SENTON

EMV-Prüfzentrum ■ EMI/EMC-Testcenter ■

Straubing, June 2, 2004

T E S T - R E P O R T

No. 55145-40285

for

RRF 010

Applicant: TÜV Pfalz Palatina S.u.r.l.

Test Specifications: FCC Code of Federal Regulations, CFR 47, Part 15, Section 15.109

Table of Contents

1. Administrative Data

Test item (EUT)	
Type designation	RRF 010
Version of EUT:	as received
Serial number(s):	190830
Type of equipment:	remote control receiver
Parts/accessories:	---
FCC-ID:	---
Technical data	
Frequency range:	N/A
Operational frequencies:	433.92 MHz
Type of modulation:	ASK
Pulse frequency:	---
Pulse width:	---
Class of emission:	19K6A1D
Antenna:	external
Power supply:	12 V DC
Applicant: (full address)	TÜV Pfalz Palatina S.u.r.l. Via Gavardina, 7 I-25010 Ponte S. Marco (BS)
Contract identification:	---
Contact person:	N. Scartapacchio
Manufacturer:	TÜV Pfalz Palatina S.u.r.l.
Application details	
Receipt of EUT:	20 April 2004
Date of test:	April - May 2004
Note:	---

2. Identification of Test Laboratory

Details of the Test Laboratory	
Company name:	Senton GmbH EMI/EMC Test Center
Address:	Aeussere Fruehlingstrasse 45 D-94315 Straubing Germany
Laboratory Accreditation:	DAR-Registration No. TTI-P-G 062/94-01
FCC Test Site registration number	90926
Industry Canada Test site registration:	IC 3050
Name for contact purposes:	Mr. Johann Roidt Phone: (+49) (0)9421 5522-0 Fax: (+49) (0)9421 5522-99

3. Summary

Summary of test results
The tested sample complies with the requirements set forth in the **Code of Regulations CFR 47, Part 15, Section 15.109** of the Federal Communication Commission (FCC).

Personnel involved in this report	
Laboratory Manager:	 Mr. Johann Roidt
Responsible for testing:	Mr. Johann Roidt
Responsible for test report:	Mr. Johann Roidt

4. Operation Mode and Configuration of EUT

Operation Mode
normal operation mode

Configuration of EUT
full setup supplied by applicant

List of ports and cables

Port	*Description*	*Classification*[1]	*Cable type*	*Cable length*
full setup supplied by applicant				

List of devices connected to EUT

Item	*Description*	*Type Designation*	*Serial no. or ID*	*Manufacturer*
full setup supplied by applicant				

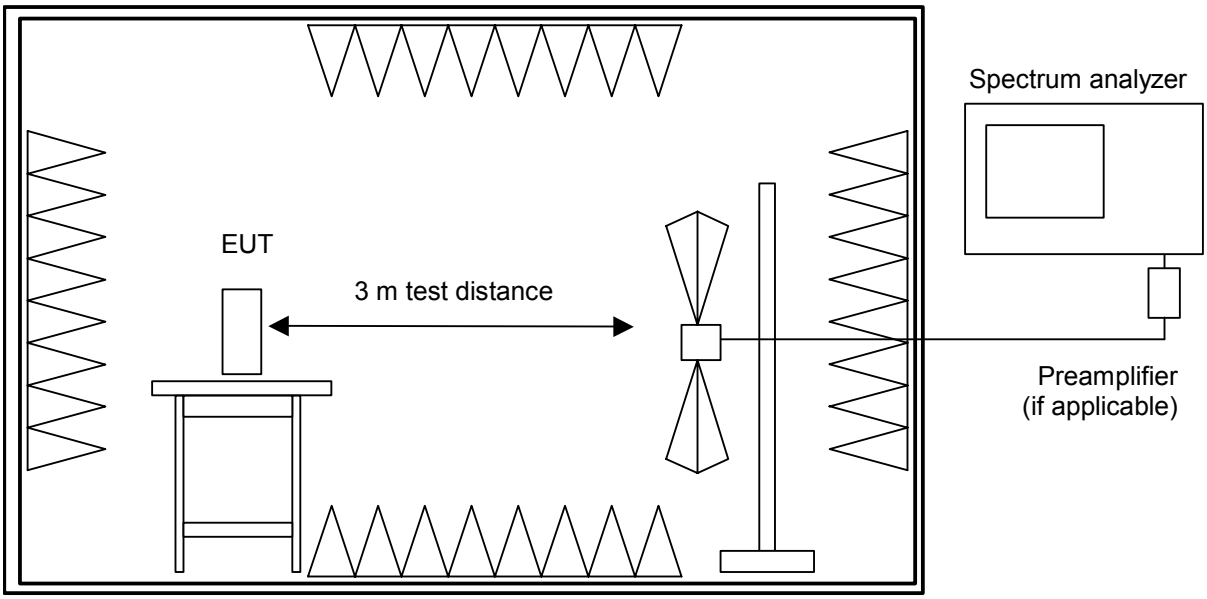
[1] Ports shall be classified as ac power, dc power or signal/control port

5. Measuring Methods

5.1. Radiated spurious emissions in fully-anechoic room

Rules and Specifications:	CFR 47 Part 15 section 15.109
Guide:	ANSI C63.4

Measurement Procedure:
Radiated emissions are measured over the frequency range from 30 MHz to the maximum frequency as specified in section 15.33. Measurements are made in both the horizontal and vertical planes of polarization in a fully anechoic room using a spectrum analyzer with the detector function set to peak and resolution as well as video bandwidth set to 100 kHz (below 1 GHz) or 1 MHz (above 1 GHz). All tests are performed at a test-distance of 3 meters. Hand-held or body-worn devices are rotated through three orthogonal axes to determine which attitude and configuration produces the highest emission relative to the limit and therefore shall be used for final testing. For final testing below 1 GHz an open-area test-site is used and the plots recorded in the fully-anechoic room are indicated as prescans. During the tests the EUT is rotated all around to find the maximum levels of emissions. The cables and equipment are placed and moved within the range of position likely to find their maximum emissions. If required preamplifiers are used for the whole frequency range. Special care is taken to avoid overload (using appropriate attenuators and filters if necessary).



Fully anechoic room

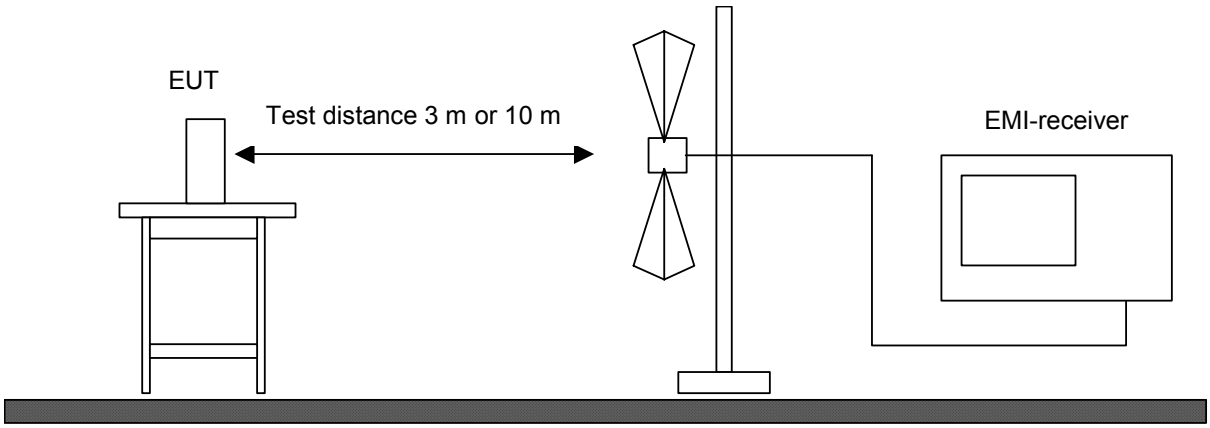
Test instruments used:

No.	Type	Model	Serial Number	Manufacturer
01	Spectrum Analyzer	FSP 30	100063	Rohde & Schwarz
02	Preamplifier	CPA9231A	3393	Schaffner
03	Biconical antenna	HK 116	829708/006	Rohde & Schwarz
04	Log. periodic antenna	3147	9112-1054	EMCO
05	Horn antenna	3115	9508-4553	EMCO
06	Horn antenna	3160-03	9112-1003	Emco
07	Horn antenna	3160-04	9112-1001	Emco
08	Horn antenna	3160-05	9112-1001	Emco
09	Horn antenna	3160-06	9112-1001	Emco
10	Horn antenna	3160-07	9112-1008	Emco
11	Horn antenna	3160-08	9112-1002	Emco
12	Horn antenna	3160-09	9403-1025	Emco
13	Preamplifier 1-8 GHz	AFS3-00100800-32-LN	847743	Miteq
14	Preamplifier 8-18 GHz	ACO/180-3530	32641	CTT
15	Fully anechoic room	No. 2	1452	Albatross Projects

5.2. Radiated spurious emissions at Open Area Test Site

Rules and Specifications:	CFR 47 Part 15 section 15.109
Guide:	ANSI C63.4

Measurement Procedure:
Radiated emissions at open area test site are measured in the frequency range 30 MHz to 1 GHz. The measurement bandwidth of the test receiver is set to 120 kHz with detector set to quasi-peak. Hand-held or body-worn devices are tested in the position producing the highest emission relative to the limit as verified by prescans in the fully-anechoic room. EUT is rotated all around and receiving antenna is raised and lowered to find the maximum levels of emission. The cables and equipment are placed and moved within the range of position likely to find their maximum emissions. In general a test-distance of 3 meters is selected. If a test-distance of 10 meters is used the limits are calculated according to 15.31 (d) and (f)(1). If required preamplifiers are used for the whole frequency range. Special care is taken to avoid overload (using appropriate attenuators and filters if necessary).

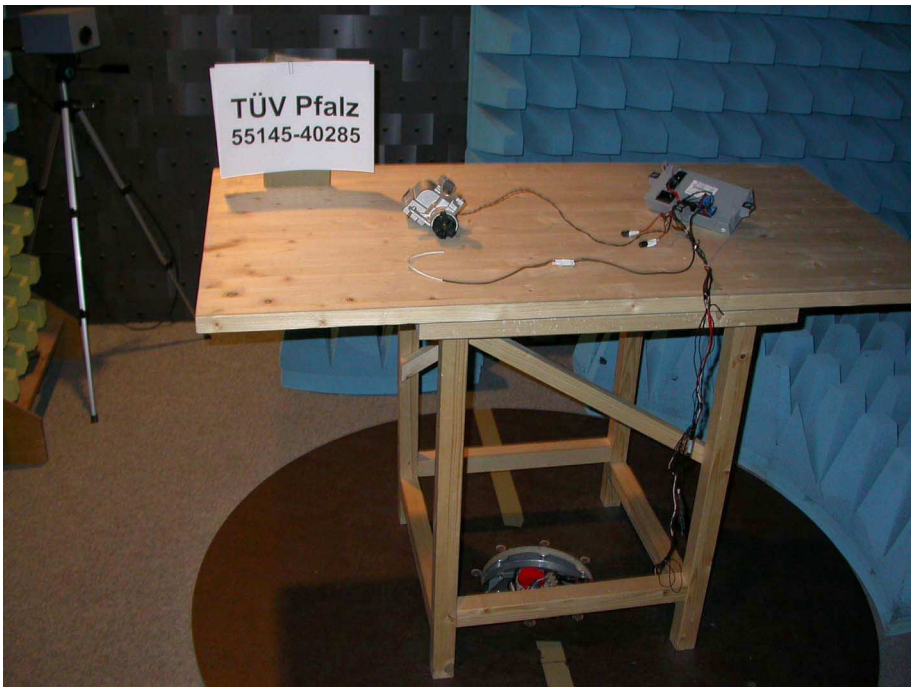


Test instruments used:

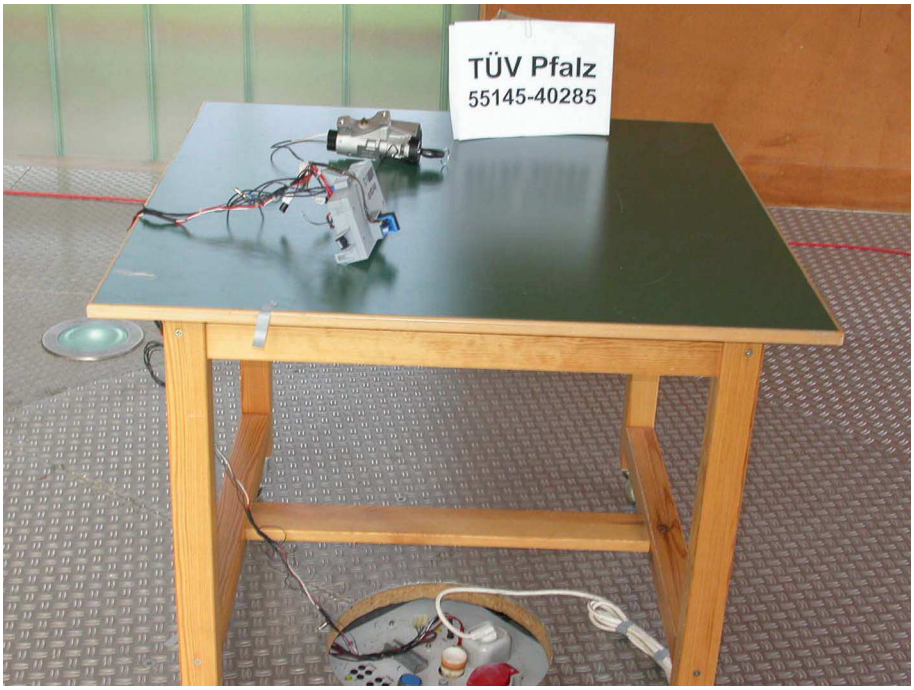
No.	Type	Model	Serial Number	Manufacturer
01	EMI Receiver	ESVP	881414/009	Rohde & Schwarz
02	Biconical antenna	HK 116	842204/001	Rohde & Schwarz
03	Log. periodic antenna	HL 223	841516/023	Rohde & Schwarz
08	Open Field Test Site	No. 1	N/A	Senton

6. Photographs Taken During Testing

Test setup for radiated spurious emissions test (fully anechoic room)



Test setup for radiated spurious emissions test (open area test site)



7. List of Measurements

FCC Part 15 Subpart B Class B			
Section(s):	**Test**	**Page(s)**	**Result**
15.109	Radiated spurious emissions		Passed

Radiated Spurious Emissions Measurement

Rules and Specifications:	CFR 47 Part 15 section 15.109
Guide:	ANSI C63.4
Limit:	Except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency of Emission (MHz)	Field Strength (microvolts/meter)
30 - 88	100
88 - 216	150
216 - 960	200
Above 960	500

Operation mode:	
Test Site:	Open Area Test Site (< 1 GHz), Fully anechoic chamber (> 1 GHz)
Distance:	3 meters
Date of Test:	04/27/2004

Frequency (MHz)	Detector	Antenna Polarization	Reading Value (dBµV)	Correction Factor (dB/m)	Field Strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)
128.293	Peak	horizontal	17.6	10.5	28.1	43.5	15.4
128.293	Peak	vertical	15.2	10.5	25.7	43.5	17.8

Sample calculation of field strength values:

Field Strength (dBµV/m) = Reading Value (dBµV) + Correction Factor (dB/m)

Test Results:	Passed

8. Referenced Regulations

All tests were performed with reference to the following regulations and standards:

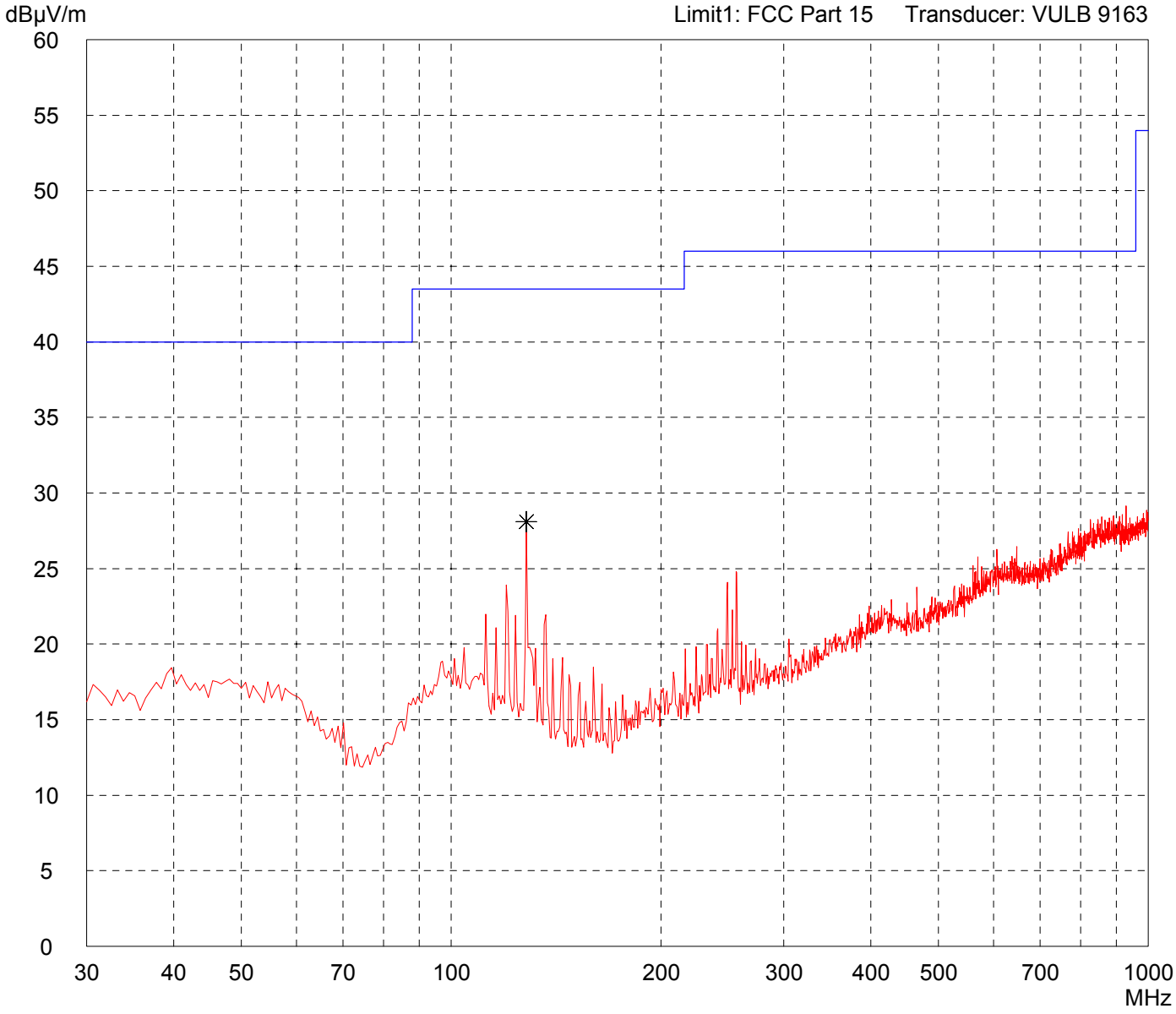
☒	CFR 47 Part 2	Code of Federal Regulations Part 2 (Frequency Allocations And Radio Treaty Matters, General Rules And Regulations) of the Federal Communication Commission (FCC)	October 1, 2001
☐	CFR 47 Part 15 Subpart A	Code of Federal Regulations Part 15 (Radio Frequency Devices), Subpart A (General) of the Federal Communication Commission (FCC)	March 13, 2003
☒	CFR 47 Part 15 Subpart B	Code of Federal Regulations Part 15 (Radio Frequency Devices), Subpart B (Unintentional Radiators) of the Federal Communication Commission (FCC)	March 13, 2003
☐	CFR 47 Part 15 Subpart C	Code of Federal Regulations Part 15 (Radio Frequency Devices), Subpart C (Intentional Radiators) of the Federal Communication Commission (FCC)	March 13, 2003
☒	ANSI C63.4	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz - 40 GHz	October, 1992
☐	RSS-210	Radio Standards Specification RSS-210 Issue 5 for Low Power Licence-Exempt Radiocommuniction Devices of Industry Canada	November 2001
☐	TIA/EIA-603	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards	February 1993
☐	TIA/EIA-603-1	Addendum to TIA/EIA-603	March 4, 1998

9. Charts taken during testing

Radiated Emission Test 30 MHz - 1 GHz
acc. to FCC Part 15 (Fully Anechoic Chamber)

Model: RRF 010	Comment: - 12 V power supply - with key in lock
Serial no.: 190830	
Applicant: TÜV Pfalz Palatina S. u. r. l.	
Test site: Fully anechoic room, cabin no. 2	
Tested on: Test distance 3 metres Horizontal Polarization	
Date of test: 04/27/2004 / Operator: M. Steindl	
Test performed: automatically / File name: default.emi	

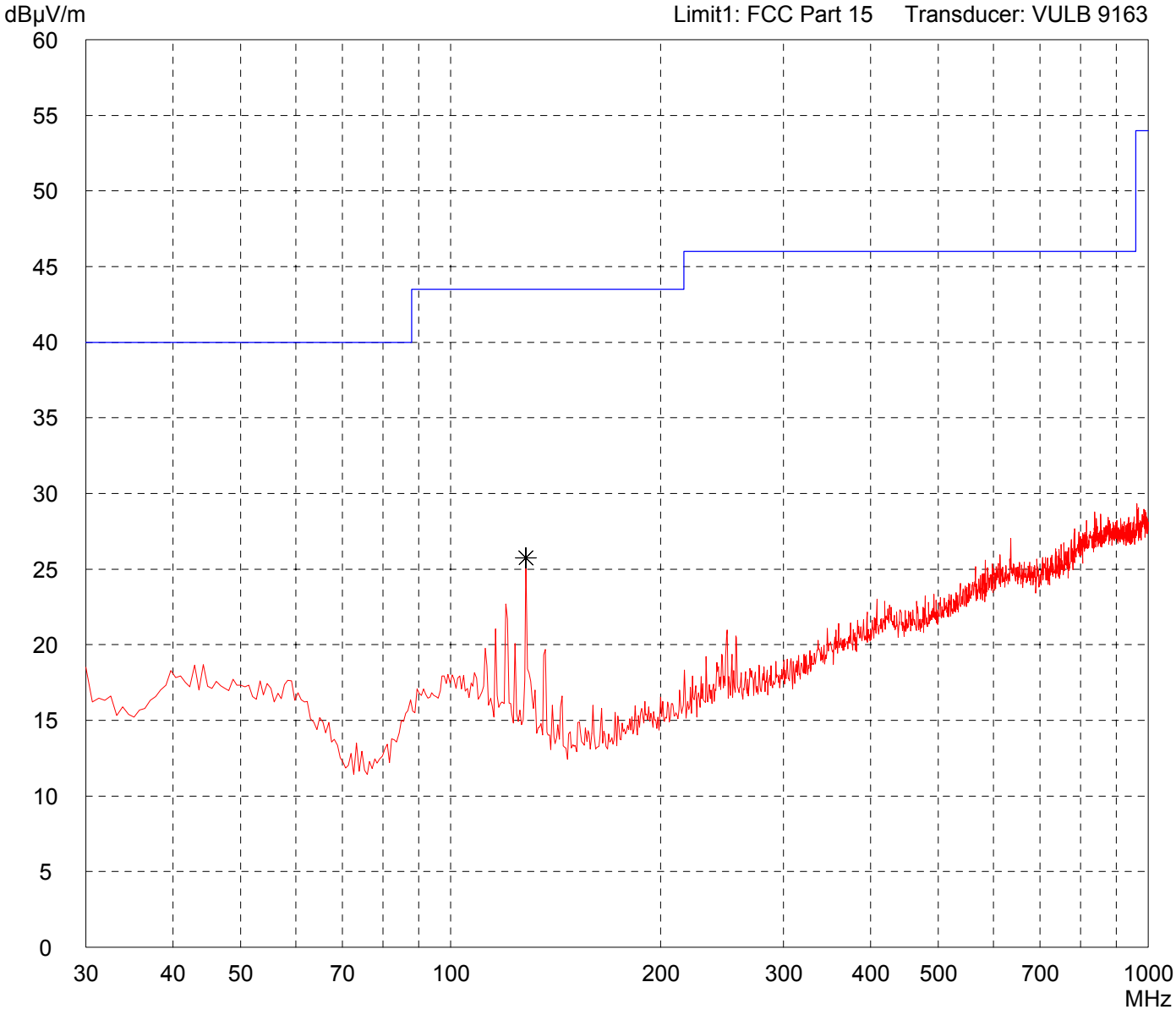
Detector: Peak	List of values: Selected by hand



Result: Prescan	Project file: 55145-40285 Page of Pages

Radiated Emission Test 30 MHz - 1 GHz
acc. to FCC Part 15 (Fully Anechoic Chamber)

Model: RRF 010	Comment: - 12 V power supply - with key in lock
Serial no.: 190830	
Applicant: TÜV Pfalz Palatina S. u. r. l.	
Test site: Fully anechoic room, cabin no. 2	
Tested on: Test distance 3 metres Vertical Polarization	
Date of test: 04/27/2004 / Operator: M. Steindl	
Test performed: automatically / File name: default.emi	
Detector: Peak	List of values: Selected by hand



Result: Prescan	Project file: 55145-40285 Page of Pages