



TEST REPORT nr. R18044401

Federal Communication Commission (FCC)

Test item

Description: DIGITAL CONTROLLER WITH ADVANCED ENERGY SAVING MANAGEMENT AND BLUETOOTH CONNECTIVITY
Trademark: EMERSON
Model/Type: XR60CHC 20+8+5A 110V
FCC ID: ZG501XRCHC

Test Specification

Standard: FCC Rules & Regulations, Title 47:2017
Part 15 paragraph(s): 209

Client's name: DIXELL S.r.l.

Address: Via dell'Industria, 27 – 32016 Alpago (BL) – ITALY

Manufacturer's name : Same as client

Address: --

Report

Tested by: C. Panozzo

Approved by: R. Beghetto – *Laboratory Manager*

Date of issue: 28.06.18

Contents: 57 pages

This test 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 item tested.



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1. Summary

Standard:

FCC Rules & Regulations, Title 47:2017
Part 15 paragraph(s): 209

Test specifications	Environmental Phenomena	Tests sequence	Result
Part 15.209	Emissions in restricted frequency bands and in unrestricted frequency bands	1	Complies
Part 15.209	Spurious emission	2	Complies

The Test Report was given to the Client representatives for necessary documentation of ratification of the tested equipment and it is valid for the FCC certification



5. Equipment list

<i>Id. number</i>	<i>Manufacturer</i>	<i>Model</i>	<i>Description</i>	<i>Serial number</i>	<i>Last calibration</i>	<i>Due date calibration</i>
CMC S108	EMCO	3115	Horn Antenna	9811-5622	June '16	June '19
CMC S164	Rohde & Schwarz	ESU26	EMC interference receiver	100052	January '18	January '19
CMC S241	Schwarzbeck	BBV 9718	Broadband Preamplifier (0,5-18GHz)	9718-126	January '18	January '19
CMC S251	Schwarzbeck	BBV 9745	Broadband Preamplifier (9kHz - 2GHz)	9745-0019	September '17	September '18
CMC S271	Schwarzbeck	BBA 9106 + VHBB 9124	Biconical Antenna (30-300MHz)	831	June '16	June '19
CMC S287	Schwarzbeck	VUSLP 9111B	Log-periodic Antenna (200 MHz-3Ghz)	9111B-203	June '16	June '19
CMC S290	Schwarzbeck	BBHA 9170	Horn Antenna (15-26,5 GHz)	9170-043	October '16	October '19
CMC S298	RIGOL	DSG3060	RF Signal Generator (9kHz-6GHz)	DSG3A183600076	November '17	November '18



6. Measurement uncertainty

Test	Test Setup	Expanded uncertainty	Note
Conducted emission CISPR 16 LISN 50uH 0,009-0,0150MHz	PE001_01	3,4 dB	1
Conducted emission CISPR 16 LISN 50uH 0,150-30,0MHz	PE001_01	2,8 dB	1
Conducted emission CISPR 16 Voltage Probe 0,15-30MHz	PE001_02	2,6 dB	1
Conducted emission CISPR 16 Current Probe 0,15-30MHz	PE001_03	2,2 dB	1
Conducted emission CISPR 16 ISN 0,15-30MHz	PE001_04	4,5 dB	1
Clic CISPR 16 LISN 50uH 0,150-30,0MHz	PE001_05	3,1 dB	1
Disturbance Power 30-300 MHz	PE002_01	3,4 dB	1
Radiated Emission LAS 0,15-30MHz	PE003_01	1,5 dB	1
Radiated Emission CISPR 16 Loop Ant. 0,15-30MHz	PE004_01	3,8 dB	1
Radiated Emission CISPR 16 Bicon. Ant. 30-300MHz	PE004_02	3,3 dB	1
Radiated Emission CISPR 16 LogP. Ant. 300-1000MHz	PE004_03	3,1 dB	1
Radiated Emission CISPR 16 Horn Ant. 1-18GHz	PE004_04	3,6 dB	1
Human Exposure to electromagnetic fields	PE005_01	15,0 %	1
Harmonic current emissions test	PE006_01	10 mA + 1,6 %	1
Voltage fluctuation and flicker test	PE007_01	4,2 %	1
Radiated Immunity 80MHz-6GHz	PE102_XX	2,1 dB 0,82 V/m a 3V/m	1
Conducted Immunity 0,15-230MHz	PE105_XX	1,2 dB 0,44 V a 3V	1
AC Magnetic field	PE106_01	1,55 % 0,15 A/m a 10A/m	1
Pulse Magnetic field	PE107_01	6,24 % 18,7 A/m a 300A/m	1
Dumped Magnetic field	PE108_01	6,24 % 1,87 A/m a 30A/m	1
Common mode conducted immunity	PE112_01	2,20 % 0,22 V a 10V	1



Test	Test Setup	Expanded uncertainty	Note
Power/Spurious 9kHz-30MHz	PR001_01	3,8 dB	1
Power/Spurious ERP 30-1000MHz d=10m	PR001_02+03	4,3 dB	1
Misura della potenza EIRP 1-18GHz d=3m	PR001_04	4,3 dB	1
Misura della potenza EIRP 18-40GHz d=3m	PR001_05	5,5 dB	1
Frequency error	PR002_01+02	$< 1 \times 10^{-7}$	1
Timing zero span (1001pts.)	PR002_01+02	0,2 % SWT	1
Modulation bandwidth	PR002_01+02	$< 1 \times 10^{-7}$	1
Conducted RF power and spurious emission	PR002_01+02	1,2 dB	1
Adjacent channel power	PR002_01+02	1,2 dB	1
Blocking	PR002_01+02	1,2 dB	1

Note 1:

The expanded uncertainty reported according to EN55016-4-2:2011 is based on a standard uncertainty multiplied by a coverage factor of $K=2$, providing a level of confidence of $p = 95\%$

Note 2:

It has been demonstrated that the used test equipment meets the specified requirements in the standard with at least a 95% confidence, covering factor $k = 2$



7. Reference documents

Reference no.	Description
FCC Rules and Regulation Title 47 part 15:2017	--
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
KDB 558074 D01 DTS Meas Guidance v04	Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under § 15.247
Internal Procedure PM001 rev. 3.0 (Quality Manual)	Measure Procedure
Internal procedure INC_M rev. 9.0 (Quality Manual)	Measurement uncertainty calculation



8. Deviation from test specification

None

9. Test case verdicts

Test case does not apply to the test object : N.A.

Test item does meet the requirement : Complies

Test item does not meet the requirement : Does not comply

Test not performed : N.E.

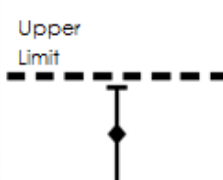
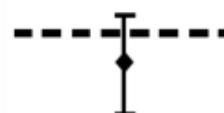


10. Results

In this clause tests results are reported.

Measurement uncertainty is in accordance with document CMC INC_M rev. 9.0.

Judgement of compliance:

Case 1	Case 2	Case 3	Case 4
			
The sample complies with the requirement.	The sample complies with the requirement.	The sample does not comply with the requirement.	The sample does not comply with the requirement.
The measurement results is within the specification limit when the measurement uncertainty is taken into account.	It is not possible to state compliance using a 95% coverage probability for the expanded uncertainty although the measurement result is below the limit.	It is not possible to state compliance using a 95% coverage probability for the expanded uncertainty also the measurement result is upper the limit.	The measurement results is outside the specification limit when the measurement uncertainty is taken into account.

In agreement with ILAC-G8: 03/2009 Guidelines on the Reporting of Compliance with Specification.



10.1 Emissions in restricted frequency bands and in unrestricted frequency bands

Test set-up and execution

- FCC Rules and Regulation; Titles 47 Part. 15.209
- KDB 558074 D01 DTS Meas Guidance v04 cl. 11 and 12
- ANSI C63.10 cl. 6.4, 6.5 and 6.6
- Internal procedure PM001
- See clause 4 of this test report
- Test date: June 19th, 2018
- Technician: C. Panozzo

Test configuration

Test site:
Semi-anechoic chamber

Auxiliary equipment:
See clause 4 of this test report

EUT exercising

See clause 4 of this test report

Test equipment used

CMC S164, CMC S241, CMC S251, CMC S290,
CMC S298
Measurement uncertainty: See clause 6 of this
test report

Test specification

Port: Enclosure
Frequency range: 30 – 26000 MHz
Antenna polarization: Horizontal (H) – Vertical (V)
EUT height about the floor:
80 cm for frequencies ≤ 1000 MHz
150 cm for frequencies > 1000 MHz
EUT – Antenna distance:
10 m for frequencies ≤ 1000 MHz
3 m for frequencies > 1000 MHz

Environmental conditions

Temperature (°C)	Atmospheric pressure (kPa)	Relative humidity (%)
22	100	42

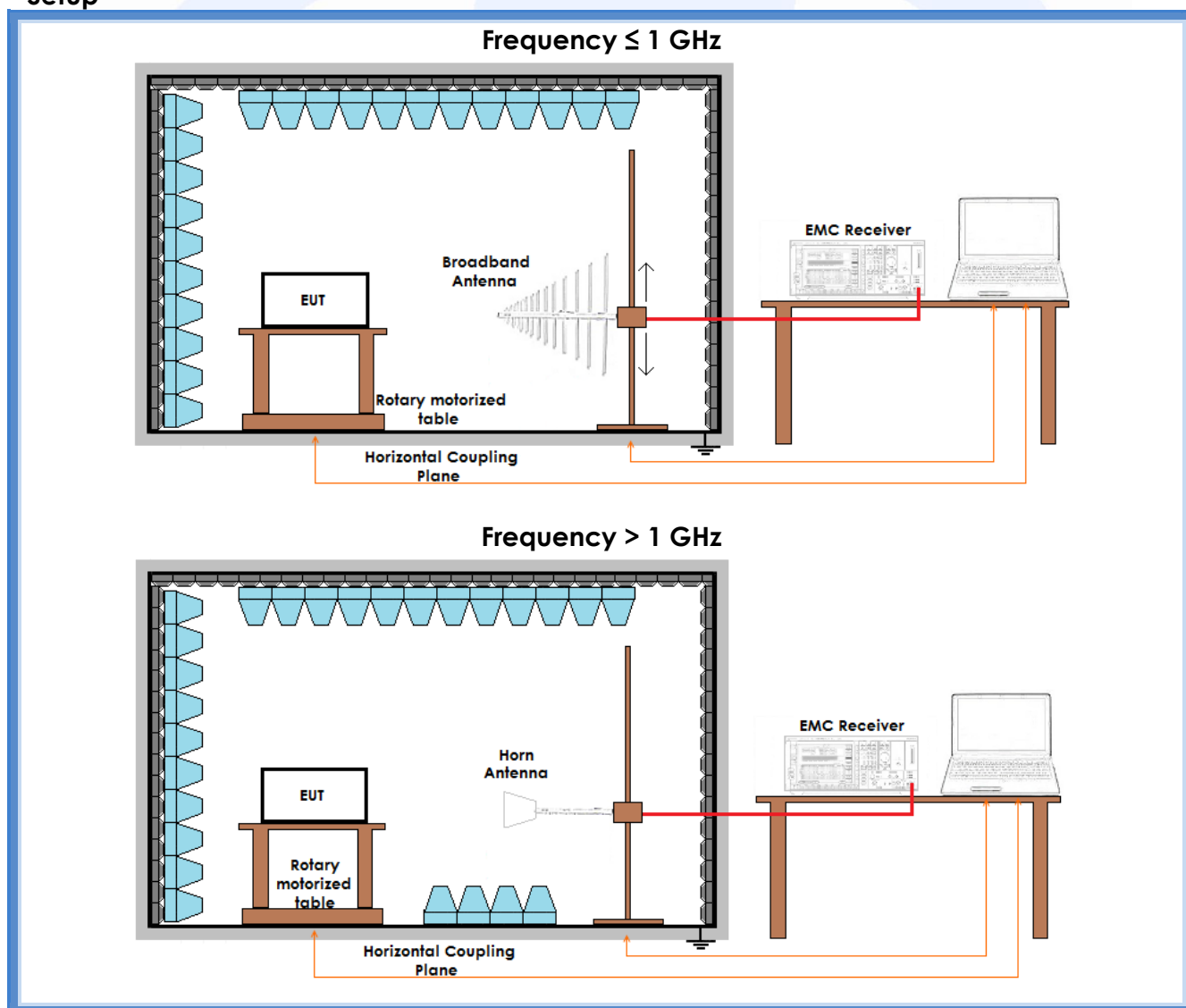


Acceptance limits

Frequency range (MHz)	Test distance (m)	Limits [dB(μV/m)]	
30 to 88	3	40	
88 to 216	3	43,5	
216 to 960	3	46,0	
Above 960	3	53,9	
	Test distance (m)	Linear average detector [dB(μV/m)]	Peak detector [dB(μV/m)]
Above 1000	3	53,9	73,9

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, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

Setup





Result

Polarization	Frequency Range (MHz)	Graphs	Remarks	Result
H	1000 – 4000	G18044401	Lowest channel	Complies
V	1000 – 4000	G18044402	Lowest channel	Complies
H	1000 – 4000	G18044403	Medium channel	Complies
V	1000 – 4000	G18044404	Medium channel	Complies
V	1000 – 4000	G18044405	Highest channel	Complies
H	1000 – 4000	G18044406	Highest channel	Complies
H	4000 – 10000	G18044407	Highest channel	Complies
V	4000 – 10000	G18044408	Highest channel	Complies
H	4000 – 10000	G18044411	Lowest channel	Complies
V	4000 – 10000	G18044412	Lowest channel	Complies
V	10000 – 18000	G18044413	Worst case	Complies
H	10000 – 18000	G18044414	Worst case	Complies
H	18000 – 26000	G18044415	Worst case	Complies
V	18000 – 26000	G18044416	Worst case	Complies
V	30 – 300	G18044417	Worst case	Complies
H	30 – 300	G18044418	Worst case	Complies
H	300 – 1000	G18044419	Worst case	Complies
V	300 – 1000	G18044420	Worst case	Complies
V	4000 – 10000	G18044422	Medium channel	Complies
H	4000 – 10000	G18044423	Medium channel	Complies
Remarks: Measurements at frequencies lower than 1000 MHz have been performed with an EUT – antenna distance of 10 m. Measured values have been corrected with different conversion factors, based on the measuring distance provided by the standard. Peaks above the limits are caused by the nominal transmitting frequencies				

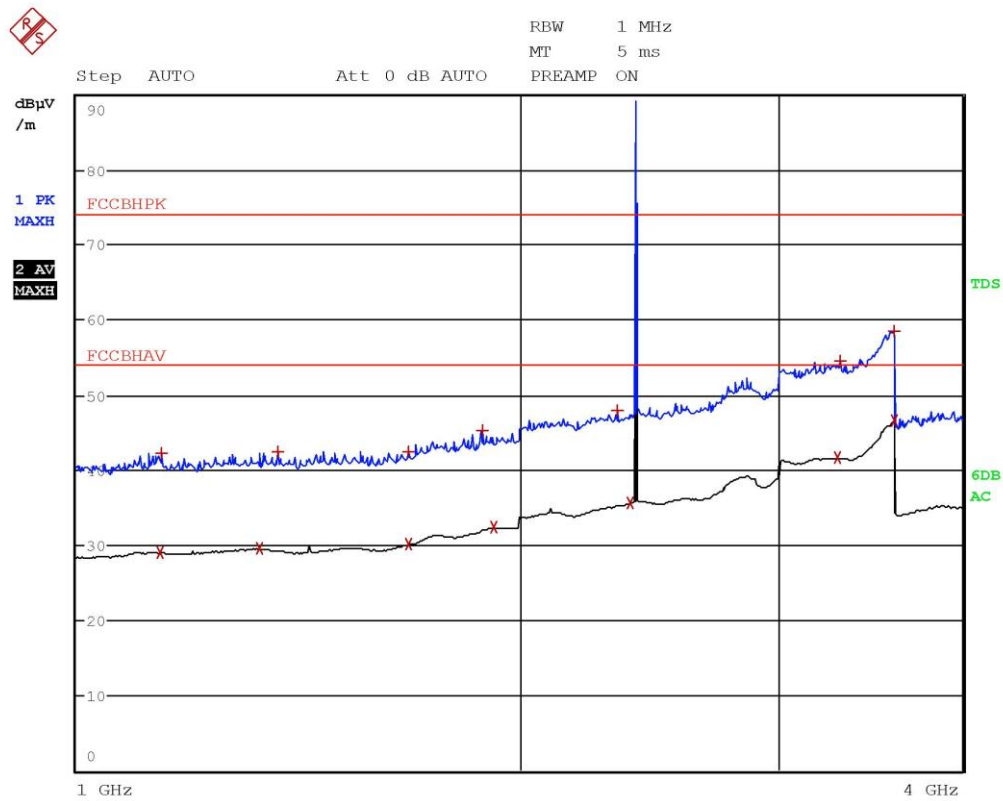
Graphs Legend

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

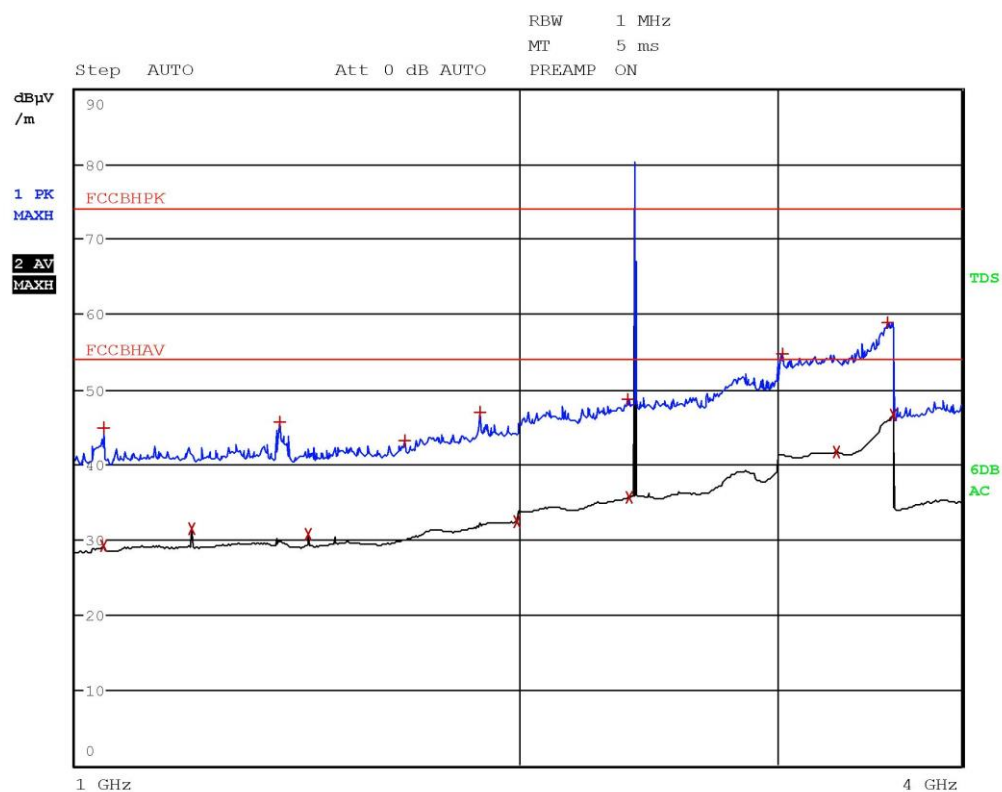


Panozzo 18044401 Horiz In Funzione tx Ch 42



EDIT PEAK LIST (Prescan Results)			
Trace1:	FCCBHPK		
Trace2:	FCCBHAV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL, dBμV/m	DELTA LIMIT dB
2 Average	1.14 GHz	29.11	-24.86
1 Max Peak	1.142 GHz	42.34	-31.63
2 Average	1.33 GHz	29.55	-24.42
1 Max Peak	1.3716 GHz	42.35	-31.62
1 Max Peak	1.6796 GHz	42.53	-31.44
2 Average	1.68 GHz	30.15	-23.82
1 Max Peak	1.8856 GHz	45.20	-28.77
2 Average	1.92 GHz	32.34	-21.63
1 Max Peak	2.3292 GHz	47.86	-26.12
2 Average	2.3784 GHz	35.60	-18.37
2 Average	3.2888 GHz	41.60	-12.37
1 Max Peak	3.3056 GHz	54.49	-19.48
2 Average	3.5992 GHz	46.57	-7.40
1 Max Peak	3.5996 GHz	58.54	-15.43

Panozzo 18044401 Horiz In Funzione tx Ch 42

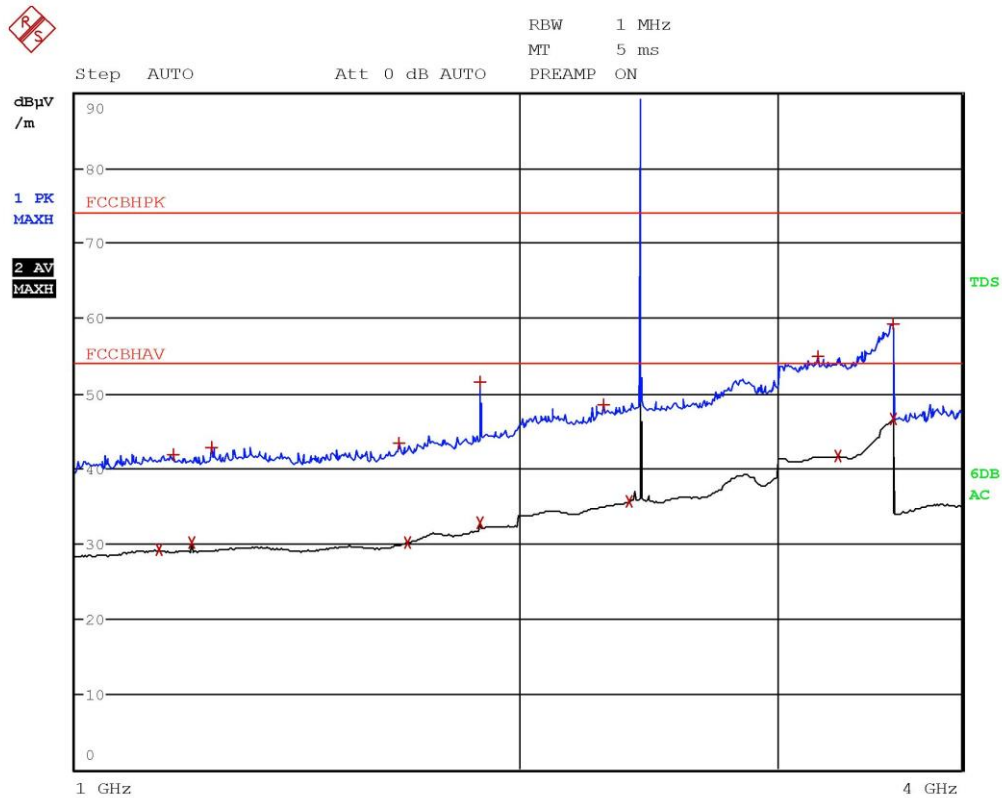


Panozzo 18044402 Vert In Funzione tx Ch 42



EDIT PEAK LIST (Prescan Results)			
Trace1:	FCCBHPK		
Trace2:	FCCBHAV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBμV/m	DELTA LIMIT dB
2 Average	1.0456 GHz	29.27	-24.70
1 Max Peak	1.046 GHz	44.82	-29.15
2 Average	1.2 GHz	31.54	-22.43
1 Max Peak	1.3772 GHz	45.70	-28.27
2 Average	1.44 GHz	30.71	-23.27
1 Max Peak	1.6748 GHz	43.12	-30.85
1 Max Peak	1.8852 GHz	46.96	-27.01
2 Average	1.9976 GHz	32.39	-21.58
1 Max Peak	2.3712 GHz	48.71	-25.26
2 Average	2.3784 GHz	35.58	-18.39
1 Max Peak	3.0248 GHz	54.72	-19.26
2 Average	3.2904 GHz	41.64	-12.33
1 Max Peak	3.5596 GHz	58.87	-15.10
2 Average	3.5996 GHz	46.62	-7.35

Panozzo 18044402 Vert In Funzione tx Ch 42

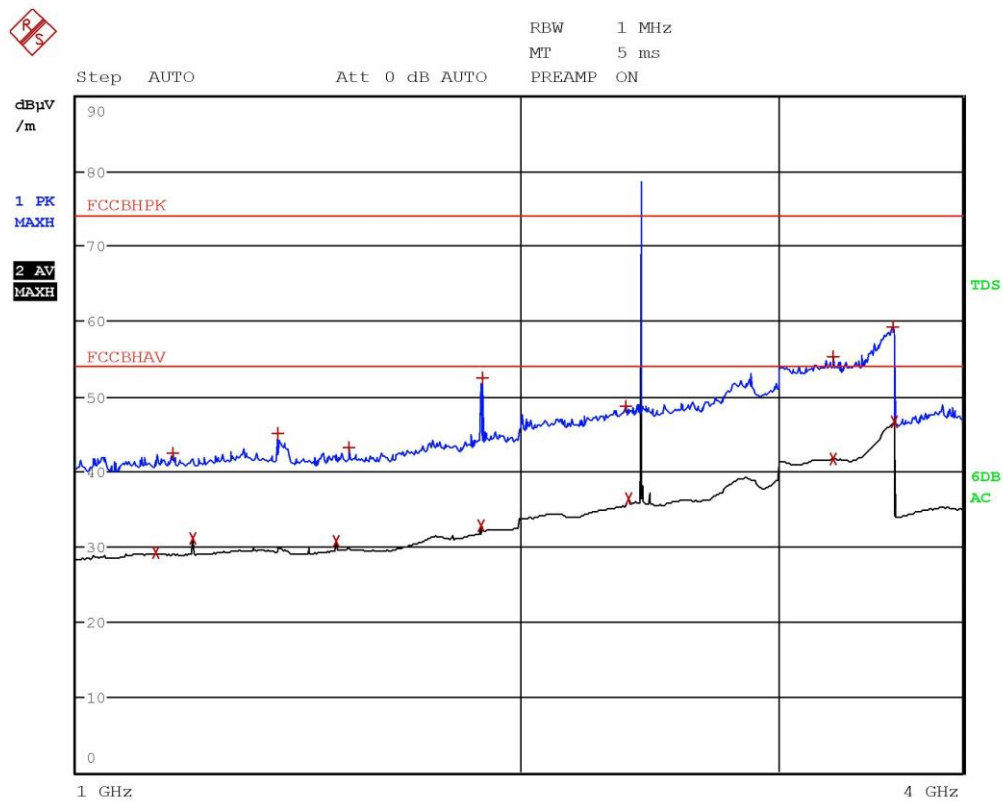


Panozzo 18044403 Horiz In Funzione tx Ch 61



EDIT PEAK LIST (Prescan Results)			
Trace1:	FCCBHPK		
Trace2:	FCCBHAV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBμV/m	DELTA LIMIT dB
2 Average	1.14 GHz	29.27	-24.70
1 Max Peak	1.1664 GHz	41.93	-32.04
2 Average	1.2 GHz	30.20	-23.77
1 Max Peak	1.236 GHz	42.76	-31.21
1 Max Peak	1.66 GHz	43.30	-30.67
2 Average	1.68 GHz	30.25	-23.72
1 Max Peak	1.8848 GHz	51.59	-22.38
2 Average	1.8852 GHz	32.81	-21.16
1 Max Peak	2.2864 GHz	48.48	-25.49
2 Average	2.3756 GHz	35.65	-18.33
1 Max Peak	3.1976 GHz	54.89	-19.09
2 Average	3.2976 GHz	41.62	-12.35
1 Max Peak	3.5916 GHz	59.26	-14.71
2 Average	3.598 GHz	46.68	-7.29

Panozzo 18044403 Horiz In Funzione tx Ch 61

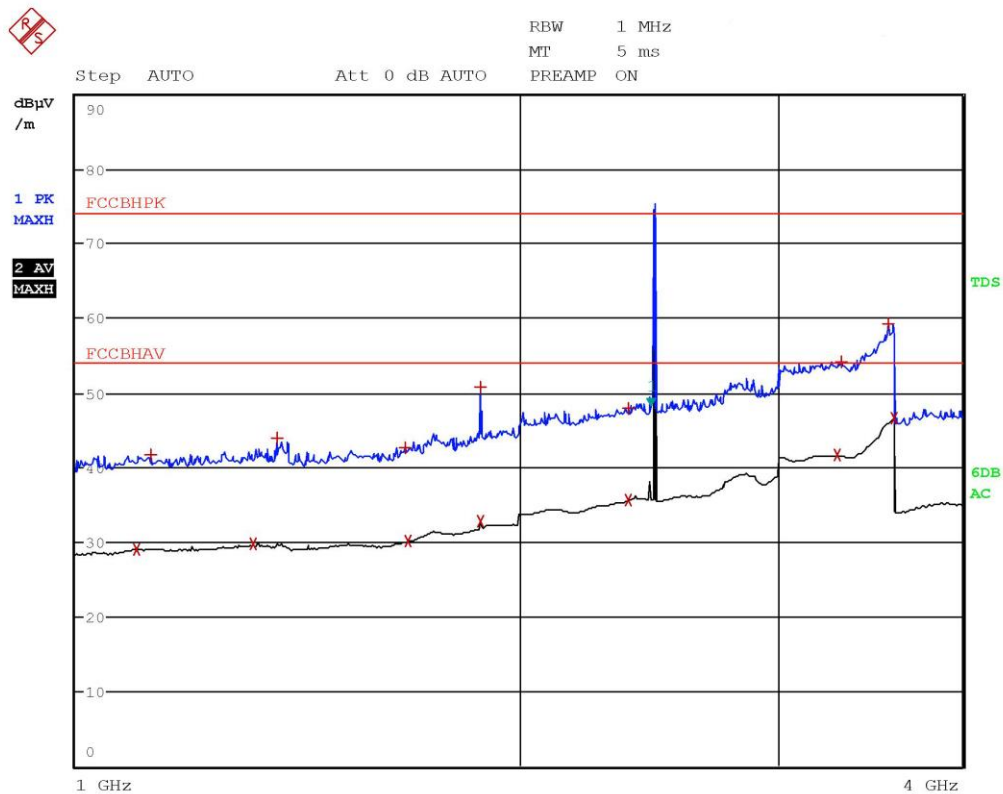


Panozzo 18044404 Vert In Funzione tx Ch 61



EDIT PEAK LIST (Prescan Results)			
Trace1:	FCCBHPK		
Trace2:	FCCBHAV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBμV/m	DELTA LIMIT dB
2 Average	1.1312 GHz	29.16	-24.81
1 Max Peak	1.1616 GHz	42.40	-31.57
2 Average	1.2 GHz	31.18	-22.79
1 Max Peak	1.3712 GHz	45.04	-28.93
2 Average	1.5 GHz	30.78	-23.19
1 Max Peak	1.5328 GHz	43.16	-30.81
2 Average	1.8852 GHz	32.76	-21.21
1 Max Peak	1.8856 GHz	52.40	-21.57
1 Max Peak	2.3604 GHz	48.65	-25.32
2 Average	2.3708 GHz	36.39	-17.58
1 Max Peak	3.2652 GHz	55.35	-18.62
2 Average	3.266 GHz	41.66	-12.31
1 Max Peak	3.5896 GHz	59.33	-14.64
2 Average	3.5972 GHz	46.65	-7.32

Panozzo 18044404 Vert In Funzione tx Ch 61

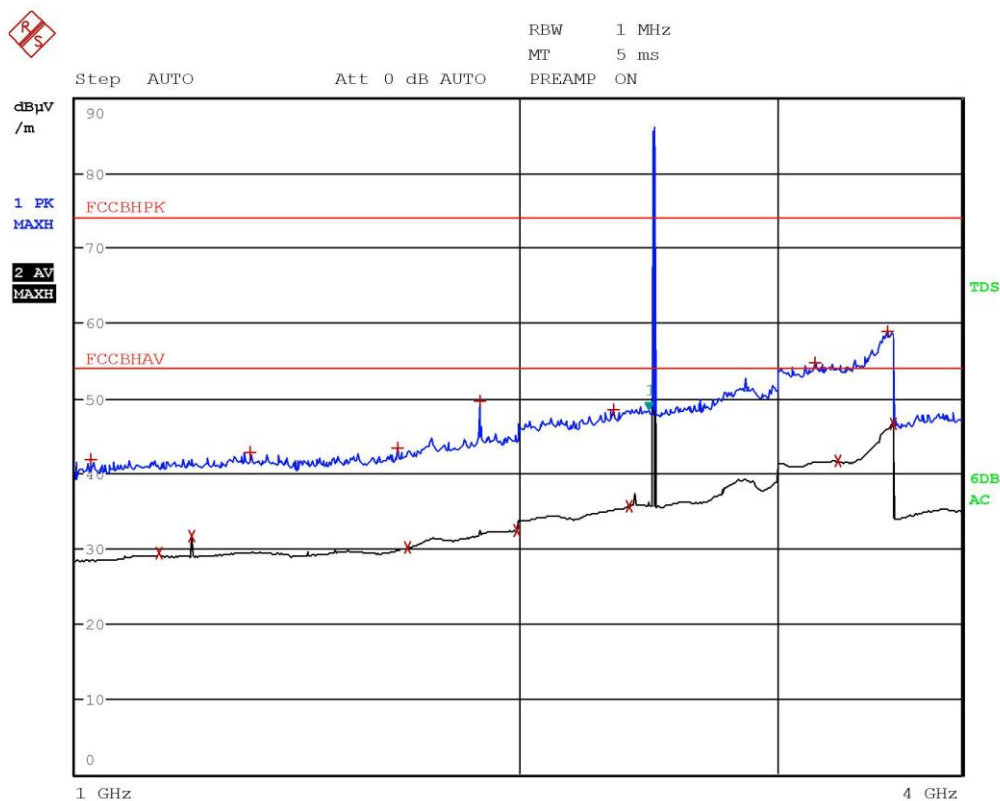


Panozzo 18044405 Vert In Funzione tx Ch 81



EDIT PEAK LIST (Prescan Results)			
Trace1:	FCCBHPK		
Trace2:	FCCBHAV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBμV/m	DELTA LIMIT dB
2 Average	1.0996 GHz	29.09	-24.88
1 Max Peak	1.1252 GHz	41.63	-32.34
2 Average	1.32 GHz	29.86	-24.11
1 Max Peak	1.3696 GHz	43.89	-30.08
1 Max Peak	1.6728 GHz	42.58	-31.39
2 Average	1.6812 GHz	30.08	-23.89
1 Max Peak	1.8852 GHz	50.76	-23.21
2 Average	1.8852 GHz	32.78	-21.19
2 Average	2.3704 GHz	35.62	-18.36
1 Max Peak	2.3728 GHz	47.96	-26.01
2 Average	3.2864 GHz	41.60	-12.38
1 Max Peak	3.3112 GHz	54.21	-19.76
1 Max Peak	3.5624 GHz	59.27	-14.70
2 Average	3.5996 GHz	46.61	-7.36

Panozzo 18044405 Vert In Funzione tx Ch 81

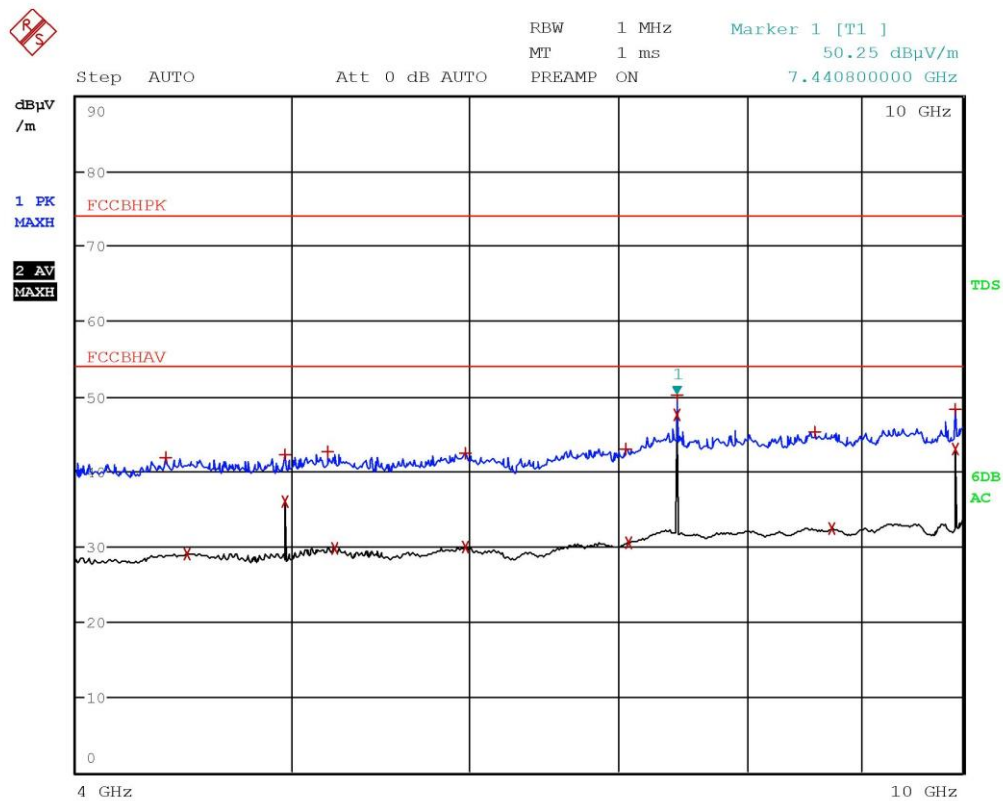


Panozzo 18044406 Horiz. In Funzione tx Ch 81



EDIT PEAK LIST (Prescan Results)			
Trace1:	FCCBHPK		
Trace2:	FCCBHAV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBμV/m	DELTA LIMIT dB
1 Max Peak	1.024 GHz	41.88	-32.09
2 Average	1.14 GHz	29.32	-24.65
2 Average	1.2 GHz	31.61	-22.36
1 Max Peak	1.314 GHz	42.83	-31.14
1 Max Peak	1.6572 GHz	43.38	-30.59
2 Average	1.68 GHz	30.08	-23.89
1 Max Peak	1.8852 GHz	49.64	-24.33
2 Average	1.9972 GHz	32.41	-21.56
1 Max Peak	2.3184 GHz	48.52	-25.45
2 Average	2.3776 GHz	35.66	-18.31
1 Max Peak	3.1804 GHz	54.69	-19.28
2 Average	3.2952 GHz	41.64	-12.33
1 Max Peak	3.5604 GHz	58.95	-15.02
2 Average	3.6 GHz	46.64	-7.33

Panozzo 18044406 Horiz. In Funzione tx Ch 81

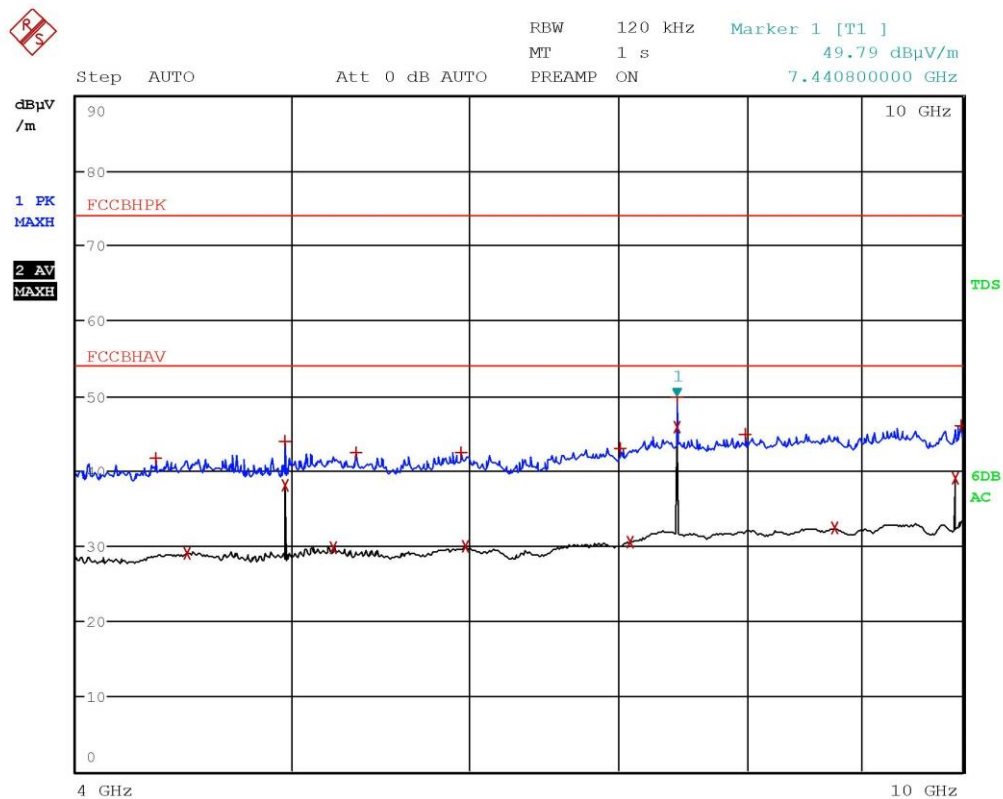


Panozzo 18044407 Horiz. In Funzione tx Ch 81



EDIT PEAK LIST (Prescan Results)			
Trace1:	FCCBHPK		
Trace2:	FCCBHAV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBμV/m	DELTA LIMIT dB
1 Max Peak	4.3856 GHz	41.91	-32.06
2 Average	4.4852 GHz	29.08	-24.89
1 Max Peak	4.9600 GHz	42.32	-31.66
2 Average	4.9600 GHz	36.00	-17.97
1 Max Peak	5.1896 GHz	42.55	-31.43
2 Average	5.2232 GHz	29.83	-24.14
1 Max Peak	5.98 GHz	42.46	-31.51
2 Average	5.9836 GHz	30.05	-23.92
1 Max Peak	7.0572 GHz	42.97	-31.00
2 Average	7.0764 GHz	30.54	-23.43
1 Max Peak	7.4400 GHz	50.24	-23.73
2 Average	7.4400 GHz	47.47	-6.50
1 Max Peak	8.5772 GHz	45.30	-28.67
2 Average	8.7408 GHz	32.43	-21.54
1 Max Peak	9.9200 GHz	48.26	-25.71
2 Average	9.9200 GHz	43.06	-10.92

Panozzo 18044407 Horiz. In Funzione tx Ch 81

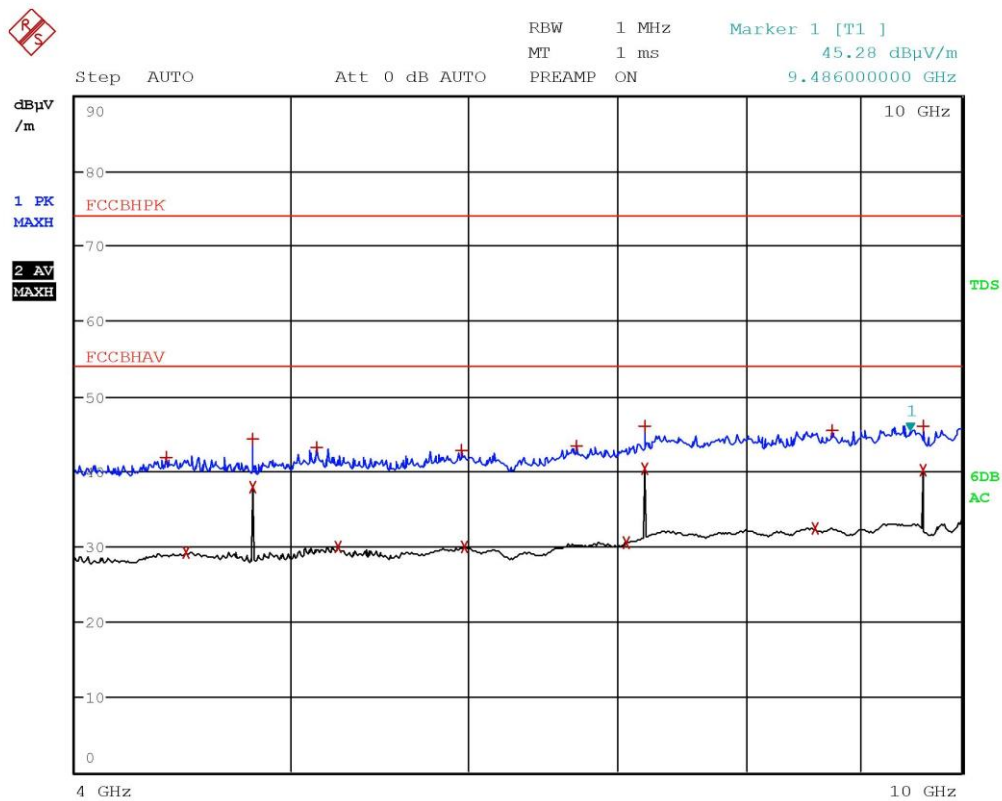


Panozzo 18044408 Vert. In Funzione tx Ch 81



EDIT PEAK LIST (Prescan Results)			
Trace1:	FCCBHPK		
Trace2:	FCCBHAV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBμV/m	DELTA LIMIT dB
1 Max Peak	4.3448 GHz	41.63	-32.34
2 Average	4.4848 GHz	29.07	-24.90
1 Max Peak	4.9600 GHz	43.93	-30.04
2 Average	4.9600 GHz	38.15	-15.82
2 Average	5.2212 GHz	29.78	-24.19
1 Max Peak	5.3396 GHz	42.46	-31.51
1 Max Peak	5.9564 GHz	42.46	-31.51
2 Average	5.9852 GHz	30.02	-23.95
1 Max Peak	7.0184 GHz	43.07	-30.90
2 Average	7.09 GHz	30.55	-23.42
1 Max Peak	7.4400 GHz	49.79	-24.18
2 Average	7.4400 GHz	45.91	-8.07
1 Max Peak	7.984 GHz	44.96	-29.01
2 Average	8.7664 GHz	32.35	-21.62
2 Average	9.9200 GHz	38.96	-15.01
1 Max Peak	9.984 GHz	45.99	-27.98

Panozzo 18044408 Vert. In Funzione tx Ch 81

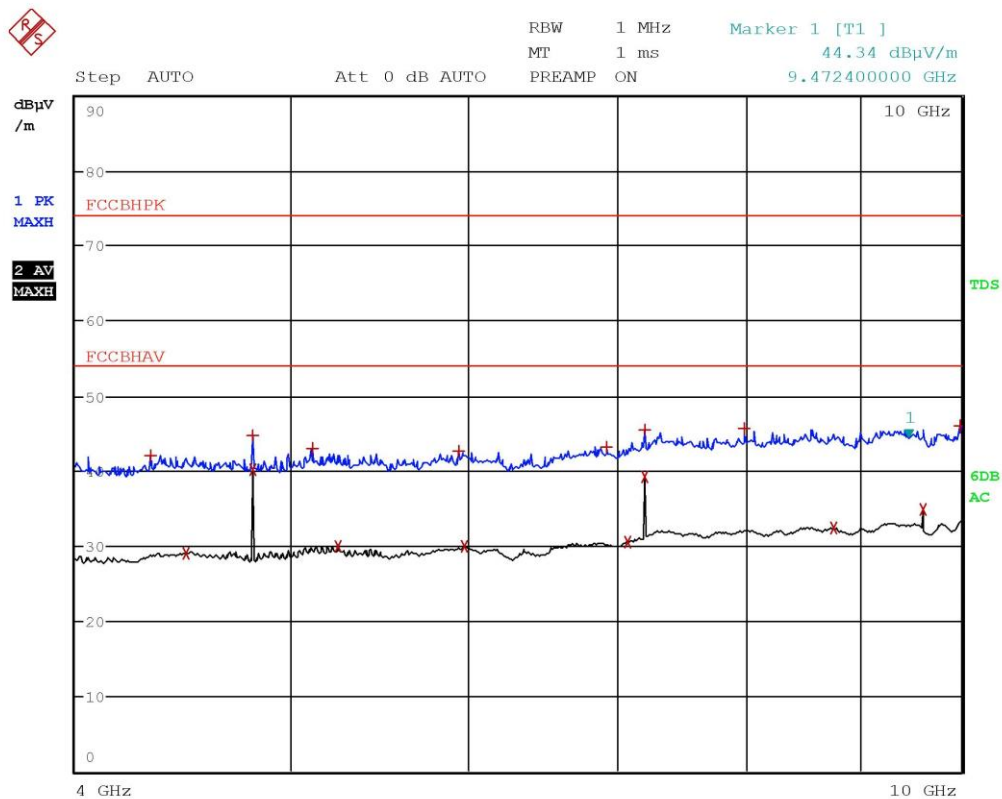


Panozzo 18044411 Horiz. In Funzione tx Ch 42



EDIT PEAK LIST (Prescan Results)			
Trace1:	FCCBHPK		
Trace2:	FCCBHAV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBμV/m	DELTA LIMIT dB
1 Max Peak	4.3936 GHz	41.84	-32.13
2 Average	4.4848 GHz	29.21	-24.76
1 Max Peak	4.8044 GHz	44.28	-29.69
2 Average	4.8044 GHz	37.92	-16.05
1 Max Peak	5.136 GHz	43.19	-30.78
2 Average	5.25 GHz	29.91	-24.06
1 Max Peak	5.9628 GHz	42.79	-31.18
2 Average	5.9836 GHz	30.05	-23.92
1 Max Peak	6.7188 GHz	43.48	-30.50
2 Average	7.0716 GHz	30.54	-23.43
1 Max Peak	7.2066 GHz	45.98	-27.99
2 Average	7.2066 GHz	40.37	-13.61
2 Average	8.5924 GHz	32.41	-21.56
1 Max Peak	8.7504 GHz	45.48	-28.49
1 Max Peak	9.6080 GHz	46.02	-27.95
2 Average	9.6080 GHz	40.23	-13.74

Panozzo 18044411 Horiz. In Funzione tx Ch 42



Panozzo 18044412 Vert . In Funzione tx Ch 42



EDIT PEAK LIST (Prescan Results)			
Trace1:	FCCBHPK		
Trace2:	FCCBHAV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBμV/m	DELTA LIMIT dB
1 Max Peak	4.3212 GHz	42.13	-31.84
2 Average	4.4836 GHz	29.08	-24.89
1 Max Peak	4.8044 GHz	44.67	-29.30
2 Average	4.8044 GHz	40.23	-13.75
1 Max Peak	5.108 GHz	42.96	-31.01
2 Average	5.2496 GHz	29.89	-24.08
1 Max Peak	5.9472 GHz	42.61	-31.36
2 Average	5.978 GHz	30.02	-23.95
1 Max Peak	6.9276 GHz	43.28	-30.69
2 Average	7.0788 GHz	30.56	-23.41
1 Max Peak	7.2066 GHz	45.50	-28.47
2 Average	7.2066 GHz	39.24	-14.73
1 Max Peak	7.992 GHz	45.56	-28.41
2 Average	8.7644 GHz	32.51	-21.46
2 Average	9.6080 GHz	34.85	-19.12
1 Max Peak	9.988 GHz	45.95	-28.03

Panozzo 18044412 Vert . In Funzione tx Ch 42

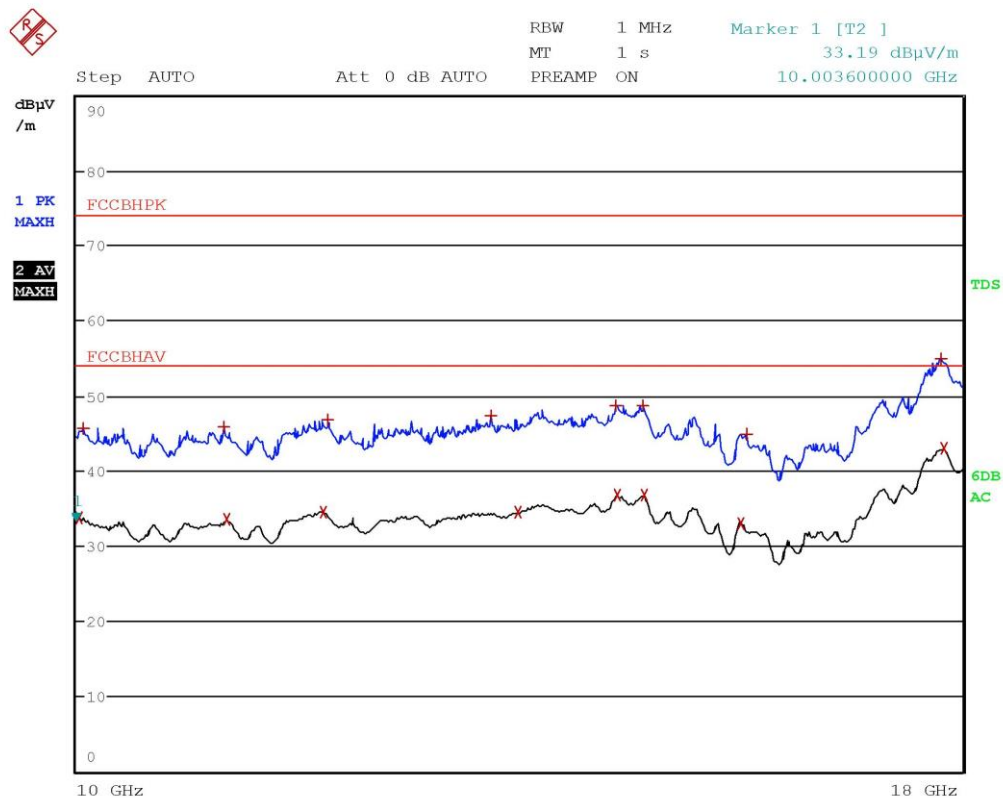


Panozzo 18044413 Vert . In Funzione tx Worst Case



EDIT PEAK LIST (Prescan Results)			
Trace1:	FCCBHPK		
Trace2:	FCCBHAV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBμV/m	DELTA LIMIT dB
2 Average	10.0248 GHz	33.66	-20.31
1 Max Peak	10.0876 GHz	45.55	-28.42
1 Max Peak	11.5384 GHz	46.10	-27.87
2 Average	11.5588 GHz	33.36	-20.61
1 Max Peak	12.272 GHz	48.18	-25.79
2 Average	12.2724 GHz	40.30	-13.67
1 Max Peak	13.254 GHz	46.62	-27.35
2 Average	13.3568 GHz	34.36	-19.61
1 Max Peak	14.2872 GHz	48.97	-25.00
2 Average	14.318 GHz	36.58	-17.39
2 Average	14.5648 GHz	36.49	-17.48
1 Max Peak	14.568 GHz	48.31	-25.66
2 Average	15.5404 GHz	33.06	-20.91
1 Max Peak	15.5508 GHz	45.45	-28.53
1 Max Peak	17.7804 GHz	55.34	-18.63
2 Average	17.788 GHz	43.09	-10.89

Panozzo 18044413 Vert . In Funzione tx Worst Case

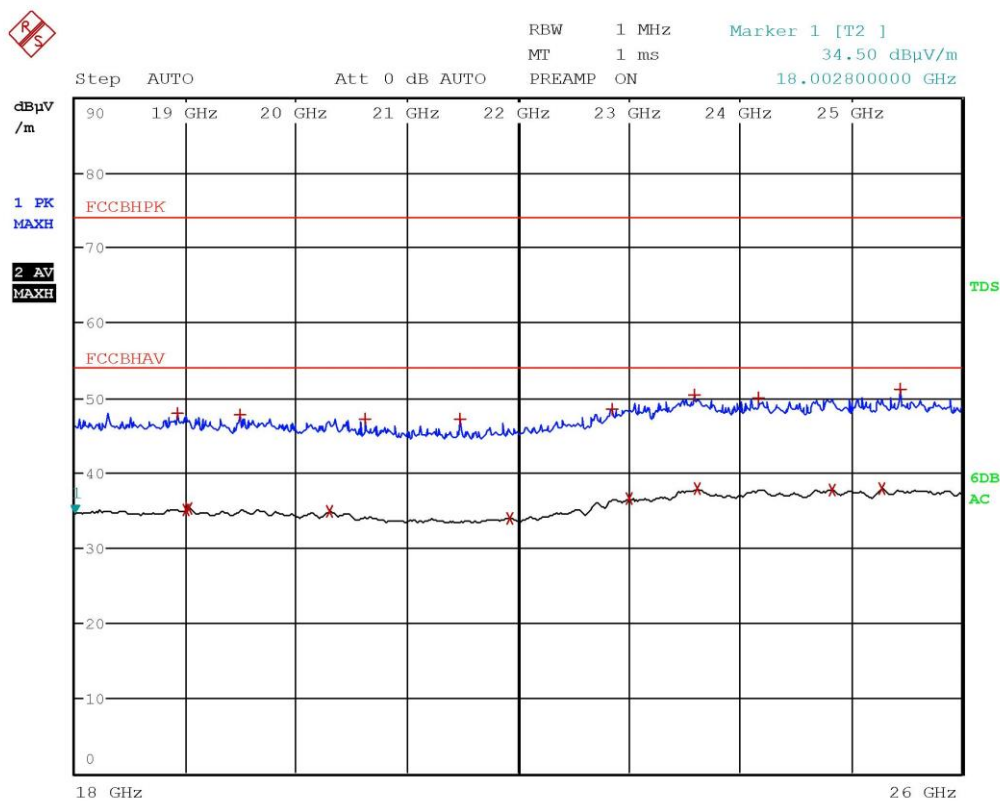


Panozzo 18044414 Horiz. In Funzione tx Worst Case



EDIT PEAK LIST (Prescan Results)			
Trace1:	FCCBHPK		
Trace2:	FCCBHAV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBμV/m	DELTA LIMIT dB
2 Average	10.018 GHz	33.70	-20.27
1 Max Peak	10.0468 GHz	45.73	-28.24
1 Max Peak	11.0312 GHz	45.83	-28.14
2 Average	11.046 GHz	33.48	-20.49
2 Average	11.7796 GHz	34.51	-19.46
1 Max Peak	11.8148 GHz	46.74	-27.23
1 Max Peak	13.1604 GHz	47.28	-26.69
2 Average	13.4044 GHz	34.44	-19.53
1 Max Peak	14.3096 GHz	48.71	-25.27
2 Average	14.3152 GHz	36.76	-17.21
1 Max Peak	14.5616 GHz	48.67	-25.30
2 Average	14.576 GHz	36.75	-17.22
2 Average	15.5404 GHz	33.04	-20.94
1 Max Peak	15.604 GHz	44.84	-29.13
1 Max Peak	17.7516 GHz	54.98	-18.99
2 Average	17.7808 GHz	43.03	-10.94

Panozzo 18044414 Horiz. In Funzione tx Worst Case

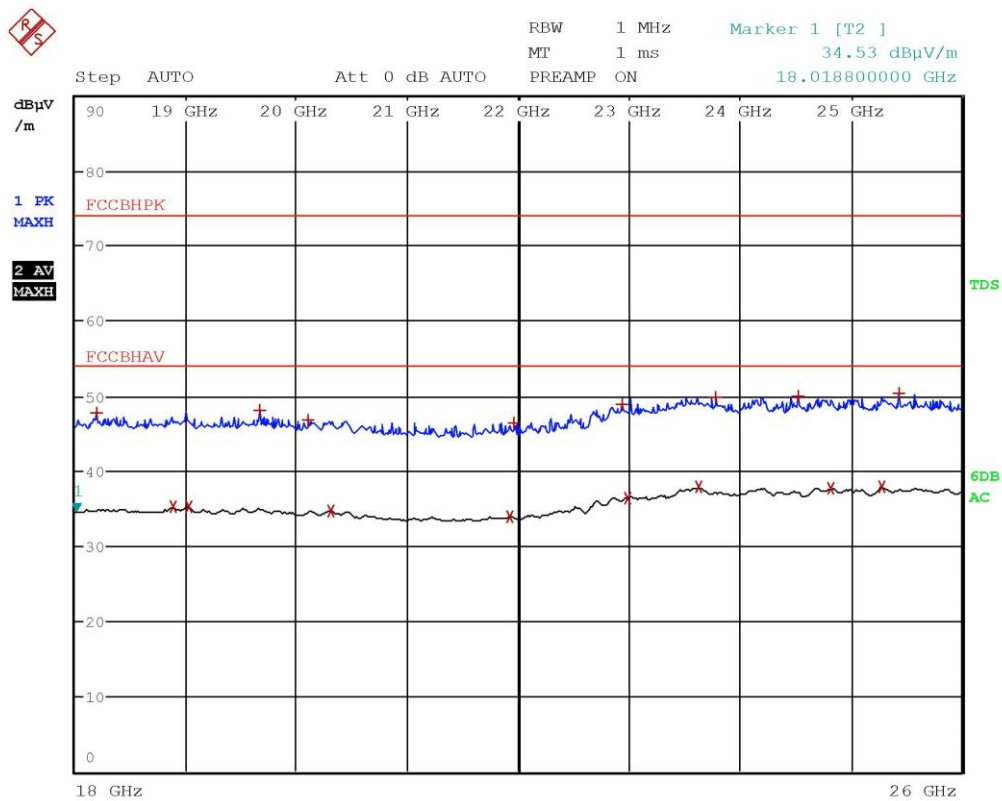


Panozzo 18044415 Horiz. In Funzione tx Worst Case



EDIT PEAK LIST (Prescan Results)			
Trace1:	FCCBHPK		
Trace2:	FCCBHAV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBμV/m	DELTA LIMIT dB
1 Max Peak	18.9184 GHz	47.88	-26.10
2 Average	18.9976 GHz	35.10	-18.87
2 Average	19.0196 GHz	35.20	-18.77
1 Max Peak	19.4928 GHz	47.70	-26.27
2 Average	20.2936 GHz	34.83	-19.15
1 Max Peak	20.616 GHz	47.13	-26.84
1 Max Peak	21.4696 GHz	47.12	-26.85
2 Average	21.9168 GHz	34.02	-19.95
1 Max Peak	22.8484 GHz	48.48	-25.50
2 Average	22.9948 GHz	36.62	-17.35
1 Max Peak	23.5884 GHz	50.31	-23.67
2 Average	23.6176 GHz	37.82	-16.15
1 Max Peak	24.1612 GHz	50.05	-23.92
2 Average	24.8288 GHz	37.81	-16.16
2 Average	25.2868 GHz	37.85	-16.12
1 Max Peak	25.4504 GHz	51.22	-22.75

Panozzo 18044415 Horiz. In Funzione tx Worst Case

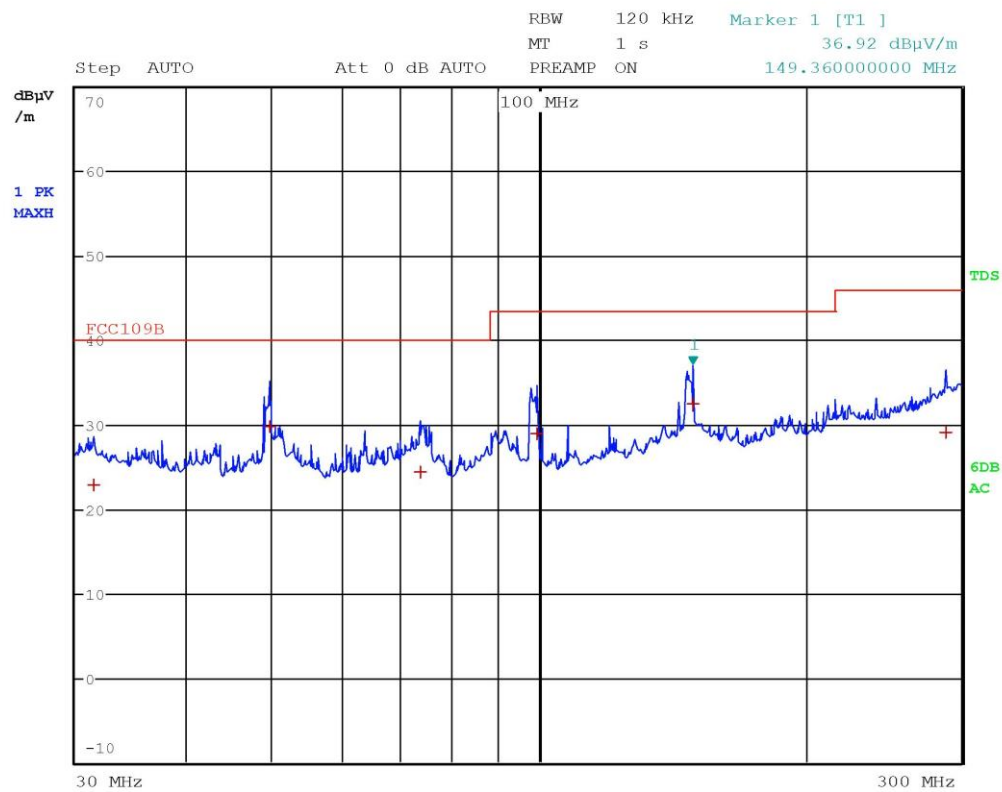


Panozzo 18044416 Vert. In Funzione tx Worst Case



EDIT PEAK LIST (Prescan Results)			
Trace1:	FCCBHPK		
Trace2:	FCCBHAV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBμV/m	DELTA LIMIT dB
1 Max Peak	18.1924 GHz	47.75	-26.22
2 Average	18.8784 GHz	35.30	-18.67
2 Average	19.0224 GHz	35.25	-18.72
1 Max Peak	19.6664 GHz	48.12	-25.85
1 Max Peak	20.1024 GHz	46.75	-27.22
2 Average	20.3092 GHz	34.69	-19.28
2 Average	21.9232 GHz	33.99	-19.98
1 Max Peak	21.9588 GHz	46.45	-27.52
1 Max Peak	22.9364 GHz	48.93	-25.05
2 Average	22.9968 GHz	36.48	-17.49
2 Average	23.6304 GHz	37.85	-16.13
1 Max Peak	23.7764 GHz	49.88	-24.09
1 Max Peak	24.5316 GHz	50.01	-23.96
2 Average	24.8248 GHz	37.78	-16.19
2 Average	25.2868 GHz	37.99	-15.98
1 Max Peak	25.4348 GHz	50.31	-23.66

Panozzo 18044416 Vert. In Funzione tx Worst Case

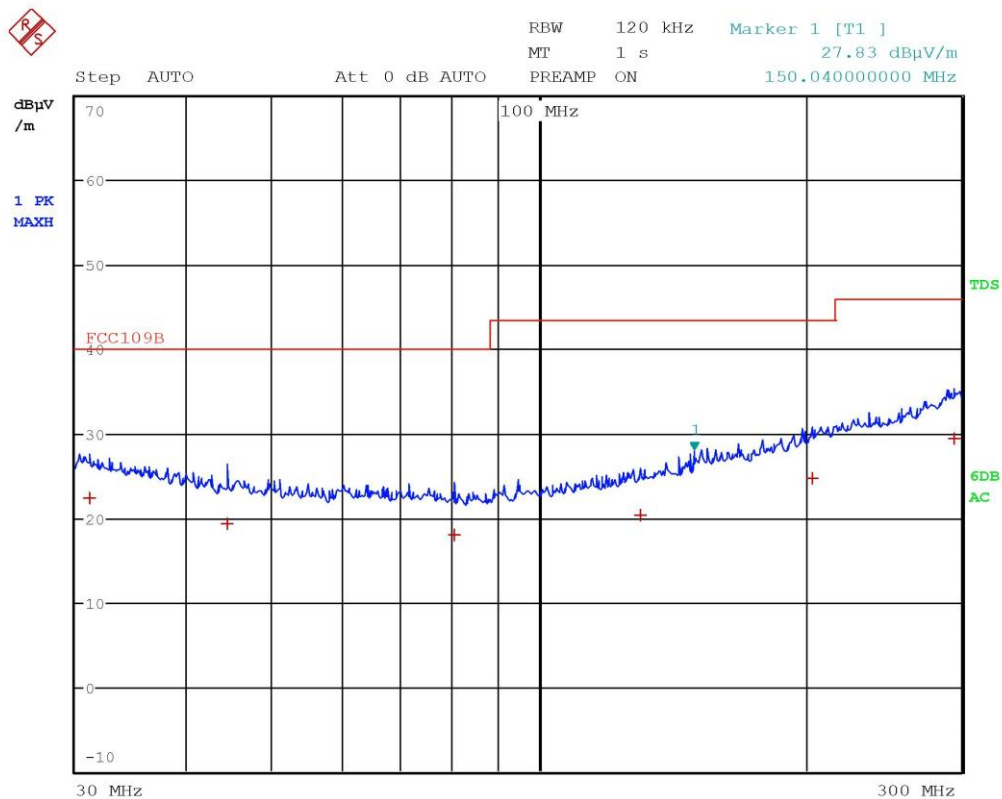


Panozzo 18044417 Vert. In Funzione tx Worst Case



EDIT PEAK LIST (Final Measurement Results)			
Trace1:	FCC109B		
Trace2:	---		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBμV/m	DELTA LIMIT dB
1 Quasi Peak	31.4 MHz	22.92	-17.07
1 Quasi Peak	49.72 MHz	29.72	-10.27
1 Quasi Peak	73.48 MHz	24.41	-15.58
1 Quasi Peak	99.52 MHz	28.94	-14.57
1 Quasi Peak	149.36 MHz	32.51	-11.00
1 Quasi Peak	288.4 MHz	29.10	-16.91

Panozzo 18044417 Vert. In Funzione tx Worst Case

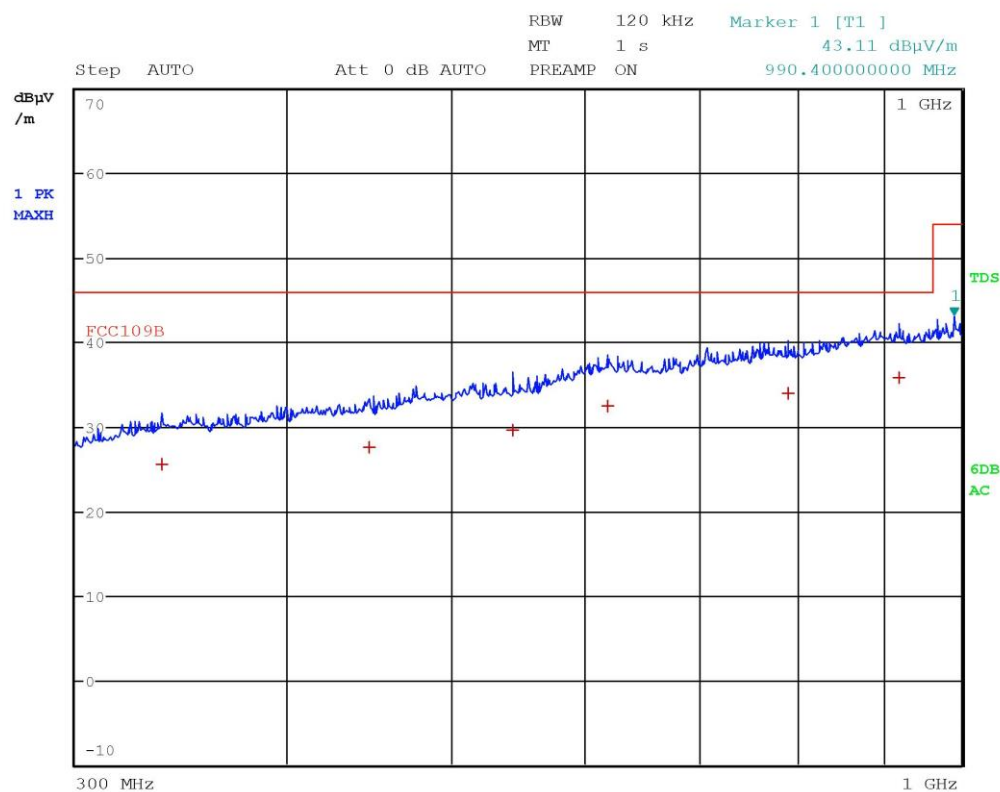


Panozzo 18044418 Horiz. In Funzione tx Worst Case



EDIT PEAK LIST (Final Measurement Results)			
Trace1:	FCC109B		
Trace2:	---		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBμV/m	DELTA LIMIT dB
1 Quasi Peak	31.08 MHz	22.43	-17.56
1 Quasi Peak	44.48 MHz	19.35	-20.64
1 Quasi Peak	80.28 MHz	17.97	-22.02
1 Quasi Peak	130.24 MHz	20.27	-23.24
1 Quasi Peak	203.52 MHz	24.73	-18.78
1 Quasi Peak	294.2 MHz	29.33	-16.68

Panozzo 18044418 Horiz. In Funzione tx Worst Case

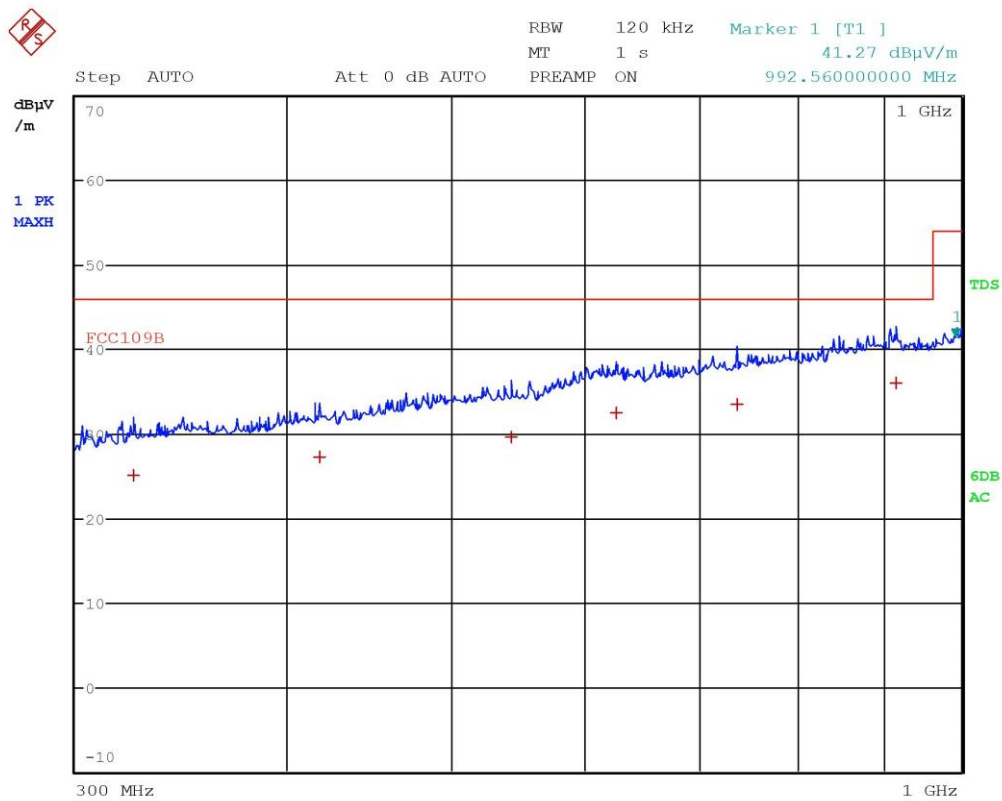


Panozzo 18044419 Horiz. In Funzione tx Worst Case



EDIT PEAK LIST (Final Measurement Results)			
Trace1:	FCC109B		
Trace2:	---		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBμV/m	DELTA LIMIT dB
1 Quasi Peak	337.6 MHz	25.53	-20.49
1 Quasi Peak	447.52 MHz	27.61	-18.40
1 Quasi Peak	543.28 MHz	29.58	-16.43
1 Quasi Peak	618.16 MHz	32.39	-13.62
1 Quasi Peak	789.68 MHz	33.89	-12.12
1 Quasi Peak	918.76 MHz	35.87	-10.14

Panozzo 18044419 Horiz. In Funzione tx Worst Case

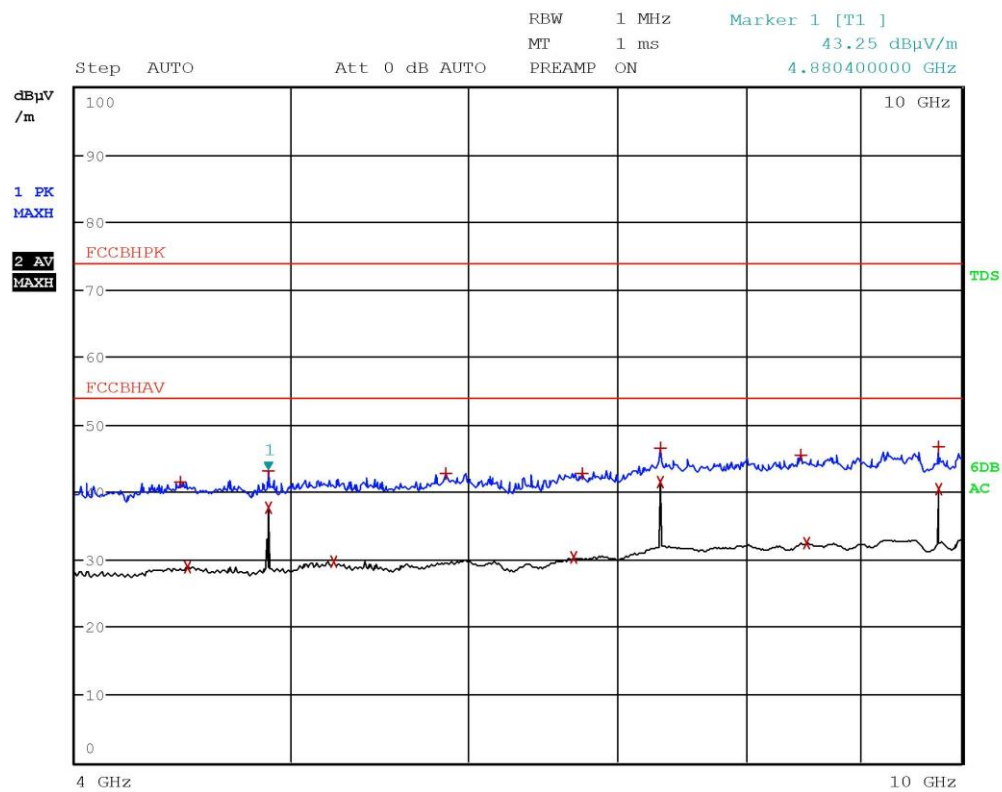


Panozzo 18044420 Vert. In Funzione tx Worst Case



EDIT PEAK LIST (Final Measurement Results)			
Trace1:	FCC109B		
Trace2:	---		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBμV/m	DELTA LIMIT dB
1 Quasi Peak	324.76 MHz	25.01	-21.00
1 Quasi Peak	418.12 MHz	27.21	-18.80
1 Quasi Peak	542.48 MHz	29.65	-16.36
1 Quasi Peak	625.08 MHz	32.48	-13.53
1 Quasi Peak	737 MHz	33.37	-12.65
1 Quasi Peak	915.72 MHz	35.89	-10.12

Panozzo 18044420 Vert. In Funzione tx Worst Case

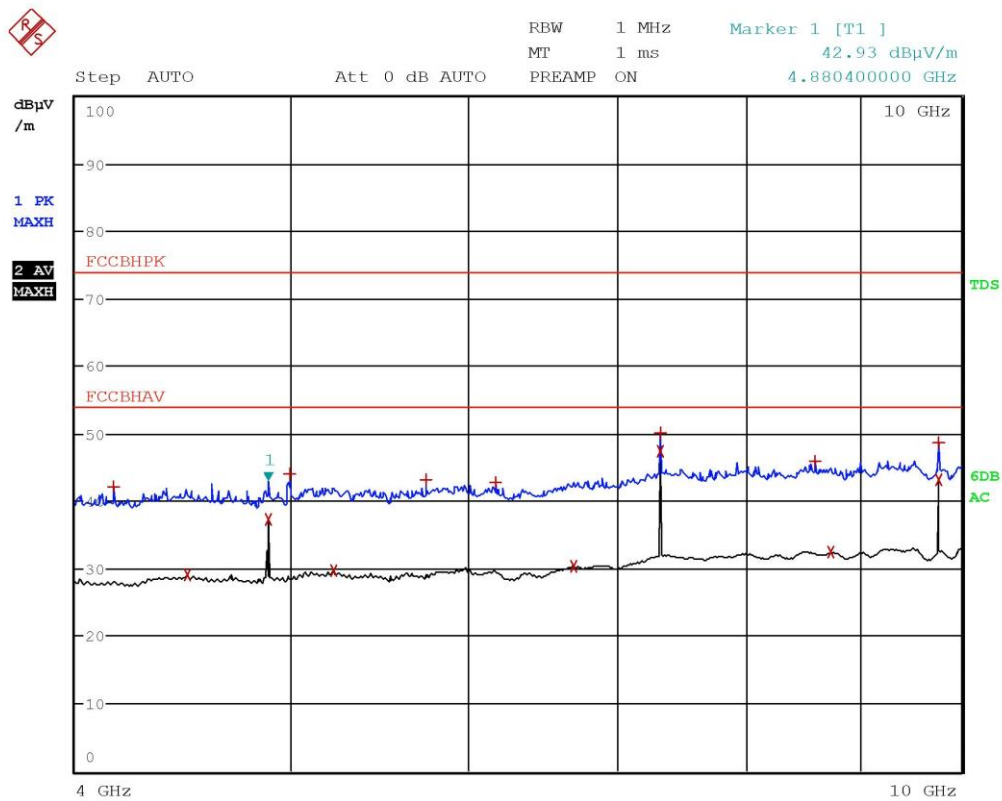


Panozzo 18044422 Vert. In funzione Tx Ch61



EDIT PEAK LIST (Prescan Results)			
Trace1:	FCCBHPK		
Trace2:	FCCBHAV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBμV/m	DELTA LIMIT dB
1 Max Peak	4.4592 GHz	41.54	-32.43
2 Average	4.4884 GHz	28.92	-25.05
1 Max Peak	4.8804 GHz	43.24	-30.73
2 Average	4.8804 GHz	37.73	-16.24
2 Average	5.2228 GHz	29.70	-24.27
1 Max Peak	5.8644 GHz	42.69	-31.28
2 Average	6.6964 GHz	30.29	-23.68
1 Max Peak	6.7516 GHz	42.81	-31.16
1 Max Peak	7.3208 GHz	46.48	-27.49
2 Average	7.3208 GHz	41.55	-12.42
1 Max Peak	8.4712 GHz	45.52	-28.45
2 Average	8.5248 GHz	32.45	-21.52
1 Max Peak	9.7608 GHz	46.65	-27.32
2 Average	9.7608 GHz	40.46	-13.51

Panozzo 18044422 Vert. In funzione Tx Ch61



Panozzo 18044423 Horiz. In funzione Tx Ch61



EDIT PEAK LIST (Prescan Results)			
Trace1:	FCCBHPK		
Trace2:	FCCBHAV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBμV/m	DELTA LIMIT dB
1 Max Peak	4.1592 GHz	42.07	-31.90
2 Average	4.4904 GHz	28.99	-24.98
2 Average	4.8804 GHz	37.24	-16.73
1 Max Peak	4.9928 GHz	44.09	-29.88
2 Average	5.2248 GHz	29.62	-24.35
1 Max Peak	5.7512 GHz	43.13	-30.84
1 Max Peak	6.1764 GHz	42.84	-31.13
2 Average	6.6944 GHz	30.28	-23.69
1 Max Peak	7.3208 GHz	50.11	-23.86
2 Average	7.3208 GHz	47.35	-6.62
1 Max Peak	8.6012 GHz	45.87	-28.10
2 Average	8.7356 GHz	32.48	-21.49
1 Max Peak	9.7608 GHz	48.69	-25.28
2 Average	9.7608 GHz	43.08	-10.89

Panozzo 18044423 Horiz. In funzione Tx Ch61

Result: The requirements are met



10.2 Spurious Emission

Test set-up and execution

- FCC Rules and Regulation; Titles 47 Part. 15.209
- KDB 558074 D01 DTS Meas Guidance v04 cl. 11 and 12
- ANSI C63.10 cl. 6.6
- Internal procedure PM001
- See clause 4 of this test report
- Test date: June 19th, 2018
- Technician: C. Panozzo

EUT exercising

See clause 4 of this test report

Test specification

Port: Enclosure
Antenna polarization: Horizontal (H) – Vertical (V)
EUT height about the floor: 150 cm
EUT – Antenna distance: 3 m
Detector AV + Peak

Test configuration

Test site:
Semi-anechoic chamber

Auxiliary equipment:
See clause 4 of this test report

Test equipment used

CMC S164, CMC S241, CMC S251, CMC S290,
CMC S298
Measurement uncertainty: See clause 6 of this
test report

Environmental conditions

Temperature (°C)	Atmospheric pressure (kPa)	Relative humidity (%)
22	100	45

Acceptance limits

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



The restricted frequency bands are listed in the following table

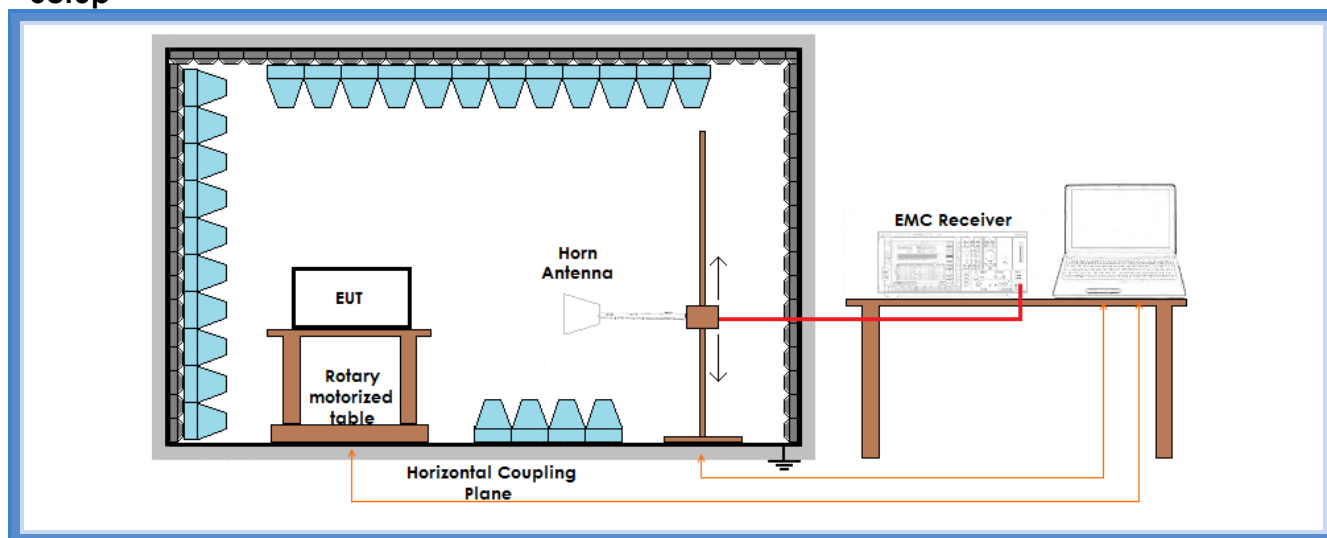
MHz	MHz	MHz	GHz
0,09 – 0,110	16,42 – 16,423	399,9 – 410	4,5 – 5,15
0,495 – 0,505	16,69475 – 16,69525	608 – 614	5,35 – 5,46
2,1735 – 2,1905	16,80425 – 16,80475	960 – 1240	7,25 – 7,75
4,125 – 4,128	25,5 – 25,67	1300 – 1427	8,025 – 8,5
4,17725 – 4,17775	37,5 – 38,25	1435 – 1626,5	9,0 – 9,2
4,20725 – 4,20775	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
8,41425 – 8,41475	162,0125 – 167,17	3260 – 3267	23,6 – 24
12,29 – 12,293	167,72 – 173,2	3332 – 3339	31,2 – 31,8
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

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

Setup



Result – AV detector

Harmonic	Limits (dB μ V/m)	Level (dB μ V/m)			Results
		Lowest channel	Medium channel	Highest channel	
II	54	More than 20 dB below limit	More than 20 dB below limit	More than 20 dB below limit	Complies
III	54	More than 20 dB below limit	More than 20 dB below limit	More than 20 dB below limit	Complies
IV	54	More than 20 dB below limit	More than 20 dB below limit	More than 20 dB below limit	Complies
V	54	More than 20 dB below limit	More than 20 dB below limit	More than 20 dB below limit	Complies
VI	54	More than 20 dB below limit	More than 20 dB below limit	More than 20 dB below limit	Complies
VII	54	More than 20 dB below limit	More than 20 dB below limit	More than 20 dB below limit	Complies
VIII	54	More than 20 dB below limit	More than 20 dB below limit	More than 20 dB below limit	Complies
IX	54	More than 20 dB below limit	More than 20 dB below limit	More than 20 dB below limit	Complies
X	54	More than 20 dB below limit	More than 20 dB below limit	More than 20 dB below limit	Complies

Remarks: EUT was tested in 3 orthogonal planes. The results in this table show the highest values. No spurious other than harmonics have been found. The results have been extrapolated to the specified distance using an extrapolation factor. For all harmonics it was considered the limit of 54 dB μ V/m as a worst case.



Result – Peak detector

Harmonic	Limits (dB μ V/m)	Level (dB μ V/m)			Results
		Lowest channel	Medium channel	Highest channel	
II	74	More than 20 dB below limit	More than 20 dB below limit	More than 20 dB below limit	Complies
III	74	More than 20 dB below limit	More than 20 dB below limit	More than 20 dB below limit	Complies
IV	74	More than 20 dB below limit	More than 20 dB below limit	More than 20 dB below limit	Complies
V	74	More than 20 dB below limit	More than 20 dB below limit	More than 20 dB below limit	Complies
VI	74	More than 20 dB below limit	More than 20 dB below limit	More than 20 dB below limit	Complies
VII	74	More than 20 dB below limit	More than 20 dB below limit	More than 20 dB below limit	Complies
VIII	74	More than 20 dB below limit	More than 20 dB below limit	More than 20 dB below limit	Complies
IX	74	More than 20 dB below limit	More than 20 dB below limit	More than 20 dB below limit	Complies
X	74	More than 20 dB below limit	More than 20 dB below limit	More than 20 dB below limit	Complies

Remarks: EUT was tested in 3 orthogonal planes. The results in this table show the highest values. No spurious other than harmonics have been found. The results have been extrapolated to the specified distance using an extrapolation factor. For all harmonics it was considered the limit of 74 dB μ V/m as a worst case.

Result: The requirements are met