

MESSRS :

Product Drawing

CUSTOMER'S PRODUCT NAME :

TDK-Lambda
PRODUCT NAME : DC/DC CONVERTER UNIT ALD-514012PJ134

***Notice**

Product Drawing is not contract. This is only technical data.

This technical data may change internal description without any notice.

When you design final product please request us specification through our sales or distributors.

After you receive the specification, the contract is effective on signature of the specification.



TDK-Lambda Corporation

PREPARED BY	APPROVED BY	AUTHORIZED BY
<i>K.Oshima Sept./14th/2010</i>	<i>H.Masuoka Sept./14th/2010</i>	<i>M.Ueguri Sept./14th/2010</i>

DWG.No.

CTR-4016-A

Precautionary Notes Regarding the Use of This Converter

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.

Caution

- This product is designed for the driving LED backlight system.
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 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.
- 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.
- Please use all the mounting holes, because to defend the converter from vibration and impact.

Handling Precautions

- 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.
- Please do not use the product, when dropping it, since there is a possibility of the parts damage.

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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. Range of Application

This specification applies to each companies.

2. Product Name

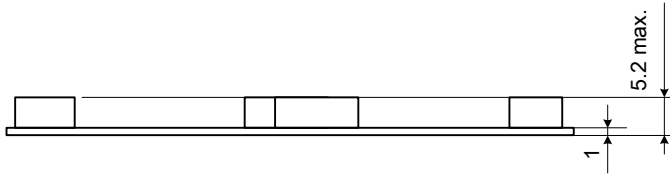
The product name is DC-DC converter unit ALD-514012PJ134.

3. Contents

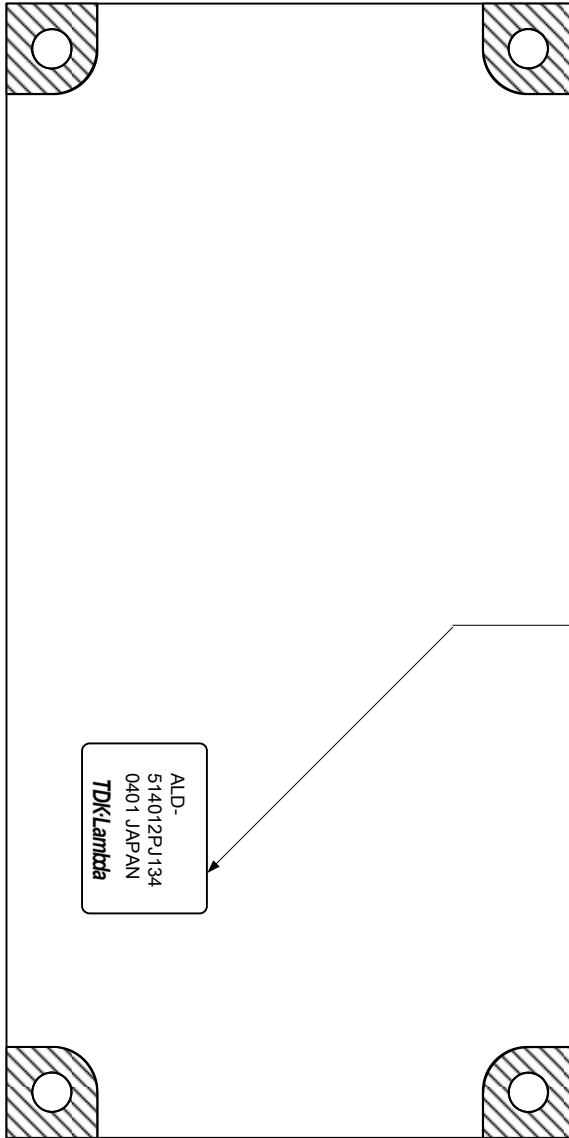
Item	Attached view	Page
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SIDE View



BOTTOM View



example (refer to *1-1 Marking)
Product Name, Lot No., name of origin, and Logo

Tolerance is ± 0.5 mm
unless otherwise specified.
Unit in mm

Mass: 22g max.

When LED driver is fixing, please confirm screw head and plate form is located within above hatching area include any tolerances.
If all the GND vias connected to the case such as sheet metals, EMI may improve.
Then, Please insulate the unhatching area from the case.

No.	Part Description	Model name / Material	Qty.	Remark	corresponding connector
(i)	Input Connector: CN1	SM14B-SRSS-TB(LF)(SN)	1	JST	SHR-14V-S-B
(ii)	Output Connector: CN3	SM10B-SRSS-TB(LF)(SN)	1	JST	SHR-10V-S-B
(iii)	Print Circuit Board: PCB	FR-4	1	UL 94V-0 t=1.0mm	-

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1-2. Pin Configuration

CN1: Input Connector

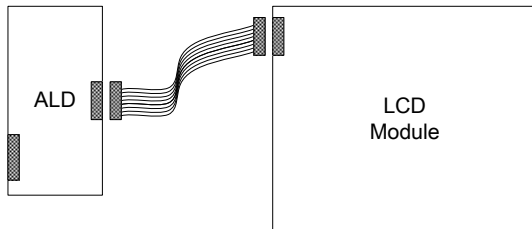
Pin No.	Symbol	Remark
CN1-1~CN1-5	Vin	Input Voltage
CN1-6~CN1-10	GND	GND
CN1-11	Vrmt	OFF:0-0.4(V) or OPEN / ON:2.5-Vin(V)
CN1-12	Vbr/Rbr	PWM Dimming MIN. Brightness : 2.5(V) or 50(kΩ) PWM Dimming MAX. Brightness : 0(V) or 0(kΩ)
CN1-13	ADIM	Analog Dimming MIN. Brightness : 2.5(V) Analog Dimming MAX. Brightness : 0(V)
CN1-14	Vst	Normal : 0(V) / Abnormal : 5(V)

CN3: Output Connector

Pin No.	Symbol	Remark
CN3-1	LED_C5	CH5 - Cathode Side
CN3-2	LED_A5	CH5 - Anode Side
CN3-3	LED_A4	CH4 - Anode Side
CN3-4	LED_C4	CH4 - Cathode Side
CN3-5	LED_C3	CH3 - Cathode Side
CN3-6	LED_A3	CH3 - Anode Side
CN3-7	LED_A2	CH2 - Anode Side
CN3-8	LED_C2	CH2 - Cathode Side
CN3-9	LED_C1	CH1 - Cathode Side
CN3-10	LED_A1	CH1 - Anode Side

LCD Module Wiring Example

Our company doesn't handle the cable that connects between the ALD and the LCD module. Please inquire of the assembly maker about the cable suitable for customer's usage. The wiring example is shown as follows.

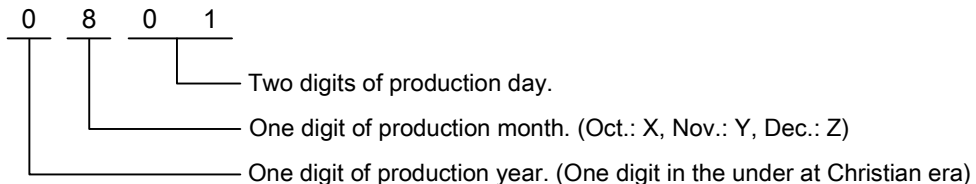


*Please use the cable that satisfies necessary condition for the maximum load voltage, the maximum working temperature, the output current, and RoHS, etc. (Example; UL10368 AWG32)
*Please confirm the LCD panel before use. Flickering or malfunction may occur when the cable is too long.

*1-1 Marking

Product name, Lot No., Country of origin

- 1) Marking is attached on bottom side by the label.
- 2) Example (Aug. 1st, 2010)



- 3) Country of origin code (JAPAN, CHINA, MALAYSIA)

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- *1-2 For proper operation of circuit protection (IC Protector), Please use minimum of 9A capacity power supply for input.
- *1-3 This product has IC protector inside. The case each LED lines are same specifications (# of LEDs, Vf, etc.), please confirm input ripple peak current within 6.25A in any conditions. When the LED kind or the number of series of each output are different, please contact us.
- *1-4 FUSE installed in this product is selected to assuming 100,000 hours (25 degC) in continuous operation time.
- *1-5 When rise time of input voltage is very slow, please turn on the remote terminal after the input voltage has risen up sufficiently. When fall time of input voltage is very slow, please turn off the remote terminal before the the input voltage falls.
- *1-6 Please use the product only within the specified input voltage, output power, output voltage and operating temperature ranges. Do not short-circuit between the output terminals or the output terminal-GND. When deviating from these, the product might be caused the damage.

[2] Use conditions

2-1. Absolute Maximum Ratings

Item	Symbol	Specification	Unit	Remark
Input Voltage	Vin	0 ~ 13.2	V	
	Vrmt	0 ~ Vin		
	Vbr/Rbr	0 ~ 5		
	ADIM	0 ~ 3		
	Vst	This terminal is output terminal. Don't apply external voltage.		
Load Voltage	Vout1~5	12.8 (at Vin=10.8V) ~44	V	Minimum load Voltage > Vin+2V

2-2. Environmental condition

Item	Symbol	Specification	Unit	Remark
Operating Temperature Range	Ta	-30 ~ 85	degC	Please confirm the surface temperature of the L6 inductor is 115°C or less in worst condition (input voltage, load voltage, mounting instruction, and temperature) when it uses it.
Storage Temperature Range	Ts	-40 ~ 85	degC	
Humidity Limit	RH	95	%RH	A maximum wet-bulb temperature is 38 degC. No dew.

2-3. Rating condition

Item	Symbol	Specification	Unit	Item	Symbol	Specification	Unit
Rating input Voltage	Vin	12	V	Load voltage	Vout1~5	25.2	V
	Vbr/Rbr	0					
	ADIM	0					

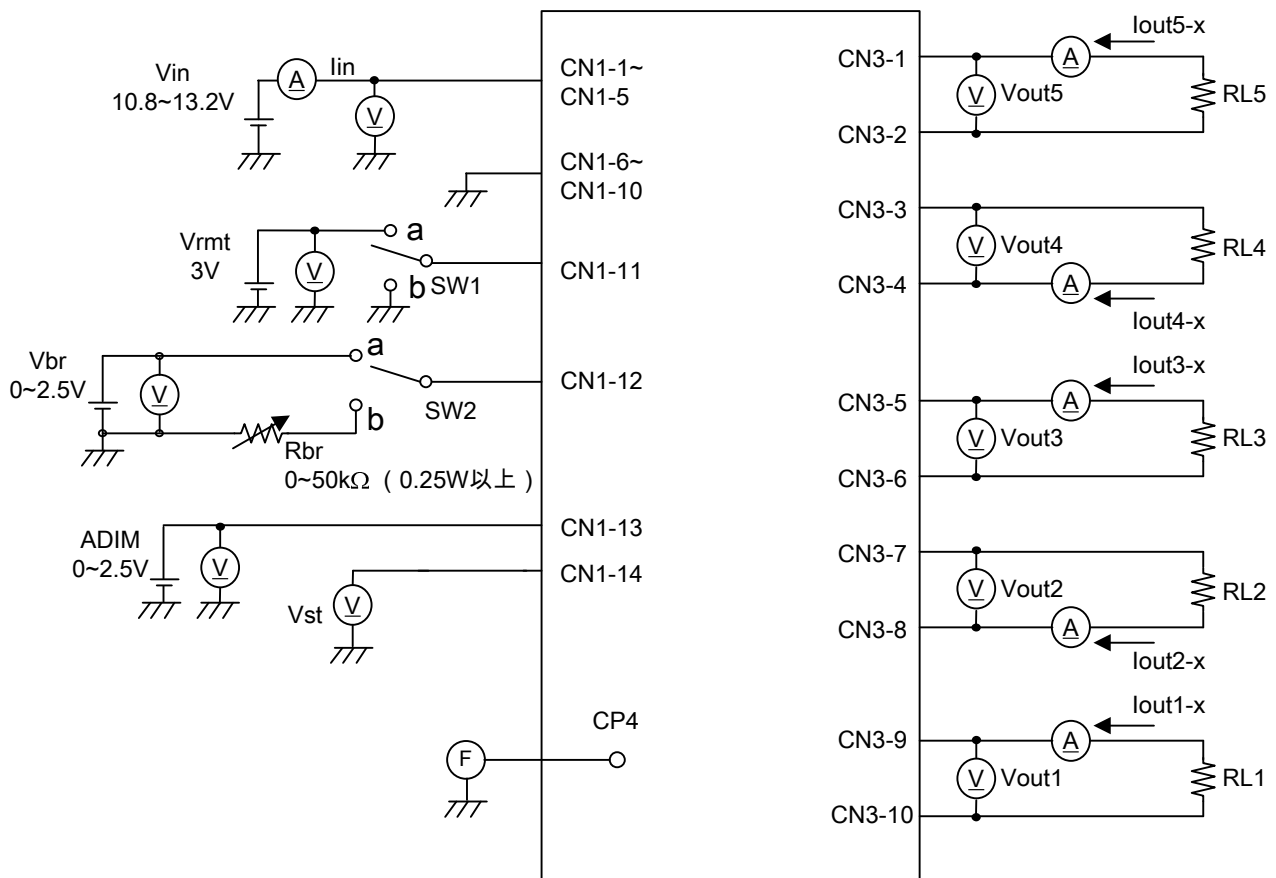
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[3] Electrical Characteristics

Item	Symbol	Condition						Specification			Unit
		Ta(degC)	Vin(V)	Vrmt(V)	Vbr(V)	ADIM(V)	RL1~5(Ω)	MIN.	TYP.	MAX.	
Input Current1	lin1	25±10	12±0.1	3±0.05				1.2	1.64	2.0	A
		-30~85	10.8~13.2					1.0	1.64	2.5	
Input Current2	lin2	25±10	12±0.1	0	0	0	180	-	-	1	mA
Output Current1	Iout1-1- Iout5-1	25±10	12±0.1	3±0.05				112	140	168	mA
		-30~85	10.8~13.2					100	140	180	
Output Current2 (PWM Dimming)	Iout1-2- Iout5-2				2.5			10	20	30	mA
Output Current3 (Analog Dimming)	Iout1-3- Iout5-3				0	2.5	870	4	20	40	mA
PWM Burst Frequency	F	25±10	12±0.1		2.5		180	160	200	240	Hz
Alarm Output *3-1	Vst1				0			-	0.1	0.5	V
	Vst2						∞	4.75	5.0	5.25	V

*3-1 This converter has alarm output function. If converter detects OVP or any strings open, Vst terminal outputs around 5V. If a string open condition occurs, other strings keep on working.

[4] Measurement Circuit



*Please refer to 1-1 Pin configuration in detail.

RL1~5: Equivalent Load (above 15W)

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*4-1 SW1 function

SW1	ON/OFF control
a	Operating
b	Not operating
open	Not operating

*4-2 SW2 function

SW2	PWM Dimming
a	*PWM DC Voltage Dimming Vbr=0 ~ 2.5V
b	*PWM Volume Dimming VR=0 ~ 50kΩ

* Vbr=0V: maximum brightness Rbr=0Ω: maximum brightness

*4-3 Measurement Equipment

- Ⓧ : DC Voltage Meter
(ADVANTEST R6452A or equivalent)
- Ⓐ : DC Current Meter
(ADVANTEST R6452A or equivalent)
- ⓕ : Frequency Counter
(ADVANTEST R6452A or equivalent)

*4-4 Protection circuit operation

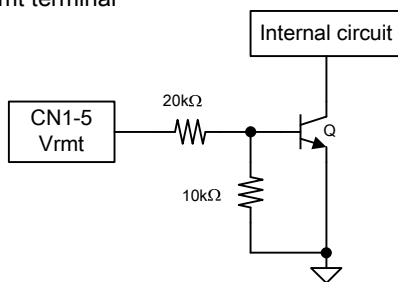
Load Condition	Alarm output (CN1-14)*1	Output status
normal	0.5V max.	CC
any strings open	4.5V min.	Open string: CV Others: CC
all strings open	4.5V min.	CV

*4-5 Notice of the alarm output

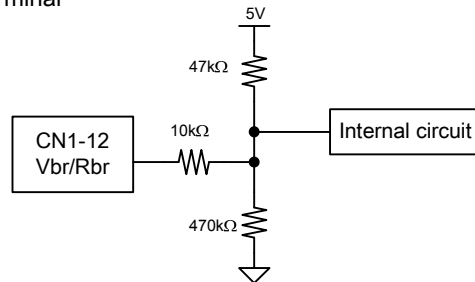
The alarm output might be generated at the transition state of ON/OFF by Vrmt or Vin.

*4-6 Internal circuit (reference)

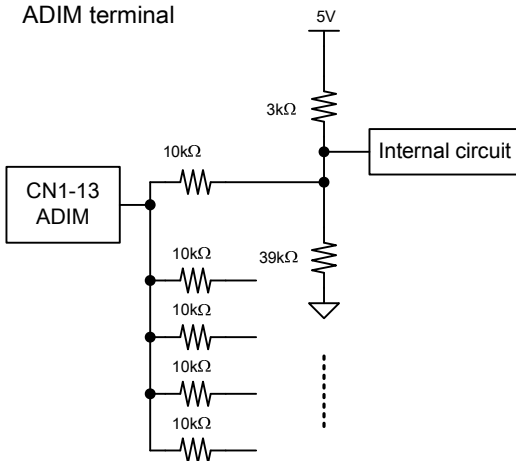
Vrmt terminal



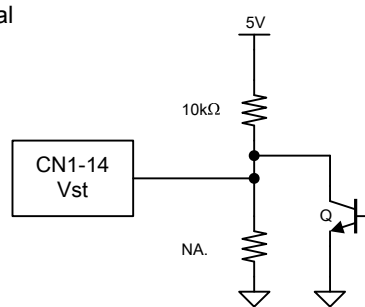
Vbr/Rbr terminal



ADIM terminal



Vst terminal



*4-7 In PWM or Analog Dimming operation, please confirm the LCD panel before use. Flickering may occur due to ripple noise is on Dimming pin (CN1-12 / CN1-13).

*4-8 When the output is turned on and off directly with a mechanical switch etc., the LED string may occur shutdown by the increase in voltage on output terminal (CN3-1, CN3-4, CN3-5, CN3-8, CN3-9).

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[5] Reliability Test

This product is satisfied following reliability test.

Item	Condition	Judgment Standard
High Temperature Continuous Operation	85degC 500hrs. Operation condition: rating condition	Electrical and appearance should be in the spec.
Heat Shock	-40degC <-> 85degC 30min./each 100cycles	
Humidity Environment Off and On Operation	60degC 90%R.H. On 1hr / Off 3hrs. 100cycles. Operation condition: rating condition	
Vibration	5 ~ 10Hz Amplitude 10mm 10 ~ 200Hz Accelerated Velocity 21.6m/s ² (2.2G) Log Sweep :10min. X, Y, Z direction 60min /each total 3hrs.	
Shock	588m/s ² (60G) 11ms Half-sine wave once each axis X, Y, Z, -X, -Y, -Z total 6times	

[6] Others

6-1 Test Conditions

Unless otherwise specified test environment is determined as temperature is 15 ~ 35 degC and humidity is 25 ~ 75 %RH.

6-2 Warranty

One year after shipment. This covers defects in material or TDK-Lambda workmanship. Defects units will be replaces at no charge.

6-3 Others

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

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