

ALD-605012P*131

Constant Current DC-DC Converter
for LED

DIP type : ALD-605012PD131

SMD type : ALD-605012PS131

Features

- Six Outputs
- Compact, high efficiency
- Usable in a wide range of temperatures
- Applicable panel size: 6 to 12 inches (rough guide)
- Combined use of PWM modulated light and analog modulated light (ADIM) assures universality
- Equipped with load (LED) open detection (alarm output) function
- Onboard and connectorless
- Wide dimming range



Applications



ALD-605012P*131 Specifications (Please refer to each specification before use)

Electrical Characteristics

Item	Unit	Symbol	Specification			Condition						Remarks
			min.	typ.	max.	Vin(V)	Vrmt(V)	Vpwm(%)	Rbr(kΩ)	Ta(°C)	RL1-6(Ω)	
Output Current	mA	Iout1-6 (Maximum dimmer)	40	50	60	12±1.2	5±0.25	100	10	-20to55	600	(*1)
		Iout1-6 (when modulating light)	3	5	7	12±1.2	5±0.25	10	10	-20to80	600	PWM modulated light (*1)(*2)
			10	20	30	12±1.2	5±0.25	100	1	-20to80	600	ADIM modulated light (*1)(*2)
Input Current	A	Iin1	-	0.9	1.2	12±1.2	5±0.25	100	10	-20to80	600	Remote ON
	mA	Iin2	-	-	10	12±1.2	0	100	10	-20to80	600	Remote OFF
Modulated light frequency	Hz	F	180	225	270	12±1.2	5±0.25	10	10	-20to80	600	
Alarm Signal	V	Vst	-	-	1	12±1.2	5±0.25	100	10	-20to80	600	On a normal operation (*3)
			4.5	5.0	5.5	12±1.2	5±0.25	100	10	-20to80	∞	In case of lamp anomaly (*3)

Other Specifications

Modulated light system		PWM/ADIM (*2)
Operating Temperature	°C	-30 to +80(with current derating)
Storage Temperature	°C	-40 to +85
Operating Humidity Ratio	RH%	95Max
Weight	g	5.5 typ.
Dimensions (WxDxH)	mm	22.86x21.1x8.5(DIP)(*4) 26.16x21.1x8.8(SMD)(*4)
Fused Input		No
Remote ON / OFF		Yes
Lamp open detection function		Yes

Conformity to RoHs Directive

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

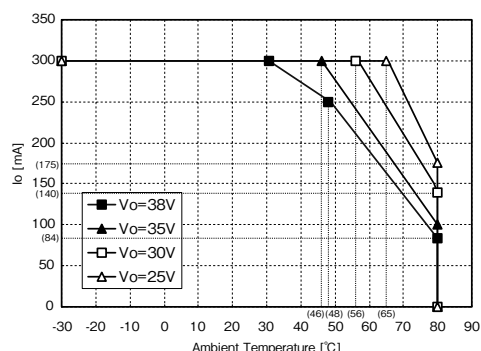
(*1) When output is open, the output voltage of that series is restricted, and other series operate normally.

(*2) See "Connections" as well as "Analog Modulation Light (ADIM) and PWM Modulation Light" for details about modulation light.

(*3) See "Connections" for details about alarm output.

(*4) These dimensions are indicated the maximum only H. Others are typical values.

Output current derating (current is total value of CH1 to CH6)

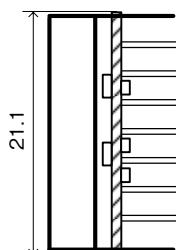
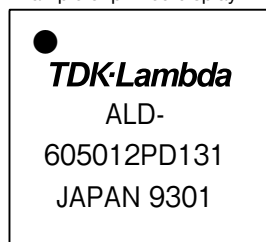


(*5) Note that with parallel connections, the greater the disparity between each string voltage (the total Vf in each string) the greater the amount of heat generated by the activated IC. Please use the same products for each string of LEDs and, likewise, use the same serial connections.

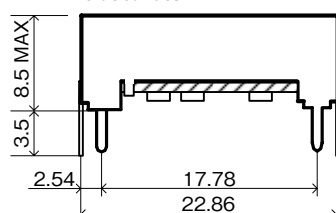
Outline Drawing

①DIP unit

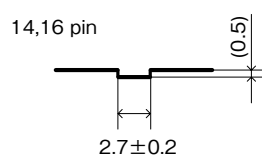
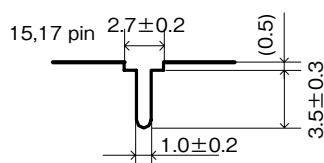
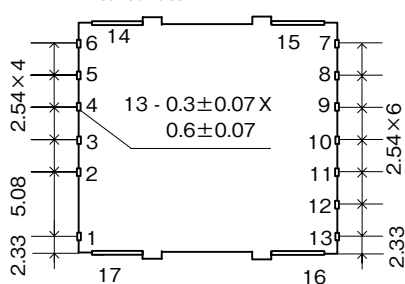
Example of printed display



Side surface

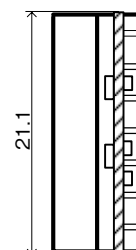
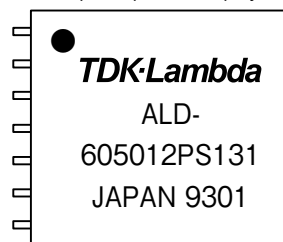


Rear surface

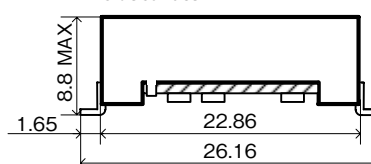


②SMD unit

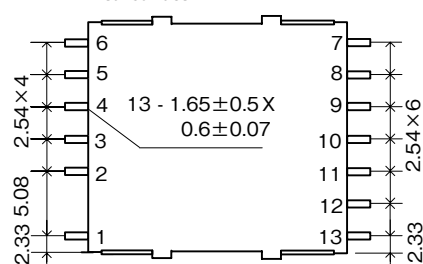
Example of printed display



Side surface



Rear surface



Terminal Connections

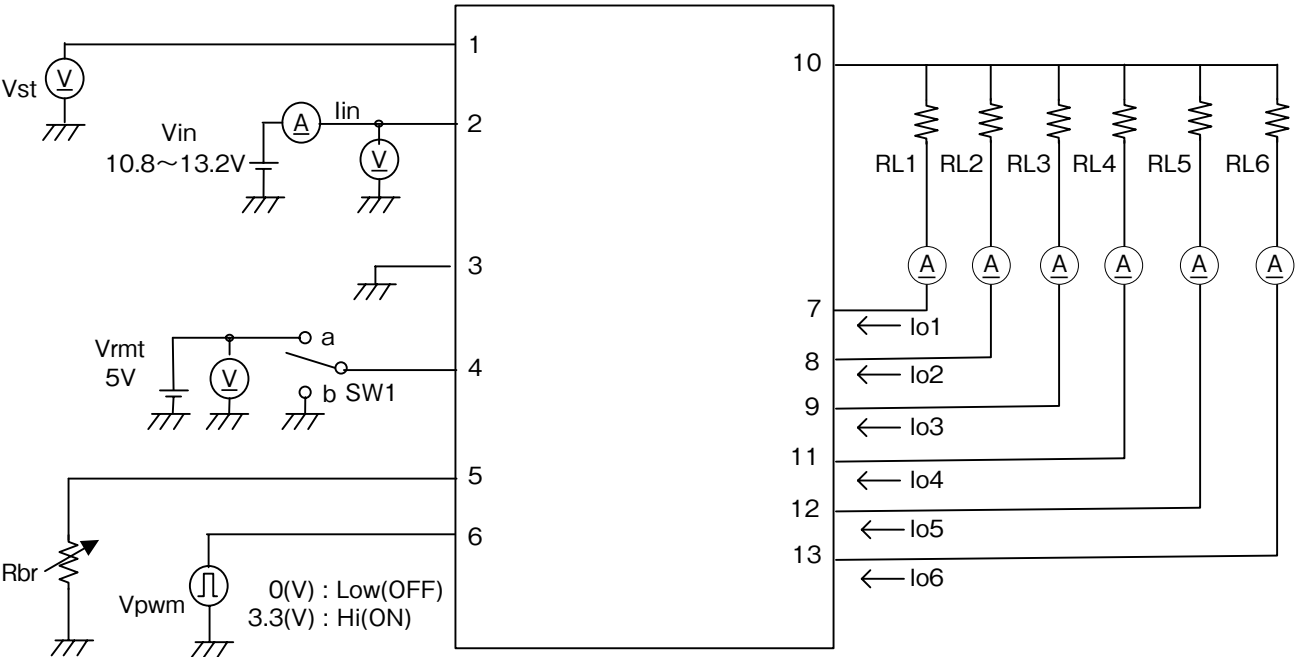
Input Terminals

Terminal No.	Symbol	Rating	Remarks
1	Vst	0(V)/5(V)	At time of normal load/ at time of abnormal load
2	Vin	12±1.2V	Power source input
3	GND	0V	Ground
4	Vrmt	0-0.4(V)/2.5-Vin(V)	OFF / ON
5	Rbr/Vbr	1-10(kΩ) 1.6to3.8(V)	ADIM modulated light MIN/MAX Modulated light function using output current variation
6	Vpwm	0(V)/3.3(V)	PWM modulated light MIN/MAX Modulated light function using output PWM modulation

Output Terminals

Terminal No.	Symbol	Rating	Remarks
7	CH1	For each CH, output current is: (Io) = 50mA, and output voltage is: (Vo) = 30V.	CH1 – cathode side
8	CH2		CH2 – cathode side
9	CH3		CH3 – cathode side
10	Vo		CH1to6 – anode side
11	CH4		CH4 – cathode side
12	CH5		CH5 – cathode side
13	CH6		CH6 – cathode side

Connections



RL1 to 6: Load resistance (600Ω, 20W min.)

Operate by ON-OFF of SW1 as follows.

SW1	Unit operates
a	Operates
b	Does not operate
Open	Does not operate

Measuring Instruments

- (V) : DC voltmeter (ADVANTEST R6452A equivalent)
- (A) : DC ammeter (ADVANTEST R6452A equivalent)
- (F) : Frequency counter (ADVANTEST R6452A equivalent)

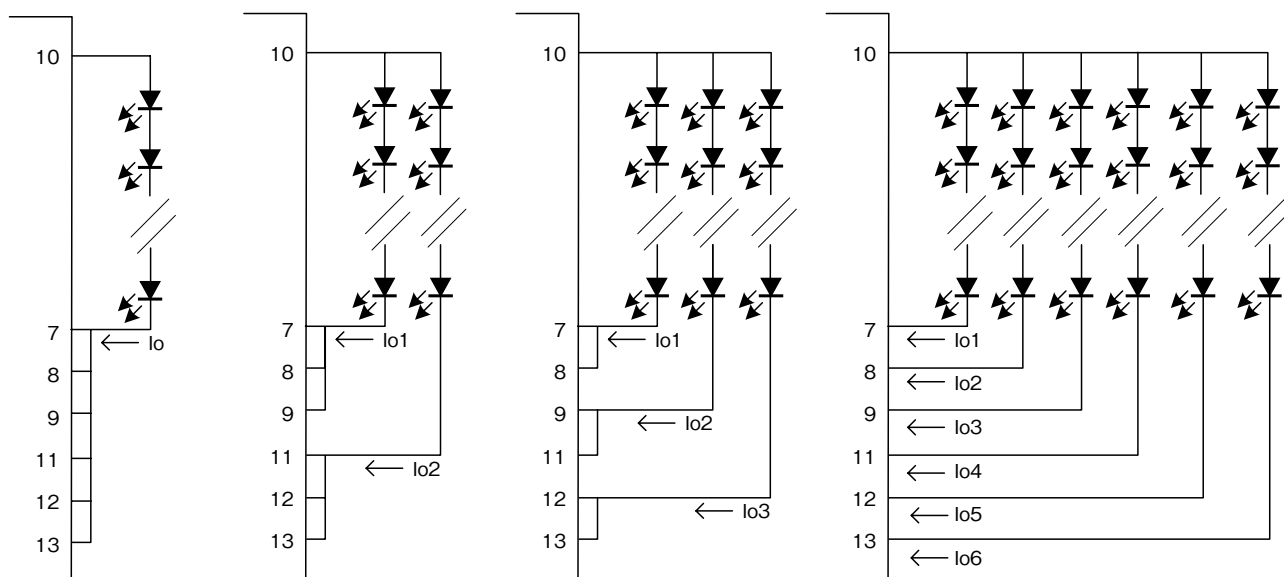
Protection Circuit Operation

Load condition	Alarm output (CN1-6)*1	Remarks
Load at normal time	1V max.	Operating normally
1 output open	4.5V min.	Other output operating normally
All outputs open	4.5V min.	Operating at minimum duty

Alarm output Vst may be output when there is excessive ON/OFF of Vin and Vrm.

Examples of Application Connections

- One serial connection
Vo : 38Vmax
Io : 300mA max
- Two serial connections
Vo : 38Vmax
Io1, 2 : 150mA max
- Three serial connections
Vo : 38Vmax
Io1, 2, 3 : 100mA max
- Six serial connections
Vo : 38V max
Io1, 2, 3, 4, 5, 6 : 50mA max



Analog Modulated Light (ADIM) and PWM Modulated Light Combination Example

Determines maximum value for output current in analog modulated light, to enable brightness control at that range, using PWM modulated light.

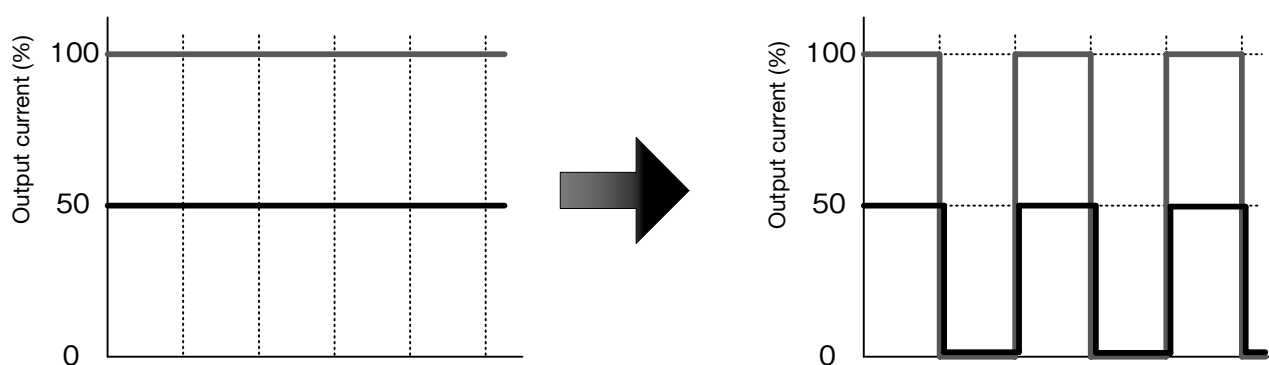
<Modulated Light Example 1 (gray in diagram below)>

Set output current value to 100%, in cases where PWM modulated light is desired at a modulated light range of 100% to 0%

<Modulated Light Example 2 (black in diagram below)>

Set output current value to 50%, in cases where PWM modulated light is desired at a modulated light range of 100% to 0%

PWM Modulated Light Voltage and Output Current Examples



Analog modulated light is the modulated light system for changing current amplitude. The benefits this system offer are that low frequency noise hardly occurs because it does not have an intermittent action and input power source load is small because input current variation is small. Conversely, because it changes the LED action point, chromaticity varies according to the modulated light.

PWM modulated light is the system where intermittent actions are made at low frequency in the range of 100kHz to 1kHz, and this on duty is varied to modulate light. Although this system leaves concern about low frequency noise and the demand for excessive answering to accommodate input power source, it offers the benefit of small chromaticity variations according to the modulated light because the LED action point does not change. PWM modulated light comes in two forms: a built-in PWM modulated light system (this is inside the LED driver generating chopping and sawtooth waves, which are compared against the external DC voltage to form a modulated light pulse) and an external PWM modulated light system (this directly applies the pulse from outside to modulate light).

The ALD Series combines analog modulated light and PWM modulated light to enable the generation of modulated light that suits your needs.