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386-1, Ho-dong, Cheoin-gu, Yongin-si, Gyeonggi-do, 449-100, Korea
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TEST REPORT For FCC

Test Report No. : 2009040020
Date of Issue : April 9, 2009
Model/Type No. : MagicPass 7300
FCC ID : XALMAGICPASS7300
Kind of Product : Fingerprint RFID Access Control
Applicant : Hugenics Co., Ltd.
Applicant Address : #302, 197-47 Dae Yang D&T BD, Guro-dong, Guro-gu, Seoul, 152-848, Korea
Manufacturer : Maxtech Co., Ltd.
Manufacturer Address : #403 Suntechcity, 513-15 Sangdaewon-dong, Jungwon-gu, Seongnam city, Kyunggi-do, Korea
Contact Person : Mun-bo Paeng / Director
Telephone : +82-2-568-1842
Received Date : March 16, 2009
Test Period : Start : March 16, 2009 End : April 9, 2009
Test Results : ☒ In Compliance ☐ Not in Compliance

The test results presented in this report relate only to the object tested.

Tested by

Eun-Won, Lee
Test Engineer
Date: April 9, 2009

Reviewed by

Young-Joon, Park
Technical Manager
Date: April 9, 2009



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REPORT REVISION HISTORY

Date	Revision	Page No
April 9, 2009	Issued (2009040020)	All

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1.0 General Product Description

1.0.1 Tested Equipment

- ☒ Unless otherwise indicated, all tests were conducted on Model MagicPass 7300.
- ☐ Tests performed on Model _____ were considered to be representative of Model(s) _____.

1.0.2 Equipment Size, Mobility and Identification

Dimensions: 95(W) by 140(H) by 35(D) ☒ mm ☐ inch
Mobility: ☐ Hand-held ☐ Table-top ☒ Built-in
☐ Traveling ☐ Floor-standing
Serial No.: Prototype

1.0.3 Electrical Ratings

AC/DC ADAPTOR	Input:	100-240 Vac, 50/60 Hz, 1.2 A
	Output:	12 Vdc, 3.0 A
EUT	Input:	12 Vdc
	Output:	-

1.0.4 Test Voltage & Frequency

Unless indicated otherwise on the individual data sheet or test results, the test voltage and frequency was as indicated below.

Voltage: 120 Vac
Frequency: 60 Hz

1.0.5 Clock & Other Frequencies Utilized

32.768 kHz, 13.56 MHz, 18.432 MHz, 20 MHz

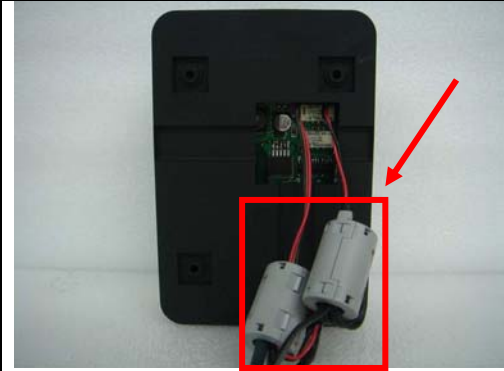
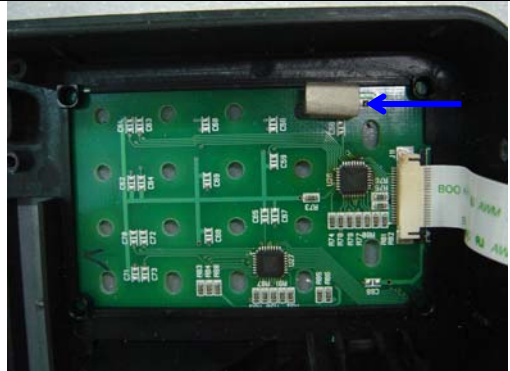
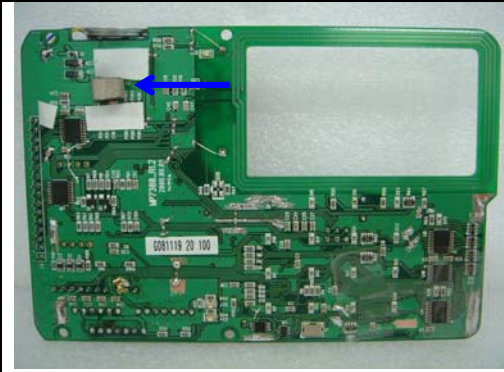
1.1 Model Differences

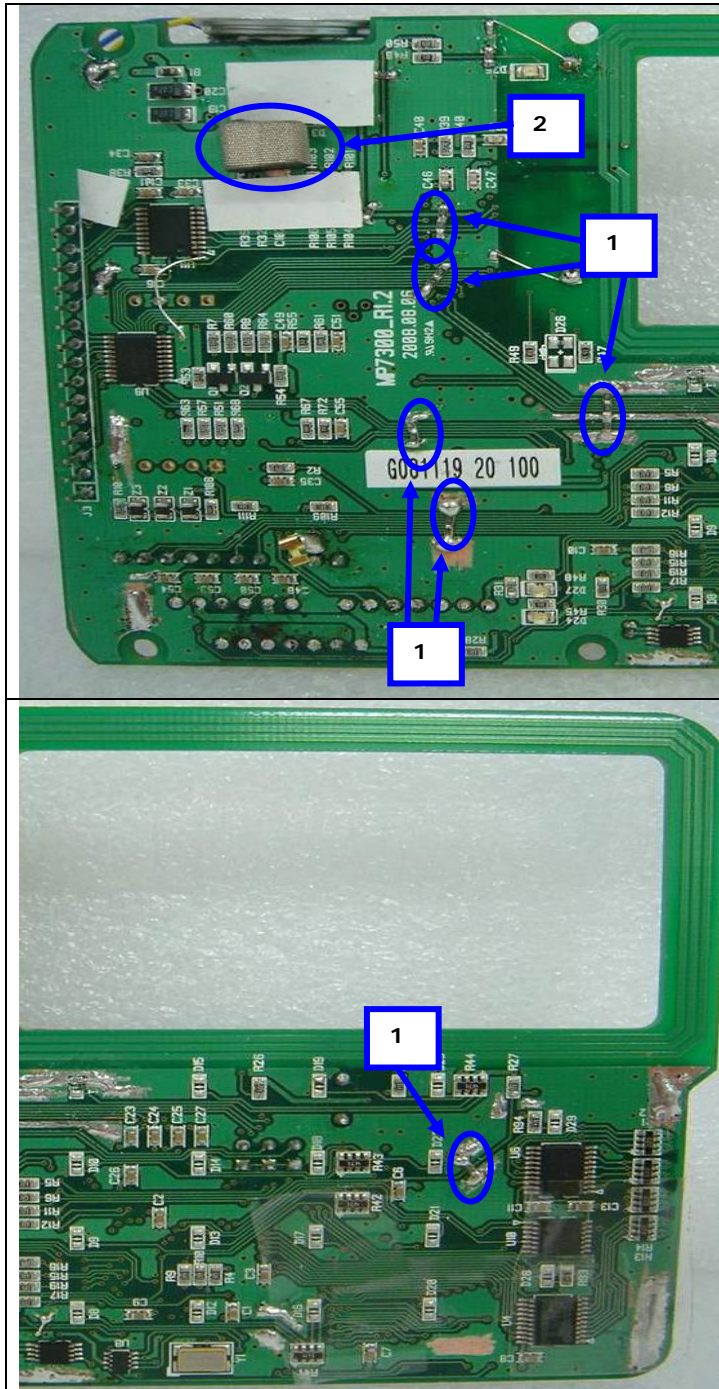
Not applicable

1.2 Device Modifications

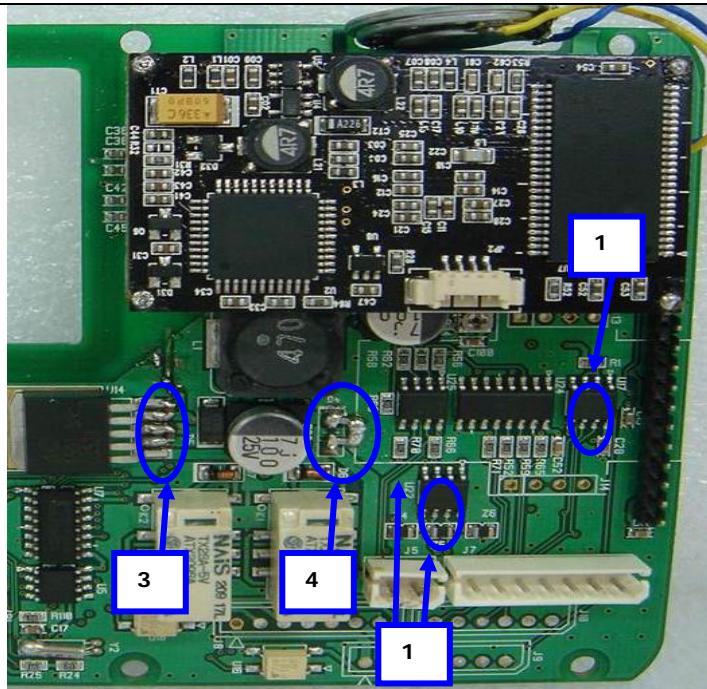
The following modifications were necessary for compliance:

- The following modifications was applied by the applicant.

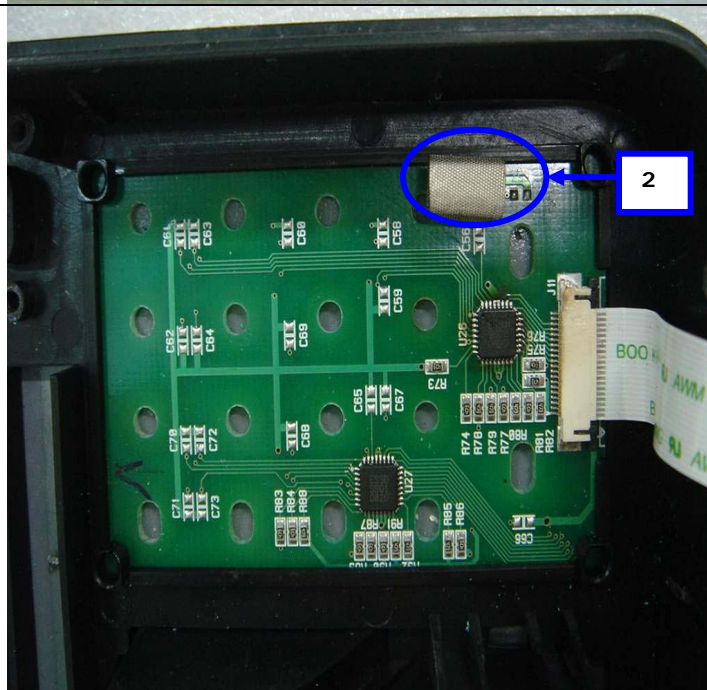
					
					
<p>—</p> <p>—</p>	<table border="1"> <tr> <td>Manufacturer</td> <td>Part No.</td> </tr> <tr> <td>TDK Corporation</td> <td>ZCAT2132-1130</td> </tr> </table>	Manufacturer	Part No.	TDK Corporation	ZCAT2132-1130
Manufacturer	Part No.				
TDK Corporation	ZCAT2132-1130				
<p>—</p>	<p>Gasket</p>				



- 1) Expansion of the Main Board ground. (0 ohm Resistor)
- 2) Expansion of the Main Board ground. (Conductive Gasket)



- 1) Expansion of the Main Board ground. (0 ohm Resistor)
- 2) Expansion of the Main Board ground. (Conductive Gasket)
- 3) Inserted a capacitor 1 nF in pin 2, 4 of a U14
- 4) Inserted a capacitor 100 nF in pin 1 of a U14





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1.3 EUT Configuration(s)

See Appendix A for individual test set-up configuration(s). The following peripheral devices and/or interface cables were connected during the measurement:

☒ Peripheral Devices

Device	Manufacturer	Model No.	Serial No.	FCC ID or DoC
AC/DC ADAPTOR (For EUT)	Kuantech(Shenzhen)Co.,Ltd.	KSAH1200300T1M2	R3607	-
Notebook PC	TOSHIBA	PSL48K-00L00K	Z7037782R	DoC
AC/DC ADAPTOR (For Notebook PC)	DELTA ELECTRONICS	ADP-75SB BB	T8W0746330531	-

☒ Cable Description

#	Description	Ferrite Core	Length (m)	Other Details
1	AC Power Cable, Unshielded	No	1.8	Connect to AC Power
2	DC IN Cable, Unshielded	Yes	0.9	Between the EUT and an AC/DC ADAPTOR
3	RS232C to USB Cable, Shielded	No	1.0	Between the EUT and a Notebook PC
4	DC IN Cable, Unshielded	Yes	1.5	Between the EUT and an AC/DC ADAPTOR
5	AC Power Cable, Unshielded	No	1.8	Connect to AC Power

1.4 Test Software

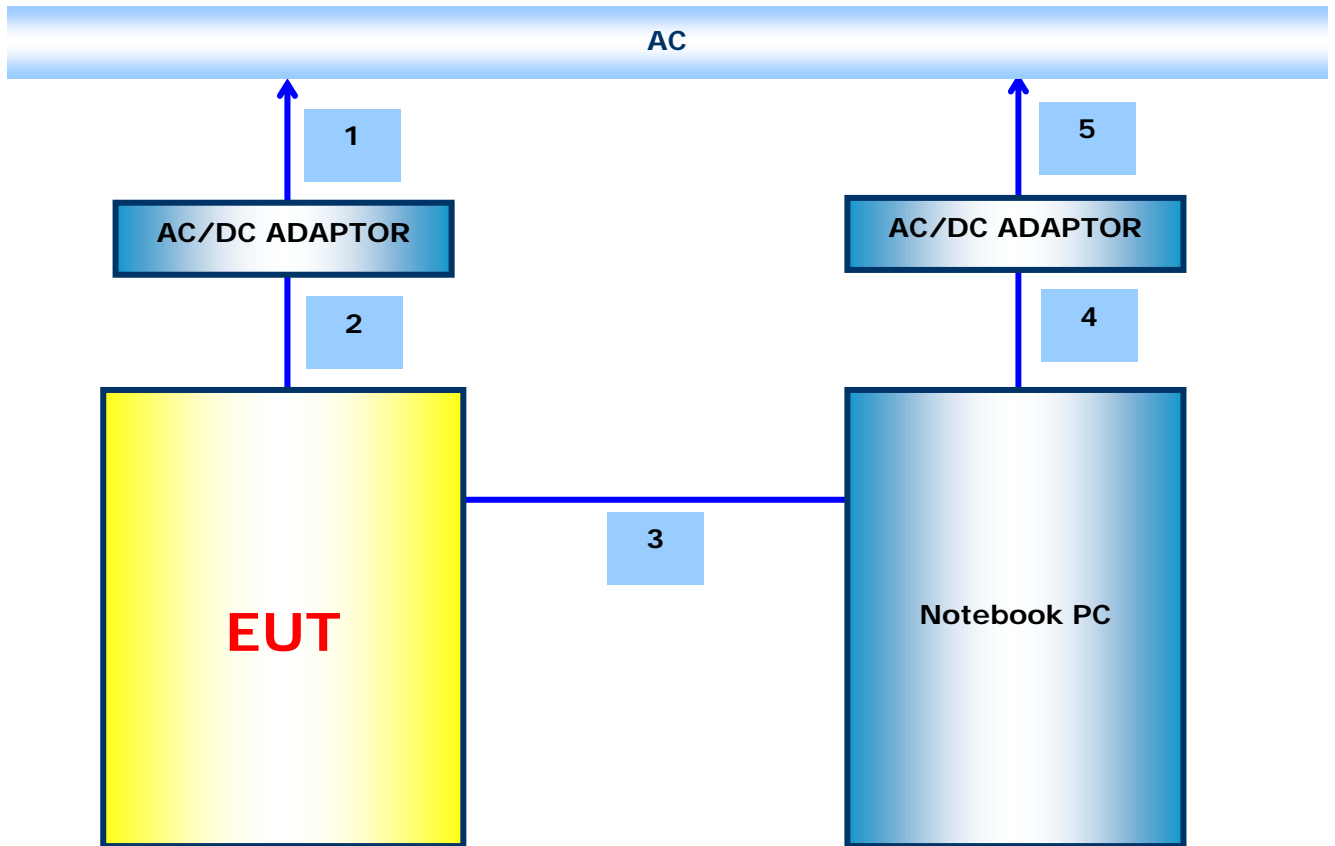
- ☐ EMC Test V 1.0
- ☐ Display Test Patterns – V1.5
- ☐ Ping.exe
- ☒ Access Control Program Version 1.0.0
- ☐ Not applicable

1.5 EUT Operating Mode(s)

Equipment under test was operated during the measurement under the following conditions:

- ☐ Standby
- ☐ Display circles pattern
- ☒ Practice operation – EUT transmitting at 13.56 MHz continuously
- ☐ Scrolling 'H'
- ☐ Read / Write

1.6 Configuration





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1.7 Calibration Details of Equipment Used for Measurement

Test equipment and test accessories are calibrated on regular basis. The maximum time between calibrations is one year or what is recommended by the manufacturer, whichever is less. All test equipment calibrations are traceable to the Korea Research Institute of Standards and Science (KRISS), therefore, all test data recorded in this report is traceable to KRISS.

1.8 Test Facility

The measurement facility is located at 386-1, Ho-dong, Cheoin-gu, Yongin-si, Gyeonggi-do, 449-100, Korea. The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

1.9 Measurement Procedure

Preliminary AC power line conducted emissions tests were performed shielded room. To find worst mode, several typical mode and typical cable position were tested. Final AC power line conducted emissions test was performed shielded room. (location is same as Preliminary test)
Based on the preliminary tests of the EUT, final test was proceeded worst case test mode and cable configuration.

Preliminary radiated emissions test were performed anechoic chamber (Distance of antenna and EUT was 3 m). To find worst mode, several typical mode and typical cable position were tested and peak level and frequency were recorded.

Final radiated emissions test was performed Open Area Test Site. Based on the preliminary tests of the EUT, final test was proceeded worst case test mode and cable configuration.

* Measurement procedures was In accordance with ANSI C63.4-2003 7.2.3, 7.2.4, 8.3.1.1, 8.3.1.2



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1.10 Laboratory Accreditations and Listings

Country	Agency	Scope of Accreditation	Logo
USA	FCC	3 & 10 meter Open Area Test Sites and one conducted site to perform FCC Part 15/18 measurements.	 93250
JAPAN	VCCI	10 meter Open Area Test Site and one conducted site.	 R-948, C-986
KOREA	KCC	EMI (10 meter Open Area Test Site and two conducted sites) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	 No. 51, KR0025
International	KOLAS	EMC	



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2.0 Emissions Test Regulations

The emissions tests were performed according to following regulations:

- | | | |
|--------------------------------------------------------------|----------------------------------------------------------------------|----------------------------------------------------------------------|
| <input type="checkbox"/> EN 61000-6-3:2007 | | |
| <input type="checkbox"/> EN 61000-6-4:2007 | | |
| <input type="checkbox"/> EN 55011:2007 +A2:2007 | <input type="checkbox"/> Group 1
<input type="checkbox"/> Class A | <input type="checkbox"/> Group 2
<input type="checkbox"/> Class B |
| <input type="checkbox"/> EN 55013:2001 +A1:2003 +A2:2006 | | |
| <input type="checkbox"/> EN 55014-1:2006 | | |
| <input type="checkbox"/> EN 55015:2006 | | |
| <input type="checkbox"/> EN 61204-3:2000 | <input type="checkbox"/> Class A | <input type="checkbox"/> Class B |
| <input type="checkbox"/> EN 61131-2:2003 | | |
| <input type="checkbox"/> EN 61326-1:2006 | <input type="checkbox"/> Class A | <input type="checkbox"/> Class B |
| <input type="checkbox"/> EN 55022:2006 | <input type="checkbox"/> Class A | <input type="checkbox"/> Class B |
| <input type="checkbox"/> EN 61000-3-2:2006 | | |
| <input type="checkbox"/> EN 61000-3-3:1995 +A1:2001 +A2:2005 | | |
| <input type="checkbox"/> VCCI V-3/2008.04 | <input type="checkbox"/> Class A | <input type="checkbox"/> Class B |
| <input type="checkbox"/> AS/NZS CISPR22:2006 | <input type="checkbox"/> Class A | <input type="checkbox"/> Class B |
| <input checked="" type="checkbox"/> FCC Part 15 Subpart C | | |
| <input type="checkbox"/> CISPR 22:2006 | <input type="checkbox"/> Class A | <input type="checkbox"/> Class B |



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2.1 Radiated Electric Field Emissions - 15.225(a)

Reference Standard

FCC Part 15.225(a)

Test Date

April 1, 2009

Test Location

☒ EMI-OATS: Testing was performed at a test distance of 3 m

Test Equipment

	Name of Equipment	Manufacturer	Model No.	Serial No.	Due Date
<input checked="" type="checkbox"/>	Field Strength Meter	Rohde & Schwarz	ESHS30	828144/002	2010-02-27
<input checked="" type="checkbox"/>	Loop Antenna	EMCO	6502	9107-2652	2010-10-13

Frequency Range of Measurement

13.553 MHz to 13.567 MHz

Instrument Settings

IF Band Width: 10 kHz

Radiated emission limits

Frequency (MHz)	Field Strength of Fundamental uV/m	Field Strength of Fundamental dBuV/m (30 m)	Field Strength of Fundamental dBuV/m (3 m)
13.553-13.567	15,848	84	104

Test Results

The requirements are:

- ☒ MET
☐ NOT MET
☐ NOT APPLICABLE

Remarks

See Appendix A for test data



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2.2 Radiated Electric Field Emissions - 15.225(b)(c)

Reference Standard

FCC Part 15.225(b)(c)

Test Date

April 1, 2009

Test Location

☒ EMI-OATS: Testing was performed at a test distance of 3 m

Test Equipment

	Name of Equipment	Manufacturer	Model No.	Serial No.	Due Date
<input checked="" type="checkbox"/>	Field Strength Meter	Rohde & Schwarz	ESHS30	828144/002	2010-02-27
<input checked="" type="checkbox"/>	Loop Antenna	EMCO	6502	9107-2652	2010-10-13

Frequency Range of Measurement

13.410 MHz to 13.553 MHz, 13.567 MHz to 13.710 MHz

13.110 MHz to 13.410 MHz, 13.710 MHz to 14.010 MHz

Instrument Settings

IF Band Width: 10 kHz

Radiated emission limits

Frequency (MHz)	Field Strength of Fundamental $\mu\text{V}/\text{m}$	Field Strength of Fundamental $\text{dB}\mu\text{V}/\text{m}$ (30 m)	Field Strength of Fundamental $\text{dB}\mu\text{V}/\text{m}$ (3 m)
13.410-13.553	334	50.4	70.4
13.567-13.710	334	50.4	70.4
13.110-13.410	106	40.5	60.5
13.710-14.010	106	40.5	60.5

Test Results

The requirements are:

- ☒ MET
☐ NOT MET
☐ NOT APPLICABLE

Remarks

Emissions 20dB's below the limit were not necessarily recorded.



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2.3 Radiated Electric Field Emissions - 15.225(d)

Reference Standard

FCC Part 15.225(d), 15.209

Test Date

April 1, 2009

Test Location

☒ EMI-OATS: Testing was performed at a test distance of 3 m

Test Equipment

	Name of Equipment	Manufacturer	Model No.	Serial No.	Due Date
<input checked="" type="checkbox"/>	Field Strength Meter	Rohde & Schwarz	ESVS30	826638/008	2009-06-10
<input checked="" type="checkbox"/>	ULTRA Broadband Antenna	Rohde & Schwarz	HL562	361324/014	2010-06-20
<input checked="" type="checkbox"/>	Field Strength Meter	Rohde & Schwarz	ESHS30	828144/002	2010-02-27
<input checked="" type="checkbox"/>	Loop Antenna	EMCO	6502	9107-2652	2010-10-13

Frequency Range of Measurement

9 kHz to 1000 MHz

Instrument Settings

IF Band Width: 10 kHz (9 kHz to 30 MHz)

IF Band Width: 120 kHz (30 MHz to 1000 MHz)

Radiated emission limits

Frequency (MHz)	Field Strength of Fundamental uV/m	Field Strength of Fundamental dBuV/m (3 m)
1.705-30.0	30	49.5
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	600	54

Test Results

The requirements are:

- ☒ MET
☐ NOT MET
☐ NOT APPLICABLE

Remarks

See Appendix A for test data



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2.4 Frequency Stability – 15.225(e)

Reference Standard

FCC Part 15.225(e)

Test Date

April 2, 2009

Test Equipment

	Name of Equipment	Manufacturer	Model No.	Serial No.	Due Date
<input checked="" type="checkbox"/>	Spectrum Analyzer	HP	E4403B	US39440619	2009-10-31
<input checked="" type="checkbox"/>	Temp & Humi Chamber	Kunpoong Engineering	KP-1000	2002KP050041	2010-01-29

Test Results

The requirements are:

- ☒ MET
☐ NOT MET
☐ NOT APPLICABLE

Test Data

Timing	-20 °C	-10 °C	0 °C	10 °C	20 °C	30 °C	40 °C	50 °C
Start-up	13.56076	13.56093	13.56048	13.56084	13.56084	13.56028	13.56045	13.56060
10 min	13.56077	13.56092	13.56048	13.56085	13.56084	13.56029	13.56044	13.56062
30 min	13.56076	13.56092	13.56049	13.56084	13.56084	13.56028	13.56045	13.56060

Timing	Power 85%	Power 115%
Start-up	13.56085	13.56084
10 min	13.56085	13.56085
30 min	13.56086	13.56085



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2.5 Conducted Voltage Emissions – 15.207

Reference Standard

FCC Part 15.207

Test Date

April 6, 2009

Test Location

Shielded Room

Test Equipment

	Name of Equipment	Manufacturer	Model No.	Serial No.	Due Date
<input type="checkbox"/>	Field Strength Meter	Rohde & Schwarz	ESHS30	828144/002	2010-02-27
<input type="checkbox"/>	LISN	EMCO	3825/2	9607-2575	2009-08-19
<input type="checkbox"/>	LISN	EMCO	3825/2	9409-2246	2009-08-19
<input checked="" type="checkbox"/>	Field Strength Meter	Rohde & Schwarz	ESHS30	862024/001	2010-03-04
<input checked="" type="checkbox"/>	LISN	Rohde & Schwarz	ESH3-Z5	100207	2009-12-12
<input checked="" type="checkbox"/>	LISN	EMCO	3825/2	9206-1971	2009-12-12

Frequency Range of Measurement

150 kHz to 30 MHz

Instrument Settings

IF Band Width: 9 kHz

Conducted Emission limits

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56	56 to 46
0.5-5	56	46
5-30	60	50

Test Results

The requirements are:

☒ MET

Frequency (MHz)	Measured Data (dBuV)	Margin (dB)	Remark
4.78	43.9	2.1	Average

☐ NOT MET

☐ NOT APPLICABLE

Remarks

See Appendix A for test data.



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APPENDIX A – TEST DATA

Radiated Electric Field Emissions (Quasi-Peak reading)

1) Fundamental Frequency Test Data

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	Correction Factor		Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Cable			
13.56	54.1	H	1.0	9.1	0.1	104.0	63.3	40.7
13.56	53.1	V	1.0	9.1	0.1	104.0	62.3	41.7

2) Frequency Range from 9 kHz to 30 MHz Test Data

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	Correction Factor		Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Cable			
8.40	27.5	H	1.0	9.4	0.1	49.5	37.0	12.5
8.48	27.0	V	1.0	9.4	0.1	49.5	36.5	13.0

3) Frequency Range from 30 MHz to 1000 MHz Test Data

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	Correction Factor		Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Cable			
192.00	30.9	V	1.0	7.1	1.5	43.5	39.5	4.0
239.92	31.7	H	3.0	9.1	1.9	46.0	42.7	3.3
336.75	26.8	H	4.0	12.0	2.6	46.0	41.4	4.6
448.75	24.8	V	2.0	14.5	3.2	46.0	42.5	3.5
475.00	22.6	V	1.5	15.0	3.3	46.0	40.9	5.1
900.25	15.9	H	4.0	21.0	4.6	46.0	41.5	4.5
962.50	23.9	H	3.5	21.6	4.6	54.0	50.1	3.9



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Conducted Voltage Emissions

Frequency [MHz]	Correction Factor		Line	Quasi-peak				Average			
				Limit	Reading	Result	Margin	Limit	Reading	Result	Margin
	LISN	Cable		[dBuV]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dB]
4.65	0.2	0.4	H	56.0	48.3	48.9	7.1	46.0	42.6	43.2	2.8
4.78	0.2	0.4	H	56.0	49.1	49.7	6.3	46.0	43.3	43.9	2.1
4.90	0.2	0.4	N	56.0	48.3	48.9	7.1	46.0	42.7	43.3	2.7
5.05	0.2	0.4	H	60.0	49.5	50.1	9.9	50.0	43.5	44.1	5.9
5.30	0.2	0.4	N	60.0	48.8	49.4	10.6	50.0	41.9	42.5	7.5
13.56	0.6	0.6	H	60.0	47.6	48.8	11.2	50.0	45.5	46.7	3.3

H : Hot, N : Neutral



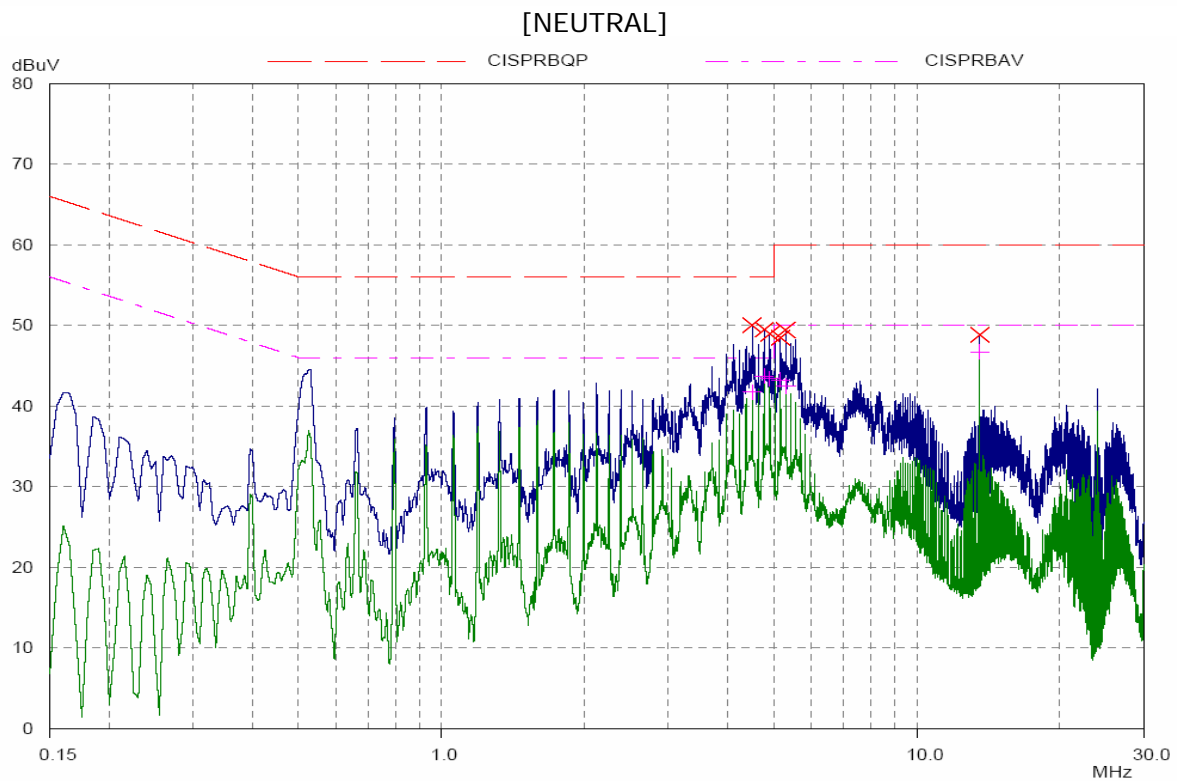
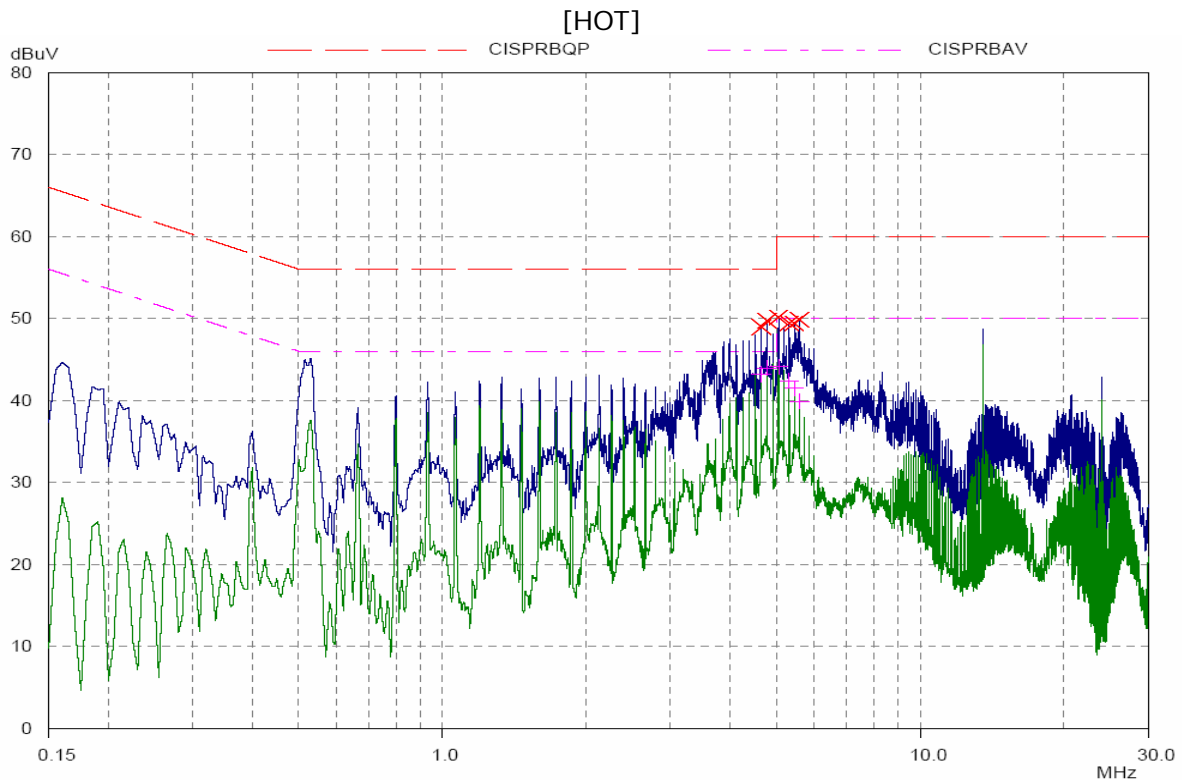
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Bandwidth of the Operating Frequency

