

MESSRS :

PRODUCT DRAWING

CUSTOMER'S PRODUCT NAME:

TDK PRODUCT NAME: DC-AC INVERTER UNIT
CXA-0283

TDK-Lambda

TDK Corporation

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DWG.No.	CTR-0768-F
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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. Part Name

The part name is CXA-0283.

2. Contents

Item	Section	Page
1.Outline		
1-1.Outline	See Section [1]	3
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Absolute Maximum Ratings	See Section [2]	5
3.Electrical specifications	See Section [3]	5
4.Test Circuit	See Section [4]	6~7
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Listed description are subject to change without notice.

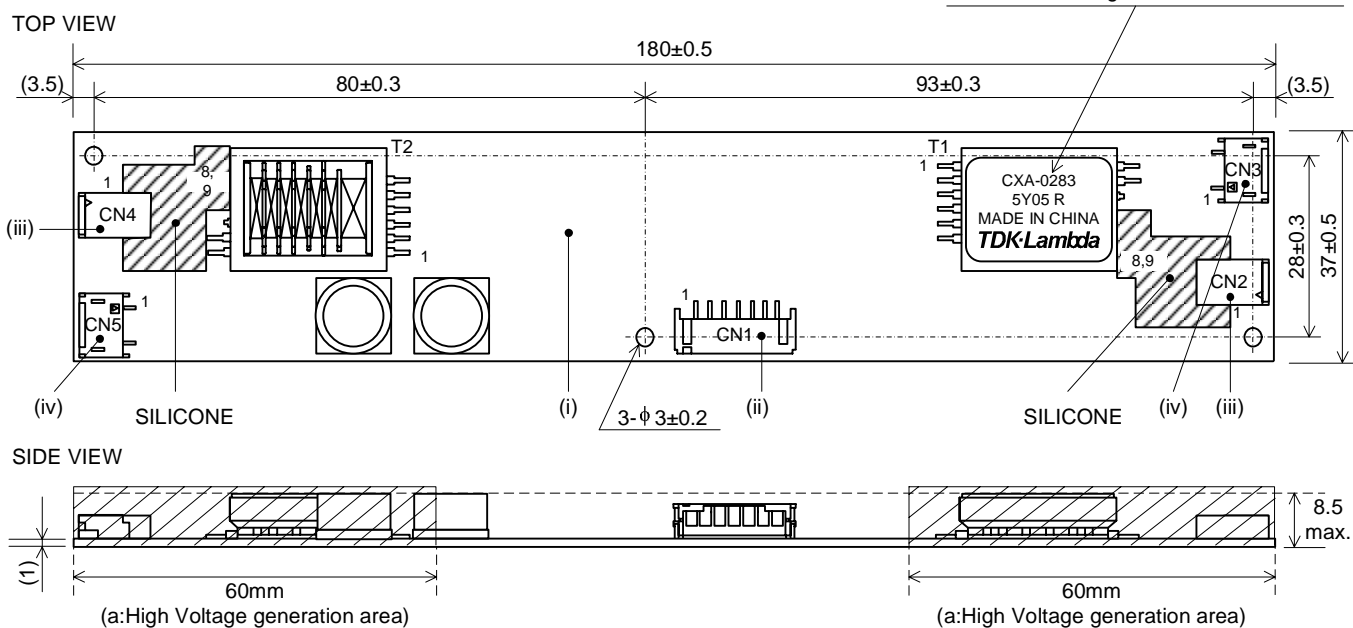
****Features****

- This inverter is for four lamps. It has Dimming function and Remote function.
- This product has shutdown function.
It shows an abnormal condition when the lamps open.
- With lamp failure detector.
Normal Operation : CN1-6=0V
Some Lamps Open : CN1-6=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.*1
*1 : 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

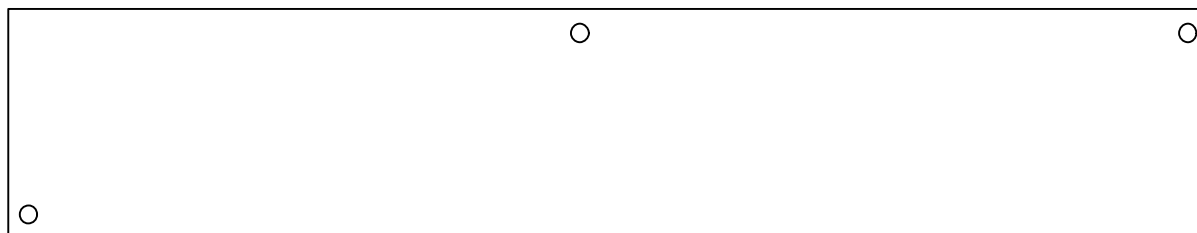
1-1. Outline

Label (Example)
TDK part No, Date code, Country of origin
TDK-Lambda logo



**Please secure the air clearance of 3mm or more from the high voltage generation area up and down and right and left.
Please refer to Note1-3. for details.

BOTTOM VIEW



Unit:mm
Weight:43.0g.typ.

No.	Part Description	Material	QU	REMARK	MATES WITH
(i)	PCB	Composite (CEM-3)	1	UL94V-0 t=1.0	-
(ii)	Input Connector CN1	S7B-PH-SM4-TB(LF)(SN)	1	JST	PHR-7
(iii)	Output Connector CN2,CN4	SM02B-BHSS-1-TB(LF)(SN)	2	JST	BHSR-02VS-1
(iv)	Output Connector CN3,CN5	SM02(4.0)B-BHS-1-TB(LF)(SN)	2	JST	BHR-02VS-1

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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	Vbr	0~2.5V	Brightness terminal
CN1-6 (Output)	Vst	0V/5V	The warning output 5V in abnormal circumstances
CN1-7	Vrmt	0V/2.5V~Vin	0~0.4V:OFF 2.5~Vin V:ON Remote terminal

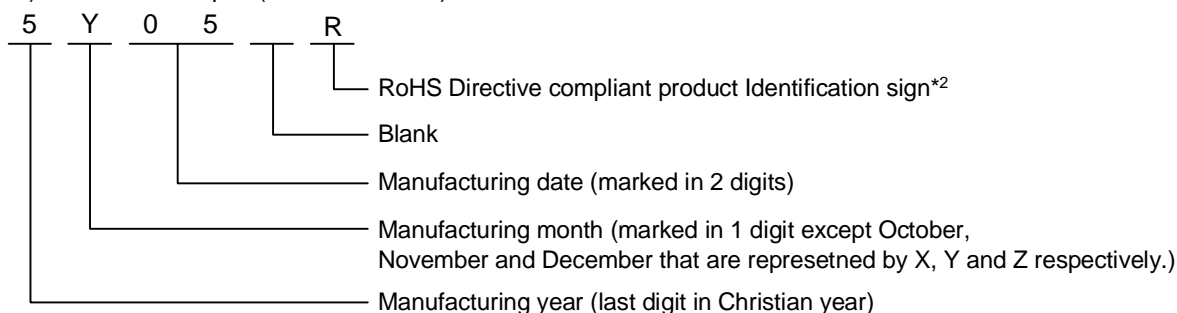
Output side CN2,3,4,5

Pin No.	Symbols	Ratings	Note
CN2-1	VHIGH1	660Vrms	Output1
CN2-2	VHIGH2	660Vrms	Output2
CN3-1	VLOW1	(2V)	Output1 Return
CN3-2	VLOW2	(2V)	Output2 Return
CN4-1	VHIGH3	660Vrms	Output3
CN4-2	VHIGH4	660Vrms	Output4
CN5-1	VLOW3	(2V)	Output3 Return
CN5-2	VLOW4	(2V)	Output4 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. Nov. 5. 2005)



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

^{*2}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 refer to test circuit diagram [4].

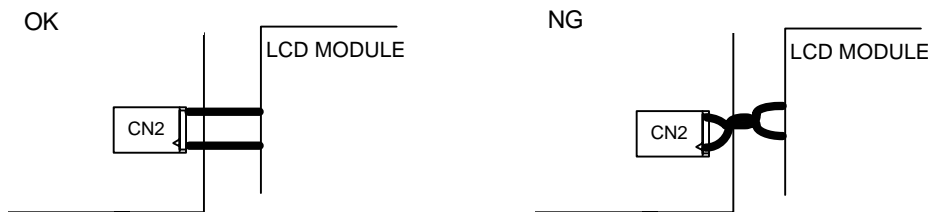
Note1-3. Please use minimum of 3mm clearance (all directions) between inverter high voltage area and any conductors. Please refer to mechanical drawing for marking of high voltage area.

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.

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Fig.1



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 4A capacity for input power supply.

[2] Absolute maximum ratings

Items	Symbols	Specification	Unit	Notes
Input Voltage	Vin	0~15	V	
	Vrmt	0~Vin		
	Vbr	0~16		
Load Resistance	RL1~4//CL1~4	150//5	kΩ//pF	
Operating Temp. range	Ta	0~60	°C	
Storage Temp. range	Ts	-30~85	°C	
Humidity range	RH	95	%RH	A maximum wet ball temperature is 38°C

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

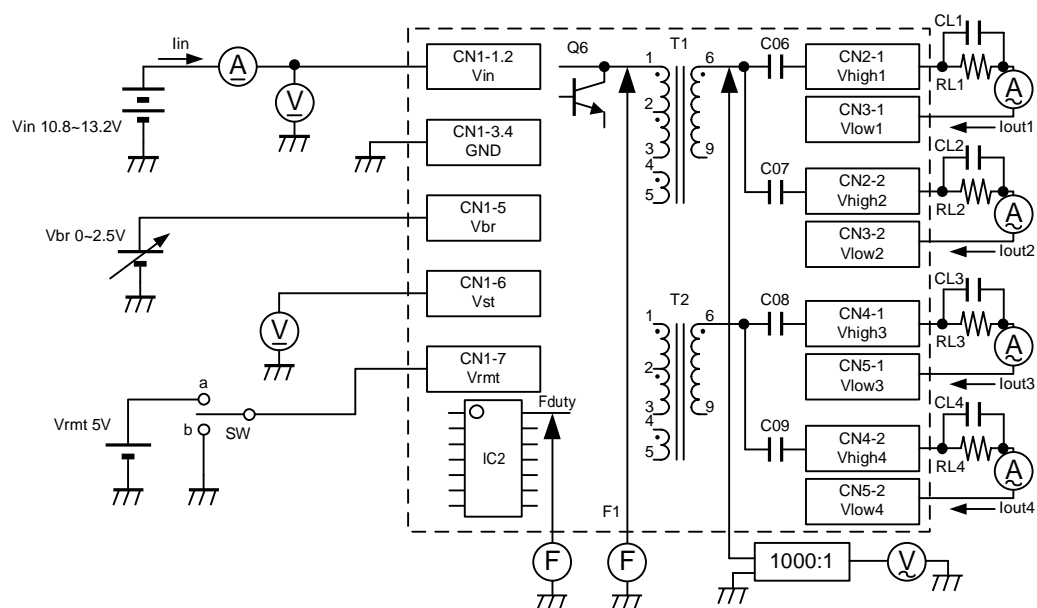
[3] Electrical specifications

Item	Symbol	Condition					Specification			Unit
		Vin(V)	Vrmt(V)	Vbr(V)	Ta(°C)	RL1~4(kΩ)/CL1~4(pF)	min.	typ.	max.	
Output Current (Brightness max.)	Iout1/Iout2	12±1.2	5±0.25	0	0~60	135~145 // 5	5.0	5.5	6.0	mArms
Output Current (Brightness min.)	Iout1/Iout2	12±1.2	5±0.25	2.5	0~60	135~145 // 5	1.8	2.5	3.2	
Input Current1	Iin1	12±0.6	5±0.25	0	0~60	140 // 5	-	1.7	2.5	A
Input Current2	Iin2	12±0.6	0	0	0~60	135~145 // 5	-	-	1	mA
Frequency	F1	12±0.6	5±0.25	0	0~60	135~145 // 5	40	45	50	kHz
Frequency(Duty)	F2	12±0.6	5±0.25	2.5	0~60	135~145 // 5	120	140	160	Hz
Open Circuit Voltage	Vopen	10.8MIN	5±0.25	0	0~60	∞	1500	1600	-	Vrms
Warning Signal (Note4-3.)	Vst	12±1.2	5±0.25	0	0~60	135~145 // 5 *Note4-3.*1	4.0	5.0	5.5	V
		12±1.2	5±0.25	0	0~60	135~145 // 5	-	0	0.5	

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[4] Test circuit



RL1~4:Load resistance (7W MIN.)
CL1~4:Stray capacitor (3kV MIN.)

Note4-1. SW(ON/OFF) Operation is as following;

SW		Operation of unit
a	2.5-14.4V	Operation
b	0-0.4V	Non operation

Note 4-2.Measuring apparatus

- ☒ Digital Multiple Meter(ADVANTEST R6452A or equivalent)
- ☐ DC Current Meter(ADVANTEST R6452A or equivalent)
- ☒ True RMS Meter(NF Circuit M2170or equivalent)
- ☐ Frequency Countor(ADVANTEST R6452A or equivalent)
- ☒ High Frequency Current Meter(FLUKE187or equivalent)
- ☐ High Voltage Probe(Tektronix P6015A or equivalent)

Note4-3.Safety Function

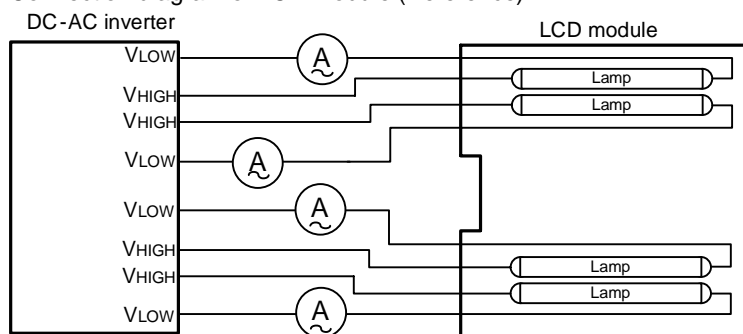
Load Condition	Alarm Signal (CN1-6) ^{*1}	Shutdown Function ^{*2}
Normal Operation	0.5V max.	Normal
1 Lamp Open	4.75~5.25V	Normal
2 Lamps Open	4.75~5.25V	Normal
3 Lamps Open	4.75~5.25V	Normal
4 Lamps Open	4.75~5.25V	Shutdown

*1. In test circuit[4] ,If anyone of load opens, then the warning signal will be activated (+5V).

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

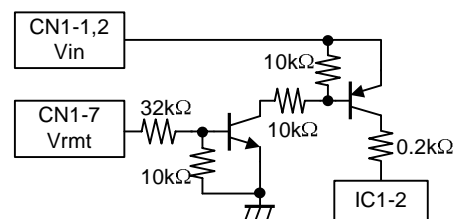
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Connection diagram of LCD module (Reference)



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

Remote terminal circuit (Reference)



[5] Reliability test

Following test items are assured.

Item	Conditions	Judgement
Low Temp.Non operational	-30°C 500h	Electrical and apperance should be in the spec.
Low Temp.operational	0°C 500h Load cond.:TYP	
High Temp.Non operational	85°C 500h	
High Temp.operational	60°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 Amplitude 0.75mm 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	

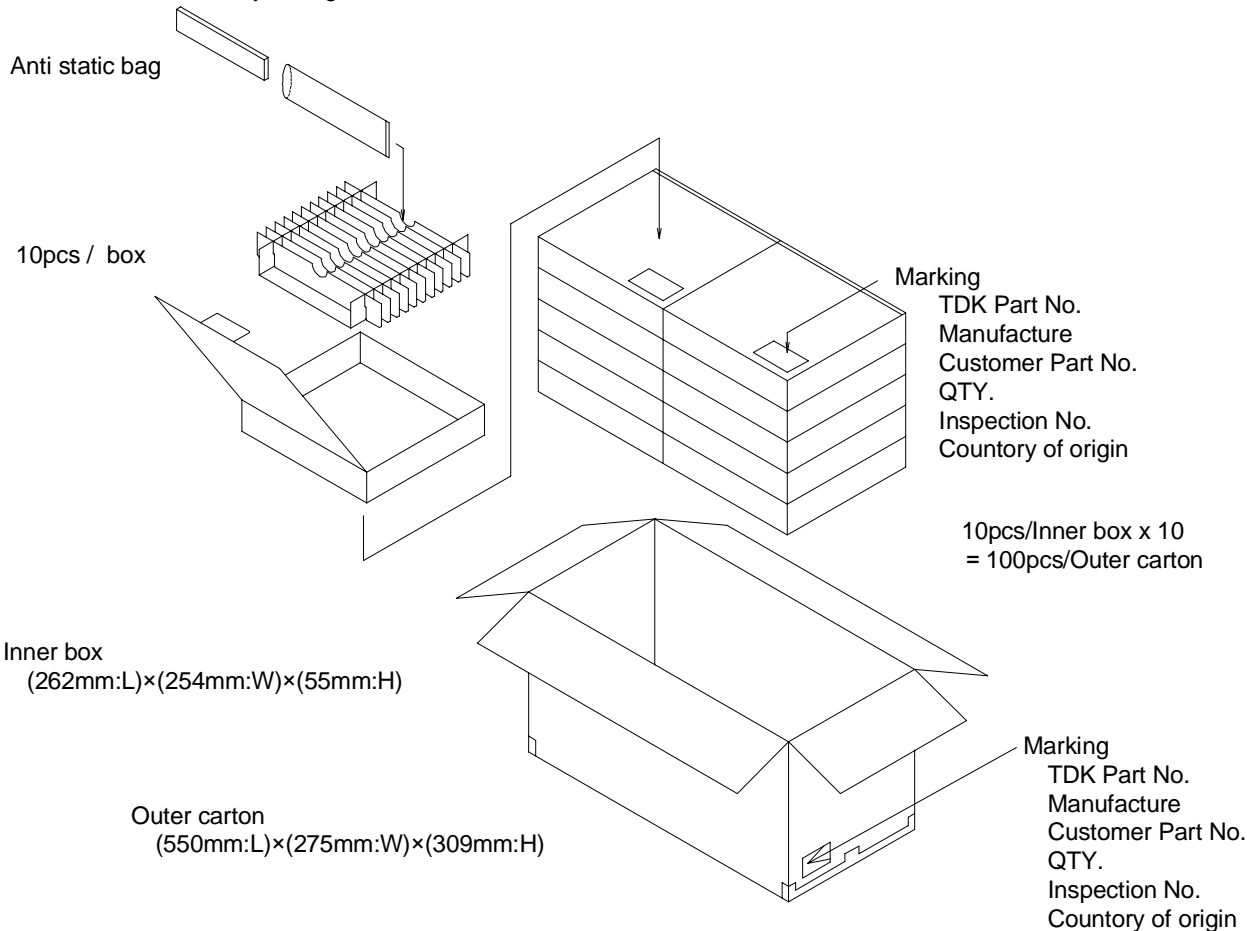
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[6] Packing and Marking

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

- 6-1. TDK part No. CXA-0283
- 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 conditions

Unless otherwise specified, the temperature to be (20±15)°C 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. MTTF

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

TEMPERATURES 25°C
MTTF 1150000 hours or more

7-5. Others

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

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