

FCC PART 15 CLASS B EMI MEASUREMENT AND TEST REPORT

For

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SHENZHEN, CHINA

&

SHENZHEN GODWING ELECTRONICS CO., LTD

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SHENZHEN, CHINA

FCC ID: KG6CD-1248

October 30, 2001

This Report Concerns: ☒ Original Report	Equipment Type: 12" TFT-LCD Monitor – ITE
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Test Date: October 29, 2001	
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Note: This test report is specially limited to the above client company and the product model only. It may not be duplicated without prior written consent of Bay Area Compliance Laboratory Corporation. This report **must not** be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government.

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1 - GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

The *Shenzhen Godwing Electronics Co., Ltd.*'s *CD-1248* or the "EUT" as referred to in this report is a 12" TFT LCD monitor.

- The EUT was connected to a Mid Tower system which provides for one (1) 3.5" floppy drive, one (1) hard drive, one (1) CD-ROM drive, one (1) Gateway motherboard, and one (1) Sound card.

1.2 Objective

This Class B report is prepared on behalf of *Shenzhen Godwing Electronics Co., Ltd.* in accordance with Part 2, Subpart J, and Part 15, Subparts A and B of the Federal Communication Commissions rules and to ICES-003 of the Canadian Interference-Causing Equipment Regulations.

The objective of the manufacturer is to demonstrate compliance with FCC Part 15 Class B limits for conducted and radiated margin and to ICES-003 requirements for Information Technology Equipment.

1.3 Related Submittal(s)/Grant(s)

No Related Submittals

1.4 Test Methodology

All measurements contained in this report were conducted with ANSI C63.4 –1992, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz. All radiated and conducted emissions measurement was performed at Bay Area Compliance Laboratory, Corp. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

1.5 Test Facility

The Open Area Test site used by Bay Area Compliance Laboratory Corporation to collect radiated and conducted emission measurement data is located in the back parking lot of the building at 230 Commercial Street, Suite 2, Sunnyvale, California, USA.

Test site at Bay Area Compliance Laboratory Corporation has been fully described in reports submitted to the Federal Communication Commission (FCC) and Voluntary Control Council for Interference (VCCI). The details of these reports has been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 11 and December 10, 1997 and Article 8 of the VCCI regulations on December 25, 1997. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-1992.

The Federal Communications Commission and Voluntary Control Council for Interference has the reports on file and is listed under FCC file 31040/SIT 1300F2 and VCCI Registration No.: C-1298 and R-1234. The test site has been approved by the FCC and VCCI for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, Bay Area Compliance Laboratory Corporation is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (NVLAP). The scope of the accreditation covers the FCC Method - 47 CFR Part 15 - Digital Devices, IEC/CISPR 22: 1993, and AS/NZS 3548: Electromagnetic Interference - Limits and Methods of Measurement of Information Technology Equipment test methods under NVLAP Lab Code 200167-0.

1.6 Test Equipment List

No.	Equipment	Manufacturer	Model No.	Last Cal.	Cal. Interval
HJ293Z	EMI Test Receiver	Rohde & Schwarz	ESCS30	Feb.28,01	1 Year
HJ294Z	AMN	Rohde & Schwarz	ESH3-Z5	Feb.24,01	1 Year
HJ285Z	L.I.S.N	KYROTISU	KNW-407	Feb.24,01	1 Year
HJ290Z	Spectrum analyzer	ANRITSU	MS2661C	Feb. 23,2001	1Year
HJ302Z	Amplifier	ANRITSU	MH648A	Jan. 11, 2001	1Year
HJ303Z	Bilog Antenna	Chase	CBL6111C	Feb. 28,2001	1 Year

1.7 Equipment Under Test (EUT)

Manufacturer	Description	Model	Serial Number	FCC ID
Shenzhen Traso Electronic Co., Ltd.	12" TFT LCD Monitor	CD-1248	None	KG6CD-1248

1.8 Host System Configuration List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
IBM	PC SYSTEM	6563	99YD560	DOC
CANON	Printer	BJC-265SSP	EVX81604	DOC
IBM	Monitor	0180-05N	23-A5752	DOC
KPT	Modem	N/A	200060093	DOC
KPT	Modem	N/A	200060057	DOC
IBM	Mouse	N-SUA-IBM6	23-185505	DOC
IBM	Keyboard	KB-9910	0504729	DOC

1.9 Support Equipment List and Details

Cable Description	Length (M)	Port/From	To
Shielded KB Cable	2.0	KB/EUT	KB Port/PC System
Shielded Mouse Cable	1.8	Mouse Port/Host	Mouse
Shielded Video Cable	1.8	Video Port/Host	Monitor
Shielded Printer Cable	2.8	Parallel Port/Host	CANON Printer
Shielded Serial Cable	2.0	Serial /Host	KPT Modem

2 - SYSTEM TEST CONFIGURATION

2.1 Justification

The system was configured for testing in a typical fashion (as normally used by a typical user).

Since the EUT was tested under native (normal) mode for the final qualification test.

2.2 EUT Exercise Software

The EUT exercising program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use. The software, H pattern, contained on the hard drive, is started in a DOS window under the Windows 98 operating system. Once loaded, the program sequentially exercises each system component.

The sequence used is as follows:

1. Lines of Hs scroll across the VGA monitor.
2. The modem(s) receives Hs.
3. The printer output Hs.

The complete cycle takes approximately 5 - 10 seconds and the process is continuously repeated.

2.3 Special Accessories

As shown in section 2.5, all interface cables used for compliance testing are shielded as normally supplied by INMAC, Y.C. Cable and from their respective support equipment manufacturers. The EUT, modem, printer and VGA monitor featured shielded metal connectors.

2.4 Block Diagram

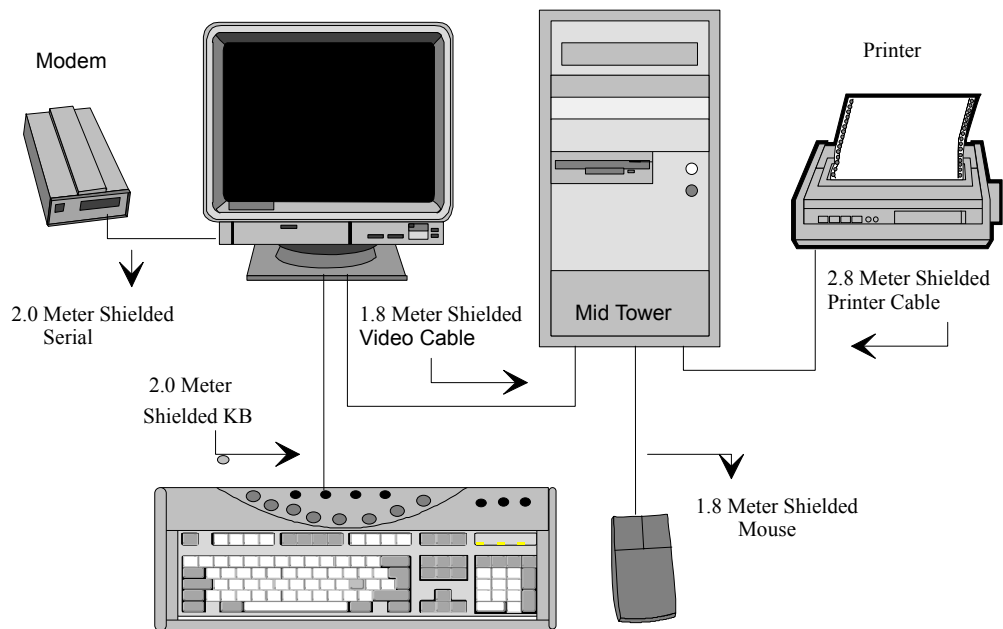
Appendix A of this report contains a copy of the EUT's block diagram as reference.

2.5 Equipment Modifications

- (1) L3&L4 and L1 to change with each other .
- (2) Cut the ground line for L3&L4.

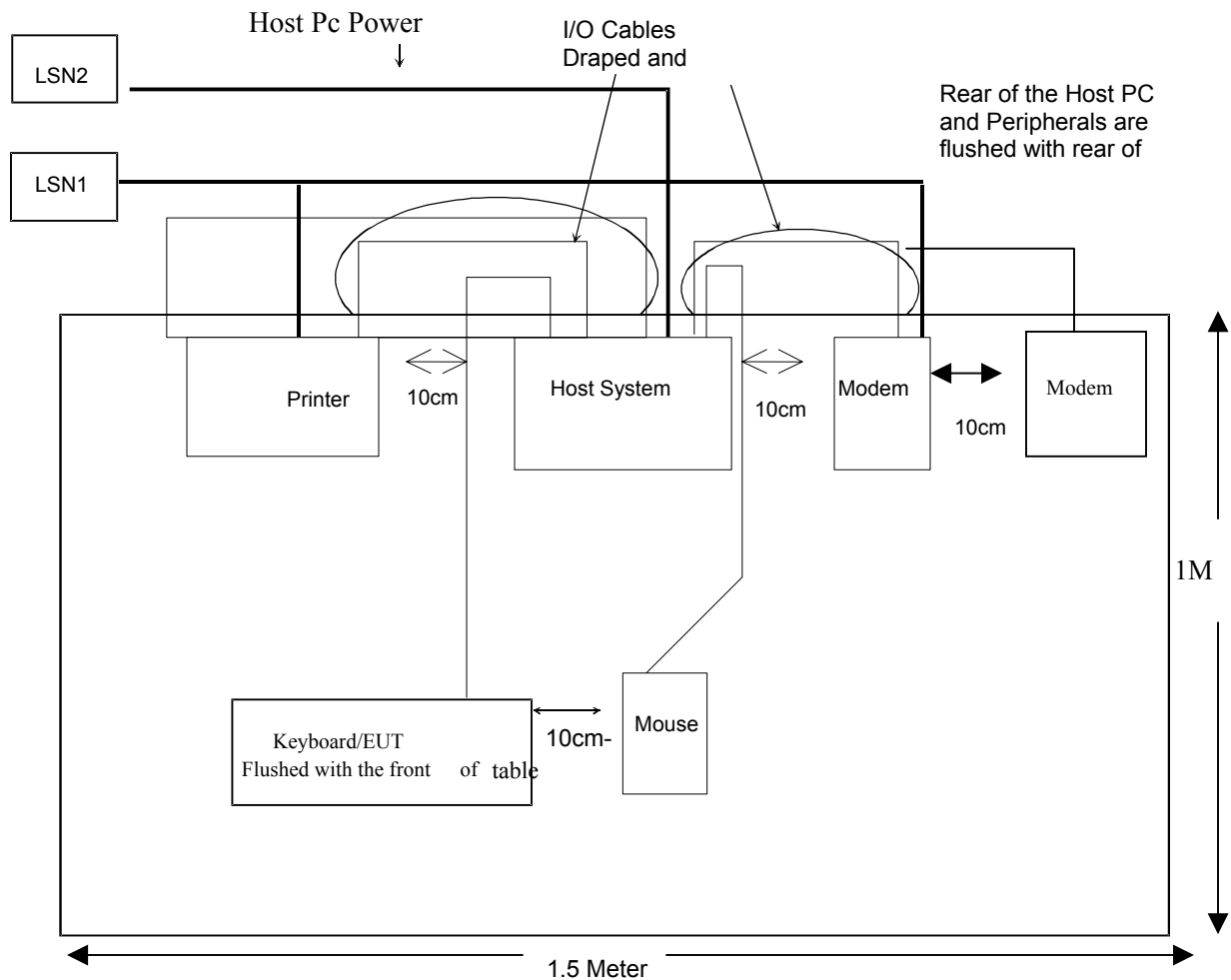
2.6 Configuration of Test System

EUT: CD-1248



2.7 Test Setup Block Diagram

EUT: CD-1248



3 - CONDUCTED EMISSIONS TEST DATA

3.1 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, and LISN.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement at BACL is ± 2.4 dB.

3.2 EUT Setup

The measurement was performed at the **Open Area Test Site**, using the same setup per ANSI C63.4 - 1992 measurement procedure. Specification used was with the EN55022 Class B limits.

The host PC system was placed on the center back of the test table connected to a 110 VAC / 60 Hz power source. The monitor was placed on the top of the host PC with the modem and the printer on either side. The rear of the host system and peripherals were placed flushed with the rear of the tabletop.

The EUT keyboard was placed directly in front of the host PC. The mouse was placed on one side of the keyboard.

The spacing between the peripherals was 10 centimeters.

External Input / Output cables were draped over edge of the test table and bundle when necessary.

3.3 Spectrum Analyzer Setup

The spectrum analyzer was set with the following configurations during the conducted emission test:

Start Frequency.....	150 kHz
Stop Frequency.....	30 MHz
Sweep Speed.....	Auto
IF Bandwidth.....	10 kHz
Video Bandwidth.....	10 kHz
Quasi-Peak Adapter Bandwidth.....	9 kHz
Quasi-Peak Adapter Mode.....	Normal

3.4 Test Procedure

During the conducted emission test, the EUT power adapter power cord was connected to the auxiliary outlet of the first LISN with the host system, VGA monitor and all support equipment power cords connected to the second LISN.

Since the EUT has only one operating mode, this mode was tested with the ASTEC Power supply to represent worst case results for the final qualification test. Therefore, these results were used for final test data recorded in the table listed under section 3.6 of this report.

Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance using all installation combination. All data was recorded in the peak detection mode. Quasi-peak readings were only performed when an emission was found to be marginal (within -4 dB μ V of specification limitation). Quasi-peak readings are distinguished with a "Qp".

3.5 Summary of Test Results

According to the data in section 3.6, the EUT complied with the EN55022 Conducted margin for a Class B device and these test results is deemed satisfactory evidence of compliance with ICES-003 of the Canadian Interference-Causing Equipment Regulations, with the *worst* margin reading of:

- 12.7dB μ V at 27.072MHz in the *Neutral* mode, 0.45-30MHz

3.6 Conducted Emissions Test Data

3.6.1 Test Data for Power Supply, 0.45 - 30 MHz.

LINE CONDUCTED EMISSIONS				FCC 15 CLASS B	
Frequency MHz	Amplitude dB μ V	Detector Qp/Ave/Peak	Phase Line/Neutral	Limit dB μ V	Margin dB
0.454	25.4	QP	Neutral	48	-22.6
0.450	31.5	QP	Line	48	-16.5
0.586	23.0	QP	Neutral	48	-25.0
0.580	32.8	QP	Line	48	-15.2
27.072	35.3	QP	Neutral	48	-12.7
27.072	34.6	QP	Line	48	-13.4

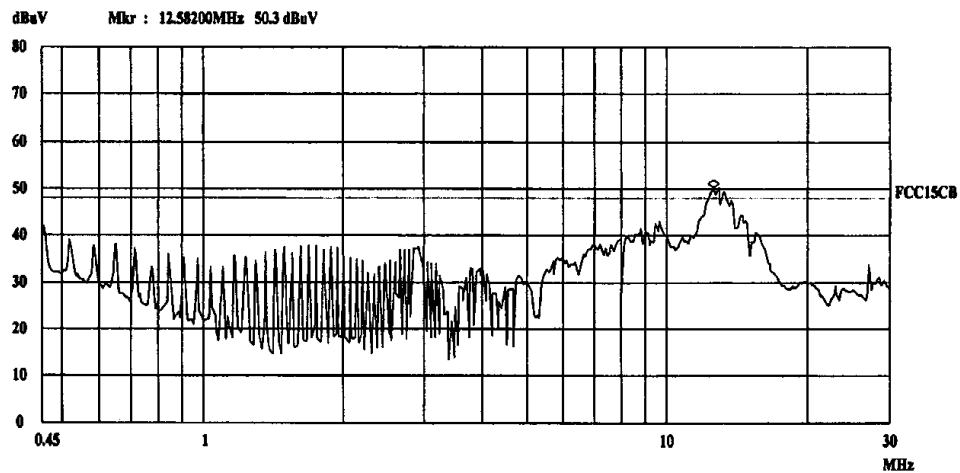
3.7 Plot of Conducted Emissions Test Data

Plot of Conducted Emissions test data for the Power Supply, it is presented in the following page as reference.

Conducted Disturbance FCC 15B

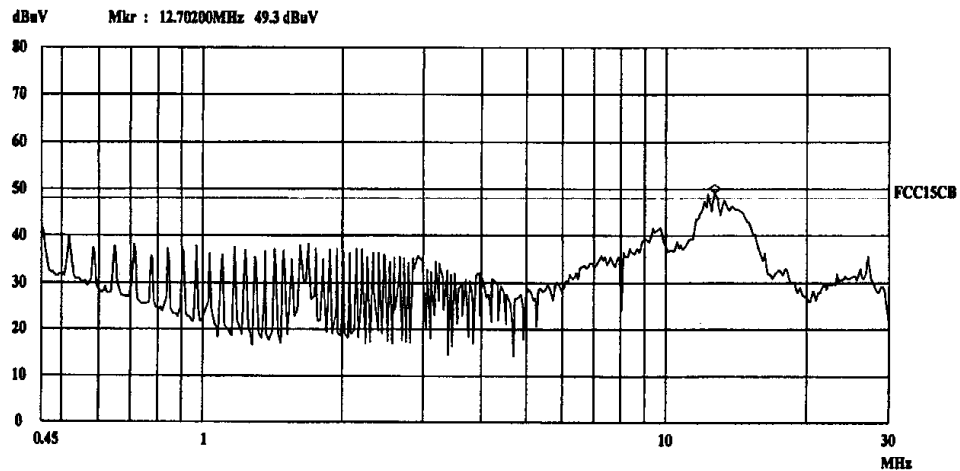
20. Dec 01 16:30

EUT: LCD Monitor
Op Cond: 800X600
Test Spec: L
Comment: 6C 120V/60Hz

**Conducted Disturbance FCC 15B**

20. Dec 01 16:23

EUT: LCD Monitor
Op Cond: 800X600
Test Spec: N
Comment: 6C 120V/60Hz



4 - RADIATED EMISSION DATA

4.1 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at BACL is ± 4.0 dB.

4.2 EUT Setup

The radiated emission tests were performed in the open area 3-meter test site, using the setup in accordance with the ANSI C63.4 - 1992. The specification used was the EN55022 Class B limits.

The host PC system was placed on the center back of the test table connected to a 110 VAC / 60 Hz power source. The monitor was placed on the top of the host PC with the modem and the printer on either side. The rear of the host system and peripherals were placed flushed with the rear of the tabletop.

The EUT keyboard was placed directly in front of the host PC. The mouse was placed on one side of the keyboard.

The spacing between the peripherals was 10 centimeters.

Input / Output cables were draped over edge of the test table and bundle when necessary.

4.3 Spectrum Analyzer Setup

According to FCC Rules, 47 CFR 15.33, since the internal processor speed operates below 108 MHz, the system was tested to 1000 MHz.

During the radiated emission test, the spectrum analyzer was set with the following configurations:

Start Frequency	30 MHz
Stop Frequency	1000 MHz
Sweep Speed	Auto
IF Bandwidth	100 kHz
Video Bandwidth	1 MHz
Quasi-Peak Adapter Bandwidth	120 kHz
Quasi-Peak Adapter Mode	Normal
Resolution Bandwidth	1MHz

4.4 Test Procedure

For the radiated emissions test, the EUT, host system, VGA monitor and all support equipment power cords was connected to the AC floor outlet.

Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance is with all installation combinations. All data was recorded in the peak detection mode. Quasi-peak readings was performed only when an emission was found to be marginal (within -4 dBμV of specification limitation), and are distinguished with a "Qp" in the data table.

Since the EUT has only one operating mode, this mode was tested with a host system to represent the worst case for the final qualification test. Therefore, these results were used for final test data recorded in the table listed under section 4.7 of this report as reference.

4.5 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Amplifier Gain}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dBμV means the emission is 7dBμV below the maximum limit for Class B. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{Class B Limit}$$

4.6 Summary of Test Results

According to the data in section 4.7, the EUT complied with the EN55022 Class B standards and these test results is deemed satisfactory evidence of compliance with ICES-003 of the Canadian Interference-Causing Equipment Regulations, and had the worst margin of:

-3.2 dBμV at 600.020 MHz in the Vertical polarization with a Mid Tower system, 3 meters

4.7 Radiated Emissions Test Result Data

4.7.1 Final Test Data, 30 – 1000 MHz, 3 meters

Frequency MHz	Polar H/ V	Corr. Ampl. dB μ V/m	Limit dB μ V/m	Margin dB
119.550	H	29.2	43.5	-14.3
160.050	H	37.6	43.5	-5.9
190.780	H	31.4	43.5	-12.1
239.110	H	39.5	46	-6.5
298.870	H	41.0	46	-5.0
318.780	H	42.0	46	-4.0
358.630	H	39.0	46	-7.0
379.540	H	36.0	46	-10.0
400.520	H	41.9	46	-4.1
418.340	H	33.1	46	-12.9
537.950	H	35.8	46	-10.2
557.310	H	39.0	46	-7.0
60.490	V	20.5	40	-19.5
83.040	V	22.6	40	-17.4
189.410	V	26.0	43.5	-17.5
239.058	V	30.6	46	-15.4
318.740	V	40.3	46	-5.7
378.560	V	30.8	46	-15.2
398.510	V	40.8	46	-5.2
418.420	V	38.0	46	-8.0
458.230	V	39.0	46	-7.0
490.700	V	33.0	46	-13.0
498.150	V	42.0	46	-4.0
600.020	V	42.8	46	-3.2
617.687	V	41.5	46	-4.5
557.880	V	41.3	46	-4.7

5 – FCC PRODUCT LABELING AND WARNING STATEMENT

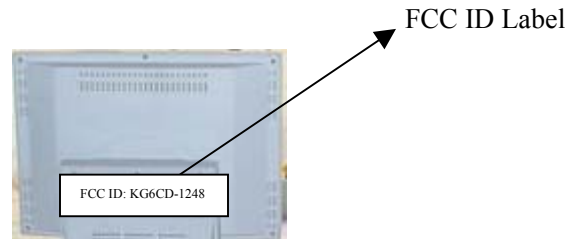
5.1 Proposed FCC Label Format

FCC ID: KG6CD-1248

Specifications: Text is black in color and is left justified. Labels are printed in indelible ink on permanent adhesive backing and shall be affixed at a conspicuous location on the EUT.

5.2 Proposed Label Location on EUT

Rear View Side of EUT



5.3 FCC Warning Statement

The EUT is required to bear the following FCC statement. When the EUT is so small or for such use that it is not practicable to place the statement on it, the statement could be placed in the user manual. A sample of the statement is presented in Appendix B of this report as reference.

“ This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.”