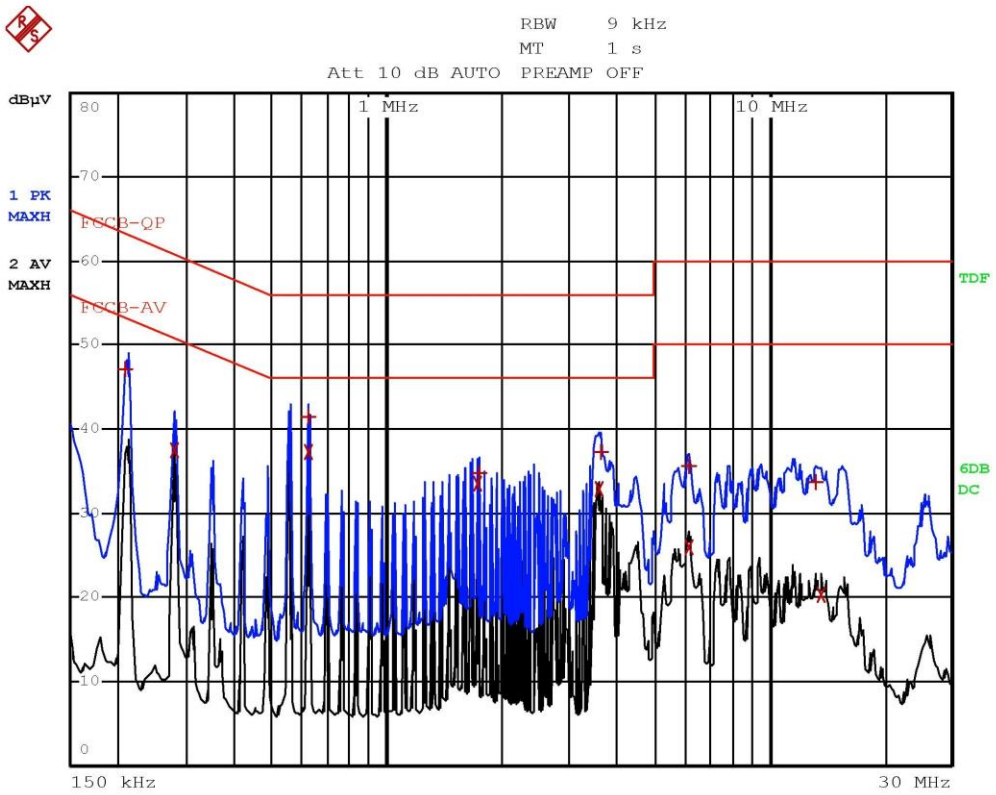


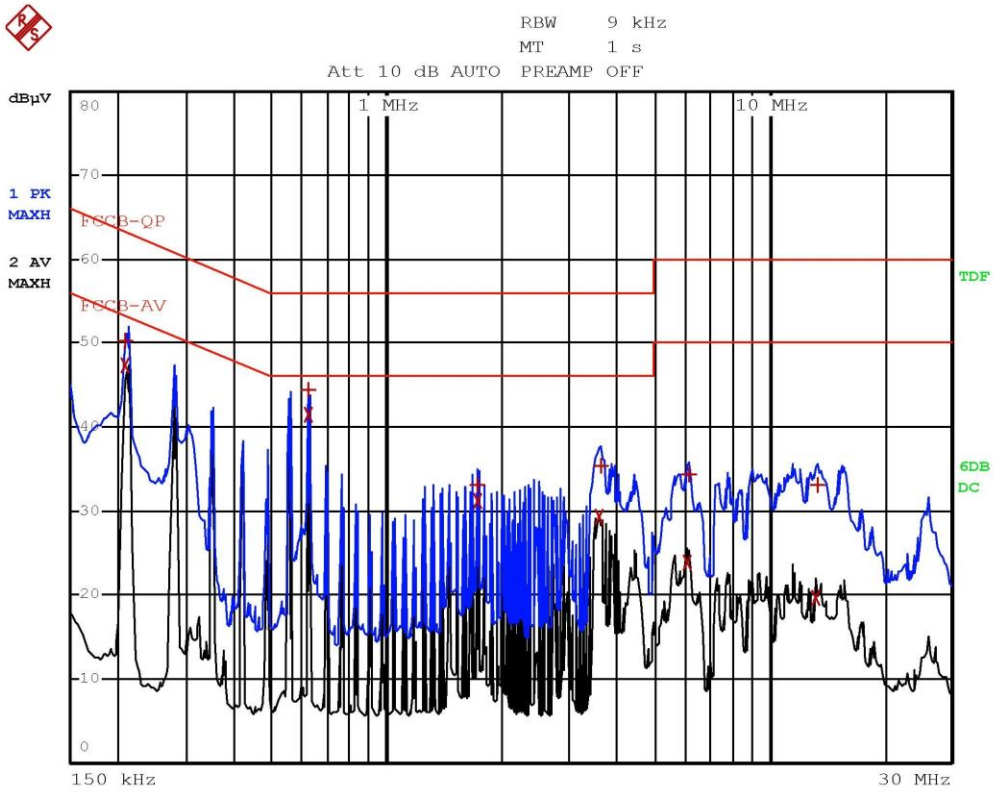
De Rosso 21184024N Line N mod N ch1

EDIT PEAK LIST (Final Measurement Results)

Trace1:	FCCB-QP
Trace2:	FCCB-AV
Trace3:	---

	TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
1	Quasi Peak	210 kHz	47.24	-15.96
2	Average	278 kHz	37.43	-13.43
1	Quasi Peak	626 kHz	41.53	-14.46
2	Average	626 kHz	37.34	-8.65
2	Average	1.738 MHz	33.48	-12.51
1	Quasi Peak	1.742 MHz	34.72	-21.27
2	Average	3.614 MHz	32.82	-13.17
1	Quasi Peak	3.622 MHz	37.23	-18.76
1	Quasi Peak	6.178 MHz	35.60	-24.39
2	Average	6.19 MHz	25.95	-24.05
1	Quasi Peak	13.294 MHz	33.62	-26.37
2	Average	13.686 MHz	20.16	-29.83

De Rosso 21184024_2N Line N mod N ch1



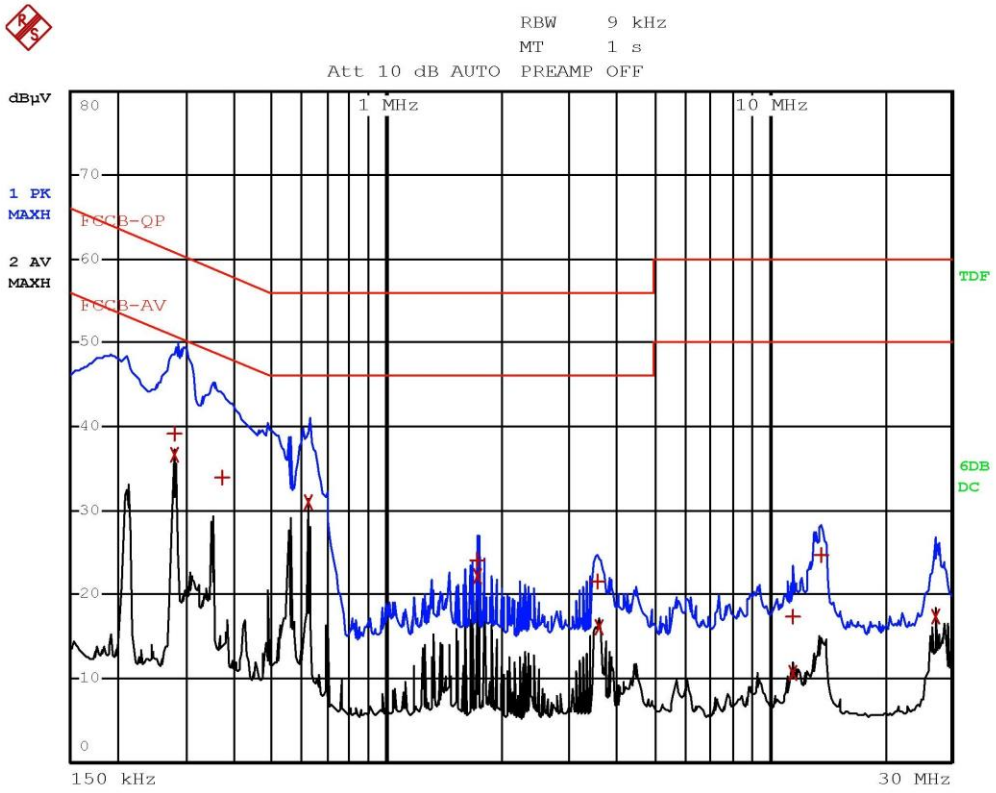
De Rosso 21184025N Line L mod N ch1

EDIT PEAK LIST (Final Measurement Results)

Trace1:	FCCB-QP
Trace2:	FCCB-AV
Trace3:	---

	TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
1	Quasi Peak	210 kHz	50.25	-12.95
2	Average	210 kHz	47.27	-5.92
1	Quasi Peak	626 kHz	44.45	-11.54
2	Average	626 kHz	41.48	-4.51
1	Quasi Peak	1.738 MHz	33.15	-22.84
2	Average	1.738 MHz	31.17	-14.82
2	Average	3.618 MHz	29.34	-16.65
1	Quasi Peak	3.622 MHz	35.29	-20.70
2	Average	6.114 MHz	23.85	-26.14
1	Quasi Peak	6.178 MHz	34.30	-25.69
2	Average	13.278 MHz	19.68	-30.31
1	Quasi Peak	13.39 MHz	33.03	-26.96

De Rosso 21184025_2N Line L mod N ch1



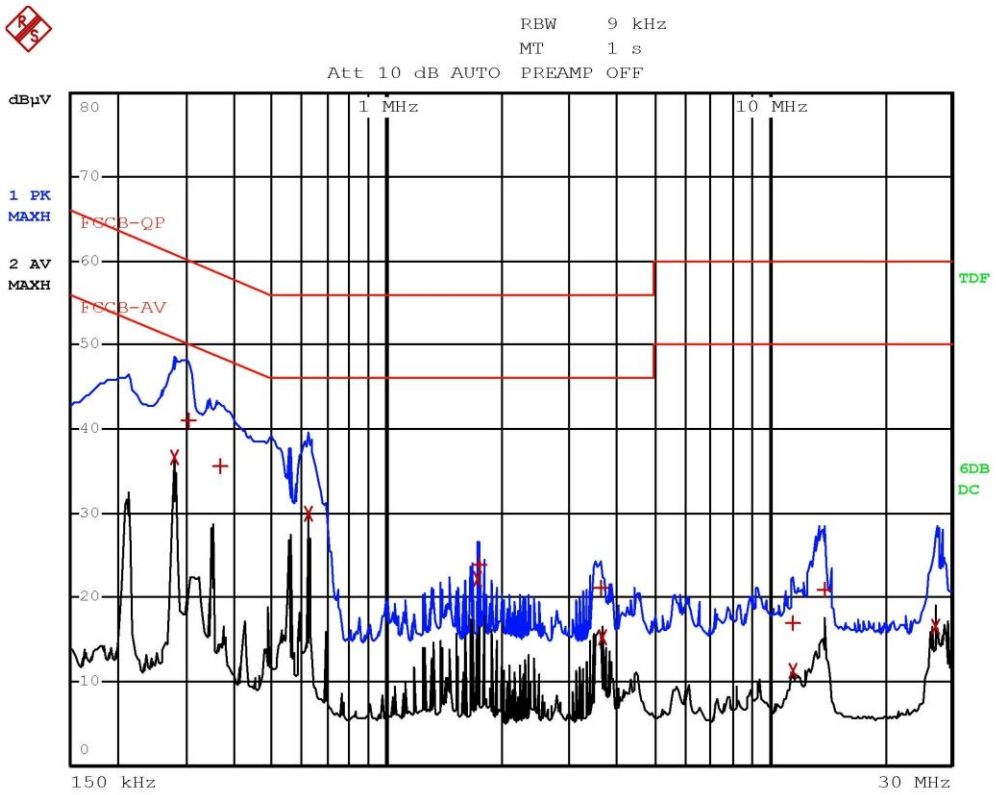
De Rosso 21184026N Line N mod N ch1

EDIT PEAK LIST (Final Measurement Results)

Trace1:	FCCB-QP
Trace2:	FCCB-AV
Trace3:	---

TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
2 Average	278 kHz	36.70	-14.16
1 Quasi Peak	282 kHz	39.22	-21.53
1 Quasi Peak	370 kHz	33.87	-24.62
2 Average	626 kHz	30.95	-15.04
1 Quasi Peak	1.738 MHz	24.04	-31.95
2 Average	1.738 MHz	22.17	-23.82
1 Quasi Peak	3.546 MHz	21.46	-34.53
2 Average	3.614 MHz	15.96	-30.03
2 Average	11.594 MHz	10.53	-39.46
1 Quasi Peak	11.598 MHz	17.32	-42.67
1 Quasi Peak	13.674 MHz	24.75	-35.24
2 Average	27.158 MHz	17.35	-32.64

De Rosso 21184026_2N Line N mod N ch1



De Rosso 21184027N Line L mod N ch1

EDIT PEAK LIST (Final Measurement Results)

Trace1:	FCCB-QP
Trace2:	FCCB-AV
Trace3:	---

TRACE		FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
2	Average	278 kHz	36.67	-14.20
1	Quasi Peak	302 kHz	41.01	-19.17
1	Quasi Peak	366 kHz	35.58	-23.00
2	Average	626 kHz	29.89	-16.10
2	Average	1.738 MHz	22.13	-23.86
1	Quasi Peak	1.742 MHz	23.82	-32.17
1	Quasi Peak	3.626 MHz	21.01	-34.98
2	Average	3.682 MHz	15.27	-30.72
2	Average	11.53 MHz	11.29	-38.70
1	Quasi Peak	11.534 MHz	16.91	-43.09
1	Quasi Peak	13.934 MHz	20.88	-39.11
2	Average	27.158 MHz	16.54	-33.45

De Rosso 21184027_2N Line L mod N ch1

9.3 Emissions in restricted frequency bands and in unrestricted frequency bands

Tested by ..... :	F. De Rosso	
Test date ..... :	03.08.2021	
Test location (stand) ..... :	Semi-anechoic chamber (CMC A070)	
Reference standards ..... :	FCC Rules and Regulation; Titles 47 Part. 15.209 ANSI C63.10 cl. 6.3, 6.4, 6.5 and 6.6	
Test set-up description ..... :	☒	Table top equipment set-up (80 cm above the reference ground plane)
	☐	Floor standing equipment set-up (insulating material up to 12 mm thick)
	☐	False floor installation equipment set-up (insulating material up to 34 cm above the reference ground plane)
Supplementary test set-up description ..... :	--	
Test method applied ..... :	SAC with measurement distance [m]: 10	
Supplementary information..... :	--	

Acceptance limits

Acceptance limits for emissions in restricted frequency bands (f < 1000 MHz)		
Frequency range (MHz)	*Test distance (m)*	*Limits [dB(µV/m)]*
0,009 to 0,490	300	48,5 to 13,8
0,490 to 1,705	30	33,8 to 22,9
1,705 to 30	30	29,5
30 to 88	3	40
88 to 216	3	43,5
216 to 960	3	46,0
960 to 1000	3	54

Remarks: 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 and 110–490 kHz. Radiated emission limits in these two bands are based on measurements employing an average detector. The results have been extrapolated to the specified distance using an extrapolation factor

Acceptance limits for emissions in restricted frequency bands (f ≥ 1000 MHz)			
Frequency (MHz)	*Test distance (m)*	*AV limits [dB(µV/m)]*	*Peak limits [dB(µV/m)]*
> 1000	3	54	74

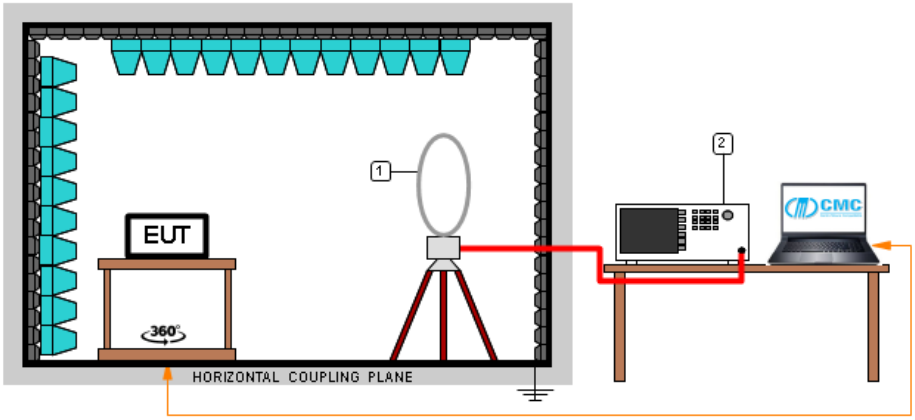
The restricted frequency bands are listed in the following table

MHz	***MHz***	***MHz***	***GHz***
0,090 – 0,110	16,42 – 16,423	399,9 – 410	4,5 – 5,15
0,495 – 0,505	16,69475 – 16,69525	608 – 614	5,35 – 5,46
2,1735 – 2,1905	16,80425 – 16,80475	960 – 1240	7,25 – 7,75
4,125 – 4,128	25,5 – 25,67	1300 – 1427	8,025 – 8,5
4,17725 – 4,17775	37,5 – 38,25	1435 – 1626,5	9,0 – 9,2
4,20725 – 4,20775	73 – 74,6	1645,5 – 1646,5	9,3 – 9,5
6,215 – 6,218	74,8 – 75,2	1660 – 1710	10,6 – 12,7
6,26775 – 6,26825	108 – 121,94	1718,8 – 1722,2	13,25 – 13,4
6,31175 – 6,31225	123 – 138	2200 – 2300	14,47 – 14,5
8,291 – 8,294	149,9 – 150,05	2310 – 2390	15,35 – 16,2
8,362 – 8,366	156,52475 – 156,52525	2483,5 – 2500	17,7 – 21,4
8,37625 – 8,38675	156,7 – 156,9	2690 – 2900	22,01 – 23,12
8,41425 – 8,41475	162,0125 – 167,17	3260 – 3267	23,6 – 24,0
12,29 – 12,293	167,72 – 173,2	3332 – 3339	31,2 – 31,8
12,51975 – 12,52025	240 – 285	3345,8 – 3358	36,43 – 36,5
12,57675 – 12,57725	322 – 335,4	3600 – 4400	Above 38,6
13,36 – 13,41			

Acceptance limits for emissions in non-restricted frequency bands (according to ANSI C63.10 cl. 11.11.1)
The DTS rules specify that in any 100 kHz bandwidth outside of the authorized frequency band, the power shall be attenuated according to the following conditions: a) If the maximum peak conducted output power procedure was used to demonstrate compliance as described in 9.1, then the peak output power measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz b) If maximum conducted (average) output power was used to demonstrate compliance as described in 9.2, then the peak power in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum in-band peak PSD level in 100 kHz. c) In either case, attenuation to levels below the 15.209 general radiated emissions limits is not required

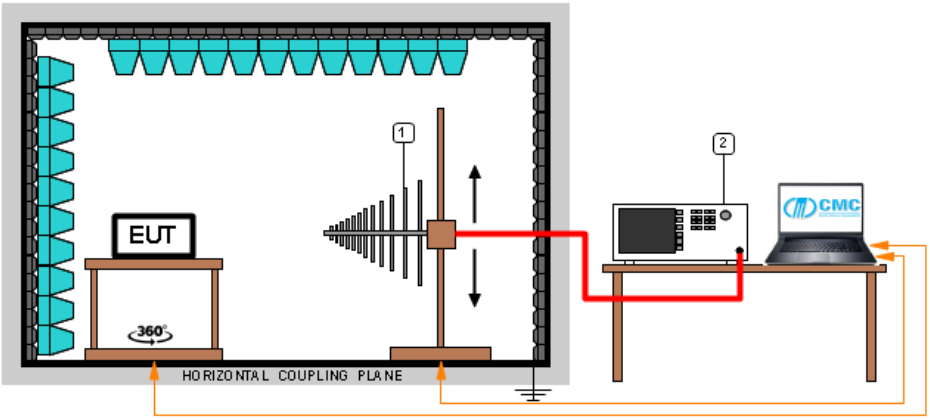
Test setup

Frequency ≤ 30 MHz



Test setup PE004_01				
Nr.	*Id. Number*	*Manufacturer*	*Model*	*Description*
2	CMC S353	Rohde & Schwarz	ESW26	EMI Test Receiver 1 Hz - 26.5 GHz
1	CMC S127	Schaffner	HLA6120	Loop Antenna 9kHz - 30MHz

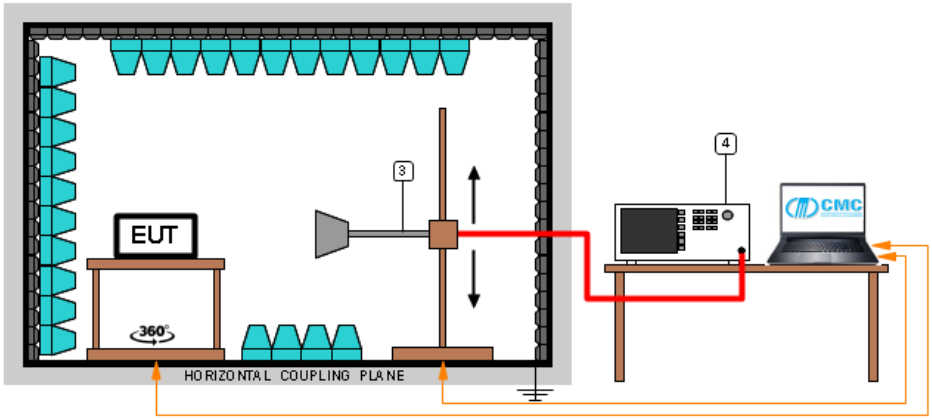
Frequency ≤ 1 GHz



Test setup PE004_02				
Nr.	*Id. Number*	*Manufacturer*	*Model*	*Description*
2	CMC S353	Rohde & Schwarz	ESW26	EMI Test Receiver 1 Hz - 26.5 GHz
1	CMC S271	Schwarzbeck	BBA 9106 + VHBB 9124	Broadband Antenna

Test setup PE004_03				
Nr.	*Id. Number*	*Manufacturer*	*Model*	*Description*
2	CMC S353	Rohde & Schwarz	ESW26	EMI Test Receiver 1 Hz - 26.5 GHz
1	CMC S287	Schwarzbeck	VUSLP 9111B	Broadband Antenna

Frequency > 1 GHz



Test setup PE004_04				
Nr.	*Id. Number*	*Manufacturer*	*Model*	*Description*
4	CMC S353	Rohde & Schwarz	ESW26	EMI Test Receiver 1 Hz - 26.5 GHz
3	CMC S108	Emco	3115	Waveguide antenna

Test setup PE004_05				
Nr.	*Id. Number*	*Manufacturer*	*Model*	*Description*
4	CMC S353	Rohde & Schwarz	ESW26	EMI Test Receiver 1 Hz - 26.5 GHz
3	CMC S290	Schwarzbeck	BBHA 9170	Horn Antenna (15-40 GHz)

Result – WiFi mode B

Transmission frequency (MHz)	*Polarization*	*Frequency Range (MHz)*	*Graphs*	*Result*
Worst case	Loop	0,009 – 30	G21184001B	P
Worst case	H	30 – 300	G21184002B	P
Worst case	V	30 – 300	G21184003B	P
Worst case	H	300 – 1000	G21184004B	P
Worst case	V	300 – 1000	G21184005B	P
2412	H	1000 – 3000	G21184006B	P
2412	V	1000 – 3000	G21184007B	P
2412	H	3000 – 18000	G21184008B	P
2412	V	3000 – 18000	G21184009B	P
2412	H	18000 – 26000	G21184010B	P
2412	V	18000 – 26000	G21184011B	P
2442	H	1000 – 3000	G21184012B	P
2442	V	1000 – 3000	G21184013B	P
2442	H	3000 – 18000	G21184014B	P
2442	V	3000 – 18000	G21184015B	P
2442	H	18000 – 26000	G21184016B	P
2442	V	18000 – 26000	G21184017B	P
2462	H	1000 – 3000	G21184018B	P
2462	V	1000 – 3000	G21184019B	P
2462	H	3000 – 18000	G21184020B	P
2462	V	3000 – 18000	G21184021B	P
2462	H	18000 – 26000	G21184022B	P
2462	V	18000 – 26000	G21184023B	P

Remarks: EUT was tested in 3 orthogonal planes, graphs are related to the highest detected levels.
Measurements at frequencies lower than 30 MHz have been performed with an EUT – antenna distance of 10 m. Measured values have been corrected with conversion factor 40log(test distance/10) based on the measuring distance provided by the standard.
Measurements at frequencies higher than 30 MHz and lower than 1000 MHz have been performed with an EUT – antenna distance of 10 m. Measured values have been corrected with conversion factor 20log(test distance/10) based on the measuring distance provided by the standard.
Peaks above the limits are caused by the nominal transmitting frequencies

Graphs Legend
PK: Peak; QP [1s] (quasi-peak at 1 second) values are marked with a +
AV: Average; AV [1s] (average at 1 second) values are marked with a X

Result – WiFi mode G

Transmission frequency (MHz)	*Polarization*	*Frequency Range (MHz)*	*Graphs*	*Result*
Worst case	Loop	0,009 – 30	G21184001G	P
Worst case	H	30 – 300	G21184002G	P
Worst case	V	30 – 300	G21184003G	P
Worst case	H	300 – 1000	G21184004G	P
Worst case	V	300 – 1000	G21184005G	P
2412	H	1000 – 3000	G21184006G	P
2412	V	1000 – 3000	G21184007G	P
2412	H	3000 – 18000	G21184008G	P
2412	V	3000 – 18000	G21184009G	P
2412	H	18000 – 26000	G21184010G	P
2412	V	18000 – 26000	G21184011G	P
2442	H	1000 – 3000	G21184012G	P
2442	V	1000 – 3000	G21184013G	P
2442	H	3000 – 18000	G21184014G	P
2442	V	3000 – 18000	G21184015G	P
2442	H	18000 – 26000	G21184016G	P
2442	V	18000 – 26000	G21184017G	P
2462	H	1000 – 3000	G21184018G	P
2462	V	1000 – 3000	G21184019G	P
2462	H	3000 – 18000	G21184020G	P
2462	V	3000 – 18000	G21184021G	P
2462	H	18000 – 26000	G21184022G	P
2462	V	18000 – 26000	G21184023G	P

Remarks: EUT was tested in 3 orthogonal planes, graphs are related to the highest detected levels.
Measurements at frequencies lower than 30 MHz have been performed with an EUT – antenna distance of 10 m. Measured values have been corrected with conversion factor 40log(test distance/10) based on the measuring distance provided by the standard.
Measurements at frequencies higher than 30 MHz and lower than 1000 MHz have been performed with an EUT – antenna distance of 10 m. Measured values have been corrected with conversion factor 20log(test distance/10) based on the measuring distance provided by the standard.
Peaks above the limits are caused by the nominal transmitting frequencies

Graphs Legend
PK: Peak; QP [1s] (quasi-peak at 1 second) values are marked with a +
AV: Average; AV [1s] (average at 1 second) values are marked with a X

Result – WiFi mode N

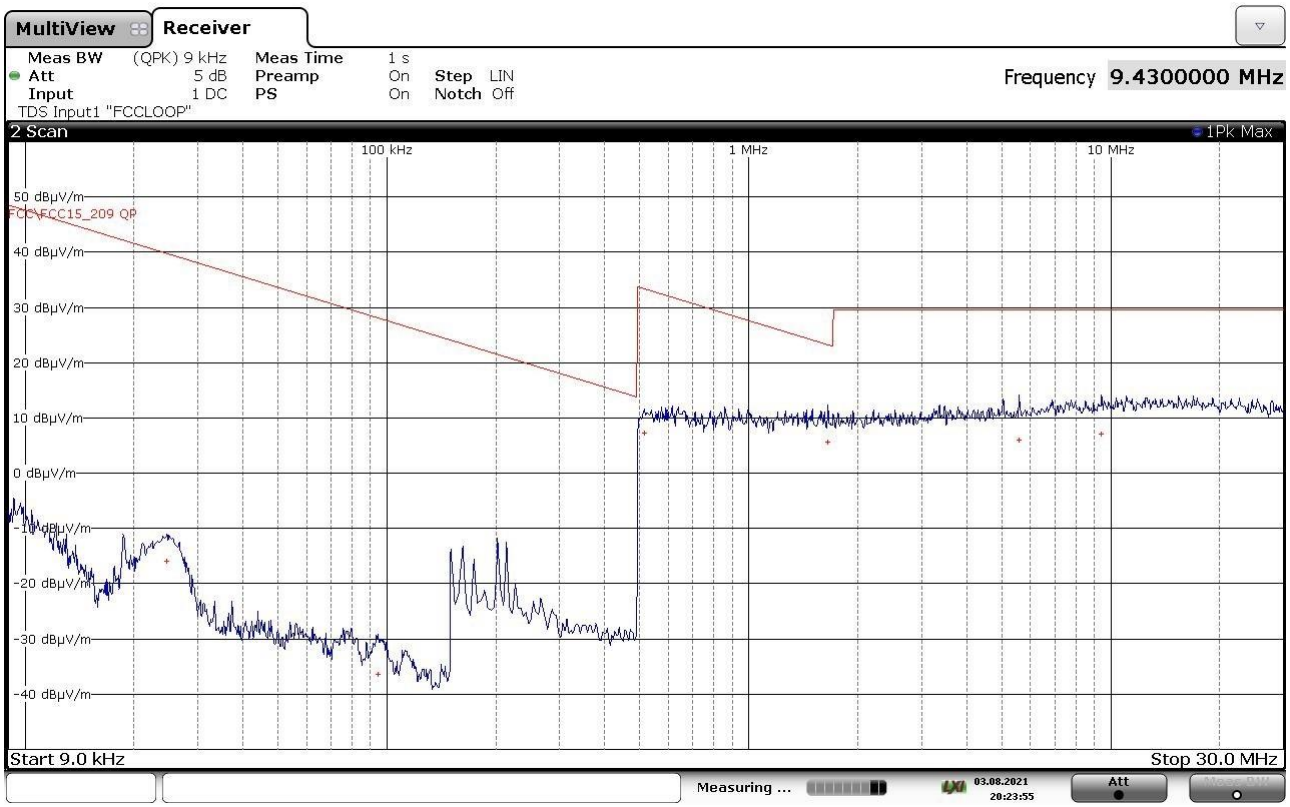
Transmission frequency (MHz)	*Polarization*	*Frequency Range (MHz)*	*Graphs*	*Result*
Worst case	Loop	0,009 – 30	G21184001N	P
Worst case	H	30 – 300	G21184002N	P
Worst case	V	30 – 300	G21184003N	P
Worst case	H	300 – 1000	G21184004N	P
Worst case	V	300 – 1000	G21184005N	P
2412	H	1000 – 3000	G21184006N	P
2412	V	1000 – 3000	G21184007N	P
2412	H	3000 – 18000	G21184008N	P
2412	V	3000 – 18000	G21184009N	P
2412	H	18000 – 26000	G21184010N	P
2412	V	18000 – 26000	G21184011N	P
2442	H	1000 – 3000	G21184012N	P
2442	V	1000 – 3000	G21184013N	P
2442	H	3000 – 18000	G21184014N	P
2442	V	3000 – 18000	G21184015N	P
2442	H	18000 – 26000	G21184016N	P
2442	V	18000 – 26000	G21184017N	P
2462	H	1000 – 3000	G21184018N	P
2462	V	1000 – 3000	G21184019N	P
2462	H	3000 – 18000	G21184020N	P
2462	V	3000 – 18000	G21184021N	P
2462	H	18000 – 26000	G21184022N	P
2462	V	18000 – 26000	G21184023N	P

Remarks: EUT was tested in 3 orthogonal planes, graphs are related to the highest detected levels.
Measurements at frequencies lower than 30 MHz have been performed with an EUT – antenna distance of 10 m. Measured values have been corrected with conversion factor 40log(test distance/10) based on the measuring distance provided by the standard.
Measurements at frequencies higher than 30 MHz and lower than 1000 MHz have been performed with an EUT – antenna distance of 10 m. Measured values have been corrected with conversion factor 20log(test distance/10) based on the measuring distance provided by the standard.
Peaks above the limits are caused by the nominal transmitting frequencies

Graphs Legend
PK: Peak; QP [1s] (quasi-peak at 1 second) values are marked with a +
AV: Average; AV [1s] (average at 1 second) values are marked with a X

Graphs

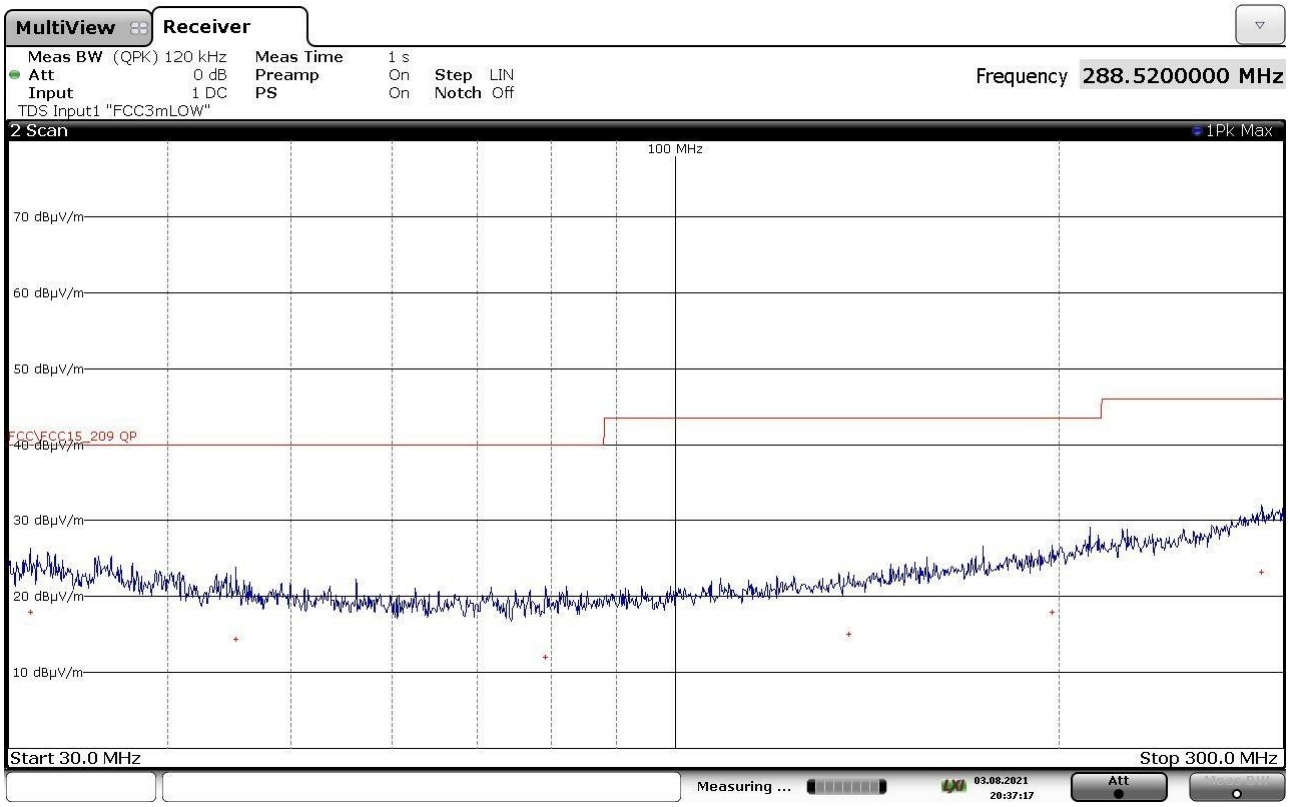
De Rosso 21184001B LOOP 10m wc mod B



FINAL RESULT TABLE		
QUASI PEAK		
Freq Hz	Lev dBuV/m	Margin dB
24680	-15,92	-55,68
94280	-36,41	-64,53
514000	+7,33	-26,05
1654000	+5,63	-17,60
5574000	+5,97	-23,57
9430000	+7,12	-22,42

21184001_2

De Rosso 21184002B horiz 10m wc mod B



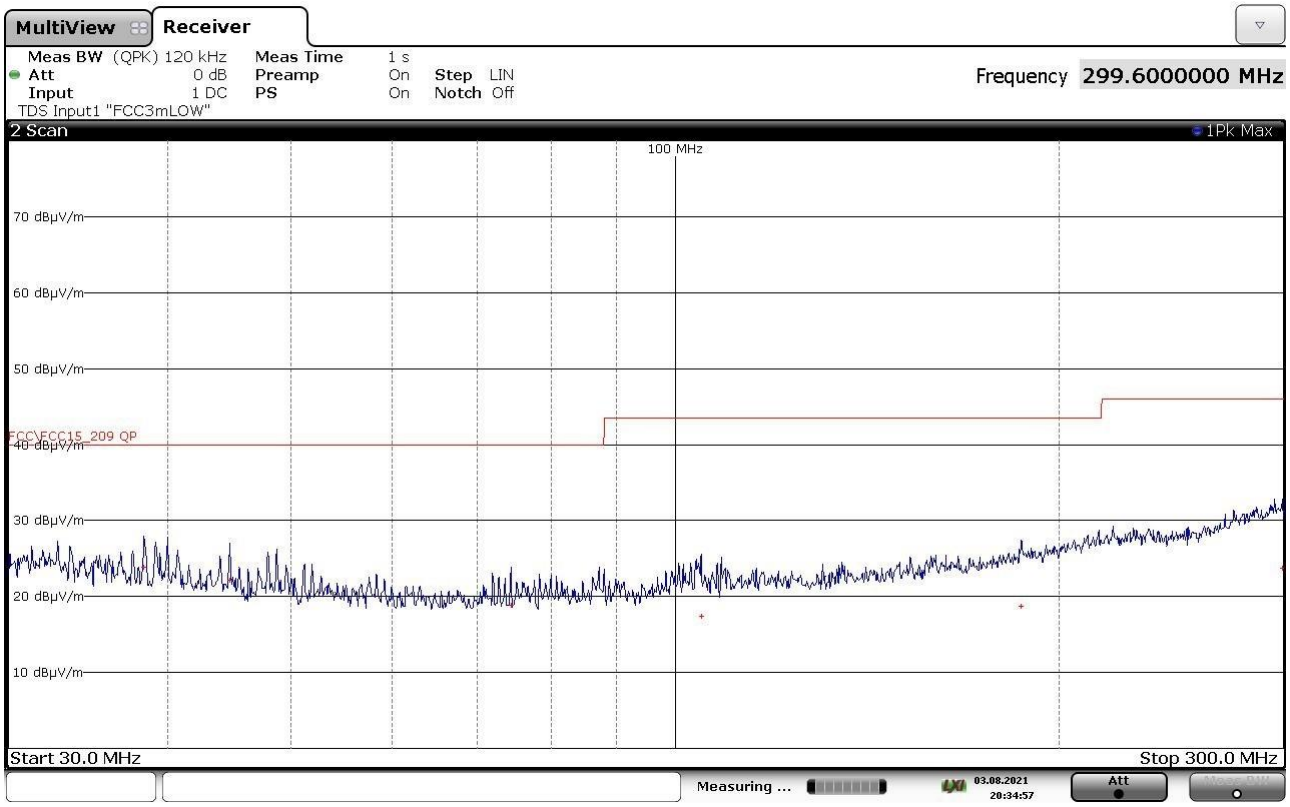
FINAL RESULT TABLE

QUASI PEAK

Freq Hz	Lev dBuV/m	Margin dB
31200000	+17,90	-22,10
45240000	+14,42	-25,58
79120000	+11,97	-28,03
136800000	+15,00	-28,52
197560000	+17,99	-25,53
288520000	+23,22	-22,80

21184002_2

De Rosso 21184003B vert 10m wc mod B



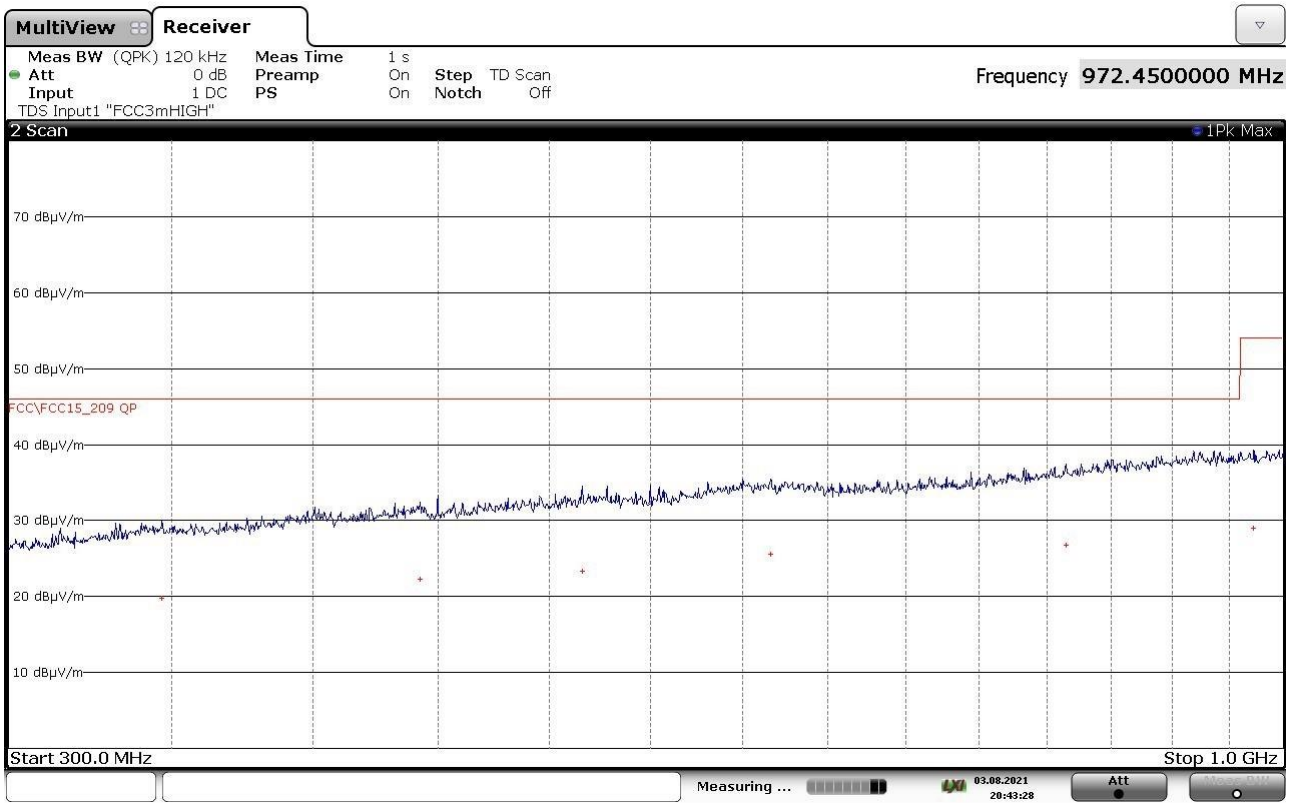
FINAL RESULT TABLE

QUASI PEAK

Freq Hz	Lev dBuV/m	Margin dB
38320000	+23,89	-16,11
44760000	+22,14	-17,86
74360000	+18,85	-21,15
104800000	+17,39	-26,13
186920000	+18,74	-24,78
299600000	+23,76	-22,26

21184003_2

De Rosso 21184004B horiz 10m wc mod B



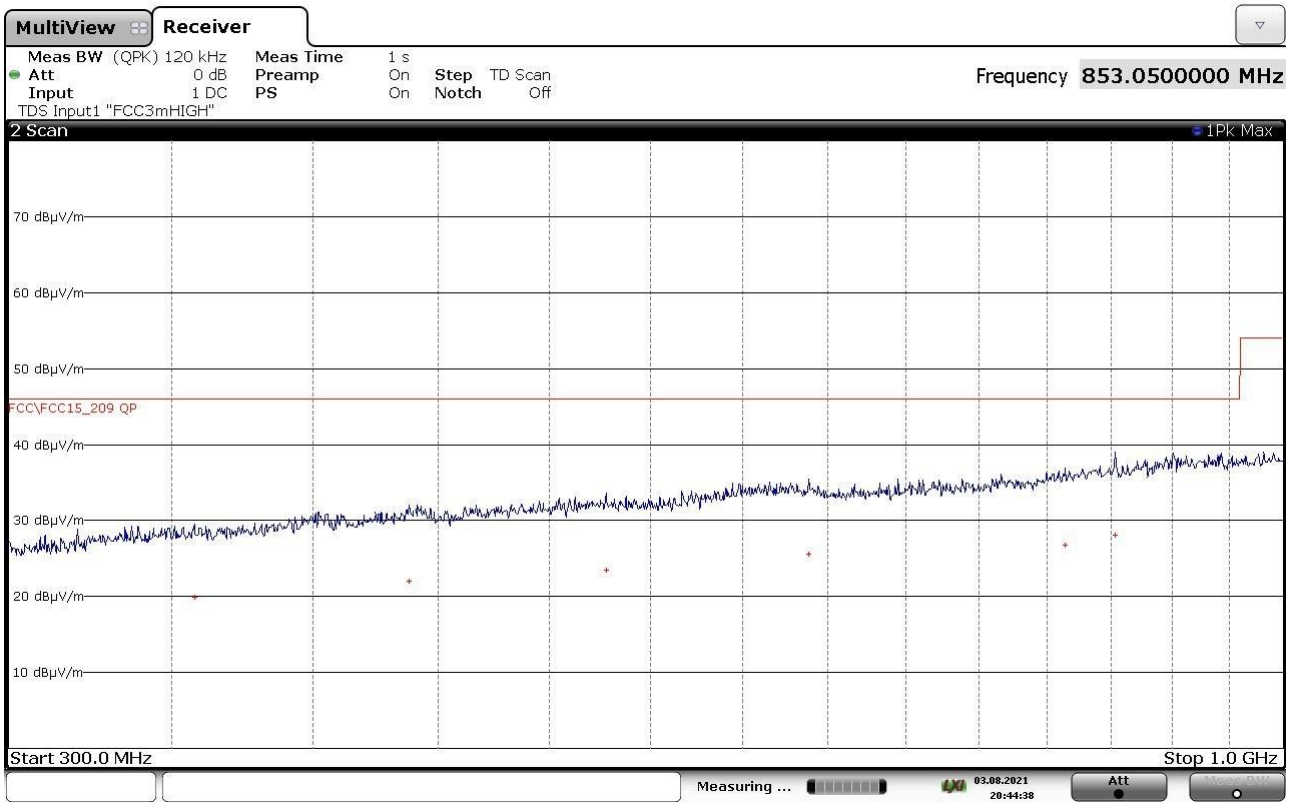
FINAL RESULT TABLE

QUASI PEAK

Freq Hz	Lev dBuV/m	Margin dB
346830000	+19,76	-26,26
442590000	+22,22	-23,80
515670000	+23,34	-22,68
616410000	+25,60	-20,42
814230000	+26,70	-19,32
972450000	+28,93	-25,05

21184004_2

De Rosso 21184005B vert 10m wc mod B



FINAL RESULT TABLE

QUASI PEAK

Freq Hz	Lev dBuV/m	Margin dB
357660000	+19,88	-26,14
437970000	+22,02	-24,00
527520000	+23,41	-22,61
638790000	+25,53	-20,49
813690000	+26,70	-19,32
853050000	+28,11	-17,91

21184005_2