

# DC to DC Converters

## Non-insulation Type, Wide Input, SMD

Conformity to RoHS Directive

### CE-1050 Series

#### FEATURES

- Wide input voltage range (DC: 12 to 24V).
- A thickness dimension is a low height of 54.5mm.
- It is available in the wide temperature range from  $-20$  to  $+85^{\circ}\text{C}$ .
- Equipped with ON/OFF control feature
- Available with a wide-range  $+3.3$  to  $+12.6\text{V}$  output voltage variation feature
- Equipped with overcurrent protection feature
- Due to the shielding structure of five-side in metal, this series feature low EMI.
- SMD type is available for feeding with both tray and taping.
- It is a product conforming to RoHS directive.

#### SPECIFICATIONS AND STANDARDS

Part No.	CE-1050		
Input voltage range	Vin	V	+9 to +26.4
Output current range*1	Iout	A	2.5max.
Output voltage setting range*2	Vout	V	+3.3 to +12.6
Output voltage total variation*3		%	$\pm 3.5$ max.
Oscillating frequency		kHz	380typ.
Output ripple noise voltage*4		mVp-p	50max.
Efficiency*5		%	90typ.
ON/OFF control voltage	ON	V	6max./3min.
	OFF	V	0.6max./0min.
Overcurrent protection		A	3.5typ.

\*1 Input/output potential difference must be at least 4V.

\*2 When output voltage is set at 12V, it is  $\pm 5\%$  max.

\*3 When output voltage is set at 12V, it is 100mV max.

\*4 With 18V input voltage, 5V output voltage, 2.5A output current.

\*5 Derating may occur depending upon the output voltage.

#### COMMON SPECIFICATIONS

Operating temperature range	$-20$ to $+85^{\circ}\text{C}$
Storage temperature range	$-20$ to $+85^{\circ}\text{C}$
Humidity range	10 to 90(%)RH

#### PRECAUTIONS

- Since this product uses a multilayered board, it has moisture-proof packaging. After opening, if the injector value is 30% or more, defects such as pattern breaking may occur during reflow, so be sure to perform baking procedures (JEDEC MSL level 3). Recommended baking conditions: once at  $120^{\circ}\text{C}$ , 120minutes
- This product cannot be cleaned. Use low-residue or non-cleaning type flux and refrain from cleaning.
- The packaging type of this product is solely taping packaging. Packaging amount is 400 items/reel.

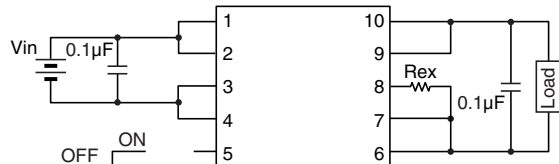
#### OUTPUT VOLTAGE SETTING METHOD

By connecting a Rex external resistor, output voltage can be altered.

It is not necessary to attach a Rex when using at a 5V output voltage.

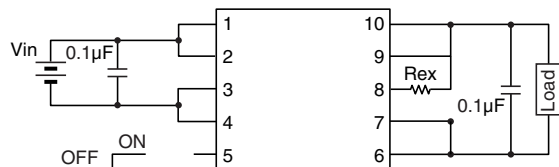
- To raise the output voltage: insert the Rex between pin 7 and 8

$$\text{Rex} = \frac{13.31 - \text{Vout}}{\text{Vout} - 5} \quad \text{Unit: V, k}\Omega$$



- To lower the output voltage: insert the Rex between pin 8 and 9

$$\text{Rex} = \frac{7.8 \times \text{Vout} - 13.31}{5 - \text{Vout}} \quad \text{Unit: V, k}\Omega$$

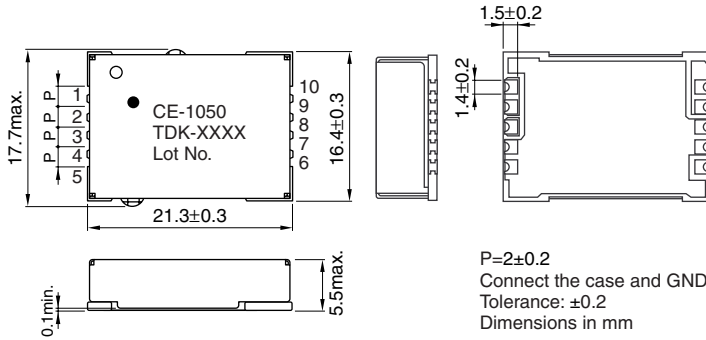


Output can be started and stopped by controlling terminal 5. Since this terminal is pulled up via a  $2\mu\text{A}$  internal current source, by connecting a condenser, the start up time can be delayed. The delay time is approximately 0.3ms per 1000pF.

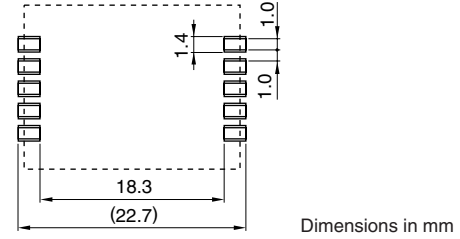
- Conformity to RoHS Directive: This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted applications.

- All specifications are subject to change without notice.

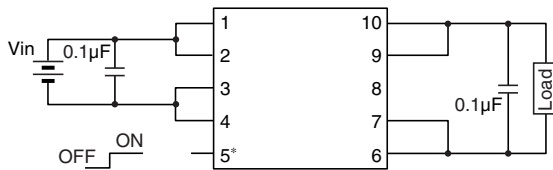
## SHAPES AND DIMENSIONS



## RECOMMENDED PC BOARD PATTERN [TOP VIEW]



## CIRCUIT DIAGRAM



\* When does not use ON/OFF control, please make it opening.

Input start-up time: less than 5ms

(When it cannot satisfy this condition, please use ON/OFF terminal. And start with the conditions that input voltage was applied.)

Added input inductor: less than  $2.2\mu\text{H}$  if added

Added input condenser: added capacity 10 times or more of input inductor

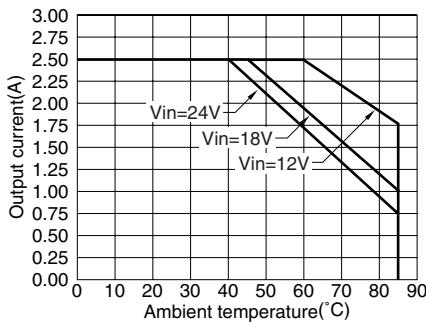
Added output capacity: Less than  $100\mu\text{F}$  If capacity is large, it may not start up.

## TERMINAL CONNECTIONS

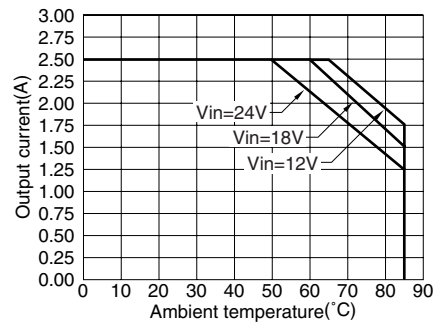
No.	Symbol	Function
1	$V_{in}$	Input voltage
2	$V_{in}$	Input voltage
3	GND	Input GND
4	GND	Input GND
5	ON/OFF	Output ON/OFF terminal
6	GND	Output GND
7	GND	Output GND
8	Vset	Output voltage variable terminal
9	Vout	Output voltage
10	Vout	Output voltage

## OUTPUT POWER - AMBIENT TEMPERATURE (DERATING)

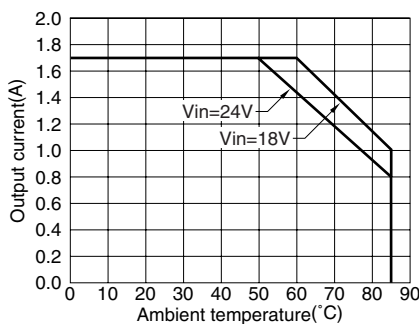
### Vout=3.3V



### Vout=5.0V



### Vout=9.0V



### Vout=12V

