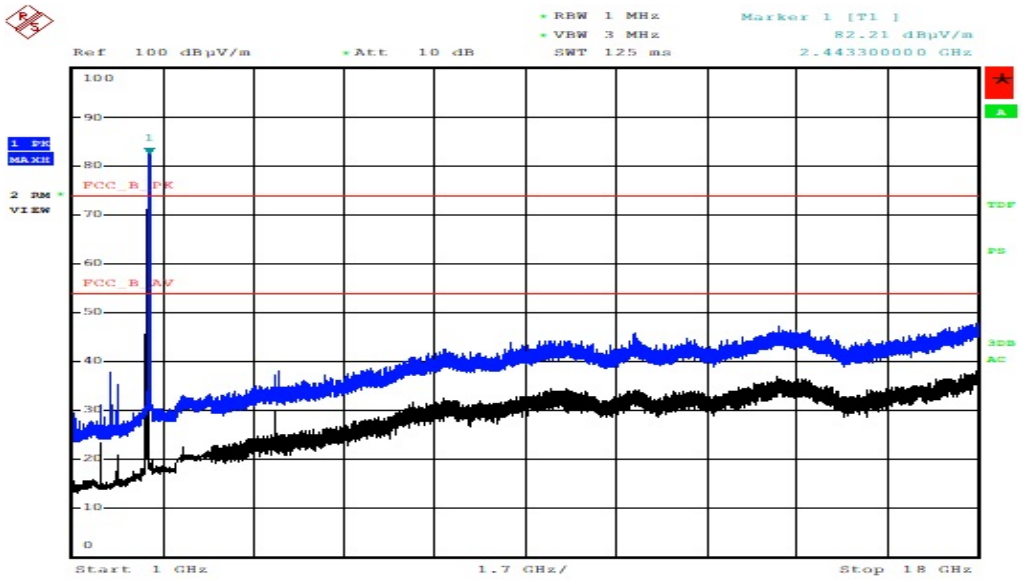
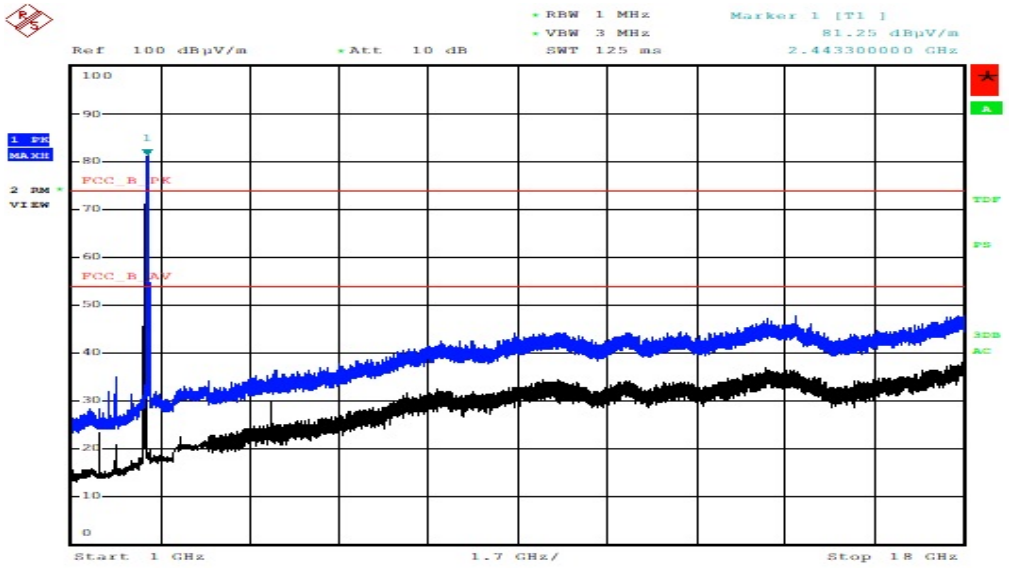
*802.11g Mode CH7 Polarity:Horizontal



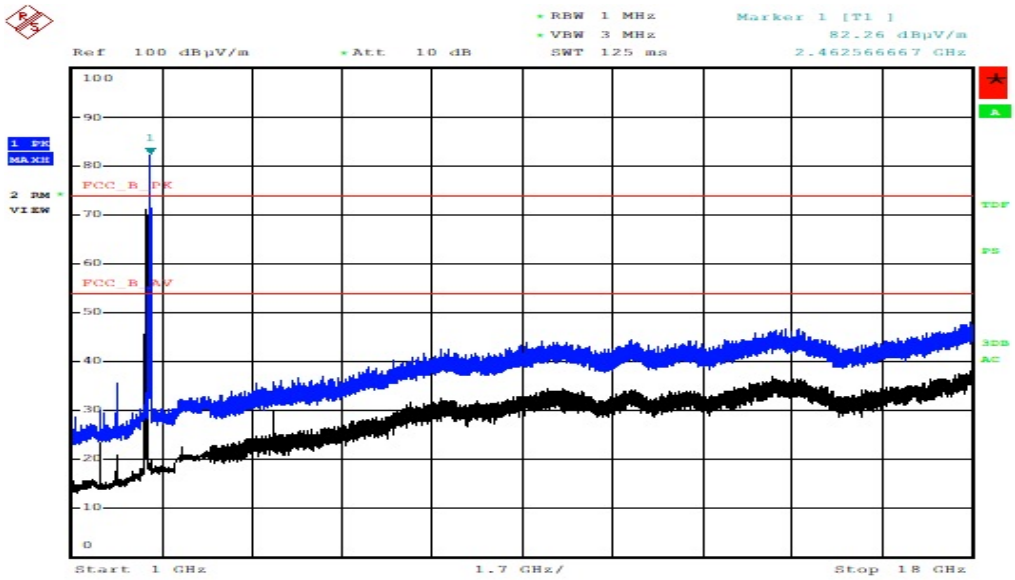
ESTR-21-00272

Polarity:Vertical



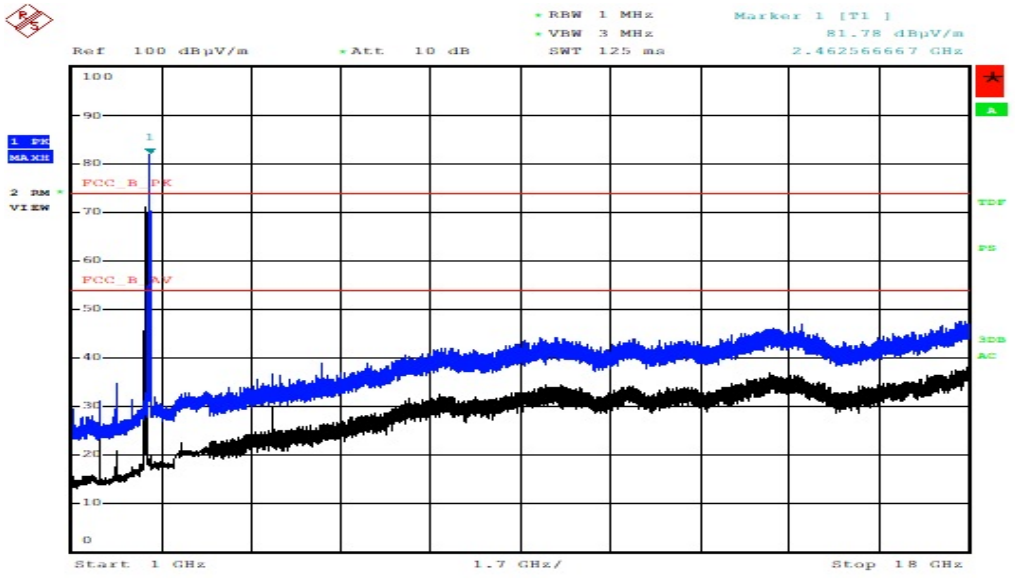
ESTR-21-00272

*802.11g Mode CH11 Polarity:Horizontal



ESTR-21-00272

Polarity:Vertical



ESTR-21-00272

10.4-15 Test Data (802.11 n20)

Test Date : 1-Nov-21 Measurement Distance : 3 m

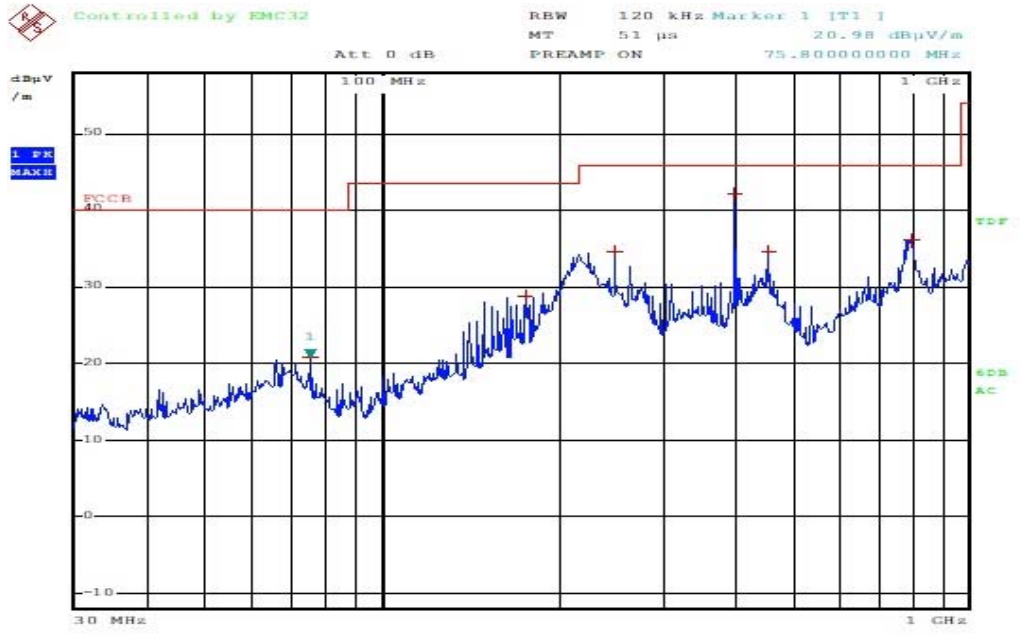
Frequency (MHz)	Reading (dBμV)	Position (V/H)	Height (m)	Correction Factor		Result Value		
				Ant Factor (dB)	Cable (dB)	Limit (dBμV/m)	Result (dBμV/m)	Margin (dB)
212.10	16.04	V	1.4	13.42	0.91	43.50	30.37	13.13
249.70	21.81	H	1.8	11.84	1.10	46.00	34.75	11.25
400.00	31.57	H	1.6	9.43	1.34	46.00	42.34	3.66
456.00	24.58	V	1.4	12.14	1.57	46.00	38.29	7.71
801.10	19.77	H	1.0	14.00	2.48	46.00	36.25	9.75
999.40	9.59	V	1.4	22.69	4.33	54.00	36.61	17.39

Remark	H : Horizontal, V : Vertical *Checked in all 3 axis and the maximum measured data were reported.(Worst data is Z axis of position) *CL = Cable Loss(In case of below 1 000 MHz) *Result Value = Reading + Ant Factor + Cable loss *The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection at frequency below 1 GHz.

10.4-16 radiated Graph(30 MHz ~ 1 GHz)

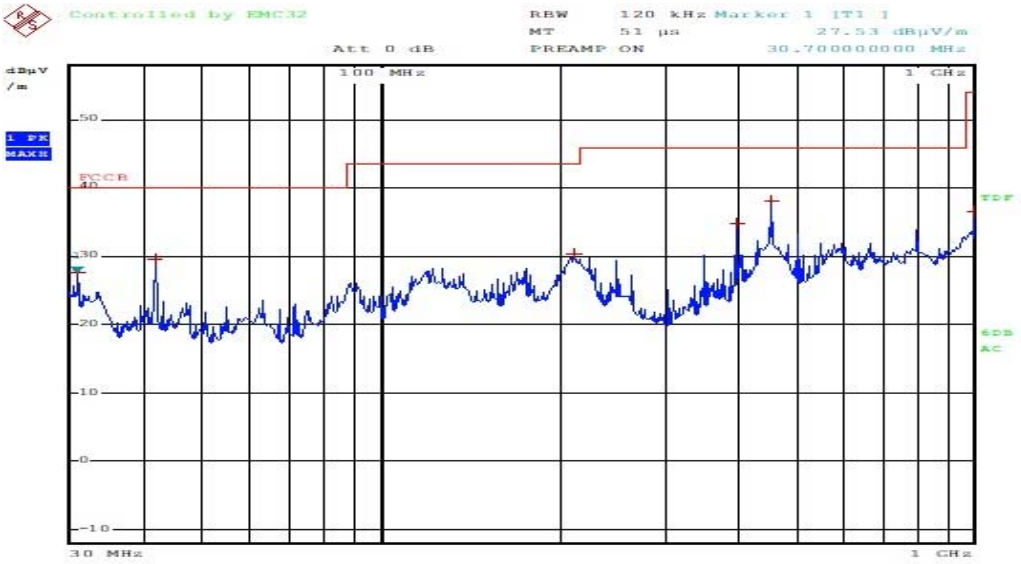
*802.11n20 Mode

Polarity:Horizontal



FS2-AWB

Polarity:Vertical



FS2-AWB

10.4-17 Test Data

Test Date : 17-Nov-21 Measurement Distance : 3 m

Frequency (MHz)	Reading (dB㎶)	Position (V/H)	Height (m)	Correction Factor		Duty Cycle Correction (dB)	Result Value		
				Ant Factor (dB)	Cable (dB)		Limit (dB㎶/m)	Result (dB㎶/m)	Margin (dB)
PEAK(RBW: 1 MHz VBW: 3 MHz)									
2390.00	49.45	H	1.5	27.89	-29.82		74.00	47.52	26.48
2390.00	50.17	V	1.6	27.89	-29.82		74.00	48.24	25.76
4824.00	45.67	H	1.5	31.52	-27.27		74.00	49.92	24.08
4824.00	45.77	V	1.6	31.52	-27.27		74.00	50.02	23.98
AV(RBW: 1 MHz VBW: 3 MHz)									
2390.00	37.26	H	1.5	27.89	-29.82	0.37	54.00	35.70	18.30
2390.00	37.19	V	1.6	27.89	-29.82	0.37	54.00	35.63	18.37
4824.00	33.67	H	1.5	31.52	-27.27	0.37	54.00	38.29	15.71
4824.00	33.59	V	1.6	31.52	-27.27	0.37	54.00	38.21	15.79

Remark

H : Horizontal, V : Vertical TEST MODE : 802.11 n20 - CH 1(2 412 MHz)

*The TX signal wasn't detected from 3th harmonics.
*Checked in all 3 axis and the maximum measured data were reported.(Worst data is Z axis of position)
*Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Duty Cycle Correction
*This test was radiated up to 26.5 GHz but no noise was measured.

10.4-18 Test Data

Test Date : 17-Nov-21 Measurement Distance : 3 m

Frequency (MHz)	Reading (dBμV)	Position (V/H)	Height (m)	Correction Factor		Duty Cycle Correction (dB)	Result Value		
				Ant Factor (dB)	Cable (dB)		Limit (dBμV/m)	Result (dBμV/m)	Margin (dB)
PEAK(RBW: 1 MHz VBW: 3 MHz)									
4884.00	44.67	H	1.5	31.58	-27.23		74.00	49.02	24.98
4884.00	45.12	V	1.5	31.58	-27.23		74.00	49.47	24.53
AV(RBW: 1 MHz VBW: 3 MHz)									
4884.00	34.21	H	1.5	31.58	-27.23	0.37	54.00	38.93	15.07
4884.00	34.64	V	1.6	31.58	-27.23	0.37	54.00	39.36	14.64

Remark	H : Horizontal, V : Vertical TEST MODE : 802.11 n20 - CH 7(2 442 MHz) *The TX signal wasn't detected from 3th harmonics. *Checked in all 3 axis and the maximum measured data were reported.(Worst data is Z axis of position) *Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Duty Cycle Correction *This test was radiated up to 26.5 GHz but no noise was measured.

10.4-19 Test Data

Test Date : 17-Nov-21 Measurement Distance : 3 m

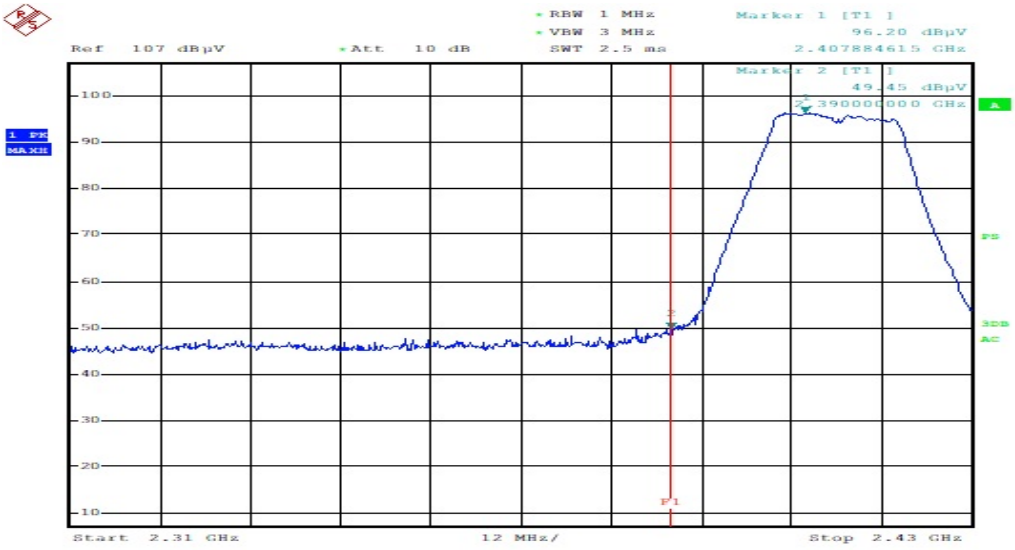
Frequency (MHz)	Reading (dBμV)	Position (V/H)	Height (m)	Correction Factor		Duty Cycle Correction (dB)	Result Value		
				Ant Factor (dB)	Cable (dB)		Limit (dBμV/m)	Result (dBμV/m)	Margin (dB)
PEAK(RBW: 1 MHz VBW: 3 MHz)									
2483.50	48.34	H	1.6	27.48	-29.75		74.00	46.07	27.93
2483.50	48.93	V	1.5	27.48	-29.75		74.00	46.66	27.34
4924.00	45.67	H	1.6	31.62	-27.21		74.00	50.08	23.92
4924.00	45.80	V	1.5	31.62	-27.21		74.00	50.21	23.79
AV(RBW: 1 MHz VBW: 3 MHz)									
2483.50	35.95	H	1.6	27.50	-29.75	0.37	54.00	34.07	19.93
2483.50	36.69	V	1.5	27.50	-29.75	0.37	54.00	34.81	19.19
4924.00	33.59	H	1.6	31.62	-27.21	0.37	54.00	38.37	15.63
4924.00	33.87	V	1.5	31.62	-27.21	0.37	54.00	38.65	15.35

Remark	H : Horizontal, V : Vertical TEST MODE : 802.11n20 - CH 11(2 462 MHz) *The TX signal wasn't detected from 3th harmonics. *Checked in all 3 axis and the maximum measured data were reported.(Worst data is Z axis of position) *Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Duty Cycle Correction *This test was radiated up to 26.5 GHz but no noise was measured.

10.4-20 Restricted Band Edges
*802.11n20 Mode

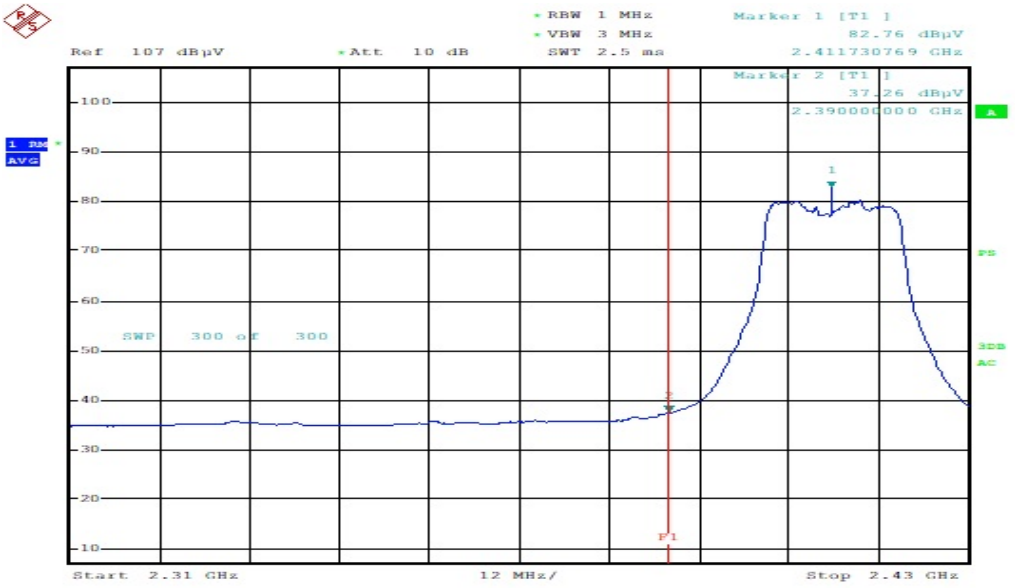
Band Edges(CH Low)

Detector mode:Peak Polarity:Horizontal



ESTR-21-00272

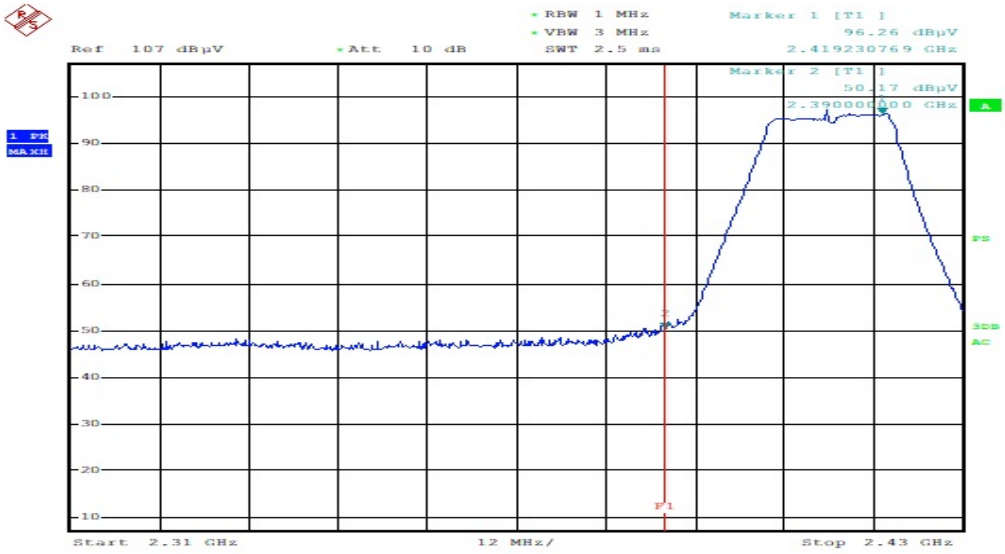
Detector mode:Average Polarity:Horizontal



ESTR-21-00272

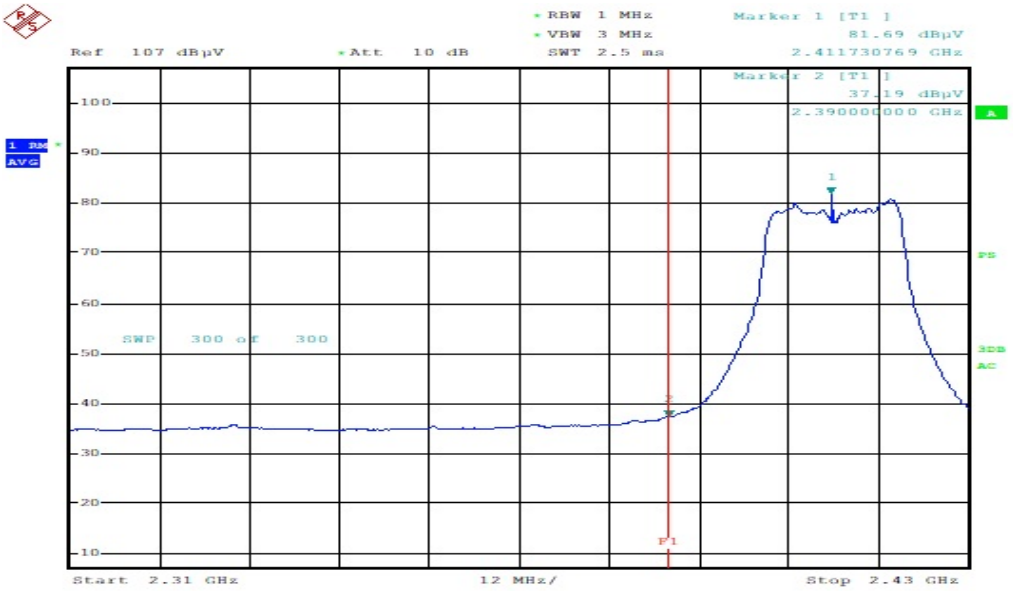
Band Edges(CH Low)

Detector mode:Peak Polarity:Vertical



ESTR-21-00272

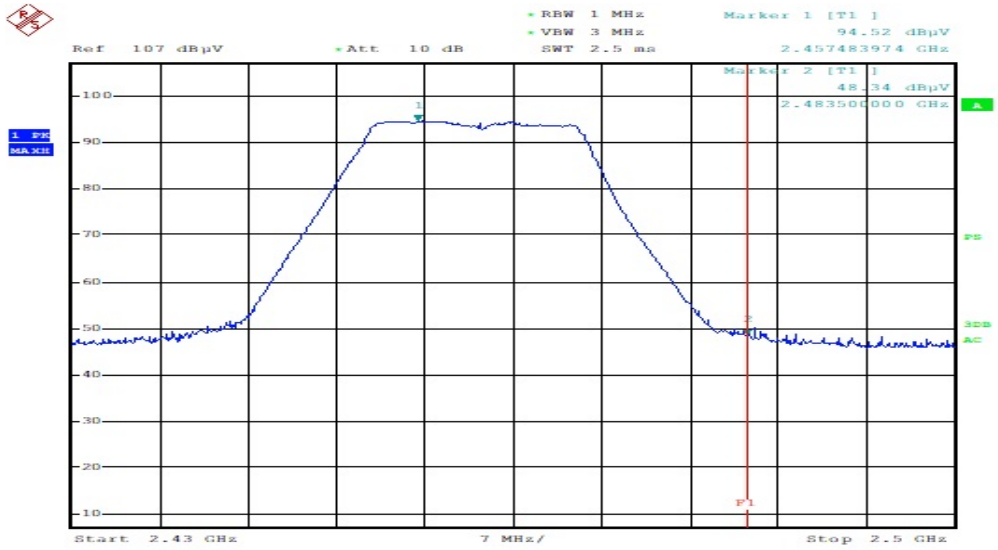
Detector mode:Average Polarity:Vertical



ESTR-21-00272

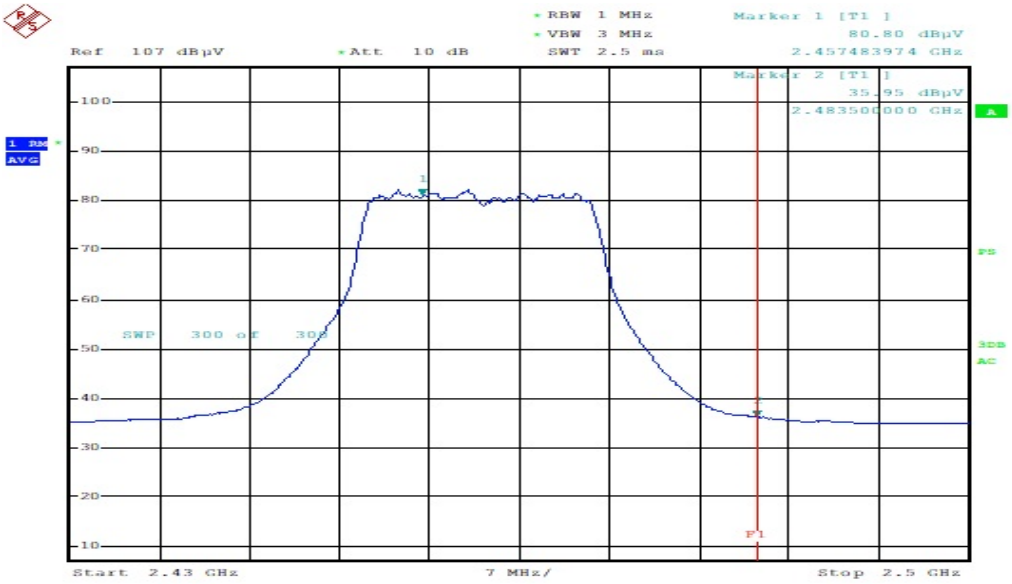
Band Edges(CH High)

Detector mode:Peak Polarity:Horizontal



ESTR-21-00272

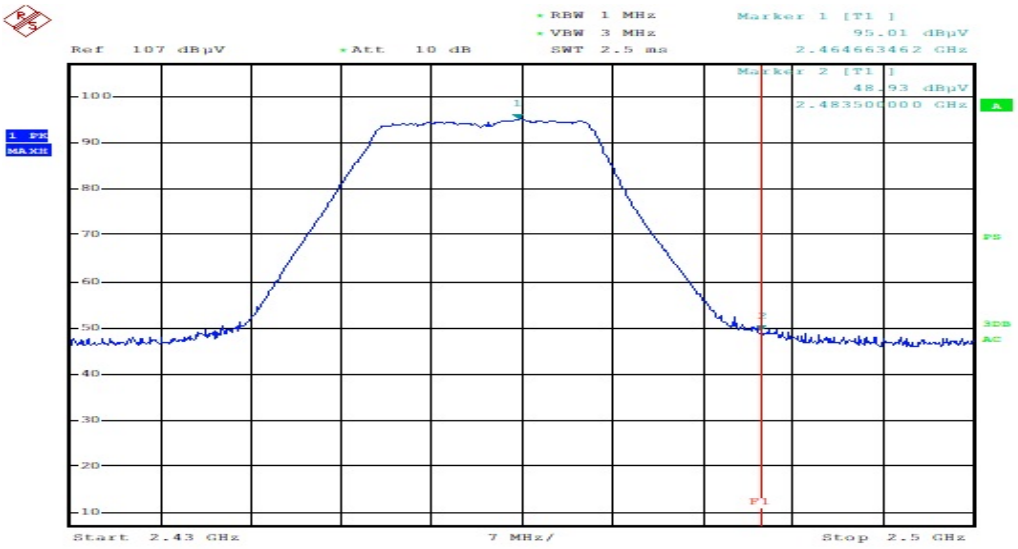
Detector mode:Average Polarity:Horizontal



ESTR-21-00272

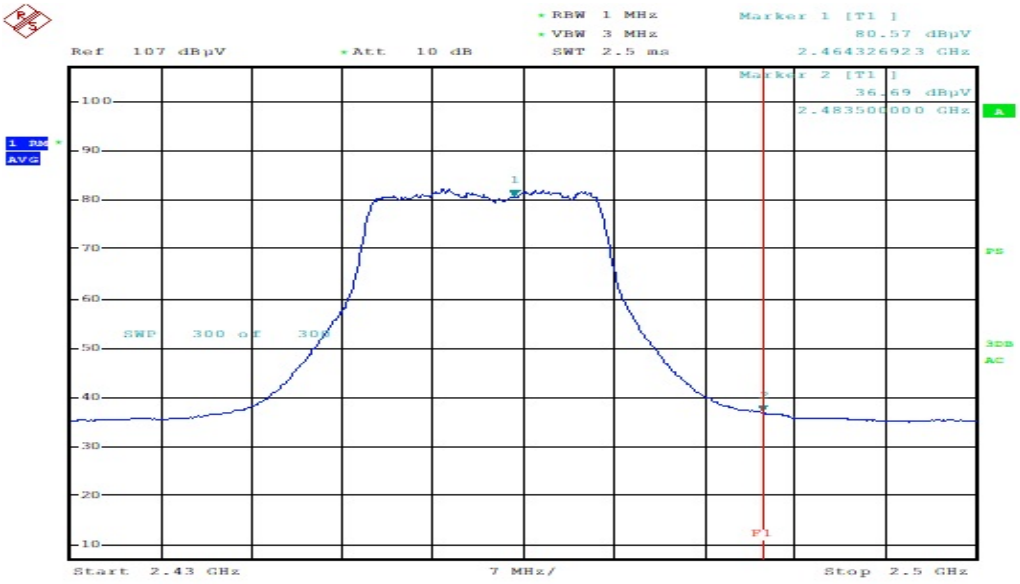
Band Edges(CH High)

Detector mode:Peak Polarity:Vertical



ESTR-21-00272

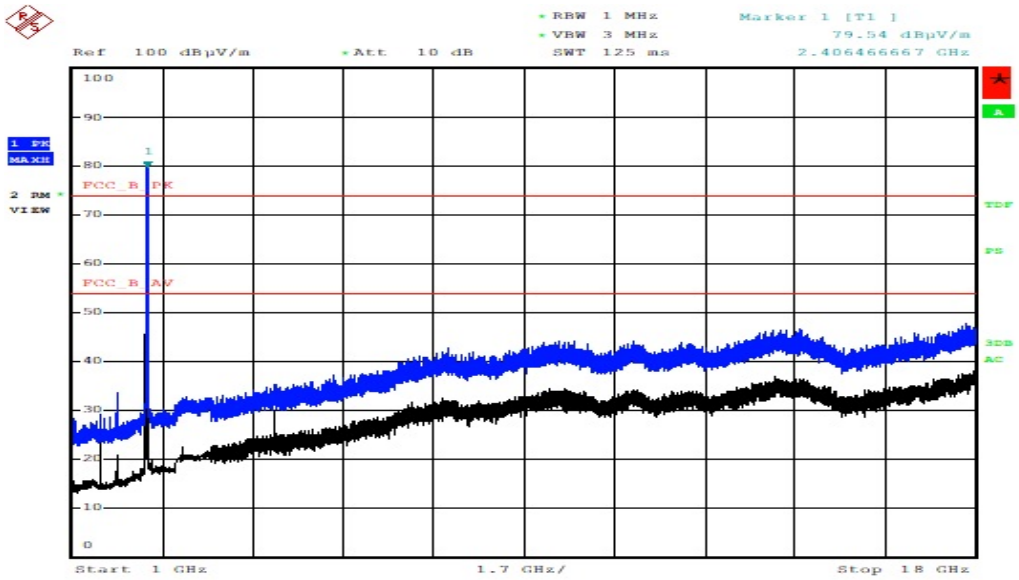
Detector mode:Average Polarity:Vertical



ESTR-21-00272

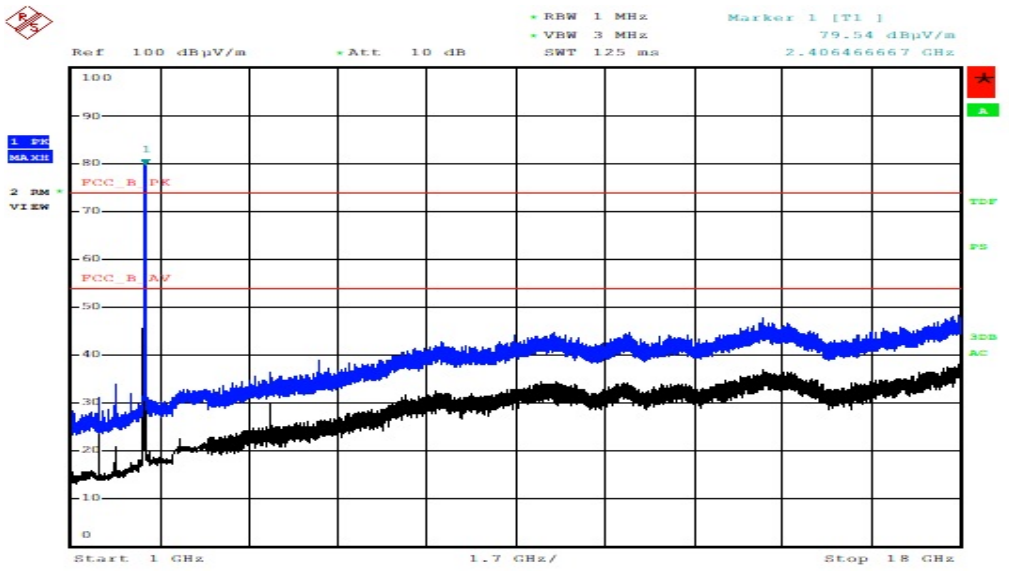
10.4-21 Restricted Band Edges

*802.11n20 Mode CH1 Polarity:Horizontal



ESTR-21-00272

Polarity:Vertical



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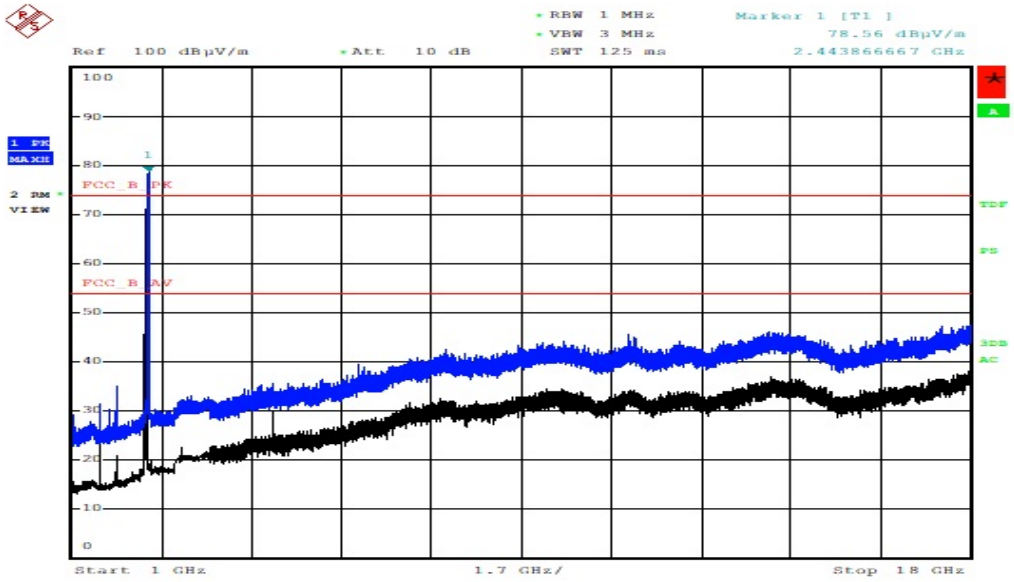
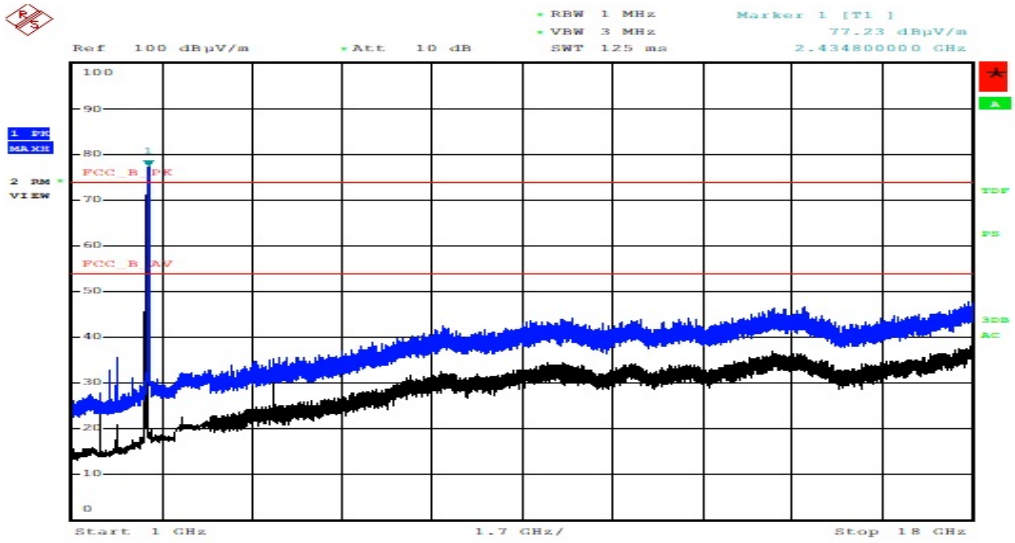
*802.11n20 Mode CH7 Polarity:Horizontal



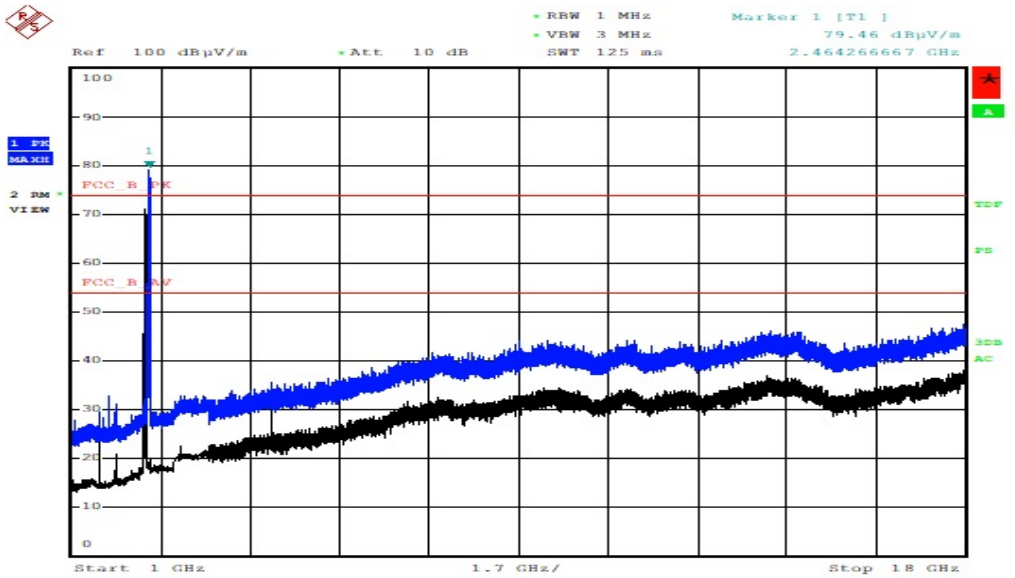
ESTR-21-00272

Polarity:Vertical



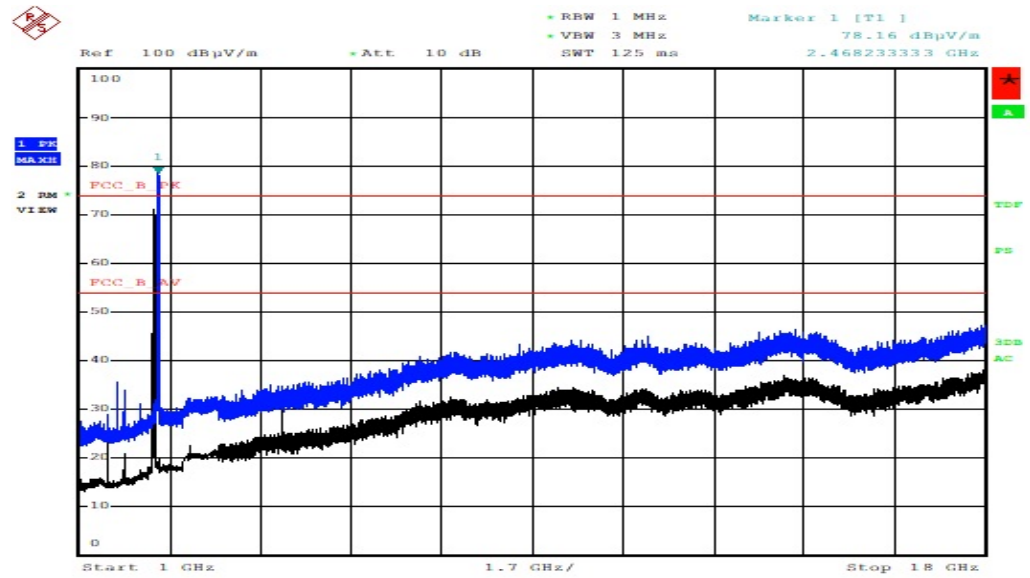
ESTR-21-00272

*802.11n20 Mode CH11 Polarity:Horizontal



ESTR-21-00272

Polarity:Vertical



ESTR-21-00272

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10.4-22 Test Data (802.11 n40)

Test Date : 1-Nov-21 Measurement Distance : 3 m

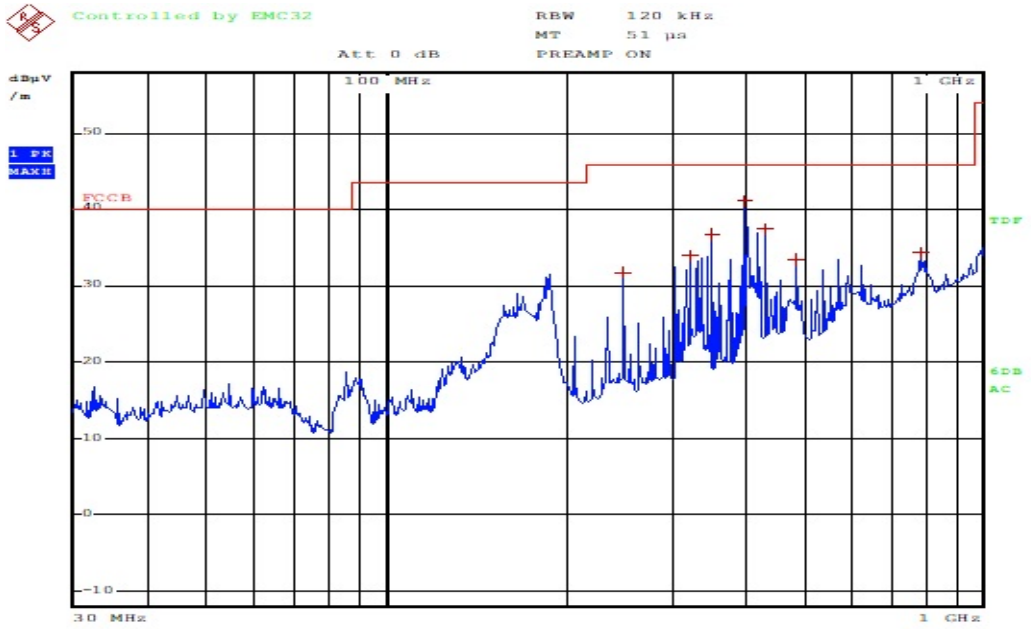
Frequency (MHz)	Reading (dBμV)	Position (V/H)	Height (m)	Correction Factor		Result Value		
				Ant Factor (dB)	Cable (dB)	Limit (dBμV/m)	Result (dBμV/m)	Margin (dB)
324.00	19.67	H	1.6	13.41	0.91	46.00	33.99	12.01
351.00	22.61	H	1.4	13.22	1.03	46.00	36.86	9.14
400.00	31.06	H	1.3	8.80	1.30	46.00	41.17	4.83
432.00	23.86	H	1.2	12.13	1.57	46.00	37.57	8.43
486.00	19.18	H	1..2	12.57	1.78	46.00	33.53	12.47
787.50	17.92	H	1.0	14.00	2.48	46.00	34.40	11.60

Remark	H : Horizontal, V : Vertical *Checked in all 3 axis and the maximum measured data were reported.(Worst data is Z axis of position) *CL = Cable Loss(In case of below 1 000 MHz) *Result Value = Reading + Ant Factor + Cable loss *The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection at frequency below 1 GHz.

10.4-23 radiated Graph(30 MHz ~ 1 GHz)

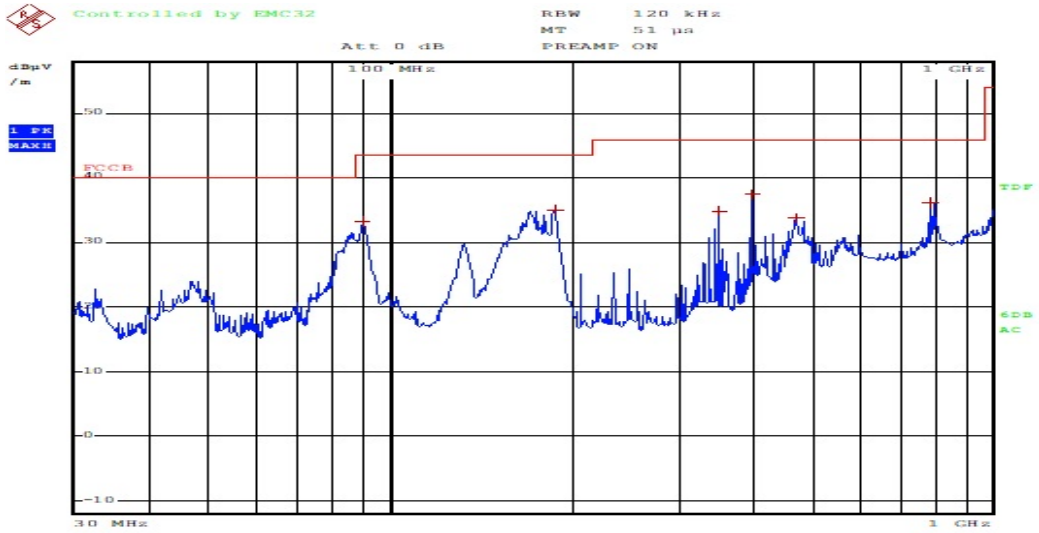
*802.11n40 Mode

Polarity:Horizontal



ESTR-21-00272

Polarity:Vertical



ESTR-21-00272

10.4-24 Test Data

Test Date : 18-Nov-21 Measurement Distance : 3 m

Frequency (MHz)	Reading (dBμV)	Position (V/H)	Height (m)	Correction Factor		Duty Cycle Correction (dB)	Result Value		
				Ant Factor (dB)	Cable (dB)		Limit (dBμV/m)	Result (dBμV/m)	Margin (dB)
PEAK(RBW: 1 MHz VBW: 3 MHz)									
2390.00	46.79	H	1.5	27.89	-29.82		74.00	44.86	29.14
2390.00	46.82	V	1.6	27.89	-29.82		74.00	44.89	29.11
4844.00	45.89	H	1.5	31.54	-27.26		74.00	50.17	23.83
4844.00	46.01	V	1.6	31.54	-27.26		74.00	50.29	23.71
AV(RBW: 1 MHz VBW: 3 MHz)									
2390.00	35.89	H	1.5	27.89	-29.82	0.96	54.00	34.92	19.08
2390.00	35.75	V	1.6	27.89	-29.82	0.96	54.00	34.78	19.22
4844.00	33.64	H	1.5	31.54	-27.26	0.96	54.00	38.88	15.12
4844.00	34.05	V	1.6	31.54	-27.26	0.96	54.00	39.29	14.71

Remark

H : Horizontal, V : Vertical TEST MODE : 802.11n40 - CH 3(2 422 MHz)

*The TX signal wasn't detected from 3th harmonics.
*Checked in all 3 axis and the maximum measured data were reported.(Worst data is Z axis of position)
*Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Duty Cycle Correction
*This test was radiated up to 26.5 GHz but no noise was measured.

10.4-25 Test Data

Test Date : 14-Sep-21 Measurement Distance : 3 m

Frequency (MHz)	Reading (dBμV)	Position (V/H)	Height (m)	Correction Factor		Duty Cycle Correction (dB)	Result Value		
				Ant Factor (dB)	Cable (dB)		Limit (dBμV/m)	Result (dBμV/m)	Margin (dB)
PEAK(RBW: 100 kHz VBW: 300 kHz)									
4884.00	45.12	H	1.5	31.58	-27.23		74.00	49.47	24.53
4884.00	46.05	V	1.5	31.58	-27.23		74.00	50.40	23.60
AV(RBW: 1 MHz VBW: 3 MHz)									
4884.00	34.21	H	1.5	31.58	-27.23	0.96	54.00	39.52	14.48
4884.00	35.34	V	1.6	31.58	-27.23	0.96	54.00	40.65	13.35

Remark	H : Horizontal, V : Vertical TEST MODE : 802.11 n40 - CH 7(2 442 MHz) *The TX signal wasn't detected from 3th harmonics. *Checked in all 3 axis and the maximum measured data were reported.(Worst data is Z axis of position) *Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Duty Cycle Correction *This test was radiated up to 26.5 GHz but no noise was measured.

10.4-26 Test Data

Test Date : 14-Sep-21 Measurement Distance : 3 m

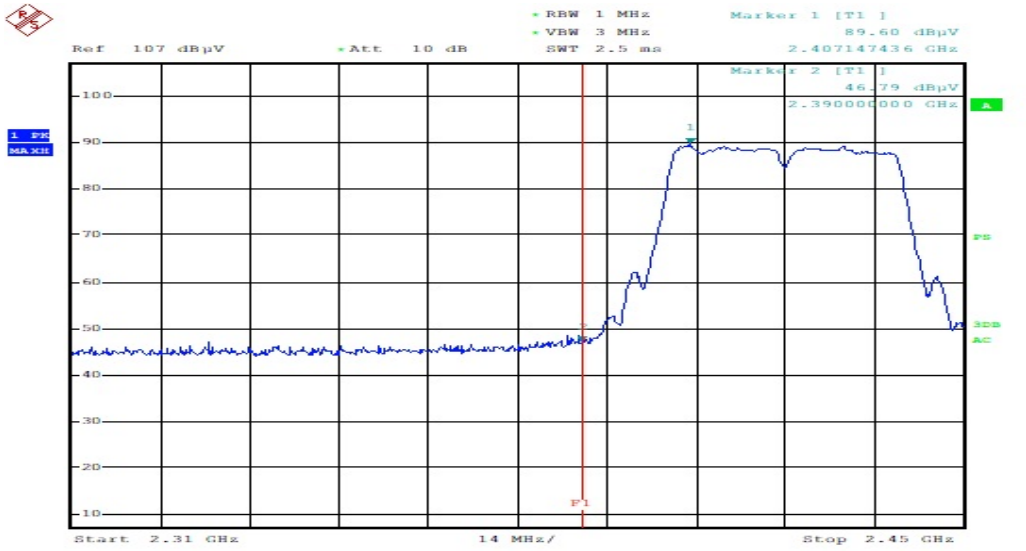
Frequency (MHz)	Reading (dBμV)	Position (V/H)	Height (m)	Correction Factor		Duty Cycle Correction (dB)	Result Value		
				Ant Factor (dB)	Cable (dB)		Limit (dBμV/m)	Result (dBμV/m)	Margin (dB)
PEAK(RBW: 100 kHz VBW: 300 kHz)									
2483.50	49.16	H	1.6	27.48	-29.75		74.00	46.89	27.11
2483.50	50.76	V	1.5	27.48	-29.75		74.00	48.49	25.51
4904.00	46.52	H	1.6	31.60	-27.22		74.00	50.90	23.10
4904.00	47.69	V	1.5	31.60	-27.22		74.00	52.07	21.93
AV(RBW: 1 MHz VBW: 3 MHz)									
2483.50	36.40	H	1.6	27.48	-29.75	0.96	54.00	35.09	18.91
2483.50	37.29	V	1.5	27.48	-29.75	0.96	54.00	35.98	18.02
4904.00	35.44	H	1.6	31.60	-27.22	0.96	54.00	40.78	13.22
4904.00	36.52	V	1.5	31.60	-27.22	0.96	54.00	41.86	12.14

Remark	H : Horizontal, V : Vertical TEST MODE : 802.11n40 - CH 11(2 462 MHz) *The TX signal wasn't detected from 3th harmonics. *Checked in all 3 axis and the maximum measured data were reported.(Worst data is Z axis of position) *Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Duty Cycle Correction *This test was radiated up to 26.5 GHz but no noise was measured.

10.4-27 Restricted Band Edges
*802.11n40 Mode

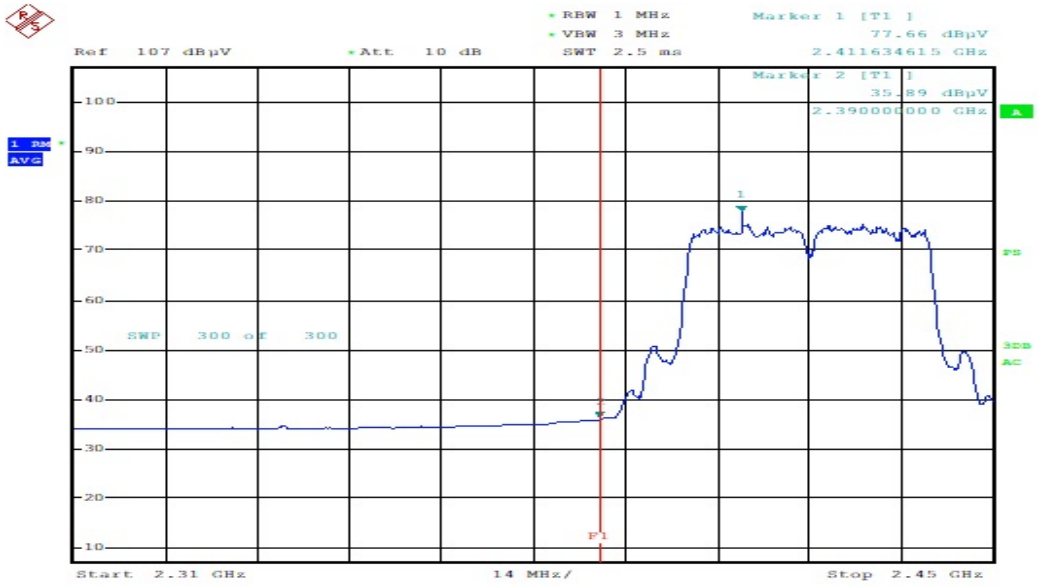
Band Edges(CH Low)

Detector mode:Peak Polarity:Horizontal



ESTR-21-00272

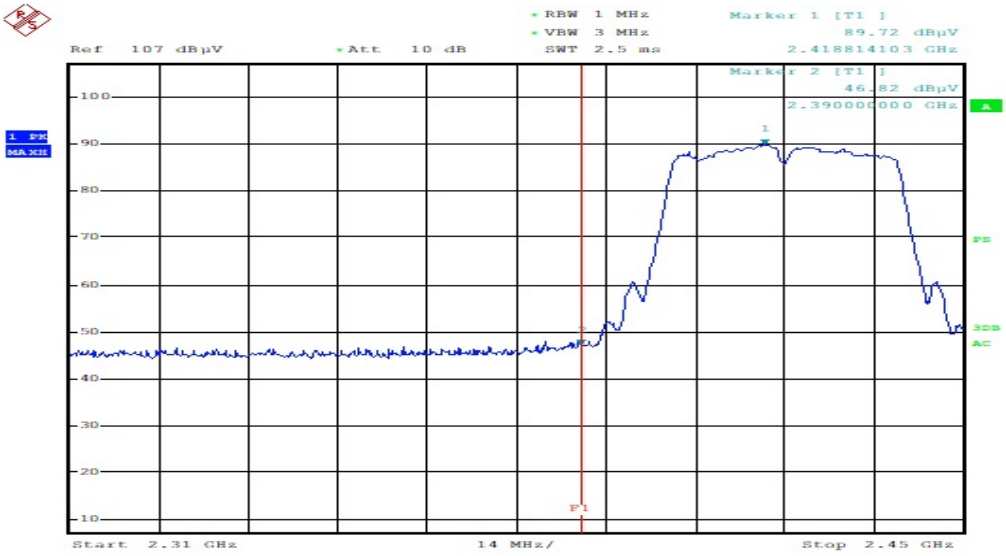
Detector mode:Average Polarity:Horizontal



ESTR-21-00272

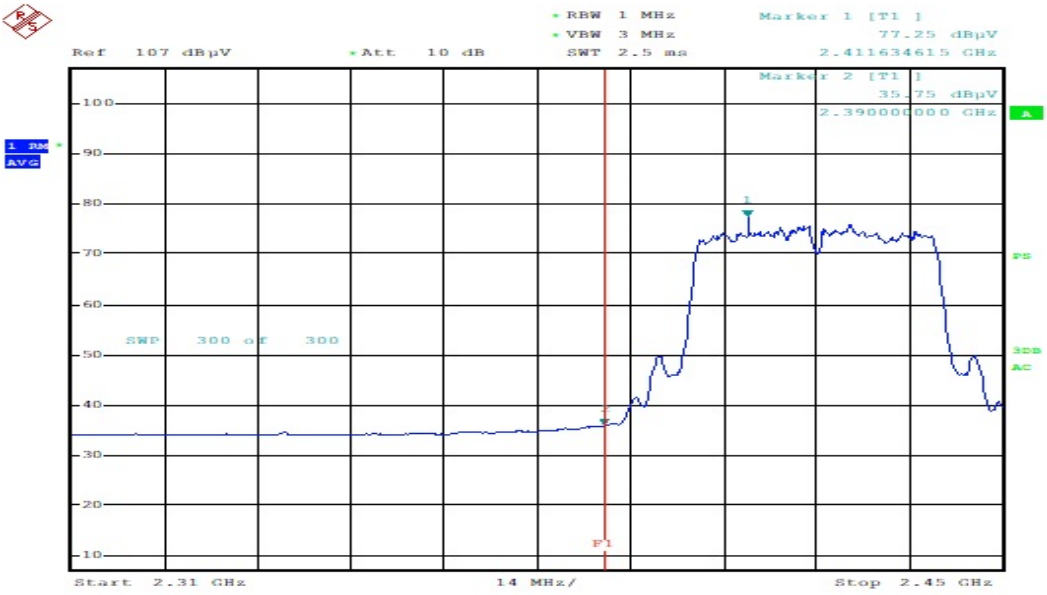
Band Edges(CH Low)

Detector mode:Peak Polarity:Vertical



ESTR-21-00272

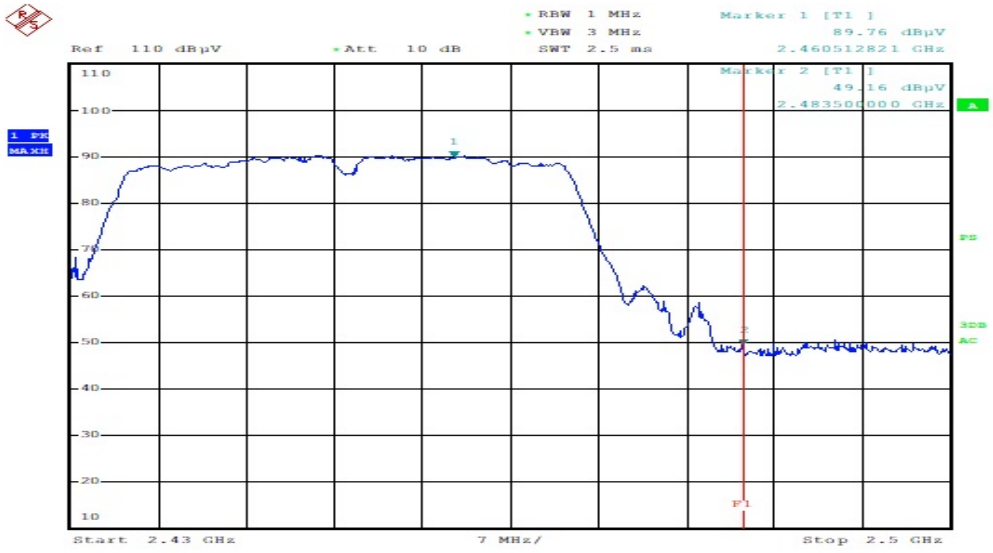
Detector mode:Average Polarity:Vertical



ESTR-21-00272

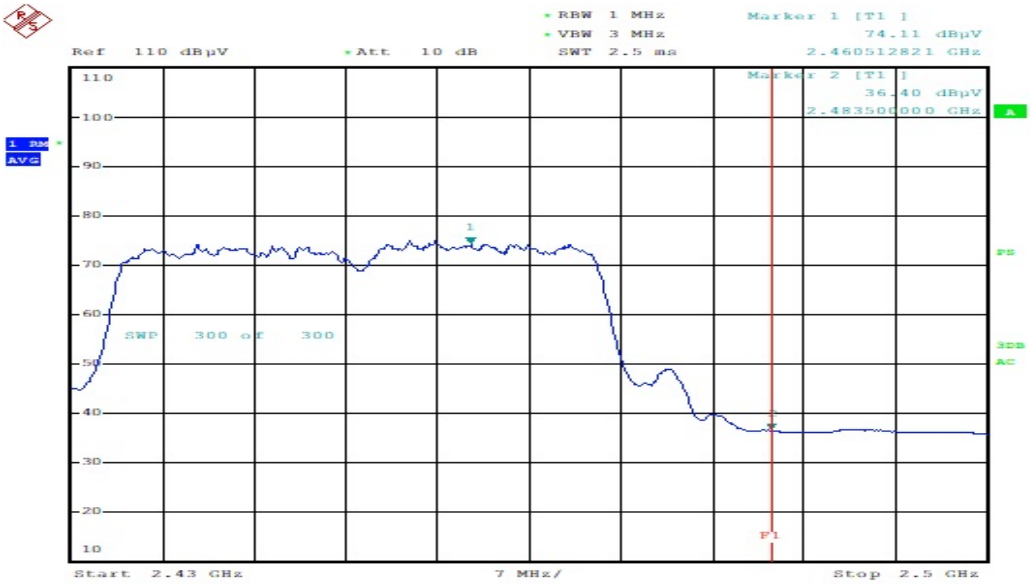
Band Edges(CH High)

Detector mode:Peak Polarity:Horizontal



ESTR-21-00272

Detector mode:Average Polarity:Horizontal



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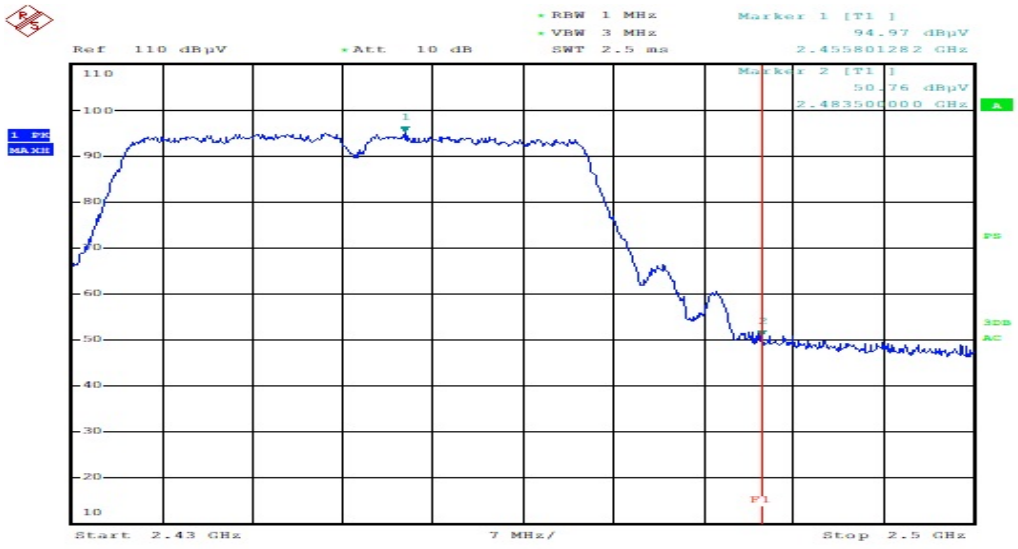
Band Edges(CH High)

Detector mode:Peak Polarity:Vertical



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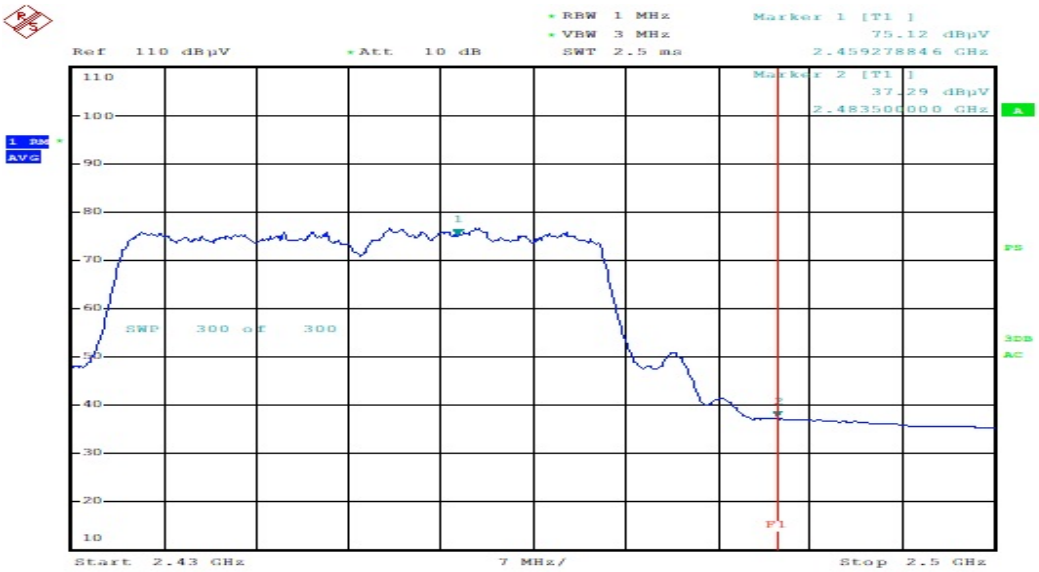
Detector mode:Average Polarity:Vertical



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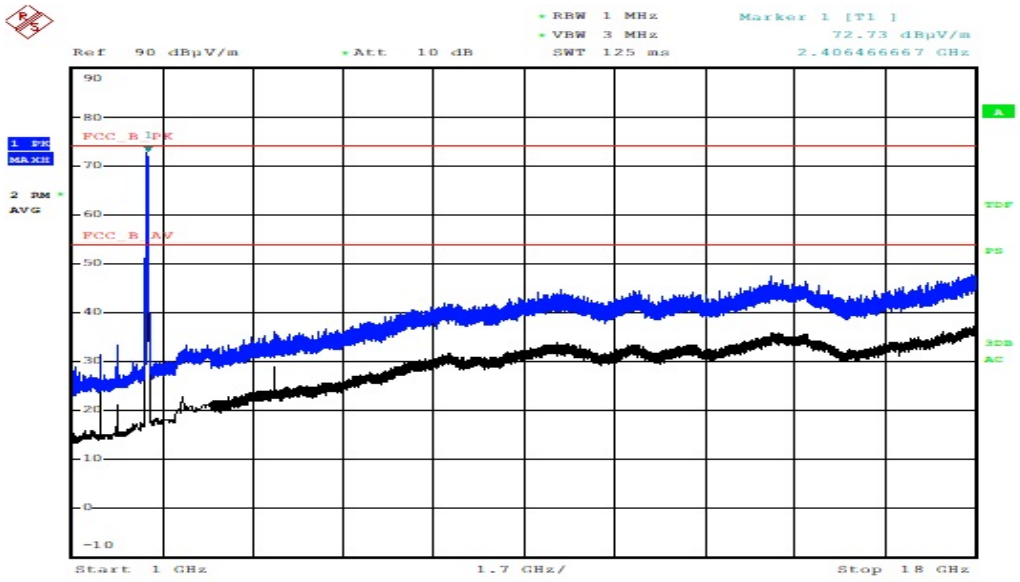
10.4-28 Restricted Band Edges

*802.11n40 Mode CH3 Polarity:Horizontal



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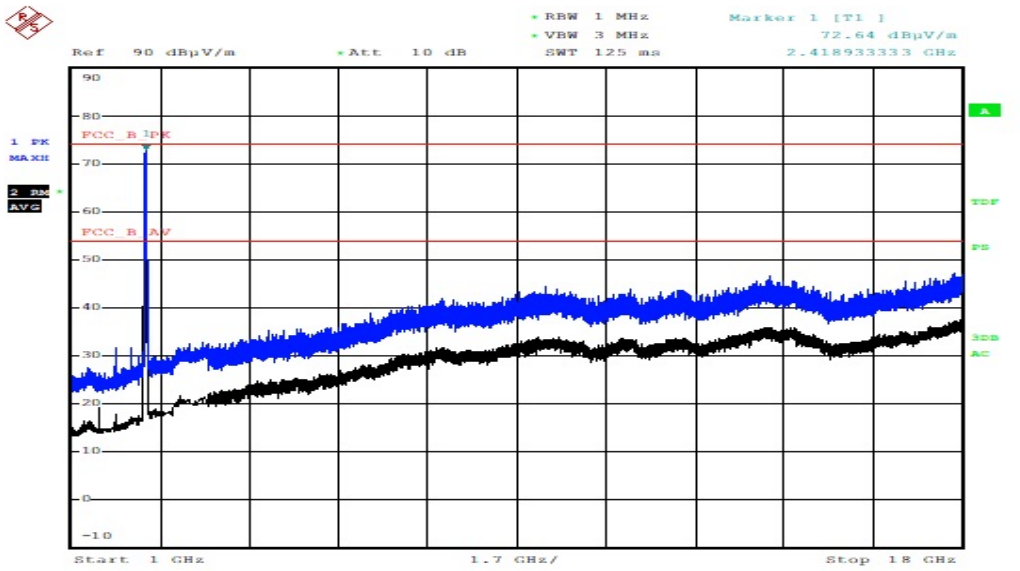
Polarity:Vertical



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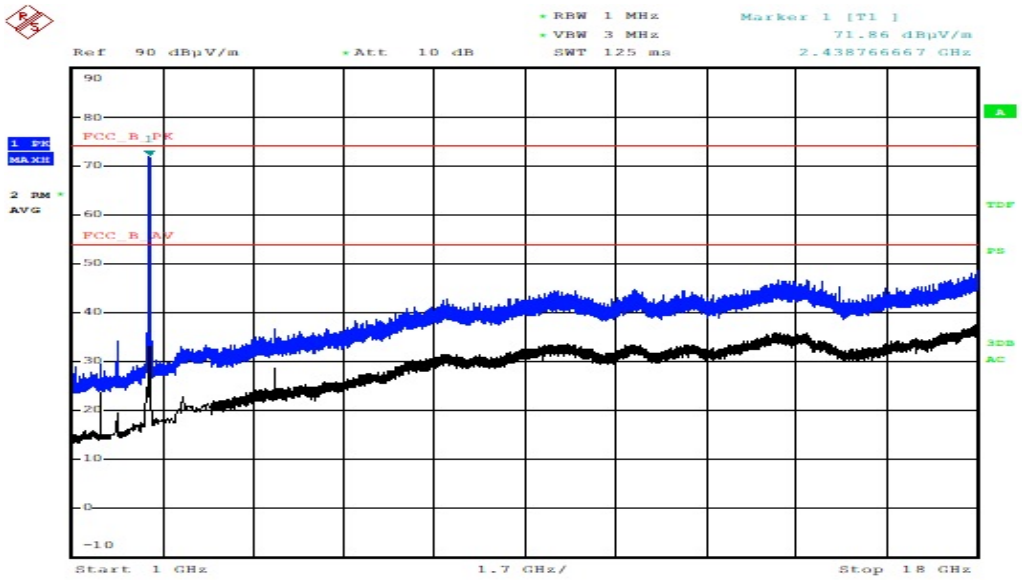
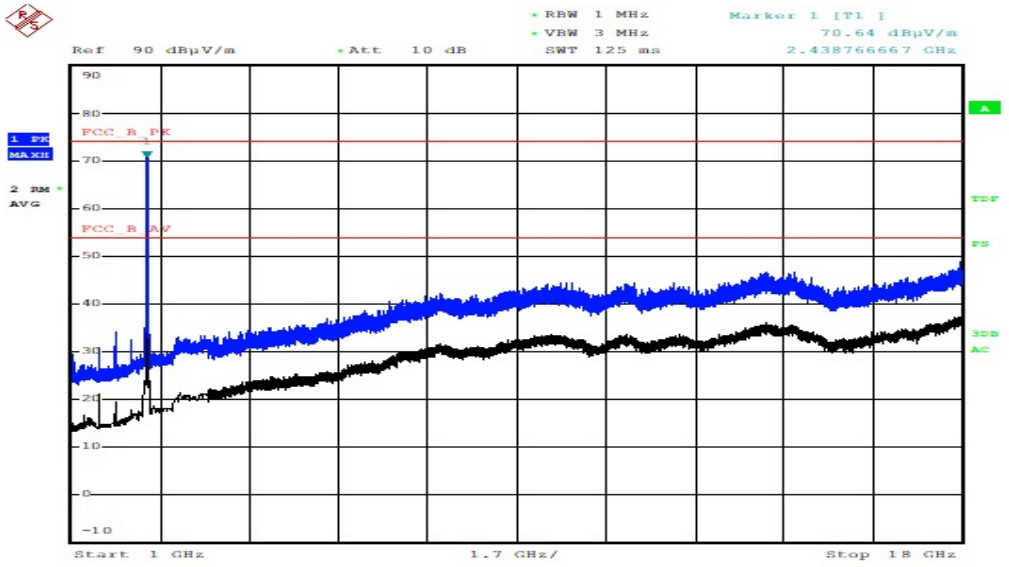
*802.11n40 Mode CH7 Polarity:Horizontal



ESTR-21-00272

Polarity:Vertical



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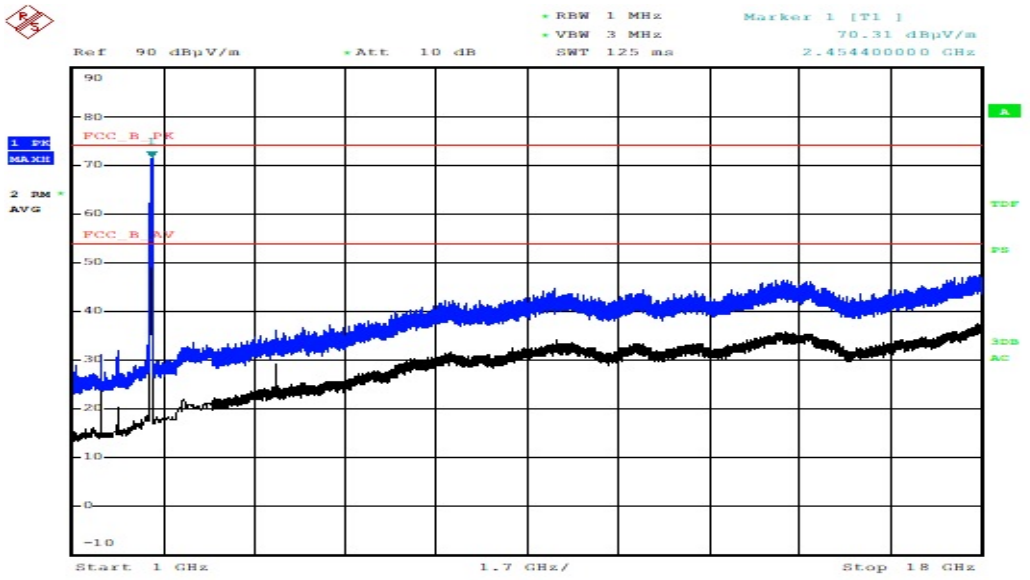
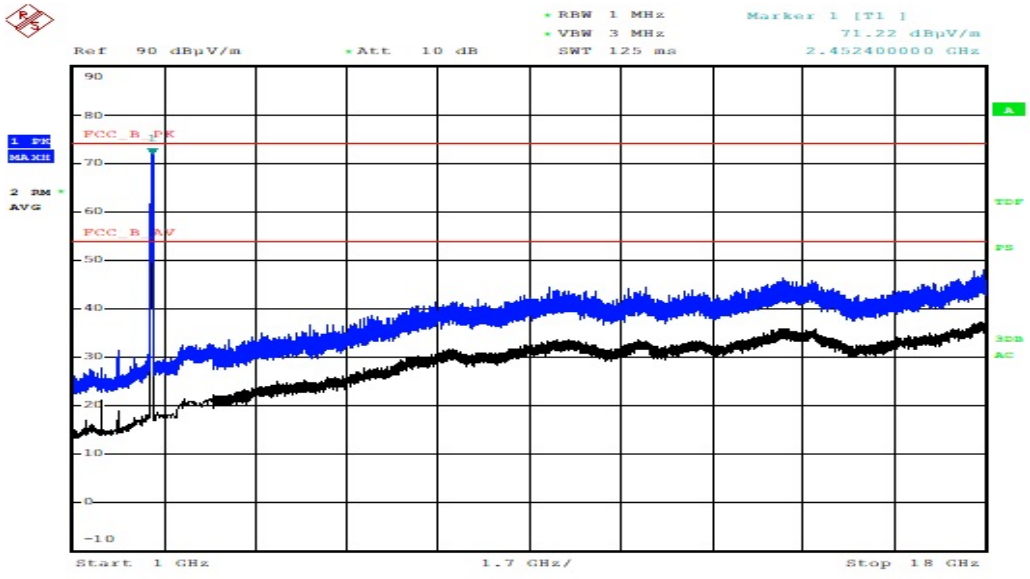
*802.11n40 Mode CH9 Polarity:Horizontal



ESTR-21-00272

Polarity:Vertical



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11. Measurement of conducted disturbance

The continuous disturbance voltage of AC Mains in the frequency from 0.15 MHz to 30 MHz was measured in accordance to FCC PART 15.207. The test setup was made according to ANSI C 63.10 (2009) in a shielded room. The EUT was placed on a non-conductive table at least 0.8 m above the ground plan. A grounded vertical reference plane was positioned in a distance of 0.4 m from the EUT. The distance from the EUT to other metal surfaces was at least 0.8 m. The EUT was only earthen by its power cord through the line impedance stabilizing network. The power cord has been bundled to a length of 1.0 m. The test receiver with Quasi Peak detector complies with CISPR 16.

11.1 Measurement equipments

Equipment Name	Type	Manufacturer	Serial No.	Next Calibration date
TEST RECEIVER	ESPI	Rohde & Schwarz	100005	19-Jul-22
LISN	ESH3-Z5	Rohde & Schwarz	836679/025	19-Jul-22
Pulse Limiter	ESH3Z2	Rohde & Schwarz	NONE	19-Jul-22

11.2 Environmental Condition

Test Place : Shielded Room

Temperature (°C) : 23.5 °C
Humidity (% R.H.) : 44.6 % R.H.

11.3-1 Test Data (802.11 b)

Test Date : 25-Oct-21

Frequency (MHz)	Correction Factor		Line (H/N)	Quasi-peak Value			Average Value		
	Lisn (dB)	Cable (dB)		Limit (dBμV)	Reading (dBμV)	Result (dBμV)	Limit (dBμV)	Reading (dBμV)	Result (dB)
0.15	0.06	0.17	H	66.00	41.55	41.78	56.00	24.28	24.51
0.16	0.06	0.17	H	65.67	42.29	42.52	55.67	25.39	25.62
0.17	0.06	0.17	H	64.77	38.60	38.83	54.77	23.15	23.38
0.19	0.04	0.32	N	63.95	36.74	37.10	53.95	20.94	21.30
0.41	0.04	0.32	H	57.69	29.59	29.95	47.69	23.36	23.72
1.14	0.04	0.46	N	56.00	28.92	29.42	46.00	18.08	18.58
Remark	H : Hot Line, N : Neutral Line *Correction Factor = Lisn + Cable *Result = Correction Factor + Reading								

11.3-2 Test Data (802.11 g)

Test Date : 25-Oct-21

Frequency (MHz)	Correction Factor		Line (H/N)	Quasi-peak Value			Average Value		
	Lisn (dB)	Cable (dB)		Limit (dBμV)	Reading (dBμV)	Result (dBμV)	Limit (dBμV)	Reading (dBμV)	Result (dB)
0.15	0.06	0.17	H	65.84	42.05	42.28	55.84	25.56	25.79
0.16	0.06	0.17	N	65.36	39.30	39.53	55.36	23.25	23.48
0.17	0.04	0.29	H	64.91	38.44	38.78	54.91	22.69	23.03
0.20	0.04	0.32	N	63.82	34.96	35.32	53.82	20.12	20.48
0.42	0.04	0.46	H	57.51	30.57	31.07	47.51	21.01	21.51
1.14	0.05	0.49	N	56.00	28.97	29.51	46.00	18.55	19.09

Remark	H : Hot Line, N : Neutral Line *Correction Factor = Lisn + Cable *Result = Correction Factor + Reading

11.3-3 Test Data (802.11 n20)

Test Date : 25-Oct-21

Frequency (MHz)	Correction Factor		Line (H/N)	Quasi-peak Value			Average Value		
	Lisn (dB)	Cable (dB)		Limit (dBμV)	Reading (dBμV)	Result (dBμV)	Limit (dBμV)	Reading (dBμV)	Result (dB)
0.15	0.06	0.17	N	65.84	42.01	42.24	55.84	24.74	24.97
0.17	0.05	0.18	N	65.06	39.58	39.81	55.06	22.26	22.49
0.42	0.05	0.21	H	57.51	30.33	30.59	47.51	21.03	21.29
1.14	0.04	0.29	N	56.00	28.10	28.44	46.00	17.56	17.90
1.15	0.04	0.32	H	56.00	29.34	29.70	46.00	18.74	19.10
20.38	0.04	0.41	H	60.00	28.04	28.49	50.00	27.85	28.30

Remark	H : Hot Line, N : Neutral Line *Correction Factor = Lisn + Cable *Result = Correction Factor + Reading

11.3-4 Test Data (802.11 n40)

Test Date : 25-Oct-21

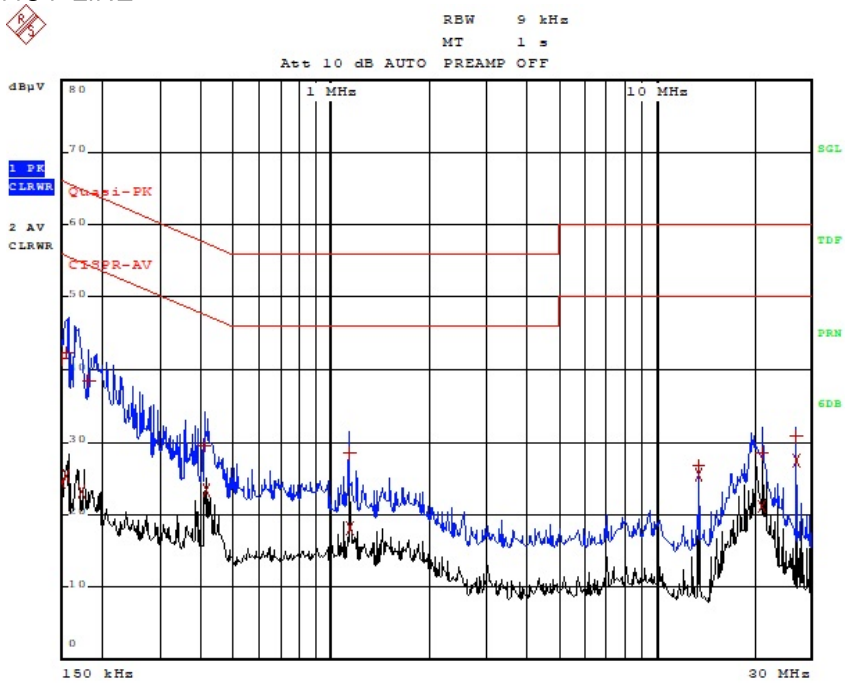
Frequency (MHz)	Correction Factor		Line (H/N)	Quasi-peak Value			Average Value		
	Lisn (dB)	Cable (dB)		Limit (dBμV)	Reading (dBμV)	Result (dBμV)	Limit (dBμV)	Reading (dBμV)	Result (dB)
0.15	0.06	0.17	H	65.84	41.98	42.21	55.84	24.89	25.12
0.17	0.05	0.18	N	64.77	37.43	37.66	54.77	23.10	23.33
0.18	0.05	0.21	H	64.63	38.60	38.86	54.63	22.78	23.04
0.41	0.04	0.29	H	57.63	30.87	31.21	47.63	23.37	23.71
13.50	0.04	0.32	H	60.00	29.27	29.63	50.00	26.88	27.24
21.22	0.04	0.41	H	60.00	30.68	31.13	50.00	27.47	27.92

Remark	H : Hot Line, N : Neutral Line *Correction Factor = Lisn + Cable *Result = Correction Factor + Reading

Appendix 1. Special diagram (802.11 b)

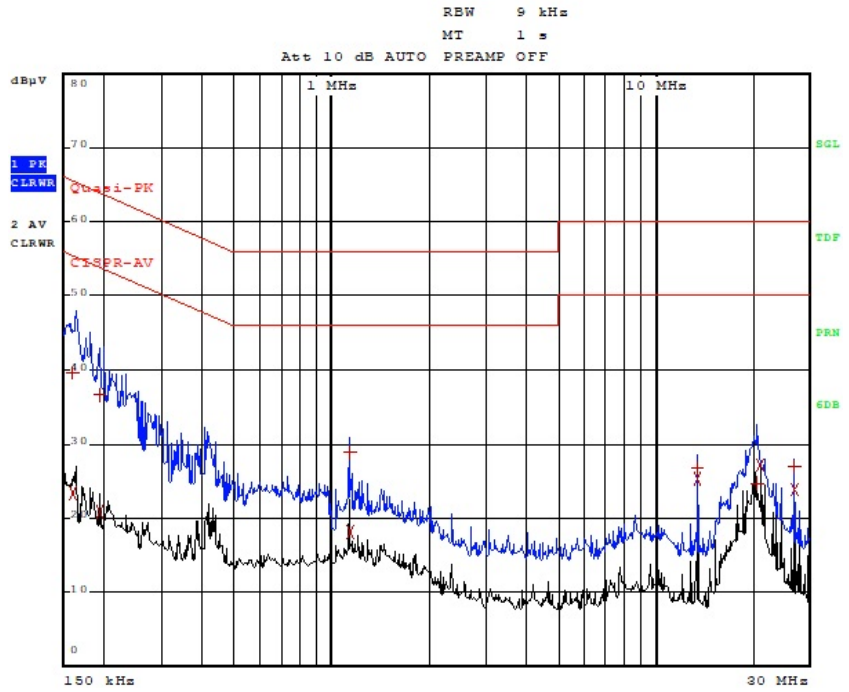
*CONDUCTED EMISSION-N/A

* HOT LINE



Comment: ESTR-21-00272

* NEUTRAL LINE

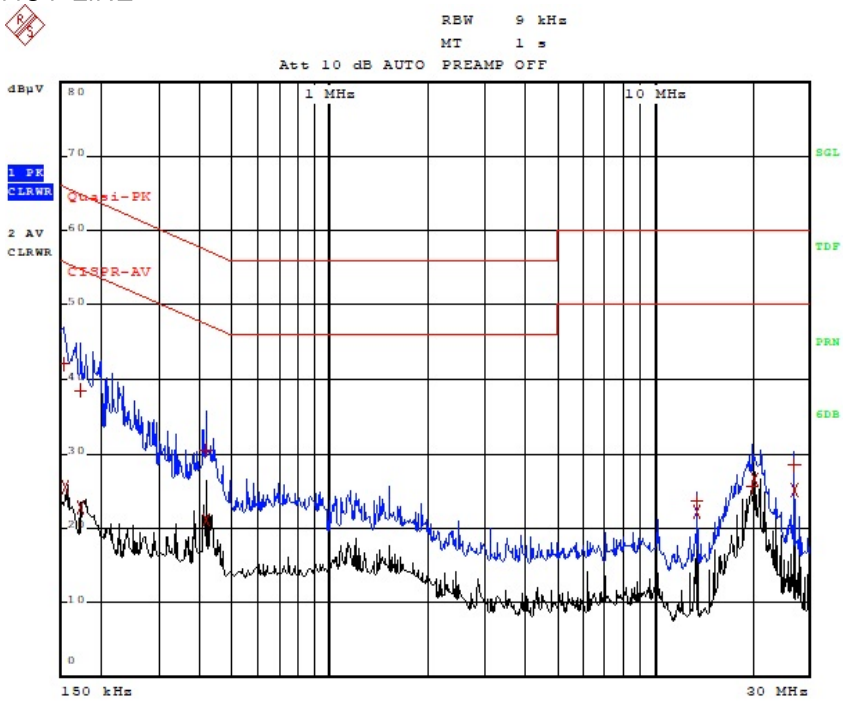


Comment: ESTR-21-00272

Appendix 1. Special diagram (802.11 g)

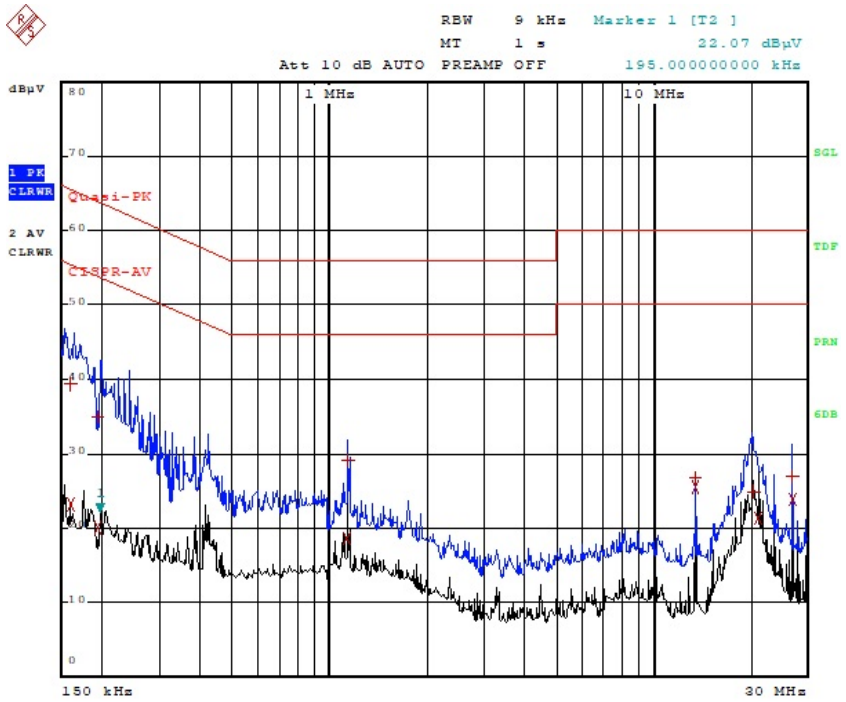
*CONDUCTED EMISSION-N/A

* HOT LINE



Comment: ESTR-21-00272

* NEUTRAL LINE

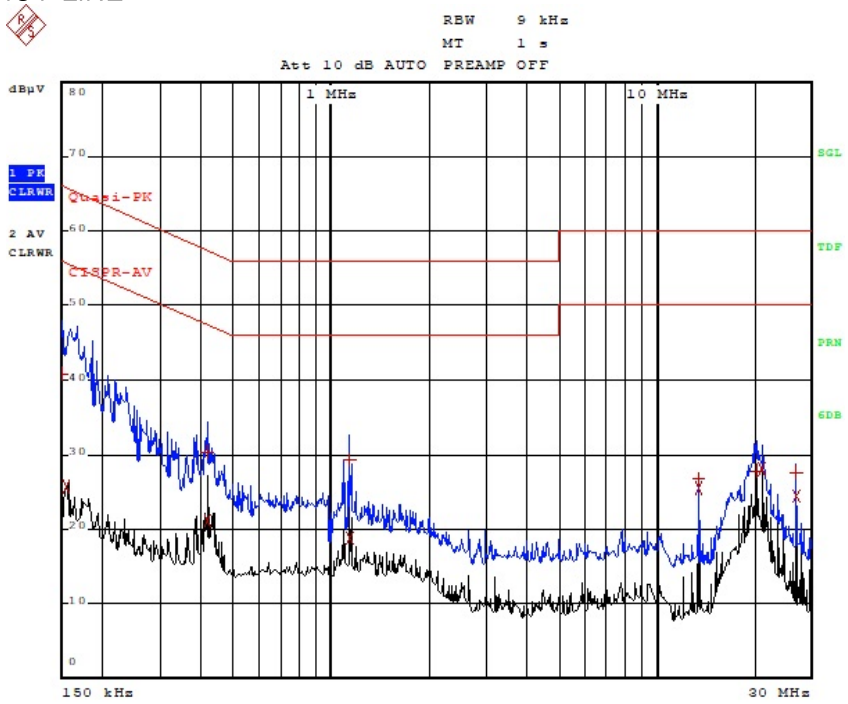


Comment: ESTR-21-00272

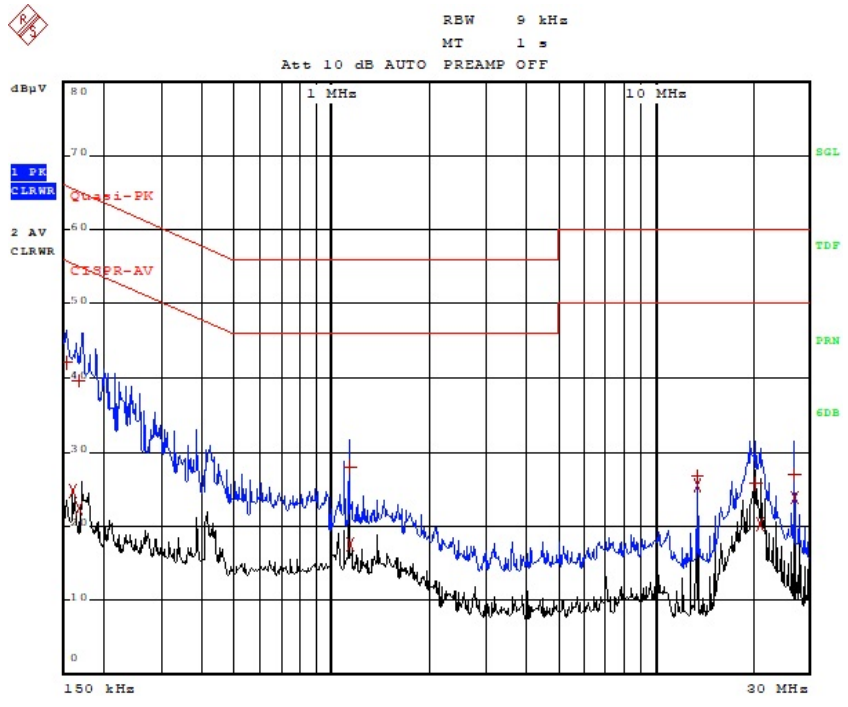
Appendix 1. Special diagram (802.11 n20)

*CONDUCTED EMISSION-N/A

* HOT LINE



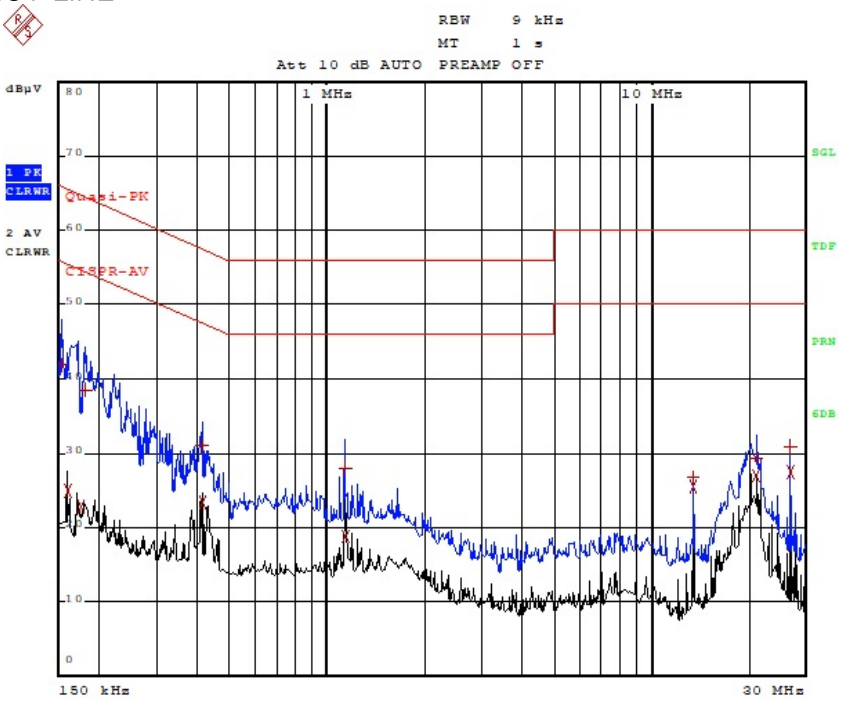
* NEUTRAL LINE



Appendix 1. Special diagram (802.11 n40)

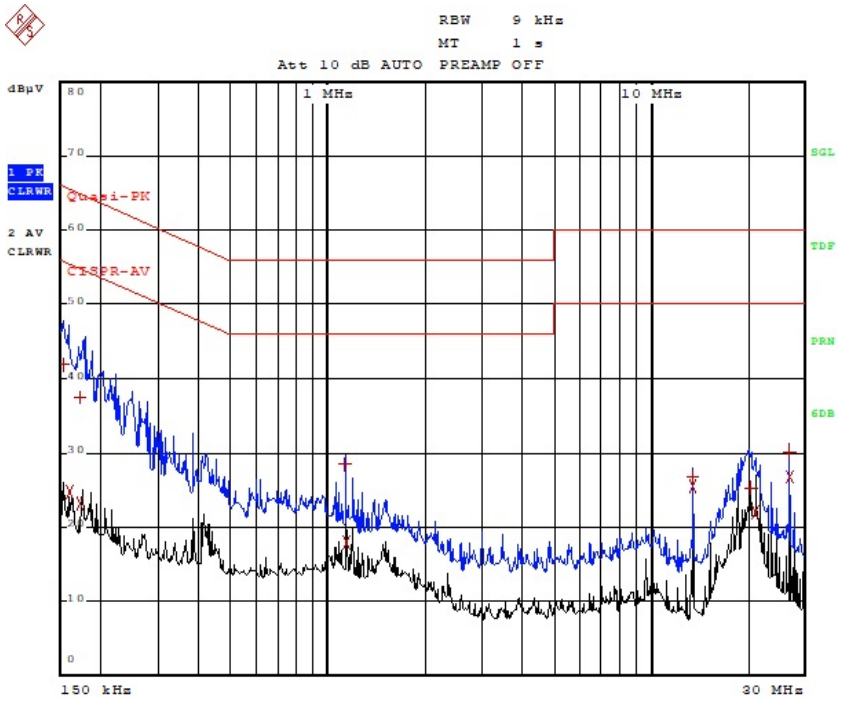
*CONDUCTED EMISSION-N/A

* HOT LINE



Comment: ESTR-21-00272

* NEUTRAL LINE



Comment: ESTR-21-00272

Appendix 2. Antenna information

1. Antenna information

antenna type : Intergrated SMD Antenna.
antenna location : Integnal
antenna gain : 6.657 dBi
No temporary RF connector provided