



**FCC CFR47 PART 15 SUBPART C  
CERTIFICATION TEST REPORT**

**FOR**

**e-BRIDGE ID Gate**

**MODEL NUMBER: KP-2005**

**FCC ID: BJI-KP2005**

**REPORT NUMBER: 06J10691-1**

**ISSUE DATE: DECEMBER 04, 2006**

*Prepared for*  
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6-78 MINAMI-CHO  
MISHIMA, SHIZUOKA 411-8520  
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**NVLAP<sup>®</sup>**  
**LAB CODE:200065-0**

Revision History

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
--	11/30/06	Initial Issue.	T.C.
B	12/1/2006	Added a ferrite SEIWA –E04SR130525A inside the antenna cable	Thu

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# 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** TOSHIBA TEC CORPORATION  
6-78 MINAMI-CHO  
MISHIMA, SHIZUOKA 411-8520  
JAPAN

**EUT DESCRIPTION:** e-BRIDGE ID Gate

**MODEL:** KP-2005

**SERIAL NUMBER:** 01819

**DATE TESTED:** NOVEMBER 3 – NOVEMBER 09 and NOVEMBER 29, 2006

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 15 SUBPART C	NO NON-COMPLIANCE NOTED

Compliance Certification Services, Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

**Note:** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by Compliance Certification Services and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Compliance Certification Services will constitute fraud and shall nullify the document. No part of this report may be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any government agency.

Approved & Released For CCS By:

Tested By:



THU CHAN  
EMC SUPERVISOR  
COMPLIANCE CERTIFICATION SERVICES

VIEN TRAN  
EMC ENGINEER  
COMPLIANCE CERTIFICATION SERVICES

## 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4-2003.

## 3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 561F Monterey Road, Morgan Hill, California, USA. The sites are constructed in conformance with the requirements of ANSI C63.4, ANSI C63.7 and CISPR Publication 22. All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

CCS is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at <http://www.ccsemc.com>.

## 4. CALIBRATION AND UNCERTAINTY

### 4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

### 4.2. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Radiated Emission, 30 to 200 MHz	+/- 3.3 dB
Radiated Emission, 200 to 1000 MHz	+4.5 / -2.9 dB
Radiated Emission, 1000 to 2000 MHz	+4.5 / -2.9 dB
Power Line Conducted Emission	+/- 2.9 dB

Uncertainty figures are valid to a confidence level of 95%.

## 5. EQUIPMENT UNDER TEST

### 5.1. DESCRIPTION OF EUT

EUT is a low power transmitter wireless card reader, and its fundamental frequency is 13.56MHz.

#### GENERAL INFORMATION

CHASSIS/ ENCLOSURE MATERIAL	PLASTIC/METAL BRACKET
POWER REQUIREMENTS	5.0 VDC
POWERLINE FILTER MANUFACTURER AND MODEL	N/A
LIST OF ALL OSCILLATOR FREQUENCIES GREATER THAN OR EQUAL TO 9 kHz	13.56MHz

### 5.2. TEST CONFIGURATION

The following configuration was investigated during testing:

EUT Configuration	Description
Typical Configuration	EUT is connected to the host PC via USB cable and a card is placed in proximity with the EUT

### 5.3. MODE(S) OF OPERATION

Mode	Description
Normal Mode	Transmit Continuously

## 5.4. SOFTWARE AND FIRMWARE

The drivers installed in the support PC during the testing were CP210x VCP Drivers, version 11.00.28844.

## 5.5. MODIFICATIONS

A Takeuchi TFT-102010N ferrite was installed on the USB cable with 1 turn, and a SEIWA – E04SR130525A ferrite was installed inside the antenna cable.

## 5.6. DETAILS OF TESTED SYSTEM

### SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop	IBM	2722	FX-18982	DoC
AC Adapter	IBM	N/A	08K8208	DoC
Test Card	MIFARE	N/A	387A6C2	N/A
Laptop	HP	HP pavilion ze1000	TW22819899	DoC
AC/DC Adapter	HP	ADP-75HB	MVT0243197436	DoC

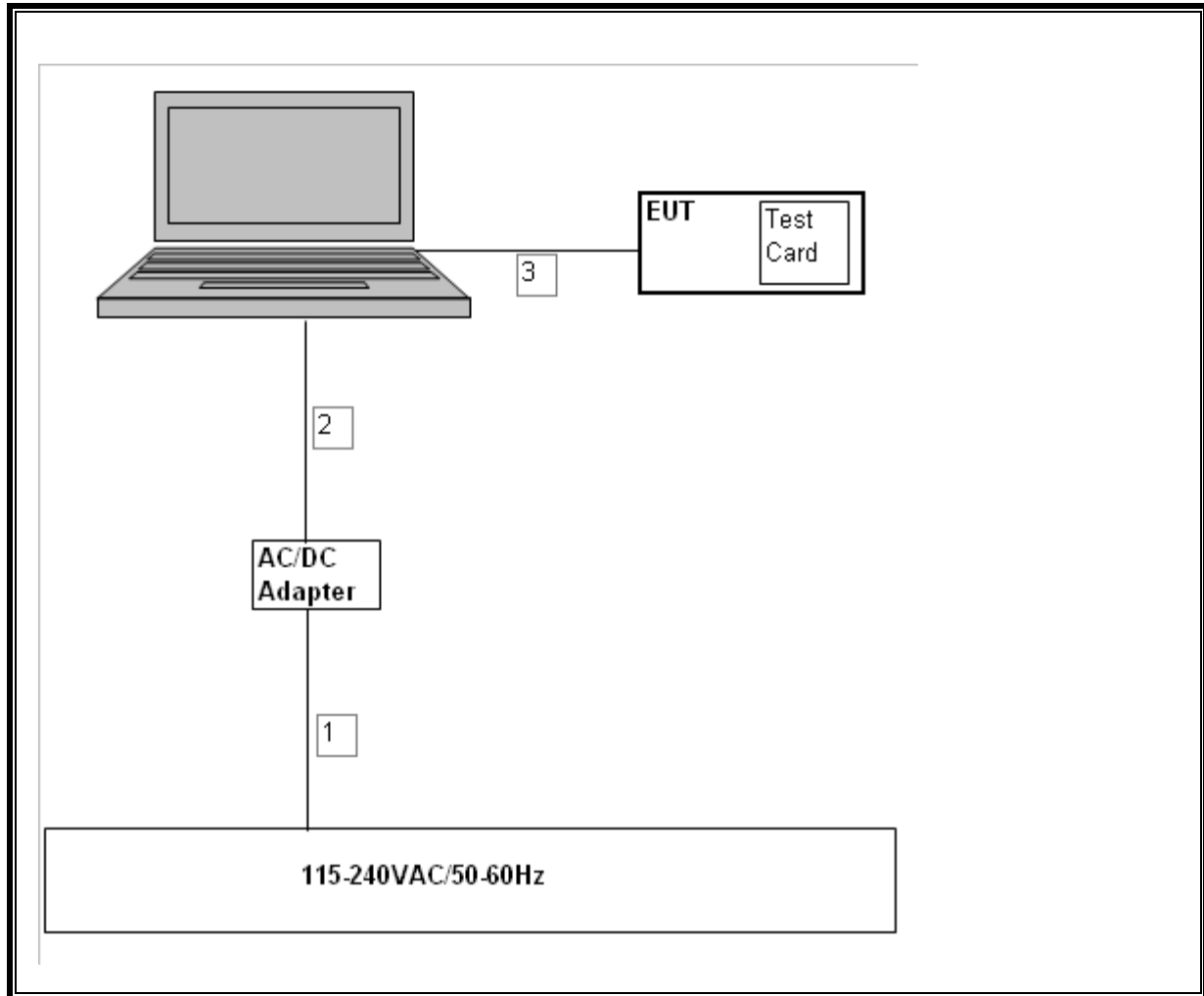
### I/O CABLES

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	AC	1	US 115V	Un-shielded	2m	No
2	DC	1	DC Plug	Un-shielded	1m	No
3	USB	1	USB	Shielded	.5m	Ferrite on USB cable

### TEST SETUP

The EUT continuously transmits when the USB cable is installed in the host PC and a card was placed in proximity with the EUT.

**SETUP DIAGRAM FOR TESTS**





## 6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

TEST EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	Cal Due
EMI Receiver, 9 kHz ~ 2.9 GHz	Agilent / HP	8542E	3942A00286	2/4/2007
RF Filter Section	Agilent / HP	85420E	3705A00256	2/4/2007
Antenna, Bilog 30 MHz ~ 2 Ghz	Sunol Sciences	JB1	A121003	9/3/2007
Antenna, Loop 9 kHz ~ 30 MHz	EMCO	6502	9202-2722	9/7/2007
Temperature / Humidity Chamber	Thermotron	SE 600-10-10	29800	6/12/2007
Spectrum Analyzer 3 Hz ~ 44 GHz	Agilent / HP	E4446A	US42070220	7/29/2007
LISN, 10 kHz ~ 30 MHz	FCC	LISN-50/250-25-2	2023	8/30/2007
LISN, 10 kHz ~ 30 MHz	Solar	8012-50-R-24-BNC	8379443	8/30/2007
EMI Test Receiver	R & S	ESHS 20	827129/006	1/3/2008

## 7. LIMITS AND RESULTS

### 7.1. 99% BANDWIDTH

#### LIMIT

None; for reporting purposes only.

#### TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

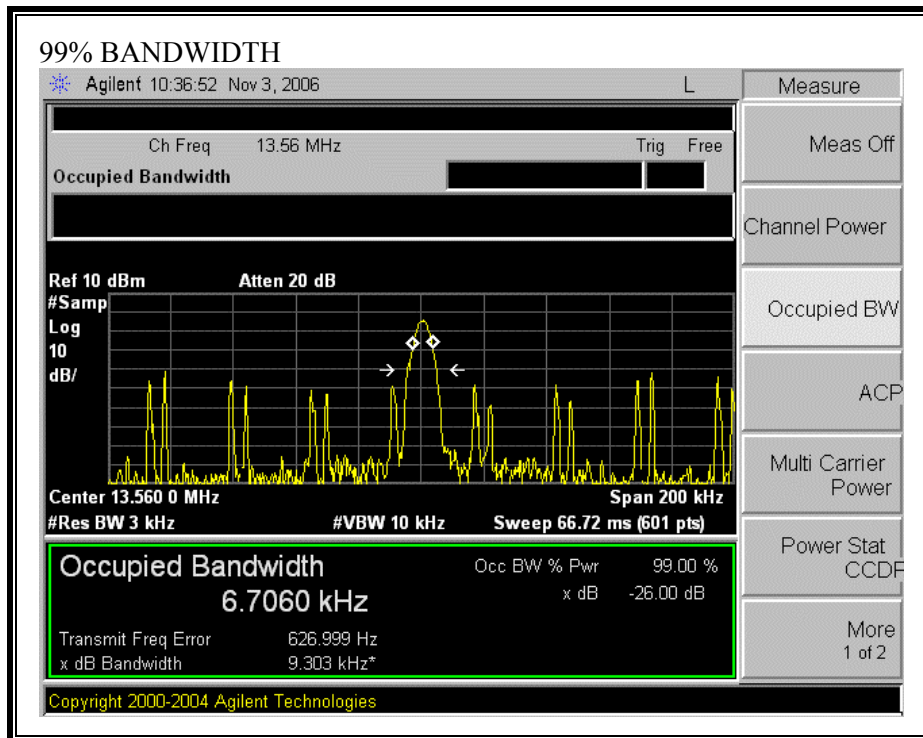
#### RESULTS

No non-compliance noted:

#### 99% Bandwidth

Frequency (MHz)	99% Bandwidth (KHz)
13.56	6.706

**99% BANDWIDTH**



## **7.2. RADIATED EMISSIONS**

### **7.2.1. OPERATION WITHIN THE BAND 13.110 – 14.010 MHz**

#### **TEST PROCEDURE**

ANSI C63.4

#### **LIMIT**

- (a) The field strength of any emissions within the band 13.553–13.567 MHz shall not exceed 15,848 microvolts/ meter at 30 meters.
- (b) Within the bands 13.410–13.553 MHz and 13.567–13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.
- (c) Within the bands 13.110–13.410 MHz and 13.710–14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.
- (d) The field strength of any emissions appearing outside of the 13.110– 14.010 MHz and shall not exceed the general radiated emission limits in § 15.209.

**TRANSCEIVER SPURIOUS EMISSIONS BELOW 30MHz**

FCC Part 15, Subpart B & C      10 Meter Distance Measurement At Open Field												
Company: TOSHIBA TEC CORPORATION												
Project #: 06J10691												
EUT Description: 13.56MHz, RF ID Reader (e-Bridge ID Gate)												
Model #: KP-2005												
Tester: Thanh Nguyen and Mengistu Mekuria												
Date: November 3rd, 2006												
Frequency (MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	AF (dB/m)	Distance Correction (dB)	PK Corrected Reading (dBuV/m)	AV Corrected Reading (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	PK Margin (dB)	AV Margin (dB)	Notes
Loop Antenna Face On:												
13.56	56.2			10.56	-19.08	47.67		84.00		-36.3		10m distance
27.12	34.4			9.046	-19.08	24.36		29.54		-5.2		10m distance
Loop Antenna Face Off:												
13.56	47.7			10.56	-19.08	39.17		84.00		-44.8		10m distance
27.12	33			9.046	-19.08	22.96		29.54		-6.6		10m distance
Rev. 5.1.6												
* No more emissions were found up to 30MHz												
Note: The emission limits are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 10000Mhz. Radiated emission limits in these three bands are based on measurements employing an average detector.												
P.K. = Peak												
Q.P. = Quasi Peak Readings												
A.F. = Antenna factor												

## 7.2.2. TRANSMITTER RADIATED SPURIOUS EMISSIONS

### TEST PROCEDURE

ANSI C63.4

The highest clock frequency generated or used in the EUT is 13.56 MHz; therefore the frequency range was investigated from 9 kHz to 1000 MHz.

### LIMIT

§15.209 (a) 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:

Limits for radiated disturbance of an intentional radiator		
Frequency range (MHz)	Limits ( $\mu\text{V/m}$ )	Measurement Distance (m)
0.009 – 0.490	2400 / F (kHz)	300
0.490 – 1.705	24000 / F (kHz)	30
1.705 – 30.0	30	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. §§ 15.231 and 15.241.

§15.209 (b) In the emission table above, the tighter limit applies at the band edges.

In addition:

§15.209 (d) The emission limits shown on the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emissions limits in these three bands are based on measurements employing an average detector.

§15.209 (d) The provisions in §§ 15.225, measuring emissions at distances other than the distances specified in the above table, determining the frequency range over which radiated emissions are to be measured, and limiting peak emissions apply to all devices operated under this part.

### RESULTS

No non-compliance noted:

**SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)**



561F Monterey Road  
 Morgan Hill, CA 95037  
 Tel: (408) 463-0888  
 Fax: (408) 463-0885

Data#: 52 File#: 06j10691.emi.emi Date: 11-29-2006 Time: 14:12:41  
 Audix ATC

Condition: FCC CLASS-B HORIZONTAL  
 Test Operator: CHIN PANG  
 Company: Toshiba Tec Corporation  
 Project #: 06U10691  
 Configuration: BUT with Support Laptop  
 Mode of Oper.: TX  
 Target: FCC Class B

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	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	85.290	26.07	8.25	34.32	40.00	-5.68	Peak
2	206.540	23.22	13.61	36.83	43.50	-6.67	Peak
3	227.880	25.31	12.95	38.26	46.00	-7.74	Peak
4	235.640	27.07	13.30	40.37	46.00	-5.63	Peak
5	250.190	24.82	13.90	38.72	46.00	-7.28	Peak
6	259.890	29.28	14.25	43.53	46.00	-2.47	Peak
7	271.530	29.25	14.65	43.90	46.00	-2.10	Peak
8	286.080	29.86	15.16	45.02	46.00	-0.98	Peak
9	300.630	27.00	15.67	42.67	46.00	-3.33	Peak
10	313.240	29.20	16.05	45.25	46.00	-0.75	QP
11	342.340	28.32	16.68	45.00	46.00	-1.00	Peak
12	368.530	24.37	17.33	41.70	46.00	-4.30	Peak
13	395.690	24.92	17.93	42.85	46.00	-3.15	Peak
14	421.880	23.06	18.58	41.64	46.00	-4.36	Peak
15	449.040	19.51	19.17	38.68	46.00	-7.32	Peak
16	557.680	18.15	20.92	39.07	46.00	-6.93	Peak
17	586.780	18.50	21.34	39.84	46.00	-6.16	Peak
18	676.990	16.94	22.74	39.68	46.00	-6.32	Peak

**SPURIOUS EMISSIONS 30 TO 1000 MHZ (WORST-CASE CONFIGURATION, VERTICAL)**



561F Monterey Road  
 Morgan Hill, CA 9503  
 Tel: (408) 463-0888  
 Fax: (408) 463-0885

Data#: 54 File#: 06j10691.emi.emi Date: 11-29-2006 Time: 14:23:11  
 Audix ATC

Condition: FCC CLASS-B VERTICAL  
 Test Operator:: CHIN PANG  
 Company: : Toshiba Tec Corporation  
 Project #: : 06U10691  
 Configuration:: EUT with support Laptop  
 Mode of Oper.: TX  
 Target: : FCC Class B

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	Freq	Read		Limit	Over	
	Level	Factor	Level	Line	Limit	Remark
	MHZ	dBuV	dB	dBuV/m	dBuV/m	dB
1	30.000	9.46	20.45	29.91	40.00	-10.09 Peak
2	40.670	10.09	15.51	25.60	40.00	-14.40 Peak
3	56.190	20.66	8.47	29.13	40.00	-10.87 Peak
4	61.040	17.40	8.78	26.18	40.00	-13.82 Peak
5	75.590	18.36	9.14	27.50	40.00	-12.51 Peak
6	85.290	23.76	8.25	32.01	40.00	-7.99 Peak
7	201.690	14.34	14.32	28.66	43.50	-14.84 Peak
8	206.540	18.25	13.61	31.86	43.50	-11.64 Peak
9	221.090	19.03	12.67	31.70	46.00	-14.30 Peak
10	235.640	20.77	13.30	34.07	46.00	-11.93 Peak
11	259.890	20.62	14.25	34.87	46.00	-11.13 Peak
12	271.530	18.91	14.65	33.56	46.00	-12.44 Peak
13	286.080	19.65	15.16	34.81	46.00	-11.19 Peak
14	313.240	18.74	16.05	34.79	46.00	-11.21 Peak
15	342.340	17.44	16.68	34.12	46.00	-11.88 Peak
16	347.190	15.71	16.85	32.56	46.00	-13.44 Peak
17	368.530	16.62	17.33	33.95	46.00	-12.05 Peak
18	395.690	18.60	17.93	36.53	46.00	-9.47 Peak
19	421.880	19.00	18.58	37.58	46.00	-8.42 Peak
20	429.640	14.19	18.74	32.93	46.00	-13.07 Peak
21	436.430	12.34	18.89	31.23	46.00	-14.77 Peak
22	449.040	14.86	19.17	34.03	46.00	-11.97 Peak
23	453.890	12.42	19.28	31.70	46.00	-14.30 Peak
24	463.590	13.89	19.50	33.39	46.00	-12.61 Peak
25	475.230	14.65	19.75	34.40	46.00	-11.60 Peak
26	489.780	12.90	20.05	32.95	46.00	-13.05 Peak
27	497.540	11.68	20.19	31.87	46.00	-14.13 Peak
28	504.330	11.75	20.26	32.01	46.00	-13.99 Peak
29	516.940	13.87	20.48	34.34	46.00	-11.66 Peak



### 7.3. FREQUENCY STABILITY

#### LIMIT

15.225 (e) The frequency tolerance of the carrier signal shall be maintained within +/- 0.01% over a temperature variation of -20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C.

#### TEST PROCEDURE

ANSI / TIA / EIA 603 Clause 2.3.1 and 2.3.2

#### RESULTS

No non-compliance noted.

Reference Frequency: EUT Channel 13.56MHz @ 20°C				
Limit: ± 100 ppm = 135.628 KHz				
Power Supply (VAC)	Environment Temperature (*C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
115.00	50	13.562775	0.005	± 100
115.00	40	13.562780	0.001	± 100
115.00	30	13.562791	-0.007	± 100
<b>115.00</b>	<b>20</b>	<b>13.562782</b>	<b>0.000</b>	<b>± 100</b>
115.00	10	13.562830	-0.036	± 100
115.00	0	13.562835	-0.039	± 100
115.00	-10	13.562830	-0.036	± 100
115.00	-20	13.562819	-0.028	± 100

## 7.4. AC MAINS LINE CONDUCTED EMISSIONS

### TEST PROCEDURE

ANSI C63.4

According to Section 13.1.3.1 of ANSI C63.4-2003, AC Line Conducted measurements on a 13.56 MHz transmitter were acceptable to be performed with a dummy load under the following conditions:

- 1) First, perform the AC line conducted tests with the antenna attached to make sure the device complies with the 15.207 limits outside the transmitter's fundamental emission band;
- 2) Second, retest with a dummy load to make sure the device complies with the 15.207 limits inside the transmitter's fundamental emission band. Only the fundamental TX emission band needs to be retested.

### LIMIT

§15.207 (a) Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50  $\mu$ H/50 ohms line impedance stabilization network (LISN).

Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequencies ranges.

Frequency range (MHz)	Limits (dB $\mu$ V)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56*	56 to 46*
0.50 to 5	56	46
5 to 30	60	50

\* Decreases with the logarithm of the frequency.

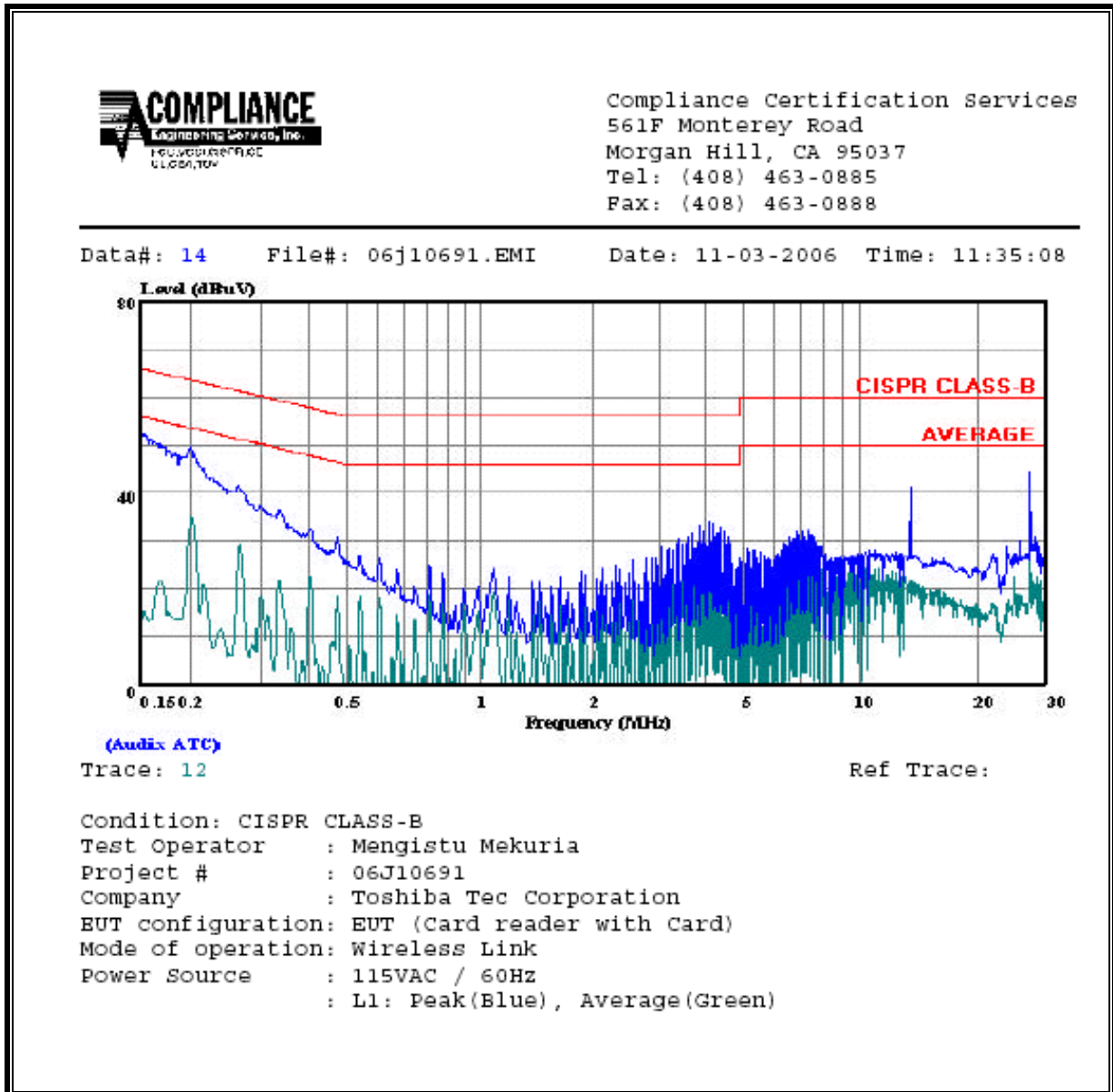
### RESULTS

No non-compliance noted:

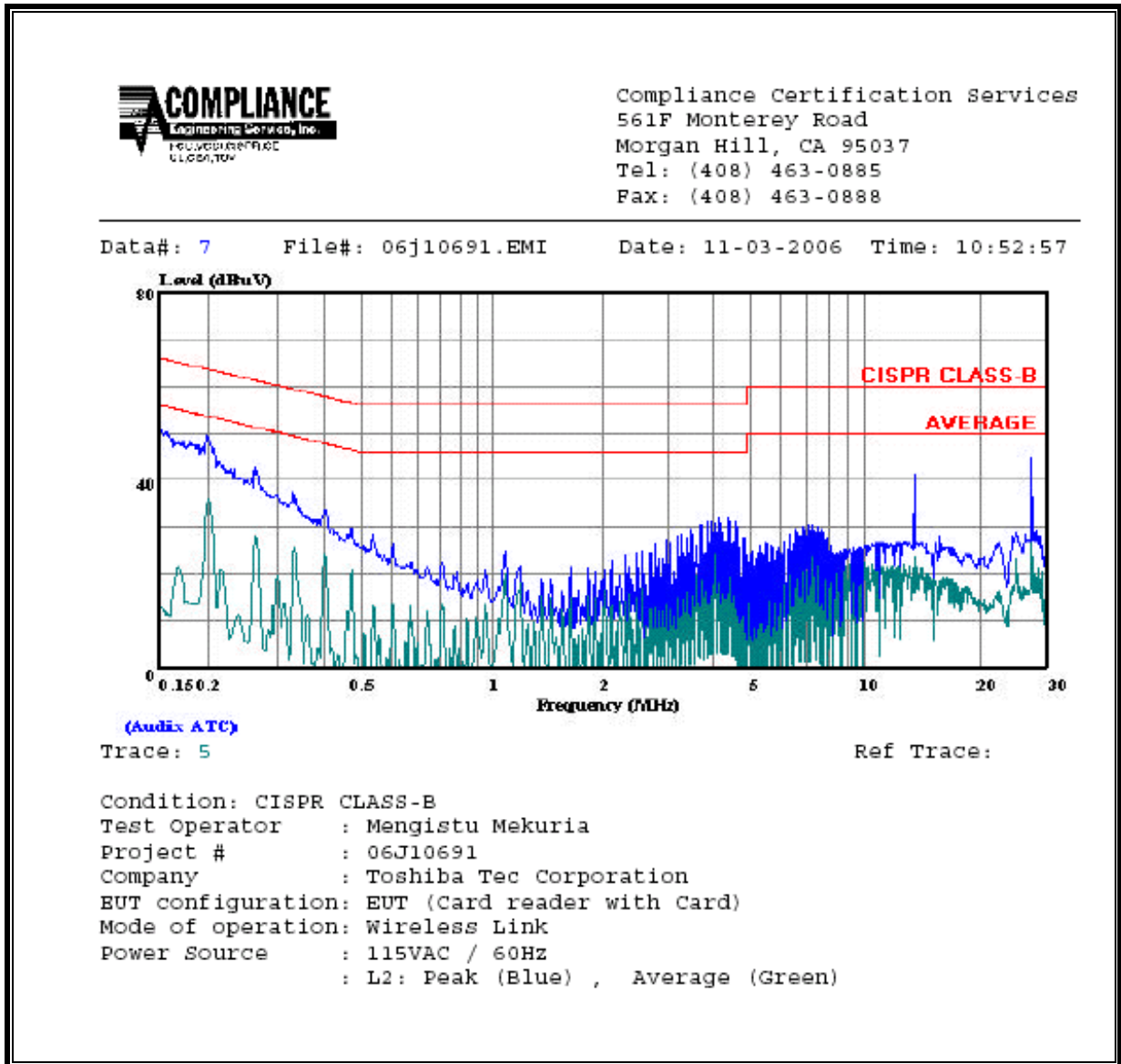
**6 WORST EMISSIONS**

CONDUCTED EMISSIONS DATA (115VAC 60Hz)									
Freq.	Reading			Class	Limit		Margin		Remark
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)	L1 / L2
0.20	49.43	--	--	0.00	63.57	53.57	-14.14	-4.14	L1
0.27	41.66	--	--	0.00	61.15	51.15	-19.49	-9.49	L1
27.13	44.38	--	--	0.00	60.00	50.00	-15.62	-5.62	L1
0.20	49.63	--	--	0.00	63.69	53.69	-14.06	-4.06	L2
0.27	44.23	--	--	0.00	61.15	51.15	-16.92	-6.92	L2
27.13	44.74	--	--	0.00	60.00	50.00	-15.26	-5.26	L2
6 Worst Data									

**LINE 1 RESULTS**

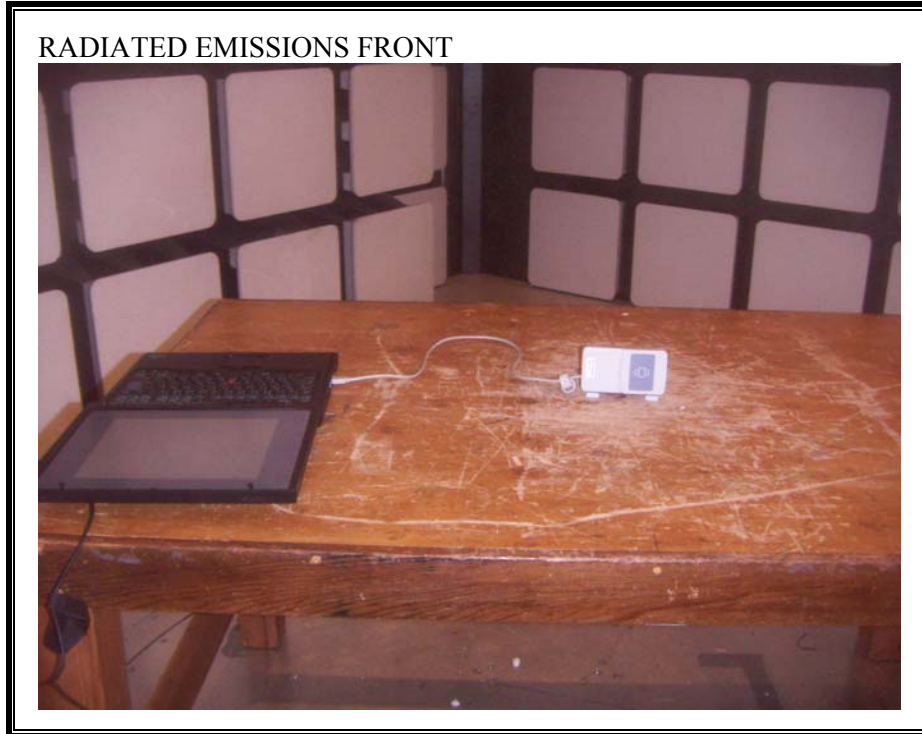


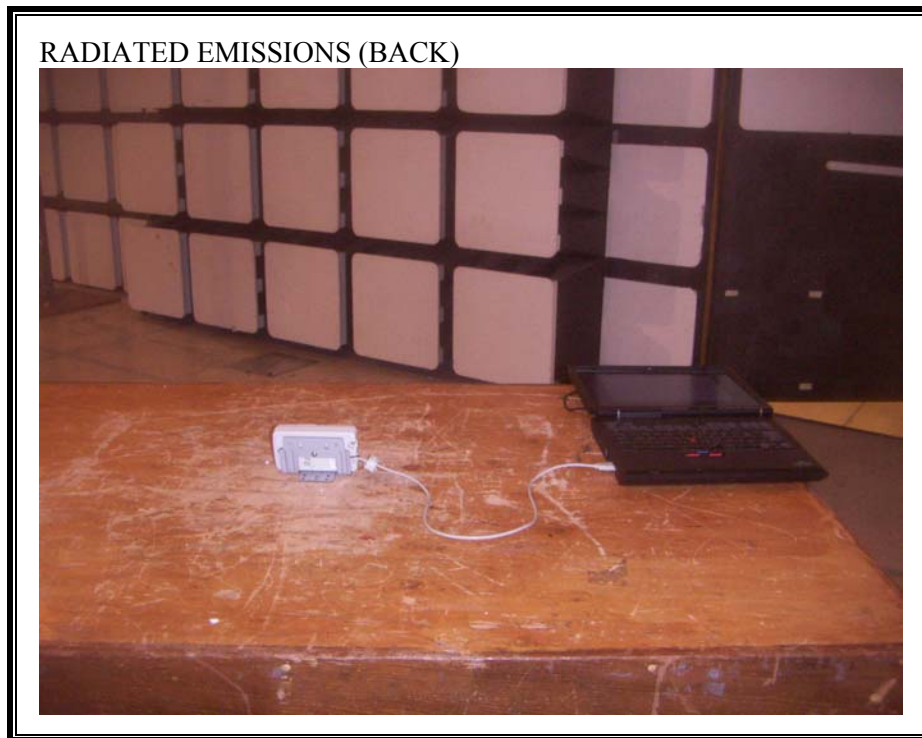
**LINE 2 RESULTS**



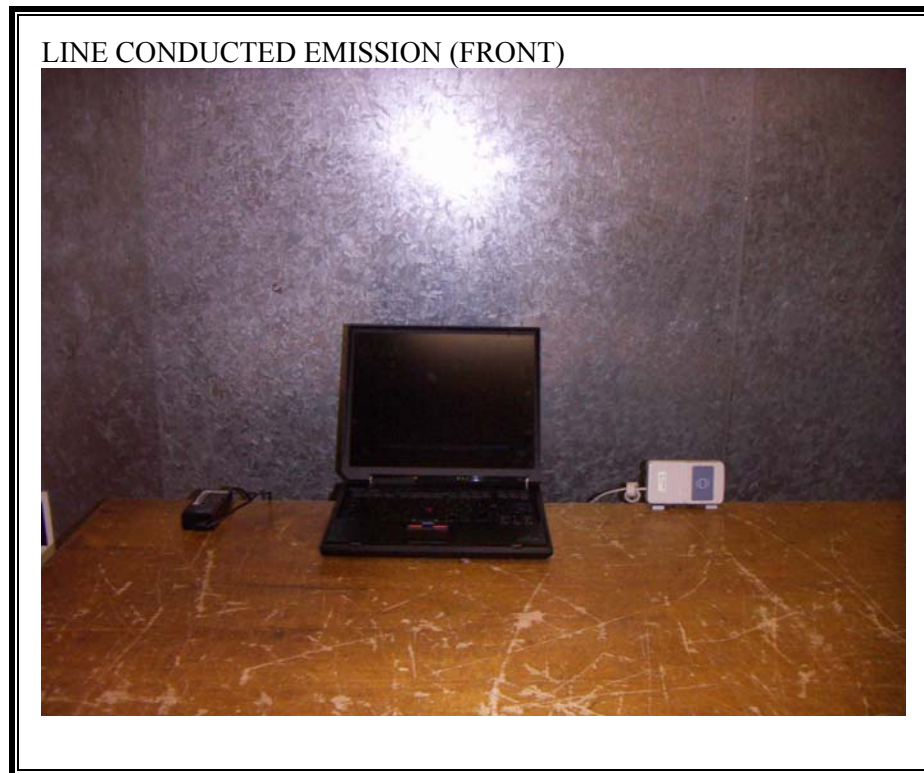
## 8. SETUP PHOTOS

### RADIATED EMISSION (30-1000 MHz)

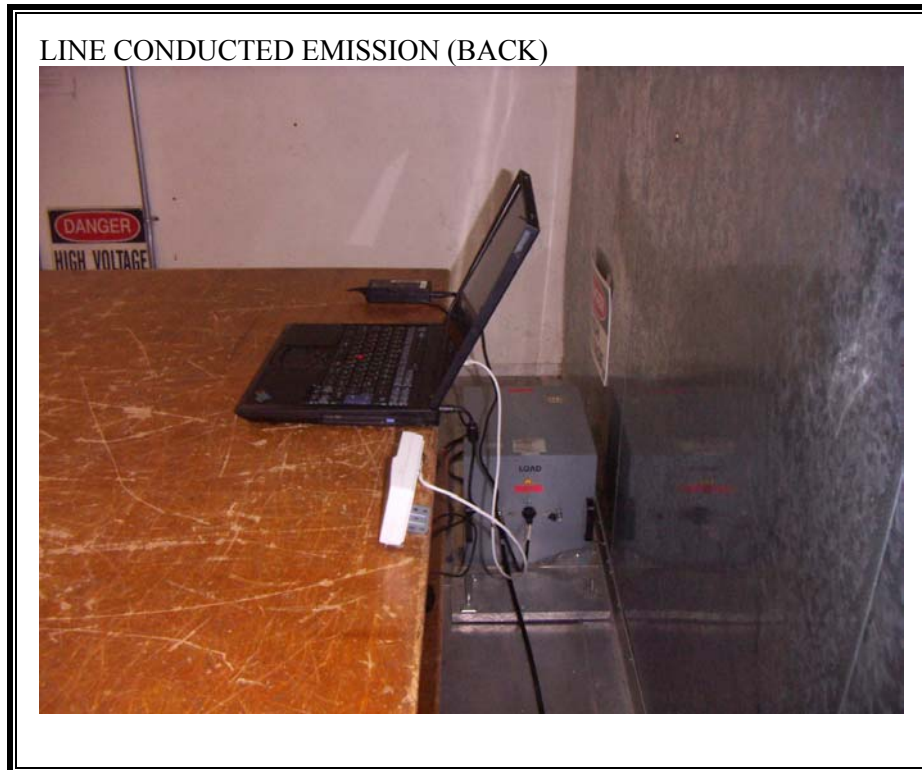




**AC MAINS LINE CONDUCTED EMISSION (0.15-30 MHz)**





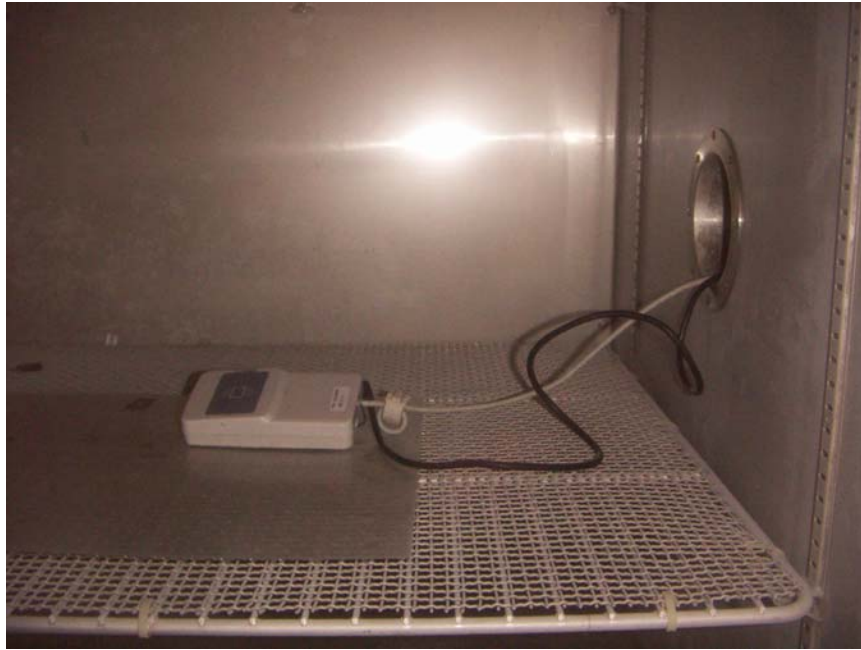


**RADIATED EMISSIONS (0.009-30 MHz)**



**FREQUENCY STABILITY**

TEMPERATURE CHAMBER



**END OF REPORT**