

**AdvancedTCA (ATCA) FlexChassis™ 5U (6-Slot) DC
CE Certificate**

P/N: 5-02468

Document: CU00246

		
CERTIFICATE OF SAFETY		
A sample of the following Pentair Electronic Packaging product has been examined and found to comply with applicable international safety requirements for - INFORMATION TECHNOLOGY EQUIPMENT		
The following standards were used in the determination of the safety construction:		
<ul style="list-style-type: none">• IEC60950-1, First Edition• EN 60950-1, First Edition• UL 60950-1, First Edition• CSA 22.2, No. 60950-1-03, First Edition		
Name of Unit: Card Cage Chassis		
Model No.: ZR5ATC6 may be followed by any alphanumeric characters, dashes, or blank		
Electrical Ratings:		
Volts: -48 Vd		A: Protection Class: I
Evaluated By: 		
Charles M. Bayhi, P.E. CPSM Corporation		<u>August 15, 2007</u>
		

CE TEST REPORT IEC 60950-1 Safety of information technology equipment	
Report reference No.....	070815 (NOTE – THIS REPORT SUPPLEMENTS UL REPORT E139432-A12-UL-1 AND IS INTENDED TO ONLY COVER NATIONAL DEVIATIONS FOR COUNTRIES DESCRIBED ON PAGE 3. UNITED STATES AND CANADIAN NATIONAL DEVIATIONS ARE DESCRIBED IN THE UL REPORT)
Date of issue.....	August 15, 2007
Testing laboratory.....	CPSM Corporation
Address.....	26982 Venado Dr. Mission Viejo, CA 92691 USA
Testing location	as above
Applicant.....	Pentair Electronic Packaging
Address.....	14100 Danielsen St, Poway Ca 92064
Standard	IEC 60950-1, 1 st Edition
Test Report Form No.	
TRF modified by.	
Master TRF.....	
Copyright blank test report.....	This report is based on a blank test report prepared by FIMKO using information obtained from the TRF originator. Copyright reserved to the bodies participating in the Committee of Certification Bodies (CCB) and/or the CENELEC Certification Agreement (CCA). This report is not valid as a CB Test Report unless appended to a CB Test Certificate issued by a NCB, in accordance with IEC 60950-1.
Test procedure	Per IEC 60950-1
Procedure deviation	
Non-standard test method	
National deviations.....	AT Austria, CA Canada, CH Switzerland, CZ Czech Republic, DE Germany, DK Denmark, FI Finland, FR France, GB United Kingdom, HU Hungary, NL The Netherlands, NO Norway, SE Sweden, SI Slovenia, SG Singapore, US United States, ZA South Africa
Number of pages (Report)	
Number of pages (Attachments).....	
Compiled by.....: Charles M. Bayhi, P.E. (+ signature) 	Approved by.....: _____ (+ signature)

National & Group Differences per CB Bulletin 99A OC (July 2001):

IEC 60950-1 1st Edition Information technology equipment
including electrical business equipment

COUNTRY	INCL. AMENDMENTS	GROUP DIFFER.	NAT'L DIFFER.	NAT'L STANDARD	TESTED
AT Austria	–	YES	–	–	P
CH Switzerland	–	YES	–	pr EN 60950	P
CZ Czech Republic	–	YES	–	–	P
DE Germany	–	–	–	–	P
DK Denmark	–	–	–	–	P
FI Finland	–	YES	YES	EN 60950	P
FR France	–	–	–	–	P
GB United Kingdom	–	–	–	–	P
HU Hungary	–	YES	–	MSZ EN 60950	P
NL The Netherlands	–	–	–	–	P
NO Norway	–	YES	YES	NEK EN 60950	P
SE Sweden	–	YES	YES	SS EN 60950, 6 TH ed.	P
SI Slovenia	–	YES	–	–	P
SG Singapore	–	–	–	–	P
ZA South Africa	–	–	–	SABS IEC 60950	P

FI National Differences for FINLAND – IEC 60950-1 First Edition			N
	The exclusions are applicable for permanently connected equipment and pluggable equipment Type B only.	n/a	N
NO National Differences for NORWAY – IEC 60950-1 First Edition			P
1.5.8	In Norway, due to the IT power system used (see annex V, figure V.7) capacitors are required to be rated for the applicable phase-to-phase voltage (230 V).	n/a	N
1.7.2	In Norway, CLASS I PLUGGABLE EQUIPMENT TYPE A intended for connection to other equipment or a communication network shall, K safety relies on connection to the protective earth, require a marking stating that the equipment must be connected to an earthed mains socket-outlet.	n/a	N
	In Sweden, if the separation between the mains and SELV terminal relies upon connection to the safety earth, the apparatus shall have a marking stating that it must be connected to an earthed mains socket-outlet. The marking text shall be in Swedish and as follows: "Apparaten skall anslutas till jordat uttag när den ansluts till ett nätverk".	n/a	N
2.2.4	In Norway, requirements according to this annex, sub-clauses 1.7.2 and 6.1.2.1 apply.	n/a	N
2.3.2	In Norway, requirements according to this annex, sub-clause 6.1.2.1 apply.	n/a	N
2.3.3	In Norway, requirements according to this annex, sub-clause 6.1.2.1 apply.	n/a	N
2.3.4	In Norway, requirements according to this annex, sub-clauses 1.7.2 and 6.1.2.1 apply.	n/a	N
2.10.3.1	In Norway, due to the IT power distribution system used (see annex V, figure V.7), the A.C. MAINS SUPPLY Voltage is considered to be equal to the line-to-line voltage, and will remain at 230 V in case of a single earth fault.	n/a	N

6.1.2.1	<p>In Norway and Sweden, add the following text between the first and second paragraph:</p> <p>If this insulation is solid, including insulation forming part of the component, it shall at least consist of either</p> <ul style="list-style-type: none"> – two layers of thin sheet material, each of which shall pass the electric strength test below, or – one layer having through insulation of a least 0.4 mm, which shall pass the electric strength test below. 	added	N
	<p>If this insulation forms part of a semiconductor component e.g. an optocoupler, there is no distance through insulation requirement for the insulation consisting of an insulating compound completely filling the casing, so that CLEARANCES and CREEPAGE DISTANCES do not exist if the components passes the electric strength test in accordance with the compliance clause below and in addition:</p> <ul style="list-style-type: none"> – passes the tests and inspection criteria of 2.10.8 with an electric strength test of 1.5 kV multiplied by 1.6 (the electric strength test of 2.10.7 shall be performed using 1.5 kV): and – is subject to ROUTINE TESTING for electric strength during manufacturing, using a test voltage of 1.5 kV. 	n/a	N
	<p>It is permitted to bridge this insulation with a capacitor complying with EN 132400:1994, subclass Y2.</p>	n/a	N
6.1.2.2	<p>In Norway and Sweden, the exclusions are applicable for PERMANENTLY CONNECTED EQUIPMENT and PLUGGABLE EQUIPMENT TYPE B only.</p>	n/a	N
Annex G.2	<p>In Norway, due to the IT power distribution system used (see annex V. figure V.7), the A.C. MAINS SUPPLY Voltage is considered to be equal to the line-to-line voltage, and will remain at 230 V in case of a single earth fault.</p>	n/a	N
SE National Differences for SWEDEN – IEC 60950-1 First Edition			P

1.5.1	<p>Add the following:</p> <p>NOTE: Switches containing mercury such as thermostats, relays and level controllers are not allowed.</p>	Added	P
1.7.2	<p>In Sweden, if the separation between the mains and SELV terminal relies upon connection to safety earth, the apparatus shall have a marking stating that it must be connected to an earthed mains socket-outlet.</p> <p>The marking text shall be in Swedish and as follows:</p> <p>"Apparaten skall anslutas till jordat uttag när den ansluts till ett nätverk".</p>	n/a	N
6.1.2.1	<p>In Sweden, add the following text between the first and the second paragraph:</p> <p>If this insulation is solid, including insulation forming part of the component, it shall at least consist of either</p> <ul style="list-style-type: none"> – two layers of thin sheet material, each of which shall pass the electric strength test below, or – one layer having through insulation of a least 0.4 mm, which shall pass the electric strength test below. 	Added	N
	<p>If this insulation forms part of a semiconductor component e.g. an optocoupler, there is no distance through insulation requirement for the insulation consisting of an insulating compound completely filling the casing, so that CLEARANCES and CREEPAGE DISTANCES do not exist, if the components passes the electric strength test in accordance with the compliance clause below and in addition:</p> <ul style="list-style-type: none"> – passes the tests and inspection criteria of 2.10.8 with an electric strength test of 1.5 kV multiplied by 1.6 (the electric strength test of 2.10.7 shall be performed using 1.5 kV); and – is subject to ROUTINE TESTING for electric strength during manufacturing, using a test voltage of 1.5 kV. 	n/a	N

	It is permitted to bridge this insulation with a capacitor complying with EN 132400:1994, subclass Y2.	n/a	N
6.1.2.2	In Norway and Sweden, the exclusions are applicable for PERMANENTLY CONNECTED EQUIPMENT and PLUGGABLE EQUIPMENT TYPE B only.	n/a	N
GROUP DIFFERENCES – IEC 60950-1 First Edition			P
2.7.1	Replace the sub-clause as follows: Basic requirements To protect against excessive current, short circuits and earth faults in PRIMARY CIRCUITS, protective devices shall be included either as integral parts of the equipment or as a parts of the building installation, subject to the following a), b), and c):	Replaced	P
	a) Except as detailed in b) and c), protective devices necessary to comply with the requirements of sub-clause 6.3 shall be included as parts of the equipment.	n/a	N
	b) For components in series with the mains input to the equipment such as the supply cord, appliance coupler, r.f.i filter and switch, short circuit and earth fault protection may be provided by protective devices in the building installation.	n/a	N
	c) It is permitted for equipment PLUGGABLE EQUIPMENT TYPE B or PERMANENTLY CONNECTED EQUIPMENT, to rely on dedicated overcurrent and short circuit protection in the building installation, provided that the means of protection, e.g. fuses or circuit breakers, is fully specified in the installation instruction.	n/a	N
	If reliance is placed on protection in the building installation, the installation instructions shall so state, except that for PLUGGABLE EQUIPMENT TYPE A the building installation shall be regarded as providing protection in accordance with the rating of the wall socket outlet.	n/a	N

2.7.2	This sub-clause has been declared 'void'.	n/a	N
3.2.3	Delete NOTE 1, and in table 3A delete the conduit sizes in parentheses.	Replaced	P
3.2.5	Replace "60245 IEC 53" by "H05 RR-F" "60227 IEC 52" by "H03 VV-F or H03 VVH2-F" "60227 IEC 53" by "H05 VV-F or H05 VVH2-F"	Replaced	P
	In Table 3B, replace the first four lines by the following: Up to and including 6 0.75 ¹⁾ Over 6 up to and including 10 1.0 (0.75) ²⁾ Over 10 up to and including 16 1.5 (1.0) ³⁾	Replaced	P
	In the conditions applicable to table 3B, delete the words "in some countries" in condition 1).	Replaced	P
	In NOTE 1, delete the second sentence.	Replaced	P
3.3.4	In Table 30, delete the fourth line - conductor sizes for 10 to 13 A, and replace with the following: Over 10 up to and including 16 1.5 to 2.5 1.5 to 4	Replaced	P
	Delete the fifth line - conductor sizes 13 to 16 A.	Replaced	P
4.3.13	Replace the second compliance paragraph by: For equipment using LED's or lasers, compliance is checked according to EN 60825-1.	Replaced	P
	NOTE 1 – if equipment falling within the scope of EN 60950 is inherently a Class 1 laser product, i.e. it contains no embedded laser or LD of a higher class number, than a laser warning label or other laser warning statement is not required (see 1.1 of EN 60825-1).	Replaced	P
	Renumber the NOTE below the third compliance paragraph 2S NOTE 2.	Replaced	P
Annex H	Replace the last paragraph of this annex by: At any point 10 cm from the surface of the OPERATOR ACCESS AREA, the dose rate shall not exceed 1 μSv/h (0.1 mR/h) (see note). Account is taken of the background level.	Replaced	P
	Replace the NOTE as follows: NOTE – These values appear in directive 96/29 Euratom.	Replaced	P

Annex P	Replace the text of this annex by: See annex ZA	Replaced	P
Annex Q	Add the following notes for the standards indicated: IEC 60127 series NOTE: Harmonized as EN 60127 series (not modified)	Replaced	P
	IEC 60529 NOTE: Harmonized as EN 60529:1991 (not modified)	Replaced	P
	IEC 61032 NOTE: Harmonized as EN 61032:1998 (not modified)	Replaced	P

Note: Before placing the products in the different countries, the manufacturer must ensure that:

1. Operating Instructions, Ratings Labels and Warnings Labels written in an Accepted or Official Language of the county in question.
 2. The equipment complies with the National Standards and/or Electrical Codes of the country in question.
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1.5.1	TABLE: list of critical components					Pass
Object/part No.	Manufacturer/ trademark	type/model	technical data	Required Marks of Conformity		Supplement ID
Enclosure	Various	(metal material)	Metal, overall 44.0 by 22.2 cm by 45.7 cm. Min. 1 mm thick. All unused openings provided with screw secured metal panels.	-		
Air Filter Assembly	Universal Air Filter Co., or manufacturer with equivalent Technical data	Type Quadrafoam, or equivalent	Rated Min HF-1. Located only on one side of the chassis.	UL		
Connectors (Used on PEM Module and Fan Tray)	Molex Inc.	45484 and 45485	RTI=220°C	UL		
Protective Earthing Terminal (Located rear of Chassis)	Panduit Corp Terminal Div. or manufacturer with equivalent technical data	Type LCD or equivalent	Double hole lug. Secured to rear chassis with two screws. (Provided with Crimping Instructions).	UL		
Protective Earthing Terminal (Located rear of Chassis), Alternate	FCI USA Inc. or manufacturer with equivalent technical data	Type YAV or equivalent	Double hole lug. Secured to rear chassis with two screws. (Provided with Crimping Instructions).	UL		
Wiring, Internal	Various	Various	Style FEP, PTFE, PVC, TFE, neoprene, polyamide or marked VW-1; min 300 V, 80°C.	UL		
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PEM MODULE (First) , (REV.G or REV.H) , See below for components, A to M.	Pentair Electronic Packaging	Assembly No. 01-W0020402 Rev.G. or Rev. H.	(Input: 60 Vdc; Output: 60 V dc). Secured by three screws. Note: Rev. G need to have plastic insulator between C24 body & PWB and between Connectors P1, P7, P2 and	--		

			PWB.			
A. Printed Wiring Board	Various	Various	Min V-1, 105°C	UL		
B. PEM Fan - 3 Provided	Delta Electronics Inc.	FFB0412VHN	(12 Vdc, 0.24 A), 15.8 cfm. Marked VDE.	UL and VDE		
B. PEM Fan - 3 Provided, Alternate	Various	Various	Rated 12 Vdc, maximum 0.5 A, minimum 12 CFM. Fan is also IEC/EN Certified to 60950 or 60950-1.	UL and either TUV-R, TUV-PS or VDE		
C. Circuit Breaker	Caring Technologies or Manufacturer with equivalent Technical Data	Type AA1-B2-12-640-521-MK (Type A) or Equivalent	(80 V, 40 A), 1 Pole.	UL		
D. EMI Filter	JMK, Inc.	MM-1855B-50E	60 Vdc, 50 A. Provided with Integral Terminals. Terminals comply to Table 3E. Measured screw diameter as 5.70 mm. provided with hex nut and Hex nut with integral washer.	UL		
E. Fuse (F1, F2, F3, F4)	Littelfuse Inc. or Manufacturer with Equivalent Technical Data	Series 451	125 Vdc, 2.5 A	UL		
F. Optical isolators (U13, U18, U19)	Fairchild	HCPL-0701	Single Protection, 2500 Vrms Isolation	UL		
G. Optical isolators (U9, U23)	Avago Technologies PTE Ltd	HCPL-7800	Single Protection, 3750 Vac isolation	UL		
H. Power Supply (DC-DC)	Tyco Electronics Power Systems Inc.	SW001A2B961-BZ	(Input 36-75 Vdc, 0.6 A; \ max.; Output 12 Vdc, 1.2 A)	UL		
I. PEM Capacitor (C24)	Various	Various	100 V, 33uF. Provided with Mylar tape.	-		
J. Connectors, Fan (P1, P7, P2) (Molex Inc.	Type 43650	600 Vdc	UL		
K. Plastic Insulator	3M Company or Manufacturer with equivalent Technical data	Type 9375(+)W or equivalent	V-2, 0.13 mm nominal thickness. RTI=50 °C. Provided between C24 and PWB)	UL		

L. Capacitor (C24) (PEM board, Rev. G)	Various	Various	100 V, 33 uF. Provided with Kapton Tape between Capacitor and PWB.	-		
M. Capacitor C71	Not Populated	-	-	-		
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PEM MODULE (Second), Optional, Same as the First PEM Module	Pentair Electronic Packaging	Assembly No. 01-W00204032 Rev.G, or Rev. H	(Input: 60 Vdc; Output: 60 Vdc)Secured by three screws.	--		
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FAN CARD CAGE TRAY, 2 Provided - Consists of components A to I.	Pentair Electronic Packaging	Part Number 01-W0020403, Rev. G or Rev. H.	(Input: 60 Vdc; No output)	--		
A. Printed Wiring Board	Various	Various	Min V-1, 105°C	UL		
B. Fans - 6 Provided	Delta Electronics Inc.	FFB0812SH	(12 Vdc, 0.60 A), 67 cfm. Brushless, Marked VDE.	UL and VDE		
B. Fans - 6 Provided, Alternate	Various	Various	Rated 12 V dc, maximum 0.80 A, minimum 50 CFM. Fan is also IEC/EN Certified to 60950 or 60960-1.	UL and either TUV-R, TUV-PS or VDE		
C. Power Supply (DC-DC), (U21)	Tyco Electronics Power Systems Inc.	SW003A0A-BZ	(Input 36-75 Vdc, 0.6 A max; Output 6 Vdc, 5 A)	UL		
D. Fuse (FS1, FS2, FS3, FS4, FS5)	Littelfuse Inc. or Manufacturer with Equivalent Technical Data	Series 451	125 Vdc, 2.5 A. Limits current draw for the fans.	UL		
E. Optical Isolators (U16, U17, U19, U20, U23, and U38)	NEC Electronics Corp. Compound Semiconductor Device Div.	PS2701	377 Vac, 50/80 mA; 3750 Vac isolation	UL		
F. Optical Isolators (U4, U6, U9, U12, U36, U37, U39)	Avago Technologies PTE Ltd. (Agilent)	HCPL-070L	Single Protection, 3750 Vrms Isolation	UL		
G. Optical Isolators	Avago Technologies	HCPL-7800	Single Protection 3750 Vac	UL		

(U29)	PTE Ltd.		isolation.			
H. Optical Isolators (U35)	Fairchild	HCPL-0730	2500 Vac isolation.	UL		
I. Optical Isolators (U4, U6, U9, U12, U36, U37, U39)	Avago Technologies PTE Ltd.	HCPL-070L	Single Protection, 3750 Vrms isolation.	UL		
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ACB IV BOARD (2 Provided) - Consists of components A to J	Pentair Electronic Packaging	Part Number 21594 346	(Input: 60 Vdc, No Output)	--		
A. Printed Wiring Board	Various	Various	Min V-1, 105°C	UL		
B. Battery - (Lithium)	Varta Consumer Batteries GMBH & Co. KGAA or Manufacturers with equivalent Technical Data	CR2016	3 V, 90 mAh. Battery expected to last the life of the product. Provided with battery protection circuit.	UL		
C. Battery Protection Circuit	Various	Various	1 KOhm resistor (R265) and Diode (V261) provided in series. See Enclosure, Schematics + PWB, Supplementary ID:5-01.	-		
D. DC-DC Converter (A311)	Power One AG	NDS03ZE-M6G [NDS03ZE-XX(d)]	(Input Rated 36-75 Vdc, 0.35 A.; Output Rated: 3.3 V dc, 3 A).	UL		
D. DC-DC Converter (A311), Alternate	Ericsson Power Modules AB	PKR 4110B SI	(Input Rated 36-75 Vdc; Output Rated: 3.3 V dc, 4.5 A, 14.5 VA)	UL		
D. DC-DC Converter (A311), Alternate	Tyco Electronics Power Systems Inc.	SW003A5F91 (SW003A5X)	(Input Rated 36-75 Vdc; Output Rated: 3.3 V dc, 3.5 A, 11.6 VA)	UL		
D. DC-DC Converter (A311), Alternate	Traco Electronic AG	TON 15 followed by suffixes	(Input Rated 36-75 Vdc, 377 mA; Output Rated: 3.3 V dc, 3.5 A)	UL		
E. Fuse (F311, F312,	Littelfuse or	Type 451 or	125 V, 2.5 A	UL		

F313, F314)	manufacturer with equivalent technical data.	equivalent				
F. Optical Isolators (N271, N281)	Avago Technologies PTE, Ltd.	HCPL-073A	Single, 3750 Vac isolation	UL		
G. Optical Isolators ((N504B)	Vishay	System U	3125 Vac isolation	UL		
H. Connectors (Used on ACB-IV)	EPT GMBH & Co. KG.	Series Hardmetric hm 2.0 Connectors	-	UL		
I. T311	Not Populated	-	-	-		
J. Connector	Various	Various	SELV (RJ-45), (Marked ETH0)	-		
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DSAP/SAP CARD - Consists of components A to D.	Pentair Electronic Packaging	Part Number 21596078	(Input: 60 Vdc, No output)	--		
B. Output Connectors	Various	Various	SELV.	-		
C. Relays (REL1, REL2, REL3, REL4)	Matsushita Electric Works, Ltd.	AGN200A03	Contact 30 Vdc, Coil 3 Vdc	UL		
D. Optical Isolator (OPTO)	Avago Technologies PTE Ltd.	HCPL-073A	Single 3750 Vac isolation	UL		
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ISAP CARD - Consists of components A to I	Pentair Electronic Packaging	Part Number 01-W00204 Rev. F	(Input: 60 Vdc, No output)	--		
A. Printed Wiring Board	Various	Various	Min. V-1, 105°C	UL		
B. Power Supply (DC-DC)	Tyco Electronics Power Systems Inc.	SW003A5F91-BZ	(Input 36-75 Vdc, 0.6 A max.; Output 3 V dc, 3.5 A)	UL		
C. Fuse (F1, FS1, FS2, FS3, FS4, FS5)	Littelfuse or manufacturer with Equivalent Technical Data	Series 451	125 V dc, 2.0 A	UL		
D. Relays (K1, K2, K5, K6)	Matsushita Electric Works. Ltd.	AGQ200A03	Contact 30 V, Coil 3 Vdc	UL		
E. Optical Isolator (U4)	Avago Technologies PTE Ltd.,	HCPL-7800	Single 3750 Vac isolation.	UL		

F. Optical Isolator (U13)	Avago Technologies PTE Ltd.,	HCPL-073A	Single 3750 Vac isolation.	UL		
G. Optical Isolator (U21, U23, U24, U28, U32)	NEC Electronics Corp. Compound Semiconductor Device Div.	PS2701	377 Vac, 50/80 mA; 3750 Vac isolation.	UL		
H. Connectors (Used on SAP and ISAP Boards)	EPT GMBH & Co. KG.	Series C/2 and Series C/3	125°C, 3 A.	UL		
I. Connectors	Various	Various	SELV	-		
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I/O Cards, Backplane, See below for components, A to E	Pentair Electronic Packaging	01-W0020401 (Rev. E or F)	(Input: 60 Vdc, No Output).	--		
A. Printed Wiring Board	Various	Various	Min V-1, 105°C	UL		
B. Connectors (J201, J221, J111, J121)	Molex Inc.	45484	RTI=220°C	UL		
C. Connectors (1_J10 to 1_J10)	Tyco Electronics Corp.	1766501	48 Vac, 130°C	UL		
D. Connectors (J523)	Erni Electroapparate GMBH	C/2	3 A, 125°C	UL		
E. Connectors (J522, J512)	EPT (Electronic Precision Technology) GMBH & Co. Kg.	Series C	250 V, 75°C	UL		