

MESSRS :

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Product Specification

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CUSTOMER'S PRODUCT NAME:

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TDK PRODUCT NAME: DC-AC INVERTER UNIT  
CXA-0406

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***TDK-Lambda***

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DWG.No.	CTR-1616-D
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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-0406.

2. Contents

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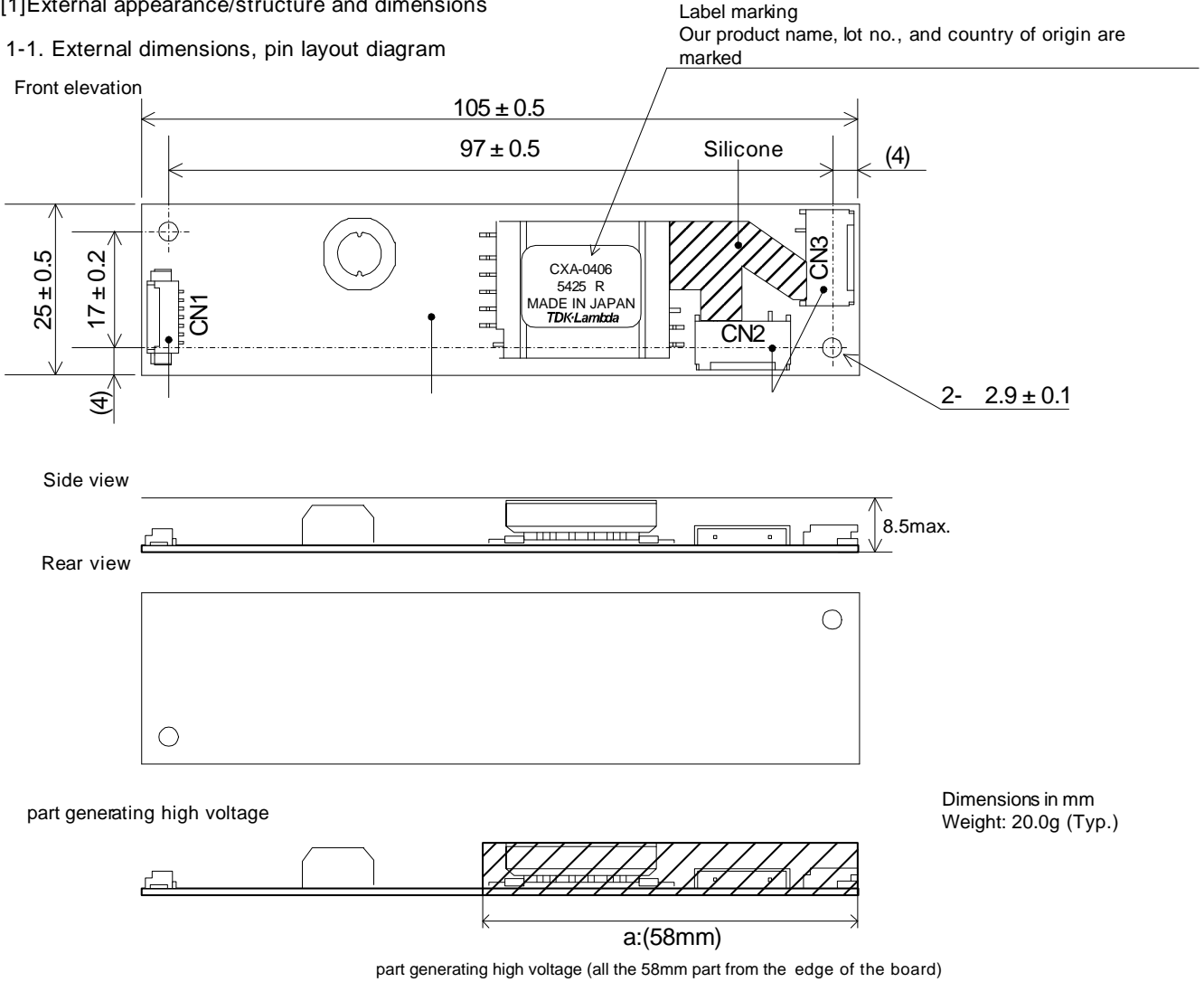
• Listed description are subject to change without notice.

Product Outline

- This product is a 2-lamp inverter and has dimming functions and remote functions.
  - Alarm output function and shutdown function are incorporated as protection circuits.
  - The high voltage generating section is coated with silicone as a measure against 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] External appearance/structure and dimensions

1-1. External dimensions, pin layout diagram



Please secure 2mm or longer space distance from the high voltage generating area in all directions. Please see Note 1-3 for the details.

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 CN1	53261-0771	1	MOLEX	51021-0700
	Output connector CN2,3	SM02(8.0)B-BHS-1-TB(LF)SN	2	JST	BHR-03VS-1

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1-2. Pin connection

Input side CN1

Pin No.	Symbol	Rating	Rating
CN1-1	Vin	4.75 ~ 5.25V	Power input
CN1-2			
CN1-3	GND	0V	GND
CN1-4			
CN1-5	Vrmt	2.5 ~ Vin/0 ~ 0.5V	Remort pin It operates at 2.5- Vin.
CN1-6	Vst	0V/5V	Alarm output
CN1-7	Vbr	0 ~ 3V or 0 ~ 10k	Dimming pin 0V or 0 : max. 3V or 10k : min.

Output side CN2

Pin No.	Symbol	Rating
CN2-1	VHIGH	340Vrms 6mArms
CN2-2	N.C.	-
CN2-3	VLOW	(2V)

Output side CN3

Pin No.	Symbol	Rating
CN3-1	VHIGH	340Vrms 6mArms
CN3-2	N.C.	-
CN3-3	VLOW	(2V)

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 January 25, 2005)



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

- ( ) 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.

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

Note 1-3. Part "a" (Between the transformer and CN2, and CN3) 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 2mm 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 3A 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.

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[2] Absolute maximum rating

Item	Symbol	Spec	Unit	Remarks
Input vottage	Vin	0 ~ 6	VDC	
Load resistance	RL	55	k	
Operating temperature range	Ta	-10 ~ 70		
Storage temperature range	Ts	-30 ~ 85		
Humidity range	RH	95	%RH	Maximum wet-bulb temperature to be 38 No condensation to occur

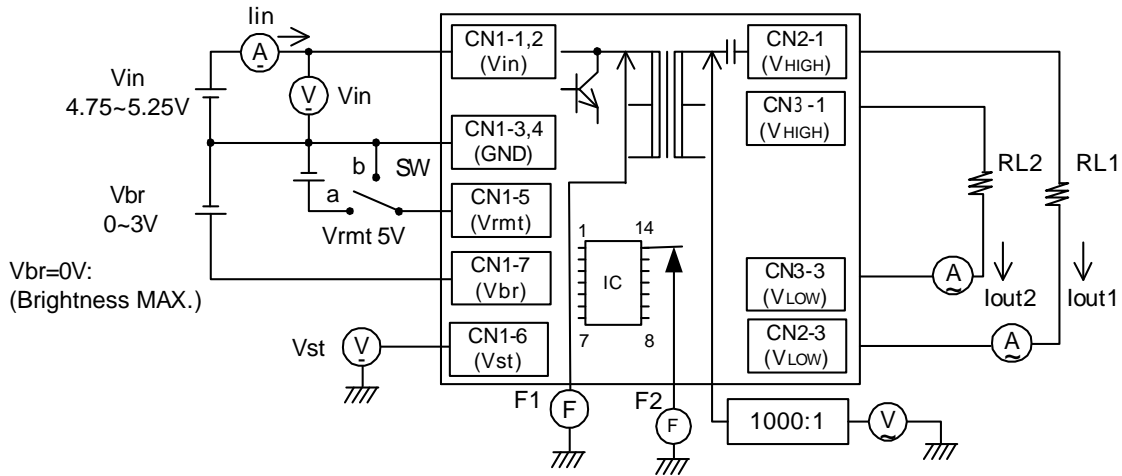
[3] Electrical character istics

Item	Symbol	Measurement condition						Inspection standard			Unit	
		Vin(V)	Vrmt(V)	Vbr(V)	Ta( )	RL1( )	RL2( )	MIN.	TYP.	MAX.		
Output current 1	Iout1,2	5.00 ± 0.05	5 ± 0.05	0	18 ~ 28	55k	55k	5.8	6.4	7.0	mArms	
Output current 2		4.75 ~ 5.25						-10 ~ 70	5.7	6.4		7.1
Output current 3		5.00 ± 0.05						3	18 ~ 28	2.7		3.2
Input current 1	lin	4.75 ~ 5.25	0	0	-10 ~ 70	55k	55k	-	1.28	1.75	A	
Input current 2								-	0	1	mA	
Oscillation frequency	F1		3	-		53	59	65	kHz			
Dimming frequency	F2					230	255	280	Hz			
Alarm output	Vst		5 ± 0.05	0		-	55k	-	4.5	5	5.5	V
Alarm output												
Alarm output												
Shuts down	lin		-	15		30	mA					
open-circuit voltage	Vo		4.75 ± 0.05						1050	1150	-	Vrms

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[4] Measurement circuit



Note 4-1.

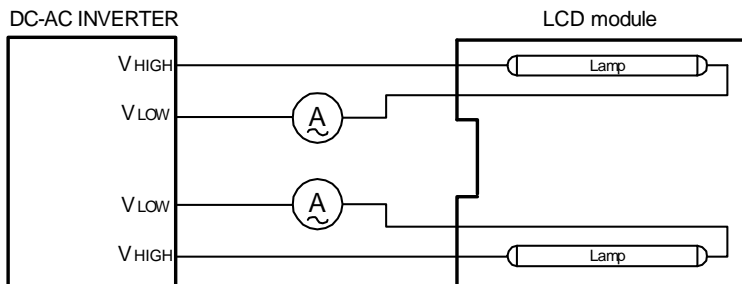
To be the one to operate as follows by ON-OFF of SW.

SW	Unit operation
a	Operates
b	Does not operate

Note 4-2. Measuring apparatus

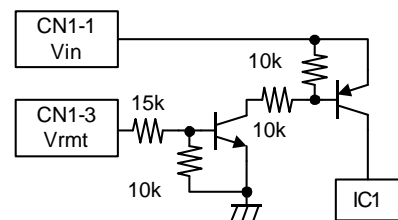
- (V): DC voltmeter (ADVANTEST R6451A or equivalent)
- (A): DC ampere meter (ADVANTEST R6451A or equivalent)
- (V): Effective value voltmeter (KEITHLEY 2001 or equivalent)
- (F): Frequency counter (ADVANTEST R6452 or equivalent)
- (A): High-frequency ampere meter (KEITHLEY 2001 or equivalent)
- 1000:1: 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	-40 500h	No defect to exist in electric characteristics and external appearance.
Low temperature operation	-10 500h Operating condition : As rated	
High temperature exposure	85 500h	
High temperature operation	70 500h Operating condition : As rated	
Thermal shock	-20 75 100 cycles 30 min. each	
Moisture resistance	40 90 ~ 95%RH 500h	
Vibration	10 ~ 55Hz Half-amplitude 0.35mm or 49m/s <sup>2</sup> Sweeping time : 1 min. 30 min. each in X, Y, Z directions	
Shock	980m/s <sup>2</sup> 6ms Sine halfwave One time. each in ± X, Y, Z directions	

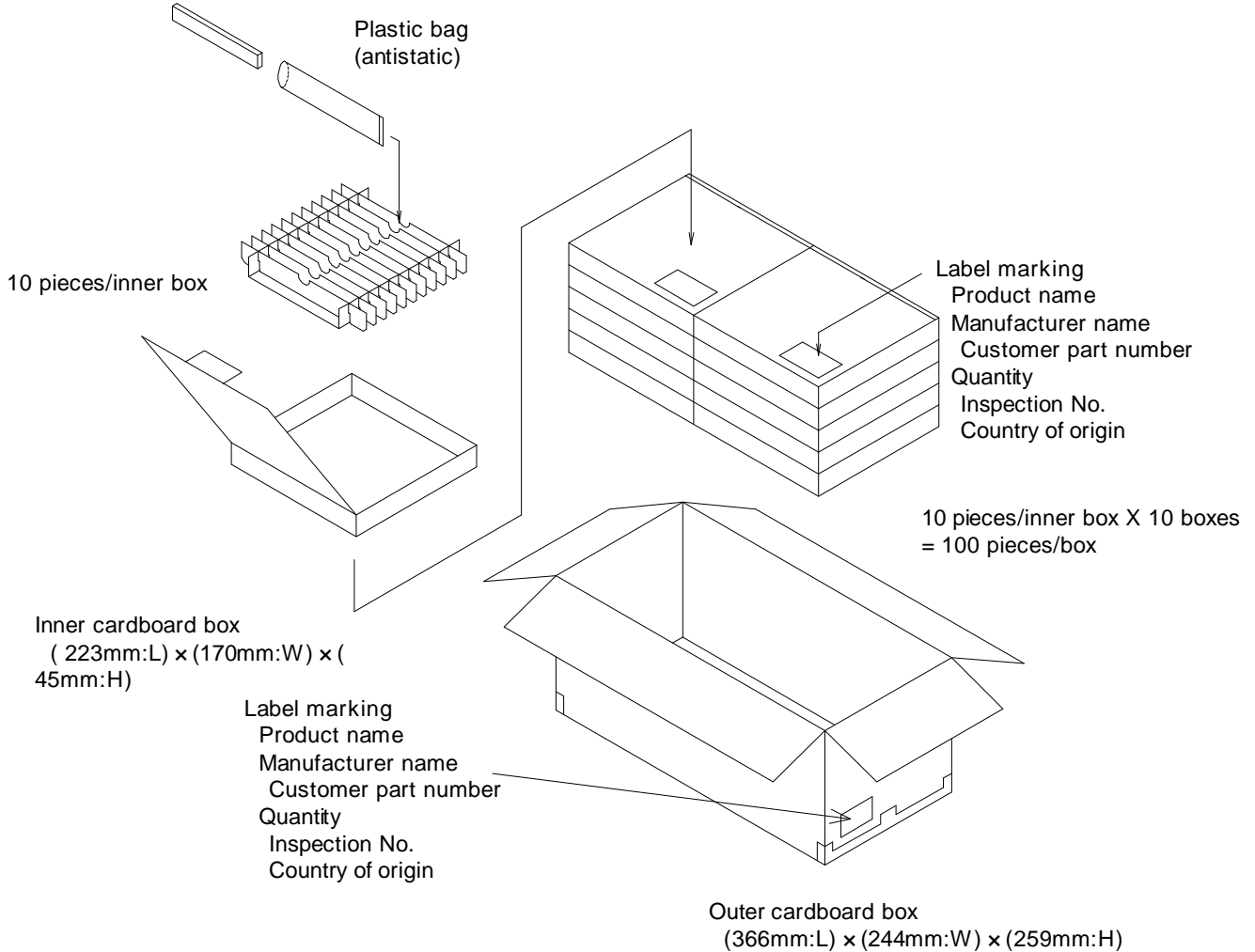
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[6] Packaging and marking

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 (Example) CXA-0406
- 6-2. Manufacturer name TDK
- 6-3. Quantity
- 6-4. Inspection No.
- 6-5. Country of origin



[7] Others

7-1. Test conditions

Unless otherwise specified, the temperature to be  $(20 \pm 15)$  and humidity to be  $(65 \pm 20)$  %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. MTTF

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

TEMPERATURES 25

MTTF 2,510,000 hours or more

7-4. Others

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

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