

**TEST REPORT****Nr. R20168801****Federal Communication Commission (FCC)**

Report Reference No.	R20168801
Date of issue:	01.10.2020
Total number pages:	193
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_HoppingCMC
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	01.10.2020	--



Testing and sampling:	
Date of receipt of test item	23.07.2020
Testing start date	25.09.2020
Testing end date	29.09.2020
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.	

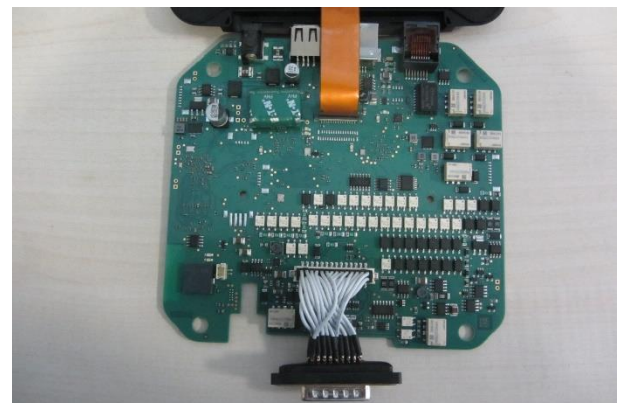


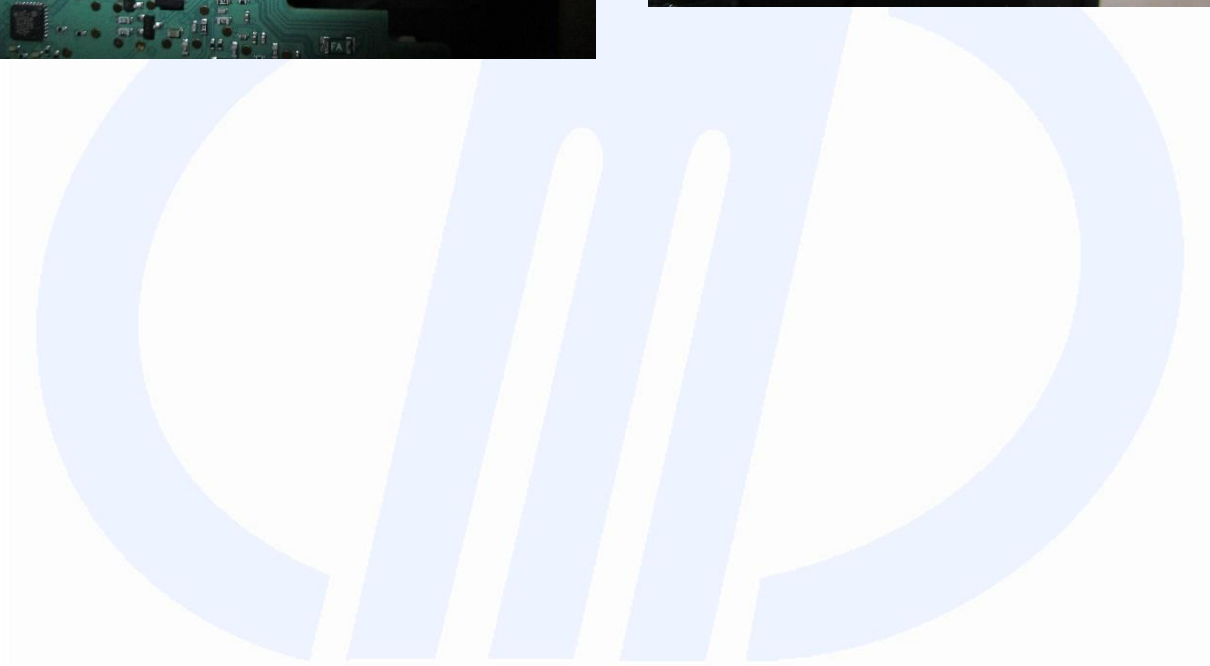
6 General description of test item(s)

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 : 2402 MHz		F _M : 2441 MHz		F _H : 2480 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, Bluetooth mode at 3 modulations, DH5, 2DH5 and 3DH5					



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 15.247 (a) (1)	Pseudo randomly ordered list of hopping frequencies	--	P
Part 15.203	Antenna requirements	ANSI C63.10	P
Part 15.207	Conducted emissions	ANSI C63.10	N/A (+)
Part 15.209	Radiated emissions and spurious emission	ANSI C63.10	P
Part 15.247	20 dB Bandwidth	ANSI C63.10	P
Part 15.247	Channel Separation	ANSI C63.10	P
Part 15.247	Number of Hopping Channel	ANSI C63.10	P
Part 15.247	Time of occupancy	ANSI C63.10	P
Part 15.247	Band edge	ANSI C63.10	P
Part 15.209 and 15.247	Peak Output Power	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	23.07.2020	
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	28.09.2020
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

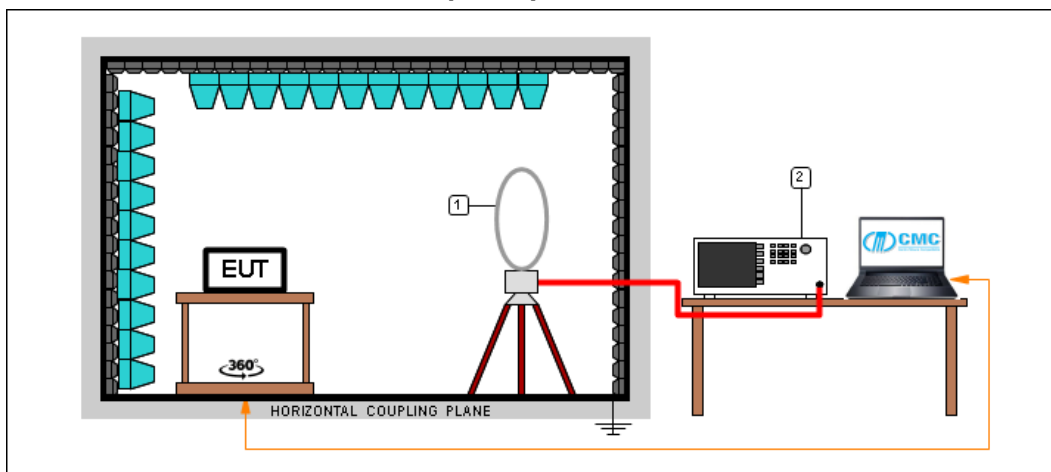
MHz	MHz	MHz	GHz
0,090 – 0,110	16,42 – 16,423	399,9 – 410	4,5 – 5,15
0,495 – 0,505	16,69475 – 16,69525	608 – 614	5,35 – 5,46
2,1735 – 2,1905	16,80425 – 16,80475	960 – 1240	7,25 – 7,75
4,125 – 4,128	25,5 – 25,67	1300 – 1427	8,025 – 8,5
4,17725 – 4,17775	37,5 – 38,25	1435 – 1626,5	9,0 – 9,2
4,20725 – 4,20775	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

In any 100 kHz 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 20 dB below that in the 100 kHz 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.

Test setup

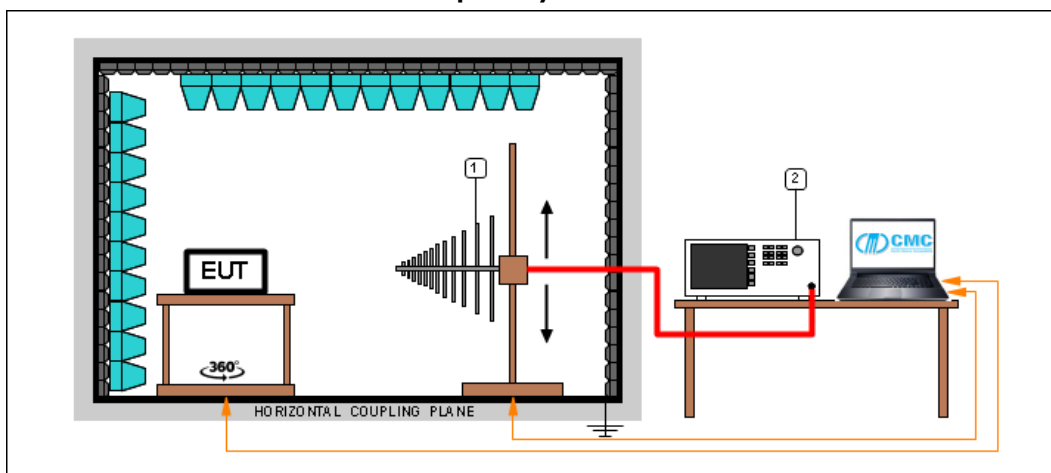
Frequency ≤ 30 MHz



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

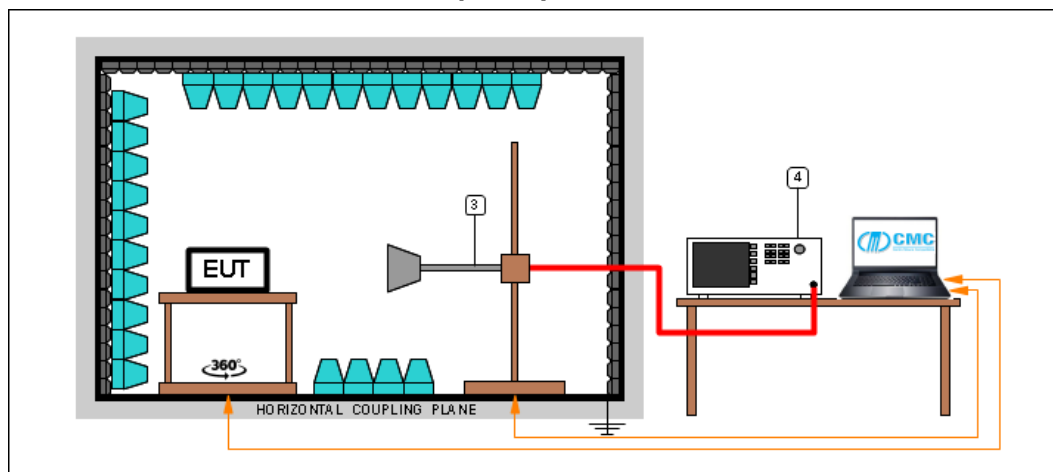
Nr.	Id. Number	Manufacturer	Model	Description
2	CMC S164	Rohde & Schwarz	ESU26	Receiver 20 Hz - 26.5 GHz
1	CMC S271	Schwarzbeck	BBA 9106 + VHBB 9124	Broadband Antenna

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

Modulation	Transmission frequency (MHz)	Polarization	Frequency Range (MHz)	Graphs	Result
DH5	2402	H	1000 – 3000	G20168801	P
DH5	2402	V	1000 – 3000	G20168802	P
DH5	2441	V	1000 – 3000	G20168803	P
DH5	2441	H	1000 – 3000	G20168804	P
DH5	2480	H	1000 – 3000	G20168805	P
DH5	2480	V	1000 – 3000	G20168806	P
2DH5	2402	V	1000 – 3000	G20168807	P
2DH5	2402	H	1000 – 3000	G20168808	P
2DH5	2441	H	1000 – 3000	G20168809	P
2DH5	2441	V	1000 – 3000	G20168810	P
2DH5	2480	V	1000 – 3000	G20168811	P
2DH5	2480	H	1000 – 3000	G20168812	P
3DH5	2402	H	1000 – 3000	G20168813	P
3DH5	2402	V	1000 – 3000	G20168814	P
3DH5	2441	V	1000 – 3000	G20168815	P
3DH5	2441	H	1000 – 3000	G20168816	P
3DH5	2480	H	1000 – 3000	G20168817	P
3DH5	2480	V	1000 – 3000	G20168818	P
3DH5	2480	V	3000 – 18000	G20168819	P
3DH5	2480	H	3000 – 18000	G20168820	P
3DH5	2441	H	3000 – 18000	G20168821	P
3DH5	2441	V	3000 – 18000	G20168822	P
3DH5	2402	V	3000 – 18000	G20168823	P
3DH5	2402	H	3000 – 18000	G20168824	P
2DH5	2402	H	3000 – 18000	G20168825	P
2DH5	2402	V	3000 – 18000	G20168826	P
2DH5	2441	V	3000 – 18000	G20168827	P
2DH5	2441	H	3000 – 18000	G20168828	P
2DH5	2480	H	3000 – 18000	G20168829	P
2DH5	2480	V	3000 – 18000	G20168830	P



Modulation	Transmission frequency (MHz)	Polarization	Frequency Range (MHz)	Graphs	Result
DH5	2480	V	3000 – 18000	G20168831	P
DH5	2480	H	3000 – 18000	G20168832	P
DH5	2441	H	3000 – 18000	G20168833	P
DH5	2441	V	3000 – 18000	G20168834	P
DH5	2402	V	3000 – 18000	G20168835	P
DH5	2402	H	3000 – 18000	G20168836	P
DH5	Worst case	H	30 – 300	G20168861	P
DH5	Worst case	V	30 – 300	G20168862	P
2DH5	Worst case	V	30 – 300	G20168863	P
2DH5	Worst case	H	30 – 300	G20168864	P
3DH5	Worst case	H	30 – 300	G20168865	P
3DH5	Worst case	V	30 – 300	G20168866	P
3DH5	Worst case	V	300 – 1000	G20168867	P
3DH5	Worst case	H	300 – 1000	G20168868	P
2DH5	Worst case	H	300 – 1000	G20168869	P
2DH5	Worst case	V	300 – 1000	G20168870	P
DH5	Worst case	V	300 – 1000	G20168871	P
DH5	Worst case	H	300 – 1000	G20168872	P
DH5	Worst case	Loop	0,009 – 30	G20168873	P
2DH5	Worst case	Loop	0,009 – 30	G20168874	P
3DH5	Worst case	Loop	0,009 – 30	G20168875	P
DH5	Worst case	H	18000 – 26000	G20168876	P
DH5	Worst case	V	18000 – 26000	G20168877	P
2DH5	Worst case	V	18000 – 26000	G20168878	P
2DH5	Worst case	H	18000 – 26000	G20168879	P
3DH5	Worst case	H	18000 – 26000	G20168880	P
3DH5	Worst case	V	18000 – 26000	G20168881	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

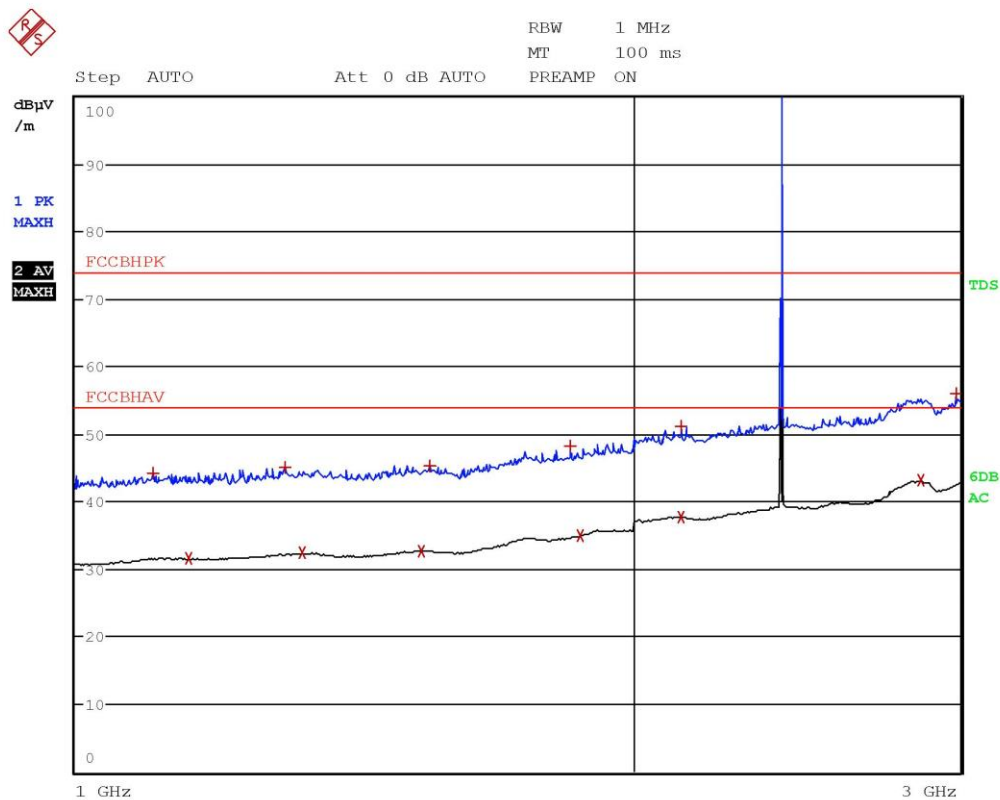
Graphs Legend

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

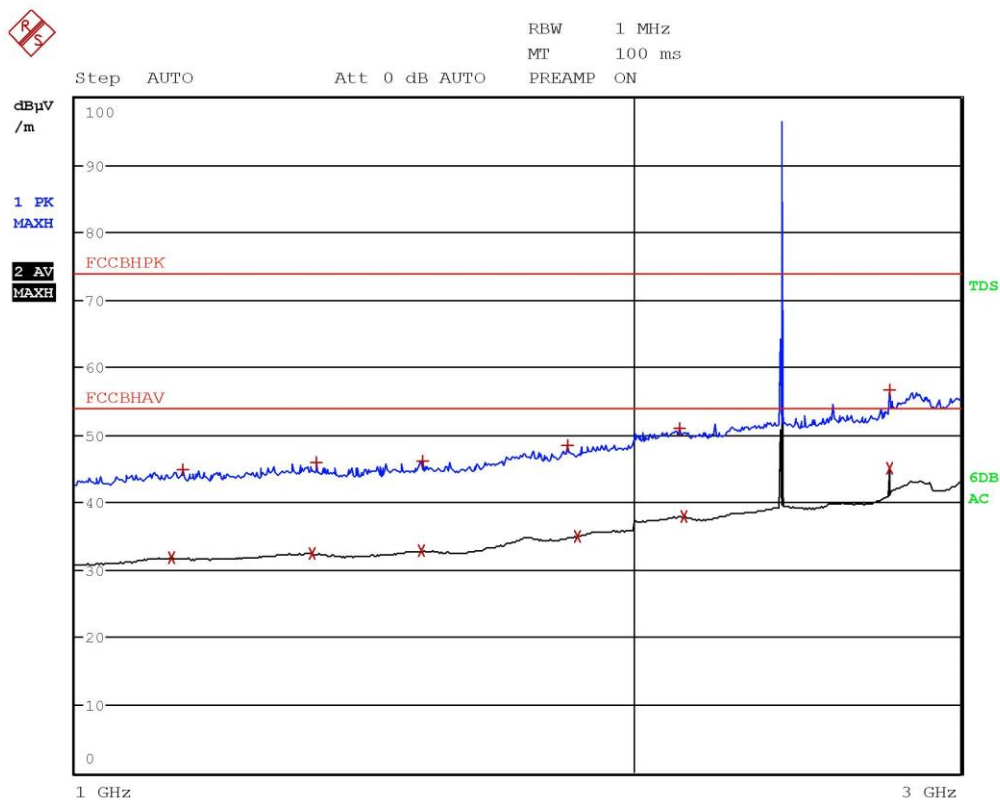


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EDIT PEAK LIST (Prescan Results)			
Trace1:	FCCBHPK		
Trace2:	FCCBHAV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBμV/m	DELTA LIMIT dB
1 Max Peak	1.1008 GHz	44.22	-29.75
2 Average	1.1504 GHz	31.66	-22.31
1 Max Peak	1.2984 GHz	44.98	-28.99
2 Average	1.326 GHz	32.46	-21.52
2 Average	1.5352 GHz	32.76	-21.21
1 Max Peak	1.5524 GHz	45.27	-28.70
1 Max Peak	1.8476 GHz	48.23	-25.74
2 Average	1.8712 GHz	34.93	-19.04
2 Average	2.1188 GHz	37.81	-16.16
1 Max Peak	2.1208 GHz	51.16	-22.82
2 Average	2.8528 GHz	43.08	-10.89
1 Max Peak	2.9816 GHz	55.90	-18.07

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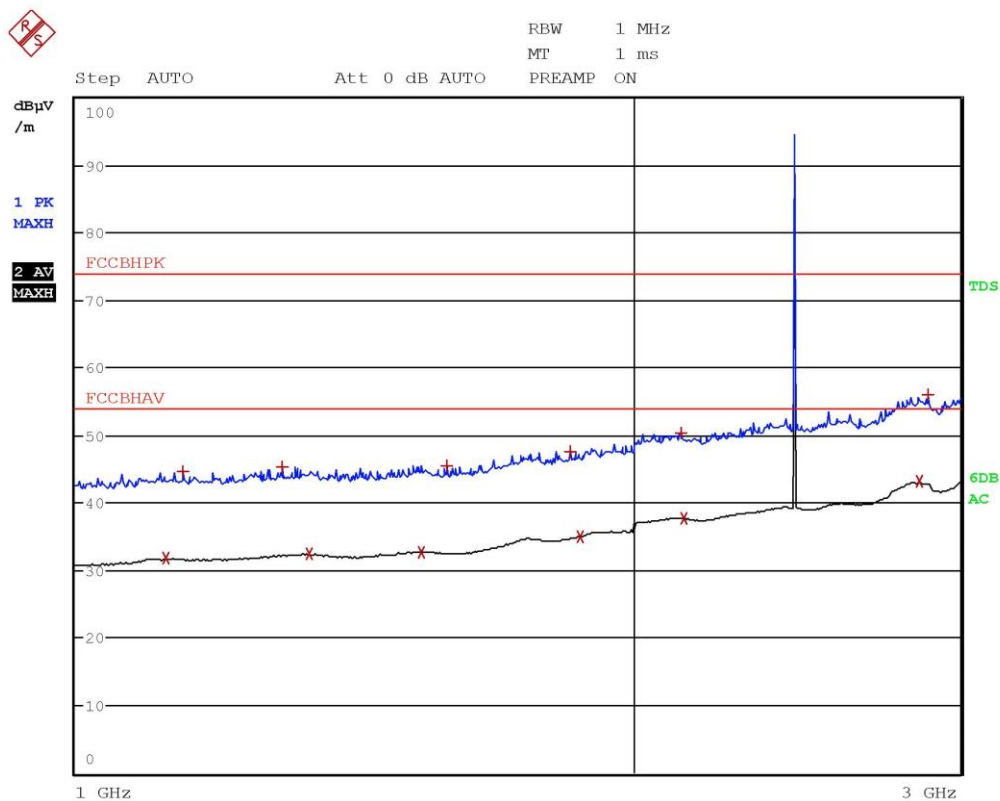


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EDIT PEAK LIST (Prescan Results)			
Trace1:	FCCBHPK		
Trace2:	FCCBHAV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBμV/m	DELTA LIMIT dB
2 Average	1.1272 GHz	31.84	-22.13
1 Max Peak	1.1432 GHz	44.89	-29.08
2 Average	1.3412 GHz	32.54	-21.43
1 Max Peak	1.3484 GHz	45.80	-28.17
2 Average	1.5352 GHz	32.78	-21.19
1 Max Peak	1.5384 GHz	46.06	-27.91
1 Max Peak	1.8416 GHz	48.38	-25.59
2 Average	1.8652 GHz	35.01	-18.96
1 Max Peak	2.1152 GHz	50.92	-23.05
2 Average	2.1268 GHz	37.86	-16.11
1 Max Peak	2.7476 GHz	56.54	-17.44
2 Average	2.7476 GHz	45.10	-8.87

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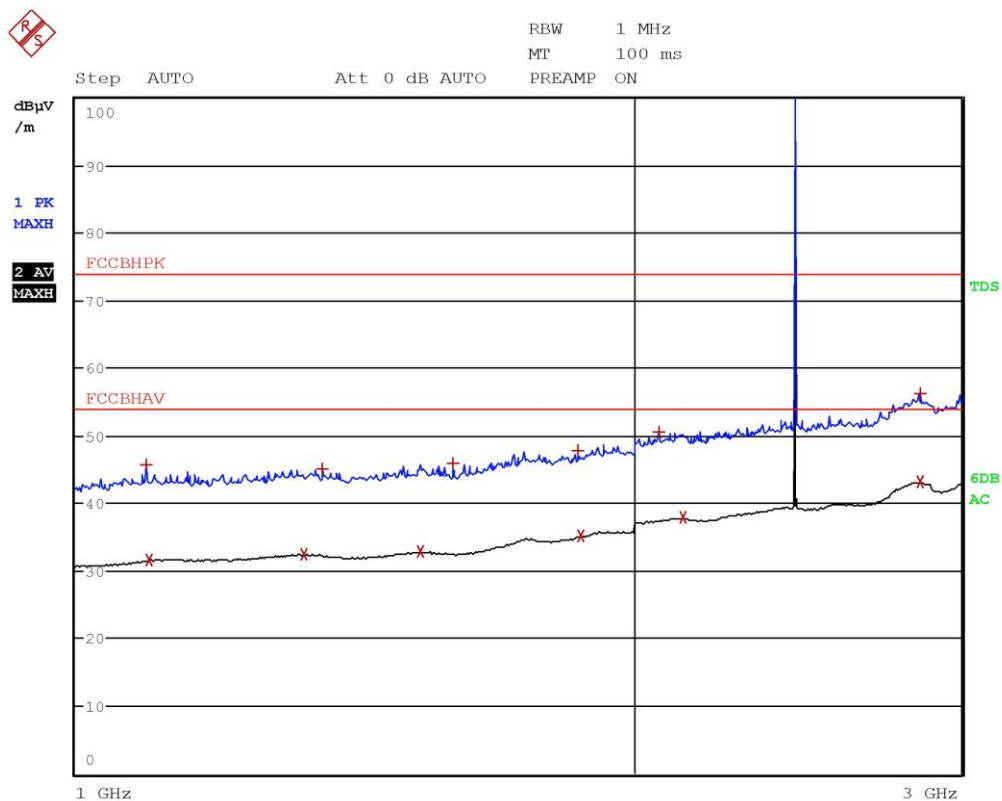


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EDIT PEAK LIST (Prescan Results)			
Trace1:	FCCBHPK		
Trace2:	FCCBHAV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBμV/m	DELTA LIMIT dB
2 Average	1.1188 GHz	31.74	-22.23
1 Max Peak	1.1428 GHz	44.65	-29.32
1 Max Peak	1.2916 GHz	45.21	-28.76
2 Average	1.336 GHz	32.39	-21.58
2 Average	1.5356 GHz	32.76	-21.21
1 Max Peak	1.5852 GHz	45.57	-28.40
1 Max Peak	1.848 GHz	47.64	-26.33
2 Average	1.8716 GHz	34.96	-19.01
1 Max Peak	2.1196 GHz	50.40	-23.58
2 Average	2.1288 GHz	37.79	-16.18
2 Average	2.8508 GHz	43.10	-10.87
1 Max Peak	2.8812 GHz	55.94	-18.04

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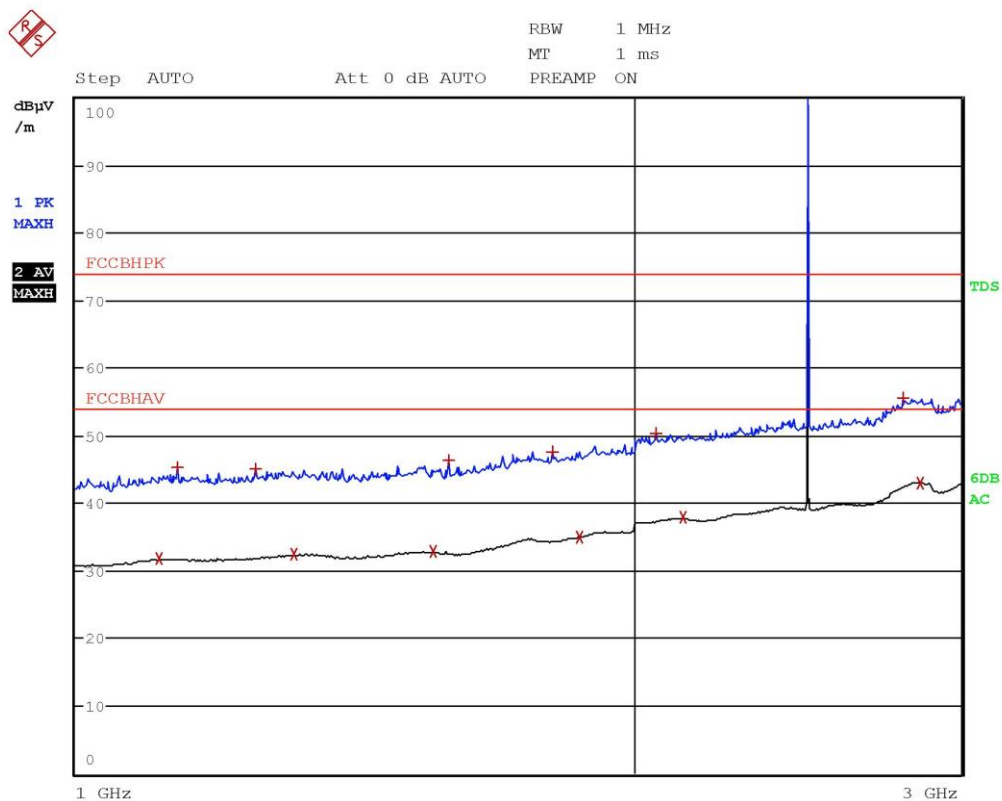


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EDIT PEAK LIST (Prescan Results)			
Trace1:	FCCBHPK		
Trace2:	FCCBHAV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBμV/m	DELTA LIMIT dB
1 Max Peak	1.0908 GHz	45.62	-28.35
2 Average	1.0964 GHz	31.67	-22.30
2 Average	1.328 GHz	32.40	-21.57
1 Max Peak	1.3572 GHz	44.97	-29.00
2 Average	1.5332 GHz	32.80	-21.17
1 Max Peak	1.5964 GHz	45.82	-28.15
1 Max Peak	1.8652 GHz	47.82	-26.15
2 Average	1.8728 GHz	35.09	-18.88
1 Max Peak	2.0612 GHz	50.63	-23.35
2 Average	2.1236 GHz	37.93	-16.04
1 Max Peak	2.848 GHz	56.23	-17.74
2 Average	2.8508 GHz	43.07	-10.90

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EDIT PEAK LIST (Prescan Results)			
Trace1:	FCCBHPK		
Trace2:	FCCBHAV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBμV/m	DELTA LIMIT dB
2 Average	1.1092 GHz	31.73	-22.24
1 Max Peak	1.1356 GHz	45.20	-28.77
1 Max Peak	1.2496 GHz	45.04	-28.93
2 Average	1.3108 GHz	32.41	-21.57
2 Average	1.558 GHz	32.79	-21.18
1 Max Peak	1.5884 GHz	46.35	-27.62
1 Max Peak	1.8076 GHz	47.51	-26.46
2 Average	1.8676 GHz	34.99	-18.98
1 Max Peak	2.056 GHz	50.26	-23.71
2 Average	2.1248 GHz	37.82	-16.15
1 Max Peak	2.7896 GHz	55.49	-18.49
2 Average	2.8492 GHz	43.06	-10.92

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