

Test Report for FCC

FCC ID:TKWBEPHTC

Report Number		ESTF150904-014			
Applicant	Company name	Suprema Inc.			
	Address	16F Parkview Office Tower, Jeongja-dong, Bundang-gu, Seongnam, Gyeonggi, 463-863 Korea			
	Telephone	82-31-783-4505			
Product	Product name	BioEntry Plus			
	Model No.	BEPH-TC	Manufacturer	Suprema Inc.	
	Serial No.	NONE	Country of origin	Korea	
Test date	22-Apr-09		Date of issue	27-Apr-09	
Testing location	ESTECH. Co., Ltd. 97-1 Hoiuk-Ri Majang-Myon, Icheon-city, KyungKi-Do, Korea				
Standard	FCC PART 15 2007 , 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. Measurement of radiated emission	8
5.1 Radiated emission limits, general requirements	8
5.2 Measurement equipment	8
5.3 Environmental conditions	8
5.4 Test data	9
6. Measurement of conducted emission	10
6.1 Measurement equipment	10
6.2 Environmental conditions	10
6.3 Test data	11
7. Photographs of test setup	12
8. Photographs of EUT	14

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, Yeoju-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 : BioEntry Plus
 Model Number : BEPH-TC
 Serial Number : NONE
 Manufacturer : Suprema Inc.
 Country of origin : Korea
 Operating Frequency : 125KHz
 Antenna Type : Loop Coil
 Modulation Type : FSK
 Channel Spacing : 1
 Rating : Adapter input : (100-240) Va.c., 1.0 A, (50-60) Hz
 DC input : 12 Vd.c. , 2.5 A
 Receipt Date : 24-Mar-09
 X-tail lists : 25 MHz x 2ea

2.2 General descriptions of EUT

Item	Specification
CPU	400MHz DSP
Fingerprint Sensor	OC Model : Optical Sensor TC Model : Capacitive Sensor
IN/OUT	Relay Out x 1, Switch Input x 2, Wiegand In/Out x 1 RS-485 x 1, Ethernet x 1
Power Input Rate	DC 12V, Max 250mA
Support Cards	BioEntry Plus OC/TC Model (BEPL-OC/TC) : - 125KHz EM4100 Compatible Card Read BioEntry Plus HID OC/TC Model (BEPH-OC/TC) - 125KHz HID Prox Compatible Card Read BioEntry Plus Mifare OC/TC Model (BEPM-OC/TC) - 13.56MHz Mifare Card Read/Write - 13.56MHz ISO14443A Card CSN Read
Size	50 x 160 x 38 (Width x Height x Depth)
Certified	KCC, CE, FCC

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

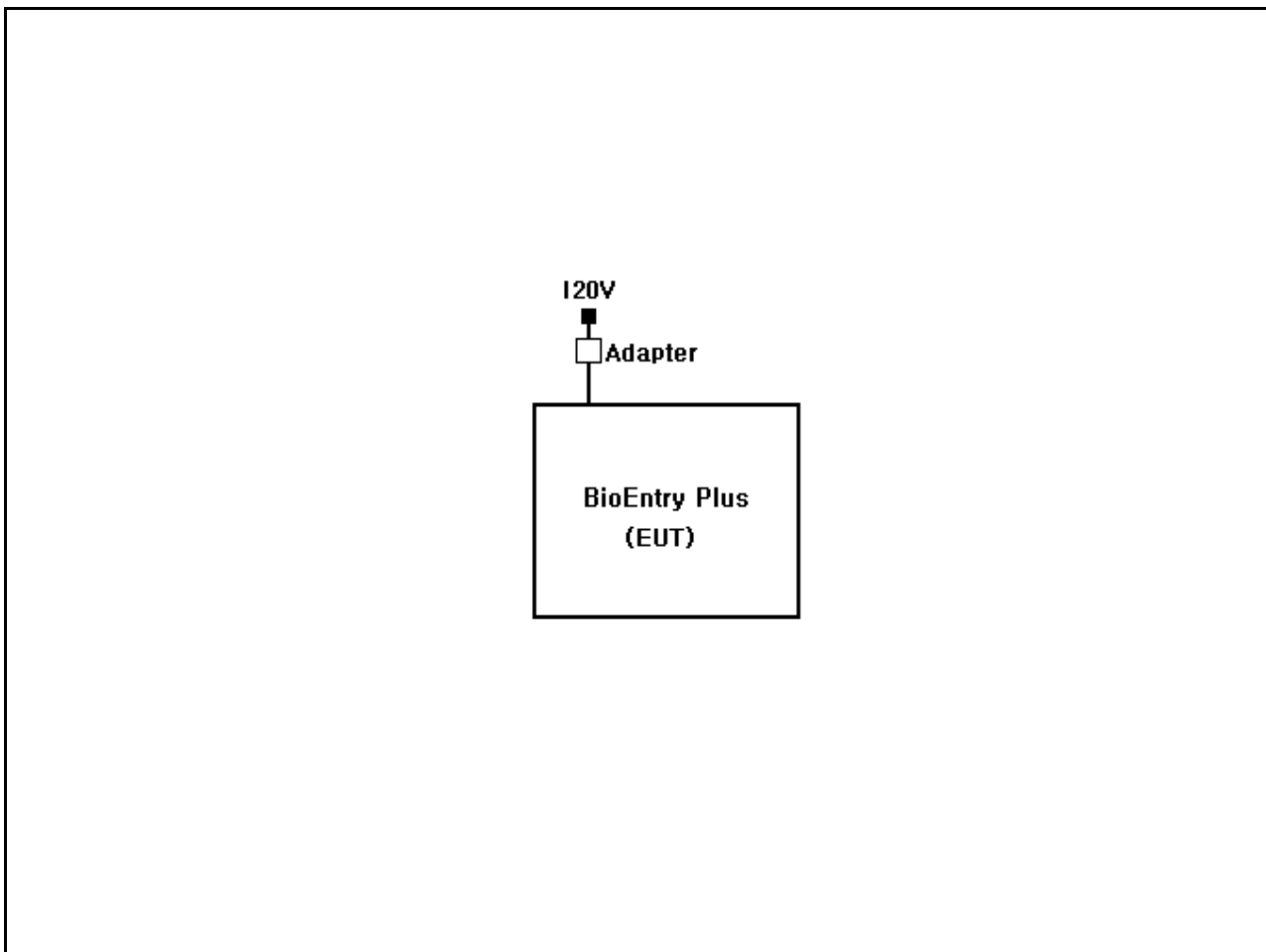
Applied Standard : 47 CFR Part 15, Subpart C				
Standard	Test Type	Result	Remark	Limit
15.207	AC Power Conducted Emission	Pass	Meet the requirement	
15.205	Restricted bands	Pass	Meet the requirement	
15.209	Radiated Emission	Pass	Meet the requirement	

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)
BioEntry Plus	BEPH-TC	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	
BioEntry Plus	Power	Adapter	-	2	No	

5. 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.

5.1 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	Field Strength(microvolt/meter)	Distance(meter)
0.009 - 0.490	2400/F(KHz)	300
0.490 - 1.705	24000/F(KHz)	30
1.705 - 30	30	30
30 - 88	100**	3
88 - 216	150**	3
216 - 960	200**	3
Above 960	500	3

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241

5.2 Measurement equipments

Equipment Name	Type	Manufacturer	Serial No.	Next Calibration date
Spectrum analyzer	R3273	ADVANTEST	110600592	9-Jun-09
Amplifier	8447F	HP	2805A02972	26-Jun-09
Test Receive	ESPI7	Rohde & Schwarz	100185	27-Aug-09
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	-

5.3 Environmental Condition

Test Place : Open site(3m)
 Temperature (°C) : 18
 Humidity (%) : 45 %

5.4 Test data

Test Date : 22-Apr-09

Measurement Distance : 3 m

Frequency (kHz)	Reading (dBμV)	Position (V/H)	Height (m)	Correction Factor		Result Value		
				Ant Factor (dB)	Cable (dB)	Limit (dBμV/m)	Result (dBμV/m)	Margin (dB)
Emissions(Peak Detector)								
126.18	33.30	V	1.0	20.10	0.6	105.6	54.00	-51.58
251.70	22.40	V	1.0	19.80	0.6	99.6	42.80	-56.79
Remark	H : Horizontal, V : Vertical *Below 30Mhz was applied Peak Detector. *There is no found Restricted bands. *Emission above 30MHz were reported in Report No.ESTF150904-013 *The 300m limit was converted to 3m Limit using square factor(x) as it was found by measurements as follows; $3\text{ m Limit(dBuV/m)} = 20\log(2400/F(\text{KHz})) + 40\log(300/3) = 20\log(2400/125) + 40\log(300/3) = 25.67 + 80$							

6. 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.

6.1 Measurement equipments

Equipment Name	Type	Manufacturer	Serial No.	Next Calibration date
LISN	ESH3-Z5	Rohde & Schwarz	838979/010	21-Feb-10
LISN	NNLA8120A	Schwarzbeck	8120161	21-Feb-10
TEST Receiver	ESPI7	Rohde & Schwarz	100185	27-Aug-09
Pulse Limiter	ESH3Z2	Rohde & Schwarz	NONE	-

6.2 Environmental Condition

Test Place : Shield Room
 Temperature (°C) : 21
 Humidity (%) : 42 %

6.3 Test data

Test Date : 22-Apr-09

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)
0.20	0.10	0.0	H	63.74	33.96	34.09	53.74	27.41	27.54
0.26	0.10	0.1	H	61.34	31.31	31.49	51.34	24.92	25.10
0.33	0.10	0.1	N	59.55	25.94	26.15	49.55	21.96	22.17
0.40	0.10	0.1	N	57.94	26.61	26.86	47.94	20.13	20.38
0.53	0.10	0.2	H	56.00	25.30	25.60	46.00	19.30	19.60
0.60	0.10	0.2	N	56.00	26.84	27.14	46.00	20.86	21.16
0.66	0.10	0.2	N	56.00	28.53	28.83	46.00	20.65	20.95
0.99	0.10	0.2	H	56.00	24.85	25.15	46.00	19.33	19.63
1.45	0.10	0.2	N	56.00	24.46	24.81	46.00	19.13	19.48
1.59	0.10	0.3	H	56.00	24.78	25.14	46.00	19.25	19.61
12.65	0.35	0.7	N	60.00	25.08	26.14	50.00	18.94	20.00
14.96	0.40	0.8	N	60.00	25.56	26.76	50.00	19.28	20.48
21.27	0.86	0.8	H	60.00	26.38	28.07	50.00	21.47	23.16
21.81	0.79	0.8	N	60.00	26.05	27.68	50.00	21.32	22.95
24.73	1.04	0.9	H	60.00	27.80	29.73	50.00	23.04	24.97
28.75	1.24	0.9	H	60.00	31.55	33.69	50.00	25.70	27.84
Remark	H : Hot Line, N : Neutral Line								

7. Photographs of test setup

7.1 Setup for Radiated Test (below 30MHz)

[Front]

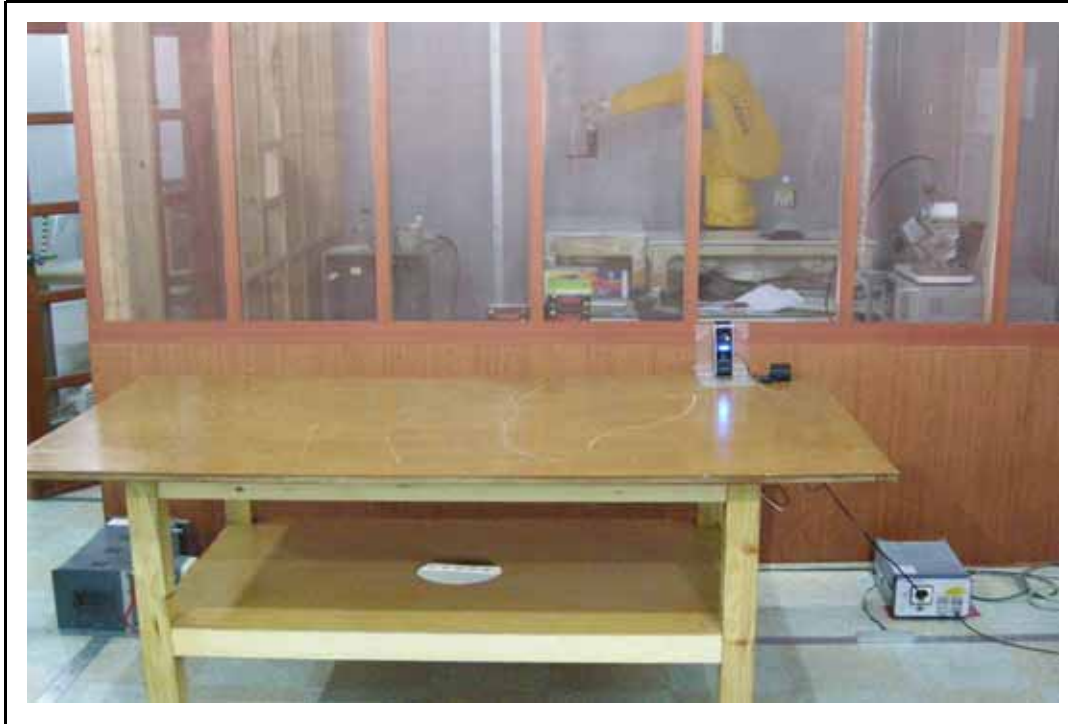


[Rear]



7.2 Setup for Conducted Test : 0.15 ~ 30 MHz

[Front]



[Rear]





ESTECH Co., Ltd.

No. 1015, World Venture Center 11,
426-5 Gasan-dong, Guncheon-gu,
Seoul, 158-803, Korea



**Electromagnetic
Interference
Test Report**

8. Photographs of EUT

[Front]



[Rear]



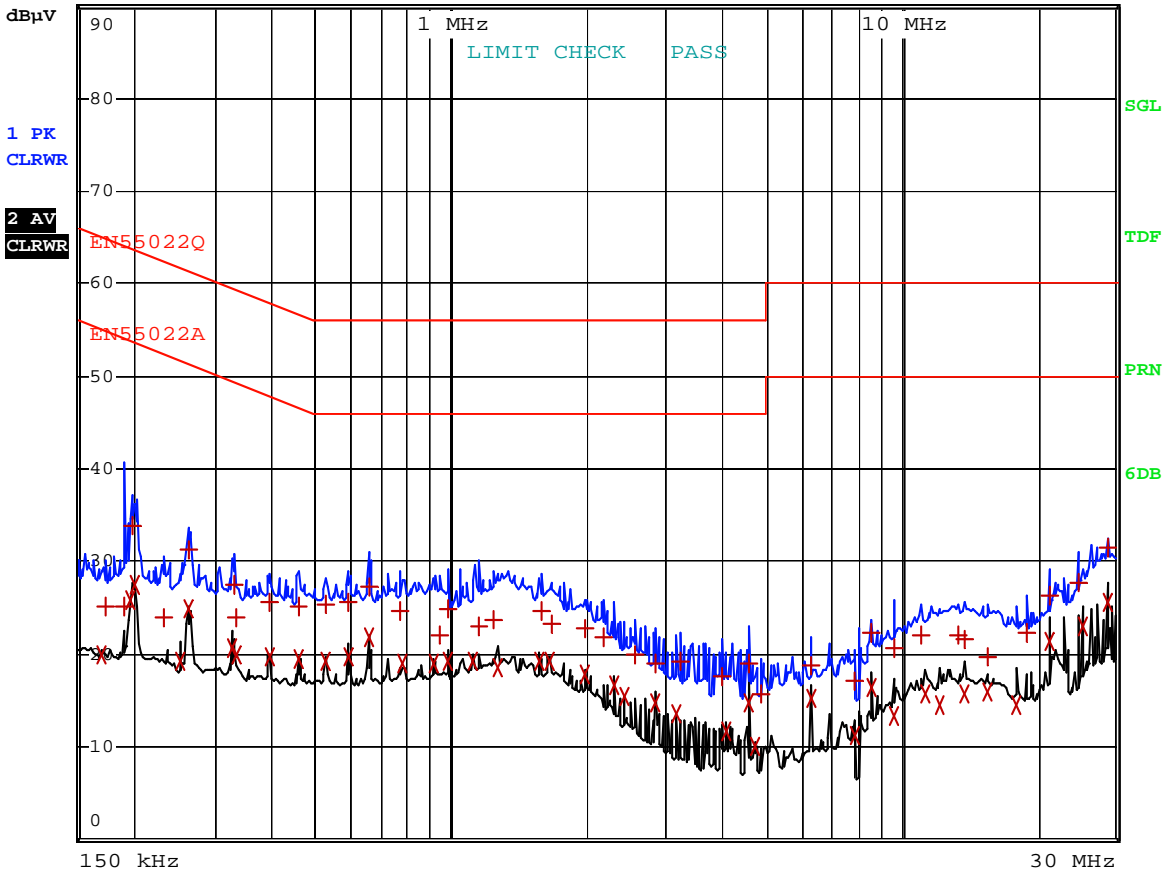
Appendix 1. Spectral diagram

*HOT



RBW 9 kHz
MT 1 s

Att 10 dB AUTO PREAMP OFF



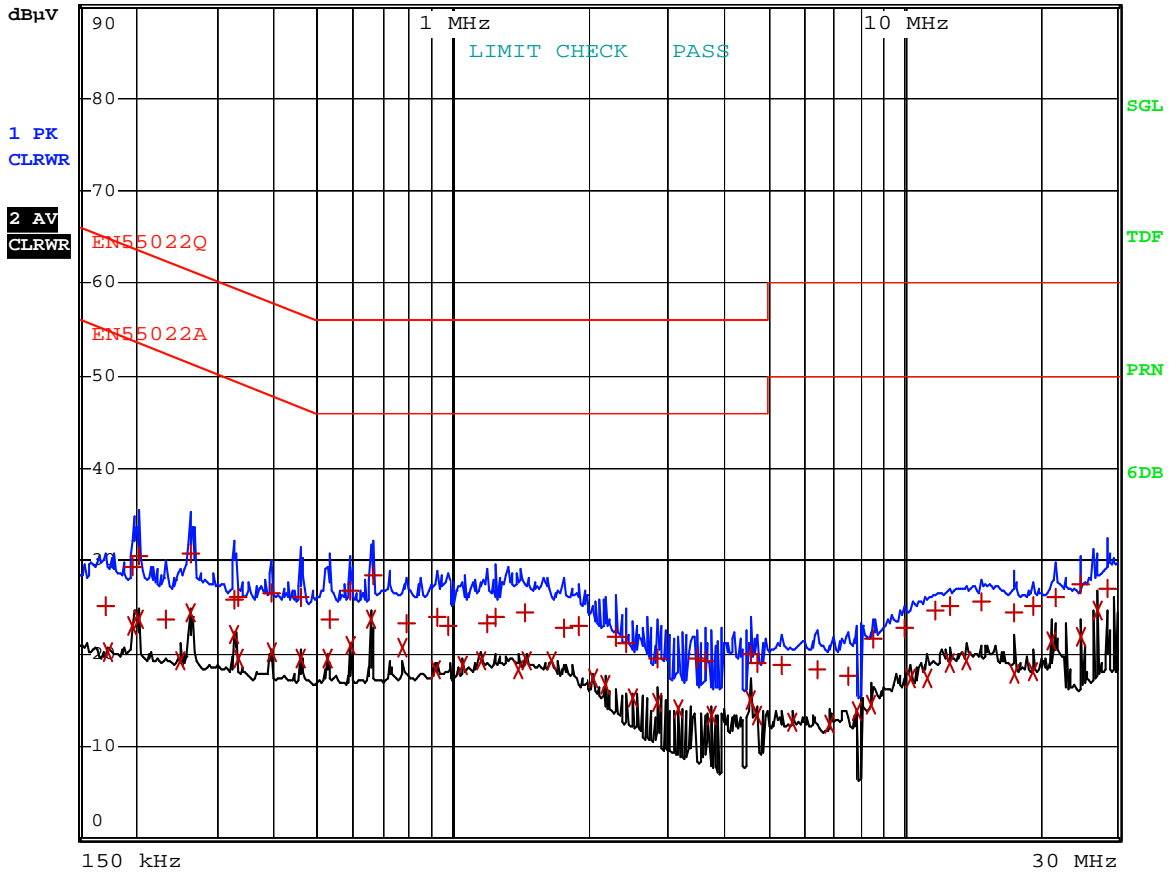
Comment: BEPH-TC_HOT
Date: 22.APR.2009 17:23:09

*NEUTRAL



RBW 9 kHz
MT 1 s

Att 10 dB AUTO PREAMP OFF



Comment: BEPH-TC_NEUTRAL
Date: 22.APR.2009 17:18:41

Appendix 2. Photographs of EUT in side PCB

