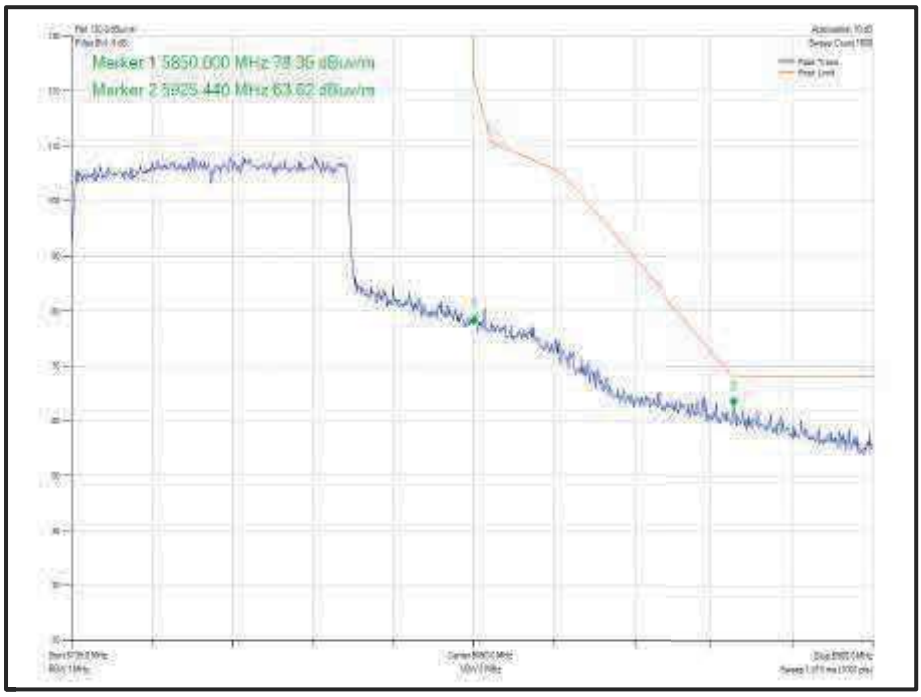

Figure 814 - 802.11ax HE80 Core 1 SU - 5775 MHz Band Edge Frequency 5725 MHz

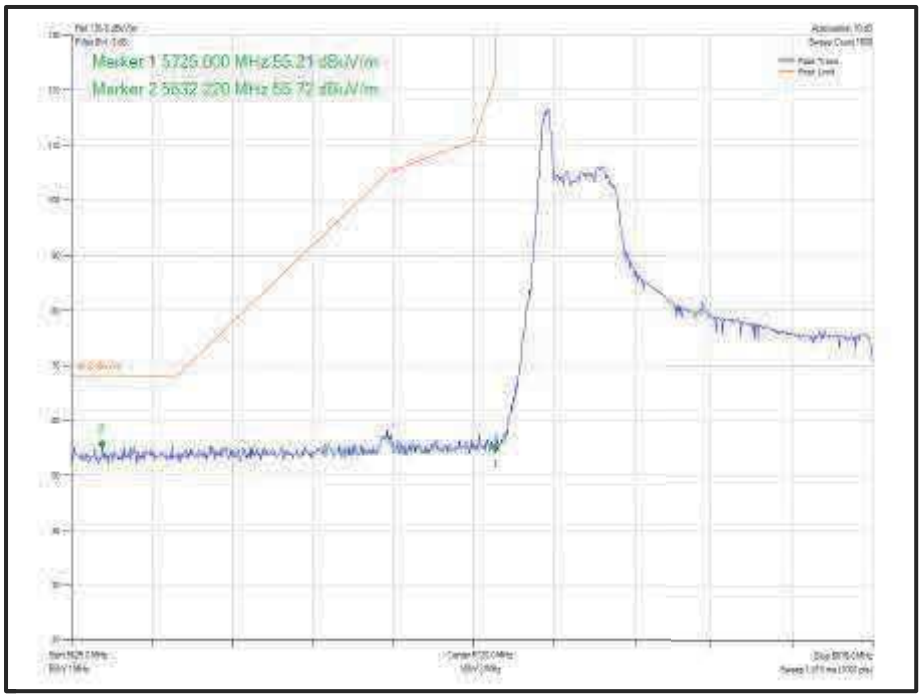

Figure 815 - 802.11ax HE80 Core 1 26-0 - 5775 MHz
Band Edge Frequency 5725 MHz

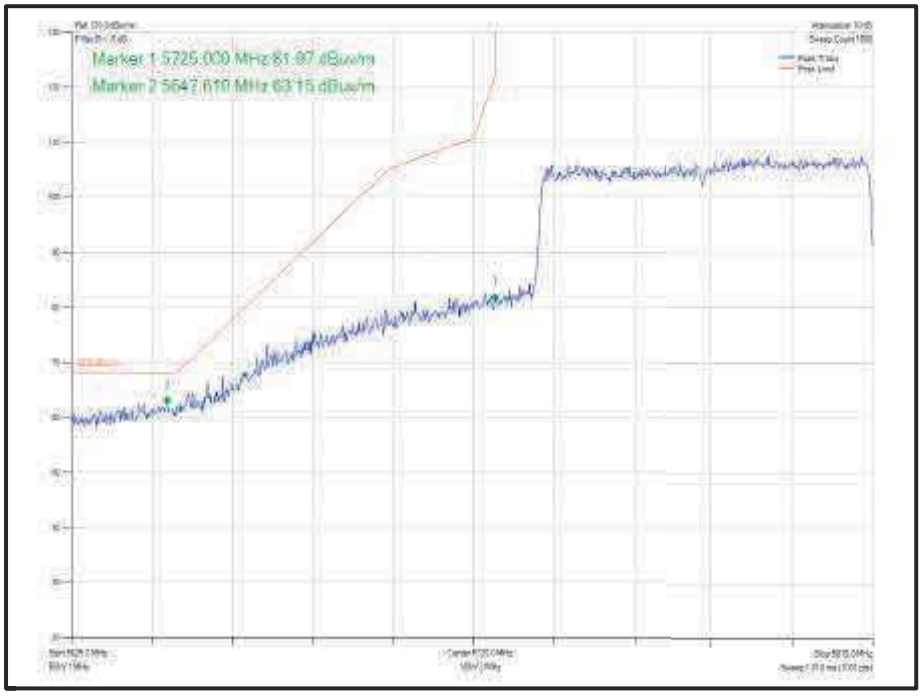

Figure 816 - 802.11ax HE80 Core 1 SU - 5775 MHz
Band Edge Frequency 5850 MHz

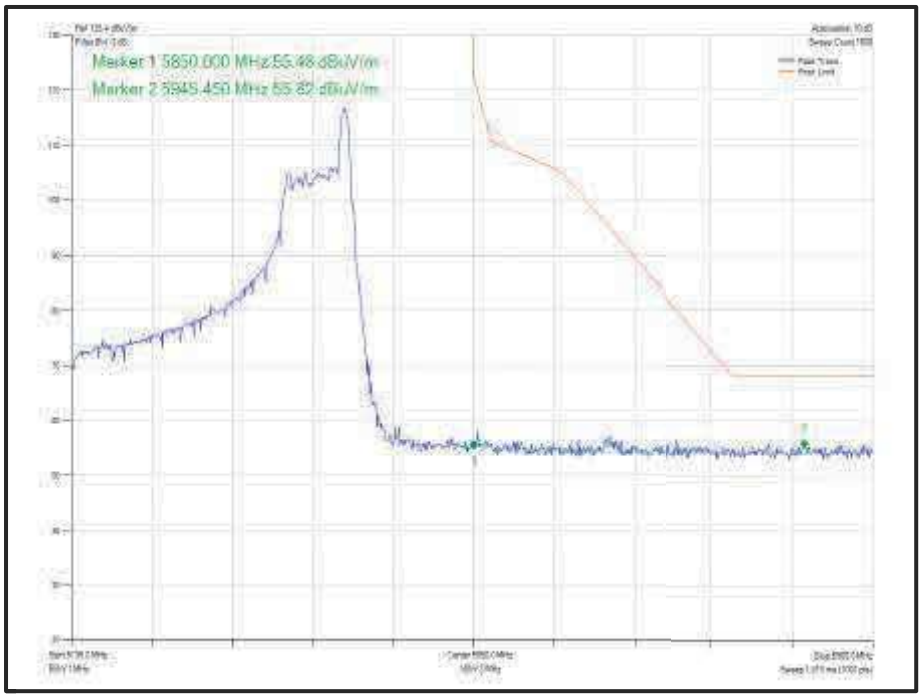

Figure 817 - 802.11ax HE80 Core 1 26-36 - 5775 MHz Band Edge Frequency 5850 MHz

Mode	Data Rate/ MCS	Resource size	Resource Index	TX Frequency (MHz)	Band Edge Frequency (MHz)	Level (dBuV/m)
802.11ac VHT80 CDD, Cores 0-1	MCS7x1	-	-	5530	5470	62.14
802.11ac VHT80 SDM, Cores 0-1	MCS7x1	-	-	5530	5470	60.93
802.11ax HE80 CDD, Cores 0-1	MCS7	SU	-	5530	5470	57.74
802.11ax HE80 CDD, Cores 0-1	MCS7	52	37	5530	5470	61.19
802.11ax HE80 SDM, Cores 0-1	MCS7	SU	-	5530	5470	57.85
802.11ax HE80 SDM, Cores 0-1	MCS7	52	37	5530	5470	61.15
802.11ac VHT80 CDD, Cores 0-1	MCS7	-	-	5610	5725	63.13
802.11ac VHT80 SDM, Cores 0-1	MCS7	-	-	5610	5725	63.14
802.11ax HE80 CDD, Cores 0-1	MCS7	SU	-	5610	5725	63.46
802.11ax HE80 CDD, Cores 0-1	MCS7	52	52	5610	5725	57.44
802.11ax HE80 SDM, Cores 0-1	MCS7	SU	-	5610	5725	63.51
802.11ax HE80 SDM, Cores 0-1	MCS7	52	52	5610	5725	57.94
802.11ac VHT80 CDD, Cores 0-1	MCS7	-	-	5775	5725	63.57
802.11ac VHT80 SDM, Cores 0-1	MCS7	-	-	5775	5725	63.54
802.11ax HE80 CDD, Cores 0-1	MCS7	SU	-	5775	5725	60.40
802.11ax HE80 CDD, Cores 0-1	MCS7	26	0	5775	5725	56.28
802.11ax HE80 SDM, Cores 0-1	MCS7	SU	-	5775	5725	61.03
802.11ax HE80 SDM, Cores 0-1	MCS7	26	0	5775	5725	55.79
802.11ac VHT80 CDD, Cores 0-1	MCS7	-	-	5775	5850	63.33
802.11ac VHT80 SDM, Cores 0-1	MCS7	-	-	5775	5850	62.85
802.11ax HE80 CDD, Cores 0-1	MCS7	SU	-	5775	5850	61.99
802.11ax HE80 CDD, Cores 0-1	MCS7	26	36	5775	5850	56.64
802.11ax HE80 SDM, Cores 0-1	MCS7	SU	-	5775	5850	62.52
802.11ax HE80 SDM, Cores 0-1	MCS7	26	36	5775	5850	56.25

Table 596 - MIMO 2TX Authorised Band Edge Results

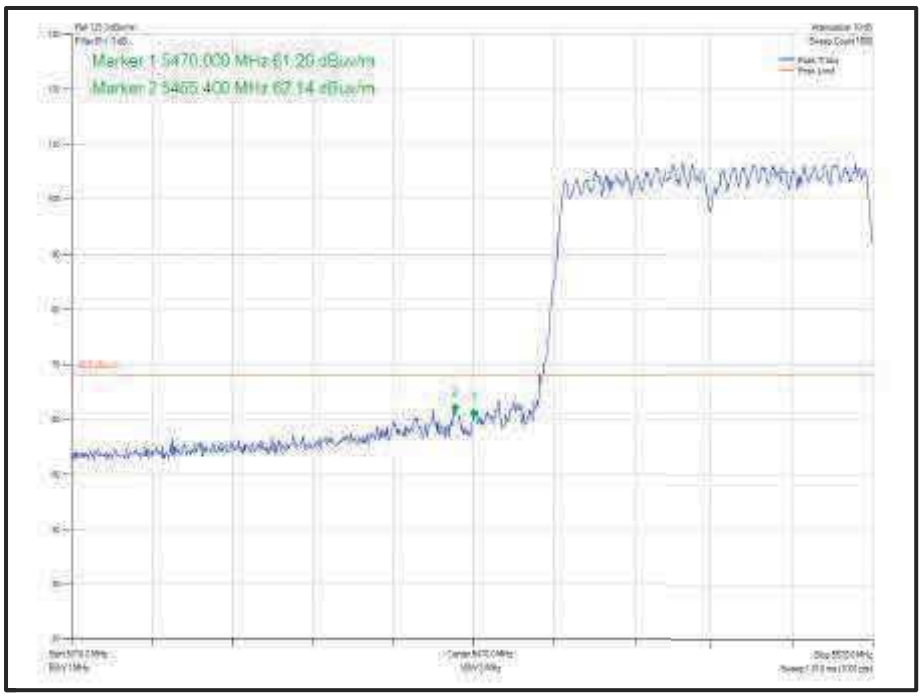

Figure 818 - 802.11ac VHT80 CDD, Cores 0-1 - 5530 MHz Band Edge Frequency 5470 MHz

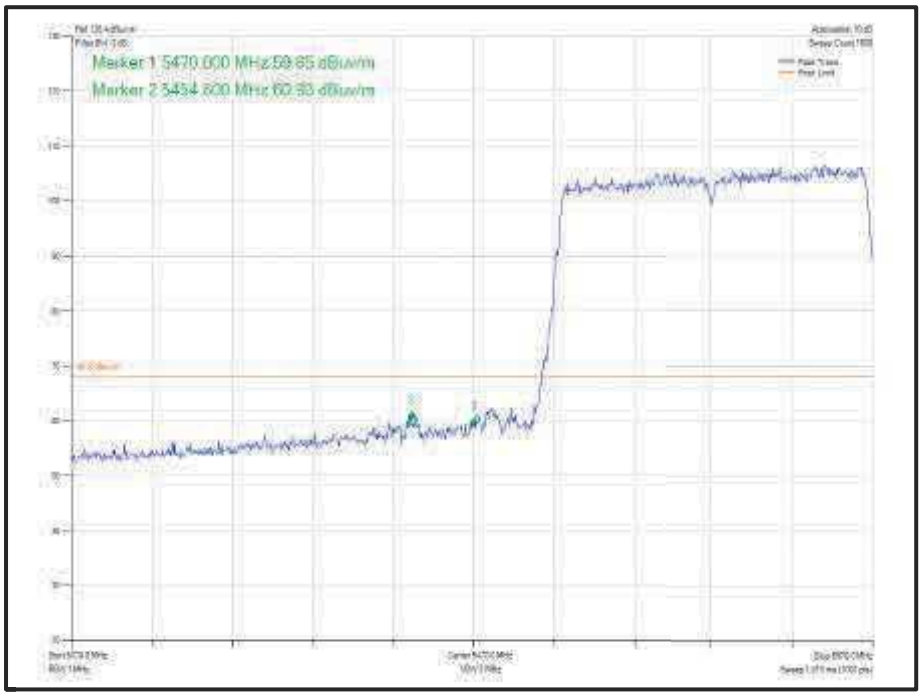

Figure 819 - 802.11ac VHT80 SDM, Cores 0-1 - 5530 MHz Band Edge Frequency 5470 MHz

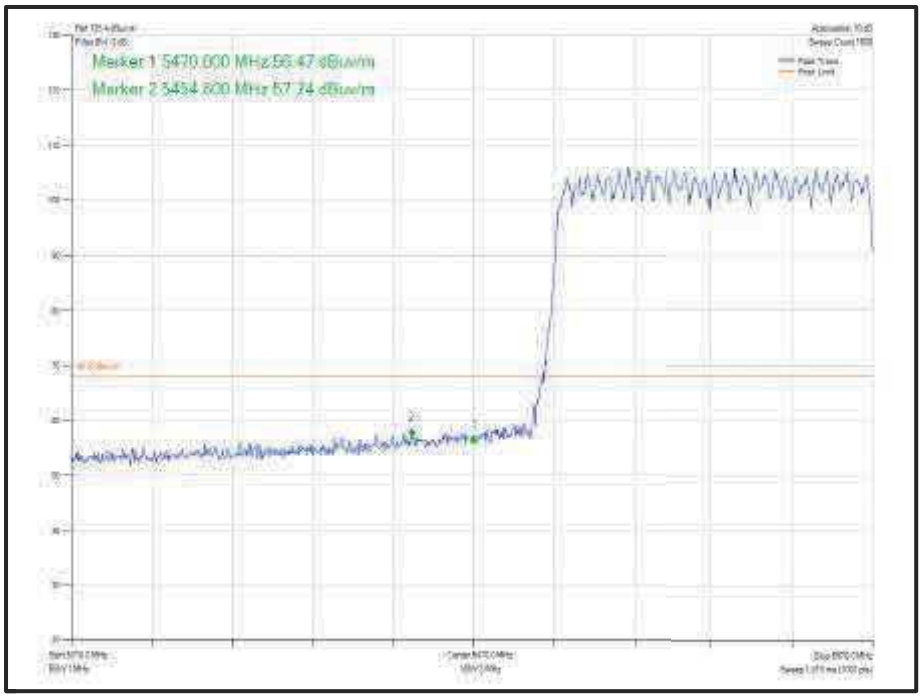

Figure 820 - 802.11ax HE80 CDD, Cores 0-1, SU - 5530 MHz Band Edge Frequency 5470 MHz

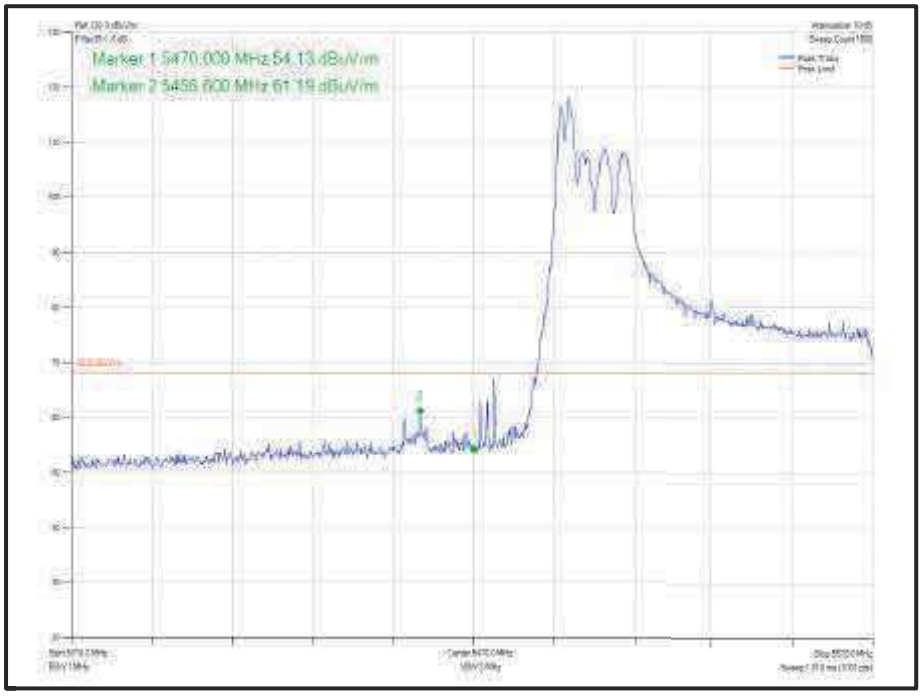

Figure 821 - 802.11ax HE80 CDD, Cores 0-1, 52-37-5530 MHz Band Edge Frequency 5470 MHz

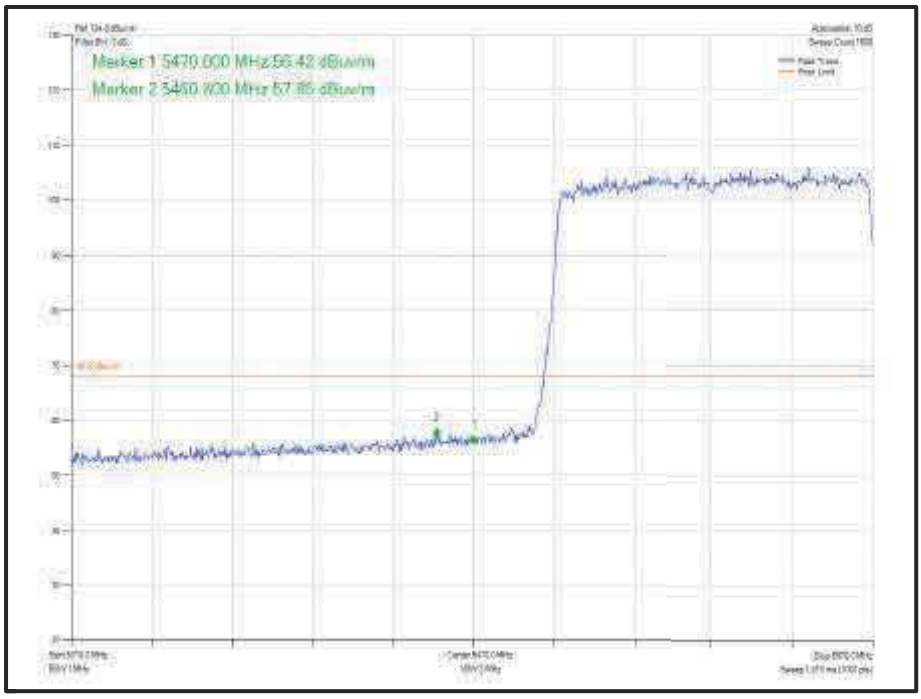

Figure 822 - 802.11ax HE80 SDM, Cores 0-1, SU - 5530 MHz Band Edge Frequency 5470 MHz

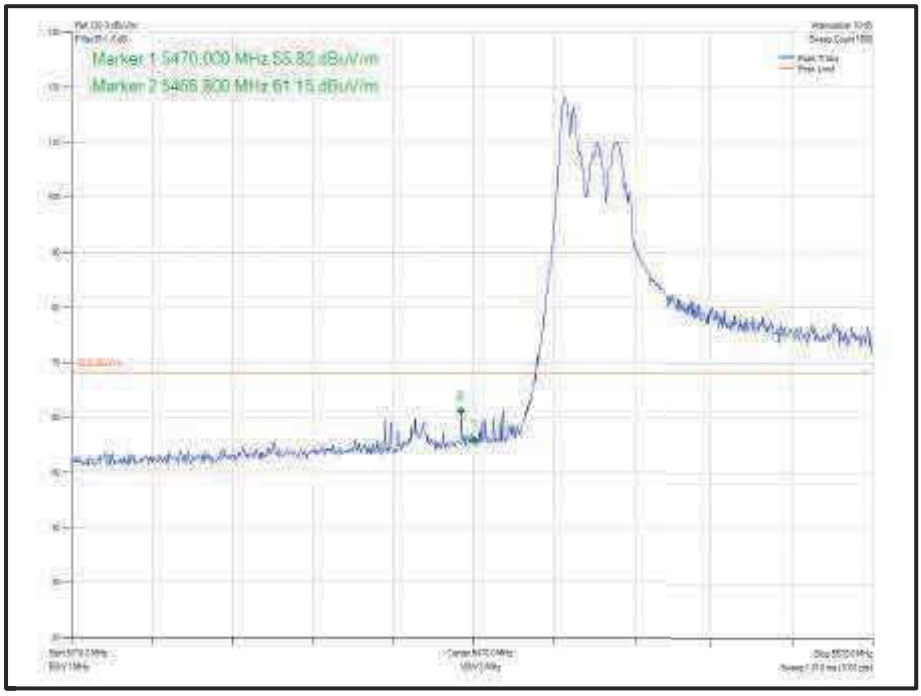

Figure 823 - 802.11ax HE80 SDM, Cores 0-1, 26-0 - 5530 MHz Band Edge Frequency 5470 MHz

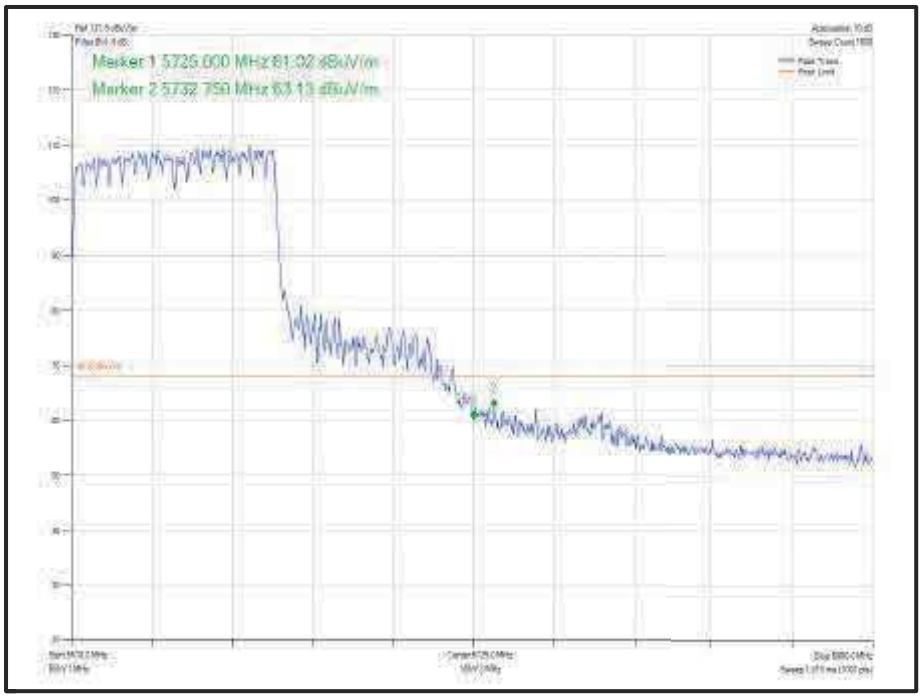

Figure 824 - 802.11ac VHT80 CDD, Cores 0-1 - 5610 MHz Band Edge Frequency 5725 MHz

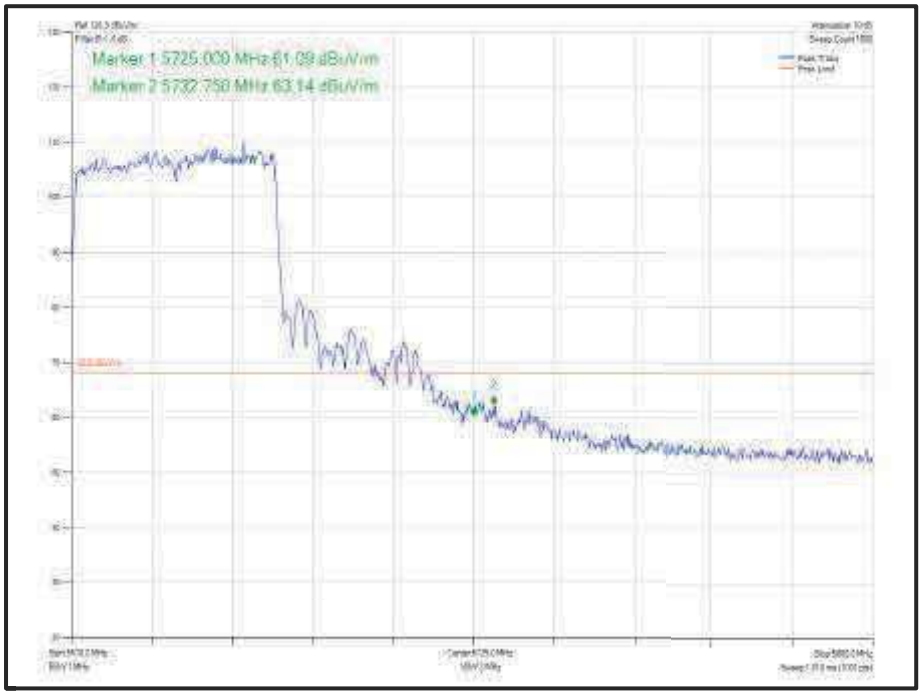

Figure 825 - 802.11ac VHT80 SDM, Cores 0-1 - 5610 MHz Band Edge Frequency 5725 MHz

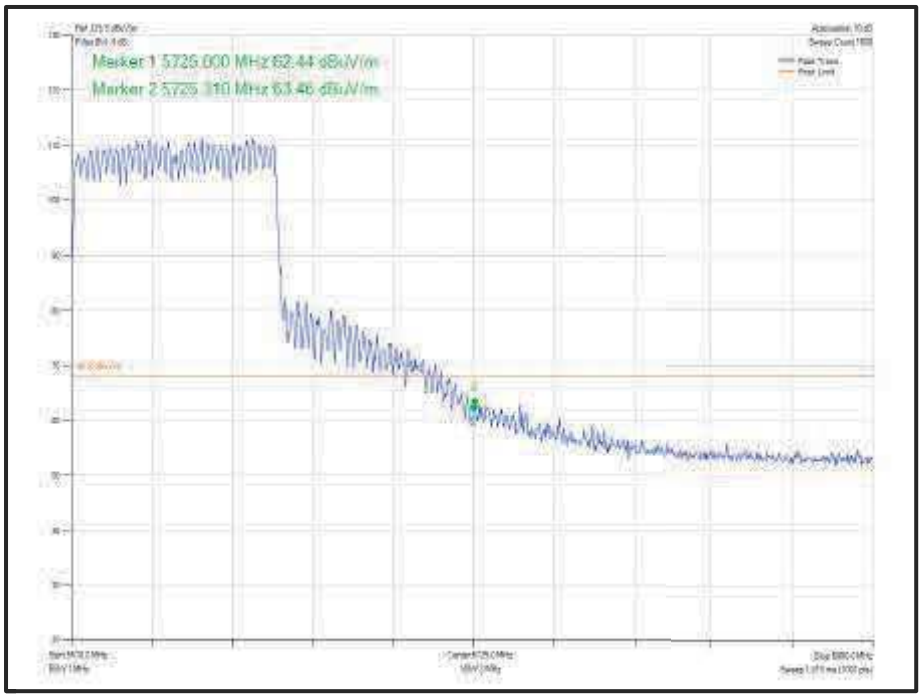

Figure 826 - 802.11ax HE80 CDD, Cores 0-1, SU - 5610 MHz Band Edge Frequency 5725 MHz

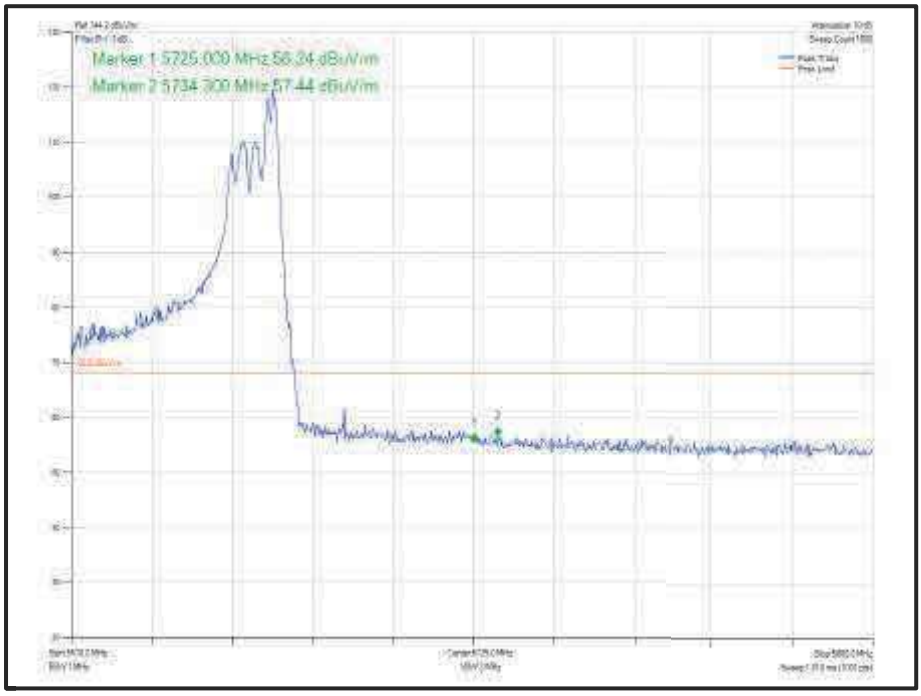

Figure 827 - 802.11ax HE80 CDD, Cores 0-1, 52-52-5610 MHz Band Edge Frequency 5725 MHz

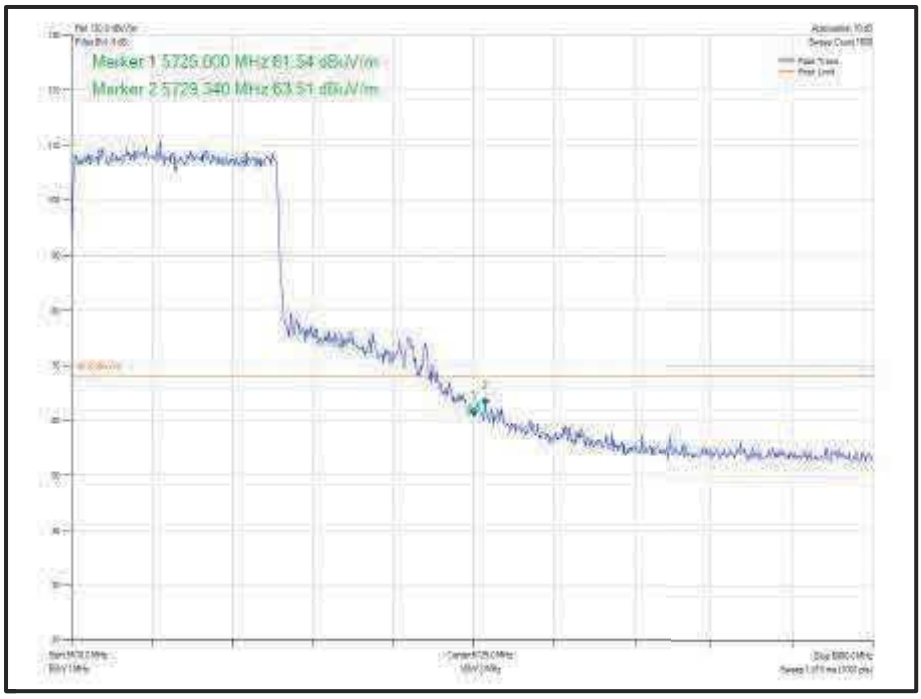

Figure 828 - 802.11ax HE80 SDM, Cores 0-1, SU - 5610 MHz Band Edge Frequency 5725 MHz

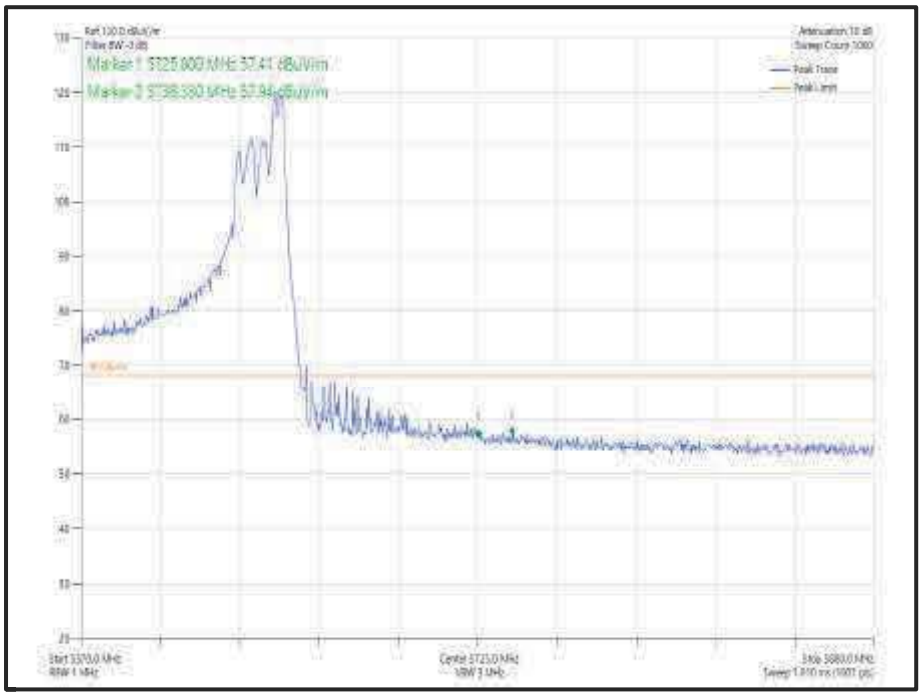

Figure 829 - 802.11ax HE80 SDM, Cores 0-1, 52-52 - 5610 MHz Band Edge Frequency 5725 MHz

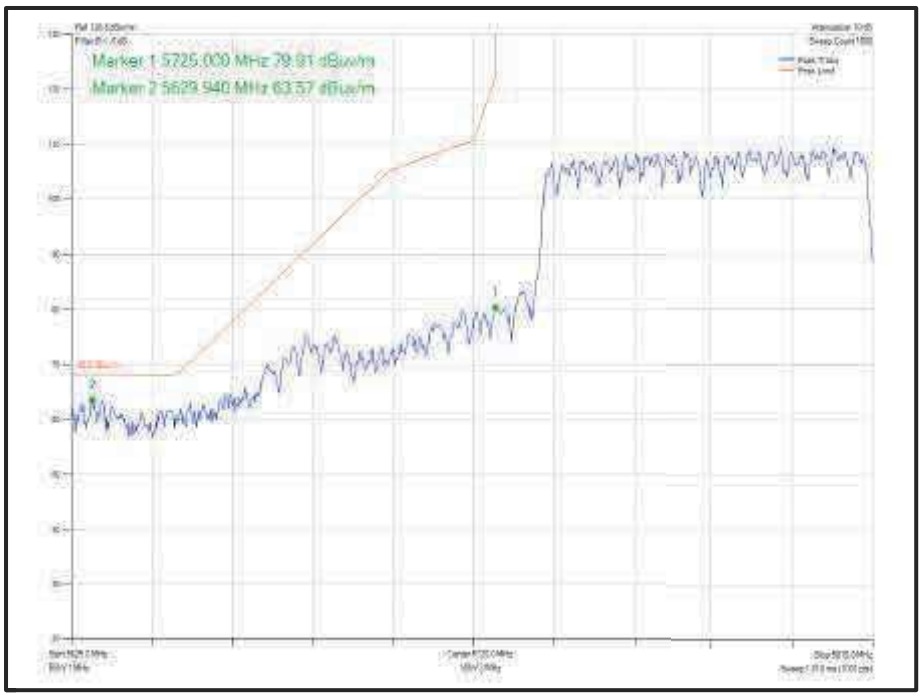

Figure 830 - 802.11ac VHT80 CDD, Cores 0-1 - 5775 MHz Band Edge Frequency 5725 MHz

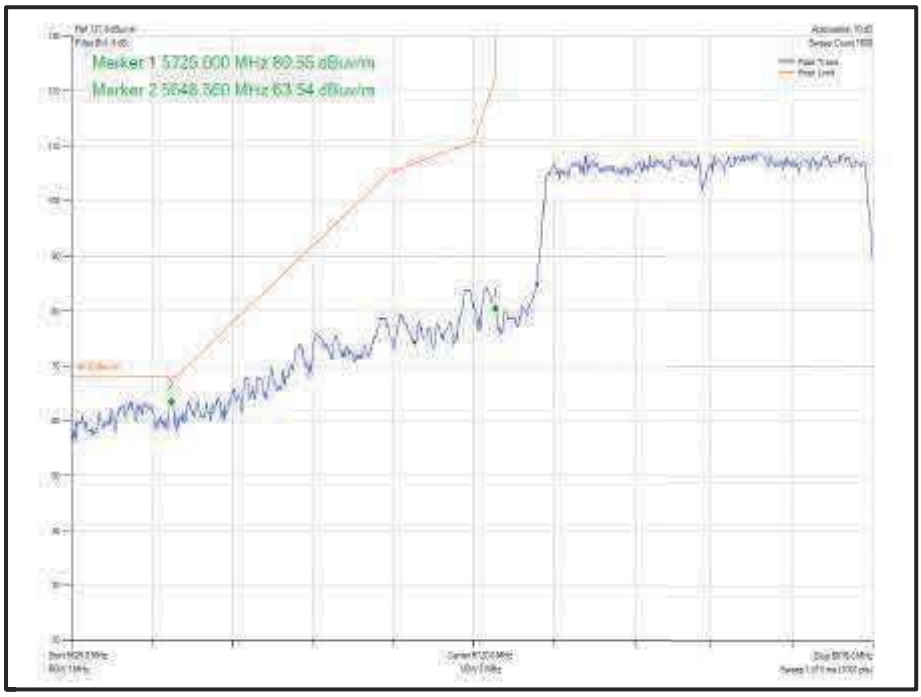

Figure 831 - 802.11ac VHT80 SDM, Cores 0-1 - 5775 MHz Band Edge Frequency 5725 MHz

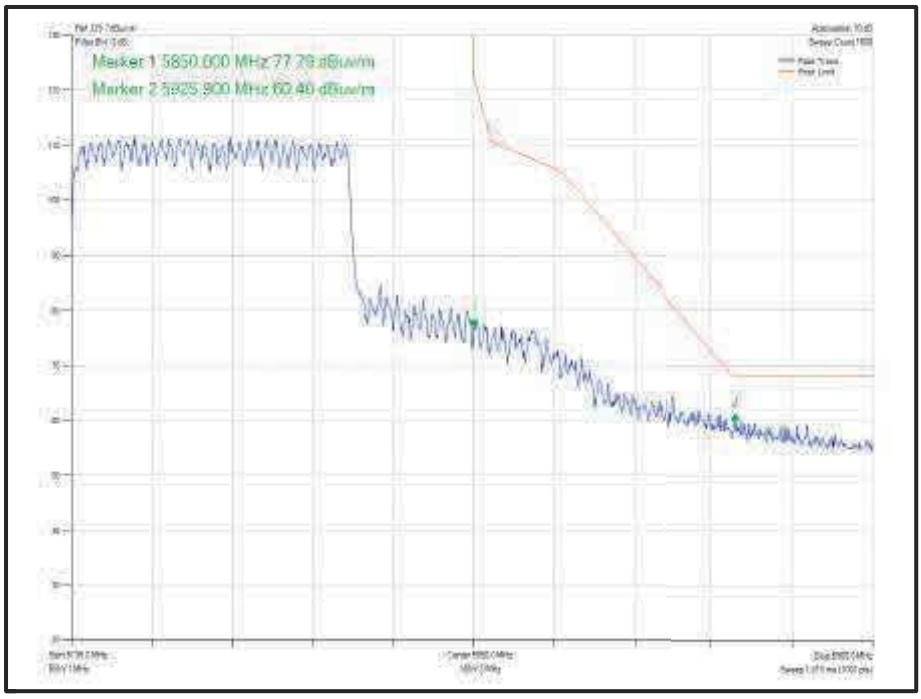

Figure 832 - 802.11ax HE80 CDD, Cores 0-1, SU - 5775 MHz Band Edge Frequency 5725 MHz

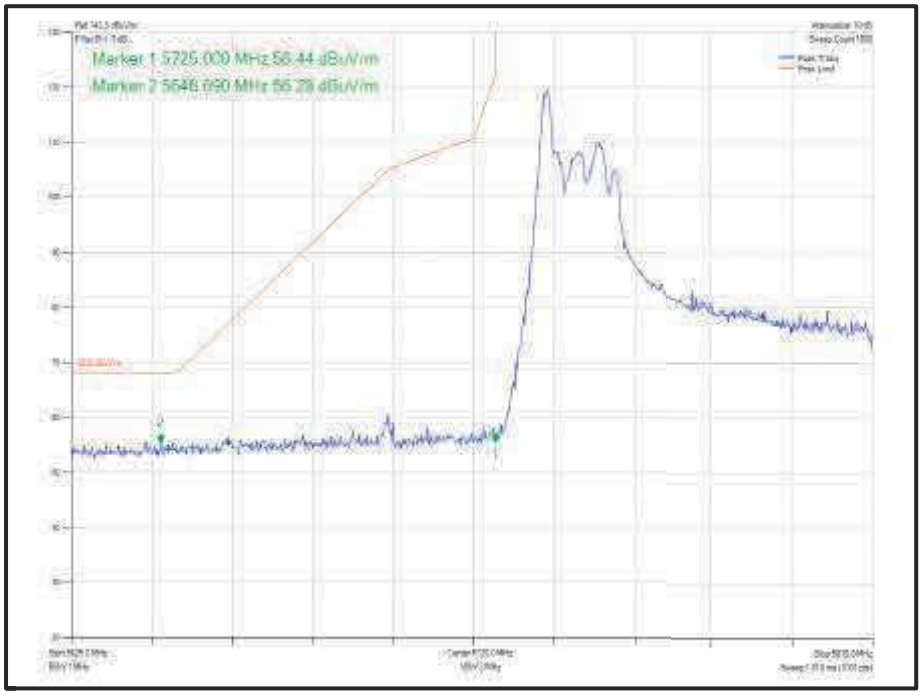

Figure 833 - 802.11ax HE80 CDD, Cores 0-1, 26-0 - 5775 MHz Band Edge Frequency 5725 MHz

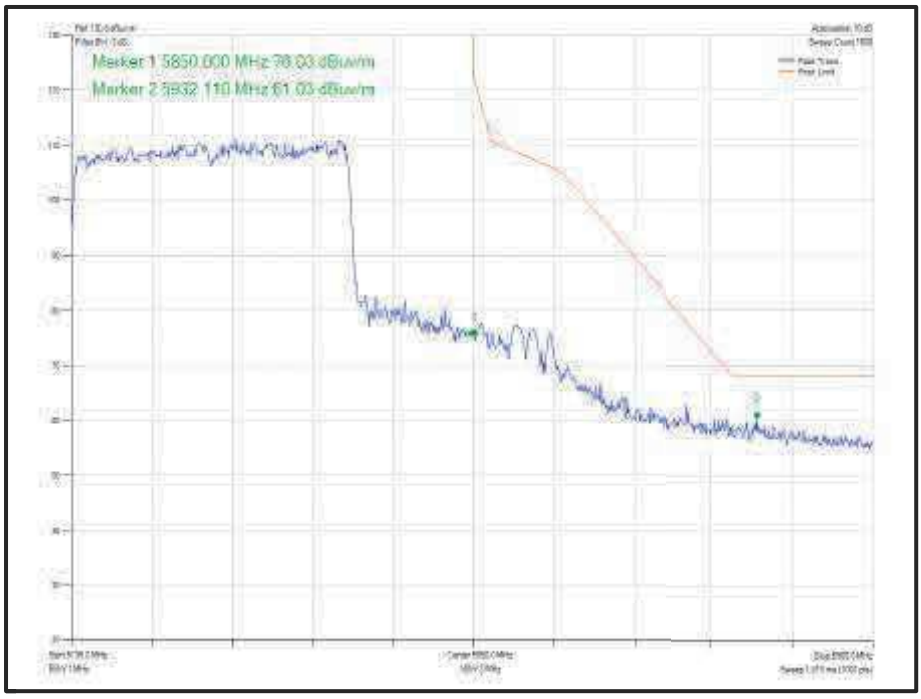

Figure 834 - 802.11ax HE80 SDM, Cores 0-1, SU - 5775 MHz Band Edge Frequency 5725 MHz

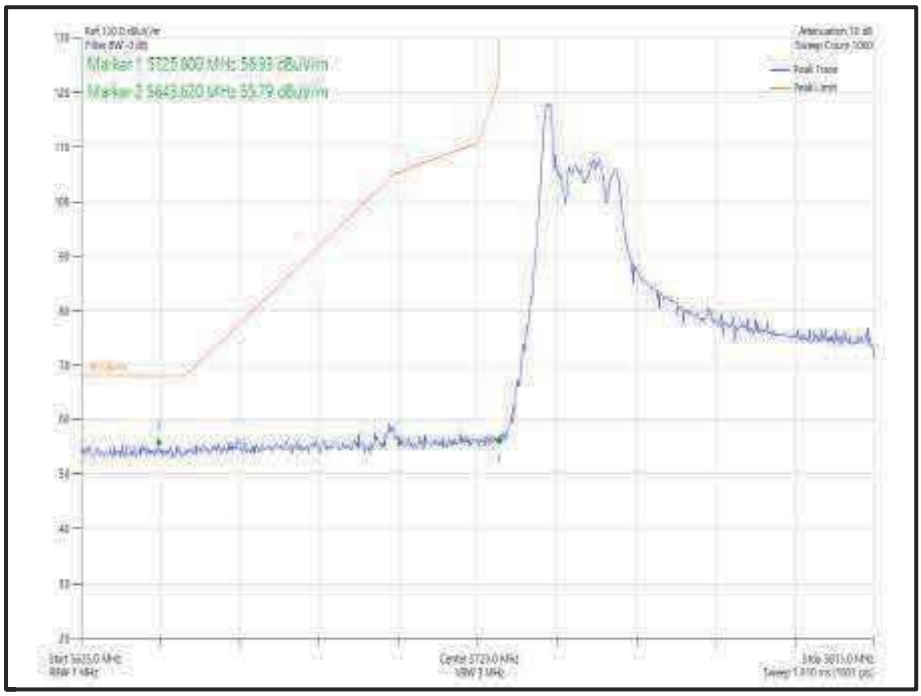

Figure 835 - 802.11ax HE80 SDM, Cores 0-1, 26-0 - 5775 MHz Band Edge Frequency 5725 MHz

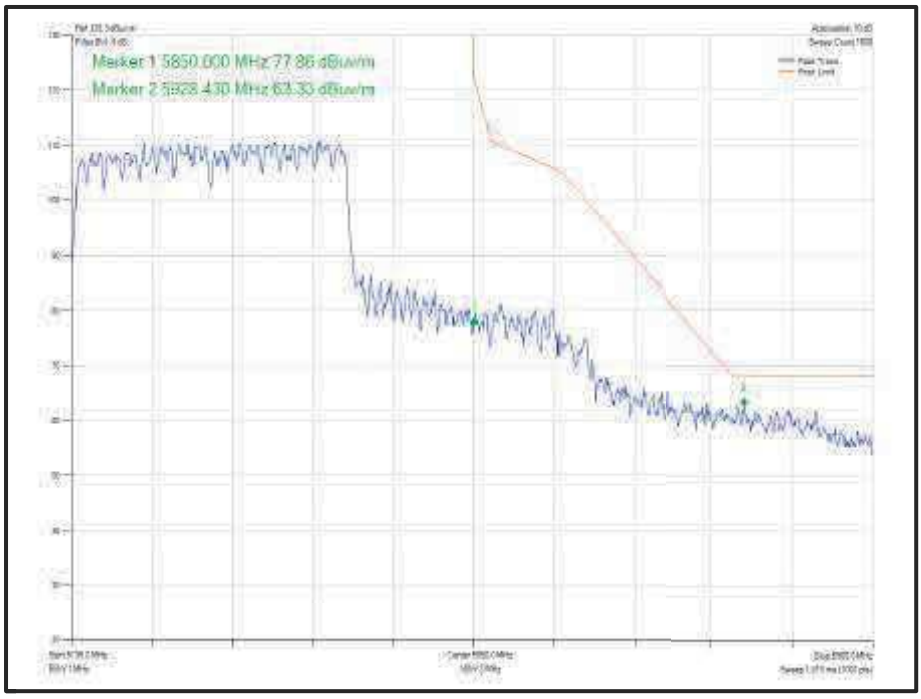

Figure 836 - 802.11ac VHT80 CDD, Cores 0-1 - 5775 MHz Band Edge Frequency 5850 MHz

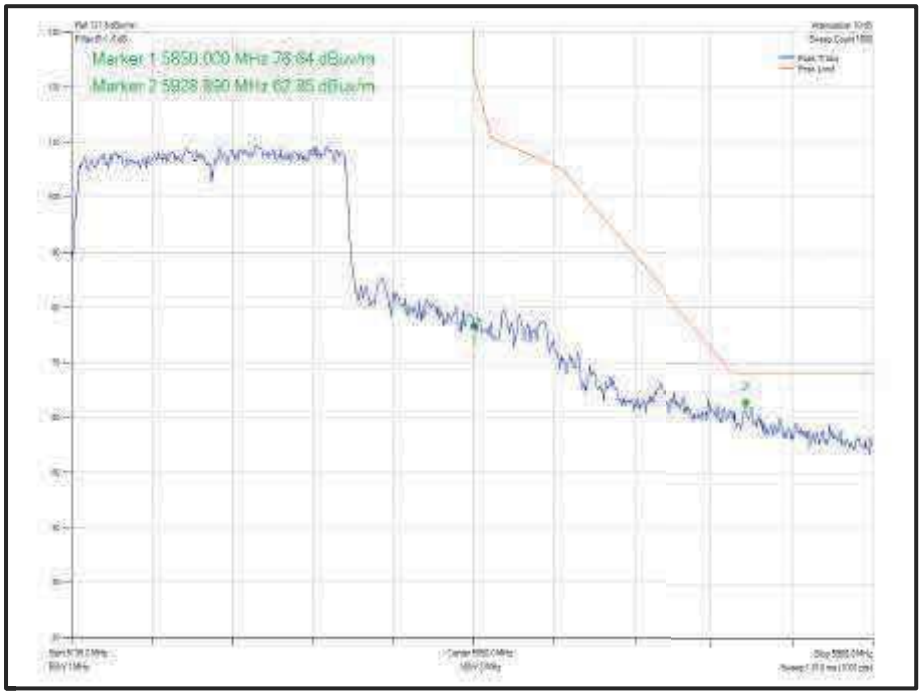

Figure 837 - 802.11ac VHT80 SDM, Cores 0-1 - 5775 MHz Band Edge Frequency 5850 MHz

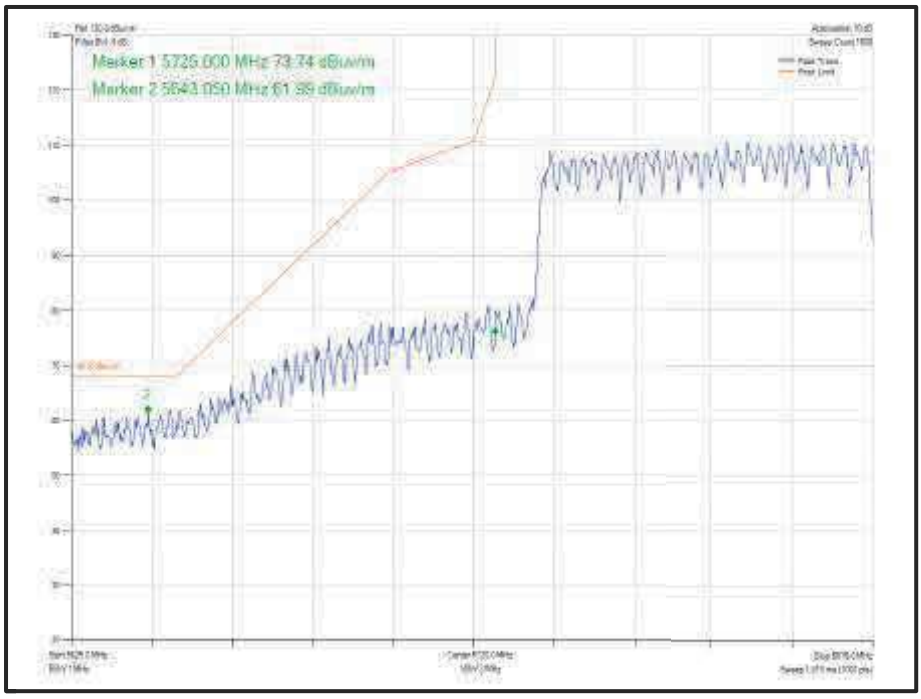

Figure 838 - 802.11ax HE80 CDD, Cores 0-1, SU - 5775 MHz Band Edge Frequency 5850 MHz

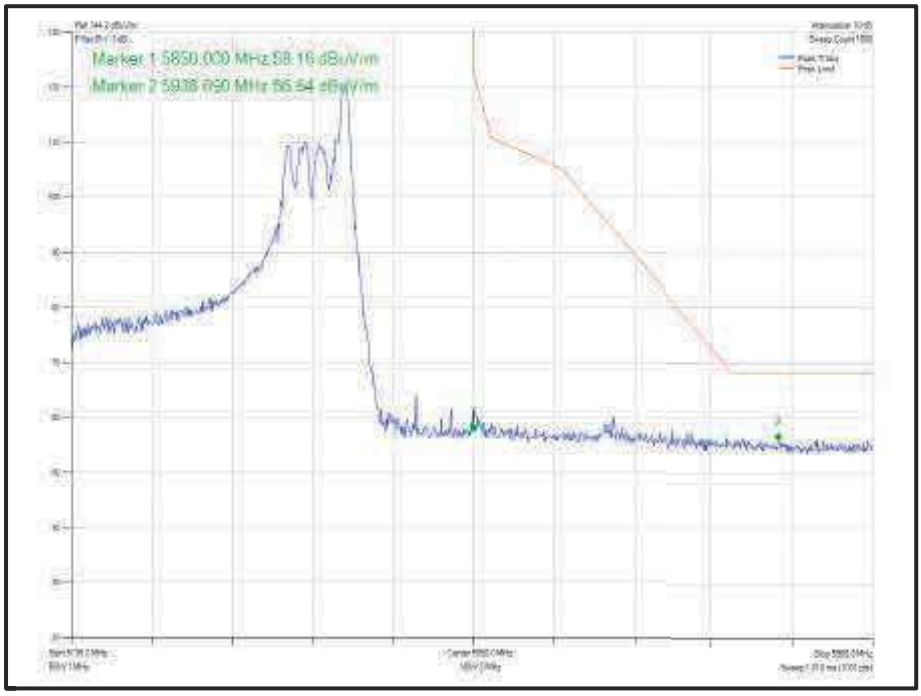

Figure 839 - 802.11ax HE80 CDD, Cores 0-1, 26-36 - 5775 MHz Band Edge Frequency 5850 MHz

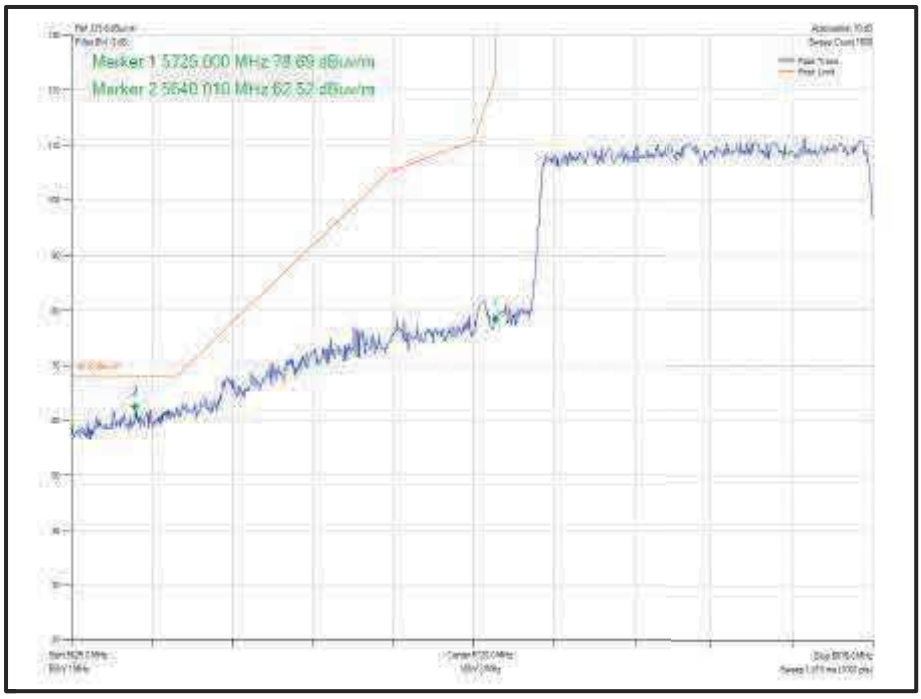

Figure 840 - 802.11ax HE80 SDM, Cores 0-1, SU -- 5775 MHz Band Edge Frequency 5850 MHz

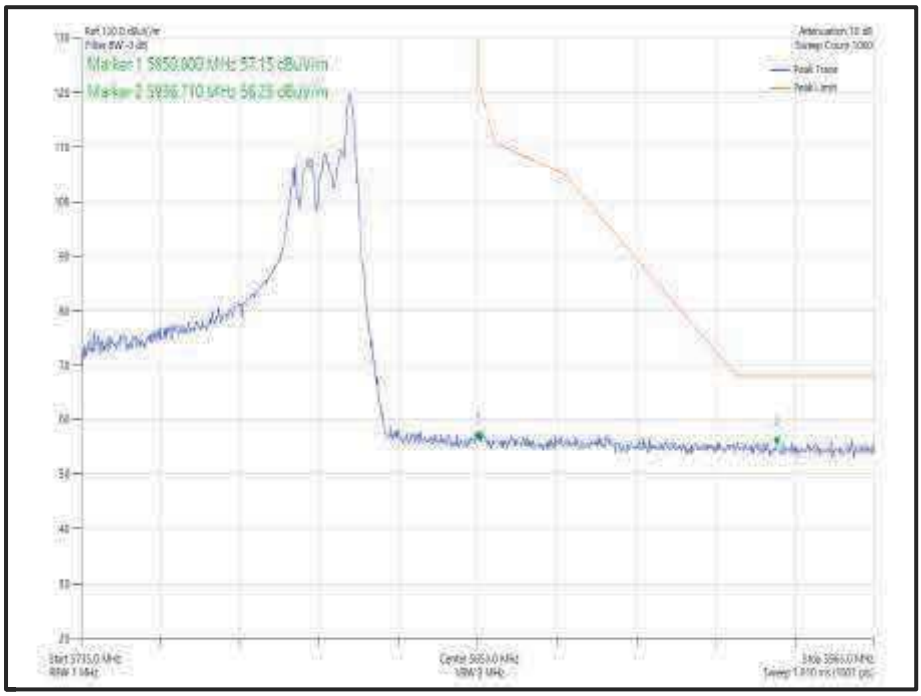

Figure 841 - 802.11ax HE80 SDM, Cores 0-1, 26-36 - 5775 MHz Band Edge Frequency 5850 MHz

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
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
Screened Room (11)	Rainford	Rainford	5136	36	01-Nov-2021
Mast	Maturo	TAM 4.0-P	5158	-	TU
Mast and Turntable Controller	Maturo	Maturo NCD	5159	-	TU
Turntable	Maturo	TT 1.5WF	5160	-	TU
Horn Antenna (1-10GHz)	Schwarzbeck	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
Pre Amp 1 - 26.5 GHz	Agilent Technologies	8449B	5445	12	06-May-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 597

TU - Traceability Unscheduled

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

A2338, S/N: C02CX02PQC36 - Modification State 0

2.5.3 Date of Test

19-July-2020 to 14-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	19.9-22.4°C
Relative Humidity	39.8-63.4%

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	59.12	47.52
802.11n HT20, Core 1	MCS7	-	-	5180	5150	63.83	48.92
802.11ax HE20, Core 1	MCS7	SU	-	5180	5150	63.77	47.38
802.11ax HE20, Core 1	MCS7	26	0	5180	5150	57.24	45.91
802.11a, Core 1	6 Mbps	-	-	5320	5350	60.96	50.20
802.11n HT20, Core 1	MCS7	-	-	5320	5350	66.20	51.12
802.11ax HE20, Core 1	MCS7	SU	-	5320	5350	63.39	49.26
802.11ax HE20, Core 1	MCS7	26	8	5320	5350	60.70	48.41
802.11a, Core 1	6 Mbps	-	-	5500	5460	58.06	47.47
802.11n HT20, Core 1	MCS7	-		5500	5460	66.15	48.92
802.11ax HE20, Core 1	MCS7	SU	-	5500	5460	61.28	47.53
802.11ax HE20, Core 1	MCS7	52	37	5500	5460	57.26	46.35

Table 598 - SISO Restricted Band Edge Results

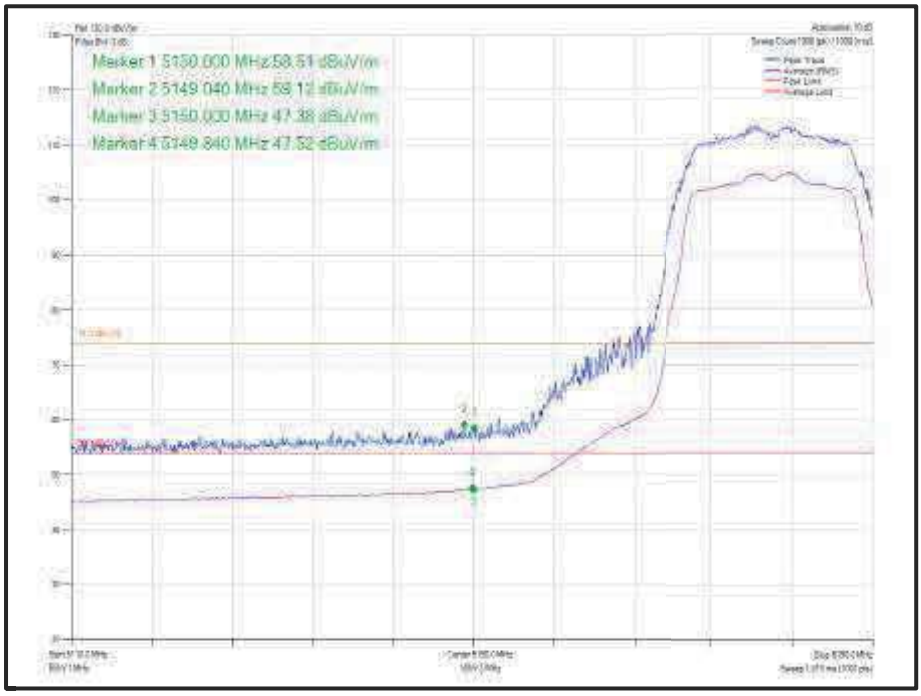

Figure 842 - 802.11a, Core 1 - 5180 MHz, Band Edge Frequency 5150 MHz

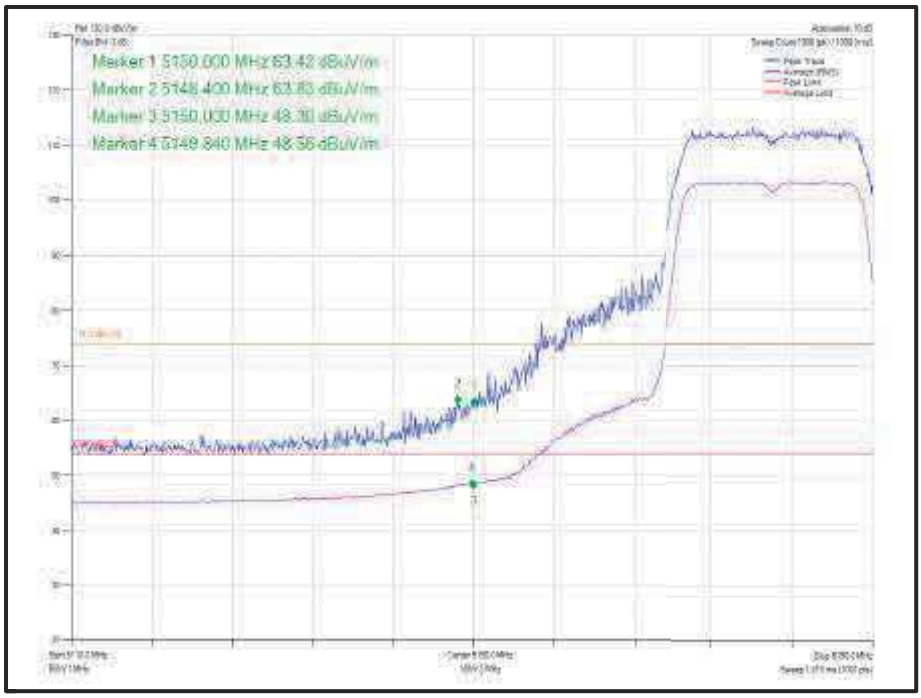

Figure 843 - 802.11n HT20, Core 1 - 5180 MHz, Band Edge Frequency 5150 MHz

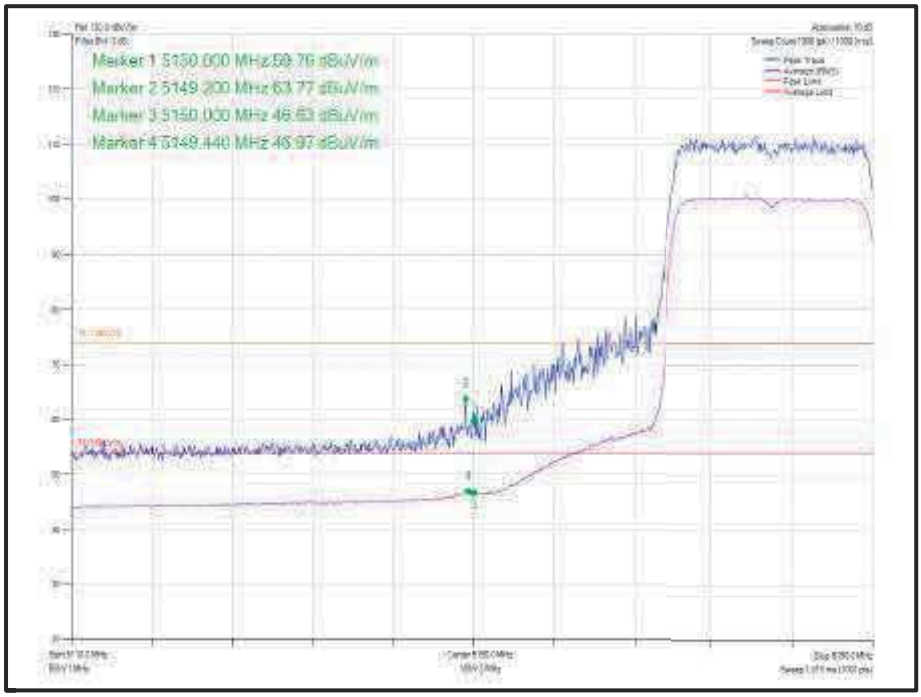

Figure 844 - 802.11ax HE20, Core 1, SU - 5180 MHz, Band Edge Frequency 5150 MHz

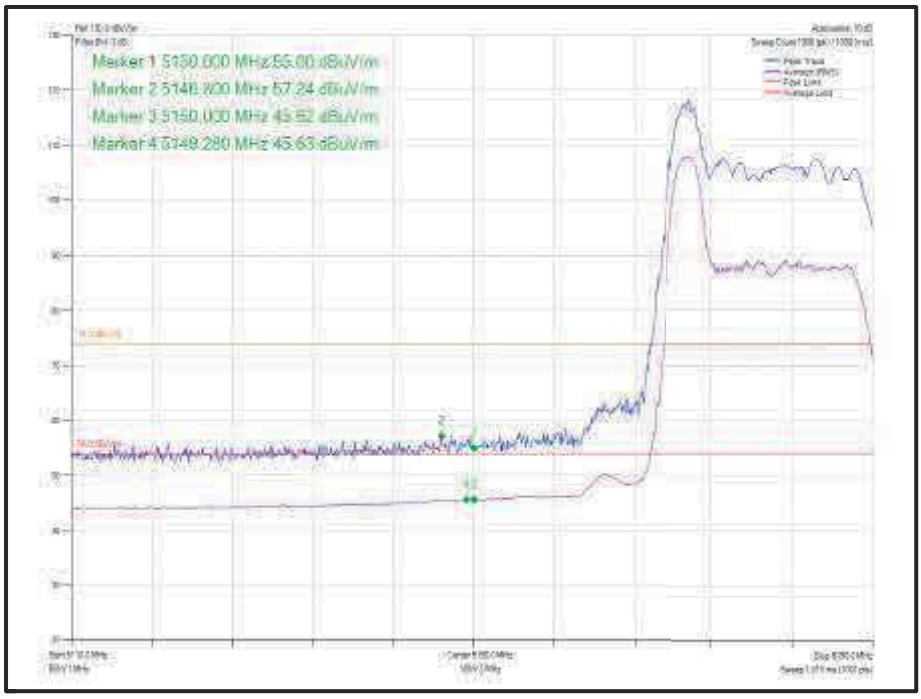

Figure 845 - 802.11ax HE20, Core 1, 26-0 - 5180 MHz, Band Edge Frequency 5150 MHz

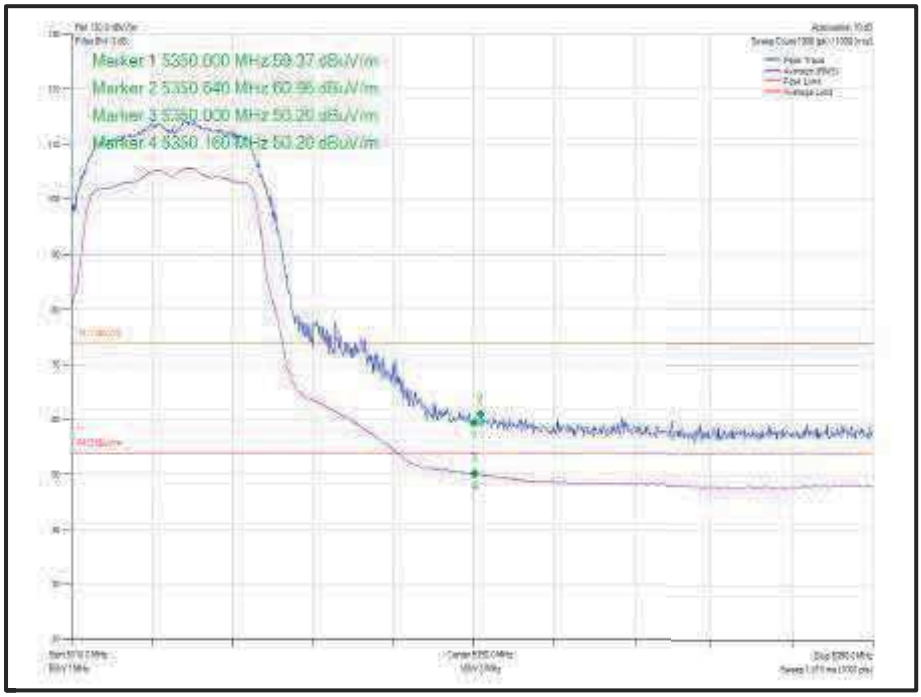

Figure 846 - 802.11a, Core 1 - 5320 MHz, Band Edge Frequency 5350 MHz

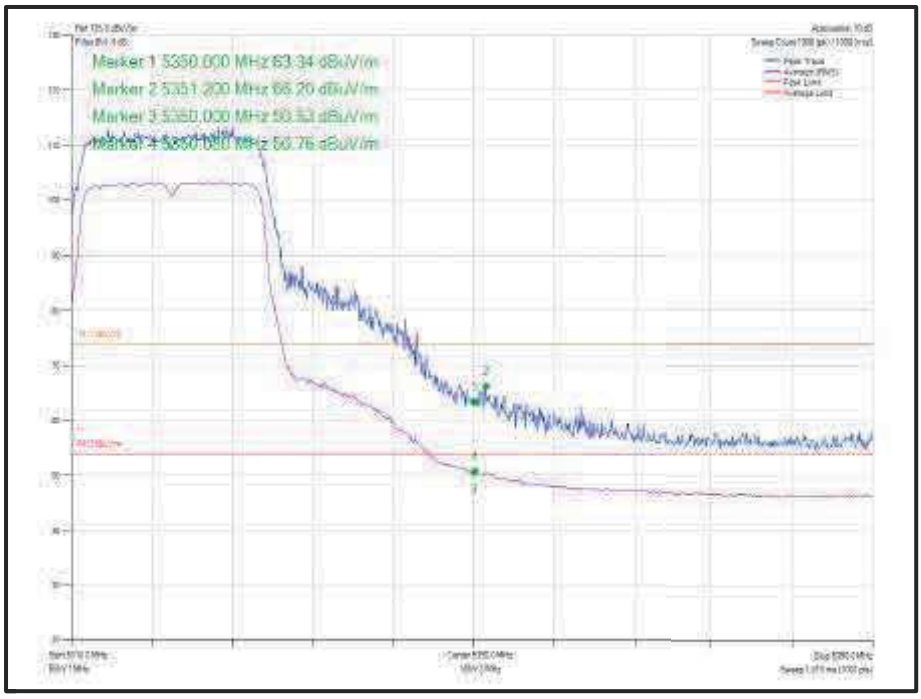

Figure 847 - 802.11n HT20, Core 1 - 5320 MHz, Band Edge Frequency 5350 MHz

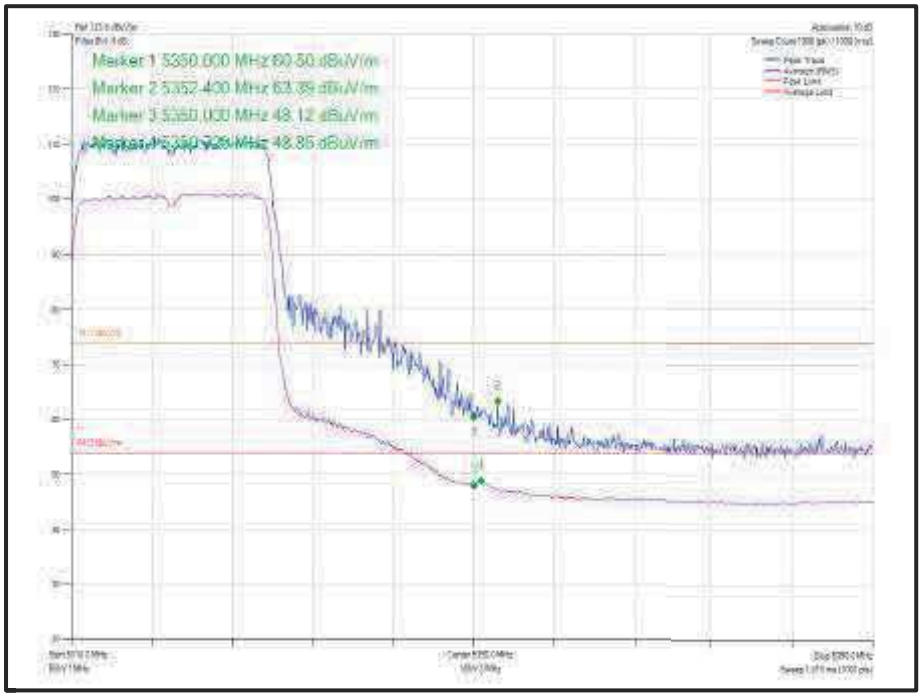

Figure 848 - 802.11ax HE20, Core 1, SU - 5320 MHz, Band Edge Frequency 5350 MHz

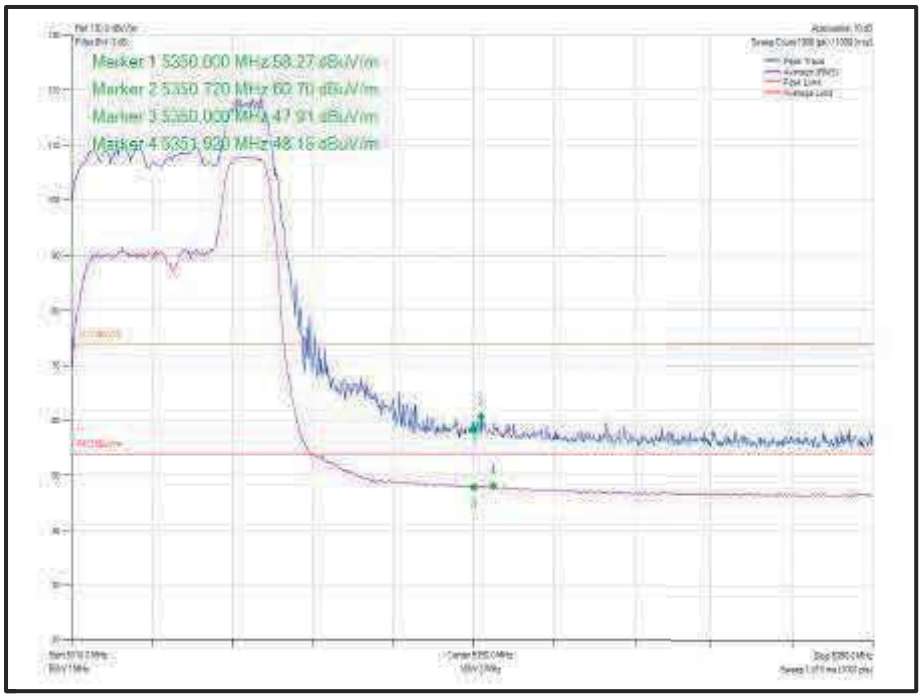

Figure 849 - 802.11ax HE20, Core 1, 52-40 - 5320 MHz, Band Edge Frequency 5350 MHz

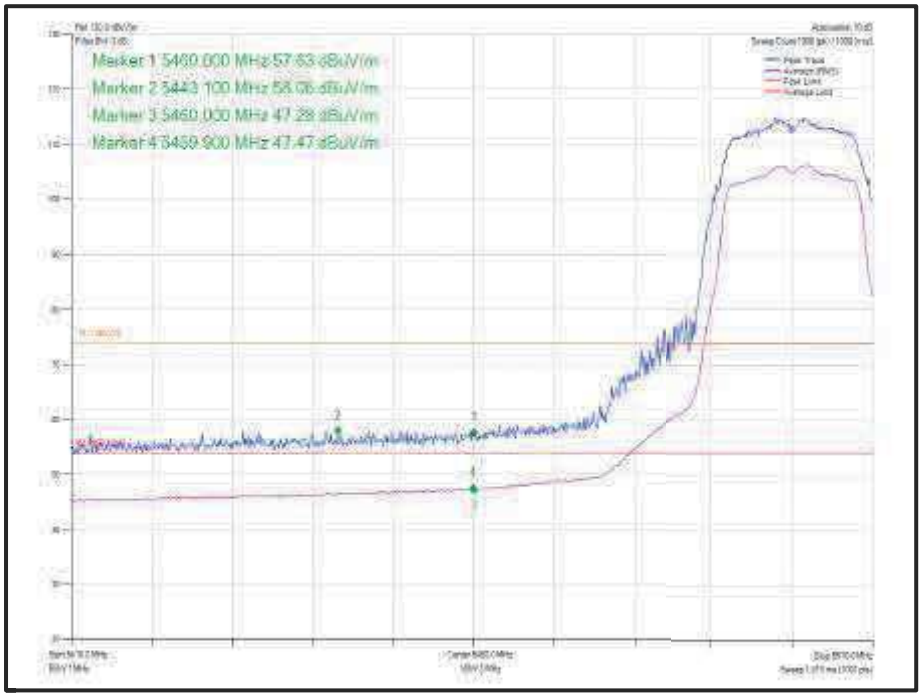

Figure 850 - 802.11a, Core 1 - 5500 MHz, Band Edge Frequency 5460 MHz

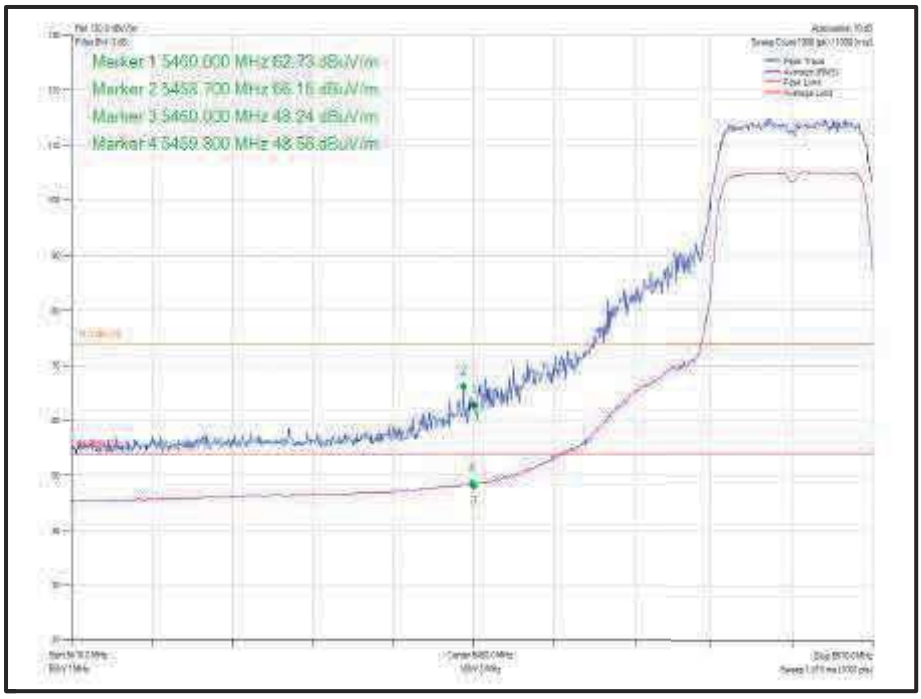

Figure 851 - 802.11n HT20, Core 1 - 5500 MHz, Band Edge Frequency 5460 MHz

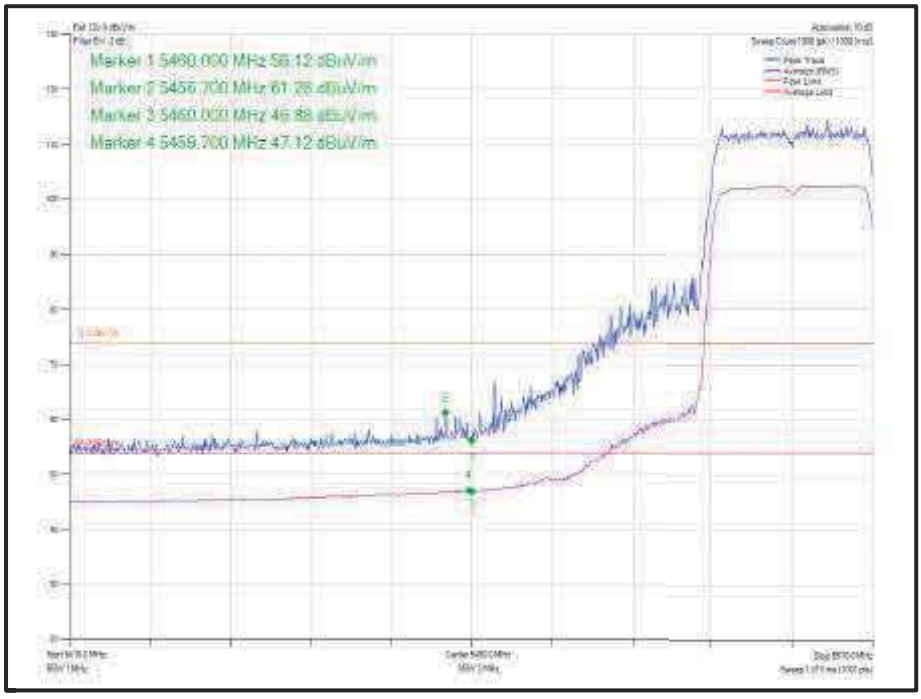

Figure 852 - 802.11ax HE20, Core 1, SU - 5500 MHz, Band Edge Frequency 5460 MHz

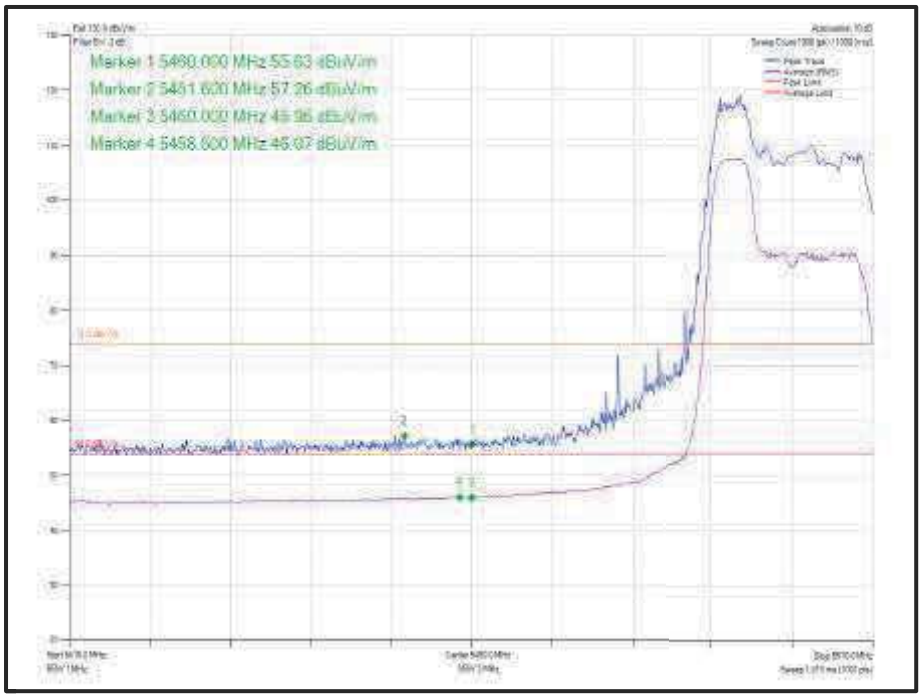

Figure 853 - 802.11ax HE20, Core 1, 52-37 - 5500 MHz, Band Edge Frequency 5460 MHz

Mode	Modulation Coding Scheme	Resource size	Resource Index	Frequency (MHz)	Band Edge Frequency (MHz)	Peak Level (dBµV/m)	Average Level (dBµV/m)
802.11n HT20 CDD, Cores 0-1	MCS7	-	-	5180	5150	63.91	49.86
802.11n HT20 SDM, Cores 0-1	MCS15	-	-	5180	5150	64.19	49.96
802.11ax HE20 CDD Cores 0-1	MCS7	SU	-	5180	5150	63.73	50.25
802.11ax HE20 CDD, Cores 0-1	MCS7	26	0	5180	5150	58.26	46.19
802.11ax HE20 SDM, Cores 0-1	MCS7	SU	-	5180	5150	63.15	49.83
802.11ax HE20 SDM, Cores 0-1	MCS7	26	0	5180	5150	60.45	46.25
802.11n HT20 CDD, Cores 0-1	MCS7	-	-	5320	5350	65.31	51.14
802.11n HT20 SDM, Cores 0-1	MCS15	-	-	5320	5350	63.27	51.17
802.11ax HE20 CDD, Cores 0-1	MCS7	SU	-	5320	5350	62.11	49.87
802.11ax HE20 CDD, Cores 0-1	MCS7	52	40	5320	5350	62.45	48.57
802.11ax HE20 SDM, Cores 0-1	MCS7	SU	-	5320	5350	61.94	50.78
802.11ax HE20 SDM, Cores 0-1	MCS7	52	40	5320	5350	62.82	48.85
802.11n HT20 CDD, Cores 0-1	MCS7	-	-	5500	5460	61.61	49.48
802.11n HT20 SDM, Cores 0-1	MCS15	-	-	5500	5460	62.26	49.45
802.11ax HE20 CDD, Cores 0-1	MCS7	SU	-	5500	5460	61.22	48.36
802.11ax HE20 CDD, Cores 0-1	MCS7	52	37	5500	5460	58.21	46.97
802.11ax HE20 SDM, Cores 0-1	MCS7	SU	-	5500	5460	61.38	48.80
802.11ax HE20 SDM, Cores 0-1	MCS7	52	37	5500	5460	59.32	47.42

Table 599 - MIMO 2TX Restricted Band Edge Results

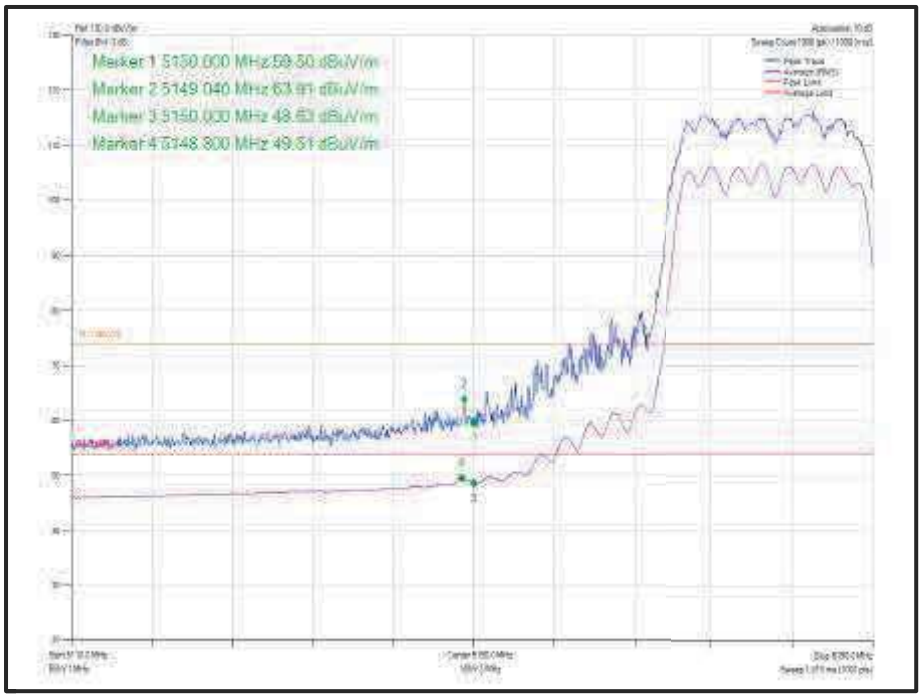

Figure 854 - 802.11n HT20 CDD, Cores 0-1 - 5180 MHz Band Edge Frequency 5150 MHz

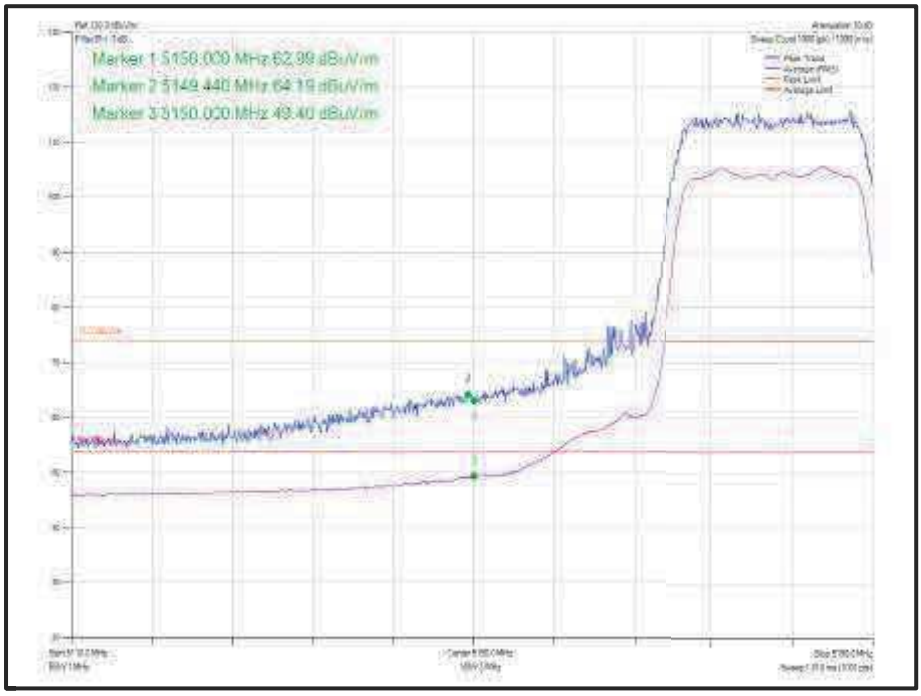

Figure 855 - 802.11n HT20 SDM, Cores 0-1 - 5180 MHz Band Edge Frequency 5150 MHz

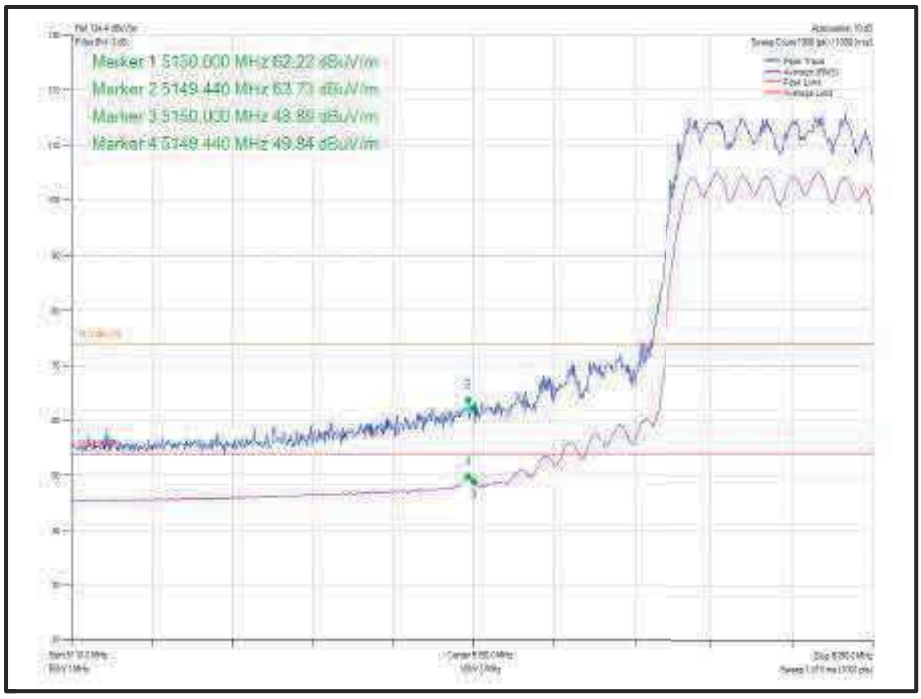

Figure 856 - 802.11ax HE20 CDD, Cores 0-1 SU - 5180 MHz Band Edge Frequency 5150 MHz

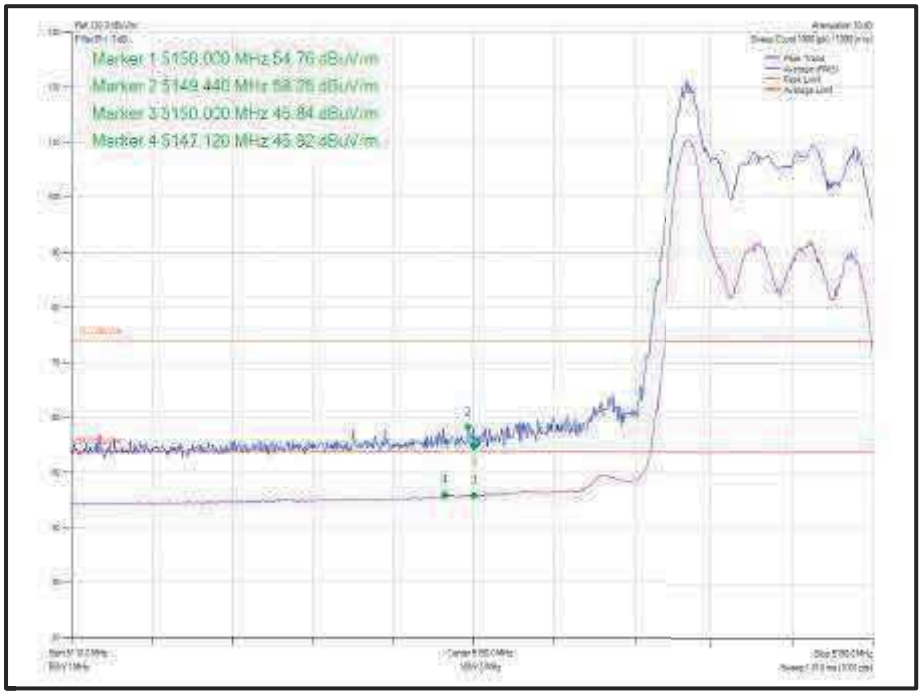

Figure 857 - 802.11ax HE20 CDD, Cores 0-1, 26-0 - 5180 MHz Band Edge Frequency 5150 MHz

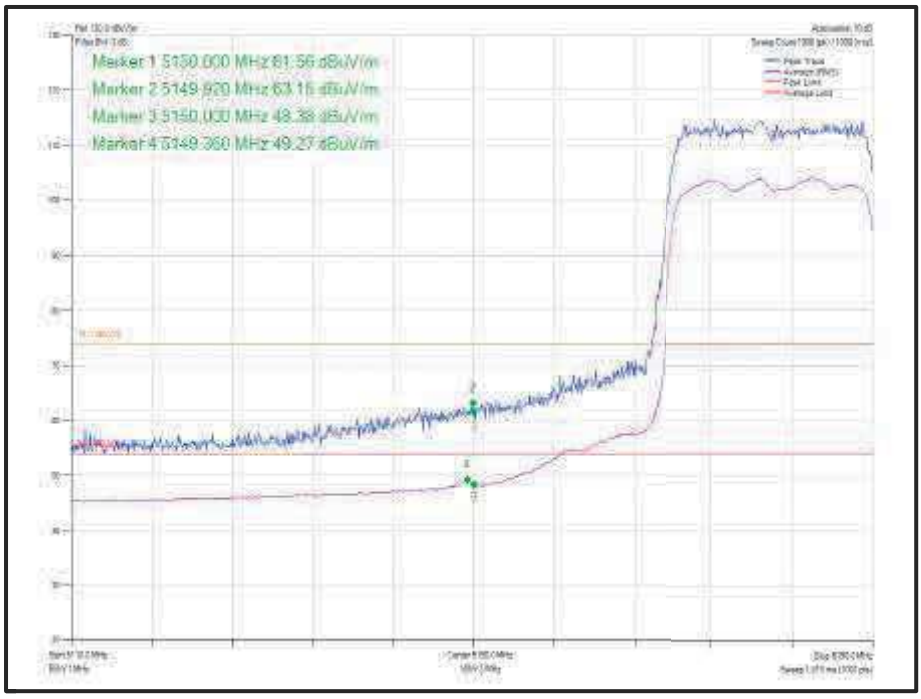

Figure 858 - 802.11ax HE20 SDM, Cores 0-1, SU - 5180 MHz Band Edge Frequency 5150 MHz

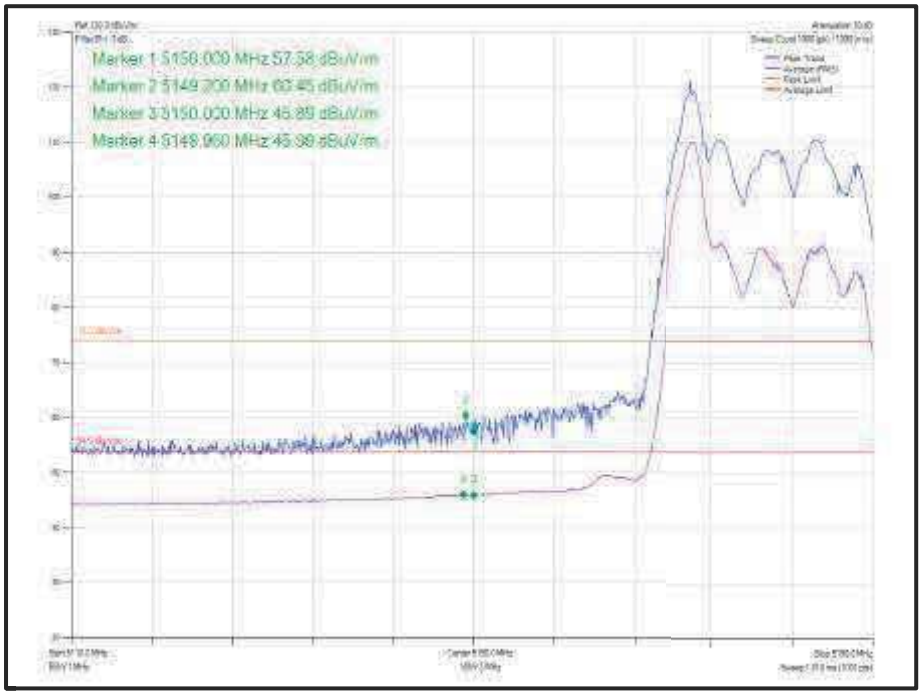

Figure 859 - 802.11ax HE20 SDM, Cores 0-1, 26-0 - 5180 MHz Band Edge Frequency 5150 MHz

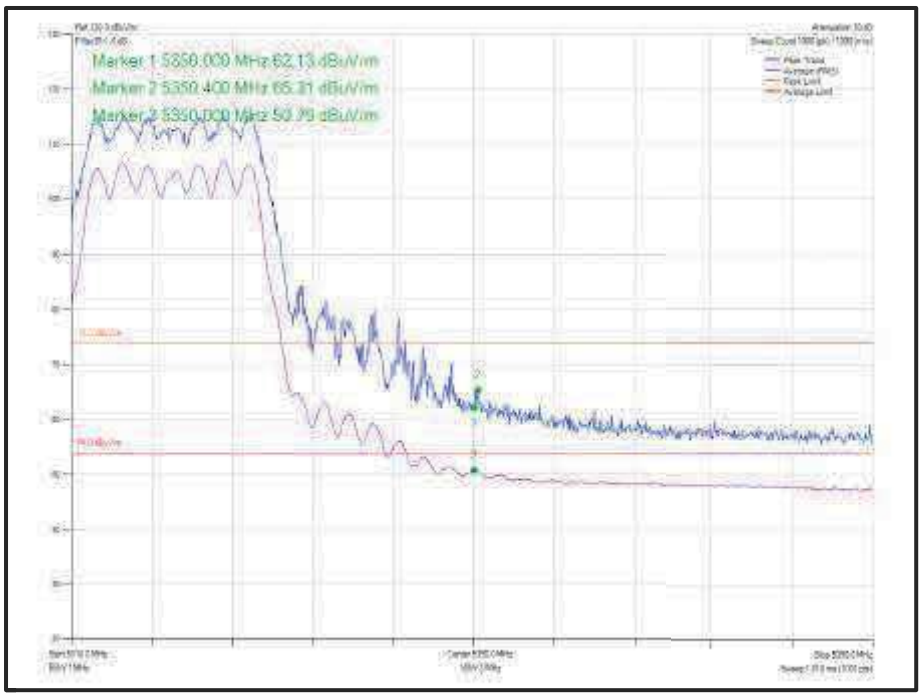

Figure 860 - 802.11n HT20 CDD, Cores 0-1 - 5320 MHz Band Edge Frequency 5350 MHz

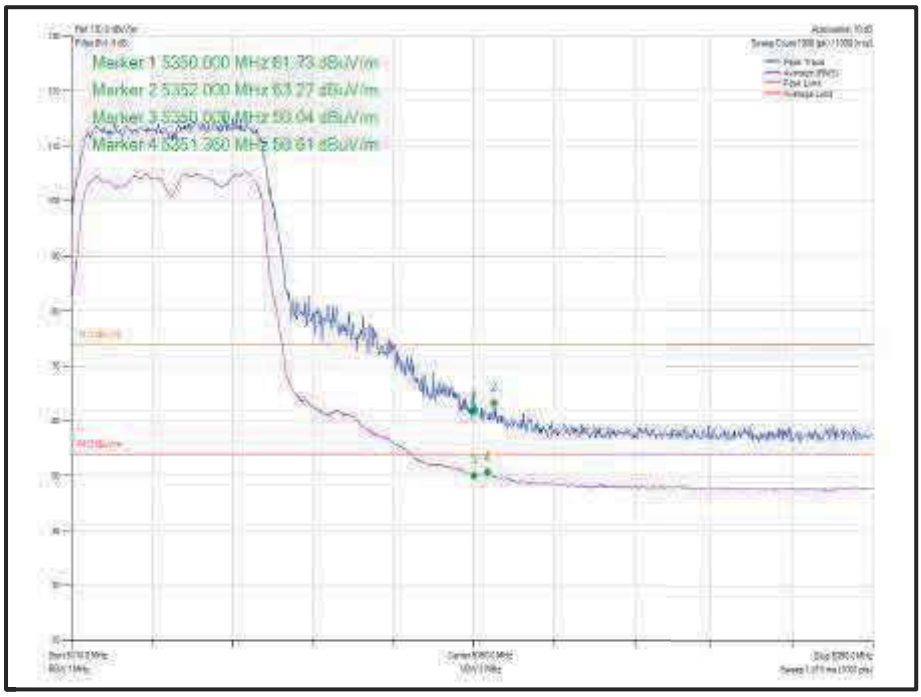

Figure 861 - 802.11n HT20 SDM, Cores 0-1 - 5320 MHz Band Edge Frequency 5350 MHz

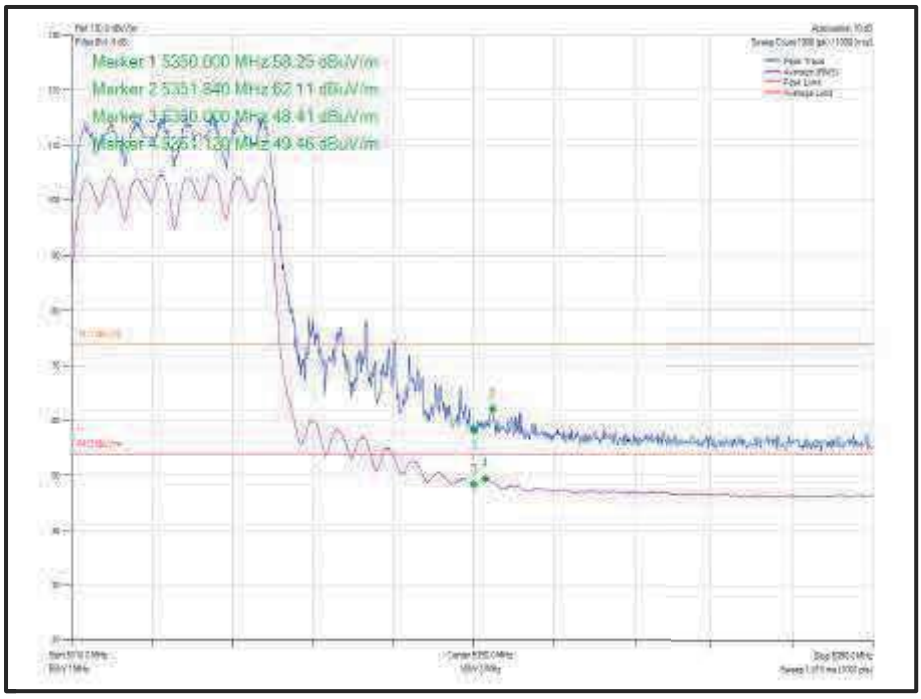

Figure 862 - 802.11ax HE20 CDD, Cores 0-1, SU - 5320 MHz Band Edge Frequency 5350 MHz

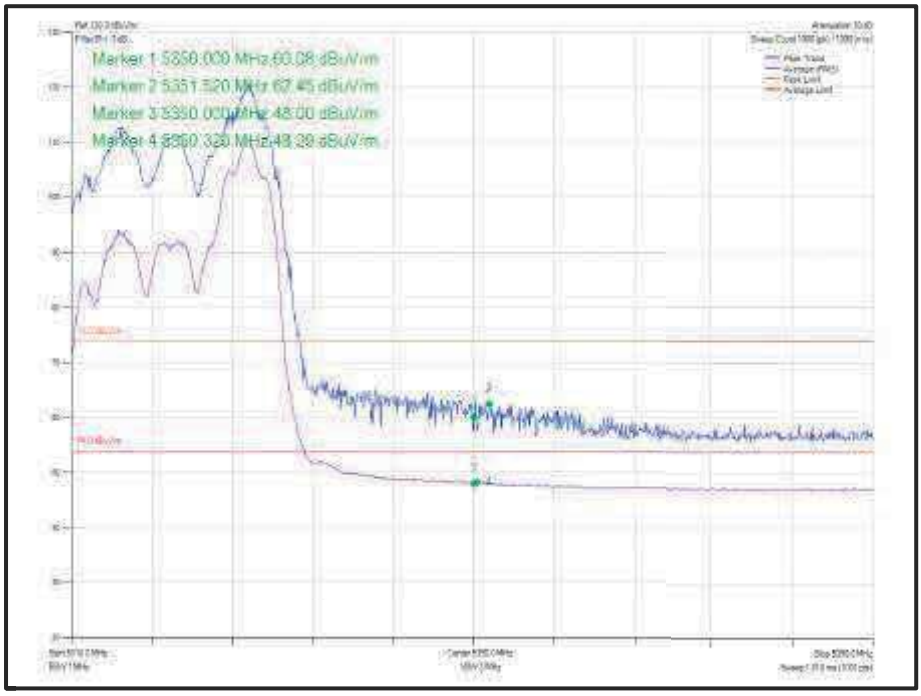

Figure 863 - 802.11ax HE20 CDD, Cores 0-1, 52-40 - 5320 MHz Band Edge Frequency 5350 MHz

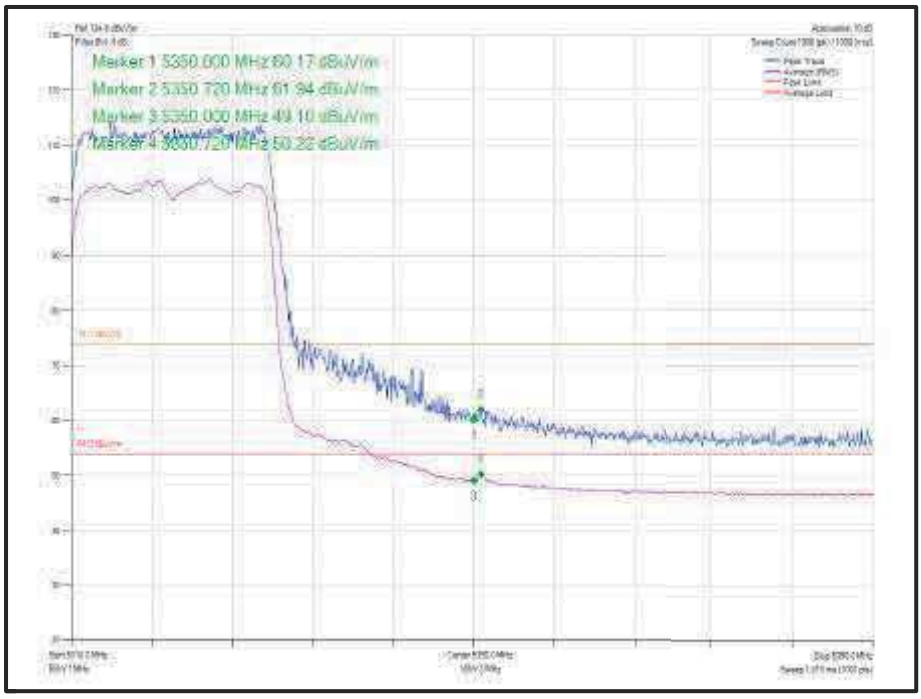

Figure 864 - 802.11ax HE20 SDM, Cores 0-1, SU - 5320 MHz Band Edge Frequency 5350 MHz

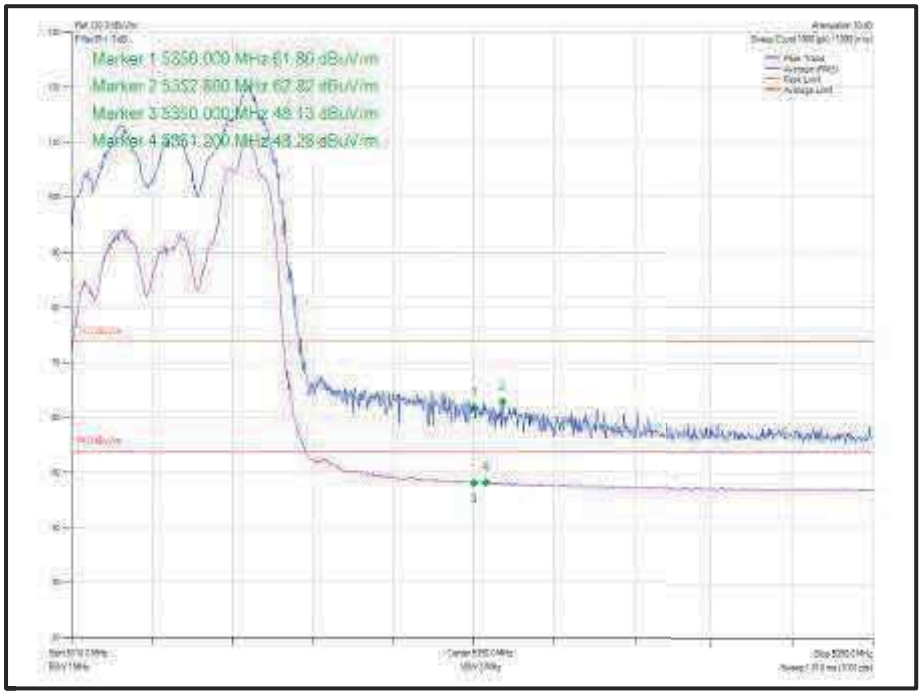

Figure 865 - 802.11ax HE20 SDM, Cores 0-1, 26-8 - 5320 MHz Band Edge Frequency 5350 MHz

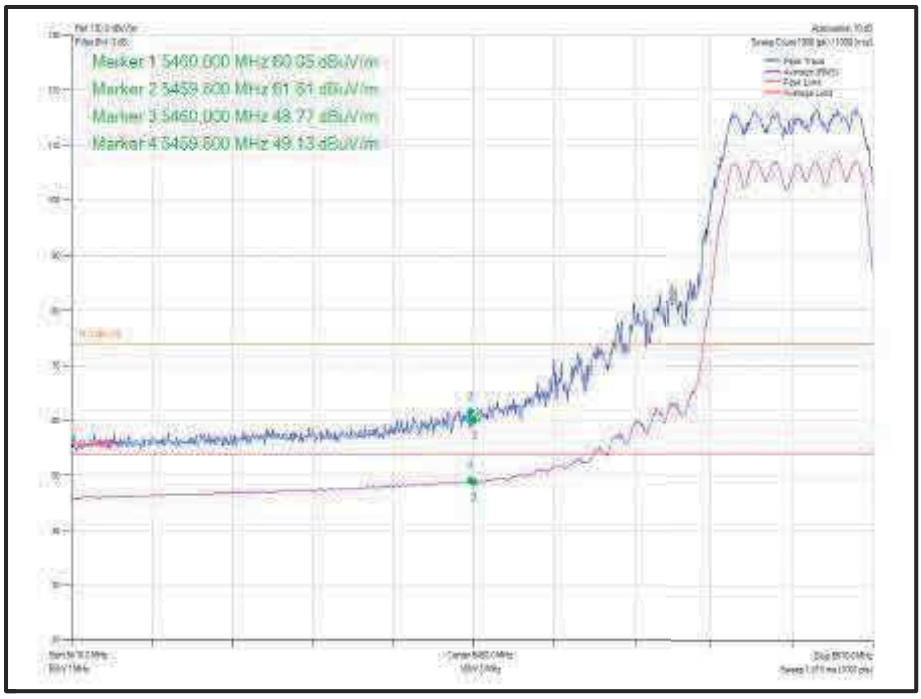

Figure 866 - 802.11n HT20 CDD, Cores 0-1 - 5500 MHz Band Edge Frequency 5460 MHz

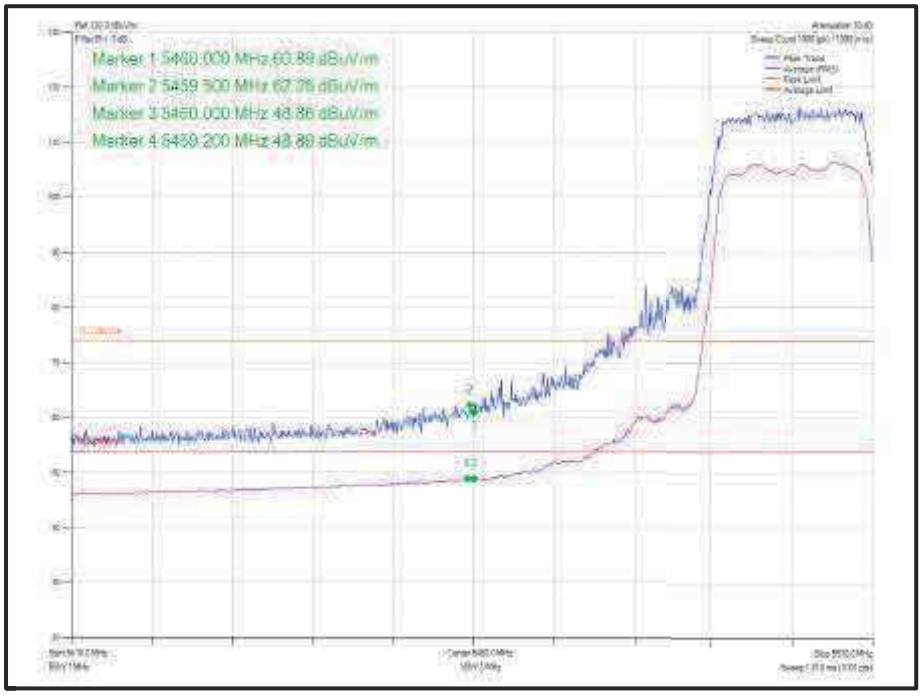

Figure 867 - 802.11n HT20 SDM, Cores 0-1 - 5500 MHz Band Edge Frequency 5460 MHz

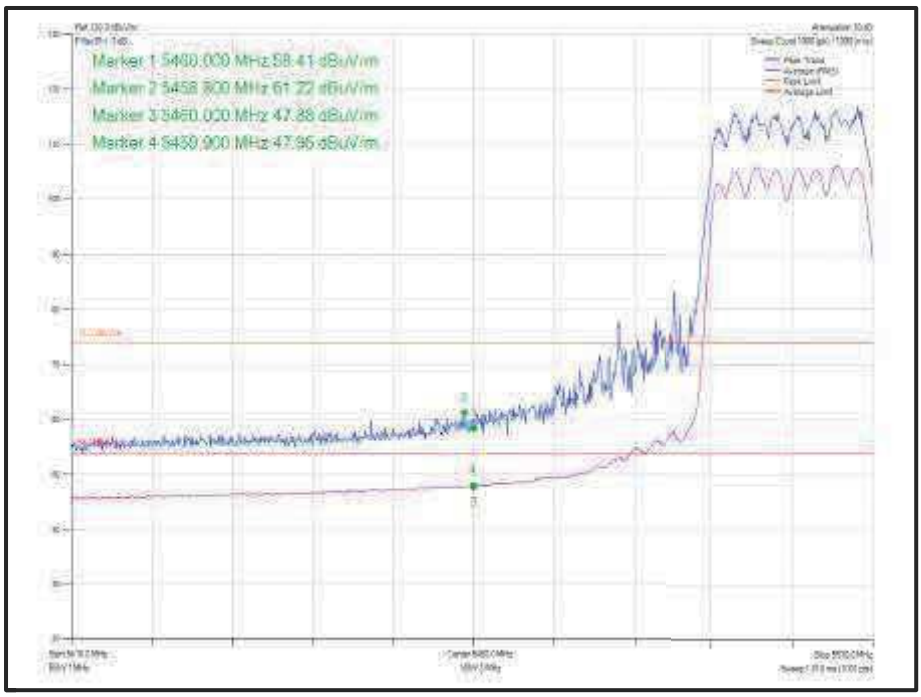

Figure 868 - 802.11ax HE20 CDD, Cores 0-1, SU- 5500 MHz Band Edge Frequency 5460 MHz

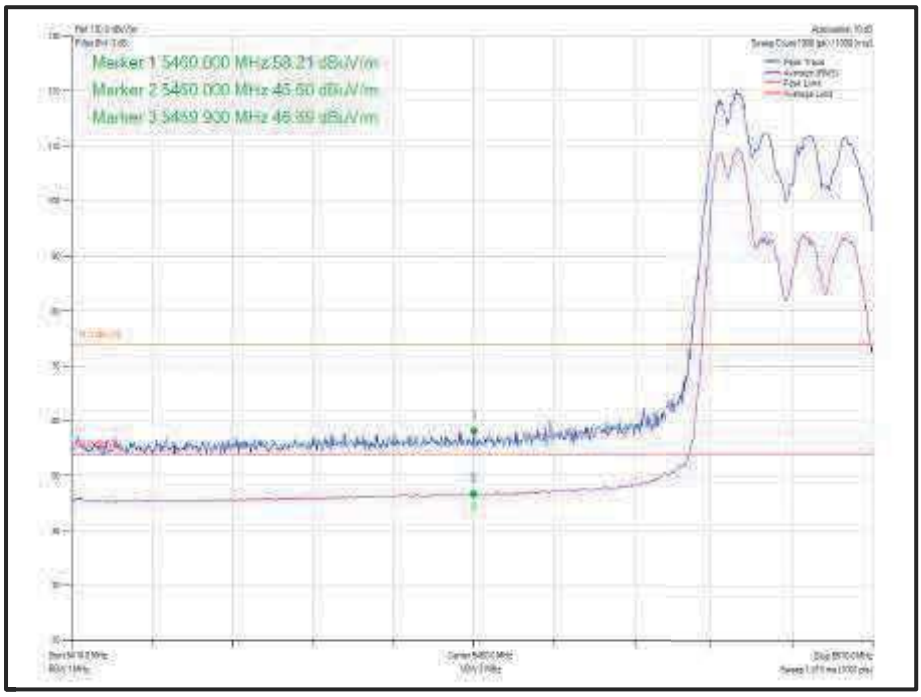

Figure 869 - 802.11ax HE20 CDD, Cores 0-1, 52-37 - 5500 MHz Band Edge Frequency 5460 MHz

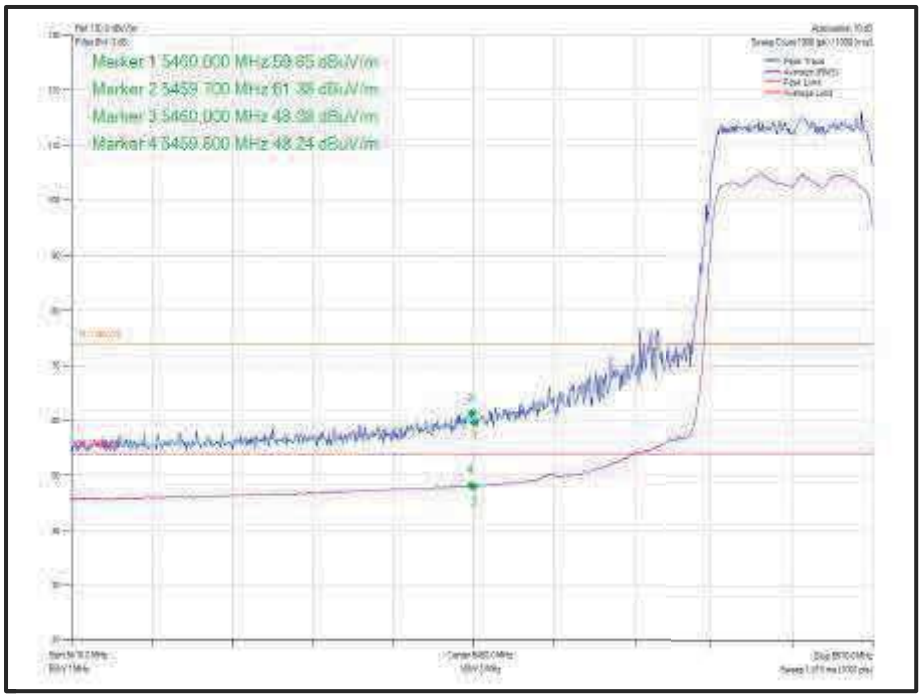

Figure 870 - 802.11ax HE20 SDM, Cores 0-1, SU- 5500 MHz Band Edge Frequency 5460 MHz

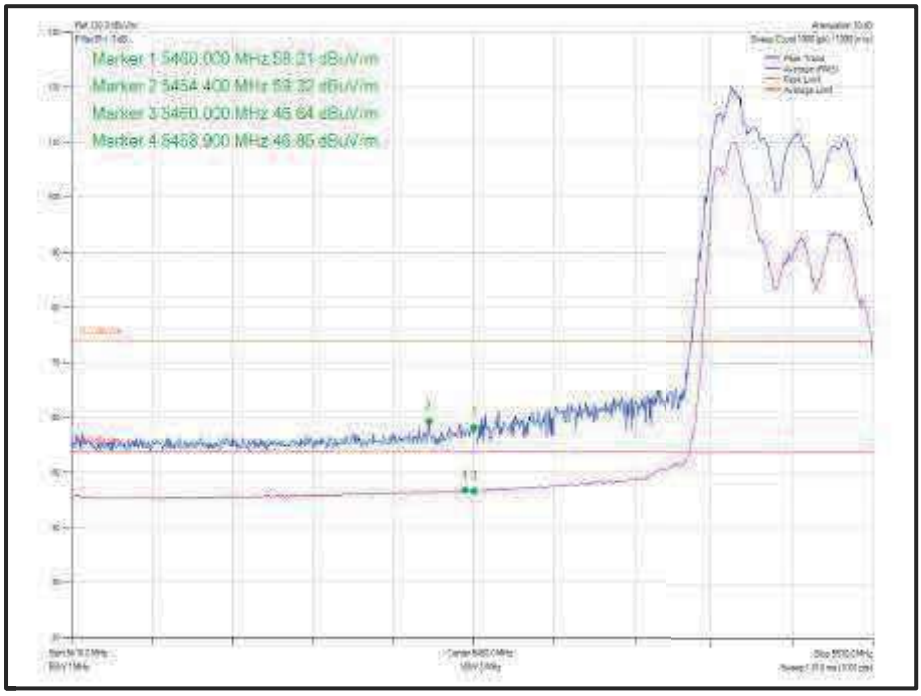

Figure 871 - 802.11ax HE20 SDM, Cores 0-1, 26-0 - 5500 MHz Band Edge Frequency 5460 MHz

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 HT40, Core 1	MCS7	-	-	5190	5150	66.81	50.53
802.11ax HE40, Core 1	MCS7	SU	-	5190	5150	63.72	50.93
802.11ax HE40, Core 1	MCS7	26	0	5190	5150	54.61	43.51
802.11n HT40, Core 1	MCS7	-	-	5310	5350	66.89	50.46
802.11ax HE40, Core 1	MCS7	SU	-	5310	5350	66.79	51.36
802.11ax HE40, Core 1	MCS7	52	44	5310	5350	68.35	47.47
802.11n HT40, Core 1	MCS7	-		5510	5460	67.83	50.61
802.11ax HE40, Core 1	MCS7	SU	-	5510	5460	61.43	47.90
802.11ax HE40, Core 1	MCS7	52	37	5510	5460	59.52	46.20

Table 600 - SISO Restricted Band Edge Results

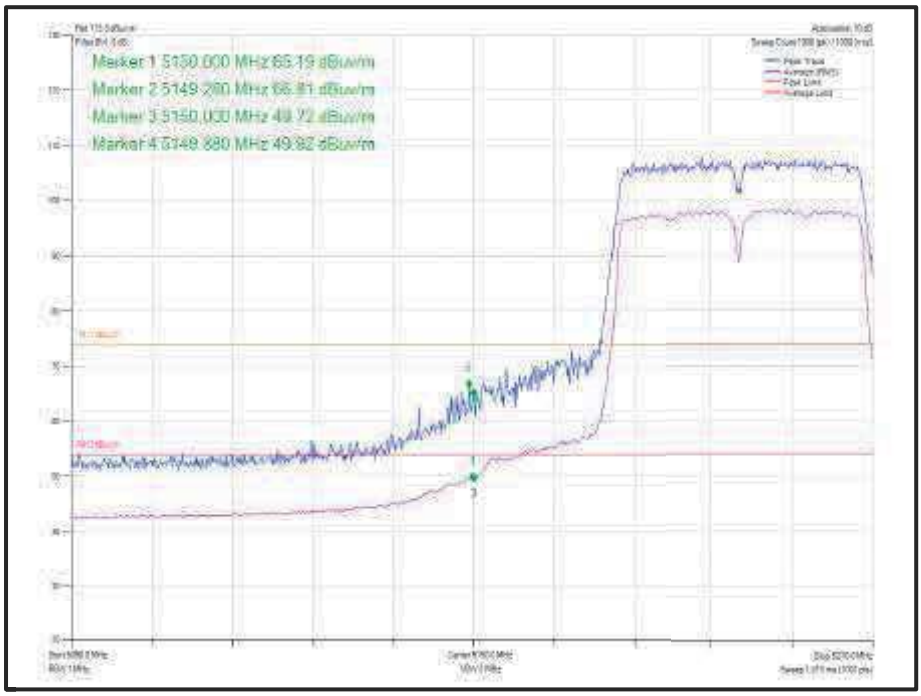

Figure 872 - 802.11n HT40, Core 1 - 5190 MHz Band Edge Frequency 5150 MHz

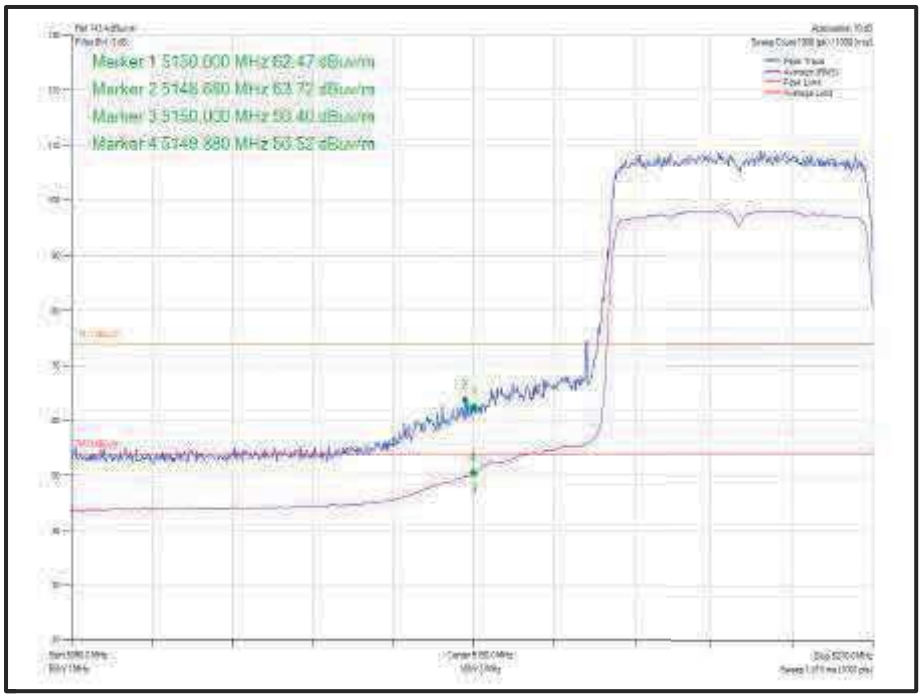

Figure 873 - 802.11ax HE40, Core 1, SU - 5190 MHz
Band Edge Frequency 5150 MHz

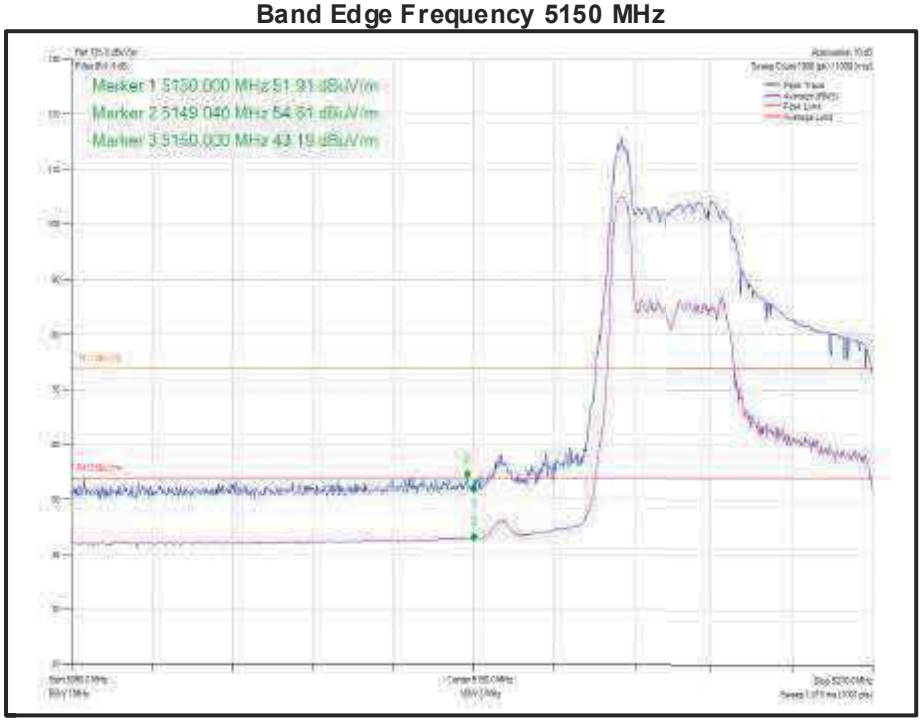

Figure 874 - 802.11ax HE40, Core 1, 26-0 - 5190 MHz
Band Edge Frequency 5150 MHz

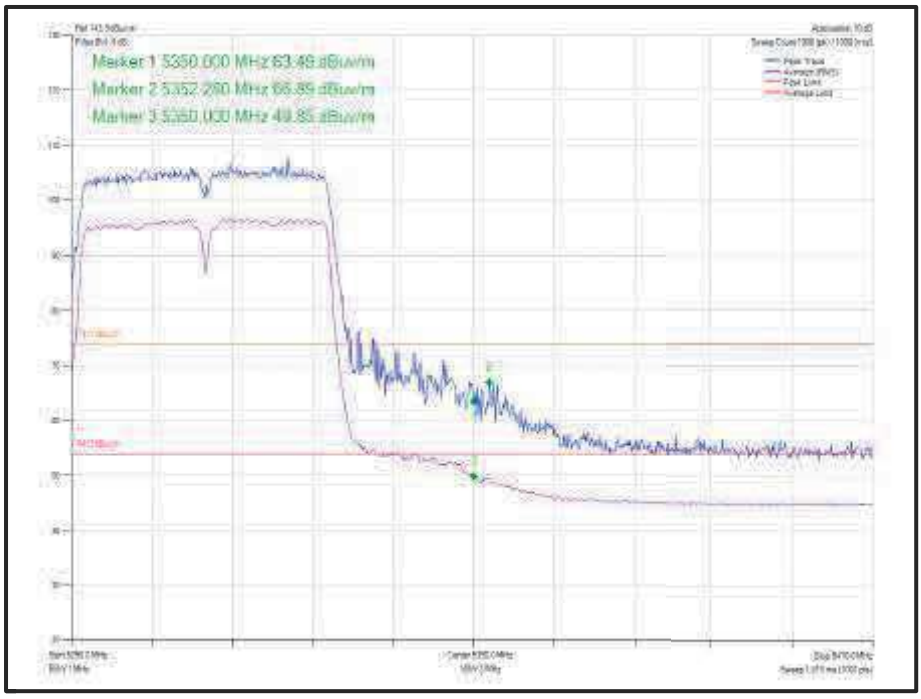

Figure 875 - 802.11n HT40, Core 1 - 5310 MHz
Band Edge Frequency 5350 MHz

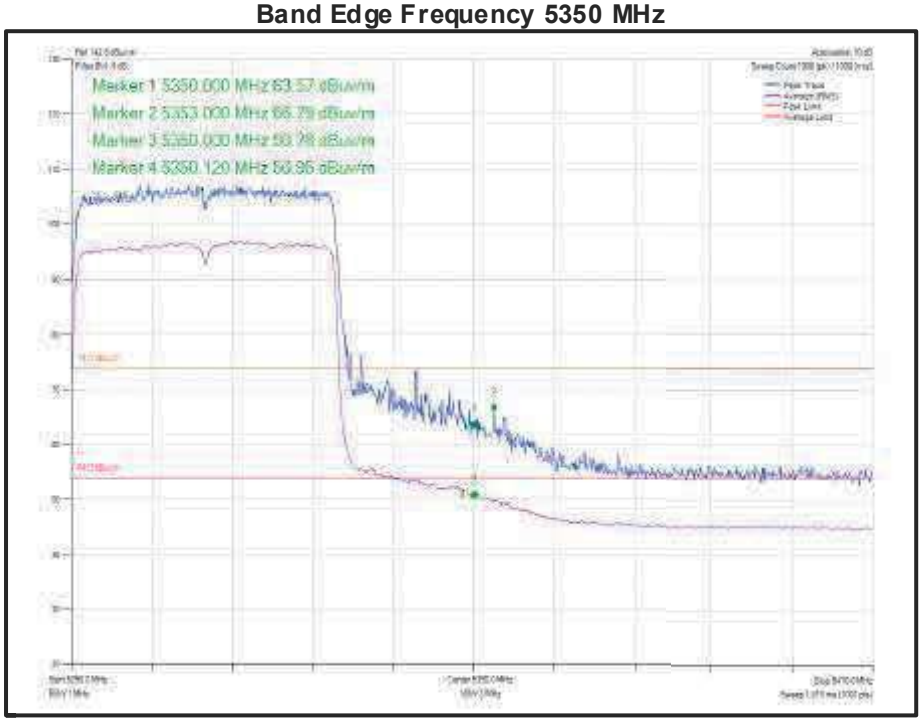

Figure 876 - 802.11ax HE40, Core 1, SU - 5310 MHz
Band Edge Frequency 5350 MHz

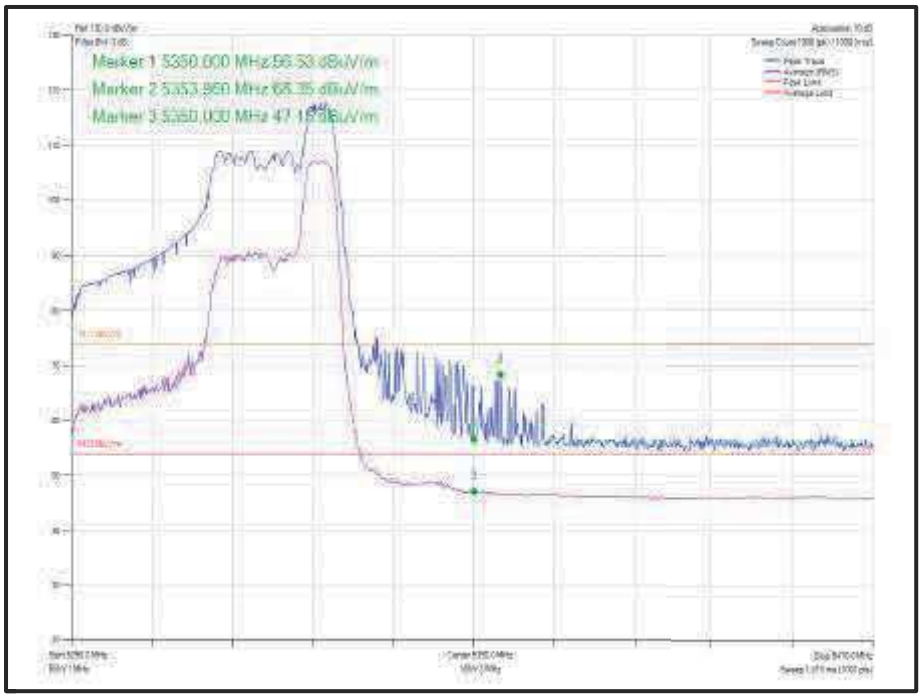

Figure 877 - 802.11ax HE40, Core 1, 52-44 - 5310 MHz
Band Edge Frequency 5350 MHz

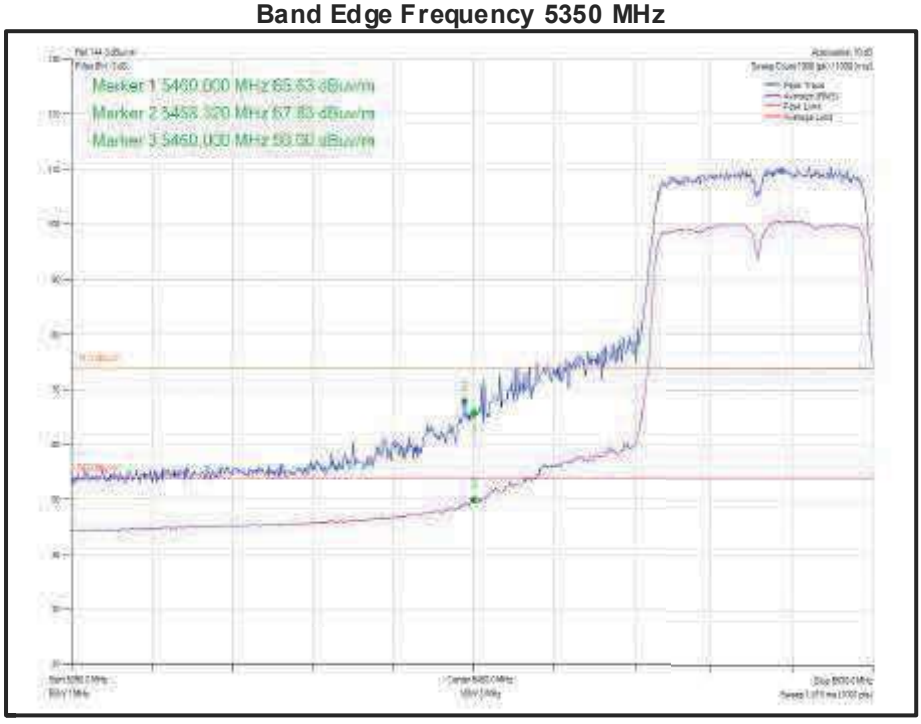

Figure 878 - 802.11n HT40, Core 1 - 5510 MHz
Band Edge Frequency 5460 MHz

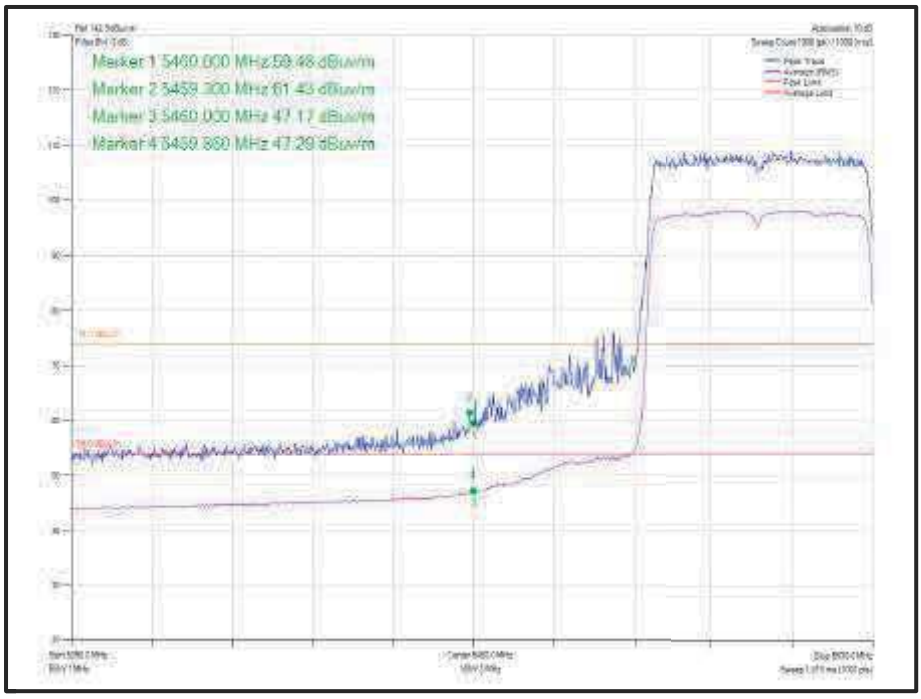

Figure 879 - 802.11ax HE40, Core 1, SU - 5510 MHz
Band Edge Frequency 5460 MHz

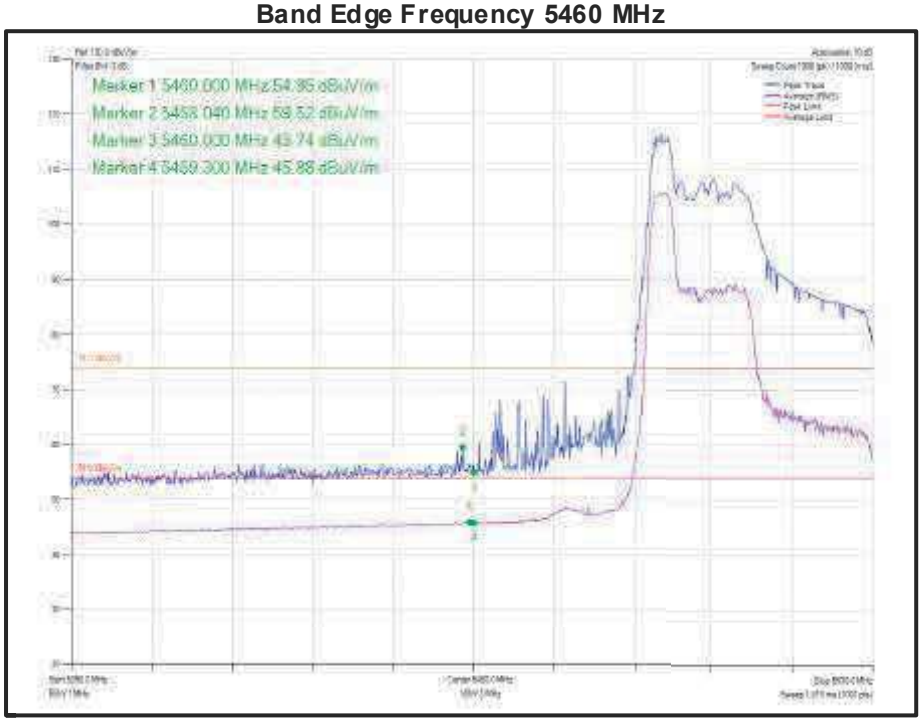

Figure 880 - 802.11ax HE40, Core 1, 52-37- 5510 MHz
Band Edge Frequency 5460 MHz

40MHz Bandwidth (2TX MIMO)

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 HT40 CDD, Cores 0-1	MCS7	-	-	5190	5150	61.80	51.45
802.11n HT40 SDM, Cores 0-1	MCS7	-	-	5190	5150	62.87	51.44
802.11ax HE40 CDD, Cores 0-1	MCS7	SU	-	5190	5150	62.59	51.57
802.11ax HE40 CDD, Cores 0-1	MCS7	26	0	5190	5150	55.49	44.55
802.11ax HE40 SDM, Cores 0-1	MCS7	SU	-	5190	5150	62.36	50.57
802.11ax HE40 SDM, Cores 0-1	MCS7	26	0	5190	5150	56.15	44.34
802.11n HT40 CDD, Cores 0-1	MCS7	-	-	5310	5350	62.87	50.81
802.11n HT40 SDM, Cores 0-1	MCS7	-	-	5310	5350	63.10	50.67
802.11ax HE40 CDD, Cores 0-1	MCS7	SU	-	5310	5350	62.41	51.11
802.11ax HE40 CDD, Cores 0-1	MCS7	52	44	5310	5350	57.46	46.34
802.11ax HE40 SDM, Cores 0-1	MCS7	SU	-	5310	5350	60.20	49.54
802.11ax HE40 SDM, Cores 0-1	MCS7	52	44	5310	5350	56.89	46.53
802.11n HT40 CDD, Cores 0-1	MCS7	-	-	5510	5460	58.23	47.96
802.11n HT40 SDM, Cores 0-1	MCS7	-	-	5510	5460	58.58	47.94
802.11ax HE40 CDD, Cores 0-1	MCS7	SU	-	5510	5460	58.25	47.42
802.11ax HE40 CDD, Cores 0-1	MCS7	52	37	5510	5460	56.09	45.89
802.11ax HE40 SDM, Cores 0-1	MCS7	SU	-	5510	5460	57.48	47.31
802.11ax HE40 SDM, Cores 0-1	MCS7	52	37	5510	5460	56.10	45.25

Table 601 – MIMO 2TX Restricted Band Edge Results

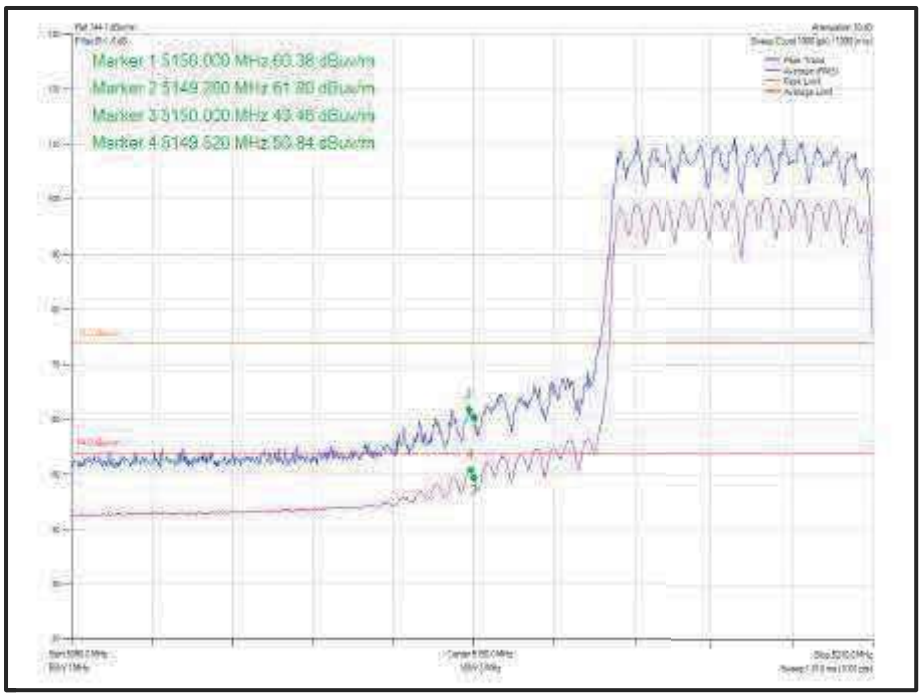

Figure 881 - 802.11n HT40 CDD Cores 0-1 - 5190 MHz Band Edge Frequency 5150 MHz

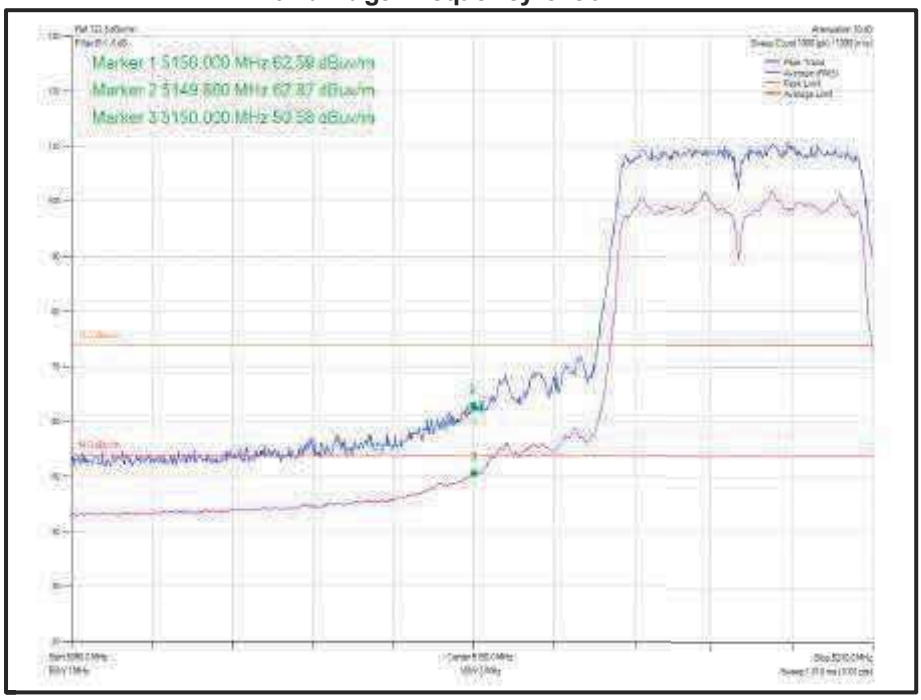

Figure 882 - 802.11n HT40 SDM Cores 0-1 - 5190 MHz Band Edge Frequency 5150 MHz

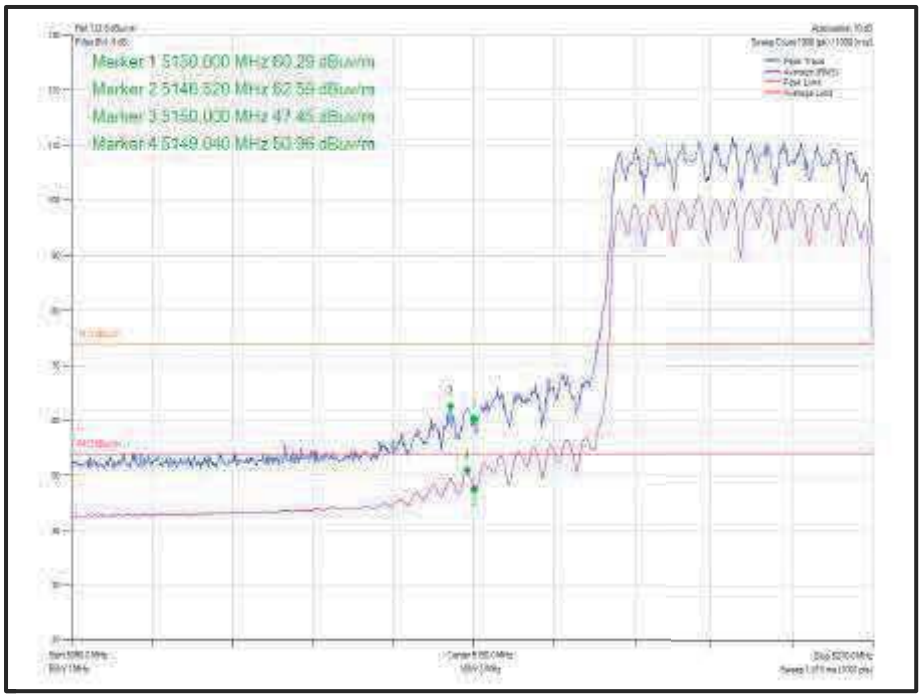

Figure 883 - 802.11ax HE40 CDD, Cores 0-1, SU - 5190 MHz Band Edge Frequency 5150 MHz

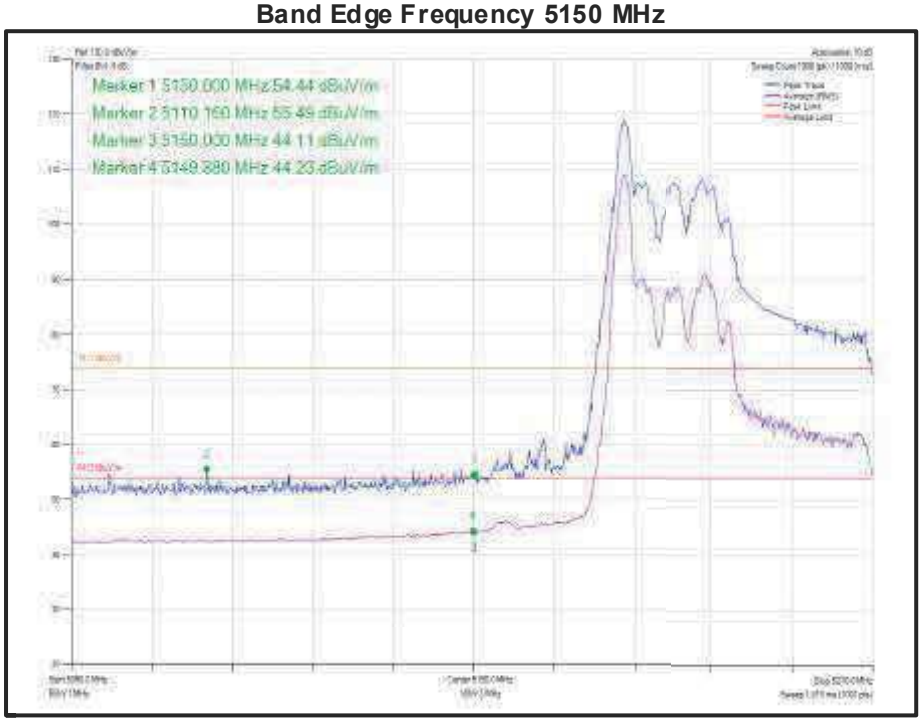

Figure 884 - 802.11ax HE40 CDD, Cores 0-1, 26-0 - 5190 MHz Band Edge Frequency 5150 MHz

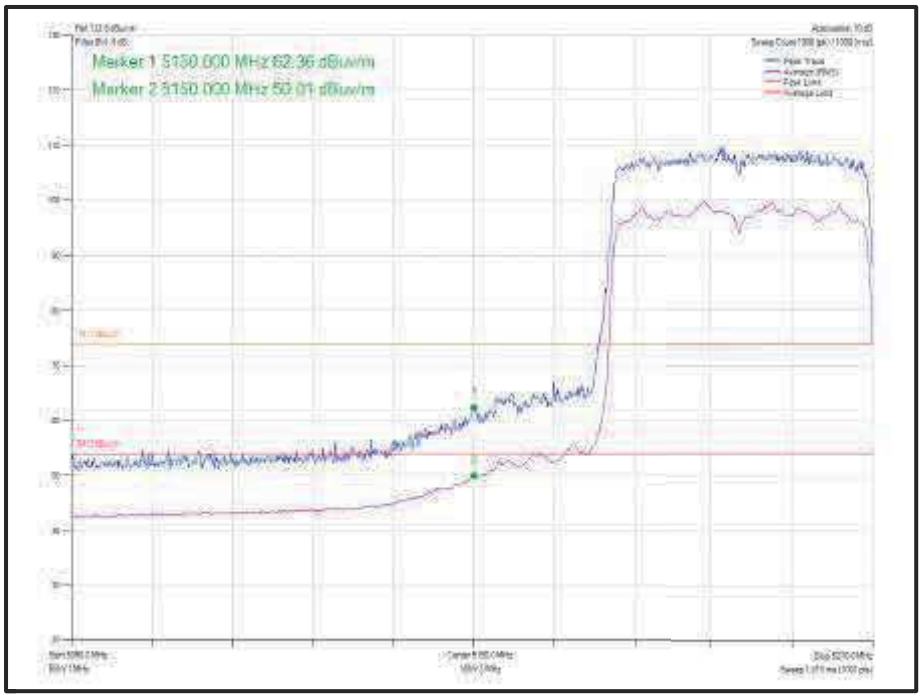

Figure 885 802.11ax HE40 SDM, Cores 0-1, SU - 5190 MHz Band Edge Frequency 5150 MHz

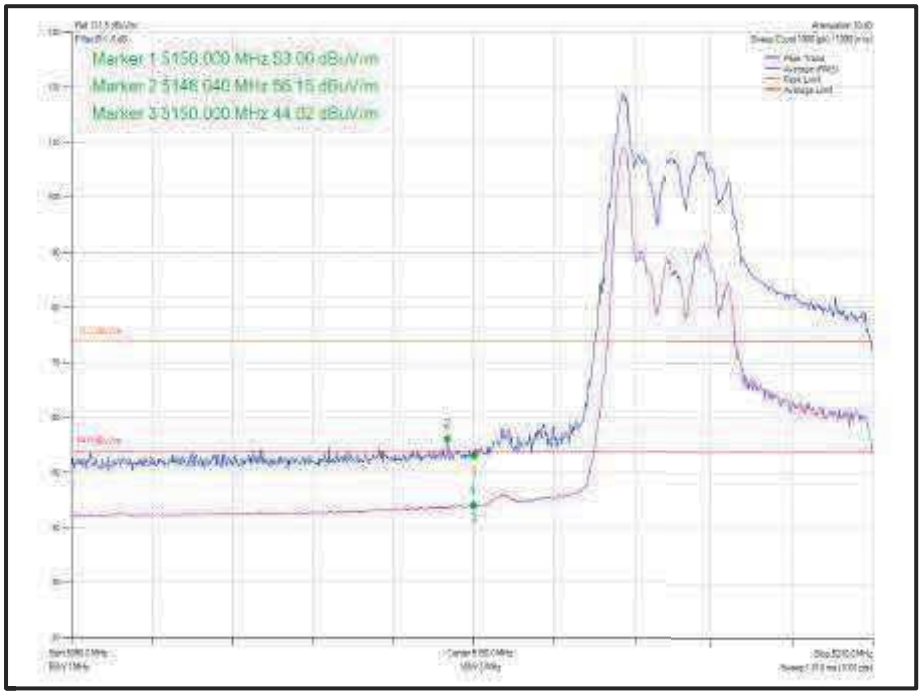

Figure 886 - 802.11ax HE40 SDM, Cores 0-1, 26-0 - 5190 MHz Band Edge Frequency 5150 MHz

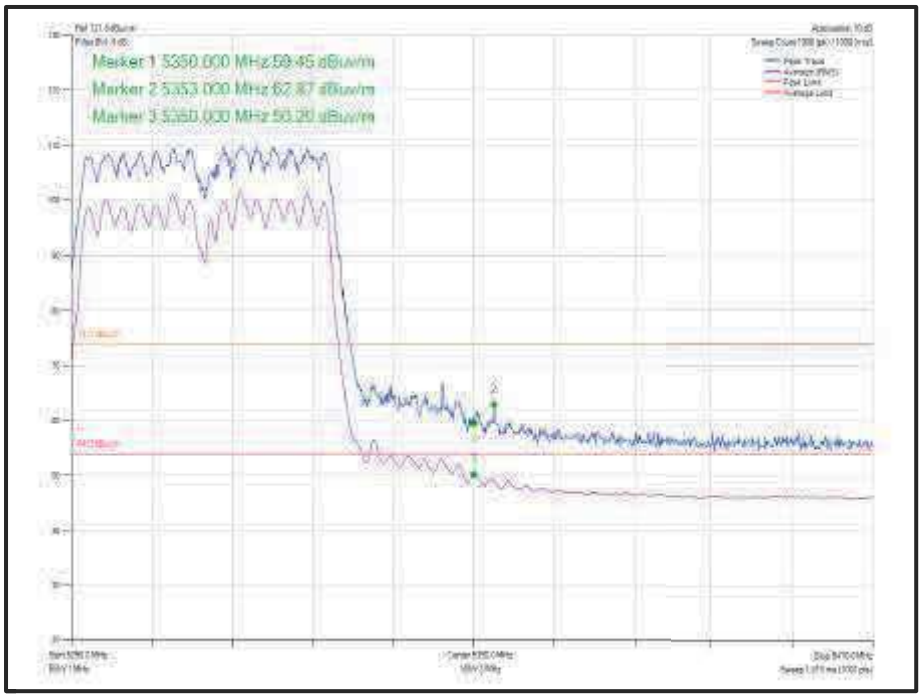

Figure 887 - 802.11n HT40 CDD, Cores 0-1 - 5310 MHz Band Edge Frequency 5350 MHz

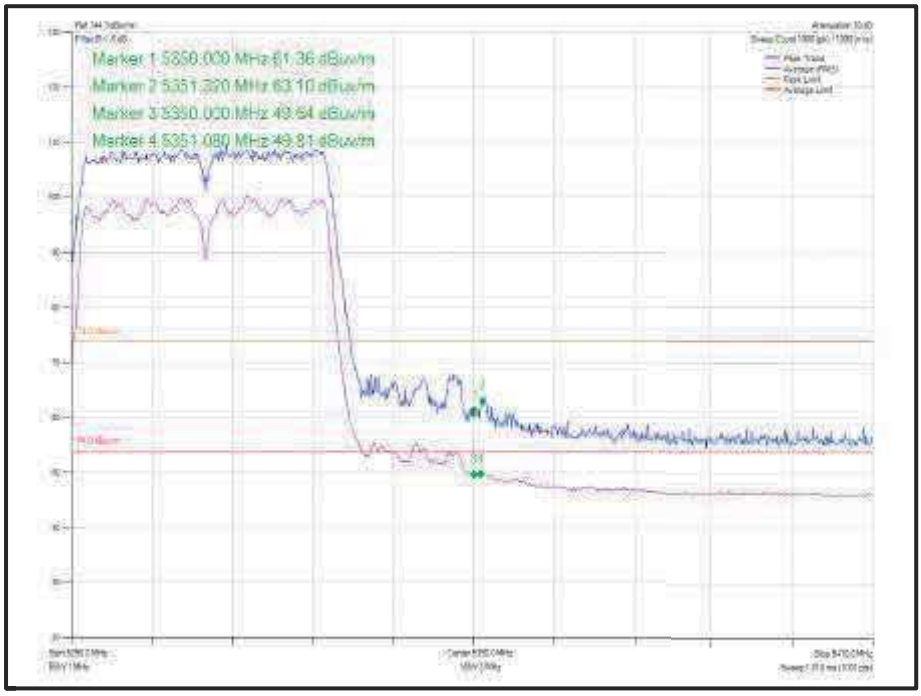

Figure 888 - 802.11n HT40 SDM, Cores 0-1 - 5310 MHz Band Edge Frequency 5350 MHz

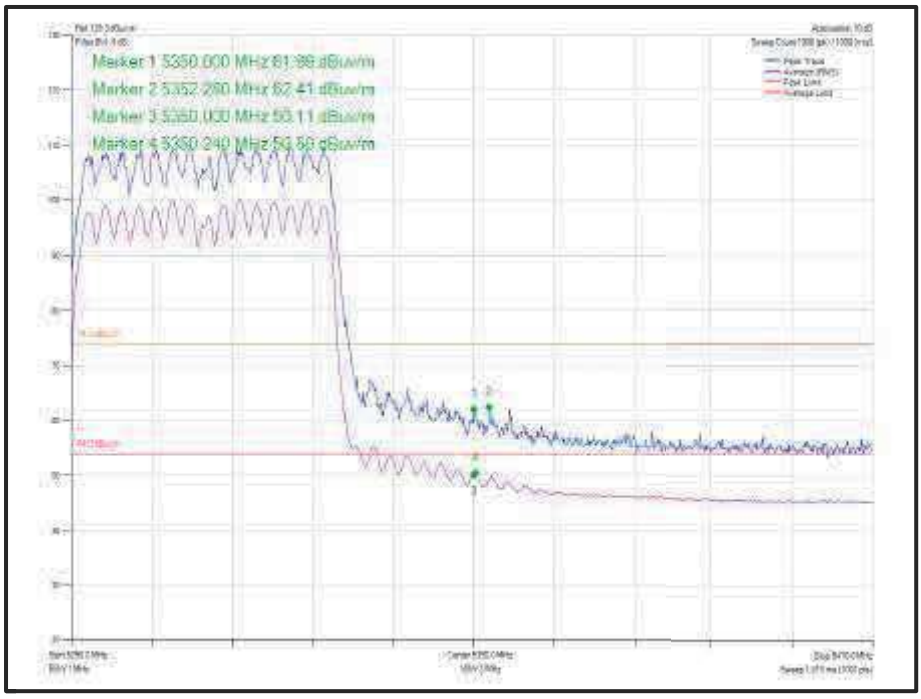

Figure 889 - 802.11ax HE40 CDD, Cores 0-1, SU - 5310 MHz Band Edge Frequency 5350 MHz

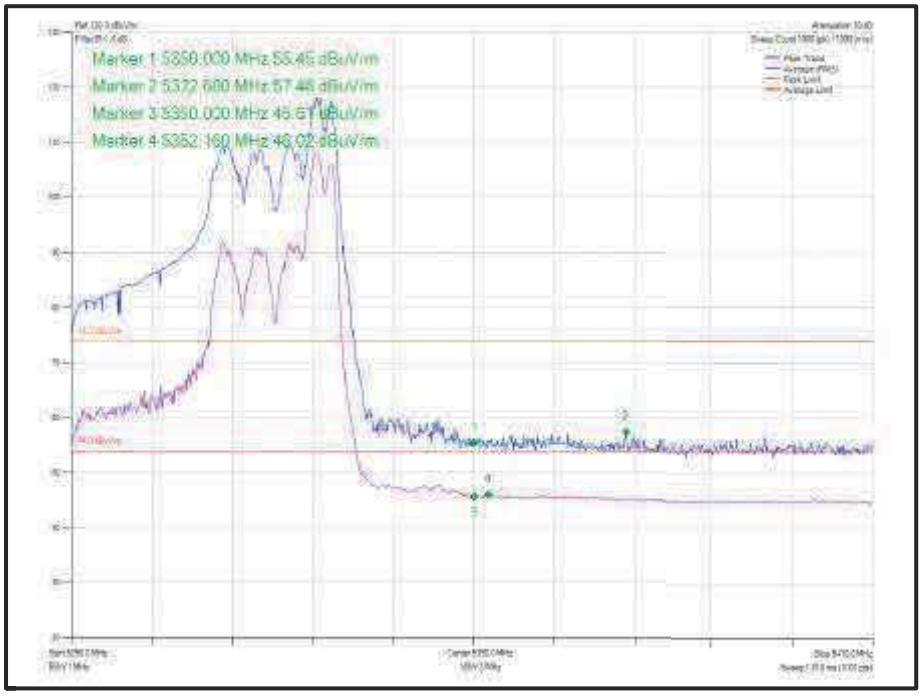

Figure 890 - 802.11ax HE40 CDD, Cores 0-1, 52-44-5310 MHz Band Edge Frequency 5350 MHz

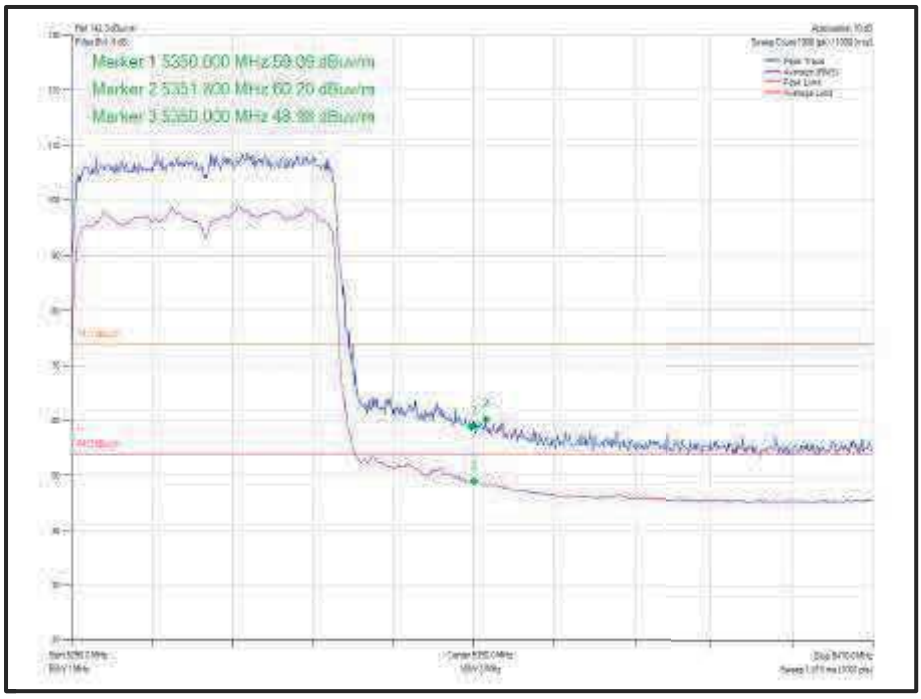

Figure 891 - 802.11ax HE40 SDM, Cores 0-1, SU - 5310 MHz Band Edge Frequency 5350 MHz

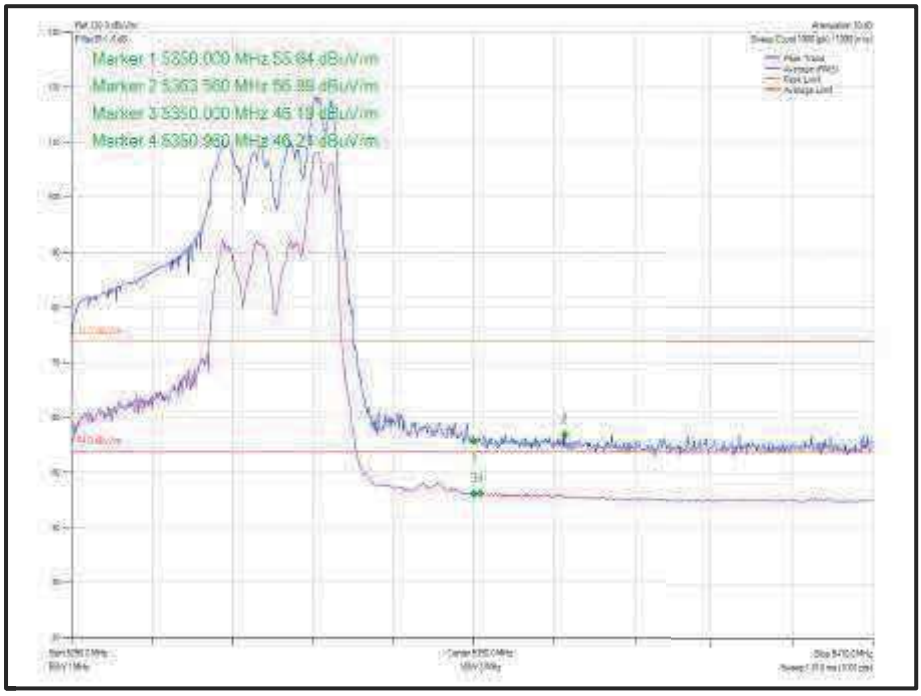

Figure 892 - 802.11ax HE40 SDM, Cores 0-1, 52-44 - 5310 MHz Band Edge Frequency 5350 MHz

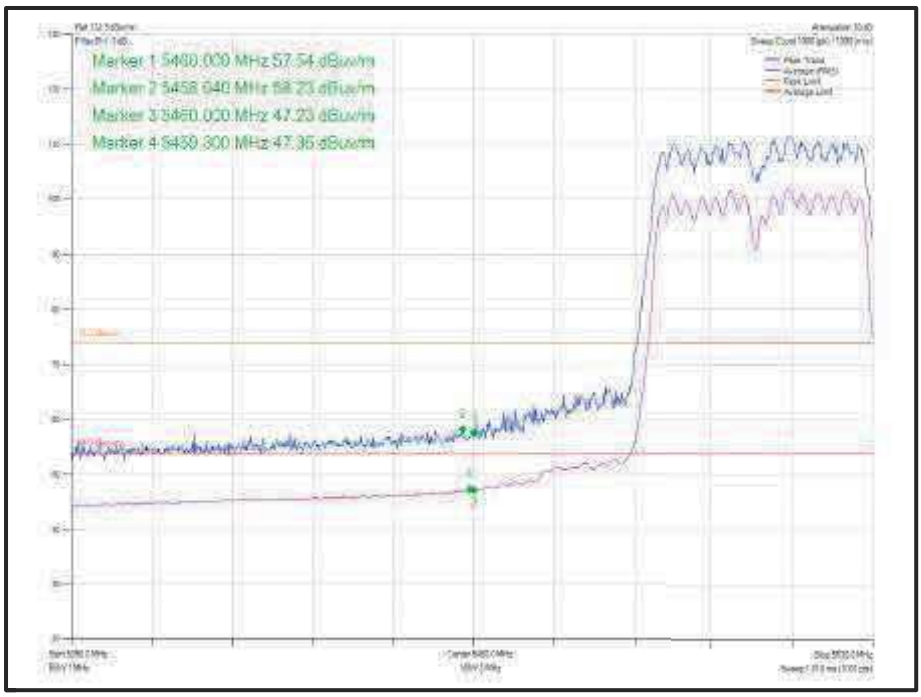

Figure 893 - 802.11n HT40 CDD, Cores 0-1 - 5510 MHz Band Edge Frequency 5460 MHz

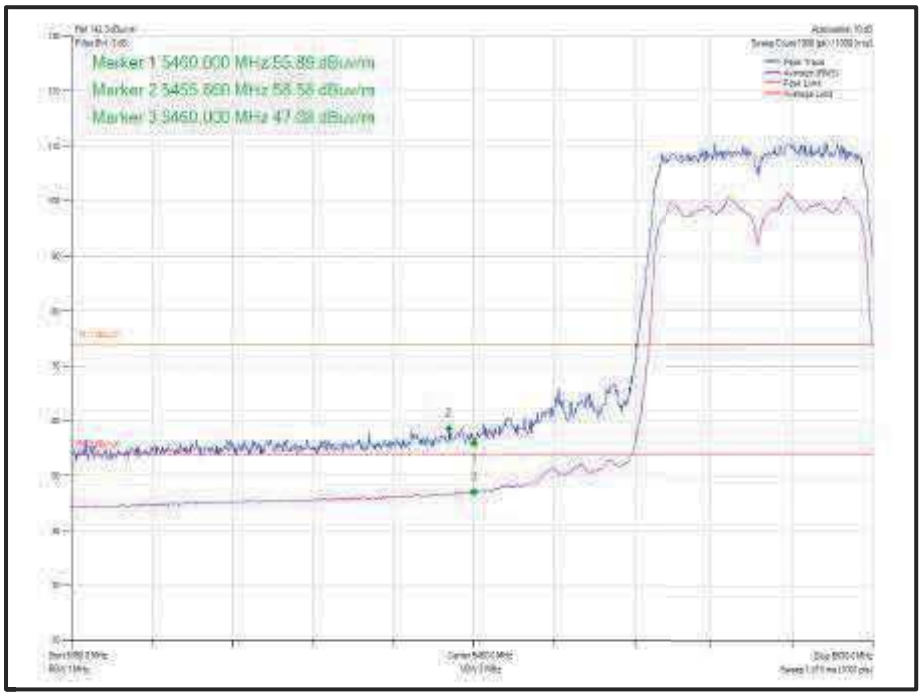

Figure 894 - 802.11n HT40 SDM, Cores 0-1 - 5510 MHz Band Edge Frequency 5460 MHz

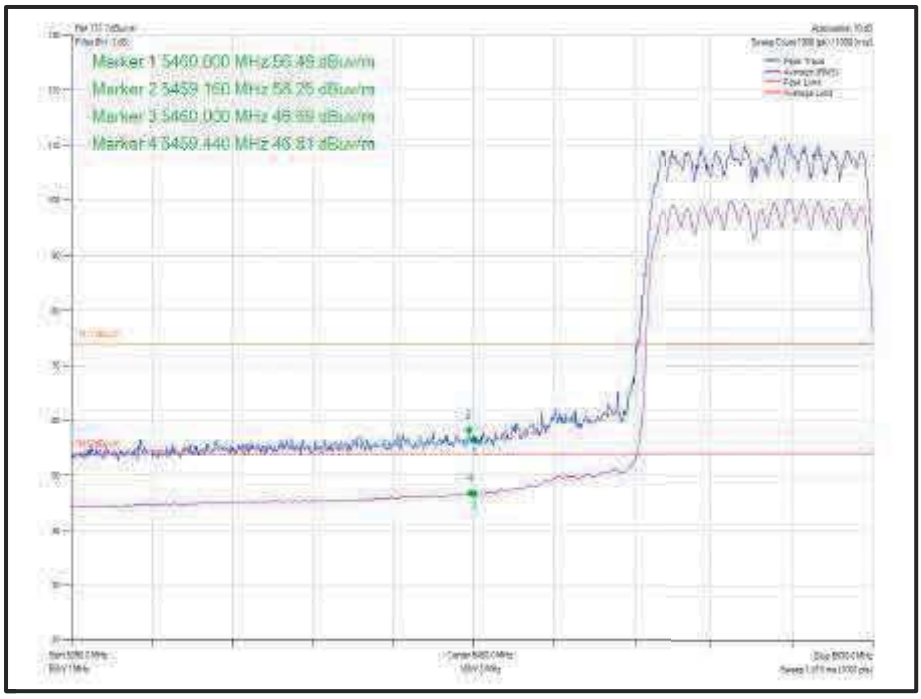

Figure 895 - 802.11ax HE40 CDD, Cores 0-1, SU - 5510 MHz Band Edge Frequency 5460 MHz

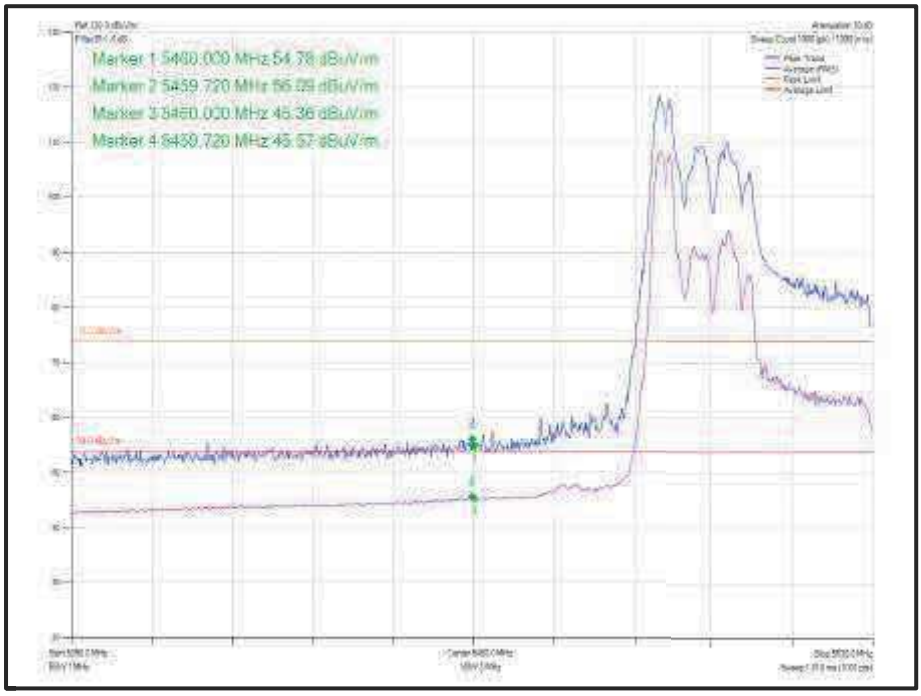

Figure 896 - 802.11ax HE40 CDD, Cores 0-1, 52-37 - 5510 MHz Band Edge Frequency 5460 MHz

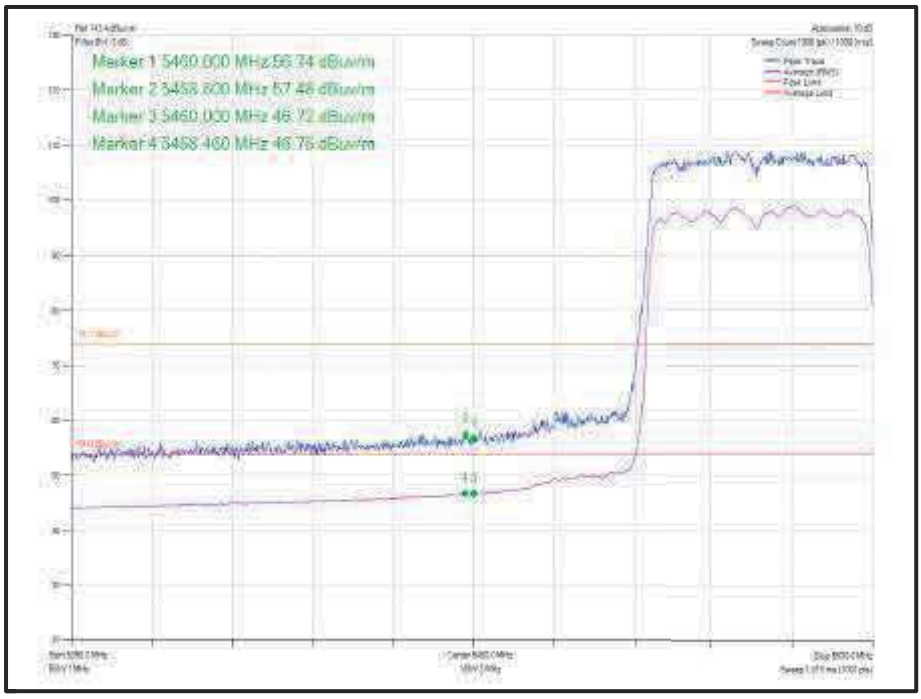

Figure 897 - 802.11ax HE40 SDM, Cores 0-1, SU - 5510 MHz Band Edge Frequency 5460 MHz

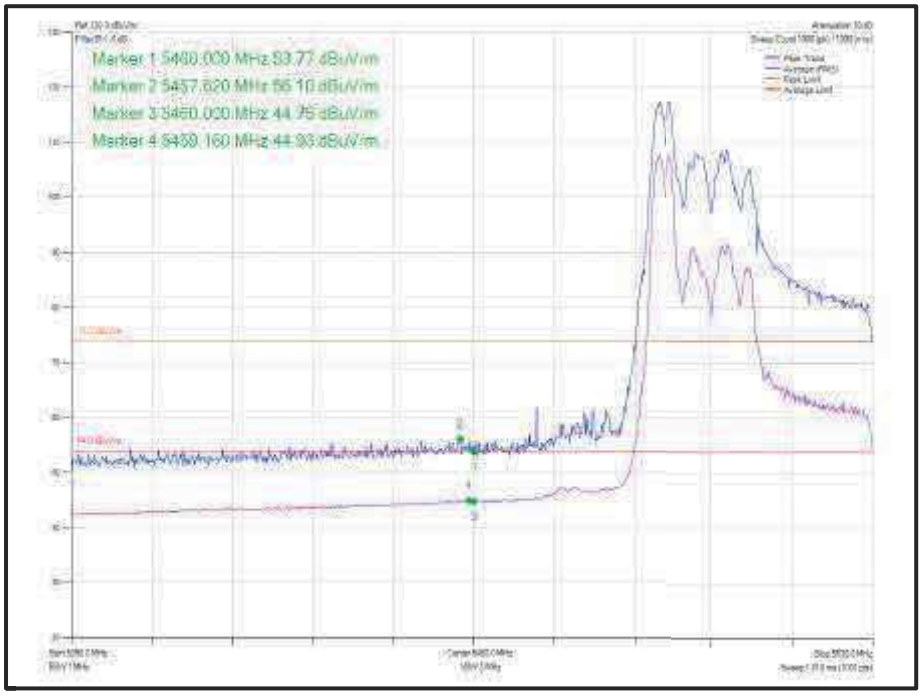

Figure 898 - 802.11ax HE40 SDM, Cores 0-1, 52-37 - 5510 MHz Band Edge Frequency 5460 MHz

Mode	Data Rate/ MCS	Resource Size	Resource Index	TX Frequency (MHz)	Band Edge Frequency (MHz)	Peak Level (dBµV/m)	Average Level (dBµV/m)
802.11ac VHT80, Core 1	MCS7x1	-	-	5210	5150	66.41	51.46
802.11ac VHT80, Core 1	MCS7x1	-	-	5290	5350	65.69	50.93
802.11ac VHT80, Core 1	MCS7x1	-	-	5530	5460	67.56	51.36
802.11ax HE80, Core 1	MCS7	SU	-	5210	5150	62.16	50.26
802.11ax HE80, Core 1	MCS7	26	0	5210	5150	59.82	48.77
802.11ax HE80, Core 1	MCS7	SU	-	5290	5350	65.23	50.77
802.11ax HE80, Core 1	MCS7	52	52	5290	5350	66.82	47.41
802.11ax HE80, Core 1	MCS7	SU	-	5530	5460	66.09	49.43
802.11ax HE80, Core 1	MCS7	52	37	5530	5460	68.11	48.48

Table 602 - SISO Restricted Band Edge Results

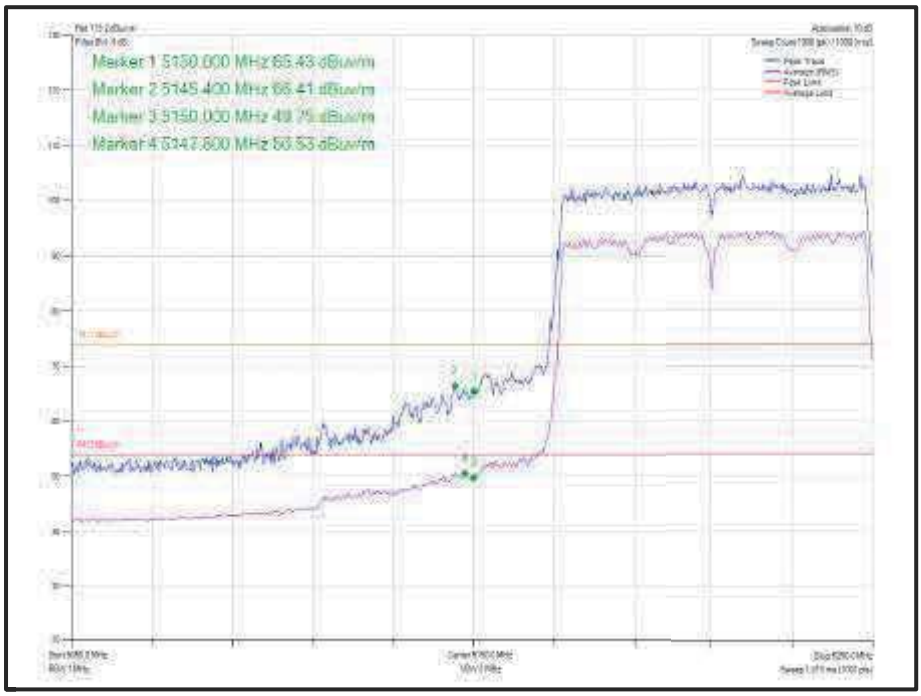

Figure 899 - 802.11ac VHT80, Core 1 - 5210 MHz Band Edge Frequency 5150 MHz

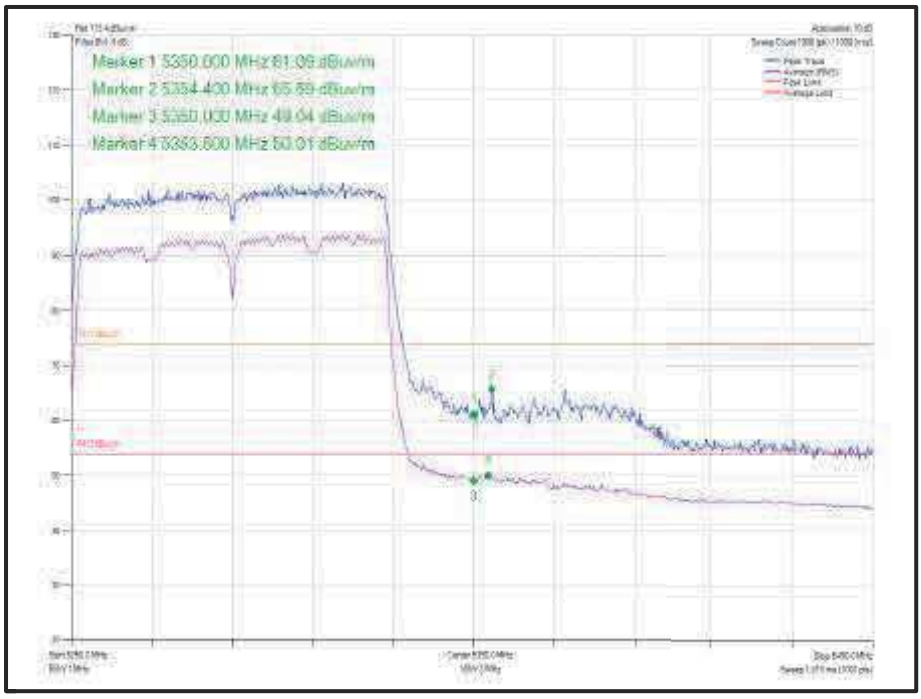

Figure 900 - 802.11ac VHT80, Core 1 - 5290 MHz
Band Edge Frequency 5350 MHz

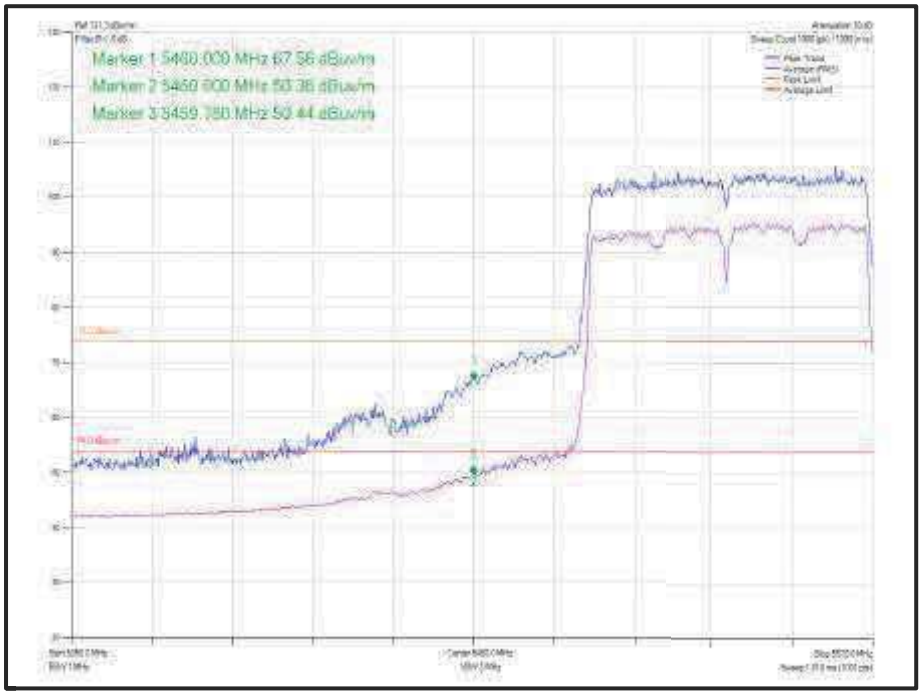

Figure 901 - 802.11ac VHT80, Core 1 - 5530 MHz
Band Edge Frequency 5350 MHz

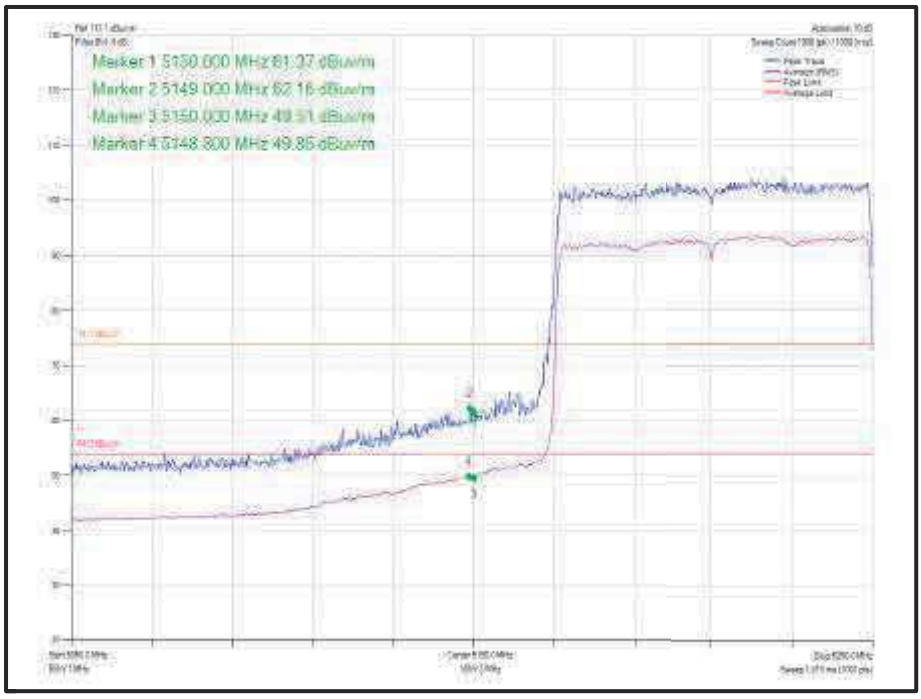

Figure 902 - 802.11ax HE80, Core 1, SU - 5210 MHz
Band Edge Frequency 5150 MHz

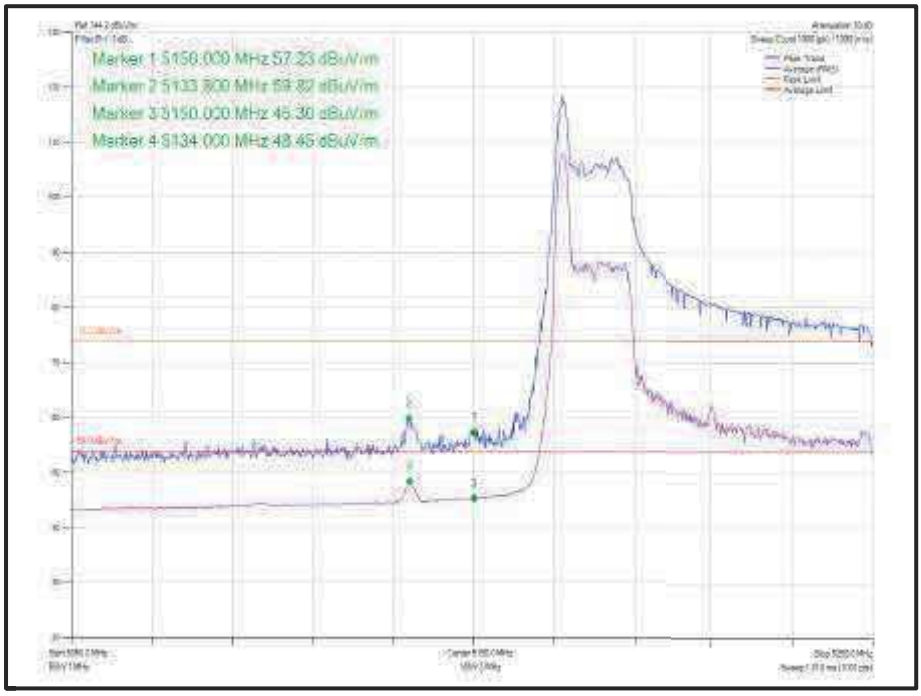

Figure 903 - 802.11ax HE80, Core 1, 26-0 - 5210 MHz
Band Edge Frequency 5150 MHz

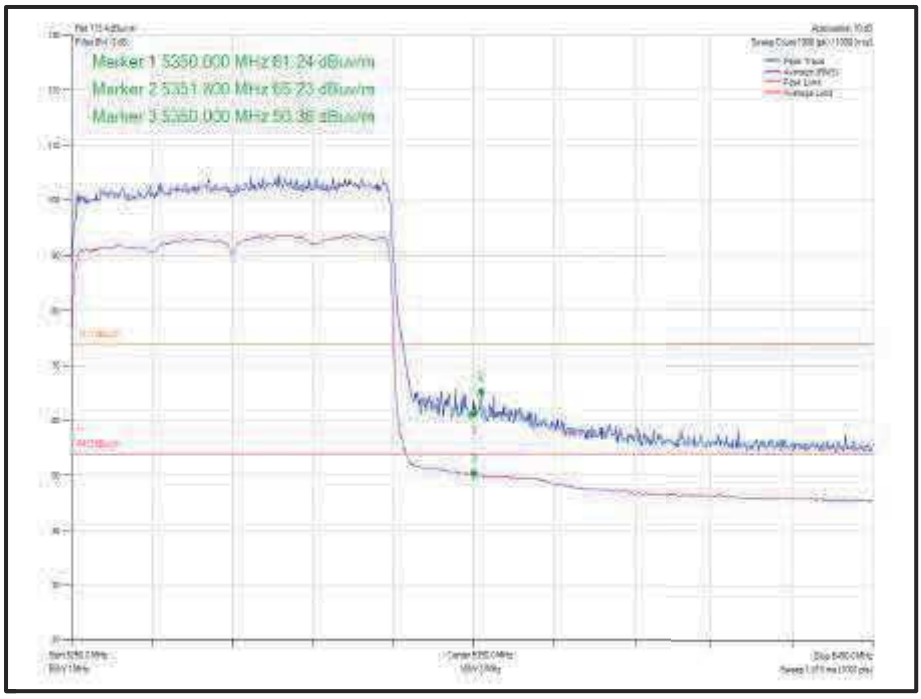

Figure 904 - 802.11ax HE80, Core 1, SU - 5290 MHz
Band Edge Frequency 5350 MHz

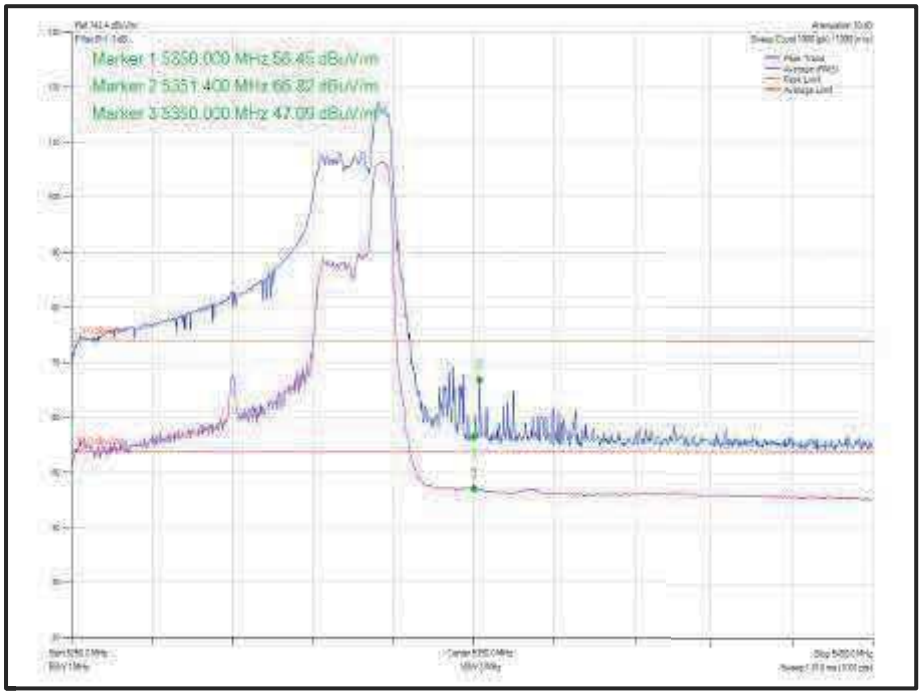

Figure 905 - 802.11ax HE80, Core 1, 52-52 - 5290 MHz
Band Edge Frequency 5350 MHz

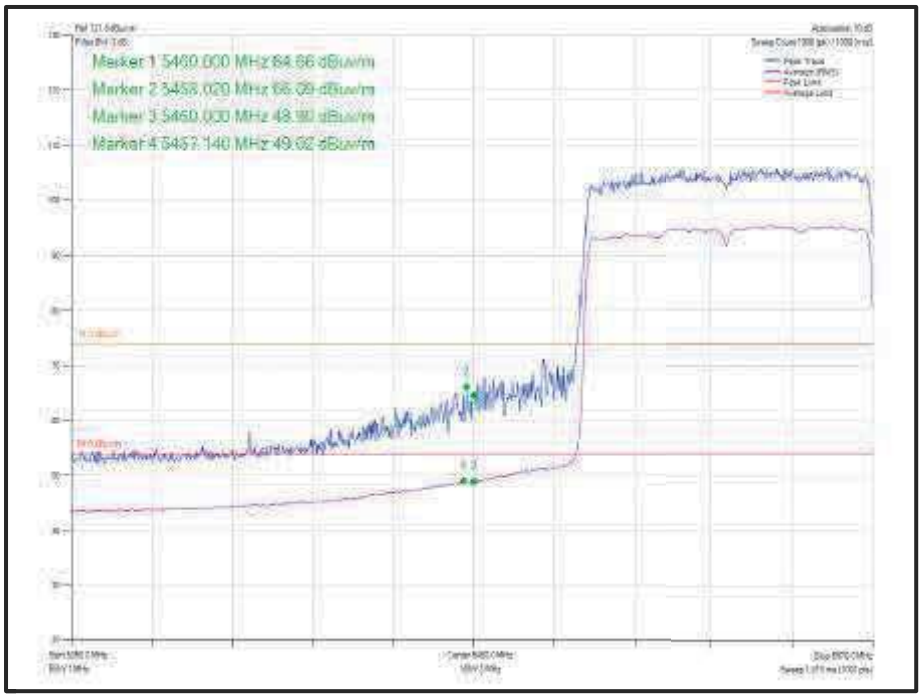

Figure 906 - 802.11ax HE80, Core 1, SU - 5530 MHz
Band Edge Frequency 5460 MHz

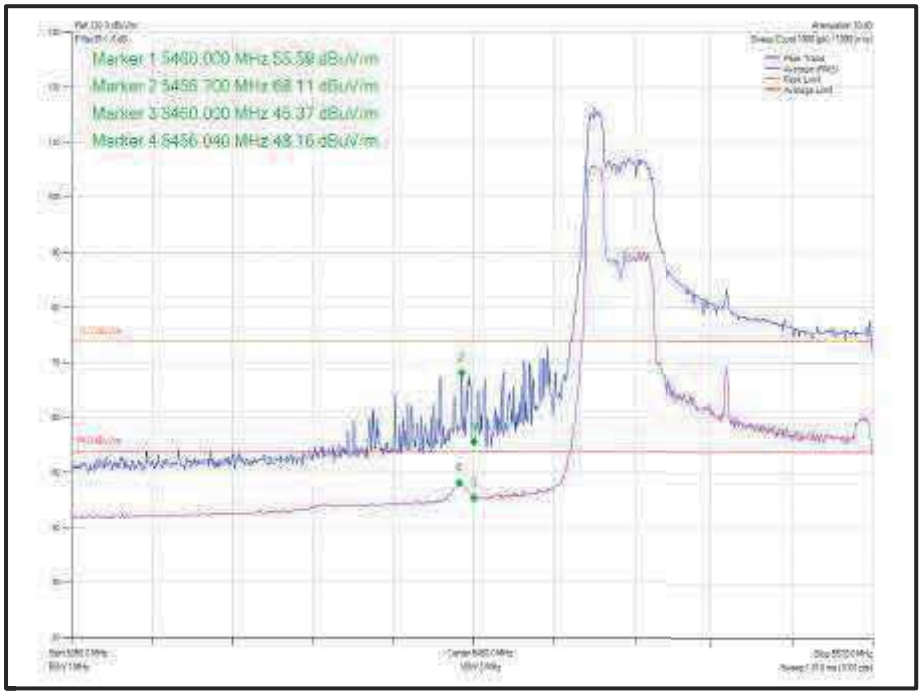

Figure 907 - 802.11ax HE80, Core 1, 52-37 - 5530 MHz
Band Edge Frequency 5460 MHz

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 CDD, Cores 0-1	MCS7x1	-	-	5210	5150	60.69	50.36
802.11ac VHT80 SDM, Cores 0-1	MCS7x1	-	-	5210	5150	61.12	49.85
802.11ax HE80 CDD, Cores 0-1	MCS7	SU	-	5210	5150	61.78	50.16
802.11ax HE80 CDD, Cores 0-1	MCS7	26	0	5210	5150	59.85	48.12
802.11ax HE80 SDM, Cores 0-1	MCS7	SU	-	5210	5150	60.00	49.28
802.11ax HE80 SDM, Cores 0-1	MCS7	26	0	5210	5150	60.02	47.47
802.11ac VHT80 CDD, Cores 0-1	MCS7	-	-	5290	5350	60.52	50.36
802.11ac VHT80 SDM, Cores 0-1	MCS7	-	-	5290	5350	62.33	50.80
802.11ax HE80 CDD, Cores 0-1	MCS7	SU	-	5290	5350	62.04	50.72
802.11ax HE80 CDD, Cores 0-1	MCS7	52	52	5290	5350	60.25	48.81
802.11ax HE80 SDM, Cores 0-1	MCS7	SU	-	5290	5350	60.66	49.84
802.11ax HE80 SDM, Cores 0-1	MCS7	52	52	5290	5350	58.67	47.24
802.11ac VHT80 CDD, Cores 0-1	MCS7	-	-	5530	5460	62.42	48.71
802.11ac VHT80 SDM, Cores 0-1	MCS7	-	-	5530	5460	60.32	48.81
802.11ax HE80 CDD, Cores 0-1	MCS7	SU	-	5530	5460	57.24	47.20
802.11ax HE80 CDD, Cores 0-1	MCS7	52	37	5530	5460	62.98	48.77
802.11ax HE80 SDM, Cores 0-1	MCS7	SU	-	5530	5460	57.25	46.74
802.11ax HE80 SDM, Cores 0-1	MCS7	52	37	5530	5460	60.38	48.07

Table 603 - MIMO 2TX Restricted Band Edge Results

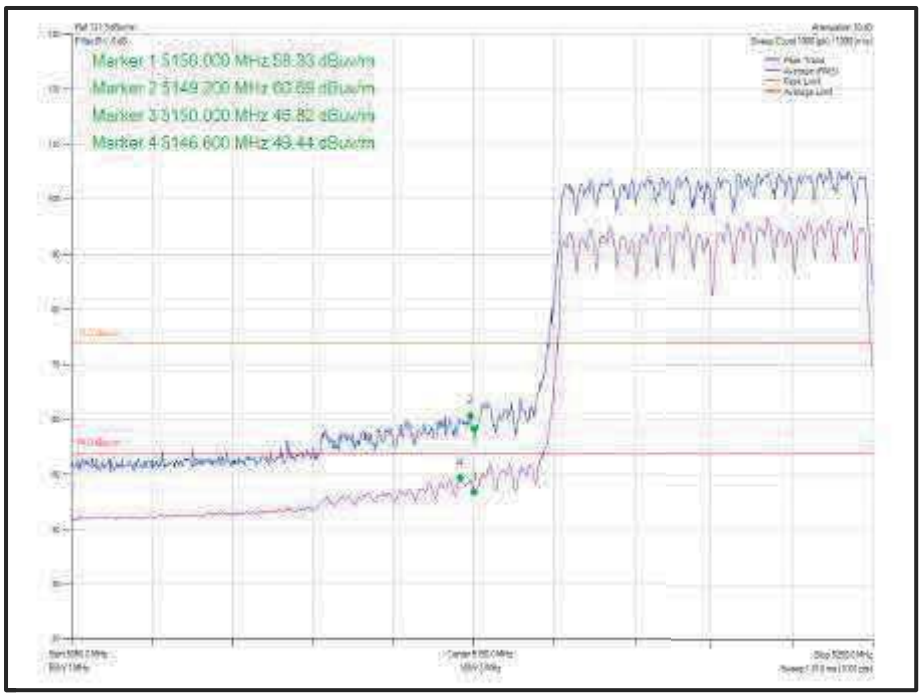

Figure 908 - 802.11ac VHT80 CDD, Cores 0-1- 5210 MHz Band Edge Frequency 5150 MHz

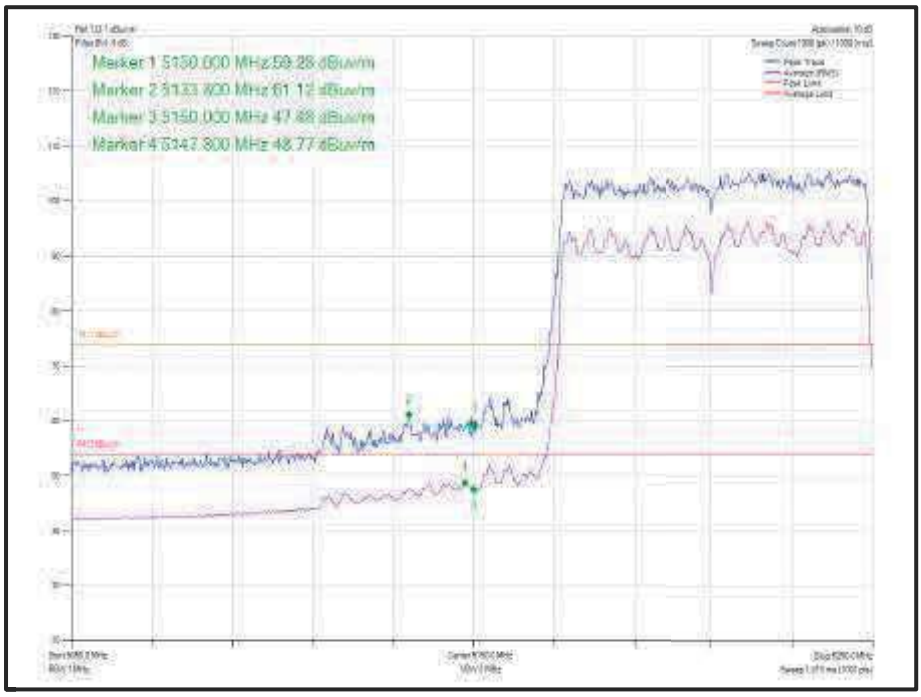

Figure 909 - 802.11ac VHT80 SDM, Cores 0-1- 5210 MHz Band Edge Frequency 5150 MHz

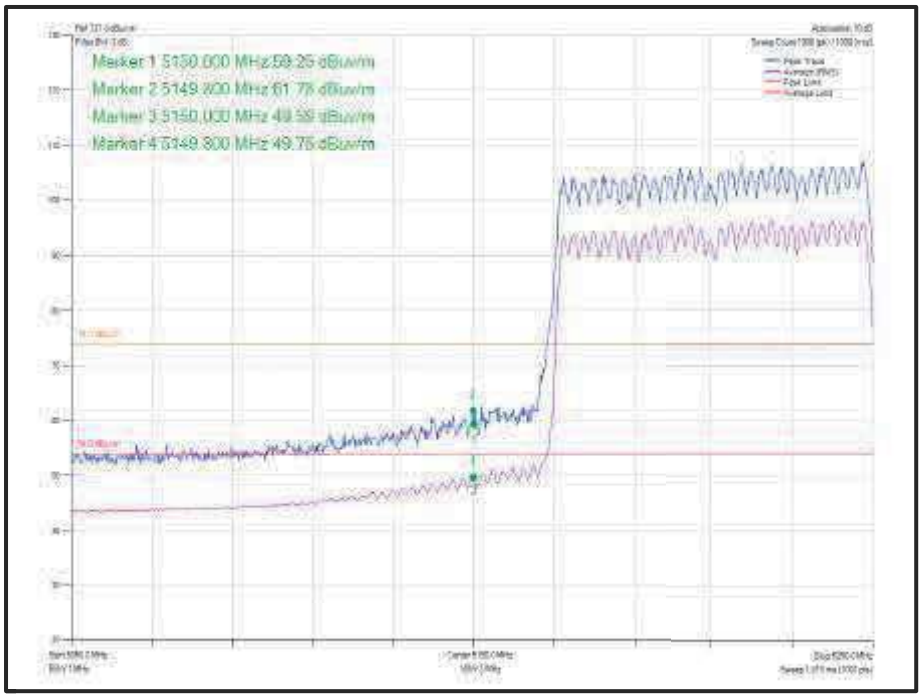

Figure 910 - 802.11ax HE80 CDD, Cores 0-1, SU - 5210 MHz Band Edge Frequency 5150 MHz

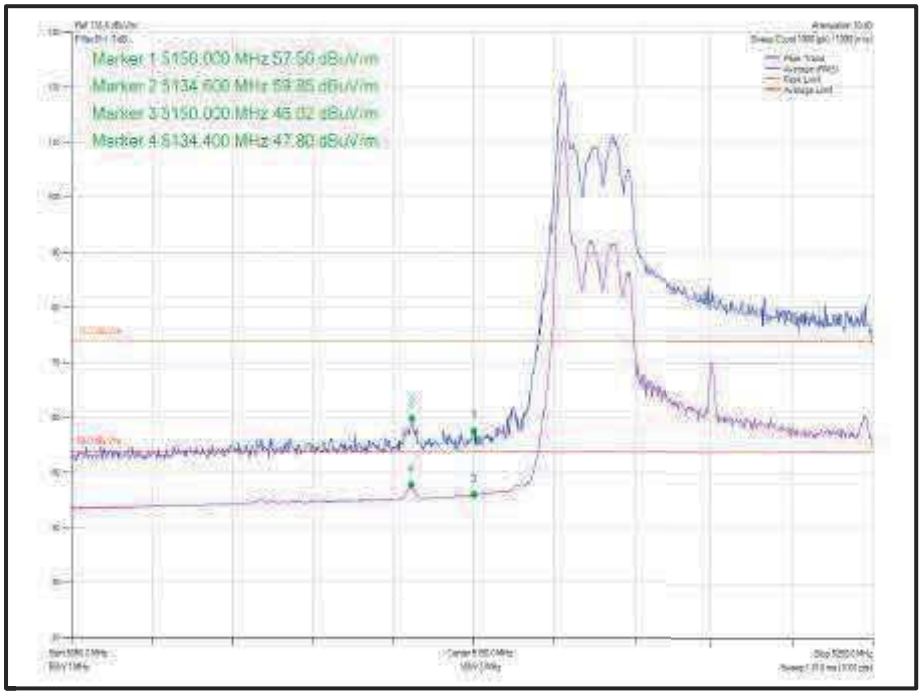

Figure 911 - 802.11ax HE80 CDD, Cores 0-1, 26-0 - 5210 MHz Band Edge Frequency 5150 MHz

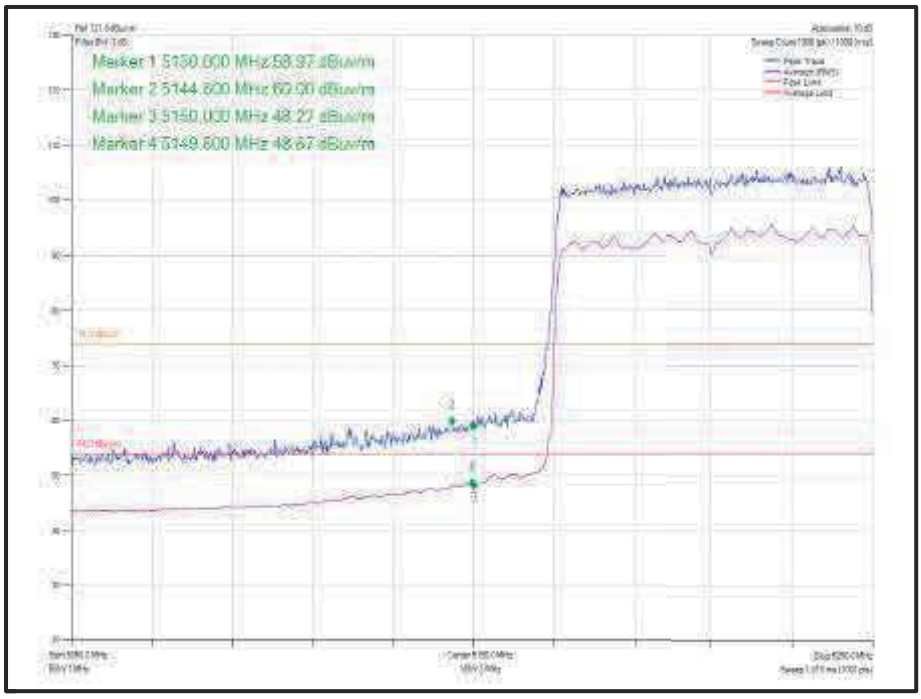

Figure 912 - 802.11ax HE80 SDM, Cores 0-1, SU - 5210 MHz Band Edge Frequency 5150 MHz

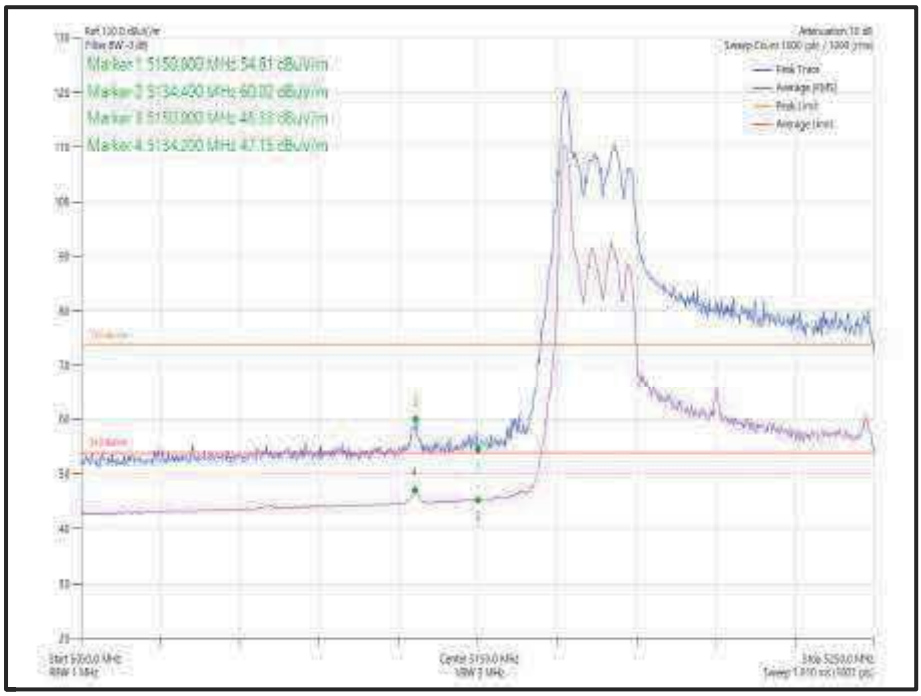

Figure 913 - 802.11ax HE80 SDM, Cores 0-1, 26-0 - 5210 MHz Band Edge Frequency 5150 MHz

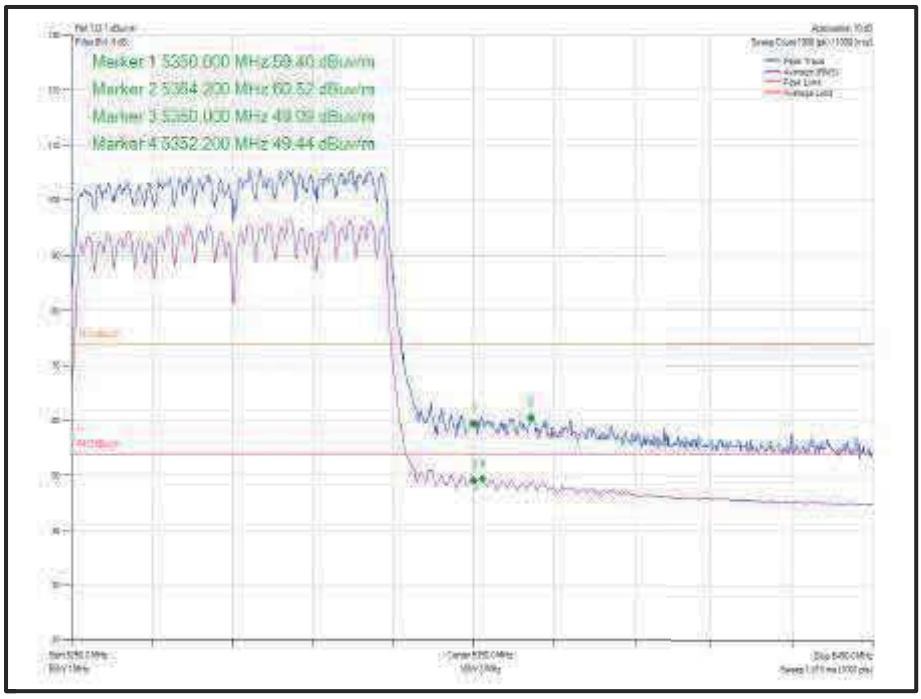

Figure 914 - 802.11ac VHT80 CDD, Cores 0-1- 5290 MHz Band Edge Frequency 5350 MHz

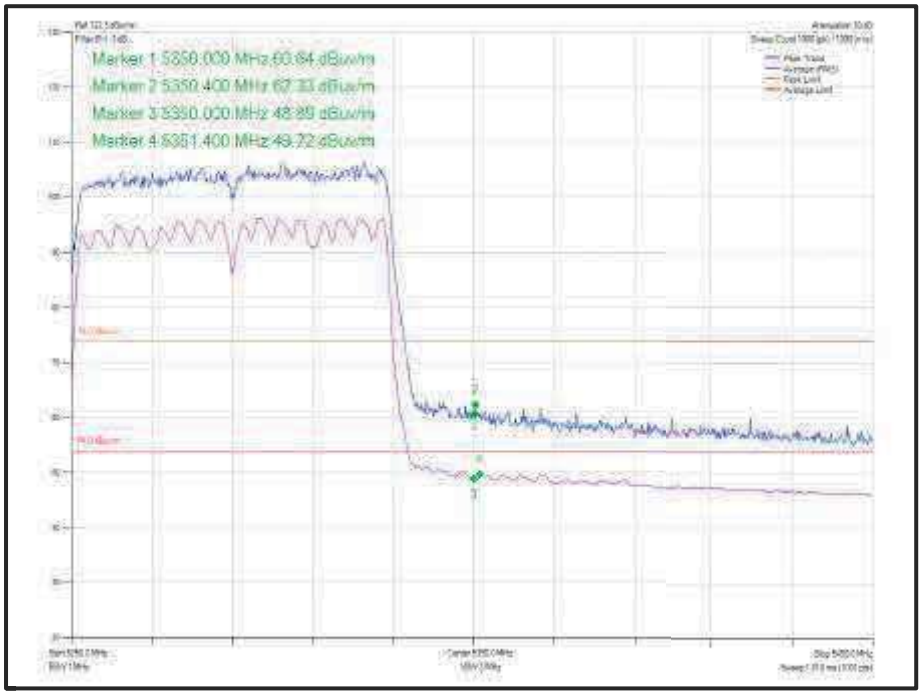

Figure 915 - 802.11ac VHT80 SDM ,Cores 0-1- 5290 MHz Band Edge Frequency 5350 MHz

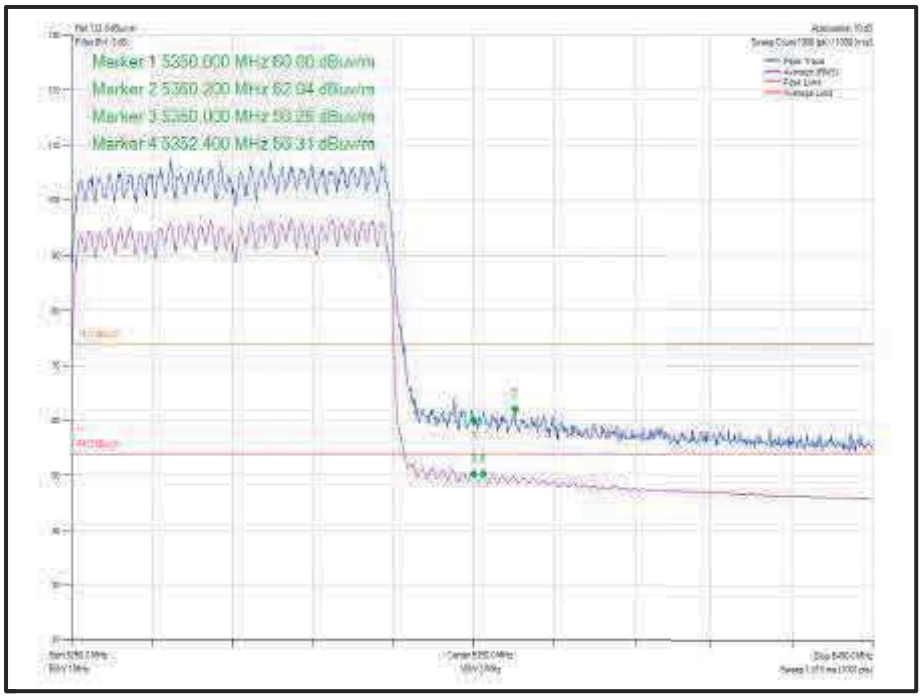

Figure 916 - 802.11ax HE80 CDD, Cores 0-1, SU - 5290 MHz Band Edge Frequency 5350 MHz

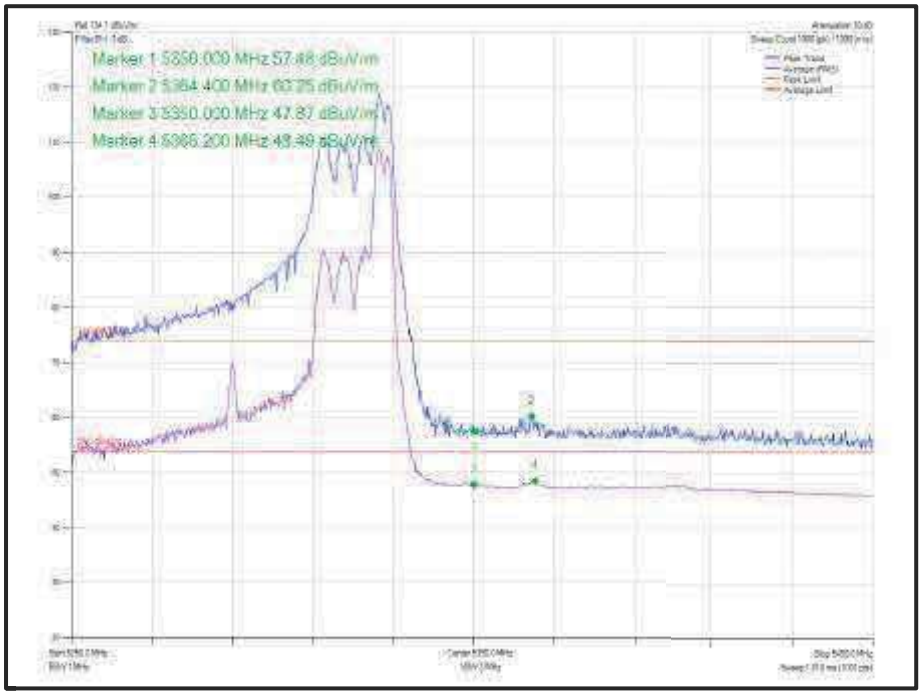

Figure 917 - 802.11ax HE80 CDD, Cores 0-1, 52-52-5290 MHz Band Edge Frequency 5350 MHz

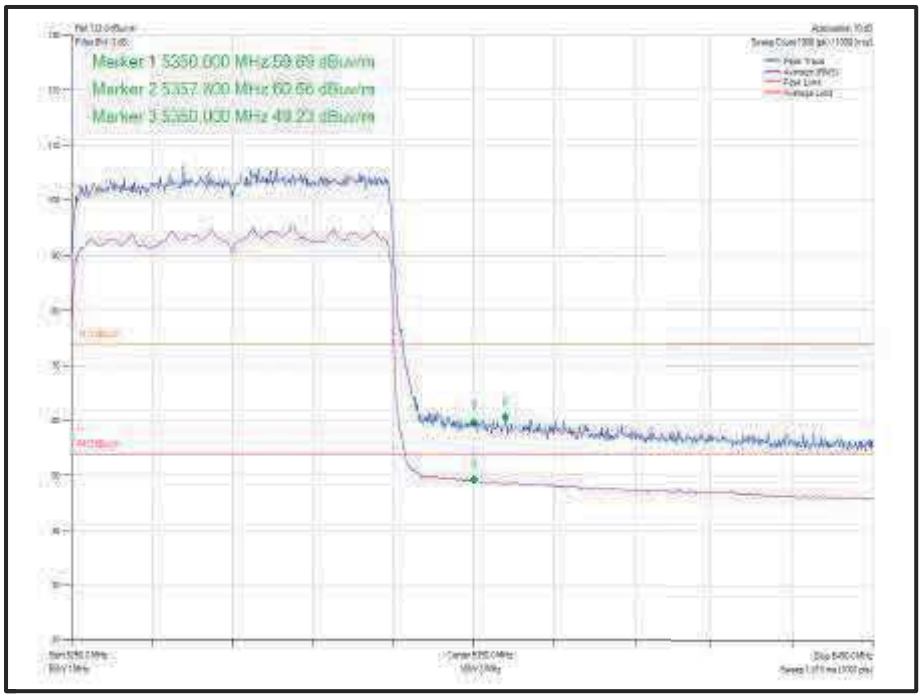

Figure 918 - 802.11ax HE80 SDM, Cores 0-1, SU - 5290 MHz Band Edge Frequency 5350 MHz

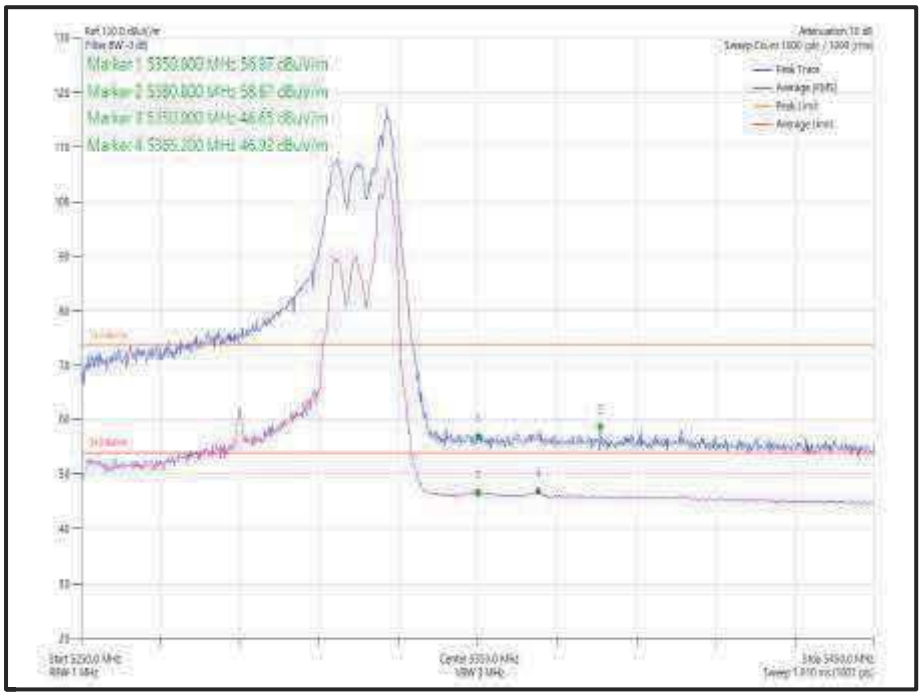

Figure 919 - 802.11ax HE80 SDM, Cores 0-1, 26-36- 5290 MHz Band Edge Frequency 5350 MHz

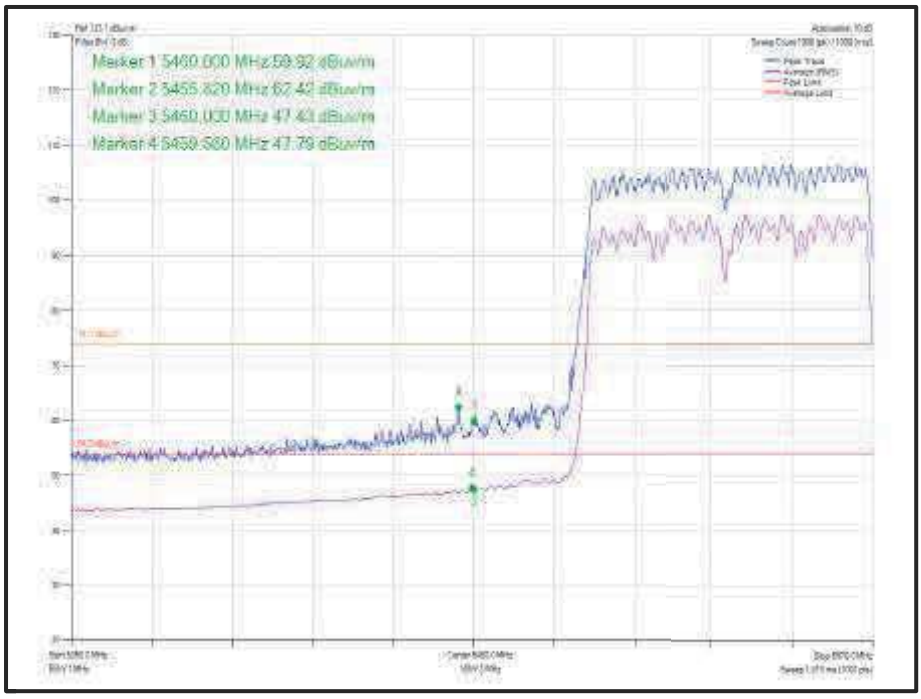

Figure 920 - 802.11ac VHT80 CDD, Cores 0-1- 5530 MHz Band Edge Frequency 5460 MHz

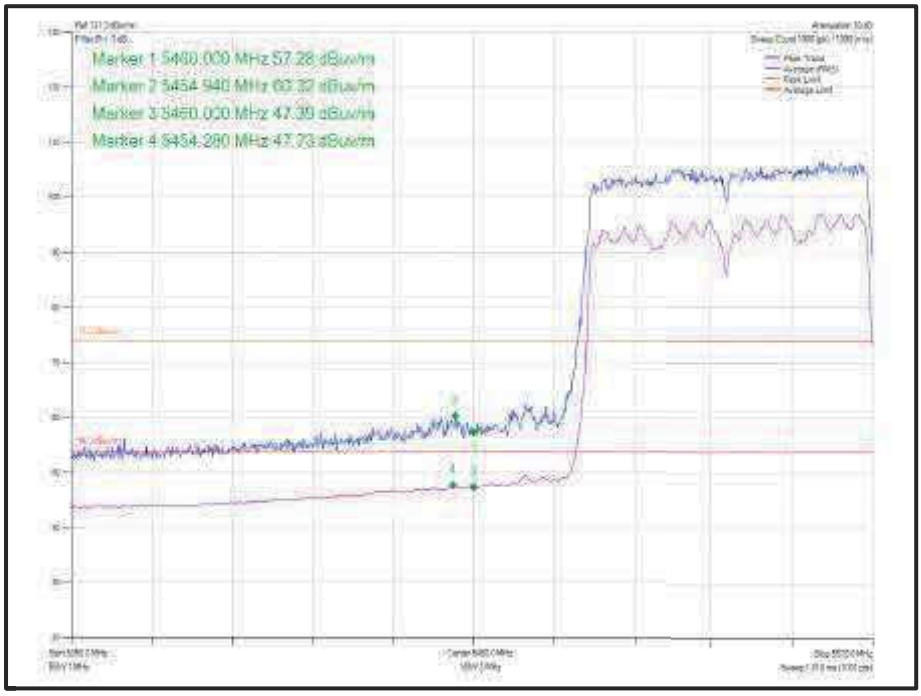

Figure 921 - 802.11ac VHT80 SDM, Cores 0-1- 5530 MHz Band Edge Frequency 5460 MHz

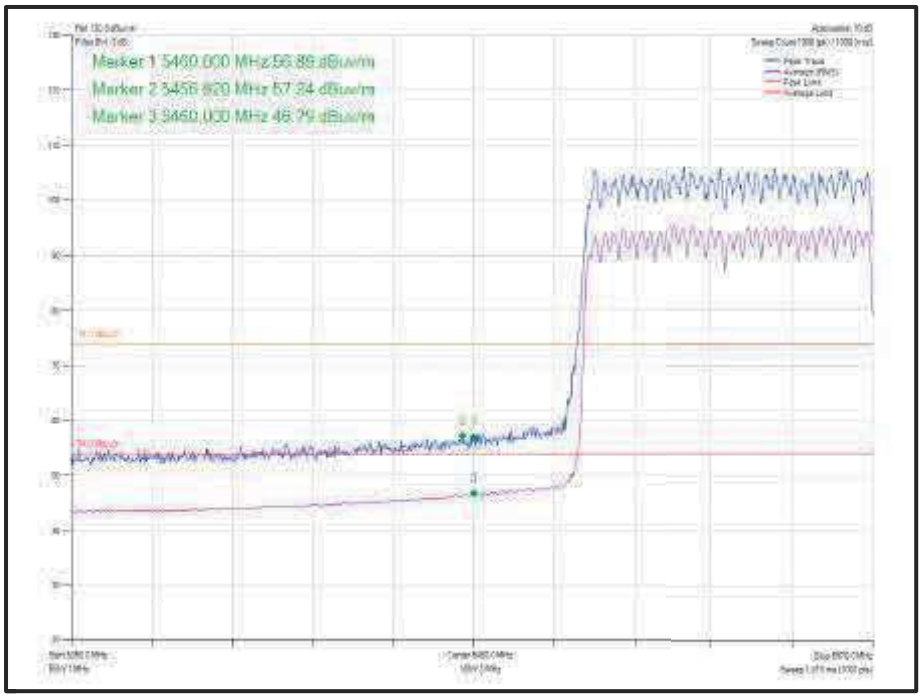

Figure 922 - 802.11ax HE80 CDD, Cores 0-1, SU - 5530 MHz Band Edge Frequency 5460 MHz

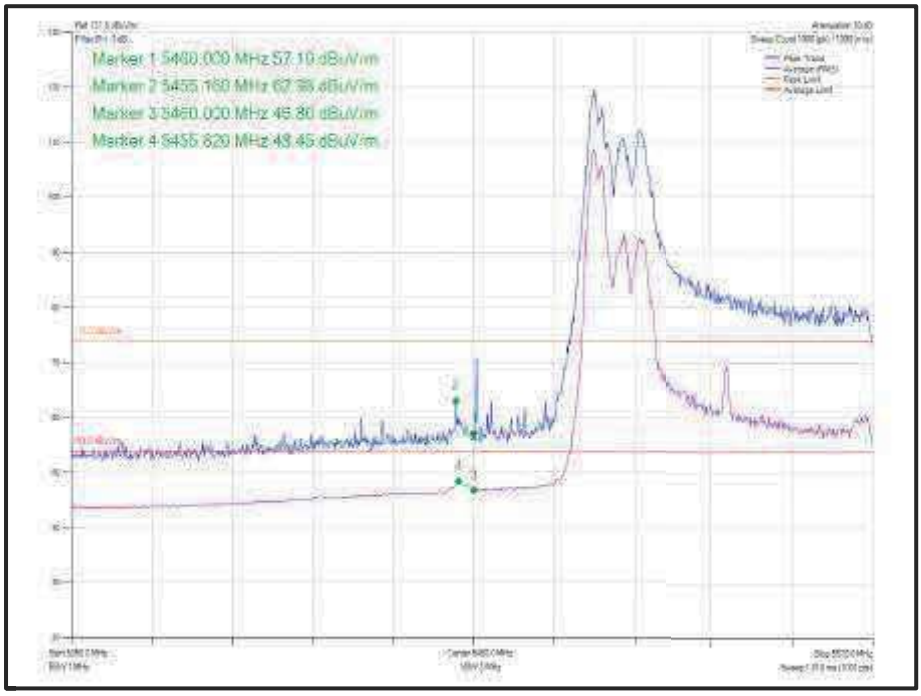

Figure 923 - 802.11ax HE80 CDD, Cores 0-1, 52-37 - 5530 MHz Band Edge Frequency 5460 MHz

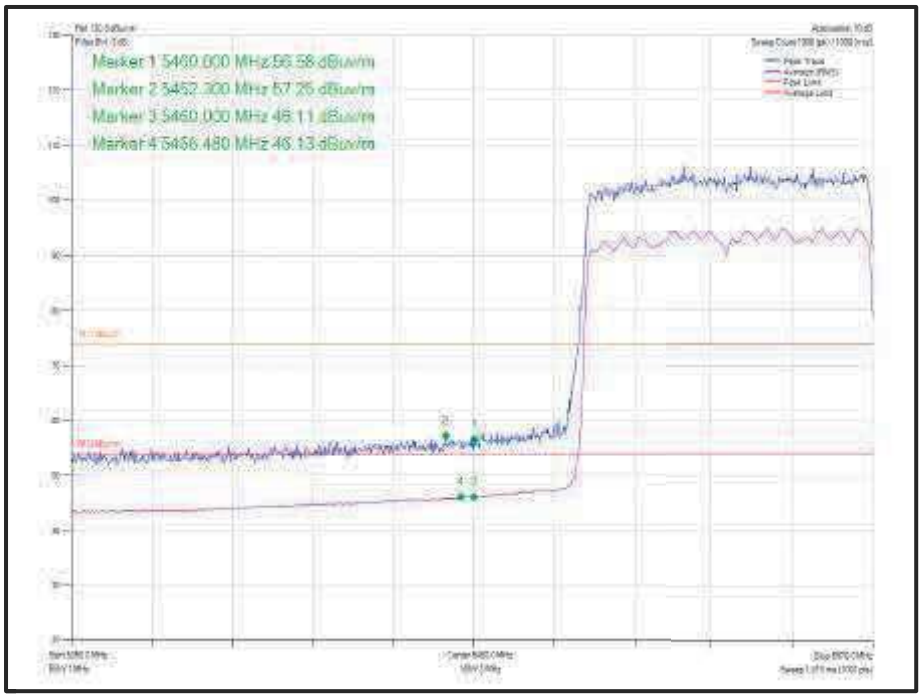

Figure 924 - 802.11ax HE80 SDM, Cores 0-1, SU - 5530 MHz Band Edge Frequency 5460 MHz

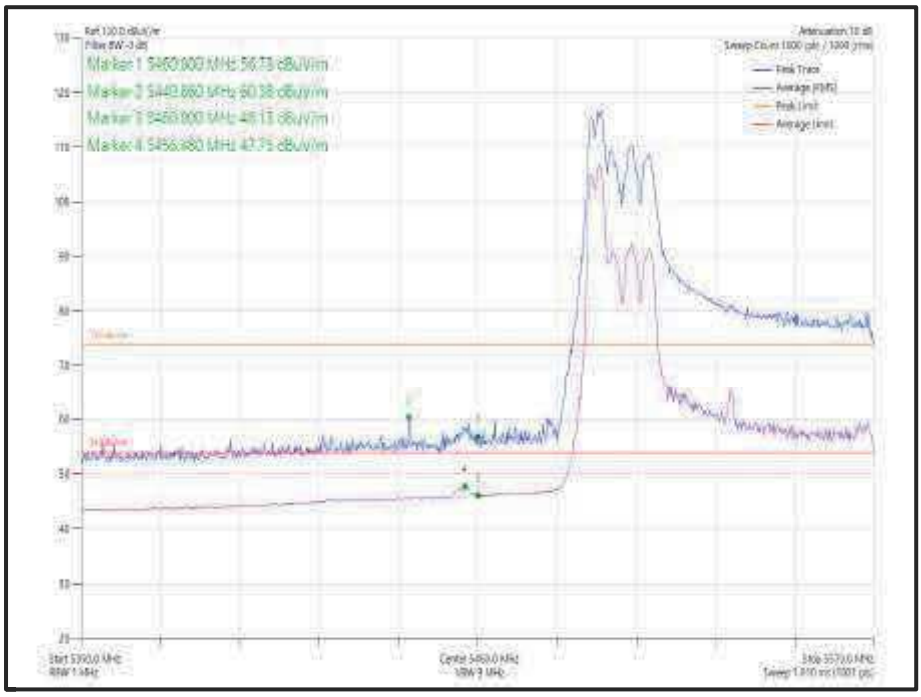

Figure 925 - 802.11ax HE80 SDM, Cores 0-1, 26-0 - 5530 MHz Band Edge Frequency 5460 MHz

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

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

Table 604 - 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
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
Screened Room (11)	Rainford	Rainford	5136	36	01-Nov-2021
Mast	Maturo	TAM 4.0-P	5158	-	TU
Mast and Turntable Controller	Maturo	Maturo NCD	5159	-	TU
Turntable	Maturo	TT 1.5WF	5160	-	TU
Horn Antenna (1-10GHz)	Schwarzbeck	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
Pre Amp 1 - 26.5 GHz	Agilent Technologies	8449B	5445	12	06-May-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 605

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

2.6.2 Equipment Under Test and Modification State

A2338, S/N: C02CX02PQC36 - Modification State 0

2.6.3 Date of Test

22-August-2020 to 07-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 dBµV/m to µV/m:
10^(Field Strength in dBµV/m/20).

EIRP was converted to field strength at 3m using the following formula:
Field Strength (dBµV/m at 3 m) = EIRP (dBm) + 95.2 dB

2.6.5 Example Test Setup Diagram

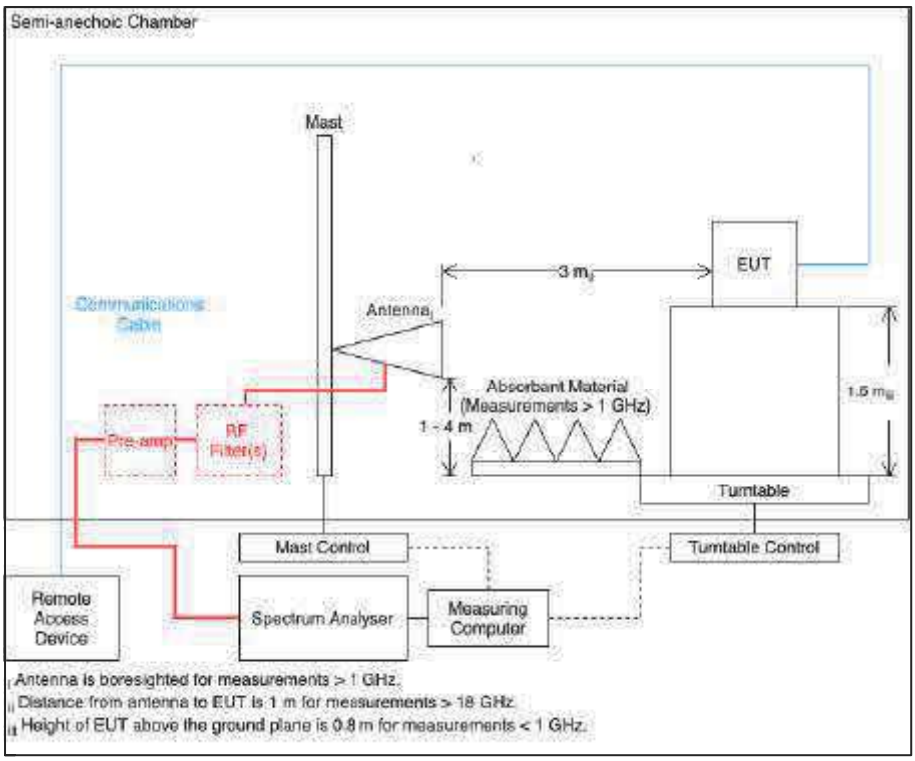

Figure 926

2.6.6 Environmental Conditions

Ambient Temperature	19.5 - 24.9 °C
Relative Humidity	50.7 - 59.2 %

2.6.7 Test Results

5 GHz WLAN

Frequency (MHz)	Level (dBuv/m)	Limit (dBuv/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
30.512	31.7	40.0	-8.3	Q-Peak	322	172	Vertical

Table 606 - 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.

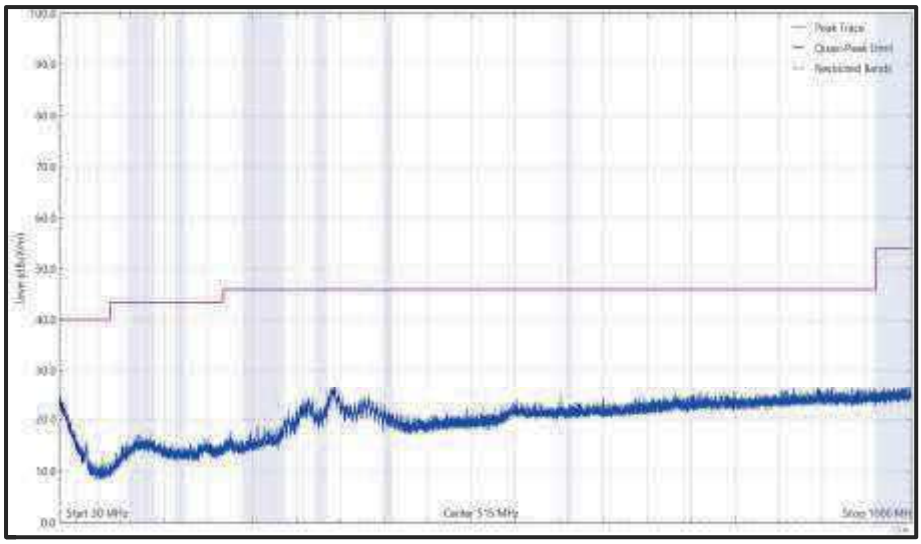

Figure 927 - U-NII-1 - 5180 MHz (CH36), HT20, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

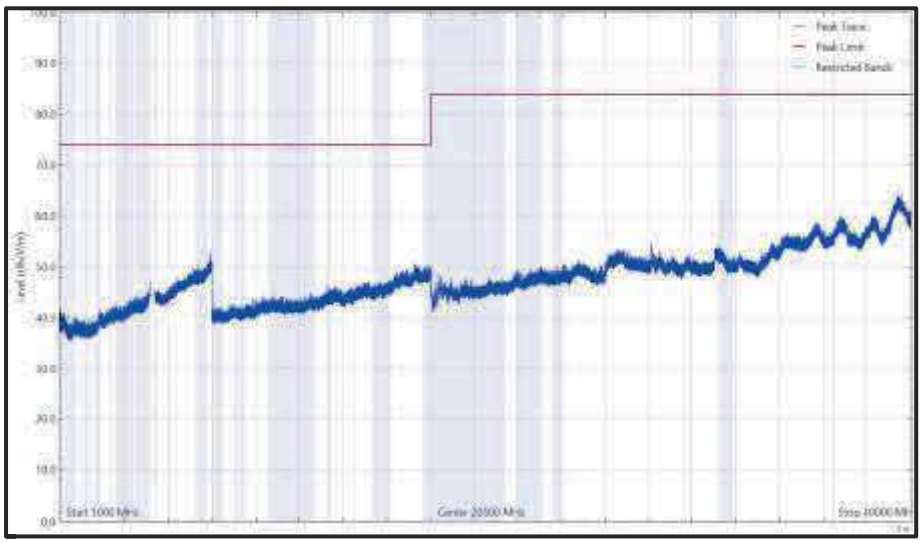

Figure 928 - U-NII-1 - 5180 MHz (CH36), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal (Peak)

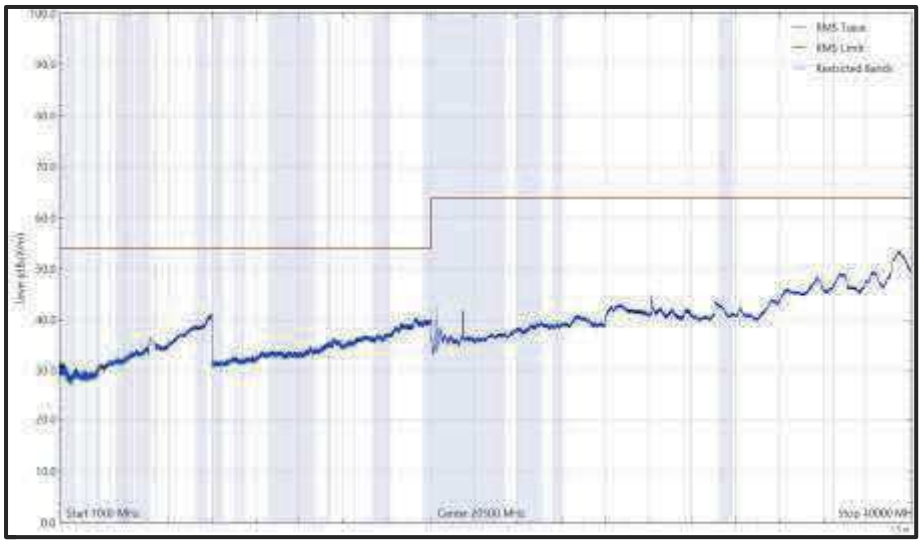

Figure 929 - U-NII-1 - 5180 MHz (CH36), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal (RMS)

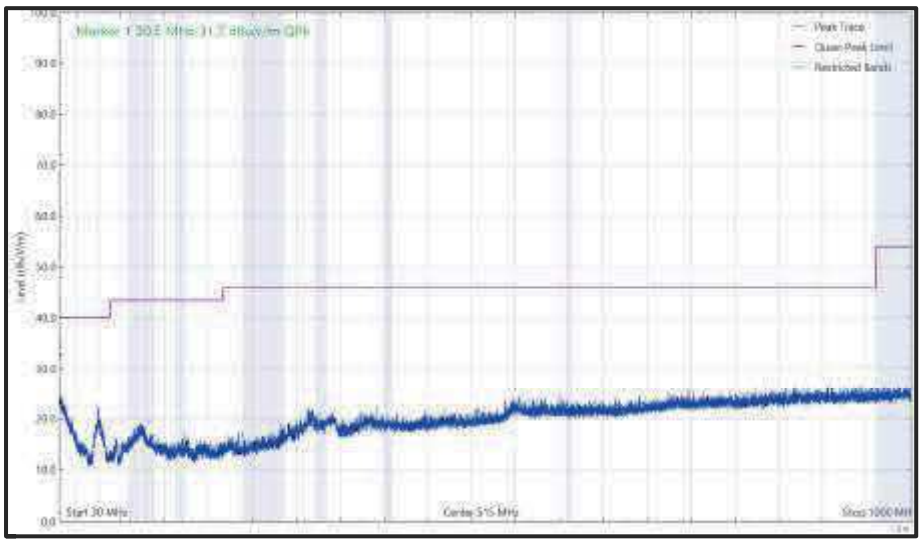

Figure 930 - U-NII-1 - 5180 MHz (CH36), HT20, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

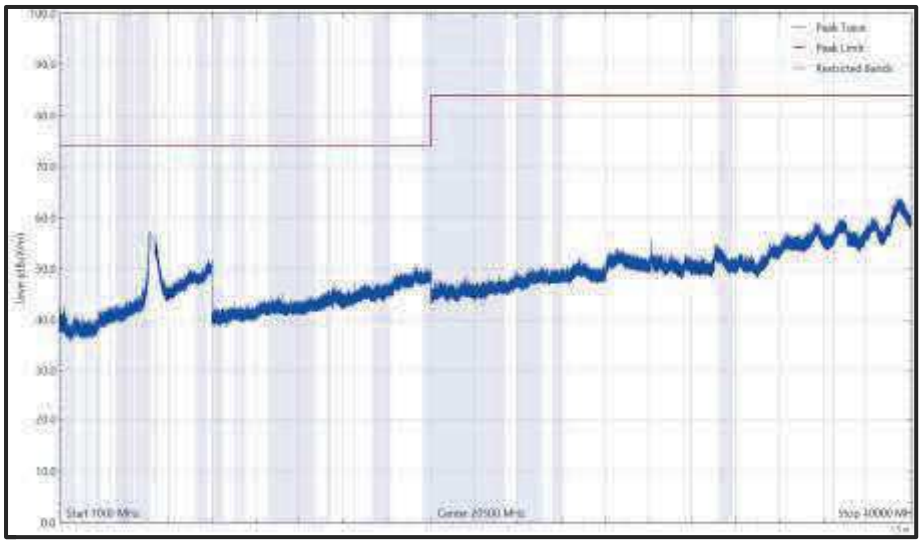

Figure 931 - U-NII-1 - 5180 MHz (CH36), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical (Peak)

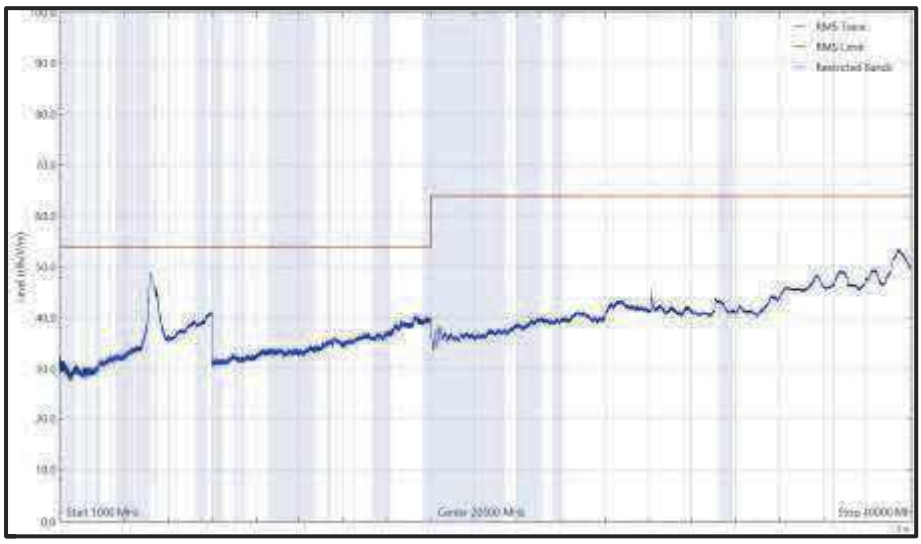

Figure 932 - U-NII-1 - 5180 MHz (CH36), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical (RMS)

Frequency (MHz)	Level (dBuv/m)	Limit (dBuv/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
10639.704	36.7	54.0	-17.3	RMS	231	103	Vertical

Table 607 - U-NII-2A - 5320 MHz (CH64), HT20, CDD, Core 0 + Core 1, 1 to 40 GHz

No other emissions found within 6 dB of the limit.

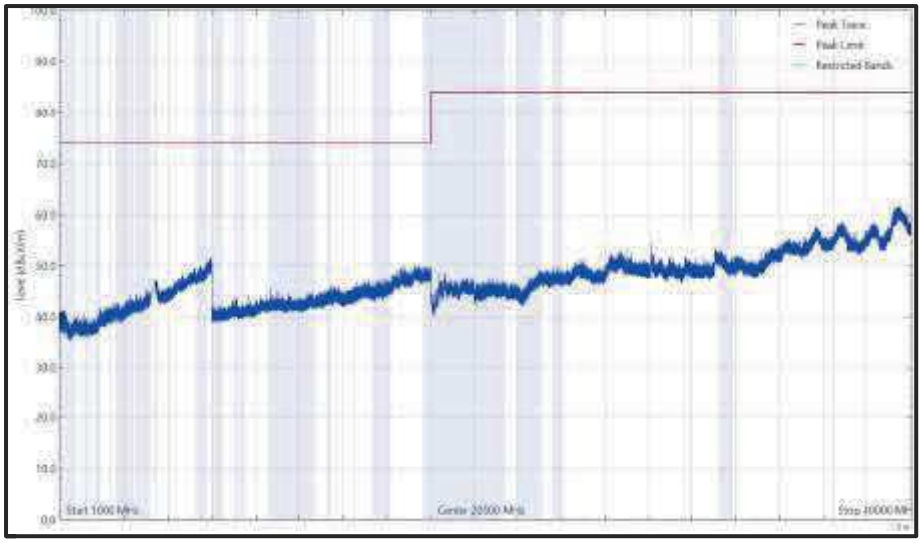

Figure 933 - U-NII-2A - 5320 MHz (CH64), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal (Peak)

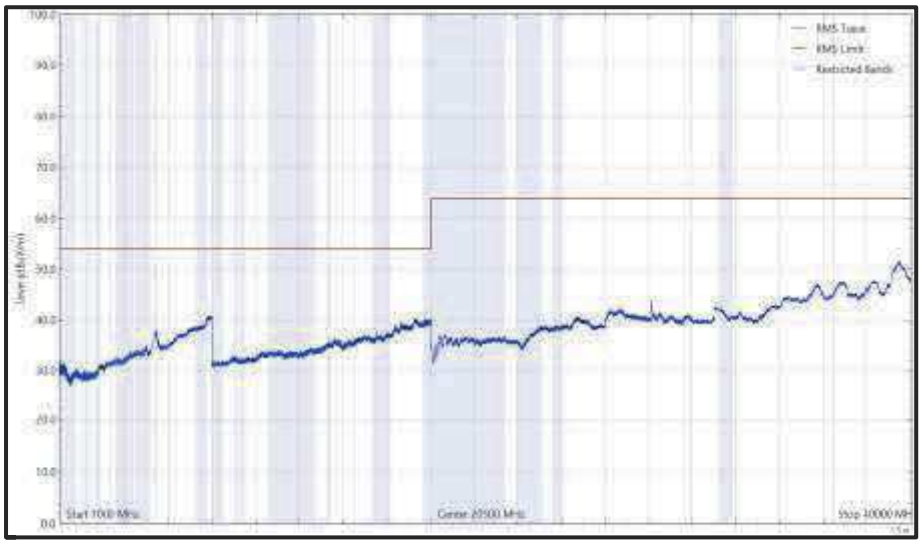

Figure 934 - U-NII-2A - 5320 MHz (CH64), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal (RMS)

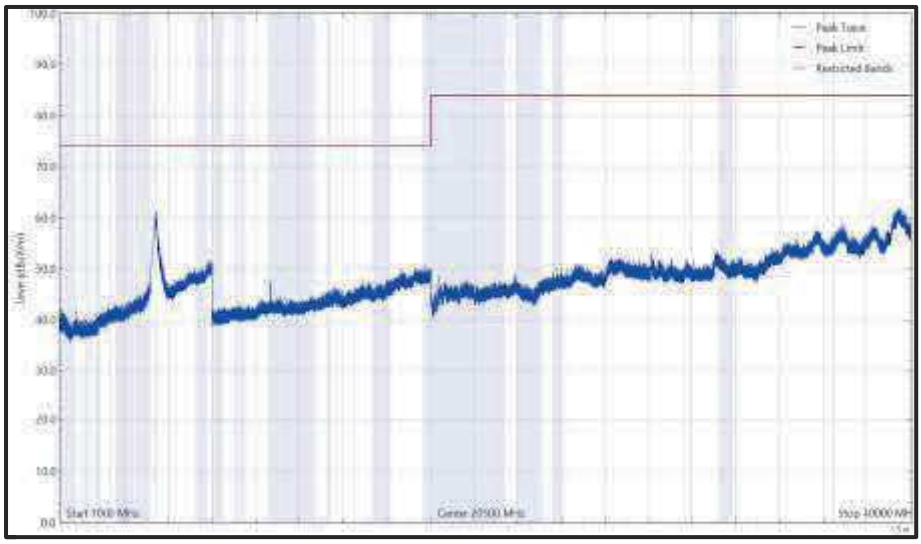

Figure 935 - U-NII-2A - 5320 MHz (CH64), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical (Peak)

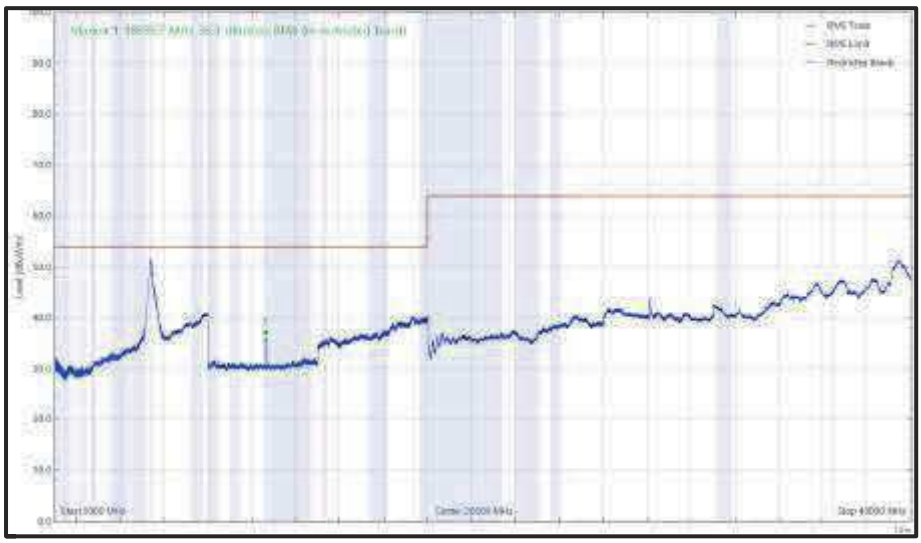

Figure 936 - U-NII-2A - 5320 MHz (CH64), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical (RMS)

Frequency (MHz)	Level (dBuv/m)	Limit (dBuv/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
10999.600	34.3	54.0	-19.7	RMS	137	100	Vertical

Table 608 - 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.

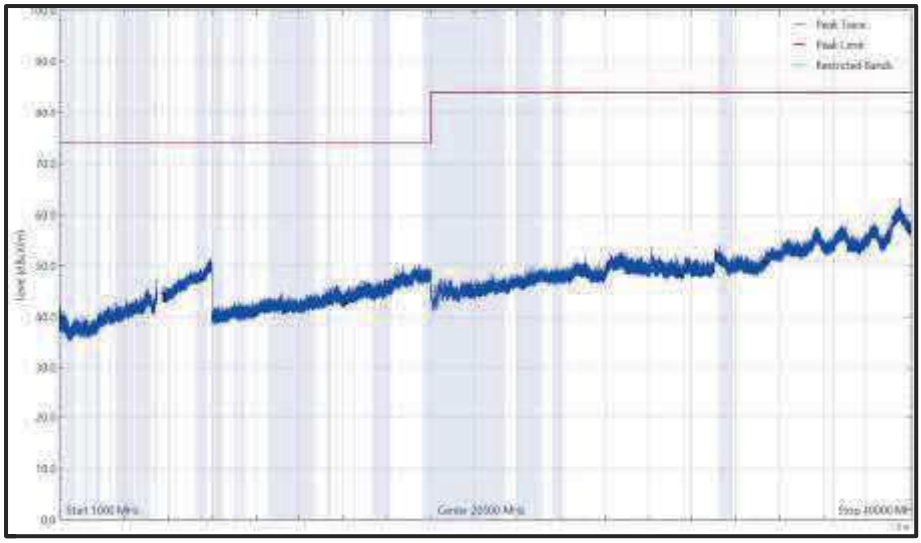

Figure 937 - U-NII-2C - 5500 MHz (CH100), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal (Peak)

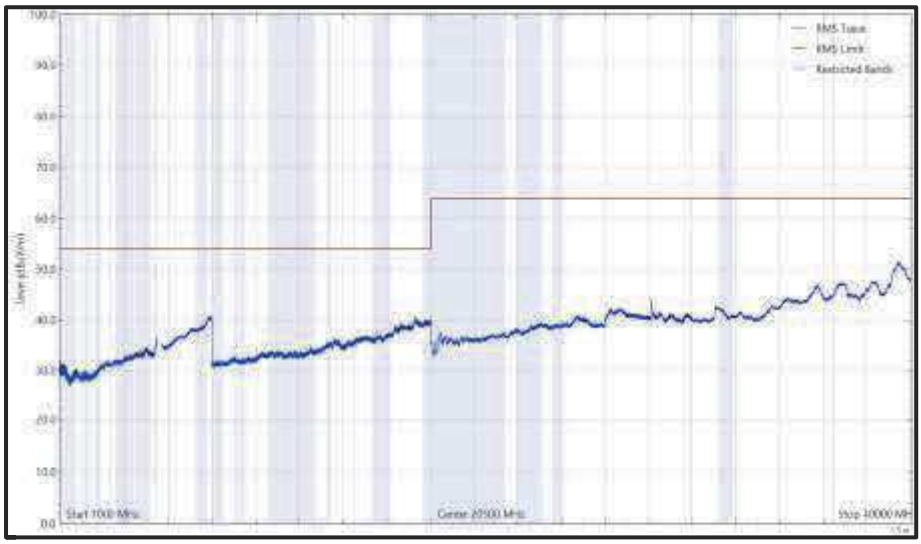

Figure 938 - U-NII-2C - 5500 MHz (CH100), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal (RMS)

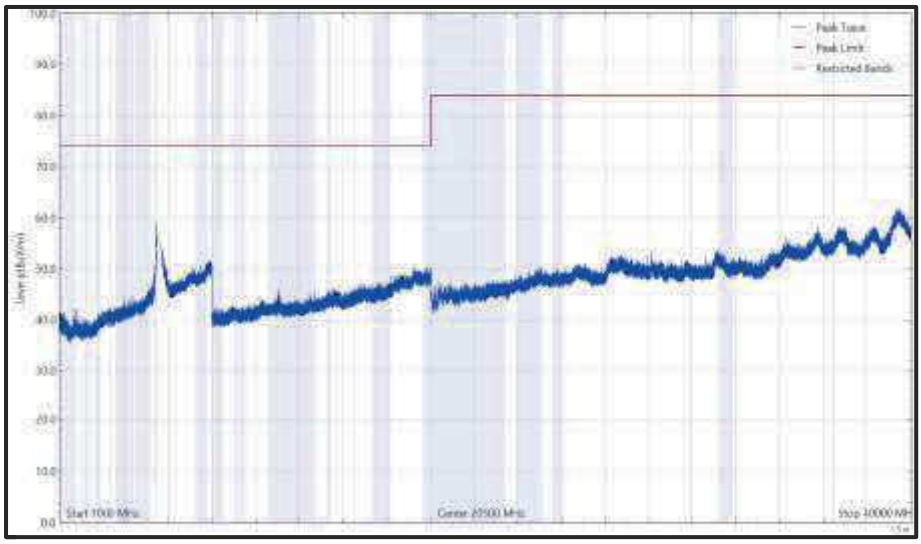

Figure 939 - U-NII-2C - 5500 MHz (CH100), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical (Peak)

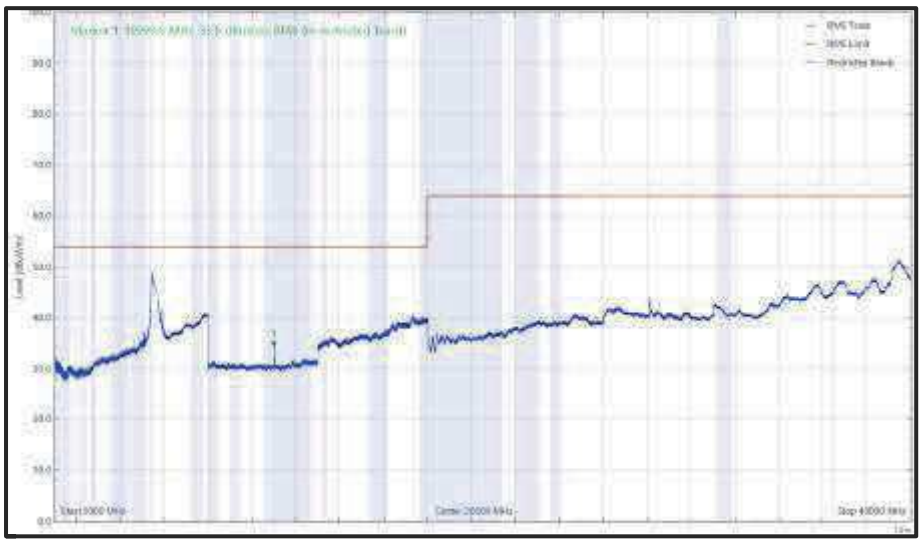

Figure 940 - U-NII-2C - 5500 MHz (CH100), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical (RMS)

Frequency (MHz)	Level (dBuv/m)	Limit (dBuv/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
*							

Table 609 - U-NII-2C - 5700 MHz (CH140), HT20, CDD, Core 0 + Core 1, 1 to 40 GHz

*No emissions found within 6 dB of the limit.

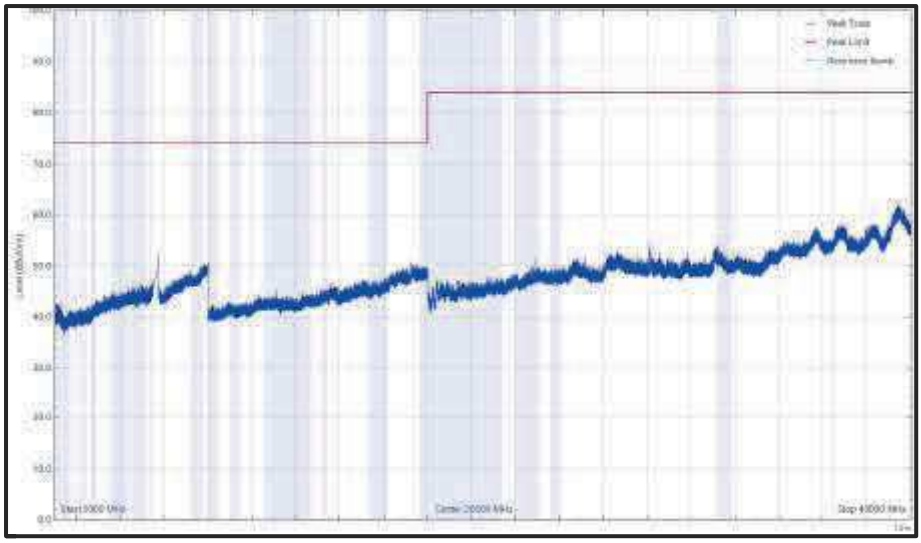

Figure 941 - U-NII-2C - 5700 MHz (CH140), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal (Peak)

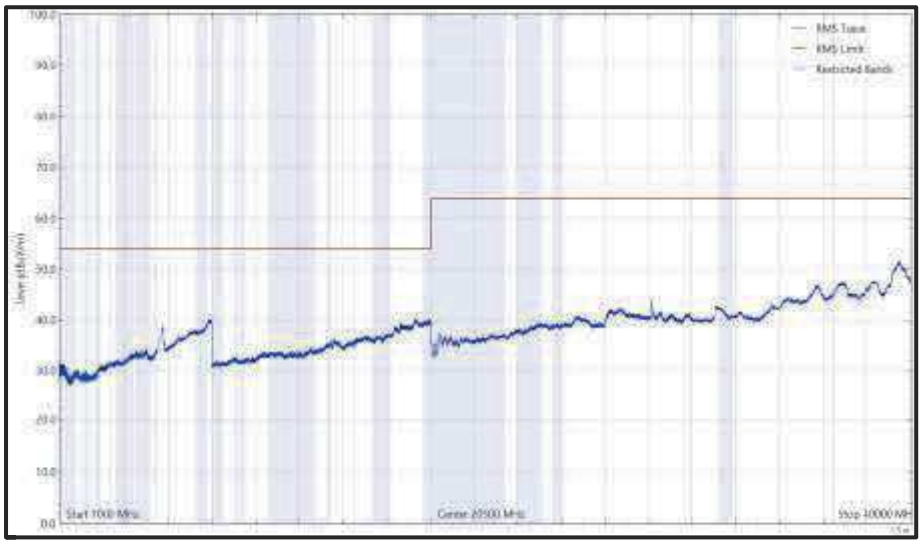

Figure 942 - U-NII-2C - 5700 MHz (CH140), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal (RMS)

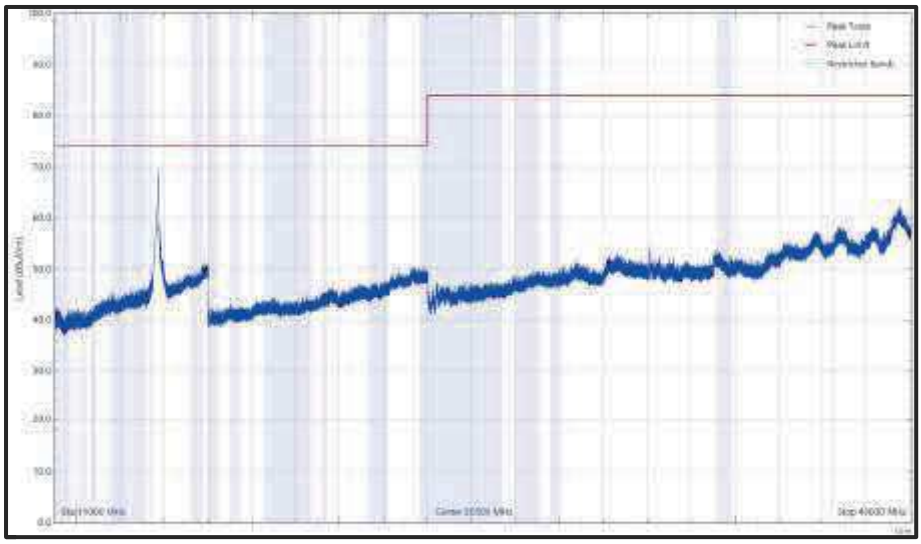

Figure 943 - U-NII-2C - 5700 MHz (CH140), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical (Peak)

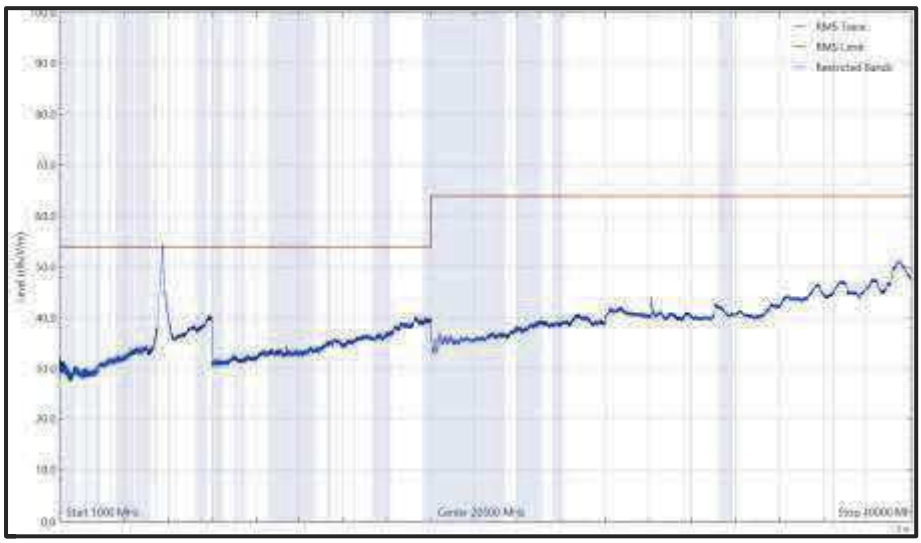

Figure 944 - U-NII-2C - 5700 MHz (CH140), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical (RMS)

Frequency (MHz)	Level (dBuv/m)	Limit (dBuv/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
*							

Table 610 - U-NII-3 - 5745 MHz (CH149), HT20, CDD, Core 0 + Core 1, 1 to 40 GHz

*No emissions found within 6 dB of the limit.

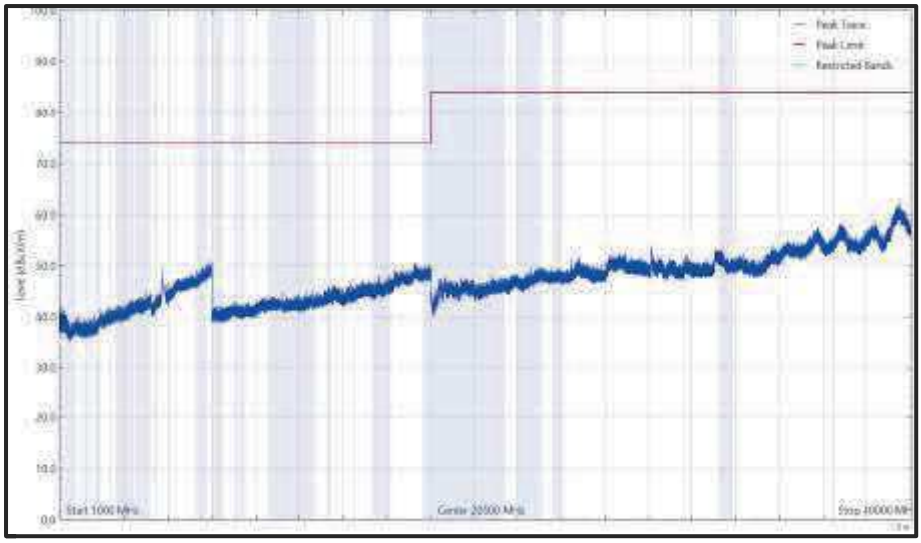

Figure 945 - U-NII-3 - 5745 MHz (CH149), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal (Peak)

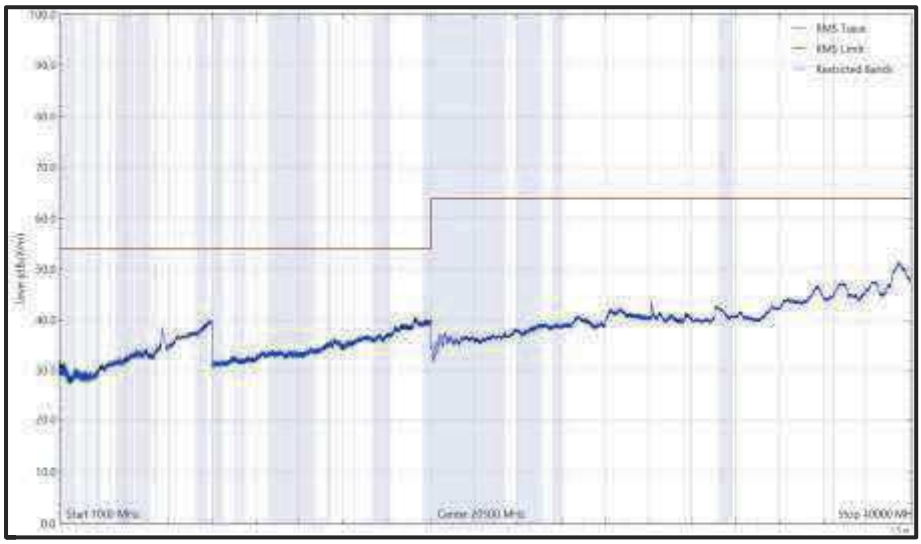

Figure 946 - U-NII-3 - 5745 MHz (CH149), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal (RMS)

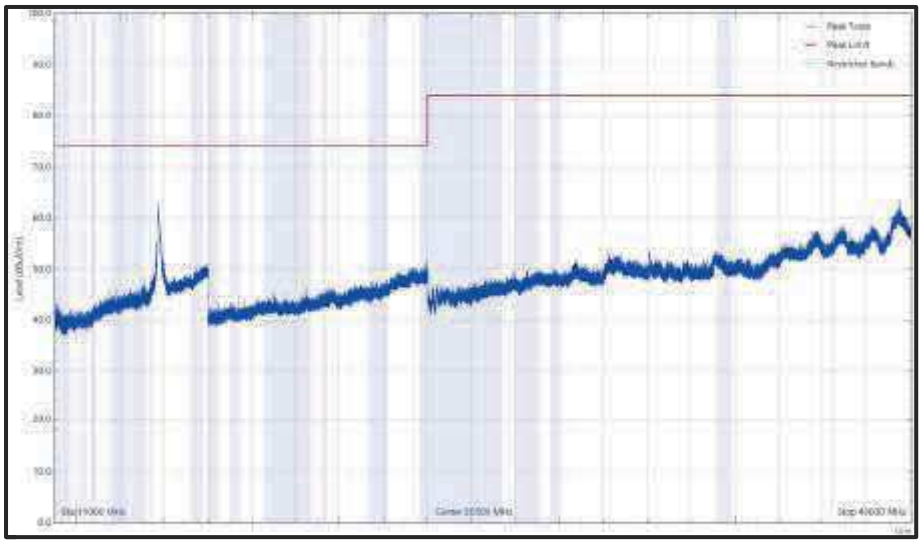

Figure 947 - U-NII-3 - 5745 MHz (CH149), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical (Peak)

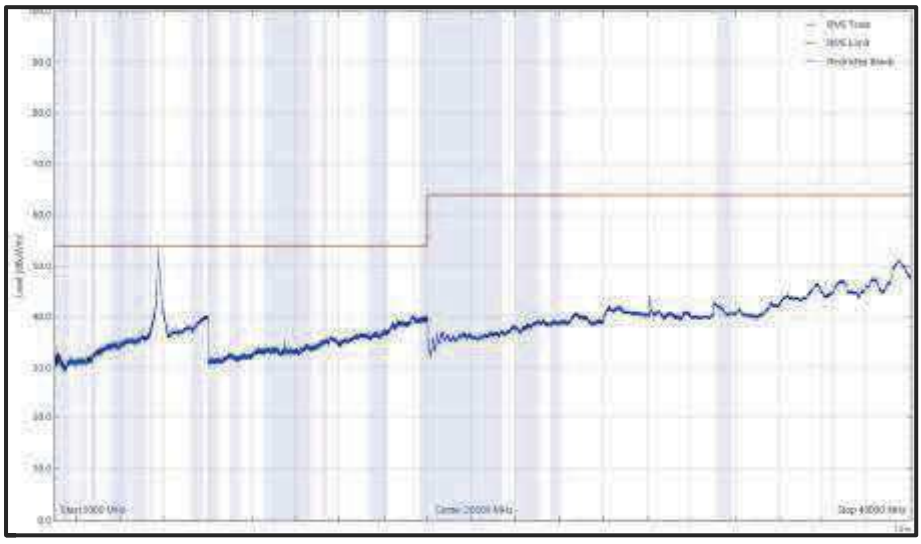

Figure 948 - U-NII-3 - 5745 MHz (CH149), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical (RMS)

Frequency (MHz)	Level (dBuv/m)	Limit (dBuv/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
5376.938	41.0	54.0	-13.0	RMS	3	290	Vertical
11649.265	44.0	54.0	-10.0	RMS	209	100	Vertical
11658.865	54.2	74.0	-19.8	Peak	207	184	Vertical

Table 611 - 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

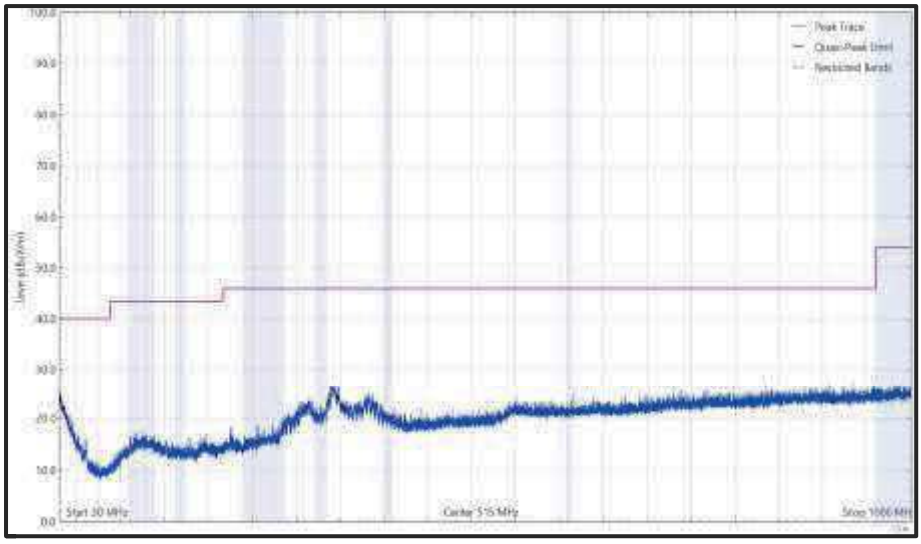

Figure 949 - U-NII-3 - 5825 MHz (CH165), HT20, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

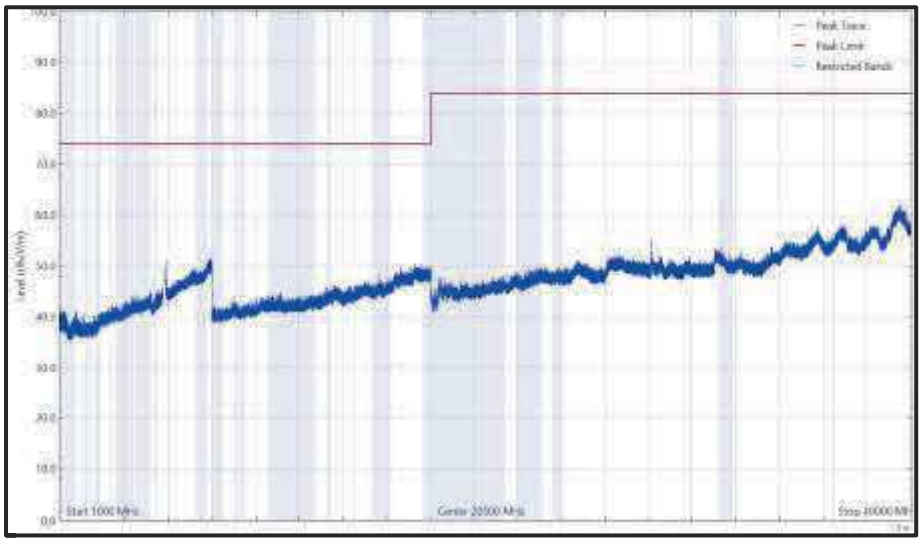

Figure 950 - U-NII-3 - 5825 MHz (CH165), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal (Peak)

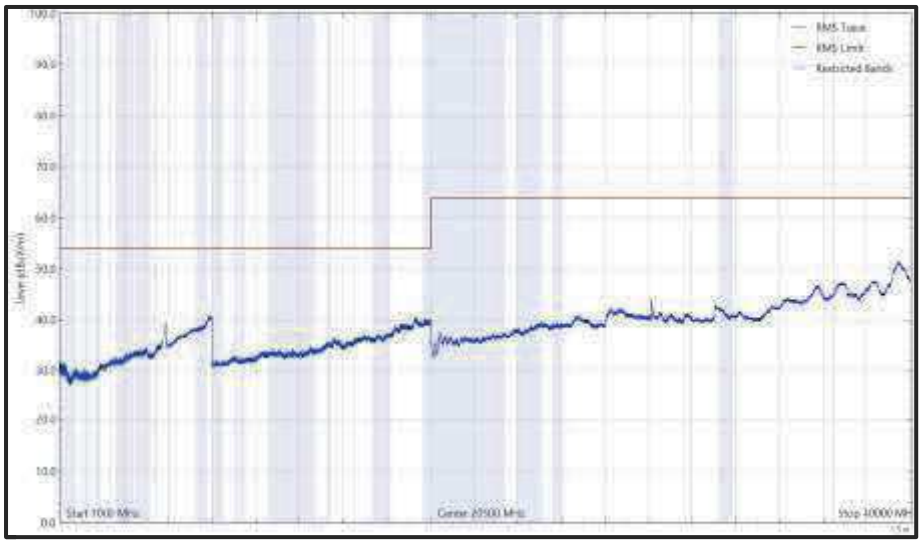

Figure 951 - U-NII-3 - 5825 MHz (CH165), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal (RMS)

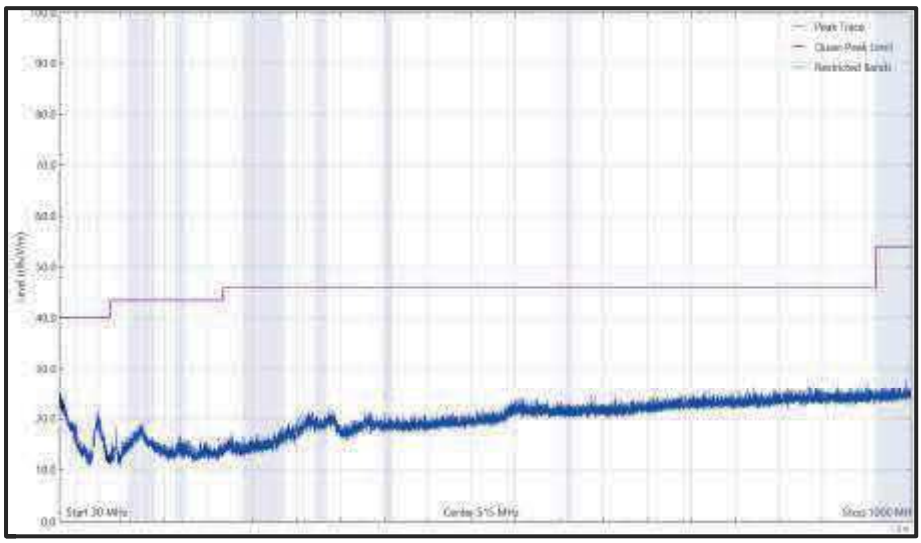

Figure 952 - U-NII-3 - 5825 MHz (CH165), HT20, CDD, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

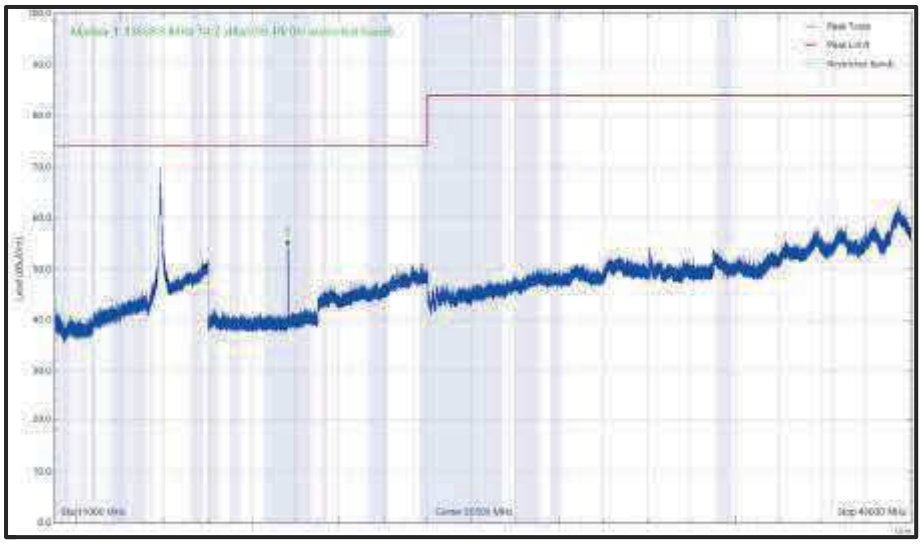

Figure 953 - U-NII-3 - 5825 MHz (CH165), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical (Peak)

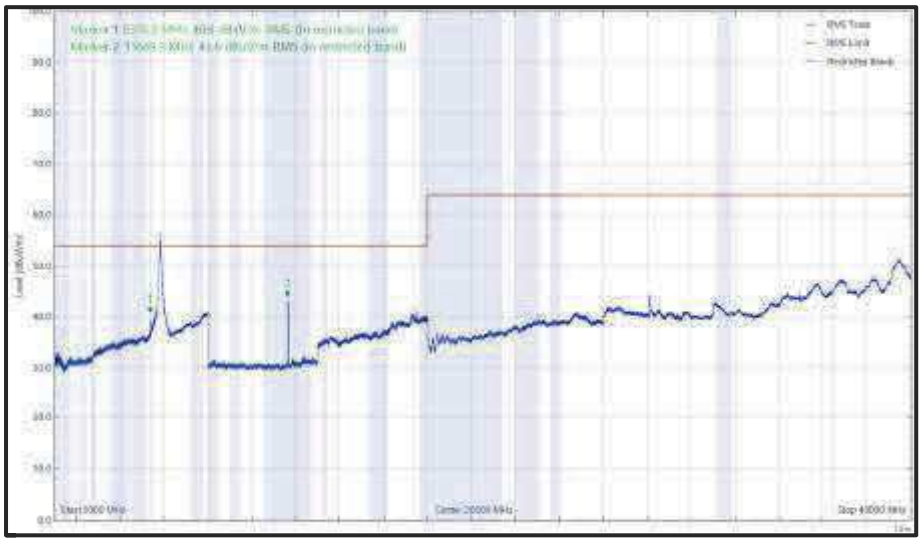

Figure 954 - U-NII-3 - 5825 MHz (CH165), HT20, CDD, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical (RMS)

Frequency (MHz)	Level (dBuv/m)	Limit (dBuv/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
*							

Table 612 - 5180 MHz (CH36), HE20, RU26-0, Core 0 + Core 1, 30 MHz to 40 GHz

*No emissions found within 6 dB of the limit.

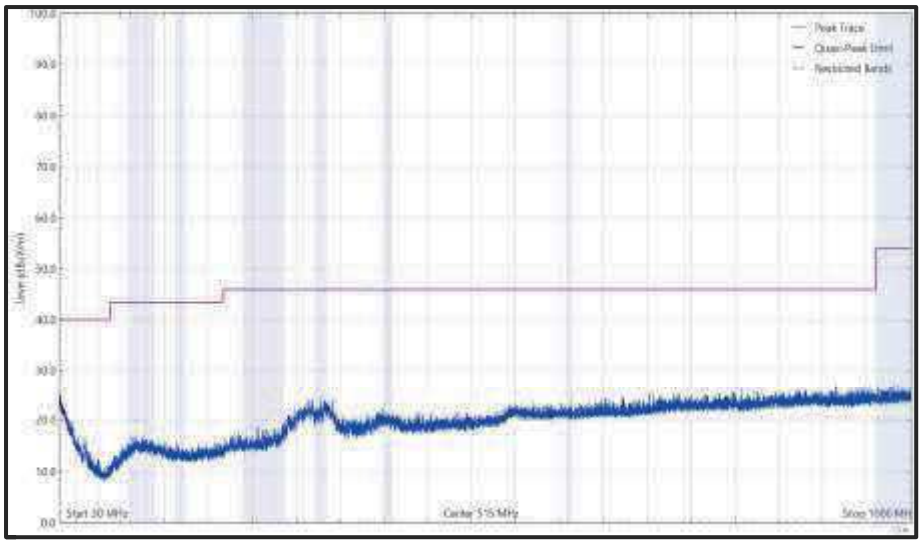

Figure 955 - 5180 MHz (CH36), HE20, RU26-0, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

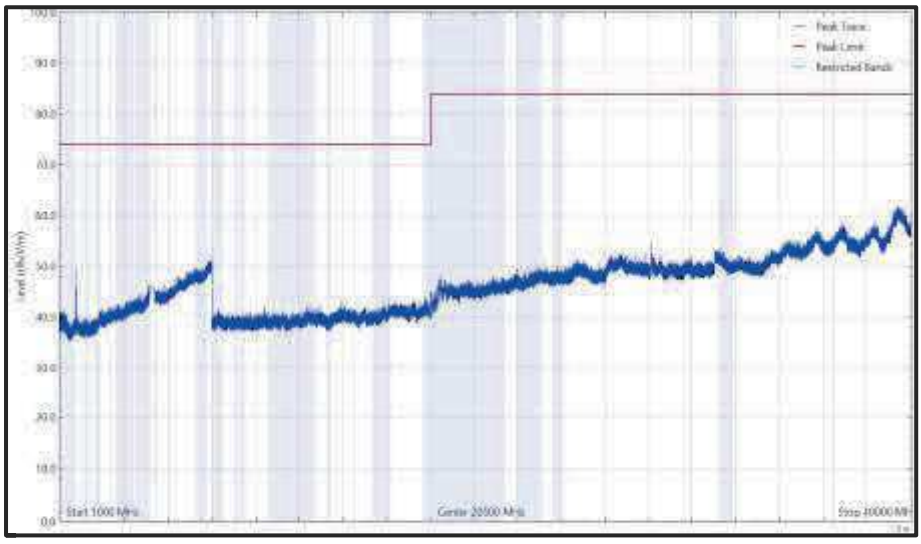

Figure 956 - 5180 MHz (CH36), HE20, RU26-0, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal (Peak)

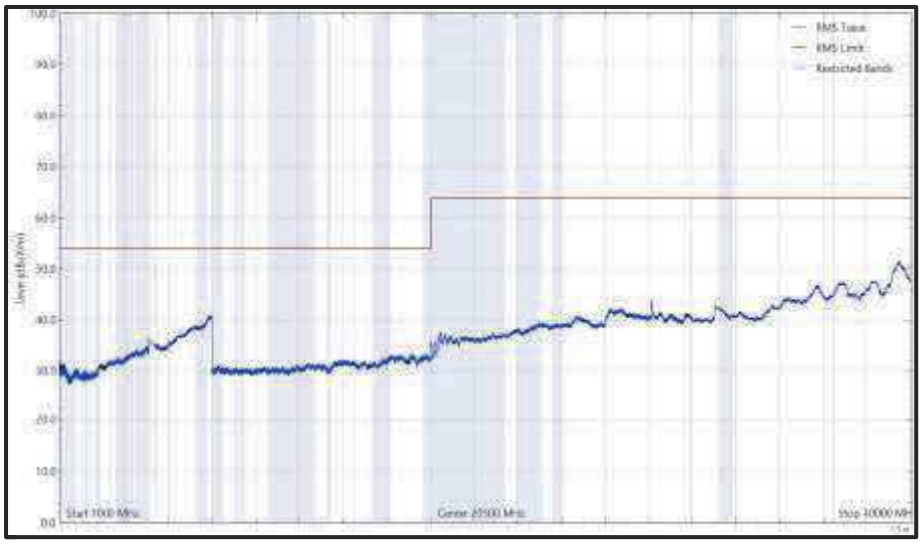

Figure 957 - 5180 MHz (CH36), HE20, RU26-0, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal (RMS)

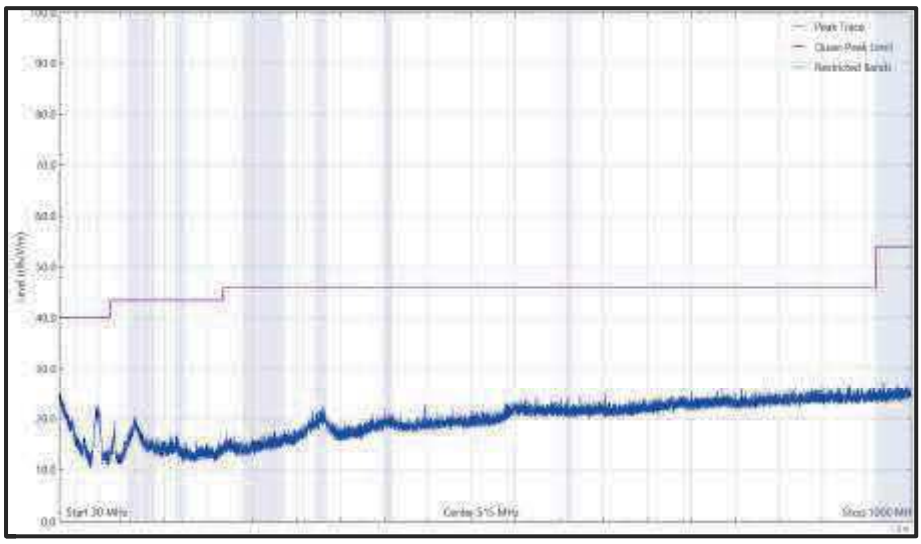

Figure 958 - 5180 MHz (CH36), HE20, RU26-0, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

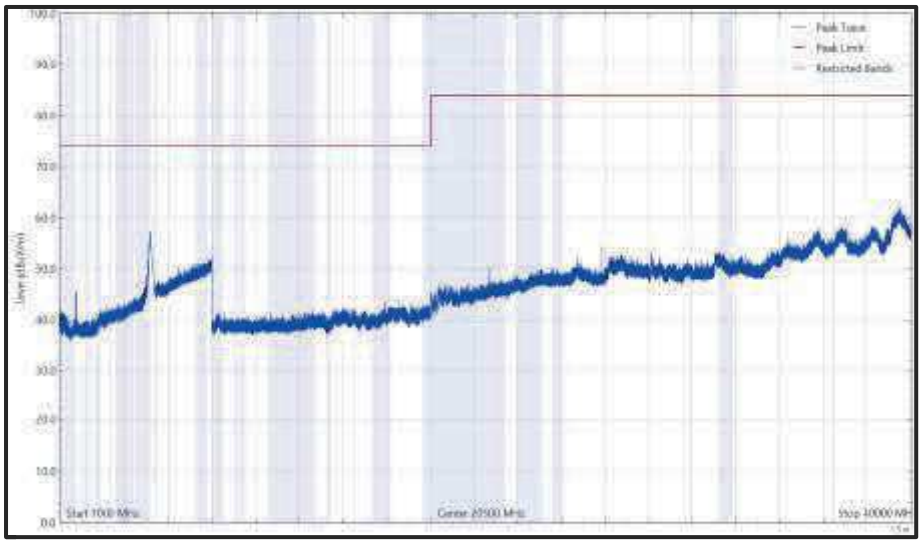

Figure 959 - 5180 MHz (CH36), HE20, RU26-0, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical (Peak)

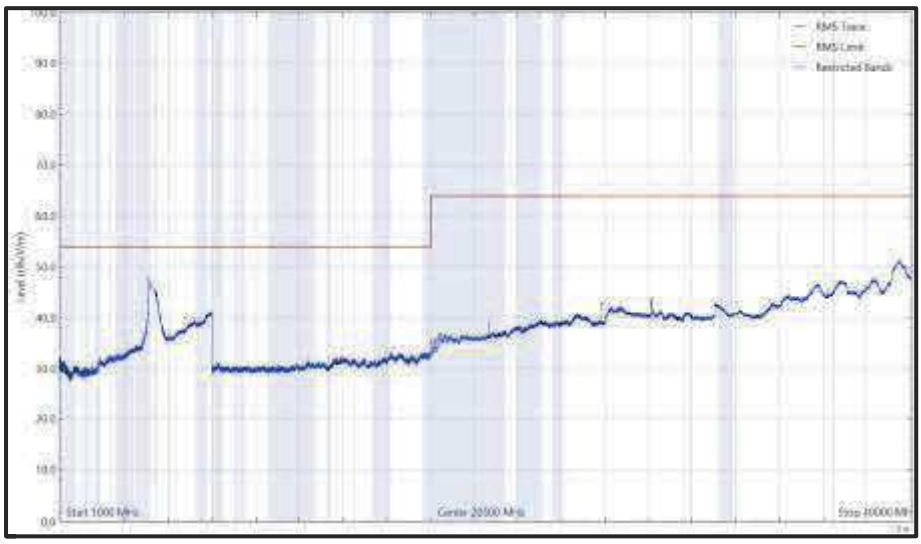

Figure 960 - 5180 MHz (CH36), HE20, RU26-0, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical (RMS)

Frequency (MHz)	Level (dBuv/m)	Limit (dBuv/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
11472.517	38.3	54.0	-14.7	RMS	201	159	Vertical
11472.582	53.1	74.0	-21.0	Peak	203	100	Vertical

Table 613 - 5745 MHz (CH149), HE20, RU26-0, Core 0 + Core 1, 1 to 40 GHz

No other emissions found within 6 dB of the limit.

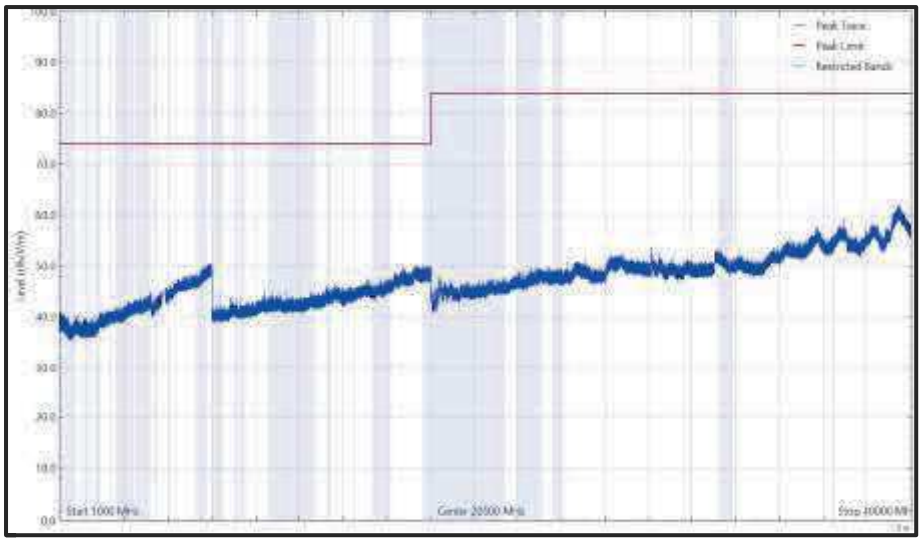

Figure 961 - 5745 MHz (CH149), HE20, RU26-0, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal (Peak)

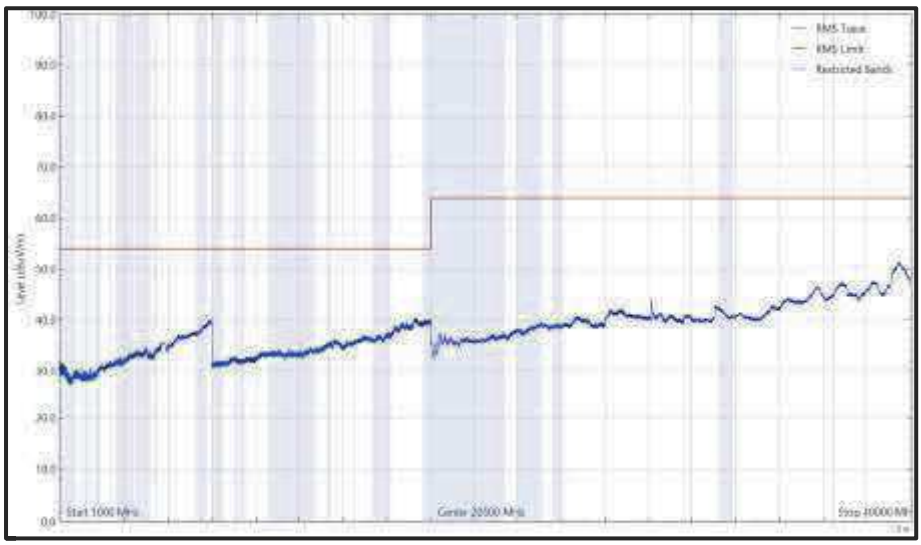

Figure 962 - 5745 MHz (CH149), HE20, RU26-0, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal (RMS)

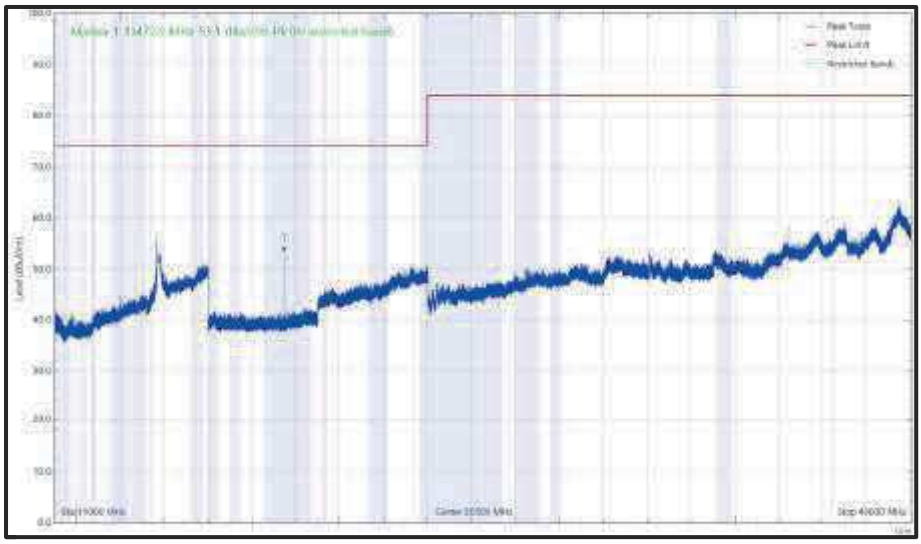

Figure 963 - 5745 MHz (CH149), HE20, RU26-0, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical (Peak)

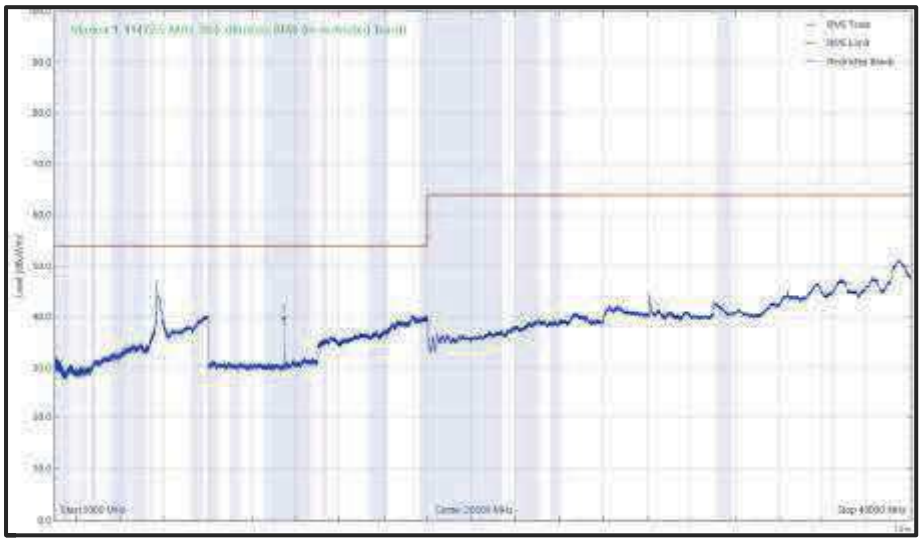

Figure 964 - 5745 MHz (CH149), HE20, RU26-0, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical (RMS)

Frequency (MHz)	Level (dBuv/m)	Limit (dBuv/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
11632.210	53.1	74.0	-20.9	Peak	207	101	Vertical

Table 614 - 5825 MHz (CH165), HE20, RU26-0, Core 0 + Core 1, 30 MHz to 40 GHz

No other emissions found within 6 dB of the limit.

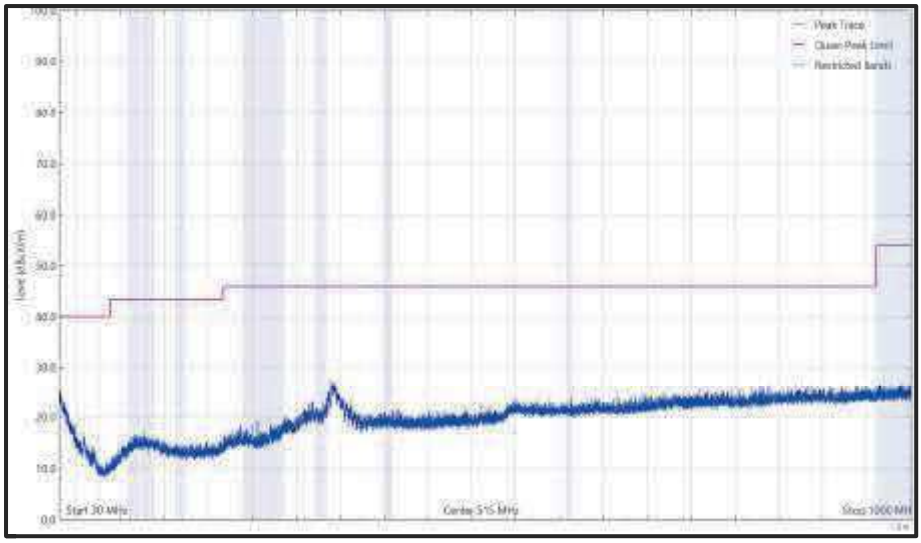

Figure 965 - 5825 MHz (CH165), HE20, RU26-0, Core 0 + Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

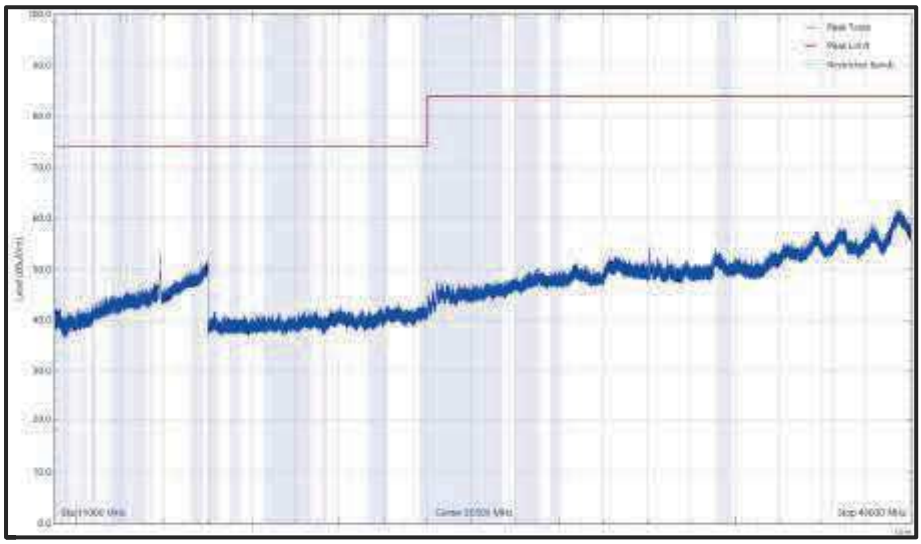

Figure 966 - 5825 MHz (CH165), HE20, RU26-0, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal (Peak)

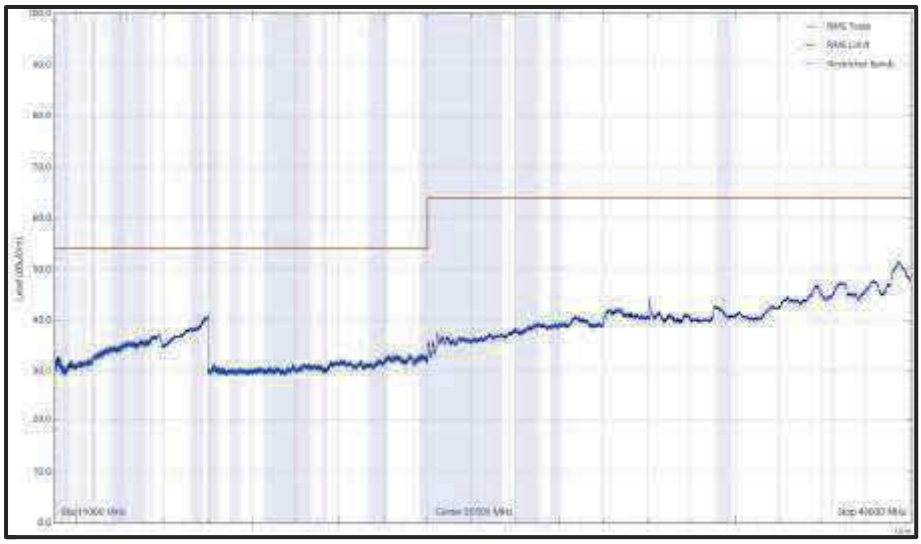

Figure 967 - 5825 MHz (CH165), HE20, RU26-0, Core 0 + Core 1, 1 GHz to 40 GHz, Horizontal (RMS)

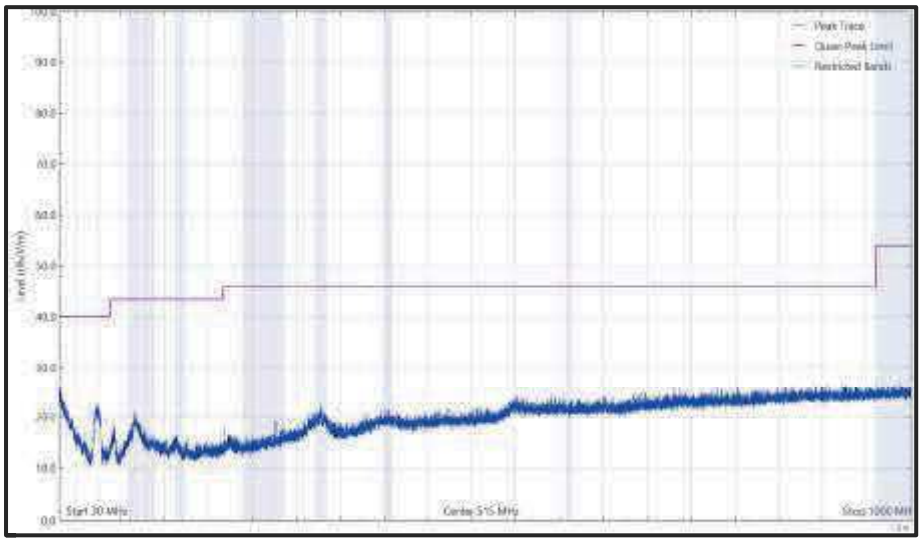

Figure 968 - 5825 MHz (CH165), HE20, RU26-0, Core 0 + Core 1, 30 MHz to 1 GHz, Vertical (Peak)

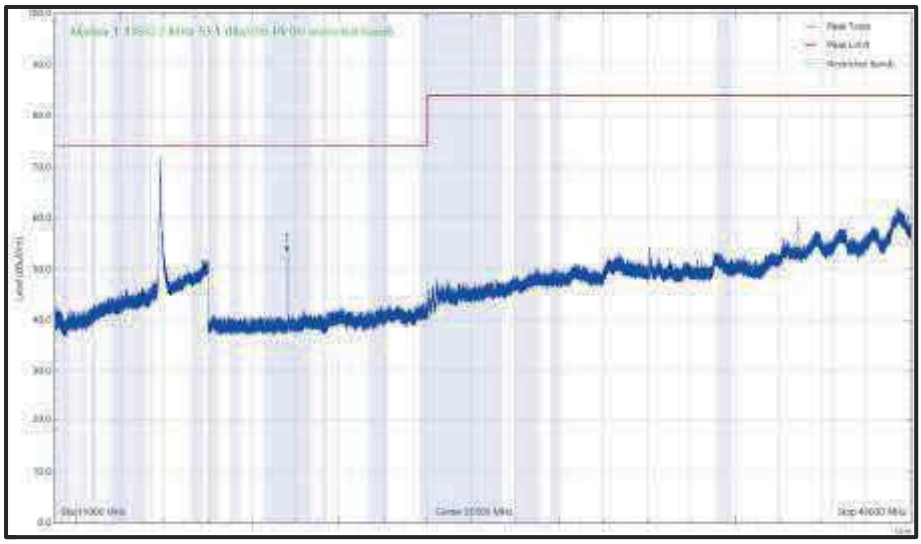

Figure 969 - 5825 MHz (CH165), HE20, RU26-0, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical (Peak)

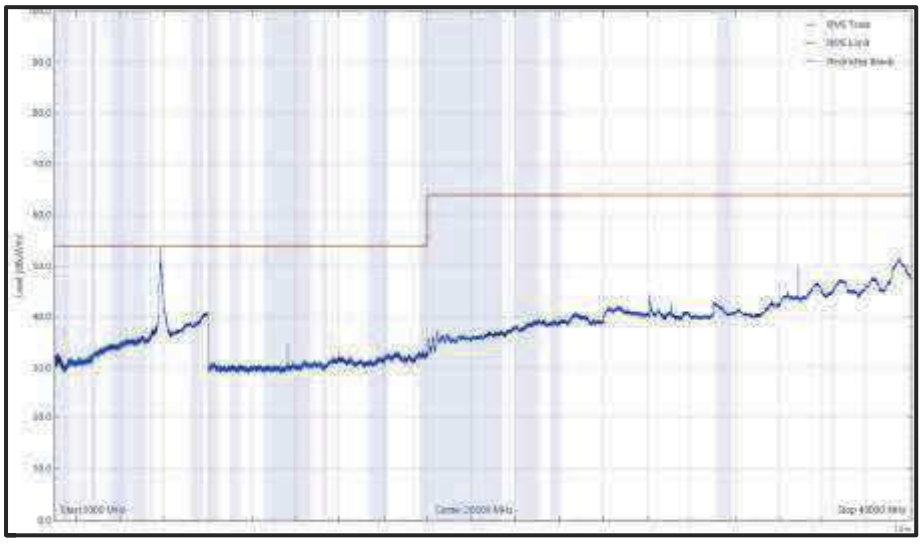

Figure 970 - 5825 MHz (CH165), HE20, RU26-0, Core 0 + Core 1, 1 GHz to 40 GHz, Vertical (RMS)

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 (µV/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 615 - 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 (µV/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 616 - Radiated Emissions Limit Table (ISEDC)

2.6.8 Test Location and Test Equipment Used

This test was carried out in EMC Chamber 5.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
Power Supply Unit	Farnell	LB30-4	158	-	O/P Mon
Screened Room (5)	Rainford	Rainford	1545	36	23-Jan-2021
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Antenna with permanent attenuator (Bilog)	Chase	CBL6143	2904	24	30-Sep-2021
Tilt Antenna Mast	Maturo Gmbh	TAM 4.0-P	4811	-	TU
Double Ridge Broadband Horn Antenna	Schwarzbeck	BBHA 9120 B	4848	12	10-Mar-2021
Cable (18 GHz)	Rosenberger	LU7-036-1000	5031	12	22-Jul-2021
Band Reject Filter - 5.795 GHz	Wainwright	WRCJV10-5725-5755-5835-5865-50SS	5071	12	26-Sep-2020
Band Reject Filter - 5.22 GHz	Wainwright	WRCJV12-5120-5150-5290-5320-50SS	5073	12	24-Sep-2020
Band Reject Filter - 5.28 GHz	Wainwright	WRCJV12-5180-5210-5350-5380-50SS	5075	12	24-Sep-2020
Band Reject Filter - 5.775 GHz	Wainwright	WRCJV10-5700-5735-5815-5850-50SS	5077	12	01-Oct-2020
Band Reject Filter - 5.570 GHz	Wainwright	WRCJV10-5440-5490-5650-5700-50SS	5079	12	02-Oct-2020
Band Reject Filter - 5.690 GHz	Wainwright	WRCJV8-5635-5670-5710-5745-50SS	5081	12	25-Sep-2020
Cable (18 GHz)	Rosenberger	LU7-071-1000	5103	12	06-Oct-2020
EmX Emissions Software	TUV SUD	EmX	5125	-	Software
DRG Horn Antenna (7.5-18GHz)	Schwarzbeck	HWRD750	5216	12	10-Mar-2021
Horn Antenna (15-40GHz)	Schwarzbeck	BBHA 9170	5217	12	12-Oct-2020
Preamplifier (30 dB 18-40GHz)	Schwarzbeck	BBV 9721	5218	12	12-Oct-2020
Preamplifier (30dB 1GHz to 18GHz)	Schwarzbeck	BBV 9718 C	5261	12	07-Apr-2021
1m -SMA Cable	Junkosha	MWX221-01000AMSAMS/A	5513	12	01-Apr-2021
1m -SMA Cable	Junkosha	MWX221-01000AMSAMS/A	5515	12	01-Apr-2021
2m SMA Cable	Junkosha	MWX221-02000AMSAMS/A	5517	12	01-Apr-2021
8m N-Type Cable	Junkosha	MWX221-08000NMSNMS/B	5520	12	24-Mar-2021
2 m K Type Cable	Junkosha	MWX241-02000KMSKMS/A	5523	12	03-Apr-2021

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
EMI Test Receiver	Rohde & Schwarz	ESW44	5527	12	06-Feb-2021
7 GHz High pass Filter	Wainwright	WHKX12-5850-6800-18000-80SS	5550	12	23-May-2021
8 - 18 GHz Amplifier	Wright Technologies	APS06-0061	5596	12	25-Aug-2021

Table 617

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

A2338, S/N: C02CX01GQC36 - Modification State 0

2.7.3 Date of Test

14-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 which used iPerf to transmit 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	20.8 - 24.2 °C
Relative Humidity	47.3 - 57.7 %

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 618 - Radar Pulse Type 0 Characteristics

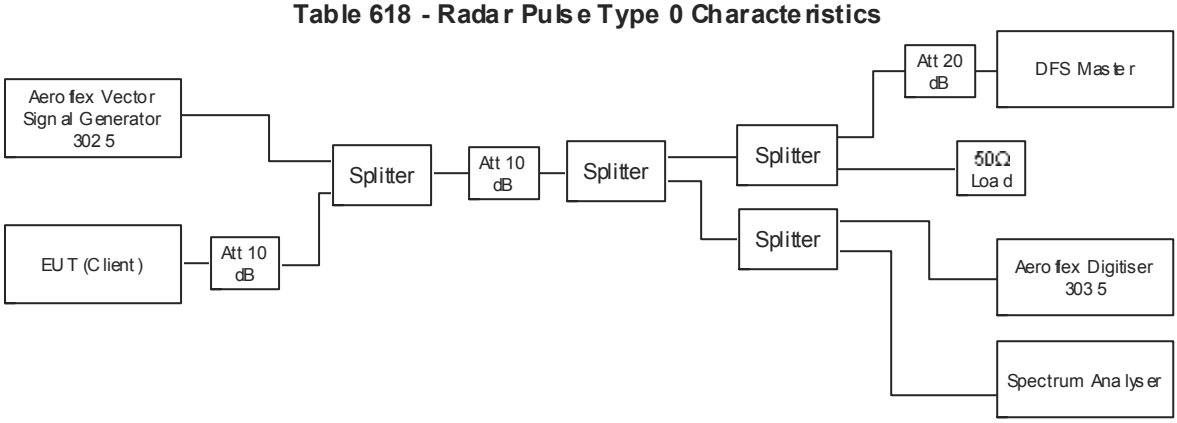

Figure 971 - Test Equipment Setup Diagram for Client without Radar Detection with Injection at the Master

Figure 972 - Verification of Radar Type 0

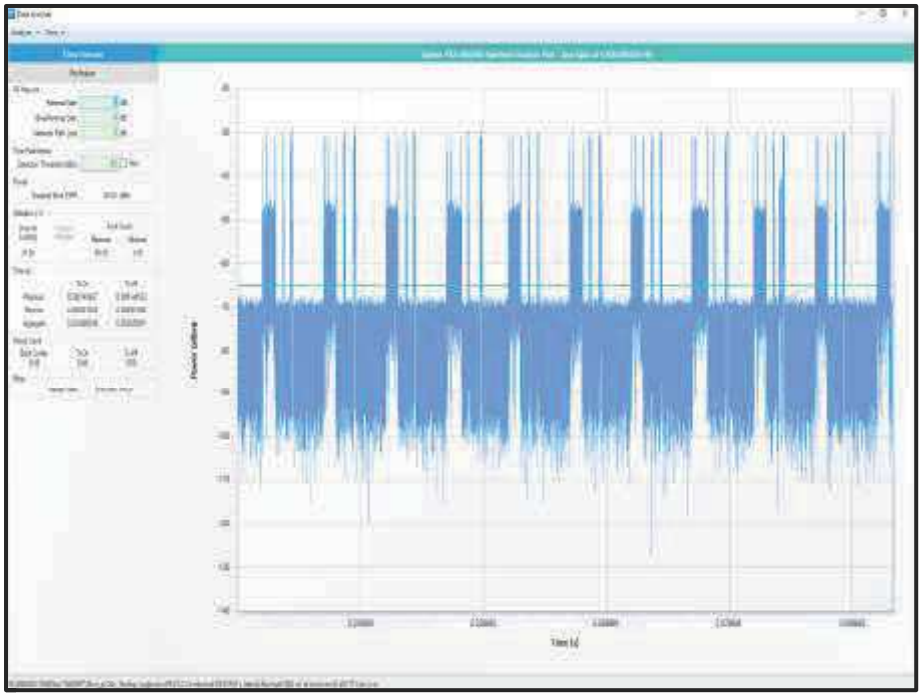

Figure 973 - Channel Loading

The channel loading was 21.64 %

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 619 - DFS Detection Thresholds for Master Devices and Client Devices with Radar Detection

Test Parameter	Result
Channel Move Time	65.07 ms
Channel Closing Time (Aggregate Time During 200ms)	0.10ms
Channel Closing Time (Aggregate Time During 200ms to 10 s)	0.00ms
Channel Closing Time (Aggregate Time During 10 s)	0.10 ms
Transmission Observed During Non-Occupancy Period	No

Table 620 - In-Service Monitoring Test Results

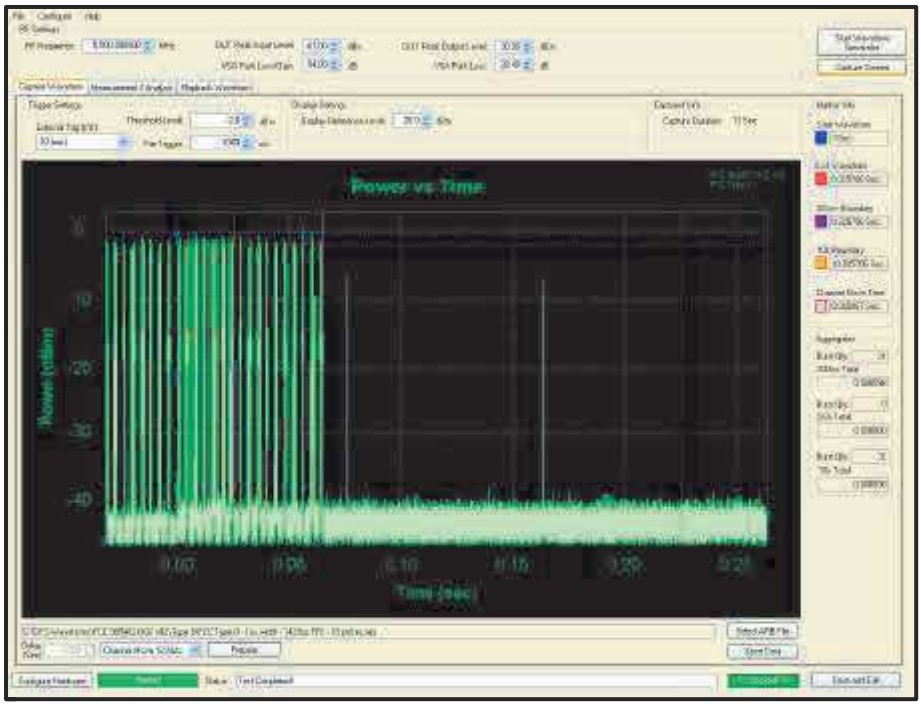

Figure 974 - First 200 ms of Channel Shutdown Period

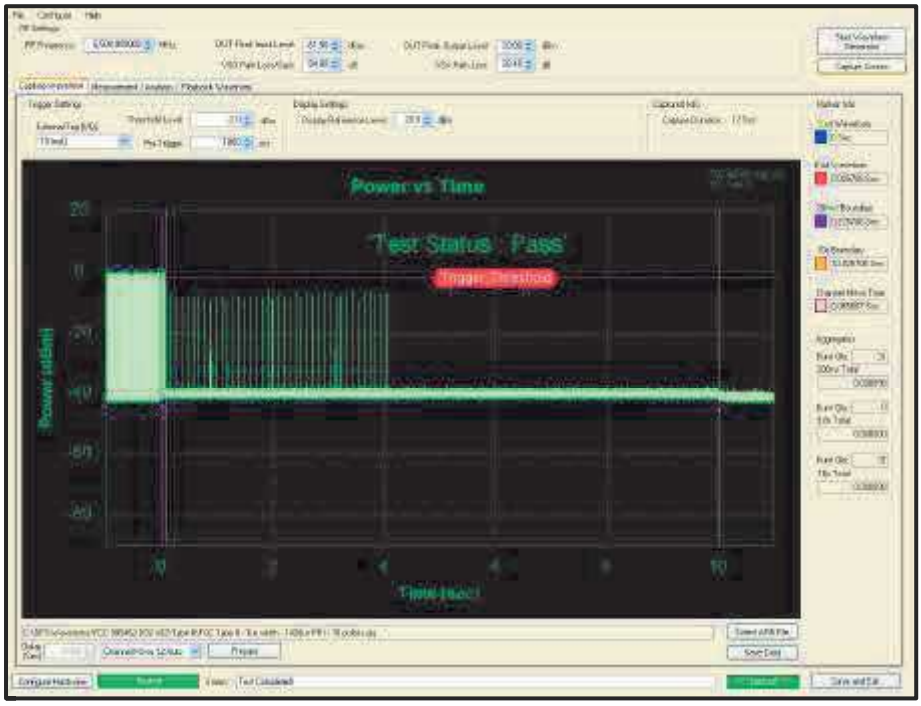

Figure 975 - First 12 s of Channel Shutdown Period

Figure 976 - 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 621 - Radar Pulse Type 0 Characteristics

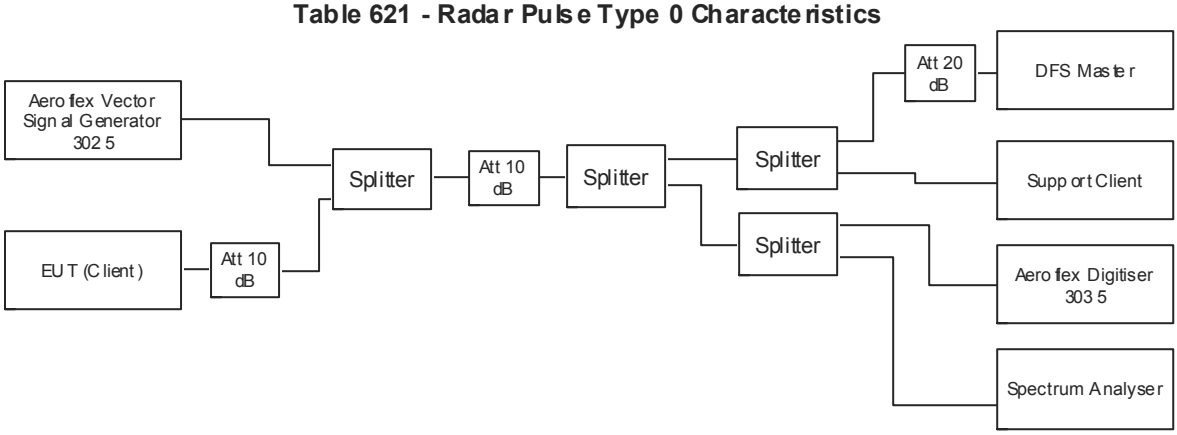

Figure 977 - Test Equipment Setup Diagram for Client without Radar Detection with Injection at the Master (Client-to-Client mode)

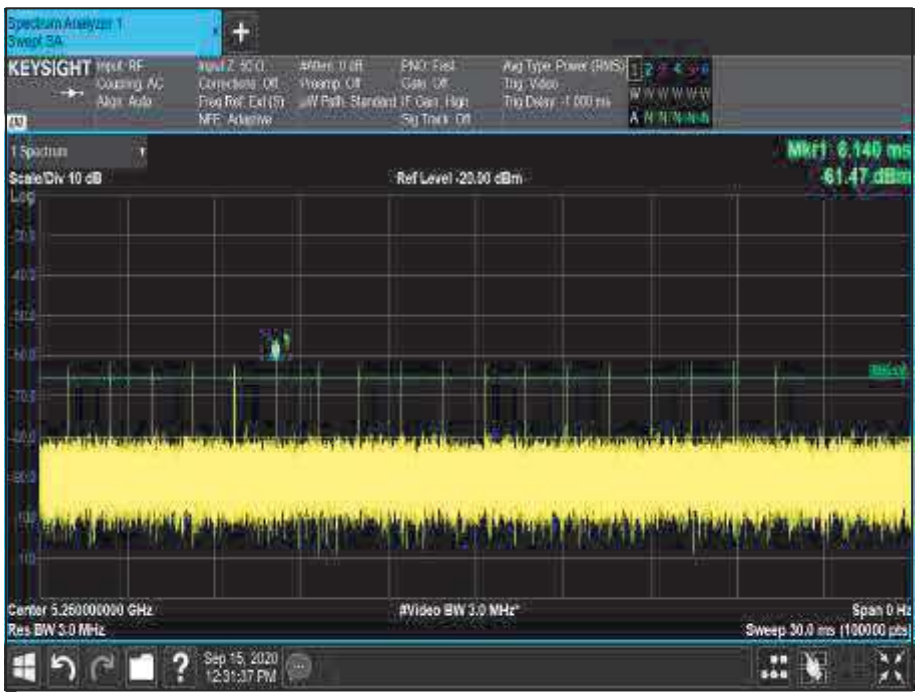

Figure 978 - Verification of Radar Type 0

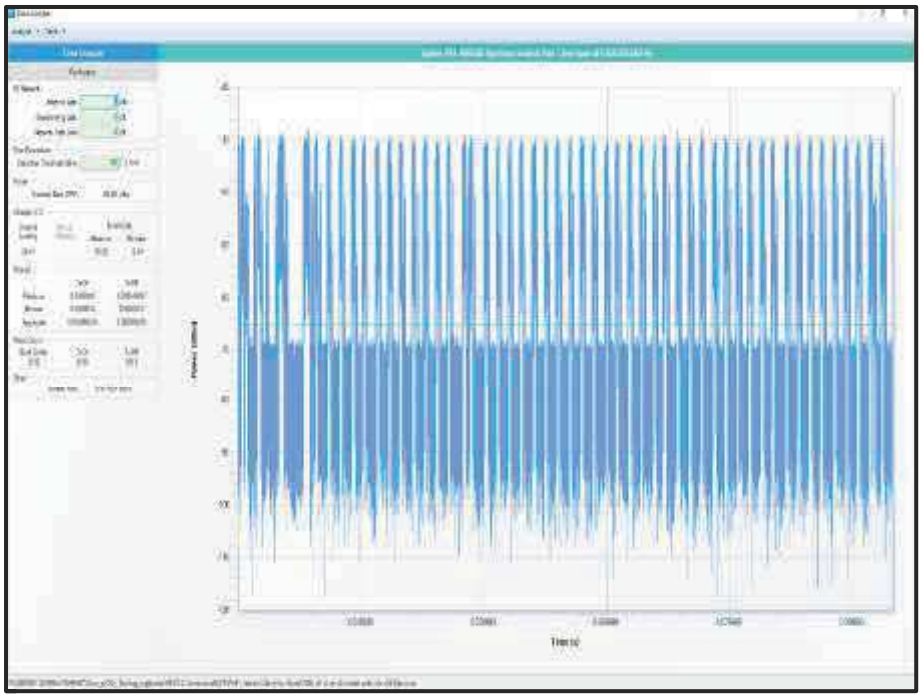

Figure 979 - Channel Loading

The channel loading was 38.41 %

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 622 - DFS Detection Thresholds for Master Devices and Client Devices with Radar Detection

Test Parameter	Result
Channel Move Time	95.47 ms
Channel Closing Time (Aggregate Time During 200 ms)	14.86 ms
Channel Closing Time (Aggregate Time During 200 ms to 10 s)	0.00 ms
Channel Closing Time (Aggregate Time During 10 s)	14.86 ms
Transmission Observed During Non-Occupancy Period	No

Table 623 - In-Service Monitoring Test Results

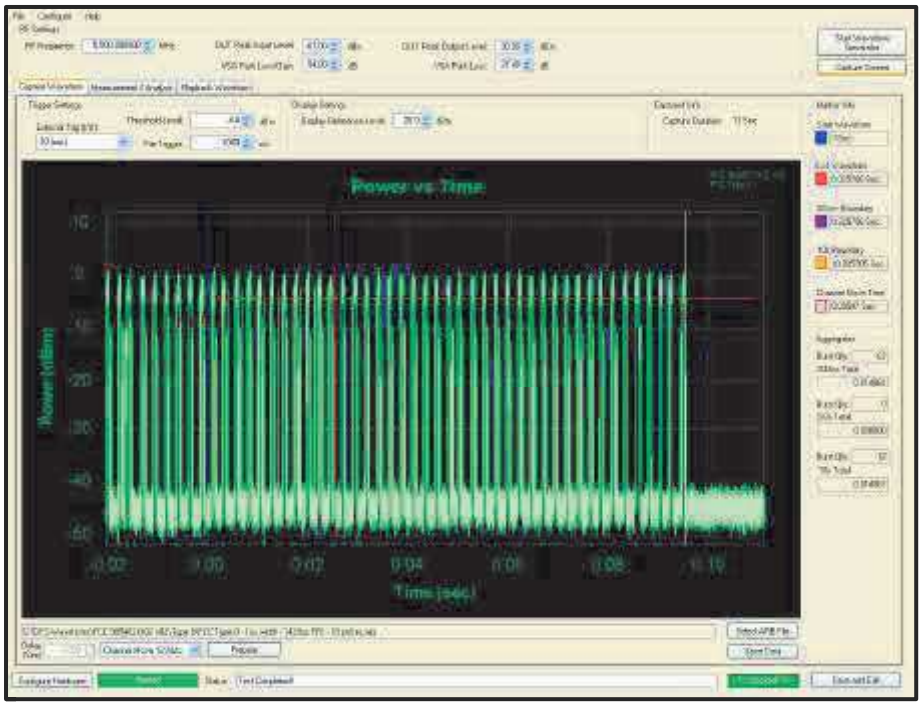

Figure 980 - First 200 ms of Channel Shutdown Period

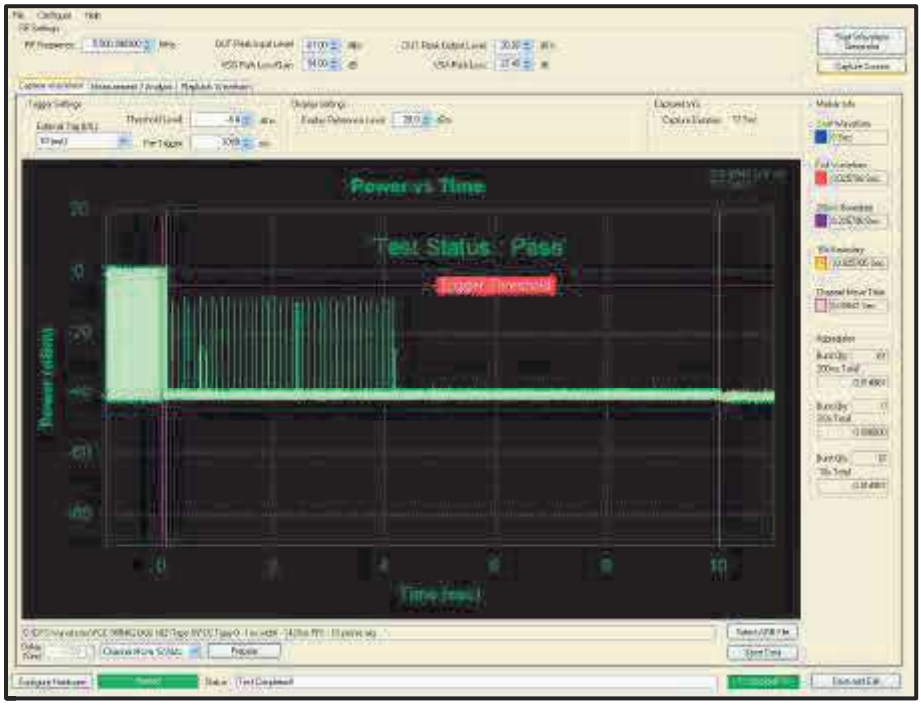

Figure 981 - First 12 s of Channel Shutdown Period

Figure 982 - 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 624 - 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

Table 625 - 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	02-Jan-2021
Network Analyser	Rohde & Schwarz	ZVA 40	3548	12	11-Dec-2020
PXI RF Digitizer	Aeroflex	3035	4012	24	30-Sep-2020
PXI Digital RF Signal Generator	Aeroflex	3025	4015	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
Wireless Cable & Fibre Router - AC 1900, Dual-band	Asus	RT-AC68U	4881	-	TU
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 626

TU - Traceability Unscheduled
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	± 1.118 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 627

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.