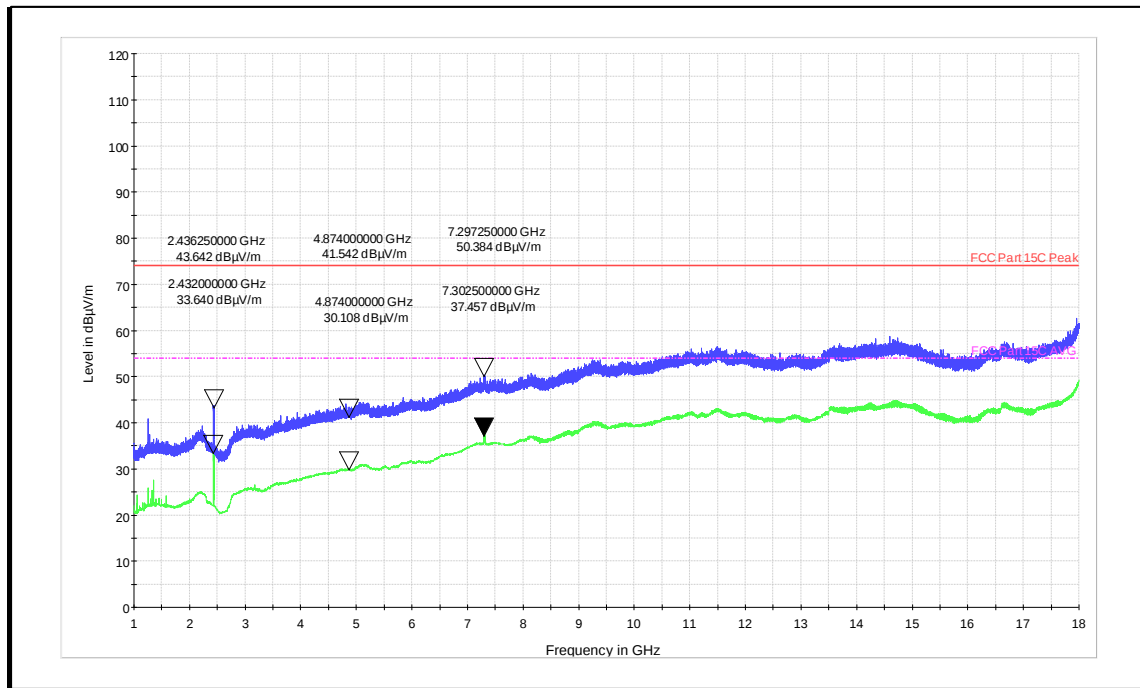
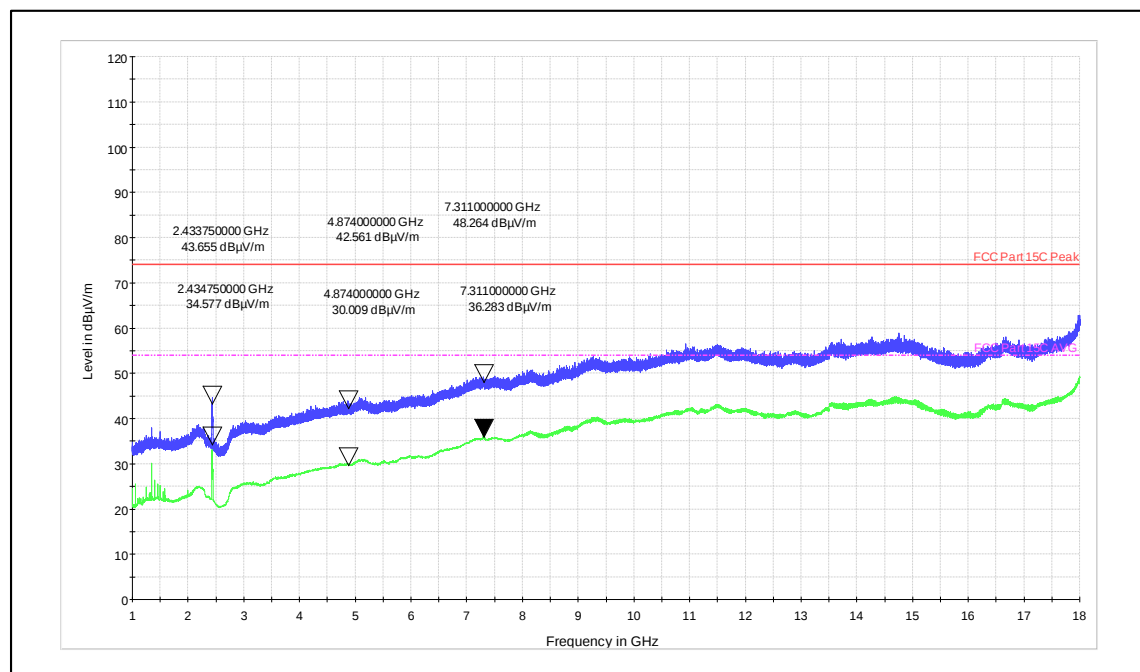




Channel Frequency - 2437MHz

Polarization – Vertical



Channel Frequency - 2437MHz

Polarization – Horizontal

Prüfbericht - Nr.:

Test Report No.:

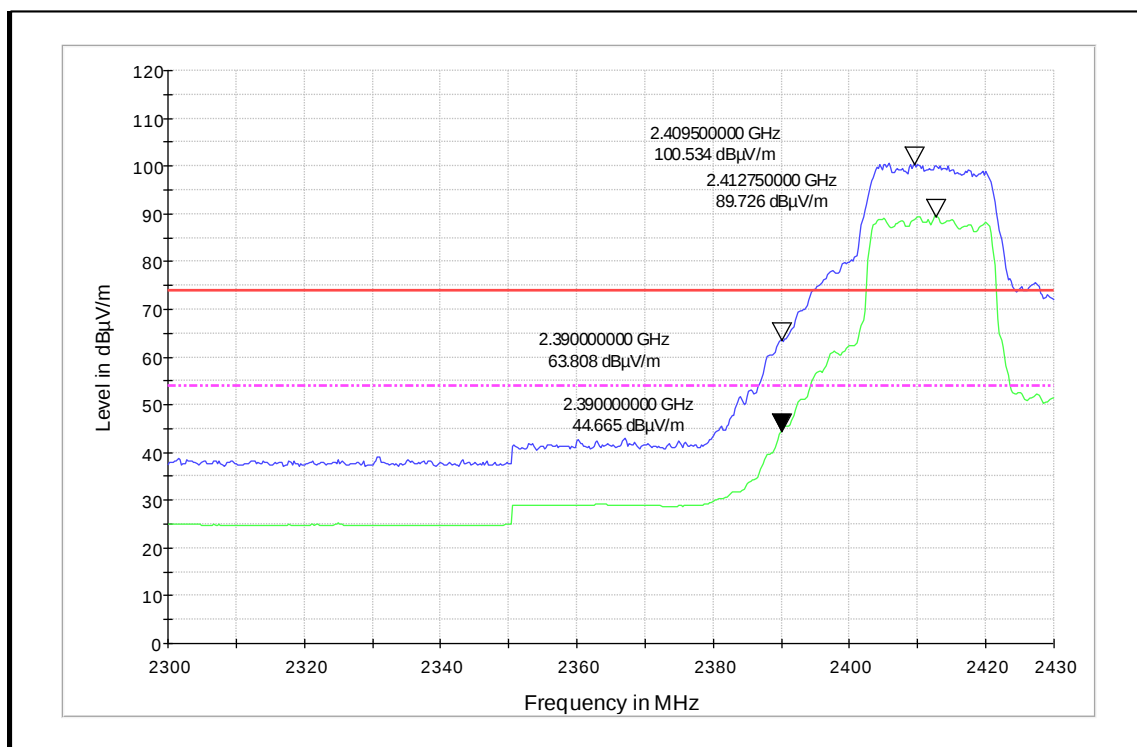
IN2391GP 001

Seite 182 von 226

Page 182 of 226

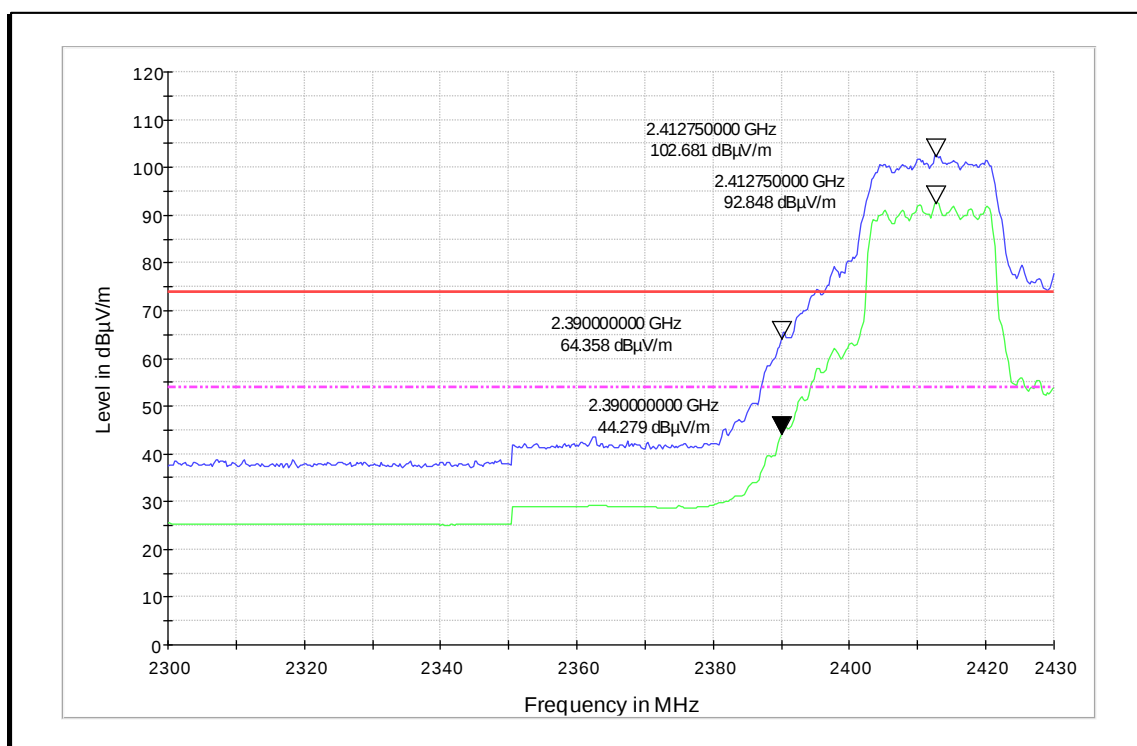
Modulation: 802.11n-HT_20

Data Rate : MCS 0



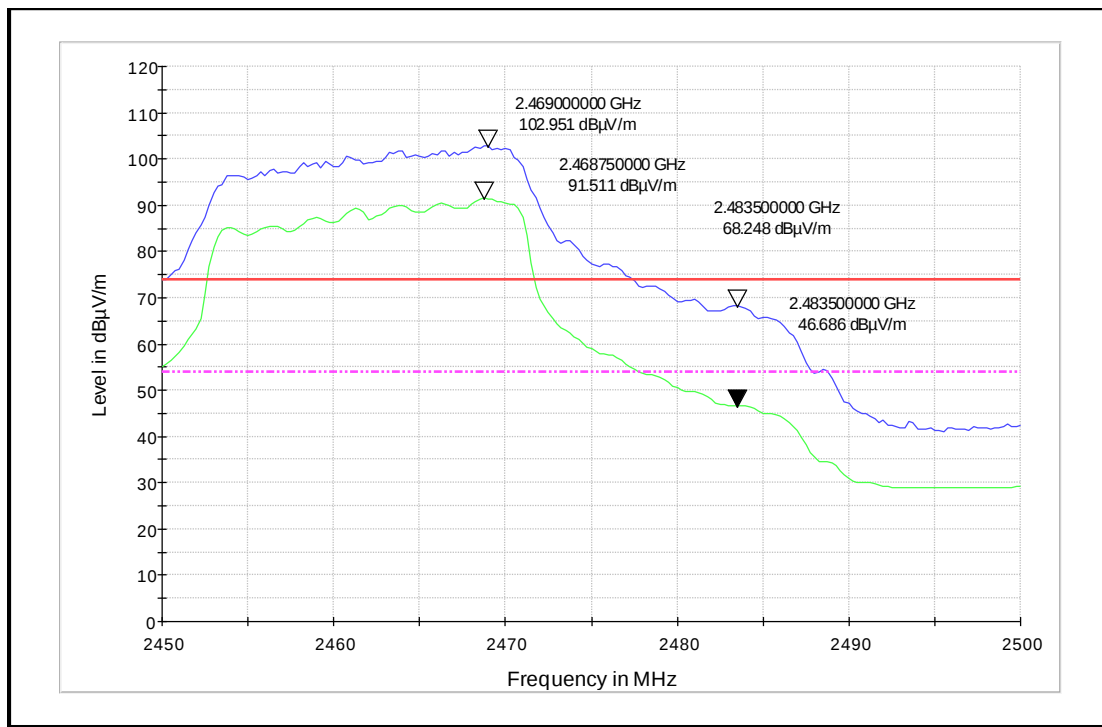
Channel Frequency - 2412MHz

Polarization – Vertical



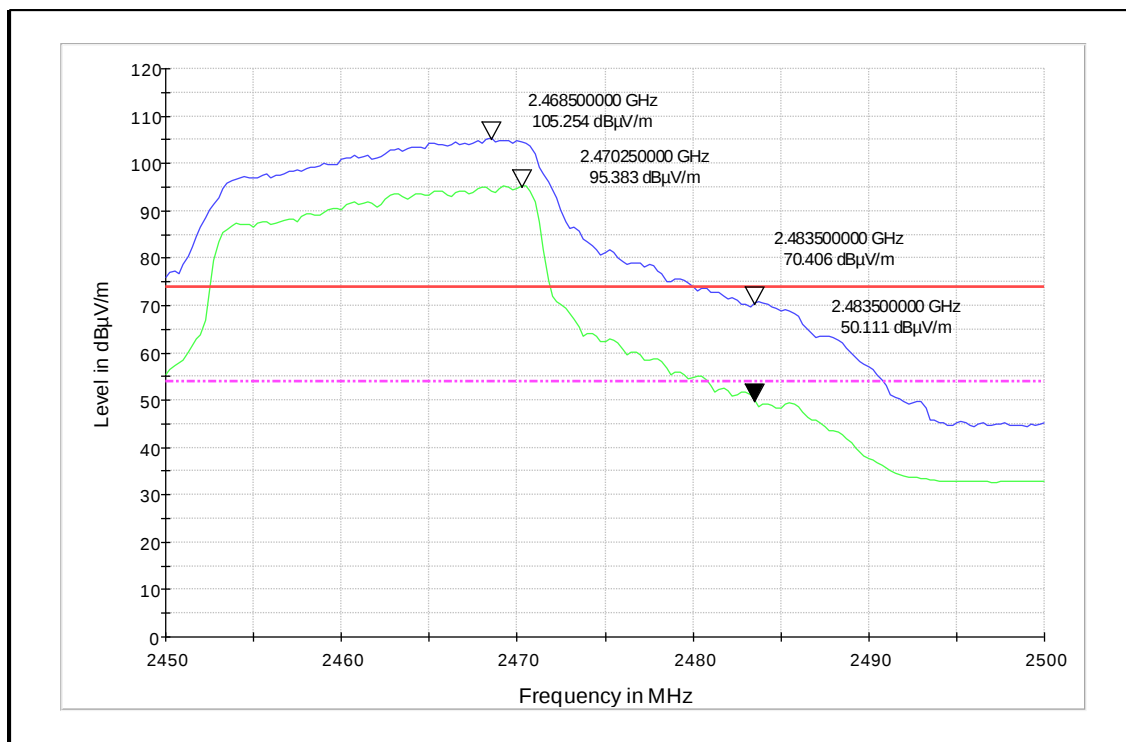
Channel Frequency - 2412MHz

Polarization – Horizontal



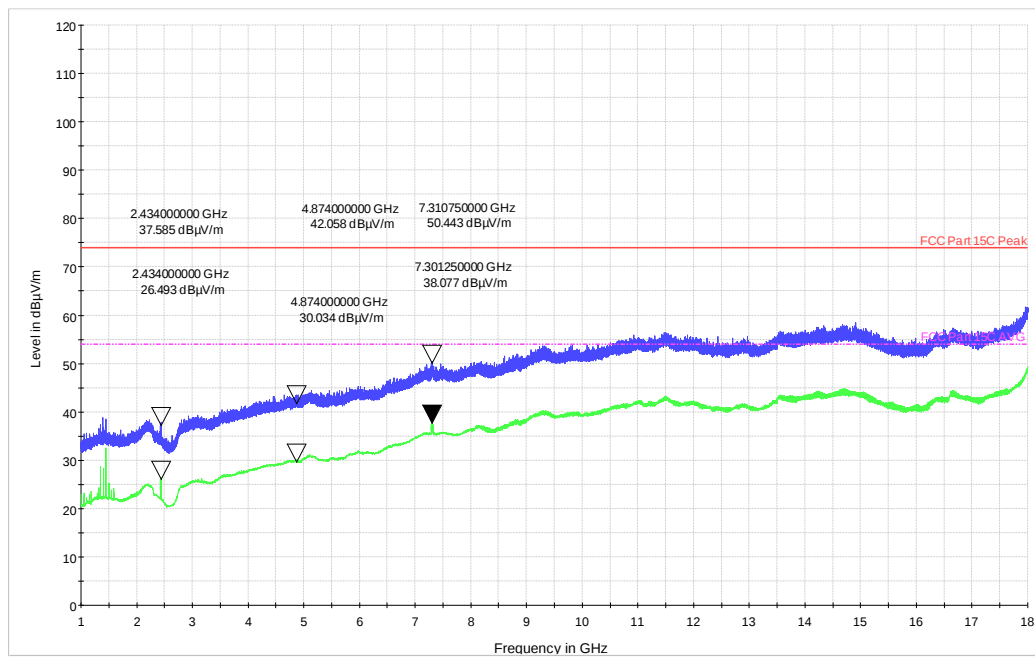
Channel Frequency - 2462MHz

Polarization – Vertical



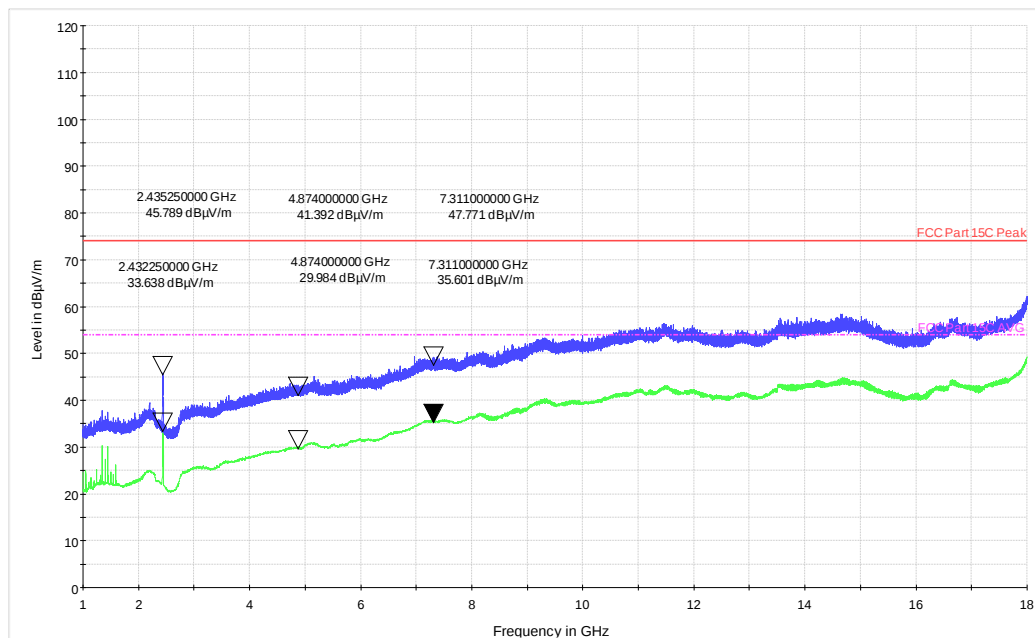
Channel Frequency - 2462MHz

Polarization – Horizontal



Channel Frequency - 2462MHz

Polarization – Vertical



Channel Frequency - 2462MHz

Polarization – Horizontal

Prüfbericht - Nr.:

Test Report No.:

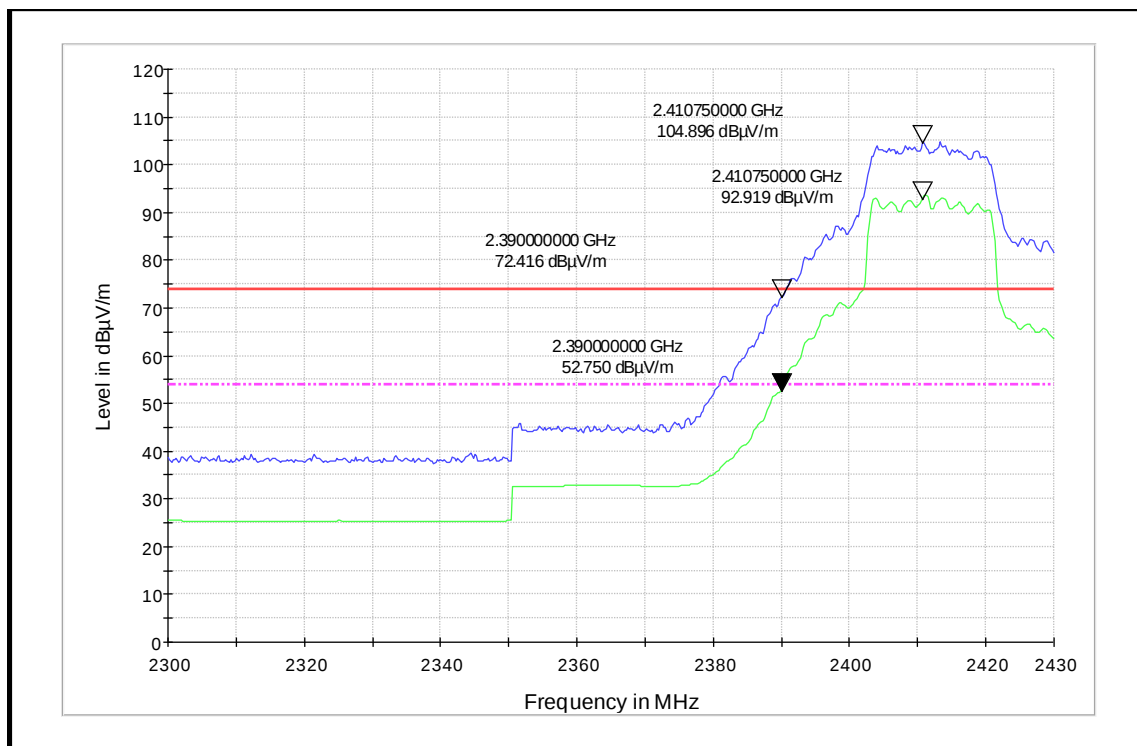
IN2391GP 001

Seite 185 von 226

Page 185 of 226

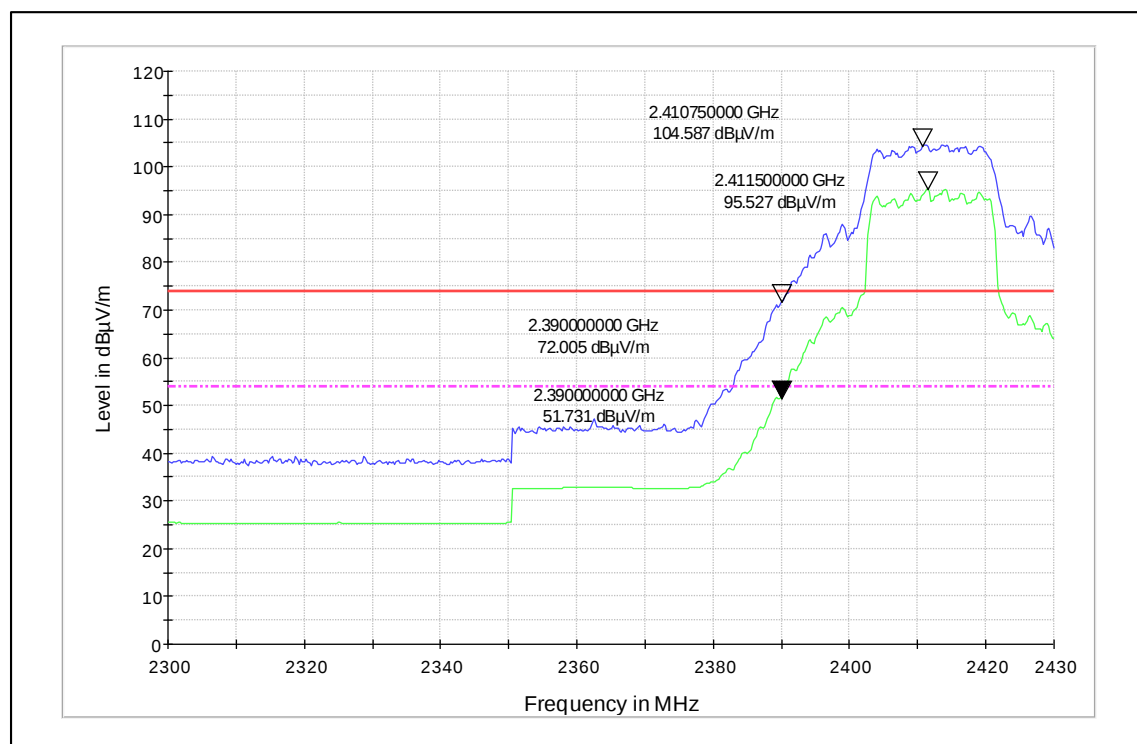
Modulation: 802.11ac-VHT_20

Data Rate : MCS 0



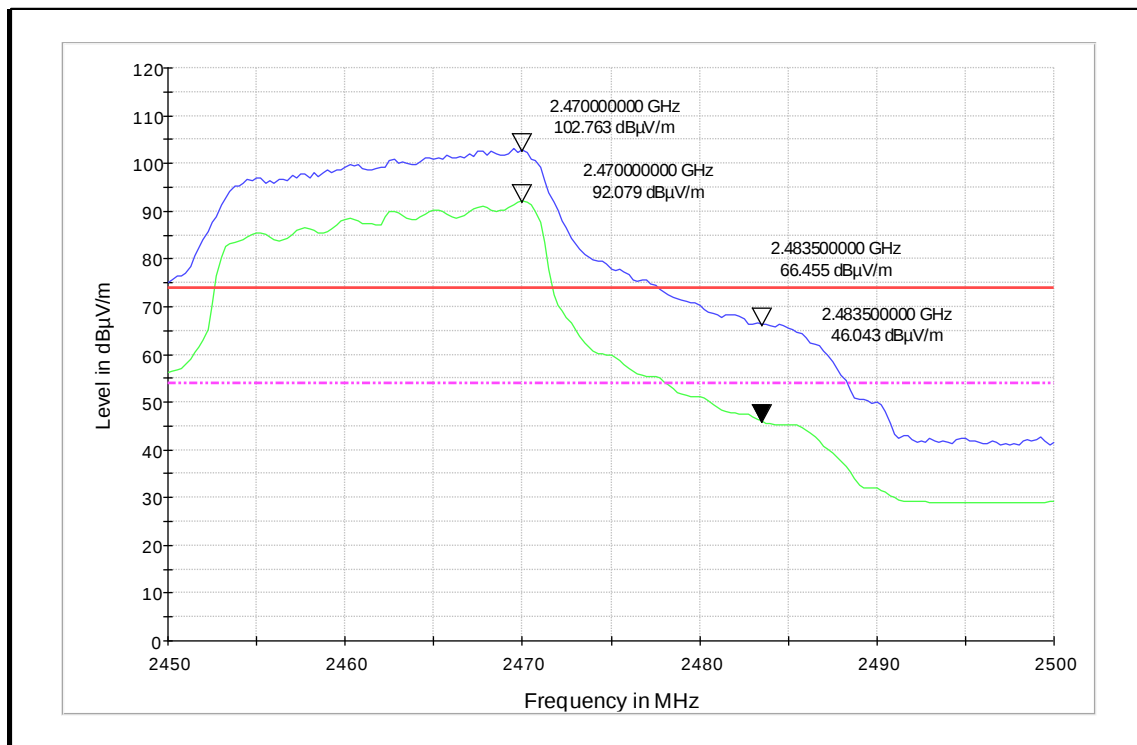
Channel Frequency - 2412MHz

Polarization – Vertical



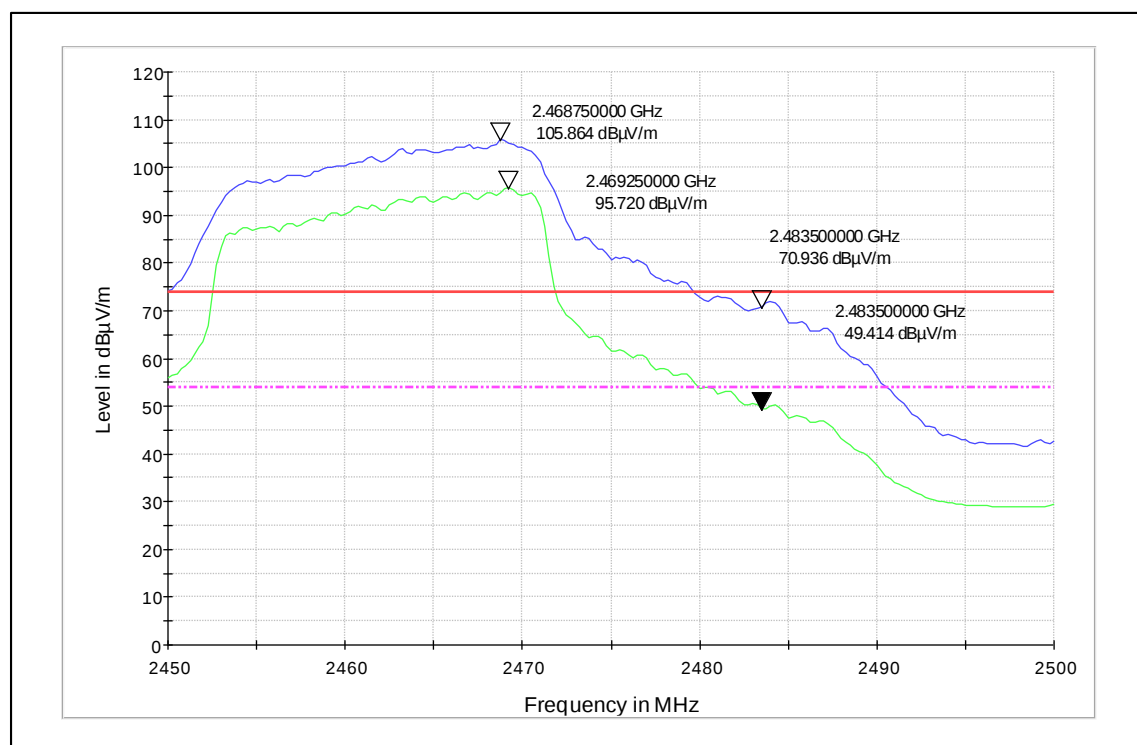
Channel Frequency - 2412MHz

Polarization – Horizontal



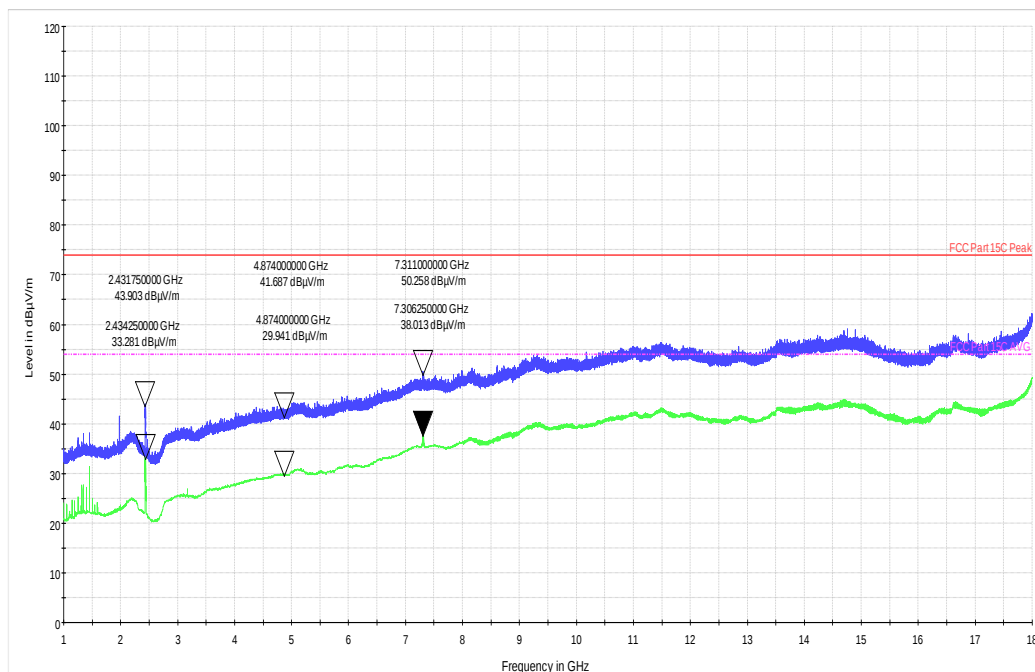
Channel Frequency - 2462MHz

Polarization – Vertical



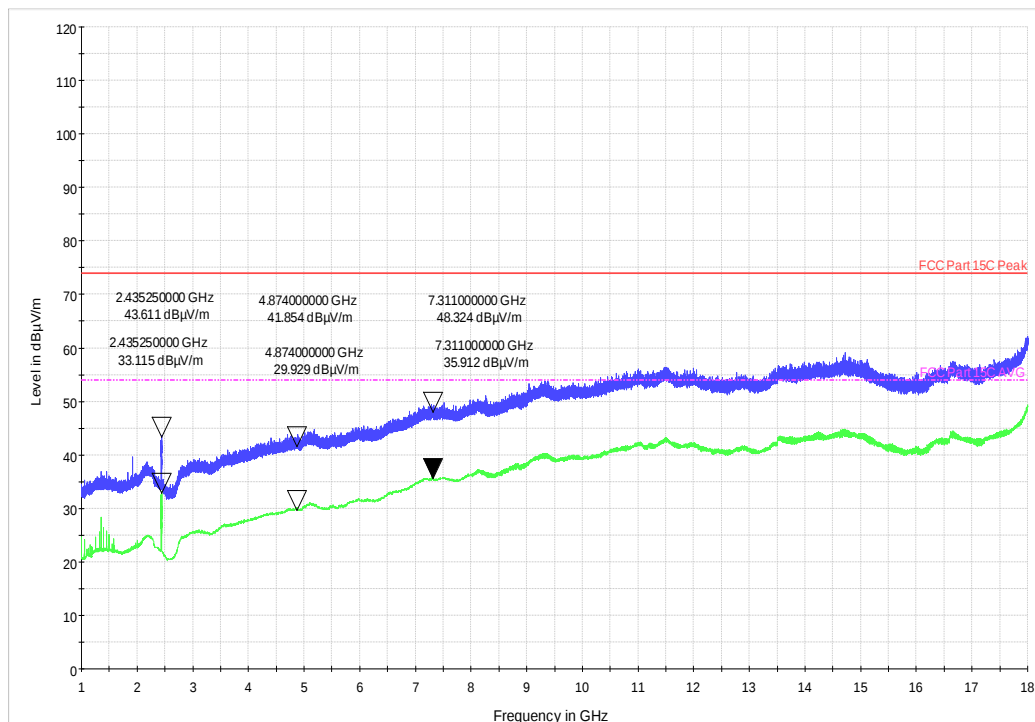
Channel Frequency - 2462MHz

Polarization – Horizontal



Channel Frequency - 2437MHz

Polarization – Vertical

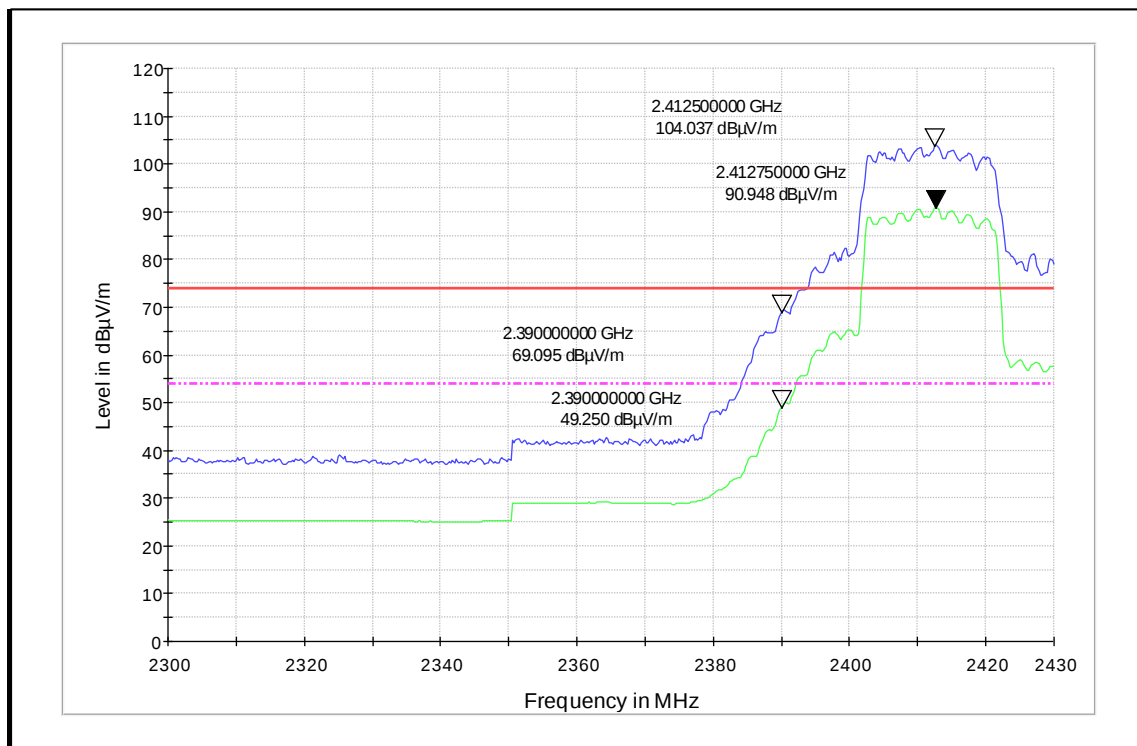


Channel Frequency - 2437MHz

Polarization – Horizontal

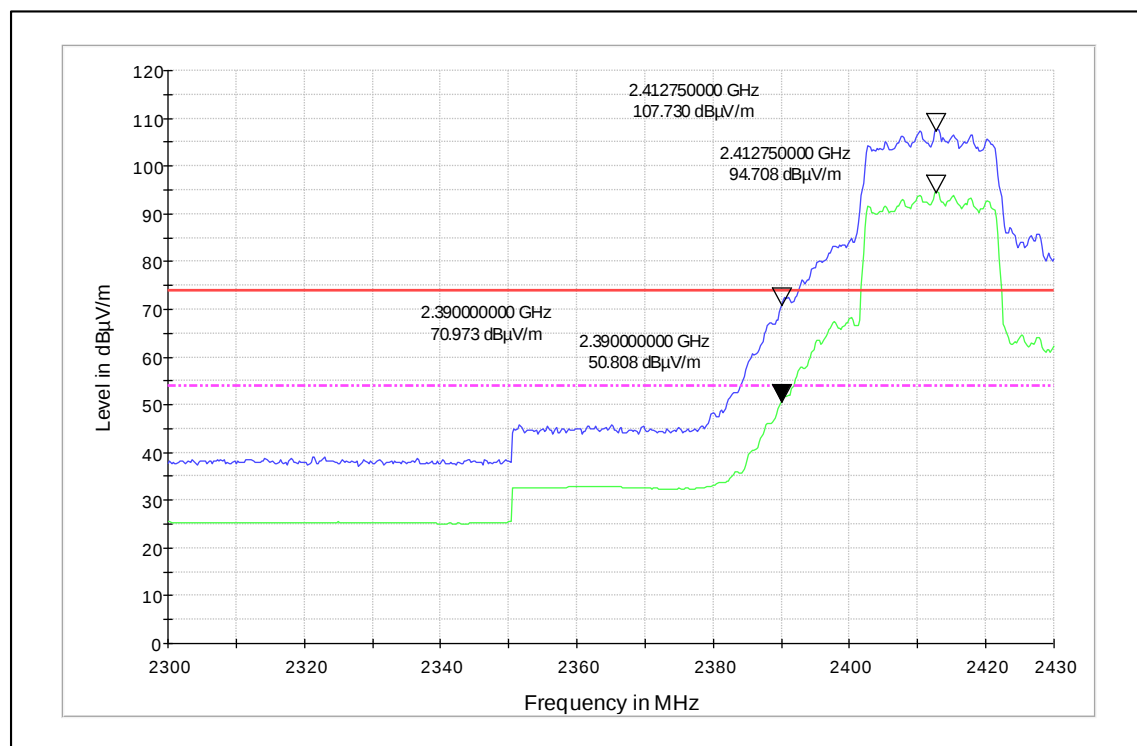
Modulation: 802.11ax-HE_20

Data Rate : MCS0



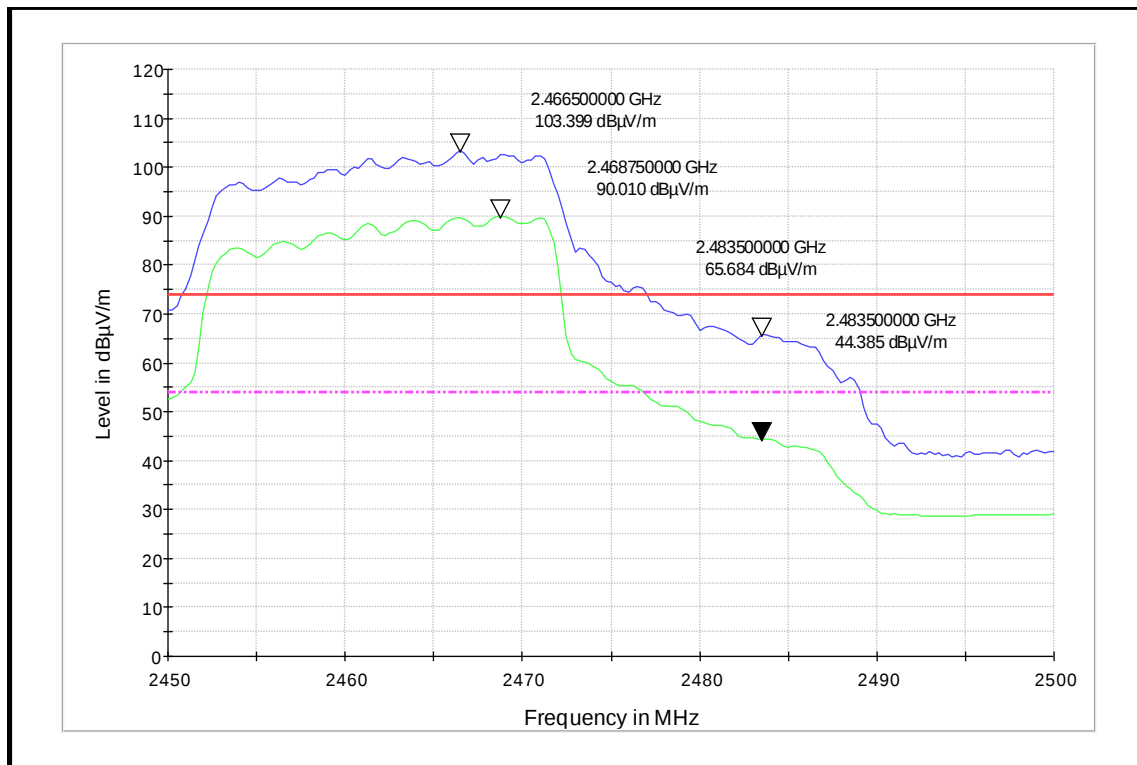
Channel Frequency - 2412MHz

Polarization – Vertical



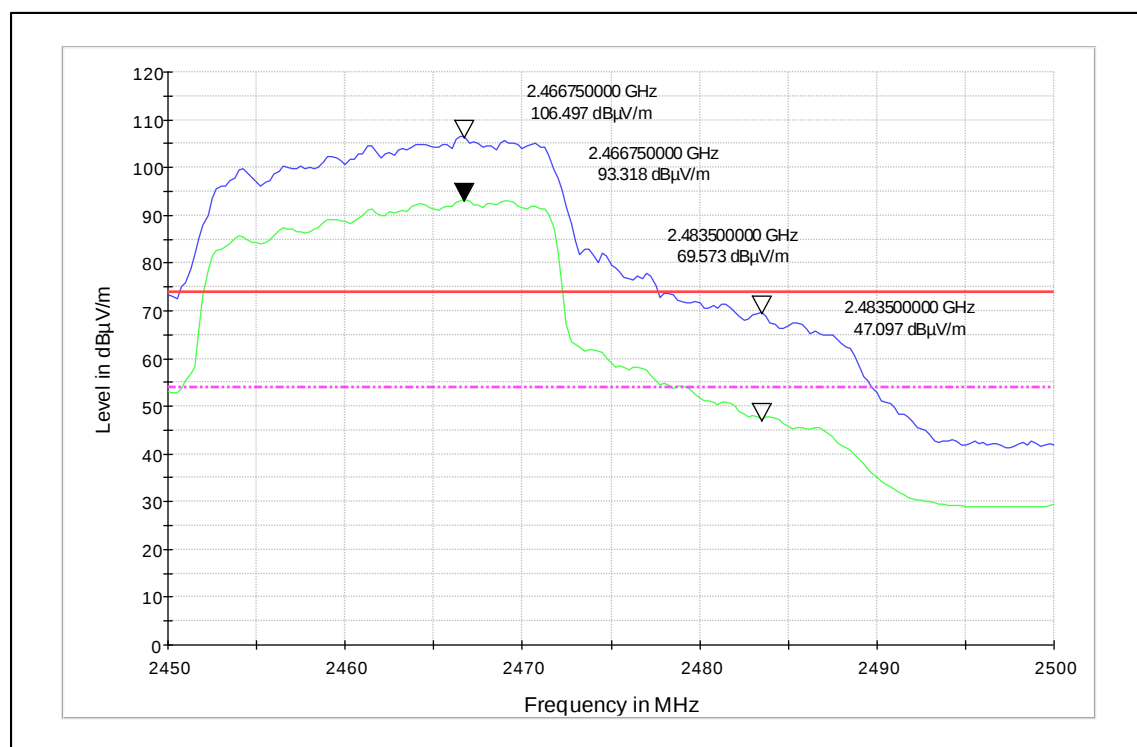
Channel Frequency - 2412MHz

Polarization – Horizontal



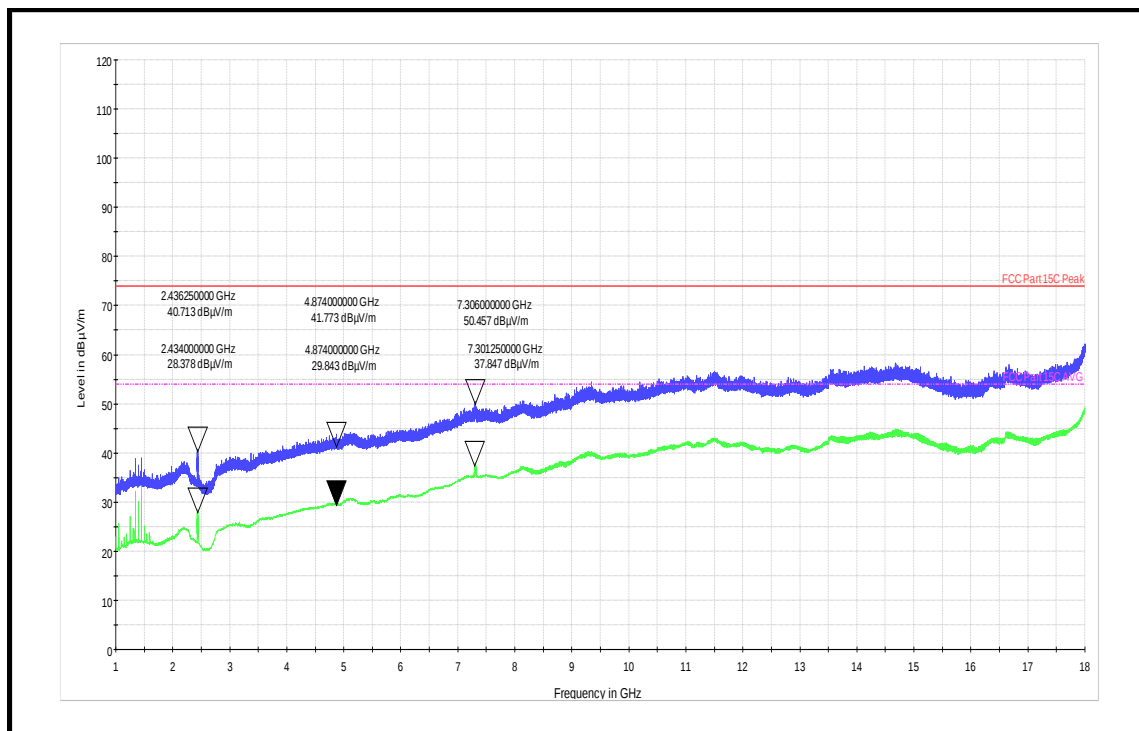
Channel Frequency - 2462MHz

Polarization – Vertical



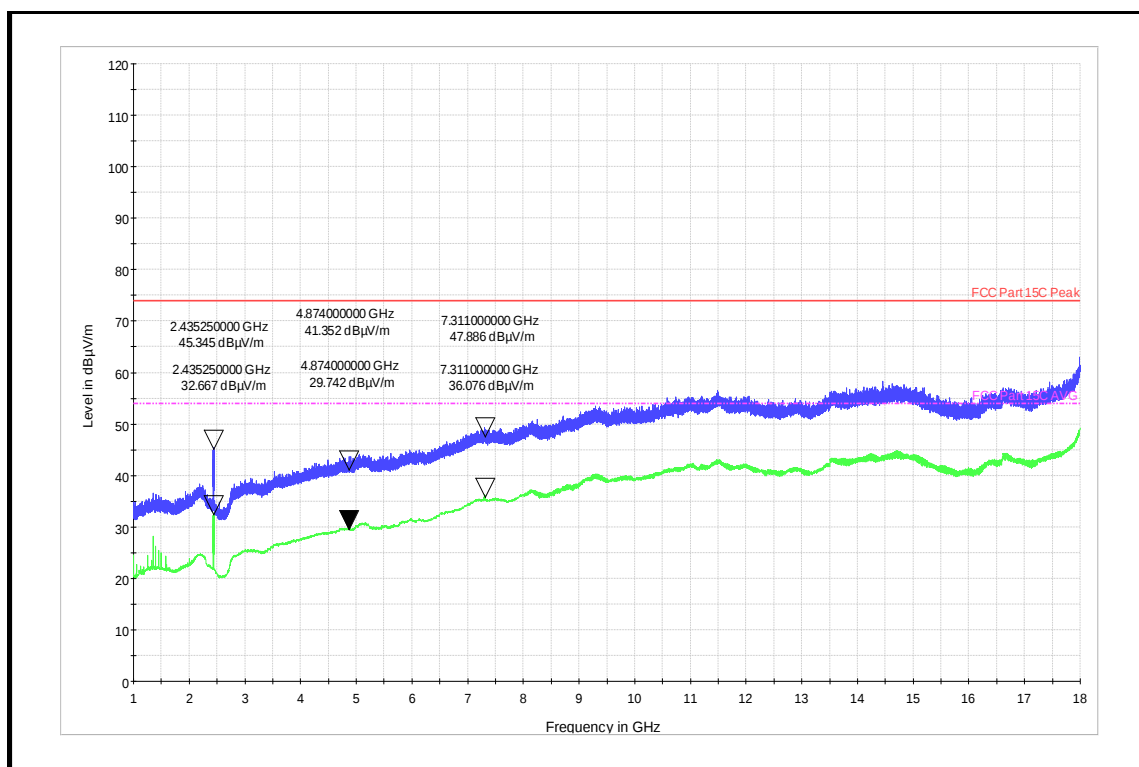
Channel Frequency - 2462MHz

Polarization – Horizontal



Channel Frequency - 2437MHz

Polarization – Vertical



Channel Frequency - 2437MHz

Polarization – Horizontal

Prüfbericht - Nr.:

Test Report No.:

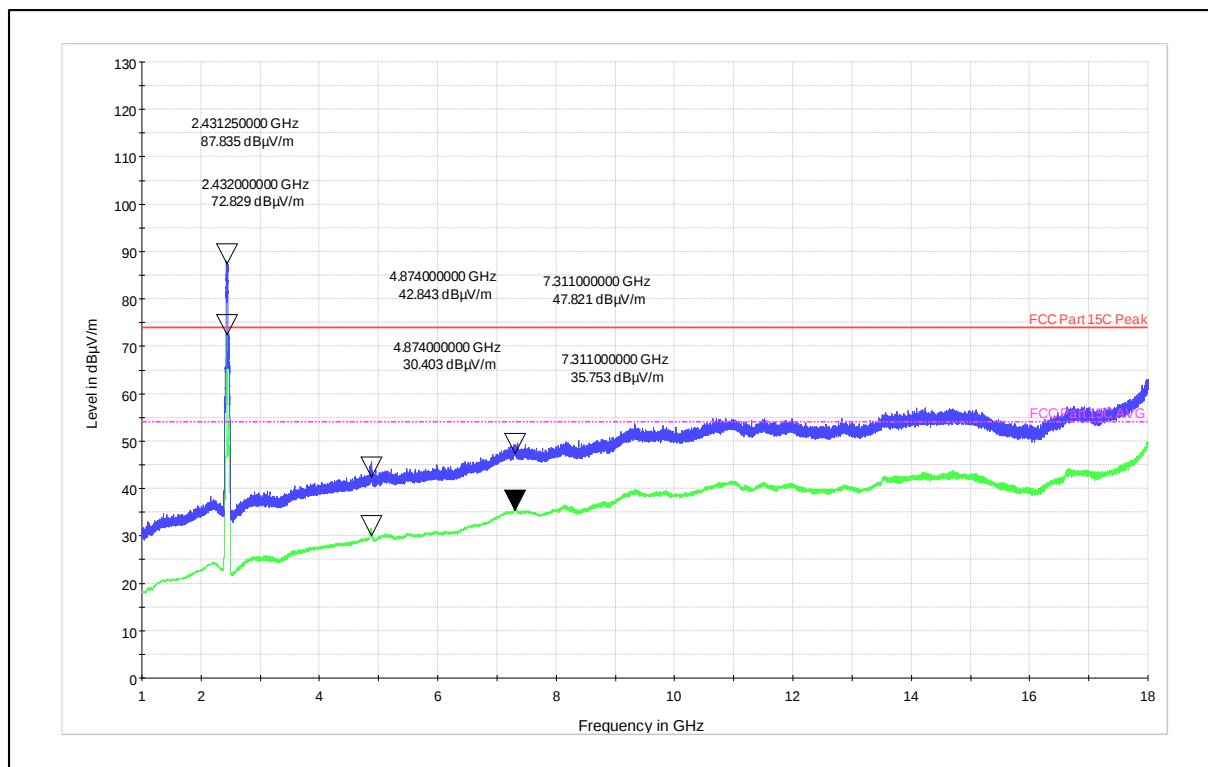
IN2391GP 001

Seite 191 von 226

Page 191 of 226

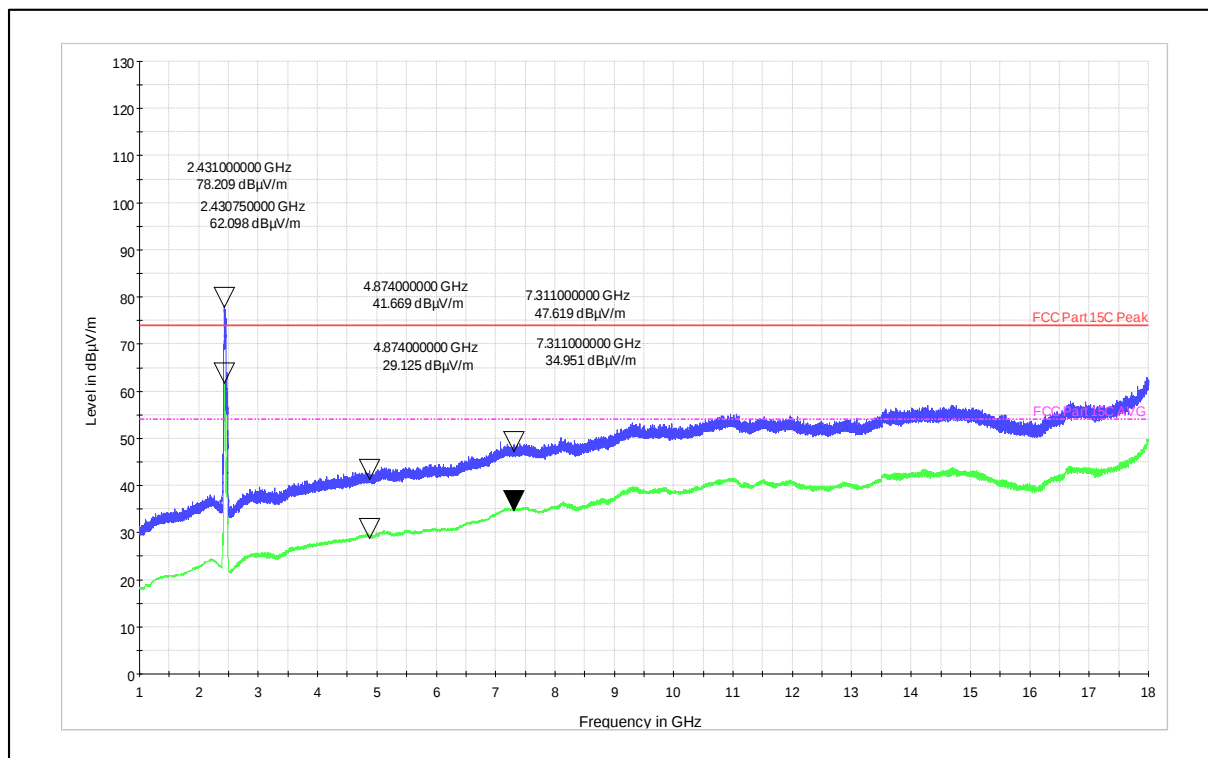
Modulation: 802.11n-HT_40

Data Rate : MCS 7



Channel Frequency - 2437MHz

Polarization – Vertical



Channel Frequency - 2437MHz

Polarization – Horizontal

Prüfbericht - Nr.:

Test Report No.:

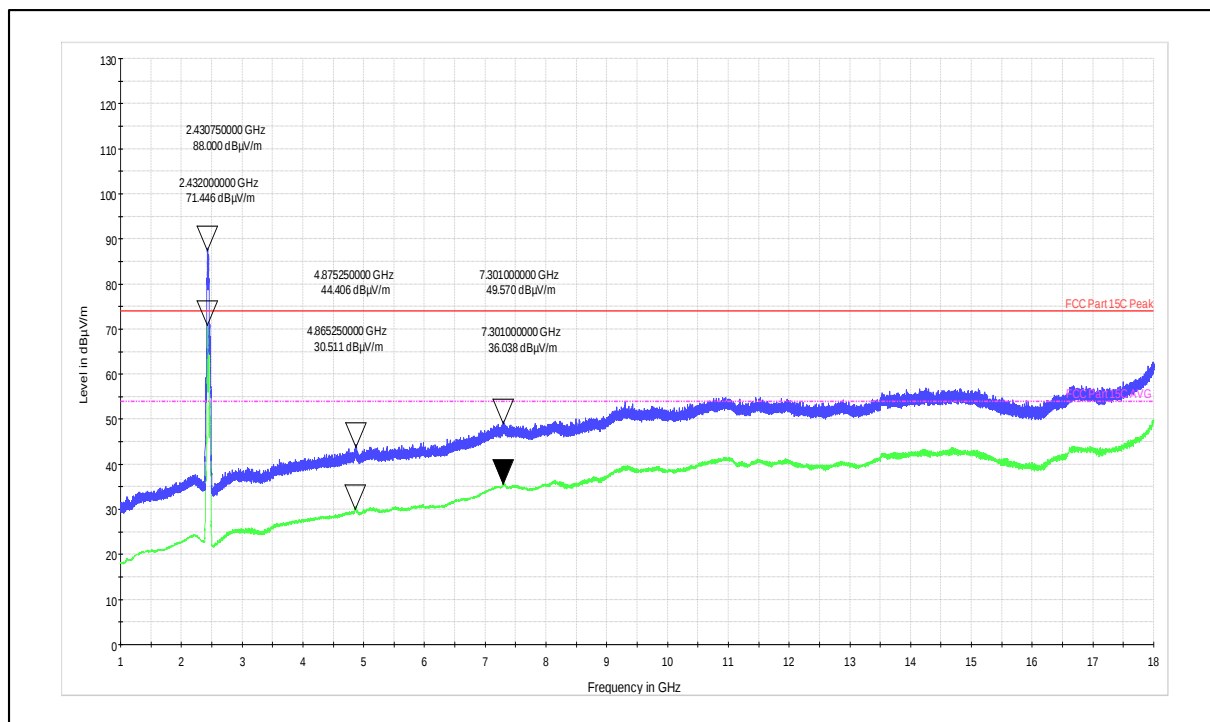
IN2391GP 001

Seite 192 von 226

Page 192 of 226

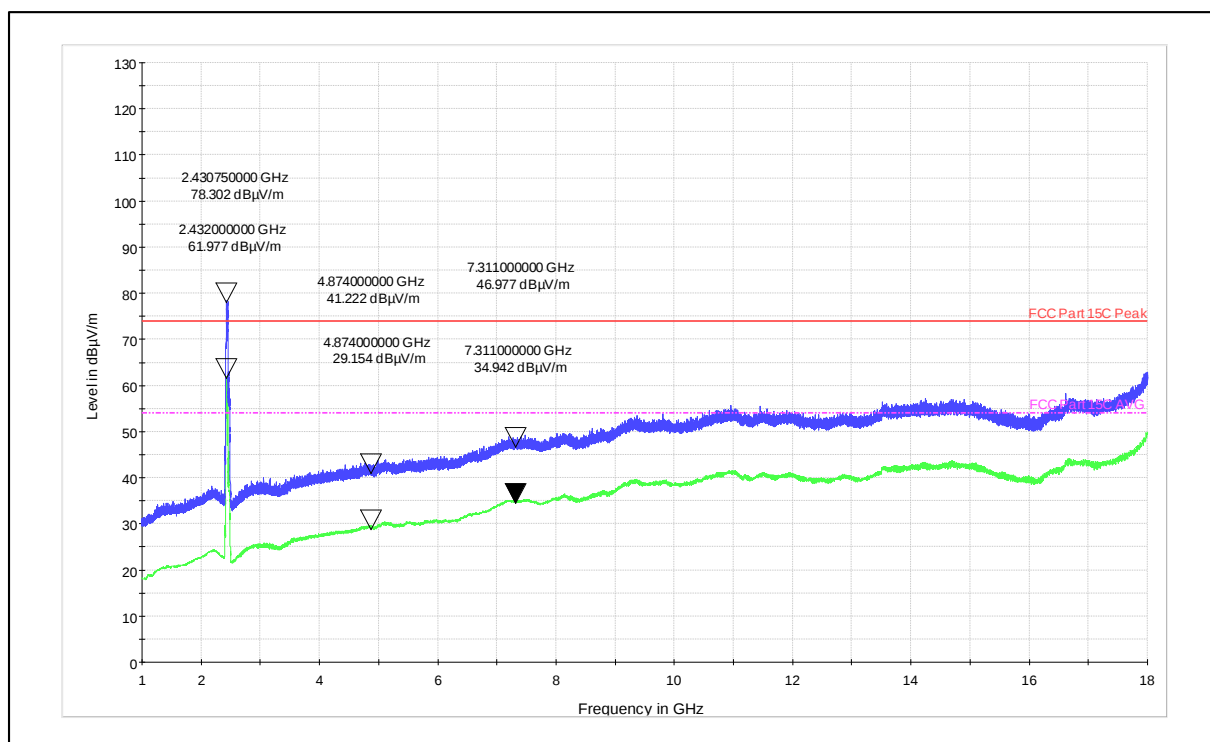
Modulation: 802.11ac-VHT_40

Data Rate : MCS 9



Channel Frequency - 2437MHz

Polarization – Vertical



Channel Frequency - 2437MHz

Polarization – Horizontal

Prüfbericht - Nr.:

Test Report No.:

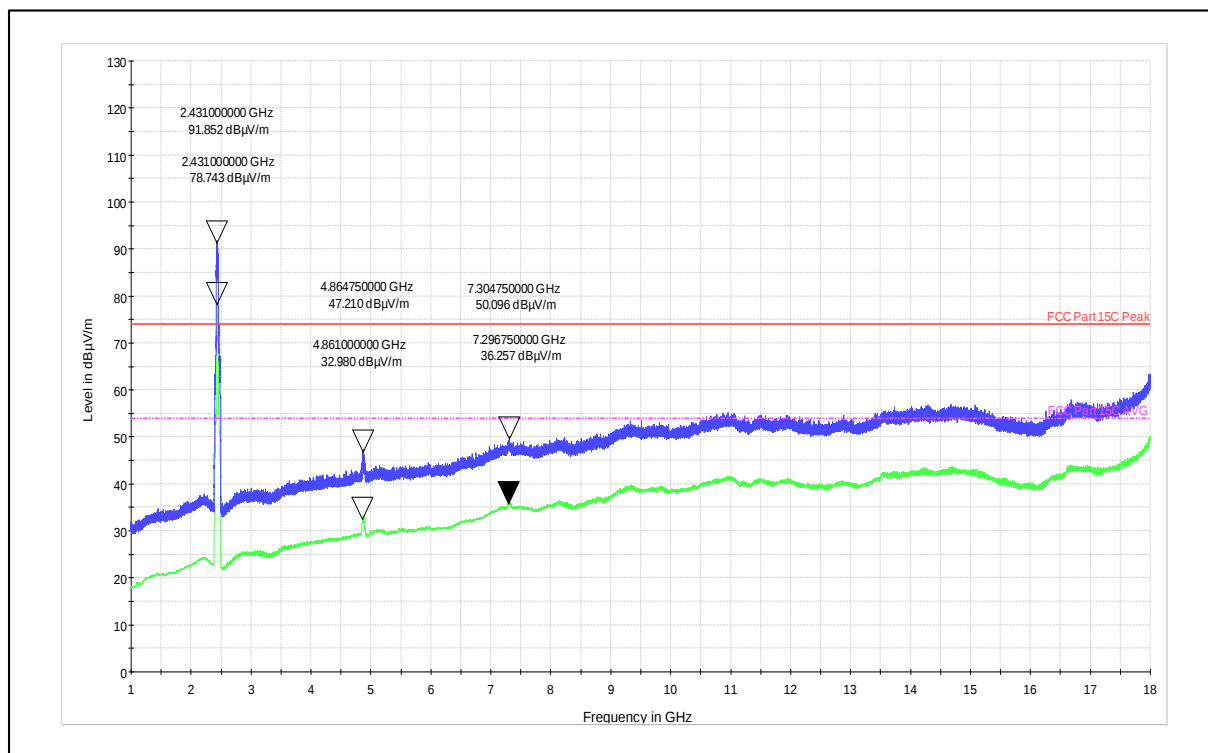
IN2391GP 001

Seite 193 von 226

Page 193 of 226

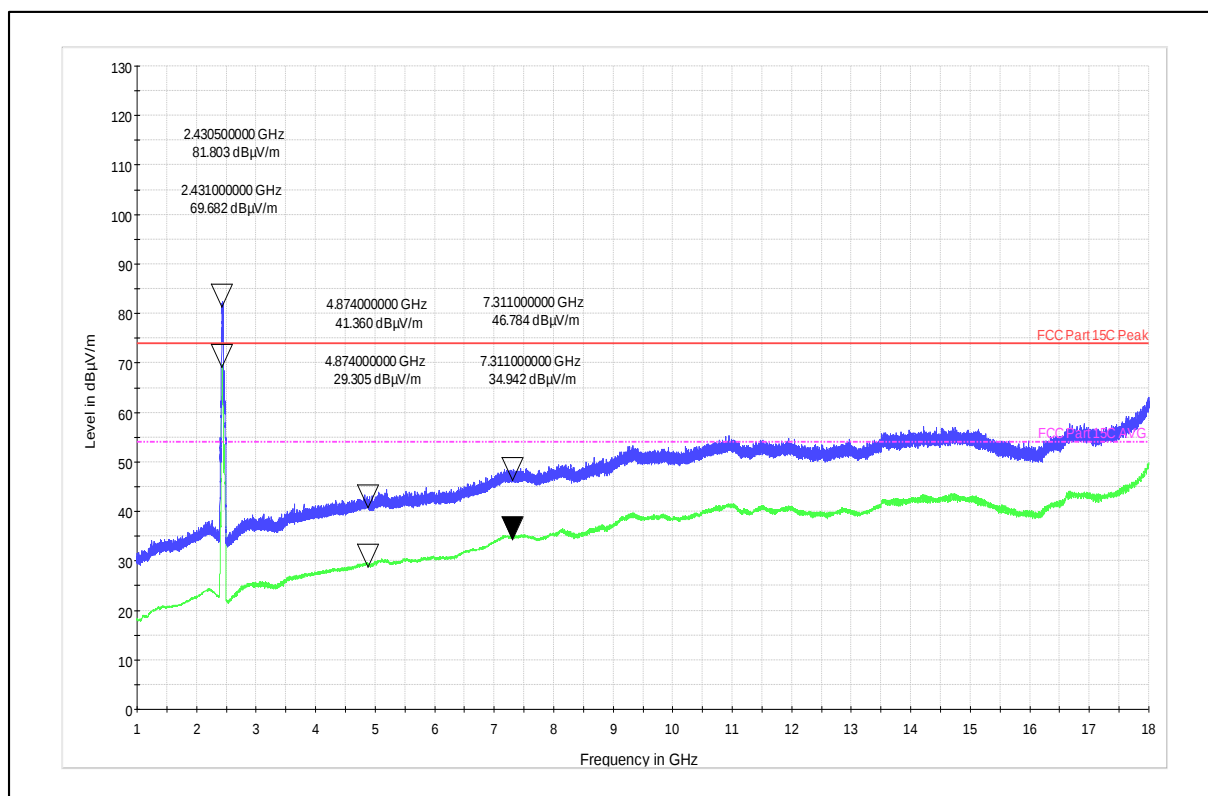
Modulation: 802.11ax-HE_40

Data Rate : MCS 0



Channel Frequency - 2437MHz

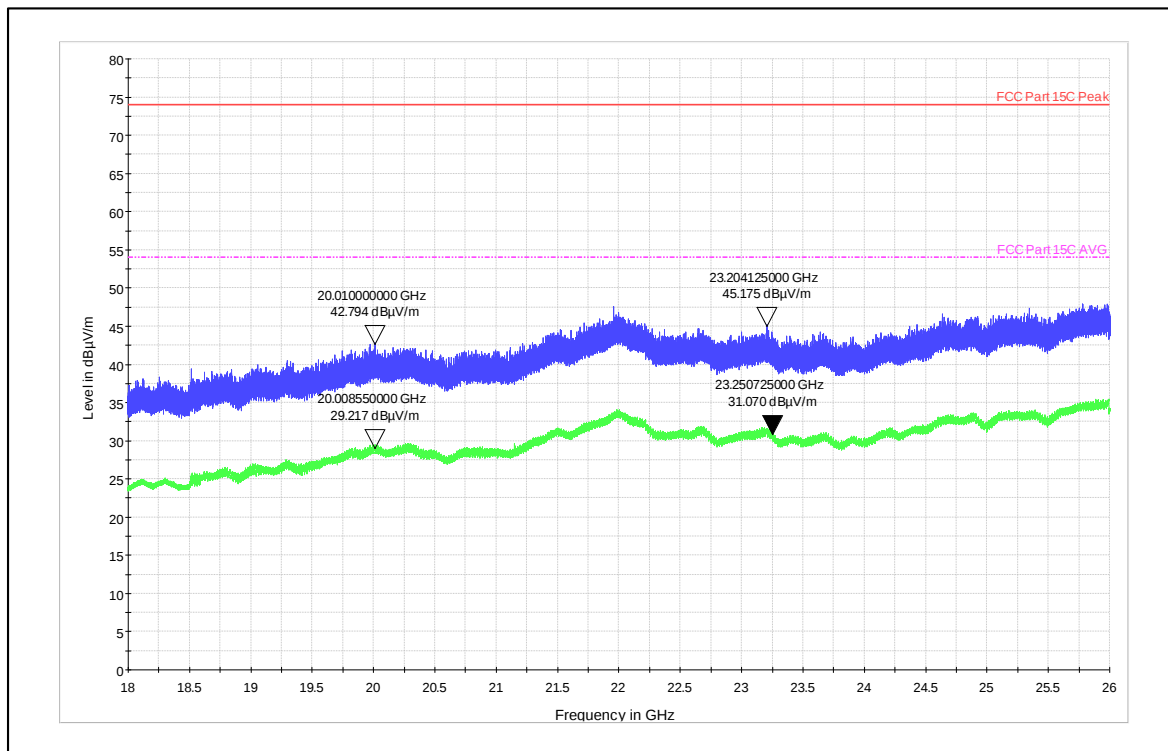
Polarization – Vertical



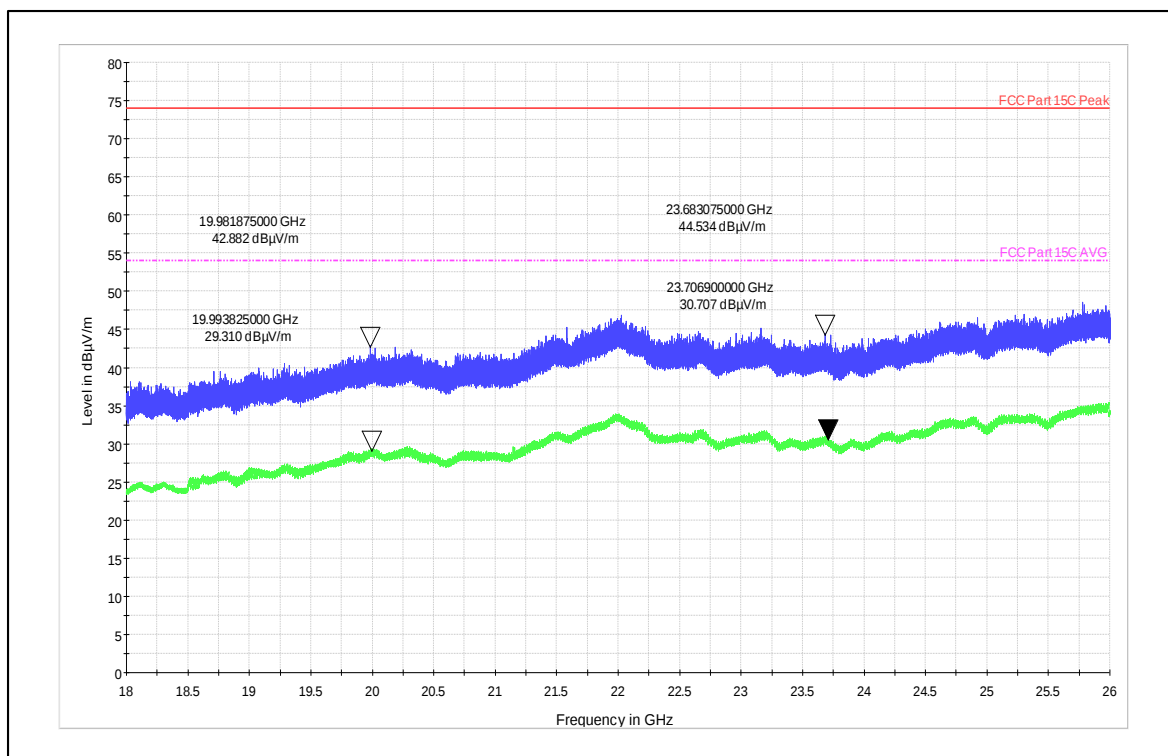
Channel Frequency - 2437MHz

Polarization – Horizontal

Channel Frequency-Vertical_18GHz - 40GHz



Channel Frequency-Horizontal_18GHz - 40GHz



Prüfbericht- Nr.:
Test Report No.:

IN2391GP 001

Seite 195 von 226
Page 195 of 226

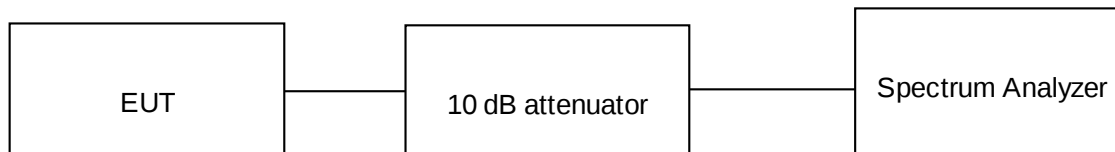
8 TEST RESULTS FOR BLUETOOTH LOW ENERGY

8.1 Maximum Peak Conducted Output Power

Result

Pass

Test Specification	FCC part 15 Subpart C 15.247 (b)(3) / RSS 247 Issue 2, Section 5.4 (d)
Test Method	Subclause 11.9.1.1 of ANSI C63.10
Measurement Bandwidth	1MHz
Detector	Peak
Port of testing	Antenna port
Requirement	Power ≤ 1 W (30 dBm) & e.i.r.p ≤ 4 W (36 dBm)



Test Condition

Normal Test Condition:

Temperature (Norm) = + 25 °C

Voltage = 3.3 V DC through AC to Dc adaptor

Relative humidity: 62%

KDB Guidelines applied:

Measurements were made as per section 8.3.1 in KDB 558074 D01 15.247 Measurement Guidance v05r02.

Prüfbericht - Nr.:

Test Report No.:

IN2391GP 001

Seite 196 von 226

Page 196 of 226

Test results:

Note:

1. All the losses are included during measurement and final values are mentioned in the test report.
2. Total Peak Output power (dBm) = Measured Peak power (dBm) + Attenuator factor (10dB) + Cable loss (1.4dB)

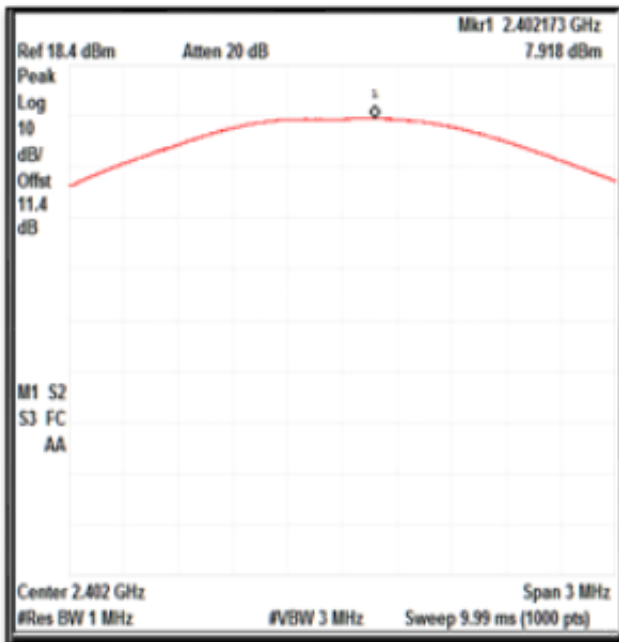
Antenna Type	Data Rate (Mbps)	Channel Frequency (MHz)	Maximum Peak Conducted Output Power (dBm)	Maximum (e.i.r.p)	Power Limit (dBm)	Limit (e.i.r.p)
1001932PT MIMO Antenna	1	2402	7.91	10.41	30.00	36
		2440	7.69	10.19	30.00	36
		2480	7.44	9.94	30.00	36
	2	2402	7.66	10.16	30.00	36
		2440	7.76	10.26	30.00	36
		2480	7.65	10.15	30.00	36
FPA3020-10A MIMO Antenna	1	2402	7.91	12.14	30.00	36
		2440	7.69	11.92	30.00	36
		2480	7.44	11.67	30.00	36
	2	2402	7.66	11.89	30.00	36
		2440	7.76	11.99	30.00	36
		2480	7.65	11.88	30.00	36

Prüfbericht - Nr.:
Test Report No.:

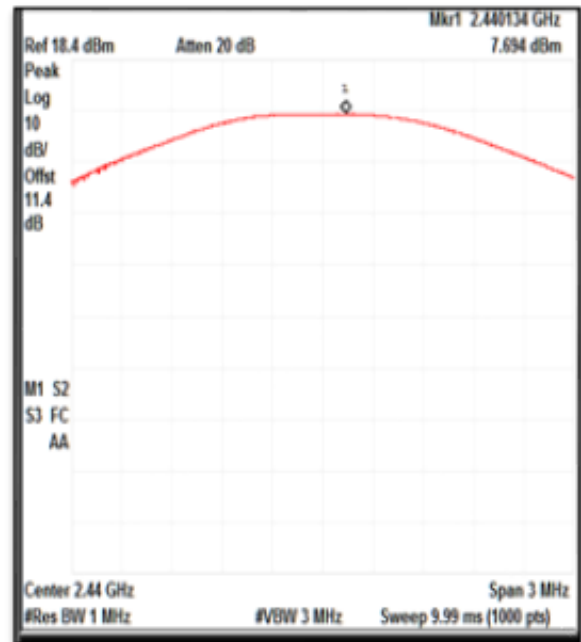
IN2391GP 001

Seite 197 von 226
Page 197 of 226

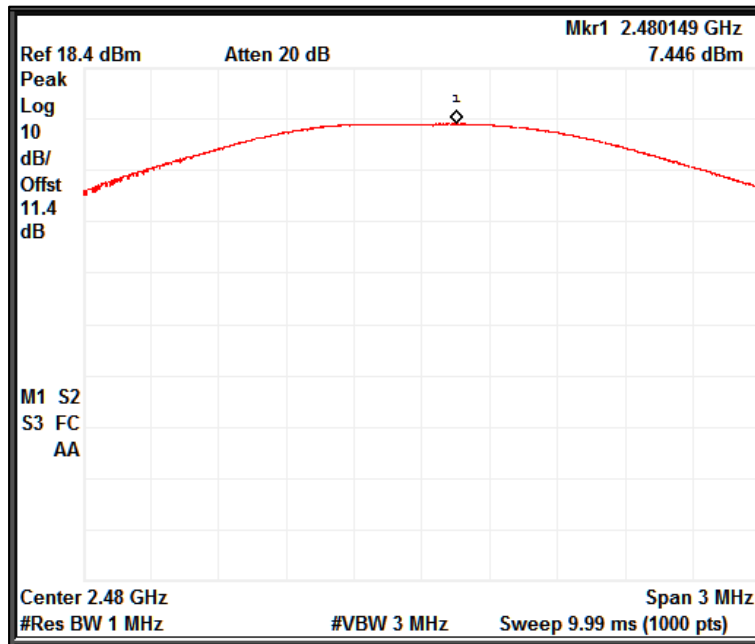
Data Rate: 1Mbps



Channel Frequency 2402MHz



Channel Frequency 2440MHz



Channel Frequency: 2480MHz

Prüfbericht - Nr.:

Test Report No.:

IN2391GP 001

Seite 198 von 226

Page 198 of 226

8.2 Maximum Power Spectral Density

Result

Pass

Test Specification

FCC part 15 Subpart C 15.247 (e) / RSS 247 Issue 2, Section 5.2 (b)

Test Method

Subclause 11.10.2 of ANSI C63.10

Measurement Bandwidth

100 kHz

Detector

Peak detector

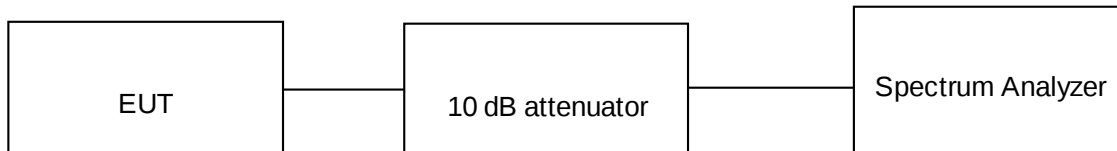
Port of testing

Antenna port

Requirement

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm

Test Method:



Test Condition

Normal Test Condition:

Temperature (Norm) = + 25°C

Voltage = 3.3 V DC through AC to Dc adaptor

Relative humidity: 62 %

KDB Guidelines applied:

Measurements were made as per section 8.4 in KDB 558074 D01 15.247 Measurement Guidance v05r02.

Prüfbericht - Nr.:

Test Report No.:

IN2391GP 001

Seite 199 von 226

Page 199 of 226

Test results:

Note:

1. All the losses are included during measurement and final values are mentioned in the test report.
2. Total Peak PSD (dBm) = Measured Peak PSD (dBm) + Attenuator factor (10dB) + Cable loss (1.4dB)

Antenna Type	Data Rate (Mbps)	Channel Frequency (MHz)	Measured PSD (dBm/kHz)	PSD Limit (dBm/kHz)
1001932PT MIMO Antenna	1	2402	6.88	8.00
		2440	6.92	8.00
		2480	6.66	8.00
	2	2402	5.98	8.00
		2440	6.11	8.00
		2480	5.93	8.00
FPA3020-10A MIMO Antenna	1	2402	6.88	8.00
		2440	6.92	8.00
		2480	6.66	8.00
	2	2402	5.98	8.00
		2440	6.11	8.00
		2480	5.93	8.00

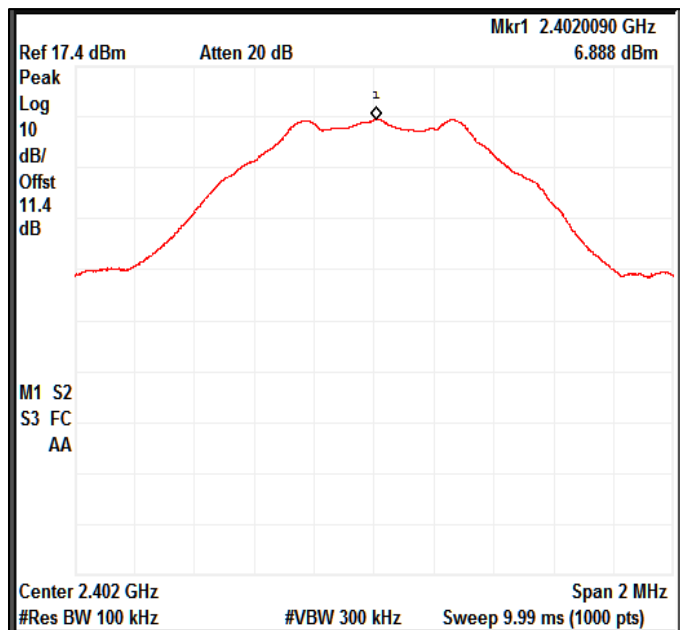
Prüfbericht- Nr.:

Test Report No.:

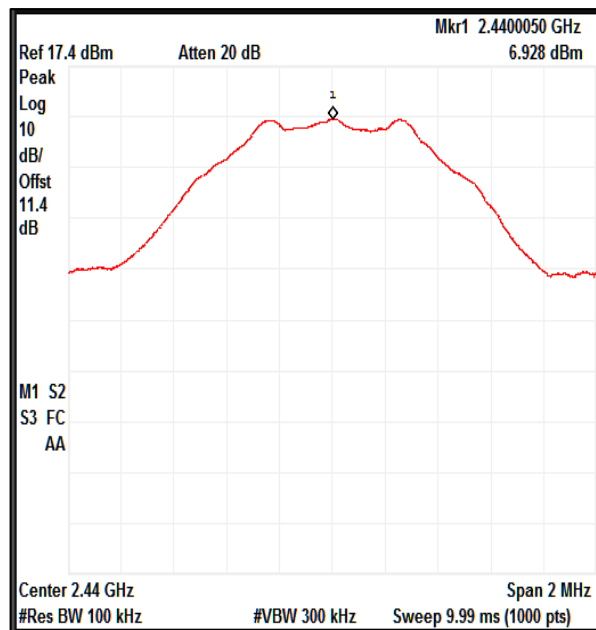
IN2391GP 001

Seite 200 von 226

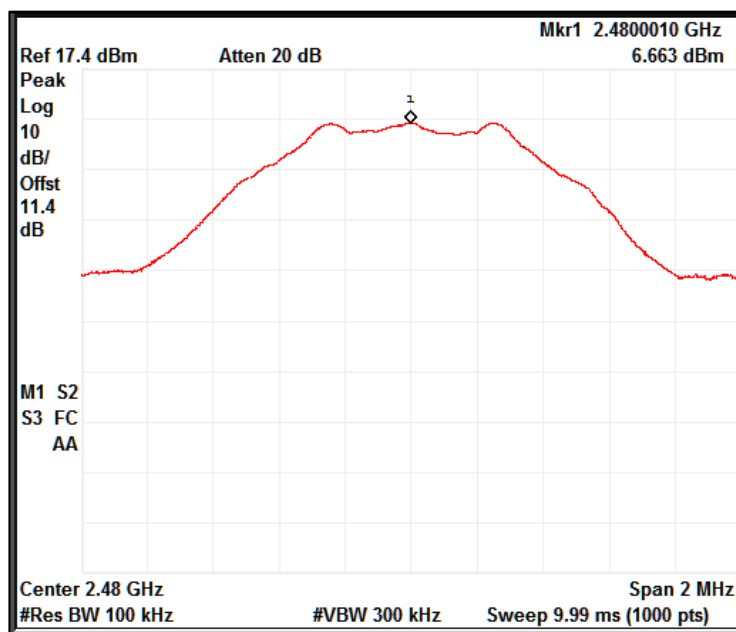
Page 200 of 226



Channel Frequency 2402MHz



Channel Frequency 2440MHz



Channel Frequency: 2480MHz

Prüfbericht - Nr.:
Test Report No.:

IN2391GP 001

Seite 201 von 226
Page 201 of 226

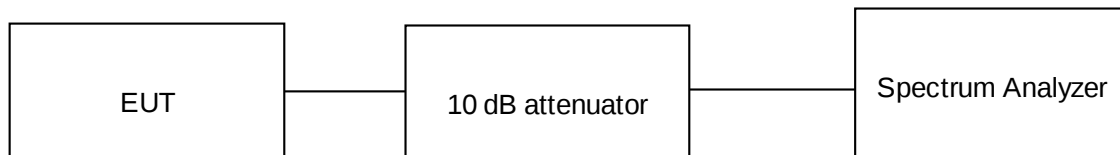
8.3 DTS Bandwidth & 99% Bandwidth

Result

Pass

Test Specification	FCC part 15 Subpart C 15.247 (a) (2) / RSS 247 Issue 2, Section 5.2 (a)
Test Method	Subclause 11.8.1 of ANSI C63.10
Measurement Bandwidth	100 kHz for x dB bandwidth 1 to 5% of OCB for 99% bandwidth
Detector	Peak
Port of testing	Antenna port
Requirement	The minimum 6 dB bandwidth shall be at least 500 kHz

Test Method:



Test Condition

Normal Test Condition:

Temperature (Norm) = + 25 °C Voltage = 3.3 V DC through AC to Dc adaptor Relative humidity: 62 %

KDB Guidelines applied:

Measurements were made as per section 8.2 in KDB 558074 D01 15.247 Measurement Guidance v05r02.

Prüfbericht - Nr.:

Test Report No.:

IN2391GP 001

Seite 202 von 226

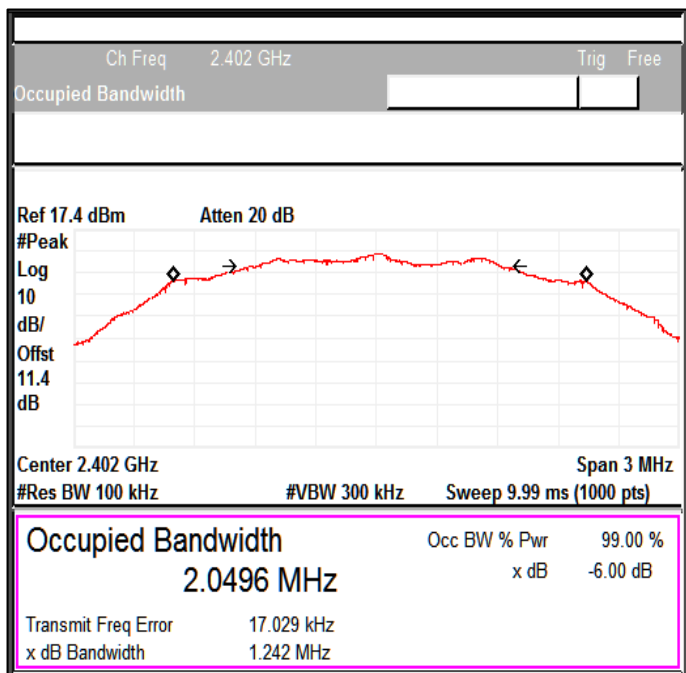
Page 202 of 226

Test results:

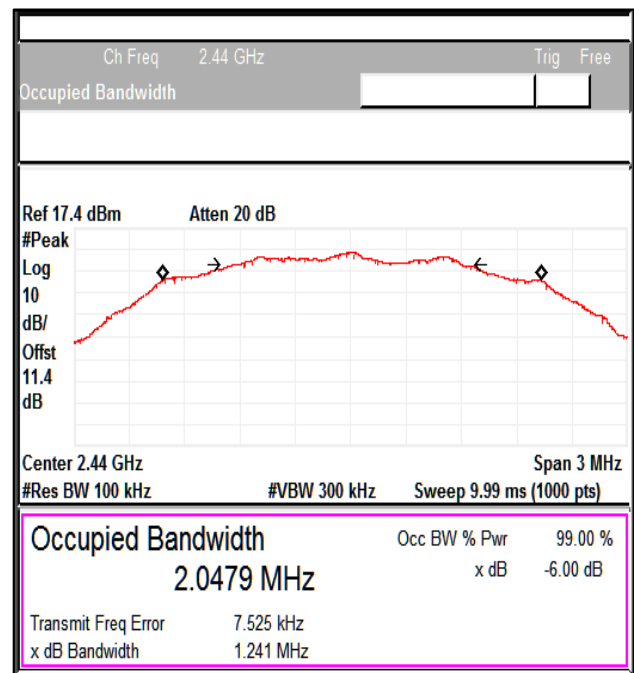
Note:

1. All the losses are included during measurement and final values are mentioned in the test report.

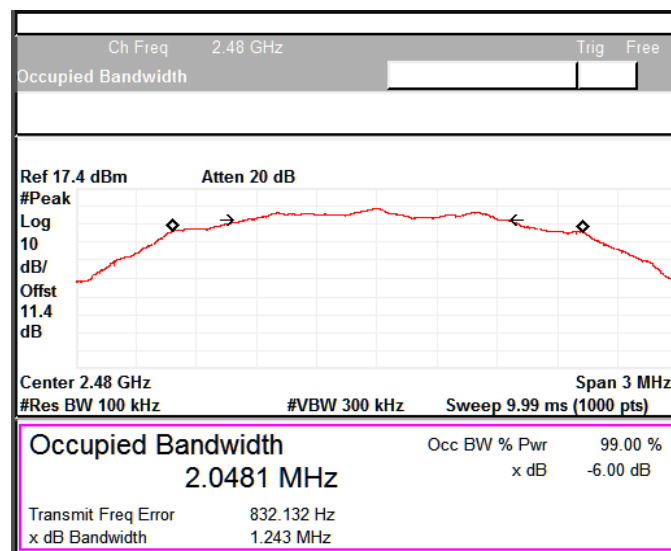
Data Rate (Mbps)	Channel Frequency (MHz)	Measured 99%Bandwidth (MHz)	Measured 6dB Bandwidth (MHz)	Limit (MHz)
1	2402	1.098	0.73	0.5
	2440	1.092	0.73	0.5
	2480	1.093	0.73	0.5
2	2402	2.049	1.24	0.5
	2440	2.047	1.24	0.5
	2480	2.048	1.24	0.5



Channel Frequency 2402MHz



Channel Frequency 2440MHz



Channel Frequency 2480MHz

8.4 Emissions in non-restricted frequency bands and Conducted Spurious Emission

Result

Pass

Test Specification

FCC part 15 Subpart C 15.247 (d) / RSS 247 Issue 2, Section 5.5

Test Method

Subclause 11.11 of ANSI C63.10

Measurement Bandwidth

100 kHz

Detector

Peak

Port of testing

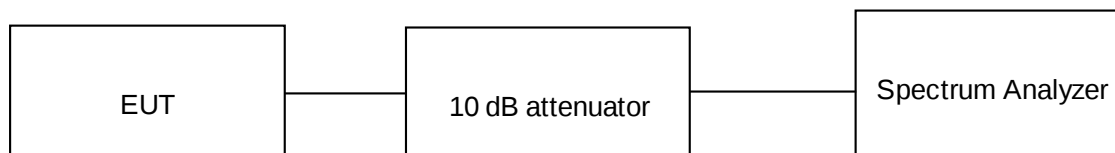
Antenna port

Requirement

In any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 30dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits

If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB

Test Method:



Test Condition

Normal Test Condition:

Temperature (Norm) = +25 °C

Voltage = 3.3 V DC through AC to Dc adaptor

Relative humidity: 62 %

KDB Guidelines applied:

Measurements were made as per section 8.5 in KDB 558074 D01 15.247 Measurement Guidance v05r02.

Test results:Note:

1. All the losses are included during measurement and final values are mentioned in the test report.
2. Final Value (dBm) = Measured Value (dBm) + Attenuator factor (10dB) + Cable loss (0.5dB)
3. This product do not support additional beamforming gain / directional gain, it uses signal antenna and hence directional gain of the single antenna is 2.35 dBi

Prüfbericht - Nr.:

Test Report No.:

IN2391GP 001

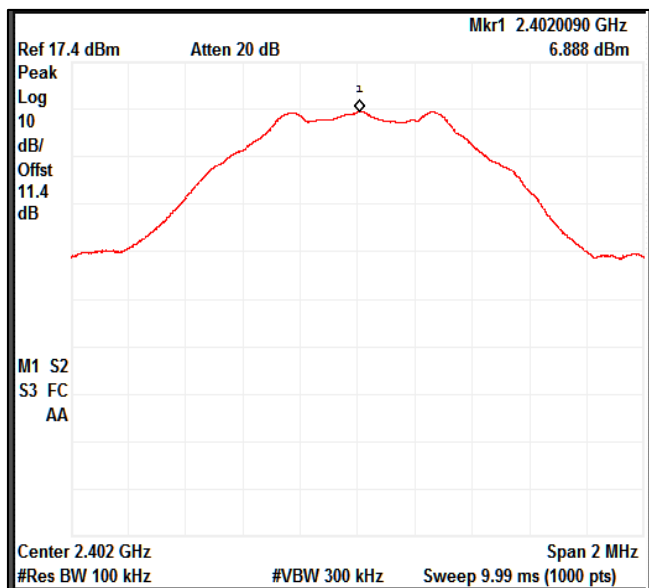
Seite 204 von 226

Page 204 of 226

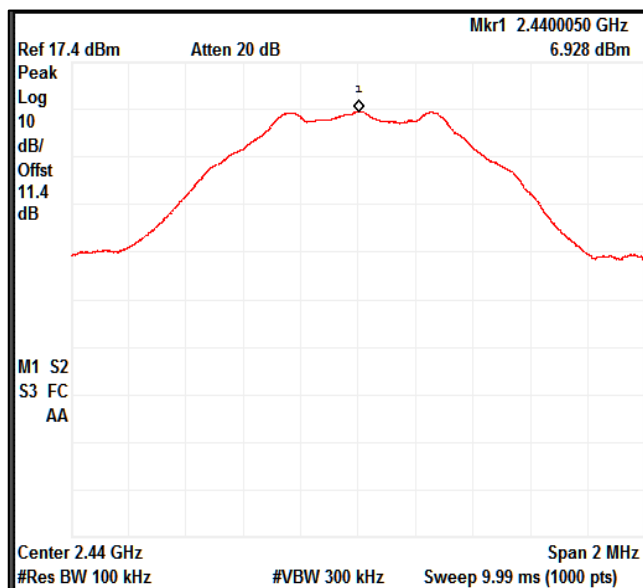
8.4.1 Out-Of-Band Emissions

Reference Plots for Conducted Spurious Emission

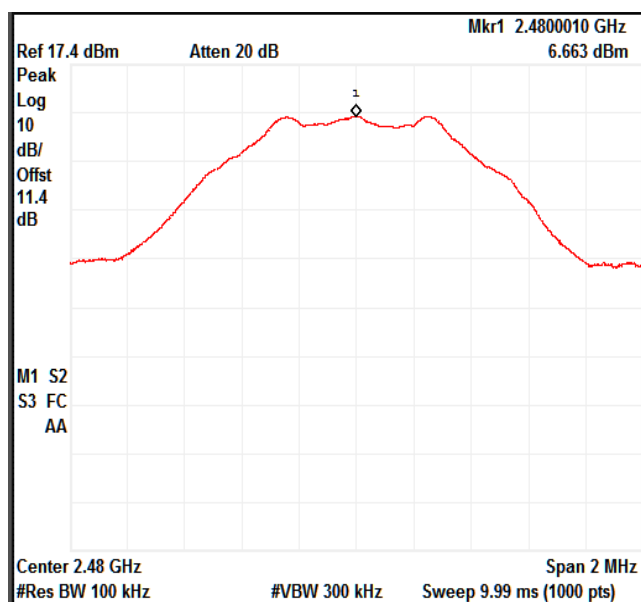
Data Rate 1Mbps



Reference Plot Channel Frequency 2402MHz



Reference Plot Channel Frequency 2440MHz



Reference Plot Channel Frequency 2480MHz

Prüfbericht - Nr.:

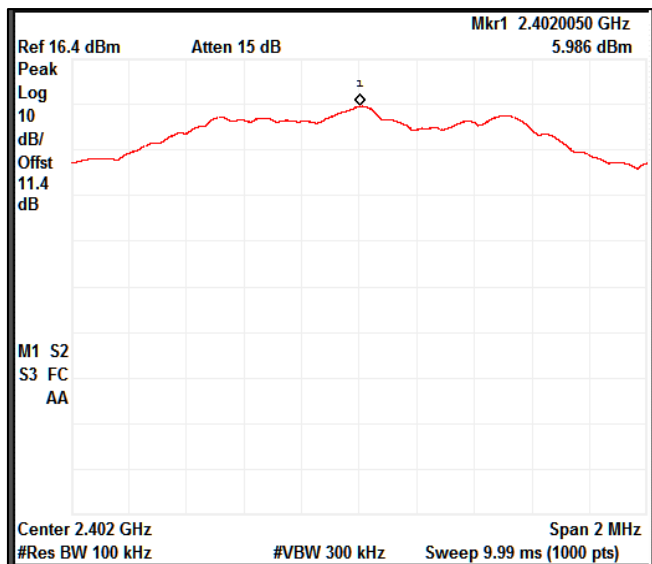
Test Report No.:

IN2391GP 001

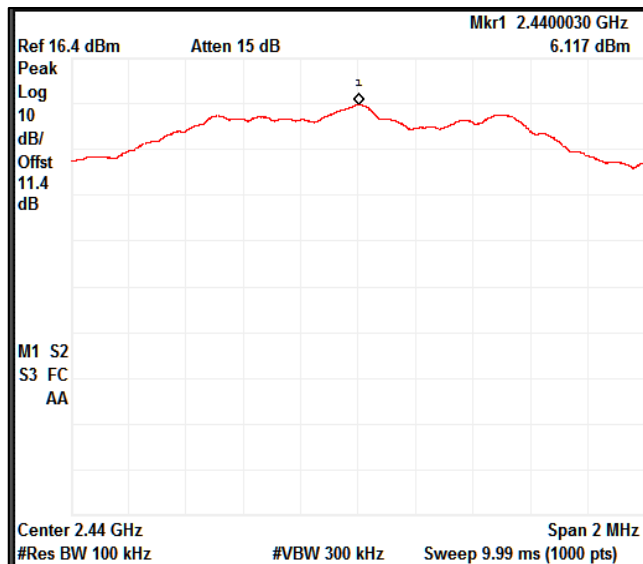
Seite 205 von 226

Page 205 of 226

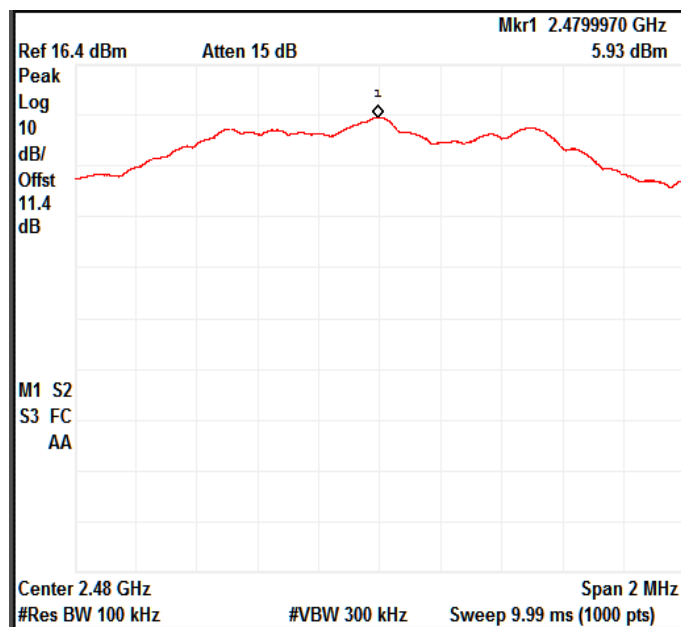
Data Rate 2Mbps



Reference Plot Channel Frequency 2402MHz



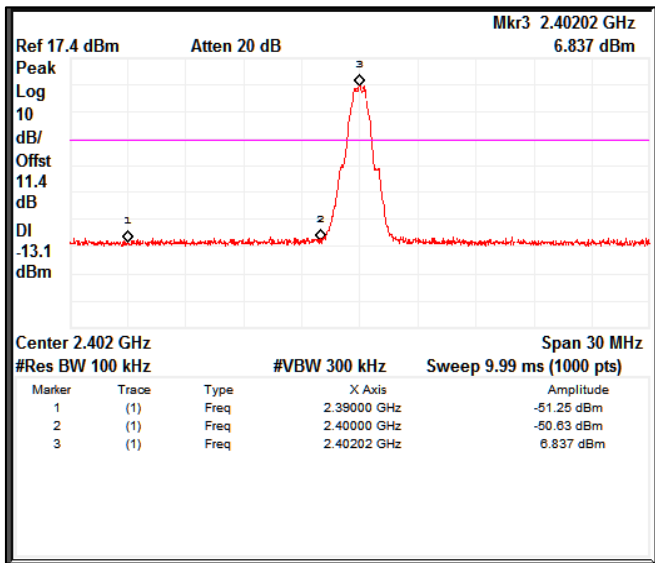
Reference Plot Channel Frequency 2440MHz



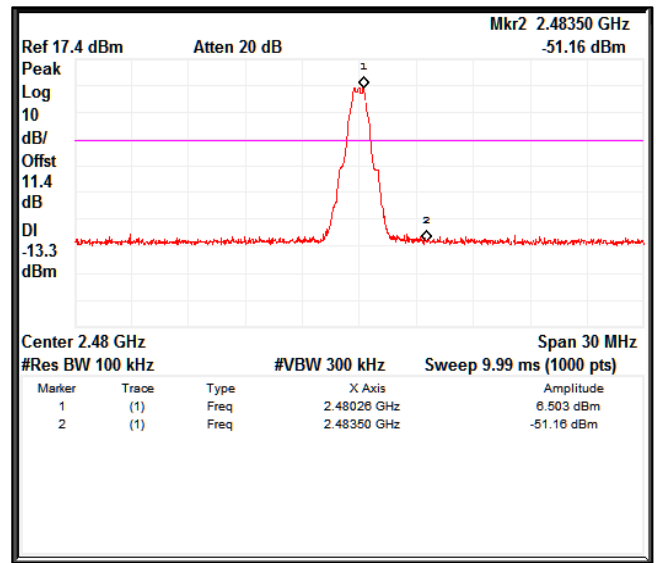
Reference Plot Channel Frequency 2480MHz

8.4.2 Band edge and reference plots

Data Rate: 1Mbps

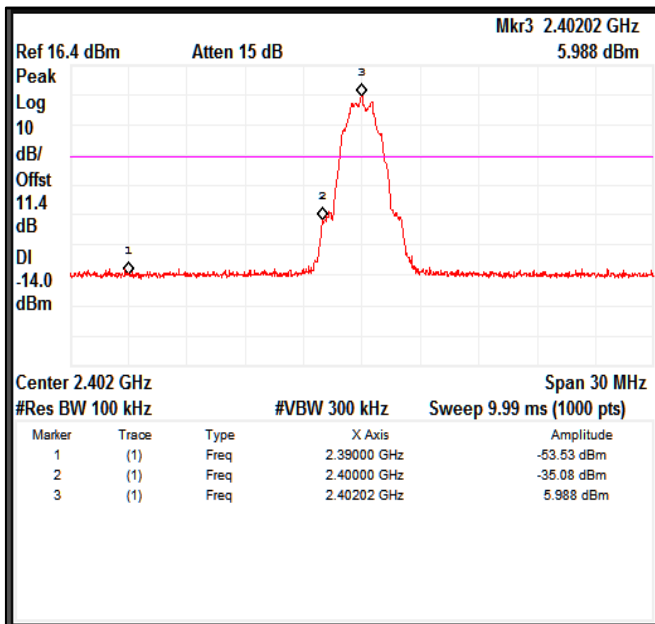


Channel Frequency 2402MHz

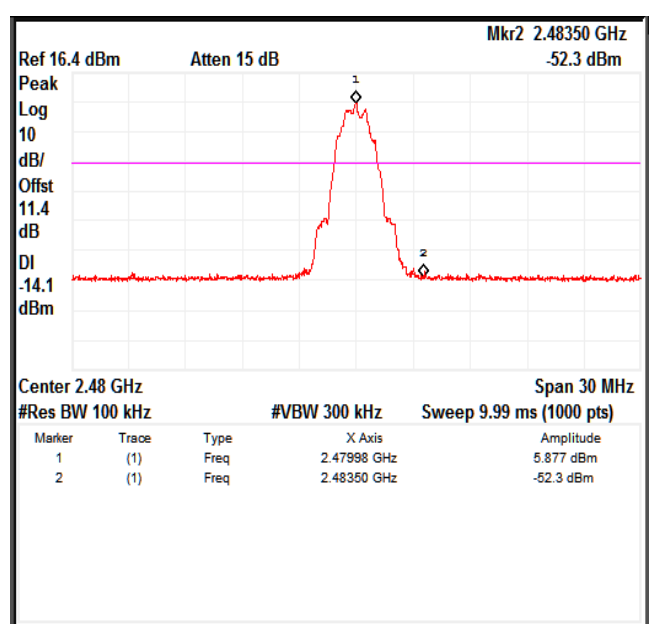


Channel Frequency 2480MHz

Data Rate: 2Mbps



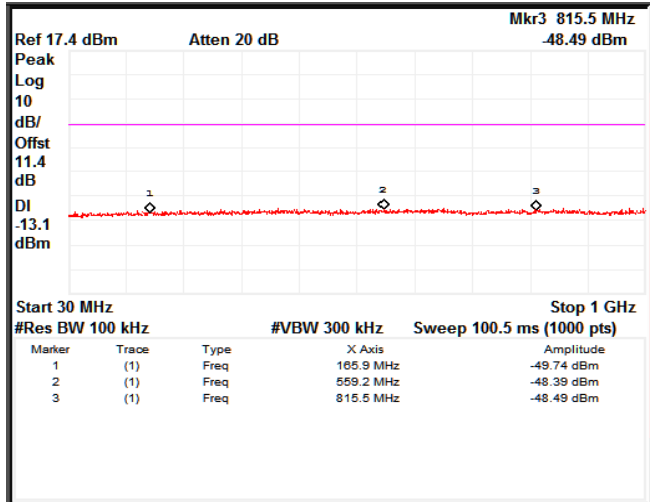
Channel Frequency 2402MHz



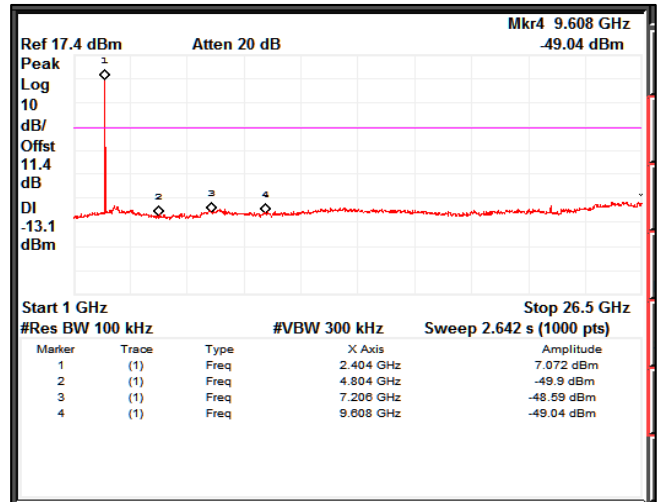
Channel Frequency 2480MHz

8.4.3 Out-Of-Band Emissions

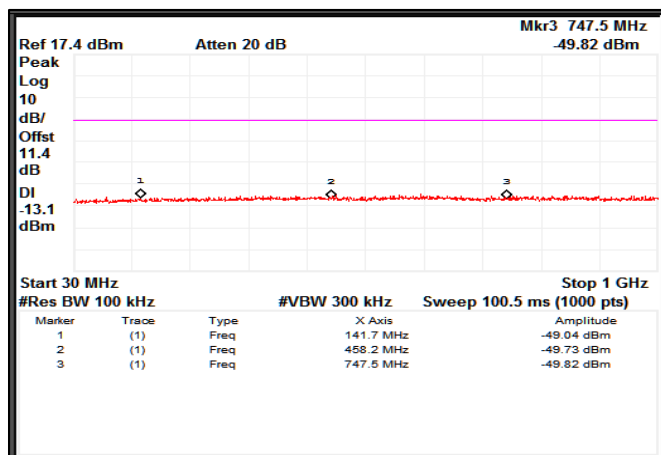
Data Rate: 1Mbps



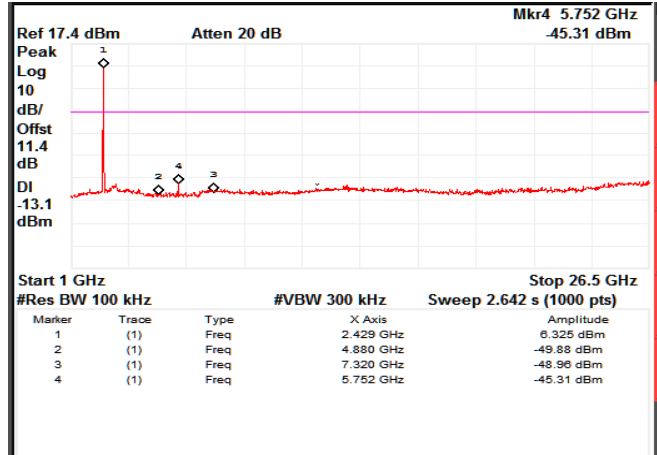
Channel Frequency 2402MHz Frequency Range 30 MHz – 1GHz



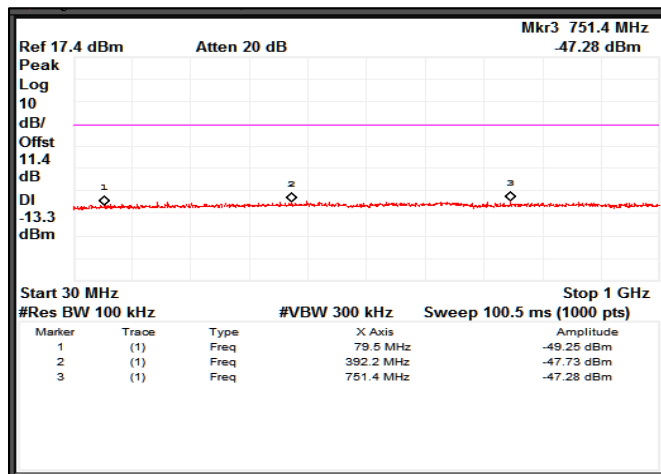
Channel Frequency 2402MHz FrequencyRange 1 GHz – 26.5GHz



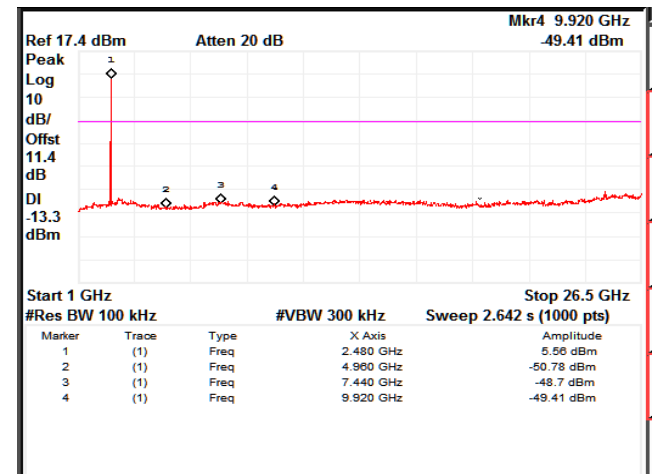
Channel Frequency 2440MHz Frequency Range 30 MHz – 1GHz



Channel Frequency 2440MHzFrequency Range 1 GHz – 26.5GHz



Channel Frequency 2480MHz Frequency Range 30 MHz – 1GHz



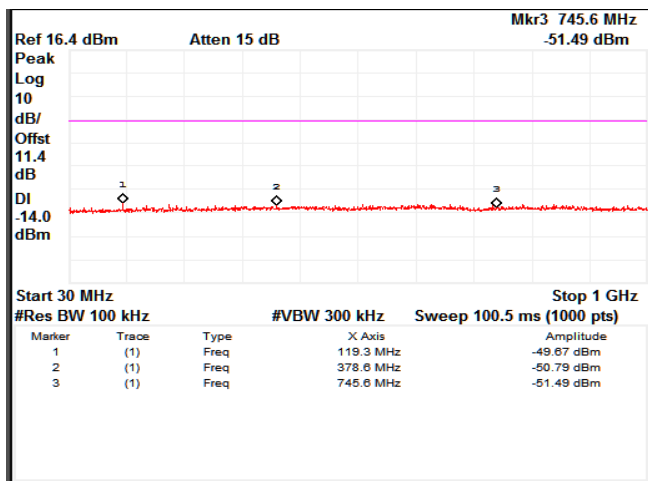
Channel Frequency 2480MHz Frequency Range 1 GHz 26.5GHz

Prüfbericht - Nr.:
Test Report No.:

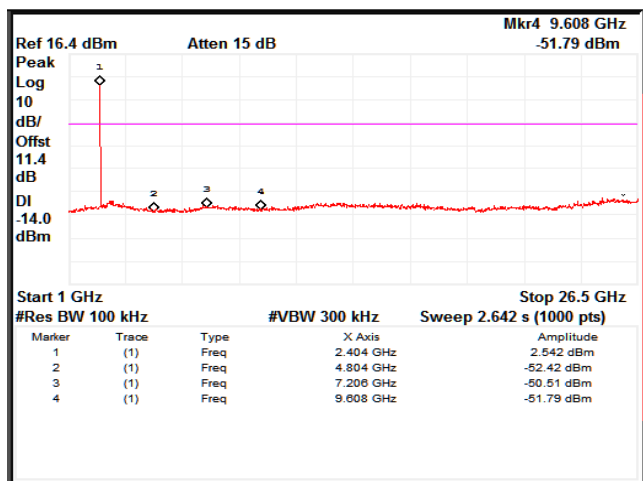
IN2391GP 001

Seite 208 von 226
Page 208 of 226

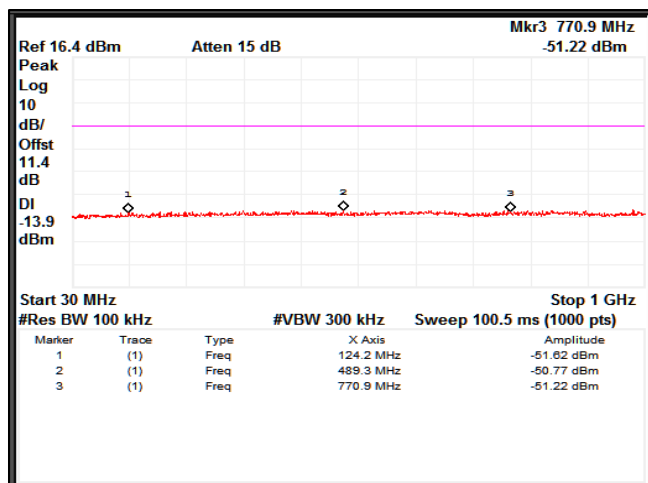
Data Rate: 2Mbps



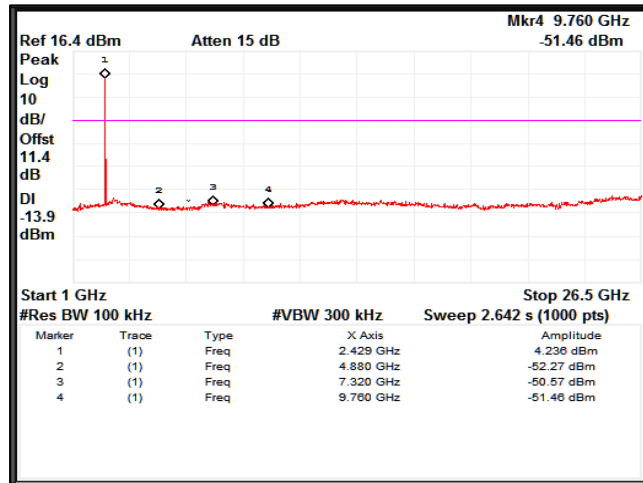
Channel Frequency 2402MHz Frequency Range 30 MHz – 1GHz



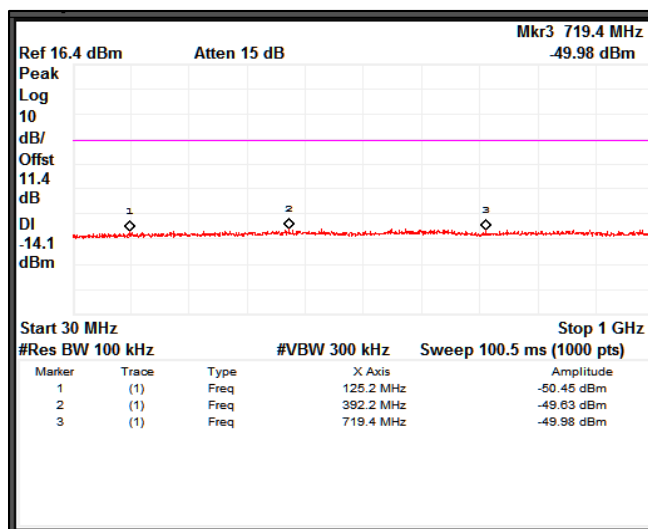
Channel Frequency 2402MHz FrequencyRange 1 GHz – 26.5GHz



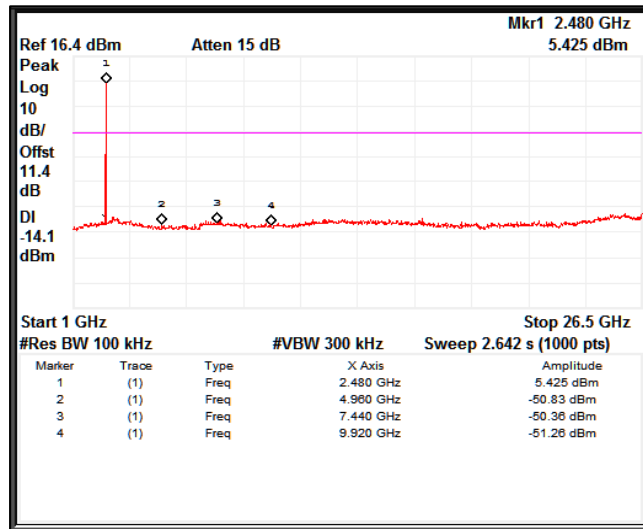
Channel Frequency 2440MHz Frequency Range 30 MHz – 1GHz



Channel Frequency 2440MHzFrequency Range 1 GHz – 26.5GHz



Channel Frequency 2480MHz Frequency Range 30 MHz – 1GHz



Channel Frequency 2480MHz FrequencyRange 1 GHz – 26.5GHz

8.5 Spurious Radiated Emissions & Restricted Bands of Operation

Result

Pass

Test Specification	FCC part 15 Subpart C 15.247 (d) / (15.209 & 15.205) / IC RSS-GEN, Section 8.9 and 8.10
Test Method	ANSI C63.10
Measurement Location	Semi Anechoic Chamber 30MHz - 1 GHz Fully Anechoic Chamber 1 GHz - 40GHz
Measurement Bandwidth	100 kHz for frequency range < 1GHz 1 MHz for Frequency range >1GHz
Detector	Refer remarks below
Measuring Distance	3 m
Requirement	As per the limits mentioned in the below table
Test setup	Refer TEST METHODOLOGY

Table 8: Transmitter limits for Radiated emission

Frequency (MHz)	Field strength (μV/m)	Field strength (dBμV/m)	Distance of Measurement (m)
0.009 – 0.490	2400/F(kHz)	48.50 – 13.80	300*
0.490 – 1.705	24000/F(kHz)	33.80 – 23.00	30*
1.705 -30	30	29.54	30*
30-88	100	40.0	3
88-216	150	43.5	3
216-960	200	46.0	3
Above 960	500	54.0	3

Remark: * The limit shows in the table above of frequency range 0.009 – 0.490, 0.490 – 1.705 MHz and 1.705-30MHz is at 300 meter, 30 meter and 30 meter range respectively, which corresponds to 128.51 – 93.80, 73.80 – 62.96 and 69.54 dBμV/m at 3m range by extrapolation calculation and the measurement of loop antenna.

The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz Radiated emission limits in these three bands are based on measurements employing an average detector.

Test Conditions:

Temperature (Norm) = + 25 °C

Voltage = 3.3 V DC through AC to Dc adaptor Relative humidity = 62 %

Prüfbericht - Nr.:

Test Report No.:

IN2391GP 001

Seite 210 von 226

Page 210 of 226

Test results:

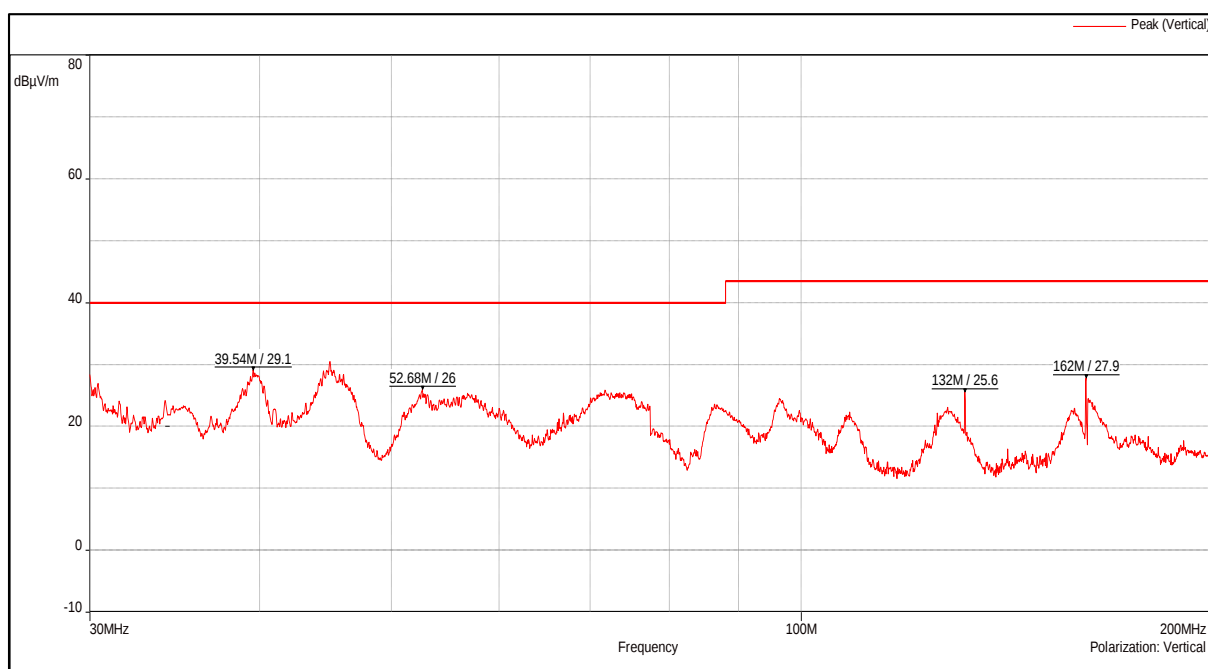
Note: All the losses are included during measurement and final values are mentioned in the test report. Refer TEST METHODOLOGY for more details

Test results for frequency range 9kHz – 30MHz

No emissions found in frequency range 9 kHz to 30 MHz, and measured levels are below 20dB from the limit line, hence not reported

Test results for frequency range 30MHz – 1GHz

Antenna Polarization	Measured Frequency (MHz)	Measured Value (dBμV/m)	Limit (dBμV/m)	Margin (dB)
Vertical	39.54	29.10	40.00	-10.90
	52.68	26.00	40.00	-14.00
	132.00	25.60	43.50	-17.90
	162.00	27.90	43.50	-15.60
	238.64	9.99	46.00	-36.01
	395.99	12.90	46.00	-33.10
	653.45	14.90	46.00	-31.10
Horizontal	39.63	16.20	40.00	-23.80
	57.06	16.60	43.50	-26.90
	127.95	27.00	43.50	-16.50
	157.98	33.93	43.50	-9.57
	263.99	3.93	46.00	-42.07
	395.99	18.70	46.00	-27.30
	659.84	14.20	46.00	-31.80



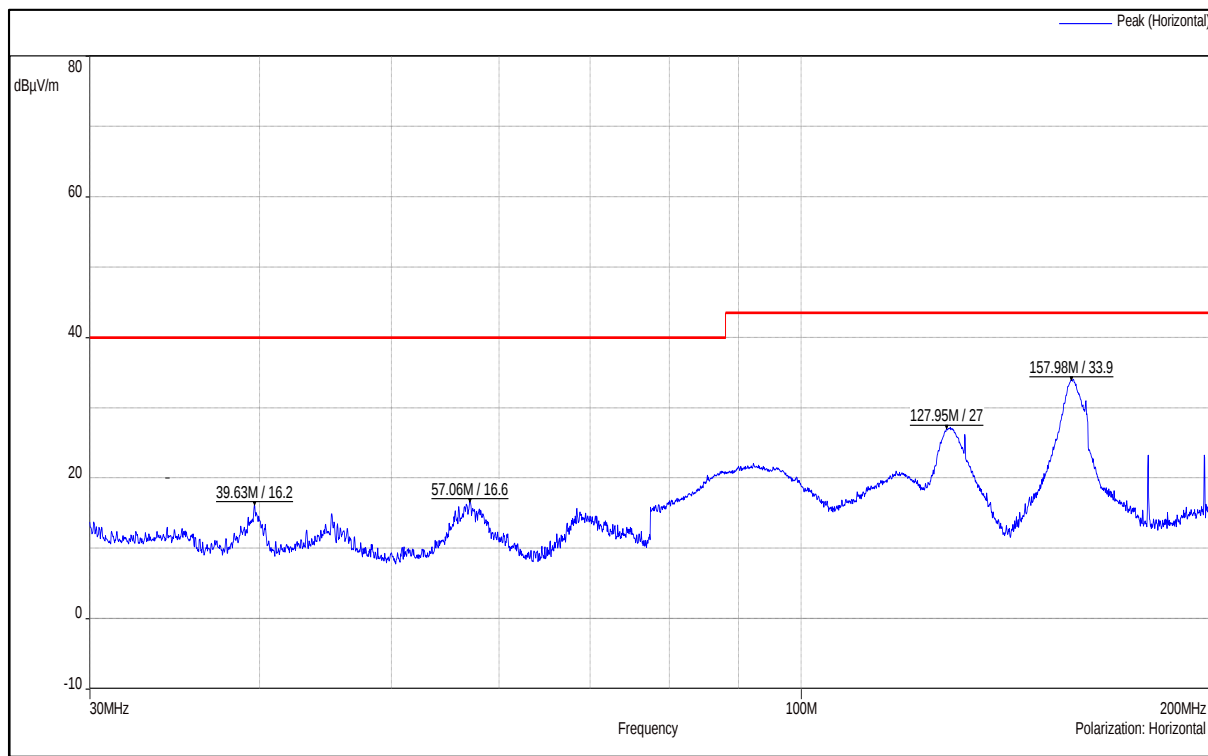
Channel Frequency 30MHz – 200MHz

Polarization Vertical

Prüfbericht - Nr.:
Test Report No.:

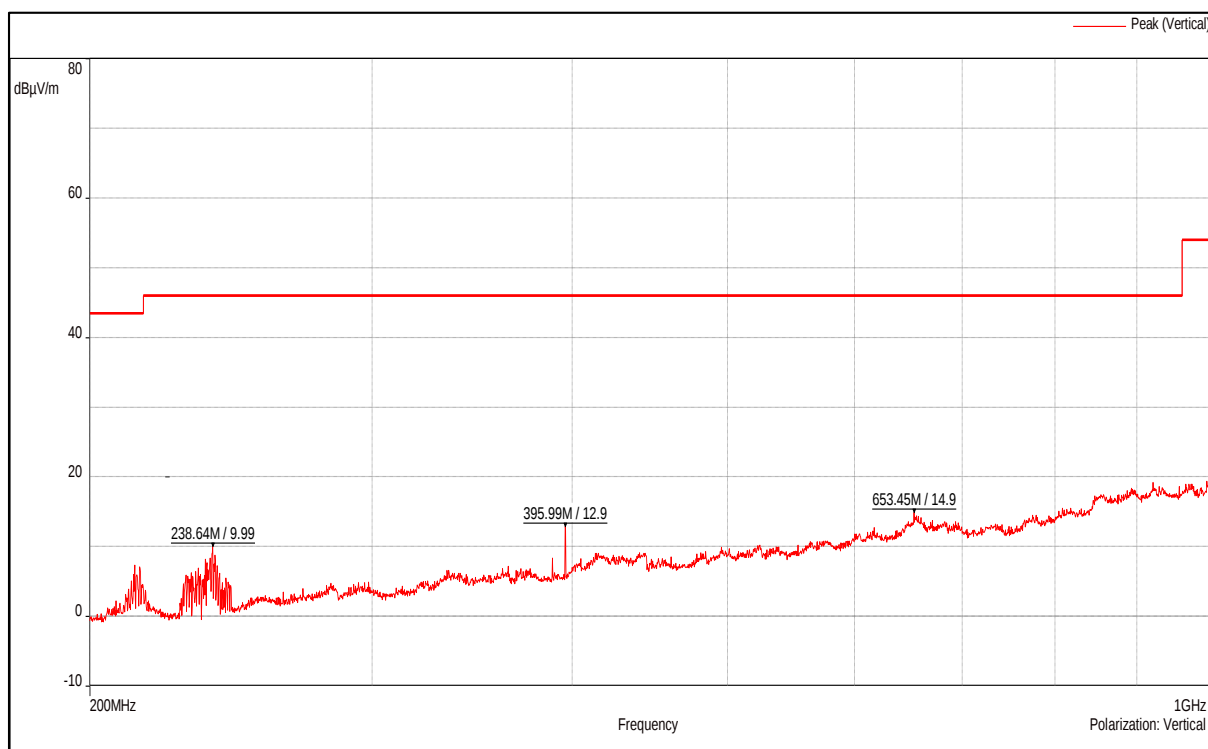
IN2391GP 001

Seite 211 von 226
Page 211 of 226



Channel Frequency 30MHz – 200MHz

Polarization Horizontal



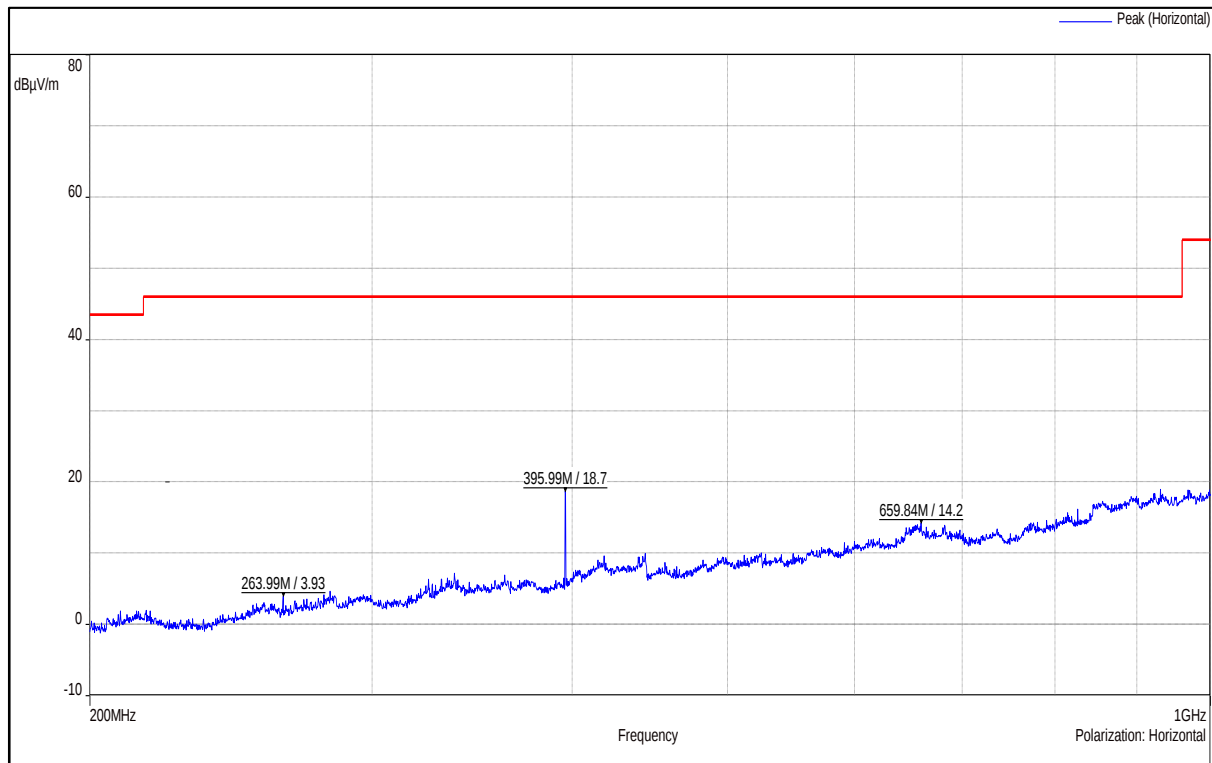
Channel Frequency 200MHz – 1GHz

Polarization Vertical

Prüfbericht - Nr.:
Test Report No.:

IN2391GP 001

Seite 212 von 226
Page 212 of 226



Channel Frequency 200MHz – 1GHz

Polarization Horizontal

Prüfbericht - Nr.:

Test Report No.:

IN2391GP 001

Seite 213 von 226

Page 213 of 226

Test results for the frequencies above 1GHz

Antenna Type: 1001932PT (Flex/PCB) MIMO Antenna Results

Data Rate (Mbps)	Channel Frequency (MHz)	Measured Frequency (MHz)	Antenna Polarization	Measured Emission (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1	2402	2390(Pk)	Vertical	37.36	74.00*	-36.64
		2390(Av)		24.52	54.00*	-29.48
		2402(Pk)		97.62	-	-
		2402(Av)		91.90	-	-
		4804(Pk)		41.79	74.00	-32.21
		4804(Av)		29.58	54.00	-24.42
		7206(Pk)		47.71	74.00	-26.29
		7206(Av)		35.20	54.00	-18.80
		2390(Pk)	Horizontal	38.37	74.00*	-35.63
		2390(Av)		25.07	54.00*	-28.93
		2402(Pk)		101.45	-	-
		2402(Av)		95.74	-	-
		4804(Pk)		41.34	74.00	-32.66
		4804(Av)		29.69	54.00	-24.31
		7206(Pk)		47.26	74.00	-26.74
		7206(Av)		35.19	54.00	-18.81
	2440	2440(Pk)	Vertical	98.43	-	-
		2440(Av)		92.70	-	-
		4880(Pk)		41.72	74.00	-32.28
		4880(Av)		29.60	54.00	-24.40
		7320(Pk)		47.82	74.00	-26.18
		7320(Av)		35.26	54.00	-18.74
		2440(Pk)	Horizontal	102.60	-	-
		2440(Av)		96.86	-	-
		4880(Pk)		43.46	74.00	-30.54
		4880(Av)		30.08	54.00	-23.92
		7320(Pk)		48.58	74.00	-25.42
		7320(Av)		35.23	54.00	-18.77
	2480	2480(Pk)	Vertical	94.32	-	-
		2480(Av)		88.53	-	-
		2483.5(Pk)		38.78	74.00*	-35.22
		2483.5(Av)		25.70	54.00*	-28.30
		4960(Pk)		41.72	74.00	-32.28
		4960(Av)		29.32	54.00	-24.68
		7440(Pk)		48.16	74.00	-25.84
		7440(Av)		35.26	54.00	-18.74
		2480(Pk)	Horizontal	100.76	-	-
		2480(Av)		94.98	-	-
		2483.5(Pk)		43.12	74.00*	-30.88
		2483.5(Av)		28.36	54.00*	-25.64
		4960(Pk)		42.16	74.00	-31.84
		4960(Av)		30.25	54.00	-23.75
		7440(Pk)		47.87	74.00	-26.13
		7440(Av)		35.30	54.00	-18.70

* : Indicate restricted band of operation §15.205

- : Fundamental Frequency

Pk: Peak Detector; Av: Average Detector

Prüfbericht - Nr.:

Test Report No.:

IN2391GP 001

Seite 214 von 226

Page 214 of 226

Data Rate (Mbps)	Channel Frequency (MHz)	Measured Frequency (MHz)	Antenna Polarization	Measured Emission (dBµV/m)	Limit (dBµV/m)	Margin (dB)
2	2402	2390(Pk)	Vertical	37.22	74.00*	-36.78
		2390(Av)		24.49	54.00*	-29.51
		2402(Pk)		98.08	-	-
		2402(Av)		84.70	-	-
		4804(Pk)		41.69	74.00	-32.31
		4804(Av)		29.58	54.00	-24.42
		7206(Pk)		46.96	74.00	-27.04
		7206(Av)		35.16	54.00	-18.84
		2390(Pk)	Horizontal	37.76	74.00*	-36.24
		2390(Av)		24.97	54.00*	-29.03
		2402(Pk)		101.58	-	-
		2402(Av)		88.24	-	-
		4804(Pk)		42.32	74.00	-31.68
		4804(Av)		29.61	54.00	-24.39
		7206(Pk)		47.80	74.00	-26.20
		7206(Av)		35.16	54.00	-18.84
	2440	2440(Pk)	Vertical	98.28	-	-
		2440(Av)		84.89	-	-
		4880(Pk)		41.96	74.00	-32.04
		4880(Av)		29.55	54.00	-24.45
		7320(Pk)		47.49	74.00	-26.51
		7320(Av)		35.19	54.00	-18.81
		2440(Pk)	Horizontal	102.66	-	-
		2440(Av)		89.29	-	-
		4880(Pk)		41.44	74.00	-32.56
		4880(Av)		29.63	54.00	-24.37
		7320(Pk)		47.23	74.00	-26.77
		7320(Av)		35.20	54.00	-18.80
	2480	2480(Pk)	Vertical	94.60	-	-
		2480(Av)		81.18	-	-
		2483.5(Pk)		39.28	74.00*	-34.72
		2483.5(Av)		25.26	54.00*	-28.74
		4960(Pk)		41.02	74.00	-32.98
		4960(Av)		29.32	54.00	-24.68
		7440(Pk)		47.22	74.00	-26.78
		7440(Av)		35.27	54.00	-18.73
		2480(Pk)	Horizontal	100.87	-	-
		2480(Av)		87.45	-	-
		2483.5(Pk)		42.57	74.00*	-31.43
		2483.5(Av)		27.18	54.00*	-26.82
		4960(Pk)		42.07	74.00	-31.93
		4960(Av)		29.50	54.00	-24.50
		7440(Pk)		48.34	74.00	-25.66
		7440(Av)		35.24	54.00	-18.76

* : Indicate restricted band of operation §15.205

- : Fundamental Frequency

Pk: Peak Detector; Av: Average Detector

Prüfbericht - Nr.:

Test Report No.:

IN2391GP 001

Seite 215 von 226

Page 215 of 226

Antenna Type: FPA3020-10A (Flex/PCB) MIMO Antenna Results

Data Rate (Mbps)	Channel Frequency (MHz)	Measured Frequency (MHz)	Antenna Polarization	Measured Emission (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1	2402	2390(Pk)	Vertical	38.09	74.00*	-35.91
		2390(Av)		24.66	54.00*	-29.34
		2402(Pk)		95.89	-	-
		2402(Av)		90.13	-	-
		4804(Pk)		41.72	74.00	-32.28
		4804(Av)		29.63	54.00	-24.37
		7206(Pk)		46.97	74.00	-27.03
		7206(Av)		35.25	54.00	-18.75
		2390(Pk)	Horizontal	37.68	74.00*	-36.32
		2390(Av)		24.63	54.00*	-29.37
		2402(Pk)		96.68	-	-
		2402(Av)		90.93	-	-
		4804(Pk)		41.90	74.00	-32.10
		4804(Av)		29.62	54.00	-24.38
		7206(Pk)		47.31	74.00	-26.69
		7206(Av)		35.20	54.00	-18.80
	2440	2440(Pk)	Vertical	95.86	-	-
		2440(Av)		90.06	-	-
		4880(Pk)		41.88	74.00	-32.12
		4880(Av)		29.58	54.00	-24.42
		7320(Pk)		47.47	74.00	-26.53
		7320(Av)		35.22	54.00	-18.78
		2440(Pk)	Horizontal	97.63	-	-
		2440(Av)		91.84	-	-
		4880(Pk)		42.91	74.00	-31.09
		4880(Av)		29.60	54.00	-24.40
		7320(Pk)		47.45	74.00	-26.55
		7320(Av)		35.29	54.00	-18.71
	2480	2480(Pk)	Vertical	91.27	-	-
		2480(Av)		85.51	-	-
		2483.5(Pk)		37.86	74.00*	-36.14
		2483.5(Av)		25.08	54.00*	-28.92
		4960(Pk)		41.68	74.00	-32.32
		4960(Av)		29.36	54.00	-24.64
		7440(Pk)		47.44	74.00	-26.56
		7440(Av)		35.28	54.00	-18.72
		2480(Pk)	Horizontal	92.26	-	-
		2480(Av)		86.48	-	-
		2483.5(Pk)		37.78	74.00*	-36.22
		2483.5(Av)		25.17	54.00*	-28.83
		4960(Pk)		41.85	74.00	-32.15
		4960(Av)		29.36	54.00	-24.64
		7440(Pk)		48.03	74.00	-25.97
		7440(Av)		35.27	54.00	-18.73

* : Indicate restricted band of operation §15.205

- : Fundamental Frequency

Pk: Peak Detector; Av: Average Detector

Prüfbericht - Nr.:

Test Report No.:

IN2391GP 001

Seite 216 von 226

Page 216 of 226

Data rate (Mbps)	Channel Frequency (MHz)	Measured Frequency (MHz)	Antenna Polarization	Measured Emission (dBµV/m)	Limit (dBµV/m)	Margin (dB)
2	2402	2390(Pk)	Vertical	37.39	74.00	-36.61
		2390(Av)		24.57	54.00	-29.43
		2402(Pk)		96.34	-	-
		2402(Av)		82.92	-	-
		4804(Pk)		42.08	74.00	-31.92
		4804(Av)		29.63	54.00	-24.37
		7206(Pk)		47.98	74.00	-26.02
		7206(Av)		35.24	54.00	-18.76
		2390(Pk)	Horizontal	37.94	74.00	-36.06
		2390(Av)		24.59	54.00	-29.41
		2402(Pk)		97.59	-	-
		2402(Av)		84.16	-	-
		4804(Pk)		41.87	74.00	-32.13
		4804(Av)		29.62	54.00	-24.38
		7206(Pk)		47.14	74.00	-26.86
		7206(Av)		35.20	54.00	-18.80
	2440	2440(Pk)	Vertical	96.05	-	-
		2440(Av)		82.59	-	-
		4880(Pk)		41.62	74.00	-32.38
		4880(Av)		29.62	54.00	-24.38
		7320(Pk)		46.95	74.00	-27.05
		7320(Av)		35.32	54.00	-18.68
		2440(Pk)	Horizontal	97.56	-	-
		2440(Av)		84.11	-	-
		4880(Pk)		41.48	74.00	-32.52
		4880(Av)		29.62	54.00	-24.38
		7320(Pk)		47.63	74.00	-26.37
		7320(Av)		35.24	54.00	-18.76
	2480	2480(Pk)	Vertical	91.45	-	-
		2480(Av)		78.04	-	-
		2483.5(Pk)		38.36	74.00	-35.64
		2483.5(Av)		24.81	54.00	-29.19
		4960(Pk)		41.93	74.00	-32.07
		4960(Av)		29.41	54.00	-24.59
		7440(Pk)		47.52	74.00	-26.48
		7440(Av)		35.34	54.00	-18.66
		2480(Pk)	Horizontal	92.61	-	-
		2480(Av)		79.16	-	-
		2483.5(Pk)		39.46	74.00	-34.54
		2483.5(Av)		25.00	54.00	-29.00
		4960(Pk)		41.44	74.00	-32.56
		4960(Av)		29.39	54.00	-24.61
		7440(Pk)		48.16	74.00	-25.84
		7440(Av)		35.33	54.00	-18.67

* : Indicate restricted band of operation §15.205

- : Fundamental Frequency

Pk: Peak Detector; Av: Average Detector

Prüfbericht - Nr.:

Test Report No.:

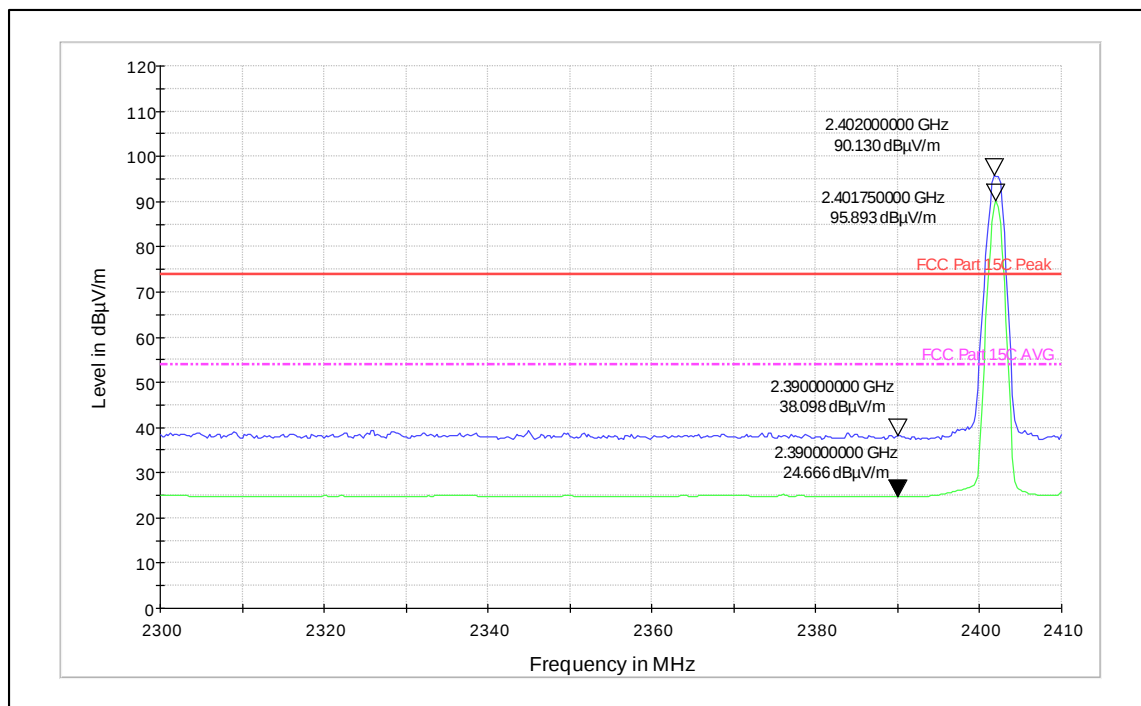
IN2391GP 001

Seite 217 von 226

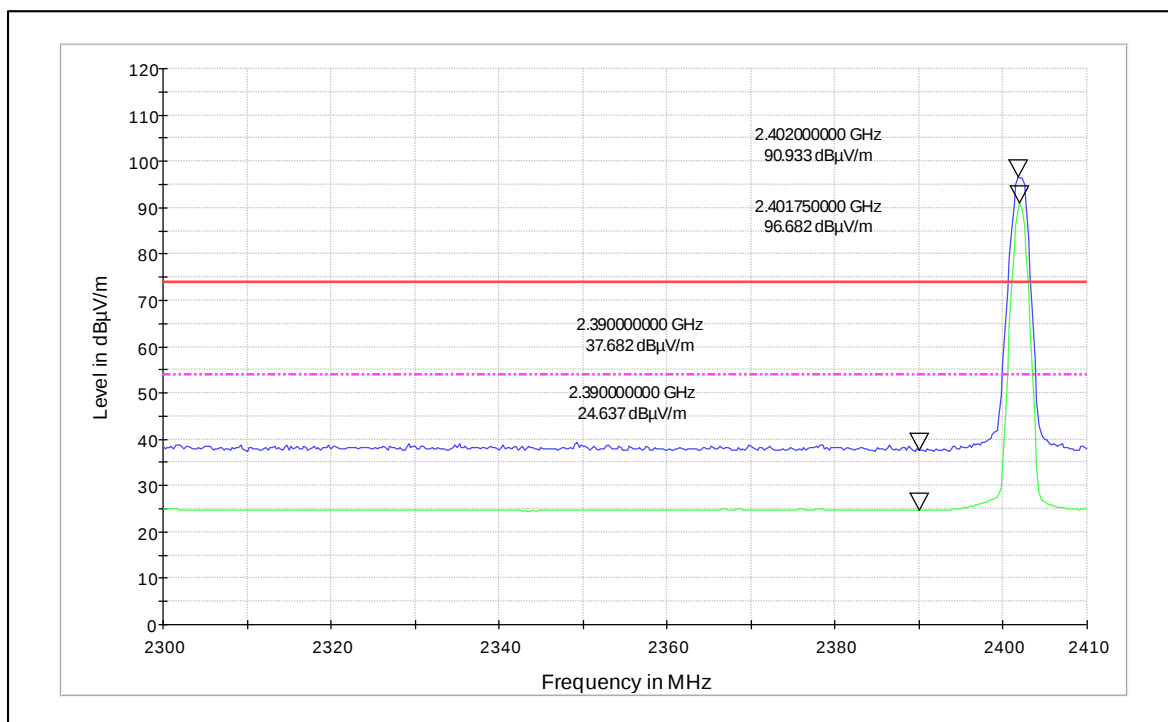
Page 217 of 226

Worst Case Plots reported

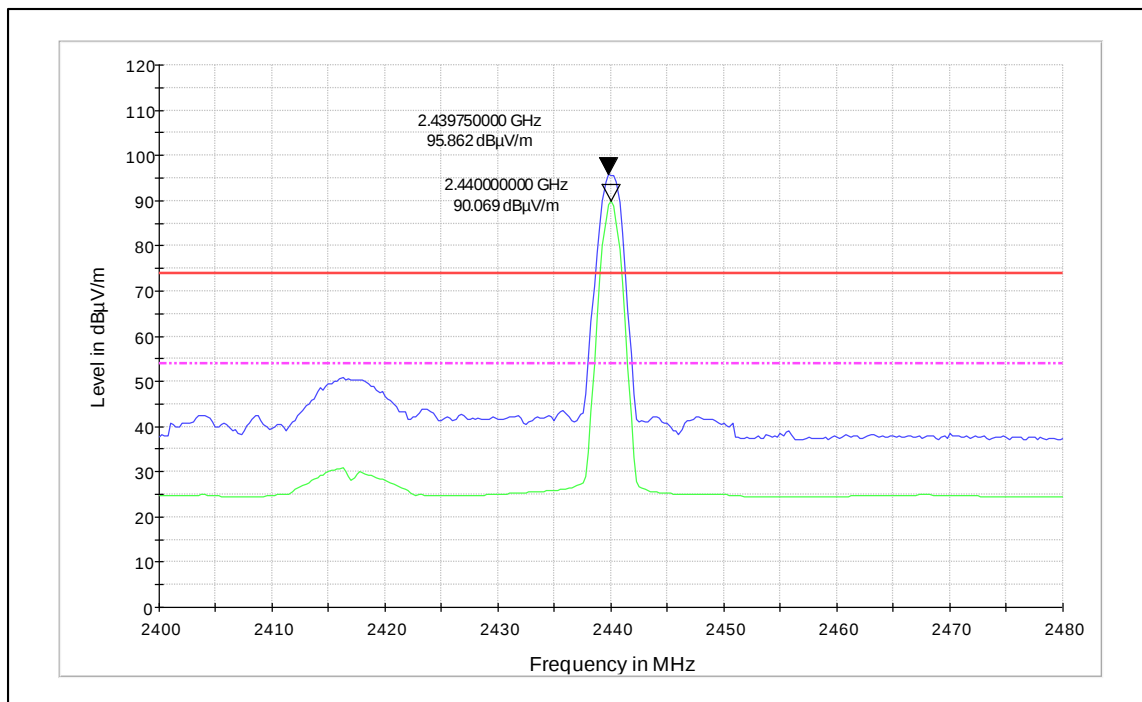
Channel Frequency-2402MHz_Vertical



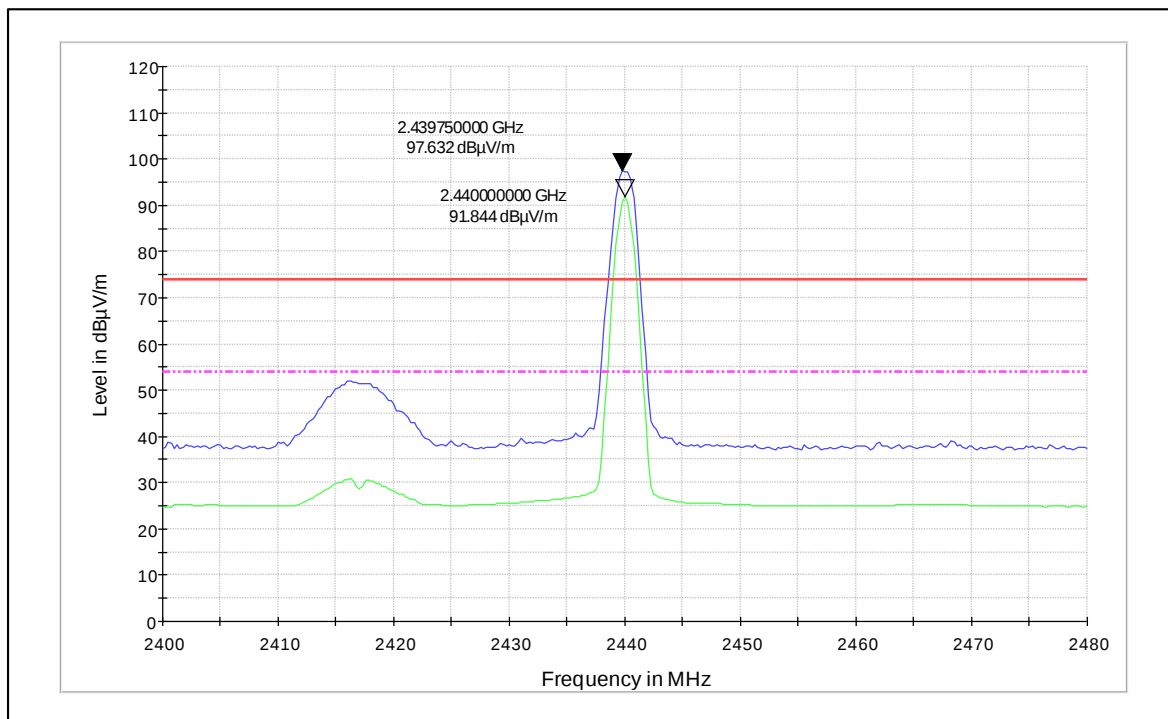
Channel Frequency-2402MHz_Horizontal



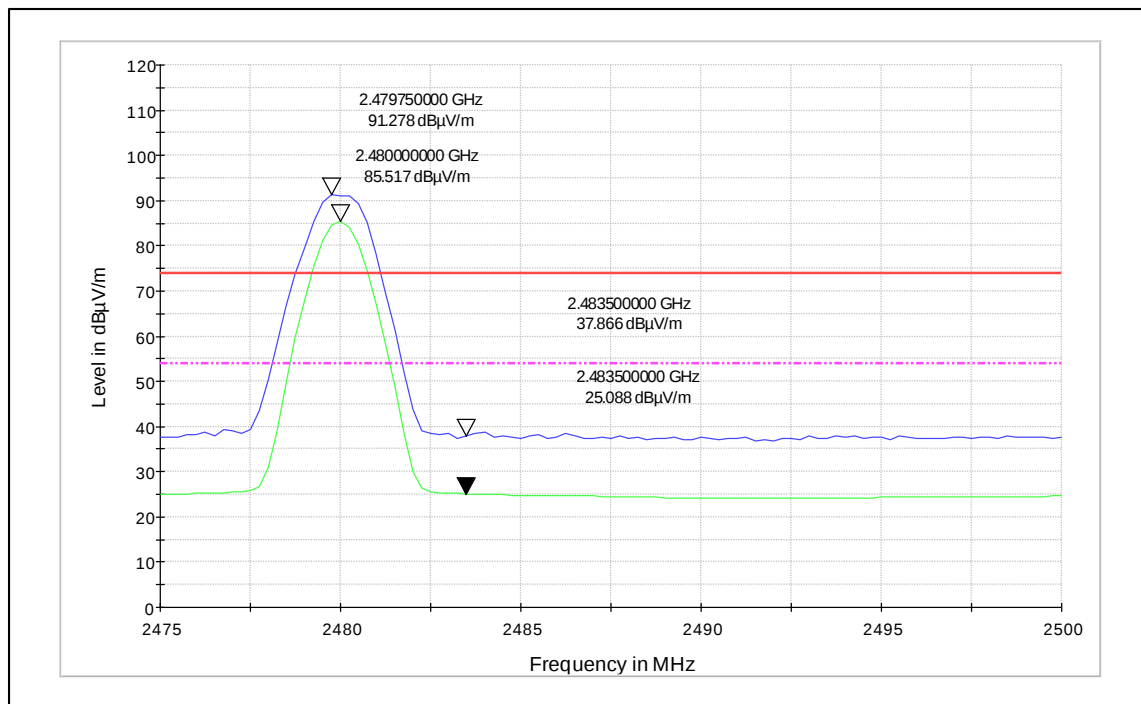
Channel Frequency-2440MHz_Vertical



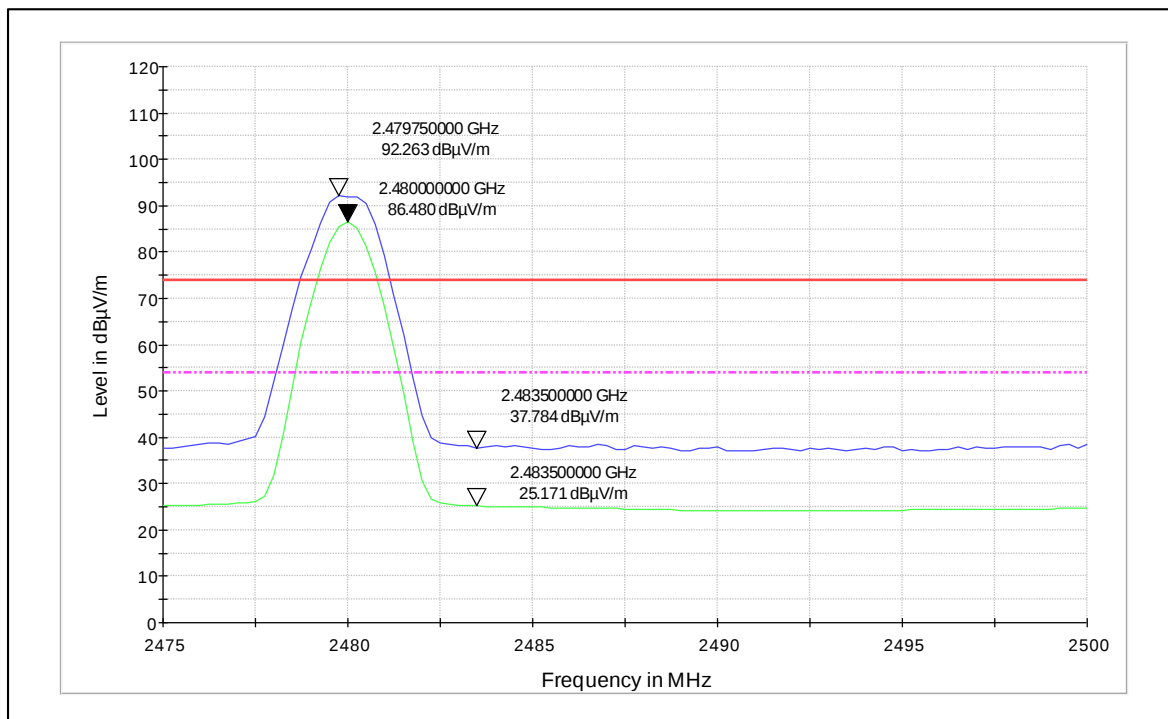
Channel Frequency-2440MHz_Horizontal



Channel Frequency-2480MHz_Vertical



Channel Frequency-2480MHz_Horizontal



Prüfbericht - Nr.:

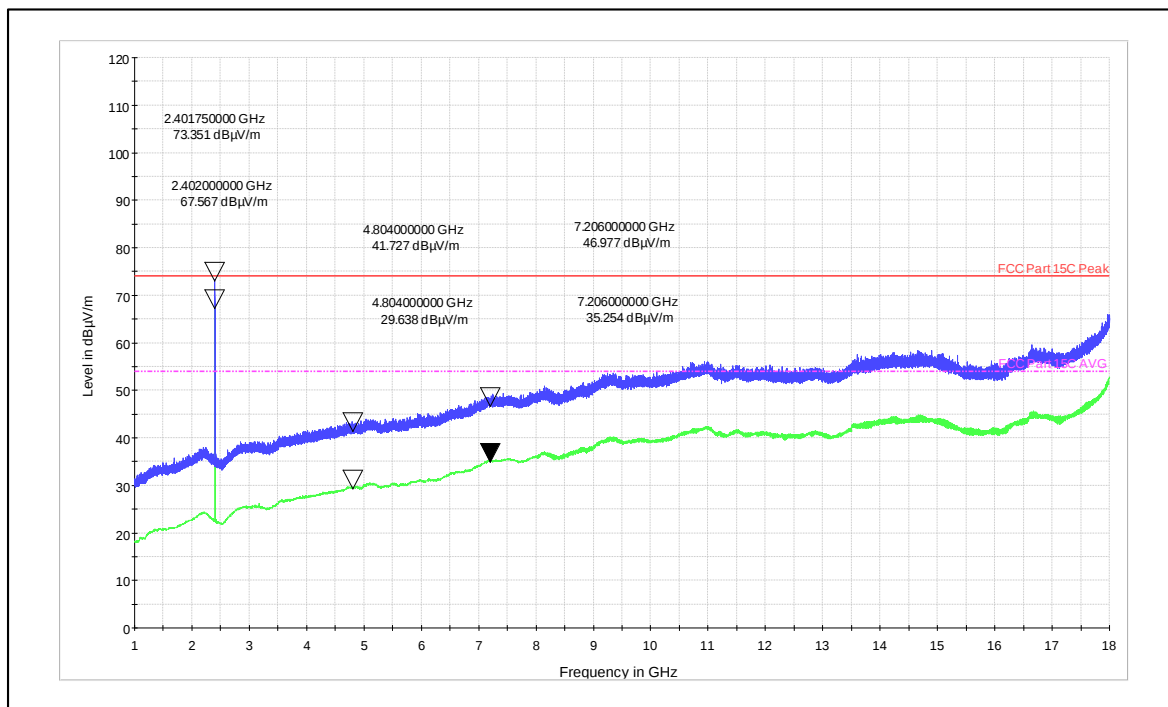
Test Report No.:

IN2391GP 001

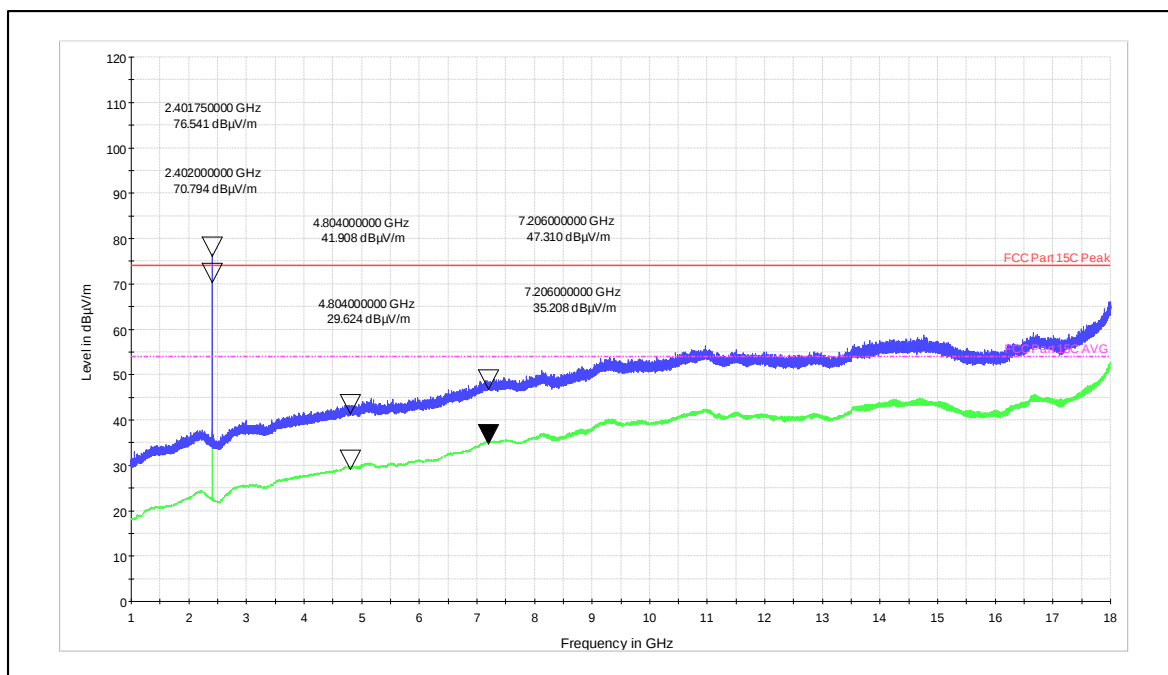
Seite 220 von 226

Page 220 of 226

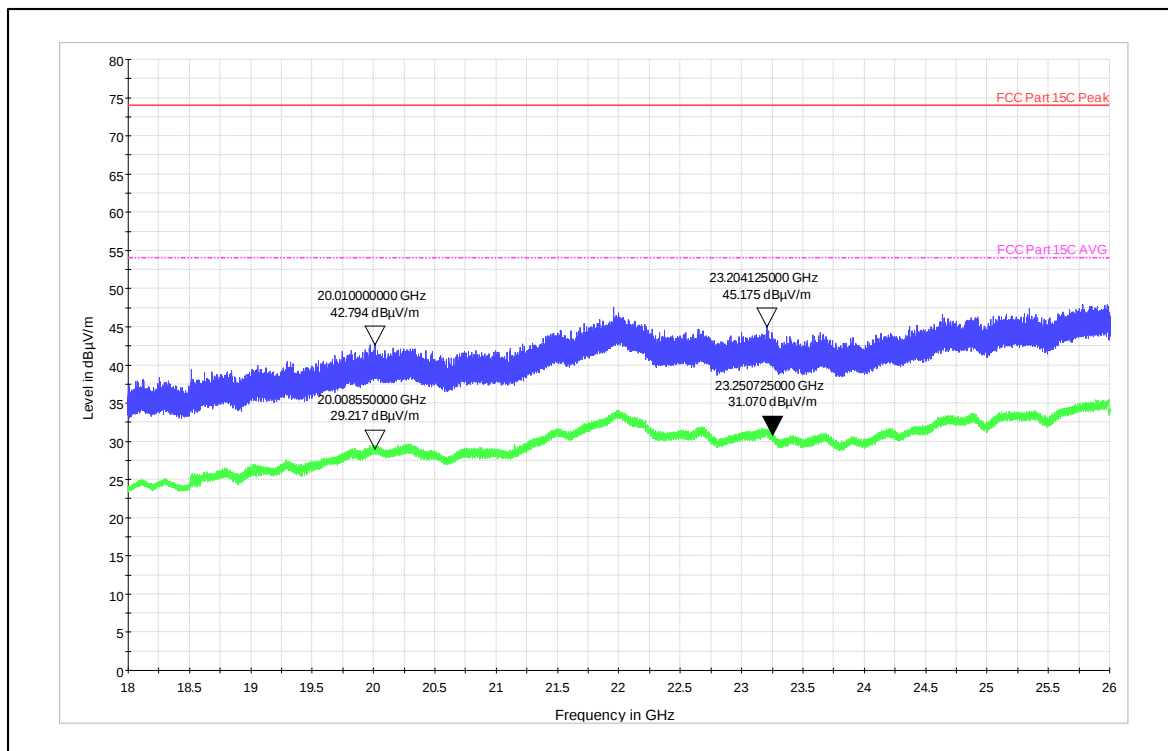
Channel Frequency-2402MHz_Vertical_1-18GHz



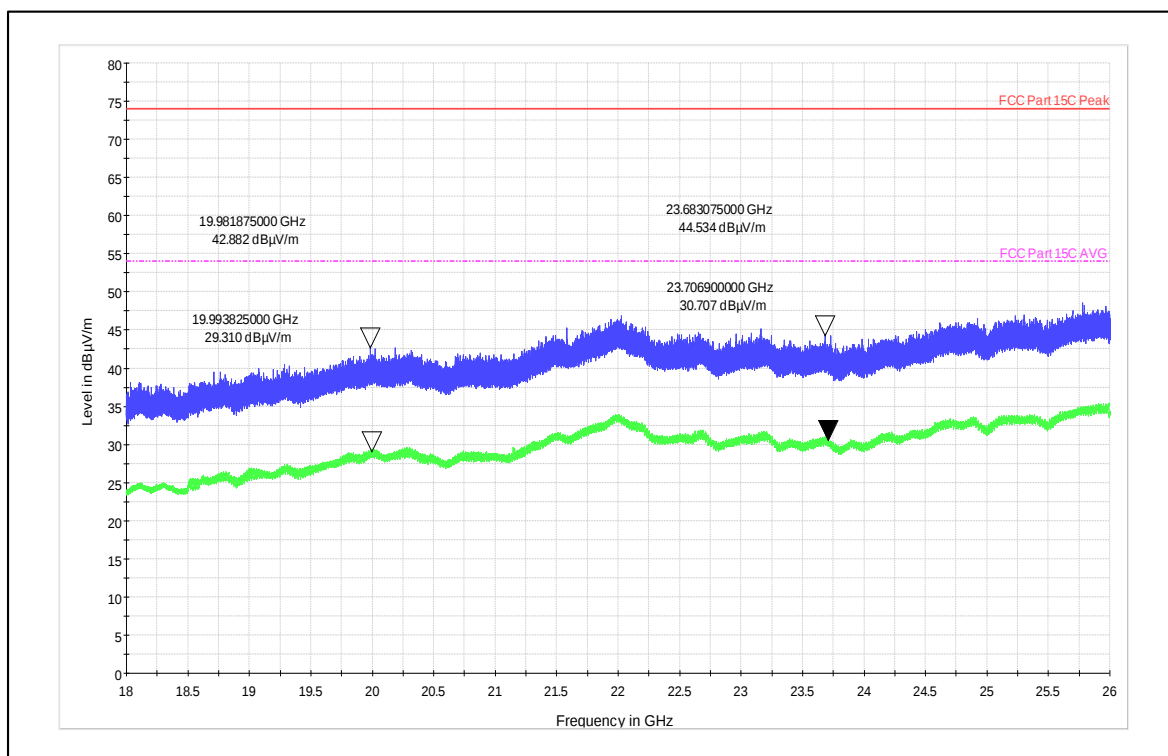
Channel Frequency-2402MHz_Horizontal_1-18GHz



Channel Frequency-Vertical_18GHz - 40GHz



Channel Frequency-Horizontal_18GHz - 40GHz



Prüfbericht - Nr.:
Test Report No.:

IN2391GP 001

Seite 222 von 226
Page 222 of 226

9 Conducted Spurious Emission Test on AC Power Line

Result

Pass

Test Specification : FCC Part 15 Section 15.207 / RSS Gen Issue 5 Section 8.8
Test Method : ANSI C 63.10-2013
Testing Location : Screened room
Measurement Bandwidth : 9kHz
Frequency Range : 150kHz – 30MHz
Supply Voltage : 110VAC, 60Hz
Test Method : Refer TEST METHODOLOGY

Limits of section 15.207

Frequency of emission	QP Limit	AV Limit
(MHz)	(dBμV)	(dBμV)
0.15 – 0.5	66 – 56*	56 – 46*
0.5 – 5	56	46
5 – 30	60	50

* Decreases with the logarithm of the frequency

Test Conditions:

Normal Temperature = +24°C Voltage (V norm) = 110V AC (Through AC to DC Adapter) Relative Humidity = 64%

Prüfbericht - Nr.:

Test Report No.:

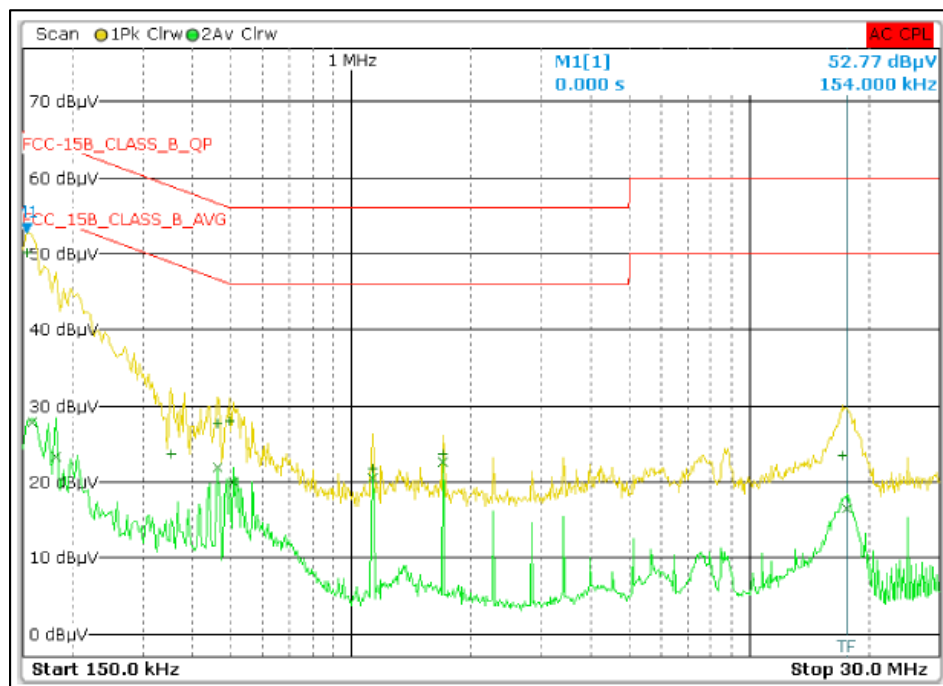
IN2391GP 001

Seite 223 von 226

Page 223 of 226

Test result:

Power: 110V 60HZ_LINE



Line Graph

Trace	Frequency	Level (dBμV)	Phase	Detector	Delta Limit/dB
1	154.00000000 kHz	50.20		Quasi Peak	-15.58
2	1.70200000 MHz	22.70		Average	-23.30
2	462.00000000 kHz	21.96		Average	-24.70
2	1.13400000 MHz	20.59		Average	-25.41
2	506.00000000 kHz	19.96		Average	-26.04
2	158.00000000 kHz	27.82		Average	-27.75
1	494.00000000 kHz	27.97		Quasi Peak	-28.13
1	462.00000000 kHz	27.73		Quasi Peak	-28.93
2	182.00000000 kHz	23.32		Average	-31.07
1	1.70200000 MHz	23.69		Quasi Peak	-32.31
2	17.55800000 MHz	16.60		Average	-33.40
1	1.13400000 MHz	21.83		Quasi Peak	-34.17
1	354.00000000 kHz	23.74		Quasi Peak	-35.13
1	17.20600000 MHz	23.44		Quasi Peak	-36.56

Line Table

Prüfbericht - Nr.:

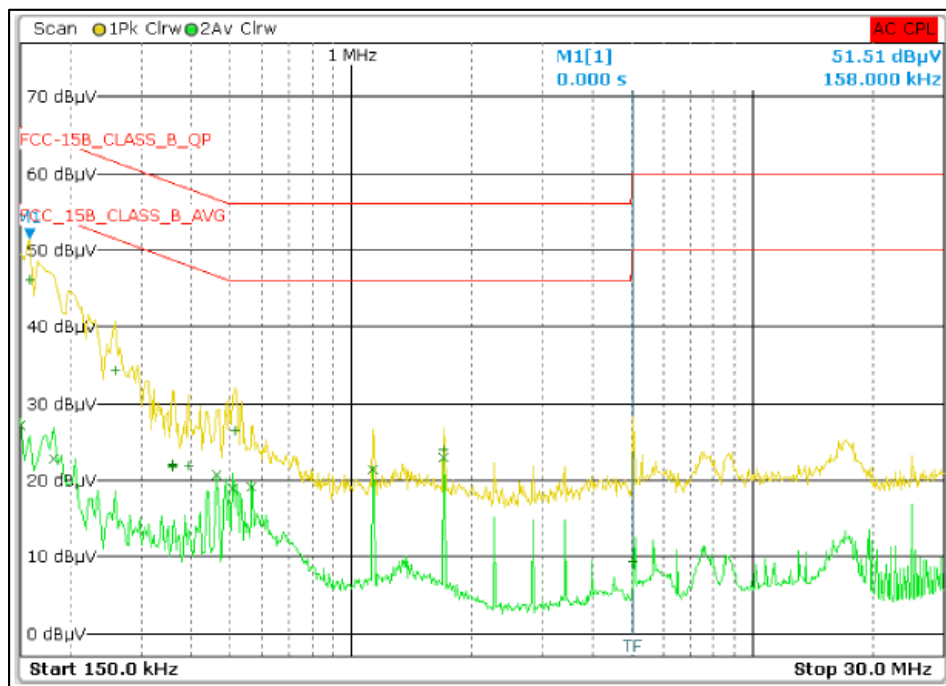
Test Report No.:

IN2391GP 001

Seite 224 von 226

Page 224 of 226

Power: 110V60Hz_NEUTRAL



Neutral Graph

Trace	Frequency	Level (dBμV)	Phase	Detector	Delta Limit/dB
1	158.00000000 kHz	46.23		Quasi Peak	-19.34
2	1.702000000 MHz	23.02		Average	-22.98
2	1.134000000 MHz	21.40		Average	-24.60
2	462.00000000 kHz	20.64		Average	-26.02
2	566.00000000 kHz	19.17		Average	-26.83
2	506.00000000 kHz	18.92		Average	-27.08
1	258.00000000 kHz	34.31		Quasi Peak	-27.19
2	150.00000000 kHz	27.21		Average	-28.79
1	514.00000000 kHz	26.41		Quasi Peak	-29.59
2	182.00000000 kHz	22.79		Average	-31.60
1	1.702000000 MHz	24.01		Quasi Peak	-31.99
1	394.00000000 kHz	21.96		Quasi Peak	-36.02
1	394.00000000 kHz	21.90		Quasi Peak	-36.08
1	358.00000000 kHz	22.14		Quasi Peak	-36.63
1	358.00000000 kHz	21.94		Quasi Peak	-36.83
1	358.00000000 kHz	21.68		Quasi Peak	-37.09
1	5.034000000 MHz	9.29		Quasi Peak	-50.71

Neutral Table

10 LIST OF TABLES

Table 1: List of test and measurement instruments.....	7
Table 2: Instrument application Software versions.....	7
Table 3: Ratings and System Details as declared by Client*.....	8
Table 4: Measurement Uncertainty	9
Table 5: List of Wi-Fi center Frequencies	10
Table 6: List of BLE Center frequencies.....	11
Table 7: Transmitter limits for Radiated emission	140
Table 8: Transmitter limits for Radiated emission	209

11 LIST OF FIGURES

Figure 1: Frequency Range 9 kHz- 30 MHz	14
Figure 2: Frequency Range 30 MHz – 200 MHz	14
Figure 3: Frequency Range 200 MHz - 1GHz	15
Figure 4: Frequency Range above 1 GHz	15

12 Power level used for testing

Wi-Fi 2.4GHz

Channel Band Width	Mode	Data rate	Channels	1001932PT (Flex/PCB) Antenna	FPA3020-10A (Flex/PCB) Antenna
20 MHz	b	1	Low	19.0	19.0
			Mid	19.0	19.0
			High	19.0	19.0
		11	Low	19.0	19.0
			Mid	19.0	19.0
			High	19.0	19.0
	g	6	Low	18.0	18.0
			Mid	19.0	19.0
			High	16.0	18.0
		54	Low	17.0	17.0
			Mid	17.0	17.0
			High	17.0	17.0
	n	MCS 0	Low	16.0	19.0
			Mid	19.0	19.0
			High	14.0	17.0
		MCS 7	Low	16.0	16.0
			Mid	16.0	16.0
			High	15.0	16.0
	ac	MCS 0	Low	17.0	19.0
			Mid	19.0	19.0
			High	14.0	17.0
		MCS 8	Low	15.0	15.0
			Mid	15.0	15.0
			High	15.0	15.0
	ax	MCS 0	Low	14.0	18.0
			Mid	19.0	19.0
			High	14.0	16.0
		MCS 11	Low	14.0	14.0
			Mid	14.0	14.0
			High	14.0	14.0

Prüfbericht - Nr.:
Test Report No.:

IN2391GP 001

Seite 226 von 226
Page 226 of 226

Channel Band Width	Mode	Data rate	Channels	1001932PT (Flex/PCB) Antenna	FPA3020-10A (Flex/PCB) Antenna
40 MHz	n	MCS 0	Low	13.0	16.0
			Mid	19.0	19.0
			High	13.0	15.0
		MCS 7	Low	16.0	16.0
			Mid	16.0	19.0
			High	13.0	17.0
	ac	MCS 0	Low	15.0	17.0
			Mid	19.0	19.0
			High	13.0	15.0
		MCS 8	Low	15.0	17.0
			Mid	15.0	19.0
			High	15.0	15.0
	ax	MCS 0	Low	14.0	17.0
			Mid	19.0	19.0
			High	12.0	16.0
		MCS 11	Low	13.0	14.0
			Mid	14.0	14.0
			High	14.0	14.0

BLE 2.4GHz

Channel BandWidth	Data rate (Mbps)	Channels	1001932PT (Flex/PCB) Antenna	FPA3020-10A (Flex/PCB) Antenna
2MHz	1	Low	8	8
		Mid	8	8
		High	8	8
	2	Low	8	8
		Mid	8	8
		High	8	8

*****END OF TEST REPORT*****