INTERNATIONAL ELECTROTECHNICAL COMMISSION (IEC)
COMMISSION ELECTROTECHNIQUE INTERNATIONALE (CEI)

Ref. Certif. No.
JPTUV-002771-A2/M2

IEC SYSTEM FOR CONFORMITY TESTING AND CERTIFICATION OF ELECTRICAL EQUIPMENT (IECEE) CB SCHEME

SYSTÈME CEI D'ESSAIS DE CONFORMITÉ ET DE CERTIFICATION DES EQUIPEMENTS ELECTRIQUE (IECEE) METHODE OC

CB TEST CERTIFICATE
CERTIFICAT D'ESSAI OC

Product *Produit*	Personal Computer
Name and address of the applicant *Nom et adresse du demandeur*	ASUSTek Computer Inc. No. 150, Li-Te Rd. PEITOU, TAIPEI 112, TAIWAN, R.O.C.
Name and address of the manufacturer *Nom et adresse du fabricant*	ASUSTek Computer Inc. No. 150, Li-Te Rd. PEITOU, TAIPEI 112, TAIWAN, R.O.C.
Name and address of the factory *Nom et adresse de l'usine*	(See appendix for factories information)
Rating and principal characteristics *Valeurs nominales et caractéristiques principales*	Input rating : AC 100-120V/200-240V, 50-60Hz, 3A/1.5A Protection class : I
Trade mark (if any) *Marque de fabrique (si elle existe)*	ASUS
Model/type Ref. *Ref. de type*	T1000-120S, T1000-149PH, C300-CSTXX, E500-CSTXX T1000-120P, T1100-150S, T1100-150P Terminator Tualatin, Terminator TF2 T1100-150S, AB-T2101 Terminator P4 X = 0-9, A-Z or blank For differences between the models, refer to the test report. Remark : Replaces JPTUV-002771-A2/M1 dated 11.01.2002, due to second modification.
Additional information (if necessary) *Information complémentaire (si nécessaire)*	**PUBLICATION** **EDITION** IEC 60950:1991+A1+A2+A3+A4 inclusive CENELEC Common Modifications National differences see test report
A sample of the product was tested and found to be in conformity with *Un échantillon de ce produit a été essayé et a été considéré conforme à la*	
as shown in the Test Report Ref. No. which form part of this certificate *comme indiqué dans le Rapport d'essais numéro de référence qui constitue une partie de ce certificat*	02160602 005

This CB Test Certificate is issued by the National Certification Body
Ce Certificat d'essai OC est établi par l'Organisme National de Certification

TÜV

TÜV Rheinland Japan Ltd.
3-19-5 Shin-Yokohama
222-0033 Japan

Date 08.04.2002

Signature

Dipl.-Ing. M. Lechtermann

Issue 1998-09

Appendix to CB Certificate JPTUV-002771-A2/M2
Report Number: 02160602 005

Name and address of the manufacturer
ASUSTek Computer Inc.
No. 150, Li-Te Rd.
Peitou, Taipei 112
Taiwan, R.O.C.

Name and address of the factory(ies)
ASUSTeK Computer Inc.

No. 5, Shing Yeh St.
Kwei Shan Hsiang, Taoyuan Hsien
Taiwan, R.O.C. 333

Maintek Computer (Suzhou) Co., Ltd.

233, Jin Feng Road
Su Zhou Dist., Jiangsu
P.R. China

Date: 08.04.2002

Dipl.-Ing. M. Lechtermann

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TEST REPORT FOR AN ADDITIONAL APPROVAL

IEC 950

Safety of information technology equipment

Report

Reference No. ..... : 02160602 005

Compiled by (+ signature) ..... : E. Otsuka

Approved by (+ signature) ..... : R. Gratton

Date of issue ..... : 04 April, 2002

Contents ..... : 11 pages

..... :

This report is based on a blank test report that was prepared by KEMA using information obtained from the TRF originator (see below).

Testing laboratory

Testing laboratory ..... : TÜV Rheinland Japan Ltd., Yokohama Laboratories

Address ..... : Festo Bldg. 5F, 1-26-10 Hayabuchi, Tsuzuki-Ku, Yokohama 224-0025, Japan

Testing location ..... : TÜV Rheinland Japan Ltd., Yokohama Laboratories

Client

Name ..... : Asustek Computer Inc.

Address ..... : No. 150, Li-Te Rd., Peitou, Taipei 112, Taiwan, R.O.C.

Test specification

Standard ..... : IEC 60950:1991 + A1:1992 + A2:1993 + A3:1995 + A4:1996
EN 60950:1992 + A1:1993 + A2:1993 + A3:1995 + A4:1997 + A11:1997
EMKO-TSE(74-SEC)207/94, UL 1950, C22.2 No. 950 3rd edition, AS 3260

Test procedure ..... : CB Scheme

Procedure deviation ..... : Australia, Austria, Belgium, China, Canada, The Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, India, Ireland, Israel, Italy, Japan, Rep. of Korea, The Netherlands, Norway, Poland, Russia Fed., Slovenia, Slovakia, South Africa, Spain, Sweden, Switzerland, United Kingdom and USA

Non-standard test method ..... : N.A.

Test Report Form/blank test report

Test Report Form No. ..... : Cbaddapp.doc

TRF originator. ..... : TÜV Rheinland

Test item

Description ..... : Personal Computer

Trademark ..... : ASUS®

Model and/or type reference ..... : 1) Terminator P4
2) AB-T2101

Manufacturer ..... : Same as client

Rating ..... : AC 100-120/200-240V, 50-60Hz, 3/1.5A

The construction of the Personal Computer model T1000-120S has been modified as follows:

1. Add additional models name: Terminator P4 and AB-T2101. The additional models are the same as previously approved model T1000-120S except for the type designation and followings:
   a. Add additional models name for power supply: ATP-1655-NP and ATP-1655-EP, which are similar to original approved model, except for the additional EMI filter board (optional) which is located at AC inlet.
2. Add alternative sources of transformer T1 and T2
3. Add alternative sources of inductor LF1 and LF2

For the above described modification the following testing was considered to be necessary:

Modification	Testing	Comments	Result
1	See below	See sub-clause 1.7.1 and labels on next page.	**P**
1.a	- Construction check - Input test - Capacitance discharge - Heating test - Leakage current - Hi-pot test	The additional models name of power supply is similar to original models, except for the EMI filter board. Model ATP-1655-NP is identical to model ATP-1655-EP except for without PFC function. For test results, see appended tables.	**P**
2	- Transformer construction check - Hi-pot test	Same specification as original used except for different vendor. Result see appended table C.2.	**P**
3	- heating test	Different type and ratings used. Results see appended table 5.1. For sources see appended table 1.5.1.	**P**

Remark:

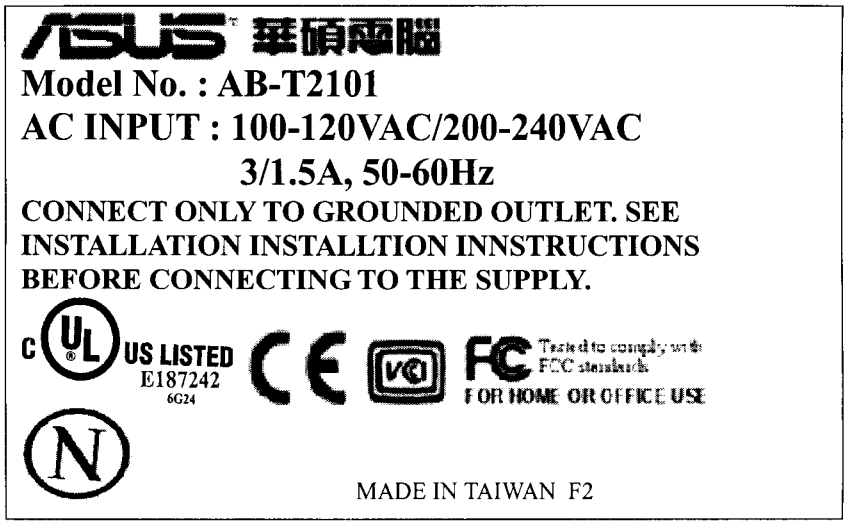
The history of modification as below:

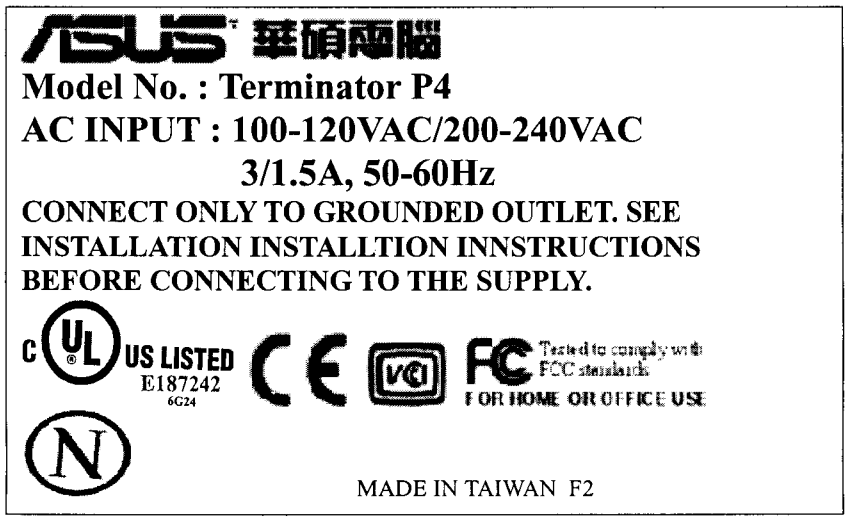
- Modification: 002
- Non-technical change: 003, 004

Factories:

1. **Maintek Computer (Suzhou) Co., Ltd.**
   No. 233, Jin Feng Road, Su Zhou District, Jiang Su Province, P.R.China
2. **ASUSTek Computer Inc.**
   No. 5, Shing Yeh Street, Kwei Shan Hsiang, Taoyuan Hsien, Taiwan, R.O.C.

Copy of the marking plate :





IEC 950			
Clause	Requirement – Test	Result – Remark	Verdict
1.7	Marking and instructions		P
1.7.1	Rated voltage (V) .....:	100-120VAC/200-240VAC	P
	Symbol of nature of supply for d.c. .....:	Mains from AC source	N
	Rated frequency (Hz) .....:	50-60Hz	P
	Rated current (A) .....:	3/1.5A	P
	Manufacturer .....:	Not shown	N
	Trademark .....:	ASUS®	P
	Type/model .....:	1. Terminator P4 2. AB-T2101	P
	Symbol of Class II .....:	Class I equipment	N
	Certification marks .....:	UL, CUL, N	N

C	ANNEX C, TRANSFORMERS		P
	Position .....:	1) T1, 2) T2	—
	Manufacturer .....:	See appended table 1.5.1	—
	Type .....:	See appended table 1.5.1	—
	Rated values .....:	Class B	—
	Temperatures	See appended table 5.4	P
	Thermal cut-out	No thermal cut-out	N
C.1	Overload test	See 5.4.3	P
	Conventional transformer		N
C.2	Insulation		
	Precautions .....:	(See transformer construction check)	P
	Retaining of end turns of all windings	Dto	P
	Earthing test at 25 A		N
C.3	Electric strength test	(See 5.3)	P

C.2	Safety isolation transformer	P
Construction details:		
Transformer T1		
Mfr.: Xepex		
Type: TEI33S-V4211-S1025B		

IEC 950			
Clause	Requirement – Test	Result – Remark	Verdict

Recurring peak voltage	340V 0-p	
Required clearance for reinforced		
insulation (from table 3 and 4)	4.0mm	
Effective voltage rms	216V	
Required creepage for reinforced		
insulation (from table 6) interpolated	5.0mm	
Measured min. creepages		
Location	inside (mm)	outside (mm)
prim-sec	6.4	7.2
prim-core	3.2	3.6
sec-core	3.2	3.6
prim-prim	%	%
Measured min. clearances		
Location	inside (mm)	outside (mm)
prim-sec	6.4	7.2
prim-core	3.2	3.6
sec-core	3.2	3.6
prim-prim	%	%
Construction: Concentric windings on EI-33 type bobbin, three layers insulation between prim and sec windings. Distance tape is 3.2mm on both sides of transformer. N2 (pin 4/5 - 6) use copper with 3 layers insulation and overlapping 2.7 mm on both sides. Winding ends additionally fixed with tape. Outer winding is primary. Tubing on winding exit ends is leaded above the distance tape.		
Pin numbers		
Prim.	7-8-10/11	
Sec.	4/5-6-3	
Bobbin		
Material	Phenolic T373J, Chang Chun Plastics Co., Ltd., V-0, 150°C	
Thickness	0.8mm	

IEC 950			
Clause	Requirement – Test	Result – Remark	Verdict

Electric strength test	
With AC 3000V after humidity treatment	
Result	pass

C.2	Safety isolation transformer		P
Construction details:			
Transformer T2			
Mfr.: Xepex			
Type: TER28S-V4211S1026A			
Recurring peak voltage		401V 0-p	
Required clearance for reinforced			
insulation (from table 3 and 4)		4.0mm	
Effective voltage rms		292V	
Required creepage for reinforced			
insulation (from table 6) with interpolation		6.2mm	
Measured min. creepages			
Location		Inside (mm)	outside (mm)
prim-sec		6.4	7.0
prim-core		3.2	3.5
sec-core		3.2	3.5
prim-prim		%	%
Measured min. clearances			
Location		inside (mm)	outside (mm)
prim-sec		6.4	7.0
prim-core		3.2	3.5
sec-core		3.2	3.5
prim-prim		%	%
Construction:			
Concentric windings on ER-28 type bobbin, three layers insulation between prim and sec windings.			

IEC 950			
Clause	Requirement – Test	Result – Remark	Verdict

Distance tape is 3.2mm on both sides of transformer. N2 (pin 8-10) use a copper with 3 layers insulation and overlapping 3.3mm on both sides. Winding ends additionally fixed with tape. Outer winding primary. Tubing on winding exit ends is leaded above the distance tape.	
Pin numbers	
Prim.	3-4-5
Sec.	1-2, 8-10
Bobbin	
Material	Phenolic T373J, Chang Chun Plastics Co., Ltd., V-0, 150°C
Thickness	0.8mm
Electric strength test	
With AC 3000V after humidity treatment	
Result	pass

1.5.1	TABLE: list of critical components				P
object/part No.	manufacturer/ trademark	type/model	technical data	standard	mark(s) of conformity[1])
Add alternative components of SPS					
Main Transformer (T1)	Xepex	TEI33S-V4211-S1025B	Class B	accord. to IEC 60085 and IEC 60950	acc. by TÜV Rheinland
Main Transformer (T2)	Xepex	TER28S-V4211-S1026A	Class B	accord. to IEC 60085 and IEC 60950	acc. by TÜV Rheinland
Line Filter (LF1, LF2)	Hua Jung	FT020S-V94002-S20950	Class 120°C	--	--
- EMI filter board					
X-Cap. (C101) (optional)	Hua Jung	MKP	0.47µF, 275V max.	IEC 60384-14/1993	VDE
	Philips	MKP 336/1/2	0.47µF, 275V max.	IEC 60384-14/1993	VDE
	Iskra	KNB 156 0/2/3	0.47µF, 275V max.	IEC 60384-14/1993	VDE
	Siemens	MKP/MKT	0.47µF, 275V max.	IEC 60384-14/1993	VDE
	Okaya	RE/PA	0.47µF, 275V max.	IEC 60384-14/1993	VDE

IEC 950			
Clause	Requirement – Test	Result – Remark	Verdict

Bleeder Resistor (R101)	--	--	1M, 1/2W	--	--
Y-Cap. (C102, C103) (optional)	Pan Overseas	AH/AC	4700pF, 250V max.	IEC 60384-14	VDE
	TDK	CS/CD	4700pF, 250V max.	IEC 60384-14	VDE
	Murata	KX/KH	4700pF, 250V max.	IEC 60384-14	VDE
	Matsushita	TS/NS-A	4700pF, 250V max.	IEC 60384-14	VDE, Demko
	Success	SF	4700pF, 250V max.	IEC 60384-14	VDE
Line filter (LF101)	Hua Jung	FT020S-V94002-S20950	Class 120°C	--	--
[1]) an asterisk indicates a mark which assures the agreed level of surveillance					

1.6	TABLE: electrical data (in normal conditions)					P
fuse #	Irated (A)	U (V)	P (W)	I (A)	Ifuse (A)	condition/status
Fuse	--	90/50Hz	112	1.93	1.93	Maximum normal load
Fuse	--	90/60Hz	112	1.92	1.92	dto
Fuse	3	100/50Hz	111	1.74	1.74	dto
Fuse	3	100/60Hz	111	1.75	1.75	dto
Fuse	3	120/50Hz	111	1.53	1.53	dto
Fuse	3	120/60Hz	111	1.53	1.53	dto
Fuse	--	127/50Hz	111	1.48	1.48	dto
Fuse	--	127/60Hz	111	1.46	1.46	dto
Fuse	--	180/50Hz	112	0.79	0.79	dto
Fuse	--	180/60Hz	111	0.78	0.78	dto
Fuse	1.5	200/50Hz	111	0.72	0.72	dto
Fuse	1.5	200/60Hz	111	0.71	0.71	dto
Fuse	1.5	240/50Hz	109	0.60	0.60	dto
Fuse	1.5	240/60Hz	112	0.63	0.63	dto
Fuse	--	254/50Hz	109	0.57	0.57	dto
Fuse	--	254/60Hz	109	0.57	0.57	dto

IEC 950			
Clause	Requirement – Test	Result – Remark	Verdict

2.1.10	TABLE: discharge test				P
Condition		τ calculated (s)	τ measured (s)	t u→ 0V (s)	Comments
System off		0.682	0.300	--	Vo = 360V, 37% of Vo = 133.2V, voltage after 1 second = 16V
System on		0.682	0.292	--	Vo = 352V, 37% of Vo = 130.2V, voltage after 1 second = 12V
Overall capacity	: 1.41μF (C5 = C6 = 0.47μF, C101 = 0.47μF on EMI filter board)				
Discharge resistor	: 0.484MΩ (R1 = R5 = 470kΩ//R101 = 1MΩ on EMI filter board)				

2.9.2 and 2.9.3	TABLE: clearance and creepage distance measurements					N
clearance cl and creepage distance dcr at/of:	Up (V)	U r.m.s. (V)	required cl (mm)	cl (mm)	Required dcr (mm)	dcr (mm)
Primary components (10N) → earted metal chassis (30N)	<420	<240	2.0	5.0	2.5	5.0
Note: The EMI filter board totally wrapped with tube right after the AC inlet.						

5.1	TABLE: temperature rise measurements			P
	test voltage (V)	a. 100-10%, b. 240+6%		—
	t1 (°C)			—
	t2 (°C)			—
temperature rise dT of part/at:		dT (K)		required dT (K)
Test Voltage		a	b	--
LF1 core		17.9	11.0	80
LF1 coil		19.4	12.0	80

IEC 950			
Clause	Requirement – Test	Result – Remark	Verdict

LF2 core	13.4	8.7	80
LF2 coil	16.1	10.2	80
BD1 between PWB	21.6	14.3	--
C2 body near BD1	10.5	6.0	45
T1 coil	23.9	24.4	65
T1 core	16.5	17.2	65
T2 coil	34.5	33.3	65
T2 core	31.0	30.5	65
Heatsink of Q6	22.7	23.2	--
Heatsink of Q2	16.3	15.6	--
Heatsink of D1	28.5	29.5	--
L2 coil	21.0	24.9	80
Heatsink of CPU	13.1	13.5	--
PFC coil	8.6	13.9	80
PFC core	8.6	13.4	80
RTC battery body	8.0	8.4	--
CD-ROM	6.3	6.0	--
HDD	11.8	11.4	--
FDD	4.8	4.5	--
Enclosure inside near SPS	11.3	10.5	30
Ambient	21.6°C	22.1°C	--

temperature rise dT of winding:	R_1 (Ω)	R_2 (Ω)	dT (K)	required dT (K)	Insulation class

IEC 950			
Clause	Requirement – Test	Result – Remark	Verdict

Comments:

The temperatures were measured by thermal couple method under worst case normal load as described in 1.6.1 at voltages described in 1.6.5.

With a specified ambient temperature of 40°C, the max. temperature rise is calculated as follows:

Winding components or components:

- class B → dTmax = 90K - 10K – (40-25)K = 65K

Electrolyte capacitor or components with:

- max. absolute temp. of 85°C → dTmax = (85-40) K = 45K

- max. absolute temp. of 120°C → dTmax = (105-40) K = 80K

Touchable enclosure surface with:

- metal parts → dTmax = 45K – (40-25)K = 30K

5.2	TABLE: leakage current measurement		P
Condition	current L→PE (mA)	current N→PE (mA)	Comments
System on	0.5	0.5	
System off	0.5	0.48	

Input voltage	:	254V
Input frequency	:	60Hz
Overall capacity	:	C1 = C7 = C12 = 4700pF, C102 = C103 = 4700pF (on EMI filter board)

5.3	TABLE: electric strength measurements	P
test voltage applied between:	test voltage (V)	breakdown
Unit: primary and secondary	DC 4242	No
Unit: primary and ground	DC 2270	No