ONETECH Corp.

#505 SK APT. Factory 223-28, Sangdaewon 1 Dong, Jungwon-Gu, Seongnam-City, Kyunggi-Do, 462-121, Korea. (TEL: 82-31-746-8500 FAX: 82-31-746-8700)

ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

COMPUTING DEVICE
CERTIFICATION TO FCC PART 15 REQUIREMENT

PRODUCT	TeleCenter		
FCC ID	O6WTC-100E0001		
MODEL NO.	TC-100E	SERIAL NO.	N/A
APPLICANT & ADDRESS	INTERACTIVE COMMUNICATIONS INFORMATION TECHNOLOGIES COMPANY LIMITED #1004 SHINHAN BLDG. 45-11 YOUIDO-DONG, YOUNGDUNGPO-KU, SEOUL 150-736, KOREA		

REPORT NO.	E007R-016	ISSUE DATE	July 10, 2000
PREPARED BY: ONETECH CORP. #505 SK APT. FACTORY 223-28, SANGDAEWON 1 DONG, JUNGWON-GU, SEONGNAM-CITY, KYUNGGI-DO, 462-121, KOREA. (TEL: 82-31-746-8500 FAX: 82-31-746-8700)			

LIST OF EXHIBITS

FCC ID : O6WTC-100E0001

MODEL : TC-100E

EXHIBIT 1. IDENTIFICATION LABEL

2. AGENT AUTHORIZATION

3. TECHNICAL INFORMATION:
ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

4. PHOTO REPORT

5. USER'S MANUAL & SCHEMATIC (BLOCK DIAGRAM)

PREPARED BY : ONETECH CORP.
#505 SK APT. Factory 223-28, Sangdaewon 1 Dong, Jungwon-Gu,
Seongnam-City, Kyunggi-Do, 462-121, Korea.
(TEL: 82-31-746-8500 FAX: 82-31-746-8700)

EXHIBIT 1. IDENTIFICATION LABEL:

PROPOSED FCC LABEL (Part15 sec. 15.19)

The label included following statement will be attached on bottom side of product.

FCC ID : O6WTC-100E0001

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 operations.

Made in Korea

"Please find an ID Label for EUT at ID Label/Location Info in Exhibit Type"

EXHIBIT 2. AGENT AUTHORIZATION:

"Please find an Agent Authorization Letter at Cover Letters in Exhibit Type"

EXHIBIT 3. TECHNICAL INFORMATION:

ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

COMPUTING DEVICE CERTIFICATION TO FCC PART 15 REQUIREMENT

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MODEL NO.	TC-100E	SERIAL NO.	N/A
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TABLE OF CONTENTS

Page

1. VERIFICATION OF COMPLIANCE 1

2. GENERAL INFORMATION 2

2.1 Product Description **2**

2.2 Related Submittal(s) / Grant(s) **2**

2.3 Test System Details **3**

2.4 Test Methodology **4**

2.5 Test Facility **4**

3. SYSTEM TEST CONFIGURATION 4

3.1 Justification **4**

3.2 Equipment Modifications **4**

3.3 Mode of operation during the test **5**

3.4 Configuration of Test System **5**

4. PRELIMINARY TESTS 5

4.1 AC Power line Conducted Emissions Tests **5**

4.2 Radiated Emissions Tests **5**

5. CONDUCTED MEASUREMENT PHOTOS 6

6. RADIATED MEASUREMENT PHOTOS 7

7. FINAL RESULT OF MEASUREMENT 8

7.1 Conducted Emissions Tests **8**

7.2 Radiated Emission Test **10**

8. FIELD STRENGTH CALCULATION 11

9. LIST OF TEST EQUIPMENT 12

1. VERIFICATION OF COMPLIANCE

APPLICANT : INTERACTIVE COMMUNICATIONS INFORMATION TECHNOLOGIES COMPANY LIMITED

ADDRESS : #1004 SHINHAN BLDG. 45-11 YOUIDO-DONG, YOUNGDUNGPO-KU, SEOUL 150-736, KOREA

CONTACT PERSON : J. H. LEE

TELEPHONE NO : 82-2-782-5171

FCC ID : O6WTC-100E0001 MODEL NO/NAME: TC-100E

SERIAL NUMBER : N/A

DATE : July 10, 2000

DEVICE TYPE	UNINTENTIONAL RADIATOR
E.U.T. DESCRIPTION	TELECENTER
THIS REPORT CONCERNS	ORIGINAL GRANT
MEASUREMENT PROCEDURES	ANSI C63.4/1992
TYPE OF EQUIPMENT TESTED	PRE-PRODUCTION
KIND OF EQUIPMENT AUTHORIZATION REQUESTED	CERTIFICATION
EQUIPMENT WILL BE OPERATED UNDER FCC RULES PART(S)	PART 15 SUBPART B ♣15.101
MODIFICATIONS ON THE EQUIPMENT TO ACHIEVE COMPLIANCE	YES
FINAL TESTS WERE CONDUCTED ON	3 METER OPEN TEST SITE

The above equipment was tested by ONETECH Corp. for compliance with the requirement set forth in the FCC Rules and Regulations. This said equipment in the configuration described in this report, shows the maximum emission levels emanating from equipment are within the compliance requirements.



YONG KWANG, KWON / CHIEF ENGINEER
EMC TESTING DEPARTMENT
ONETECH Testing & Eval. Lab.
SEOUL KOREA

2. GENERAL INFORMATION

2.1 Product Description

The INTERACTIVE COMMUNICATIONS INFORMATION TECHNOLOGIES COMPANY LIMITED., Model TC-100E (referred to as the EUT in this report) is a TeleCenter which incorporates a dedicated computing device with data terminal functions that can be used for a variety of applications in different industries, including Internet access, E-mail, Facsimile Messaging, etc. The product specification information described herein was obtained from product data sheet or user's manual.

CHASSIS TYPE	Plastic
LIST OF EACH OSC. OR CRY. FREQ.(FREQ.>=1MHz)	11.05 MHz, 14.3 MHz, 20 MHz on the main board 1.843 MHz, 3.579 MHz, 28.224 MHz on the modem board 4 MHz, 36.86 MHz
PROCESSOR	STPC 75 MHz Client
POWER REQUIREMENTS	DC 5V/3A, 12V/0.5A from an adapter
NUMBER OF LAYERS	6 layers (Main board), 4 layers (CIF board), 2 layers (Modem board and Phone board)
NO. OF EXTERNAL CONNECTOR	Two PS/2 ports, Two serial ports, One network jack for LAN, Two phone jacks
MODEM SPEED	Rockwell RC336D (33.6Kbps)
LCD	SANYO 8.03 inches color
LAN	RealTek RTL 8019AS
MEMORY	Main : Max 32MB DARM, Flash Disk : 8MB Video : 1MB
VIDEO CONTROLLER	Chips Technologies F65550

Model Differences:

No other model differences have been mentioned.

2.2 Related Submittal(s) / Grant(s)

ORIGINAL SUBMITTAL ONLY

2.3 Test System Details

The EUT was tested with the following all equipment used in the tested system are:

Model	Manufacturer	FCC ID	Description	Connected to
TC-100E	ICIT CO., LTD.	O6WTC-100E0001	TeleCenter (EUT)	N/A
ISA25	ILSAN ELECOM	N/A	ADAPTER	EUT
SKR-1032	SEJIN	GJJSKR-1032B	KEYBOARD	EUT
M-SF14	LOGITECH	DZLMF14R	MOUSE	EUT
C4565A	HP	B94C4555X	PRINTER	EUT
020-0470	CARDINAL	GDE0196	MODEM	EUT
GA-6BXE	GIGABITE	DoC	PC*	EUT
AV-5T	KDS	EVOKD-1510T	MONITOR*	PC
5123W	BEHAVIOR TECH COMPUTER COPORATION	E5XKBP104M10	KEYBOARD*	PC
N/A	ULTIMA ELECTRONICS CORP	ITEUECMN9532	MOUSE*	PC
QEH24TD/TM	QNIX	N/A	HUB*	EUT & PC

"*" marked equipment was located in a remote place.

2.4 Test Methodology

Both Radiated emission testing and Bandwidth of operating frequency were performed according to the procedures in ANSI C63.4/1992. Radiated testing was performed at an antenna to EUT distance of 3 meters.

2.5 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located on at 426-1 Daessangryung-Ri, Chowol-Myun, Kwangju-Kun, Kyunggi-Do 464-080 Korea. Detailed description of test facility was submitted to the Commission on January 12, 1999. (Registration Number: 92819)

3. SYSTEM TEST CONFIGURATION

3.1 Justification

The system was configured for testing in a typical fashion (as a customer would normally use it). During the tests, the following components inside the EUT were installed.

DEVICE TYPE	MANUFACTURER	MODEL/PART NUMBER	FCC ID
MAIN BOARD	INTERACTIVE COMMUNICATIONS INFORMATION TECHNOLOGIES COMPANY LIMITED	ICIT-TC100E	N/A
MODEM BOARD	INTERACTIVE COMMUNICATIONS INFORMATION TECHNOLOGIES COMPANY LIMITED	ICIT-TC100E	N/A
PHONE BOARD	UNITELECOM	N/A	N/A
CIF BOARD	INTERACTIVE COMMUNICATIONS INFORMATION TECHNOLOGIES COMPANY LIMITED	ICIT-TC100E	N/A

3.2 Equipment Modifications

To achieve compliance to FCC part 15 rule, the following change(s) were made by Onetech Corp. during compliance testing: # Mod : 1. Phone Board

- Connected screw halls to metal frame of the main housing.
- Added a resistor (33ohm) and a capacitor (47pF) on the signal line of U19 SCLK.
- Added a capacitor (1000pF) on cable connector of CIF board.
- Added 5 decoupling capacitors between GND and power line.

2. Modem Board

- Added a resistor (100ohm) and a capacitor (47pF) on CLK_OUT of U9.
- Connected analog GND to digital GND.

3. Adapter

- Added a ferrite core.

3.3 Mode of operation during the test

After connecting the EUT with a personal computer in a remote place using LAN cable and then line port was connected to PSTN, the EUT sent and received data to the personal computer using "Ping –t" Dos Commands and downloaded files from the Internet. The GWBASIC Program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use. This program was included into HOST. Once loaded, this program sequentially exercises each system component in turn. The sequence used is:(1) series of H characters are printed on the LCD monitor of the EUT until the screen is completely full, (2) copy series of H characters to mass storage device(if one is used), (3) print series of H characters to printer. The complete cycle takes about 20 seconds and is repeated continuously.

3.4 Configuration of Test System

Line Conducted Emission Test:

EUT was connected to an adapter connected to LISN, all supporting equipment were connected to another LISN. Preliminary Conducted Emission test was performed by using the procedure in ANSI C63.4/1992 7.2.3 to determine the worse operating conditions.

Radiated Emission Test:

Preliminary radiated emissions tests were conducted using the procedure in ANSI C63.4/1992, 8.3.1.1 to determine the worse operating conditions. Final radiated emission tests were conducted at 3 meters open area test site.

4. PRELIMINARY TESTS

4.1 AC Power line Conducted Emissions Tests

During Preliminary Tests, the following operating mode was investigated

Operation Mode	**The Worse operating condition (Please check one only)**
Sending and received data to the personal computer, downloading files from the Internet and printing series of H characters to the printer and LCD monitor of the EUT	X

4.2 Radiated Emissions Tests

During Preliminary Tests, the following operating modes were investigated

Operation Mode	**The Worse operating condition (Please check one only)**
Sending and received data to the personal computer, downloading files from the Internet and printing series of H characters to the printer and LCD monitor of the EUT	X

5. CONDUCTED MEASUREMENT PHOTOS

<Conducted Measurement Photos>





6. RADIATED MEASUREMENT PHOTOS

<Radiated Measurement Photos>





7. FINAL RESULT OF MEASUREMENT

Per preliminary tests, the following normal operating condition were selected which shown the maximum emissions level.

7.1 Conducted Emissions Tests

Humidity Level : 43 % Temperature : 26

Limits apply to : FCC CFR 47, PART 15, SUBPART C

Result : PASSED BY –11.66 dB

EUT : TeleCenter Date: July 30, 2000

Operating Condition : Sending and receiving data to the personal computer and downloading files from the Internet

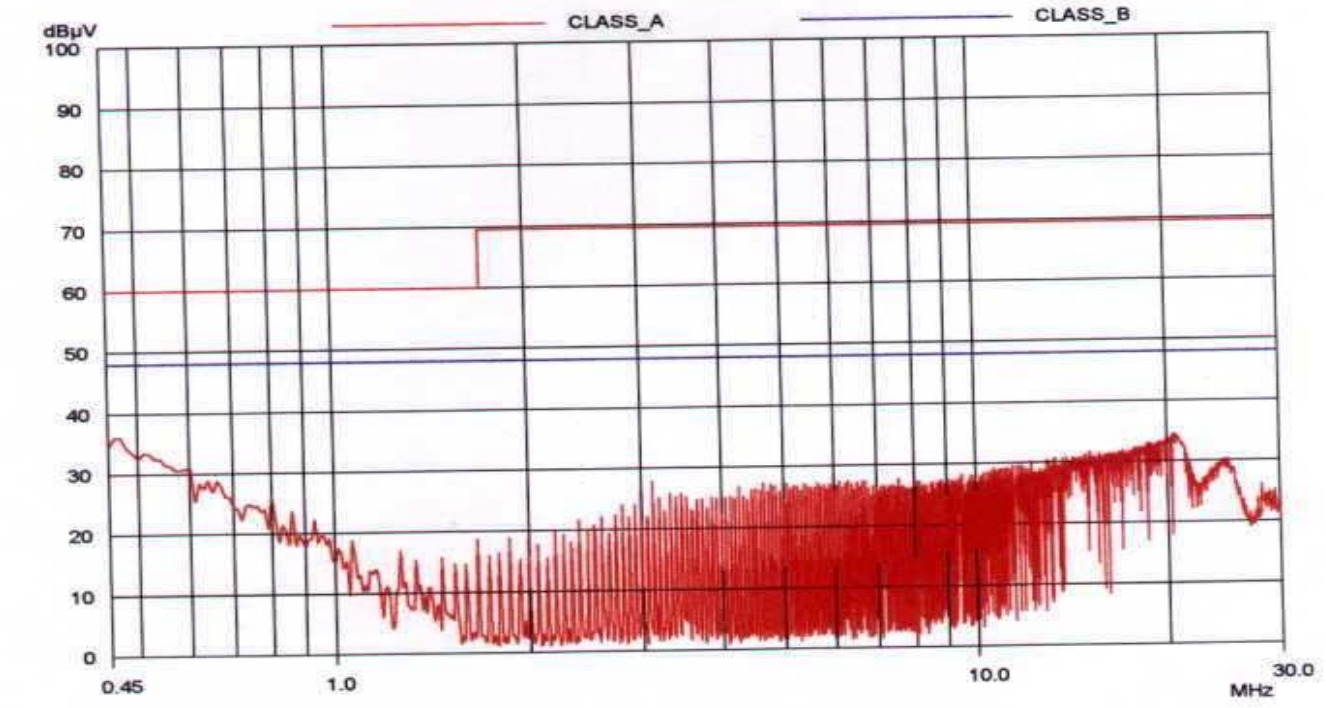
Detector : CISPR Quasi-Peak (6 dB Bandwidth: 9 kHz)

Power Line Conducted Emissions			**FCC Limit**	
Frequency (MHz)	**Amplitude (dBuV)**	**conductor**	**Limit (dBuV)**	**Margin (dB)**
0.46	36.34	Neuatral	48.00	-11.66
0.80	26.34	Hot	48.00	-21.66
4.45	28.07	Neuatral	48.00	-19.93
13.88	30.88	Hot	48.00	-17.12
19.53	33.28	Hot	48.00	-14.72
20.40	34.33	Hot	48.00	-13.67

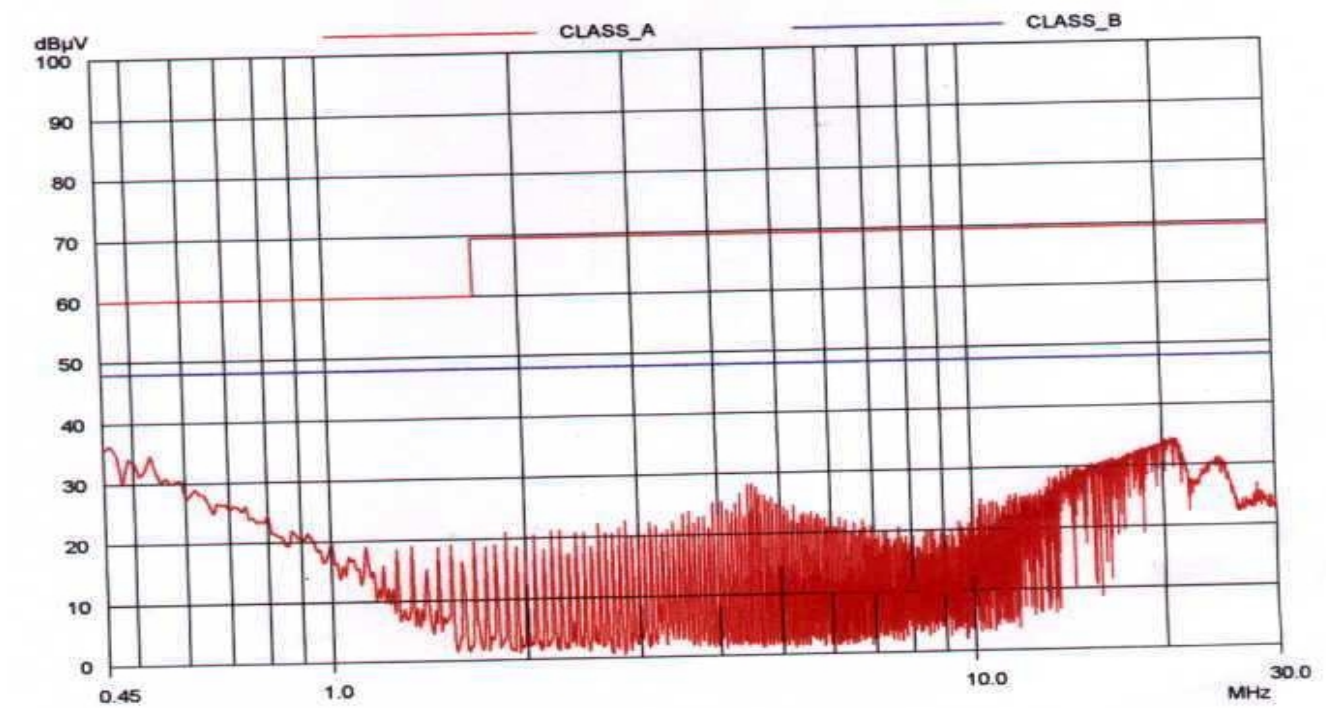
Line Conducted Emissions Tabulated Data



Measuring by: Gea Won, Lee / Project Engineer



Hot Line



Neutral Line

7.2 Radiated Emission Test

The following table shows the highest levels of radiated emissions on both polarizations of horizontal and vertical.

Humidity Level : 48 % Temperature : 28

Limits apply to : FCC CFR 47, PART 15, SUBPART B (Section: 15.109)

Result : PASSED BY –2.61 dB at 72.05 MHz

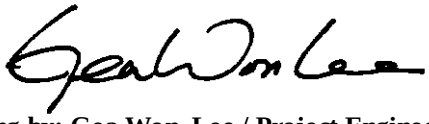
EUT : TeleCenter Date: July 01, 2000

Operating Condition : Sending and receiving data to the personal computer and downloading files from the Internet

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

Distance : 3 Meter

Radiated Emissions		Ant	Correction Factors		Total	FCC Limit	
Freq. (MHz)	Ampl. (dBuV)	Pol.	Ant. (dBuV)	Cable (dB)	Ampl (dBuV/m)	Limit (dBuV/m)	Margin (dB)
46.05	22.1	V	11.40	0.89	34.39	40.00	-5.61
55.35	25.1	V	10.72	0.98	36.80	40.00	-3.20
60.95	25.0	V	9.43	0.98	35.41	40.00	-4.59
54.60	24.0	V	8.66	1.00	33.66	40.00	-6.34
72.05	29.5	V	6.89	1.00	37.39	40.00	-2.61
73.85	27.9	V	6.53	1.00	35.43	40.00	-4.57
114.47	23.0	V	12.93	1.22	37.15	43.50	-6.35
120.01	22.1	V	13.34	1.23	36.67	43.50	-6.83
130.87	23.0	V	12.97	1.27	37.24	43.50	-6.26
134.58	21.4	V	12.84	1.29	35.53	43.50	-7.97
152.16	22.5	V	13.56	1.36	37.42	43.50	-6.08
193.68	15.7	H	16.48	1.53	33.71	43.50	-9.79



Measuring by: Gea Won, Lee / Project Engineer

8. FIELD STRENGTH CALCULATION

Meter readings are compared to the specification limit correcting for antenna and cable losses

+ Meter reading (dBuV)

+ Cable Loss (dB)

+ Antenna Factor (Loss) (dB/meter)

= Corrected Reading (dBuV/meter)

- Specification Limit (dBuV/meter)

= dB Relative to Spec (+/- dB)

9. LIST OF TEST EQUIPMENT

No.	EQUIPMENTS	MFR.	MODEL	SER. NO.	LAST CAL	DUE CAL	USE
1.	Test receiver	R/S	ESVS 10	827864/005	SEP/99	12MONTH	■
2.	Test receiver	R/S	ESHS 10	834467/007	APR/00	12MONTH	■
3.	Spectrum analyzer	HP	8568B	3026A0226	SEP/99	12MONTH	■
4.	RF preselector	HP	85685A	3107A01264	SEP/99	12MONTH	■
5	Quasi-Peak Adapter	HP	85650A	3107A01542	SEP/99	12MONTH	■
6.	Signal Generator	Philips	PM5518-TX	N/A	APR./99	12MONTH	
7.	Pattern generator	N/A	LCG-401	SG-0010126	N/A	N/A	
8.	Dipole Antenna	EMCO	3121C	9107-745	FEB/99	12MONTH	
9.	Biconical antenna	EMCO	3104C	9109-4441 9109-4443 9109-4444	MAR/2000	12MONTH	■
10.	Log Periodic antenna	EMCO	3146	9109-3213 9109-3214 9109-3217	MAR/2000	12MONTH	■
11.	Conical Log spiral Antenna	EATON	93491-2	340	FEB/99	12MONTH	
12.	LISN	EMCO	3825/2	9109-1867 9109-1869	MAR/2000	12MONTH	
13.	RF Amplifier	HP	8447F	3113A04554	AUG/99	N/A	
14.	Spectrum Analyzer	ADVANTEST	R4131BN	91520070	FEB/99	12MONTH	
15.	Computer System Hard disk drive	HP	98581C 9153C	98543A CMC762Z9153	N/A N/A	N/A N/A	■ ■
16.	Plotter	HP	7475A	30052 22986	N/A	N/A	
17.	Position Controller	EMCO	1090	9107-1038	N/A	N/A	■
18.	Turn Table	EMCO	1080-1.21	9109-1576	N/A	N/A	■
19.	Antenna Master	EMCO	1070-1	9109-1624	N/A	N/A	■

EXHIBIT 4. PHOTO REPORT

COMPUTING DEVICE
CERTIFICATION TO FCC PART 15 REQUIREMENT

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FCC ID	O5GTC-100E0001		
MODEL NO.	TC-100E	SERIAL NO.	N/A
APPLICANT & ADDRESS	INTERACTIVE COMMUNICATIONS INFORMATION TECHNOLOGIES COMPANY LIMITED #1004 SHINHAN BLDG. 45-11 YOUIDO-DONG, YOUNGDUNGPO-KU, SEOUL 150-736, KOREA		

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"Please find in/outside photos of EUT at External Photos in Exhibit Type"

EXHIBIT 5. USER'S MANUAL & SCHEMATIC (BLOCK DIAGRAM)

COMPUTING DEVICE
CERTIFICATION TO FCC PART 15 REQUIREMENT

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"Please find a manual and block diagram for EUT at User Manual in Exhibit Type"