

Test Report for FCC

FCC ID: OZ5URCDMS1200

Report Number		ESTF151010-002			
Applicant	Company name	OHSUNG ELECTRONICS CO.LTD			
	Address	#181 Gongdan-dong, Gumi-si, Gyeongsangbuk-Do, Korea			
	Telephone	82-54-461-3647			
Product	Product name	Multi-Zone Amplifier			
	Model No.	DMS-1200	Manufacturer	OHSUNG ELECTRONICS CO.LTD	
	Serial No.	NONE	Country of origin	KOREA	
Test date	2010-10-12		Date of issue	14-Oct-10	
Testing location	ESTECH. Co., Ltd. 97-1 Hoiuk-Ri Majang-Myon, Icheon-city, KyungKi-Do, Korea				
Standard	FCC PART 15 2008 , ANSI C 63.4 2003				
Test item	<input checked="" type="checkbox"/> Conducted Emission	<input type="checkbox"/> Class A	<input checked="" type="checkbox"/> Class B	Test result	OK
	<input checked="" type="checkbox"/> Radiated Emission	<input type="checkbox"/> Class A	<input checked="" type="checkbox"/> Class B	Test result	OK
Measurement facility registration number		94696			
Tested by	Senior Engineer J.H.KIM		(Signature)		
Reviewed by	Engineering Manager J.M.Yang		(Signature)		
Abbreviation	OK, Pass = Passed, Fail = Failed, N/A = not applicable				
<p>* Note</p> <ul style="list-style-type: none"> - This test report is not permitted to copy partly without our permission - This test result is dependent on only equipment to be used - This test result based on a single evaluation of one sample of the above mentioned 					

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1. Laboratory Information

1.1 General

This EUT (Equipment Under Test) has been shown to be capable of compliance with the applicable technical standards and is tested in accordance with the measurement procedures as indicated in this report.

ESTECH Lab attests to accuracy of test data. All measurement reported herein were performed by ESTECH Co., Ltd.

ESTECH Lab assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

1.2 Test Lab.

Corporation Name : ESTECH Co. Ltd

Head Office : Rm 1015, World Venture Center II, 426-5, Gasan-dong, Geumcheon-gu, Seoul, Korea
(Safety & Telecom. Test Lab)

EMC Test Lab : 58-1 Osan-Ri, GaNam-Myon, YeoJoo-Gun, KyungKi-Do, Korea
97-1 Hoiuk-Ri Majang-Myon, Icheon-city, KyungKi-Do, Korea

1.3 Official Qualification(s)

KCC : Granted Accreditation from Ministry of Information & Communication for EMC, Safety and Telecommunication

KOLAS : Accredited Lab By Korea Laboratory Accreditation Schema base on CENELEC requirements

FCC : Filed Laboratory at Federal Communications Commission

VCCI : Granted Accreditation from Voluntary Control Council for Interference from ITE

2. Description of EUT

2.1 Summary of Equipment Under Test

Product Name : Multi-Zone Amplifier
 Model Number : DMS-1200
 Serial Number : NONE
 Manufacturer : OHSUNG ELECTRONICS CO.LTD
 Country of origin : KOREA
 Rating : (100 ~ 240) Va.c., 7 A max., (50 ~ 60) Hz
 Receipt Date : 29-Jul-10
 X-tal lists : 18.432 MHz, 25 MHz, 32.768 kHz

2.2 General descriptions of EUT

Specifications

Audio section

Rated Wattage per Channel	50W+50W(8ohms, 20Hz~20KHz with 0.1% T.H.D 140W+140W(8ohms, 1KHz with 10% T.H.D
Frequency Response	20Hz~20KHz +/-1.0dB at 8ohms 20Hz~20KHz +/-3.0dB at 4ohms
Signal to Noise Ratio	85+/- 5dB
Total Harmonic Distortion	<0.06%, 20Hz~20KHz
Output connectors	8ohms, 4ohms stable
Input sensitivity	600~2200mVp-p/10Kohm
Network Connectivity	10/100 BaseT Ethernet
Tone Controls	Bass, Treble, 5-Band parametric EQ, LVLC(low volume level control)
Full Matrix Switching for Audio streaming	Yes
Number of Analogue Input sources	4
Number of Digital Input Sources (S/PDIF)	1
Speaker Output Zones	6
Line level Output Zones	2 (2.2Vp-p Variable output, 2.0Vp-p fixed output level)
Independent Gain Control per Zone	Yes
Accessories	AC cord, RCA cable, User's manual

Environmental

Operational Temperature	32°F ~104°F (0°C- 40°C)
Humidity	5%- 95% (Non Condensing)
Storage Temperature	-4°F ~158°F (-20°C- 60°C)

General

Power supply	AC 100-240, 50/60Hz
Power consumption	7A maximum
Maximum external Dimensions H x W x D	5.25 1/32" x 17 1/18" x 16 1/1.87" 133mm x 432mm x 420mm
Weight	27lbs (12.1kg)



3. Test Standards

Test Standard : FCC PART 15 (2008)

This Standard sets out the regulations under which an intentional, unintentional, or incidental radiator may be operated without an individual license. It also contains the technical specifications, administrative requirements and other conditions relating to the marketing of Part 15 devices.

Test Method : ANSI C 63.4 (2003)

This standard sets forth uniform methods of measurement of radio-frequency (RF) signals and noise emitted from both unintentional and intentional emitters of RF energy in the frequency range 9 kHz to 40 GHz. Methods for the measurement of radiated and AC power-line conducted radio noise are covered and may be applied to any such equipment unless otherwise specified by individual equipment requirements. These methods cover measurement of certain devices that deliberately radiate energy, such as intentional emitters, but does not cover licensed transmitters. This standard is not intended for certification/approval of avionic equipment or for industrial, scientific, and medical (ISM) equipment. These methods apply to the measurement of individual units or systems comprised of multiple units.



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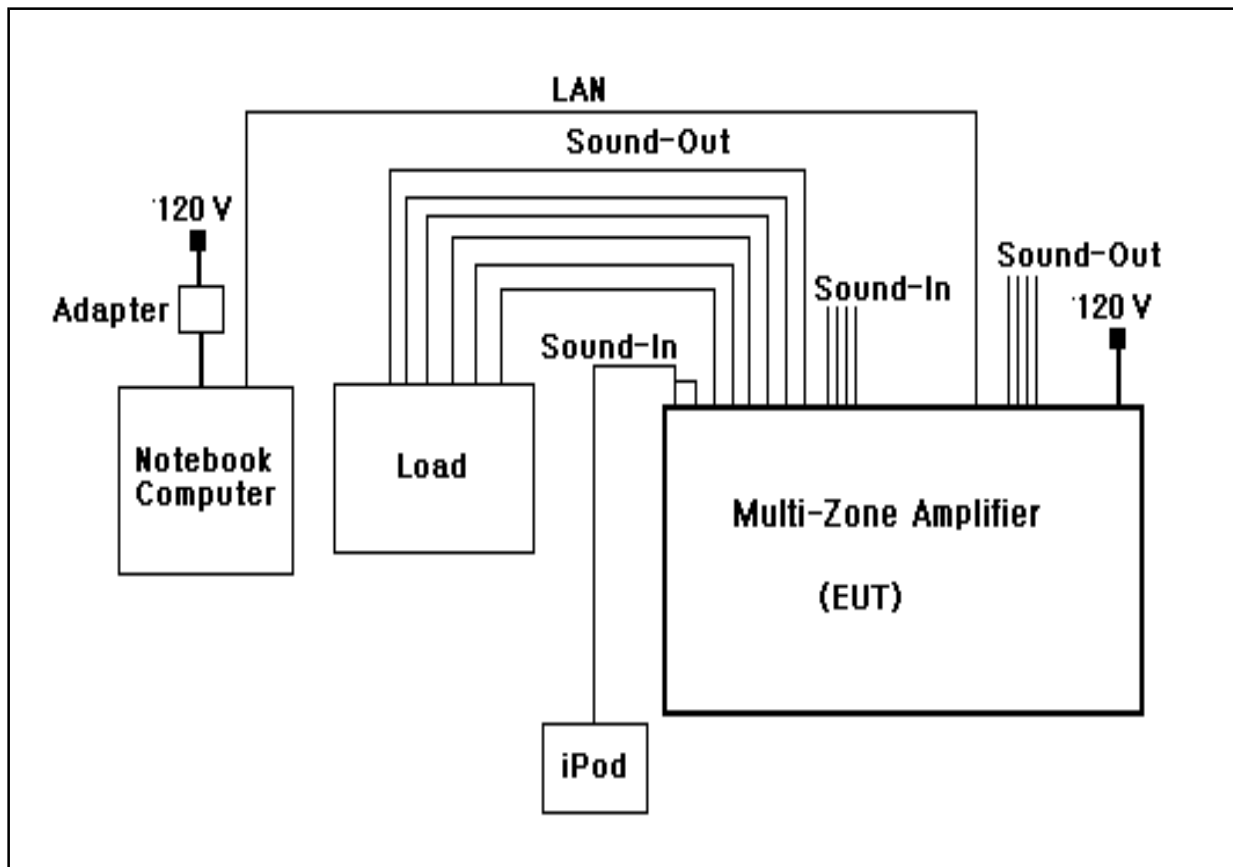
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4. Measurement Condition

4.1 EUT Operation.

1. Connect the EUT with the notebook computer's Lan port
2. Connect the EUT with 8 Ω Loads
3. Install provided a software in the Notebook computer.
4. Input 1 kHz sinewave in the EUT's sound in port by iPod.
5. The operational conditions of the EUT was determined by the manufacturer according to the typical use of the EUT with respect to the expected highest level of emission.

4.2 Configuration and Peripherals



4.3 EUT and Support equipment

Equipment Name	Model Name	S/N	Manufacturer	Remark (FCC ID)
Multi-Zone Amplifier	OHSUNG ELECTRONICS CO.LTD	NONE	OHSUNG ELECTRONICS CO.LTD	EUT
Load	NONE	NONE	OHSUNG ELECTRONICS CO.LTD	
iPod	A1136	9C6453A6V9K	Apple Computer Inc.	
Notebook Computer	dv5-1206TX	CNF9100JMW	HEWLETT-PACKARD COMPANY	
Adapter	0957-2231	07JO856632	Bestec Electronics (DongGuan) Co.,Ltd.	

4.4 Cable Connecting

Start Equipment		End Equipment		Cable Standard		Remark
Name	I/O port	Name	I/O port	Length	Shielded	
Multi-Zone Amplifier	Sound-Out x 6 Port	Load	-	5	No	
AV equipment	Sound-In x 2 Port	iPod	Sound-Out	2	No	
AV equipment	Sound-In x 4 Port	-	-	2	No	
AV equipment	Sound-Out x 2 Port	-	-	2	No	
AV equipment	LAN	Notebook Computer	LAN	2	No	
Notebook Computer	POWER	Adapter	-	2	No	

5. Measurement of radiated disturbance

Above 30 MHz Electric Field strength was measured in accordance with FCC Part 15 (2008) & ANSI C 63.4 (2003). The test setup was made according to FCC Part 15 (2008) & ANSI C 63.4 (2003) on an open test site, which allows a 3 m distance measurement. The EUT was placed in the center of wooden turntable. The height of this table was 0.8 m. The measurement was conducted with both horizontal and vertical antenna polarization. The turntable has fully rotated. For further description of the configuration refer to the picture of the test setup.

5.1 Measurement equipments

Equipment Name	Type	Manufacturer	Serial No.	Next Calibration date
Receiver	ESVS10	Rohde & Schwarz	838562/002	2011. 2. 1
Spectrum Analyzer	R3273	ADVANTEST	110600592	2011. 2. 1
Logbicon Antenna	VULB9160	Schwarzbeck	3142	2011.5.13
Amplifier	8447F	HP	2805A02972	2011. 2. 1
Turn Table	2087	EMCO	2129	-
Antenna Mast	2070-01	EMCO	9702-203	-
PREAMPLIFIER	8449B	HP	3008A00581	2011. 2. 01
Horn Antenna	BBHA 9120 D	Schwarzbeck	469	2011. 7. 14
ANT Mast Controller	2090	EMCO	1535	-
Turn Table Controller	2090	EMCO	1535	-

5.2 Environmental Condition

Test Place : Open site(3 m)

Temperature (°C) : 7 °C

Humidity (% R.H.) : 41 % R.H.



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5.3 Test data (Below 1 GHz)

Test Date : 12-Oct-10

Measurement Distance : 3 m

Frequency (MHz)	Reading (dB μ V)	Position (V/H)	Height (m)	Correction Factor		Result Value		
				Ant Factor (dB)	Cable (dB)	Limit (dB μ V/m)	Result (dB μ V/m)	Margin (dB)
36.14	20.10	H	3.2	10.77	0.9	40.0	31.80	-8.20
75.02	19.20	H	3.0	9.00	1.3	40.0	29.53	-10.47
110.47	17.20	V	1.0	10.02	1.6	43.5	28.84	-14.66
138.80	21.00	V	1.0	12.30	2.0	43.5	35.28	-8.22
149.64	13.70	H	2.4	12.66	2.0	43.5	28.35	-15.15
225.01	10.70	H	2.5	10.62	2.6	46.0	23.89	-22.11
250.01	17.80	H	1.6	11.97	2.8	46.0	32.56	-13.44
372.56	14.80	H	1.3	15.17	3.8	46.0	33.78	-12.22
448.78	15.10	H	1.0	16.78	4.5	46.0	36.36	-9.64
499.58	16.20	H	1.1	17.80	4.7	46.0	38.75	-7.25
620.93	16.40	V	1.3	20.38	5.6	46.0	42.34	-3.66
643.51	13.60	H	1.0	20.62	6.0	46.0	40.24	-5.76
816.14	7.20	H	1.0	22.98	7.0	46.0	37.15	-8.85

Remark

H : Horizontal, V : Vertical
 *There is no detected Radiated Emission above 1GHz
 *CL = Cable Loss-Amplifier Gain(In case of above1000Mhz)
 *CL = Cable Loss(In case of below1000Mhz)
 *The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120KHz for Quasi-peak detection at frequency below 1GHz.
 *The resolution bandwidth and video bandwidth of spectrum analyzer is 1MHz and 10Hz for average detection at frequency above 1GHz.

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5.3 Test data (Above 1 GHz)

Test Date : 12-Oct-10

Measurement Distance : 3 m

Frequency (MHz)	Reading (dB μ V)	Position (V/H)	Height (m)	Correction Factor		Result Value		
				Ant Factor (dB)	Cable (dB)	Limit (dB μ V/m)	Result (dB μ V/m)	Margin (dB)
Peak(RBW:1 MHz VBW:1 MHz)								
1044.00	48.97	H	1.2	25.59	-35.3	74.0	39.26	-34.74
1044.00	47.87	V	1.0	25.59	-35.3	74.0	38.16	-35.84
1440.00	49.15	H	1.1	25.79	-35.1	74.0	39.84	-34.16
1440.00	48.17	V	1.2	25.79	-35.1	74.0	38.86	-35.14
1601.00	49.48	H	1.1	26.11	-34.5	74.0	41.09	-32.91
1601.00	48.58	V	1.1	26.11	-34.5	74.0	40.19	-33.81
Average(RBW:1 MHz VBW:10 Hz)								
1044.00	38.50	H	1.2	25.59	-35.3	54.0	28.79	-25.21
1044.00	37.67	V	1.0	25.59	-35.3	54.0	27.96	-26.04
1440.00	36.74	H	1.1	25.79	-35.1	54.0	27.43	-26.57
1440.00	35.64	V	1.2	25.79	-35.1	54.0	26.33	-27.67
1601.00	34.61	H	1.1	26.11	-34.5	54.0	26.22	-27.78
1601.00	34.57	V	1.1	26.11	-34.5	54.0	26.18	-27.82
Remark	H : Horizontal, V : Vertical *CL = Cable Loss-Amplifier Gain(In case of above1000 MHz) *CL = Cable Loss(In case of below1000 MHz) *The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection *The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz for Average detection at frequency above 1GHz.							

6. Measurement of conducted disturbance

The continuous disturbance voltage of AC Mains in the frequency from 0.15 MHz to 30 MHz was measured in accordance to FCC Part 15 (2008) & ANSI C 63.4 (2003) The test setup was made according to FCC Part 15 (2008) & ANSI C 63.4 (2003) in a shielded Room. The EUT was placed on a non-conductive table at least 0.8 m above the ground plan. A grounded vertical reference plane was positioned in a distance of 0.4 m from the EUT. The distance from the EUT to other metal surfaces was at least 0.8 m. The EUT was only earthen by its power cord through the line impedance stabilizing network. The power cord has been bundled to a length of 1.0 m. The test receiver with Quasi Peak detector complies with CISPR 16.

6.1 Measurement equipments

Equipment Name	Type	Manufacturer	Serial No.	Next Calibration date
LISN	ESH3-Z5	Schwarzbeck	838979/010	2011. 2. 1
LISN	NSLK8127	Schwarzbeck	8127304	2011. 1.18
TEST Receiver	ESPI7	Rohde & Schwarz	100185	2011. 8. 24
Pulse Limiter	ESH3Z2	Rohde & Schwarz	NONE	2011. 2. 1

6.2 Environmental Condition

Test Place : Shielded Room
 Temperature (°C) : 22 °C
 Humidity (% R.H.) : 46 % R.H.



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6.3 Test data

Test Date : 12-Oct-10

Frequency (MHz)	Correction Factor		Line (H/N)	Quasi-peak Value			Average Value		
	Lish (dB)	Cable (dB)		Limit (dB μ V)	Reading (dB μ V)	Result (dB μ V)	Limit (dB μ V)	Reading (dB μ V)	Result (dB)
0.15	0.10	0.4	H	66.00	47.10	47.58	56.00	39.76	40.24
0.16	0.10	0.4	N	65.26	46.14	46.62	55.26	38.40	38.88
0.19	0.10	0.4	N	63.95	58.13	58.62	53.95	48.43	48.92
0.20	0.10	0.4	N	63.78	52.87	53.36	53.78	49.89	50.38
0.25	0.11	0.4	H	61.63	41.26	41.76	51.63	32.44	32.94
0.26	0.11	0.4	N	61.59	43.93	44.43	51.59	37.11	37.61
0.78	0.12	0.5	H	56.00	41.59	42.19	46.00	41.19	41.79
0.92	0.12	0.5	N	56.00	42.64	43.25	46.00	42.52	43.13
1.35	0.14	0.5	H	56.00	42.09	42.74	46.00	41.73	42.38
1.49	0.15	0.5	H	56.00	43.01	43.67	46.00	42.86	43.52
2.06	0.18	0.5	N	56.00	42.96	43.69	46.00	42.81	43.54
2.63	0.21	0.6	H	56.00	41.95	42.75	46.00	41.68	42.48
5.61	0.33	0.8	N	60.00	34.73	35.86	50.00	33.01	34.14
8.72	0.38	0.9	N	60.00	37.45	38.74	50.00	34.93	36.22
9.94	0.39	1.0	N	60.00	41.45	42.80	50.00	38.01	39.36
11.85	0.45	1.0	N	60.00	46.29	47.78	50.00	42.49	43.98
11.99	0.46	1.0	N	60.00	46.48	47.98	50.00	46.47	47.97
12.13	0.46	1.0	H	60.00	46.60	48.11	50.00	43.81	45.32
Remark	H : Hot Line, N : Neutral Line								

7. Photographs of test setup

7.1 Setup for Radiated Test

[Front]



[Rear]



7.2 Setup for Radiated Test : Above 1 GHz

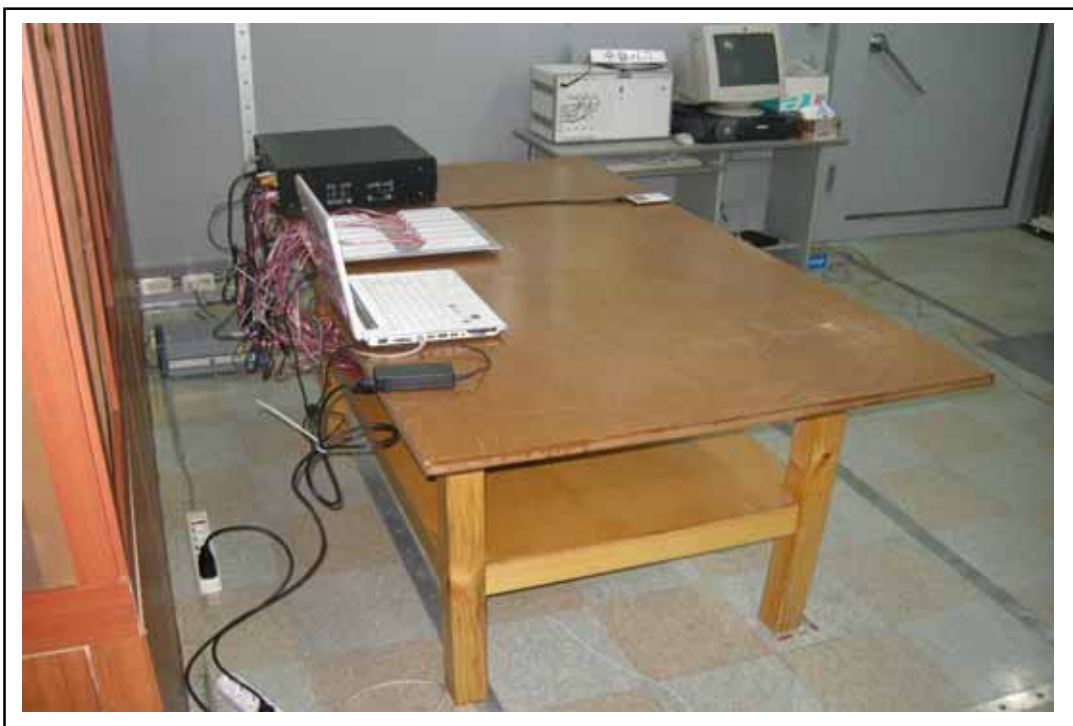


7.2 Setup for Conducted Test : 0.15 MHz ~ 30 MHz

[Front]



[Rear]



8. Photographs of EUT

[Front]



[Rear]





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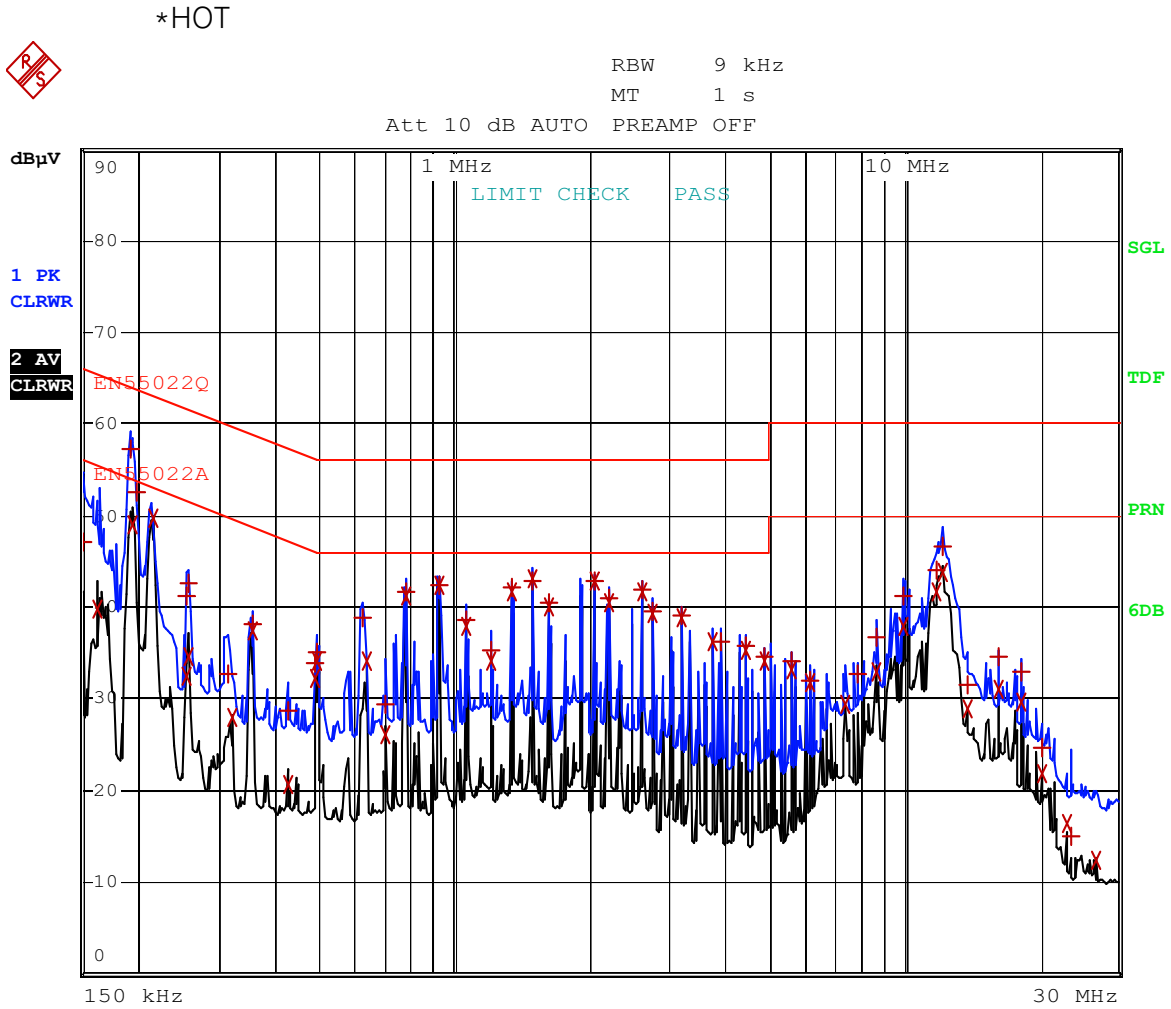


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[Inside]



Appendix 1. Spectral diagram



Comment: DMS-1200 HOT
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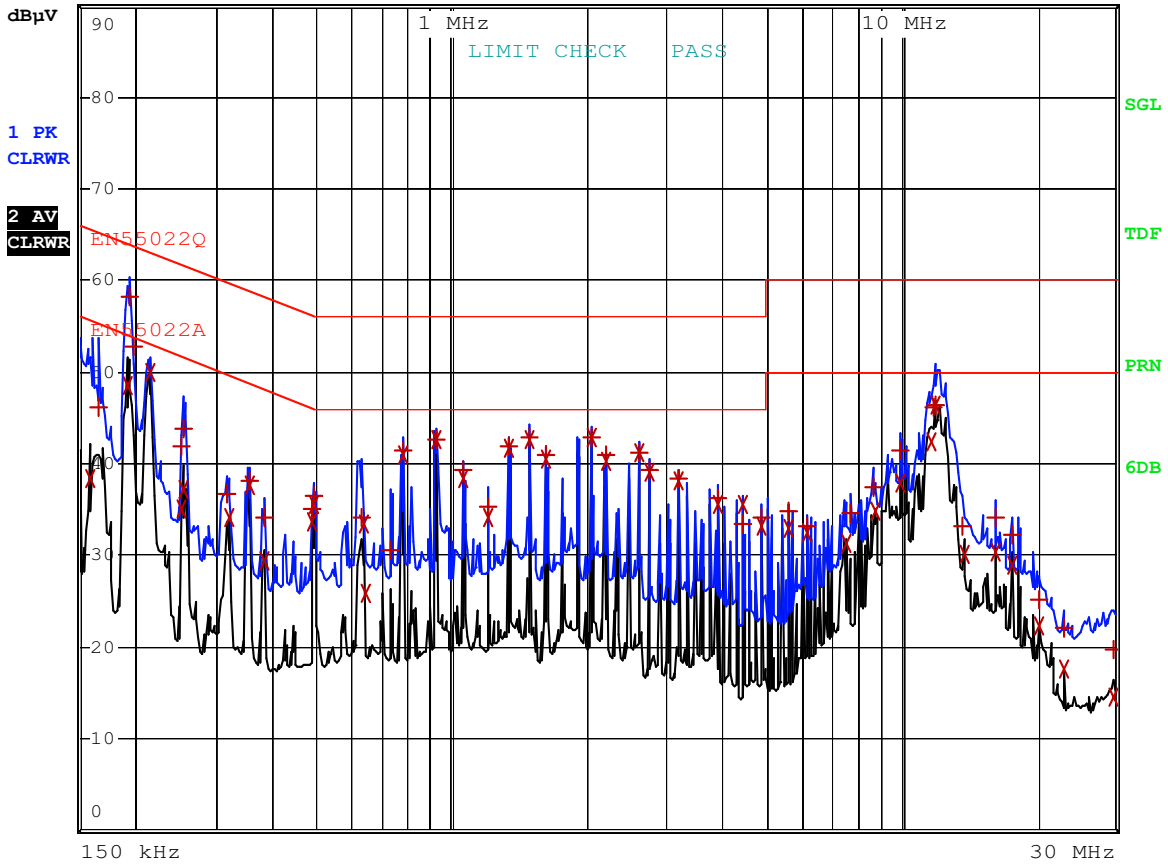
*NEUTRAL



RBW 9 kHz

MT 1 s

Att 10 dB AUTO PREAMP OFF



Comment: DMS-1200 NEUTRAL
Date: 12.OCT.2010 23:47:36