



Test Report for FCC

FCC ID:TKWBLNOC

Report Number		ESTF150811 - 003			
Applicant	Company name	Suprema Inc.			
	Address	16F Parkview Office Tower, Jeongja - dong, Bundang - gu, Seongnam, Gyeonggi, 463-863 Korea			
	Telephone	82-31-710-2443			
Product	Product name	BioLite - NET			
	Model No.	BLN-OC	Manufacturer	Suprema Inc.	
	Serial No.	NONE	Country of origin	Korea	
Test date	6-Oct-08		Date of issue	10-Nov-08	
Testing location	ESTECH. Co., Ltd. 97-1 Hoiuk-Ri Majang-Myon, Icheon-city, KyungKi-Do, Korea				
Standard	FCC Part 15 Subpart C , ANSI C 63.4 2003				
Test item	Conducted Emission	Class A	Class B	Test result	OK
	Radiated Emission	Class A	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 					

Contents

1. Laboratory Information	3
2. Description of EUT	4
3. Test Standards	5
4. Measurement condition	6
5. 20dBm Bandwidth	8
5.1 Procedure	8
5.2 20dBm Bandwidth Set up	8
5.3 Measurement Data	8
6. Frequency Tolerance	9
6.1 Procedure	9
6.2 Test Equipments	9
6.3 Measurement Data	10
7. Measurement of radiated emission	11
7.1 Radiated emission limits, general requirements	11
7.2 Measurement equipment	11
7.3 Environmental conditions	11
7.4 Test data(9kHz ~30MHz)	12
7.5 Test data(30MHz ~1000MHz)	13
8. Measurement of conducted emission	14
8.1 Measurement equipment	14
8.2 Environmental conditions	14
8.3 Test data	15
9. Photographs of test setup	16
10. Photographs of EUT	18

Appendix 1. Spectral diagram



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)

MIC : 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 : BioLite - NET
 Model Number : BLN-OC
 Serial Number : NONE
 Manufacturer : Suprema Inc.
 Country of origin : Korea
 Operating Frequency : 13.56MHz
 Antenna Type : PCB Pattern Antenna
 Modulation Type : ASK
 Channel Spacing : 1
 Rating : AC input 120V,1.0A, 60Hz,DC output 12V - - - 2.5A
 Receipt Date : 30-Sep-08
 X-tail lists : 25MHz,27.12MHz

2.2 General descriptions of EUT

- Power: 12Vdc
- Core : Blackfin ADSP-BF531, 400MHz (BGA)
- Memory : Flash = 8MB, SDRAM = 16MB
- Sound and indicate : Multi-color LED & 1 buzzer (multi tone)
- Fingerprint Sensor : 500dpi optical sensor
- Operational temperature: -20~60°C
- LCD : 128 * 64 monochrome with backlight
- Keypad : 3*4 + 3
- RF card : Mifare (13.56MHz)
- Communication : RS485 for Secure I/O or host communication
- TTL I/O, Wiegand I/O
 - 2 input for exit switch and door sensor
 - Wiegand input / output
- RTC : Lithium battery usage (the expected life : 2 week)
- Complete standalone operation with IP65 rated outdoor performance
- System capacity
 - 200 users / 400 templates / 5,000 log records
- Network interface
 - RS485 = Host PC interface or 1 Secure I/O
 - TCP/IP
- Functionalities
 - Operation mode (per user)
 - Finger only /Password only /Finger AND Password /Finger OR Password
 - RF card only
 - User Level
 - Administrator / Normal
 - Access Control
 - Time zone per device (always allowed/always blocked/per weekday)
 - Time zone per user (as device/always allowed/always blocked/per weekday)
 - Door event
 - Held Open / Forced Open
 - Alarming method : Device sound, backlight / SIO relay
 - Configurable properties per user Security Level, Operation Mode, Time zone
 - Configurable properties per user Security Level, Enroll Quality, Sensitivity (OC), Identification Mode, Identification Mode, Time zone, Tamper operation
 - PC Connection
 - Via RS485 or Via LAN = Firmware download, Audit trail via logs
 - RF antenna : PCB pattern antenna
 - Width = 0.8mm/ Length = 805mm / 1-row 6-layer turn

3. Test Standards

Test Standard : FCC PART 15 (2007)

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.

Summary of Test Results

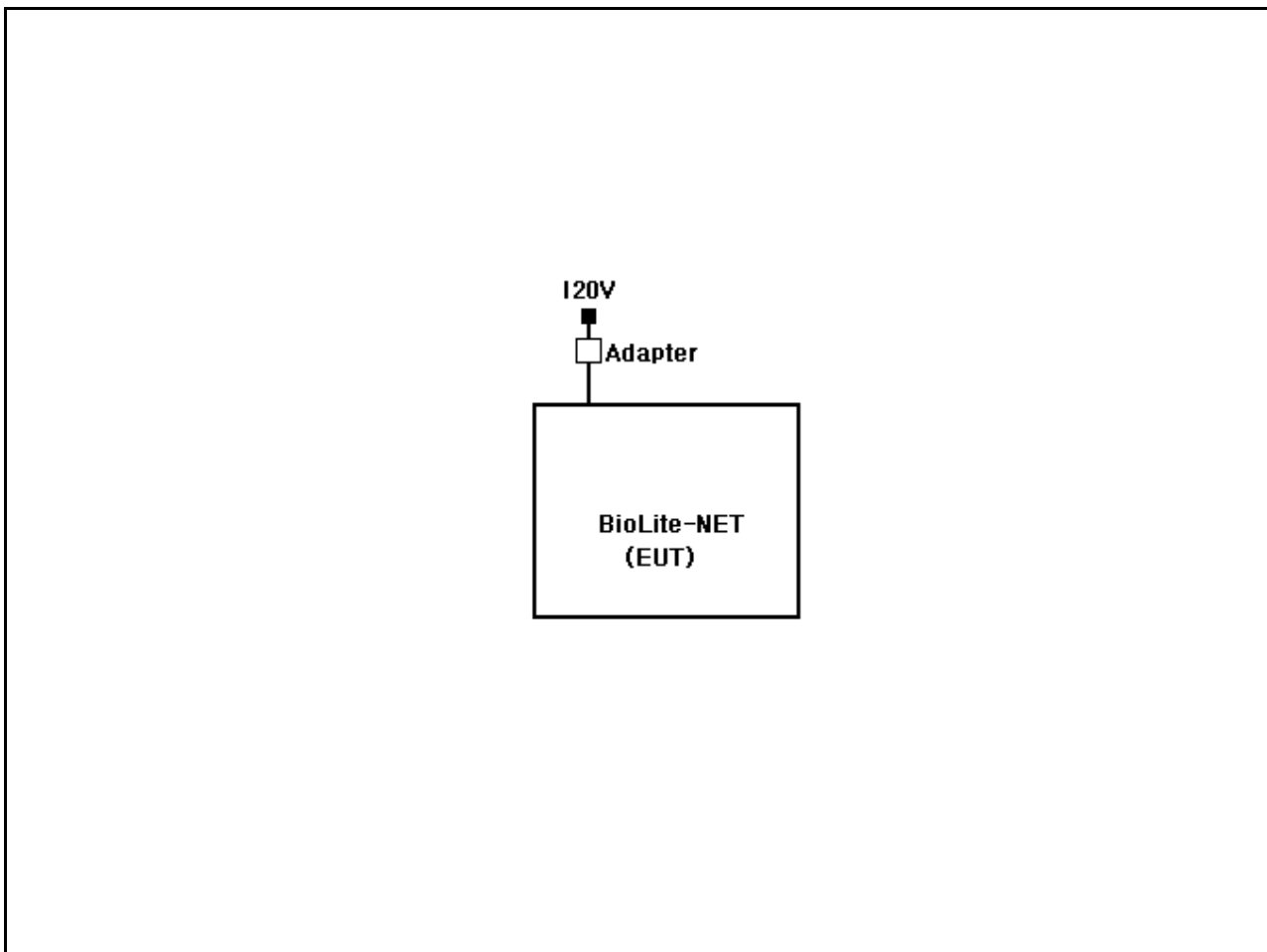
Applied Standard : 47 CFR Part 15, Subpart C				
Standard	Test Type	Result	Remark	Limit
15.207	AC Power Conducted Emission	Pass	Meet the requirement	
15.225(a)(b)(c)(d)	Radiated Emission (9kHz ~ 30MHz)	Pass	Meet the requirement	
15.225(d) 15.209	Radiated Emission (30MHz ~ 1GHz)	Pass	Meet the requirement	
15.225(e)	Frequency stability	Pass	Meet the requirement	
15.215(c)	20dB Bandwidth	Pass	Meet the requirement	

4. Measurement Condition

4.1 EUT Operation.

The EUT was measured by transmitter mode continuously.

4.2 Configuration and Peripherals



4.3 EUT and Support equipment

Equipment Name	Model Name	S/N	Manufacturer	Remark (FCC ID)
BioLite - NET	BLN - OC	NONE	Suprema Inc.	EUT
Adapter	JPW128	NONE	AULT KOREA CORP	

4.4 Cable Connecting

Start Equipment		End Equipment		Cable Standard		Remark
Name	I/O port	Name	I/O port	Length	Shielded	
BioLite - NET	Power	Adapter	-	2	No	

5. 20 dB Bandwidth

5.1 Procedure

The measurement was performed in the antenna height to gain the maximum of Electric field strength

5.2 20dB Bandwidth setup

The spectrum analyzer is set to as following

RBW:10KHz

VBW:100KHz

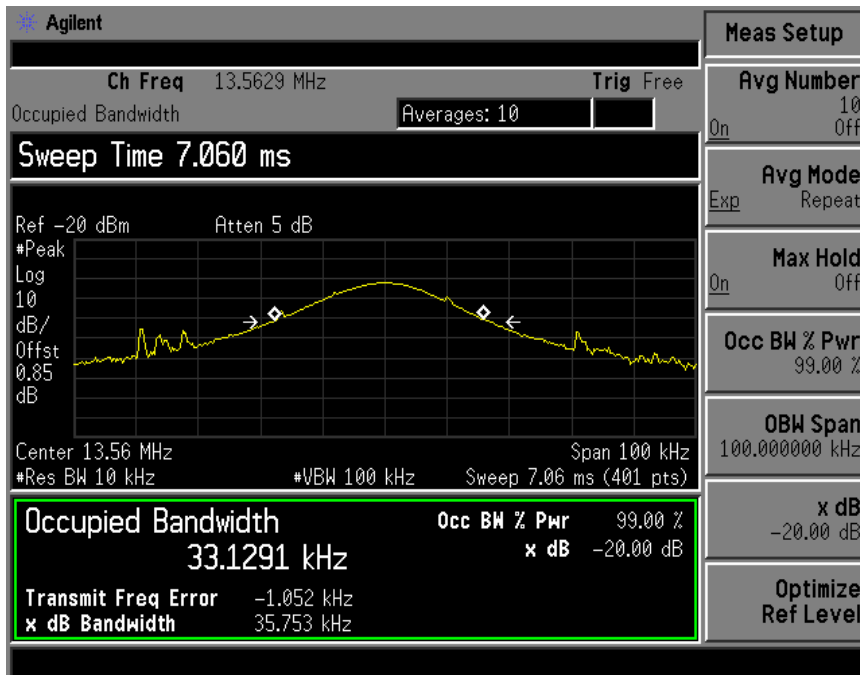
Span:100KHz

Sweep:suitable duration based on the EUT specification

20dB Bandwidth Test Instruments

Decription	Model	Serial Number	Cal. Due Data
Spectrum Analyzer	E4407B	US42041281	11 - Sep - 09
Dual Directional Coupler	778D	16502	28 - Feb - 09

5.3 Measurement Data



6. Frequency Tolerance

6 Procedure

The frequency stability of the transmitter is measured by:

- a) Temperature: The temperature is varied from -20 to +60 using an environmental chamber.
- b) Primary Supply Voltage: The primary supply voltage is varied from 85% to 115% of the voltage normally at the input to the device or at the power supply terminals if cables are not normally supplied.

The frequency tolerance of the carrier shall be maintained within $\pm 0.01\%$ of the operating frequency.

The following test equipments are used during test

Decription	Model	Serial Number	Cal. Due Data
Spectrum Analyzer	E4407B	US42041281	11-Sep-09
DC Power Supply	AK-3010	01000106	28-Feb-09
Temp./Humidity Chamber	SM-150-2	04-TH24	3-Mar-09

6.3 Measurement Data

Operating Frequency :	13,565,000
Reference Voltage :	12.00Vdc
Deviation Limit :	± 0.01%

Voltage (%)	Power (VDC)	Temperature ()	Frequency (Hz)	Deviation
100	12.00	+20 (Ref)	13,565,001	-0.000007
100		-20	13,565,012	-0.000088
100		-10	13,565,015	-0.000111
100		0	13,565,020	-0.000147
100		10	13,565,011	-0.000081
100		20	13,565,001	-0.000007
100		25	13,565,013	-0.000096
100		30	13,565,009	-0.000066
100		40	13,565,005	-0.000037
100		50	13,565,014	-0.000103
85		10.2	20	13,565,005
115	13.8	20	13,565,003	-0.000022

7. Measurement of radiated disturbance

The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter Open test site. The table was rotated 360 degrees to determine the position of the highest radiation. Then antenna is a loop antenna is fixed at one meter above the ground to determine the maximum value of the field strength. Both parallel and perpendicular of the antenna are set to make the measurement. For each suspected emission, the EUT was arranged to its worst case and then the table was turned from 0 degrees to 360 degrees to find the maximum reading. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

7.1 Radiated emission limits, general requirements

Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field strength @30m (uV/m)	Field strength @30m (dBuV/m)	Field strength @3m (dBuV/m)
Below 13.110	30	29.5	69.5
13.110 ~ 13.410	106	40.5	80.5
13.410 ~ 13.553	334	50.5	90.5
13.553 ~ 13.567	15,848	84	124
13.567 ~ 13.710	334	50.5	90.5
13.710 ~ 14.010	106	40.5	80.5
Above 14.010	30	29.5	69.5

* dBuV/m=20*log(uV/m) * Distance factor=40dB / decade(15.31(f))

7.2 Measurement equipments

Equipment Name	Type	Manufacturer	Serial No.	Next Calibration date
Test Receive	ESVS10	Rohde & Schwarz	838562/002	24-Jan-09
Spectrum Analyzer	R3261C	ADVANTEST	61720116	22-Apr-09
Logbicon Antenna	VULB9160	Schwarzbeck	3142	15-May-09
Horn Antenna	BBHA 9120 D	Schwarzbeck	352	13-Jun-09
Amplifier	8447F	HP	2805A02972	26-Jun-09
Spectrum Analyzer	R3273	ADVANTEST	110600592	22-Apr-09
PREAMPLIFIER	8449B	Sonoma Instrument	3008A00595	28-Dec-08
Loop Antenna	HFH2-Z2	Rohde & Schwarz	100188	7-Jul-09
Turn Table	2087	EMCO	2129	-
Antenna Mast	2070-01	EMCO	9702-203	-
ANT Mast Controller	2090	EMCO	1535	-
Turn Table Controller	2090	EMCO	1535	-

7.3 Environmental Condition

Test Place : Open site(3m)
 Temperature (°C) : 26
 Humidity (%) : 52 %

7.4 Test data(9kHz ~ 30MHz)

Test Date : 6-Oct-08

Measurement Distance : 3 m

Frequency (MHz)	Reading (dB μ V)	Position (V/H)	Height (m)	Correction Factor		Result Value(Qeas - Peak)		
				Ant Factor (dB)	Cable (dB)	Limit (dB μ V/m)	Result (dB μ V/m)	Margin (dB)
13.56	46.00	H	1.0	20.00	0.6	124.0	66.63	-57.37
Remark	<p>*Below 30Mhz was applied Average Detector. *There was no detected Restricted bands and Radiated suprious emission below 30MHz. *The 30m limit was converted to 3m Limit using square factor(x) as it was found by measurements as follows; *3 m Limit(dBuV/m) = 20log(X)+40log(30/3)= 20log(15848)+40log(30/3) = 124dBuV</p>							

7.5 Test data(30MHz ~ 1000MHz)

Test Date : 6-Oct-08

Measurement Distance : 3 m

Frequency (MHz)	Reading (dB μ V)	Position (V/H)	Height (m)	Correction Factor		Result Value(Qeas - Peak)		
				Ant Factor (dB)	Cable (dB)	Limit (dB μ V/m)	Result (dB μ V/m)	Margin (dB)
30.00	16.10	V	1.0	11.26	0.9	40.0	28.24	-11.76
50.01	10.00	V	1.0	12.51	1.1	40.0	23.60	-16.40
77.26	12.80	H	4.0	9.03	1.4	40.0	23.18	-16.82
81.77	9.70	H	4.0	8.22	1.4	40.0	19.31	-20.69
116.70	10.70	H	2.8	10.42	1.7	43.5	22.79	-20.71
150.00	16.40	H	2.3	12.75	2.0	43.5	31.14	-12.36
166.65	11.00	H	2.2	12.18	2.2	43.5	25.34	-18.16
200.00	12.00	H	1.8	9.67	2.3	43.5	23.99	-19.51
216.68	19.60	H	1.6	10.25	2.5	46.0	32.34	-13.66
225.04	20.70	H	1.3	10.54	2.6	46.0	33.80	-12.20
250.05	16.80	H	1.2	11.40	2.8	46.0	30.99	-15.01
266.70	25.50	H	1.2	11.92	2.9	46.0	40.36	-5.64
300.00	15.20	H	1.0	12.95	3.2	46.0	31.33	-14.67
350.04	15.80	H	1.0	14.01	3.6	46.0	33.46	-12.54
400.00	21.00	H	1.0	15.14	4.0	46.0	40.14	-5.86
483.39	15.80	V	1.9	16.91	4.6	46.0	37.33	-8.67
533.37	14.70	V	1.1	17.84	5.1	46.0	37.61	-8.39
638.88	5.00	H	1.0	19.94	6.0	46.0	30.91	-15.09
Remark	H : Horizontal, V : Vertical							

8. Measurement of conducted disturbance

The continuous disturbance voltage of AC Mains in the frequency from 0.15 to 30 MHz was measured in accordance to FCC Part 15 (2007). The test setup was made according to ANSI C 63.4 (2003) in a shielded. The EUT was placed on a non-conductive table at least 80 above the ground plan. A grounded vertical reference plane was positioned in a distance of 40cm from the EUT. The distance from the EUT to other metal surfaces was at least 0.8m. 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 1.0m.. The test receiver with Quasi Peak detector complies with CISPR 16.

8.1 Measurement equipments

Equipment Name	Type	Manufacturer	Serial No.	Next Calibration date
LISN	ESH3-Z5	Rohde & Schwarz	838979/010	2009. 2. 28
LISN	NNLA8120A	Schwarzbeck	8120161	2009. 2. 28
TEST Receiver	ESPI7	Rohde & Schwarz	100185	2009. 8. 27
Pulse Limiter	ESH3Z2	Rohde & Schwarz	NONE	-

8.2 Environmental Condition

Test Place : Shield Room
 Temperature (°C) : 22
 Humidity (%) : 46 %

8.3 Test data

Test Date : 6-Oct-08

Frequency (MHz)	Correction Factor		Line (H/N)	Quasi-peak Value			Average Value		
	Lisn (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)
0.16	0.10	0.0	N	65.52	31.77	31.88	55.52	23.09	23.20
0.20	0.10	0.0	H	63.69	42.70	42.83	53.69	37.59	37.72
0.26	0.10	0.1	H	61.37	40.99	41.16	51.37	33.58	33.75
0.33	0.10	0.1	H	59.53	43.54	43.75	49.53	36.63	36.84
0.40	0.10	0.1	N	57.96	30.17	30.42	47.96	25.54	25.79
0.53	0.10	0.2	H	56.00	24.55	24.85	46.00	18.16	18.46
0.60	0.10	0.2	H	56.00	29.48	29.78	46.00	20.58	20.88
0.66	0.10	0.2	H	56.00	26.00	26.30	46.00	19.16	19.46
0.76	0.10	0.2	H	56.00	25.01	25.31	46.00	20.51	20.81
1.19	0.10	0.2	H	56.00	23.80	24.12	46.00	18.37	18.69
1.24	0.10	0.2	N	56.00	23.21	23.53	46.00	21.29	21.61
11.75	0.34	0.7	H	60.00	28.46	29.47	50.00	22.49	23.50
14.07	0.38	0.8	H	60.00	29.24	30.38	50.00	20.84	21.98
16.67	0.50	0.8	N	60.00	34.54	35.84	50.00	34.19	35.49
21.78	0.79	0.8	N	60.00	31.28	32.90	50.00	22.68	24.30
21.96	0.90	0.8	H	60.00	29.52	31.26	50.00	22.33	24.07
24.09	1.00	0.9	H	60.00	28.98	30.87	50.00	17.54	19.43
Remark	H : Hot Line, N : Neutral Line								

9. Photographs of test setup

9.1 Setup for Radiated Test

[Test setup for below 30MHz]



[Test setup for above 30MHz]



9.2 Setup for Conducted Test : 0.15 ~ 30 MHz

[Front]



[Rear]





ESTECH Co., Ltd.

Rm 1015, World Venture Center II,
426-5 Gasan-dong, Guncheon-gu,
Seoul, 158-803, Korea



**Electromagnetic
Interference
Test Report**

10.0 Photographs of EUT

[Front]



[Rear]



10.1 Photographs of EUT

[Front]



[Rear]



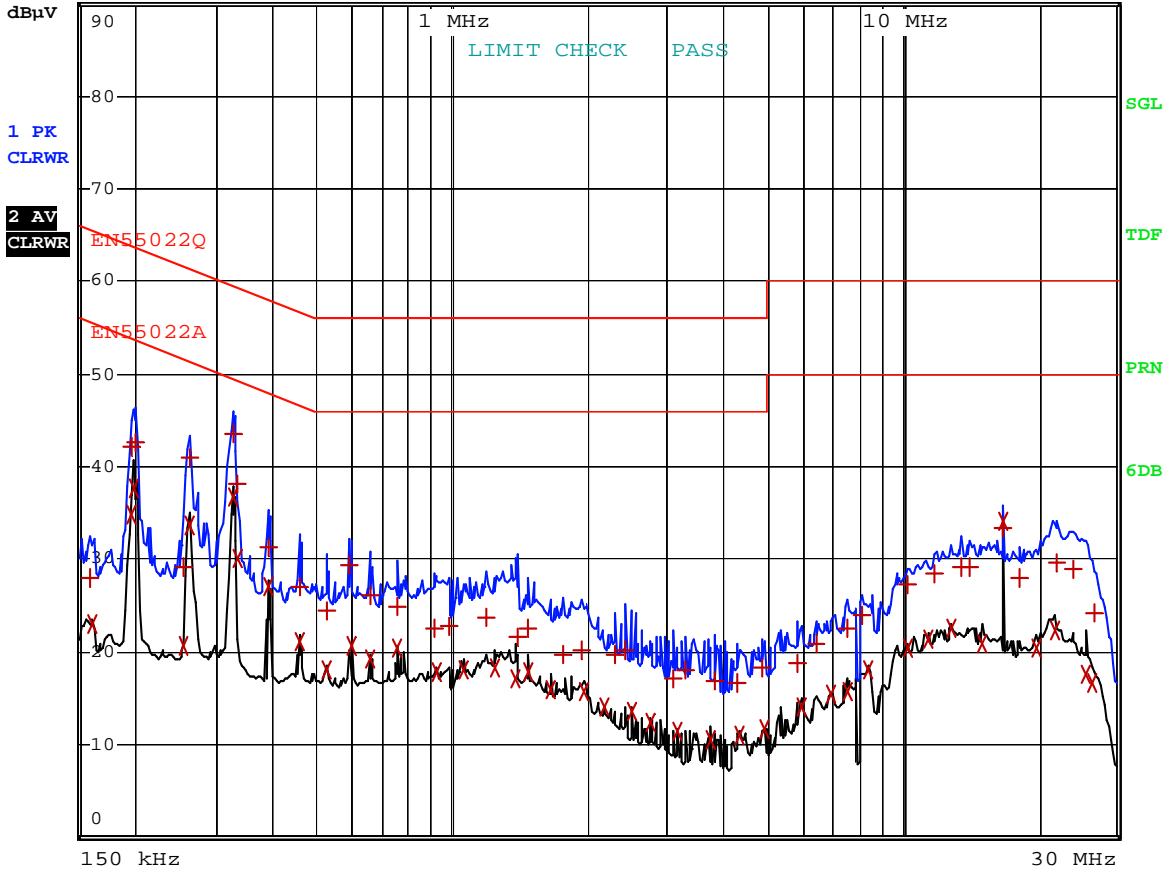
Appendix 1. Spectral diagram

*HOT



RBW 9 kHz
MT 1 s

Att 10 dB AUTO PREAMP OFF



Comment: BLN-OC_HOT

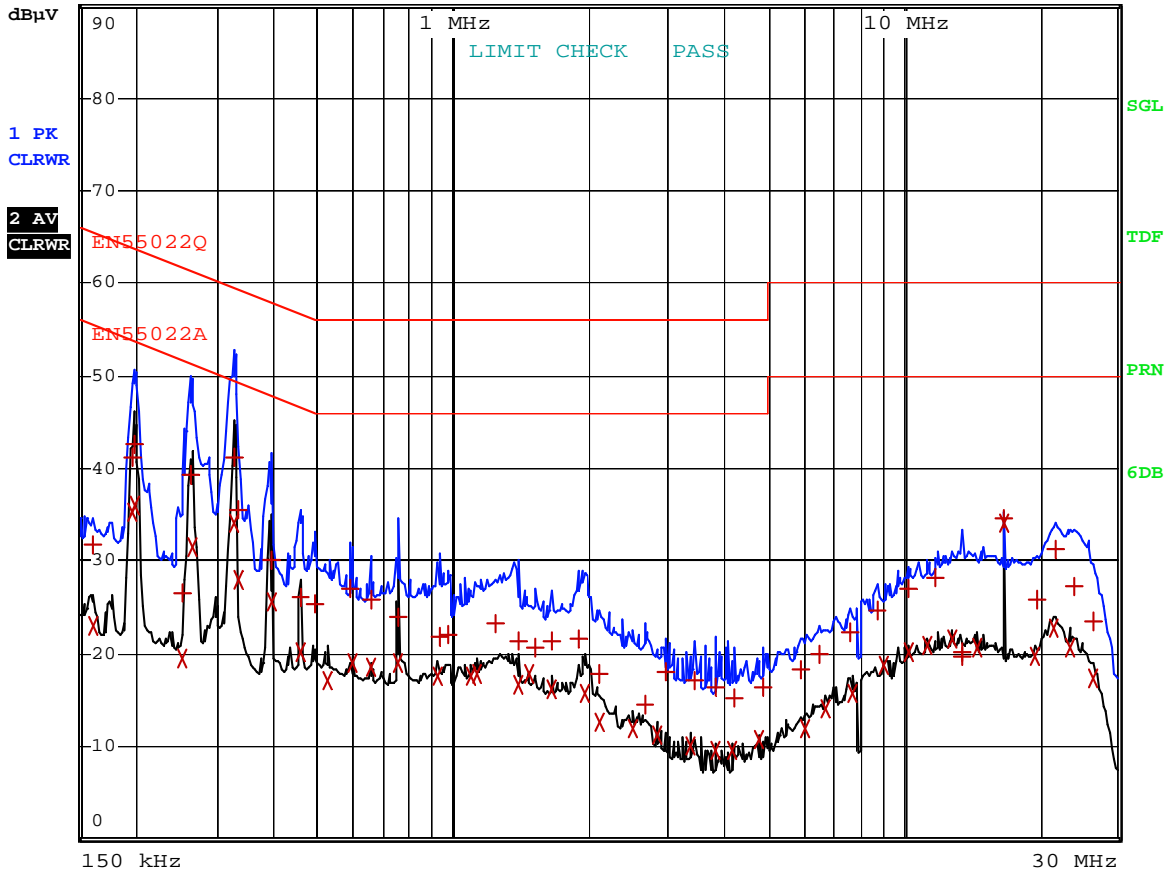
Date: 6.OCT.2008 16:36:08

*NEUTRAL



RBW 9 kHz
MT 1 s

Att 10 dB AUTO PREAMP OFF



Comment: BLN-OC_NUETRAL

Date: 6.OCT.2008 16:29:46