

CETECOM ICT Services GmbH

Radio Satellite Communication

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RSC14

issued test report consists of 75 Pages

Page 1 (75)

Recognized by the
Federal Communications Commission
FCC-Identification Number: 90462
TCB ID: DE 0001



Anechoic chamber registration no.: 3463 (IC)

Accredited by the
German Accreditation Council
DAR-Registration Number

TTI-P-G 166/98



Independent ETSI
compliance test house



Accredited Bluetooth™ Test Facility (BQTF)

Test Report No.: 2_3398-01-05/03
FCC Part 74.861 / CANADA RSS-123
SR 300 with AC2 ; EK 100/300/500
FCC ID : DMOF2EUVL
IC : 2099A-G2SREK

CETECOM – ICT Services GmbH
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1 General Information

1.1 Notes

The test results of this test report relate exclusively to the test item specified in 1.5. The CETECOM ICT Services GmbH does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of the CETECOM ICT Services GmbH.

Test Laboratory Manager:

2003-12-01	RSC8411	Berg M.
Date	Section	Name


Signature

Technical Responsibility for Area of Testing:

2003-12-01	RSC8412	Hausknecht D.
Date	Section	Name


Signature

1.2 Testing Laboratory

CETECOM ICT Services GmbH
Untertürkheimer Straße 6 - 10
66117 Saarbrücken
Germany

Telephone : + 49 681 598 - 0
Telefax : + 49 681 598 - 9075
E-mail : info@ict.cetecom.de
Internet : www.cetecom-ict.de

Accredited testing laboratory

The Test laboratory (area of testing) is accredited according to DIN EN ISO/IEC 17025.

DAR-registration number : TTI-P-G 166/98-30

Accredited Bluetooth™ Test Facility (BQTF)

[BLUETOOTH is a trademark owned by Bluetooth SIG, Inc. and licensed to CETECOM](#)

1.3 Details of Applicant

Name : Sennheiser electronic GmbH & Co. KG
Street : Am Labor 1
City : D-30900 Wedemark
Country : Germany
Telephone : +49 (0) 5130 600-0
Telefax : +49 (0) 5130 600-324
Contact : Mr. Klaus Willemsen
Telephone : +49 (0) 5130 600-542
E-mail : willemsk@sennheiser.com

1.4 Application Details

Date of receipt of application : 2003-09-15
Date of receipt of test item : 2003-10-07
Date of test : 2003-10-07/08/10

1.5 TEST ITEM

Type of equipment : Low power auxiliary equipment
Type designation : **Tx: SR 300 with AC 2 (Antenna combiner)**
: **Rx: EK 100/300/500**
Manufacturer : see applicant
Street :
City :
Country :
Serial number : 100011, 100016, 100020, 100024, 100029
Additional information :
Frequency : **518 MHz – 864 MHz (518-608 MHz and 614-806 MHz)**
Type of modulation : 134KF3E (2x max. Audio Frequency + 2x max. FM Deviation)
Number of channels : **7205 (in 25 kHz steps)**
Antenna : Rx: integrated antenna ; Tx: BNC connector
Power supply : **Tx: 115/12V AC/DC Adapter ; Rx: 2x1.5V DC Battery**
Output power : max 20.3 mW
Field strength : 123.6 dB μ V/m in 3m
Occupied bandwidth : max. 200 kHz
Transmitter spurious : **-37.1 dBm**
Receiver spurious : 36.4 dB μ V/m in 3m
Temperature range : -30°C - +50°C
FCC ID : DMOF2EUVL
IC : **2099A-G2SREK**

DECLARATION OF COMPLIANCE: I declare that the testing was performed or supervised by me; that the test measurements were made in accordance with the above-mentioned Industry Canada standard(s); and that the equipment identified in this application has been subjected to all the applicable test conditions specified in the Industry Canada standards and all of the requirements of the standard have been met.

Signature: _____


Date: 2003-10-13 Michael Berg ; Test management
NAME AND TITLE (Please print or type):

1.6 Test Specifications:

FCC Part 74 Subpart H
CANADA RSS-123

2 Technical Test

2.1 Summary of Test Results

TEST PROCEDURE

All tests were done in accordance with the EIA/TIA 603.

THE SUBSTITUTION METHOD (TIA/EIA 603) WAS USED.

This products fulfills also the requirements for CANADA RSS-123

No deviations from the technical specification(s) were ascertained in the course of the tests performed.

Final verdict : PASS

2.2 Test report

TEST REPORT

Test report no.: 2_3398-01-05/03

TEST REPORT REFERENCE

LIST OF MEASUREMENTS

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Equipment under test : SR 300
 Ambient temperature : 23°C
 Relative humidity : 50%

OUTPUT POWER (conducted) FCC Rule Part 74.861 (e)(1)(ii)

Method of measurement

The EUT was connected to a resistive coaxial attenuator of normal load impedance, and the un-modulated output power was measured by means of a RF power Meter.

Results:

TEST CONDITIONS		TRANSMITTER POWER (mW)					
		518.000	644.300	758.000	804.000	864.000	
Frequency (MHz)							
T _{nom} (23)°C	115V	18.9	20.3	14.0	19.4	9.8	
Maximum deviation from output power under extreme test conditions (dBc)		±0.7dB					
Measurement uncertainty		±0.5dB					

LIMIT

FCC Rule Part 74.861

Frequency range MHz	Power level conducted mW
54-72, 76-88, 174-216	50
470-608, 614-806	250

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
 (for reference numbers see test equipment listing)

Equipment under test : SR 300
Ambient temperature : 23°C
Relative humidity : 50%

AFC FREQ ERROR vs. VOLTAGE

FCC Rule Part 74.861

Method of measurement:

The EUT was fixed in test fixture to a resistive coaxial attenuator of normal load impedance, and the un-modulated carrier was measured by means of a spectrum analyzer .

The input voltage was varied in an range $\pm 15\%$ of the nominal voltage and the maximum change in frequency was noted within one minute.

The temperature tests were performed for each frequency range on one channel

518MHz

Voltage (V)	Frequency Error (Hz)	Frequency Error (%)	Frequency Error (ppm)
97.15	+1210	0.00023359	2.3359
100.05	+1150	0.00022201	2.2201
103.50	+1090	0.00021042	2.1042
105.80	+1050	0.00020270	2.0270
109.25	+1010	0.00019498	1.9498
111.55	+970	0.00018726	1.8726
115.0	+930	0.00017954	1.7954
117.30	+890	0.00017181	1.7181
120.75	+870	0.00016795	1.6795
123.05	+850	0.00016409	1.6409
126.50	+830	0.00016023	1.6023
132.25	+810	0.00015637	1.5637

644 MHz

Voltage (V)	Frequency Error (Hz)	Frequency Error (%)	Frequency Error (ppm)
97.15	-1140	-0.00017702	-1.7702
100.05	-1150	-0.00017857	-1.7857
103.50	-1170	-0.00018168	-1.8168
105.80	-1190	-0.00018478	-1.8478
109.25	-1200	-0.00018634	-1.8634
111.55	-1210	-0.00018789	-1.8789
115.0	-1210	-0.00018789	-1.8789
117.30	-1210	-0.00018789	-1.8789
120.75	-1210	-0.00018789	-1.8789
123.05	-1220	-0.00018944	-1.8944
126.50	-1220	-0.00018944	-1.8944
132.25	-1230	-0.00019099	-1.9099

LIMIT

FCC Rule Part 74.861(4)

The frequency tolerance of the transmitter shall be 0.005 percent

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED

(for reference numbers see test equipment listing)

64 ; 05

Equipment under test : SR 300

Ambient temperature : 23°C

Relative humidity : 50%

758 MHz

Voltage (V)	Frequency Error (Hz)	Frequency Error (%)	Frequency Error (ppm)
97.15	-850	-0.00011214	-1.1214
100.05	-870	-0.00011478	-1.1478
103.50	-850	-0.00011214	-1.1214
105.80	-850	-0.00011214	-1.1214
109.25	-870	-0.00011478	-1.1478
111.55	-890	-0.00011741	-1.1741
115.0	-890	-0.00011741	-1.1741
117.30	-890	-0.00011741	-1.1741
120.75	-890	-0.00011741	-1.1741
123.05	-890	-0.00011741	-1.1741
126.50	-910	-0.00012005	-1.2005
132.25	-910	-0.00012005	-1.2005

804 MHz

Voltage (V)	Frequency Error (Hz)	Frequency Error (%)	Frequency Error (ppm)
97.15	+760	0.00009453	0.9453
100.05	+760	0.00009453	0.9453
103.50	+780	0.00009701	0.9701
105.80	+790	0.00009826	0.9826
109.25	+800	0.00009950	0.9950
111.55	+800	0.00009950	0.9950
115.0	+810	0.00010075	1.0075
117.30	+810	0.00010075	1.0075
120.75	+820	0.00010199	1.0199
123.05	+830	0.00010323	1.0323
126.50	+830	0.00010323	1.0323
132.25	+830	0.00010323	1.0323

864 MHz

Voltage (V)	Frequency Error (Hz)	Frequency Error (%)	Frequency Error (ppm)
97.15	+330	0.00003819	0.3819
100.05	+360	0.00004167	0.4167
103.50	+370	0.00004282	0.4282
105.80	+370	0.00004282	0.4282
109.25	+400	0.00004630	0.4630
111.55	+410	0.00004745	0.4745
115.0	+430	0.00004977	0.4977
117.30	+430	0.00004977	0.4977
120.75	+430	0.00004977	0.4977
123.05	+430	0.00004977	0.4977
126.50	+430	0.00004977	0.4977
132.25	+450	0.00005208	0.5208

LIMIT

FCC Rule Part 74.861(4)

The frequency tolerance of the transmitter shall be 0.005 percent

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED

(for reference numbers see test equipment listing)

64 ; 05

Equipment under test : SR 300
 Ambient temperature : 23°C
 Relative humidity : 50%

AFC FREQ ERROR vs. TEMPERATURE

Method of measurement:

The EUT was connected to a resistive coaxial attenuator of normal load impedance, and the un-modulated carrier was measured by means of a spectrum analyzer .

With all power removed, the temperature was decreased to -30°C and permitted to stabilize for three hours . Power was applied and the maximum change in frequency was noted within one minute.

With power OFF , the temperature was raised in 10°C steps. The sample was permitted to stabilize at each step for at least one-half hour. Power was applied and the maximum frequency error was noted within one minute .

The temperature tests were performed for each frequency range on one channel

518 MHz

TEMPERATURE (°C)	Frequency Error (Hz)	Frequency Error (%)	Frequency Error (ppm)
-30	+5150	0.00099421	9.9421
-20	+5270	0.00101737	10.1737
-10	+5030	0.00097104	9.7104
±0.0	-4610	-0.00088996	-8.8996
+10	-1880	-0.00036293	-3.6293
+20	+930	0.00017954	1.7954
+30	-830	-0.00016023	-1.6023
+40	-3180	-0.00061390	-6.1390
+50	-2800	-0.00054054	-5.4054

644 MHz

TEMPERATURE (°C)	Frequency Error (Hz)	Frequency Error (%)	Frequency Error (ppm)
-30	-900	-0.00013975	-1.3975
-20	-380	-0.00005901	-0.5901
-10	0.0	0.00000000	0.0000
±0.0	-670	-0.00010404	-1.0404
+10	-1530	-0.00023758	-2.3758
+20	-1210	-0.00018789	-1.8789
+30	-1230	-0.00019099	-1.9099
+40	-1790	-0.00027795	-2.7795
+50	-1700	-0.00026398	-2.6398

LIMIT

FCC Rule Part 74.861

The frequency tolerance of the transmitter shall be 0.005 percent

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
 (for reference numbers see test equipment listing)

64 ; 05

Equipment under test : SR 300
 Ambient temperature : 23°C
 Relative humidity : 50%

758 MHz

TEMPERATURE (°C)	Frequency Error (Hz)	Frequency Error (%)	Frequency Error (ppm)
-30	+2340	0.00030871	3.0871
-20	+3150	0.00041557	4.1557
-10	+4500	0.00059367	5.9367
±0.0	+3820	0.00050396	5.0396
+10	+2330	0.00030739	3.0739
+20	-890	-0.00011741	-1.1741
+30	-1330	-0.00017546	-1.7546
+40	-2990	-0.00039446	-3.9446
+50	-2100	-0.00027704	-2.7704

804 MHz

TEMPERATURE (°C)	Frequency Error (Hz)	Frequency Error (%)	Frequency Error (ppm)
-30	-140	-0.00001741	-0.1741
-20	+700	0.00008706	0.8706
-10	+1820	0.00022637	2.2637
±0.0	+1510	0.00018781	1.8781
+10	+870	0.00010821	1.0821
+20	+810	0.00010075	1.0075
+30	+800	0.00009950	0.9950
+40	+1010	0.00012562	1.2562
+50	+930	0.00011567	1.1567

864 MHz

TEMPERATURE (°C)	Frequency Error (Hz)	Frequency Error (%)	Frequency Error (ppm)
-30	+5310	0.00061458	6.1458
-20	+5430	0.00062847	6.2847
-10	+3570	0.00041319	4.1319
±0.0	+1430	0.00016551	1.6551
+10	-1490	-0.00017245	-1.7245
+20	-430	-0.00004977	-0.4977
+30	-430	-0.00004977	-0.4977
+40	-2860	-0.00033102	-3.3102
+50	-1310	-0.00015162	-1.5162

LIMIT

FCC Rule Part 74.861

The frequency tolerance of the transmitter shall be 0.005 percent

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED

(for reference numbers see test equipment listing)

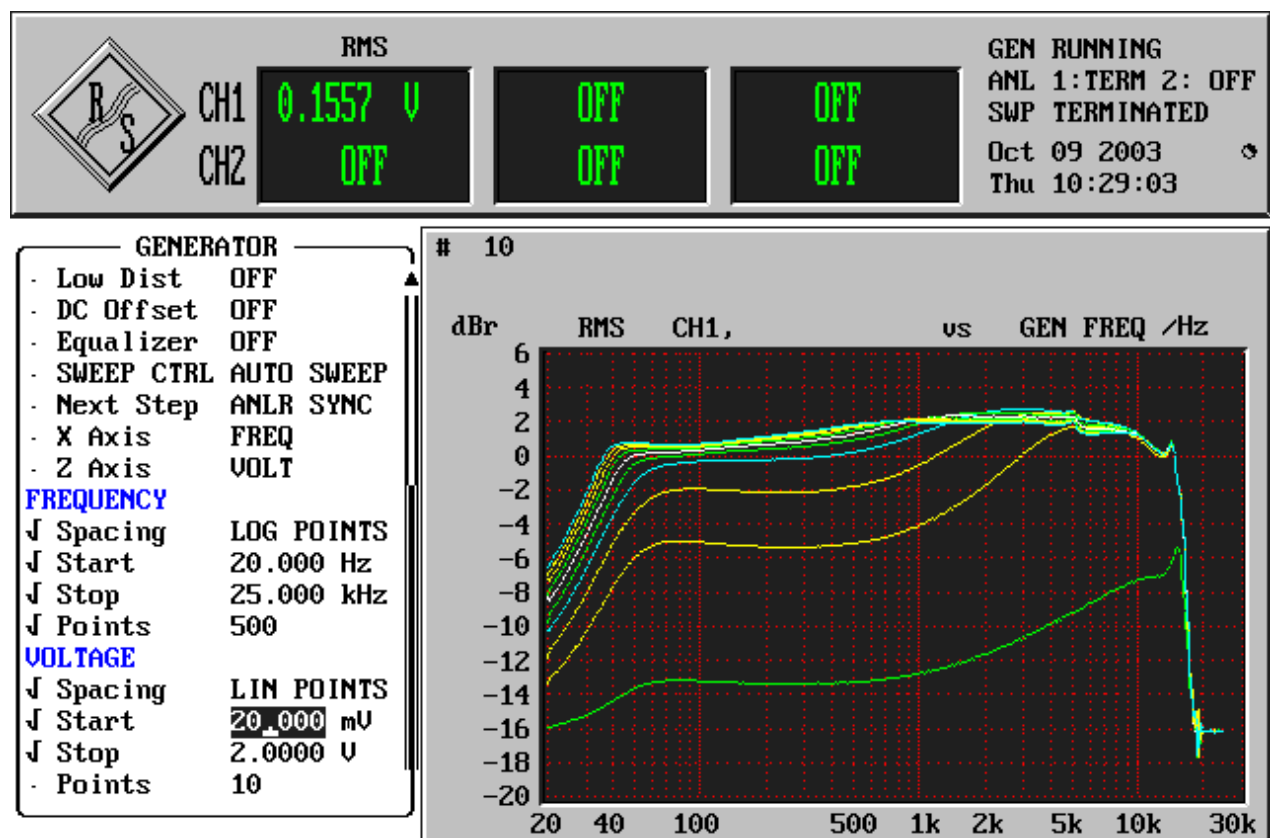
64 ; 05

Equipment under test : SR 300
 Ambient temperature : 23°C
 Relative humidity : 50%

CHARACTERISTICS OF THE AUDIO MODULATION CIRCUITRY FCC Rule Part 74 .861 (e)(3)

Method of measurement :

The audio frequency responds was measured in accordance with EIA/TIA 603.
 The plots shows 10 curves with different modulation levels, starting from 0.02mV to 2000 mV (30%+20 dB Modulation). the frequency is varied from 10 Hz to 25 kHz .



max. measured frequency deviation : 44 kHz

this measurement is valid for all channels

Limit : max Deviation ± 75 kHz

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED

(for reference numbers see test equipment listing)

Equipment under test : SR 300
Ambient temperature : 23°C
Relative humidity : 50%

OCCUPIED BANDWIDTH

FCC Rule Part 74.861(e)(3). (5)/ Sec. 2.1049

Test method :

The audio frequency responds was measured in accordance with EIA/TIA 603.

Data in the plots show that all sidebands between 50 & 100% for the authorized bandwidth are attenuated by at least 25dB. From 100 to 250% of the authorized bandwidth they are attenuated by at least 35dB and beyond 250% 43 log(Po) dB. The plot shows the transmitter modulated with 15000 Hz (the highest modulation frequency), adjusted for 50% modulation plus 16 dB. The spectrum analyzer was set with the un-modulated carrier at the top of the screen. The test procedure diagram and occupied bandwidth plots follow.

TEST CONDITIONS		OCCUPIED BANDWIDTH (kHz)					
		518.0	644.0	758.0	804.0	864.0	
Frequency (MHz)							
T _{nom} (23)°C	V _{nom} (115.0)V	90.180	57.174	89.178	89.178	89.178	
max. Deviation (FM)		47 kHz					
Measurement uncertainty		±0.5%					

Limits

FCC Rule Part 74.861(e)(5)

The operating bandwidth shall not exceed 200 kHz

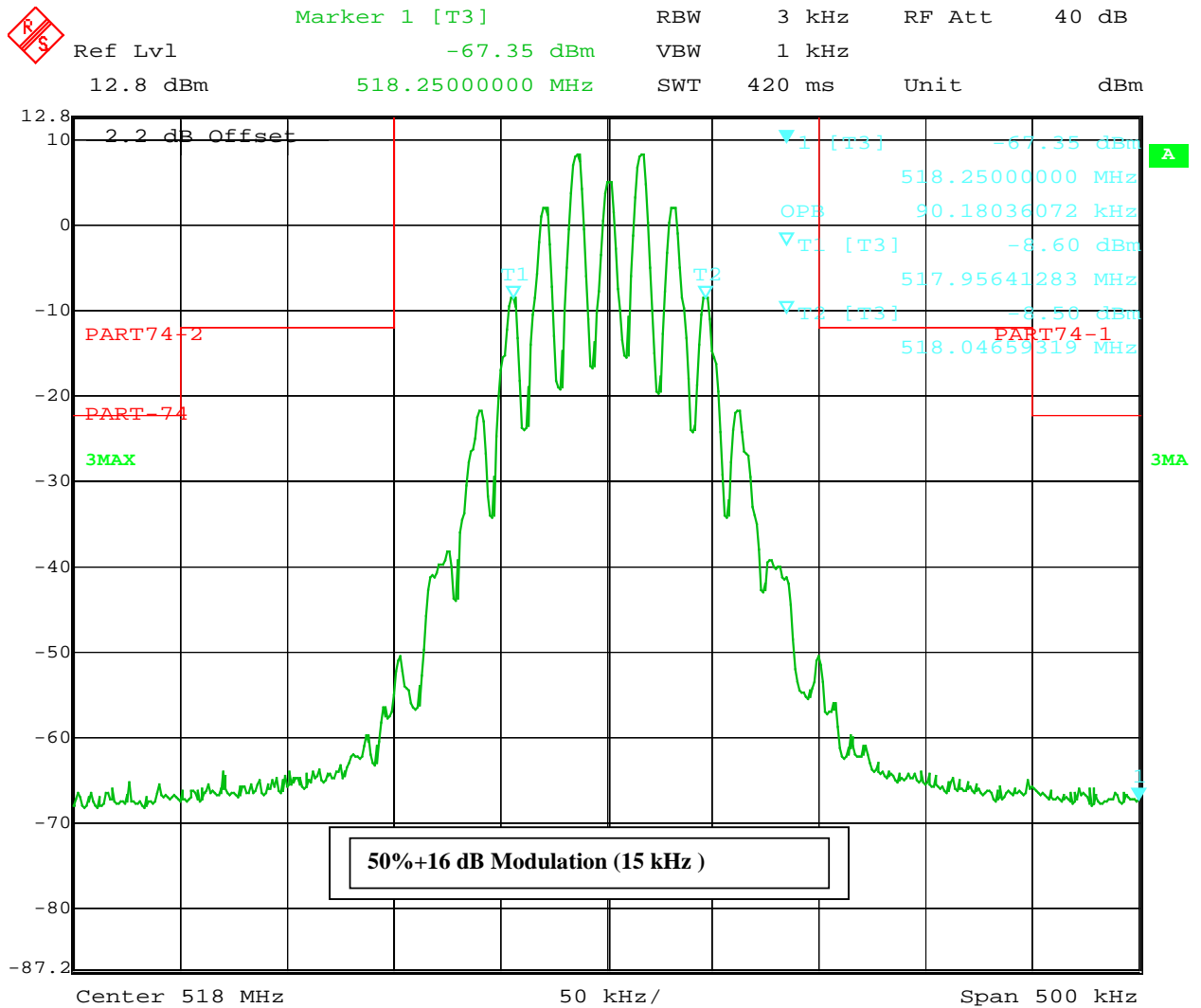
REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
 (for reference numbers see test equipment listing)

Equipment under test : SR 300
 Ambient temperature : 23°C
 Relative humidity : 50%

OCCUPIED BANDWIDTH

FCC Rule Part 74.861(e)(3). (5)/ Sec. 2.989

Frequency: 518.000 MHz / max. deviation : ± 47 kHz (Limit ± 75 kHz)



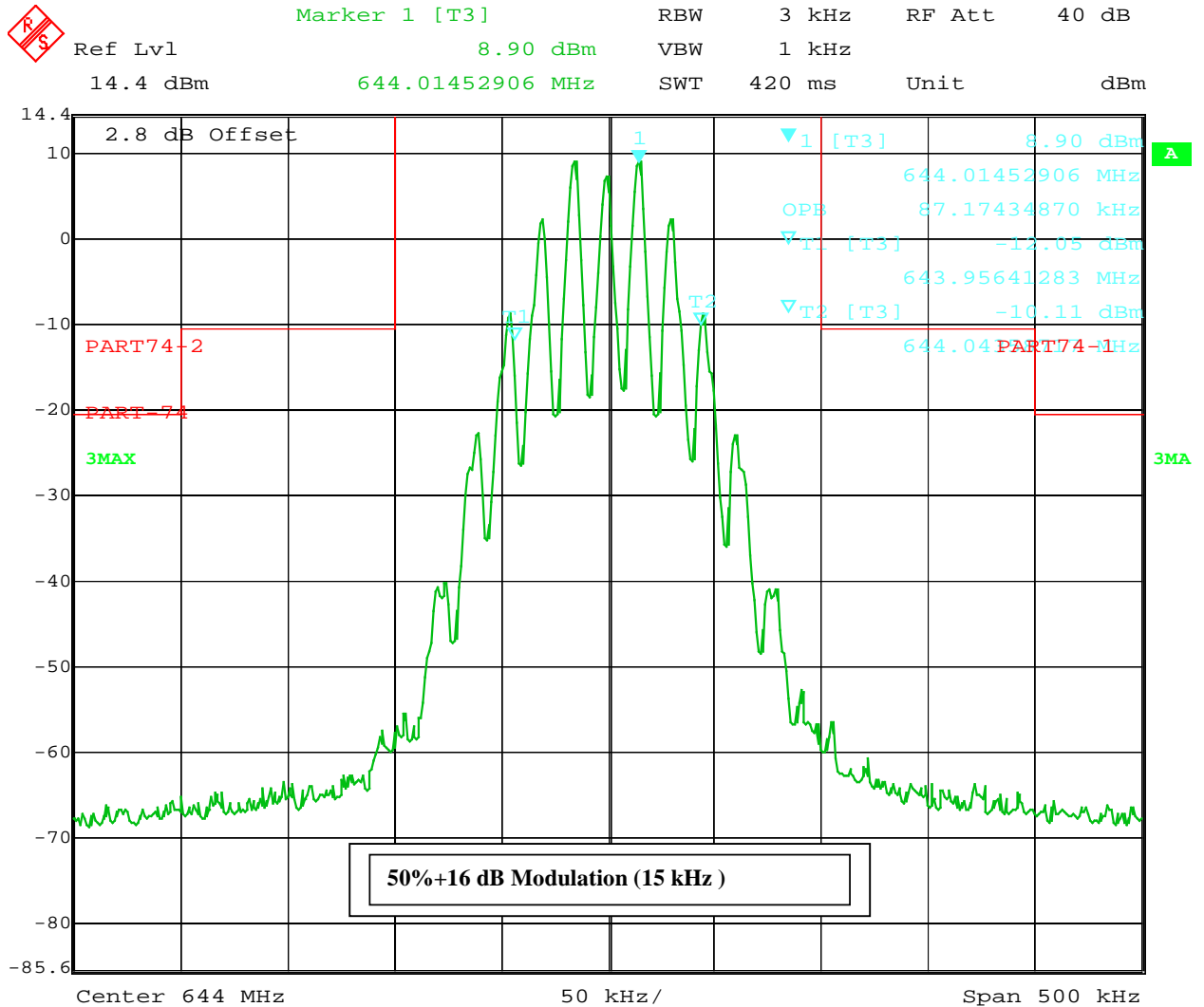
Date: 9.OCT.2003 14:29:11

Equipment under test : SR 300
 Ambient temperature : 23°C
 Relative humidity : 50%

OCCUPIED BANDWIDTH

FCC Rule Part 74.861(e)(3). (5)/ Sec. 2.1049

Frequency: 644.000 MHz / max. deviation : ± 47 kHz (Limit ± 75 kHz)



Date: 9.OCT.2003 14:33:20

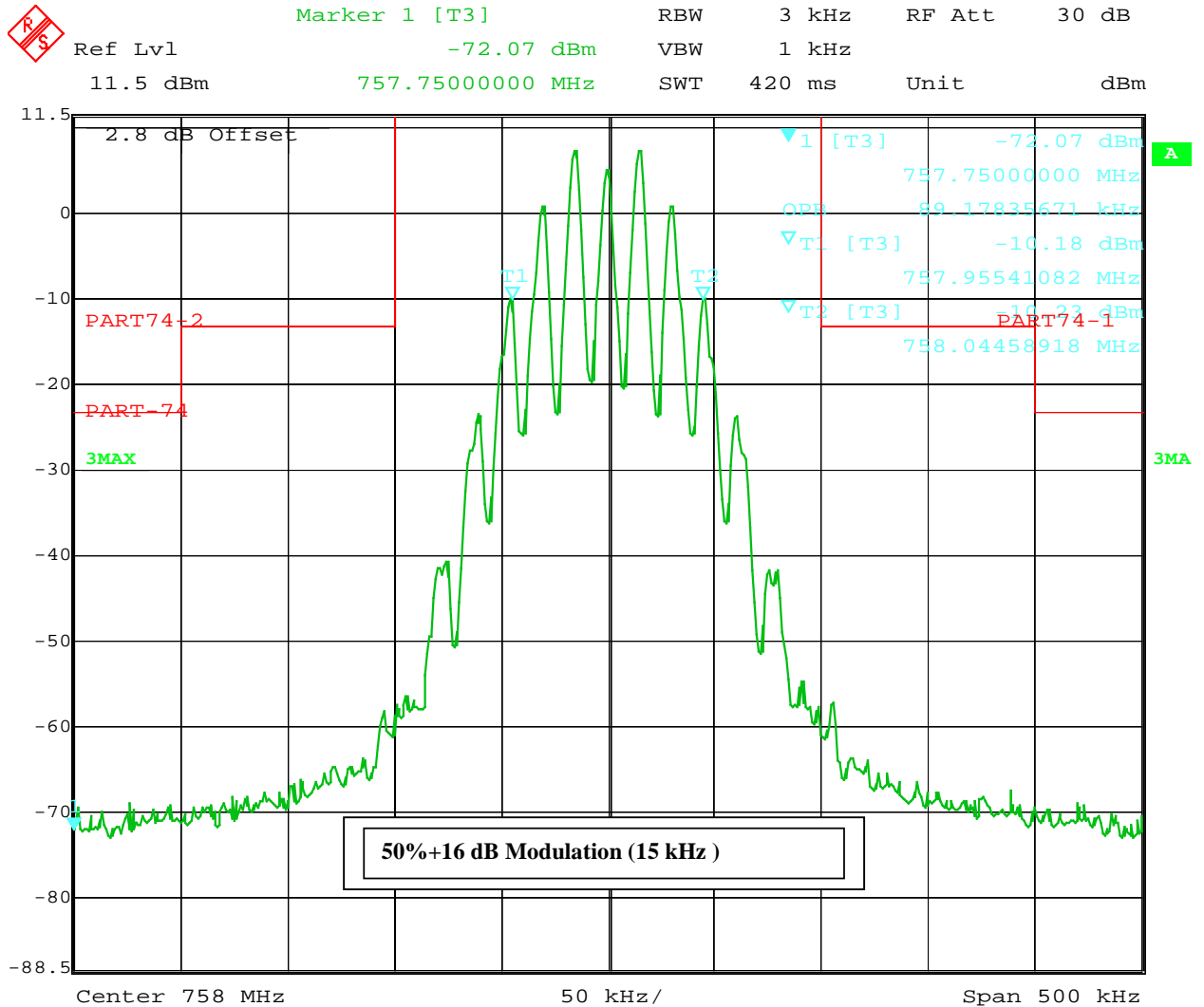
REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
 (for reference numbers see test equipment listing)
 64 ;05

Equipment under test : SR 300
 Ambient temperature : 23°C
 Relative humidity : 50%

OCCUPIED BANDWIDTH

FCC Rule Part 74.861(e)(3). (5)/ Sec. 2.1049

Frequency: 758.00 MHz / max. deviation : ± 47 kHz (Limit ± 75 kHz)

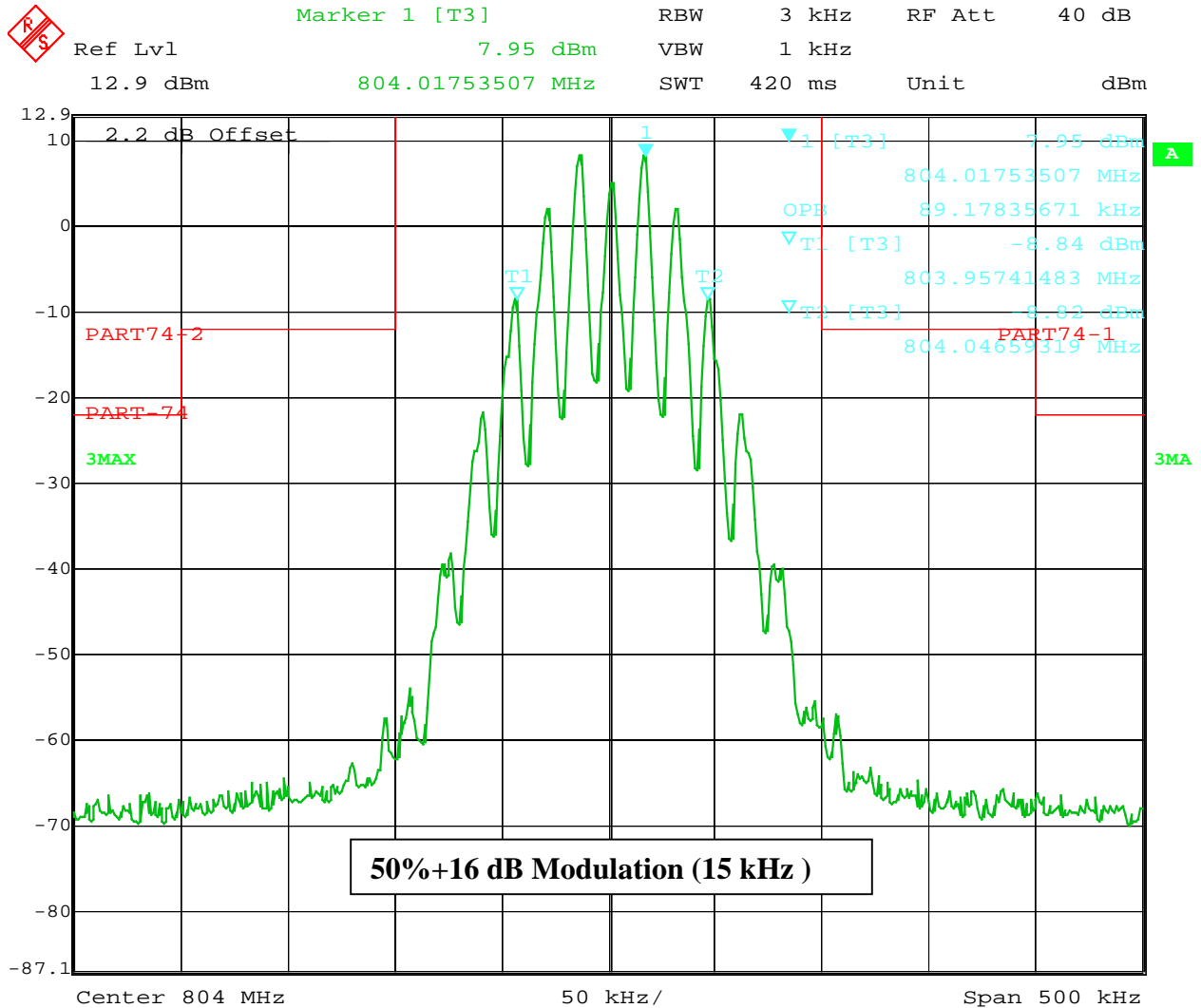


Date: 9.OCT.2003 14:34:52

Equipment under test : SR 300
 Ambient temperature : 23°C
 Relative humidity : 50%

OCCUPIED BANDWIDTH FCC Rule Part 74.861(e)(3). (5)/ Sec. 2.989

Frequency: 804.000 MHz / max. deviation : ± 47 kHz (Limit ± 75 kHz)



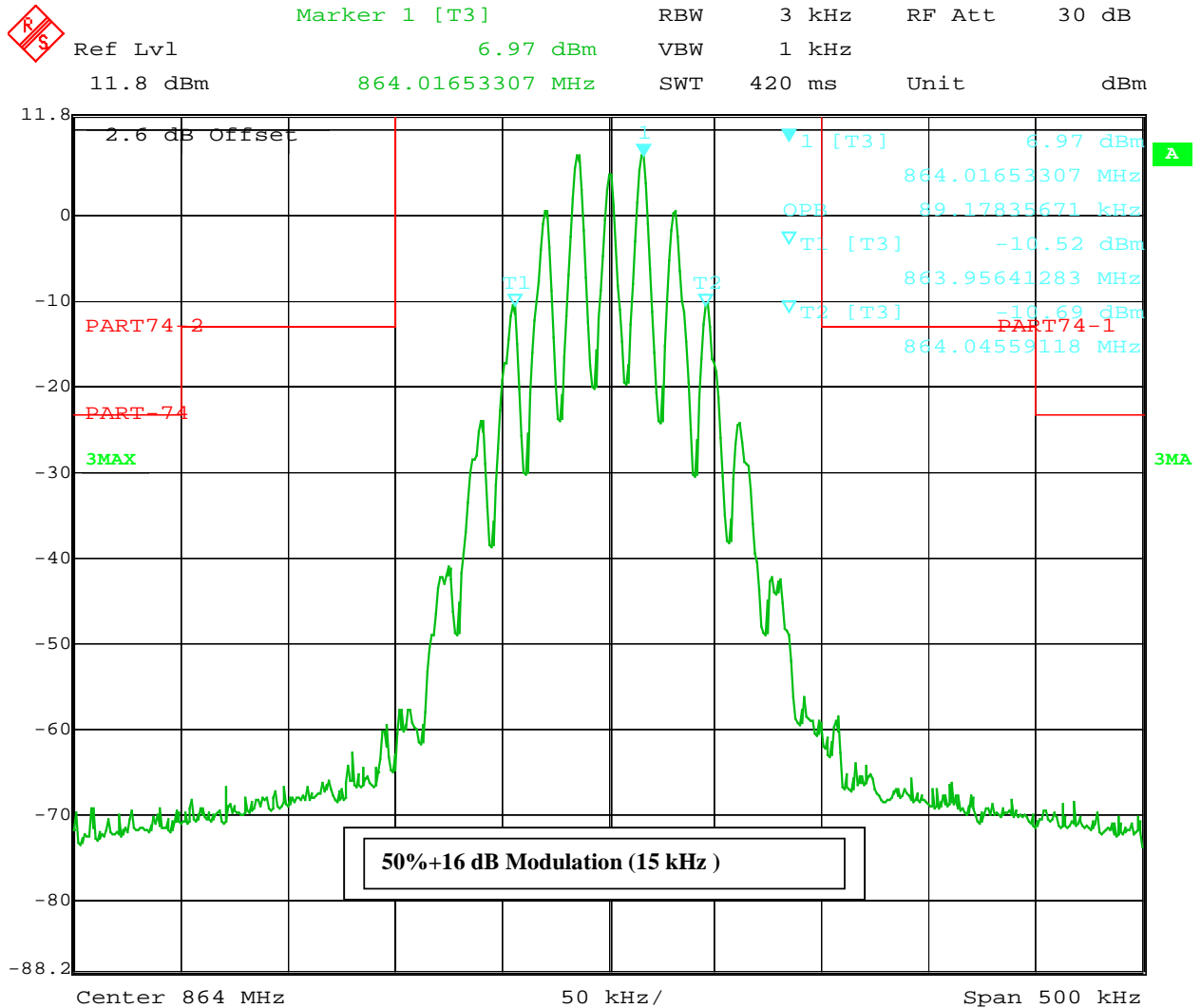
Date: 9.OCT.2003 14:23:17

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
 (for reference numbers see test equipment listing)
 64 ;05

Equipment under test : SR 300
 Ambient temperature : 23°C
 Relative humidity : 50%

OCCUPIED BANDWIDTH FCC Rule Part 74.861(e)(3). (5)/ Sec. 2.1049

Frequency: 864.000 MHz / max. deviation : ± 47 kHz (Limit ± 75 kHz)



Date: 9.OCT.2003 14:19:24

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
 (for reference numbers see test equipment listing)

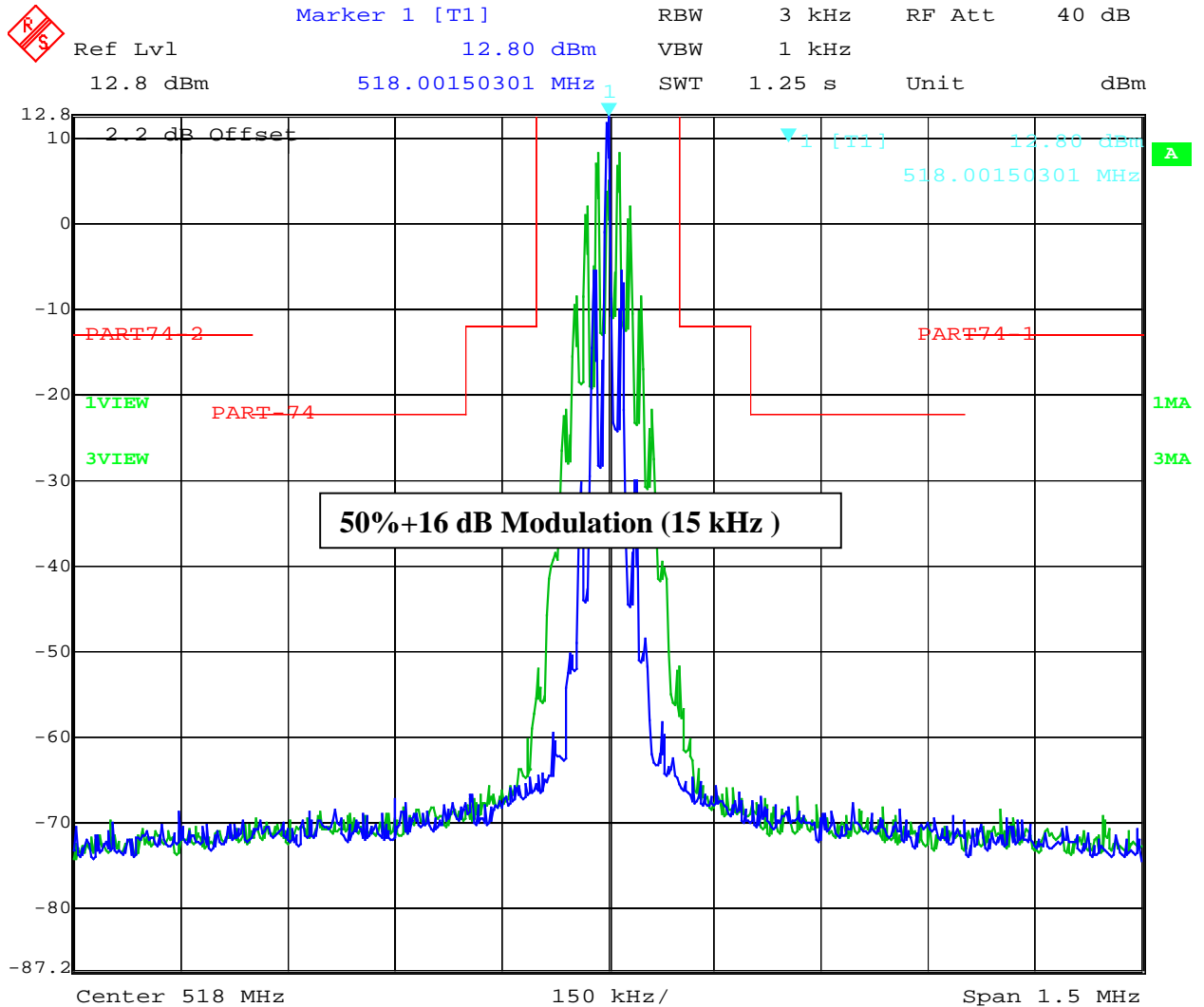
Equipment under test : SR 300

Ambient temperature : 23°C

Relative humidity : 50%

Emission mask FCC 74 861(e)(6)

518.00 MHz



Date: 9.OCT.2003 14:30:08

Limits

FCC Rule Part 74.861(e)(6)

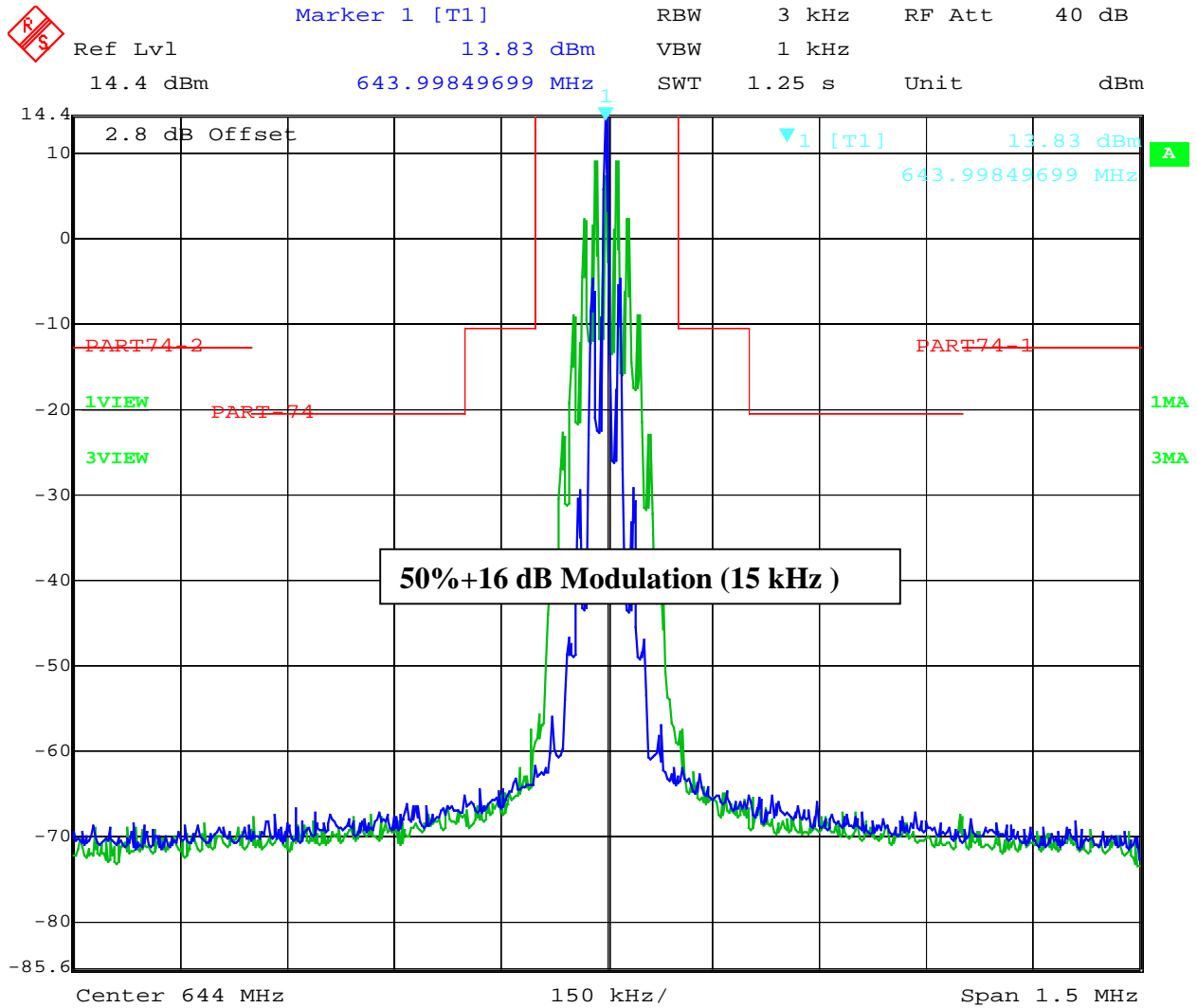
$f \pm 100$ kHz to $f \pm 200$ kHz	$f \pm 200$ kHz to $f \pm 500$ kHz	$f \pm 500$ kHz
25 dBc	35 dBc	-43 +10 log ₁₀ (mean output power in watts) dB below the mean output power

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
 (for reference numbers see test equipment listing)

Equipment under test : SR 300
 Ambient temperature : 23°C
 Relative humidity : 50%

Emission mask
 644.000 MHz

FCC 74 861(e)(6)



Date: 9.OCT.2003 14:32:26

Limits

FCC Rule Part 74.861(e)(6)

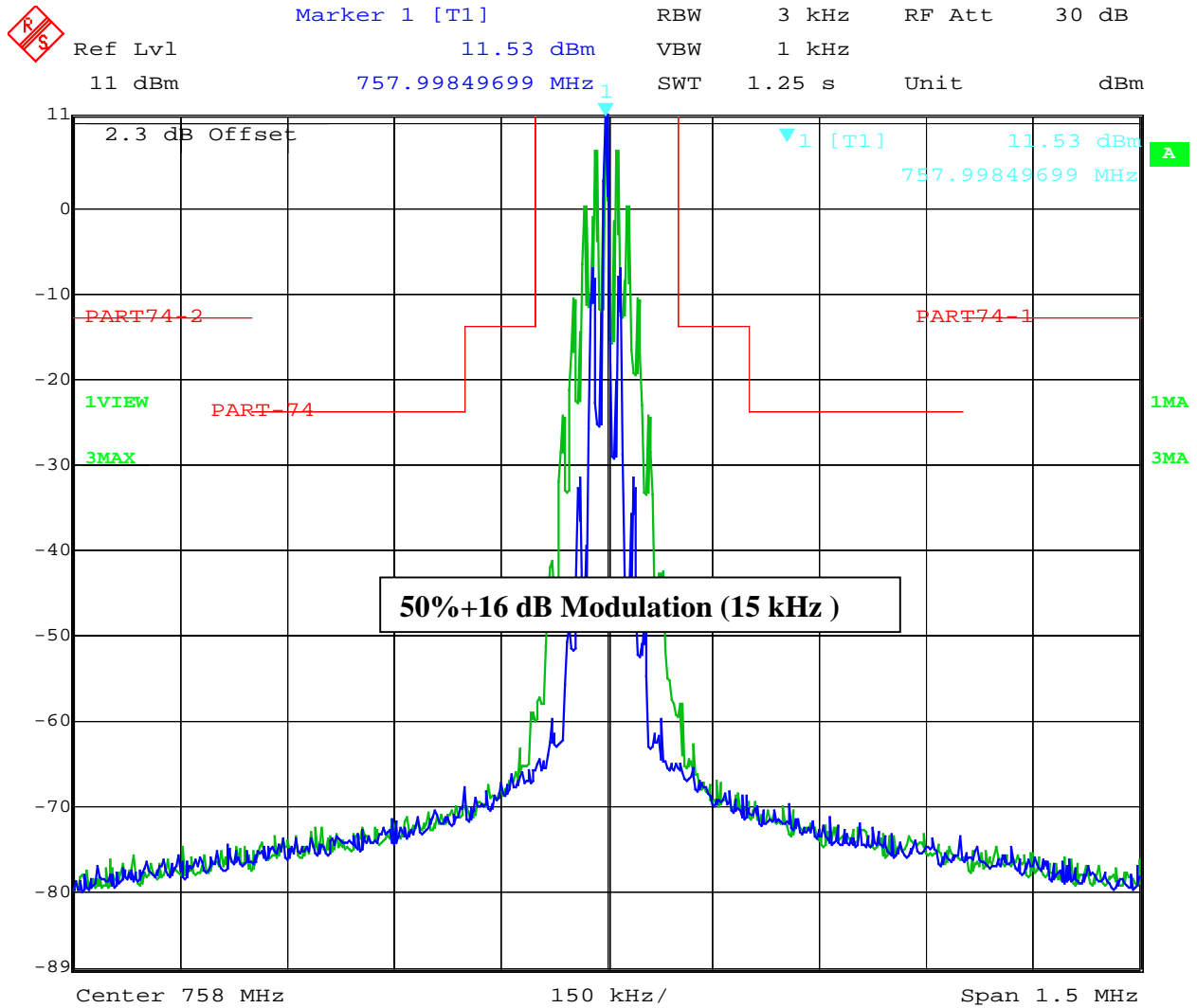
$f \pm 100 \text{ kHz to } f \pm 200 \text{ kHz}$	$f \pm 200 \text{ kHz to } f \pm 500 \text{ kHz}$	$f \pm 500 \text{ kHz}$
25 dBc	35 dBc	-43 + 10 log ₁₀ (mean output power in watts) dB below the mean output power

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
 (for reference numbers see test equipment listing)

Equipment under test : SR 300
 Ambient temperature : 23°C
 Relative humidity : 50%

Emission mask
 758.000 MHz

FCC 74 861(e)(6)



Date: 9.OCT.2003 14:36:48

Limits

FCC Rule Part 74.861(e)(6)

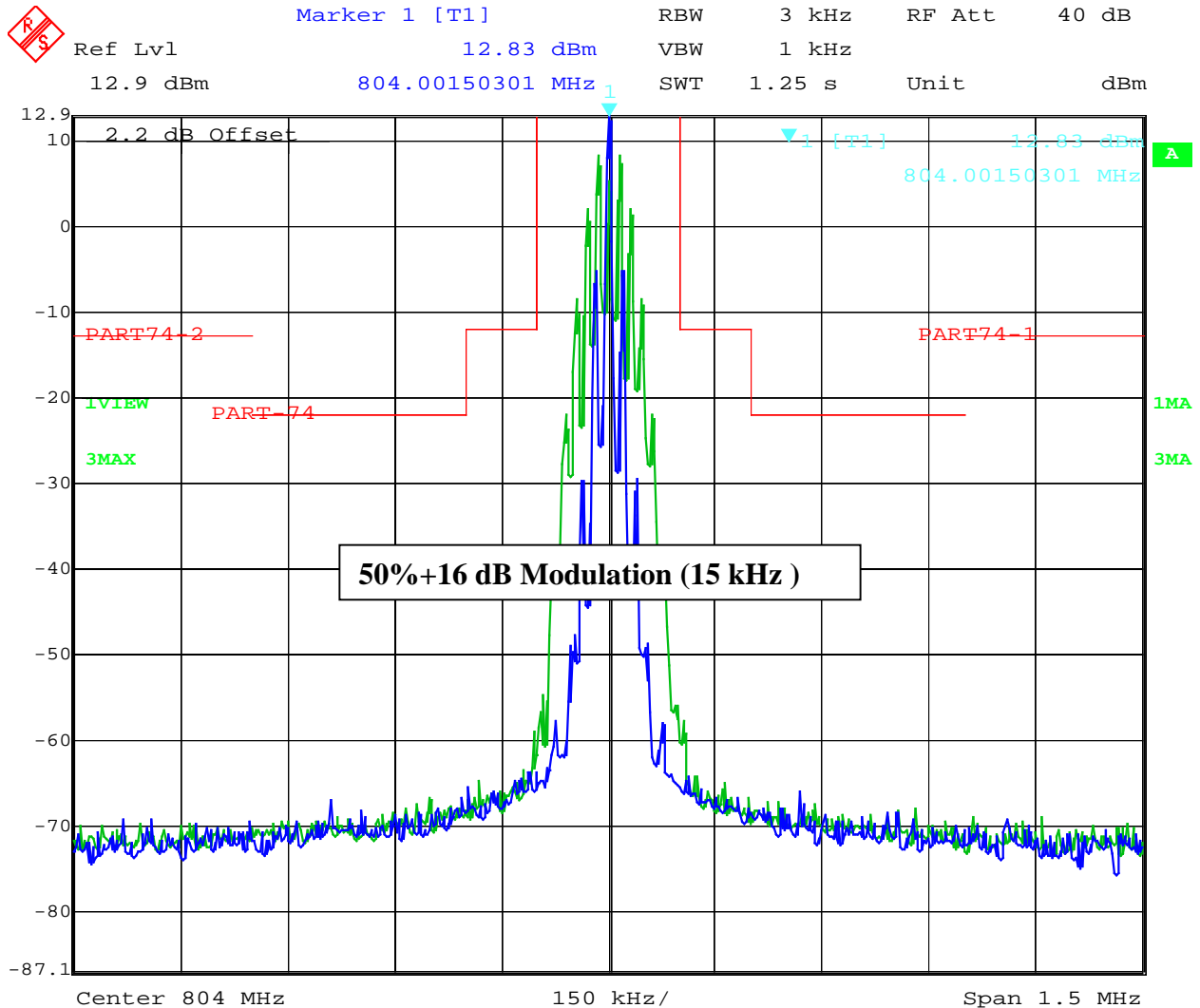
$f \pm 100 \text{ kHz to } f \pm 200 \text{ kHz}$	$f \pm 200 \text{ kHz to } f \pm 500 \text{ kHz}$	$f \pm 500 \text{ kHz}$
25 dBc	35 dBc	-43 +10 log ₁₀ (mean output power in watts) dB below the mean output power

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
 (for reference numbers see test equipment listing)

Equipment under test : SR 300
 Ambient temperature : 23°C
 Relative humidity : 50%

Emission mask
 804.000 MHz

FCC 74 861(e)(6)



Date: 9.OCT.2003 14:22:42

Limits

FCC Rule Part 74.861(e)(6)

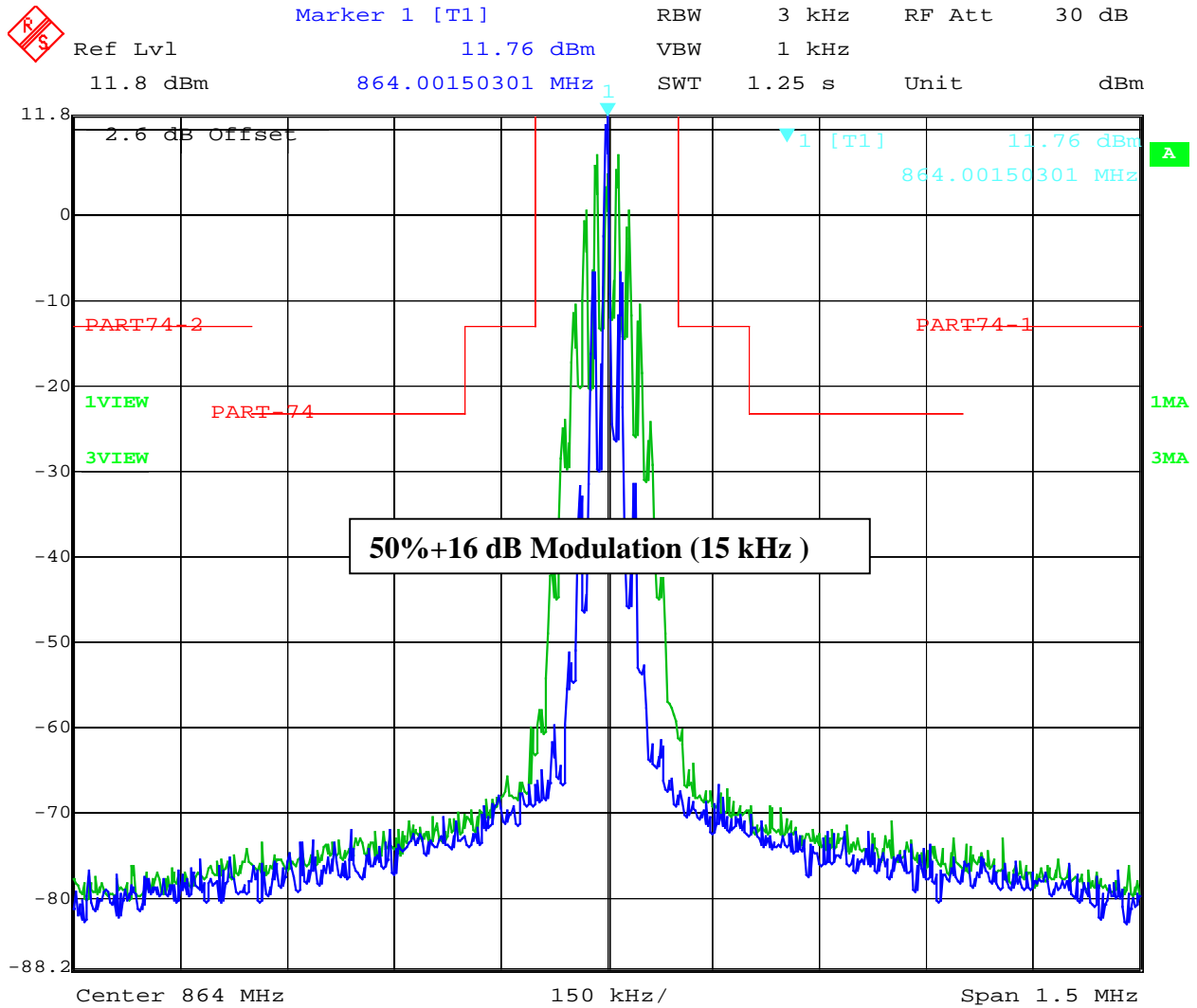
$f \pm 100 \text{ kHz to } f \pm 200 \text{ kHz}$	$f \pm 200 \text{ kHz to } f \pm 500 \text{ kHz}$	$f \pm 500 \text{ kHz}$
25 dBc	35 dBc	-43 + 10 log ₁₀ (mean output power in watts) dB below the mean output power

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
 (for reference numbers see test equipment listing)

Equipment under test : SR 300
 Ambient temperature : 23°C
 Relative humidity : 50%

Emission mask
 864.000 MHz

FCC 74 861(e)(6)



Date: 9.OCT.2003 14:20:40

Limits

FCC Rule Part 74.861(e)(6)

$f \pm 100 \text{ kHz to } f \pm 200 \text{ kHz}$	$f \pm 200 \text{ kHz to } f \pm 500 \text{ kHz}$	$f \pm 500 \text{ kHz}$
25 dBc	35 dBc	-43 + 10 log ₁₀ (mean output power in watts) dB below the mean output power

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
 (for reference numbers see test equipment listing)

Equipment under test : SR 300
 Ambient temperature : 23°C
 Relative humidity : 50%

CONDUCTED EMISSIONS

FCC 74 861(e)(6)

EMISSION LIMITATIONS					
f (MHz)		amplitude of emission (dBm)	limit max. allowed emission power (dBm)	actual attenuation below frequency of operation (dBc)	results
518.0 MHz					
518.0		12.77	-13.0 (25.77 dBc)		carrier
1023.0		-37.06		49.83	complies
644.0 MHz					
644.0		13.08	-13.0 (26.08 dBc)		carrier
1274.5		-45.37		58.45	complies
758.0 MHz					
758.0		11.46	-13.0 (24.46 dBc)		carrier
no	peak	found			complies
804.0 MHz					
804.0		12.88	-13.0 (25.88 dBc)		carrier
1600.2		-43.06		55.94	complies
864.0 MHz					
864		11.77	-13.0 (33.37 dBc)		carrier
no	peak	found			complies
Measurement uncertainty			± 0.5dB		

Limits

FCC Rule Part 74.861(e)(6)

(6) The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the following schedule:

- (i) On any frequency removed from the operating frequency by more than 50 percent up to and including 100 percent of the authorized bandwidth: at least 25 dB;
- (ii) On any frequency removed from the operating frequency by more than 100 percent up to and including 250 percent of the authorized bandwidth: at least 35 dB;
- (iii) On any frequency removed from the operating frequency by more than 250 percent of the authorized bandwidth: at least 43+10log10 (mean output power in watts) dB.

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
 (for reference numbers see test equipment listing)

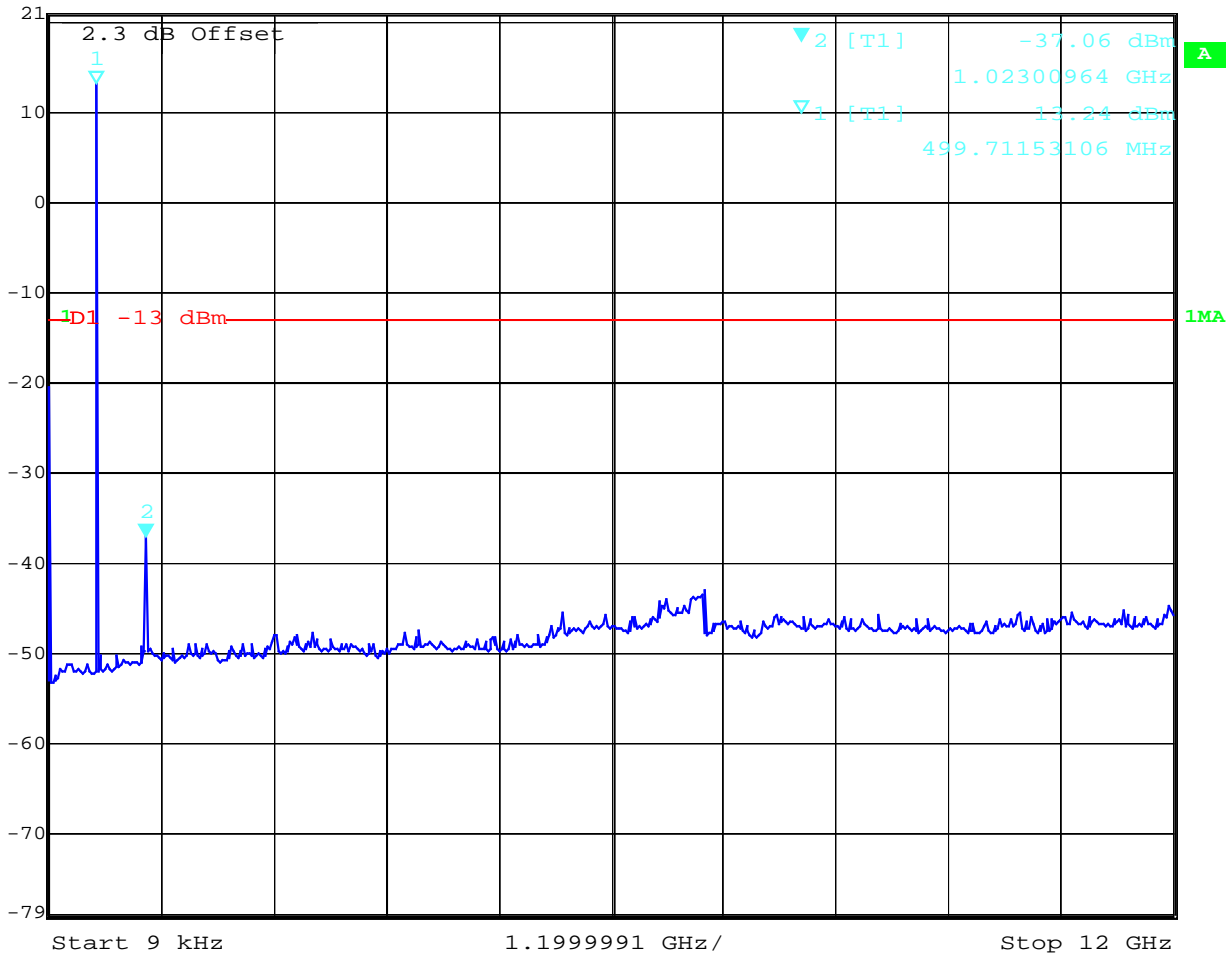
Equipment under test : SR 300
 Ambient temperature : 23°C
 Relative humidity : 50%

CONDUCTED EMISSIONS

FCC 74.861(e)(6)

Frequency: 518.000 MHz

	Ref Lvl	Marker 2 [T1]	RBW	1 MHz	RF Att	30 dB
	21 dBm	-37.06 dBm	VBW	1 MHz		
		1.02300964 GHz	SWT	68 ms	Unit	dBm



Date: 9.OCT.2003 14:42:41

Limits

FCC Rule Part 74.861(e)(6)

(6) The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the following schedule:

- (i) On any frequency removed from the operating frequency by more than 50 percent up to and including 100 percent of the authorized bandwidth: at least 25 dB;
- (ii) On any frequency removed from the operating frequency by more than 100 percent up to and including 250 percent of the authorized bandwidth: at least 35 dB;
- (iii) On any frequency removed from the operating frequency by more than 250 percent of the authorized bandwidth: at least $43+10\log_{10}$ (mean output power in watts) dB.

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED (for reference numbers see test equipment listing)

Equipment under test : SR 300
 Ambient temperature : 23°C
 Relative humidity : 50%

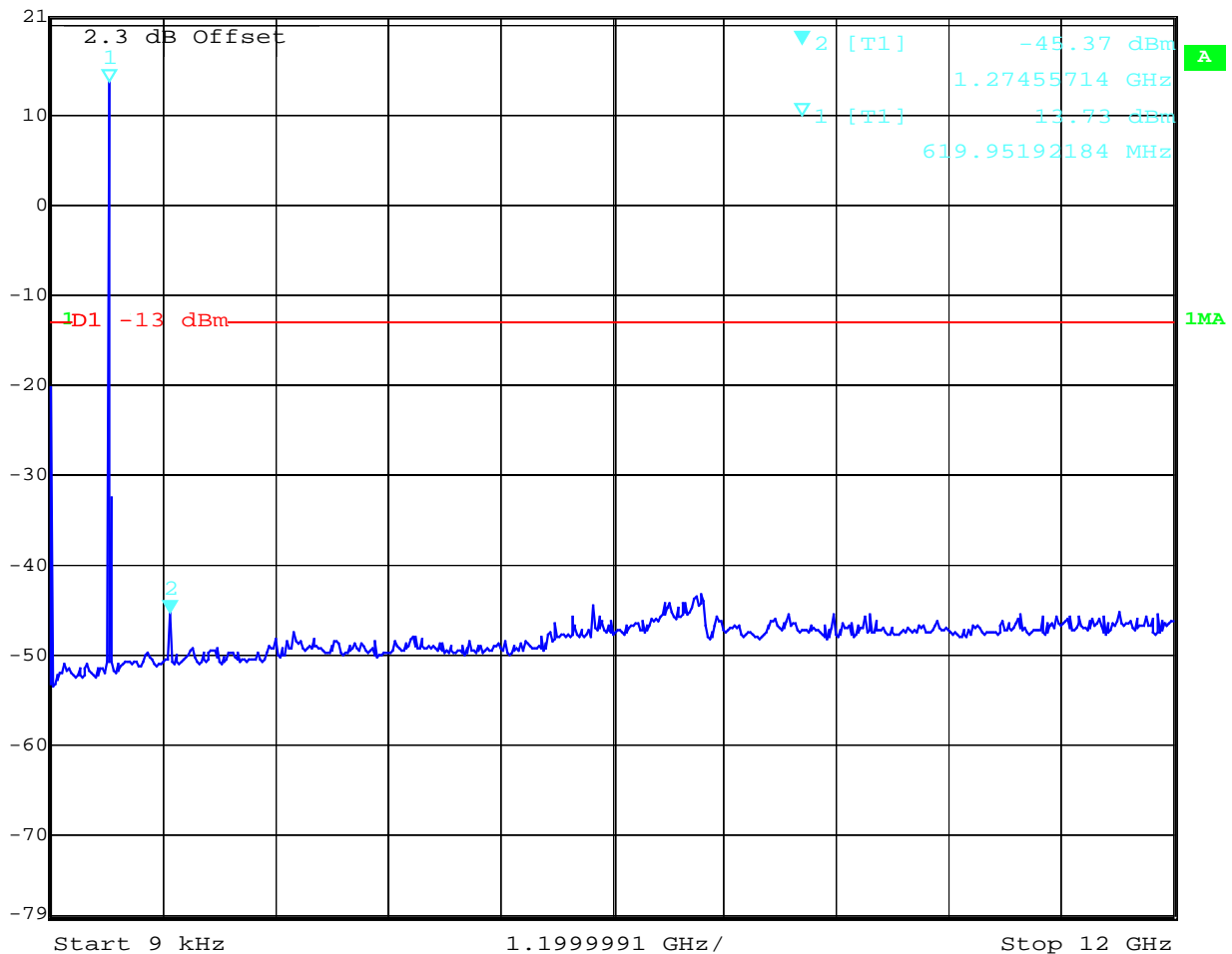
CONDUCTED EMISSIONS

FCC 74.861(e)(6)

Frequency: 644.000 MHz



Ref Lvl	21 dBm	Marker 2 [T1]	-45.37 dBm	RBW	1 MHz	RF Att	30 dB
			1.27455714 GHz	VBW	1 MHz		
				SWT	68 ms	Unit	dBm



Date: 9.OCT.2003 14:40:45

Limits

FCC Rule Part 74.861(e)(6)

(6) The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the following schedule:

- (i) On any frequency removed from the operating frequency by more than 50 percent up to and including 100 percent of the authorized bandwidth: at least 25 dB;
- (ii) On any frequency removed from the operating frequency by more than 100 percent up to and including 250 percent of the authorized bandwidth: at least 35 dB;
- (iii) On any frequency removed from the operating frequency by more than 250 percent of the authorized bandwidth: at least 43+10log10 (mean output power in watts) dB.

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
 (for reference numbers see test equipment listing)

Equipment under test : SR 300

Ambient temperature : 23°C

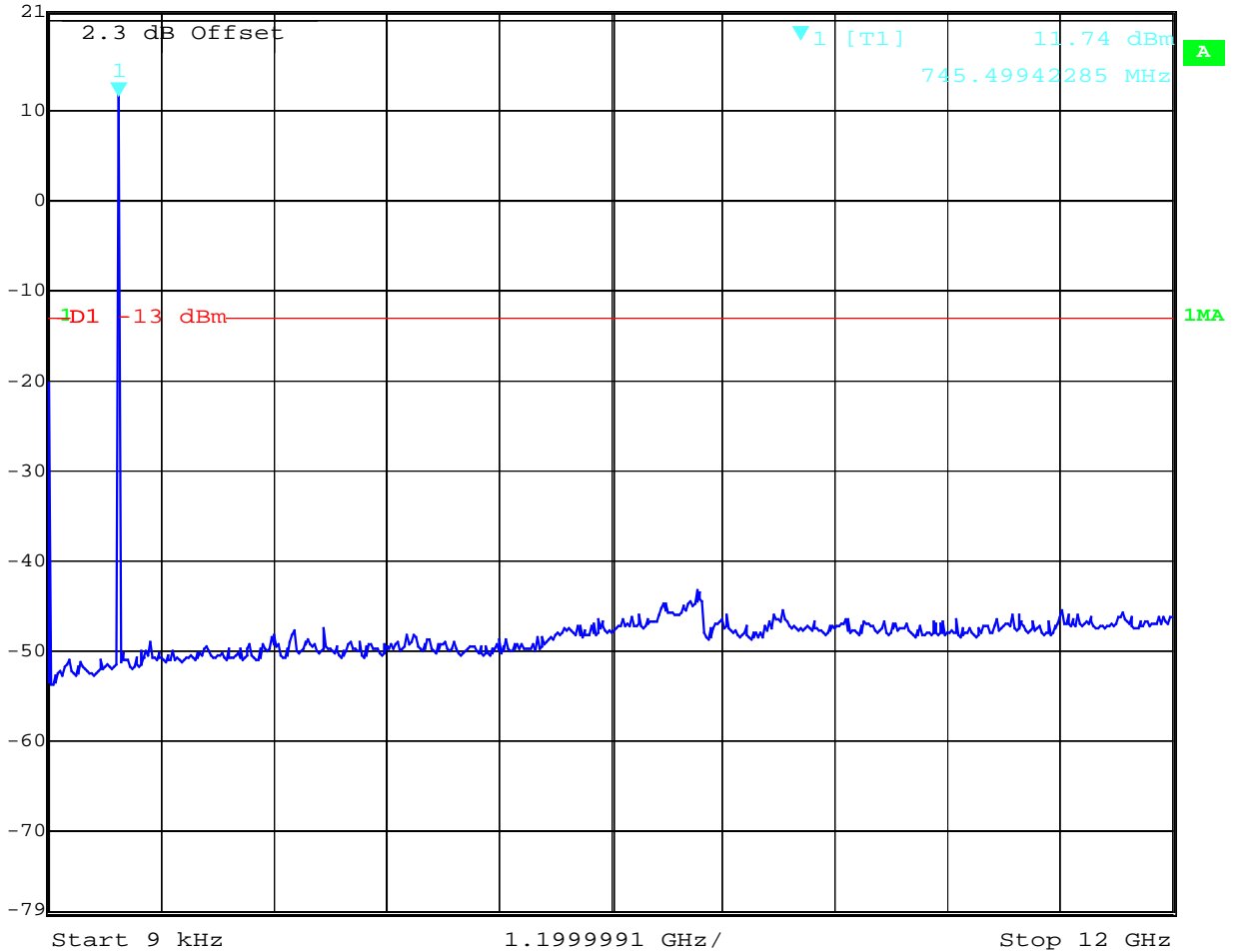
Relative humidity : 50%

CONDUCTED EMISSIONS

FCC 74 891(e)(6)

Frequency: 758.000 MHz

	Ref Lvl	11.74 dBm	RBW	1 MHz	RF Att	30 dB
	21 dBm	745.49942285 MHz	VBW	1 MHz	Unit	dBm
			SWT	68 ms		



Date: 9.OCT.2003 14:39:10

Limits

FCC Rule Part 74.861(e)(6)

(6) The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the following schedule:

- (i) On any frequency removed from the operating frequency by more than 50 percent up to and including 100 percent of the authorized bandwidth: at least 25 dB;
- (ii) On any frequency removed from the operating frequency by more than 100 percent up to and including 250 percent of the authorized bandwidth: at least 35 dB;
- (iii) On any frequency removed from the operating frequency by more than 250 percent of the authorized bandwidth: at least 43+10log10 (mean output power in watts) dB.

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)

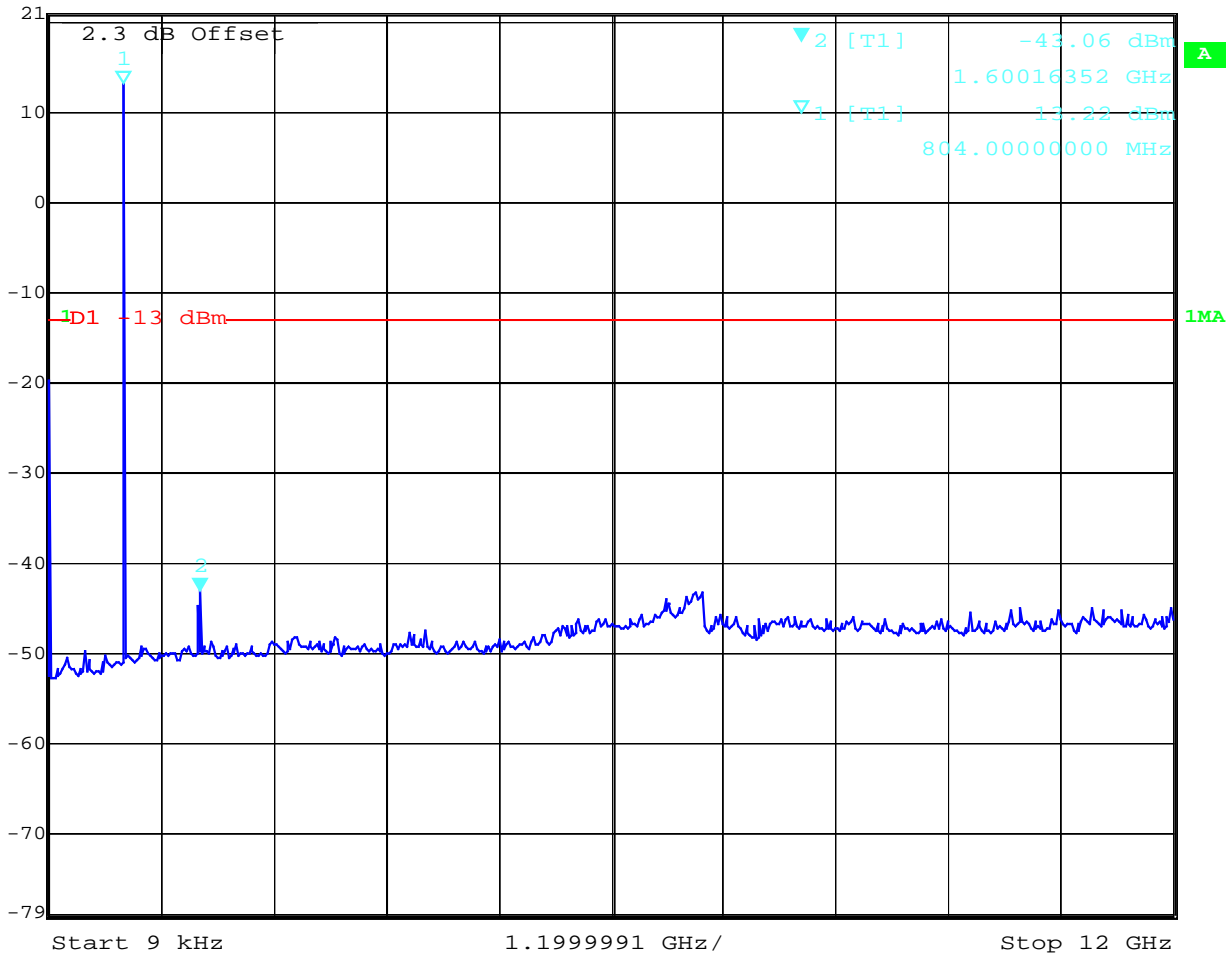
Equipment under test : SR 300
 Ambient temperature : 23°C
 Relative humidity : 50%

CONDUCTED EMISSIONS

FCC 74.861(e)(6)

Frequency: 804.000 MHz

	Marker 2 [T1]	RBW	1 MHz	RF Att	30 dB
	Ref Lvl	-43.06 dBm	VBW	1 MHz	
	21 dBm	1.60016352 GHz	SWT	68 ms	Unit dBm



Date: 9.OCT.2003 14:43:58

Limits

FCC Rule Part 74.861(e)(6)

- (6) The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the following schedule:
- (i) On any frequency removed from the operating frequency by more than 50 percent up to and including 100 percent of the authorized bandwidth: at least 25 dB;
 - (ii) On any frequency removed from the operating frequency by more than 100 percent up to and including 250 percent of the authorized bandwidth: at least 35 dB;
 - (iii) On any frequency removed from the operating frequency by more than 250 percent of the authorized bandwidth: at least $43+10\log_{10}$ (mean output power in watts) dB.

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
 (for reference numbers see test equipment listing)

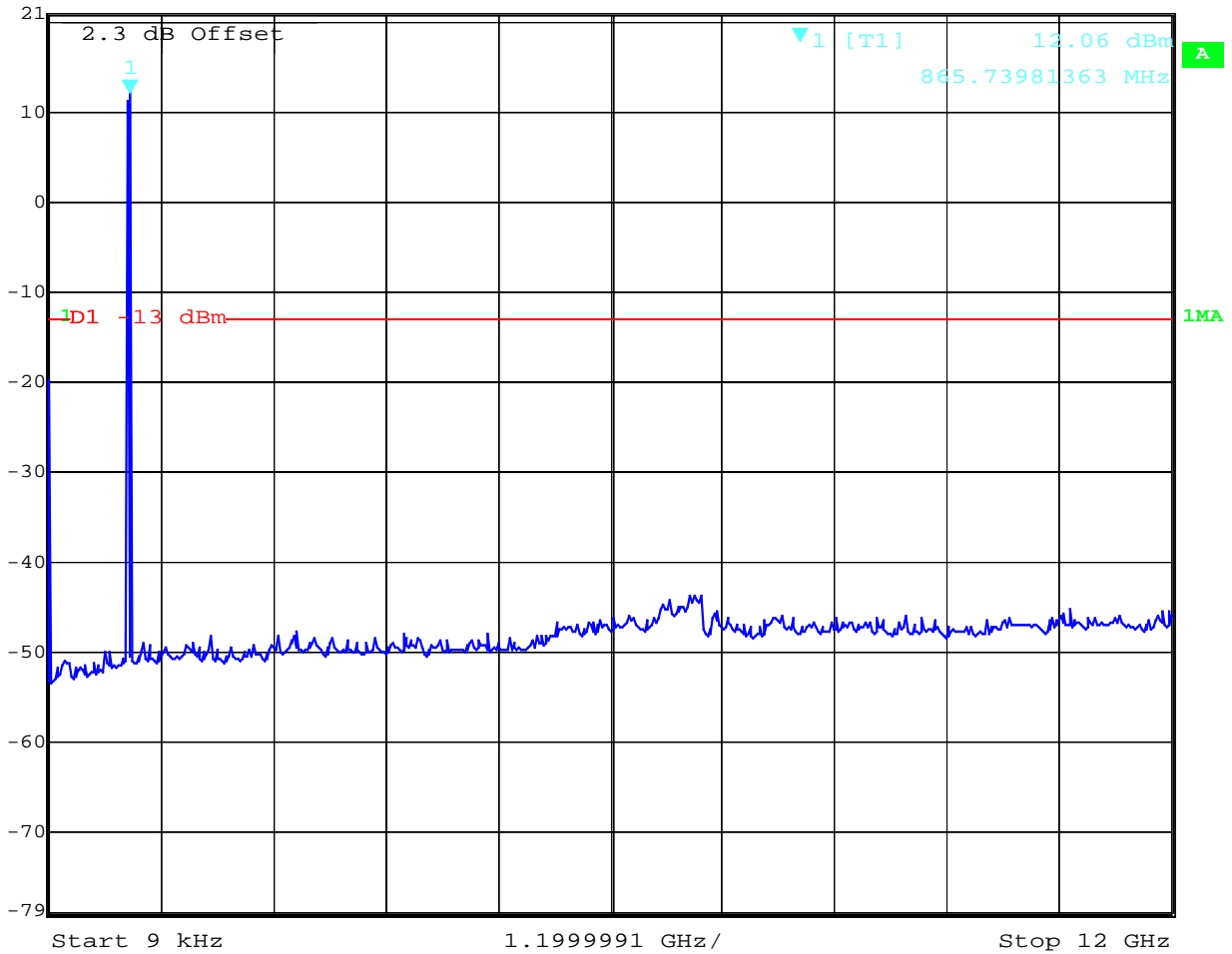
Equipment under test : SR 300
 Ambient temperature : 23°C
 Relative humidity : 50%

CONDUCTED EMISSIONS

FCC 74 861(e)(6)

Frequency: 864.000 MHz

	Marker 1 [T1]	RBW	1 MHz	RF Att	30 dB
	Ref Lvl	12.06 dBm	VBW	1 MHz	
	21 dBm	865.73981363 MHz	SWT	68 ms	Unit dBm



Date: 9.OCT.2003 14:45:14

Limits

FCC Rule Part 74.861(e)(6)

(6) The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the following schedule:

- (i) On any frequency removed from the operating frequency by more than 50 percent up to and including 100 percent of the authorized bandwidth: at least 25 dB;
- (ii) On any frequency removed from the operating frequency by more than 100 percent up to and including 250 percent of the authorized bandwidth: at least 35 dB;
- (iii) On any frequency removed from the operating frequency by more than 250 percent of the authorized bandwidth: at least 43+10log10 (mean output power in watts) dB.

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
 (for reference numbers see test equipment listing)**

Equipment under test : SR 300
Ambient temperature : 23°C
Relative humidity : 50%

RADIATED EMISSIONS

FCC Rule Part 74 subpart H

Test procedure

- 1). On a test site, the EUT shall be placed on a turntable, and in the position closest to the normal use as declared by the user.
- 2). The test antenna shall be oriented initially for vertical polarization located 3m from the EUT to correspond to the frequency of the transmitter.
- 3). The output of the test antenna shall be connected to the measuring receiver and either a peak or quasi-peak detector was used for the measurement as indicated on the report. The detector selection is based on how close the emission level was approaching the limit.
- 4). The transmitter shall be switched on, if possible, without the modulation and the measurement receiver shall be tuned to the frequency of the transmitter under test.
- 5). The test antenna shall be raised and lowered through the specified range of height until a maximum signal level is detected by the measuring receiver.
- 6). The transmitter shall then be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
- 7). The test antenna shall be raised and lowered again through the specified range of height until a maximum signal level is detected by the measuring receiver.
- 8). The maximum signal level detected by the measuring receiver shall be noted.
- 9). The transmitter shall be replaced by a substitution antenna (tuned dipole for f less than 1GHz and horn for frequency higher than 1GHz).
- 10). The substitution antenna shall be oriented for vertical polarization and the length (if a dipole antenna is used) of the substitution antenna shall be adjusted to correspond to the frequency of the transmitter.
- 11). The substitution antenna shall be connected to a calibrated signal generator.
- 12). If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
- 13). The test antenna shall be raised and lowered through the specified range of the height to ensure that the maximum signal is received.
- 14). The input signal to the substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuation setting of the measuring receiver.
- 15). The input level to the substitution antenna shall be recorded as power level in dBm, corrected for any change of input attenuator setting of the measuring receiver.
- 16). The measurement shall be repeated with the test antenna and the substitution antenna oriented for horizontal polarization.
- 17). The measure of the effective radiated power is the larger of the two levels recorded, at the input to the substitution antenna, corrected for the gain of the substitution antenna if necessary.
- 18). Repeat above substitution measurement procedure for fundamental and all harmonica emissions.

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)

Equipment under test : SR 300

Ambient temperature : 23°C

Relative humidity : 50%

Freq	SA Reading	SG Setting	Ant. gain	Dipole gain	Cable loss	ERP Result	Limit	Margin	Pol
MHz	dB μ V	dBm	dB i	dB d	dB	dBm	dBm	dBm	H/V
518.0	110.2	15.5		0.0	2.7	12.8			V
518.0	108.4	12.9		0.0	2.7	10.2			H
no traceable peak found									
644.0	110.8	15.9		0.0	2.8	13.1			V
644.0	108.0	13.3		0.0	2.8	10.5			H
no traceable peak found									
758.0	109.1	14.4		0.0	2.9	11.5			V
758.0	106.5	12.0		0.0	2.9	9.1			H
no traceable peak found									

Freq	SA Reading	SG Setting	Ant. gain	Dipole gain	Cable loss	ERP Result	Limit	Margin Limit	Pol
MHz	dB μ V	dBm	dB i	dB d	dB	dBm	dBm	dB	H/V
804.0	110.4	16.0		0.0	3.1	12.9			V
804.0	107.9	13.3		0.0	3.1	10.2			H
no traceable peak found									
864.0	107.6	13.0		0.0	3.2	9.8			V
864.0	104.9	10.4		0.0	3.2	7.2			H
no traceable peak found									

measured with a 0 db gain antenna and the AC 2 antenna combiner

all results worst case

f < 1 GHz : RBW/VBW: 100 kHz

f \geq 1GHz : RBW/VBW: 1 MHz

Limits

FCC Rule Part 74.861(e)(6)

f \pm 100 kHz to f \pm 200 kHz	f \pm 200 kHz to f \pm 500 kHz	f \pm 500 kHz
25 dBc	35 dBc	-43 +10 log ₁₀ (mean output power in watts) dB below the mean output power

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED

(for reference numbers see test equipment listing)

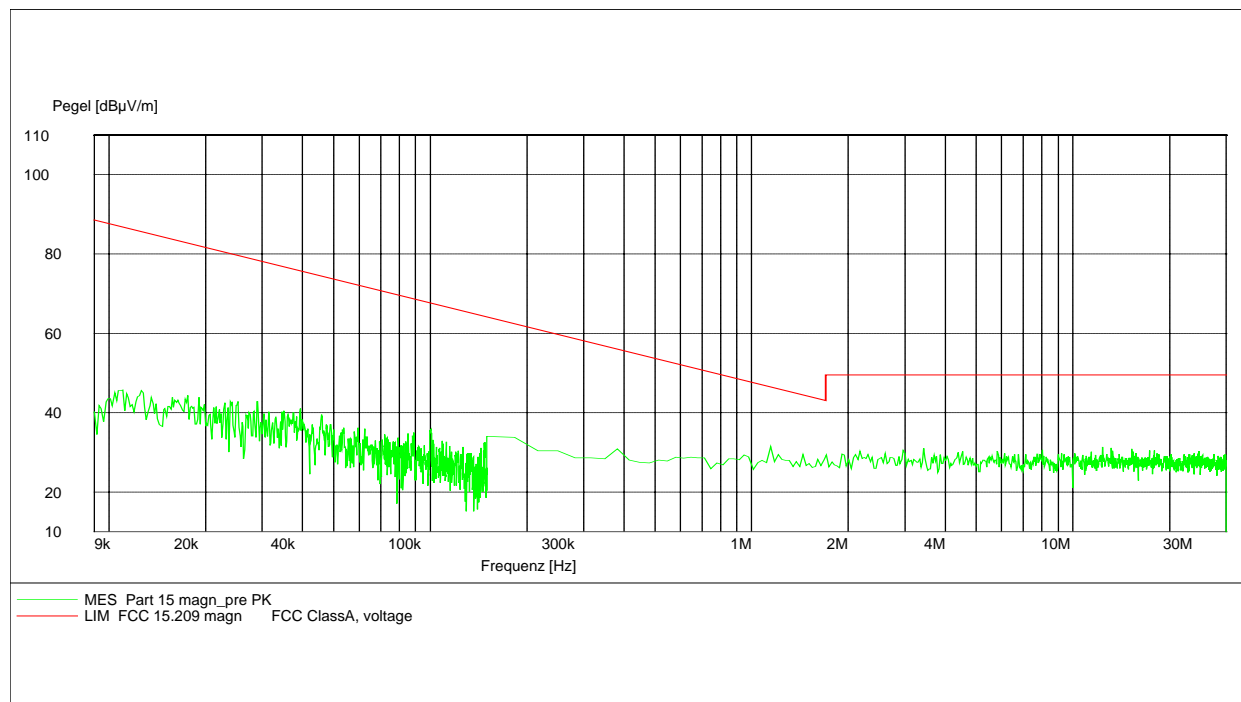
17 - 24

Equipment under test : SR 300
Ambient temperature : 23°C
Relative humidity : 50%

RADIATED EMISSIONS FCC Rule Part 74 subpart H for all measurements the carrier suppressed with a rejection filter

(this plot is valid for all channels)
Part 15.209 Magnetics

EUT: SR 300
Manufacturer: Sennheiser electronic GmbH & Co. KG
Operating Condition: normal mode
Test Site: Cetecom, Room 6
Operator: Berg
Test Specification: 115v / 60 Hz
Comment:
Start of Test: 14.10.03 / 10:12:21

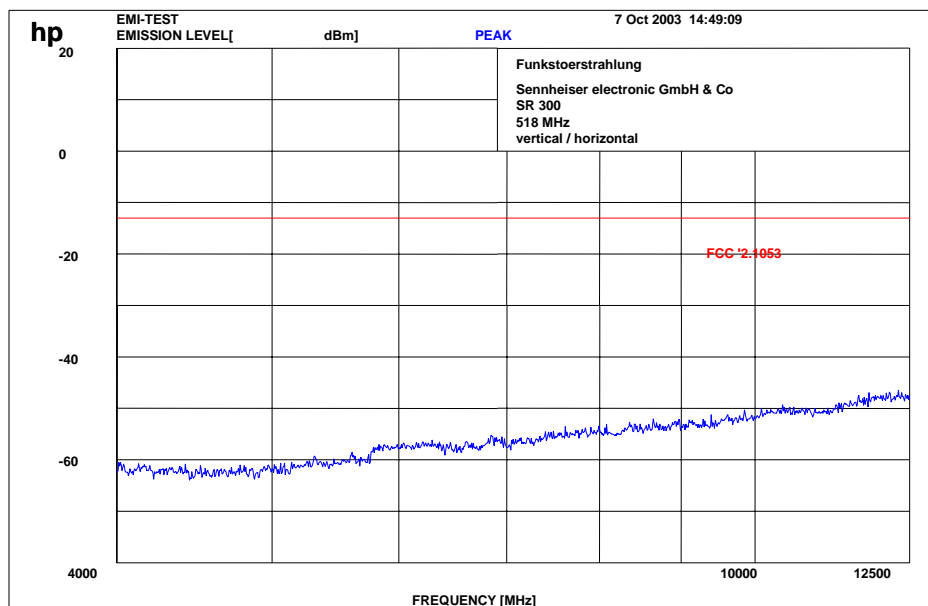
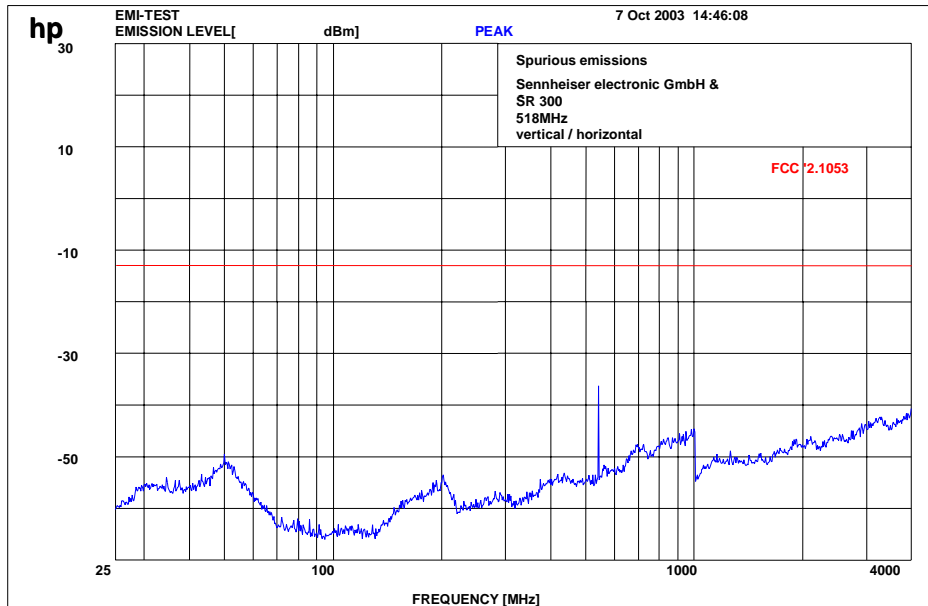


REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)
17 - 24

Equipment under test : SR 300
 Ambient temperature : 23°C
 Relative humidity : 50%

RADIATED EMISSIONS 518.00 MHz

FCC Rule Part 74 subpart H

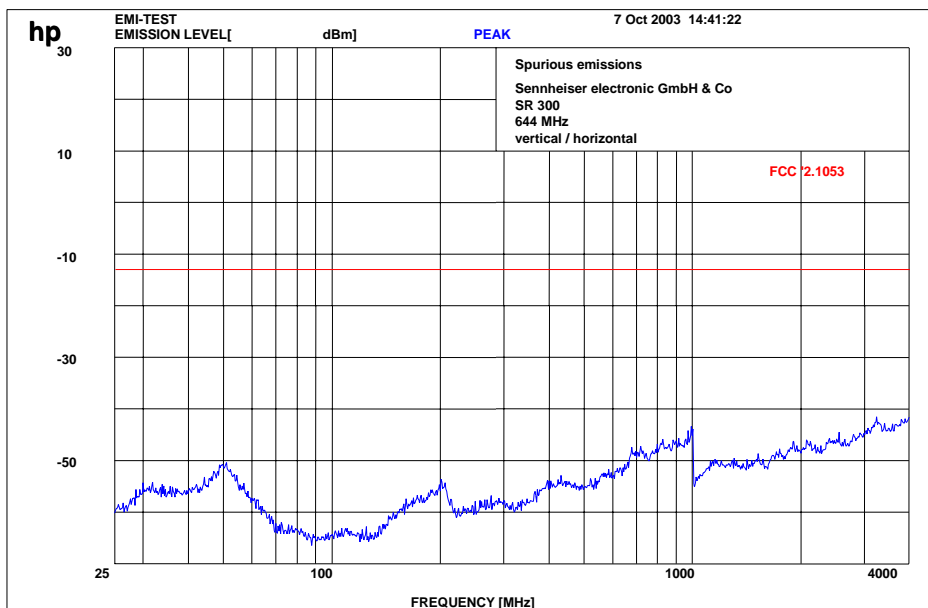
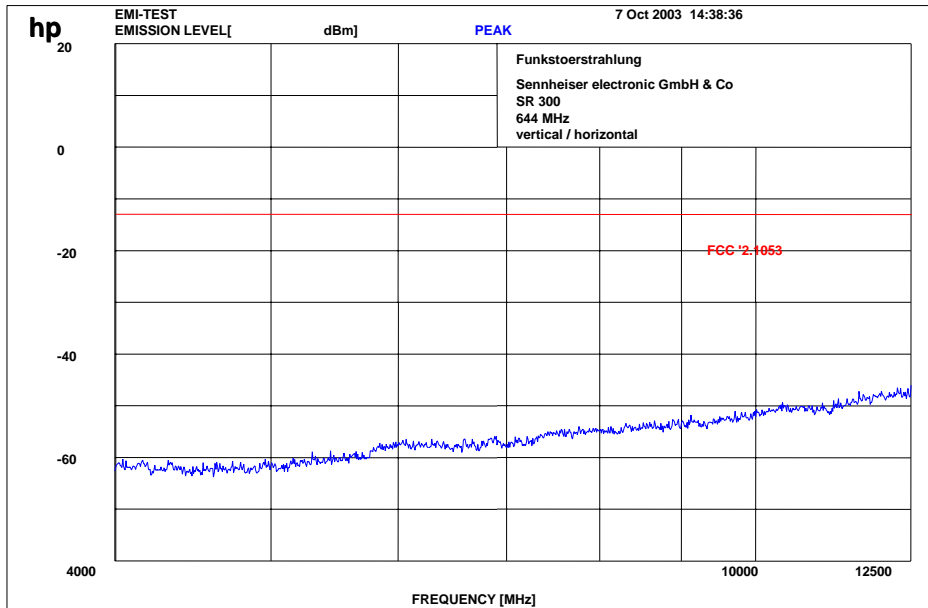


REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
 (for reference numbers see test equipment listing)

Equipment under test : SR 300
 Ambient temperature : 23°C
 Relative humidity : 50%

RADIATED EMISSIONS 644 MHz

FCC Rule Part 74 subpart H



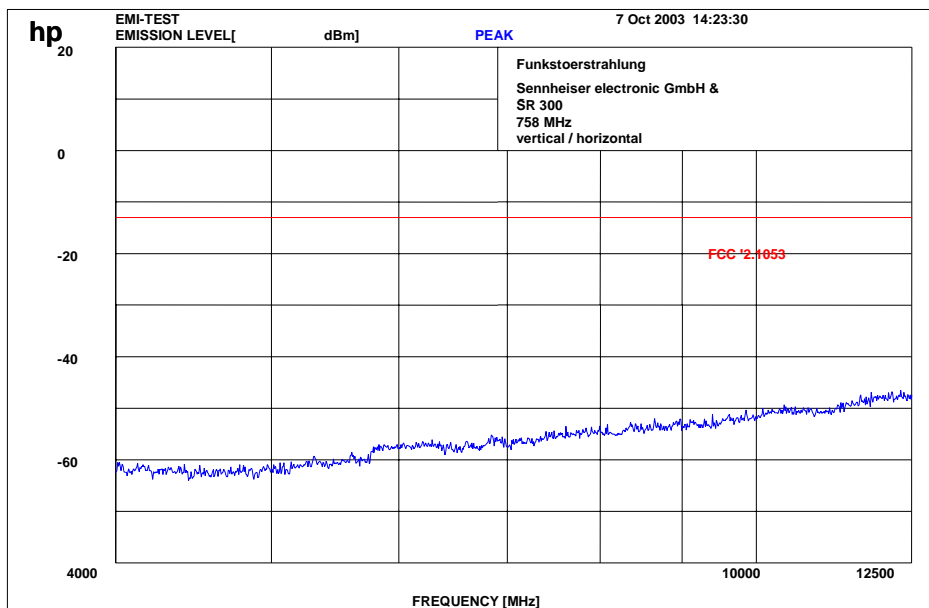
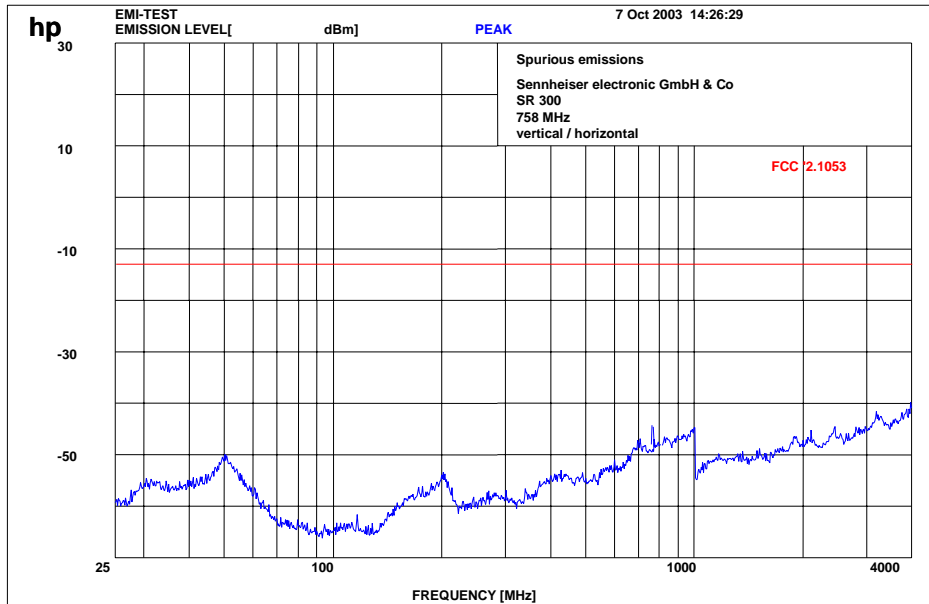
REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
 (for reference numbers see test equipment listing)

17 - 24

Equipment under test : SR 300
 Ambient temperature : 23°C
 Relative humidity : 50%

RADIATED EMISSIONS 758.00 MHz

FCC Rule Part 74 subpart H

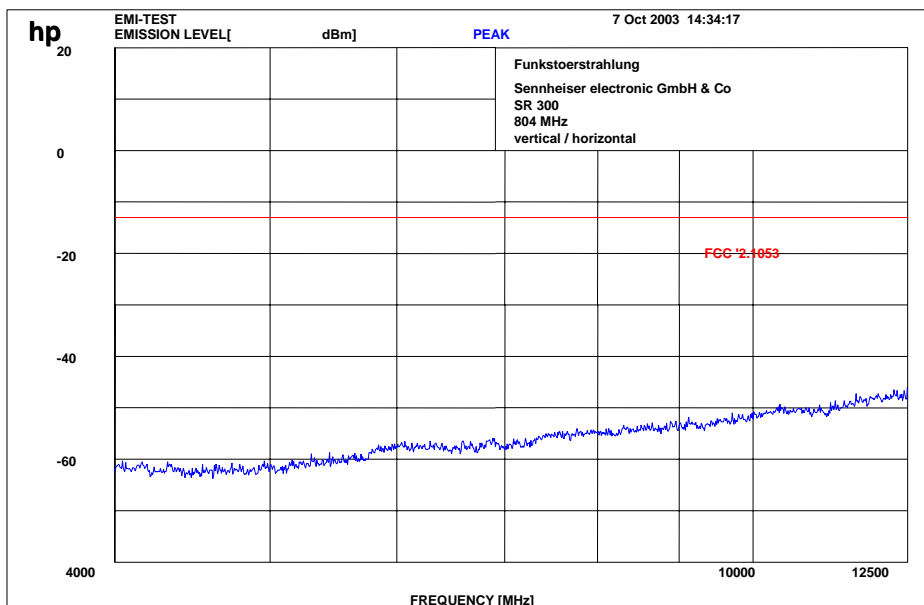
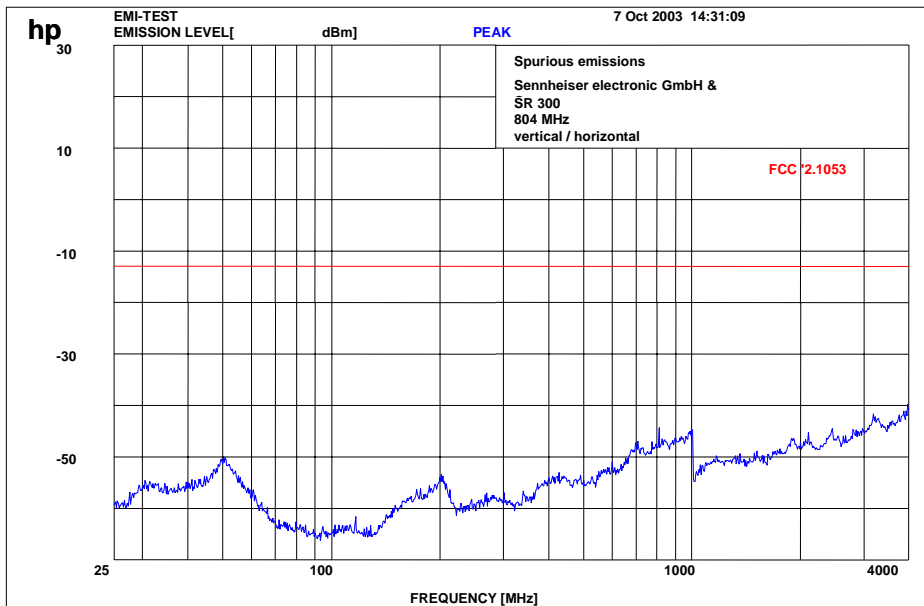


REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
 (for reference numbers see test equipment listing)

Equipment under test : SR 300
 Ambient temperature : 23°C
 Relative humidity : 50%

RADIATED EMISSIONS 804.00 MHz

FCC Rule Part 74 subpart H

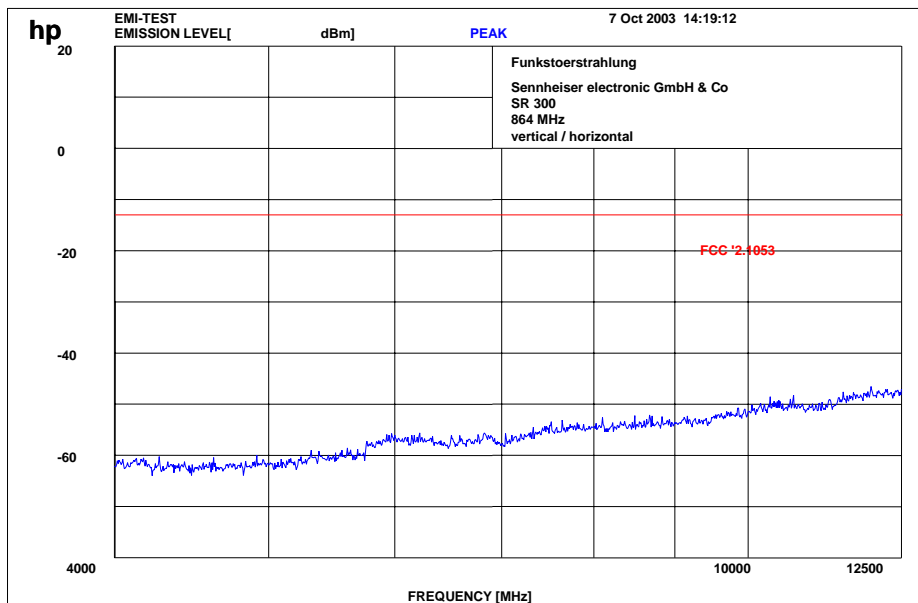
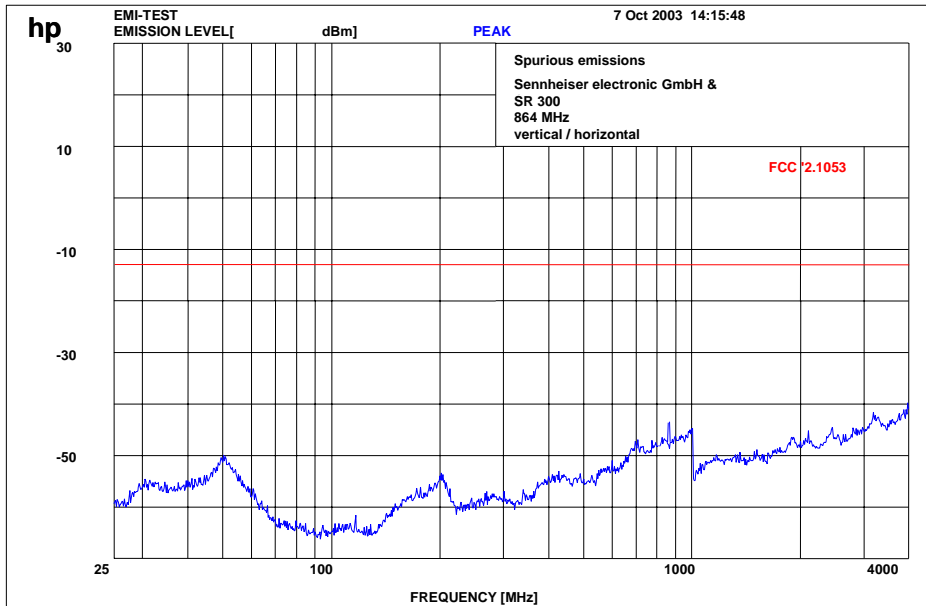


REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
 (for reference numbers see test equipment listing)

Equipment under test : SR 300
 Ambient temperature : 23°C
 Relative humidity : 50%

RADIATED EMISSIONS 864.00 MHz

FCC Rule Part 74 subpart H



REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
 (for reference numbers see test equipment listing)

17 - 24

Equipment under test : SR 300

Ambient temperature : 23°C

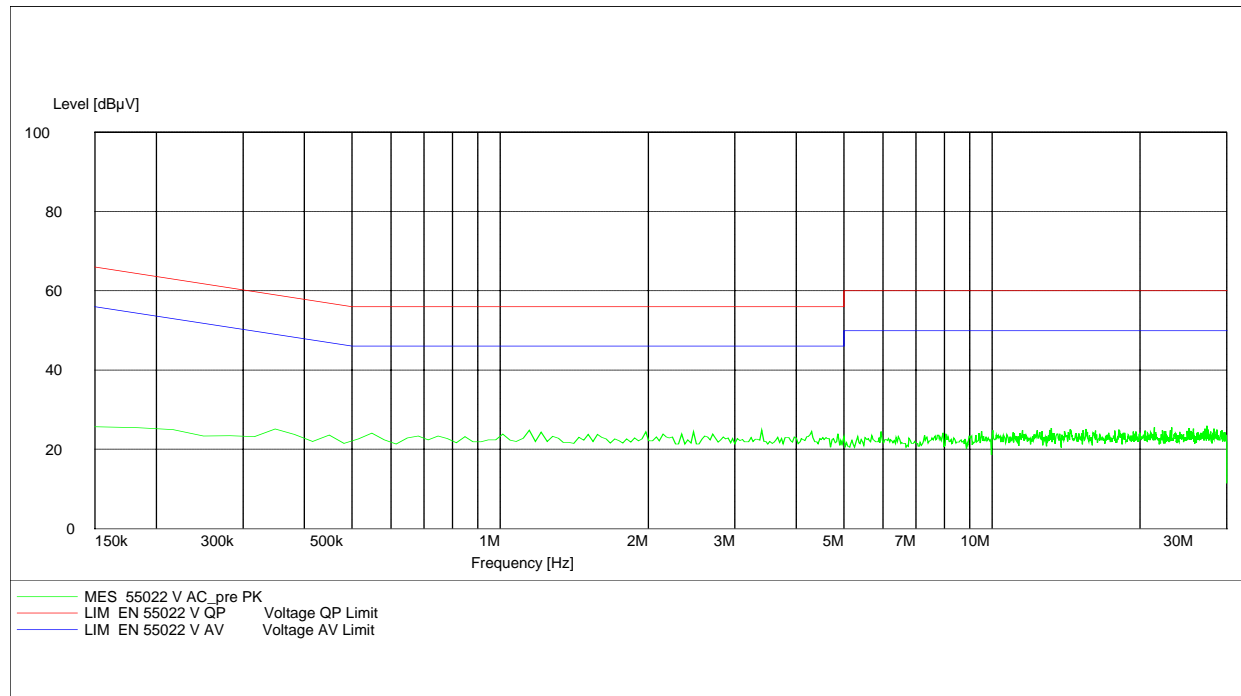
Relative humidity : 50%

Conducted emissions

§ 15.107/207

CISPR 22

EUT: SR 300 with AC 2
Manufacturer: Semmheiser electronic GmbH & Co.KG
Operating Condition: normal mode
Test Site: Room 006
Operator: Berg
Test Specification: 115V / 66 Hz
Comment:
Start of Test: 14.10.03 / 10:28:55



REFERENCE NUMBER(S) OF TEST EQUIPMENT USED

(for reference numbers see test equipment listing)

52-61

Equipment under test : EK 100/300/500
Ambient temperature : 23°C
Relative humidity : 50%

FCC Part 15 Subpart B

The radiated measurements are performed in vertical and horizontal plane in the frequency range from 9 kHz to 20 GHz in semi-anechoic chambers. The EUT is positioned on a non-conductive support with a height of 0.80 m above a conductive ground plane that covers the whole chamber.

The receiving antennas conform with specifications ANSI C63.2-1987 clause 15 and ANSI C63.4-1992 clause 4.1.5. These antennas can be moved over the height range between 1.0 m and 4.0 m in order to search for maximum field strength emitted from EUT. The measurement distances between EUT and receiving antennas are indicated in the test set-ups for the various frequency ranges. For each measurement, the EUT is rotated in all three axes until the maximum field strength is received.

The wanted and unwanted emissions are received by spectrum analyzers where the detector modes and resolution bandwidths over various frequency ranges are set according to requirement ANSI C63.4-1992 clause 4.2.

Antennas conform with ANSI C63.2-1996 item 15.

150 kHz - 30 MHz: Quasi Peak measurement, 9kHz Bandwidth, passive loop antenna.

30 MHz - 200 MHz: Quasi Peak measurement, 120kHz Bandwidth, biconical antenna

200MHz - 1GHz: Quasi Peak measurement, 120kHz Bandwidth, log periodic antenna

>1GHz: Average, RBW 1MHz, VBW 10 Hz, wave guide horn

All measurement settings are according to FCC 15.35, 15.209.

The product fulfils also the requirements for CANADA RSS-210

No deviations from the technical specification(s) were ascertained in the course of the tests performed.

FINAL VERDICT : PASS

Equipment under test : EK 100/300/500
 Ambient temperature : 23°C
 Relative humidity : 50%

SPURIOUS RADIATION

§ 15.109

Radiated

SPURIOUS EMISSIONS LEVEL ($\mu\text{V/m}$)								
518.000 MHz			644.000 MHz			758.000 MHz		
f (MHz)	Detector	Level (dB $\mu\text{V/m}$)	f (MHz)	Detector	Level (dB $\mu\text{V/m}$)	f (MHz)	Detector	Level (dB $\mu\text{V/m}$)
759.0	PK	34.8	885.0	PK	36.4	999.0	PK	37.2
804.000 MHz			864.000 MHz					
1045.0	PK	36.1	1105.0	PK	34.0			
Measurement uncertainty			± 3 dB					

$f < 1$ GHz : RBW/VBW: 100 kHz

$f \geq 1$ GHz : RBW/VBW: 1 MHz

H = Horizontal ; V= Vertical

Measurement distance see table

Limits

SUBCLAUSE § 15.109

Frequency (MHz)	Field strength ($\mu\text{V/m}$)	Measurement distance (m)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30 / 29.5 dB $\mu\text{V/m}$	30
30 - 88	100 / 40 dB $\mu\text{V/m}$	3
88 - 216	150 / 43.5 dB $\mu\text{V/m}$	3
216 - 960	200 / 46 dB $\mu\text{V/m}$	3
above 960	500 / 54 dB $\mu\text{V/m}$	3

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED

(for reference numbers see test equipment listing)

Equipment under test : EK 100/300/500

Ambient temperature : 23°C

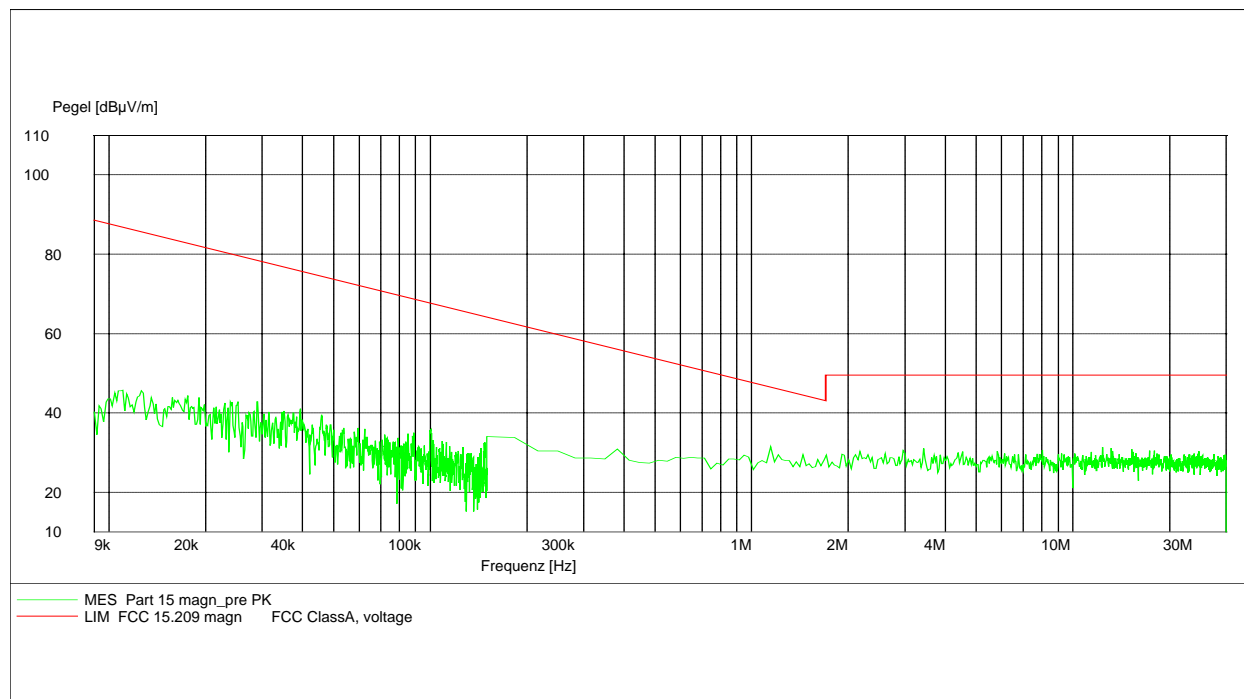
Relative humidity : 50%

RADIATED EMISSIONS (this plot is valid for all channels)

§ 15.109

FCC Rule 47

EUT: SK 100/300/500
Manufacturer: Sennheiser electronic GmbH & Co. KG
Operating Condition: normal mode
Test Site: Cetecom, Room 6
Operator: Berg
Test Specification: 115v / 60 Hz
Comment:
Start of Test: 14.10.03 / 10:35:26



**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)**

17 - 24

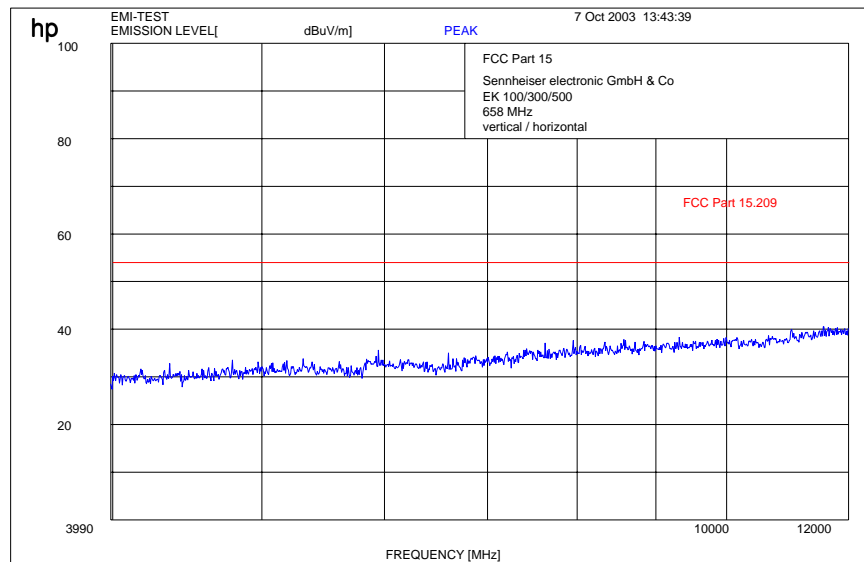
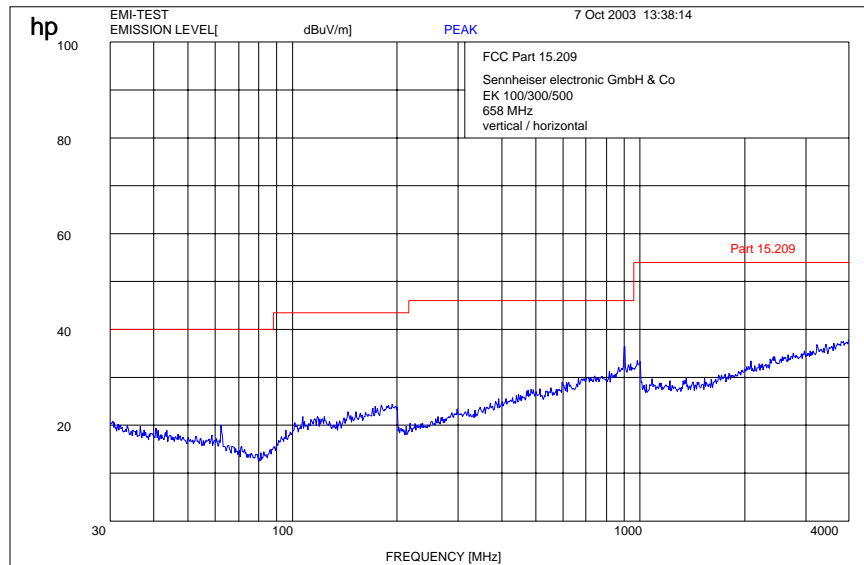
Equipment under test : EK 100/300/500

Ambient temperature : 23°C

Relative humidity : 50%

RADIATED EMISSIONS
518.00 MHz (Plot valid for all channels)

§ 15.109



f < 1 GHz : RBW/VBW: 100 kHz

f ≥ 1GHz : RBW/VBW: 1 MHz

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)

17 - 24

TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS

To simplify the identification on each page of the test equipment used, on each page of the test report, each item of test equipment and ancillaries such as cables are identified (numbered) by the Test Laboratory, below.

No	Instrument/Ancillary	Type	Manufacturer	Serial No.	Calibrated
01	Spectrum Analyzer	8566 A	Hewlett-Packard	1925A00257	Yes
02	Analyzer Display	8566 A	Hewlett-Packard	1925A00860	Yes
03	Oscilloscope	7633	Tektronix	230054	Yes
04	Radio Communication Analyzer	CMTA 54	Rohde & Schwarz	894 043/010	Yes
05	System Power Supply	6038 A	Hewlett-Packard	2848A07027	Yes
06	Signal Generator	8111 A	Hewlett-Packard	2215G00867	Yes
07	Signal Generator	8662 A	Hewlett-Packard	2224A01012	Yes
08	Function Generator	AFGU	Rohde & Schwarz	862 480/032	Yes
09	Regulating Transformer	MPL	Erfi	91350	n.a.
10	LISN	NNLA 8120	Schwarzbeck	8120331	Yes
11	Relay-Matrix	PSU	Rohde & Schwarz	893 285/020	Yes
12	Power-Meter	436 A	Hewlett-Packard	2101A12378	Yes
13	Power-Sensor	8484 A	Hewlett-Packard	2237A10156	Yes
14	Power-Sensor	8482 A	Hewlett-Packard	2237A00616	Yes
15	Modulation Meter	9008	Racal-Dana	2647	Yes
16	Frequency Counter	5340 A	Hewlett-Packard	1532A03899	Yes
17	Anechoic Chamber	---	MWB	87400/002	Yes
18	Spectrum Analyzer	85660 B	Hewlett-Packard	2747A05306	Yes
19	Analyzer Display	85662 A	Hewlett-Packard	2816A16541	Yes
20	Quasi Peak Adapter	85650 A	Hewlett-Packard	2811A01131	Yes
21	RF-Preselector	85685 A	Hewlett-Packard	2833A00768	Yes
22	Biconical Antenna	3104	Emco	3758	Yes
23	Log. Per. Antenna	3146	Emco	2130	Yes
24	Double Ridged Horn	3115	Emco	3088	Yes
25	EMI-Testreceiver	ESAI	Rohde & Schwarz	863 180/013	Yes
26	EMI-Analyzer-Display	ESAI-D	Rohde & Schwarz	862 771/008	Yes
27	Biconical Antenna	HK 116	Rohde & Schwarz	888 945/013	Yes
28	Log. Per. Antenna	HL 223	Rohde & Schwarz	825 584/002	Yes
29	Relay-Switch-Unit	RSU	Rohde & Schwarz	375 339/002	Yes
30	Highpass	HM985955	FSY Microwave	001	n.a.
31	Amplifier	P42-GA29	Tron-Tech	B 23602	Yes
32	Anechoic Chamber		Frankonia		Yes
33	Control Computer	PSM 7	Rohde & Schwarz	834 621/004	Yes
34	EMI Test Receiver	ESMI	Rohde & Schwarz	827 063/010	Yes
35	EMI Test Receiver	Display	Rohde & Schwarz	829 808/010	Yes

TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS

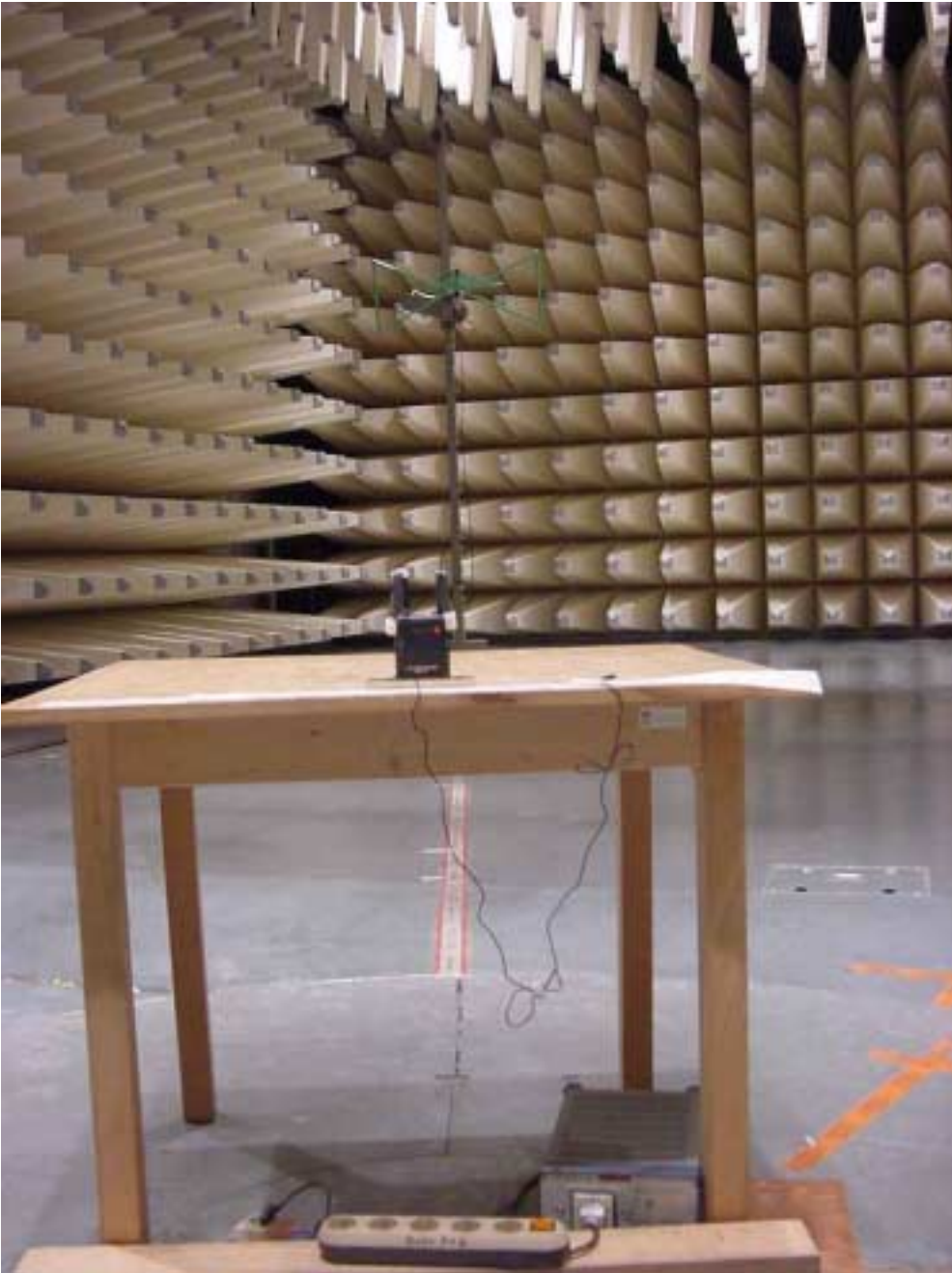
To simplify the identification on each page of the test equipment used. on each page of the test report. each item of test equipment and ancillaries such as cables are identified (numbered) by the Test Laboratory. below.

No	Instrument/Ancillary	Type	Manufacturer	Serial No.	Calibrated
36	Control Computer	HD 100	Deisel	100/322/93	n.a.
37	Relay Matrix	PSN	Rohde & Schwarz	829 065/003	Yes
38	Control Unit	GB 016 A2	Rohde & Schwarz	344 122/008	Yes
39	Relay Switch Unit	RSU	Rohde & Schwarz	316 790/001	Yes
40	Power Supply	6032A	Hewlett Packard	2846A04063	Yes
41	Spectrum Monitor	EZM	Rohde & Schwarz	883 720/006	n.a.
42	Measuring Receiver	ESH 3	Rohde & Schwarz	890 174/002	Yes
43	Measuring Receiver	ESVP	Rohde & Schwarz	891 752/005	Yes
44	Bicon Ant. 20-300MHz	HK 116	Rohde & Schwarz	833 162/011	Yes
45	Logper Ant. 0.3-1 GHz	HL 223	Rohde & Schwarz	832 914/010	Yes
46	Amplifier 0.1-4 GHz	AFS4	Miteq Inc.	206461	Yes
47	Logper Ant. 1-18 GHz	HL 024 A2	Rohde & Schwarz	342 662/002	Yes
48	Polarisation Network	HL 024 Z1	Rohde & Schwarz	341 570/002	Yes
49	Double Ridged Horn Antenna 1-26.5 GHz	3115	EMCO	9107-3696	Yes
50	Microw. Sys. Amplifier 0.5- 26.5 GHz	8317A	Hewlett Packard	3123A00105	Yes
51	Audio Analyzer	UPD	Rohde & Schwarz	1030.7500.04	Yes
52	Controler	PSM 7	Rohde & Schwarz	883 086/026	Yes
53	DC V-Network	ESH3-Z6	Rohde & Schwarz	861 406/005	Yes
54	DC V-Network	ESH3-Z6	Rohde & Schwarz	893 689/012	Yes
55	AC 2 Phase V-Network	ESH3-Z5	Rohde & Schwarz	861 189/014	Yes
56	AC 2 Phase V-Network	ESH3-Z5	Rohde & Schwarz	894 981/019	Yes
57	AC-3 Phase V-Network	ESH2-Z5	Rohde & Schwarz	882 394/007	Yes
58	Power Supply	6032A	Rohde & Schwarz	2933A05441	Yes
59	RF-Test Receiver	ESVP.52	Rohde & Schwarz	881 487/021	Yes
60	Spectrum Monitor	EZM	Rohde & Schwarz	883 086/026	n.a.
61	RF-Test Receiver	ESH3	Rohde & Schwarz	881 515/002	Yes
62	Relay Matrix	PSU	Rohde & Schwarz	882 943/029	Yes
63	Relay Matrix	PSU	Rohde & Schwarz	828 628/007	Yes
64	Spectrum Analyzer	FSIQ 26	Rohde & Schwarz	119.6001.27	Yes
65	Spectrum Analyzer	HP 8565E	Hewlett Packard	3473A00773	Yes
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Test setup
Radiated Emissions
SR 300



Test site
Radiated Emissions
EK 100/300/500



Test site
Conducted emissions



Photographs of the equipment

SR 300

Photograph no.: 1



Photographs of the equipment

SR 300

Photograph no.: 2



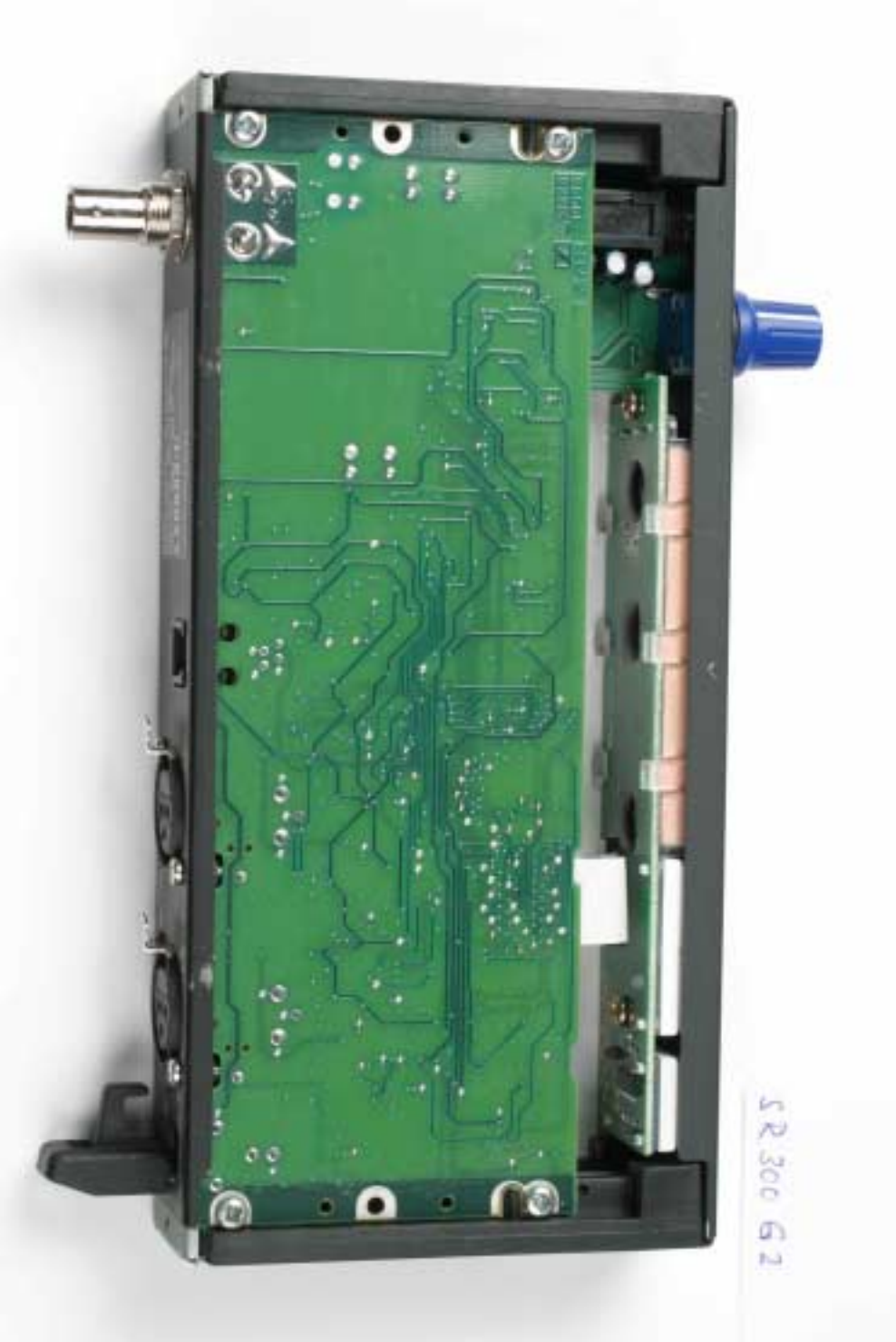
Photographs of the equipment

SR 300
Photograph no.: 3



Photographs of the equipment

SR 300
Photograph no.: 4



Photographs of the equipment

SR 300

Photograph no.: 5



TX SR 300 G2



TX SR 300 G2

Photographs of the equipment

AC 2

Photograph no.: 6



Photographs of the equipment

AC 2

Photograph no.: 8



Photographs of the equipment

AC 2

Photograph no.: 9



Photographs of the equipment

AC 2

Photograph no.: 10



Photographs of the equipment

EK 100

Photograph no.: 11



Photographs of the equipment

EK 100

Photograph no.: 12



Photographs of the equipment

EK 100

Photograph no.: 13



Photographs of the equipment

EK 100
Photograph no.: 14



Photographs of the equipment

EK 100

Photograph no.: 15



Photographs of the equipment

EK 100

Photograph no.: 16



Photographs of the equipment

EK 300

Photograph no.: 17



Photographs of the equipment

EK 300

Photograph no.: 18



Photographs of the equipment

EK 300

Photograph no.: 19



Photographs of the equipment

EK 300
Photograph no.: 20



Photographs of the equipment

EK 300

Photograph no.: 21



Photographs of the equipment

EK 500

Photograph no.: 22



Photographs of the equipment

EK 500

Photograph no.: 23



Photographs of the equipment

EK 500

Photograph no.: 24



Photographs of the equipment

EK 500
Photograph no.: 25



Photographs of the equipment

EK 500

Photograph no.: 26



Photographs of the equipment

EK 100/300/ 500
Photograph no.: 27

