

MESSRS :

Product Specification

CUSTOMER'S PRODUCT NAME:

TDK PRODUCT NAME: DC-AC INVERTER UNIT
CXA-0420

TDK-Lambda

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DWG.No.	CTR-1750-B
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Notices on Inverter Use

Please pay enough attention to these notices and ensure safety design when using this product. There is potential risk for electrification, damage, ignition, or the like when the product is used wrong.



Warning



This product generates high voltage, so do not touch it when energized. Touching could cause electrification.



Caution

This is a product designed to light a cold-cathode tube. Please do not use it with other loads. Please keep this product within the limits of this specification sheet.

Please do not keep this product in an environment accompanied with dust, gas corrosion, etc (salt, acid, alkali, etc).

Since this product generates high voltage, please be sure to mark to alert users when there is a possibility for them to touch.

Please provide a sufficient fail-safe when you use this product for medical equipment directly affecting life, or to control transportation equipment taking charge of life, because this is a product designed for use in general electronic equipment.

Please avoid use in an environment accompanied with high temperature, high humidity, dust, gas corrosion (salt, acid, alkali, etc).

Also, please use it in a way to avoid condensation. It could cause damage or electrocution.

For a product with no built-in protection circuit (element, fuse, etc), we recommend use of a fuse in the input stage to prevent smoking or ignition at the time of an abnormal operation. For a product incorporating a built-in protection circuit (element, fuse, etc), it is also possible for the built-in protection circuit not to function due to differences in the operating condition, voltage source capacity, etc, so we recommend use of an appropriate individual protection circuit in such cases.

Please use the product within the specified limits of input voltage, output power, output voltage, and operating temperature range. Use beyond the specified limits could cause damage, etc.

Please implement measures against surge voltage such as by lightning. Abnormal voltage could cause damage, etc.

Please consider measures to keep foreign materials from entering after installation to prevent a failure due to short in the high-tension part.

This product is not designed for radiation hardness.

Caution for handling

As this product uses fine wire, please be careful not to cut the wire, paying attention to the following points. It could cause damage, etc.

- Please refrain from stacking the products.
- Please do not touch the product with tools or the like.

Please do not apply excessive force during installation. It could cause damage, etc such as chip cracks.

Provide clearance between the high-voltage section of this product and the frame body on which the product is installed and also the conductor section as per listed on section [1] "Outline".

When dropped, the part could be damaged, so please do not use it.

Should you use it, please make sure sufficiently that there is no abnormality in the product.

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1. Part Name

The part name is CXA-0420.

2. Contents

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Listed description are subject to change without notice.

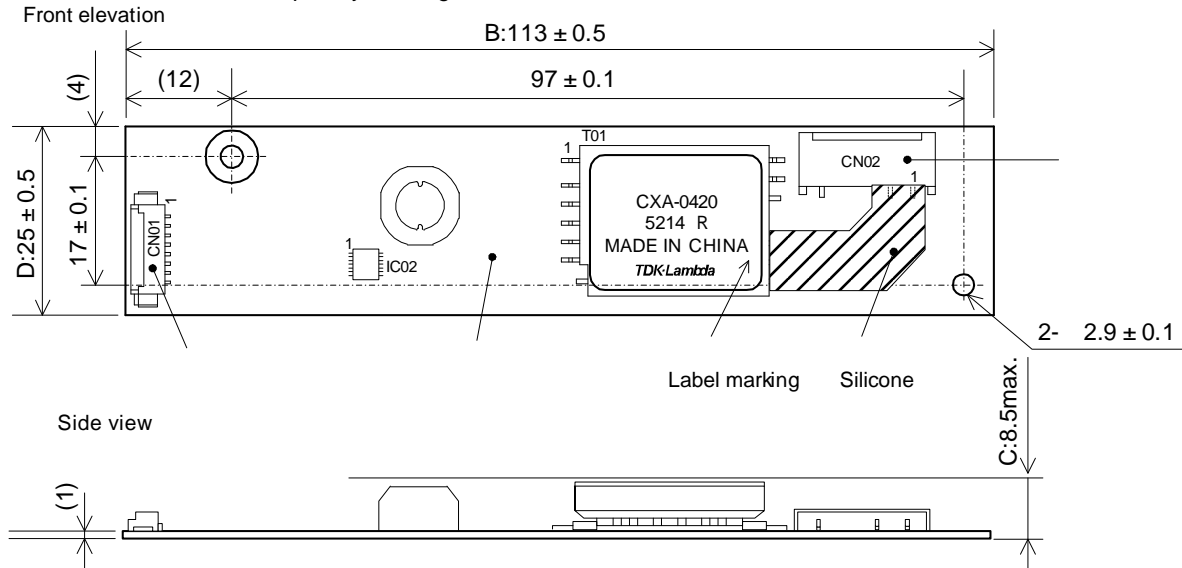
Product Outline

- This product is a 2-lamp inverter and has dimming functions and remote functions.
- This product has a shutdown function for safety to stop high voltage generation when all loads (lamps) are open.
- Also, a lamp blowout detection function (alarm signal) is incorporated to output 5V to CN01-8 pin when the load is open. When loads (lamps) are connected normally, 0V is output on CN01-8, and when loads (lamps) are open or lamps are shorted with GND, 5V is output on CN01-8.
- The high voltage generating section is coated with silicone as a measure against dust.
- Dimming is available with this product by choosing either one of the following methods (See [4] Measurement Circuit).
 - Dimming by volume resistance (0-10k)
 - Dimming by applying voltage (0-2.5V)
- RoHS Directive compliant product

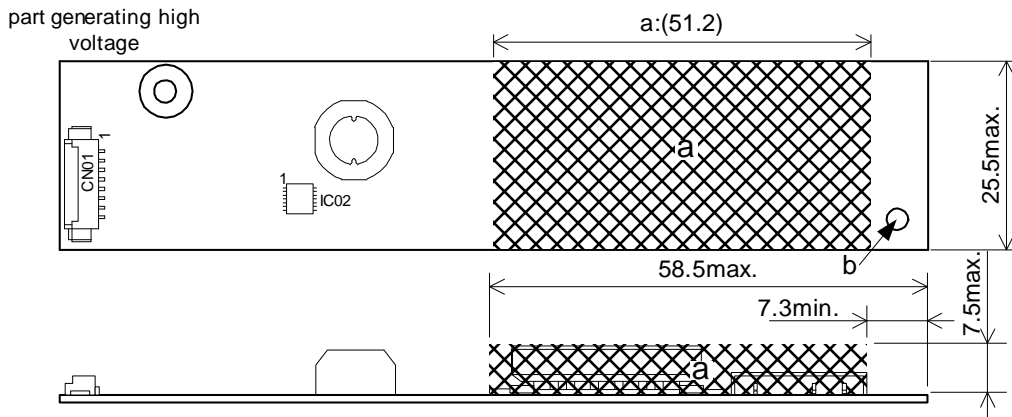
RoHS Directive compliant: This means that, except for exempted applications, lead, cadmium, mercury, hexavalent chromium, and specified bromine fire retardant materials of PBB and PBDE are not used based on EU Directive 2002/95/EC.

[1] External appearance/structure and dimensions

1-1. External dimensions, pin layout diagram



Please secure 3mm or longer space distance from the high voltage generating area in all directions. Please see Note 1-3 for the details.



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No.	Product name	Type name / material	Quantity	Remarks	Recommended conforming connector
	Printed wiring board PWB	Composite (CEM-3)	1	UL94V-0 t=1.0	-
	Input connector CN01	53261-0871	1	JST	51021-0800
	Output connector CN02	SM03(7-D1)B-BHS-1-TB(LF)(SN)	1	JST	BHR-04VS-1

1-2. Pin connection

Input side CN01

Pin No.	Symbol	Rating	Remarks
CN01-1	Vin	4.5 ~ 13.2V	Power input
CN01-2			
CN01-3	GND	0V	GND
CN01-4			
CN01-5	Vrmt	0V/2.5V ~ Vin	Remort pin 0 ~ 0.8V:OFF 2.0V ~ VDDB:ON Open:ON
CN01-6	Rbr/Vbr	0 ~ 2.5V /0 ~ 10k	Dimming pin (voltage input/ resistor connection)
CN01-7	Rbr2	0 ~ 10k	Dimming pin (resistor connection)
CN01-8	Vst (Output)	0V/5V	Alarm output At abnormal times: 5V

Output side CN02

Pin No.	Symbol	Rating	Remarks
CN02-1	VHIGH1	360Vrms	Output 1
CN02-2	VHIGH2	360Vrms	Output 2
CN02-3	NC	-	-
CN02-4	VLOW	(2V)	Return on output 1,2

Note 1-1. Marking of product name, lot no., and country of origin

- 1) Product name, lot no. and country of origin are marked on a label on a transformer.
- 2) Lot no. marking example (manufactured on February 14, 2005)



- 3) Country of origin marking example (MADE IN JAPAN and MADE IN CHINA, etc.)

Note 1-2. As to pin connections, please refer to Section [4] Measurement Circuit.

Note 1-3. Part "a" (Between the transformer and CN2) in the external appearance diagram generates high voltage. When you mount a conductive material (metal frame, etc) nearby part "a" during installation, please be careful to secure 3mm or larger spacial distance in all directions around it to prevent electric discharge from the high-tension part to the conductive material.

Note 1-4. When the voltage of the output connector is measured with no load (e.g., before the cold-cathode tube is lighted), the voltage will be measured lower than the actual output, depending on the capacitance of a probe used and a measurement method, because it will be divided by the capacitance of a ballast capacitor, a high voltage probe, etc in the DC-AC inverter circuit.

In order to eliminate this error by capacitance, above output open circuit voltage is specified by measuring the output on the transformer's winding pins.

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Note 1-5. The voltage applied to the load could be lower than the output open-circuit voltage when the distributed capacitance in a mounted condition is high (due to leakage of current by distributed capacitance), and makes it particularly hard to light when driving a cold-cathode tube in low temperatures. Please be careful in your installation to make the distributed capacitance as low as possible.(For example, make high-tension wiring to a cold-cathode tube as short as possible, Also, please do not twist the cable connecting the LCD and the output connector (CN02) of the inverter.)

Note 1-6.

In a low current zone, please confirm characteristics of the lamp before use. Flickering could occur depending on a lamp.

Note 1-7.

Please set the input power source capacity to 3.5A or higher. If it is less than 3.5A, there is a possibility for a circuit protection element(fuse or IC protector) not to melt.

Note 1-8.

CFL COLG pin of CN02 (CN02-4) andGNDB pin of CN01 (CN01-3,4) are different, so please do not connect them.

Note 1-9.

The metal screw of M2 and M2.5 can be used for installation hole b.

[2] Absolute maximum rating

Item	Symbol	Spec	Unit	Remarks
Input voltage	Vin	0 ~ 14	V	-
	Vrmt	-1 ~ Vin+1		
	Vbr	-1 ~ +5		
Load resistance	RL	80	k	-
Operating temperature range	Ta	-10 ~ 75		-
Storage temperature range	Ts	-20 ~ 85		-
Humidity range	RH	95	%RH	Maximum wet-bulb temperature to be 38 No condensation to occur

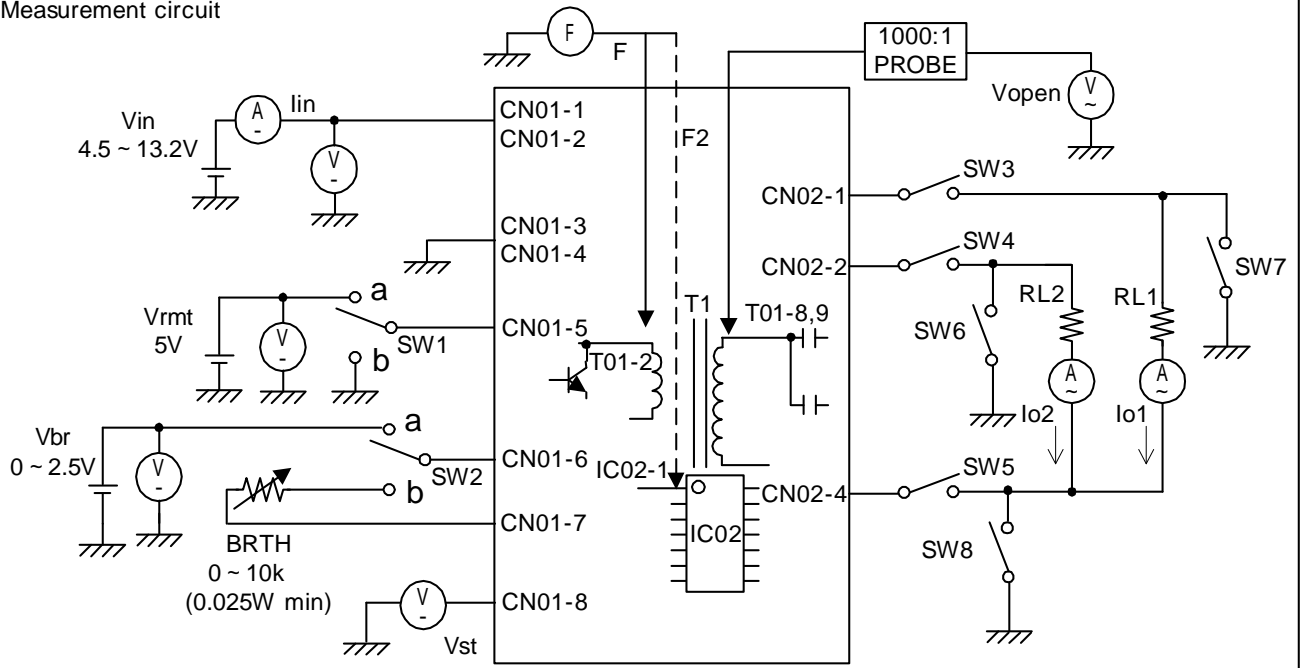
[3] Electrical characteristics

Item	Symbol	Measurement condition				Inspection standard			Unit	
		Vin(V)	Vrmt(V)	Vv(V), RL(k)	Ta()	RL1/RL2	min	typ		max
Output current (dimming max.)	Io1/2	4.5 ~ 13.2	5 ± 0.05	2.5V or 10k	-10 ~ 75	70k 70k	4.5	5.0	5.5	mArms
Output current (dimming min.)	Io1/2	4.5 ± 0.05	5 ± 0.05	0V or 0	-10 ~ 75	70k 70k	2.0	2.5	3.0	mArms
Output current (dimming min.)	Io1/2	13.2 ± 0.05	5 ± 0.05	0V or 0	-10 ~ 75	70k 70k	2.0	2.5	3.0	mArms
Input current 1	Iin1	5 ± 0.05	5 ± 0.05	2.5V or 10k	-10 ~ 75	70k 70k	-	1050	1350	mA
Input current 2	Iin2	12 ± 0.05	5 ± 0.05	2.5V or 10k	-10 ~ 75	70k 70k	-	500	630	mA
Input current 3	Iin3	4.5 ~ 13.2	0	2.5V or 10k	-10 ~ 75	70k 70k	-	0.5	1	mA
Input current 4	Iin4	4.5 ~ 13.2	5 ± 0.05	2.5V or 10k	-10 ~ 75		-	19	30	mA
Oscillation frequency	F1	4.5 ~ 13.2	5 ± 0.05	2.5V or 10k	-10 ~ 75	70k 70k	50	55	60	kHz
Dimming frequency	F2	4.5 ~ 13.2	5 ± 0.05	0V or 0	-10 ~ 75	70k 70k	240	255	269	Hz
Output open-circuit voltage	Vopen	4.5 ~ 13.2	5 ± 0.05	2.5V or 10k	-10 ~ 75		1100	1300	1600	Vrms
Alarm output	Vst1	4.5 ~ 13.2	5 ± 0.05	2.5V or 10k	-10 ~ 75	70k	4.0	5.0	5.5	V
	Vst2	4.5 ~ 13.2	5 ± 0.05	2.5V or 10k	-10 ~ 75	70k	4.0	5.0	5.5	V
	Vst3	4.5 ~ 13.2	5 ± 0.05	2.5V or 10k	-10 ~ 75	To be connected to GND To be connected to GND	4.0	5.0	5.5	V
	Vst4	4.5 ~ 13.2	5 ± 0.05	2.5V or 10k	-10 ~ 75	To be connected to GND 70k	4.0	5.0	5.5	V
	Vst5	4.5 ~ 13.2	5 ± 0.05	2.5V or 10k	-10 ~ 75	70k To be connected to GND	4.0	5.0	5.5	V
	Vst6	4.5 ~ 13.2	5 ± 0.05	2.5V or 10k	-10 ~ 75		4.0	5.0	5.5	V
	Vst7	4.5 ~ 13.2	5 ± 0.05	2.5V or 10k	-10 ~ 75	70k 70k	-	0	0.5	V

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[4] Measurement circuit



RL1,2:Load resistor (7W or higher)

* With regard to the pin numbers and locations, please refer to 1-1. Appearance and Dimensions Diagram.

Note 4-1.

To be the one to operate as follows by ON-OFF of SW1.

SW1	Unit operation
a	Operates
b	Does not operate
Open	Operates

Note 4-2.

To be the one to operate as follows by switching SW2.

SW2	Unit operation
a	Voltage dimming Vbr=0 ~ 2.5V (2.5V:Luminance max.)
b	Volume dimming VR=0 ~ 10k (10 :Luminance max.)

Note 4-3.

To be the one to operate as follows by ON-OFF of SW3 ~ 8.

SW3 ~ 5	Alarm output operation
Open	Operates (5V output)
Close	Does not operate (0V output)

SW6 ~ 8	Alarm output operation
Open	Does not operate (0V output)
Close	Operates (5V output)

Note 4-4. Measuring apparatus

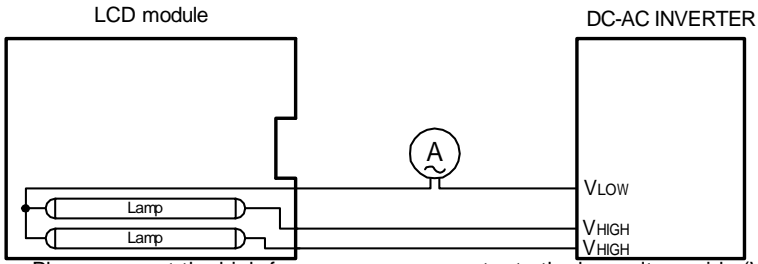
- (V) :DC voltmeter (ADVANTEST R6451A or equivalent)
- (A) :DC ampere meter (ADVANTEST R6451A or equivalent)
- (V) :Effective value voltmeter (KEITHLEY 2001 or equivalent)
- (F) :Frequency counter (ADVANTEST R6452A or equivalent)
- (A) :High-frequency ampere meter (KEITHLEY 2001 or equivalent)

1000:1 :High voltage probe (Tektronix P3000 or equivalent)

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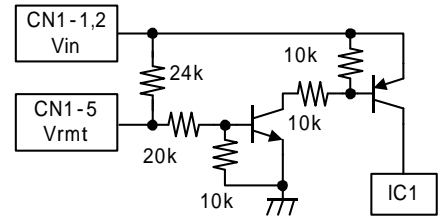
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LCD module connection diagram (reference)



Please connect the high-frequency ammeter to the low voltage side (VLow side).

BRTCpin circuit (reference)



[5] Reliability Test

To meet the following reliability tests.

Test item	Test conditions	Judgment criteria
Low temperature exposure	-25 500h	No defect to exist in electric characteristics and external appearance.
Low temperature operation	-15 1000h Operating condition : As rated	
High temperature exposure	90 500h	
High temperature operation	75 1000h Operating condition : As rated	
Thermal shock	-25 85 100 cycles 30 min. each	
Moisture resistance	60 90 ~ 95%RH 1000h Operating condition : As rated	
Vibration	5 ~ 100Hz 19.6m/s ² One minute cycle 120 min. each in X, Y, Z directions	
Shock	539.4m/s ² 11ms Sine halfwave Five times. each in ± X, Y, Z directions	

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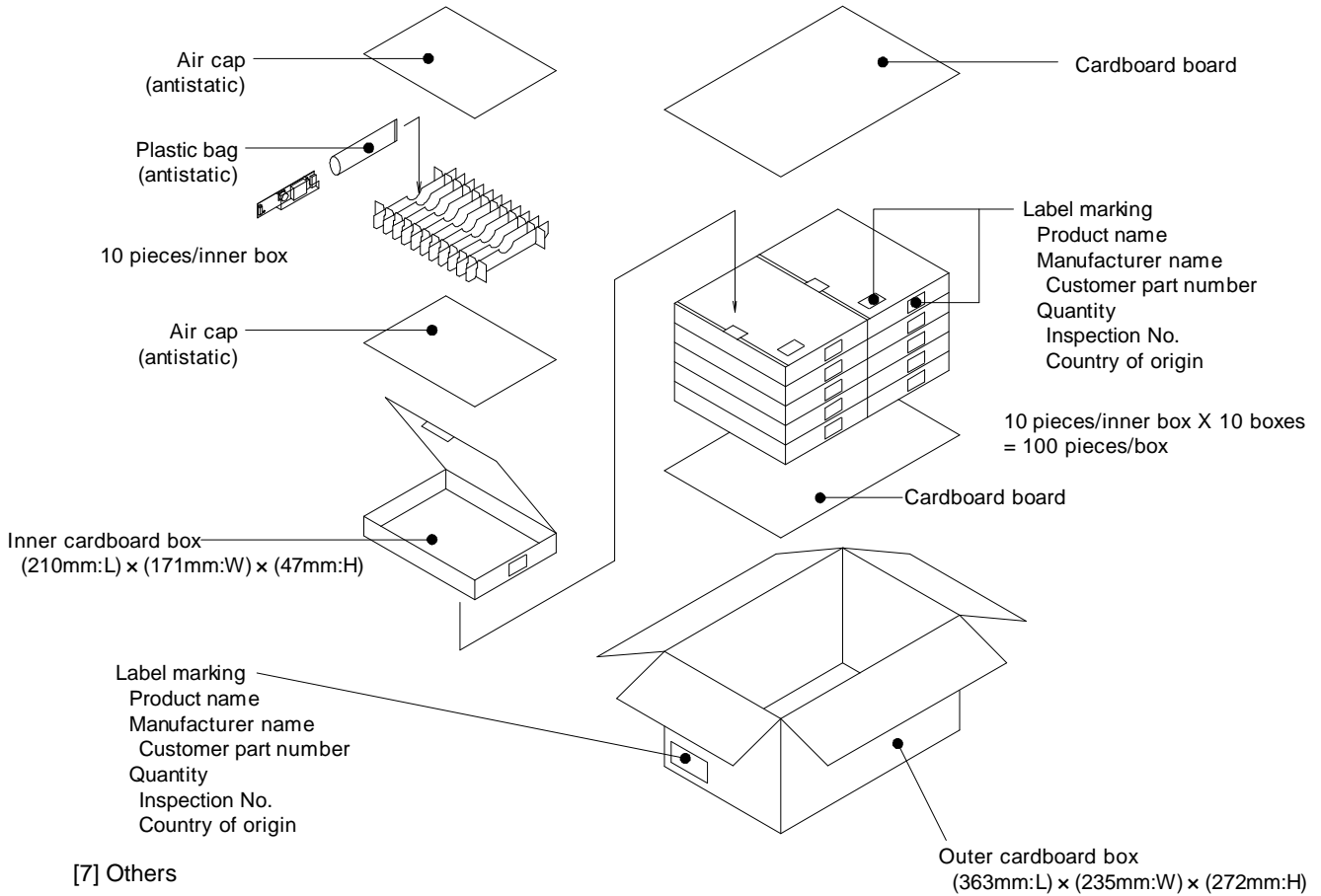
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[6] Packaging and marking

6-1. The product is to be packaged to be safe and free from water absorption and damage and to be marked with following items.

- 1) Product name CXA-0420
- 2) Manufacturer name TDK
- 3) Quantity
- 4) Inspection No.
- 5) Country of origin

Packing style as under Fig. (100 going in with a standard.)



[7] Others

7-1. Test conditions

Unless otherwise specified, the temperature to be (20 ± 15) and humidity to be (65 ± 20) %RH.

7-2. Warranty

Warranty shall be for one year after delivery, and those products causing failure during the warranty period and which failures are attributed to the manufacturer's responsibility shall be replaced at no charge.

7-3. Disposition for non-conforming lots

Non-conforming lots, when occurred, shall be discussed and decided upon between both parties.

7-4. Application standard

It is designed based on UL1950 and IEC60950.

7-5. MTF

MTTF which calculated according to MIL-HDBK-217-F is as follows.

TEMPERATURES 25
 MTTF 870,000h

7-6. Others

When any doubt arises about this specification, it shall be discussed and decided upon between both parties.

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