MESSRS :

Product Drawing

CUSTOMER'S PRODUCT NAME:

TDK PRODUCT NAME: DC-AC INVERTER UNIT
CXA-0523

TDK·Lambda

TDK Corporation

Corporate Headquarters
13-1,Nihonbashi 1-chome,Chuo-ku,
Tokyo 103, JAPAN
Telephone : 81-3-3278-5111

PREPARED BY	APPROVED BY	AUTHORIZED BY
Feb 21 , 2008 *S.Goya*	*Feb 21 , 2008* *K.Imai*	*Feb 21 , 2008* *H.Masuoka*

DWG.No.	CTR-3210-X

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. Part Name

The part name is CXA-0523.

2. Contents

Listed description are subject to change without notice.

●Features●

・This is the double output (two CCFL) inverter. It has Dimming function and Remote function.

・Dimming function

This product is good at modulated light by the selection of either following method.

a. Variable resistance (0 - 10kOhm) is inserted between CN1-6 and CN1-7.

b. Voltage (0 - 2.5V) is impressed between CN1-6 and CN1-3,4.

・This product has shutdown function.

It prevents from keeping generating the high voltage when the lamps open.(Refer Note.3-5.)

・With lamp failure detector.

Normal Operation : CN1-8=0V

Some Lamps Open : CN1-8=5V

・The high-voltage area (terminals and patterns) is coated with silicone so as to avoid the defects caused by dust.

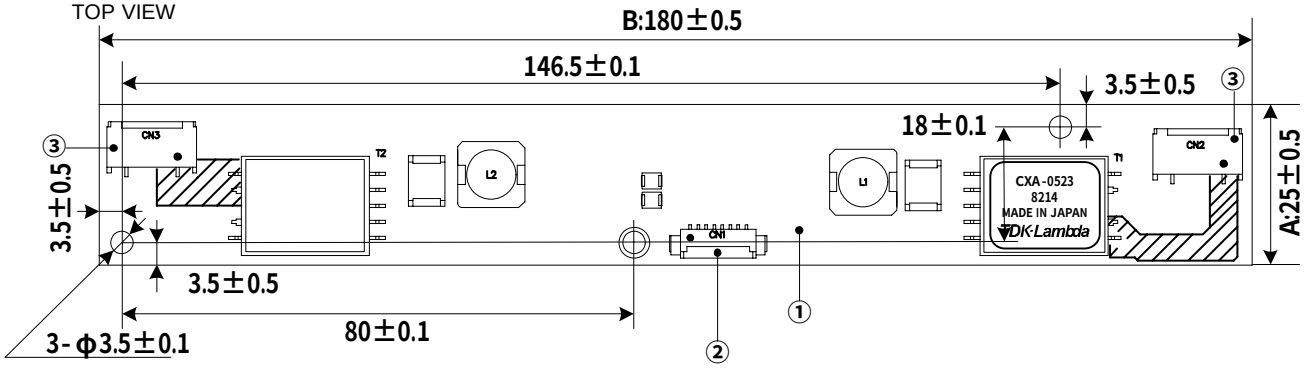
・This product is conformity to RoHS directive.(※)

(※)Conformity to RoHS Directive:This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used,except for exempted applications.

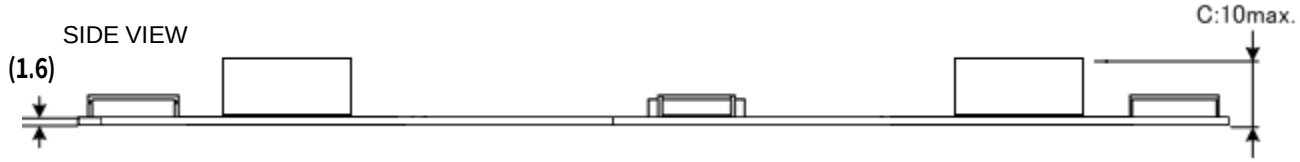
[1] Outline

1-1. Outline

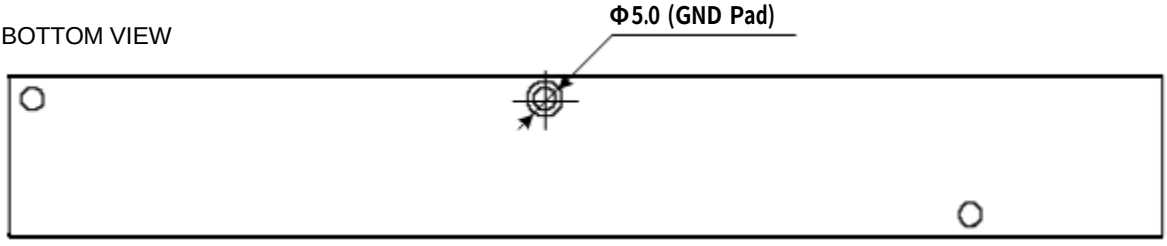
TOP VIEW



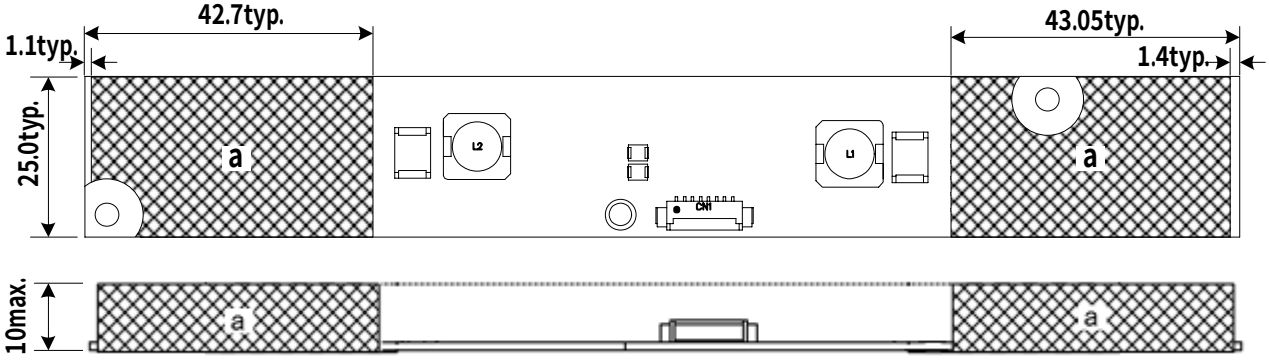
SIDE VIEW



BOTTOM VIEW



HIGH VOLTAGE GENERATION AREA



Unit:mm

Weight:34.0g.typ.

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No.	Part Description	Material	QU	Remark
①	PCB	Composite (CEM-3)	1	UL94V-0 t=1.6
②	Input Connector CN1	53261-0871	1	MOLEX
③	Output Connector CN2,CN3	SM02(8.0)B-BHS-1-TB(LF)(SN)	2	JST

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	0V～0.8V/ 2.5V～Vin	0～0.8V：OFF 2.5V～Vin：ON OPEN：ON
CN1-6	Rbr1/Vbr	0V～2.5V/ 0～10kΩ/ OPEN	Variable resistance dimming control/ Voltage dimming control
CN1-7	Rbr2	0～10kΩ	Variable resistance dimming control
CN1-8	Vst	0V/5V	The warning output 5V in abnormal circumstances

Output side CN2

Pin No.	Symbols	Notes
CN2-1	VHIGH	Output1(560Vrms 7.5mArms)
CN2-3	VLOW	Output1 Return

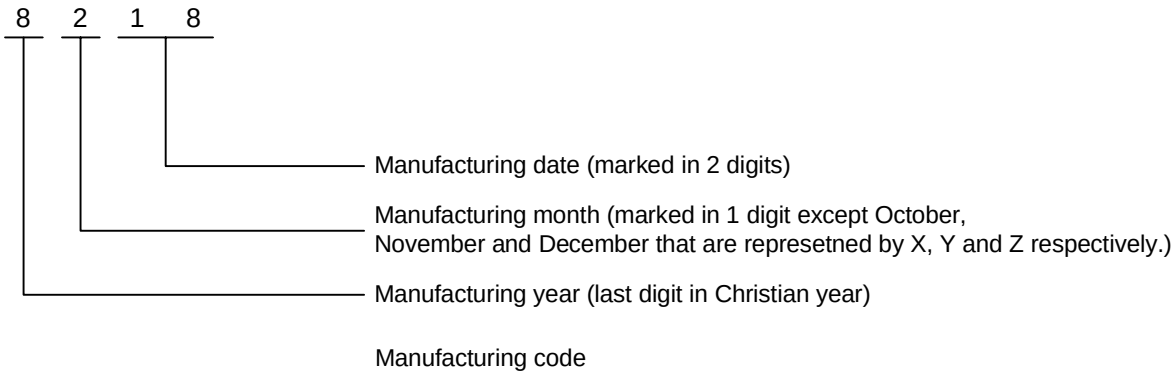
Output side CN3

Pin No.	Symbols	Notes
CN3-1	VHIGH	Output2(560Vrms 7.5mArms)
CN3-3	VLOW	Output2 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. Feb. 18. 2008)



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

* Conformity to RoHS Directive:This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used,except for exempted applications.

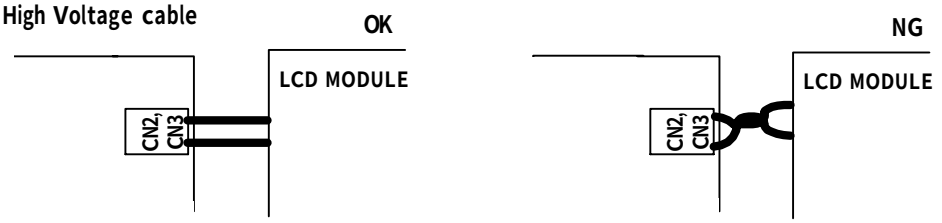
Note1-2. For circuit connection, please prefer to test circuit diagram [3].

Note1-3. Please use minimum of 3mm 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 specially 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.Please refer to fig1.

fig1. High Voltage cable



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.

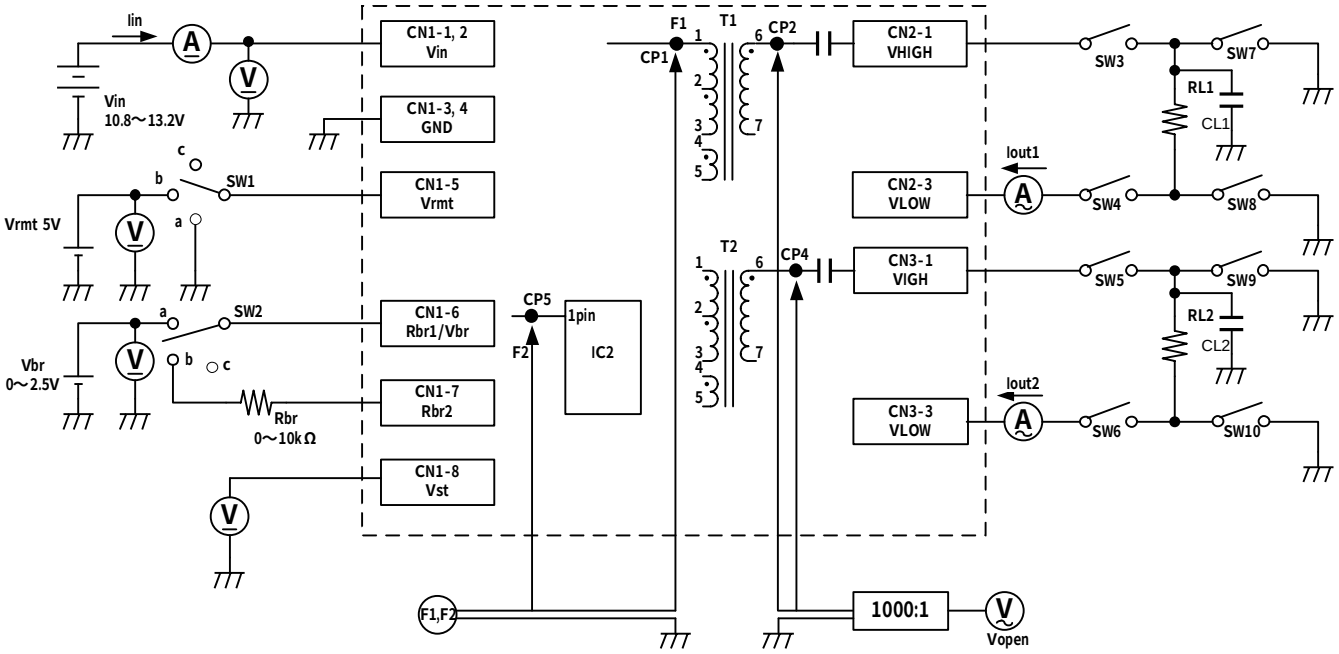
Note1-7. This product has 2.5A circuit protector inside. Please confirm input ripple current within 2.5Ao-p for proper use. Please set the input power source capacity to 5.0A or higher. If it is less than 5.0A, the circuit protector can not terminate power source.

Note1-8. VLOW terminal of CN2(CN2-3) and CN3(CN3-3) are different from GND terminal of CN1(CN 1-3,4). Please be not connected.

[2] Absolute Maximum Ratings

Item	Symbol	Specification	Unit	Notes
Input Voltage	Vin	0~14	V	
	Vrmt	-1~Vin+1		
	Vbr	-1~+5		
Load Resistance	RL1,RL2	90	kΩ	
Operating Temp. range	Ta	-20~70	°C	
Storage Temp. range	Ts	-30~85	°C	
Humidity range	RH	95	%RH	A maximum wet ball temperature is 40°C No dew

[3] Test circuit



Note3-1. SW1(ON/OFF) Operation is as following;

SW1	Operation
a	Non operation
b	**Operation**
c	**Operation**

Note3-2. SW2(ON/OFF) Operation is as following;

SW2	Operation
a	*Voltage dimming **Vbr=0～2.5V** (*Vbr=2.5V : Brightness max.)
b	*Variable resistance dimming **Rbr=0～10kΩ** (Rbr=10kΩ : Brightness max.)
c	**OPEN** **(Brightness max.)**

Note3-3. SW2(ON/OFF) Operation is as following;

SW3～SW6	Alarm Signal
OPEN	4.0V ～ 5.5V
CLOSE	0.5V max.

SW7～SW10	Alarm Signal
OPEN	0.5V max.
CLOSE	4.0V ～ 5.5V

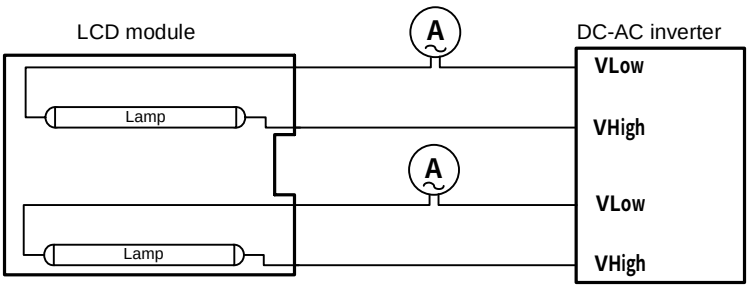
Note3-4.Test Equipments

- (V) Digital Multiple Meter(ADVA NTEST R6451A or equivalent)
- (A) DC Current Meter(ADVANTEST R6451A or equivalent)
- (V~) True RMS Meter(KEITHLEY 2001 or equivalent.)
- (F) Frequency Countor(ADVANTE ST R6452A or equivalent)
- (A~) High Frequency Current Mete r(KEITHLEY 2001 or equivalent)
- 1000:1 PROBE — High Voltage Probe (Tektronix P3000 or equivalent)

Note3-5.Safety Function

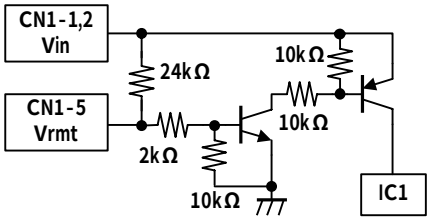
Safety function				Shutdown Operation	Remark
Output 1：CN2		Output 2：CN3			
CN2-1	CN2-3	CN3-1	CN3-3		
Normal	Normal	Normal	Normal	Normal	---
Open	Normal	Normal	Normal	Normal	---
Normal	Open	Normal	Normal	Normal	---
Open	Open	Normal	Normal	Normal	---
Normal	Normal	Open	Normal	Normal	---
Normal	Normal	Normal	Open	Normal	---
Normal	Normal	Open	Open	Normal	---
Open	Normal	Open	Normal	Shutdown	If the inverter detects o pen circuit all of the lamps for more than 3 secon ds it will shut down.
Open	Normal	Normal	Open	Shutdown	If the inverter detects o pen circuit all of the lamps for more than 3 secon ds it will shut down.
Normal	Open	Open	Normal	Shutdown	If the inverter detects o pen circuit all of the lamps for more than 3 secon ds it will shut down.
Normal	Open	Normal	Open	Shutdown	If the inverter detects o pen circuit all of the lamps for more than 3 secon ds it will shut down.
Open	Open	Open	Open	Shutdown	If the inverter detects o pen circuit all of the lamps for more than 3 secon ds it will shut down.

Connection diagram of LCD module (Reference)



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

Remote terminal circuit (Reference)



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[4] Electrical specifications

Item	Symbol	Condition					Spec.			Unit
		Vin (V)	Vrmt (V)	Vbr or Rbr1-Rbr2	RL1//CL1 RL2//CL2	Ta (°C)	min.	typ.	max.	
Output Current1,2(Max.)	Iout1-1,2 /Iout2-1,2	12.0±10%	5.0	2.5V or 10kΩ or OPEN	76kΩ//12pF 76kΩ//12pF	-20～+70	7.0	7.5	8.0	mArms
Output Current3,4(Min.)	Iout1-3,4 /Iout2-3,4	12.0±10%	5.0	0.0V or 0Ω	76kΩ//12pF 76kΩ//12pF	-20～+70	3.0	3.9	4.4	mArms
Input Current	Iin1	12.0	5.0	2.5V or 10kΩ or OPEN	76kΩ//12pF 76kΩ//12pF	-20～+70	---	0.95	1.50	A
	Iin2	12.0	0.0	2.5V or 10kΩ or OPEN	76kΩ//12pF 76kΩ//12pF	-20～+70	---	---	1.0	mA
	Iin3	12.0	5.0	2.5V or 10kΩ or OPEN	∞ ∞	-20～+70	---	12	30	mA
Oscillation Frequency	F1	12.0	5.0	2.5V or 10kΩ or OPEN	76kΩ//12pF 76kΩ//12pF	-20～+70	50	55	60	kHz
Dimming Frequency	F2	12.0	5.0	0.0V or 0Ω	76kΩ//12pF 76kΩ//12pF	-20～+70	235	255	285	Hz
Open-Circuit Voltage	Vopen	10.8	5.0	2.5V or 10kΩ or OPEN	∞ ∞	-20～+70	1600	1800	1900	Vrms
Alarm Output	AM1	12.0	5.0	2.5V or 10kΩ or OPEN	76kΩ//12pF ∞	-20～+70	4.0	5.0	5.5	V
	AM2	12.0	5.0	2.5V or 10kΩ or OPEN	∞ 76kΩ//12pF	-20～+70	4.0	5.0	5.5	V
	AM3	12.0	5.0	2.5V or 10kΩ or OPEN	∞ ∞	-20～+70	4.0	5.0	5.5	V
	AM4	12.0	5.0	2.5V or 10kΩ or OPEN	76kΩ//12pF connected to GND	-20～+70	4.0	5.0	5.5	V
	AM5	12.0	5.0	2.5V or 10kΩ or OPEN	connected to GND 76kΩ//12pF	-20～+70	4.0	5.0	5.5	V
	AM6	12.0	5.0	2.5V or 10kΩ or OPEN	connected to GND connected to GND	-20～+70	4.0	5.0	5.5	V
	AM7	12.0	5.0	2.5V or 10kΩ or OPEN	76kΩ//12pF 76kΩ//12pF	-20～+70	---	0	0.5	V
Safety Function	Iin4	12.0	5.0	2.5V or 10kΩ or OPEN	76kΩ//12pF ∞	-20～+70	---	0.95	1.50	A
	Iin5	12.0	5.0	2.5V or 10kΩ or OPEN	∞ 76kΩ//12pF	-20～+70	---	0.95	1.50	A
	Iin6	12.0	5.0	2.5V or 10kΩ or OPEN	∞ ∞	-20～+70	---	12	30	mA
	Iin7	12.0	5.0	2.5V or 10kΩ or OPEN	76kΩ//12pF 76kΩ//12pF	-20～+70	---	0.95	1.50	A

[5] Reliability Test

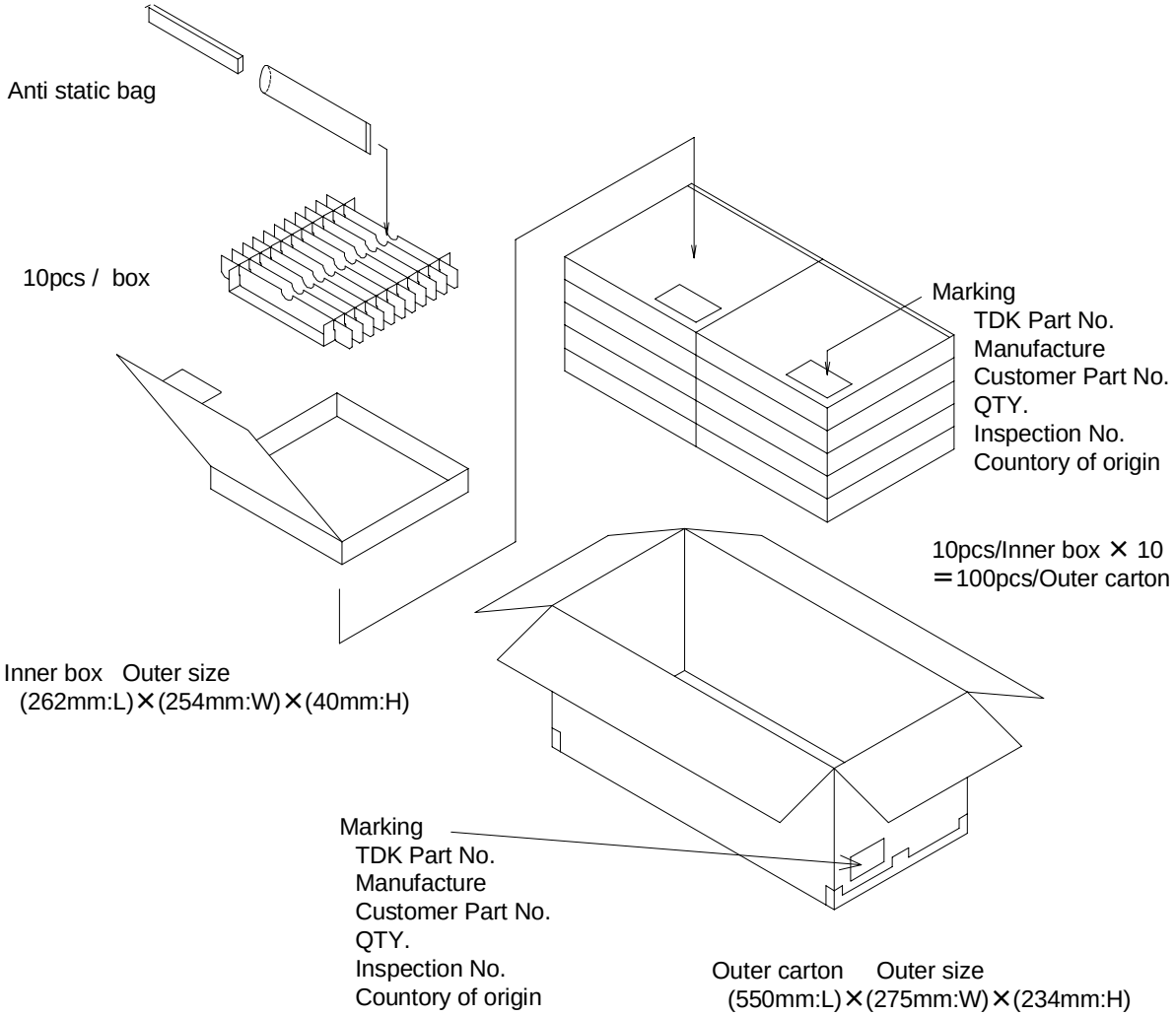
Following test items are assured.

Item	Condition	Judgement
Low Temp.Non operational	-30°C 500h	Electrical and apperrance should be in the spec.
Low Temp.operational	-20°C 500h Load cond.:TYP	
High Temp.Non operational	85°C 500h	
High Temp.operational	70°C 500h Load cond.:TYP	
Heat shock	-30°C↔85°C 30min.Each 100 Cycles	
Humidity (Non operational)	60°C 90~95%RH 500h	
Vibration	10~57Hz Amplitude0.75mm 58~500Hz 9.8m/s^2 Sweep:11min 60min each axis X,Y,Z	
Shock	980m/s^2 11ms Harf-sine pulse 1 time each axis ±X,Y,Z	

[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-0523
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 warrantry

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

7-3. MTTF

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

TEMPERATURES 25°C
MTTF 1030798 hours or more

7-4. Others

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

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