

MESSRS :

PRODUCT DRAWING

CUSTOMER'S PRODUCT NAME:

TDK PRODUCT NAME: DC-AC INVERTER UNIT
CXA-P1212C-WJL



TDK Corporation

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|---------|------------|
| DWG.No. | CTR-0929-D |
|---------|------------|

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.

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 a clearance of 2 mm or more between the high-voltage section of this product and the frame body on which the product is installed and also the conductor section (pattern, pad, etc.).
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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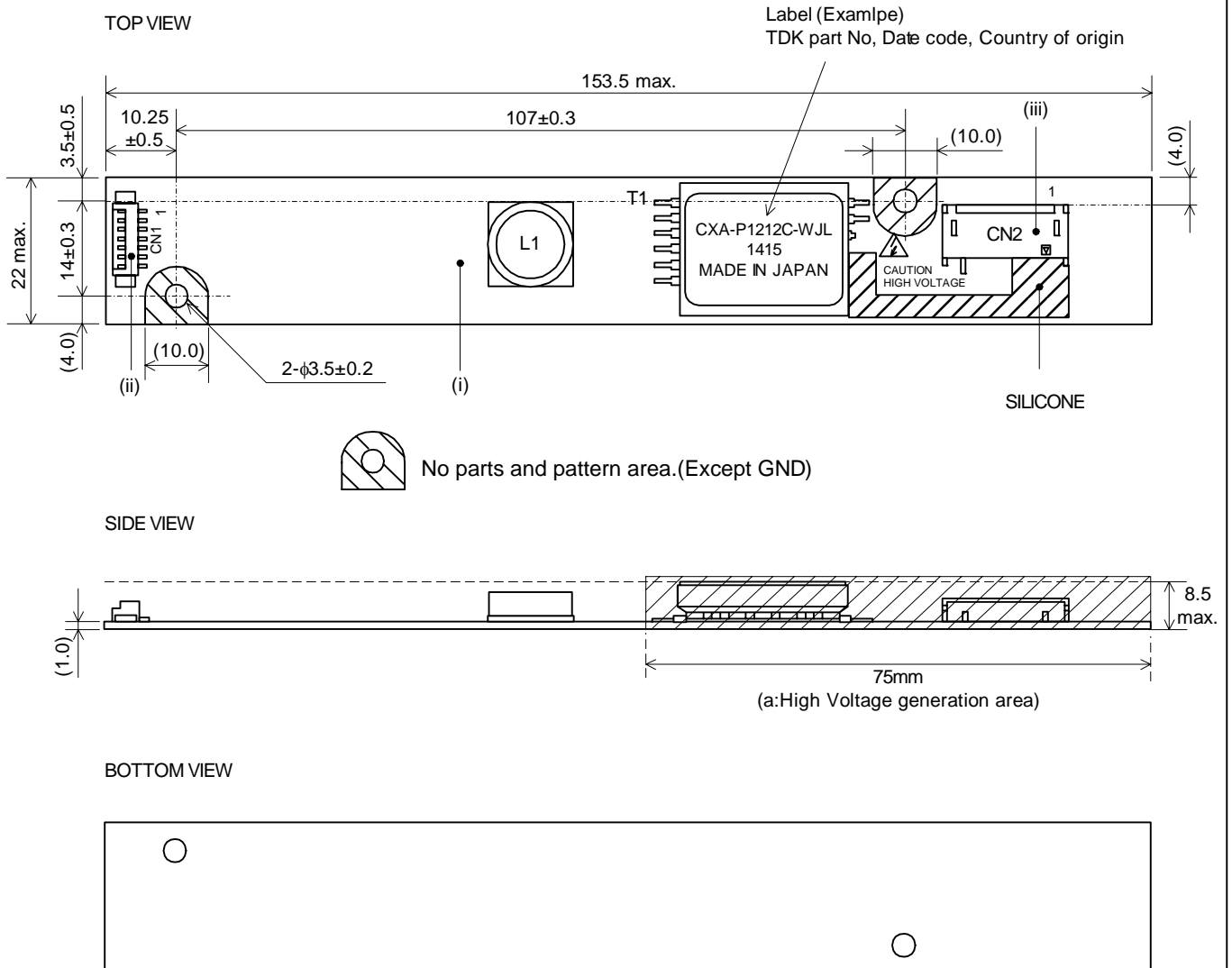
• The specifications may be changed without any notice.
 • When placing orders,
 please confirm "Specifications" or "Product Drawing" through TDK sales or distributors.

Features

- This inverter is for two lamps. It has Dimming function(PWM System) and Remote function.
- This product has shutdown function.
 It prevents from keeping generating the high voltage when the lamps open.(Refer Note.3-4.)
- With lamp failure detector.
 Normal Operation : CN1-8=0V
 Some Lamps Open : CN1-8=5V
- Select the way of dimming (between CN1-6 and CN1-7)
 1. Insert a potentiometer (0-50kΩ)
 2. Apply the voltage (0-2.5V)
- The high-voltage area (terminals and patterns) is coated with silicone so as to avoid the defects caused by dust.

[1] Outline

1-1. Outline

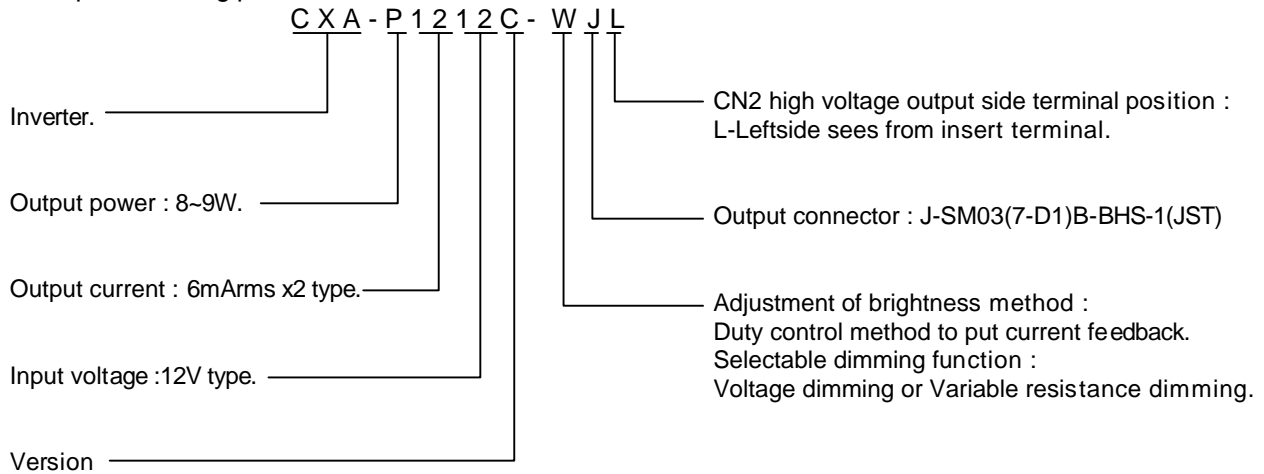


Unit:mm
 Weight:20.0g.typ.

| No. | Part Description | Material | QU | REMARK | MATES WITH |
|-------|----------------------|-------------------|----|---------------|------------|
| (i) | PCB | Composite (CEM-3) | 1 | UL94V-0 t=1.0 | - |
| (ii) | Input Connector CN1 | 53261-0790 | 1 | MOLEX | 51021-0700 |
| (iii) | Output Connector CN2 | SM03(7-D1)B-BHS-1 | 1 | JST | BHR-04VS-1 |

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Example of naming product



1-2. Connector Configuration

Input side CN1

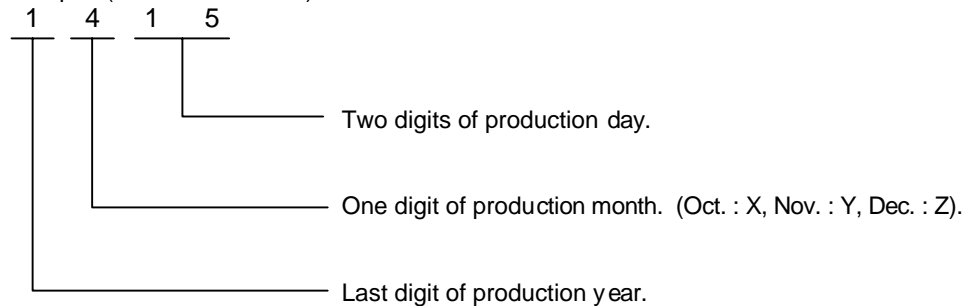
| Pin No. | Symbols | Ratings | Notes |
|---------|---------|----------------------------|--|
| CN1-1 | Vin | 10.8-13.2V | Input Voltage |
| CN1-2 | | | |
| CN1-3 | GND | 0V | GND |
| CN1-4 | | | |
| CN1-5 | Vrmt | 0-0.4V:OFF 2.5-Vin V:ON | Remote Input Voltage |
| CN1-6 | Vst | 0V / 5V | The warning output 5V in abnormal circumstances |
| CN1-7 | Vbr/Rbr | 0-2.5V/0-50kΩ | Control/VR |

Output side CN2

| Pin No. | Symbols | Ratings | Notes |
|---------|---------|---------|----------------|
| CN2-1 | VHIGH1 | 600Vrms | Output1 |
| CN2-2 | VHIGH2 | 600Vrms | Output2 |
| CN2-3 | NC | - | - |
| CN2-4 | VLOW | (2V) | Output1 Return |

Note1-1. Marking of TDK part No, Date code, Country of origin.

- 1) TDK part No., Date code, Country of origin, is marked on the transformer.
- 2) Date code example. (ex. APR. 15. 2001)



- 3) Country of origin code example. (ex. MADE IN JAPAN. MADE IN CHINA).

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Note1-2. For circuit connection, please refer to test circuit diagram [3].

Note1-3. Please use minimum of 2mm clearance (all directions) between inverter high voltage area and any conductors. Please refer to mechanical drawing for marking of high voltage area.

Note1-4. Open voltage (strike voltage) is measured across the transformer secondary winding at no load as the reading at the output connector would be less than the actual value.

Note1-5. If the start up voltage falls below Cold Cathode Tube strike voltage, the CCFL will not light up easily especially at lower ambient temperature. Please review mounting instruction to avoid any abnormal operation due to coupling/leakage capacitance of inverter high voltage area to any surrounding conductor.

Note1-6. Please check your lamp characteristic for minimum operational current and set the limit point in your design to avoid flickering and/or abnormal operation.

Note1-7. For proper operation of circuit protection (fuse or IC PROTECTOR), Please use minimum of 2A capacity for input power supply.

Note1-8. For proper operation: Don't connect the output VLOW(CN2-4) terminal to the input GND(CN1-3,4).

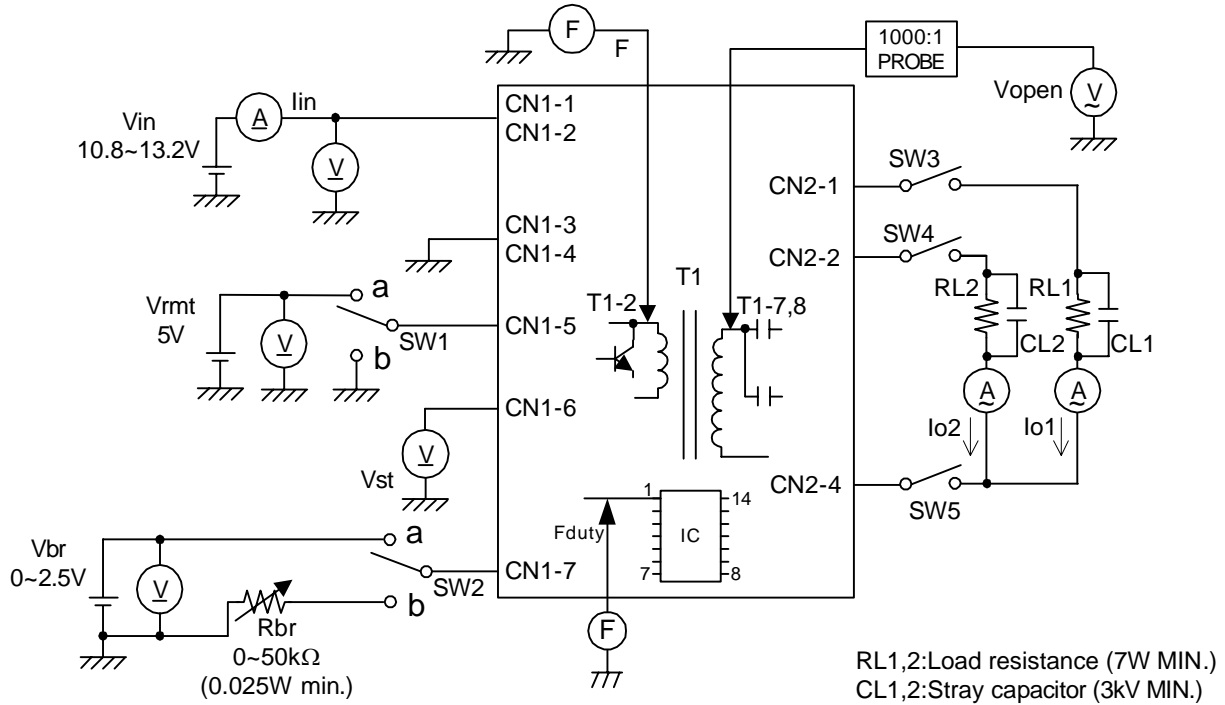
[2]Absolute maximum ratings

| Items | Symbols | Specification | Unit | Notes |
|-----------------------|---------|---------------|----------|---|
| Input Voltage | Vin | 0~15 | V | |
| | Vrmt | -1~Vin+1 | | |
| | Vbr | 0~16 | | |
| Load Resistance | RL//CL | 100 // 5 | kΩ // pF | |
| Operating Temp. range | Ta | -10~70 | °C | |
| Storage Temp. range | Ts | -30~85 | °C | |
| Humidity range | RH | 95 | %RH | A maximum wet ball temperature is 38°C No dew. |

Note2-1. The test circuits added 5pF capacitor across the load resistor for LCD back light stay capacitor.

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[3] Test circuit



*For the number of the component's position, please refer to Outline diagram [1].

Note.3-1. SW1(ON/OFF) Operation is as following;

| SW1 | Operation of unit |
|------|-------------------|
| a | Operation |
| b | Non operation |
| Open | Non operation |

Note.3-2. SW2(ON/OFF) Operation is as following;

| SW2 | Operation of unit |
|-----|---|
| a | *Voltage dimming Vbr=0~2.5V |
| b | *Variable resistance dimming VR=0~50kΩ |

*Vbr=0V:brightness MAX.
Rbr=0Ω:brightness MAX.

Note3-3. Test Equipments

- (V) Digital Multiple Meter(ADVANTEST R6451A or equivalent)
- (A) DC Current Meter(ADVANTEST R6451A or equivalent)
- (F) Frequency Counter(ADVANTEST R6451A or equivalent)
- (V) True RMS Meter(KEITHLEY 2001 or equivalent.)
- (A) High Frequency Current Meter(KEITHLEY 2001 or equivalent)

1000:1 High Voltage Probe(Tektronix P3000 or equivalent)

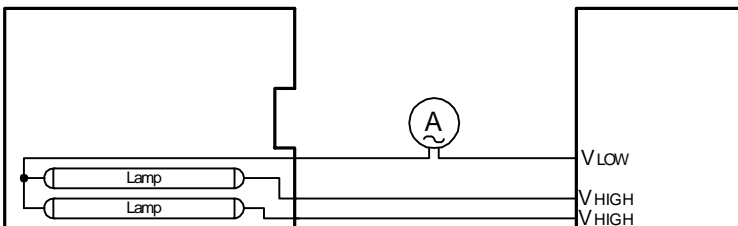
Note3-4. Safety Function

| Load Condition | *1 Alarm Signal (CN1-6) | *2 Shutdown Operation |
|------------------|-------------------------|-----------------------|
| Normal Operation | 0.5V max. | Normal |
| 1 Lamp Open | 4.75~5.25V | Normal |
| 2 Lamps Open | 4.75~5.25V | Shutdown |

*1. If the inverter detects open circuit all lamps for more than 3 seconds it will shut down.

*2. In test circuit[3], if anyone of switches SW3~SW5 opens, then the warning signal will be activated (+5V).

Connection diagram of LCD module (Reference)
LCD module

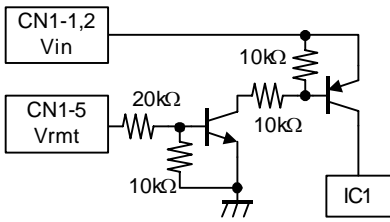


*Connect the High Frequency Current Meter to the Low-Voltage (VLOW) side.

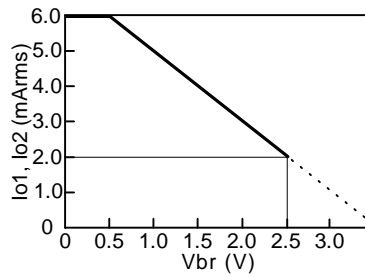
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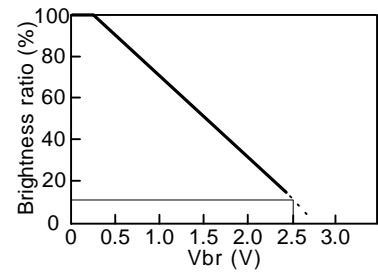
Remote terminal circuit (Reference)



Dimming characteristic (Reference)



Brightness ratio characteristic (Reference)



[4] Electrical specifications

| Item | Symbol | Conditions | | | | | Specifications | | | Unit |
|-------------------------------------|--------|------------|---------|-------------------|--------|--------------------------------------|----------------|------|------|--------|
| | | Vin(V) | Vrmt(V) | Vbr(V)/ VR(kΩ) | Ta(°C) | RL1(kΩ)//CL1(pF) RL2(kΩ)//CL2(pF) | MIN. | TYP. | MAX. | |
| Output Current (Brightness MAX.) | Io1/2 | 12±1.2 | 5±0.25 | 0 / 0 | -10~70 | 85~95 // 5 85~95 // 5 | 5.3 | 6.0 | 6.7 | mA rms |
| | | 12±0.6 | 5±0.25 | 0 / 0 | 23±5 | 90 // 5 90 // 5 | 5.5 | 6.0 | 6.5 | |
| Output Current (Brightness MIN.) | Io1/2 | 12±1.2 | 5±0.25 | 2.5 / 50 | -10~70 | 85~95 // 5 85~95 // 5 | 1.1 | 2.0 | 2.9 | |
| | | 12±0.6 | 5±0.25 | 2.5 / 50 | 23±5 | 85~95 // 5 85~95 // 5 | 1.2 | 2.0 | 2.8 | |
| Input Current1 | Iin1 | 12±0.6 | 5±0.25 | 0 / 0 | -10~70 | 90 // 5 90 // 5 | - | 0.8 | 1.0 | A |
| Input Current2 | Iin2 | 12±0.6 | 0±0.25 | 0 / 0 | -10~70 | 85~95 // 5 85~95 // 5 | - | - | 1 | mA |
| Frequency | F1 | 12±0.6 | 5±0.25 | 0 / 0 | -10~70 | 85~95 // 5 85~95 // 5 | 38 | 43 | 48 | kHz |
| Frequency(Duty) | F2 | 12±0.6 | 5±0.25 | 2.5 / 50 | -10~70 | 85~95 // 5 85~95 // 5 | 220 | 250 | 280 | Hz |
| Open Circuit Voltage | Vopen | 10.8 | 5±0.25 | 0 / 0 | -10~70 | ∞ ∞ | 1.5 | 1.7 | - | kVrms |
| Warning Signal (Note7) | Vst | 12±1.2 | 5±0.25 | 0 / 0 | -10~70 | 85~95 // 5 ∞ | 4.5 | 5.0 | 5.5 | V |
| | | 12±1.2 | 5±0.25 | 0 / 0 | -10~70 | ∞ 85~95 // 5 | 4.5 | 5.0 | 5.5 | |
| | | 12±1.2 | 5±0.25 | 0 / 0 | -10~70 | 85~95 // 5 85~95 // 5 | - | 0 | 0.5 | |

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[5] Reliability test

Following test items are assured.

| Items | Conditions | Judgement |
|----------------------------|---|---|
| Low Temp.Non operational | -30°C 500h | Electrical and apperance should be in the spec. |
| Low Temp.operational | -10°C 500h Load cond.:TYP | |
| High Temp.Non operational | 85°C 500h | |
| High Temp.operational | 70°C 500h Load cond.:TYP | |
| Heat shock | -20°C to 75°C 30min.Each 100 Cycles | |
| Humidity (Non operational) | 60°C 90~95%RH 500h | |
| Vibration | 10~57Hz Amplitude 0.75mm 58~500Hz 1G Sweep:11min 60min each axis X,Y,Z | |
| Shock | 100G 11ms Harf-sine pulse 1 time each axis ±X,Y,Z | |

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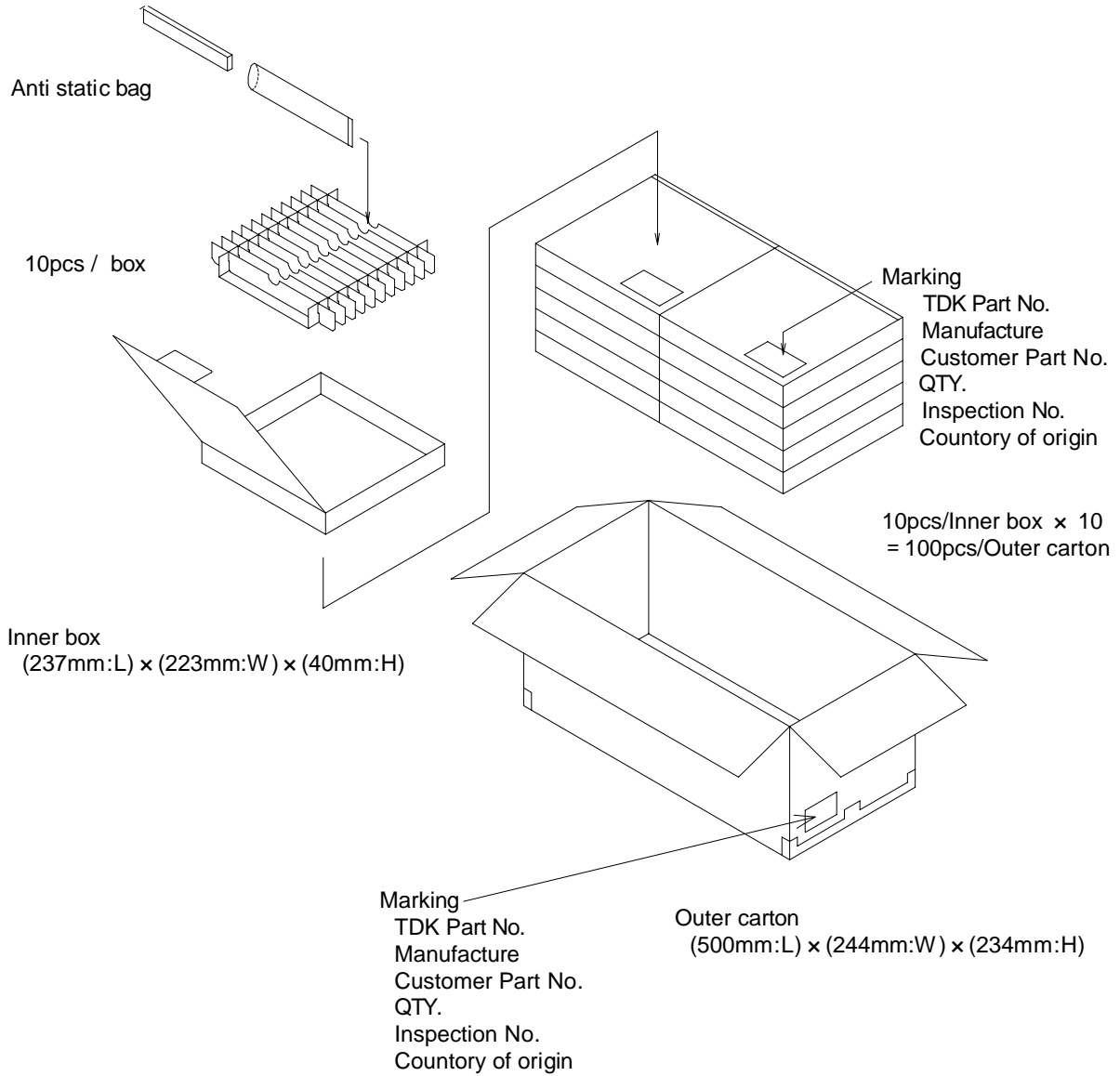
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[6] Packing and Marking

A shipping box is packaged to avoid from water or damage. Following items are printed on the box.

- 6-1. TDK part No. CXA-P1212C-WJL
- 6-2. Manufacture TDK
- 6-3. Customer part No.
- 6-4. QTY.
- 6-5. Inspection No.
- 6-6. Country of origin



[7] Others

7-1. Test cond.

A normal test condition :Temperature (20±15°C), Humidity (65±20%RH).

7-2. Std warantrny

One year after shipment.This covers any defects in material or workmanship.
Defective units will be replaces at no charge.

7-3. Others

TDK and customer are to discuss changes,problems, and modifications and etc, when needed.

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