

Appendix F Content

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TEST CONDITIONS	DESCRIPTION
TC#01⁽¹⁾⁽²⁾ (ax mode non-beam forming)	<u>Power supply (V):</u> $V_{\text{nominal}} = 12 \text{ Vdc}$ <u>Channel Bandwidth:</u> 20 MHz <u>Test Frequencies for Conducted/Radiated tests: (SISO Radio A, SISO Radio B and Radio A+B)</u> <u>UNII-1:</u> Lowest channel: 5180 MHz Middle channel: 5200 MHz Highest channel: 5240 MHz <u>UNII-2A:</u> Lowest channel: 5260 MHz Middle channel: 5280 MHz Highest channel: 5320 MHz <u>UNII-2C:</u> Lowest channel: 5500 MHz Middle channel: 5580 MHz Highest channel: 5700 MHz <u>UNII-3:</u> Lowest channel: 5745 MHz Middle channel: 5785 MHz Highest channel: 5825 MHz
	<u>Channel Bandwidth:</u> 40 MHz <u>Test Frequencies for Conducted/Radiated tests: (SISO Radio A, SISO Radio B and MIMO Radio A+B)</u> <u>UNII-1:</u> Lowest channel: 5190 MHz Highest channel: 5230 MHz <u>UNII-2A:</u> Lowest channel: 5270 MHz Highest channel: 5310 MHz <u>UNII-2C:</u> Lowest channel: 5510 MHz Middle channel: 5550 MHz Highest channel: 5670 MHz <u>UNII-3:</u> Lowest channel: 5755 MHz Highest channel: 5795 MHz
	<u>Channel Bandwidth:</u> 80 MHz <u>Test Frequencies for Conducted/Radiated tests: (SISO Radio A, Radio B and MIMO Radio A+B)</u> <u>UNII-1:</u> Lowest channel: 5210 MHz <u>UNII-2A:</u> Lowest channel: 5290 MHz <u>UNII-2C:</u> Lowest channel: 5530 MHz Highest channel: 5610 MHz <u>UNII-3:</u> Lowest channel: 5775 MHz

TEST CONDITIONS	DESCRIPTION
TC#02⁽¹⁾ (ax mode Beam forming)	<u>Power supply (V):</u> $V_{\text{nominal}} = 12 \text{ Vdc}$ <u>Channel Bandwidth:</u> 20 MHz <u>Test Frequencies for Conducted/Radiated tests (MIMO RADIO A+B):</u> <u>UNII-1:</u> Lowest channel: 5180 MHz Middle channel: 5200 MHz Highest channel: 5240 MHz <u>UNII-2A:</u> Lowest channel: 5260 MHz Middle channel: 5280 MHz Highest channel: 5320 MHz <u>UNII-2C:</u> Lowest channel: 5500 MHz Middle channel: 5580 MHz Highest channel: 5700 MHz <u>UNII-3:</u> Lowest channel: 5745 MHz Middle channel: 5785 MHz Highest channel: 5825 MHz <u>Channel Bandwidth:</u> 40 MHz <u>Test Frequencies for Conducted/Radiated tests (MIMO RADIO A+B):</u> <u>UNII-1:</u> Lowest channel: 5190 MHz Highest channel: 5230 MHz <u>UNII-2A:</u> Lowest channel: 5270 MHz Highest channel: 5310 MHz <u>UNII-2C:</u> Lowest channel: 5510 MHz Middle channel: 5550 MHz Highest channel: 5670 MHz <u>UNII-3:</u> Lowest channel: 5755 MHz Highest channel: 5795 MHz <u>Channel Bandwidth:</u> 80 MHz <u>Test Frequencies for Conducted/Radiated tests (MIMO RADIO A+B):</u> <u>UNII-1:</u> Lowest channel: 5210 MHz <u>UNII-2A:</u> Lowest channel: 5290 MHz <u>UNII-2C:</u> Lowest channel: 5530 MHz Highest channel: 5610 MHz <u>UNII-3:</u> Lowest channel: 5775 MHz

Note (1): The test set-up was made in accordance to the general provisions of FCC Unlicensed National Information Infrastructure (U-NII) Devices 789033 D02 General U-NII Test Procedures New Rules v02r01 dated Dec 14, 2017.

The EUT was tested in the following operating mode:

- Continuously transmitting with a modulated carrier at maximum power in all required channels using the supported data rates/modulation types.
- For spurious emissions for OFDM modes 802.11a, 802.11n20/40, 802.11ac20/40/80, and 11ax20/40/80 a preliminary scan was performed to determine the worst case. The result for the worst case is not 802.11ax Full RU (see Annex B, C, D and E).
- The data rates of MCS8 for ax20, MCS 9 for ax40 and MCS11 for ax80 were selected based on preliminary testing that identified those rates corresponding to the worst cases.
- For all modes, the EUT was configured in test mode using a software application. The application was used to enable a continuous transmission and to select the test channels as required. The client supplied instructions to configure the EUT. The customer supplied a document containing the setup instructions.
- Beamforming mode is only supported with OFDMA Full RU according to manufacturer specifications

Note (2): Preliminary measurements determined the PSD levels of partial RU is higher than the full RU in ax mode.

Directional Antenna Gain Calculations for CDD MIMO In-Band Measurements:

For 2Tx CDD MIMO modes, in accordance with KDB 662911 D01 v02r01 Section F)2)f)i), directional gain was calculated as follows:

- For power spectral density (PSD) measurements:
 $\text{Directional gain}_{\text{PSD}} = G_{\text{ANT}} + 10 \log(N_{\text{ANT}}/N_{\text{SS}}) \text{ dBi}$
 $N_{\text{SS}} = 1 \text{ (worst case)}, N_{\text{ANT}} = 2, G_{\text{ANT}} = -2.8 \text{ dBi}$
 $\text{Directional gain}_{\text{PSD}} = 2 + 10 \log(2/1) = 2 + 10\log(2) = -2.8 + 3.01 = + 0.21 \text{ dBi}$
PSD Antenna Gain MIMO Chain 0 & 1: + 0.21 dBi
- For power measurements:
 $\text{Directional gain}_{\text{POWER}} = G_{\text{ANT}} \text{ dBi } (N_{\text{ANT}} < 4)$
 $\text{Directional gain}_{\text{POWER}} = G_{\text{ANT}} = -2.8 \text{ dBi}$
Power Antenna Gain MIMO Chain 0 & 1: - 2.8 dBi

SECTION F.1: RSS-247 6.2.4.1 / FCC 15.407 (A) (3) MAXIMUM CONDUCTED OUTPUT POWER IN UN-II BANDS

Limits

FCC 15.407:

For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the band 5.725-5.850 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

RSS-247:

For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or $1.76 + 10 \log_{10} B$, dBm, whichever is less. Devices shall implement TPC in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.

For devices other than devices installed in vehicles:

For the band 5.15-5.25 GHz, the maximum e.i.r.p. shall not exceed 200 mW (23 dBm) or $10 + 10 \log_{10} B$, dBm, whichever power is less. B is the 99% emission bandwidth in MHz.

For the 5.25-5.35 GHz, 5.470-5.6 GHz, and 5.650-5.725 GHz bands, the maximum conducted output power shall not exceed 250 mW (24 dBm) or $11 + 10 \log_{10} B$, dBm, whichever power is less. The maximum e.i.r.p. shall not exceed 1.0 W or $17 + 10 \log_{10} B$, dBm, whichever is less

For the band 5.725-5.850 GHz, the maximum conducted output power shall not exceed 1 W. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the output power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Test Condition: TC#01 (ax mode non-beam forming)

Antenna gain: -2.5 dBi

Mode: SISO

Modulation: 802.11ax HE20 SS1 (OFDMA MCS8) FULL RU

Results

Port	Freq (MHz)	# of Tx Chains	Avg Power (dBm)	Max EIRP (dBm)
1	5180.00000	1	8.1	5.60
1	5200.00000	1	8.5	6.00
1	5240.00000	1	8.5	6.00
1	5260.00000	1	8.7	6.20
1	5280.00000	1	8.6	6.10
1	5320.00000	1	8.7	6.20
1	5500.00000	1	6.3	3.80
1	5580.00000	1	9.0	6.50
1	5700.00000	1	8.8	6.30
1	5745.00000	1	7.5	5.00
1	5785.00000	1	7.6	5.10
1	5825.00000	1	8.7	6.20
2	5180.00000	1	8.0	5.50
2	5200.00000	1	8.2	5.70
2	5240.00000	1	7.8	5.30
2	5260.00000	1	8.2	5.70
2	5280.00000	1	7.5	5.00
2	5320.00000	1	7.5	5.00
2	5500.00000	1	5.0	2.50
2	5580.00000	1	5.2	2.70
2	5700.00000	1	7.3	4.80
2	5745.00000	1	6.1	3.60
2	5785.00000	1	6.9	4.40
2	5825.00000	1	8.4	5.90

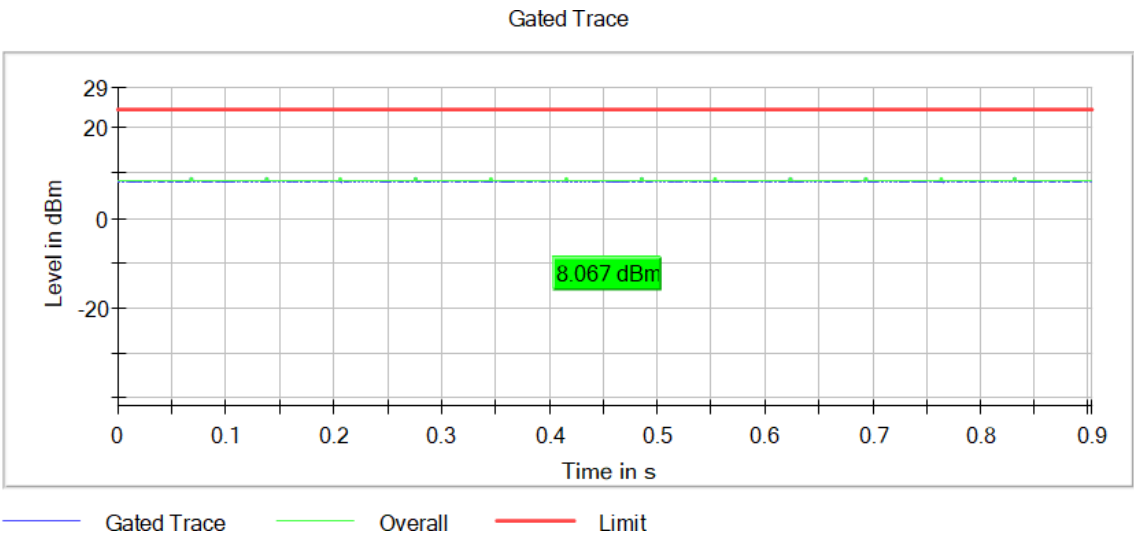
Verdict

Pass

Attachments

Active Port = 1, Frequency MHz = 5180.00000, Modulation = 802.11ax HE20 SS1 (OFDMA MCS8), Mode = SISO, Number of Transmission Chains = 1

Images:



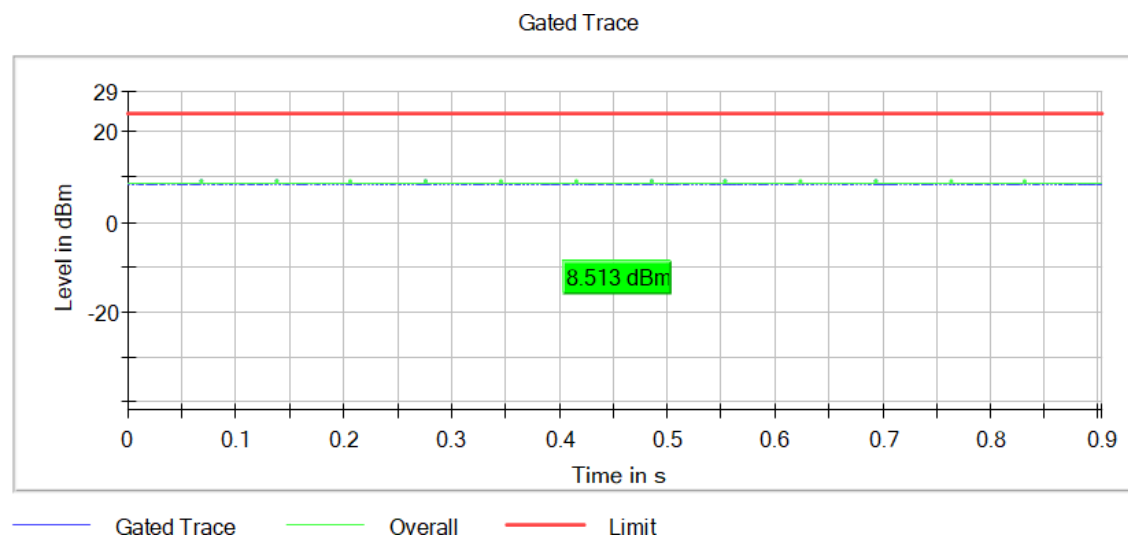
Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 1, Frequency MHz = 5200.00000, Modulation = 802.11ax HE20 SS1 (OFDMA MCS8), Mode = SISO, Number of Transmission Chains = 1

Images:



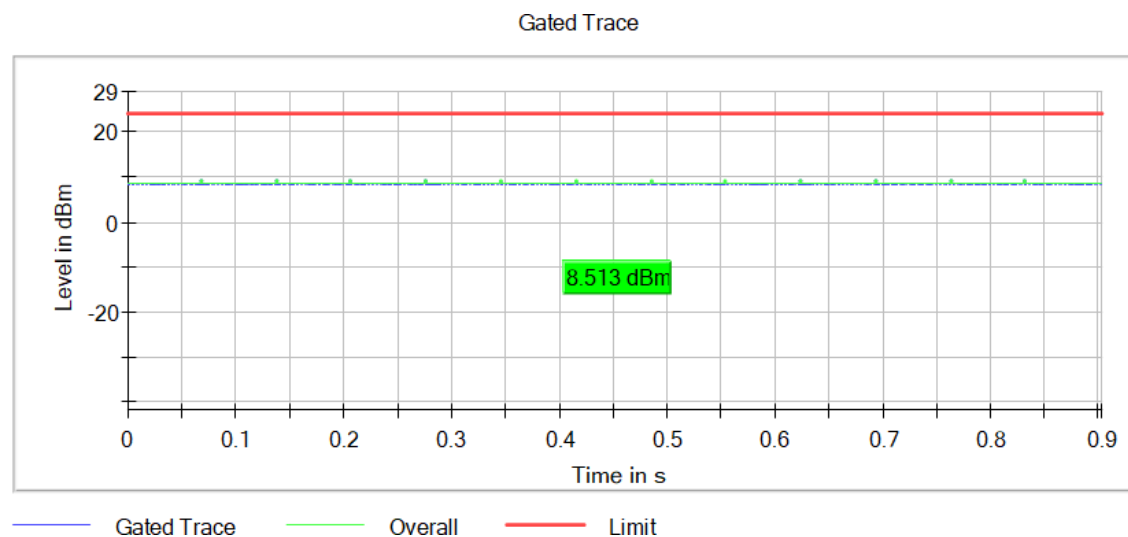
Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 1, Frequency MHz = 5240.00000, Modulation = 802.11ax HE20 SS1 (OFDMA MCS8), Mode = SISO, Number of Transmission Chains = 1

Images:



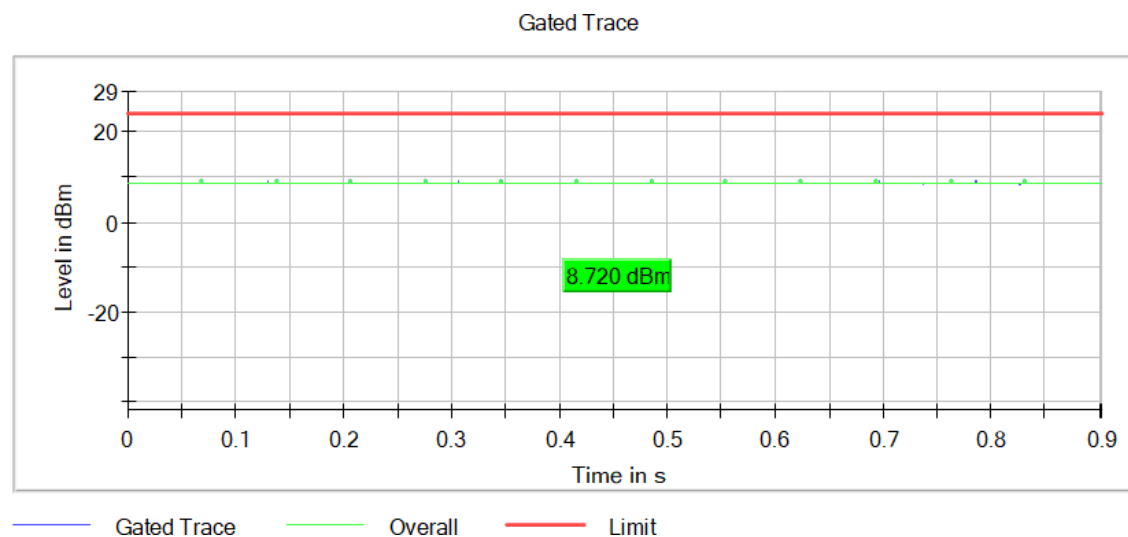
Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 1, Frequency MHz = 5260.00000, Modulation = 802.11ax HE20 SS1 (OFDMA MCS8), Mode = SISO, Number of Transmission Chains = 1

Images:



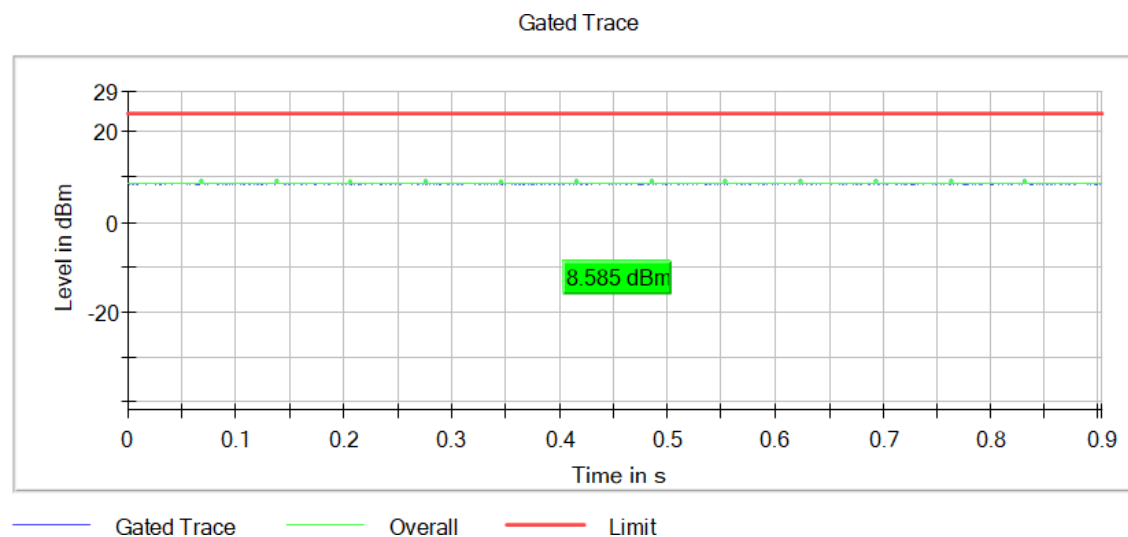
Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 1, Frequency MHz = 5280.00000, Modulation = 802.11ax HE20 SS1 (OFDMA MCS8), Mode = SISO, Number of Transmission Chains = 1

Images:



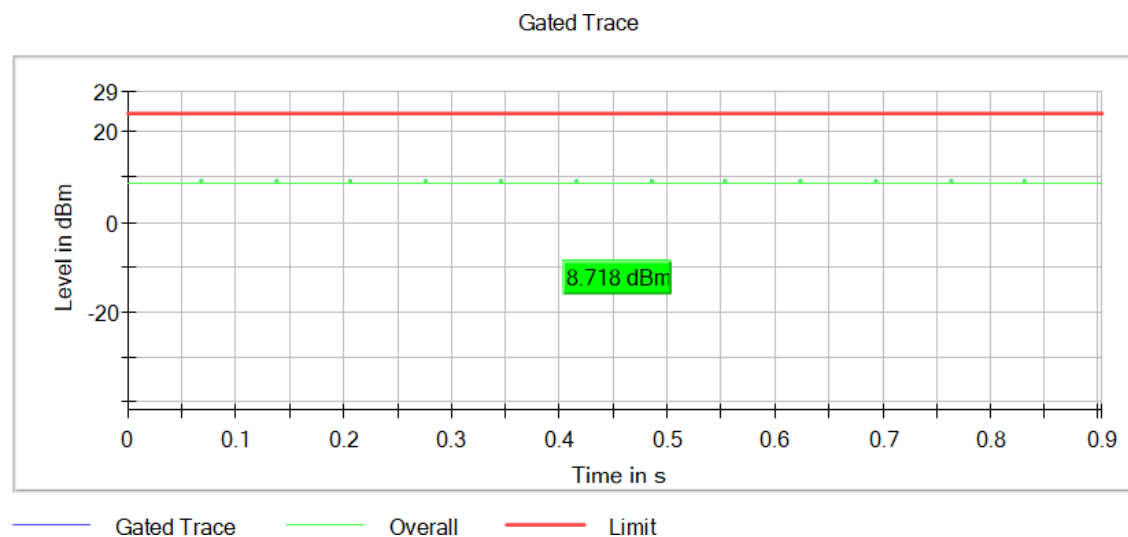
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Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 1, Frequency MHz = 5320.00000, Modulation = 802.11ax HE20 SS1 (OFDMA MCS8), Mode = SISO, Number of Transmission Chains = 1

Images:



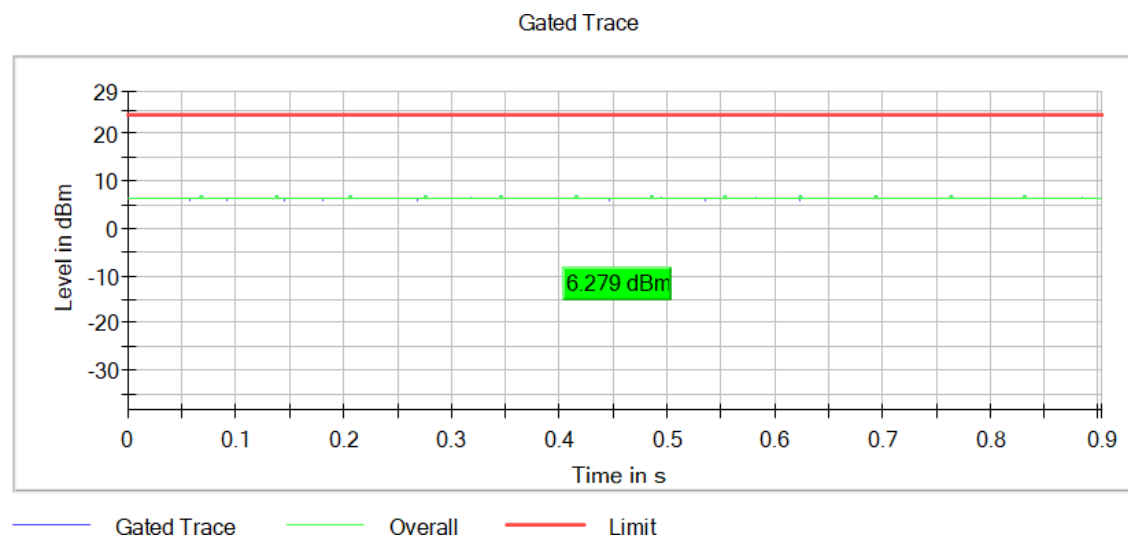
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Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 1, Frequency MHz = 5500.00000, Modulation = 802.11ax HE20 SS1 (OFDMA MCS8), Mode = SISO, Number of Transmission Chains = 1

Images:



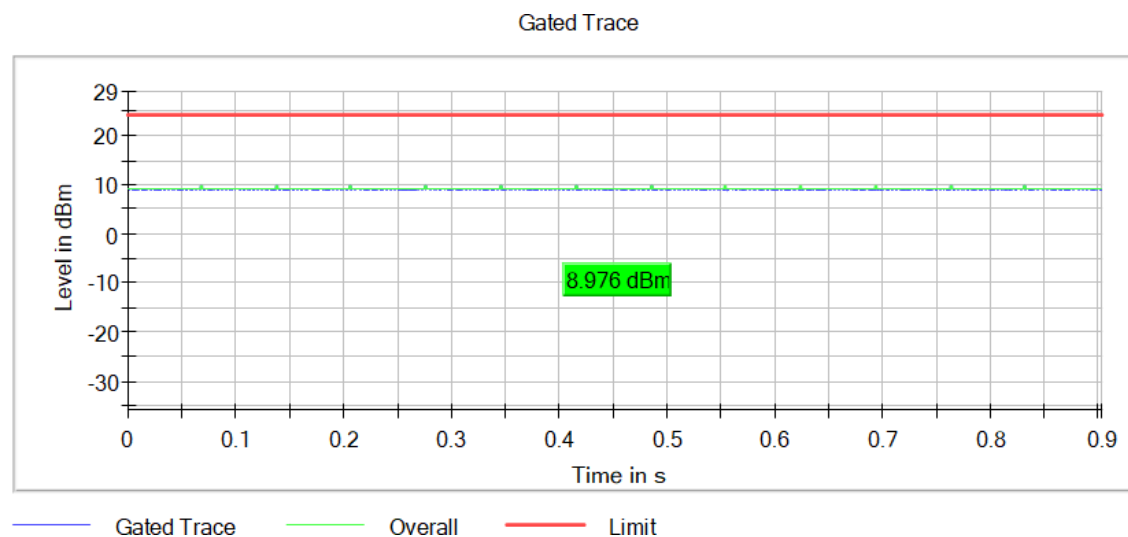
Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 1, Frequency MHz = 5580.00000, Modulation = 802.11ax HE20 SS1 (OFDMA MCS8), Mode = SISO, Number of Transmission Chains = 1

Images:



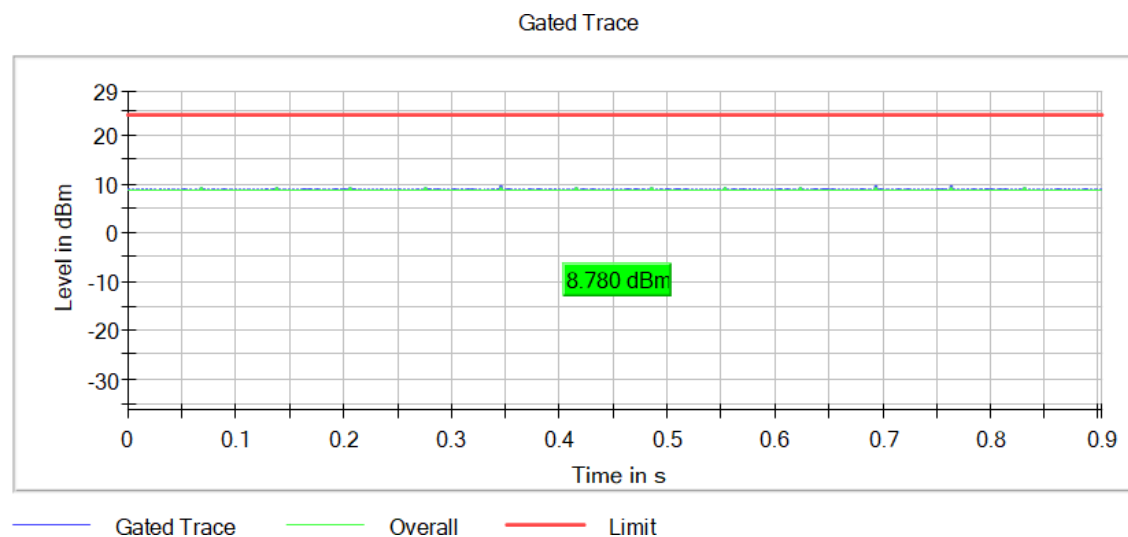
Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 1, Frequency MHz = 5700.00000, Modulation = 802.11ax HE20 SS1 (OFDMA MCS8), Mode = SISO, Number of Transmission Chains = 1

Images:



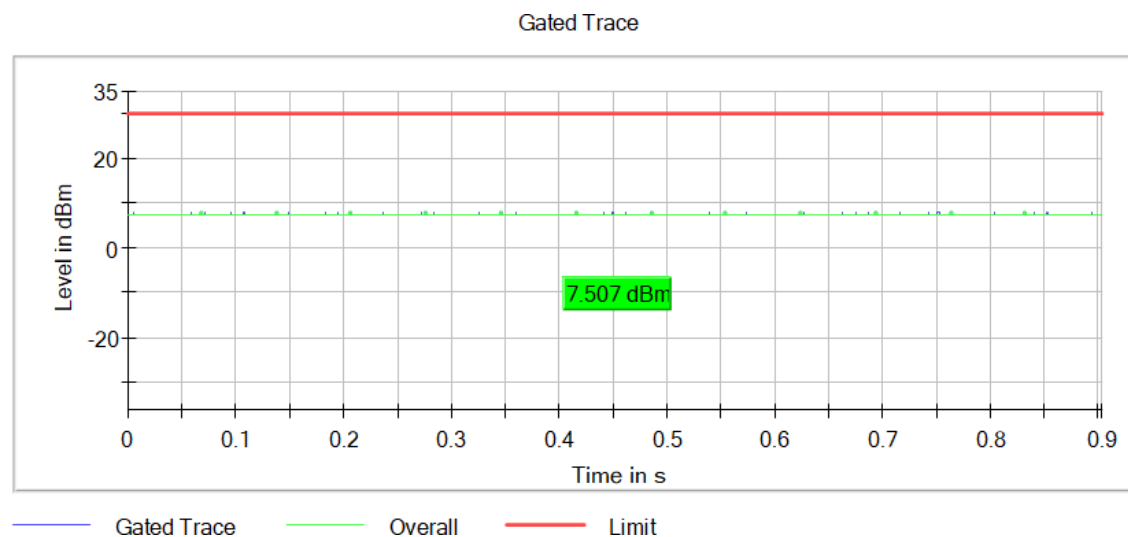
Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 1, Frequency MHz = 5745.00000, Modulation = 802.11ax HE20 SS1 (OFDMA MCS8), Mode = SISO, Number of Transmission Chains = 1

Images:



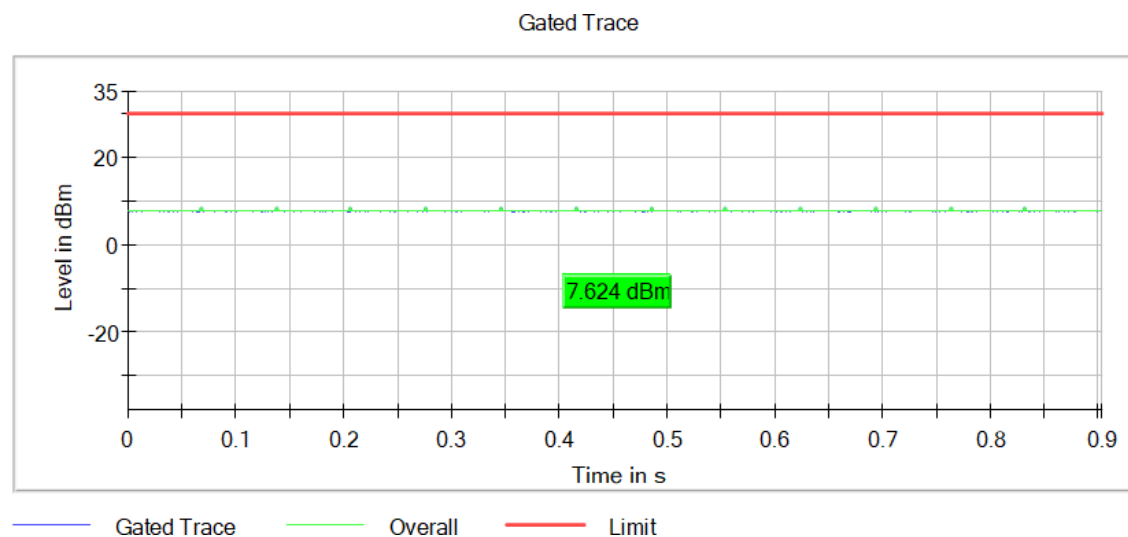
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Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 1, Frequency MHz = 5785.00000, Modulation = 802.11ax HE20 SS1 (OFDMA MCS8), Mode = SISO, Number of Transmission Chains = 1

Images:



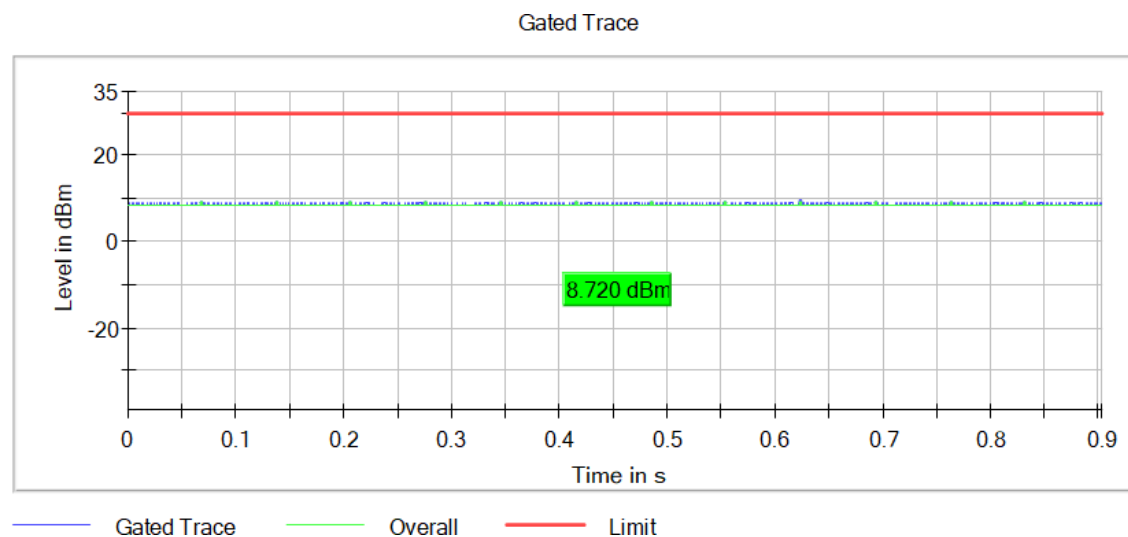
Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 1, Frequency MHz = 5825.00000, Modulation = 802.11ax HE20 SS1 (OFDMA MCS8), Mode = SISO, Number of Transmission Chains = 1

Images:



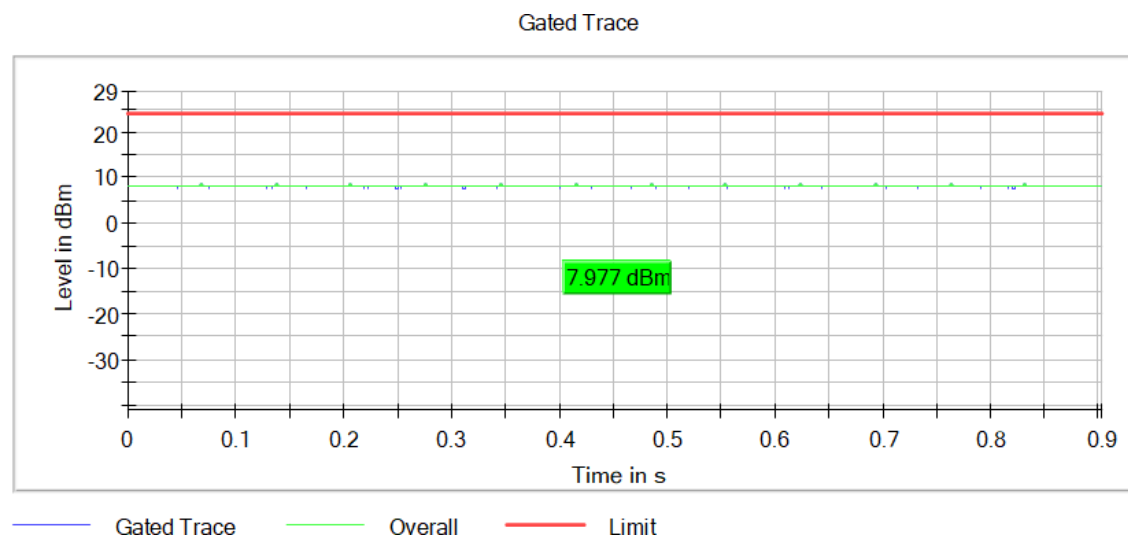
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Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 2, Frequency MHz = 5180.00000, Modulation = 802.11ax HE20 SS1 (OFDMA MCS8), Mode = SISO, Number of Transmission Chains = 1

Images:



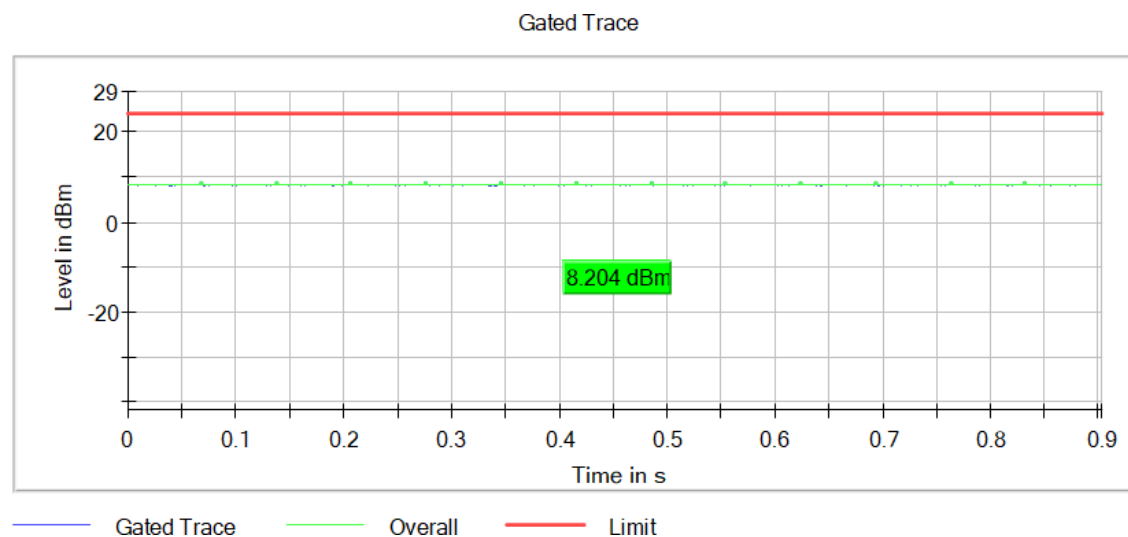
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Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 2, Frequency MHz = 5200.00000, Modulation = 802.11ax HE20 SS1 (OFDMA MCS8), Mode = SISO, Number of Transmission Chains = 1

Images:



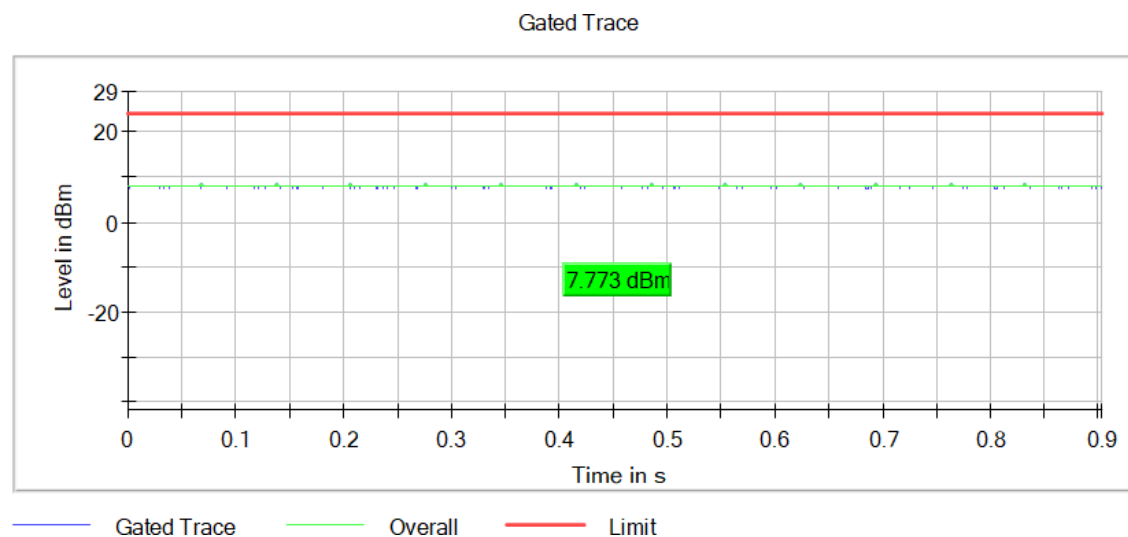
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Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 2, Frequency MHz = 5240.00000, Modulation = 802.11ax HE20 SS1 (OFDMA MCS8), Mode = SISO, Number of Transmission Chains = 1

Images:



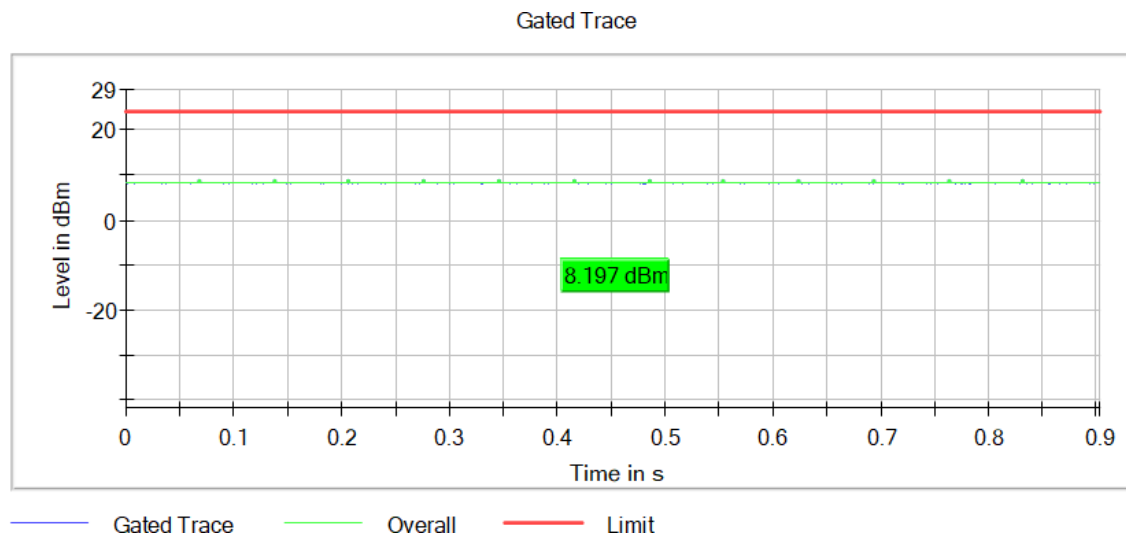
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Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 2, Frequency MHz = 5260.00000, Modulation = 802.11ax HE20 SS1 (OFDMA MCS8), Mode = SISO, Number of Transmission Chains = 1

Images:



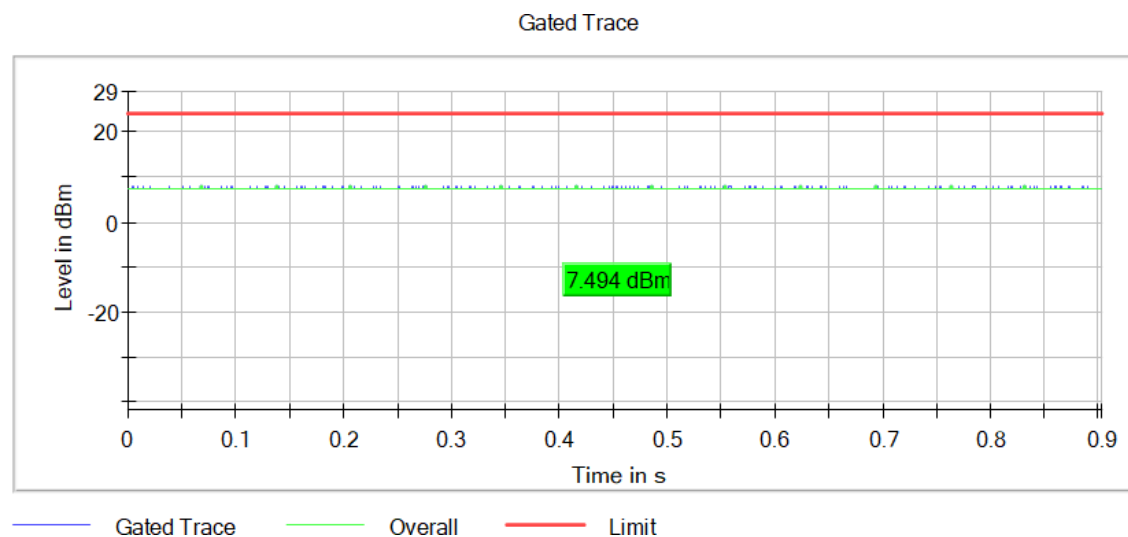
Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 2, Frequency MHz = 5280.00000, Modulation = 802.11ax HE20 SS1 (OFDMA MCS8), Mode = SISO, Number of Transmission Chains = 1

Images:



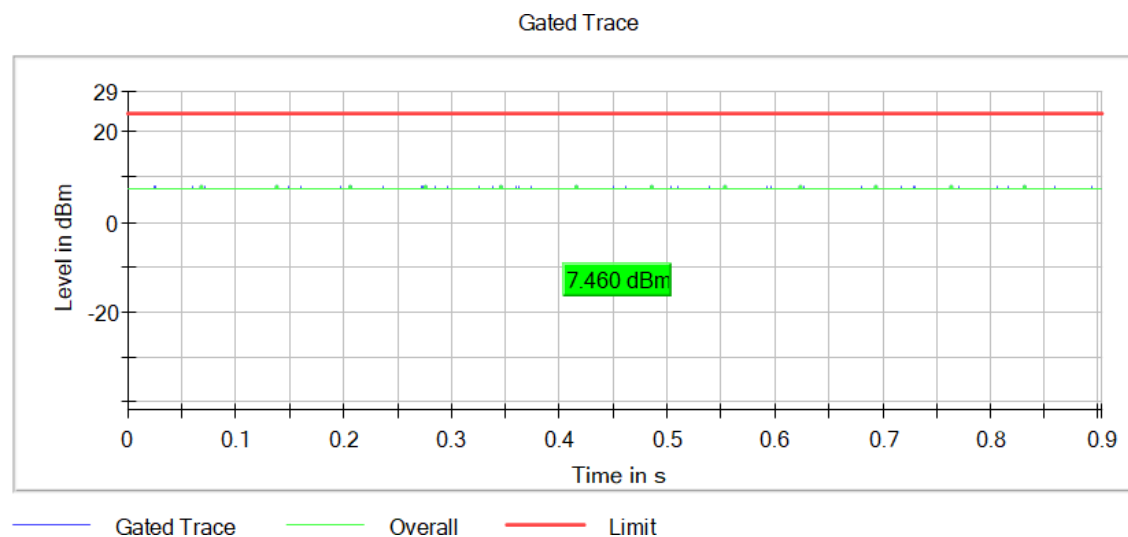
Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 2, Frequency MHz = 5320.00000, Modulation = 802.11ax HE20 SS1 (OFDMA MCS8), Mode = SISO, Number of Transmission Chains = 1

Images:



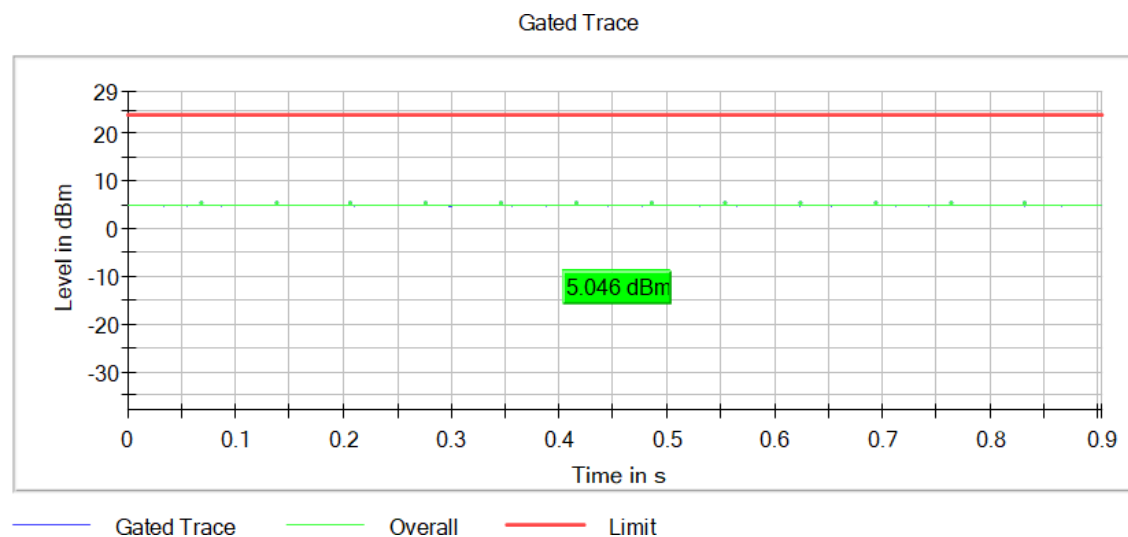
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Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 2, Frequency MHz = 5500.00000, Modulation = 802.11ax HE20 SS1 (OFDMA MCS8), Mode = SISO, Number of Transmission Chains = 1

Images:



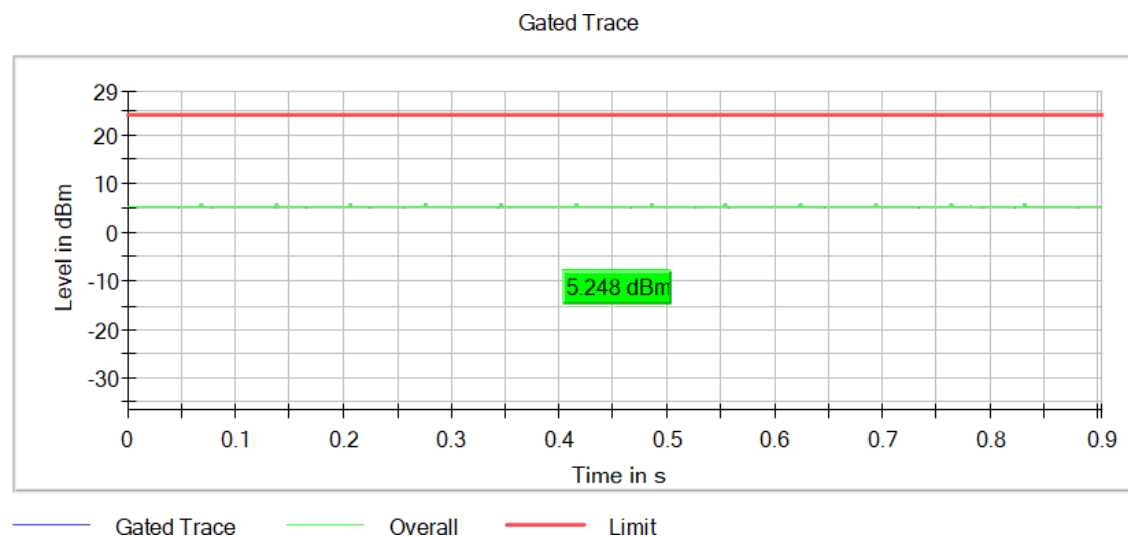
Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 2, Frequency MHz = 5580.00000, Modulation = 802.11ax HE20 SS1 (OFDMA MCS8), Mode = SISO, Number of Transmission Chains = 1

Images:



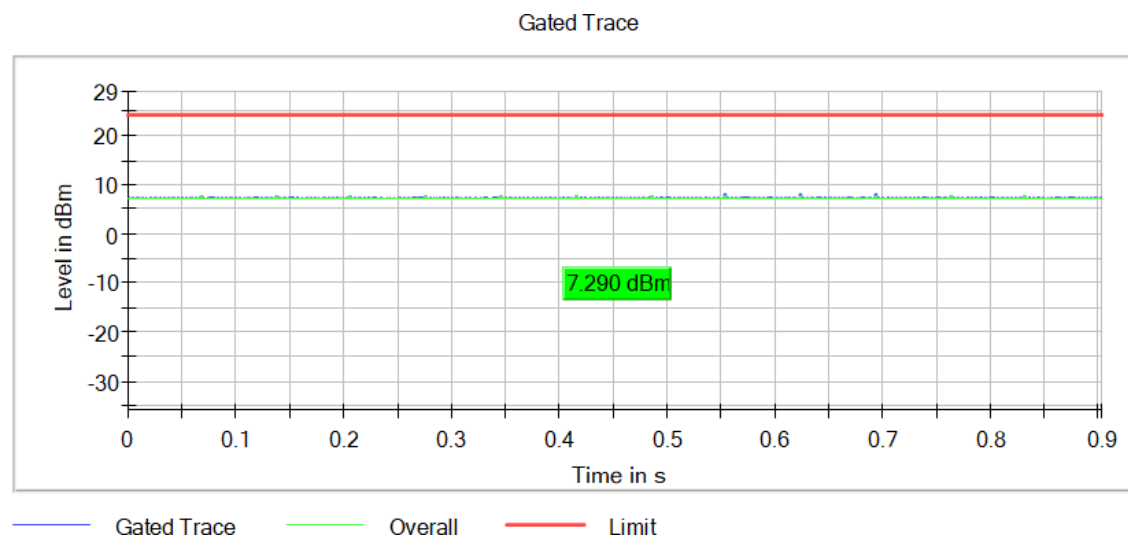
Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 2, Frequency MHz = 5700.00000, Modulation = 802.11ax HE20 SS1 (OFDMA MCS8), Mode = SISO, Number of Transmission Chains = 1

Images:



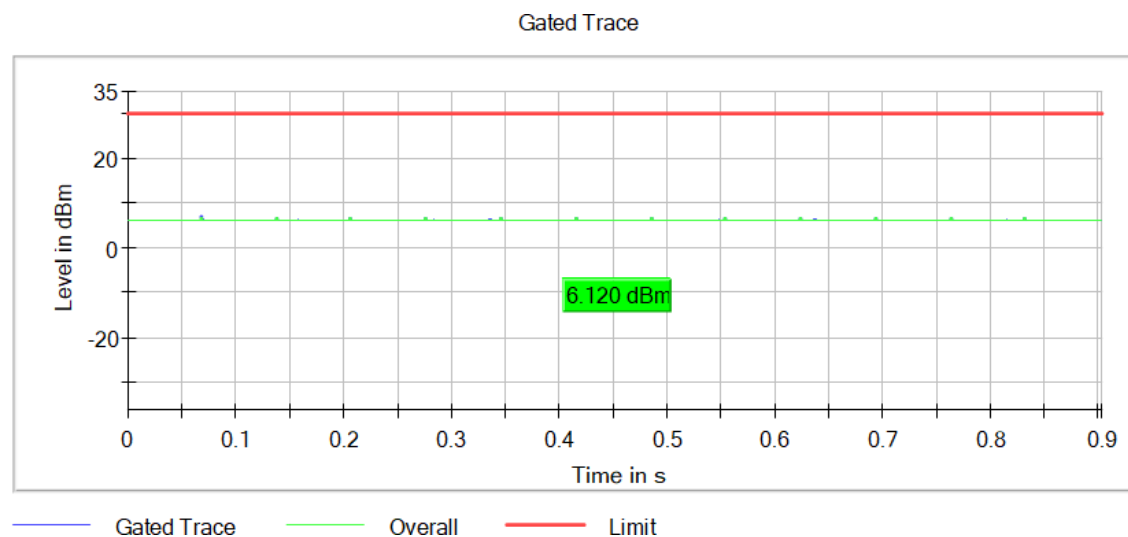
Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 2, Frequency MHz = 5745.00000, Modulation = 802.11ax HE20 SS1 (OFDMA MCS8), Mode = SISO, Number of Transmission Chains = 1

Images:



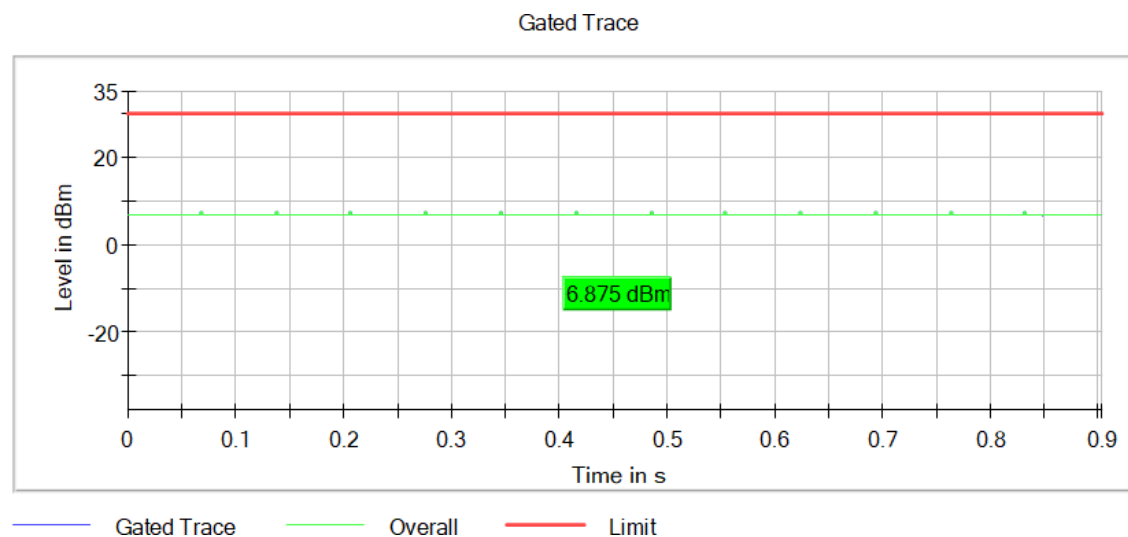
Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 2, Frequency MHz = 5785.00000, Modulation = 802.11ax HE20 SS1 (OFDMA MCS8), Mode = SISO, Number of Transmission Chains = 1

Images:



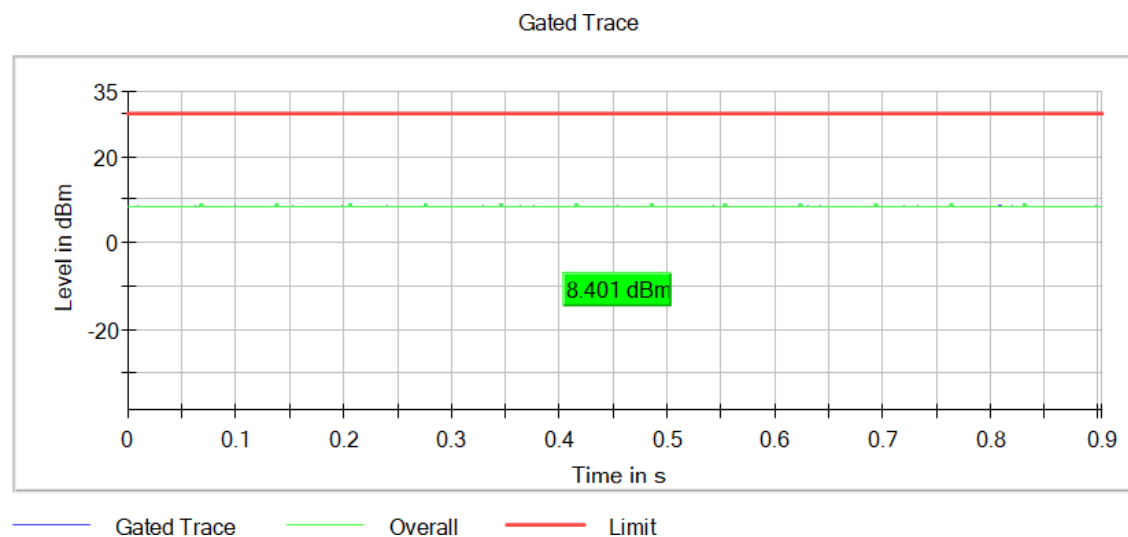
Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 2, Frequency MHz = 5825.00000, Modulation = 802.11ax HE20 SS1 (OFDMA MCS8), Mode = SISO, Number of Transmission Chains = 1

Images:



Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Mode: SISO

Modulation: 802.11ax HE40 SS1 (OFDMA MCS9)

Results

Port	Freq (MHz)	# of Tx Chains	Avg Power (dBm)	Max EIRP (dBm)
1	5190.00000	1	8.3	5.80
1	5230.00000	1	8.7	6.20
1	5270.00000	1	8.7	6.20
1	5310.00000	1	8.6	6.10
1	5510.00000	1	6.7	4.20
1	5550.00000	1	7.6	5.10
1	5670.00000	1	7.6	5.10
1	5755.00000	1	8.1	5.60
1	5795.00000	1	8.0	5.50
2	5190.00000	1	8.0	5.50
2	5230.00000	1	7.7	5.20
2	5270.00000	1	7.9	5.40
2	5310.00000	1	7.4	4.90
2	5510.00000	1	4.9	2.40
2	5550.00000	1	5.6	3.10
2	5670.00000	1	6.3	3.80
2	5755.00000	1	6.8	4.30
2	5795.00000	1	6.4	3.90

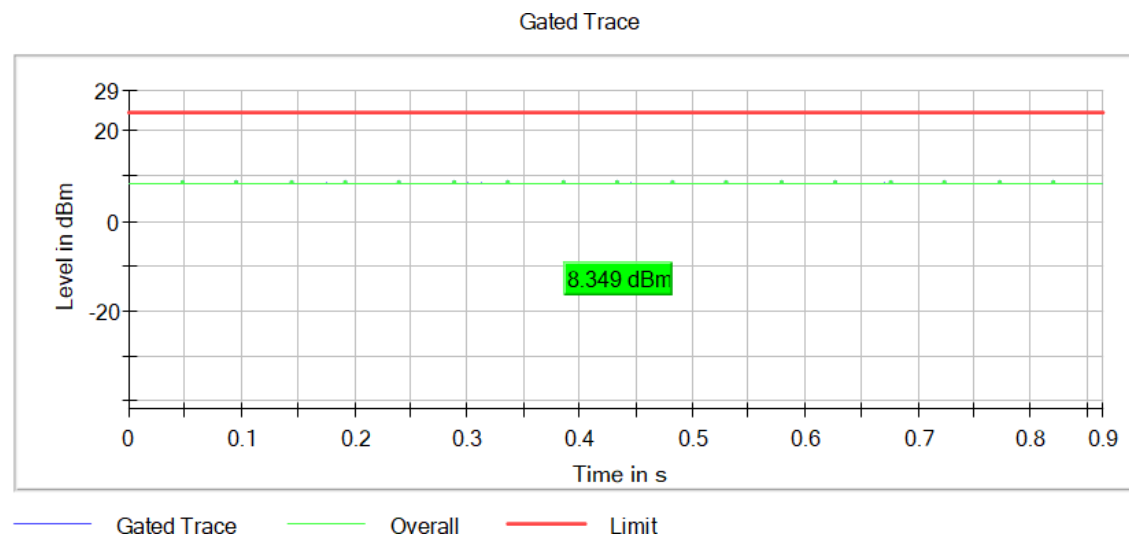
Verdict

Pass

Attachments

Active Port = 1, Frequency MHz = 5190.00000, Modulation = 802.11ax HE40 SS1 (OFDMA MCS9), Mode = SISO, Number of Transmission Chains = 1

Images:



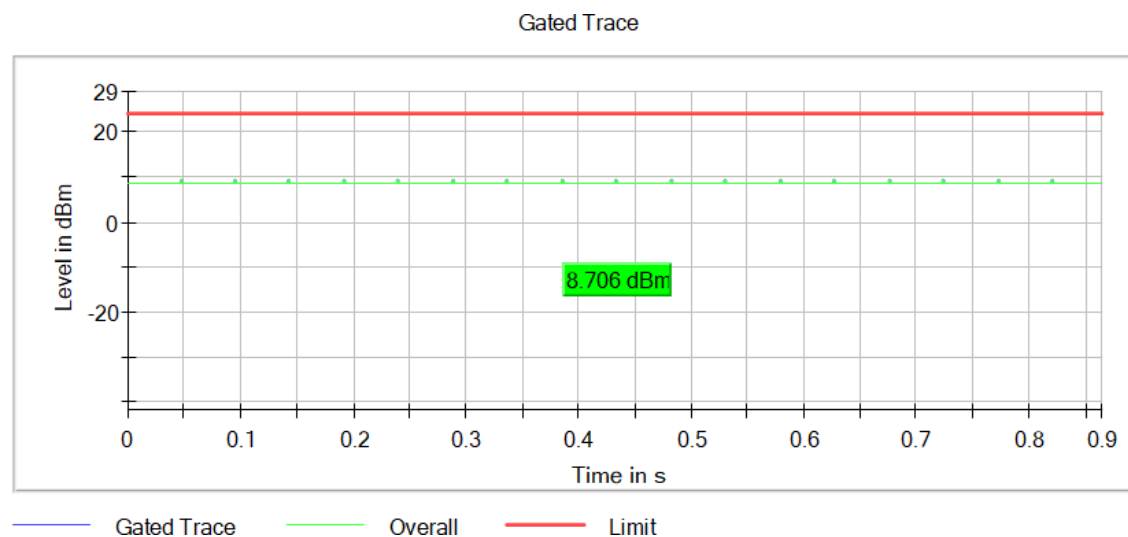
Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 1, Frequency MHz = 5230.00000, Modulation = 802.11ax HE40 SS1 (OFDMA MCS9), Mode = SISO, Number of Transmission Chains = 1

Images:



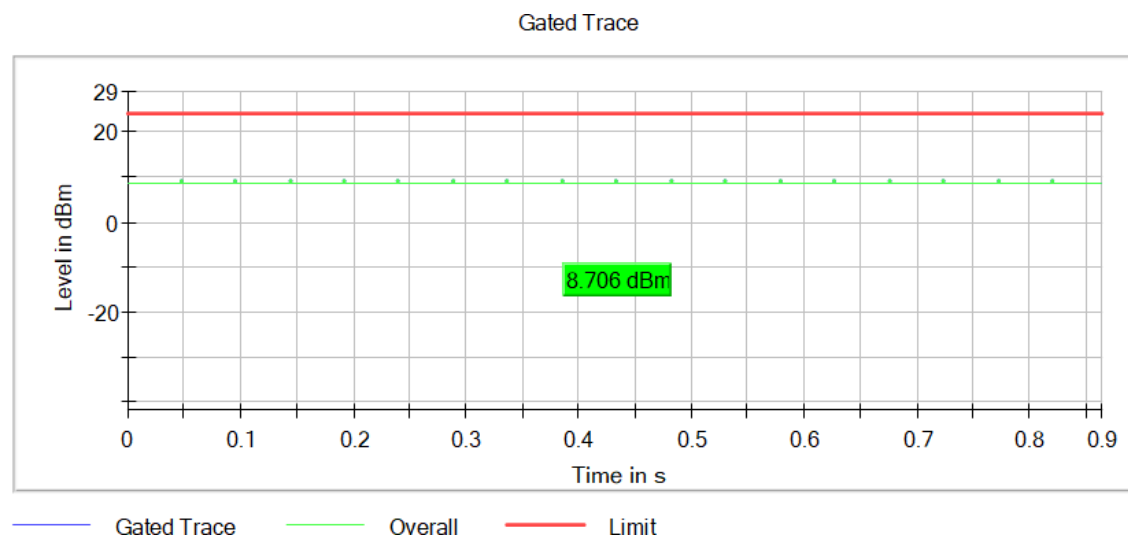
Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 1, Frequency MHz = 5270.00000, Modulation = 802.11ax HE40 SS1 (OFDMA MCS9), Mode = SISO, Number of Transmission Chains = 1

Images:



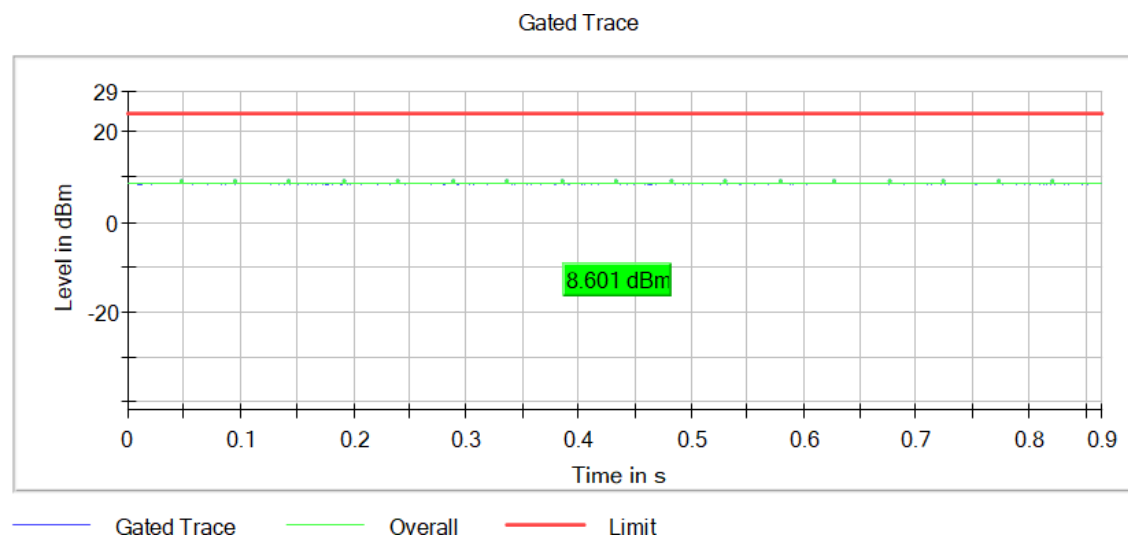
Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 1, Frequency MHz = 5310.00000, Modulation = 802.11ax HE40 SS1 (OFDMA MCS9), Mode = SISO, Number of Transmission Chains = 1

Images:



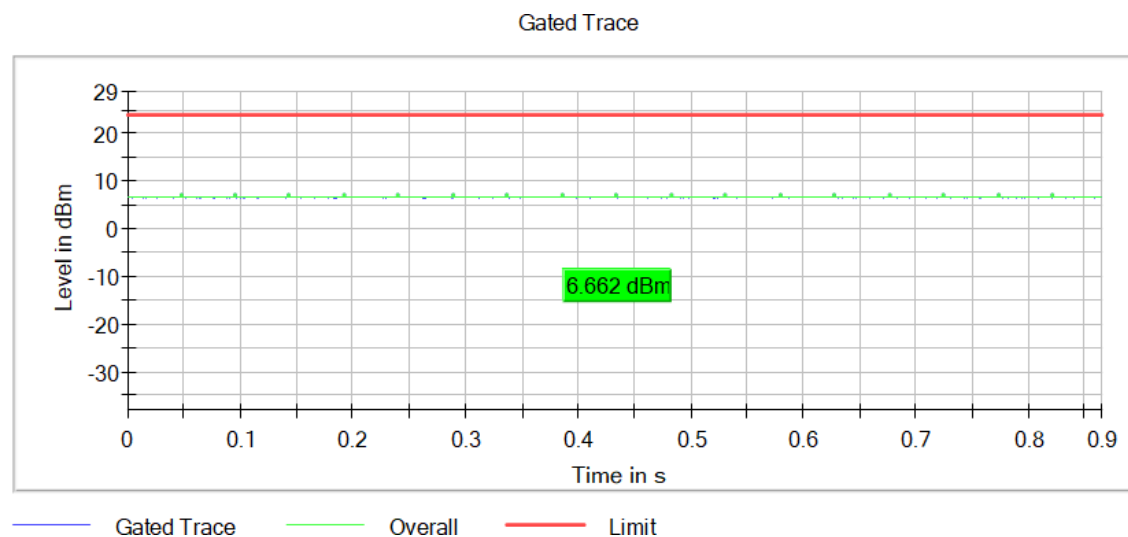
Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 1, Frequency MHz = 5510.00000, Modulation = 802.11ax HE40 SS1 (OFDMA MCS9), Mode = SISO, Number of Transmission Chains = 1

Images:



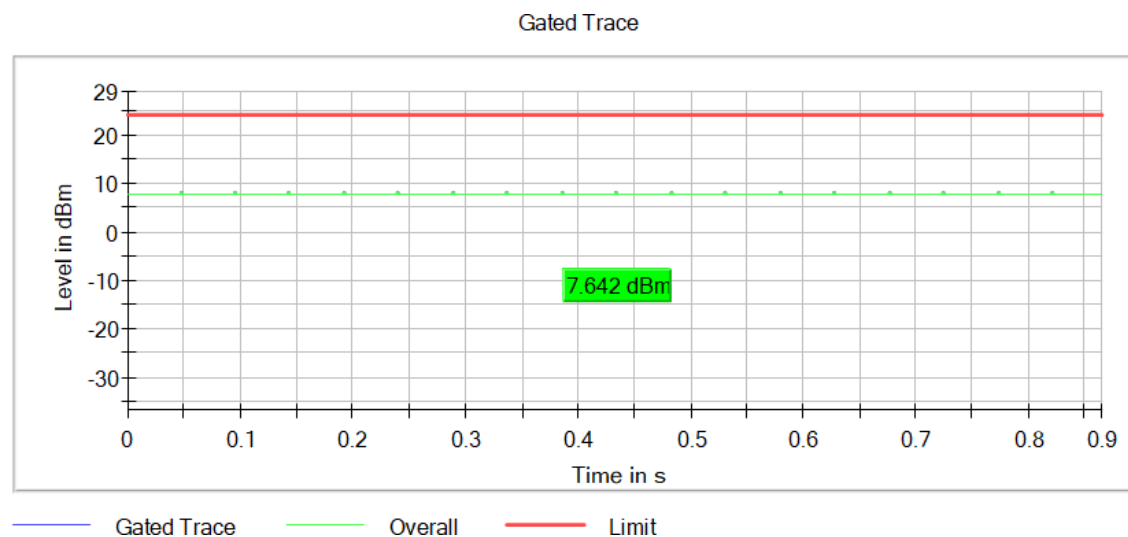
Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 1, Frequency MHz = 5550.00000, Modulation = 802.11ax HE40 SS1 (OFDMA MCS9), Mode = SISO, Number of Transmission Chains = 1

Images:



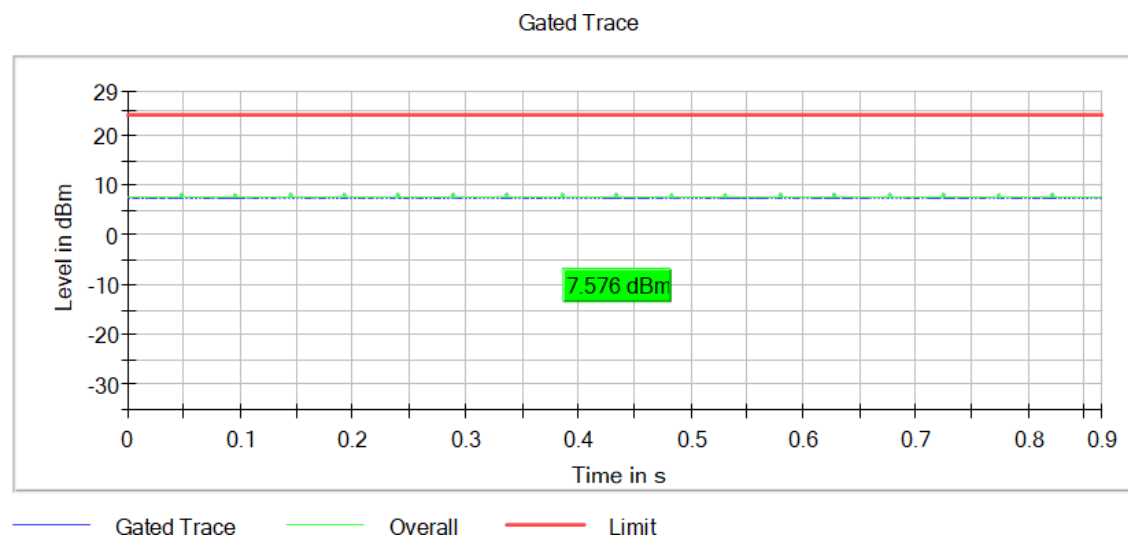
Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 1, Frequency MHz = 5670.00000, Modulation = 802.11ax HE40 SS1 (OFDMA MCS9), Mode = SISO, Number of Transmission Chains = 1

Images:



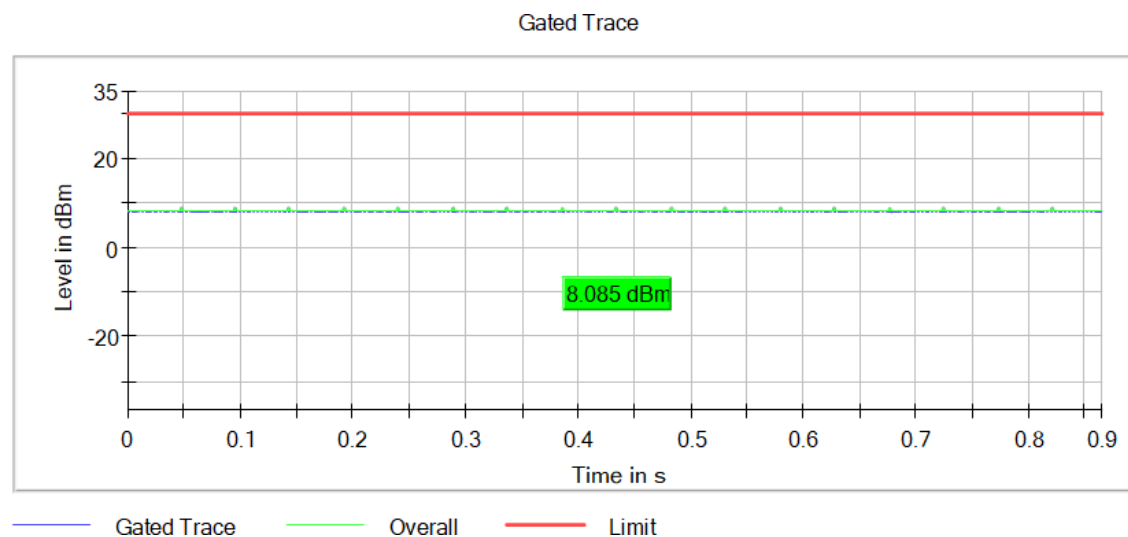
Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 1, Frequency MHz = 5755.00000, Modulation = 802.11ax HE40 SS1 (OFDMA MCS9), Mode = SISO, Number of Transmission Chains = 1

Images:



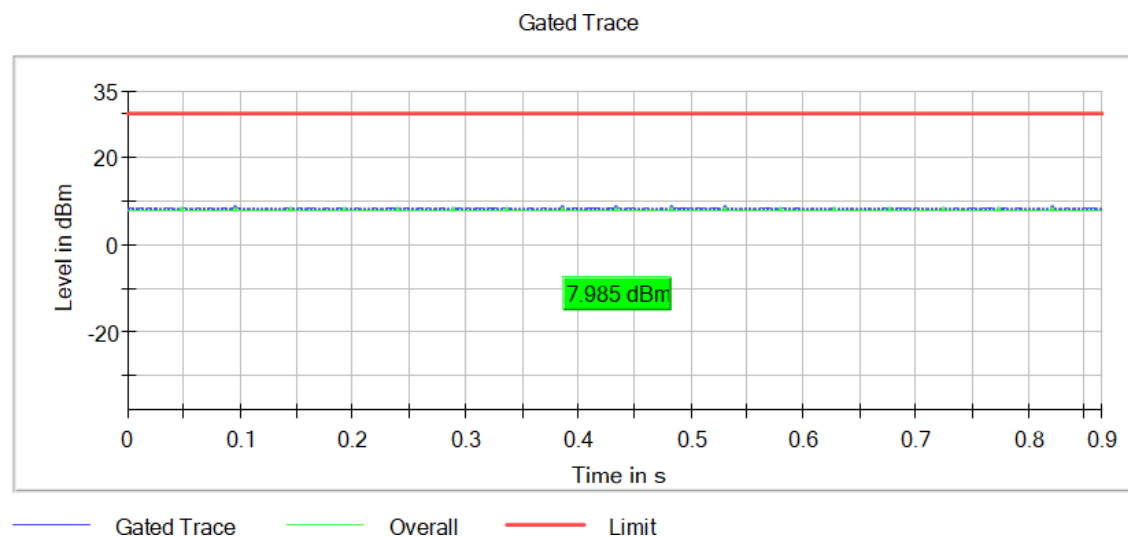
Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 1, Frequency MHz = 5795.00000, Modulation = 802.11ax HE40 SS1 (OFDMA MCS9), Mode = SISO, Number of Transmission Chains = 1

Images:



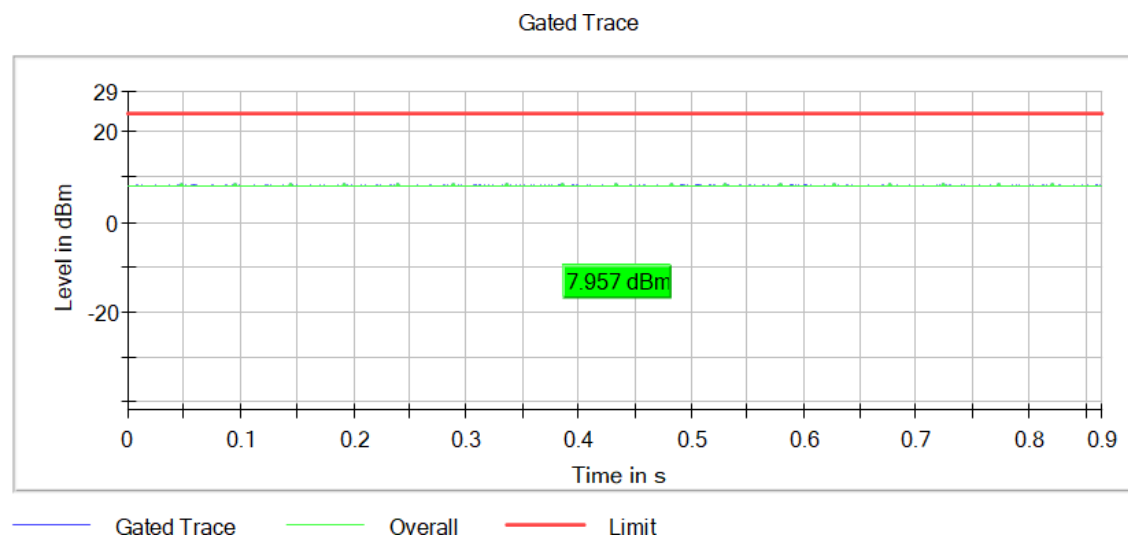
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Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 2, Frequency MHz = 5190.00000, Modulation = 802.11ax HE40 SS1 (OFDMA MCS9), Mode = SISO, Number of Transmission Chains = 1

Images:



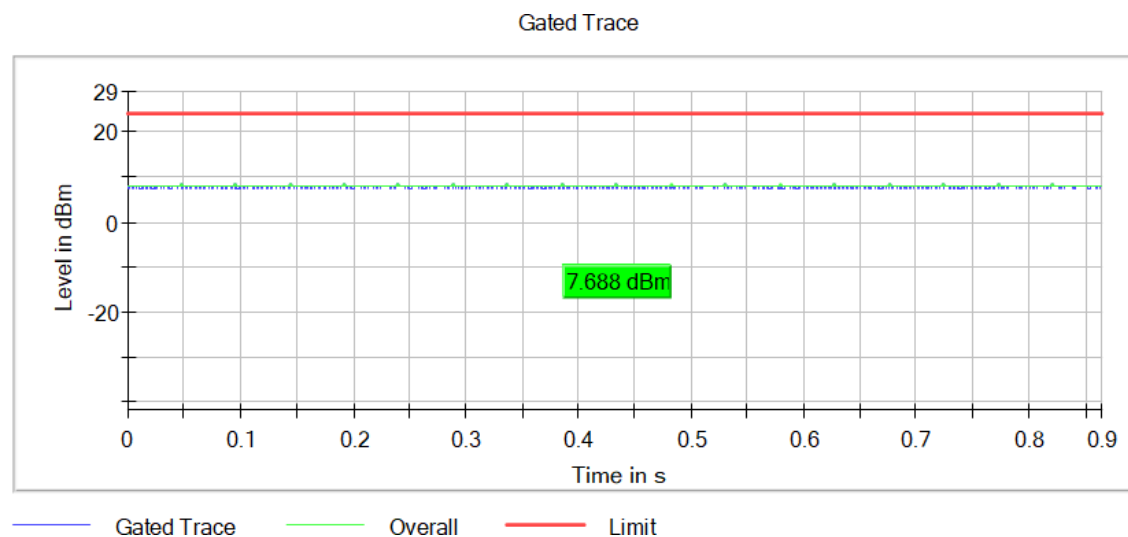
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Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 2, Frequency MHz = 5230.00000, Modulation = 802.11ax HE40 SS1 (OFDMA MCS9), Mode = SISO, Number of Transmission Chains = 1

Images:



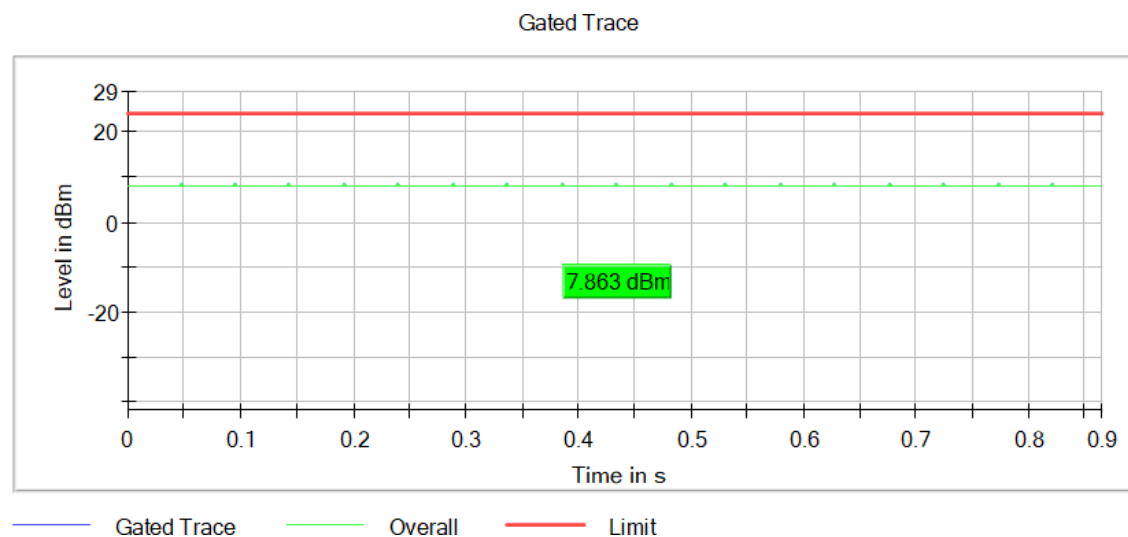
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Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 2, Frequency MHz = 5270.00000, Modulation = 802.11ax HE40 SS1 (OFDMA MCS9), Mode = SISO, Number of Transmission Chains = 1

Images:



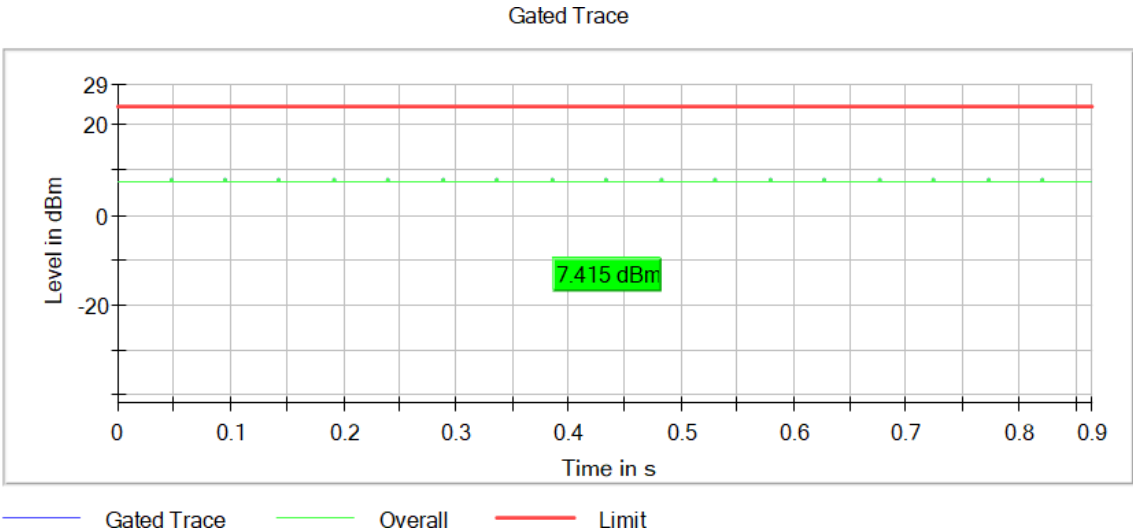
Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 2, Frequency MHz = 5310.00000, Modulation = 802.11ax HE40 SS1 (OFDMA MCS9), Mode = SISO, Number of Transmission Chains = 1

Images:



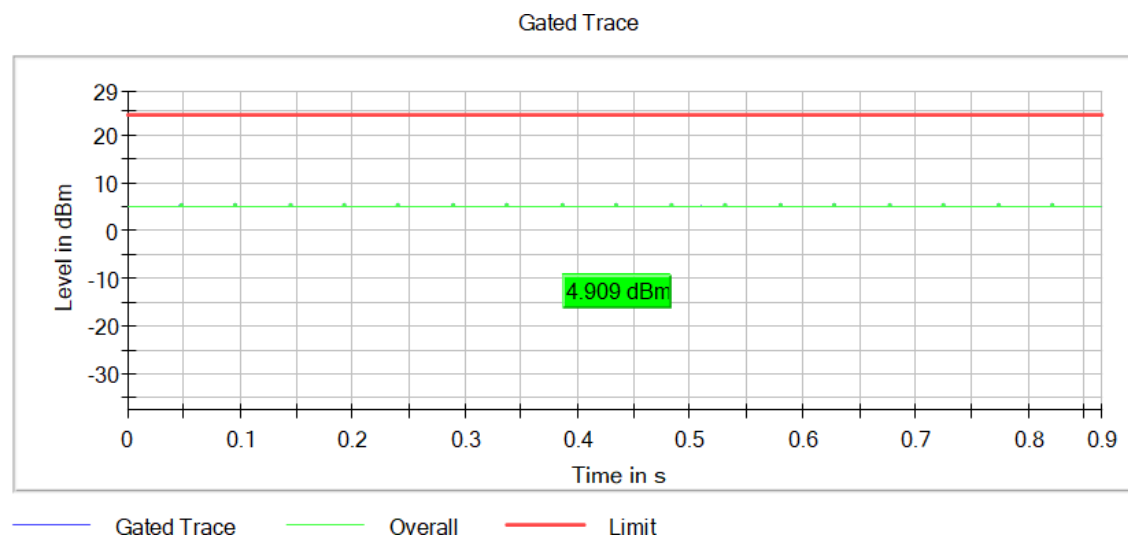
Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 2, Frequency MHz = 5510.00000, Modulation = 802.11ax HE40 SS1 (OFDMA MCS9), Mode = SISO, Number of Transmission Chains = 1

Images:



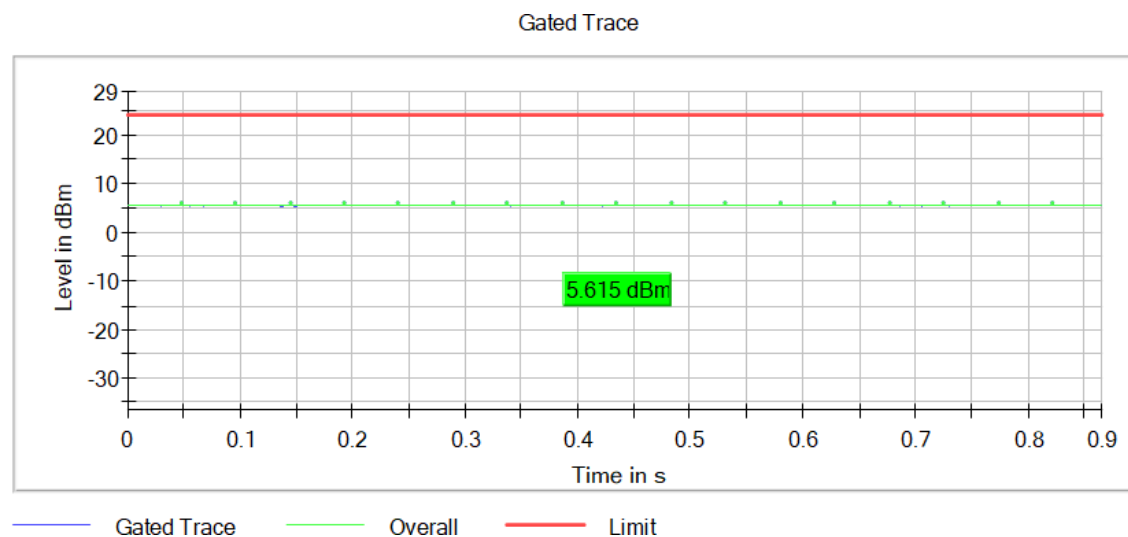
Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 2, Frequency MHz = 5550.00000, Modulation = 802.11ax HE40 SS1 (OFDMA MCS9), Mode = SISO, Number of Transmission Chains = 1

Images:



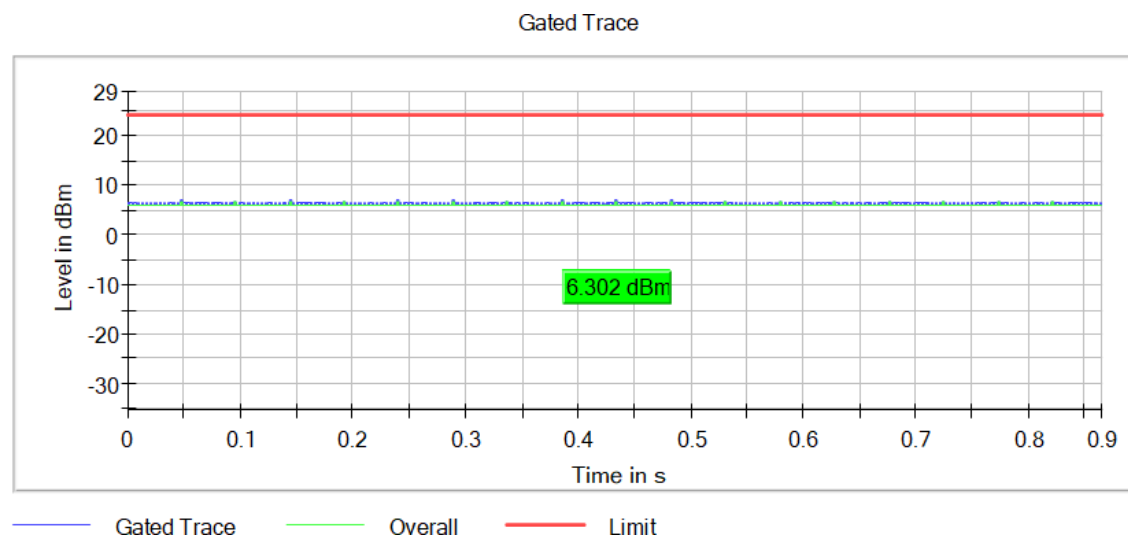
Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 2, Frequency MHz = 5670.00000, Modulation = 802.11ax HE40 SS1 (OFDMA MCS9), Mode = SISO, Number of Transmission Chains = 1

Images:



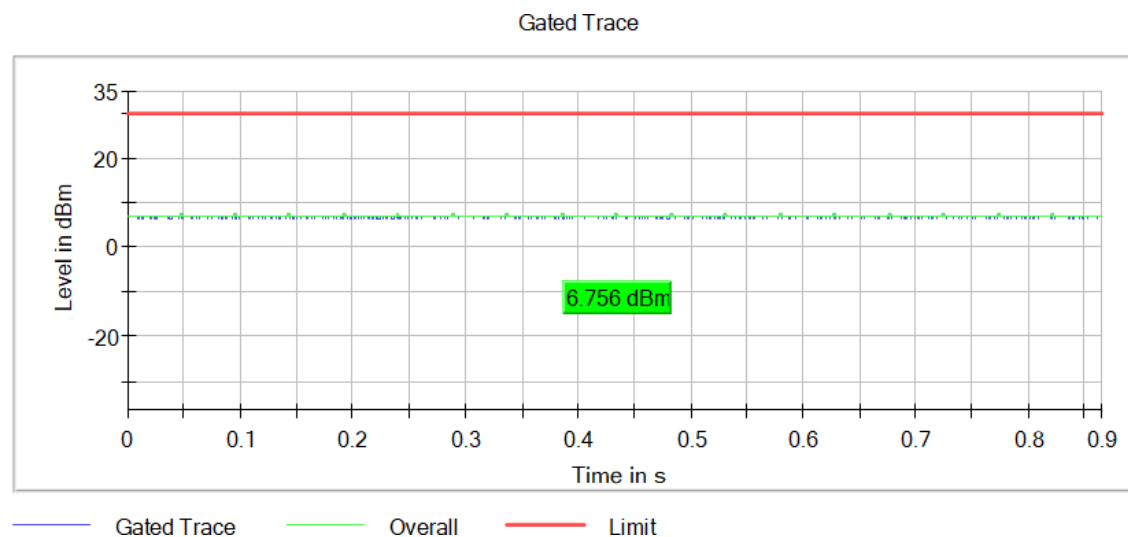
Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 2, Frequency MHz = 5755.00000, Modulation = 802.11ax HE40 SS1 (OFDMA MCS9), Mode = SISO, Number of Transmission Chains = 1

Images:



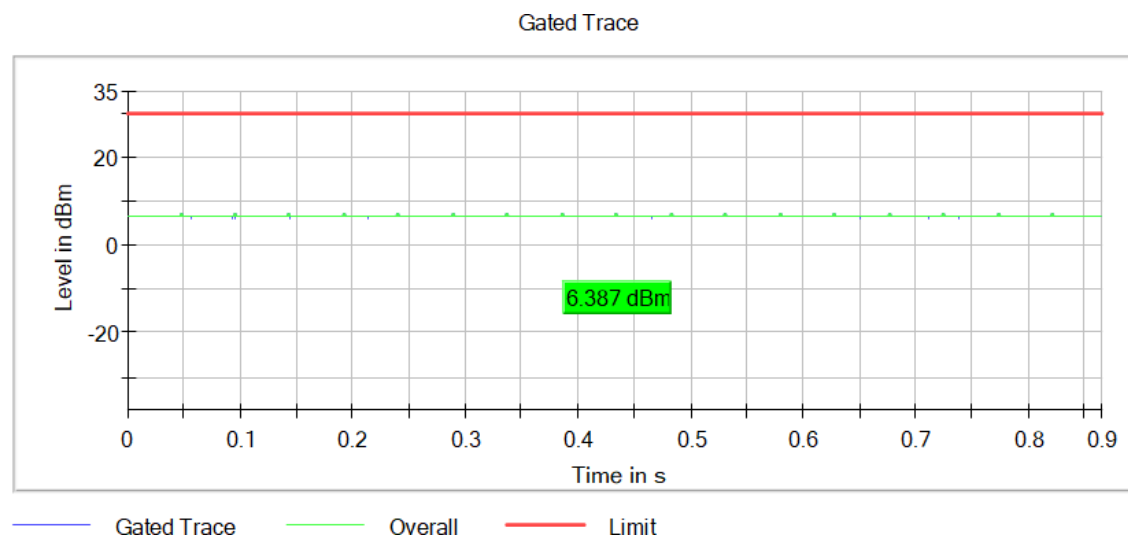
Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 2, Frequency MHz = 5795.00000, Modulation = 802.11ax HE40 SS1 (OFDMA MCS9), Mode = SISO, Number of Transmission Chains = 1

Images:



Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Mode: SISO

Modulation: 802.11ax HE80 SS1 (OFDMA MCS11)

Results

Port	Freq (MHz)	# of Tx Chains	Avg Power (dBm)	Max EIRP (dBm)
1	5210.00000	1	8.5	6.00
1	5290.00000	1	8.6	6.10
1	5530.00000	1	7.2	4.70
1	5610.00000	1	9.4	6.90
1	5775.00000	1	8.1	5.60
2	5210.00000	1	8.2	5.70
2	5290.00000	1	7.8	5.30
2	5530.00000	1	5.4	2.90
2	5610.00000	1	6.0	3.50
2	5775.00000	1	7.0	4.50

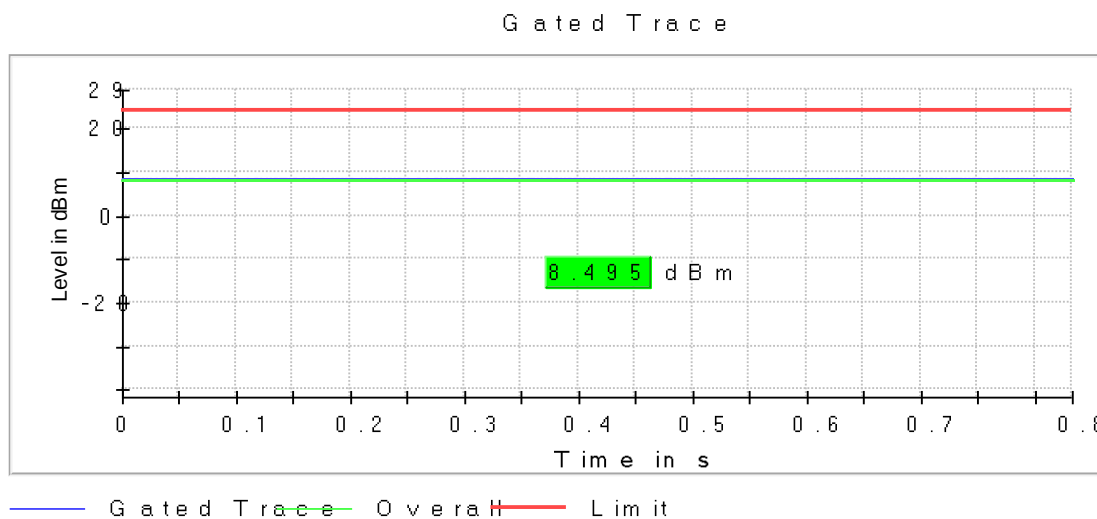
Verdict

Pass

Attachments

Active Port = 1, Frequency MHz = 5210.00000, Modulation = 802.11ax HE80 SS1 (OFDMA MCS11), Mode = SISO, Number of Transmission Chains = 1

Images:



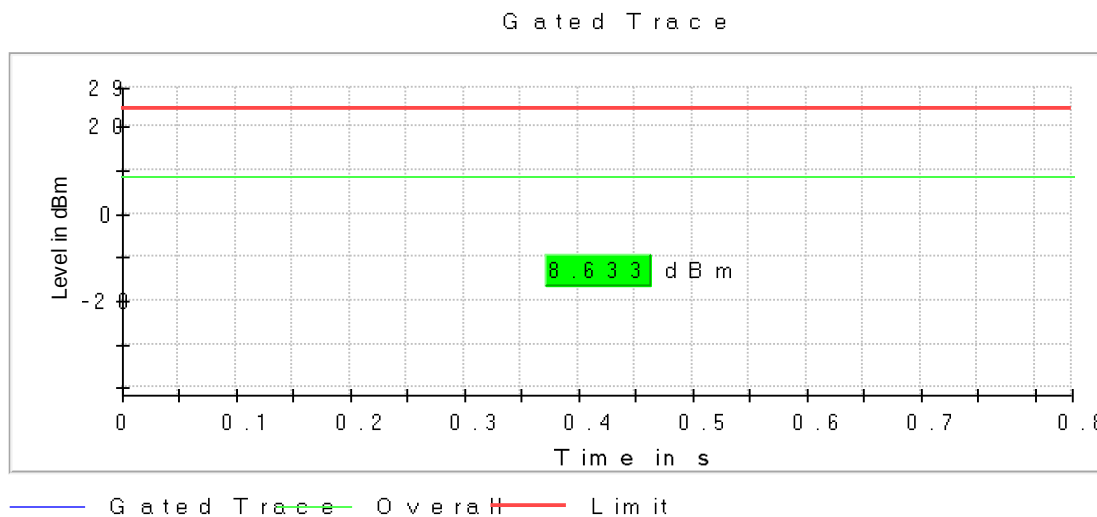
Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 1, Frequency MHz = 5290.00000, Modulation = 802.11ax HE80 SS1 (OFDMA MCS11), Mode = SISO, Number of Transmission Chains = 1

Images:



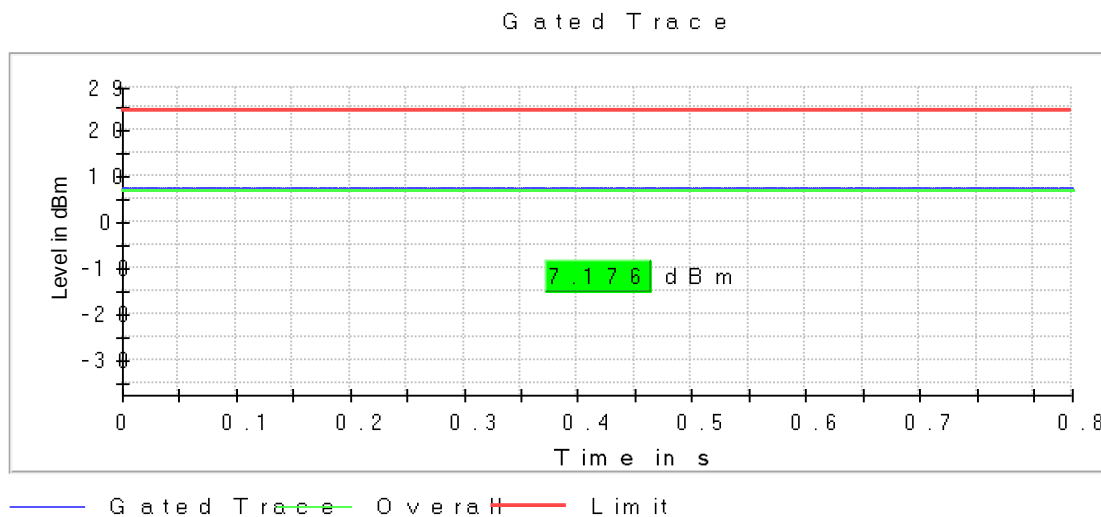
Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 1, Frequency MHz = 5530.00000, Modulation = 802.11ax HE80 SS1 (OFDMA MCS11), Mode = SISO, Number of Transmission Chains = 1

Images:



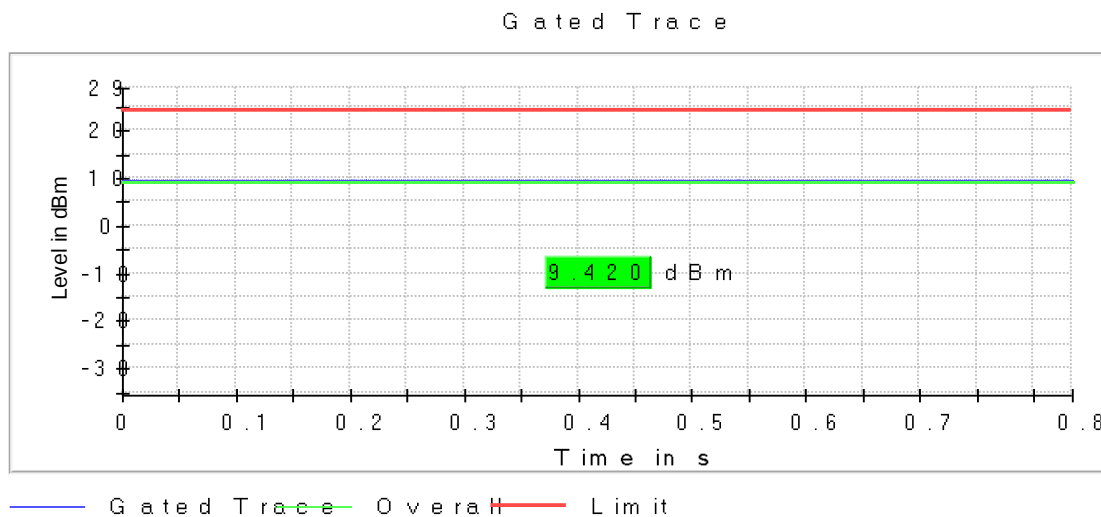
Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 1, Frequency MHz = 5610.00000, Modulation = 802.11ax HE80 SS1 (OFDMA MCS11), Mode = SISO, Number of Transmission Chains = 1

Images:



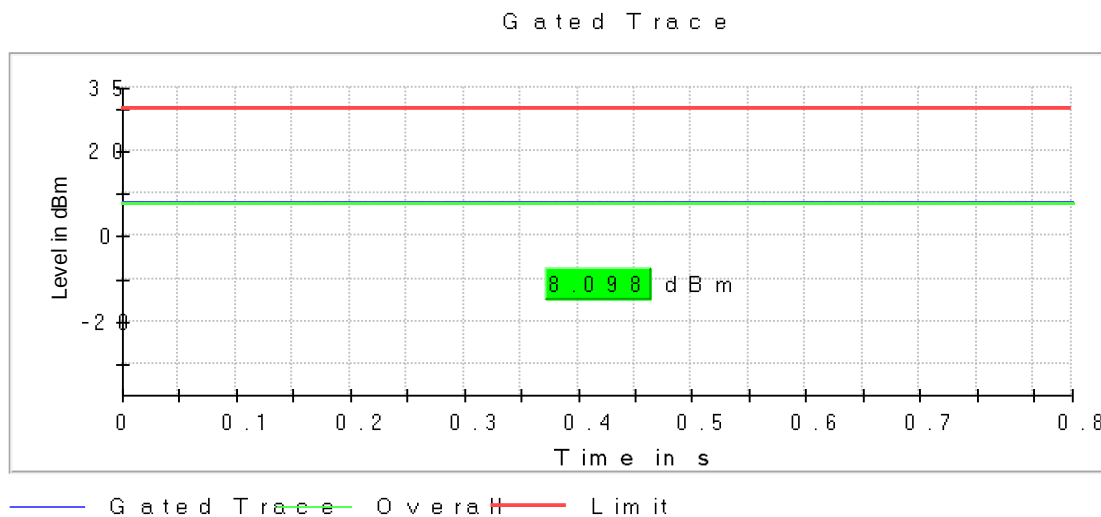
Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 1, Frequency MHz = 5775.00000, Modulation = 802.11ax HE80 SS1 (OFDMA MCS11), Mode = SISO, Number of Transmission Chains = 1

Images:



Tables:

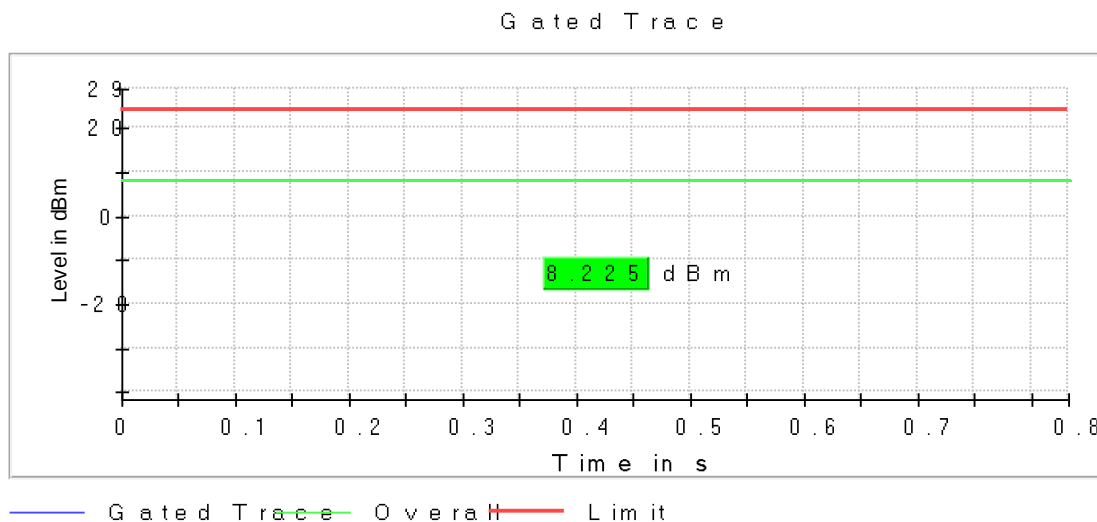
Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Attachments

Active Port = 2, Frequency MHz = 5210.00000, Modulation = 802.11ax HE80 SS1 (OFDMA MCS11), Mode = SISO, Number of Transmission Chains = 1

Images:



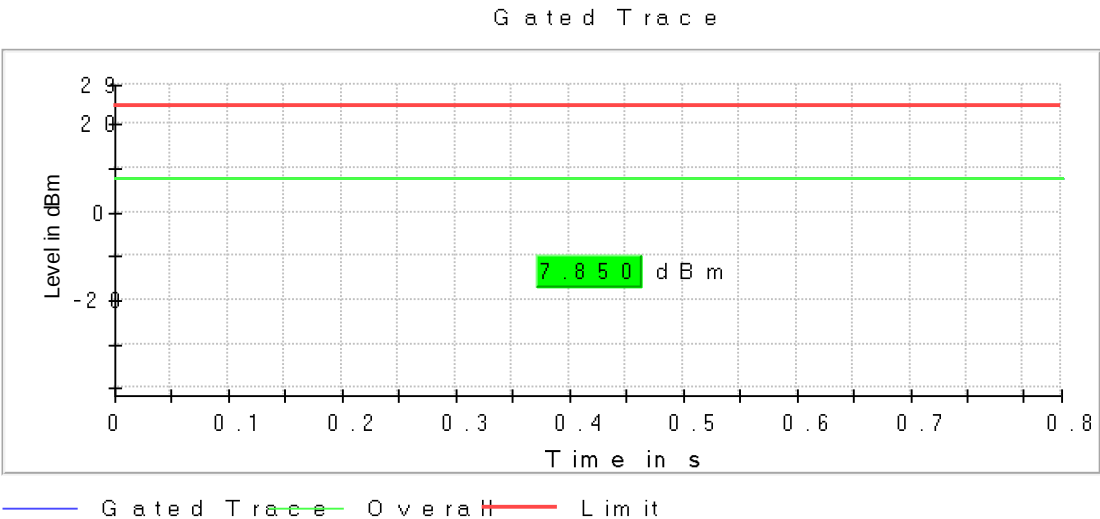
Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 2, Frequency MHz = 5290.00000, Modulation = 802.11ax HE80 SS1 (OFDMA MCS11), Mode = SISO, Number of Transmission Chains = 1

Images:



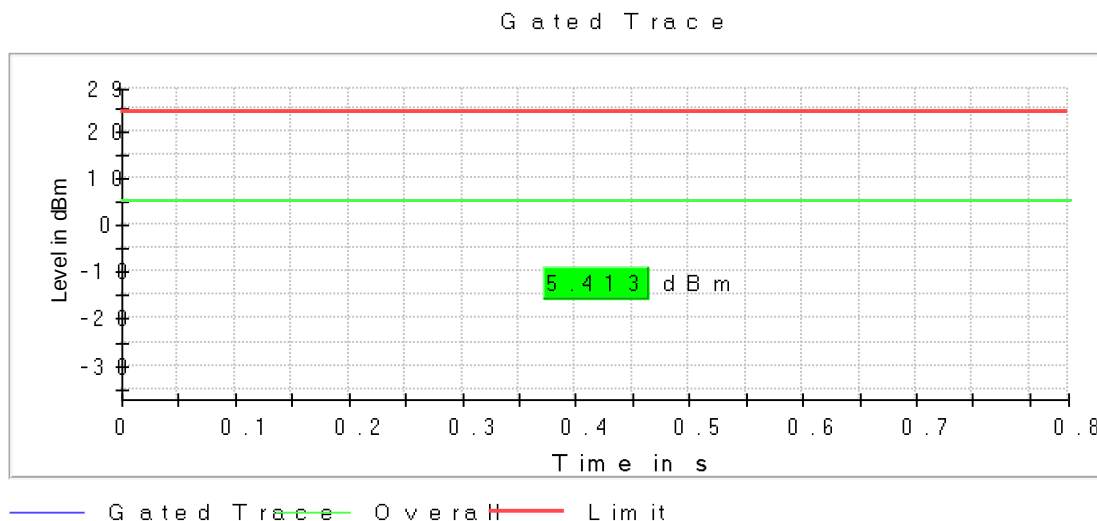
Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 2, Frequency MHz = 5530.00000, Modulation = 802.11ax HE80 SS1 (OFDMA MCS11), Mode = SISO, Number of Transmission Chains = 1

Images:



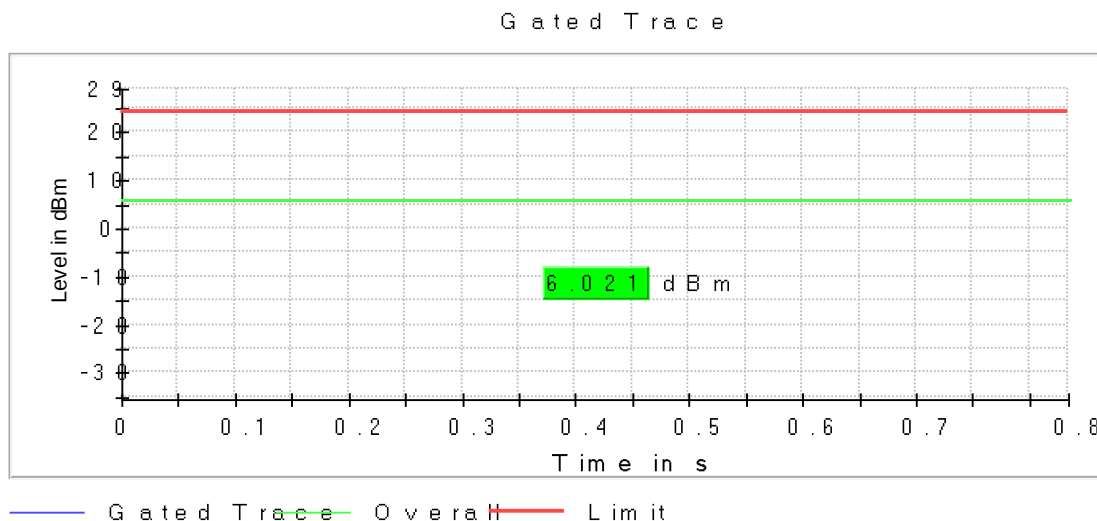
Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 2, Frequency MHz = 5610.00000, Modulation = 802.11ax HE80 SS1 (OFDMA MCS11), Mode = SISO, Number of Transmission Chains = 1

Images:



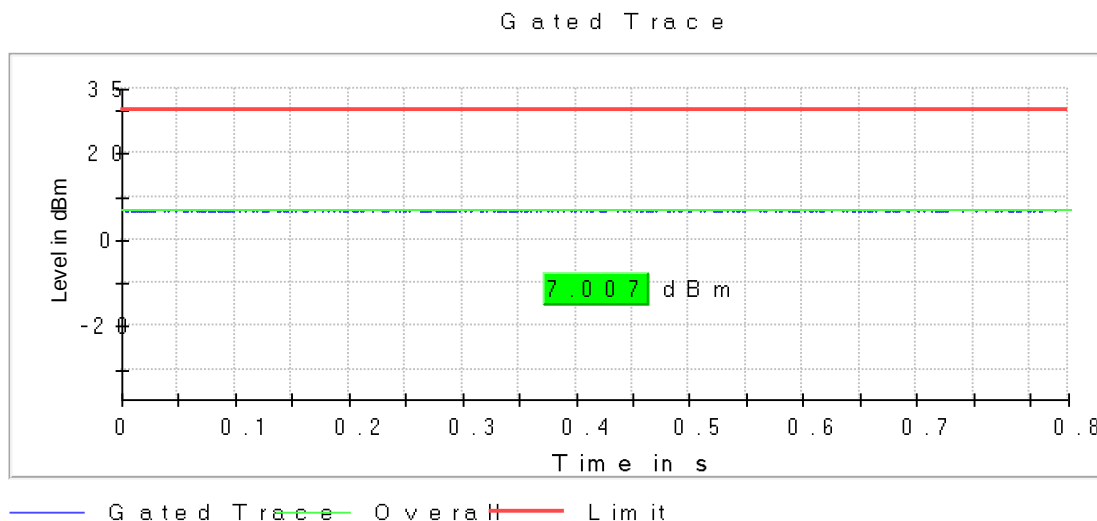
Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 2, Frequency MHz = 5775.00000, Modulation = 802.11ax HE80 SS1 (OFDMA MCS11), Mode = SISO, Number of Transmission Chains = 1

Images:



Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Mode: MIMO CCD Mode 2x2

Modulation: 802.11ax HE20 SS1 (OFDMA MCS8)

Results

Port	Freq (MHz)	# of Tx Chains	Avg Power (dBm)	Max EIRP (dBm)
1+2	5180.00000	2	9.7	7.20
1+2	5200.00000	2	9.9	7.40
1+2	5240.00000	2	9.8	7.30
1+2	5260.00000	2	10.2	7.70
1+2	5280.00000	2	9.8	7.30
1+2	5320.00000	2	9.9	7.40
1+2	5500.00000	2	7.5	5.00
1+2	5580.00000	2	9.3	6.80
1+2	5700.00000	2	10.0	7.50
1+2	5745.00000	2	8.7	6.20
1+2	5785.00000	2	9.1	6.60
1+2	5825.00000	2	10.2	7.70

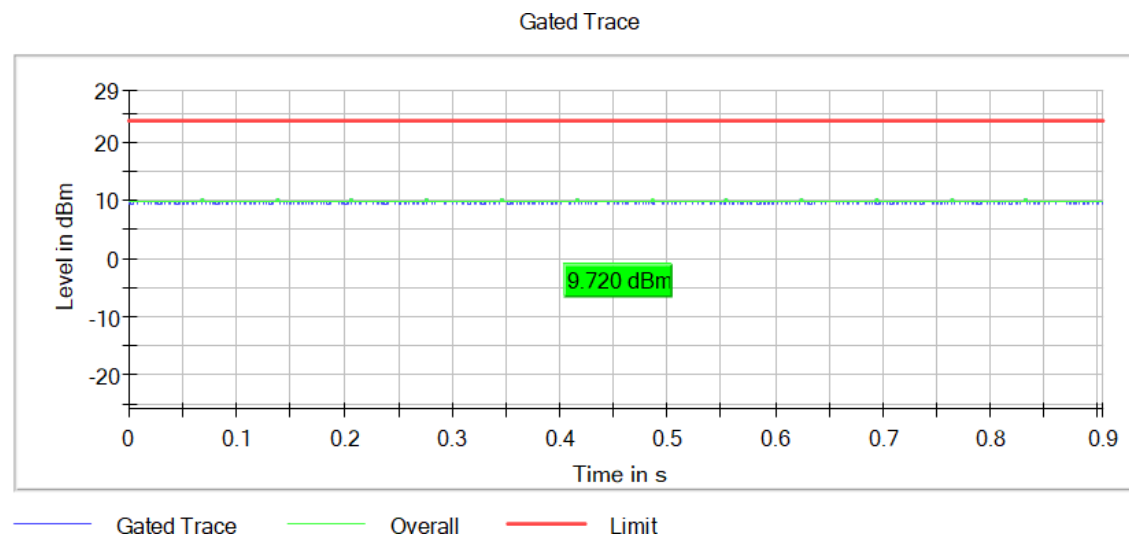
Verdict

Pass

Attachments

Active Port = 1+2, Frequency MHz = 5180.00000, Modulation = 802.11ax HE20 SS1 (OFDMA MCS8), Mode = MIMO CCD Mode 2x2, Number of Transmission Chains = 2

Images:



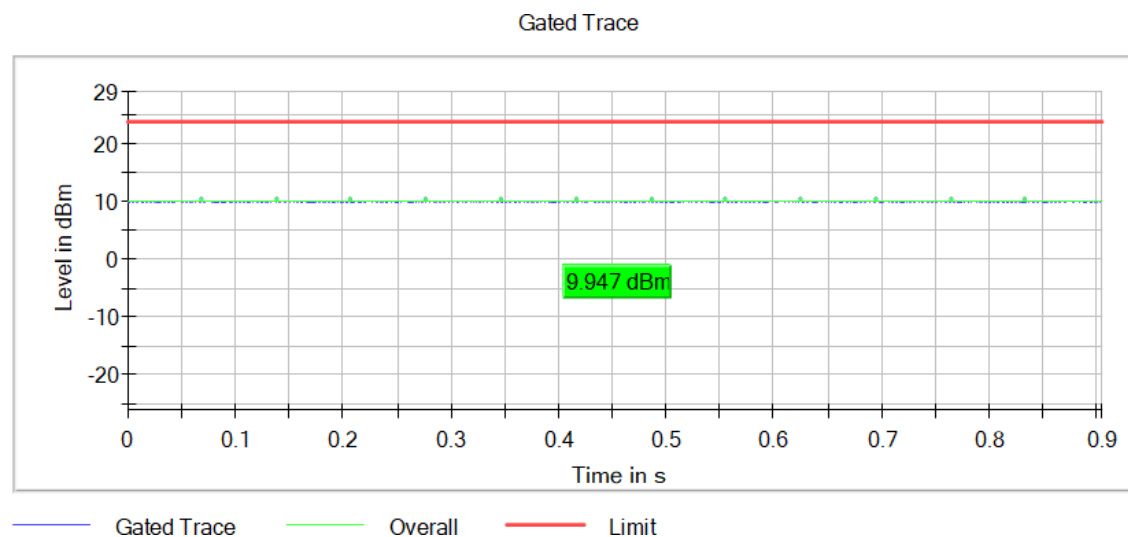
Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 1+2, Frequency MHz = 5200.00000, Modulation = 802.11ax HE20 SS1 (OFDMA MCS8), Mode = MIMO CCD Mode 2x2, Number of Transmission Chains = 2

Images:



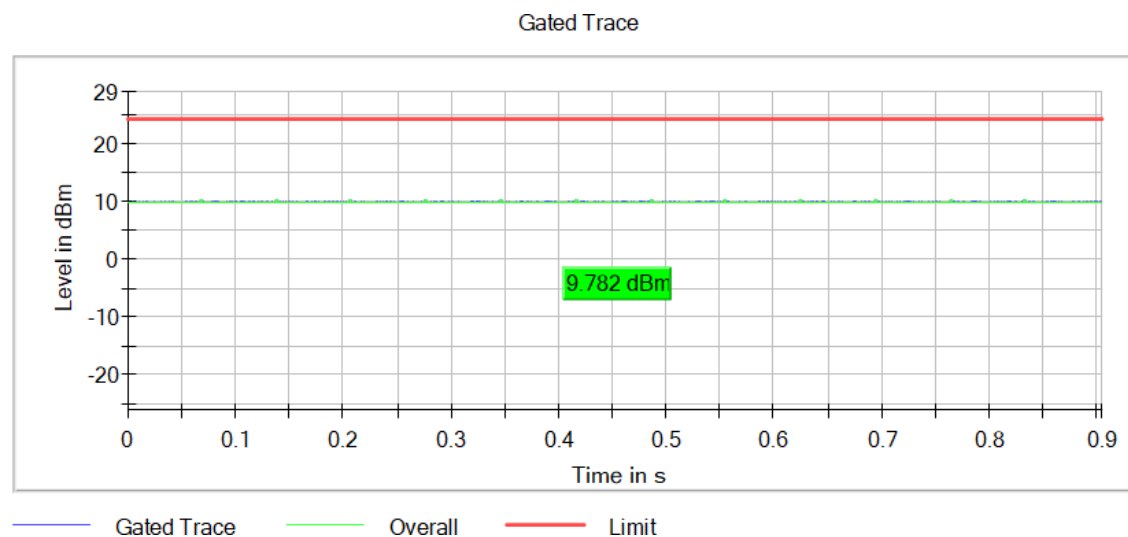
Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 1+2, Frequency MHz = 5240.00000, Modulation = 802.11ax HE20 SS1 (OFDMA MCS8), Mode = MIMO CCD Mode 2x2, Number of Transmission Chains = 2

Images:



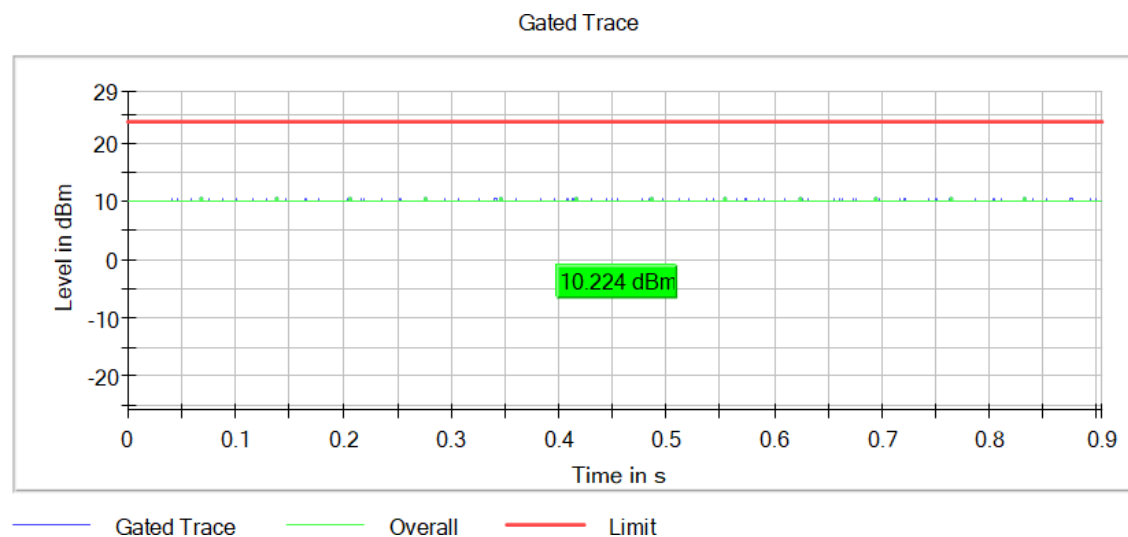
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Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 1+2, Frequency MHz = 5260.00000, Modulation = 802.11ax HE20 SS1 (OFDMA MCS8), Mode = MIMO CCD Mode 2x2, Number of Transmission Chains = 2

Images:



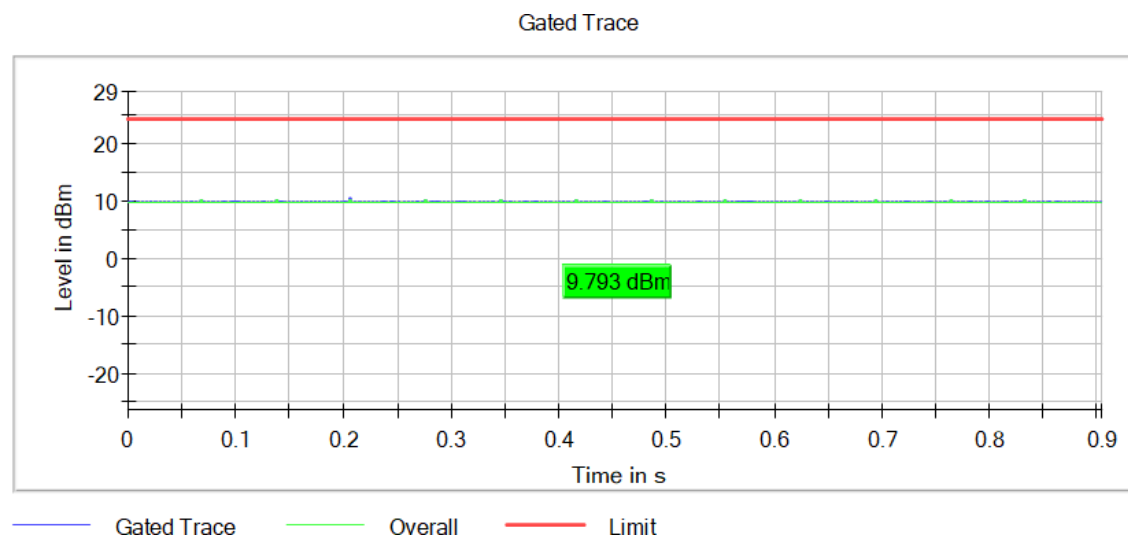
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Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 1+2, Frequency MHz = 5280.00000, Modulation = 802.11ax HE20 SS1 (OFDMA MCS8), Mode = MIMO CCD Mode 2x2, Number of Transmission Chains = 2

Images:



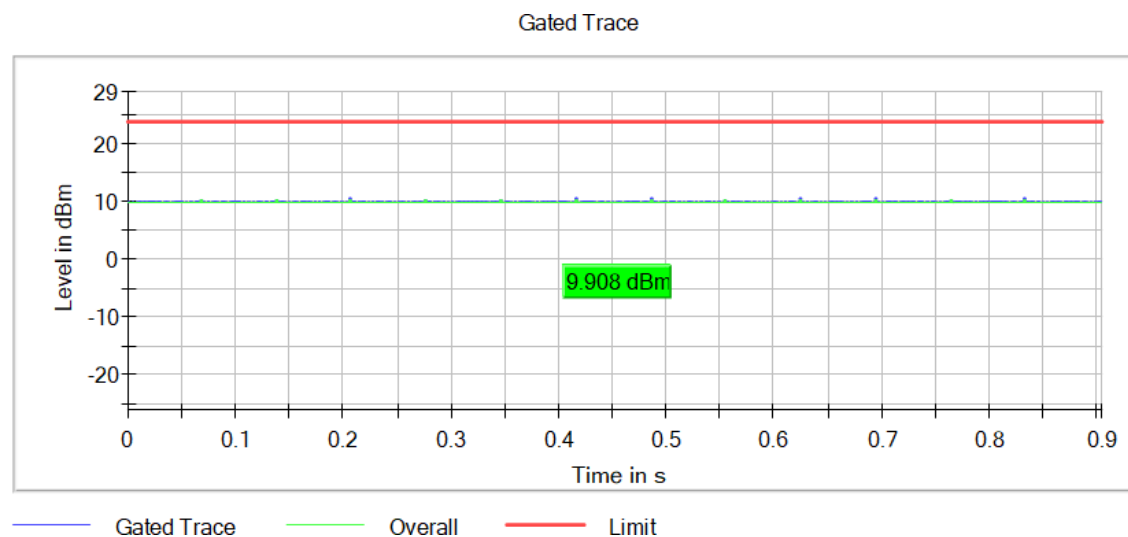
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Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 1+2, Frequency MHz = 5320.00000, Modulation = 802.11ax HE20 SS1 (OFDMA MCS8), Mode = MIMO CCD Mode 2x2, Number of Transmission Chains = 2

Images:



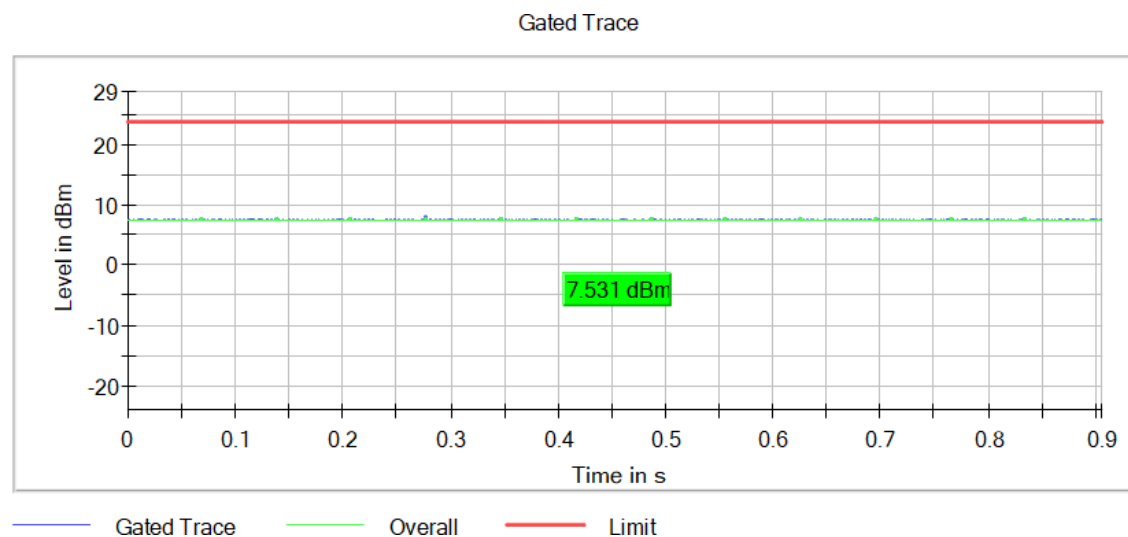
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Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 1+2, Frequency MHz = 5500.00000, Modulation = 802.11ax HE20 SS1 (OFDMA MCS8), Mode = MIMO CCD Mode 2x2, Number of Transmission Chains = 2

Images:



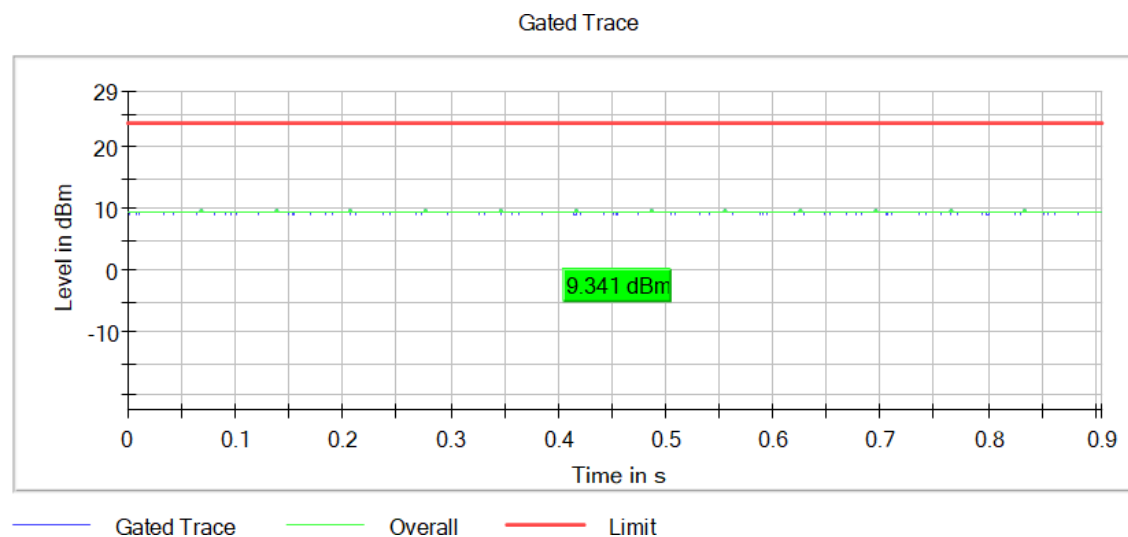
Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 1+2, Frequency MHz = 5580.00000, Modulation = 802.11ax HE20 SS1 (OFDMA MCS8), Mode = MIMO CCD Mode 2x2, Number of Transmission Chains = 2

Images:



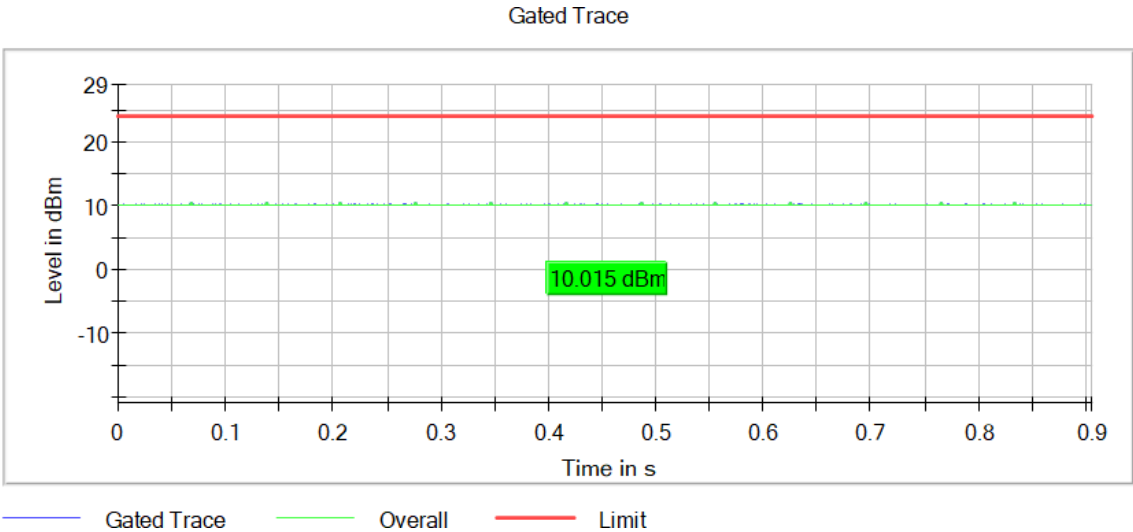
Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 1+2, Frequency MHz = 5700.00000, Modulation = 802.11ax HE20 SS1 (OFDMA MCS8), Mode = MIMO CCD Mode 2x2, Number of Transmission Chains = 2

Images:



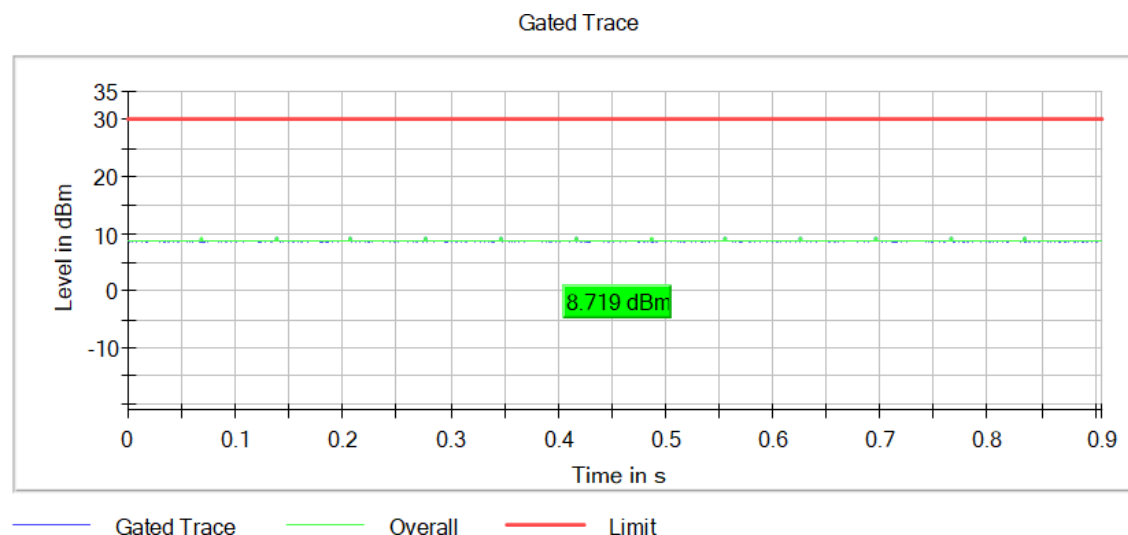
Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 1+2, Frequency MHz = 5745.00000, Modulation = 802.11ax HE20 SS1 (OFDMA MCS8), Mode = MIMO CCD Mode 2x2, Number of Transmission Chains = 2

Images:



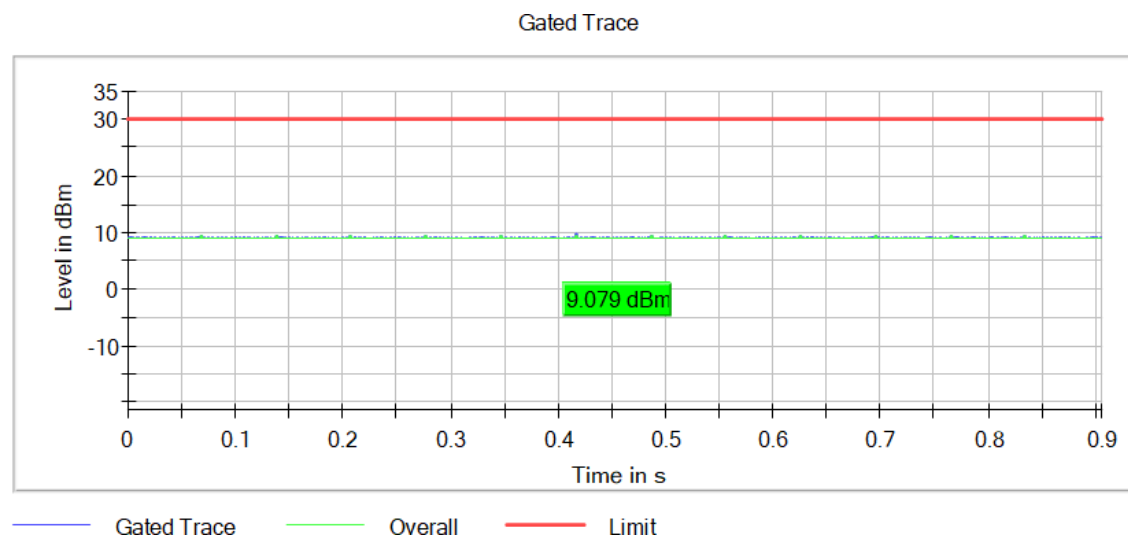
Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 1+2, Frequency MHz = 5785.00000, Modulation = 802.11ax HE20 SS1 (OFDMA MCS8), Mode = MIMO CCD Mode 2x2, Number of Transmission Chains = 2

Images:



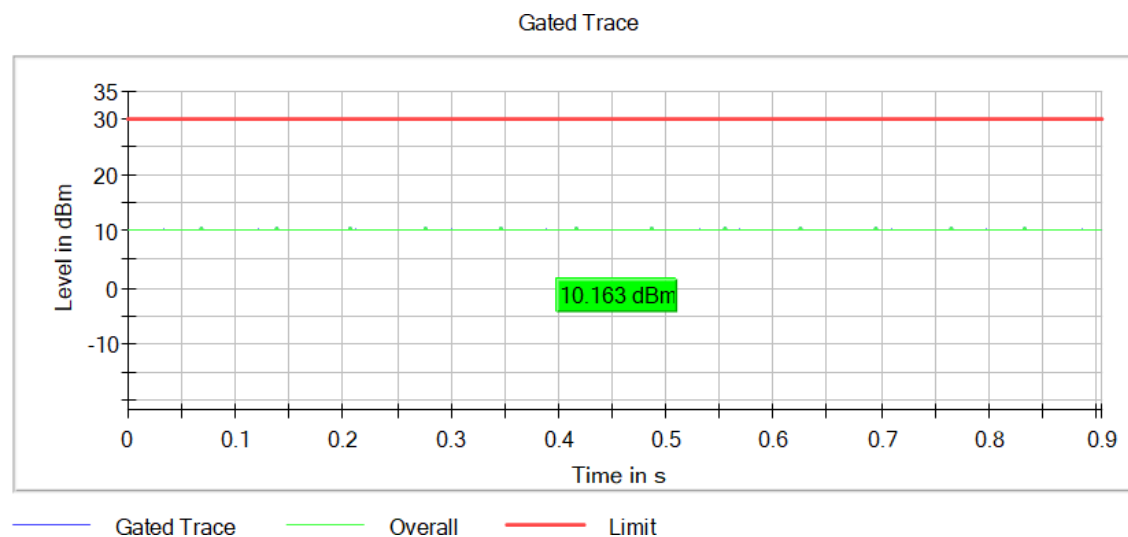
Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 1+2, Frequency MHz = 5825.00000, Modulation = 802.11ax HE20 SS1 (OFDMA MCS8), Mode = MIMO CCD Mode 2x2, Number of Transmission Chains = 2

Images:



Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Mode: MIMO CCD Mode 2x2

Modulation: 802.11ax HE40 SS1 (OFDMA MCS9)

Results

Port	Freq (MHz)	# of Tx Chains	Avg Power (dBm)	Max EIRP (dBm)
1+2	5190.00000	2	9.8	7.30
1+2	5230.00000	2	10.0	7.50
1+2	5270.00000	2	10.1	7.60
1+2	5310.00000	2	10.0	7.50
1+2	5510.00000	2	7.7	5.20
1+2	5550.00000	2	8.5	6.00
1+2	5670.00000	2	8.9	6.40
1+2	5755.00000	2	9.3	6.80
1+2	5795.00000	2	10.2	7.70

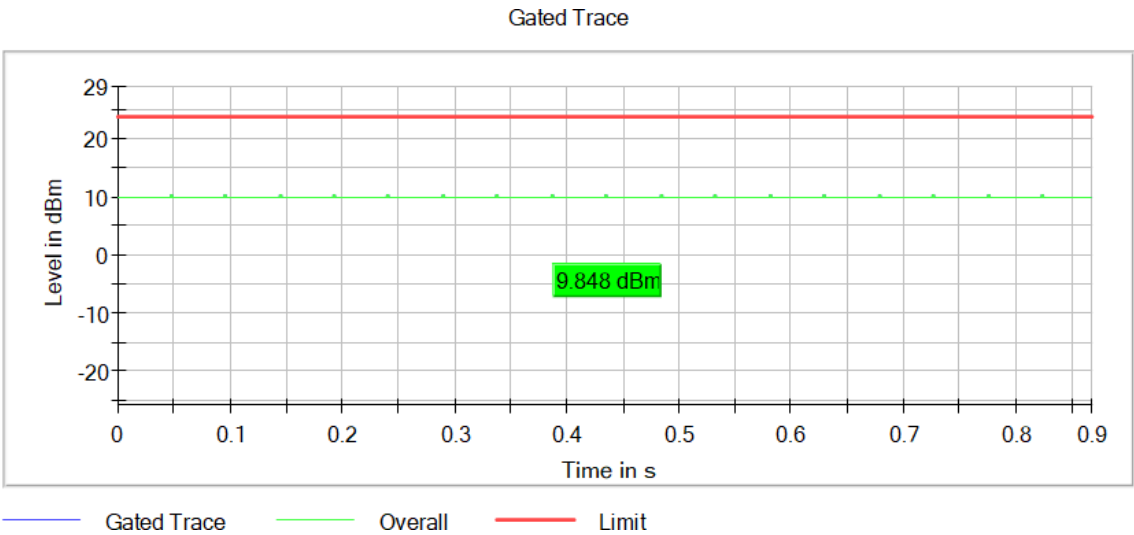
Verdict

Pass

Attachments

Active Port = 1+2, Frequency MHz = 5190.00000, Modulation = 802.11ax HE40 SS1 (OFDMA MCS9), Mode = MIMO CCD Mode 2x2, Number of Transmission Chains = 2

Images:



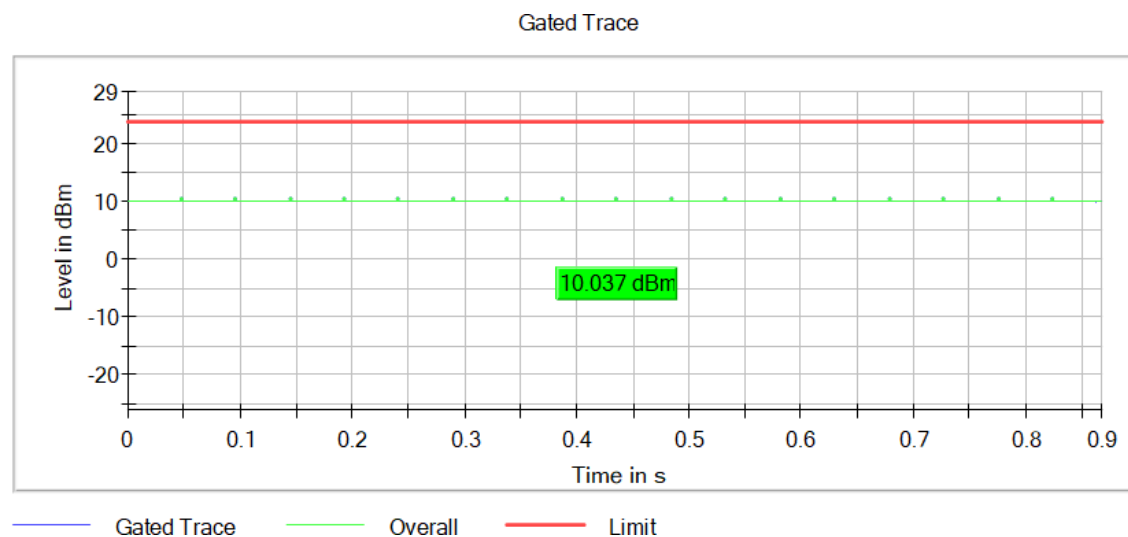
Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 1+2, Frequency MHz = 5230.00000, Modulation = 802.11ax HE40 SS1 (OFDMA MCS9), Mode = MIMO CCD Mode 2x2, Number of Transmission Chains = 2

Images:



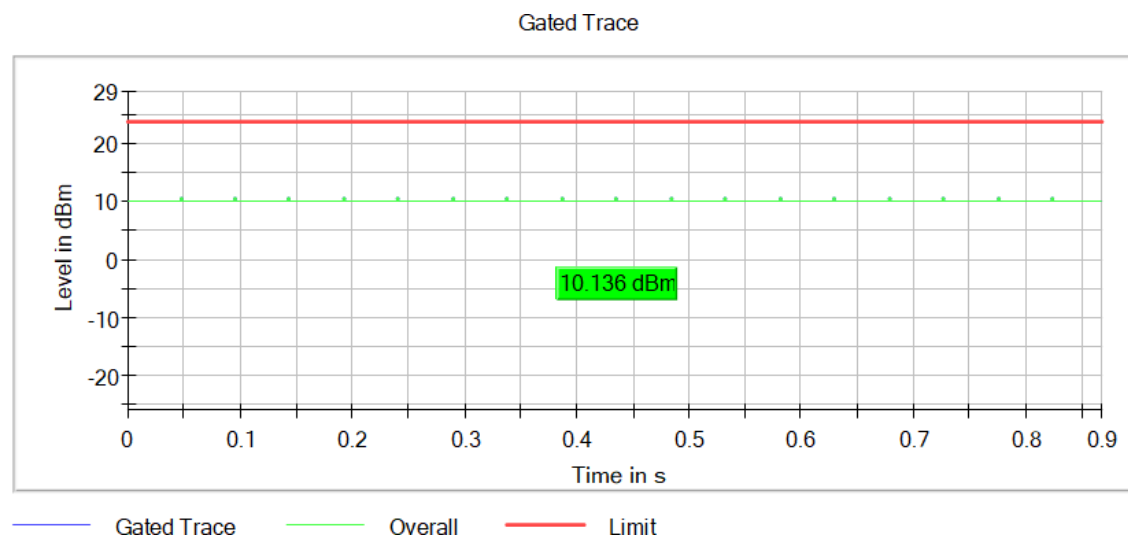
Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 1+2, Frequency MHz = 5270.00000, Modulation = 802.11ax HE40 SS1 (OFDMA MCS9), Mode = MIMO CCD Mode 2x2, Number of Transmission Chains = 2

Images:



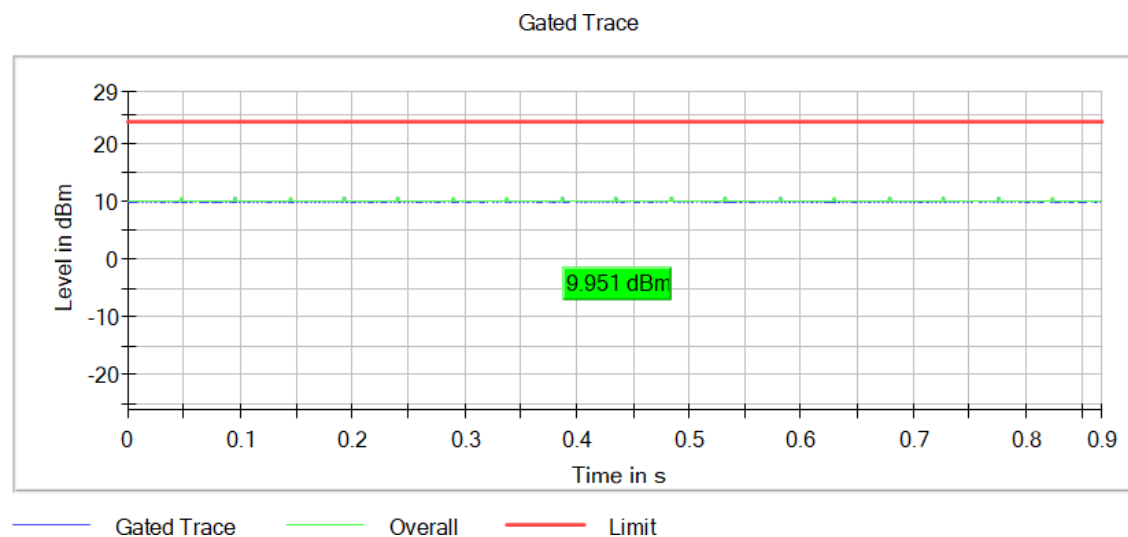
Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 1+2, Frequency MHz = 5310.00000, Modulation = 802.11ax HE40 SS1 (OFDMA MCS9), Mode = MIMO CCD Mode 2x2, Number of Transmission Chains = 2

Images:



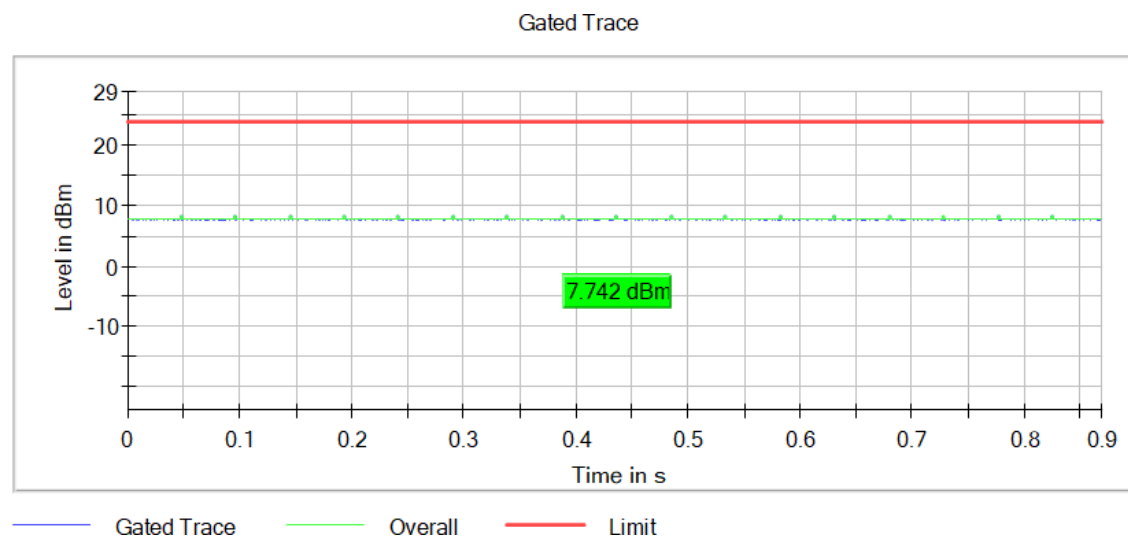
Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 1+2, Frequency MHz = 5510.00000, Modulation = 802.11ax HE40 SS1 (OFDMA MCS9), Mode = MIMO CCD Mode 2x2, Number of Transmission Chains = 2

Images:



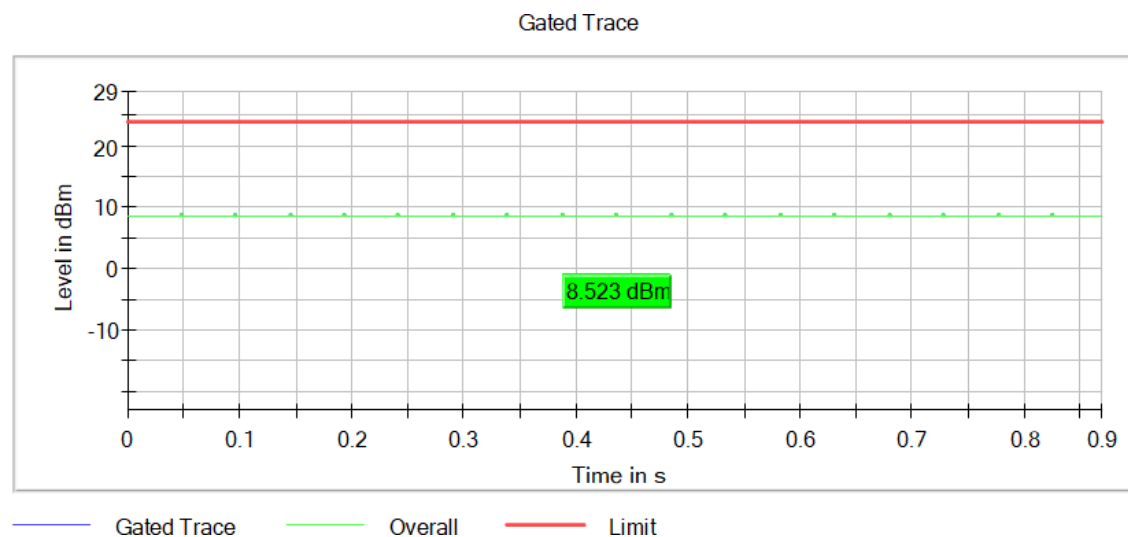
Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 1+2, Frequency MHz = 5550.00000, Modulation = 802.11ax HE40 SS1 (OFDMA MCS9), Mode = MIMO CCD Mode 2x2, Number of Transmission Chains = 2

Images:



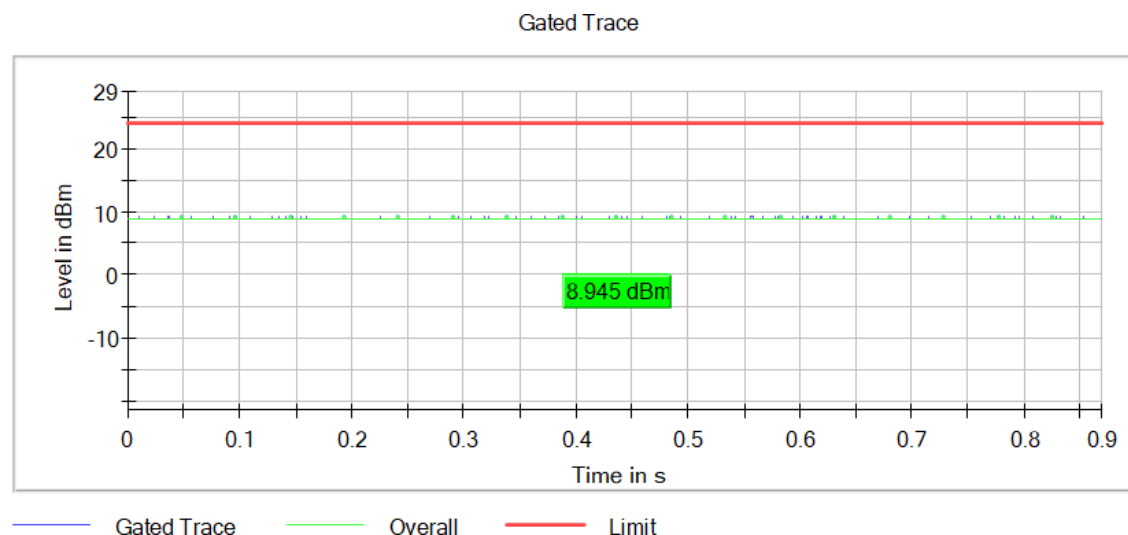
Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 1+2, Frequency MHz = 5670.00000, Modulation = 802.11ax HE40 SS1 (OFDMA MCS9), Mode = MIMO CCD Mode 2x2, Number of Transmission Chains = 2

Images:



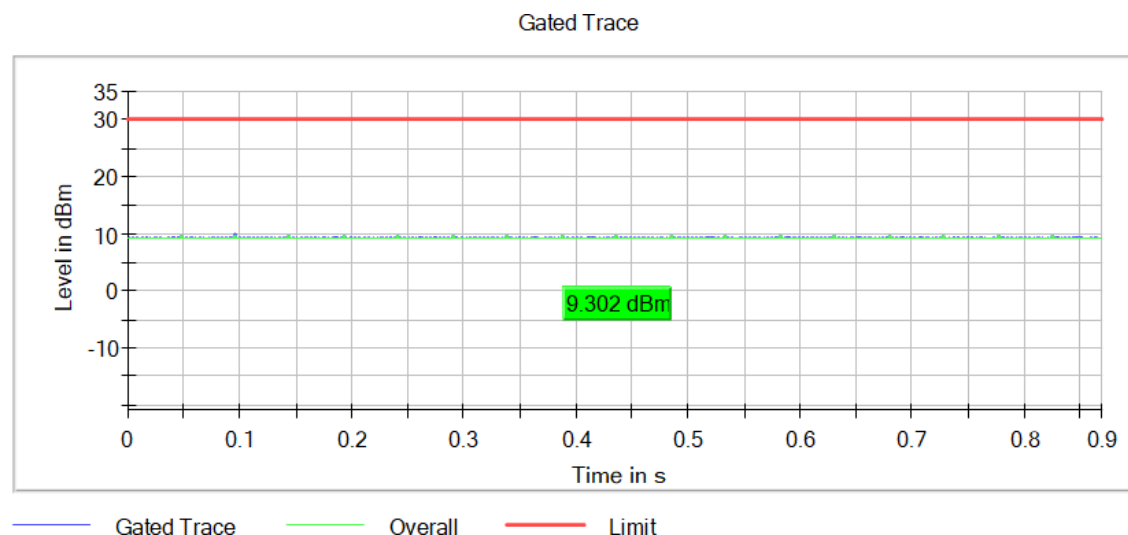
Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 1+2, Frequency MHz = 5755.00000, Modulation = 802.11ax HE40 SS1 (OFDMA MCS9), Mode = MIMO CCD Mode 2x2, Number of Transmission Chains = 2

Images:



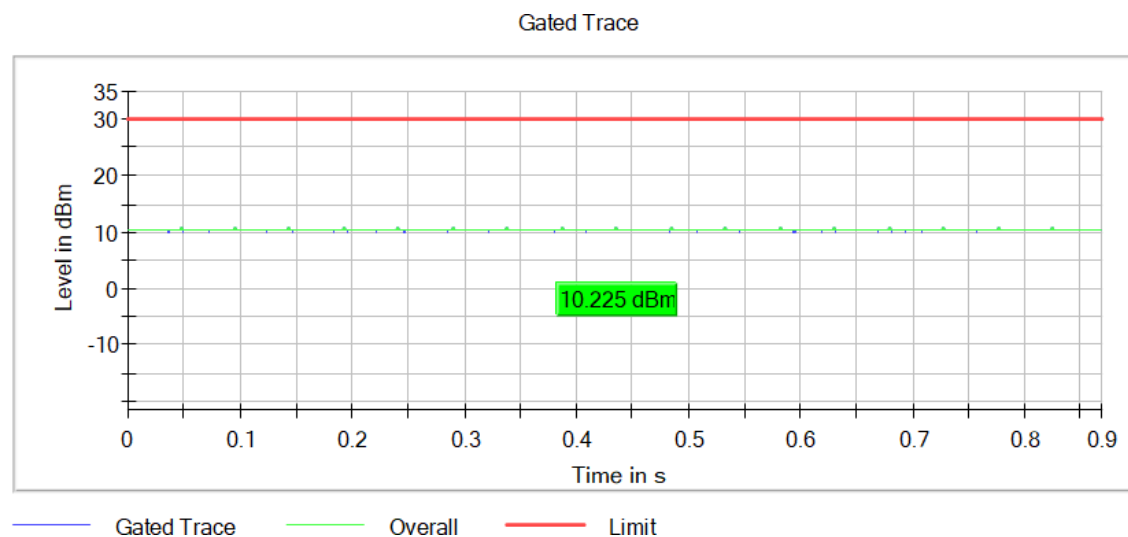
Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 1+2, Frequency MHz = 5795.00000, Modulation = 802.11ax HE40 SS1 (OFDMA MCS9), Mode = MIMO CCD Mode 2x2, Number of Transmission Chains = 2

Images:



Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Mode: MIMO CCD Mode 2x2

Modulation: 802.11ax HE80 SS1 (OFDMA MCS11)

Results

Port	Freq (MHz)	# of Tx Chains	Avg Power (dBm)	Max EIRP (dBm)
1+2	5210.00000	2	10.5	8.00
1+2	5290.00000	2	10.7	8.20
1+2	5530.00000	2	8.9	6.40
1+2	5610.00000	2	10.4	7.90
1+2	5775.00000	2	9.8	7.30

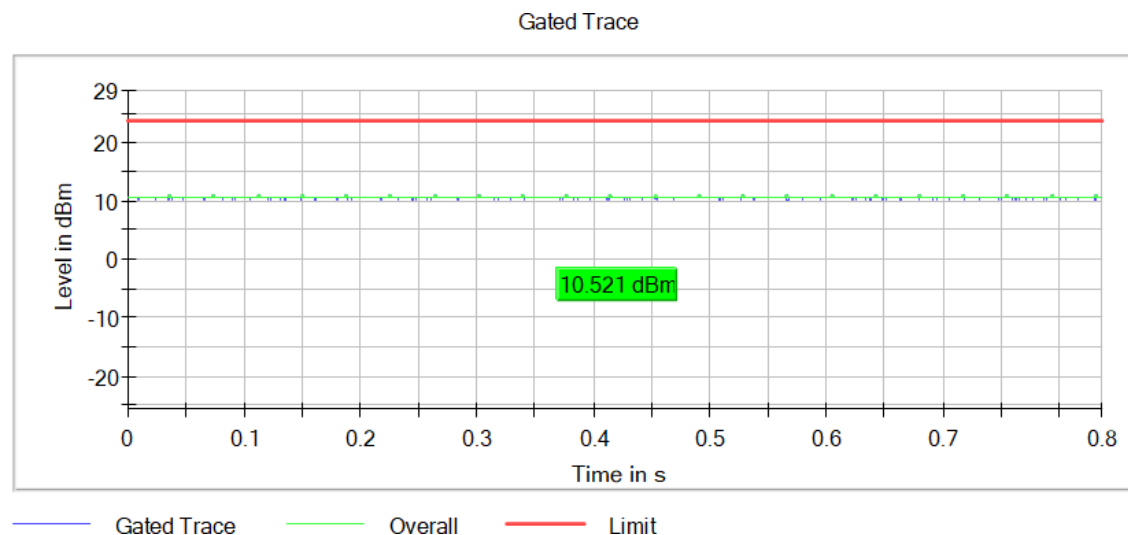
Verdict

Pass

Attachments

Active Port = 1+2, Frequency MHz = 5210.00000, Modulation = 802.11ax HE80 SS1 (OFDMA MCS11), Mode = MIMO CCD Mode 2x2, Number of Transmission Chains = 2

Images:



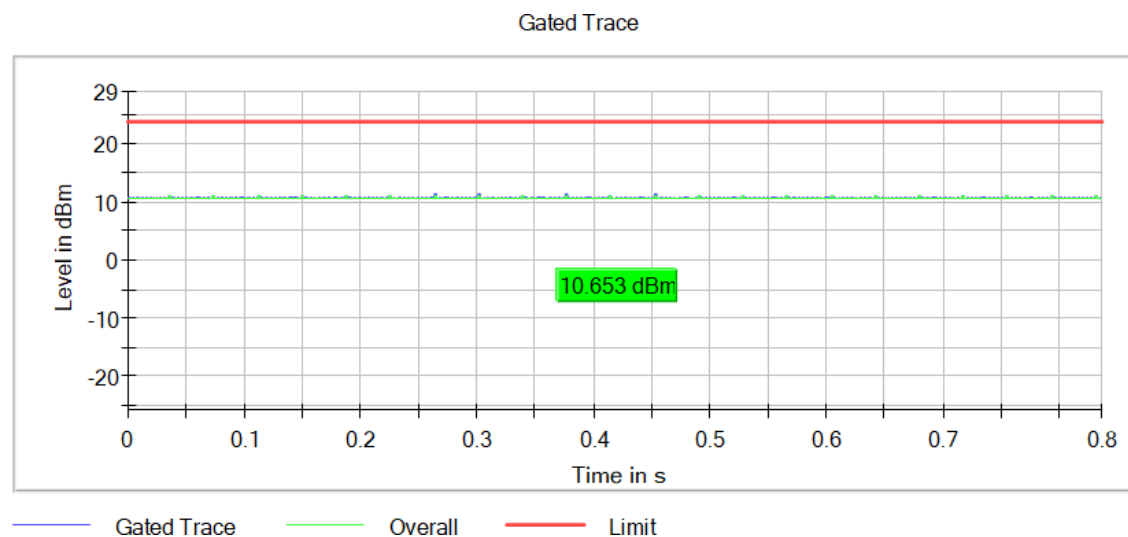
Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 1+2, Frequency MHz = 5290.00000, Modulation = 802.11ax HE80 SS1 (OFDMA MCS11), Mode = MIMO CCD Mode 2x2, Number of Transmission Chains = 2

Images:



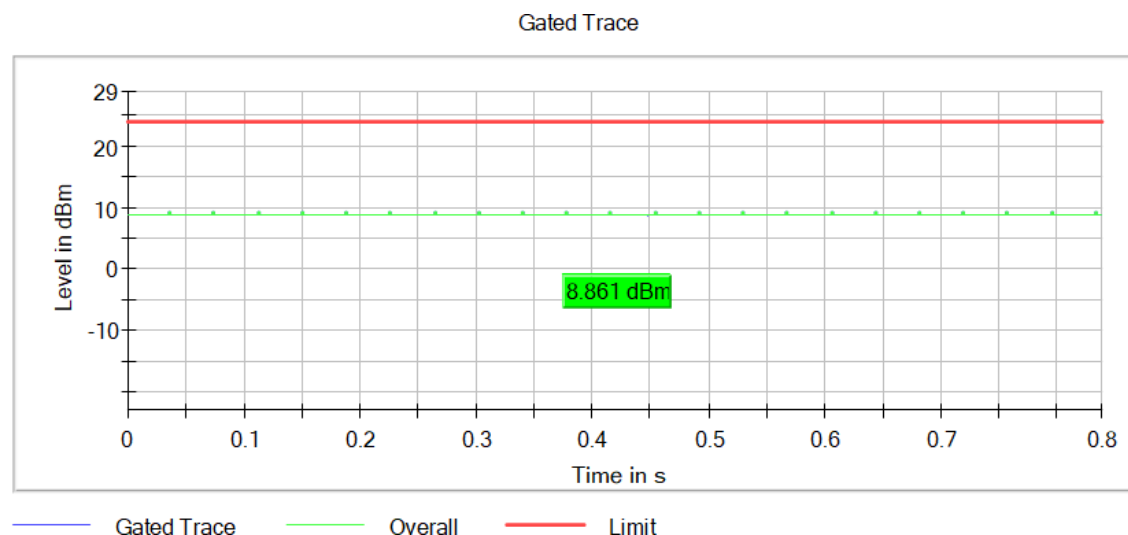
Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 1+2, Frequency MHz = 5530.00000, Modulation = 802.11ax HE80 SS1 (OFDMA MCS11), Mode = MIMO CCD Mode 2x2, Number of Transmission Chains = 2

Images:



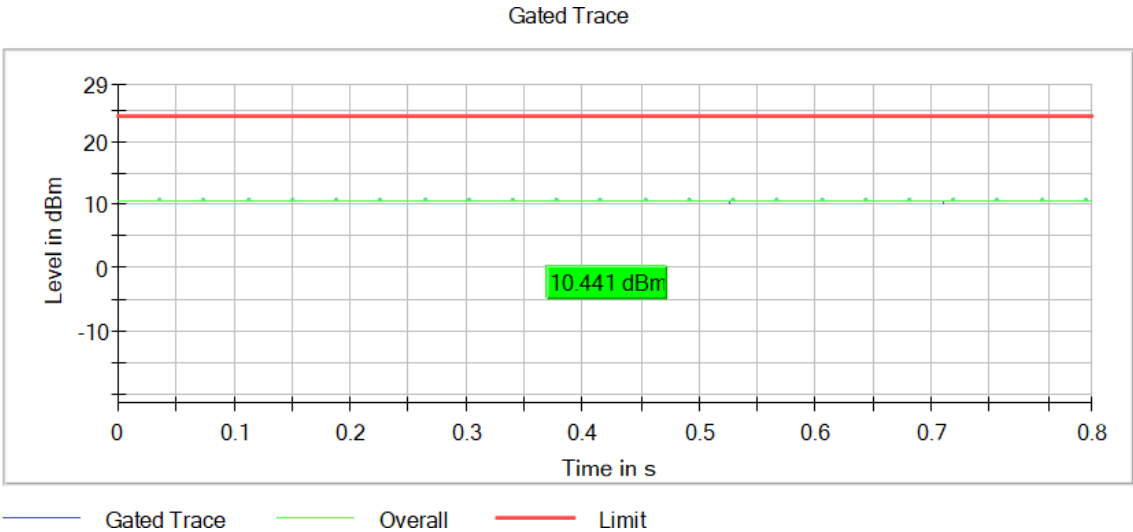
Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 1+2, Frequency MHz = 5610.00000, Modulation = 802.11ax HE80 SS1 (OFDMA MCS11), Mode = MIMO CCD Mode 2x2, Number of Transmission Chains = 2

Images:



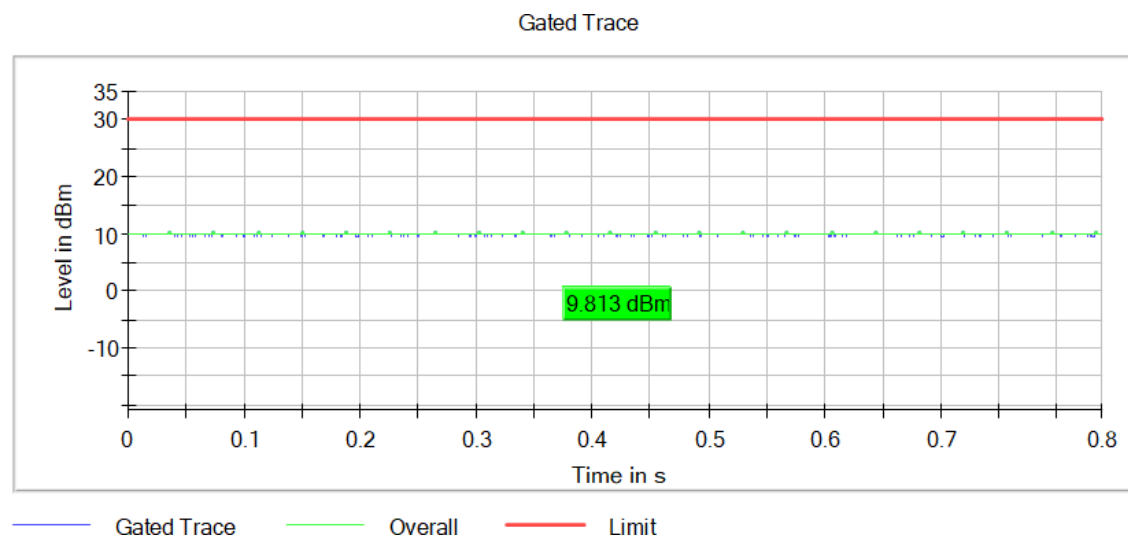
Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Active Port = 1+2, Frequency MHz = 5775.00000, Modulation = 802.11ax HE80 SS1 (OFDMA MCS11), Mode = MIMO CCD Mode 2x2, Number of Transmission Chains = 2

Images:



Tables:

Spectrum Analyzer Parameters

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 μ s	1.000 μ s

Test Condition: TC#02 (ax mode beam forming)

UNII-1:

Bandwidth: 20 MHz

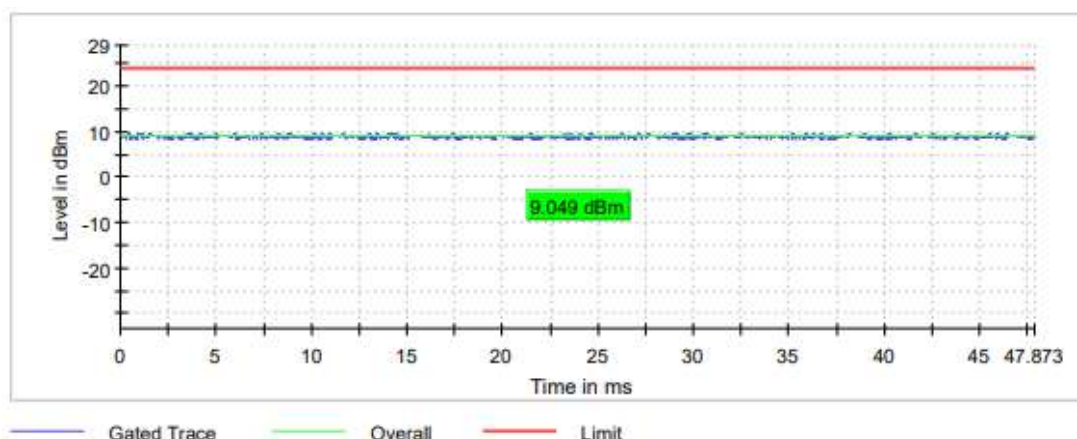
Maximum declared antenna gain: -2.8 dBi

Directional Gain: +0.2 dBi

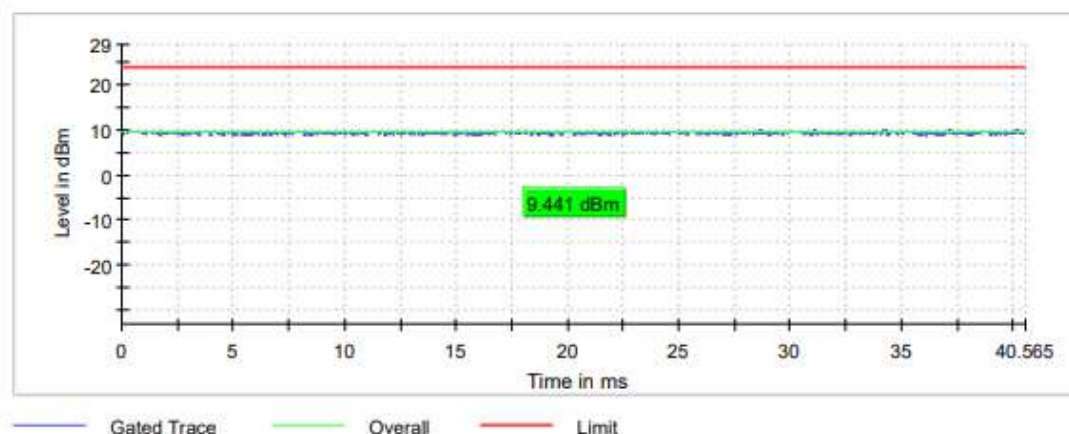
	Lowest frequency 5260MHz	Middle frequency 5280 MHz	Highest frequency 5320 MHz
Maximum conducted power (dBm)	9.049	9.441	9.411
Maximum EIRP power (dBm)	9.249	9.641	9.611

The maximum directional gain of the antenna is less than 6 dBi and therefore the maximum output power is not required to be reduced from the stated values.

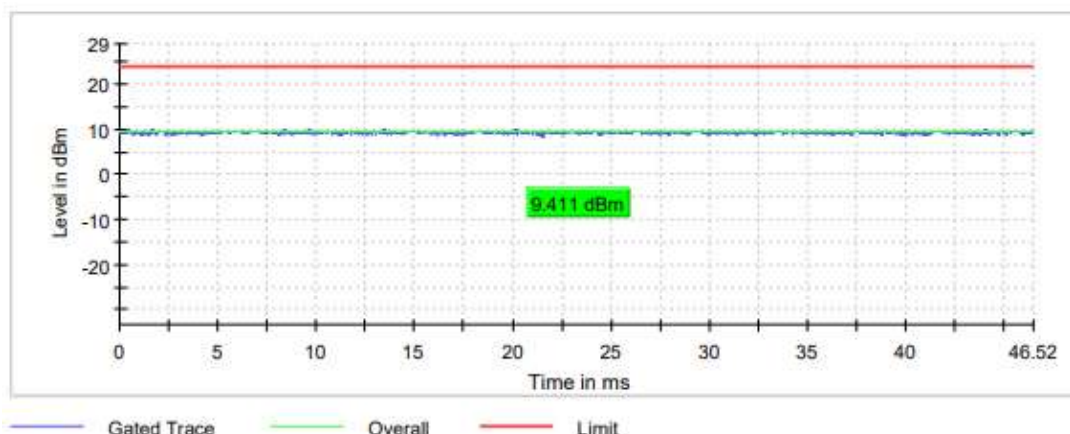
Lowest Channel



Middle Channel



High Channel



Bandwidth: 40 MHz

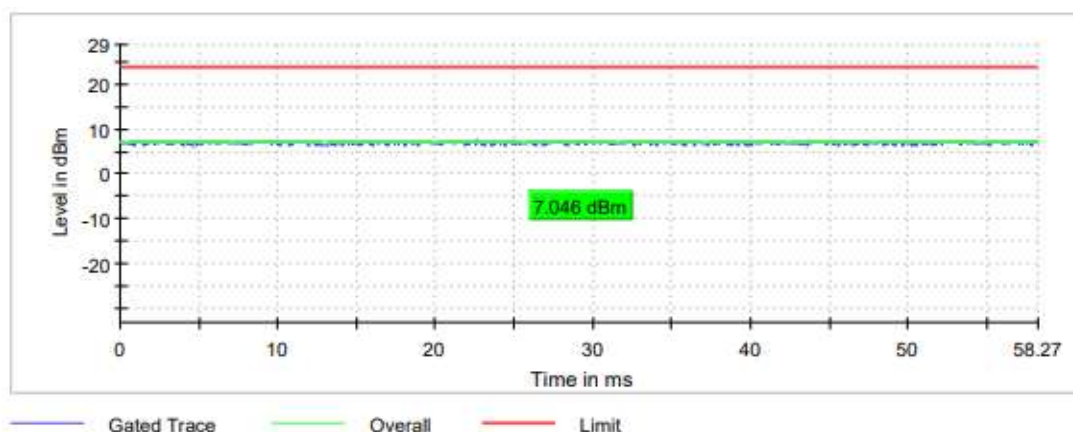
Maximum declared antenna gain: -2.8 dBi

Directional Gain: +0.2 dBi

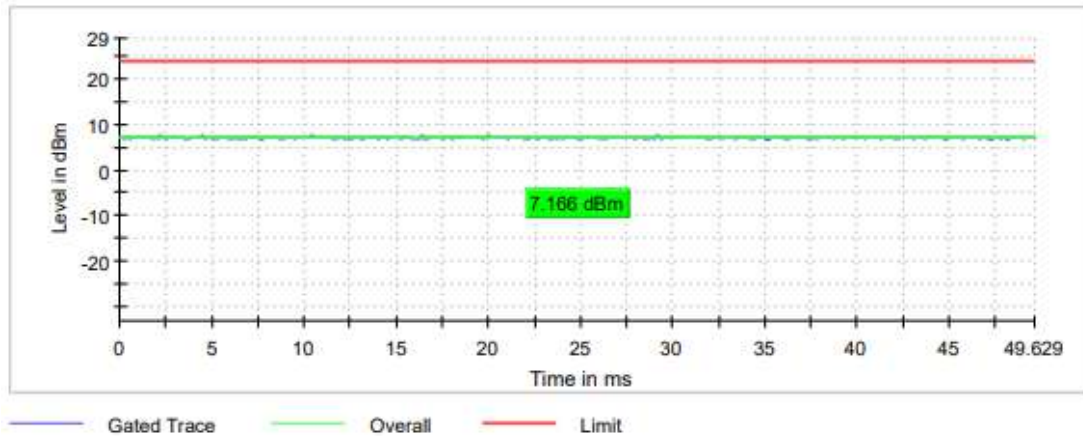
	Lowest frequency 5270 MHz	Highest frequency 5310 MHz
Maximum conducted power (dBm)	7.046	7.166
Maximum EIRP power (dBm)	7.246	7.366

The maximum directional gain of the antenna is less than 6 dBi and therefore the maximum output power is not required to be reduced from the stated values.

Lowest Channel



Highest Channel



Bandwidth: 80 MHz

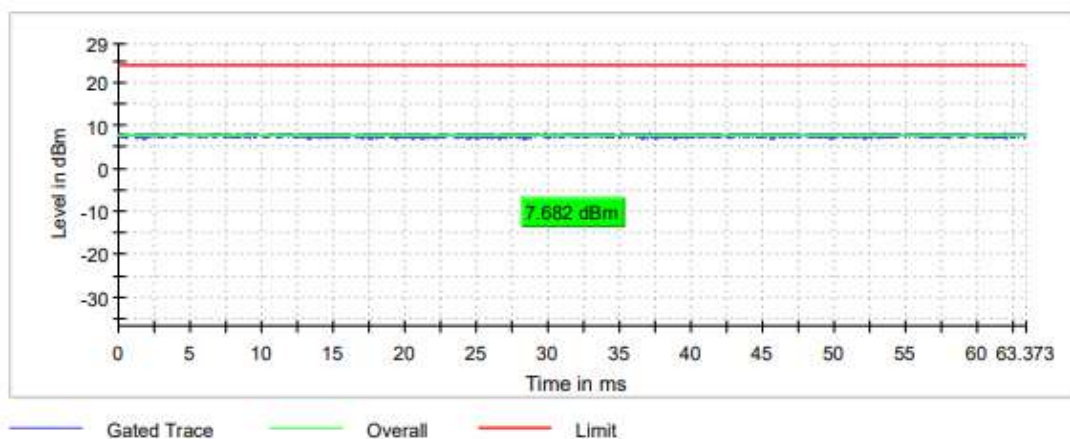
Maximum declared antenna gain: -2.8 dBi

Directional Gain: +0.2 dBi

	Lowest frequency 5290 MHz
Maximum conducted power (dBm)	7.682
Maximum EIRP power (dBm)	7.882

The maximum directional gain of the antenna is less than 6 dBi and therefore the maximum output power is not required to be reduced from the stated values.

Lowest Channel



Measurement Setup

Setting	Instrument Value
Measurement Time	1.000 s
Points	1000000
Time resolution	1.000 μ s

UNII-2A:

Bandwidth: 20 MHz

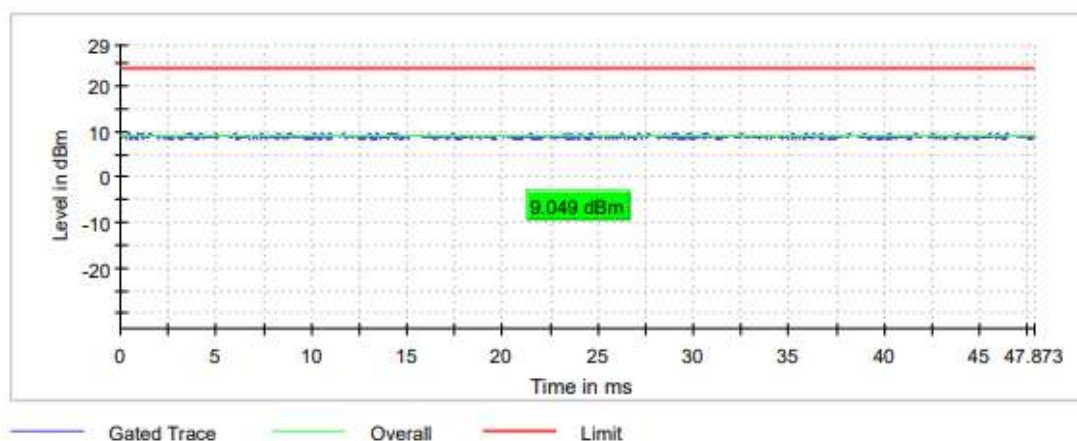
Maximum declared antenna gain: -2.8 dBi

Directional Gain: +0.2 dBi

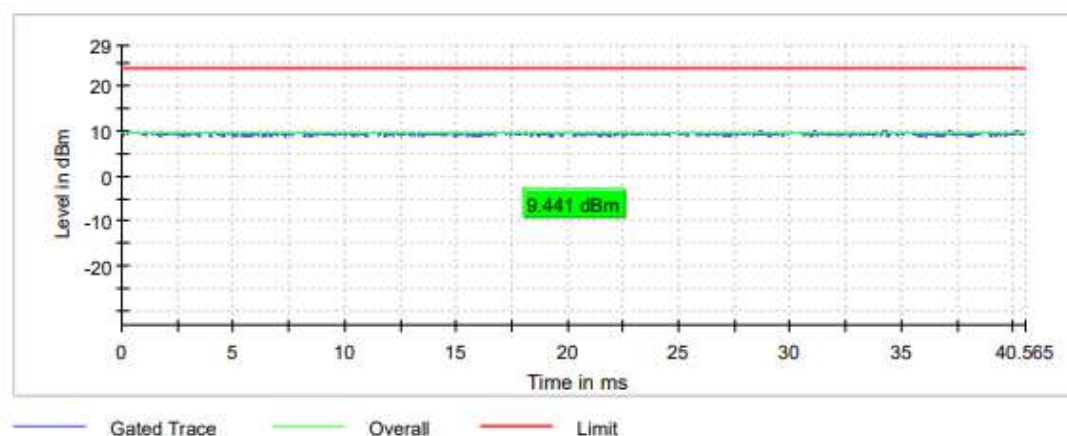
	Lowest frequency 5260MHz	Middle frequency 5280 MHz	Highest frequency 5320 MHz
Maximum conducted power (dBm)	9.049	9.441	9.411
Maximum EIRP power (dBm)	9.249	9.641	9.611

The maximum directional gain of the antenna is less than 6 dBi and therefore the maximum output power is not required to be reduced from the stated values.

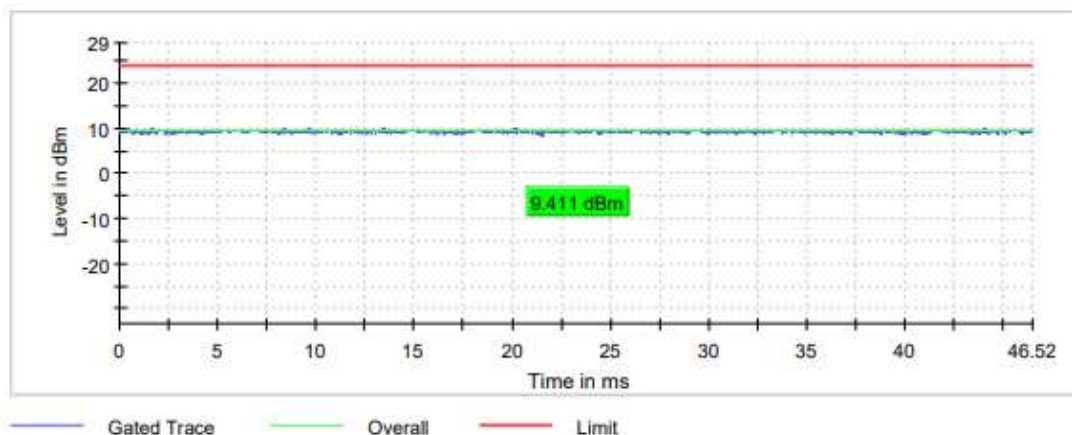
Lowest Channel



Middle Channel



High Channel



Bandwidth: 40 MHz

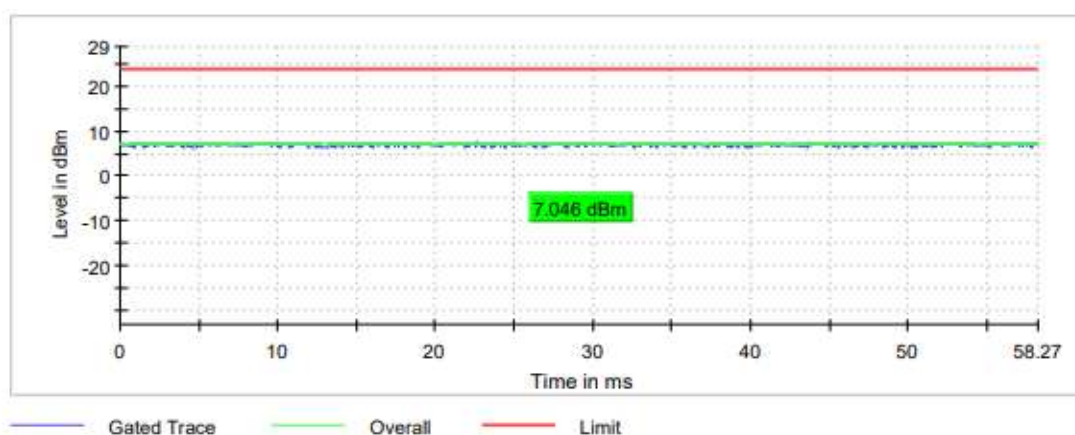
Maximum declared antenna gain: -2.8 dBi

Directional Gain: +0.2 dBi

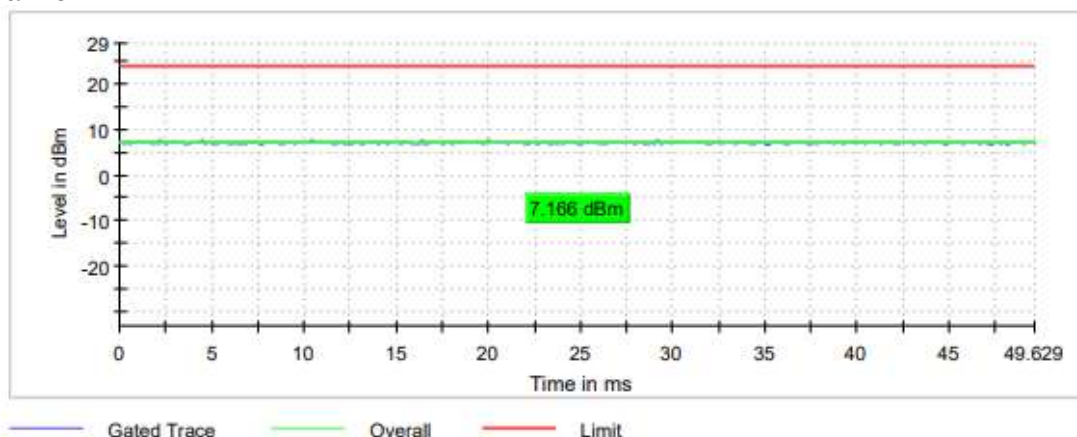
	Lowest frequency 5270 MHz	Highest frequency 5310 MHz
Maximum conducted power (dBm)	7.046	7.166
Maximum EIRP power (dBm)	7.246	7.366

The maximum directional gain of the antenna is less than 6 dBi and therefore the maximum output power is not required to be reduced from the stated values.

Lowest Channel



Highest Channel



Bandwidth: 80 MHz

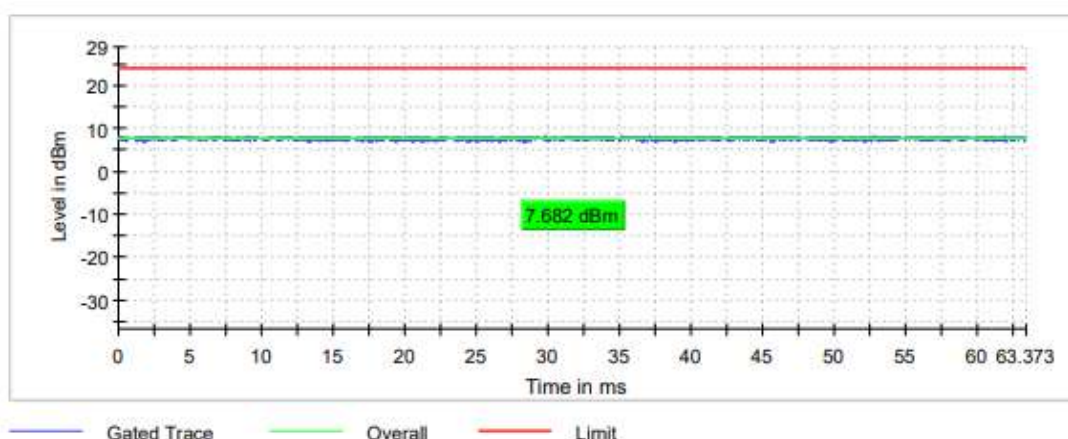
Maximum declared antenna gain: -2.8 dBi

Directional Gain: +0.2 dBi

	Lowest frequency 5290 MHz
Maximum conducted power (dBm)	7.682
Maximum EIRP power (dBm)	7.882

The maximum directional gain of the antenna is less than 6 dBi and therefore the maximum output power is not required to be reduced from the stated values.

Lowest Channel



Measurement Setup

Setting	Instrument Value
Measurement Time	1.000 s
Points	1000000
Time resolution	1.000 μ s

UNII-2C:

Bandwidth: 20 MHz

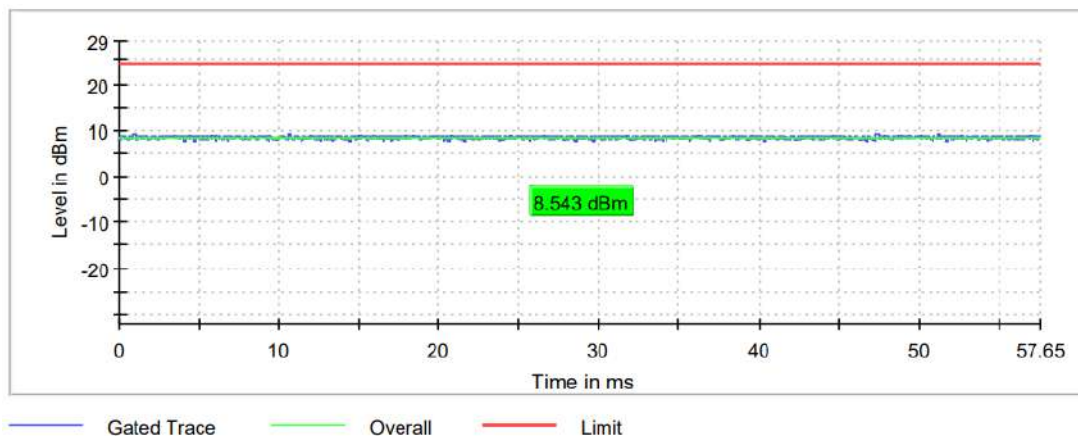
Maximum declared antenna gain: -2.8 dBi

Directional Gain: +0.2 dBi

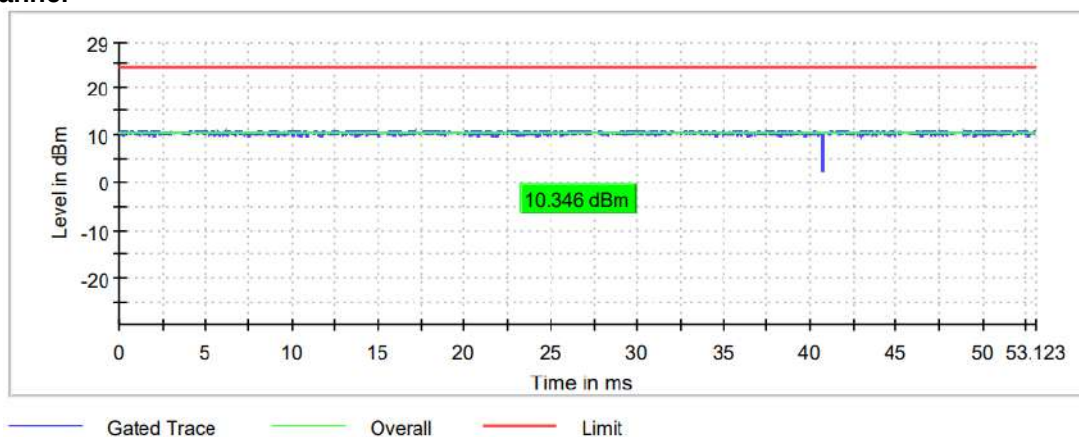
	Lowest frequency 5500 MHz	Middle frequency 5580 MHz	Highest frequency 5700 MHz
Maximum conducted power (dBm)	8.543	10.346	9.814
Maximum EIRP power (dBm)	8.743	10.546	10.014

The maximum directional gain of the antenna is less than 6 dBi and therefore the maximum output power is not required to be reduced from the stated values.

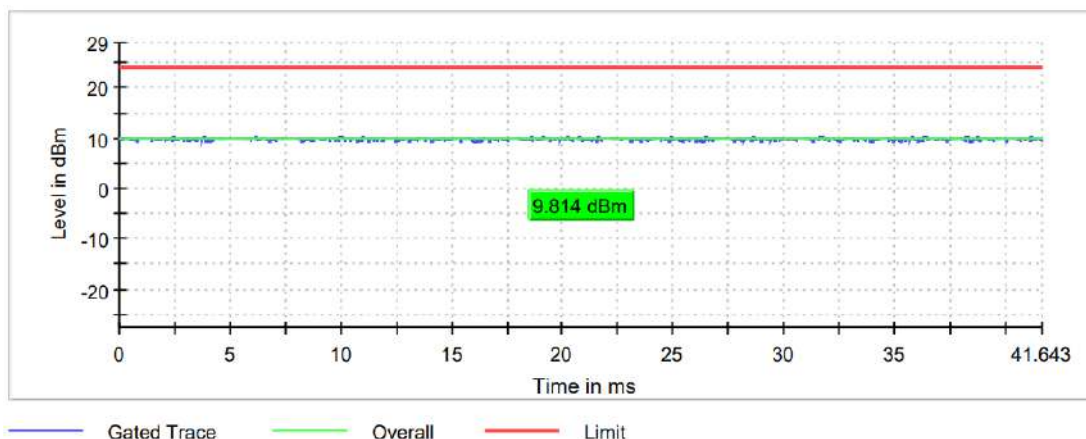
Lowest Channel



Middle Channel



High Channel



Bandwidth: 40 MHz

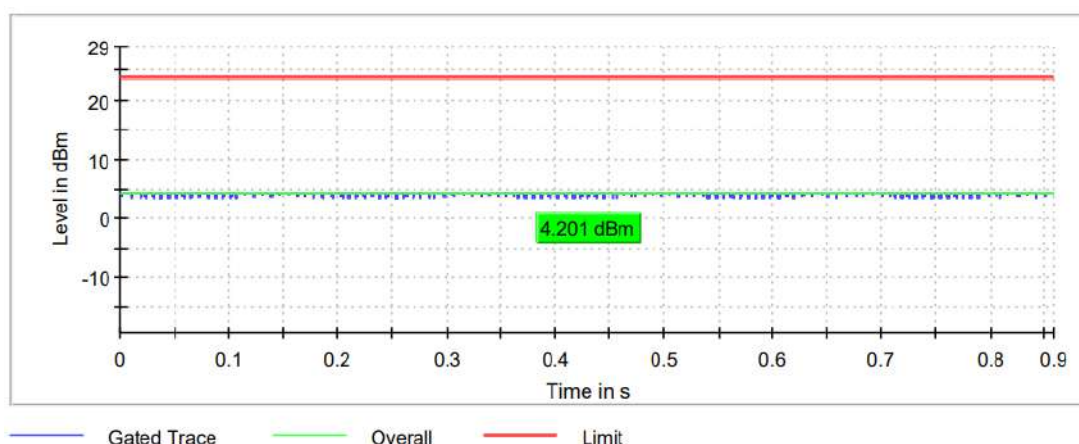
Maximum declared antenna gain: -2.8 dBi

Directional Gain: +0.2 dBi

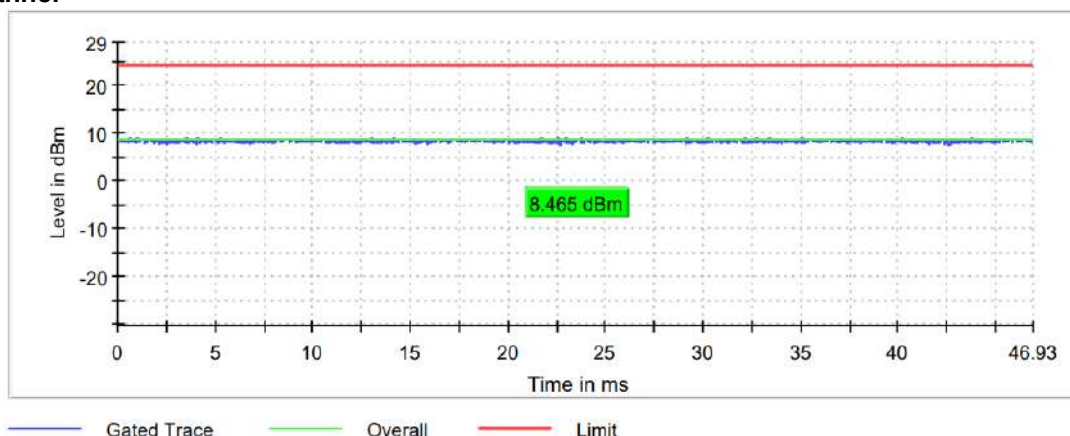
	Lowest frequency 5510 MHz	Middle frequency 5550 MHz	Highest frequency 5670 MHz
Maximum conducted power (dBm)	4.201	8.465	8.363
Maximum EIRP power (dBm)	4.401	8.665	8.563

The maximum directional gain of the antenna is less than 6 dBi and therefore the maximum output power is not required to be reduced from the stated values.

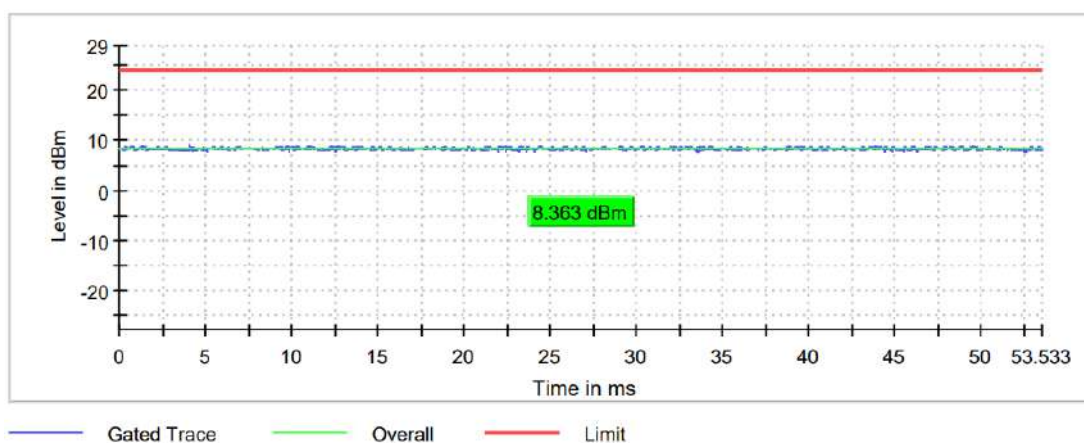
Lowest Channel



Middle Channel



Highest Channel



Bandwidth: 80 MHz

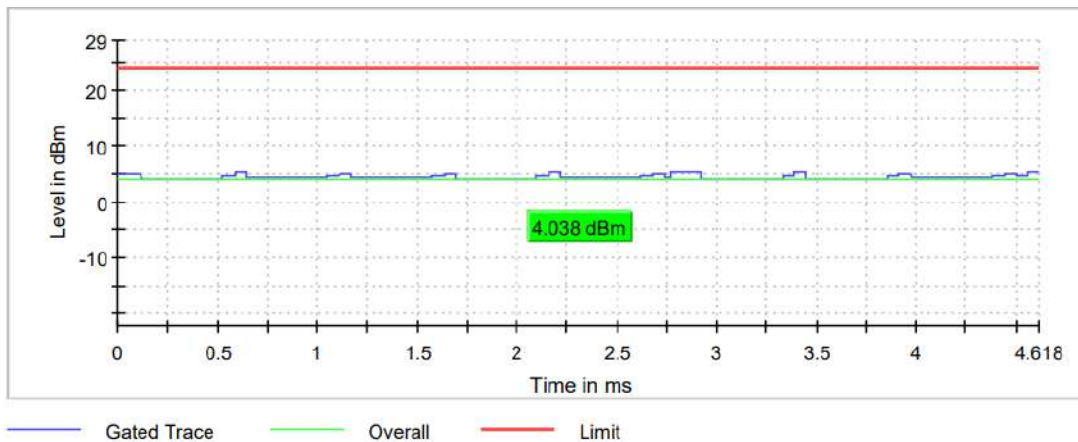
Maximum declared antenna gain: -2.8 dBi

Directional Gain: +0.2 dBi

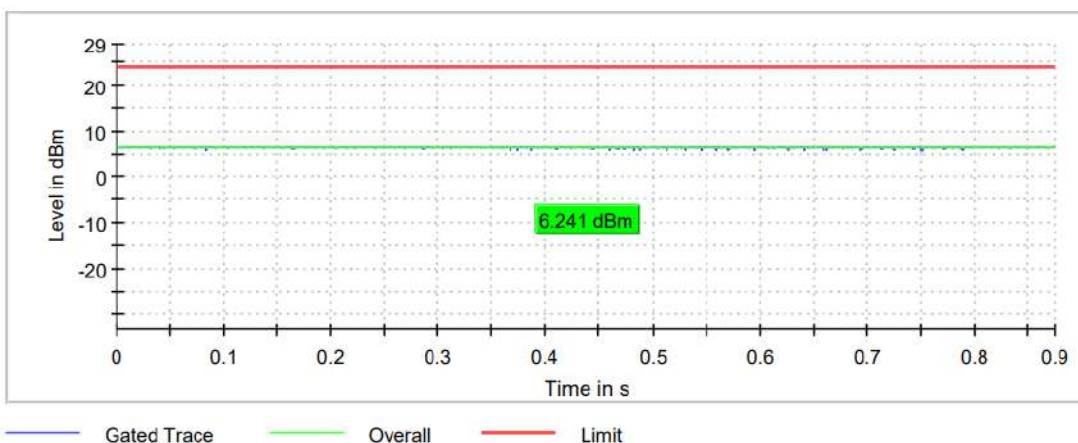
	Lowest frequency 5530 MHz	Highest frequency 5610 MHz
Maximum conducted power (dBm)	4.038	6.241
Maximum EIRP power (dBm)	4.238	6.441

The maximum directional gain of the antenna is less than 6 dBi and therefore the maximum output power is not required to be reduced from the stated values.

Lowest Channel



Highest Channel



UNII-3:

Bandwidth: 20 MHz

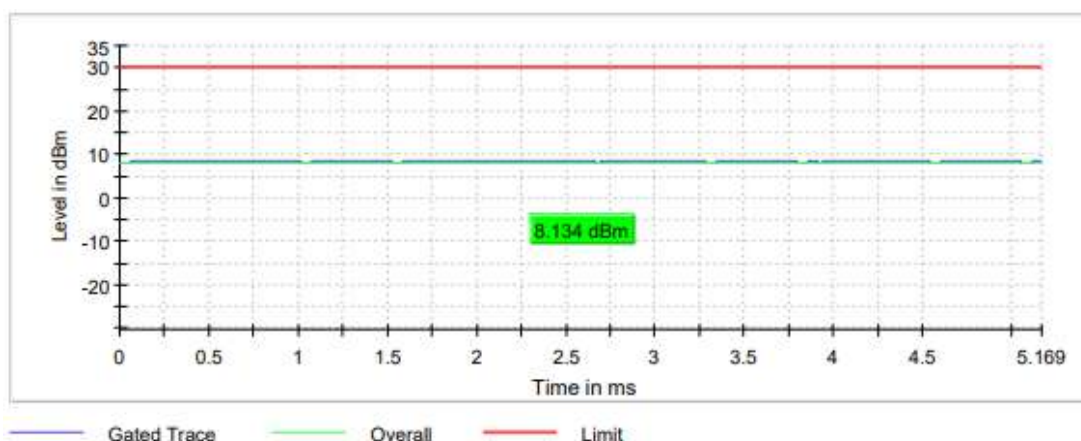
Maximum declared antenna gain: -2.8 dBi

Directional Gain: +0.2 dBi

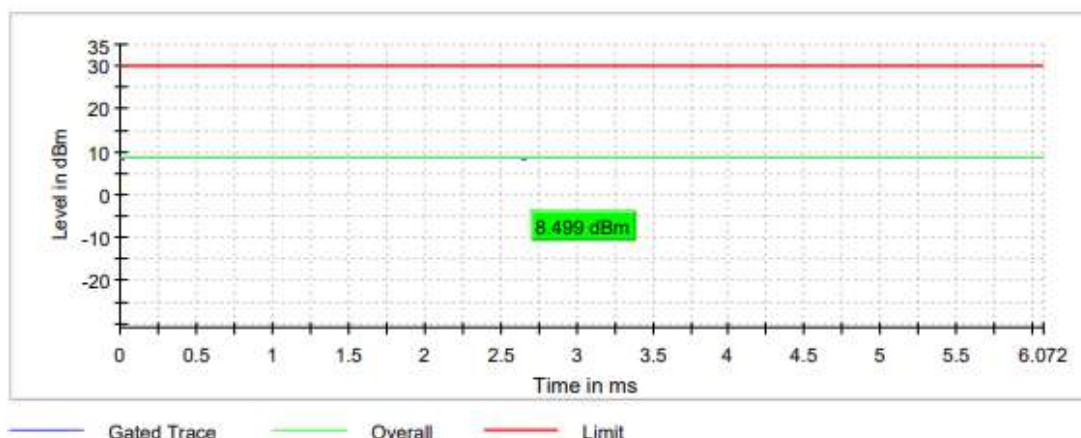
	Lowest frequency 5745 MHz	Middle frequency 5785 MHz	Highest frequency 5825 MHz
Maximum conducted power (dBm)	8.134	8.499	7.864
Maximum EIRP power (dBm)	8.334	8.699	8.064

The maximum directional gain of the antenna is less than 6 dBi and therefore the maximum output power is not required to be reduced from the stated values.

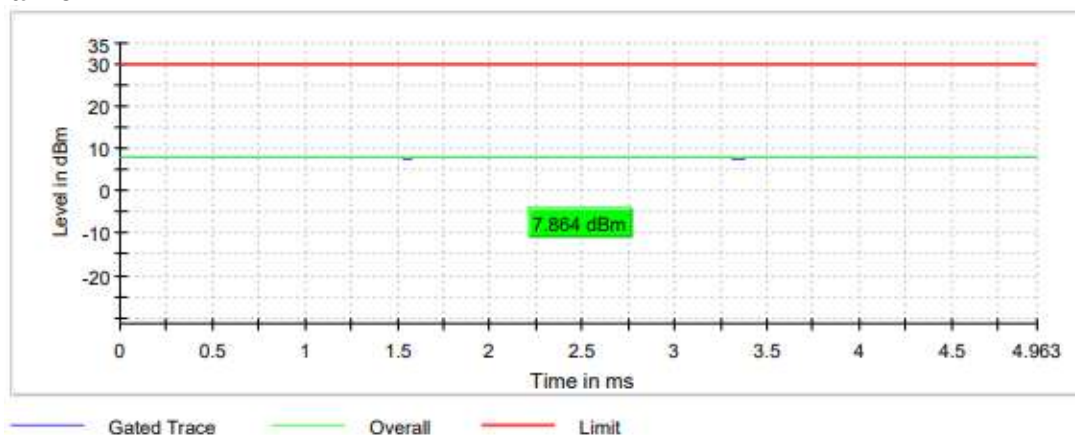
Lowest Channel



Middle Channel



Highest Channel



Bandwidth: 40 MHz

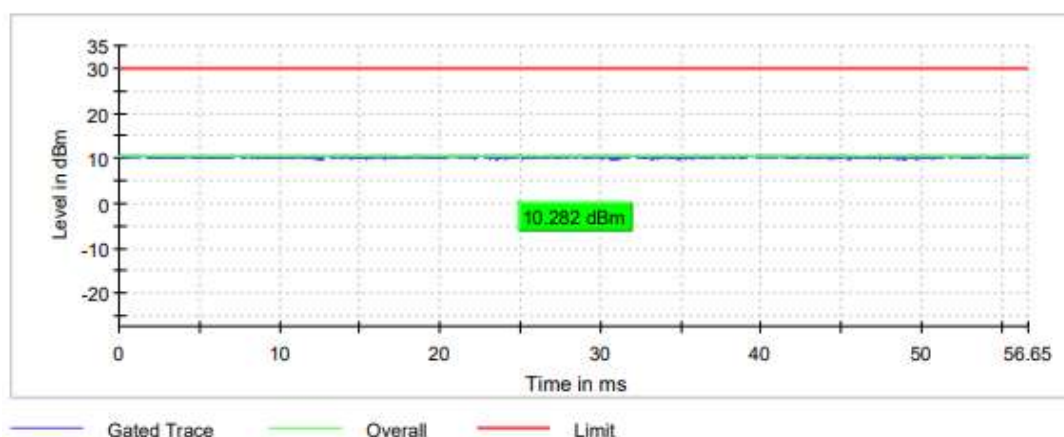
Maximum declared antenna gain: -2.8 dBi

Directional Gain: +0.2 dBi

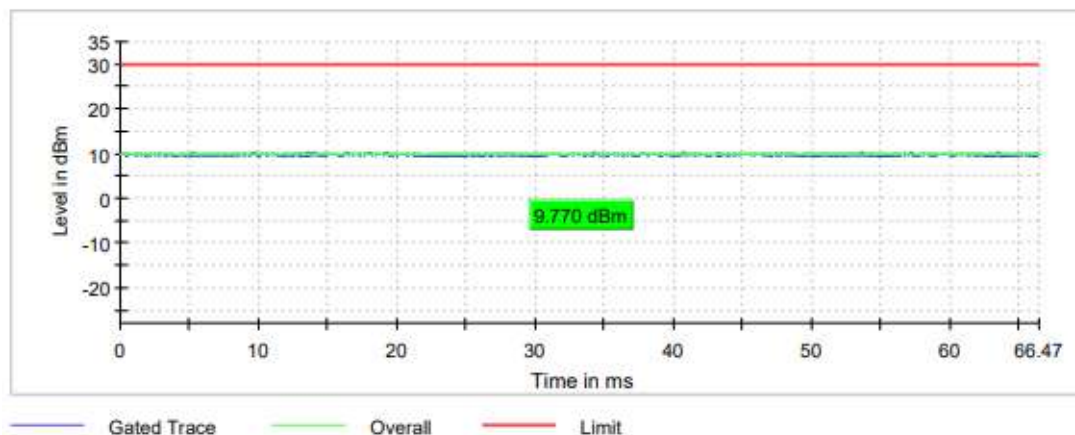
	Lowest frequency	Highest frequency
	5755 MHz	5795 MHz
Maximum conducted power (dBm)	10.282	9.770
Maximum EIRP power (dBm)	10.482	9.970

The maximum directional gain of the antenna is less than 6 dBi and therefore the maximum output power is not required to be reduced from the stated values.

Lowest Channel



Highest Channel



Bandwidth: 80 MHz

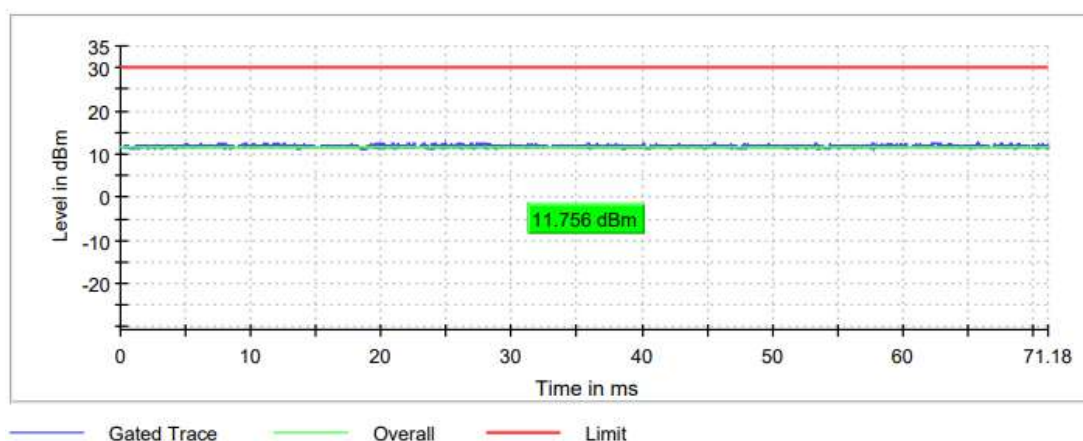
Maximum declared antenna gain: -2.8 dBi

Directional Gain: +0.2 dBi

	Lowest frequency 5775 MHz
Maximum conducted power (dBm)	11.756
Maximum EIRP power (dBm)	11.956

The maximum directional gain of the antenna is less than 6 dBi and therefore the maximum output power is not required to be reduced from the stated values.

Lowest Channel



Measurement Setup

Setting	Instrument Value
Measurement Time	1.000 s
Points	1000000
Time resolution	1.000 μ s

SECTION F.2: RSS-247 6.2.4.1 / FCC 15.407 (A) (3) TRANSMITTER MAXIMUM POWER SPECTRAL DENSITY IN U-NII BANDS

Limits

FCC 15.407:

For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the band 5.725-5.850 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

RSS-247:

For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or $1.76 + 10 \log_{10} B$, dBm, whichever is less. Devices shall implement TPC in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.

For devices other than devices installed in vehicles:

For the band 5.15-5.25 GHz, the maximum e.i.r.p. shall not exceed 200 mW (23 dBm) or $10 + 10 \log_{10} B$, dBm, whichever power is less. B is the 99% emission bandwidth in MHz.

For the 5.25-5.35 GHz, 5.470-5.6 GHz, and 5.650-5.725 GHz bands, the maximum conducted output power shall not exceed 250 mW (24 dBm) or $11 + 10 \log_{10} B$, dBm, whichever power is less. The maximum e.i.r.p. shall not exceed 1.0 W or $17 + 10 \log_{10} B$, dBm, whichever is less

For the band 5.725-5.850 GHz, the maximum conducted output power shall not exceed 1 W. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the output power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For all modes, the maximum power spectral density level in the fundamental emission was measured using the method according to point F) (Method SA-1) of Guidance 789033 D02 General UNII Test Procedures New Rules v01.

Note: The following test results are shown based on KDB 662911 D01 Multiple Transmitter Output v02r01 E) 3) a) (ii) Measure and sum spectral maxima across the outputs as described in section E)2)b).

- 1- For 2Tx CDD MIMO modes, in accordance with KDB 662911 D01 v02r01 Section F)2)f)i), directional gain was calculated as follows:

- For power spectral density (PSD) measurements:

$$\text{Directional gain}_{\text{PSD}} = G_{\text{ANT}} + 10 \log(N_{\text{ANT}}/N_{\text{SS}}) \text{ dBi}$$

$$N_{\text{SS}} = 1 \text{ (worst case)}, N_{\text{ANT}} = 2, G_{\text{ANT}} = -2.8 \text{ dBi}$$

$$\text{Directional gain}_{\text{PSD}} = -2.8 + 10 \log(2/1) = -2.8 + 10 \log(2) = -2.8 + 3 = + 0.2 \text{ dBi}$$

$$\text{PSD Antenna Gain MIMO Chain 0 \& 1: } + 0.2 \text{ dBi}$$

For MIMO CDD operation modes, the limit should be reduced by the amount in dB the antenna gain exceeds 6 dBi. In this case the limit is not reduced due to the antenna gain calculations is +0.2dBi.

Test Condition: TC#01 (ax mode non-beam forming)

Modulation: 802.11ax HE20 SS1 (OFDMA MCS8)

Results

Port	Freq (MHz)	PSD (dBm)
1	5180.00000	-3.45
1	5200.00000	-3.08
1	5240.00000	-3.20
1	5260.00000	-3.00
1	5280.00000	-3.01
1	5320.00000	-2.89
1	5500.00000	-5.08
1	5580.00000	-2.51
1	5700.00000	-2.81
1	5745.00000	-5.99
1	5785.00000	-6.01
1	5825.00000	-4.87
2	5180.00000	-3.63
2	5200.00000	-3.38
2	5240.00000	-3.94
2	5260.00000	-3.48
2	5280.00000	-3.98
2	5320.00000	-4.06
2	5500.00000	-6.37
2	5580.00000	-5.71
2	5700.00000	-4.08
2	5745.00000	-7.26
2	5785.00000	-6.62
2	5825.00000	-5.16

Verdict

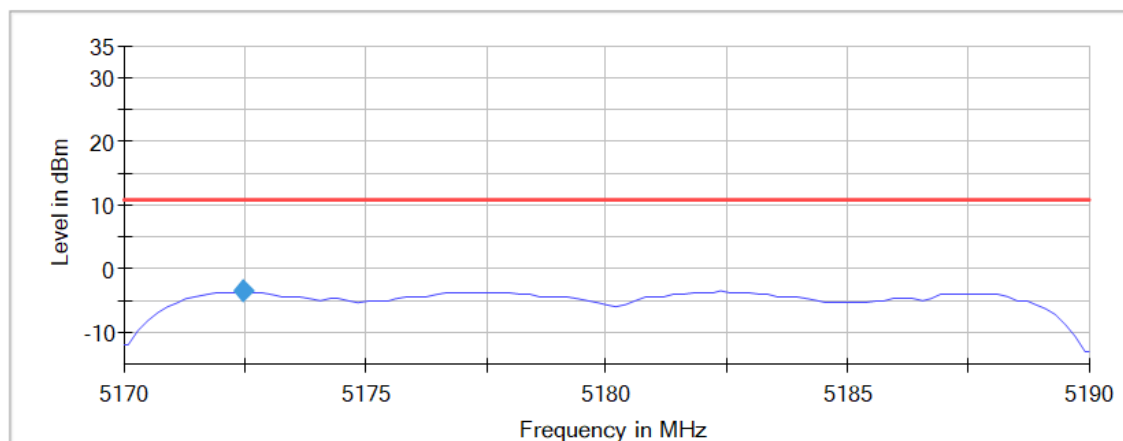
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Attachments

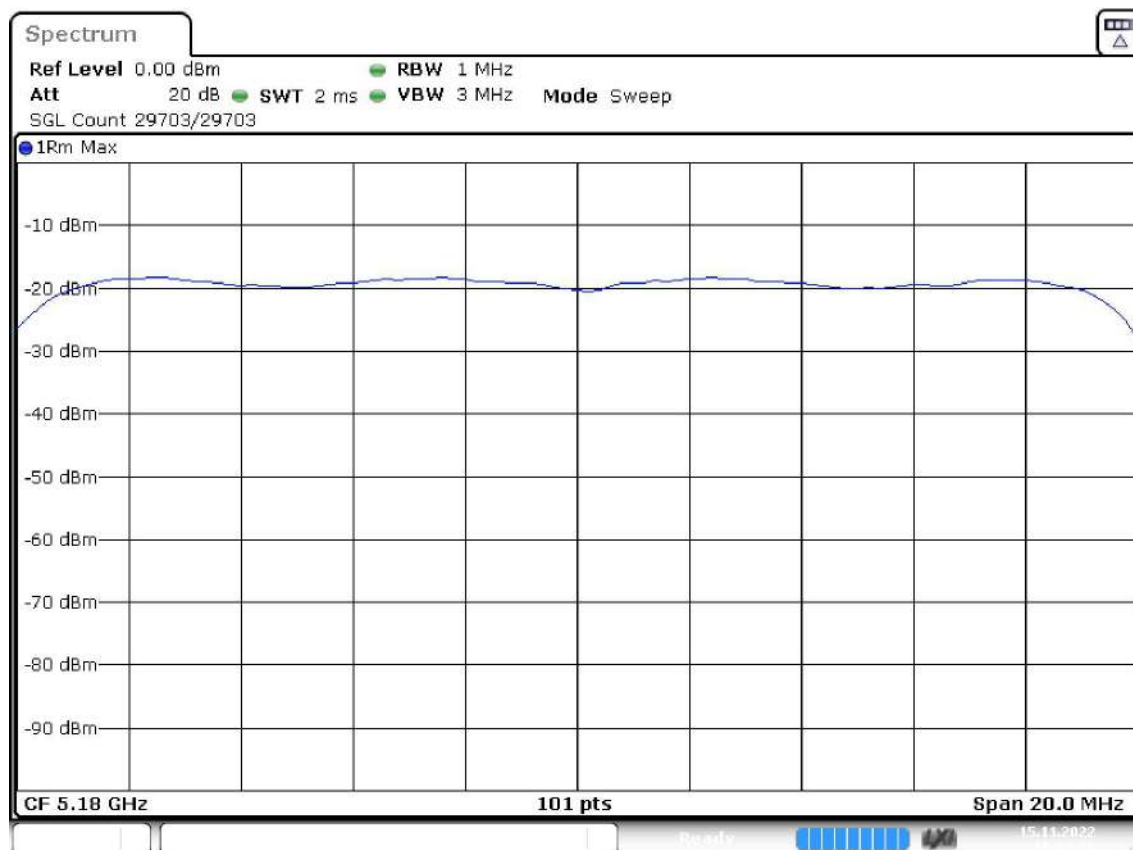
Active Port = 1, Frequency MHz = 5180.00000, Modulation = 802.11ax HE20 SS1 (OFDMA MCS8), Mode = SISO, Number of Transmission Chains = 1

Images:

Power Spectral Density (SA-3)



— Limit — Sum Level ◆ PSD

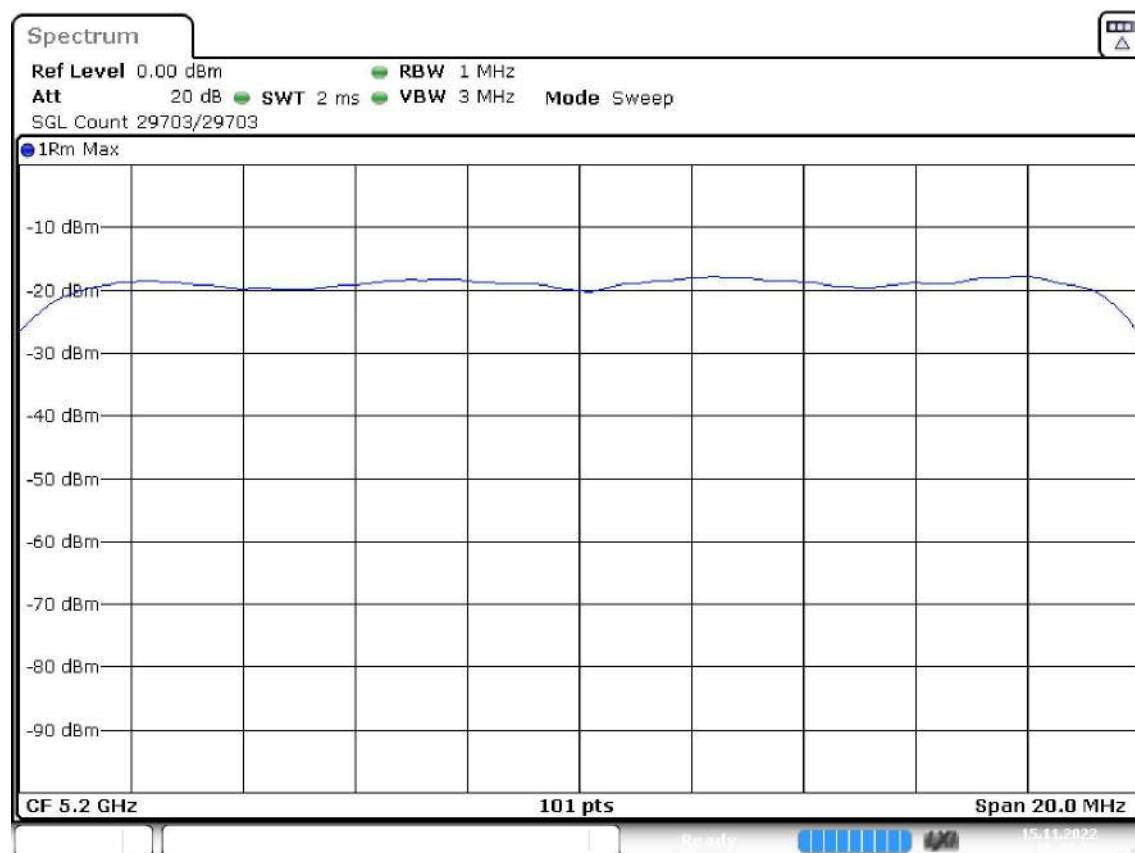
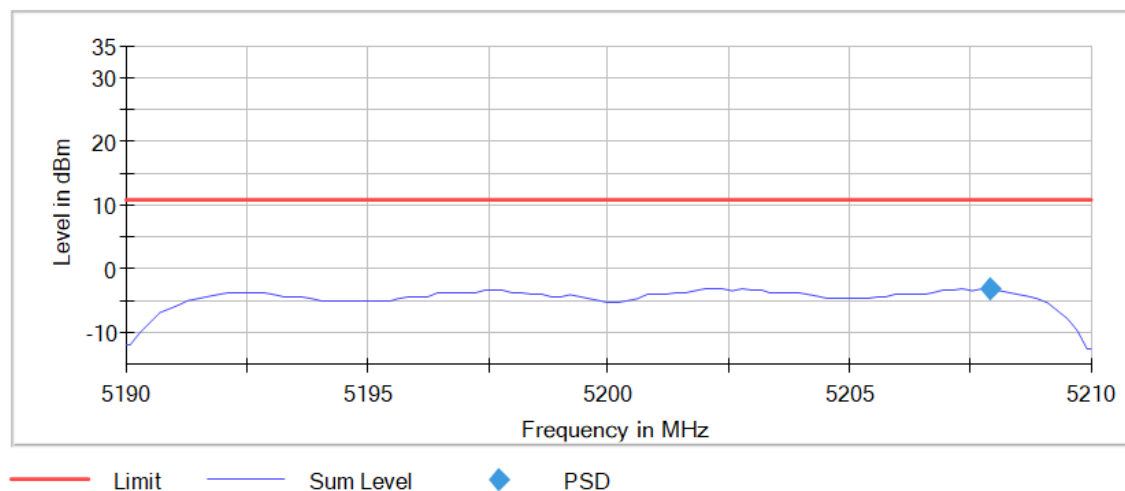


Date: 15.NOV.2022 16:22:58

Active Port = 1, Frequency MHz = 5200.00000, Modulation = 802.11ax HE20 SS1 (OFDMA MCS8), Mode = SISO, Number of Transmission Chains = 1

Images:

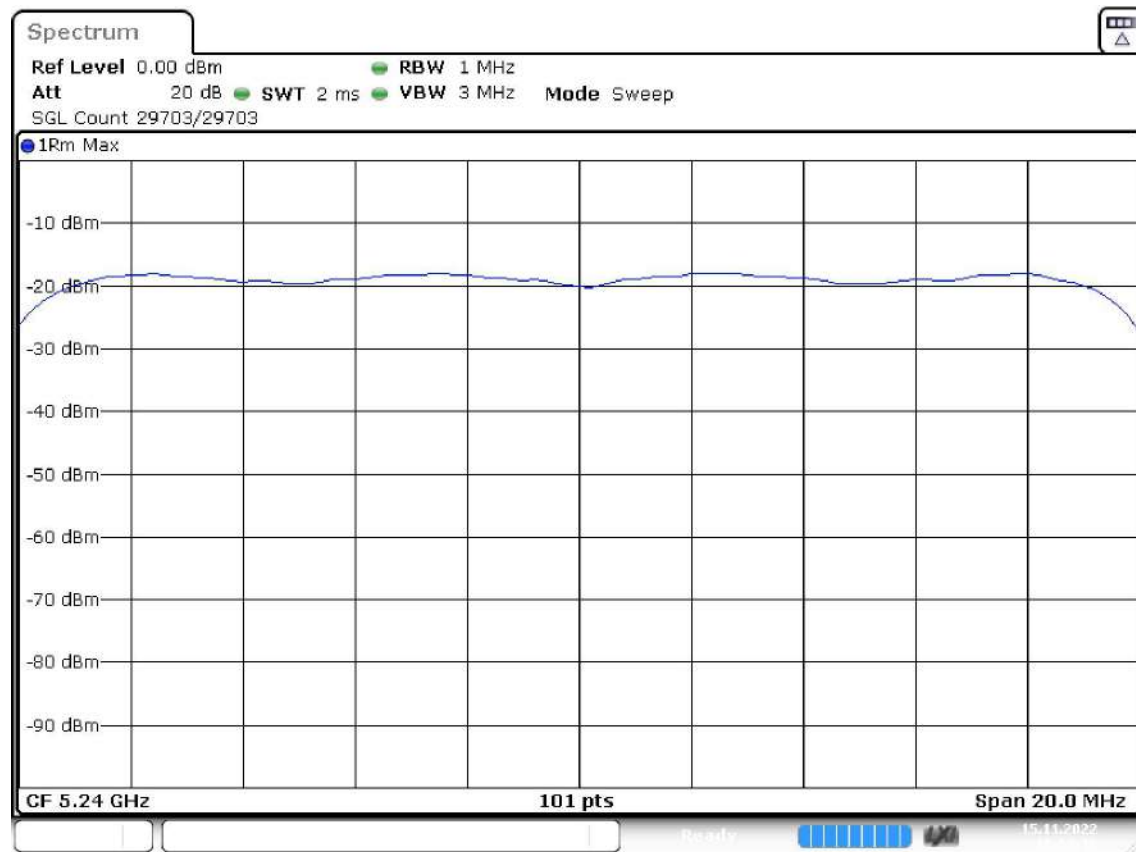
Power Spectral Density (SA-3)



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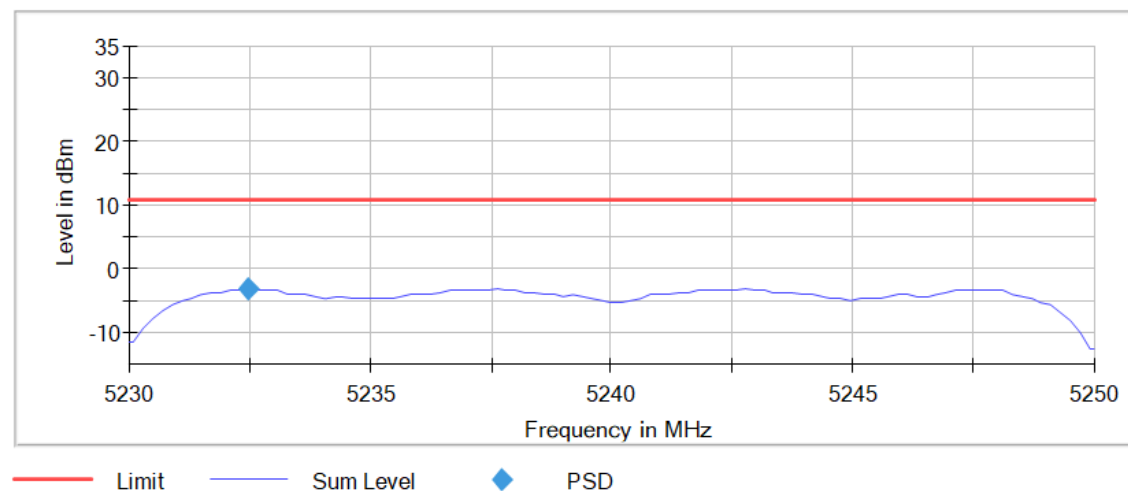
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Images:



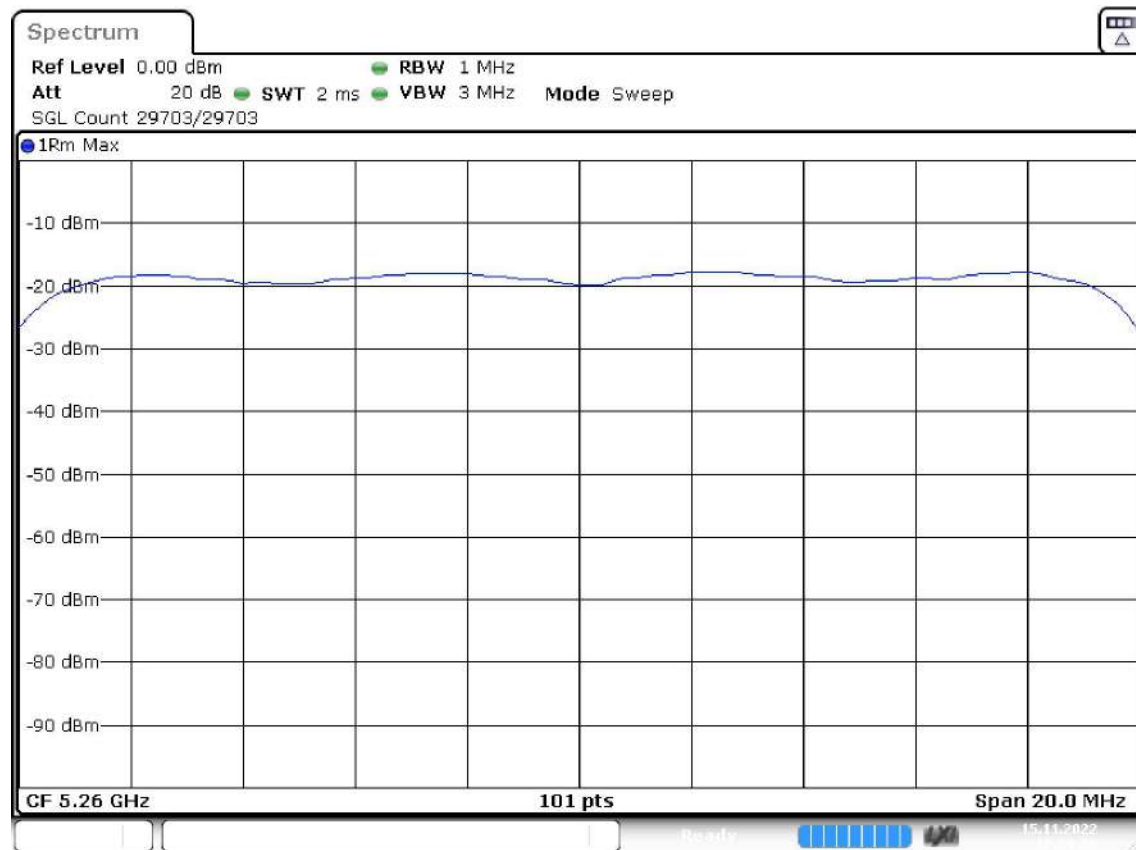
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Power Spectral Density (SA-3)



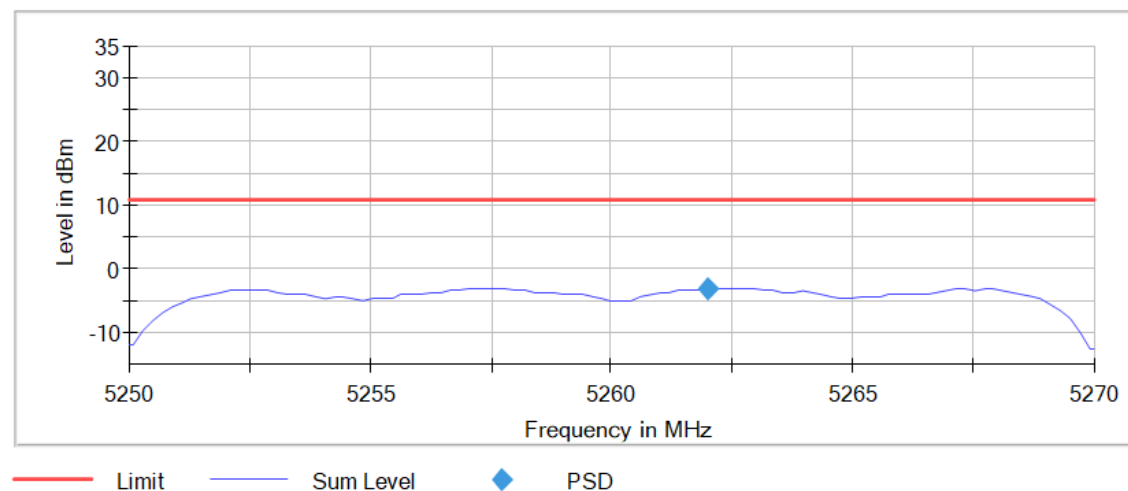
Active Port = 1, Frequency MHz = 5260.00000, Modulation = 802.11ax HE20 SS1 (OFDMA MCS8), Mode = SISO, Number of Transmission Chains = 1

Images:



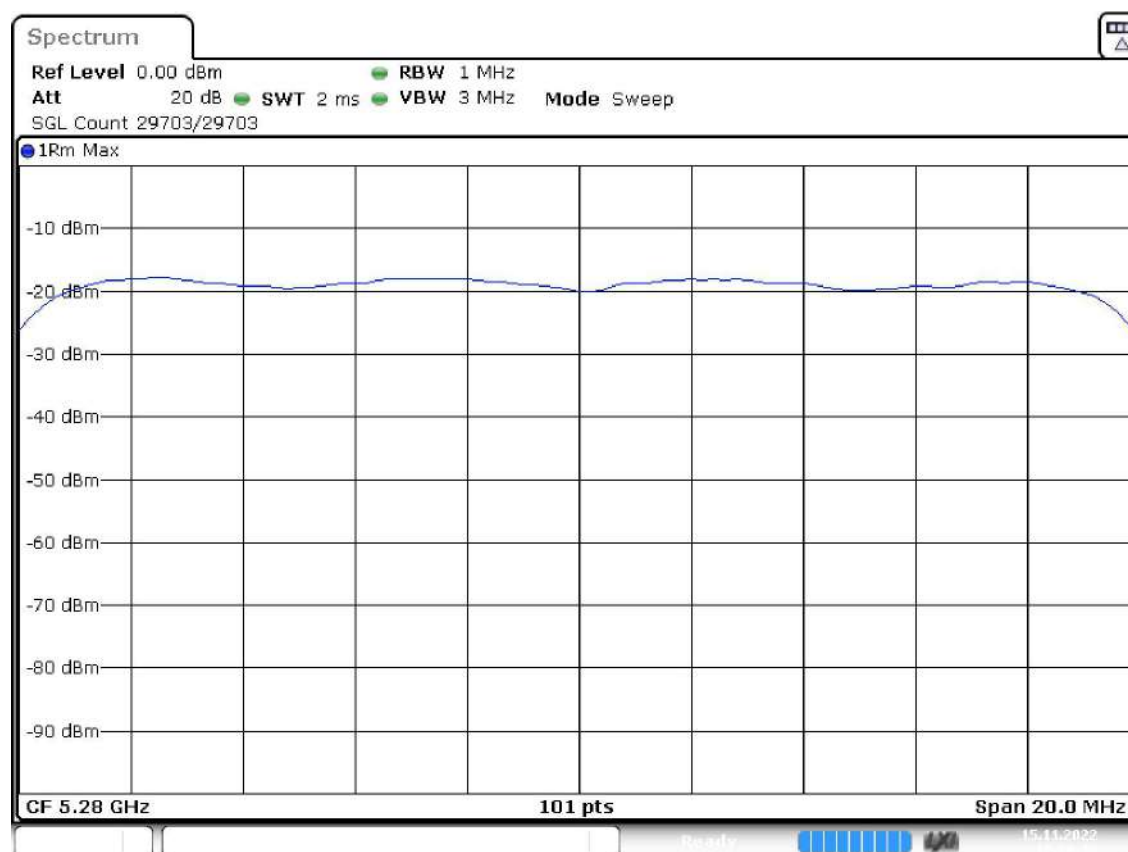
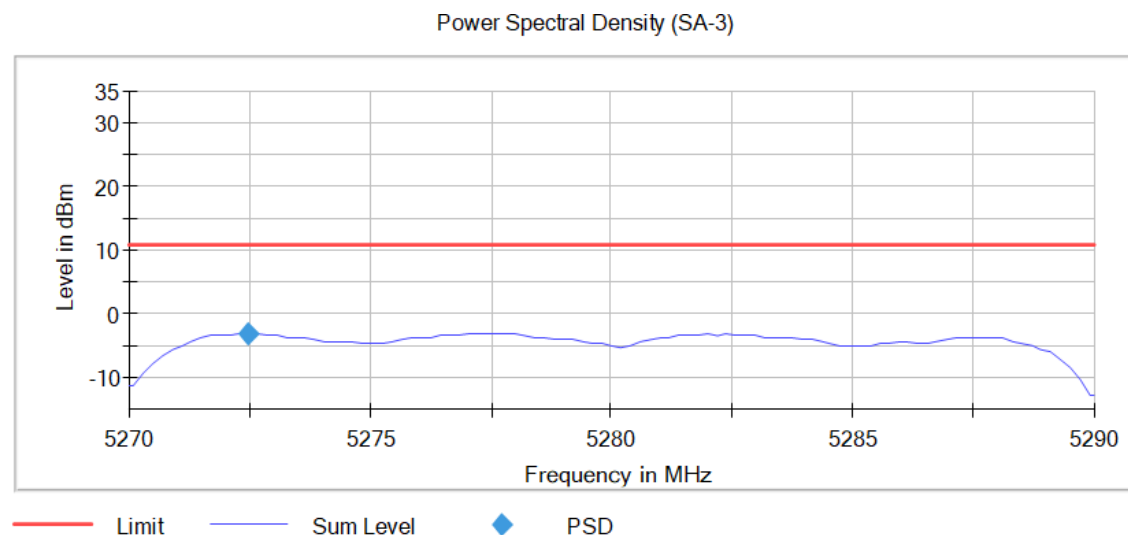
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Power Spectral Density (SA-3)



Active Port = 1, Frequency MHz = 5280.00000, Modulation = 802.11ax HE20 SS1 (OFDMA MCS8), Mode = SISO, Number of Transmission Chains = 1

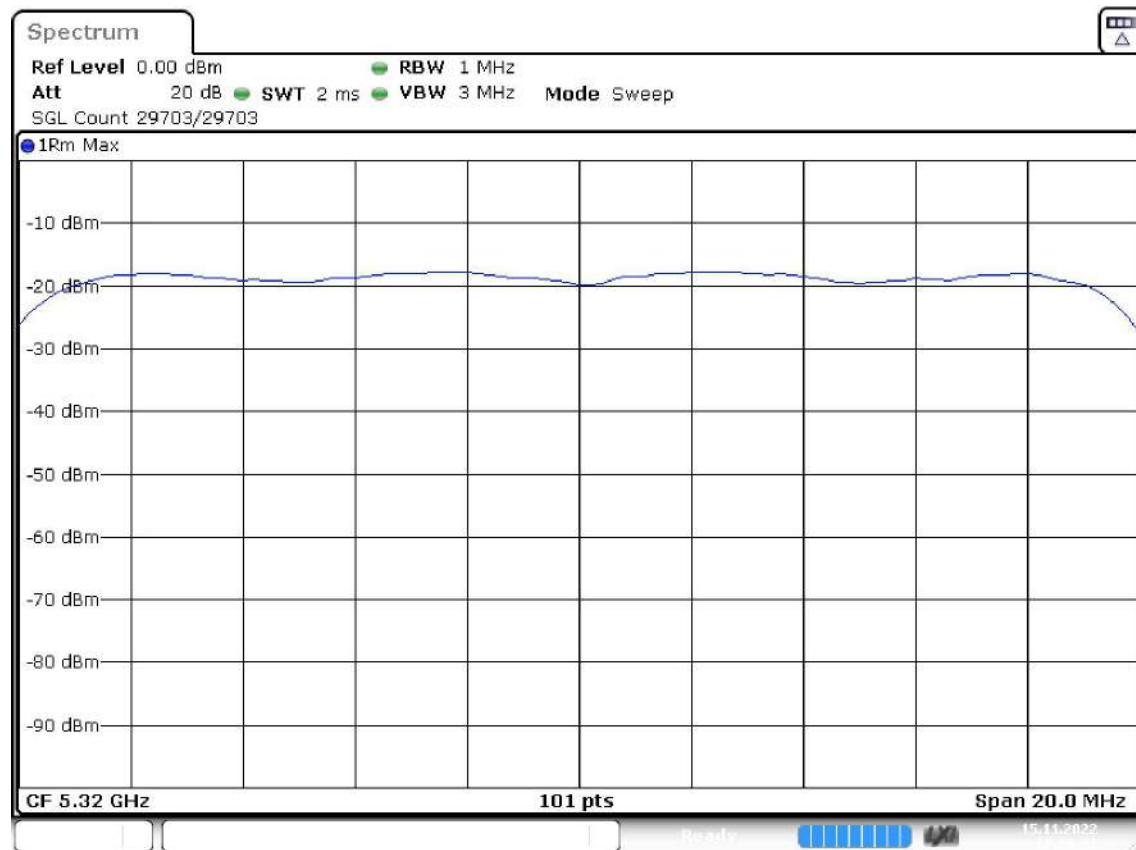
Images:



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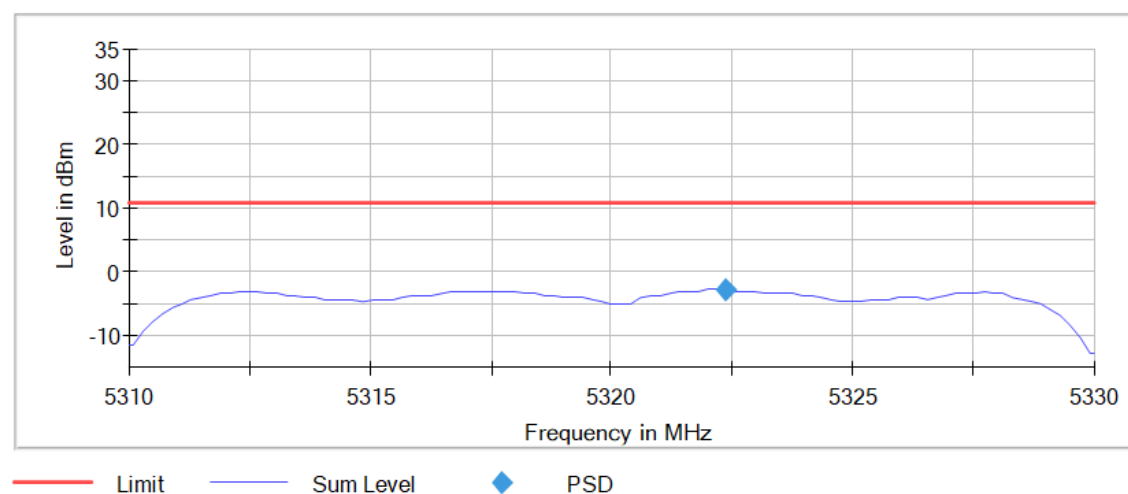
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Images:



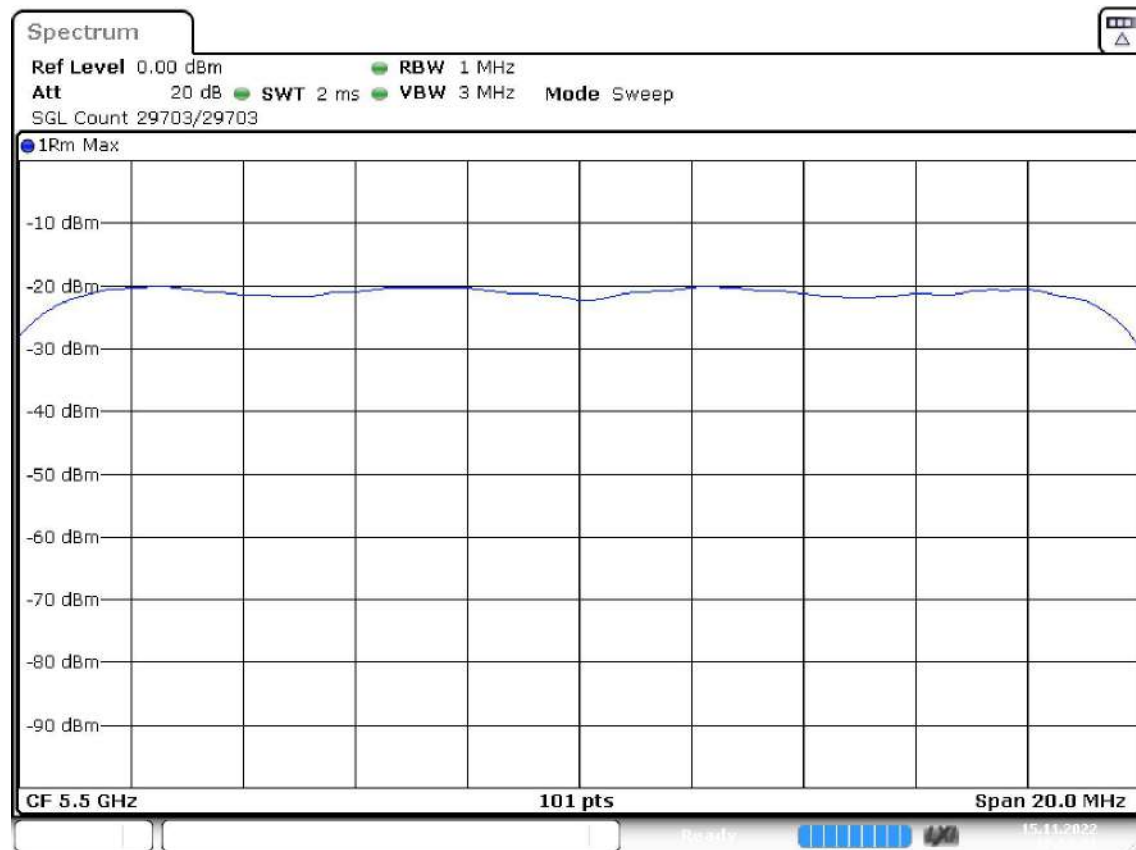
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Power Spectral Density (SA-3)



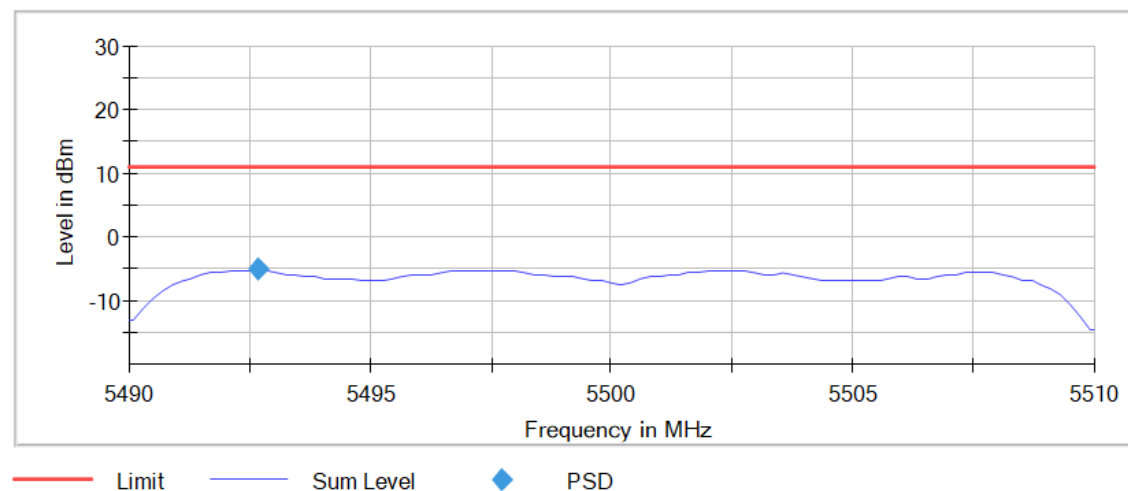
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Images:



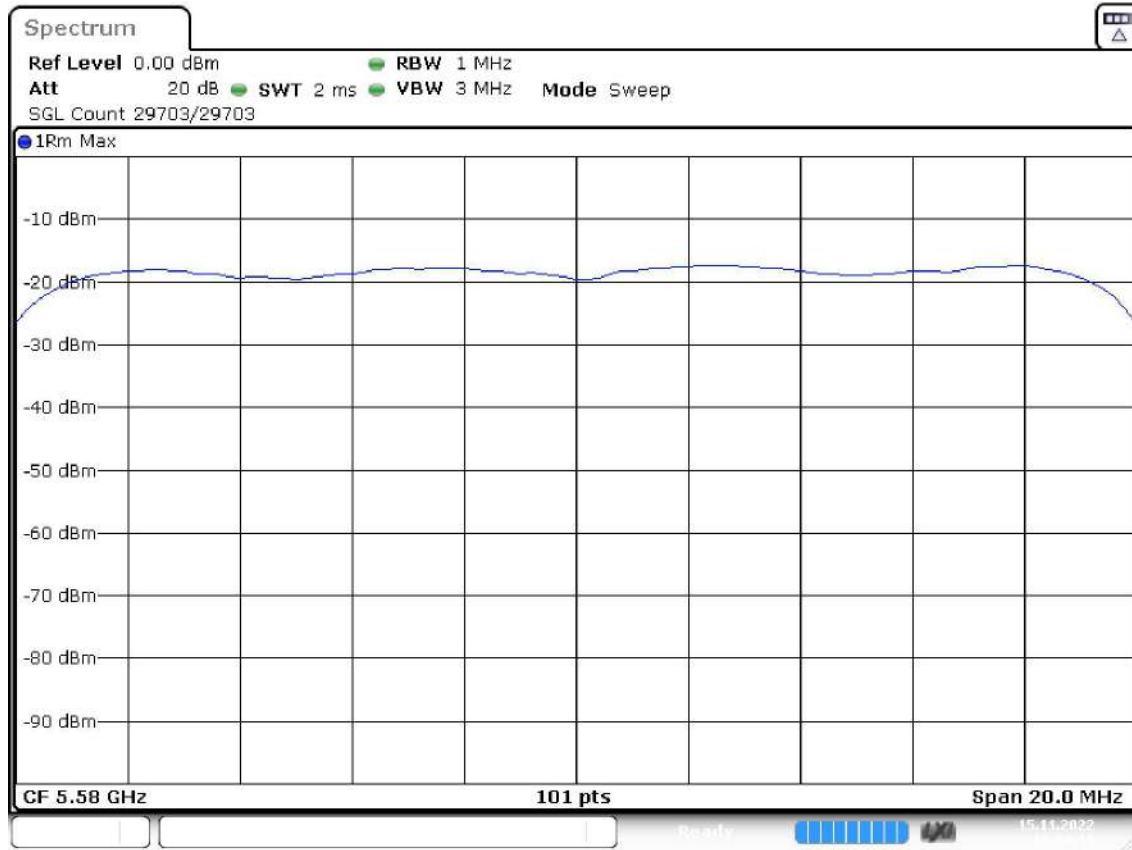
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Power Spectral Density (SA-3)



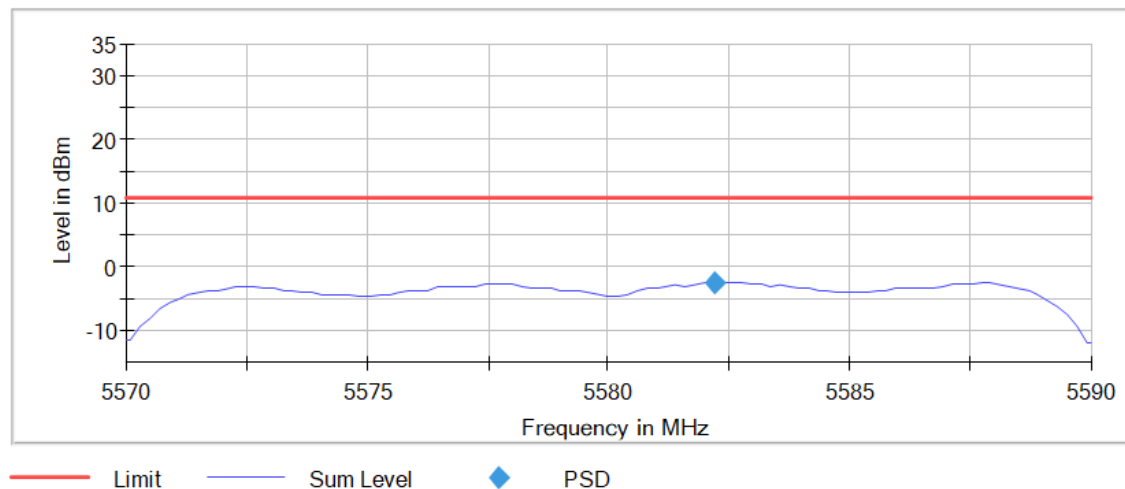
Active Port = 1, Frequency MHz = 5580.00000, Modulation = 802.11ax HE20 SS1 (OFDMA MCS8), Mode = SISO, Number of Transmission Chains = 1

Images:



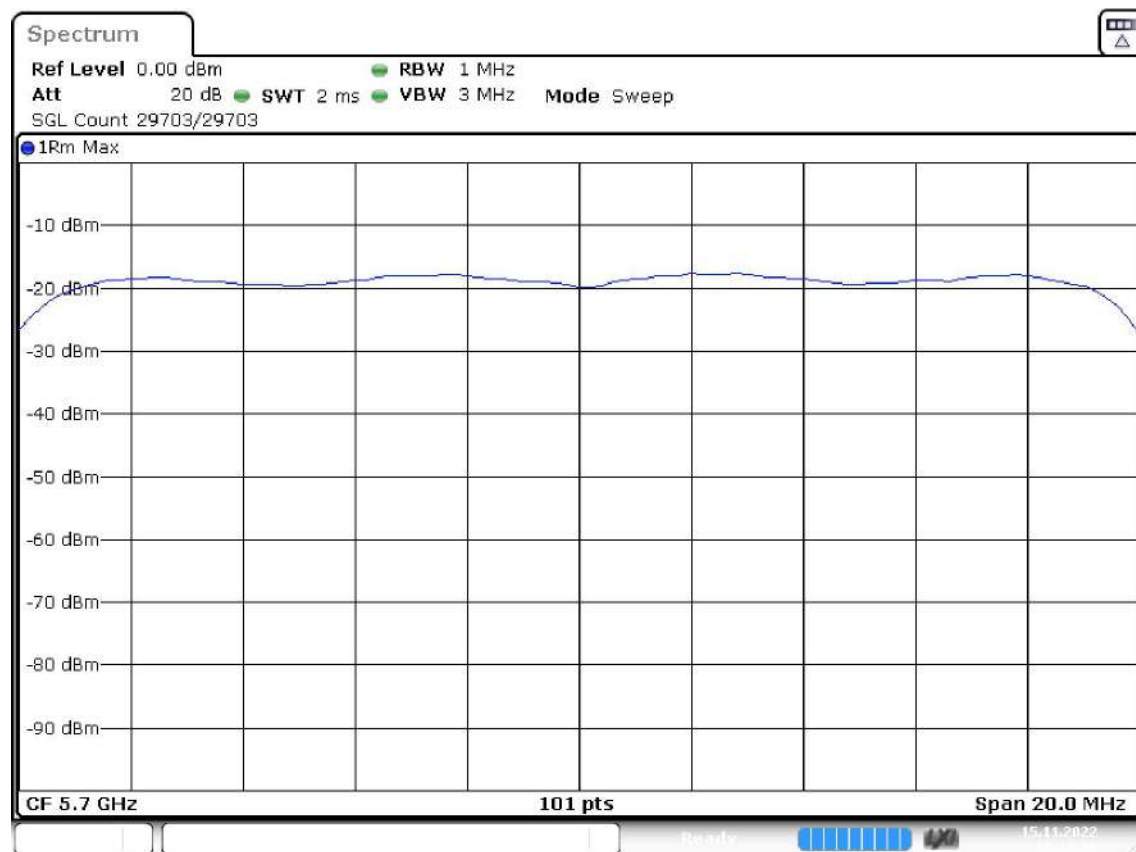
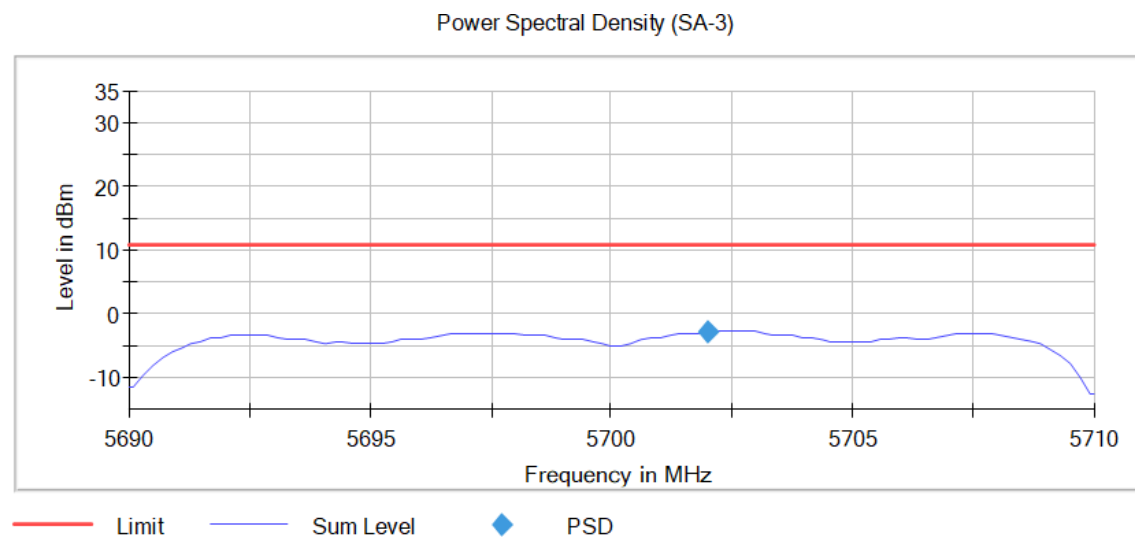
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Power Spectral Density (SA-3)



Active Port = 1, Frequency MHz = 5700.00000, Modulation = 802.11ax HE20 SS1 (OFDMA MCS8), Mode = SISO, Number of Transmission Chains = 1

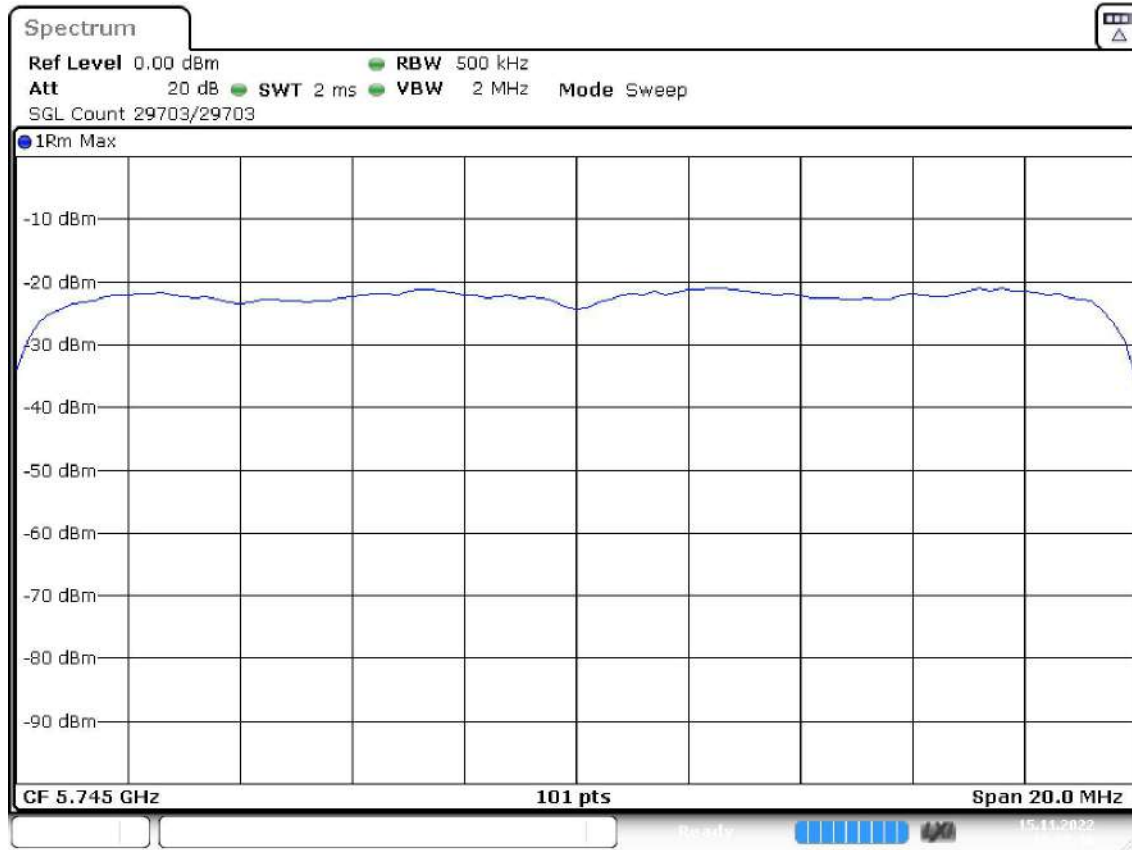
Images:



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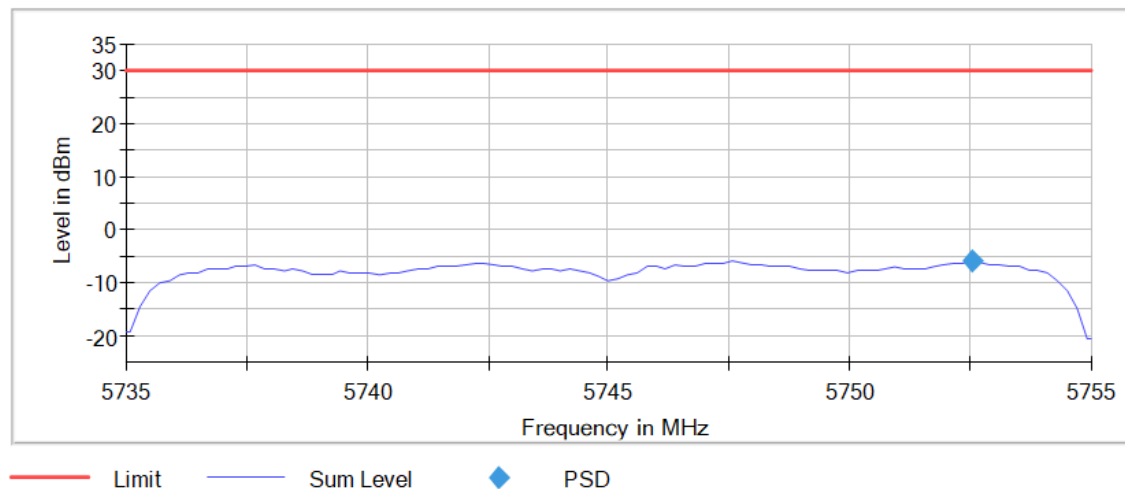
Active Port = 1, Frequency MHz = 5745.00000, Modulation = 802.11ax HE20 SS1 (OFDMA MCS8), Mode = SISO, Number of Transmission Chains = 1

Images:



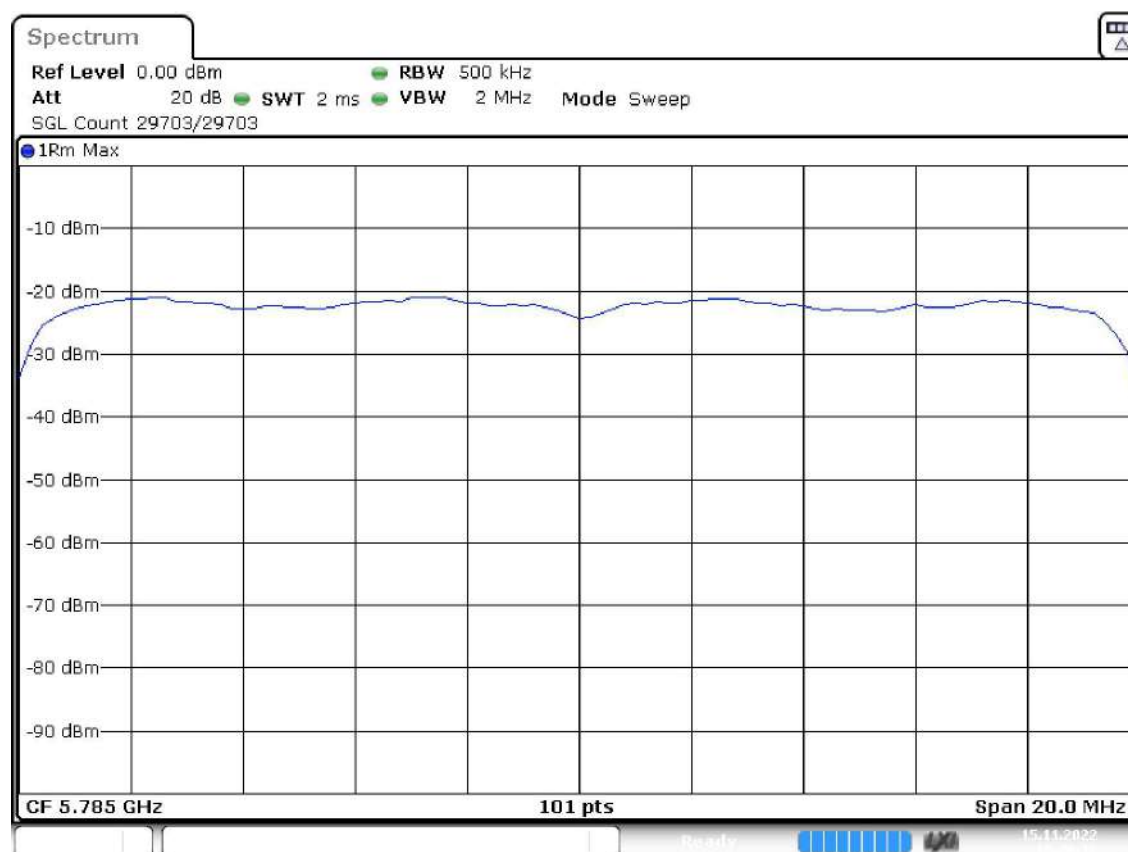
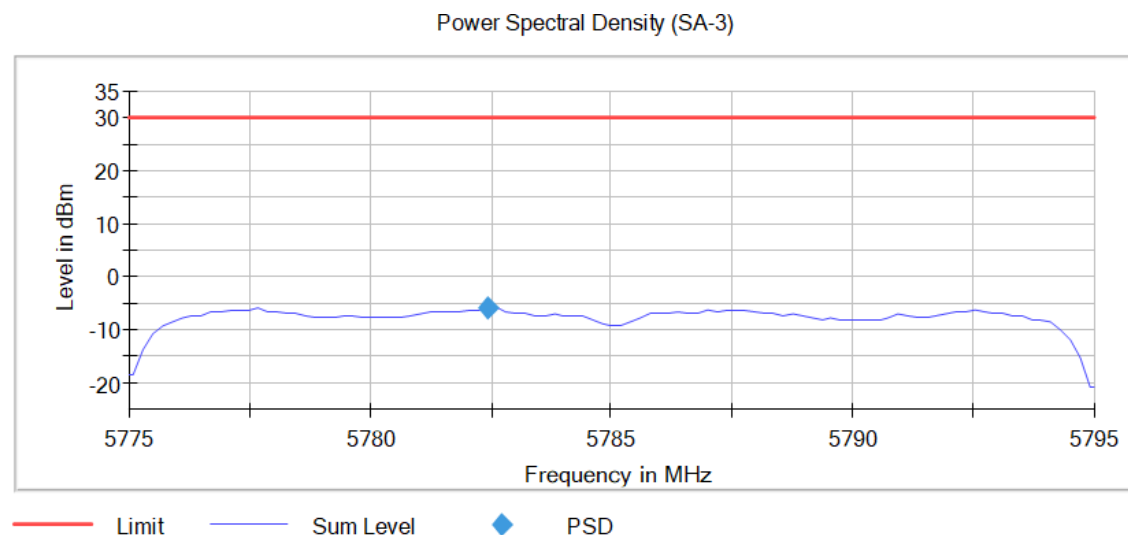
Date: 15.NOV.2022 18:27:49

Power Spectral Density (SA-3)



Active Port = 1, Frequency MHz = 5785.00000, Modulation = 802.11ax HE20 SS1 (OFDMA MCS8), Mode = SISO, Number of Transmission Chains = 1

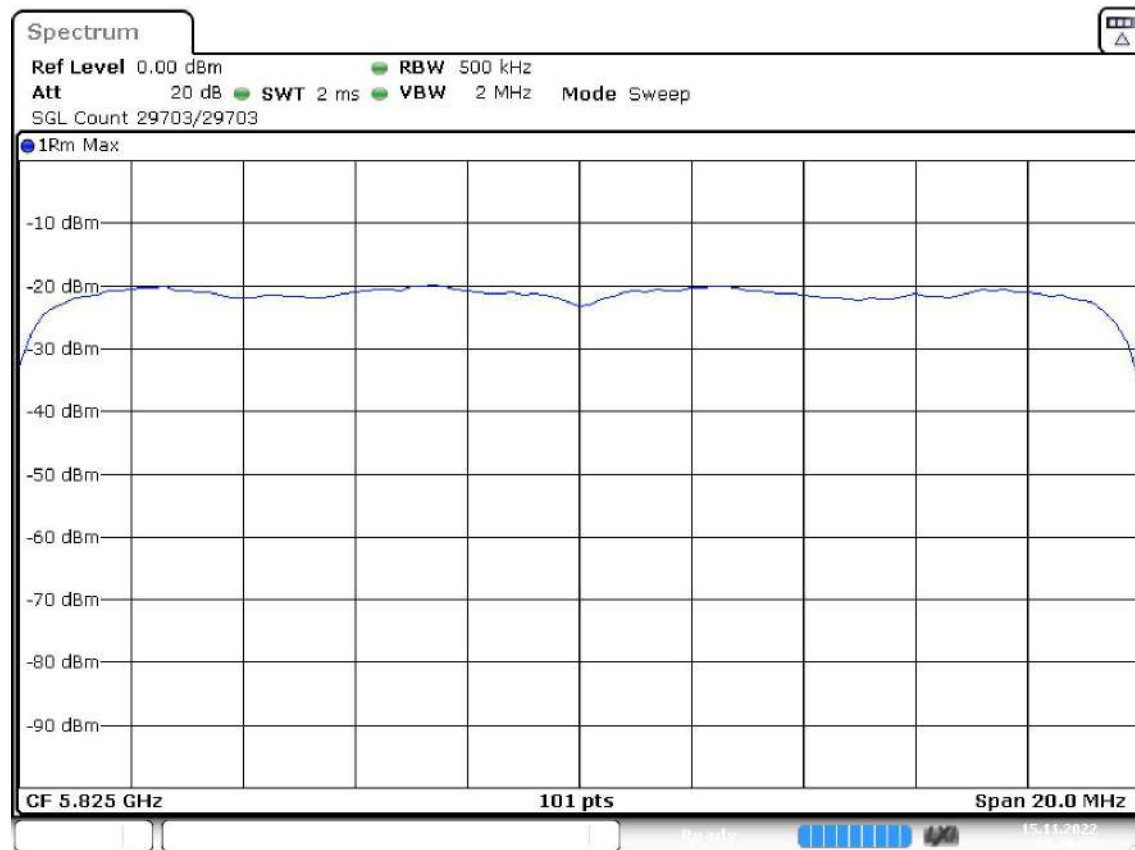
Images:



Date: 15.NOV.2022 18:40:11

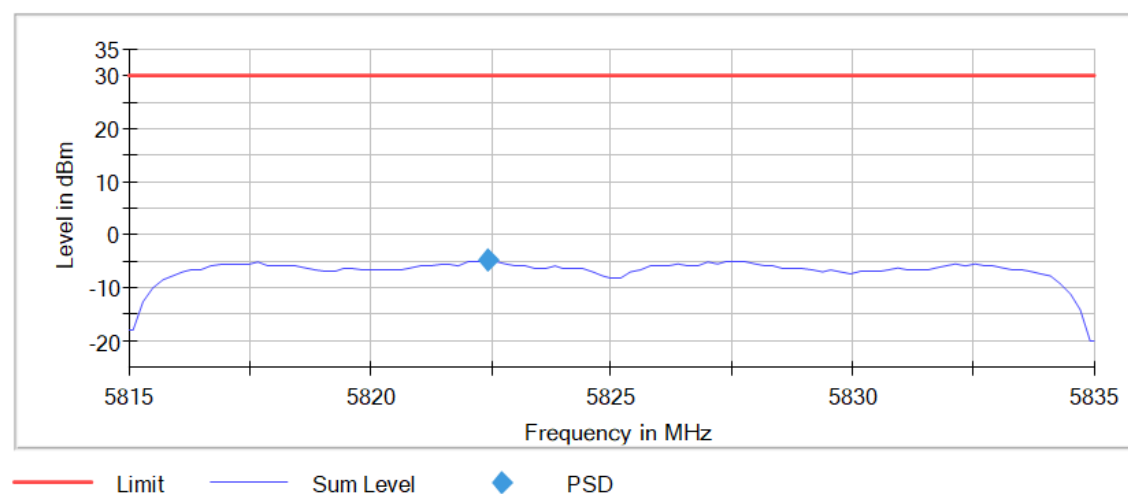
Active Port = 1, Frequency MHz = 5825.00000, Modulation = 802.11ax HE20 SS1 (OFDMA MCS8), Mode = SISO, Number of Transmission Chains = 1

Images:



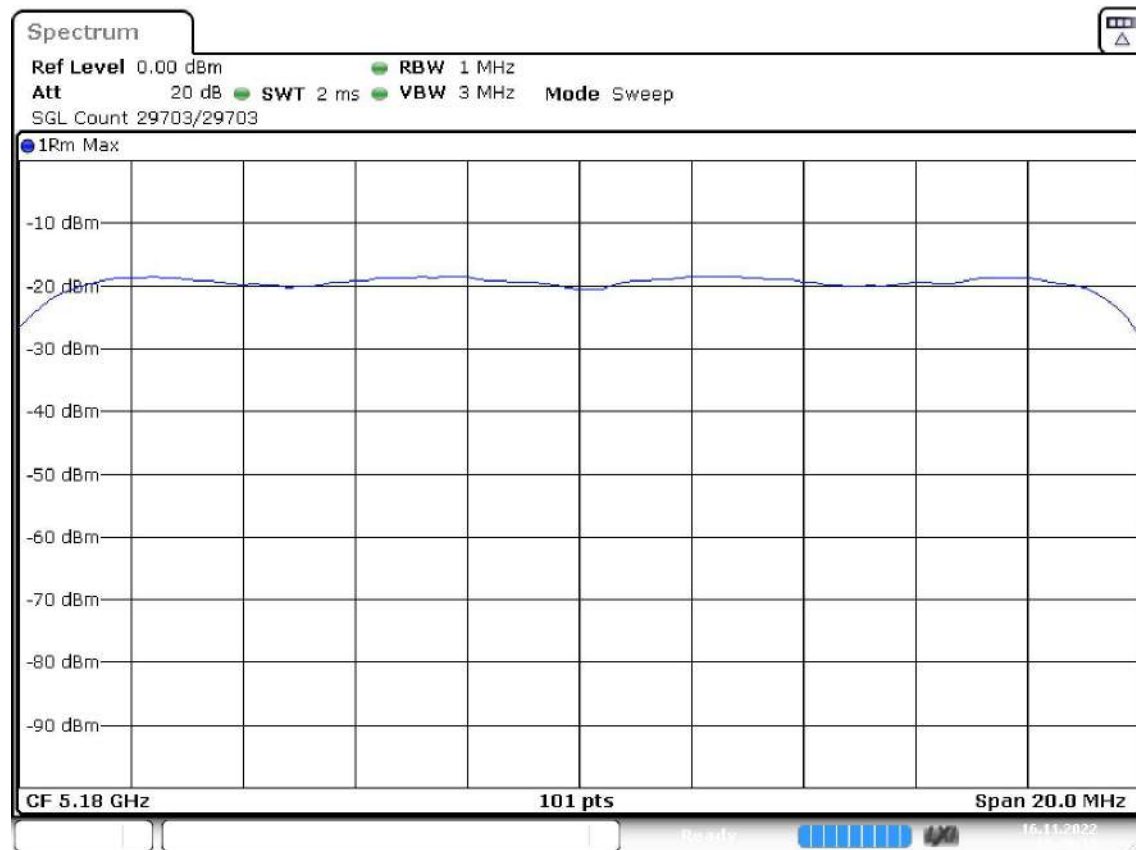
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Power Spectral Density (SA-3)



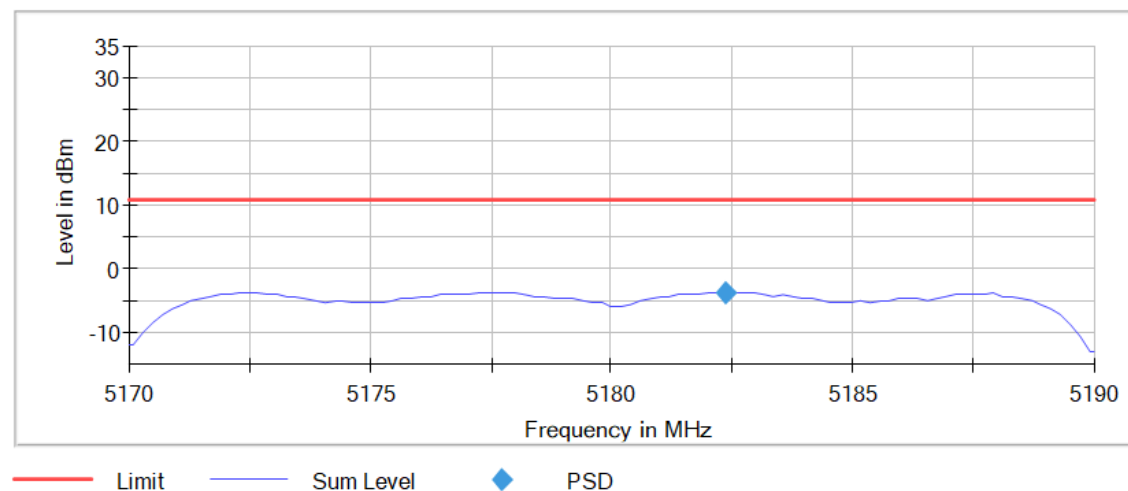
Active Port = 2, Frequency MHz = 5180.00000, Modulation = 802.11ax HE20 SS1 (OFDMA MCS8), Mode = SISO, Number of Transmission Chains = 1

Images:



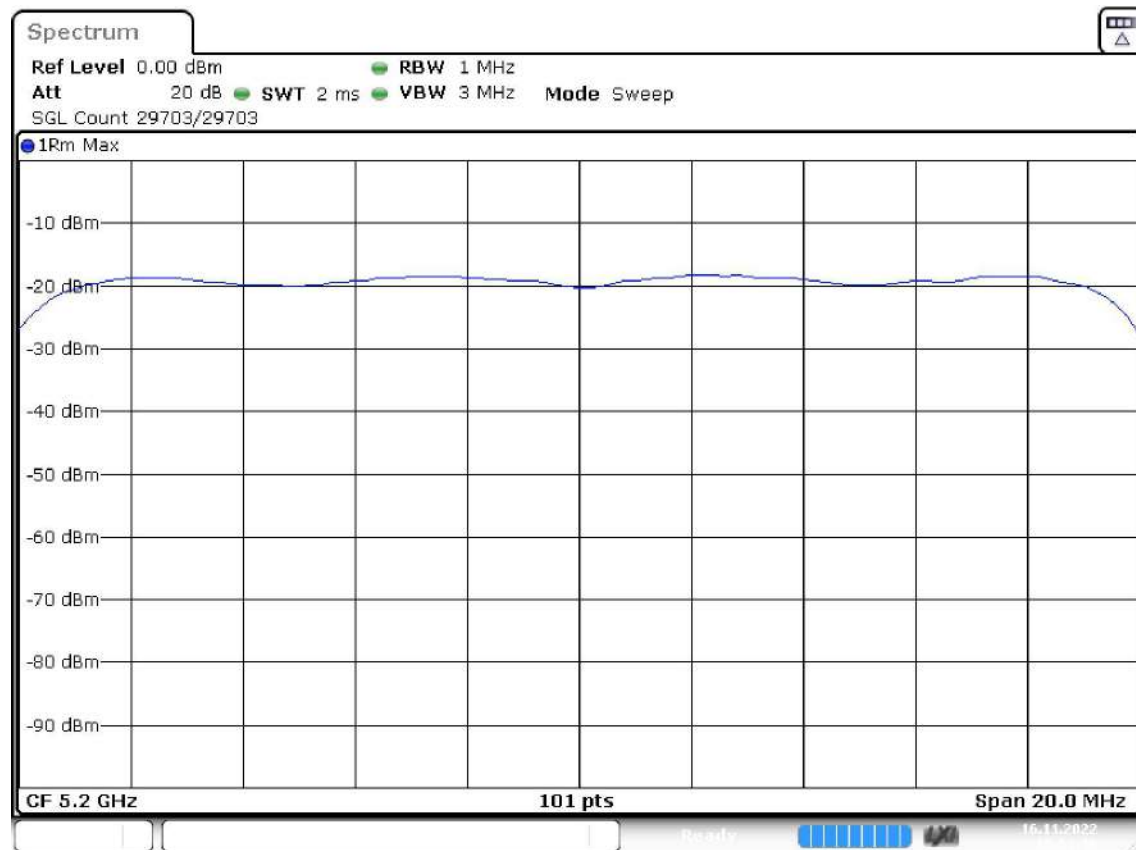
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Power Spectral Density (SA-3)



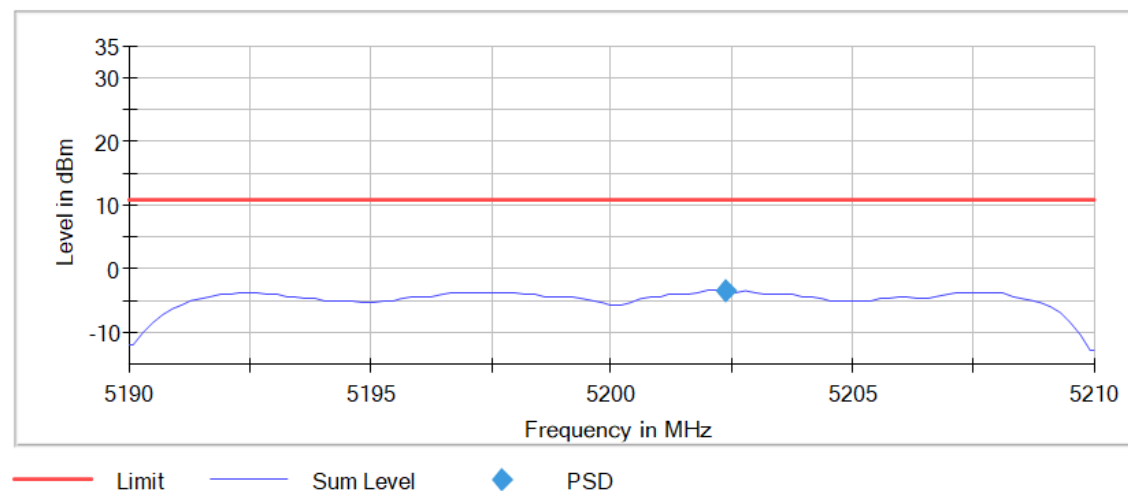
Active Port = 2, Frequency MHz = 5200.00000, Modulation = 802.11ax HE20 SS1 (OFDMA MCS8), Mode = SISO, Number of Transmission Chains = 1

Images:



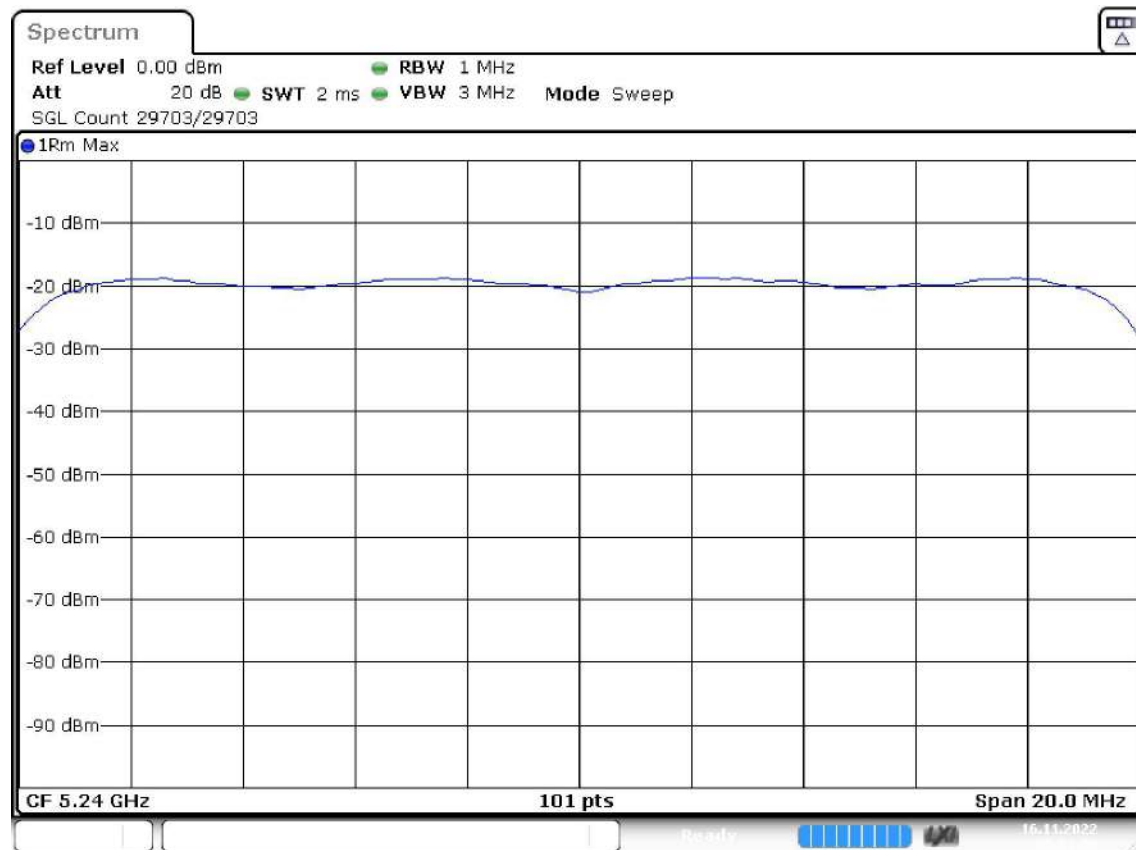
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Power Spectral Density (SA-3)



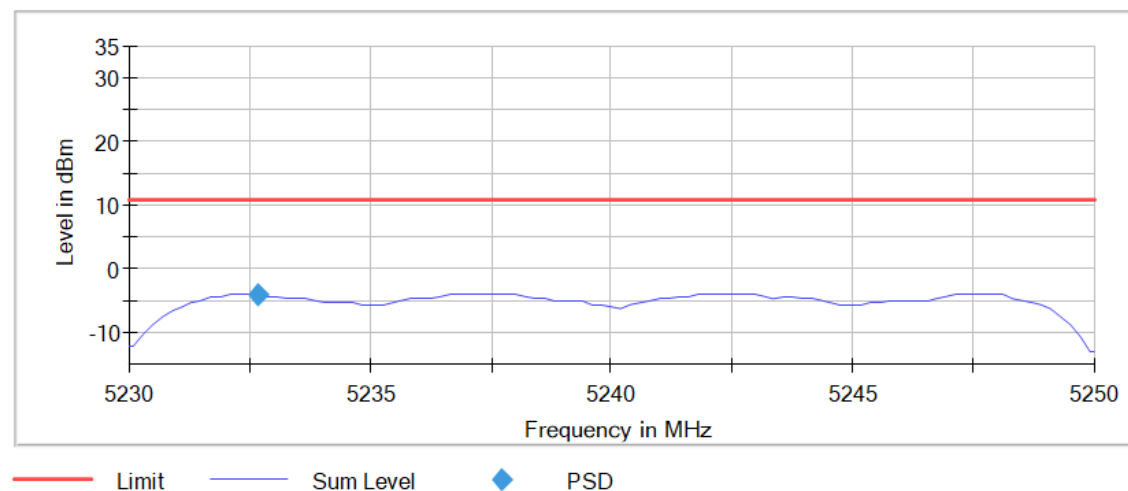
Active Port = 2, Frequency MHz = 5240.00000, Modulation = 802.11ax HE20 SS1 (OFDMA MCS8), Mode = SISO, Number of Transmission Chains = 1

Images:



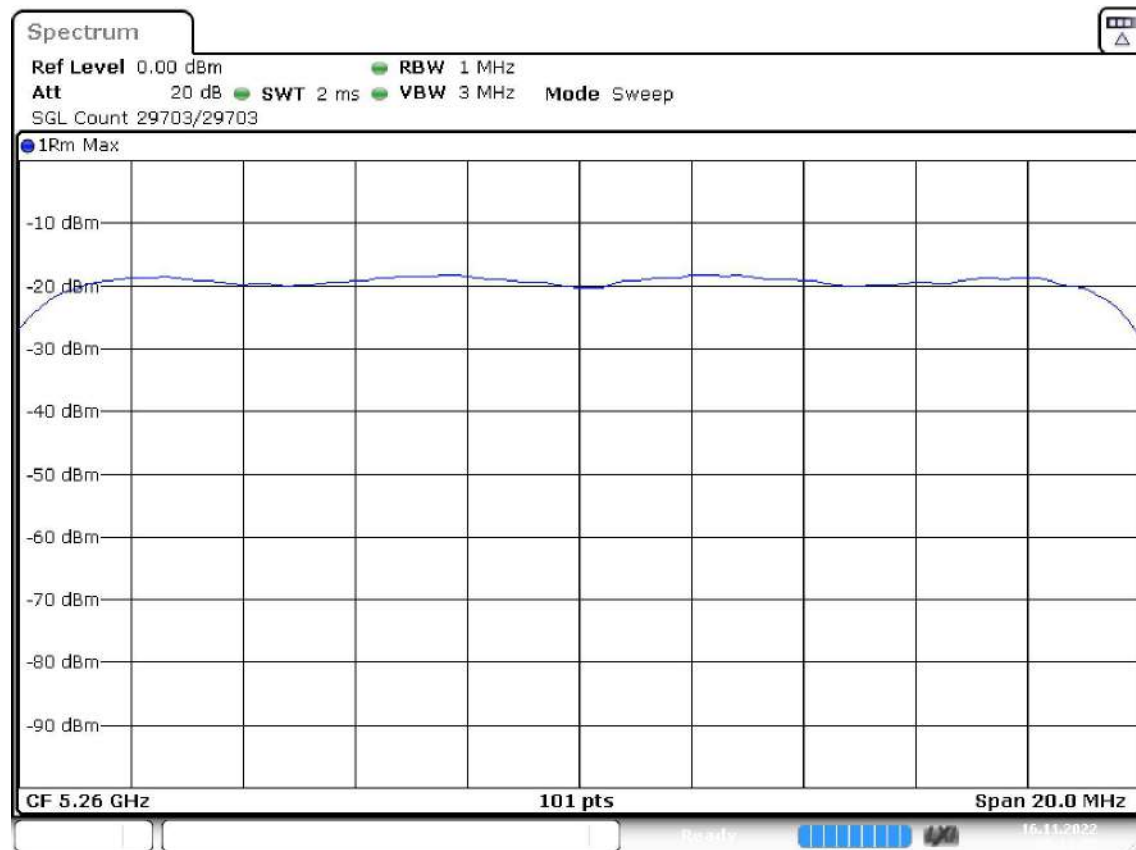
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Power Spectral Density (SA-3)



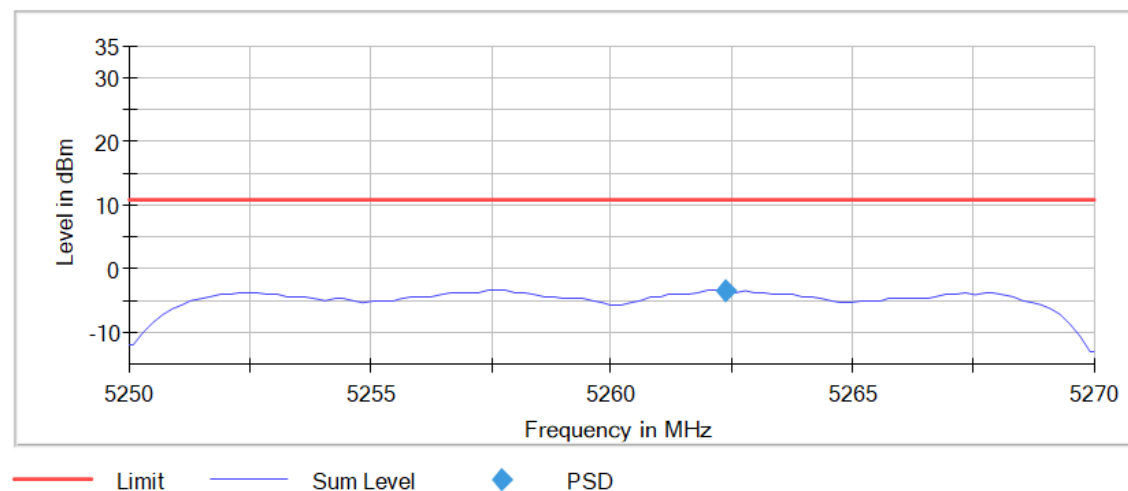
Active Port = 2, Frequency MHz = 5260.00000, Modulation = 802.11ax HE20 SS1 (OFDMA MCS8), Mode = SISO, Number of Transmission Chains = 1

Images:



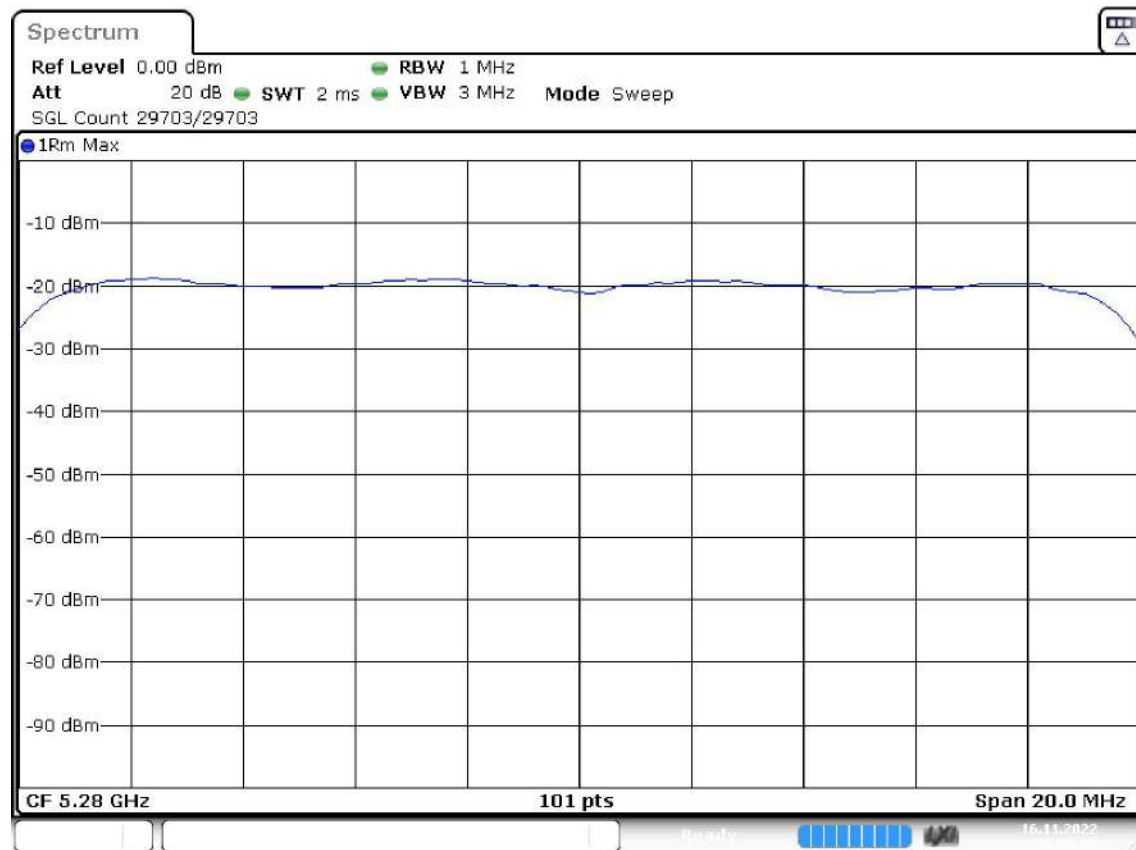
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Power Spectral Density (SA-3)



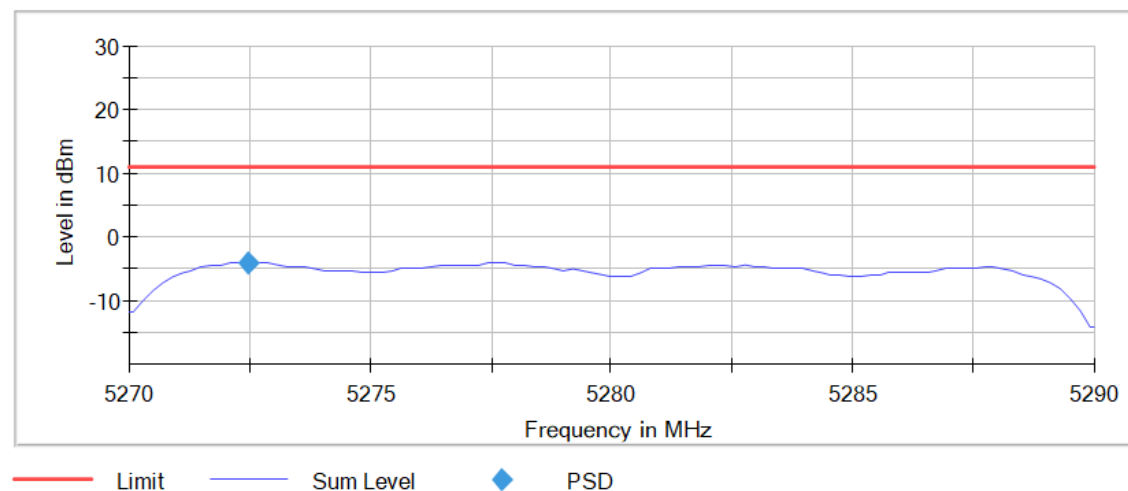
Active Port = 2, Frequency MHz = 5280.00000, Modulation = 802.11ax HE20 SS1 (OFDMA MCS8), Mode = SISO, Number of Transmission Chains = 1

Images:



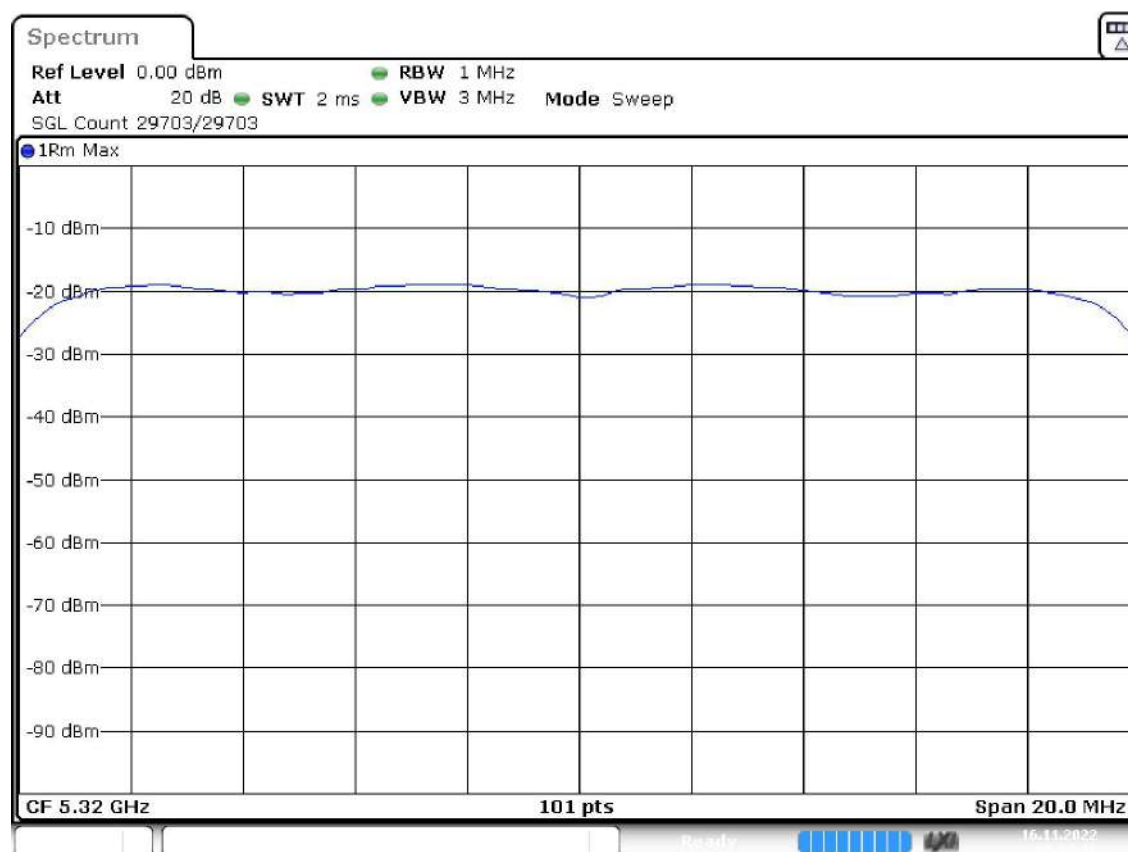
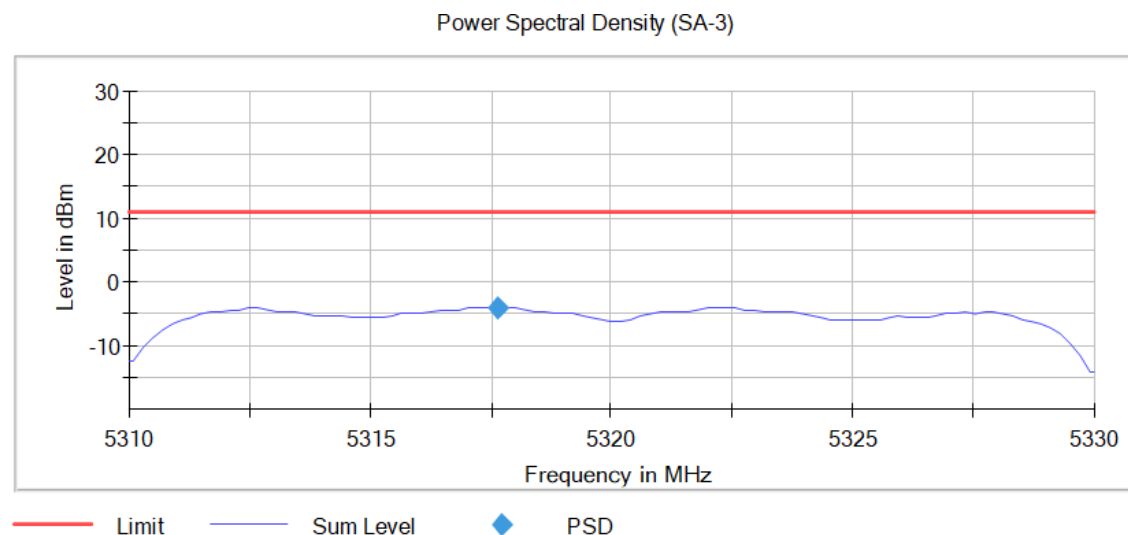
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Power Spectral Density (SA-3)



Active Port = 2, Frequency MHz = 5320.00000, Modulation = 802.11ax HE20 SS1 (OFDMA MCS8), Mode = SISO, Number of Transmission Chains = 1

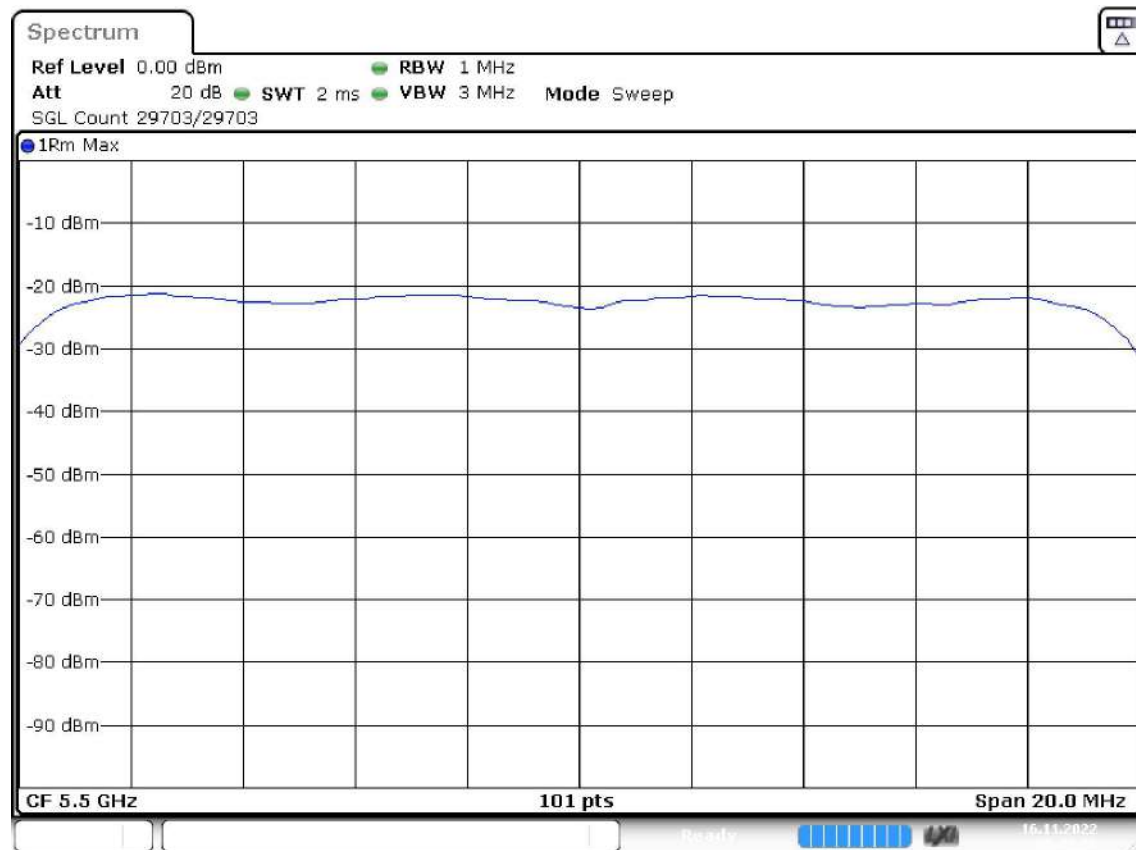
Images:



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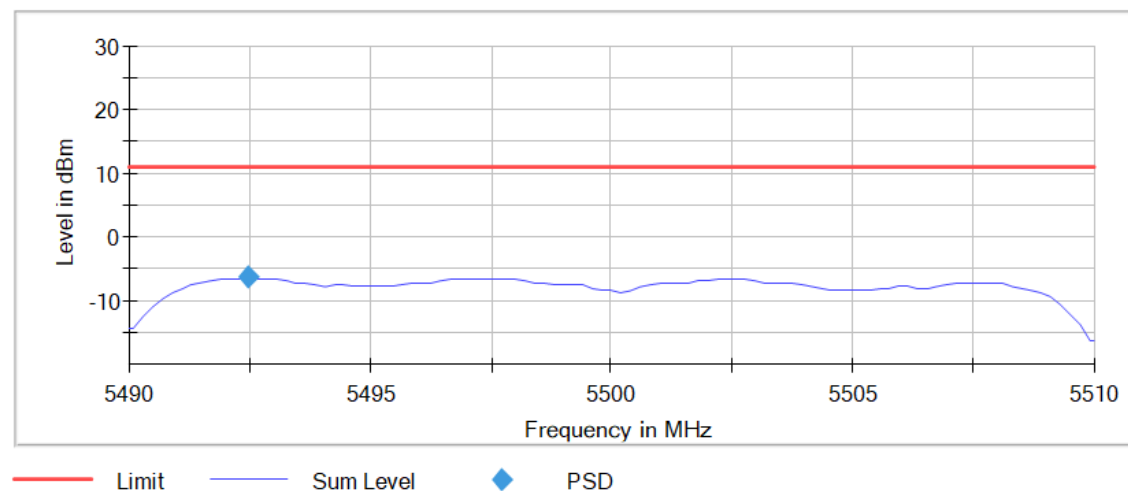
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Images:



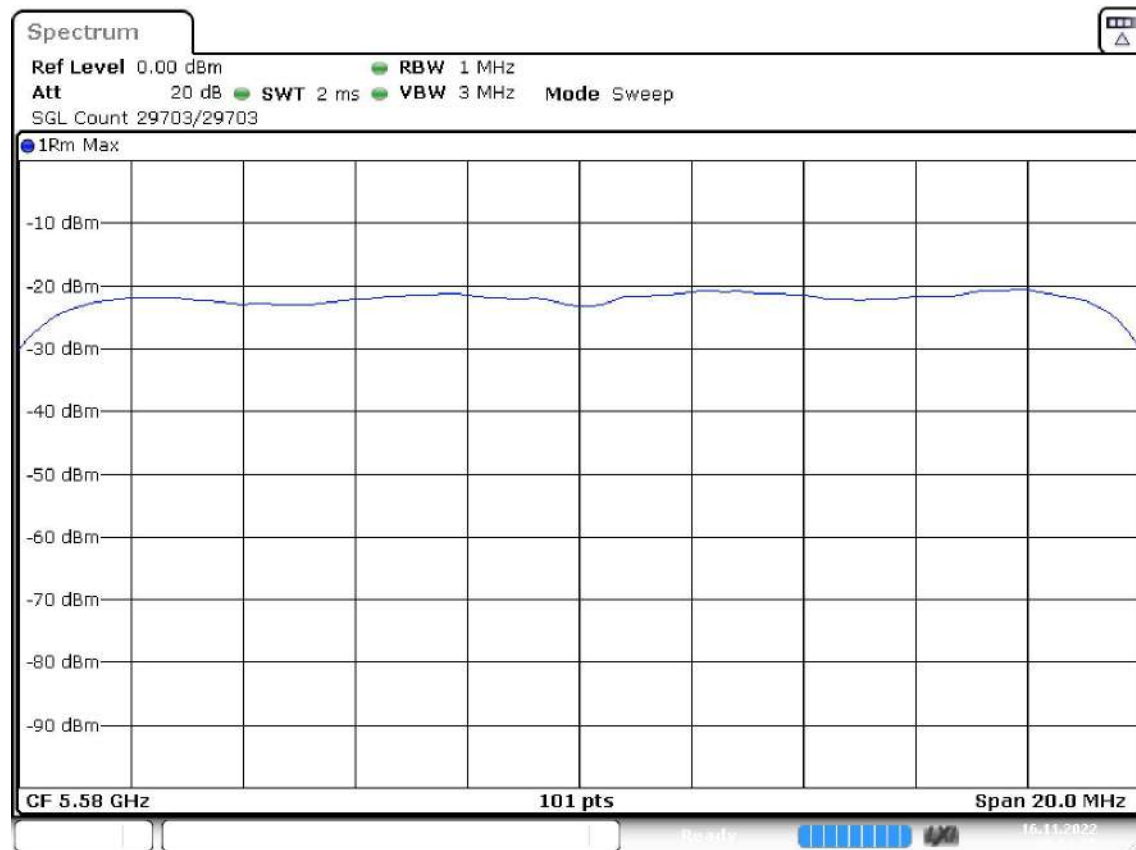
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Power Spectral Density (SA-3)



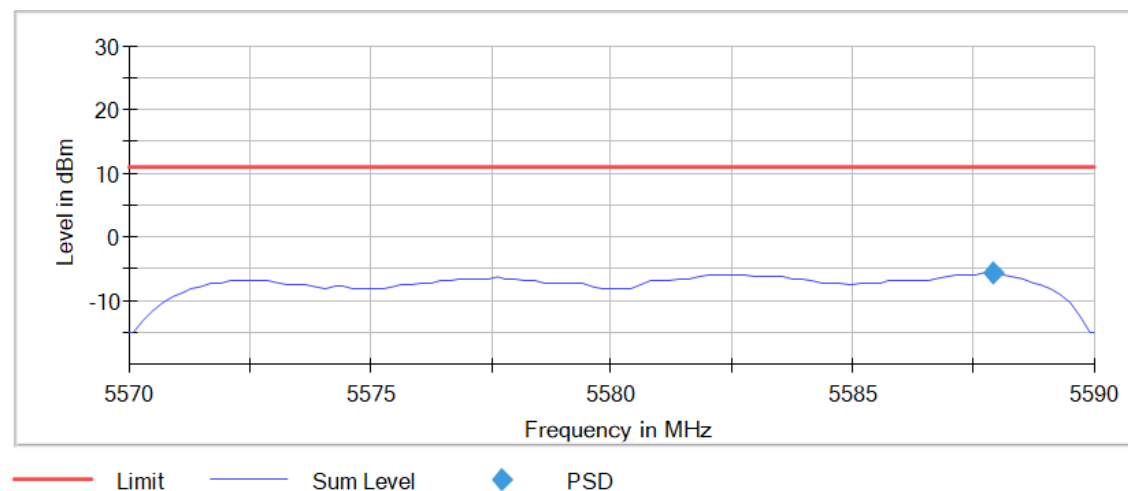
Active Port = 2, Frequency MHz = 5580.00000, Modulation = 802.11ax HE20 SS1 (OFDMA MCS8), Mode = SISO, Number of Transmission Chains = 1

Images:



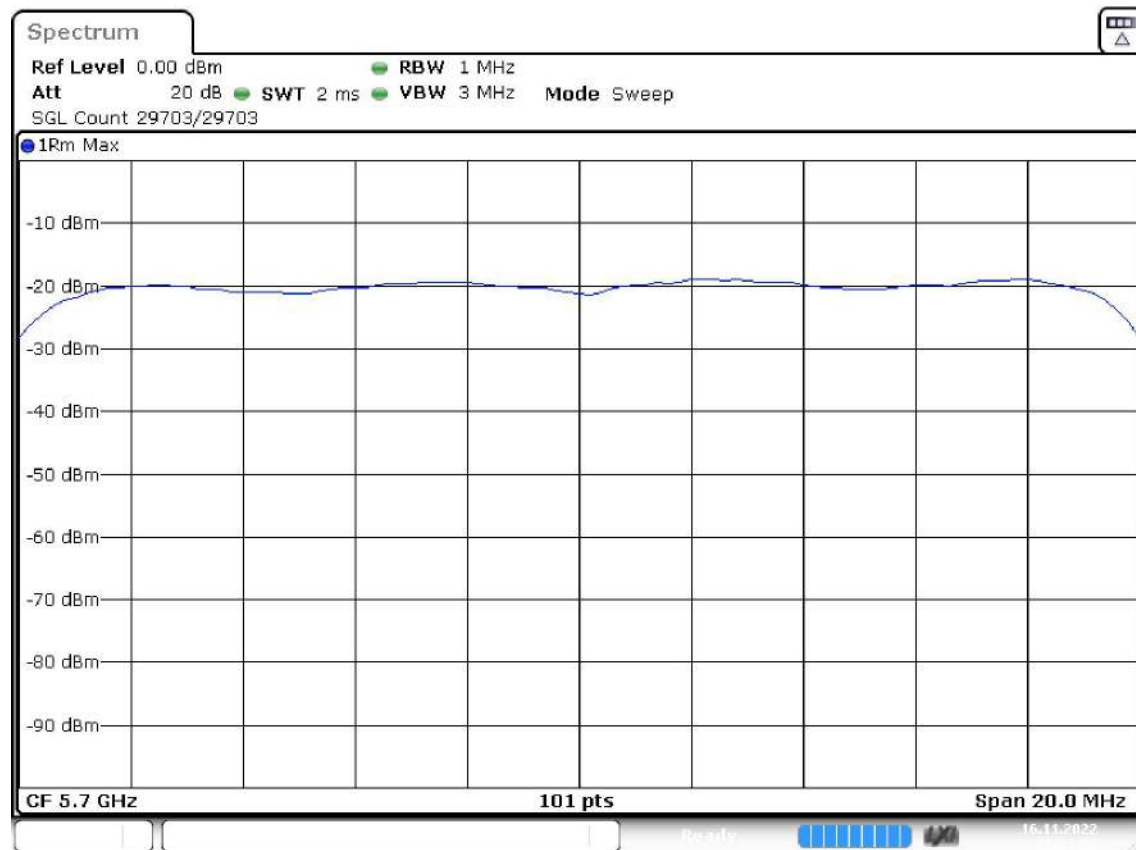
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Power Spectral Density (SA-3)



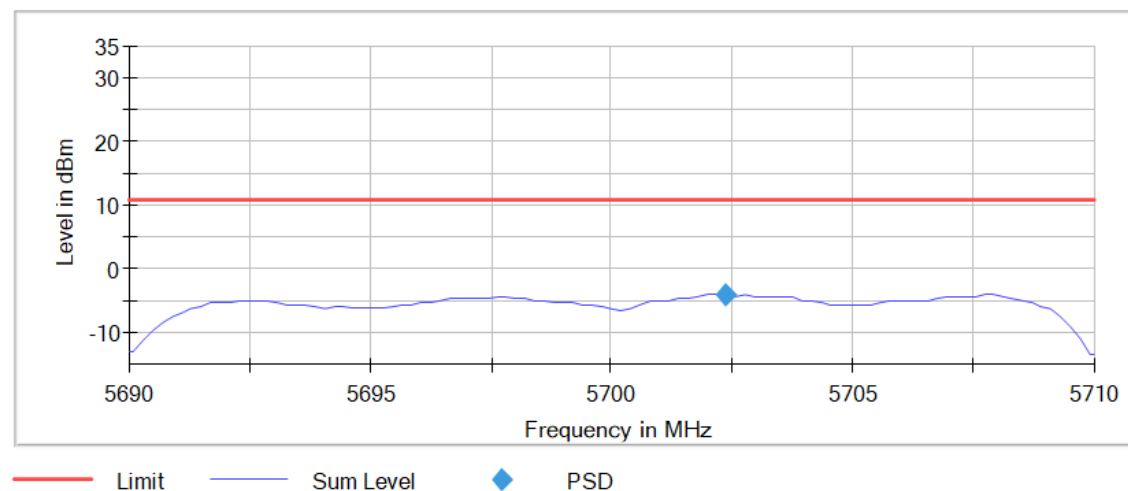
Active Port = 2, Frequency MHz = 5700.00000, Modulation = 802.11ax HE20 SS1 (OFDMA MCS8), Mode = SISO, Number of Transmission Chains = 1

Images:



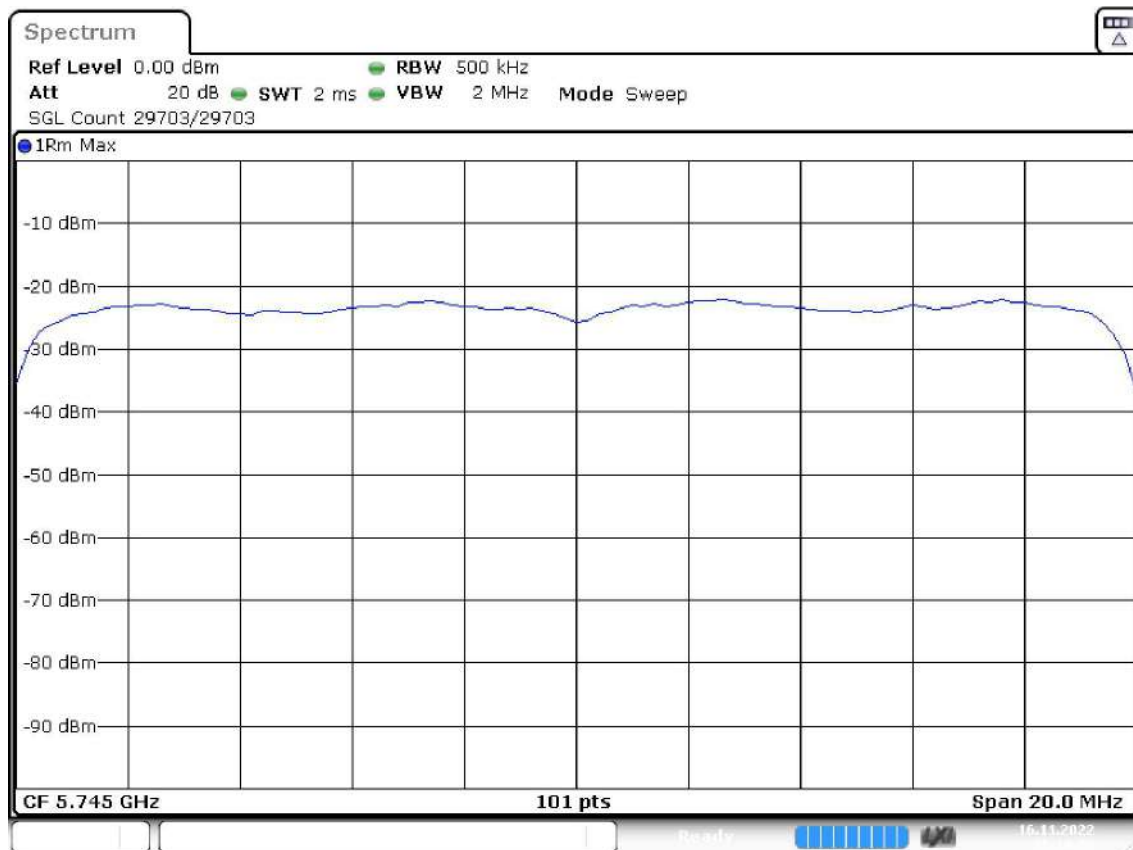
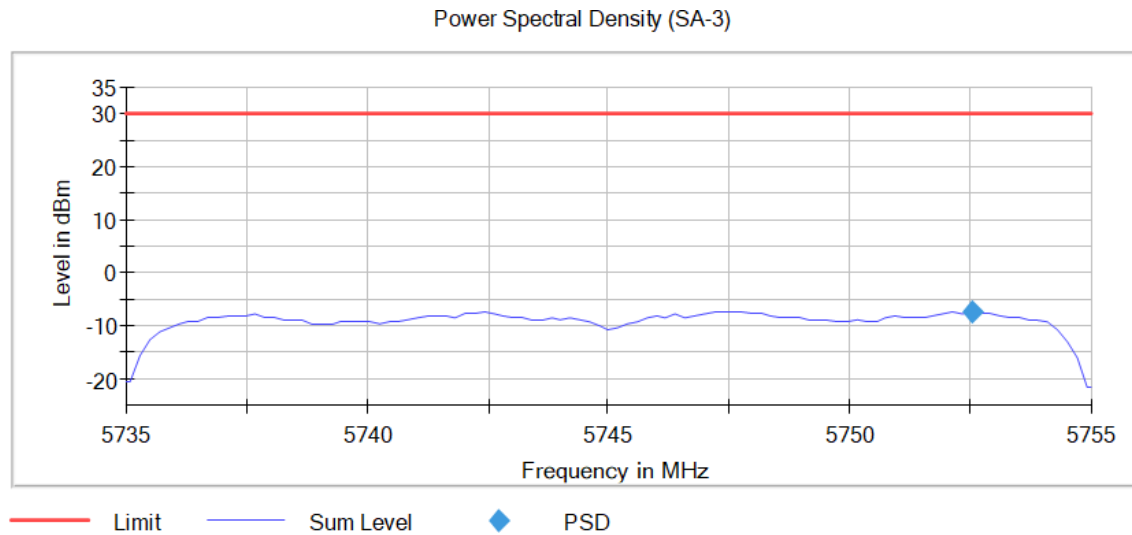
Date: 16.NOV.2022 21:01:22

Power Spectral Density (SA-3)



Active Port = 2, Frequency MHz = 5745.00000, Modulation = 802.11ax HE20 SS1 (OFDMA MCS8), Mode = SISO, Number of Transmission Chains = 1

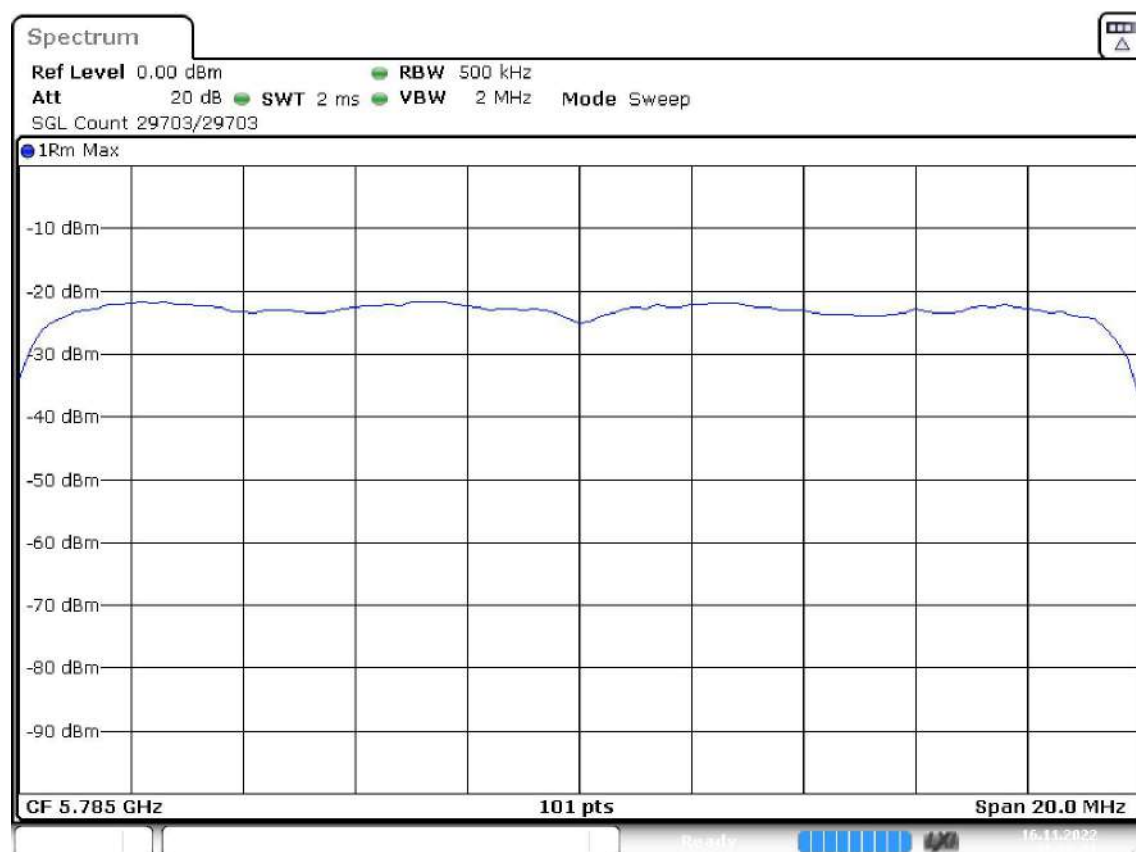
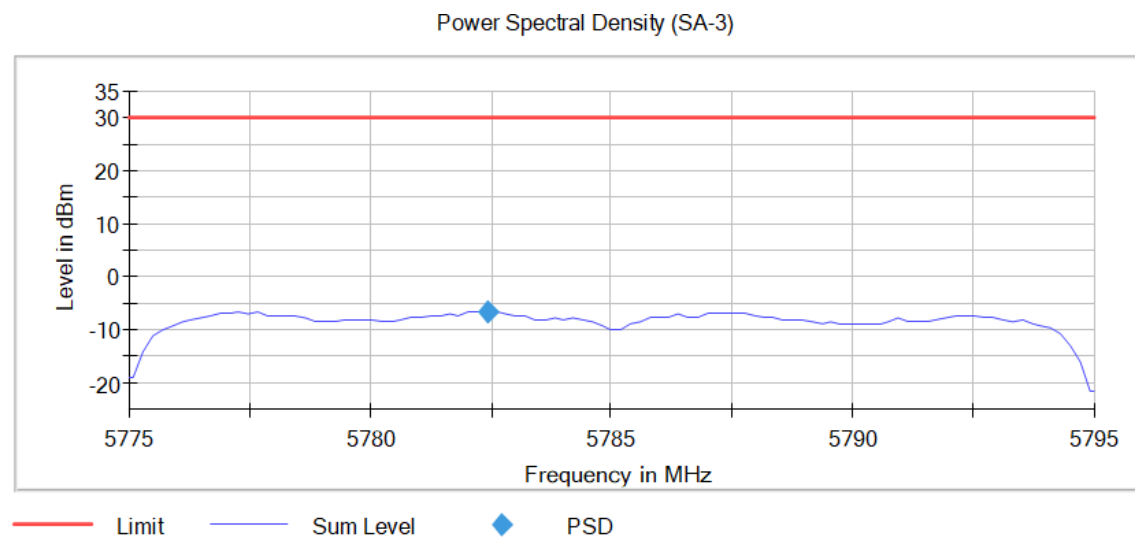
Images:



Date: 16.NOV.2022 21:14:08

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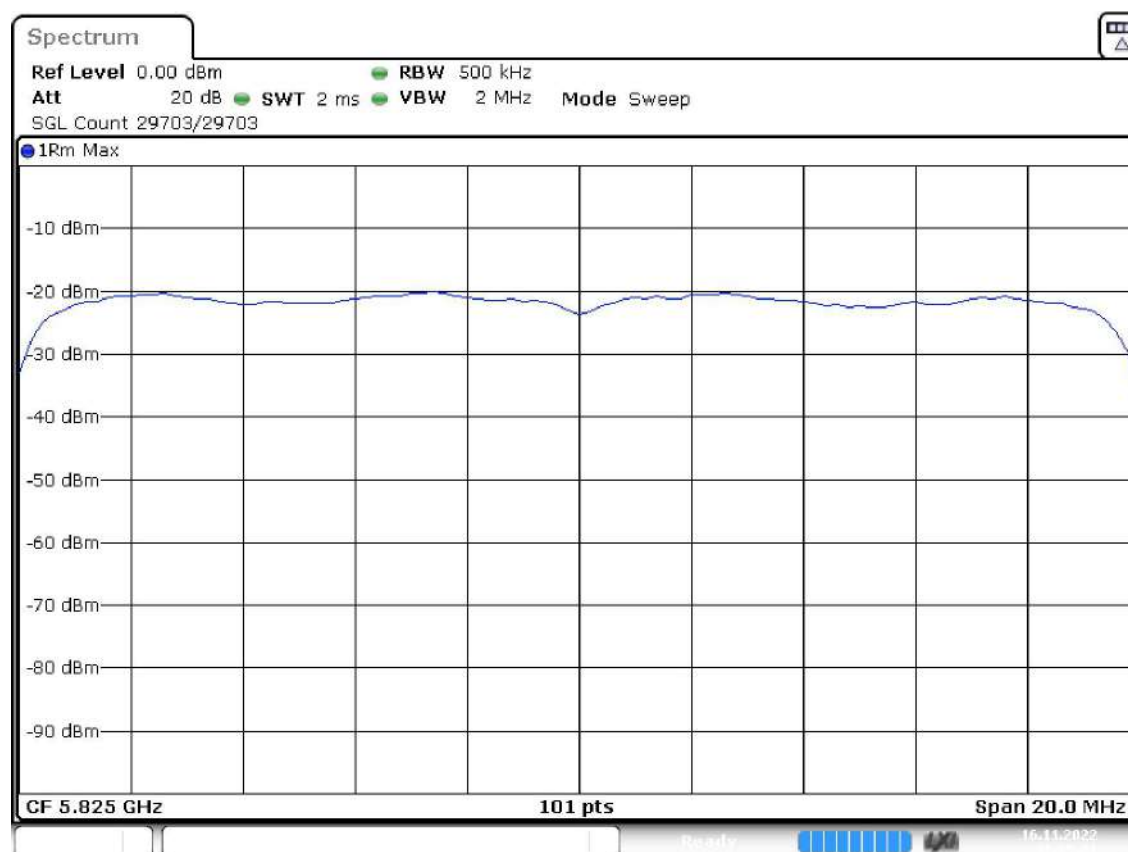
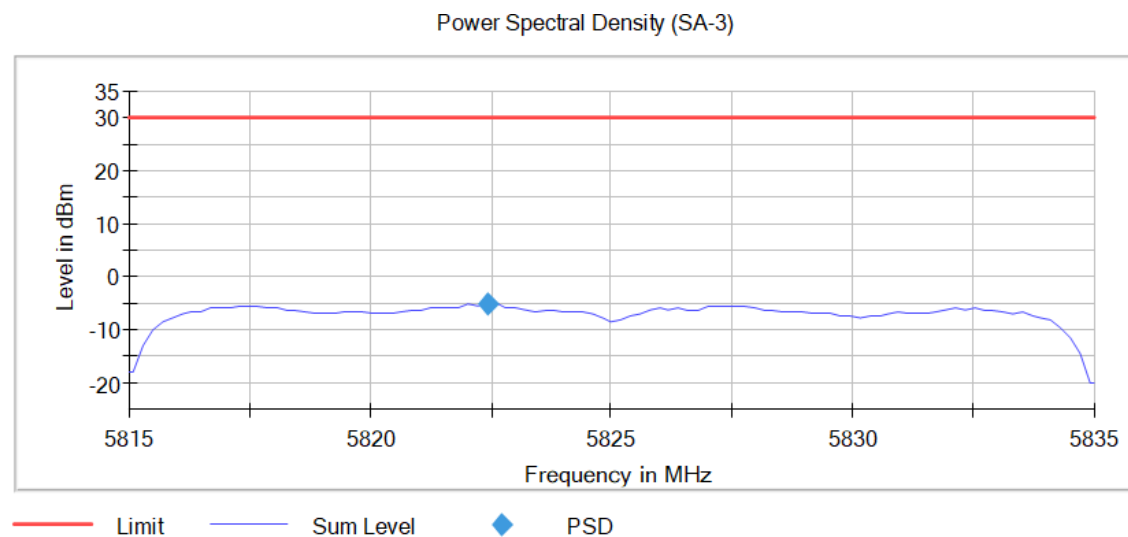
Images:



Date: 16.NOV.2022 21:26:51

Active Port = 2, Frequency MHz = 5825.00000, Modulation = 802.11ax HE20 SS1 (OFDMA MCS8), Mode = SISO, Number of Transmission Chains = 1

Images:



Date: 16.NOV.2022 21:35:02

Mode: SISO

Modulation: 802.11ax HE40 SS1 (OFDMA MCS9)

Results

Port	Freq (MHz)	PSD (dBm)
1	5190.00000	-5.67
1	5230.00000	-5.28
1	5270.00000	-5.13
1	5310.00000	-4.83
1	5510.00000	-7.05
1	5550.00000	-6.22
1	5670.00000	-6.27
1	5755.00000	-7.61
1	5795.00000	-7.65
2	5190.00000	-5.97
2	5230.00000	-6.33
2	5270.00000	-6.35
2	5310.00000	-6.30
2	5510.00000	-8.40
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2	5755.00000	-9.02
2	5795.00000	-9.32

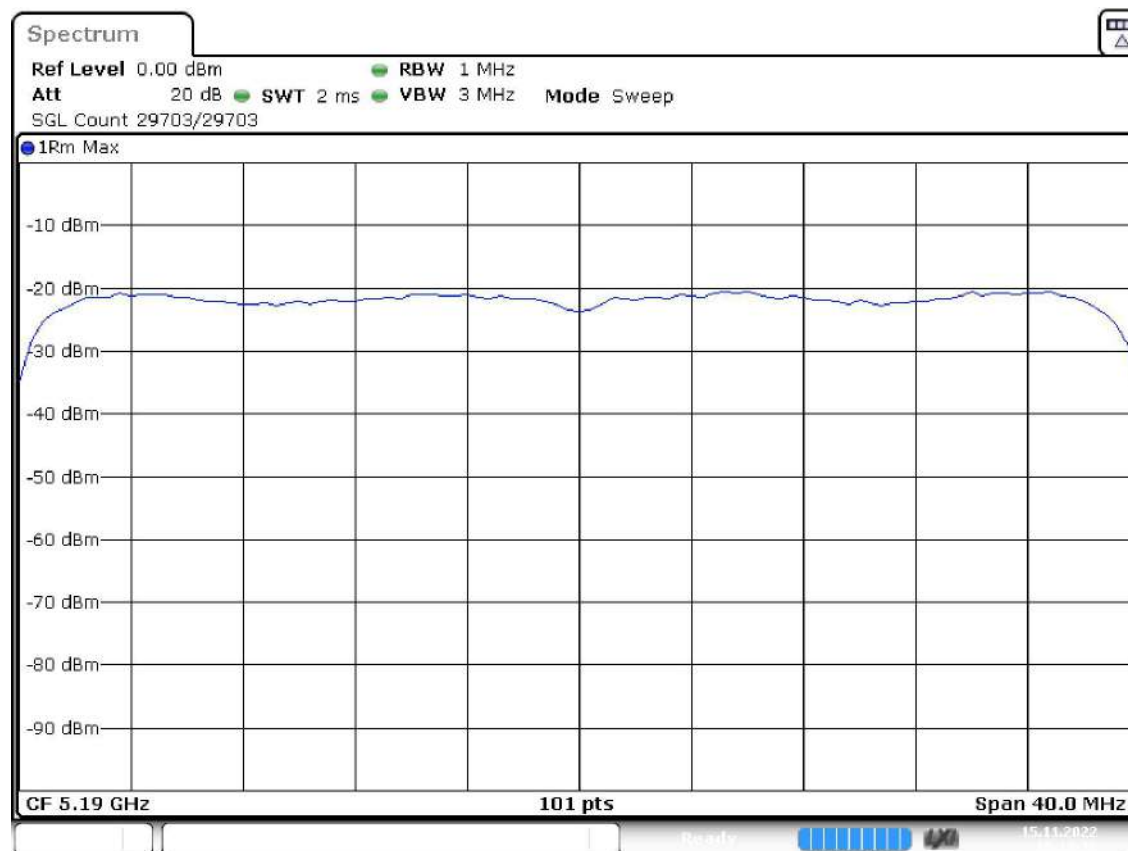
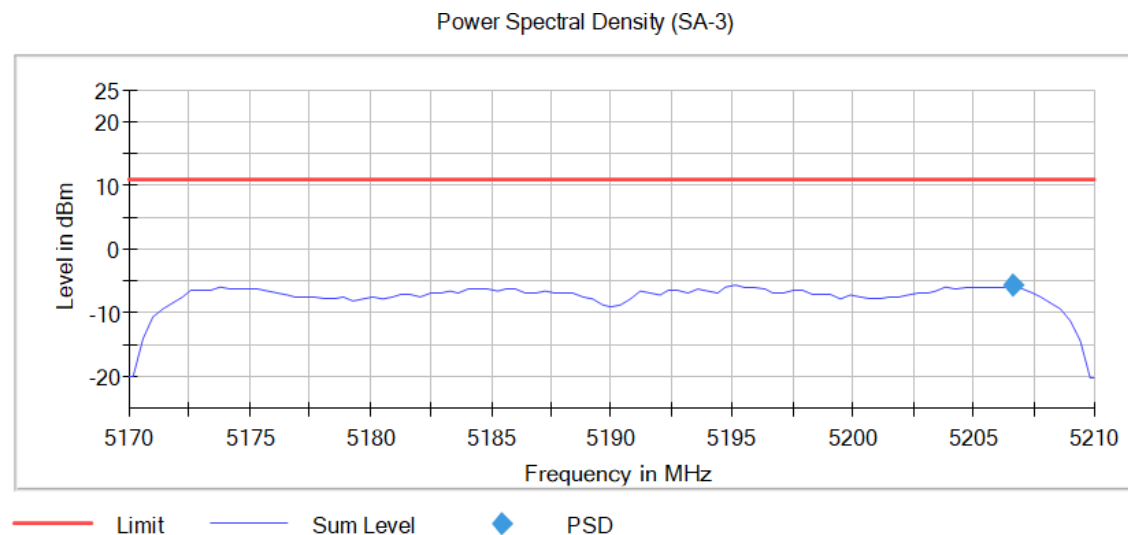
Verdict

Pass

Attachments

Active Port = 1, Frequency MHz = 5190.00000, Modulation = 802.11ax HE40 SS1 (OFDMA MCS9), Mode = SISO, Number of Transmission Chains = 1

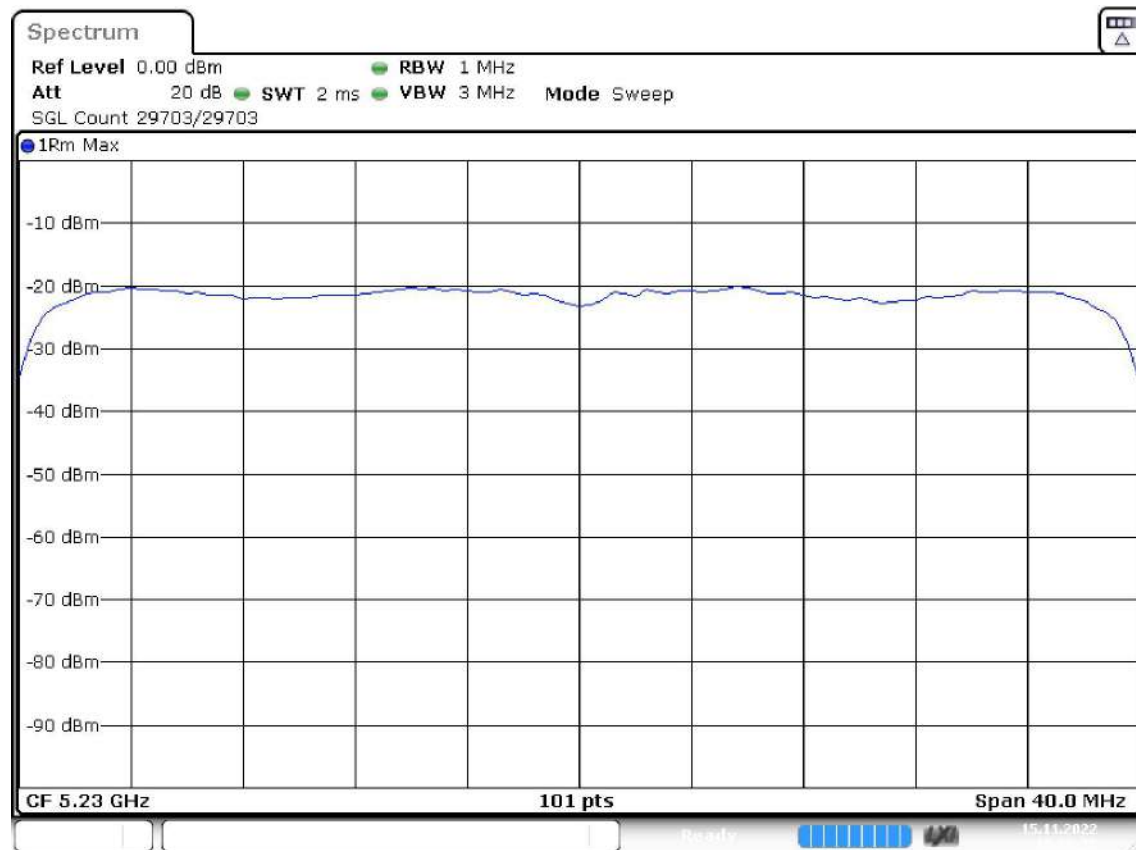
Images:



Date: 15.NOV.2022 19:13:28

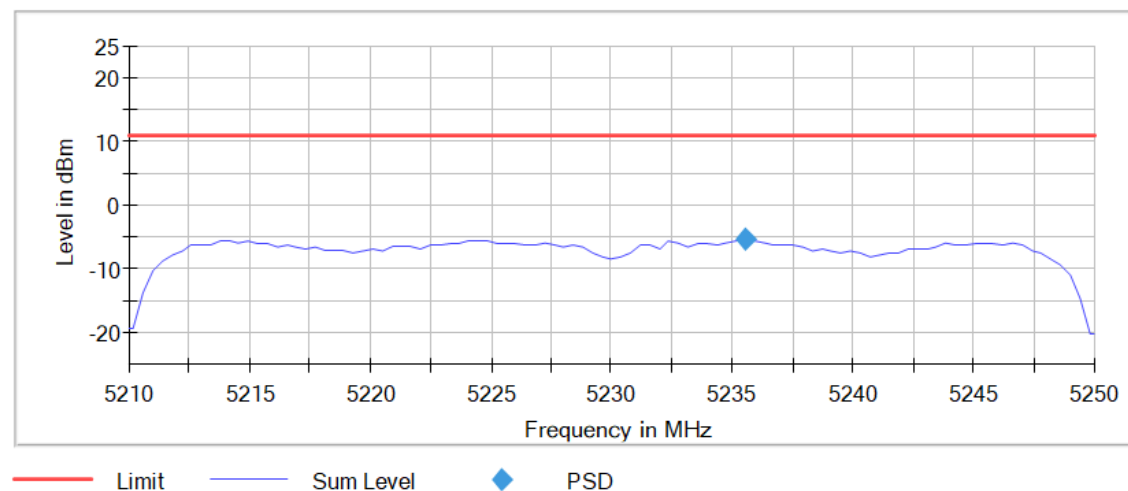
Active Port = 1, Frequency MHz = 5230.00000, Modulation = 802.11ax HE40 SS1 (OFDMA MCS9), Mode = SISO, Number of Transmission Chains = 1

Images:



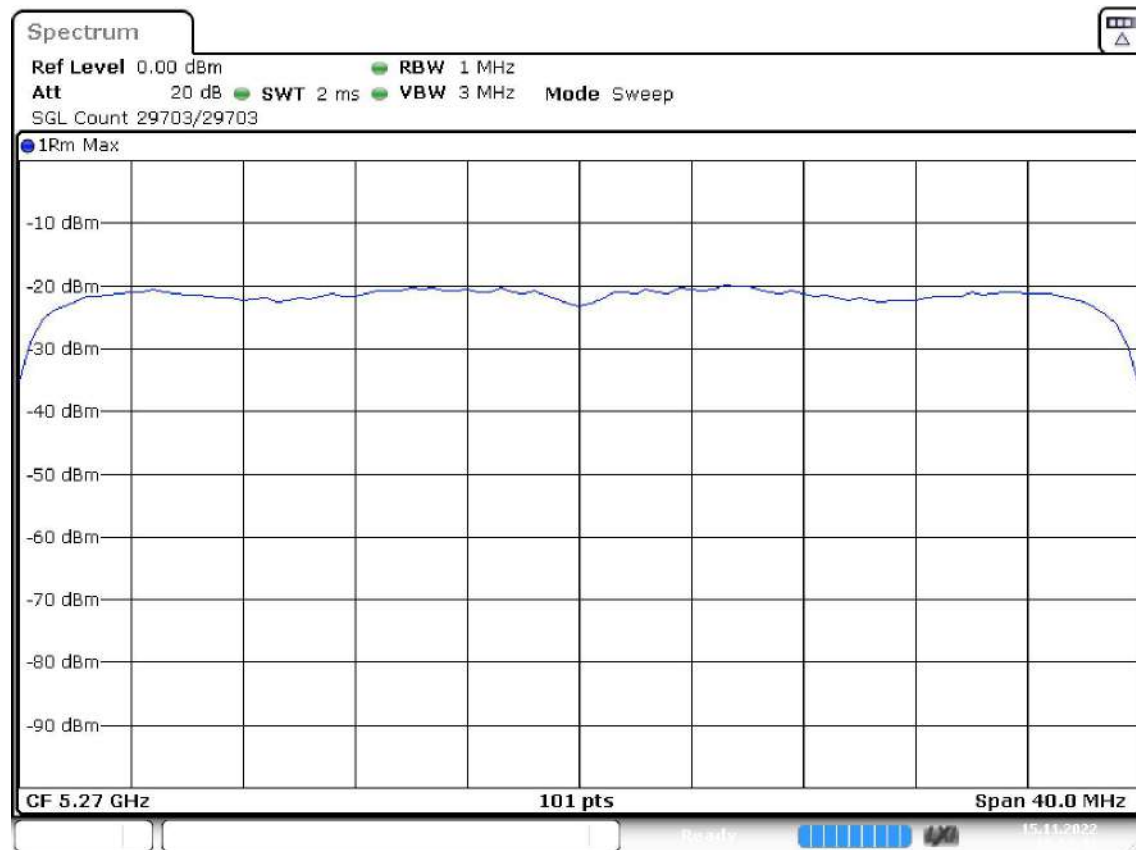
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Power Spectral Density (SA-3)



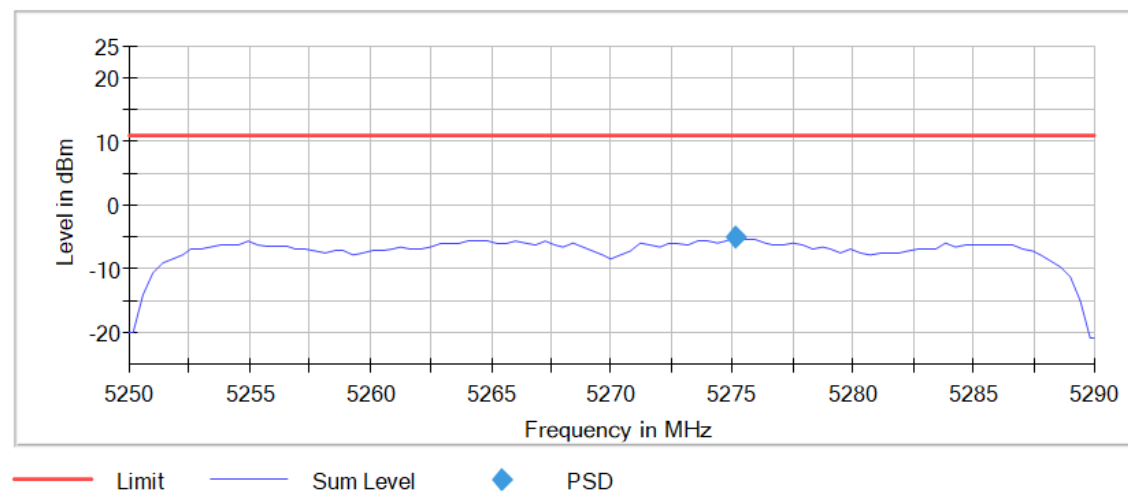
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Images:



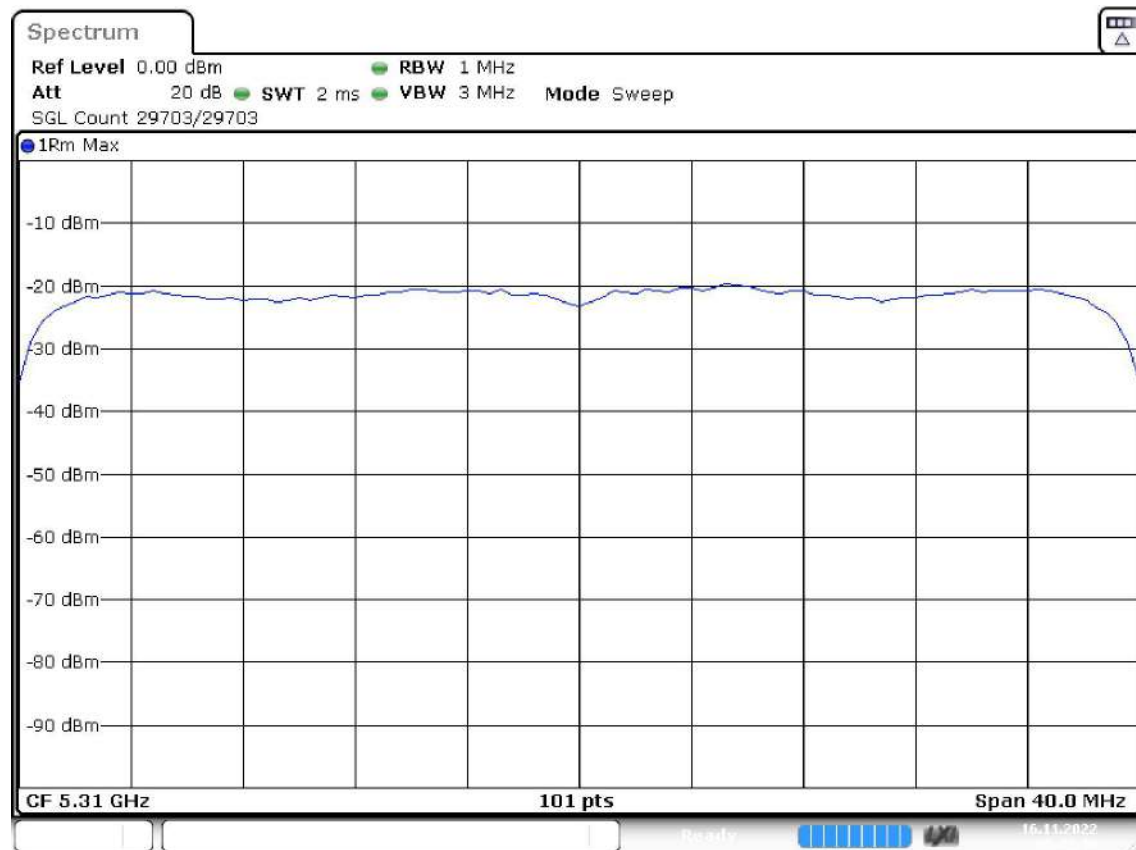
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Power Spectral Density (SA-3)



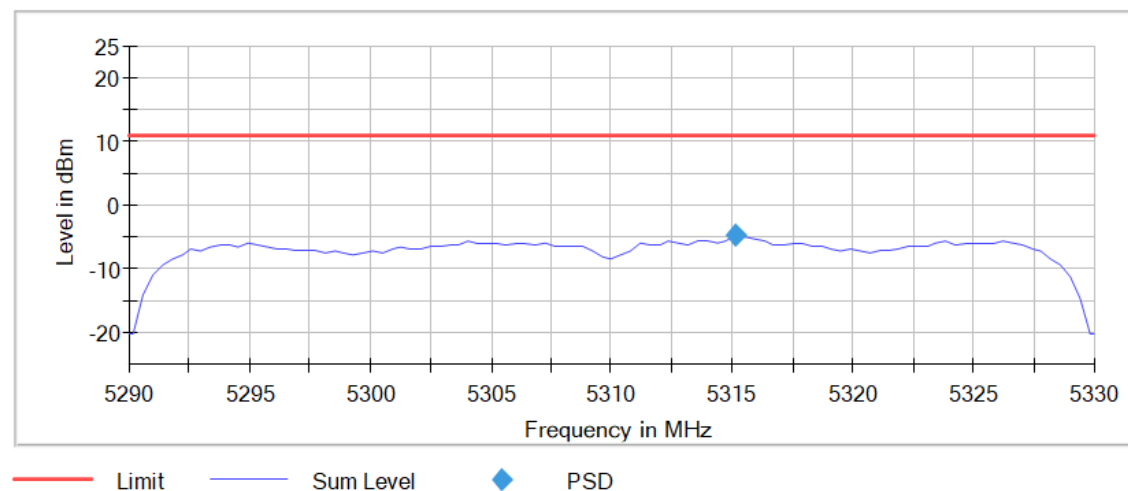
Active Port = 1, Frequency MHz = 5310.00000, Modulation = 802.11ax HE40 SS1 (OFDMA MCS9), Mode = SISO, Number of Transmission Chains = 1

Images:



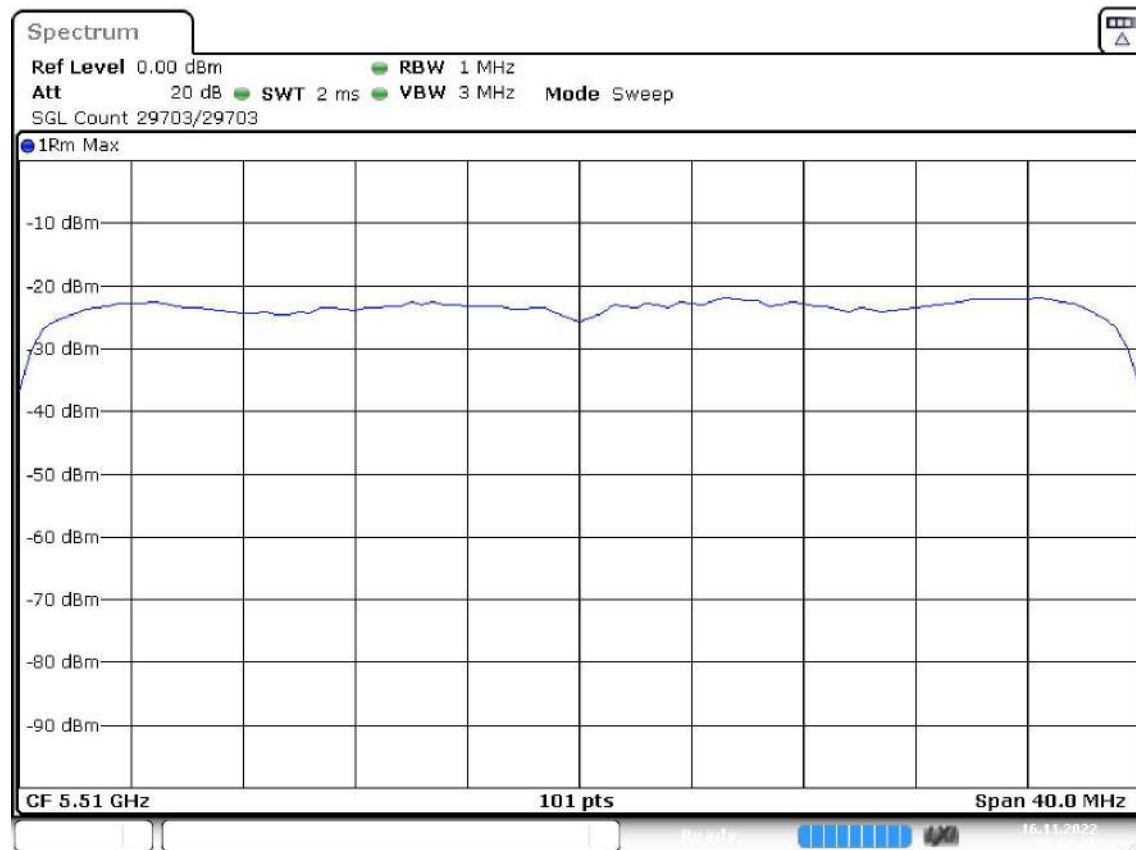
Date: 16.NOV.2022 09:42:45

Power Spectral Density (SA-3)



Active Port = 1, Frequency MHz = 5510.00000, Modulation = 802.11ax HE40 SS1 (OFDMA MCS9), Mode = SISO, Number of Transmission Chains = 1

Images:



Date: 16.NOV.2022 09:58:35

Power Spectral Density (SA-3)

