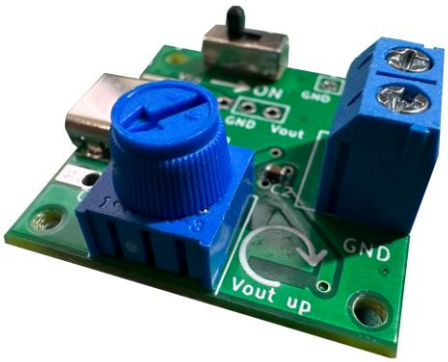
Step-Up/Step-Down DC-DC Converter

User Manual

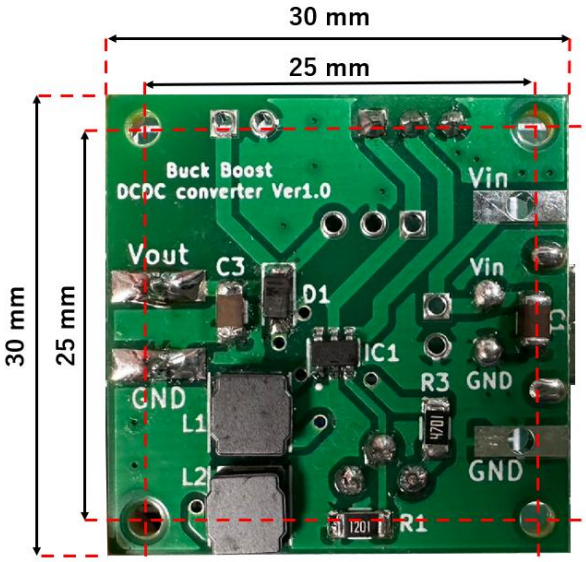


◆Features◆

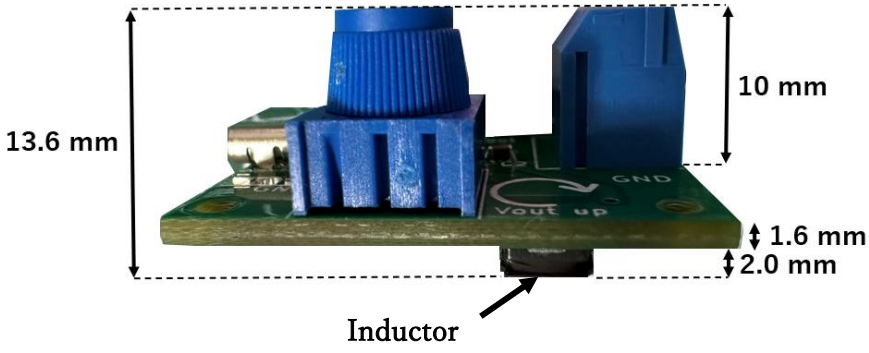
- This product is a step-up/down DC-DC converter board (SEPIC type) with manually adjustable output voltage using a flathead screwdriver.
- The board supports connections via USB Type-C, soldering, terminal blocks, and pin headers.
- You can estimate the output voltage from the position of the potentiometer arrow without using a tester.
- To reduce the board size, electronic components are soldered on both sides of the board.
  *Components other than the terminal block are installed and delivered.
  The terminal block is included, but pin headers and pin sockets are not included.
- The output can be turned ON/OFF using the switch on the board.
- The board has four M2 screw holes, allowing it to be securely mounted.

◆Specifications of PCB◆

- Output voltage range：3.0 V～13.0 V
- Input voltage range：2.0 V～12.0 V
- Switching frequency：1.2 MHz
- Efficiency：86 %　(Input voltage = 5V , Output voltage = 12 V , Output current = 300 mA)
- Rated output power：4.0W
- Size of PCB：Length = 30 mm、Width = 30 mm、Height = 13.6 mm



Back side of PCB



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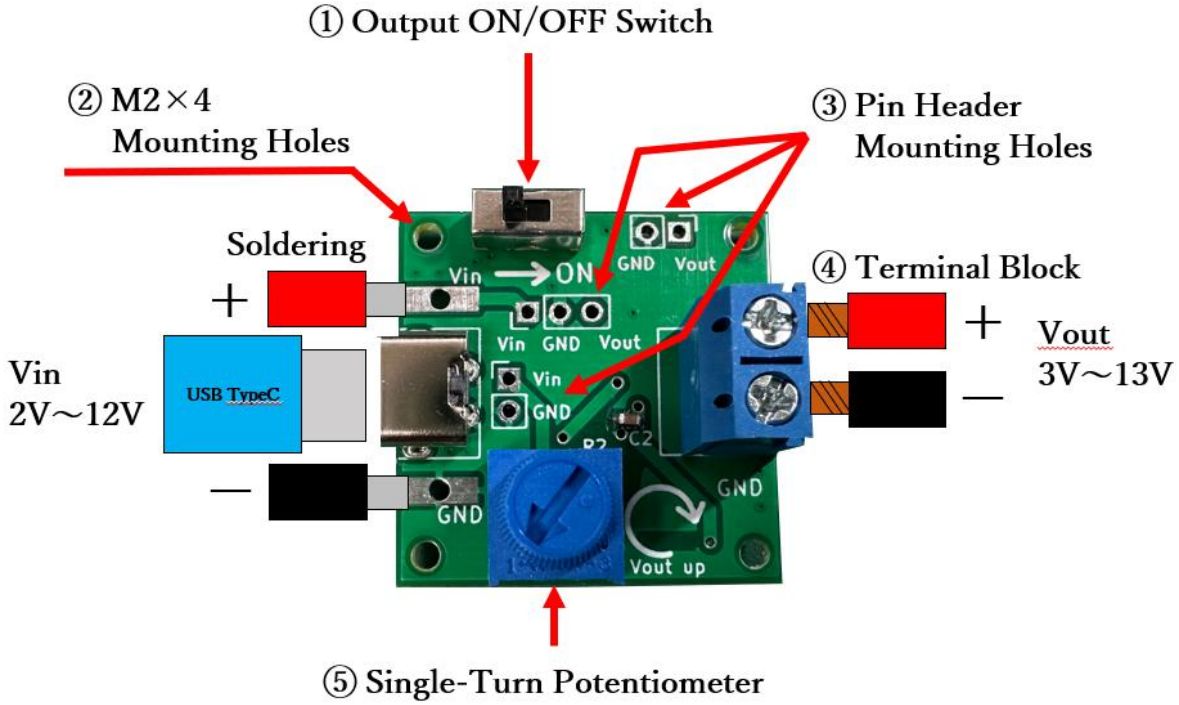
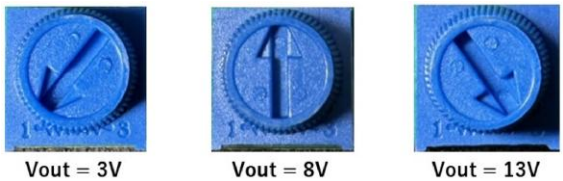
◆How to use of PCB◆

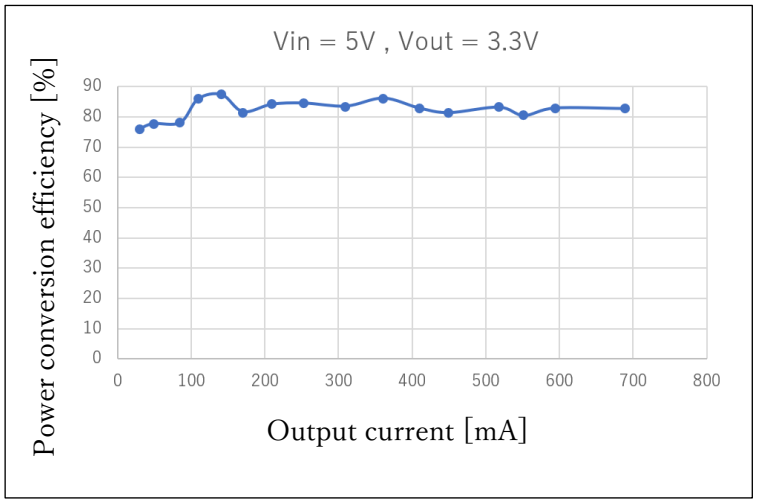


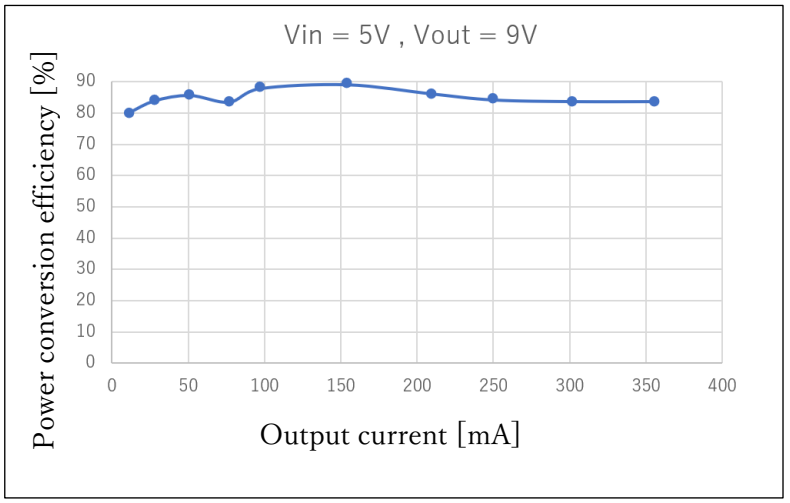
①Output ON/OFF Switch	You can turn on or off using the switch. It will turn ON when switched in the direction of the arrow on the board.
②M2×4 Mounting Holes	You can fix the PCB with M2 screw.
③Pin Header Mounting Holes	You can use pin header or pin socket.
④ Terminal Block	Soldering is possible on the pads on both sides (if not using the terminal block). 
⑤ Single-Turn Potentiometer	・When the variable resistor R2 is turned clockwise as viewed from the top, the output voltage Vout increases. ・Please check the position of the arrow before turning the output ON.  Vout = 3V　Vout = 8V　Vout = 13V *This is the output voltage when there is no load.

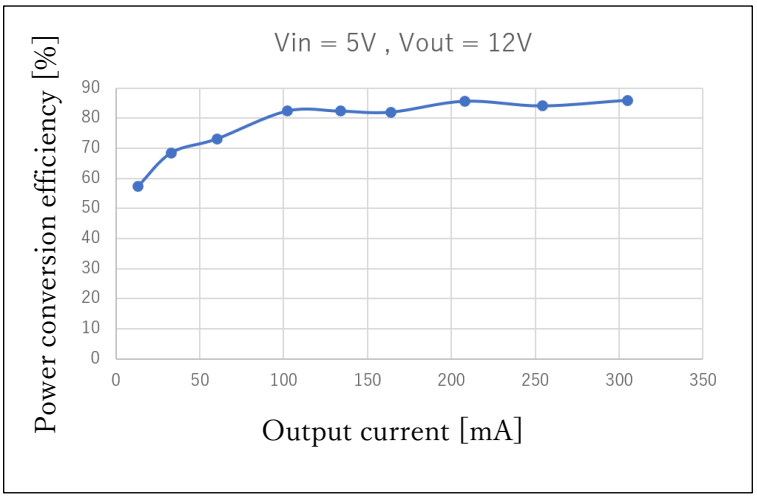
◆Evaluation of power conversion efficiency◆

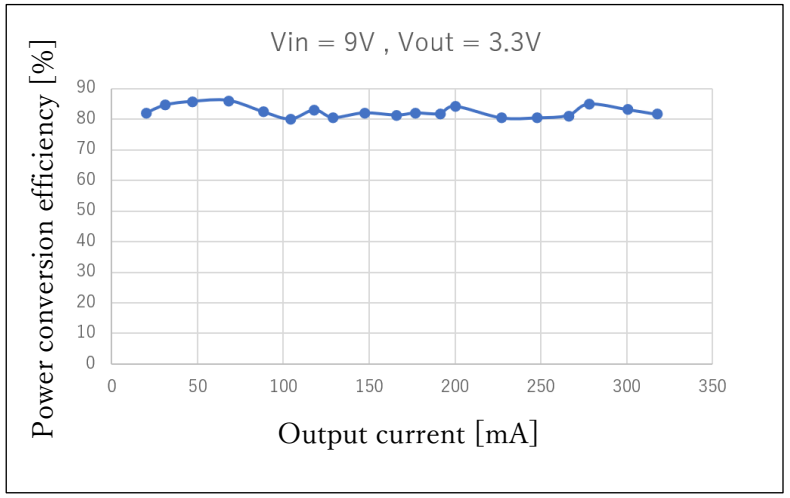
The graph of output current-to-power conversion efficiency for representative input and output voltages are shown below.

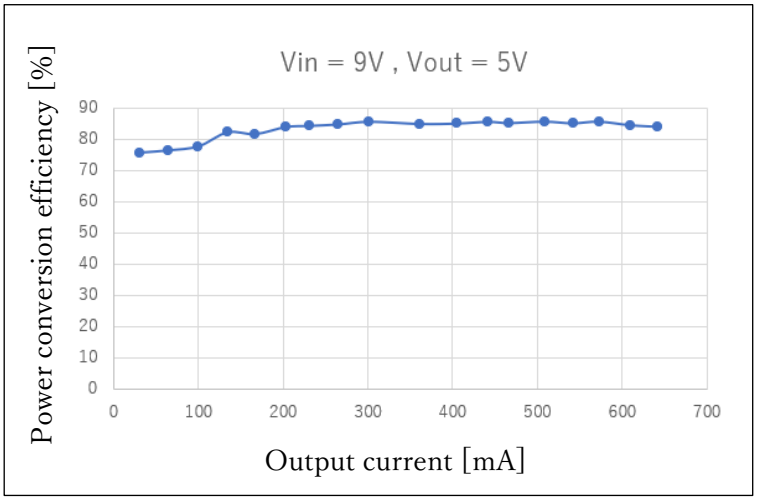
Please note that there may be slight variations depending on the device, so use this as a reference.

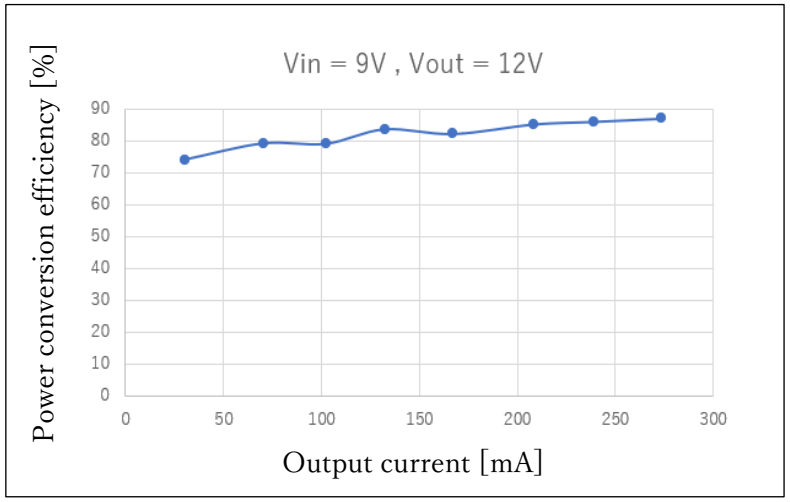




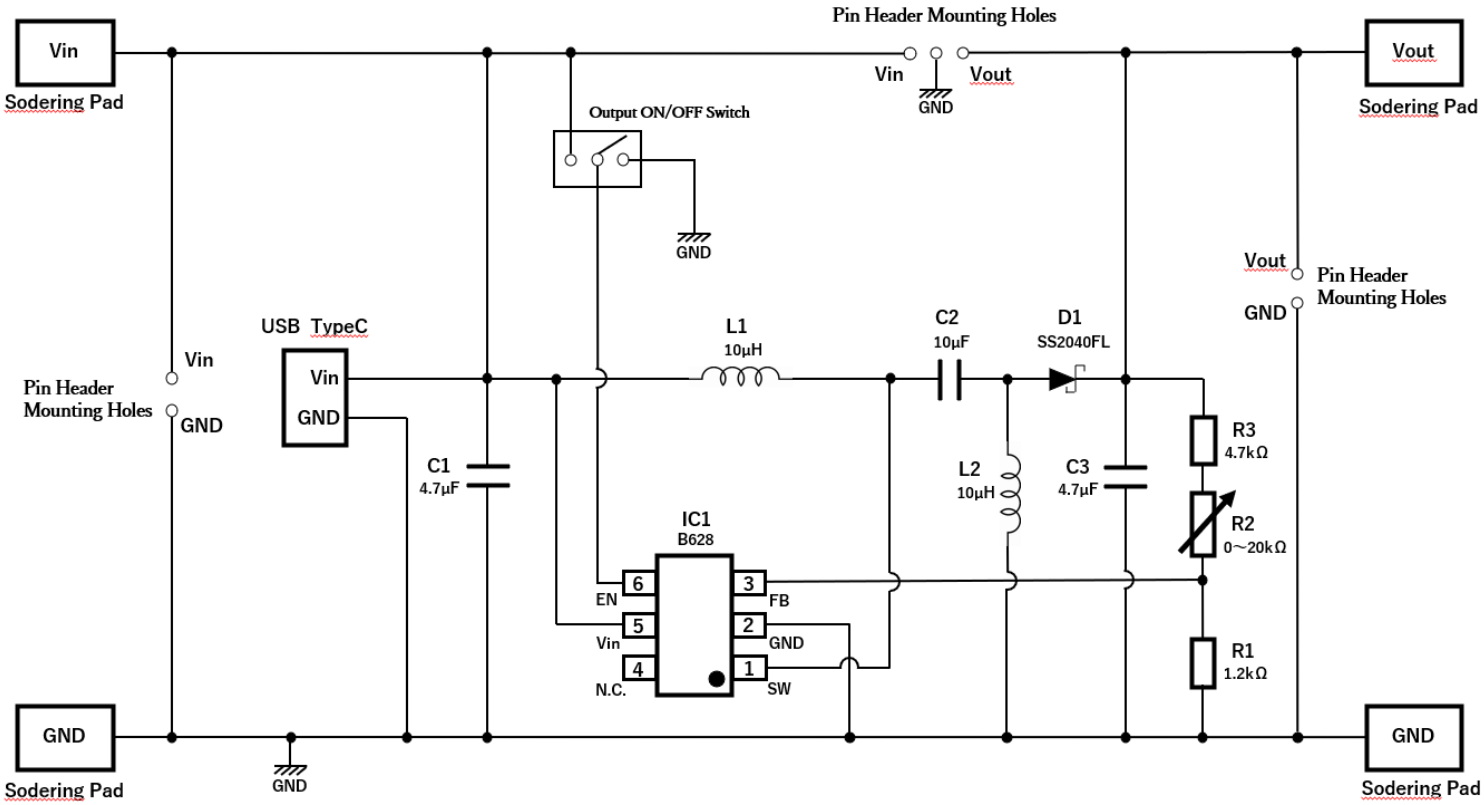








◆Electrical Circuit Diagram



◆Parts List◆

Symbol / Name	Model / Specification	Notes
IC1	B628	
C1 , C3	GRM31CR71H475KA12	
C2	GRM188R6YA106MA73	
L1 , L2	LQH5BPB100MT0	
D1	SS2040FL	
R1	1.2KΩ , Rating：1/8W , Size：0805	
R2	3386K-EY5-203TR	
R3	4.7KΩ , Rating：1/8W , Size：0805	
Output terminal block	WJ301-5.0-02P-122-00A	It is not mounted on the PCB, but included with PCB.
Output ON/OFF switch	SS-12D00G3	
Input USB TypeC	A295-CTRPB-1	
PCB	30 mm×30 mm	This PCB is designed by the creator.

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◆Precautions for use◆

- This product does not include any overload protection components such as fuses or circuit protectors on the input or output sides. Therefore, please take great care to avoid short circuits and overload conditions.
  To prevent the risk of short circuits, do not operate the board on a metal surface.

- Please use the product so that the maximum output power does not exceed 4W.
  When the output power reaches 4W, the board surface temperature rises to approximately 53° C, the inductor to about 60° C, and the IC to about 70° C. Please be careful to avoid burns.

- This product cannot be used with devices that require large amounts of power, such as stepping motors.

- When the board is not in use, please turn the Output ON/OFF switch to OFF whenever possible.
  Before use, make sure that the output switch is set to OFF.

- Before turning the output ON, check the position of the potentiometer arrow and confirm that there are no short circuits on either the input or output sides.

- The terminal block is included but not soldered; all other components are already assembled.
  Please solder the terminal block at your own discretion.

- We cannot accept any responsibility for malfunctions, board damage, or any accidents caused by user modifications or by operating the product with an output power exceeding 4W.