



**ESTECH Co., Ltd.**  
3rd Fl., Chungdam Bldg.,  
119-1 Chungdam-dong,  
Kangnamgu, Seoul



**Electromagnetic  
Interference  
Test Report**

## Compliance Test Report for FCC

Report Number		ESTF150211-001				
Applicant	Company name	TECHSCAN KOREA Co., Ltd.				
	Address	2F, Mirae B/D, 779-19, Daerim-Dong, Yongdungpo-Gu, Seoul, Korea				
	Telephone	82-2-842-2211				
Product	Product name	BAR CODE SCANNER (READER)				
	Model No.	TSK-2000KRU	Manufacturer	TECHSCAN KOREA Co., Ltd.		
	Serial No.	NONE	Country of origin	KOREA		
Test date	2002-11-25	~	2002-11-25	Date of issue		
Testing location	ESTECH. Co., Ltd. 97-1 Hoiuk-Ri Majang-Myon, Icheon-city, KyungKi-Do, Korea					
Standard	FCC PART 15 2002 , ANSI C 63.4 2001					
Test item	■ Conducted Emission	<input type="checkbox"/> Class A	<input checked="" type="checkbox"/> Class B	Test result		
	■ Radiated Emission	<input type="checkbox"/> Class A	<input checked="" type="checkbox"/> Class B	Test result		
Measurement facility registration number		94696				
Tested by	Senior Engineer J.M. Yang		(Signature)			
Reviewed by	Director T.K. Lee		(Signature)			
Abbreviation	OK, Pass = Passed, Fail = Failed, N/A = not applicable					
<p>* Note</p> <ul style="list-style-type: none"> <li>- This test report is not permitted to copy partly without our permission</li> <li>- This test result is dependent on only equipment to be used</li> <li>- This test result based on a single evaluation of one sample of the above mentioned</li> </ul>						



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**Electromagnetic  
Interference  
Test Report**

## Contents

1. Laboratory Information .....	3
2. Description of EUT .....	4
3. Test Standards .....	5
4. Measurement condition .....	6
5. Measurement of radiated emission .....	8
5.1 Measurement equipment .....	8
5.2 Environmental conditions .....	8
5.3 Test data .....	9
6. Measurement of conducted emission .....	10
6.1 Measurement equipment .....	10
6.2 Environmental conditions .....	10
6.3 Test data .....	11
7. Photographs of test setup .....	12
8. Photographs of EUT .....	14

Appendix 1. Spectral diagram

Appendix 2. Photographs of EUT in side PCB

Appendix 3. Block diagram of EUT

Appendix 4. Circuit Diagram



**ESTECH Co., Ltd.**  
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**Electromagnetic  
Interference  
Test Report**

## 1. Laboratory Information

### 1.1 General

This EUT (Equipment Under Test) has been shown to be capable of compliance with the applicable technical standards and is tested in accordance with the measurement procedures as indicated in this report.

ESTECH Lab attests to accuracy of test data. All measurement reported herein were performed by ESTECH Co., Ltd.

ESTECH Lab assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

### 1.2 Test Lab.

Corporation Name : ESTECH Co. Ltd

Head Office : 3 rd Fl., Chungdam Bldg., 119-1 Chungdam-dong Kangnam-gu , Seoul, Korea  
(Safety & Telecom. Test Lab)

EMC Test Lab : 58-1 Osan-Ri, GaNam-Myon, YeoJoo-Gun, KyungKi-Do, Korea  
97-1 Hoiuk-Ri Majang-Myon, Icheon-city, KyungKi-Do, Korea

Branch Office : USA-ESTECH INC.  
21801 Stevens Creek Blvd. Suite 2A Cupertino, CA95014

### 1.3 Official Qualification(s)

MIC : Granted Accreditation from Ministry of Information & Communication for EMC, Safety and Telecommunication

KOLAS : Accredited Lab By Korea Laboratory Accreditation Schema base on CENELEC requirements

FCC : Filed Laboratory at Federal Communications Commission

VCCI : Granted Accreditation from Voluntary Control Council for Interference from ITE



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Test Report**

### 3. Test Standards

**Test Standard : FCC PART 15 (2002)**

This Standard sets out the regulations under which an intentional, unintentional, or incidental radiator may be operated without an individual license. It also contains the technical specifications, administrative requirements and other conditions relating to the marketing of Part 15 devices.

**Test Method : ANSI C 63.4 (2001)**

This standard sets forth uniform methods of measurement of radio-frequency (RF) signals and noise emitted from both unintentional and intentional emitters of RF energy in the frequency range 9 kHz to 40 GHz. Methods for the measurement of radiated and AC power-line conducted radio noise are covered and may be applied to any such equipment unless otherwise specified by individual equipment requirements. These methods cover measurement of certain devices that deliberately radiate energy, such as intentional emitters, but does not cover licensed transmitters. This standard is not intended for certification/approval of avionic equipment or for industrial, scientific, and medical (ISM) equipment. These methods apply to the measurement of individual units or systems comprised of multiple units.



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Interference  
Test Report**

## 2. Description of EUT

### 2.1 Summary of Equipment Under Test

Product : BAR CODE SCANNER (READER)

Model Number : TSK-2000KRU

Serial Number : NONE

Manufacturer : TECHSCAN KOREA Co., Ltd.

Country of origin : KOREA

Rating : PC Power Using (DC 5V)

Receipt Date : 2002-11-12

### 2.2 General descriptions of EUT

- This is bar code scanner
- Scan Rate : 200 Scan/Sec
- Readable Barcode : UPC/EAN/JAN, Code 39, Interleaved 2 of 5, Standard 2 of 5, Matrix 2 of 5, Industrial 2 of 5, Codabar, Code 128, MSI, Plessey, Code 93
- Interface : USB, IBM PC XT/AT/PS2 Keyboard wedge, Standard RS-232C, TTL serial, Wand emulation



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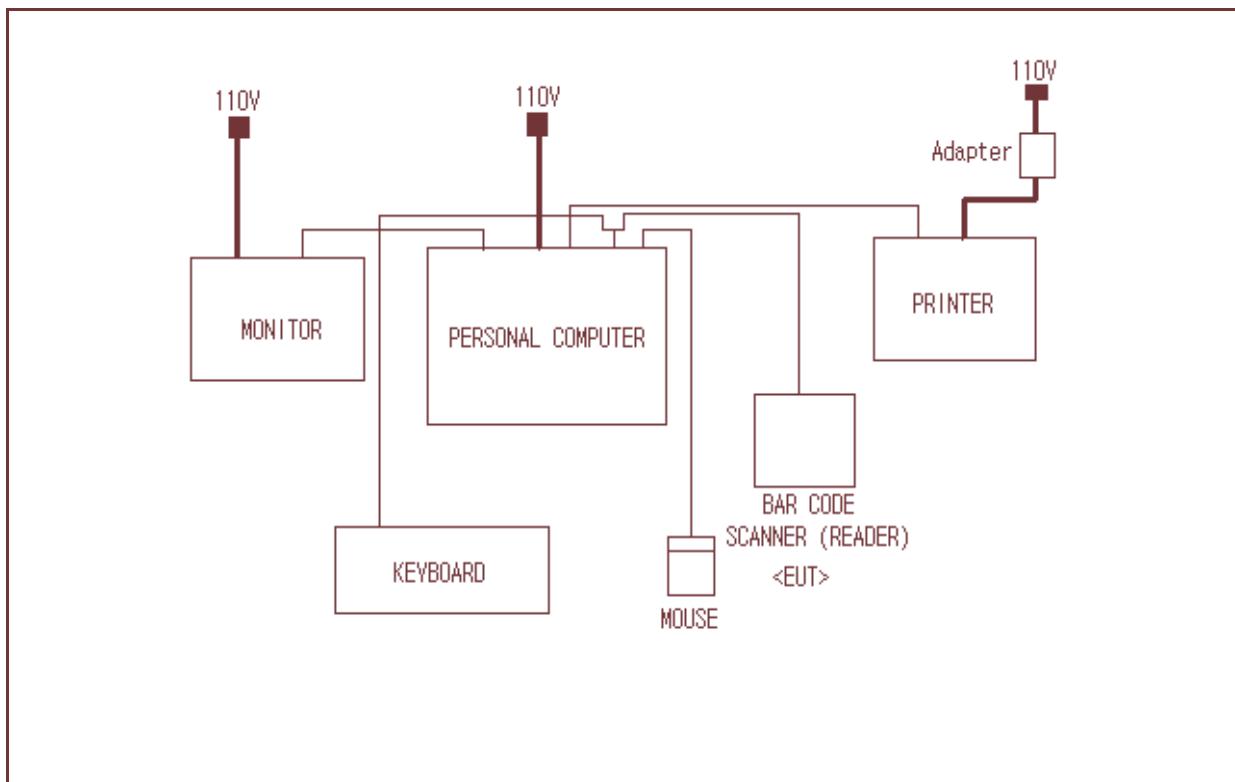
**Electromagnetic  
Interference  
Test Report**

## 4. Measurement Condition

### 4.1 EUT Operation.

- \* The EUT was in the following operation mode during all testing
- \* The operational conditions of the EUT was determined by the manufacturer according to the typical use of the EUT with respect to the expected highest level of emission
- \* After arranging EUT and peripheral, artificially operation of switch, and Bar code continually output data

### 4.2 Configuration and Peripherals



### 4.3 EUT and Support equipment

Equipment Name	Model Name	S/N	Manufacturer	Remark (FCC ID)
BAR CODE SCANNER(READER)	TSK-2000KRU	NONE	TECHSCAN KOREA Co., Ltd.	EUT
Personal Computer	M6030	772292ERA00237	Samsung Electronics Co. Ltd.	-
Monitor	FS740	045CJ64DD100	Compaq	-
Keyboard	SEM-DT35	186661447	Samsung Electro- Mechanics Ltd.	-
Mouse	PN X05-51692	3872A463	Microsoft Corporation	-
Printer	C6414J	TH18M149P2	HEWLETT PACKARD	-
Adapter	C6409-60152	NONE	HEWLETT PACKARD	-

### 4.4 Cable Connecting

Start Equipment		End Equipment		Cable Standard		Remark
Name	I/O port	Name	I/O port	Length	Shielded	
BAR CODE SCANNER(READER)	PS/2 Keyboard	Personal Computer	PS/2 Keyboard	2	Y	-
Personal Computer	PS/2 Keyboard	Keyboard	PS/2 Keyboard	2	N	-
Personal Computer	PS/2 Mouse	Mouse	PS/2 Mouse	2	N	-
Personal Computer	Video	Monitor	Video	2	Y	-
Personal Computer	Parallel	Printer	Parallel	2	Y	-
Printer	Power	Adapter	-	2	N	-

## 5. Measurement of radiated disturbance

Above 30 MHz Electric Field strength was measured in accordance with FCC Part 15 (2002) & ANSI C 63.4 (2001). The test setup was made according to FCC Part 15 (2002) & ANSI C 63.4 (2001) on an open test site, which allows a 3m distance measurement. The EUT was placed in the center of wooden turntable. The height of this table was 0.8m. The measurement was conducted with both horizontal and vertical antenna polarization. The turntable has fully rotated. For further description of the configuration refer to the picture of the test set-up.

### 5.1 Measurement equipments

Equipment Name	Type	Manufacturer	Serial No.	Next Calibration date
Receiver	ESPC	Rohde & Schwarz	845296/021	2003.6.21
LogBicon Antenna	VULB 9160	S/B	3107	2003.6.7
Turn Table	2087	EMCO	2129	–
Antenna Mast	2070-01	EMCO	9702-203	–
ANT Mast Controller	2090	EMCO	1535	–
Turn Table Controller	2090	EMCO	1535	–

### 5.2 Environmental Condition

Test Place : Open site(3m)

Temperature (°C) : 16 °C

Humidity (%) : 56 %



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## Electromagnetic Interference Test Report

### 5.3 Test data

Measurement Distance : 3 m



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**Electromagnetic  
Interference  
Test Report**

## 6. Measurement of conducted disturbance

The continuous disturbance voltage of AC Mains in the frequency from 0.15 to 30 MHz was measured in accordance to FCC Part 15 (2002) & ANSI C 63.4 (2001). The test setup was made according to FCC Part 15 (2002) & ANSI C 63.4 (2001) in a shielded. The EUT was placed on a non-conductive table at least 80 above the ground plan. A grounded vertical reference plane was positioned in a distance of 40cm from the EUT. The distance from the EUT to other metal surfaces was at least 0.8m. The EUT was only earthen by its power cord through the line impedance stabilizing network. The power cord has been bundled to a length of 1.0m.. The test receiver with Quasi Peak detector complies with CISPR 16.

### 6.1 Measurement equipments

Equipment Name	Type	Manufacturer	Serial No.	Next Calibration date
LISN	ESH3-Z5	Rohde & Schwarz	838979/010	2003. 2. 1
LISN	NNLA8120A	Schwarzbeck	NONE	2003. 2. 1
TEST Receive	ESPC	Rohde & Schwarz	845296/021	2003.6.21
Pulse Limiter	ESH3Z2	Rohde & Schwarz	NONE	2003.7.4

### 6.2 Environmental Condition

Test Place : Shield Room

Temperature (°C) : 18 °C

Humidity (%) : 58 %

### 6.3 Test data

Frequency (MHz)	Reading (dB $\mu$ V)	Line (H/N)	Correction Factor		Limit (dB $\mu$ V)	Result (dB $\mu$ V)	Margin (dB $\mu$ V)
			Lisn (dB)	Cable (dB)			
0.15	44.53	N	0.07	0.0	66.00	44.60	-21.40
0.20	42.07	N	0.07	0.0	63.82	42.17	-21.65
0.26	40.01	H	0.07	0.1	61.50	40.15	-21.35
0.29	39.34	H	0.07	0.1	60.44	39.51	-20.93
0.39	40.51	N	0.07	0.1	58.06	40.73	-17.33
0.49	41.82	N	0.07	0.2	56.21	42.08	-14.13
0.59	37.97	N	0.08	0.2	56.00	38.25	-17.75
0.68	42.02	N	0.08	0.2	56.00	42.30	-13.70
0.88	39.52	N	0.09	0.2	56.00	39.81	-16.19
1.76	39.81	N	0.11	0.3	56.00	40.19	-15.81
1.95	38.40	H	0.12	0.3	56.00	38.81	-17.19
2.93	38.39	N	0.14	0.3	56.00	38.83	-17.17
5.08	30.62	N	0.20	0.3	60.00	31.13	-28.87
5.28	29.19	H	0.25	0.3	60.00	29.75	-30.25
6.45	35.97	N	0.26	0.4	60.00	36.60	-23.40
7.62	34.36	N	0.30	0.4	60.00	35.10	-24.90
8.80	33.15	N	0.33	0.5	60.00	34.00	-26.00
15.25	33.10	N	0.61	0.8	60.00	34.51	-25.49
Remark	H : Hot Line, N : Neutral Line						



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Test Report**

## 7. Photographs of test setup

### 7.1 Setup for Radiated Test : 30 ~ 1000 MHz

[ Front ]



[ Rear ]





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Interference  
Test Report**

## 7.2 Setup for Conducted Test : 0.15 ~ 30 MHz

[ Front ]



[ Rear ]





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**Electromagnetic  
Interference  
Test Report**

## 8. Photographs of EUT

[ Front ]

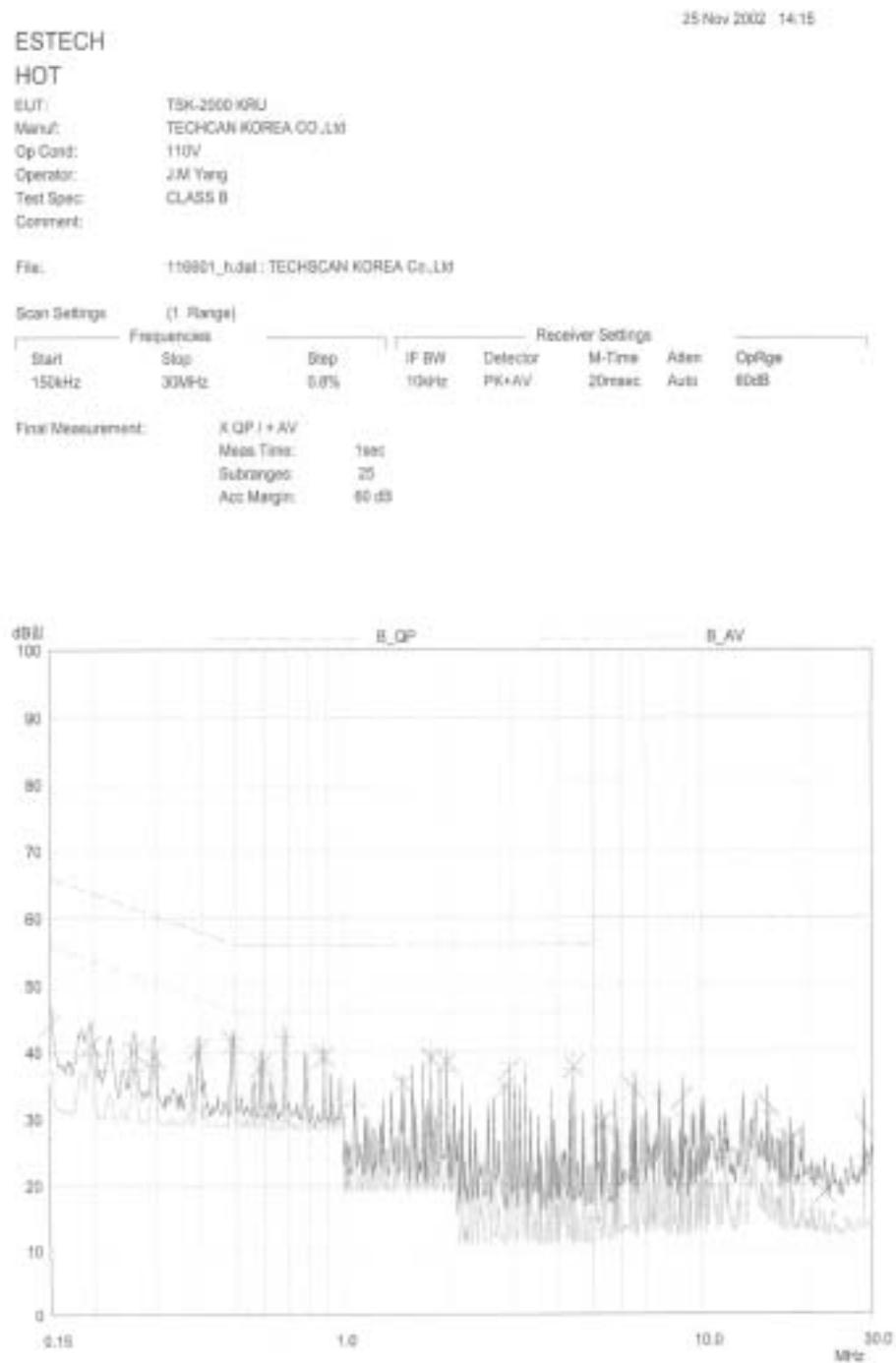


[ Rear ]



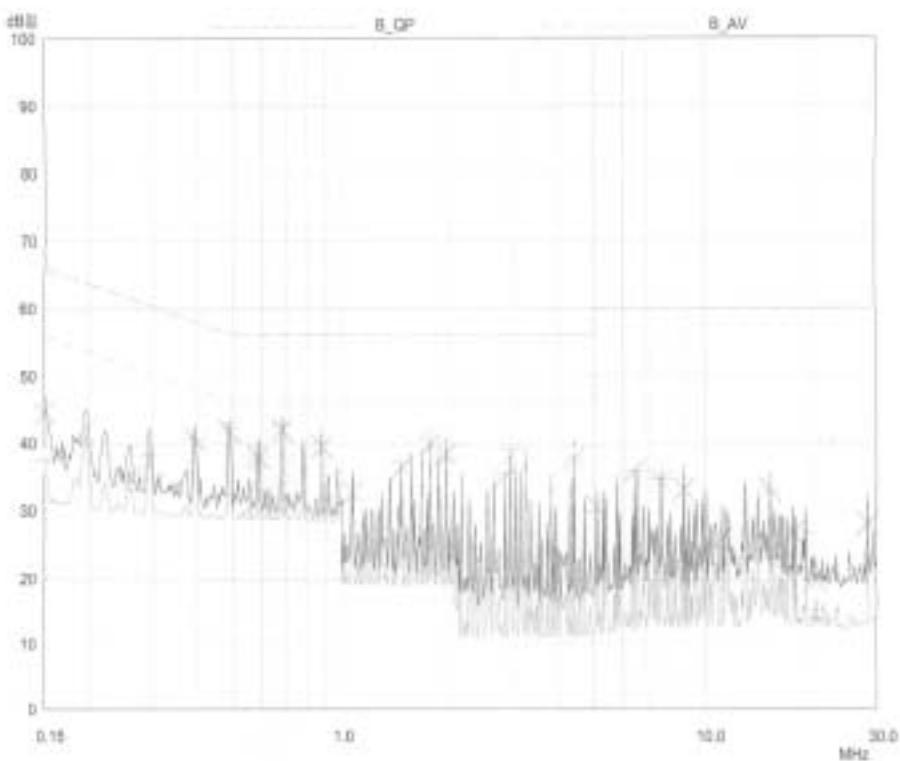
## Appendix 1. Spectral diagram

\*HOT

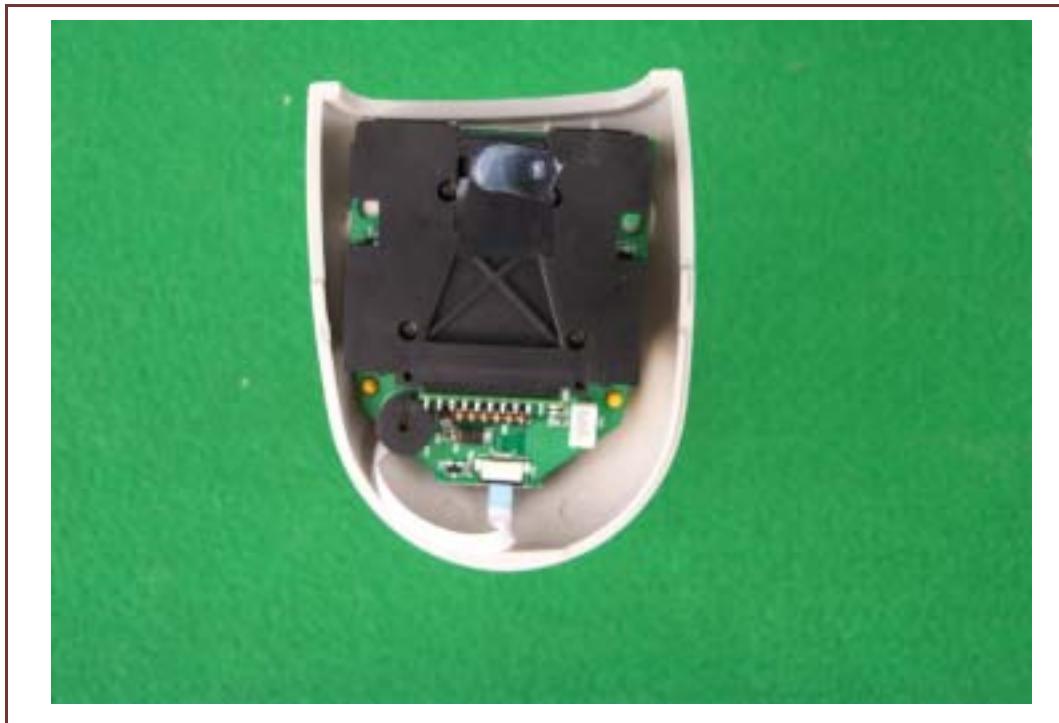


\*NETRUL

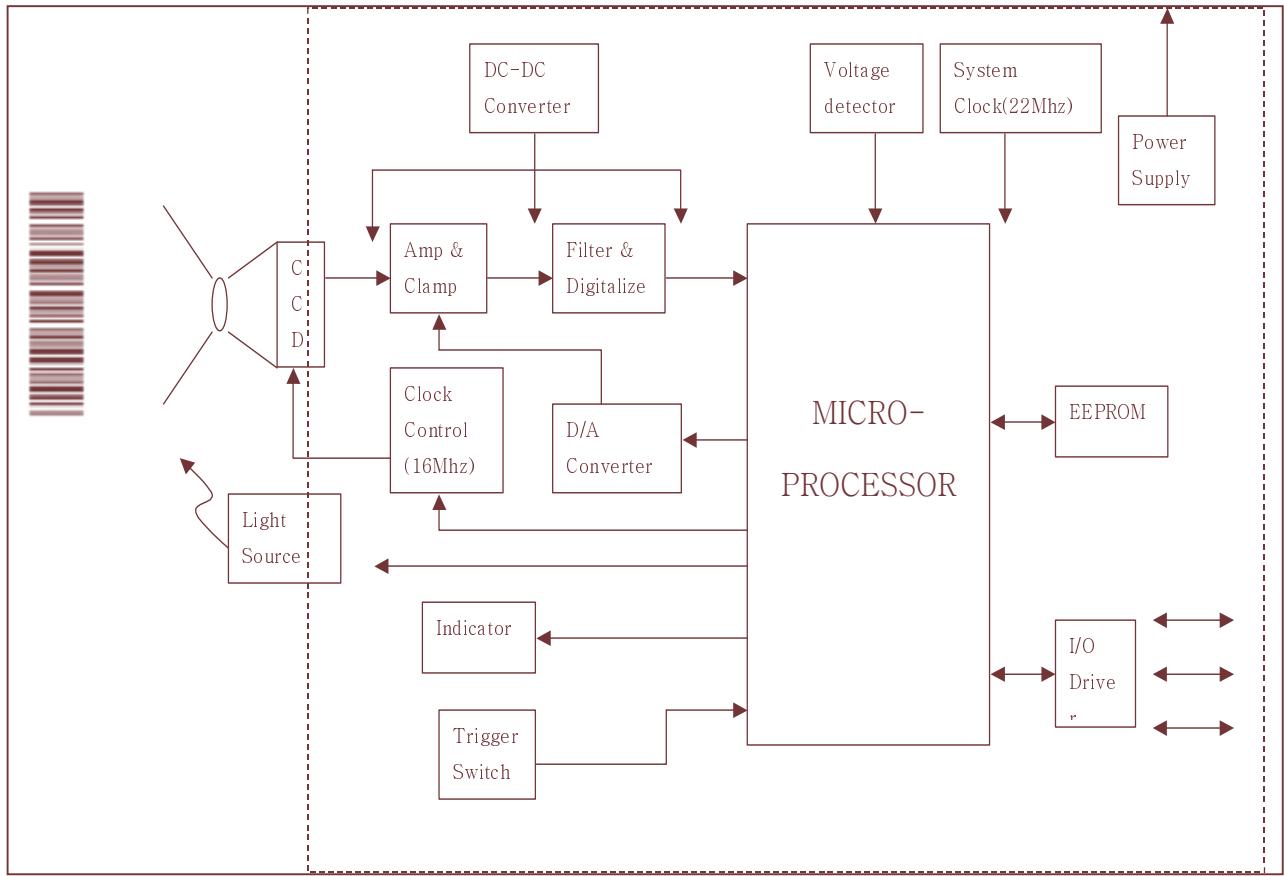
ESTECH  
NEUTRAL  
EUT: TSK-2000 KRU  
Manuf: TECHSCAN KOREA CO.,LTD  
Op Cond: 110V  
Operator: J.M.Yang  
Test Spec: CLASS B  
Comment:  
File: 116601\_nutat : TECHSCAN KOREA Co.,LTD  
Scan Settings (f: Range) Frequencies Receiver Settings  
Start Stop Bsp IF BW Detector M-Time Aten OpRge  
150Hz 30MHz 0.01% 10kHz Pk+AV 20msec Auto 60dB  
Final Measurement: X GP I+A/V  
Mean Time: 1sec  
Subranges: 25  
Acc Margin: 60 dB



## Appendix 2. Phorographs of EUT in side PCB



### Appendix 3. Block diagram of EUT



## Appendix 4. Circuit Diagram