

**TEST REPORT**
Nr. R20168501**Federal Communication Commission (FCC)**

Report Reference No.	R20168501
Date of issue:	23.12.2020
Total number pages:	178
Applicant's name	Texa S.p.A.
Address	Via 1° Maggio, 9 – 31050 Monastier di Treviso (TV) – Italy
Test specification:	
Standards	FCC Rules & Regulations, Title 47:2019 Part 15 paragraph(s): 203, 204, 205, 207, 209, 215 and 247
Non-standard test method	N/A
Test Report Form No.	15-247_DTSCMC
Test Report Form(s) Originator ..	CMC Centro Misure Compatibilità S.r.l.
Master TRF	2020-10
General disclaimer:	
The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of CMC Centro Misure Compatibilità S.r.l.	
Test item description	Vehicle communication interface
Trademark	Texa
Manufacturer	Texa S.p.A.
Model / Type reference	Navigator TXT Multihub
FCC ID	T8RTXT1MW
Rating(s)	12-24 Vdc from vehicular battery
Report	
Tested by (name + signature)	M. Segalla
Approved by (name + signature)	R. Beghetto



1 Summary

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2 Reference standard	
FCC Rules and Regulation Title 47 part 15:2019	--
3 List of attachments	
Attachment 1: Instruments list, measurement uncertainty, judgement of compliance and quality manual references	
4 Deviation(s) from test specification	
None	
5 Testing location	
CMC Centro Misure Compatibilità S.r.l. Via della Fisica, 20 – 36016 Thiene (VI) – Italy Test site facility's FCC registration number: 182474	

Revision index	Date	Change history
1.0	23.12.2020	--



Testing and sampling:	
Date of receipt of test item	23.07.2020
Testing start date	17.09.2020
Testing end date	23.12.2020
Sampling procedure.....	Equipment used for testing was picked up by the manufacturer, at the end of the production process with random criterion. The results relate to the sample as it has been received.
Internal identification	Adhesive label with the product number P200752
General remarks:	
This report shall not be reproduced, except in full, without the written approval of CMC. The test results presented in this report relate only to the object tested. “(see appended table)”: refers to a table appended to the report. Throughout this report a comma is used as the decimal separator.	
Possible test case verdicts:	
Test case does not apply to the test object:	N/A (Not Applicable)
Test object does meet the requirement:	P (Pass)
Test object does not meet the requirement:	F (Fail)
Test object does not performed:	N/E (Not Executed)
Definition of symbols used in this test report:	
☒ Indicates that the listed condition, standard or equipment is applicable for this report. ☐ Indicates that the listed condition, standard or equipment is not applicable for this report.	

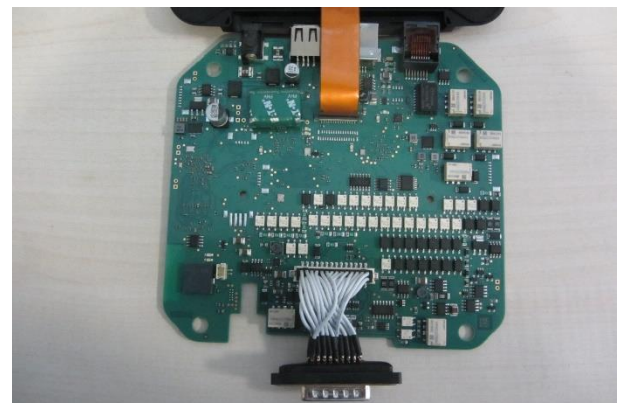


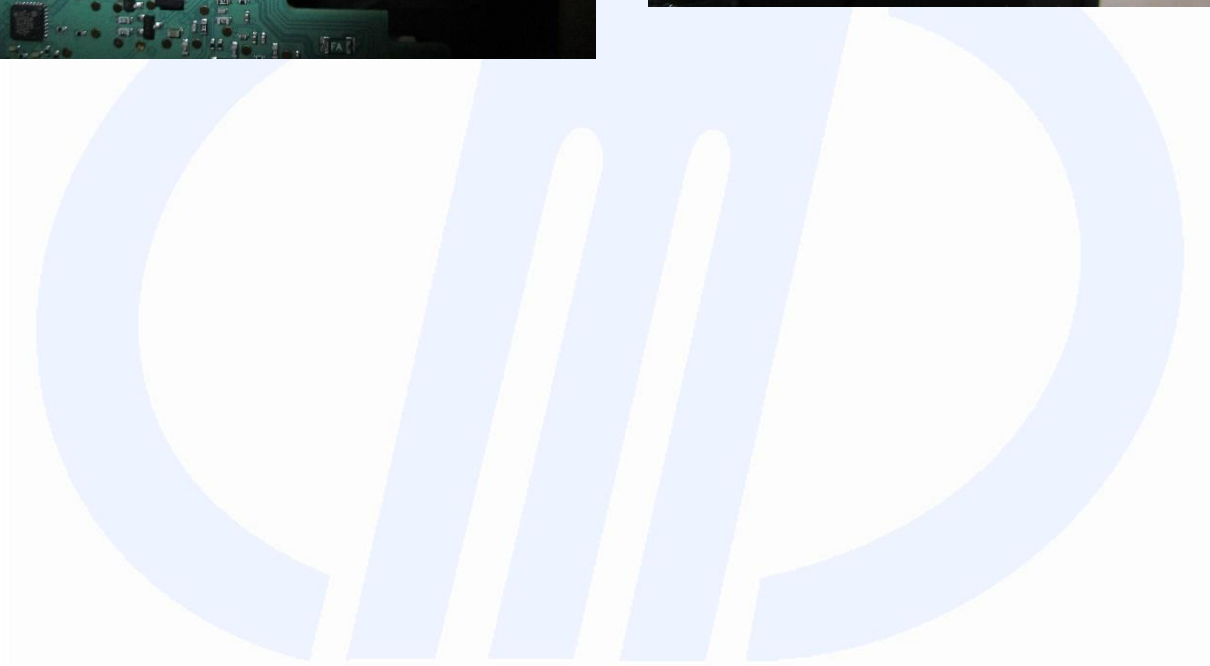
6 General description of test item(s)

Description	Vehicle communication interface						
Model Number	Navigator TXT Multihub						
FCC ID	T8RTXT1MW						
Serial Number	--						
Brand name	Texa						
Frequency band	2400 – 2483,5 MHz						
Nominal frequencies	F _L : 2412 MHz		F _M : 2437 MHz		F _H : 2462 MHz		
Rated power supply	Voltage and Frequency			Reference poles			
			N	L1	L2	L3	PE
	☐	AC:	☐	☐	☐	☐	☐
	☐	AC:	☐	☐	☐	☐	☐
	☒	DC: 12 V from vehicular battery					☐
Software version	1.0.0.28						
Test configuration	☒	Table top equipment					
	☐	Floor standing equipment					
	☐	Hand-held equipment					
Type of equipment	☒	Transmitter unit					
	☒	Receiver unit					
Type of station	☐	Fixed station					
	☐	Portable station					
	☒	Mobile station					
Operating modes	No.	Operating mode of test item					
	1	EUT in continuous transmission at maximum power, WiFi mode					



6.1 Photos of the test item







7 Verdict summary section

FCC Rules & Regulations, Title 47:2019 Part 15 paragraph(s): 203, 204, 205, 207, 209, 215 and 247			
Clause	Requirement – Test case	Basic standard	Verdict
Part 15.203	Antenna requirements	--	P
Part 15.207	Conducted emissions	ANSI C63.10	N/A (+)
Part 15.209	Emissions in restricted frequency bands and in unrestricted frequency bands	ANSI C63.10	P
Part 15.247 (a) (2)	DTS bandwidth	ANSI C63.10	P
Part 15.215 (c)	20 dB bandwidth	ANSI C63.10	P
Part 15.247 (d)	Band edge	ANSI C63.10	P
Part 15.209 and 15.247	Fundamental emission output power	ANSI C63.10	P
Part 15.209 and 15.247	Maximum power spectral density level in the fundamental emission	ANSI C63.10	P

(+) Devices which only employ battery power. See FCC Part 15.207 (c)



Normative references	
Reference no.	Description
FCC Rules and Regulation Title 47 part 15:2019	--
KDB 558074 D01 15.247 Meas Guidance v05r02	Guidance for compliance measurements on Digital Transmission System, Frequency Hopping Spread Spectrum System, and Hybrid System Devices operating under section 15.247 of the FCC rules
ANSI C63.4:2014	American National Standard for Methods of Measuring of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz – 40 GHz
ANSI C63.10:2013	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices



8 Test conditions

8.1 General

Environmental reference conditions.....:	The climatic conditions during the tests are within the limits specified by the manufacturer for the operation of the EUT and the test equipment. The climatic conditions during the tests were within the following limits:		
	Temperature	Humidity	Atmospheric pressure
	15 °C – 35 °C	30 % - 60 %	800 hPa – 1060 hPa
	If explicitly required in the basic standard or applied product standard the climatic values are recorded and documented separately in this test report.		
Measurement uncertainties	Attachment 1		



9 Test results

9.1 Antenna requirements

Tested by	M. Segalla	
Test date	17.09.2020	
Reference standards	FCC Rules and Regulation; Titles 47 Part. 15.203 and 15.204	
Test specification	An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §§ 15.211, 15.213, 15.217, 15.219, 15.221, or § 15.236. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with § 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded	
Antenna type.....	☒	Integral antenna
	☐	External antenna
Antenna gain.....	0 dBi	
External R.F. power amplifier	Not Present	



9.2 Emissions in restricted frequency bands and in unrestricted frequency bands

Tested by	M. Segalla
Test date	17.09.2020
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(μ V/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 ($f \geq 1000$ MHz)			
Frequency (MHz)	Test distance (m)	AV limits [dB(μ V/m)]	Peak limits [dB(μ V/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			

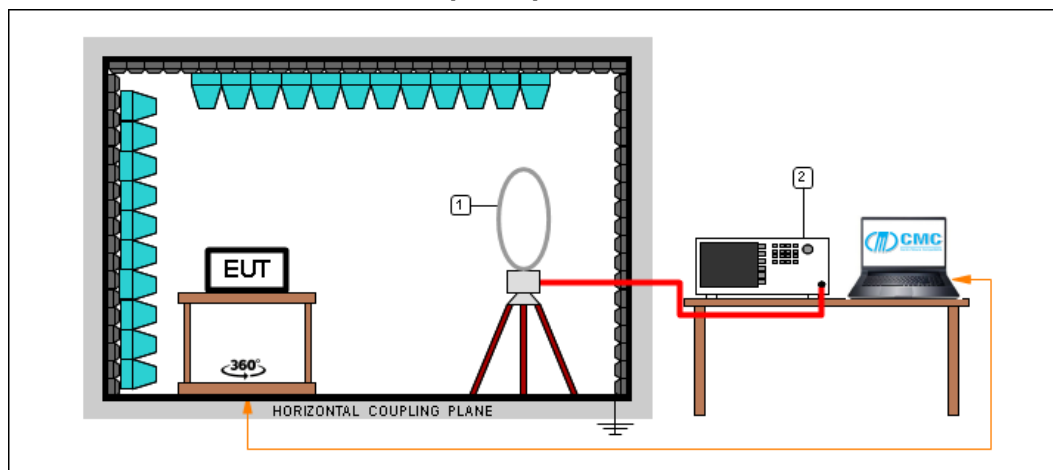
Acceptance limits for emissions in non-restricted frequency bands (according to ANSI C63.10 cl. 11.11.1)

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:

- 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
- 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.
- In either case, attenuation to levels below the 15.209 general radiated emissions limits is not required

Test setup

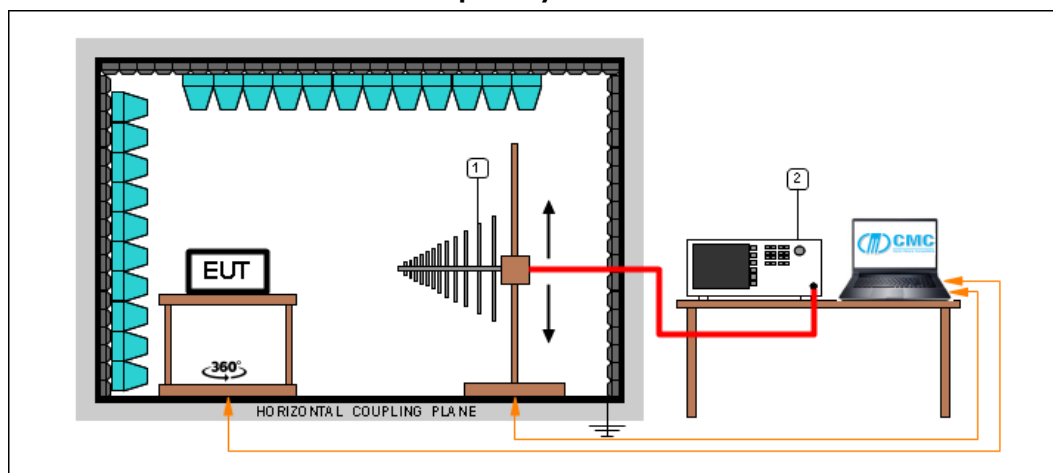
Frequency ≤ 30 MHz



Test setup PE004_01

Nr.	Id. Number	Manufacturer	Model	Description
2	CMC S164	Rohde & Schwarz	ESU26	Receiver 20 Hz - 26.5 GHz
1	CMC S127	Schaffner	HLA6120	Loop Antenna 9kHz - 30MHz

Frequency ≤ 1 GHz



Test setup PE004_02

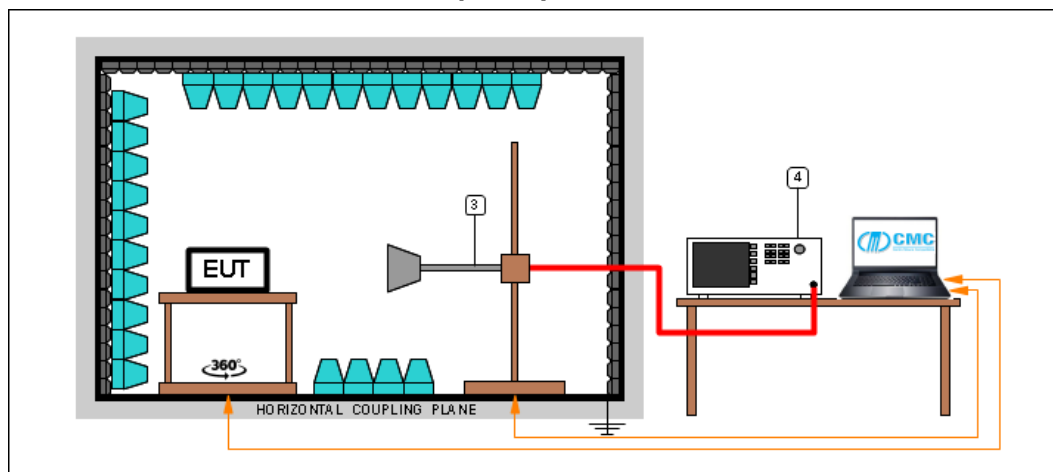
Nr.	Id. Number	Manufacturer	Model	Description
2	CMC S164	Rohde & Schwarz	ESU26	Receiver 20 Hz - 26.5 GHz
1	CMC S271	Schwarzbeck	BBA 9106 + VHBB 9124	Broadband Antenna

Test setup PE004_03

Nr.	Id. Number	Manufacturer	Model	Description
2	CMC S164	Rohde & Schwarz	ESU26	Receiver 20 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 S164	Rohde & Schwarz	ESU26	Receiver 20 Hz - 26.5 GHz
3	CMC S108	Emco	3115	Waveguide antenna

Test setup PE004_05

Nr.	Id. Number	Manufacturer	Model	Description
4	CMC S164	Rohde & Schwarz	ESU26	Receiver 20 Hz - 26.5 GHz
3	CMC S290	Schwarzbeck	BBHA 9170	Horn Antenna (15-40 GHz)



Result – WiFi mode N (MCS0)

Transmission frequency (MHz)	Polarization	Frequency Range (MHz)	Graphs	Result
2412	H	1000 – 3000	G20168505	P
2412	V	1000 – 3000	G20168506	P
2437	V	1000 – 3000	G20168507	P
2437	H	1000 – 3000	G20168508	P
2462	H	1000 – 3000	G20168509	P
2462	V	1000 – 3000	G20168510	P
2462	V	3000 – 18000	G20168511	P
2462	H	3000 – 18000	G20168512	P
2437	H	3000 – 18000	G20168513	P
2437	V	3000 – 18000	G20168514	P
2412	V	3000 – 18000	G20168515	P
2412	H	3000 – 18000	G20168516	P
Worst case	H	30 – 300	G20168517	P
Worst case	V	30 – 300	G20168518	P
Worst case	V	300 – 1000	G20168519	P
Worst case	H	300 – 1000	G20168520	P
Worst case	Loop	0,009 – 30	G20168521	P
Worst case	H	18000 – 26000	G20168522	P
Worst case	V	18000 – 26000	G20168523	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 $40\log(\text{test distance}/10)$ 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 $20\log(\text{test distance}/10)$ 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
2412	H	1000 – 3000	G20168559	P
2412	V	1000 – 3000	G20168560	P
2437	H	1000 – 3000	G20168561	P
2437	V	1000 – 3000	G20168562	P
2462	H	1000 – 3000	G20168563	P
2462	V	1000 – 3000	G20168564	P
2462	H	3000 – 18000	G20168565	P
2462	V	3000 – 18000	G20168566	P
Worst case	V	30 – 300	G20168582	P
Worst case	H	30 – 300	G20168583	P
Worst case	H	300 – 1000	G20168584	P
Worst case	V	300 – 1000	G20168585	P
Worst case	Loop	0,009 – 30	G20168586	P
2437	V	3000 – 18000	G20168587	P
2437	H	3000 – 18000	G20168588	P
2412	H	3000 – 18000	G20168589	P
2412	V	3000 – 18000	G20168590	P
Worst case	H	18000 – 26000	G20168592	P
Worst case	V	18000 – 26000	G20168593	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 $40\log(\text{test distance}/10)$ 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 $20\log(\text{test distance}/10)$ 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 B

Transmission frequency (MHz)	Polarization	Frequency Range (MHz)	Graphs	Result
2412	H	3000 – 18000	G20168541	P
2412	V	3000 – 18000	G20168542	P
2437	H	3000 – 18000	G20168543	P
2437	V	3000 – 18000	G20168544	P
2462	H	3000 – 18000	G20168545	P
2462	V	3000 – 18000	G20168546	P
2462	H	1000 – 3000	G20168547	P
2462	V	1000 – 3000	G20168548	P
2437	H	1000 – 3000	G20168549	P
2437	V	1000 – 3000	G20168550	P
2412	H	1000 – 3000	G20168551	P
2412	V	1000 – 3000	G20168552	P
Worst case	Loop	0,009 – 30	G201685A16	P
Worst case	V	30 – 300	G201685A17	P
Worst case	H	30 – 300	G201685A18	P
Worst case	H	300 – 1000	G201685A19	P
Worst case	V	300 – 1000	G201685A20	P
Worst case	V	18000 – 26000	G201685A22	P
Worst case	H	18000 – 26000	G201685A23	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 $40\log(\text{test distance}/10)$ 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 $20\log(\text{test distance}/10)$ based on the measuring distance provided by the standard.

Peaks above the limits are caused by the nominal transmitting frequencies

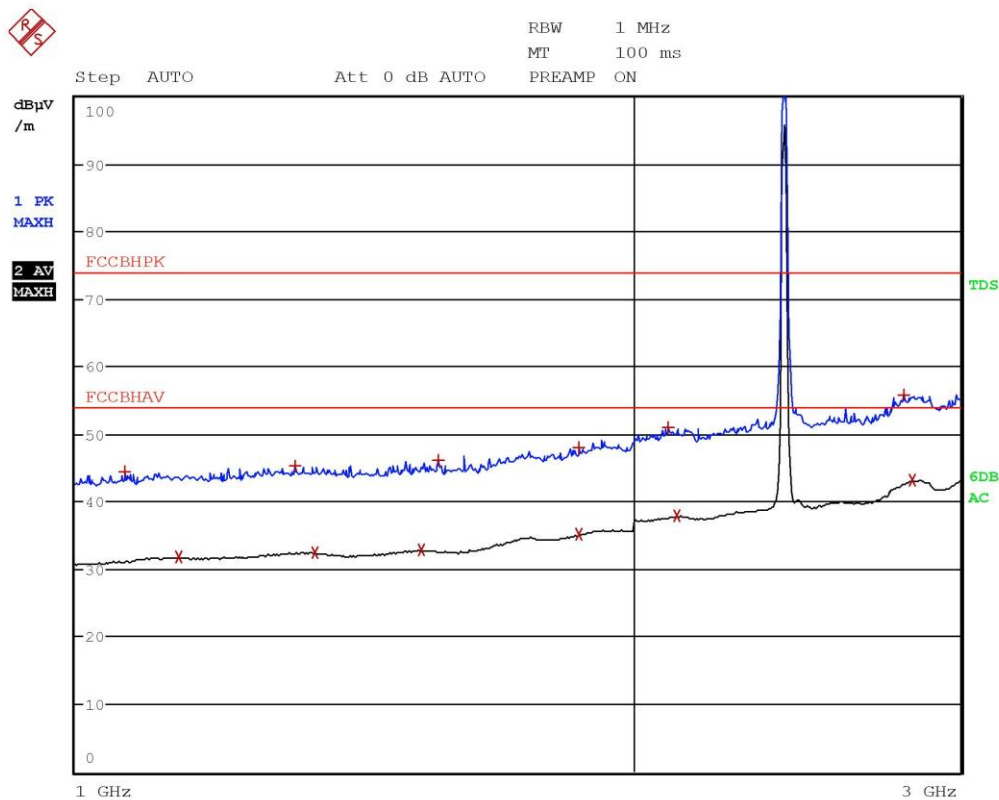
Graphs Legend

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

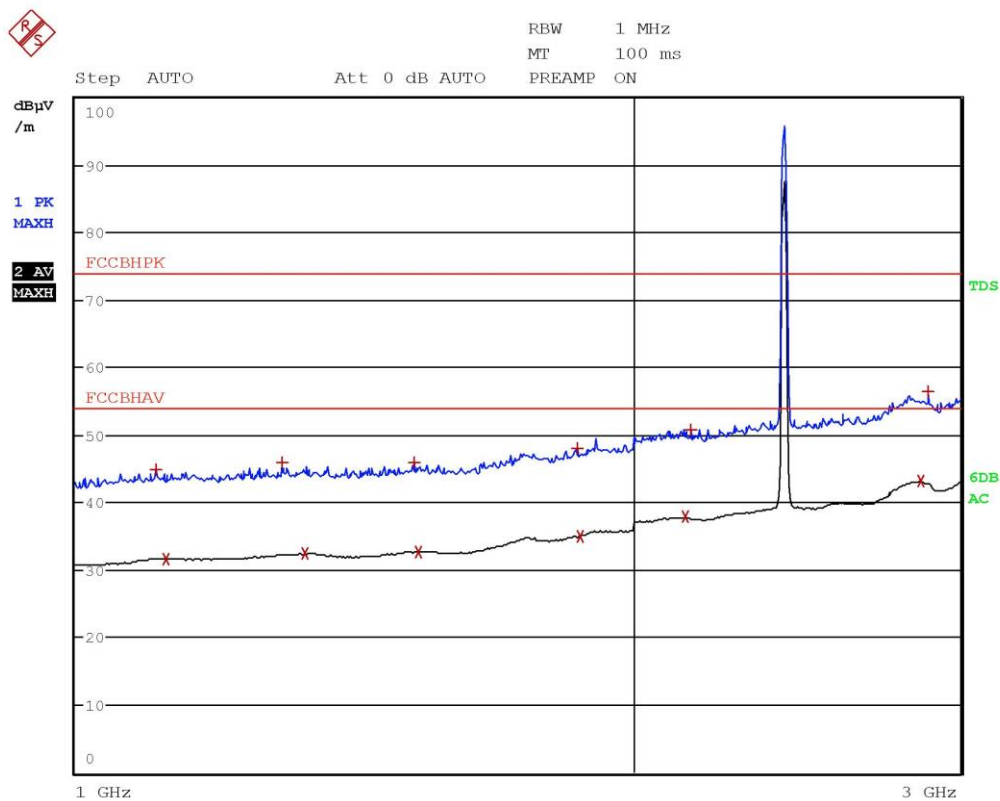


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EDIT PEAK LIST (Prescan Results)			
Trace1:	FCCBHPK		
Trace2:	FCCBHAV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBμV/m	DELTA LIMIT dB
1 Max Peak	1.0624 GHz	44.40	-29.58
2 Average	1.1376 GHz	31.74	-22.23
1 Max Peak	1.3128 GHz	45.30	-28.67
2 Average	1.346 GHz	32.49	-21.48
2 Average	1.5352 GHz	32.83	-21.14
1 Max Peak	1.5696 GHz	46.02	-27.95
1 Max Peak	1.8664 GHz	47.95	-26.03
2 Average	1.8688 GHz	35.17	-18.80
1 Max Peak	2.0868 GHz	50.84	-23.13
2 Average	2.1088 GHz	37.83	-16.14
1 Max Peak	2.7952 GHz	55.81	-18.16
2 Average	2.8236 GHz	43.20	-10.77

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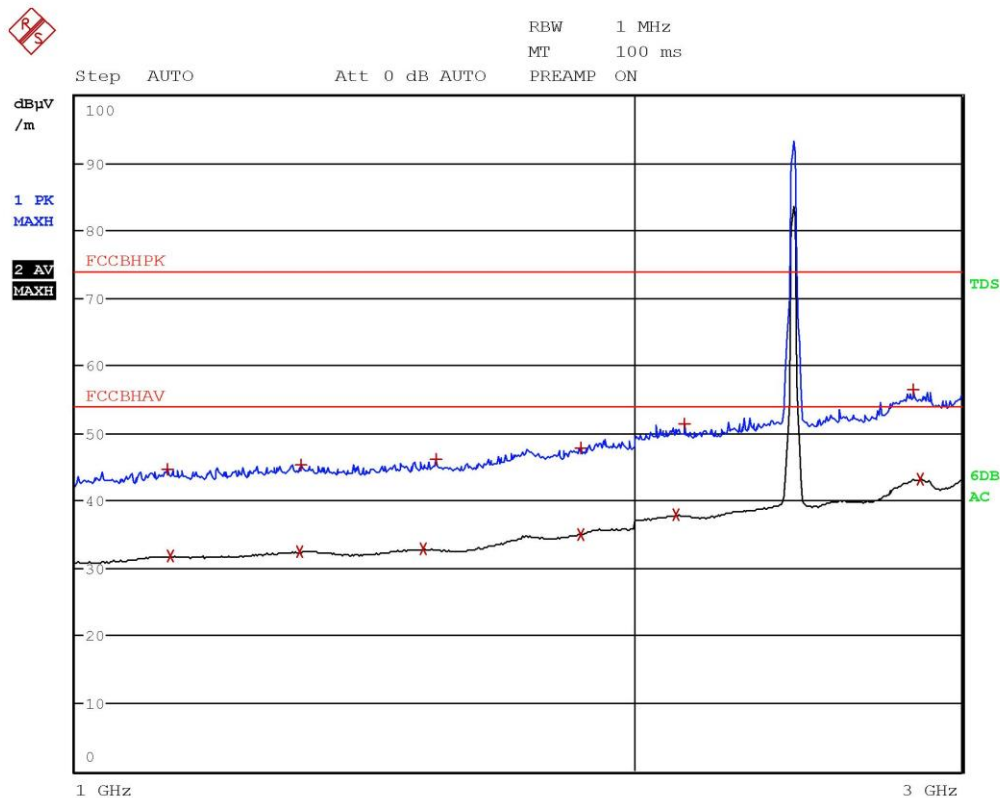


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EDIT PEAK LIST (Prescan Results)			
Trace1:	FCCBHPK		
Trace2:	FCCBHAV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBμV/m	DELTA LIMIT dB
1 Max Peak	1.1048 GHz	44.89	-29.08
2 Average	1.1196 GHz	31.71	-22.27
1 Max Peak	1.2932 GHz	45.93	-28.04
2 Average	1.3304 GHz	32.48	-21.49
1 Max Peak	1.522 GHz	45.83	-28.14
2 Average	1.5304 GHz	32.76	-21.21
1 Max Peak	1.8644 GHz	47.97	-26.00
2 Average	1.8708 GHz	35.04	-18.93
2 Average	2.13 GHz	37.81	-16.16
1 Max Peak	2.148 GHz	50.72	-23.25
2 Average	2.8536 GHz	43.17	-10.81
1 Max Peak	2.8828 GHz	56.34	-17.63

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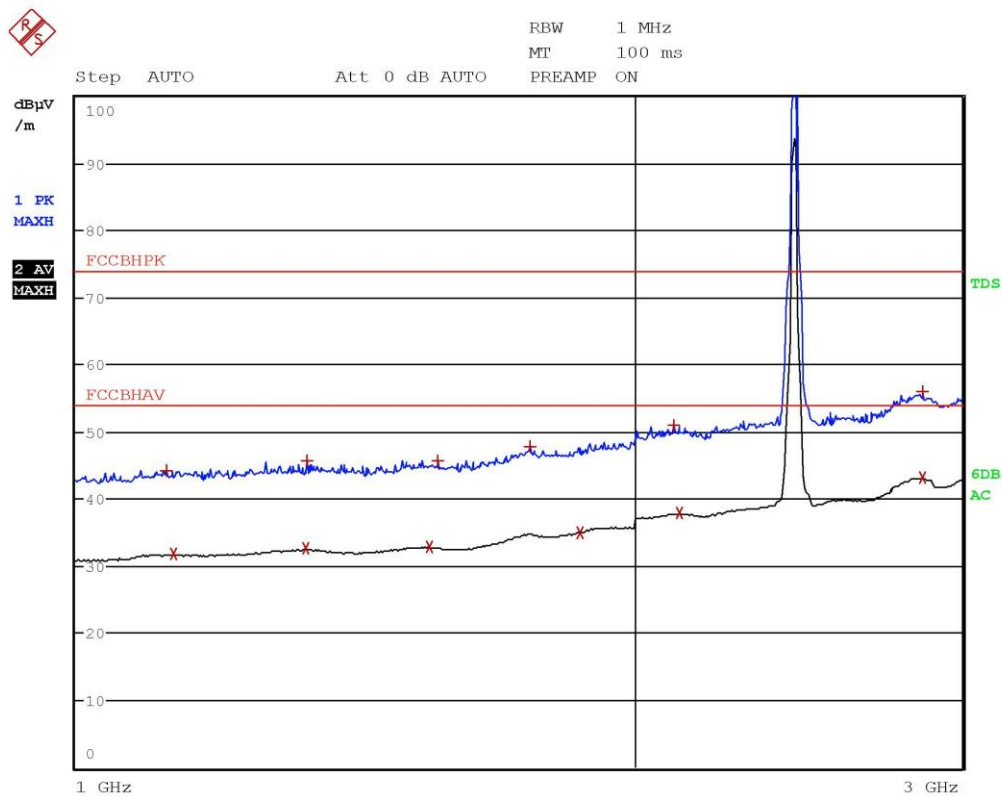


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EDIT PEAK LIST (Prescan Results)			
Trace1:	FCCBHPK		
Trace2:	FCCBHAV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBμV/m	DELTA LIMIT dB
1 Max Peak	1.1216 GHz	44.56	-29.41
2 Average	1.1252 GHz	31.82	-22.16
2 Average	1.32 GHz	32.48	-21.49
1 Max Peak	1.3224 GHz	45.17	-28.80
2 Average	1.5376 GHz	32.83	-21.14
1 Max Peak	1.5624 GHz	46.04	-27.93
1 Max Peak	1.8696 GHz	47.81	-26.16
2 Average	1.8724 GHz	35.01	-18.96
2 Average	2.1052 GHz	37.84	-16.13
1 Max Peak	2.1292 GHz	51.37	-22.60
1 Max Peak	2.8232 GHz	56.31	-17.66
2 Average	2.8516 GHz	43.19	-10.78

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