

MESSRS :

PRODUCT DRAWING

CUSTOMER'S PRODUCT NAME:

TDK PRODUCT NAME: DC-AC INVERTER UNIT
CXA-0492

TDK-Lambda

TDK Corporation

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DWG.No.	CTR-2661-C
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Precautionary Notes Regarding the Use of This Inverter

When using this product, give due consideration to the precautionary notes described below and ensure a safe design. Inappropriate use may result in electric shock, injury or fire.



Warning



- This product is subject to high voltage. Do not touch it while the power is on. Failing to do so may result in electric shock.



Caution

- This product is designed for the lighting of a Cold Cathode Fluorescent Lamp. Do not use it with any other load.
- Store this product under the conditions defined in the specification document.
- Do not store this product in an environment where dust, dirt or corrosive gas (salt, acid, base, etc.) is present.
- This product is subject to high voltage. If there is a possibility that the user may touch the product, provide a proper indication in order to draw the user's attention.
- This product is designed for use with general electronic equipment. If it is to be used with medical equipment that directly affects human life or for the control of transportation equipment to which passengers entrust their lives, provide thorough fail-safe measures.
- Avoid using this product under high temperatures or high humidity or in an environment in which dust, dirt or any corrosive gas (salt, acid, base, etc.) is present. Also, be careful not to allow the formation of dew condensation. It may result in damage or electric shock.
- If the product does not have a built-in protective circuit (circuit breaker, fuse, etc.), it is recommended that a fuse be used at the input stage to prevent the generation of smoke or fire in the event of a malfunction. Even when the product has a built-in protective circuit (circuit breaker, fuse, etc.), the circuit may not function properly due to inappropriate operating conditions or power-supply capacity. It is recommended that an appropriate protective circuit (circuit breaker, fuse, etc.) be provided separately from the built-in circuit.
- Use the product only within the specified input voltage, output power, output voltage and operating temperature ranges. Exceeding these values may result in damage, etc.
- Provide a measure for the prevention of surge voltage due to lightning, etc. Abnormal voltage may result in damage, etc.
- To prevent problems arising from short-circuiting of the high-voltage section, provide appropriate measures to prevent the entry of foreign substances following installation.
- This product is not designed to provide resistance to radiation.
- Ripples could be superimposed on the voltage and the current in the input source connected to the inverter, depending on the impedance in the input source, wiring, etc. When you select an input source, please check waveforms, etc on the final set.

Handling Precautions

- This product uses thin wires. Observe the following precautions and handle it with care so as not to cause wire breakage. Broken wire may result in damage, etc.
 - Do not stack multiple products on top of one another.
 - Do not allow the product to come in contact with tools, etc.
- Do not apply excessive stress during installation. It may cause chipping and cracking, resulting in damage, etc.
- 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 page 2, [1] "Outline".
- Please do not use the product, when dropping it, since there is a possibility of the parts damage. Please confirm abnormality is not found in the product enough when using it by any chance.

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1 . Applicability

This specification sheet shall apply to a DC-AC converter to be delivered to Messrs. Each company.

2 . Product Name

The name of the product defined in this specification sheet shall be called DC-AC Inverter CXA-0492.

3 . Specified Items

Items	Diagrams and tables attached	Page
1.External appearance/structure and dimensions		
1-1. Appearance and Dimensions Diagram	Per Section [1].	3
1-2. Pin connection	Per Section [1].	4
2.Absolute maximum rating	Per Section [2].	5
3.Electrical characteristics	Per Section [3].	5
4.Measurement circuit	Per Section [4].	6
5.Various tests	Per Section [5].	7
6.Packaging and marking	Per Section [6].	8
7.Others		
7-1.Test conditions	Per Section [7].	8
7-2.Correspondence of trouble goods	Per Section [7].	8
7-3.Ozone-depleting substances	Per Section [7].	8
7-4.Disposition for non-conforming lots	Per Section [7].	8
7-5.Adjustment standard	Per Section [7].	8
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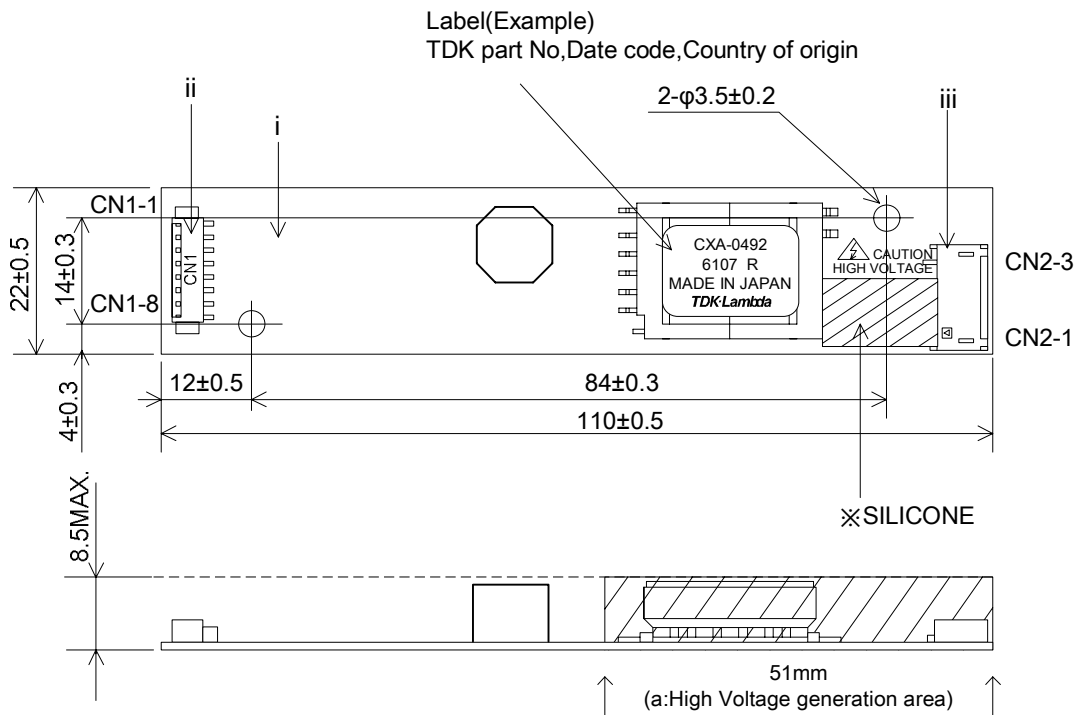
- The specifications may be changed without any notice.
- When placing orders, please confirm "Specifications" or Product Drawing" through TDK sales or distributors.

●Product Outline●

- This product is a 1-lamp inverter and has dimming 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.
 - This is a RoHS Directive compliant (※)product.
- (※)RoHS Directive compliant: This means that, except for exempted applications, lead, cadmium, mercury, hexavalent chromium, and specified bromite 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.



Unit:mm
Weight:18.0g.typ.

No.	Product name	Type name / material	Quantity	Remarks	Recommended conforming connector
i	Printed wiring board PCB	Composite (CEM-3)	1	UL94V-0 t=1.0	-
ii	Input connector CN1	53261-0871	1	MOLEX	51021-0800
iii	Output connector CN2	SM02(8.0)B-BHS-1-TB(LF)(SN)	1	JST	BHR-03VS-1

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1-2. Pin connection

Input side CN1

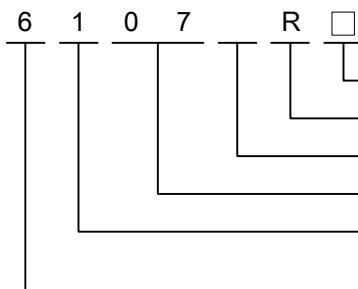
Pin No.	Symbol	Rating	Remarks
CN1-1	Vin	10.8 ~ 13.2V	Power input
CN1-2			
CN1-3	GND	0V	GND
CN1-4			
CN1-5	Vrmt	0V / 2.5V ~ Vin	Remote Pin 0 ~ 0.4V : OFF 2.5 ~ Vin V : ON
CN1-6	Vbr1 / Rbr1	0 ~ 2.5V / 0 ~ 50kΩ	Dimming Pin 1
CN1-7	Vbr2 / Rbr2	GND/0 ~ 50kΩ	Dimming Pin 2
CN1-8	Vst (Output)	0V/5V	Alarm output At abnormal times : 5V

Output side CN2

Pin No.	Symbol	Rating	Remarks
CN2-1	VHIGH	870Vrms 6mArms	Output 1
CN2-2	-	-----	NC
CN2-3	VLow	(2V)	Output 1 Remote

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

- 1) The marking method shall be by a label put on a transformer.
- 2) Lot no. marking example (manufactured on January 7, 2006)



Revision symbol (To be blank initially, then to show A, B, ... when revised)
This is a RoHS Directive compliant (*) product. Identification mark
Blank

Manufacturing date (marked in 2 digits)
Manufacturing month (marked in 1 digit except October, November and December that are represented by X, Y and Z respectively.)
Manufacturing year (last digit in Christian year)

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

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, and never use stranded wire for the high-tension wiring.)

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 2.5A or higher. If it is less than 2.5A, there is a possibility for a circuit protection element (fuse or IC protector) not to melt.

Note 1-8. Due to impedance from the input source and line, ripple can overlap in the voltage/current from the input source. Though the product has an internal fuse rated at 1.25A, input ripple current should be less than 1.25A.

Note 1-9. VLow pin of CN02 (CN2-1) and GND pin of CN01 (CN01-3,4) are different, so please do not connect them.

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[2] Absolute maximum rating

Item	Symbol	Spec	Unit	Remarks
Input voltage	Vin	0 ~ 14	V	
	Vrmt	-1 ~ Vin+1		
	Vbr	0 ~ 16		
Load resistance	RL//CL	160//16	kΩ//pF	
Operating temperature range	Ta	-30 ~ 80	°C	
Storage temperature range	Ts	-30 ~ 85	°C	
Humidity range	RH	95	%RH	Maximum wet-bulb temperature to be 38°C No condensation to occur

[3] Electrical characteristics

Item	Symbol	Conditions					Spec			Unit
		Vin(V)	Vrmt(V)	Rbr(kΩ)/ Vbr(V)	Ta(°C)	RL1(kΩ)//CL1(pF)	MIN.	TYP.	MAX.	
Output current (dimming max.)	Iout1	12±1.2	5±0.25	0 / 0	-30 ~ 80	145//15	5.5	6.0	6.5	mArms
Output current (dimming min.)	Iout1	12±1.2	5±0.25	50 / 2.5	-30 ~ 80	145//15	1.6	2.6	3.6	mArms
Input current 1	Iin1	12±1.2	5±0.25	0 / 0	-30 ~ 80	145//15	-	0.59	1.25	A
Input current 2	Iin2	12±1.2	0±0.25	0 / 0	-30 ~ 80	145//15	-	-	1	mA
Input current 3	Iin3	12±1.2	5±0.25	0 / 0	-30 ~ 80	∞	-	12	30	mA
Oscillation frequency	F1	12±1.2	5±0.25	0 / 0	-30 ~ 80	145//15	52	57	62	kHz
Oscillation frequency (Duty)	F2	12±1.2	5±0.25	50 / 2.5	-30 ~ 80	145//15	230	255	280	Hz
Output open-circuit voltage	Vopen	10.8 ±0.05	5±0.25	0 / 0	-30 ~ 80	∞	2050	2200	-	Vrms
Alarm output	Vst	12±1.2	5±0.25	0 / 0	-30 ~ 80	∞	4.5	5.1	5.5	V
		12±1.2	5±0.25	0 / 0	-30 ~ 80	145//15	-	0	0.5	V

Note 3-1. Iin3 and Vst1 are the values when the oscillation stopped at about three seconds after it begins to operate by a no load.

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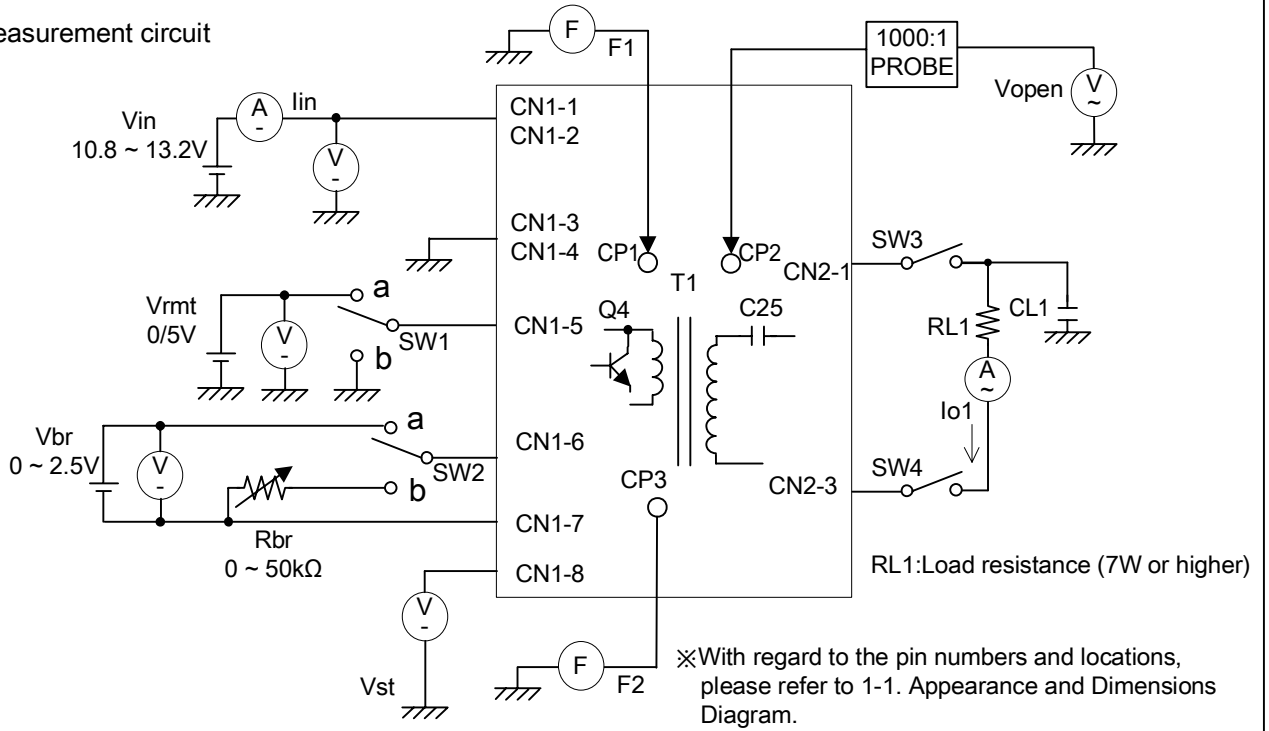
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[4] Measurement circuit



※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	Does not operate

Note 4-2. To be the one to operate as follows by switching SW2.

SW2	Unit operation
a	※Voltage dimming Vbr=0 ~ 2.5V
b	※Volume dimming VR=0 ~ 50kΩ

※Vbr=0V:LuminanceMAX.
Rbr=0Ω:LuminanceMAX.

Note 4-3. Protection circuit operation

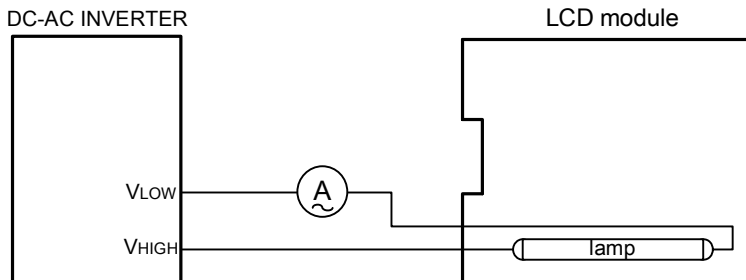
Load condition	Alarm output (CN1-8)※1	Shutdown function※2
At normal times	0.5V max.	Does not shut down
When one load (lamp) is N.G.	4.75 ~ 5.25V	Shuts down

※1.5V alarm output is generated when either one of SW3 and SW4 of [4] Measurement circuits or more loads turn open.
 ※2. This inverter includes a protection circuit that stops the operation in about 3 seconds when all the lamps turn open.

Note 4-4. Measuring instrument machine

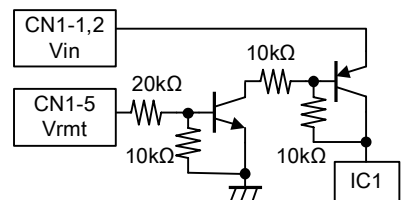
- Ⓜ: DC voltmeter (ADVANTEST R6451A or equivalent)
- Ⓐ: DC ampere meter (ADVANTEST R6451A or equivalent)
- Ⓜ: Effective value voltmeter (KEITHLEY 2001 or equivalent)
- Ⓜ: Frequency counter (ADVANTEST R6452A or equivalent)
- Ⓐ: High-frequency ampere meter (KEITHLEY 2001 or equivalent)
- 1000:1: High voltage probe (Tektronix P3000 or equivalent)

LCD module connection diagram (reference)



※Please connect the high-frequency ampere meter to the low voltage side (VLow side).

Vrmt pin circuit (reference)



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[5] Various tests

To meet the following reliability tests.

Test item	Test conditions	Judgment criteria
Low temperature exposure	-30°C 500h	No defect to exist in electric characteristics and external appearance.
Low temperature operation	-30°C 500h Operating condition : As rated Load Cond. : TYP.	
High temperature exposure	85°C 500h	
High temperature operation	80°C 500h Operating condition : As rated Load Cond. : TYP.	
Thermal shock	-20°C↔75°C 100 cycles 30 min. each 30min. Each 100 Cycles	
Moisture resistance	60°C 90 ~ 95% R H 500h	
Moisture resistant operation	60°C 90 ~ 95%RH 500h Operating condition : As rated Load Cond. : TYP.	
Vibration	10 ~ 57Hz Half-amplitude 0.75mm Amplitude 58 ~ 500Hz 9.8m/s ² Sweeping time : 11 min. Sweep : 11min X, Y, Z directions, 1 hour for each 3 hours in total 60min each axis X,Y,Z	
Shock	980m/s ² 11ms Half wave sine wave Half-Sine Pulse ±1 X, Y, Z directions, 1 time for each 6 times in total 1 times each axis ±X,±Y,±Z	

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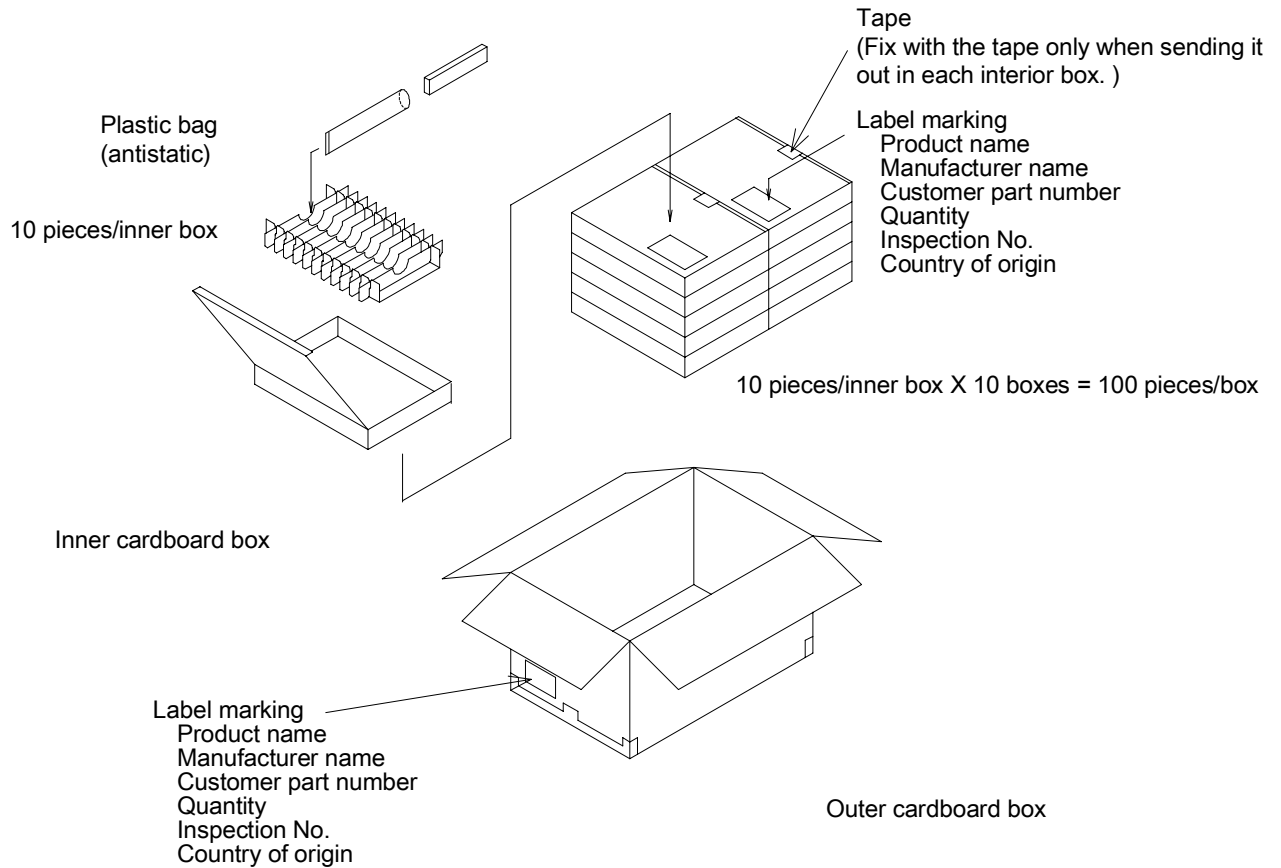
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[6] Packaging and marking

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

- 6-1. Product name or Name CXA-0492
- 6-2. Manufacturer name TDK
- 6-3. Customer part number
- 6-4. Wrapping form
- 6-5. Country of origin
- 6-6. Quantity

Packing style as under Fig.



[7]Others

- 7-1. Test conditions
Unless otherwise specified, the temperature to be (20±15)°C and humidity to be (65±20) %RH.
- 7-2. Correspondence of trouble goods
To the breakdown, which failures are attributed to the manufacturer's responsibility shall be replaced at no charge.
- 7-3. Ozone-depleting substances
Ozone-depleting substances are not used in the manufacturing process of this product.
- 7-4. Disposition for non-conforming lots
Non-conforming lots, when occurred, shall be discussed and decided upon between both parties.
- 7-5. Adjustment standard
It is designed based on UL1950 and IEC60950.
- 7-6. Others
When any doubt arises about this specification, it shall be discussed and decided upon between both parties.

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