

FCC PART 15 CLASS B

EMI MEASUREMENT AND TEST REPORT

For

Korea Digital Technology Co., Ltd.

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FCC ID: TUGKIR020

This Report Concerns: ☒ Original Report	Product Name: Digital Color Camera
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Report Number: R0603175	
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GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

The *Korea Digital Technology Co., Ltd.* product, FCC ID: *TUGKIR020*, model number: *KIR-020*, or the "EUT" as referred to this report, is a Digital Color Camera. The features are as following:

- 1) Clear and crispy picture by 1/3" Super HAD Color Sony CCD
- 2) Automatically adjusting brightness of Infrared LEDs thanks to built-in CDS sensor
- 3) 4~9mm Varifocal Lens (8mm, 6mm, 3.7mm)
- 4) Built-in control PCB for minimizing the heat
- 5) Patented SELF-DIAGNOSIS system
 - Automatic cut-off input when excessive voltage input
 - Automatic cut-off input when the cooling fan stops
- 6) Patented STATUS INDICATING system
 - The corresponding LED flashes when input excess voltage
 - The corresponding LED flashes when cooling fan stops
- 7) Patented "DUAL LENS TUBE" to prevent the distorted reflection from LED or from the foreign objects on the front glass
- 8) Perfect air-circulation system with the cooling fan

Approximately measurement: 10.0cmW x 6.0cmL x 6.0cmH.

* The test data gathered are from production sample, serial number: *KIR020001*, Revision: 1.0 provided by the manufacturer.

EUT Photo



Objective

This Class B report is prepared on behalf of *Korea Digital Technology Co., Ltd.* in accordance with Part 2, Subpart J, and Part 15, Subparts A and B of the Federal Communication Commissions rules.

The objective is to determine compliance with U.S.A. FCC Class B and Canada ICES-003 issue 4 limits for conducted and radiated margin requirements for Information Technology Equipment.

Related Submittal(s)/Grant(s)

No Related Submittals.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2003, 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.

Test Facility

The Test site used by Bay Area Compliance Laboratory Corporation to collect radiated and conducted emission measurement data is located at 230 Commercial Street, Sunnyvale, California 94085, 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 have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules and Article 8 of the VCCI regulations. The facility also complies with the test methods and procedures set forth in ANSI C63.4-2003.

The Federal Communications Commission and Voluntary Control Council for Interference has the reports on file and is listed under FCC registration number: 90464 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, BACL is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200167-0). The current scope of accreditations is attached hereinafter and can also be found at <http://ts.nist.gov/ts/htdocs/210/214/scopes/2001670.htm>

SYSTEM TEST CONFIGURATION

Justification

The EUT was tested in accordance with ANSI C63.4-2003.

EUT Exercise Software

The software was provided by customer. The EUT exercising software program was designed to exercise the various installed components in accordance with ANSI C63.4-2003.

Special Accessories

The unit was tested with the normally supplied cabling and accessories provided by the supporting equipment and no special accessories were used.

Equipment Modifications

No modifications were made to the EUT.

Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
Sony	Notebook	PCG-885L	28352030-4516747

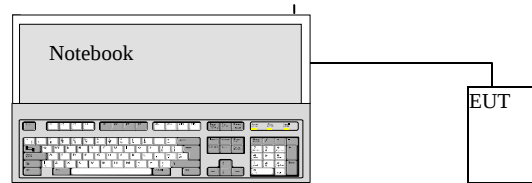
Power Supply and Line Filters

Manufacturer	Description	Model	Serial Number
HJC Hua Jung Co.	Power Adaptor	HASU11FB36	552001300455

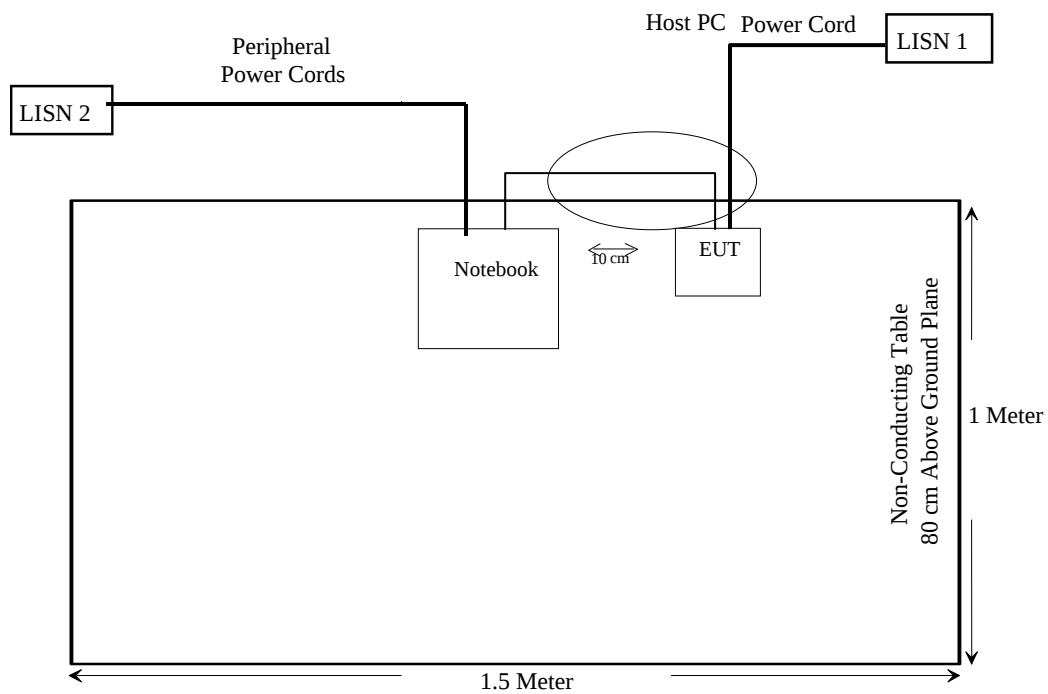
Interface Ports and Cabling

Cable Description	Length (M)	From	To
BNC Cable	1.5	Video Out Port/EUT	Laptop

Configuration of Test System



Test Setup Block Diagram



SUMMARY OF TEST REPORT

RULE	DESCRIPTION	RESULTS
15.107	Conducted Emissions	Compliant
15.109	Radiated Emissions	Complies
15.19	Labelling Requirements	Compliant
15.21, 15.105	Information to the User	Compliant
15.27	Special Accessories	Compliant

§15.107 - CONDUCTED EMISSIONS

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are receiver, 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.

EUT Setup

The measurement was performed in the shielded room, using the same setup per ANSI C63.4-2003 measurement procedure. The specification used was FCC 15 Class B limits.

The spacing between the peripherals was 10 cm.

The external I/O cables were draped along the test table and bundled as required.

The adapter was connected to 120Vac/60Hz power source.

Environmental Conditions

Temperature:	18 °C
Relative Humidity:	49%
ATM Pressure:	1021mbar

**Testing was performed by Jerry Wang on 2006-03-27.*

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
Rohde & Schwarz	Artificial-Mains Network	ESH2-Z5	871884/039	2005-11-14
Rohde & Schwarz	EMI Test Receiver	ESCS30	100176	2006-03-13

*** Statement of Traceability: BACL Corp.** attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

Test Procedure

During the conducted emission test, the EUT was connected to the mains outlet of the LISN-1. Maximizing procedure was performed on the six (6) highest provided emissions of the EUT.

All data was recorded in the peak detection mode, quasi-peak and average. Average readings are distinguished with an “Ave”.

Test Results Summary

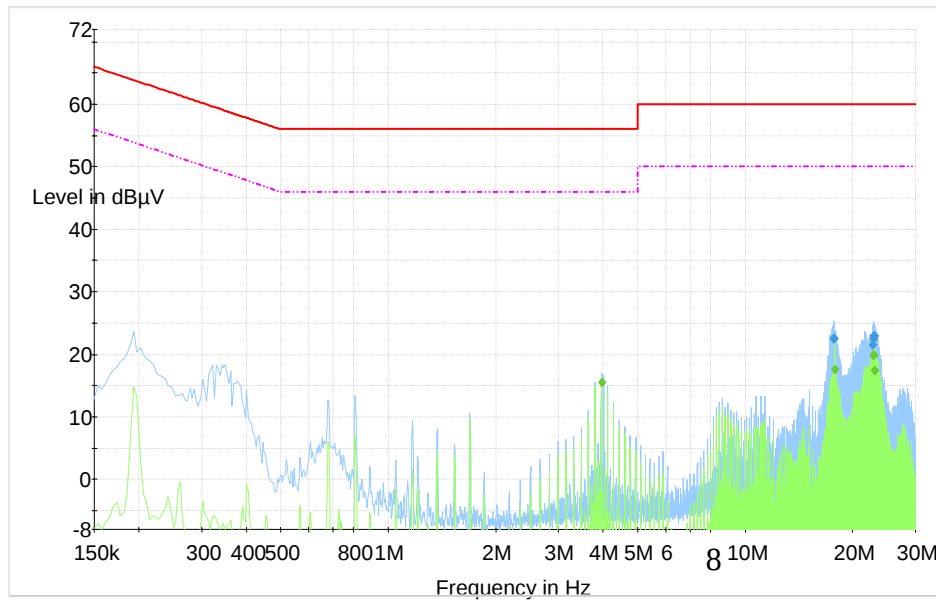
According to the recorded data, the EUT complied with the FCC Conducted limits for a Class B device, with the worst margin reading of:

30.0 dB at 22.922000MHz in the Line & Neutral conductor mode

Conducted Emissions Test Data

Line:

BACL Conducted EMI Test L

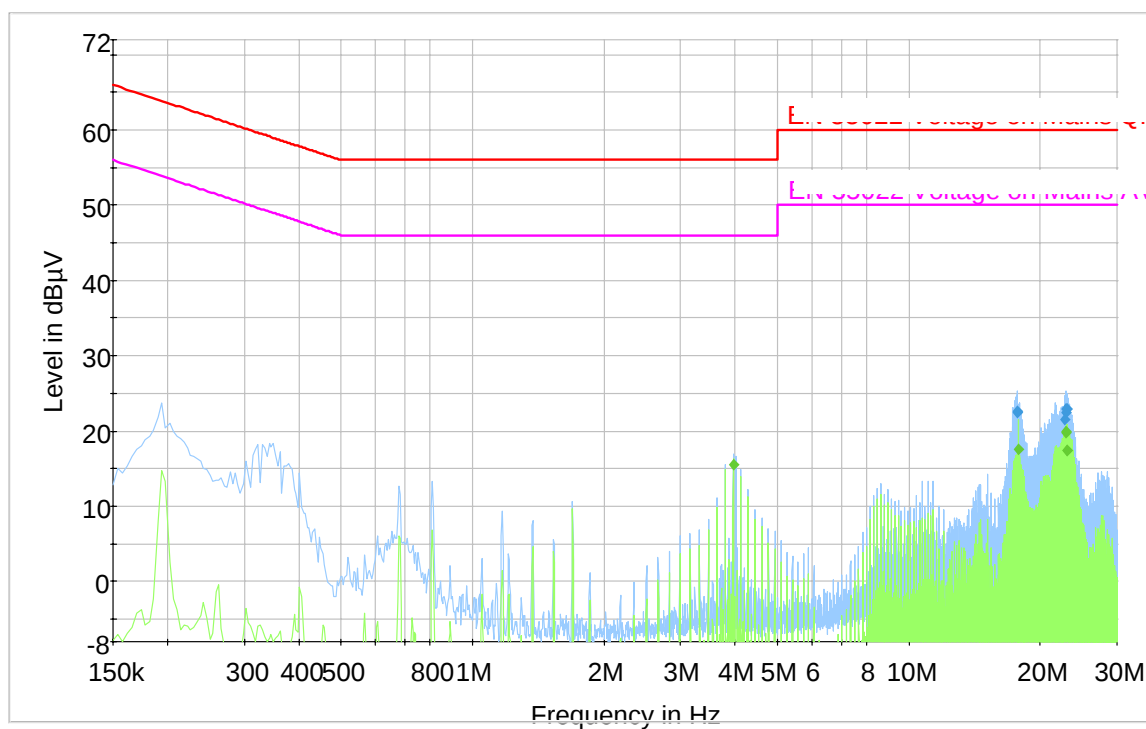


QP Measurements

Frequency (MHz)	QuasiPeak (dBμV)	PE	Line	Margin (dB)	Limit (dBμV)
22.922000	23.0	GND	L1	37.0	60.0
23.118000	22.9	GND	L1	37.1	60.0
17.778000	22.7	GND	L1	37.3	60.0
17.714000	22.4	GND	L1	37.6	60.0
22.986000	22.5	GND	L1	37.6	60.0
22.790000	21.5	GND	L1	38.5	60.0

Average Measurements

Frequency (MHz)	Average (dBμV)	PE	Line	Margin (dB)	Limit (dBμV)
22.922000	20.0	GND	L1	30.0	50.0
22.858000	19.8	GND	L1	30.2	50.0
3.958000	15.6	GND	L1	30.4	46.0
17.826000	17.6	GND	L1	32.5	50.0
23.054000	17.5	GND	L1	32.5	50.0
23.118000	17.4	GND	L1	32.6	50.0

Neutral:**BACL Conducted EMI Test N****QP Measurements**

Frequency (MHz)	QuasiPeak (dBμV)	PE	Line	Margin (dB)	Limit (dBμV)
22.922000	23.0	GND	N	37.0	60.0
23.118000	22.9	GND	N	37.1	60.0
17.778000	22.7	GND	N	37.3	60.0
17.714000	22.4	GND	N	37.6	60.0
22.986000	22.5	GND	N	37.6	60.0
22.790000	21.5	GND	N	38.5	60.0

Average Measurements

Frequency (MHz)	Average (dBμV)	PE	Line	Margin (dB)	Limit (dBμV)
22.922000	20.0	GND	N	30.0	50.0
22.858000	19.8	GND	N	30.2	50.0
3.958000	15.6	GND	N	30.4	46.0
17.826000	17.6	GND	N	32.5	50.0
23.054000	17.5	GND	N	32.5	50.0
23.118000	17.4	GND	N	32.6	50.0

§15.109 - RADIATED EMISSIONS

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are receiver, 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 EMI Measurements, the best estimate of the uncertainty of a radiation emissions measurement at BACL is ± 4.0 dB.

EUT Setup

The radiated emission tests were performed in the open area 10-meter test site, using the setup in accordance with the ANSI C63.4-2003. The specification used was the FCC15B limits.

The spacing between the peripherals was 10 cm.

The external I/O cables were draped along the test table and bundled as required.

The adapter was connected to 120Vac/60Hz power source.

Environmental Conditions

Temperature:	19.2°C
Relative Humidity:	35%
ATM Pressure:	1019mbar

**Testing was performed by Jerry Wang on 2006-03-25.*

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal Date
Sonoma Instruments	Pre amplifier	317	260406	2006-02-03
Sunol Science Corp	Combination Antenna	JB3 Antenna	A013105	2006-02-11
Rohde & Schewarz	EMI Test Receiver	ESCI 1166.595 0K03	100044	2006-02-07

*** Statement of Traceability:** BACL Corp. attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

Test Procedure

For the radiated emissions test, the EUT all support equipment were connected to the AC floor outlet. Maximizing procedure was performed on the six (6) highest emissions in the described configurations. 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 dB of specification limits), and are distinguished with a "Qp" in the data table.

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:

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

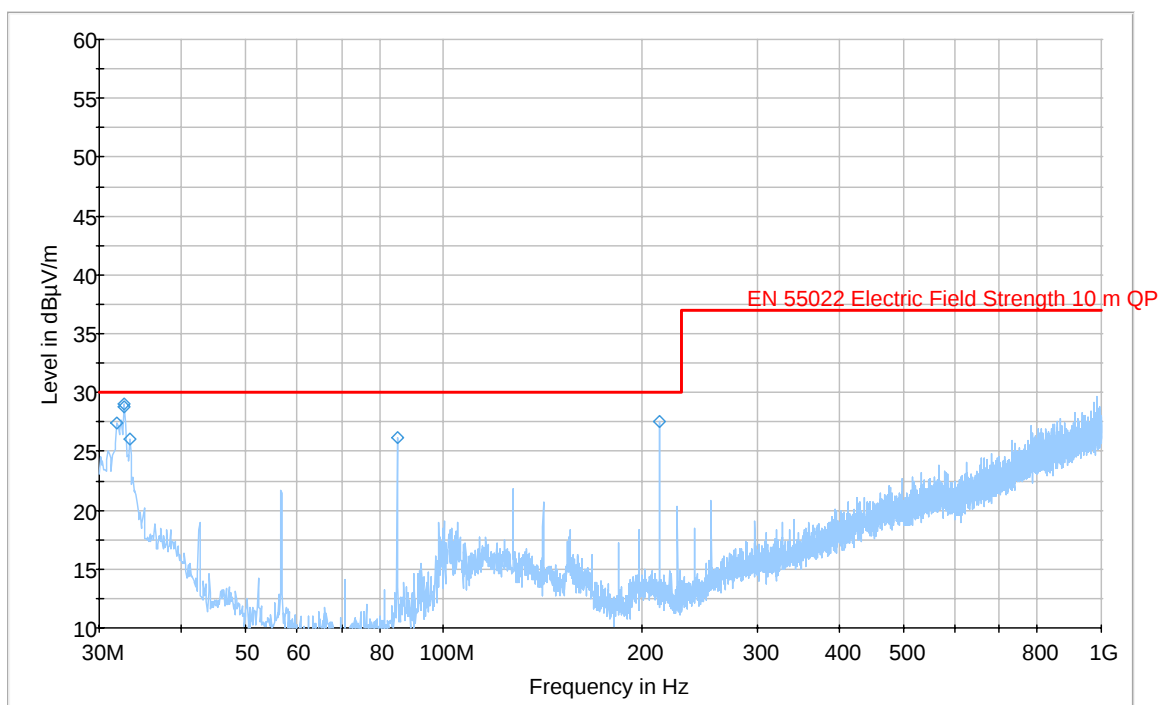
The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB means the emission is 7dB below the maximum limit for Class B. The equation for margin calculation is as follows:

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

Summary of Test Results

According to the following table, the EUT complied with the FCC 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:

-1.0 dB at 32.6675 MHz in the Vertical polarization
** The test data was within the measurement of uncertainty.*

Radiated Emissions Test Data, Measure at 10 Meter,**BACL EMI Test Sweep**

Frequency (MHz)	MaxPeak-Max (dBμV/m)	Antenna height (cm)	Polarity	Turntable position (deg)	Margin (dB)	Limit (dBμV/m)
32.667500	29.0	204.0	V	-2.0	-1.0*	30.0
32.788750	28.8	204.0	V	-2.0	-1.2*	30.0
212.845000	27.5	395.0	H	56.0	-2.5*	37.0
31.940000	27.4	104.0	V	152.0	-2.6*	30.0
33.395000	26.1	104.0	V	305.0	-3.9*	30.0
85.047500	26.1	305.0	V	2.0	-3.9*	37.0

* The test data was within the measurement of uncertainty.