

0.3 V Ultra-low Output Voltage 300 mA Buck DC/DC Converter Evaluation Board

NO.EEV-519-K081D-191021

RP517K081D-EV is the evaluation board for RP517 which has the below features, benefits and specifications.

OVERVIEW

RP517K is a low-voltage resistance buck DC/DC converter featuring ultra-low 0.3 μ A quiescent current and 0.3 V output voltage. Suitable for wearable and IoT devices which require long-life batteries and downsizing.

KEY BENEFITS

- Ultra-low consumption current (I_Q : 0.3 μ A) with the VFM control for DC/DC (switching frequency: 1 MHz max.)
- Suitable for low power devices due to its ultra-low output voltage range from 0.3 V to 1.2 V
- Suitable for coin batteries and USB ports due to its wide input range from 1.8 V to 5.5 V

KEY SPECIFICATIONS

- Output current: 300 mA
- Output Voltage Range: 0.3 V to 1.2 V (Settable in 0.1 V step)
- Output Voltage Accuracy: ± 18 mV
- Built-in Driver On-resistance ($V_{IN} = 3.6$ V): Typ. PMOS 0.19 Ω , NMOS 0.19 Ω
- Standby Current: 0.01 μ A
- Package: DFN(PLP)2527-10
- For more details on RP517 IC, please refer to <https://www.e-devices.ricoh.co.jp/en/products/power/dcdc/rp517/rp517-ea.pdf>.

PART NUMBER INFORMATION

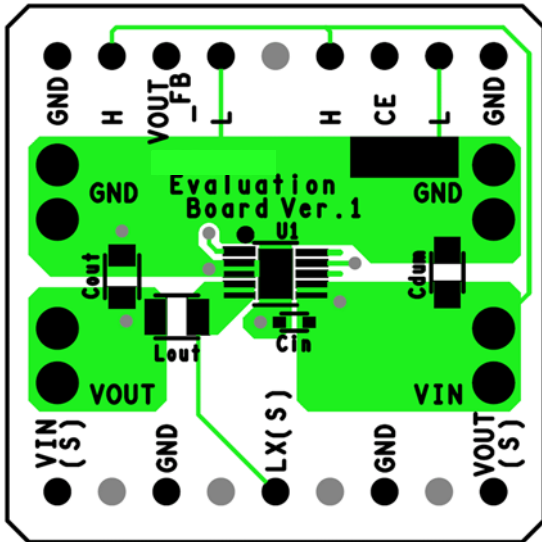
Product Name	Package
RP517K081D	DFN(PLP)2527-10

081: Specify the set output voltage (V_{SET}): 0.8 V.
D: Specify with auto-discharge function.

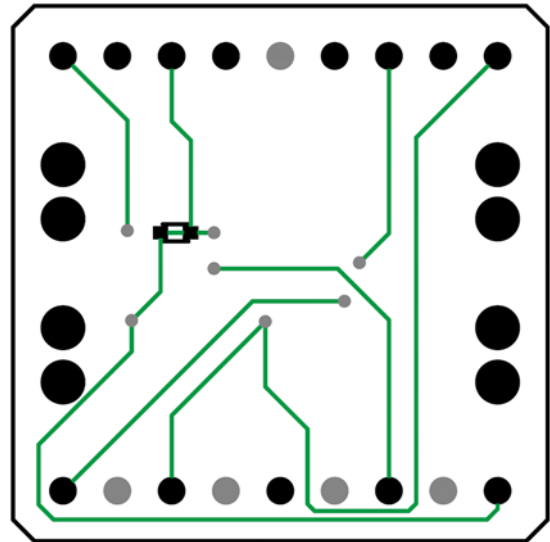
PCB LAYOUT

RP517K (DFN(PLP)2527-10)

Top Layer



Bottom Layer



ABSOLUTE MAXIMUM RATINGS

Absolute Maximum Ratings

Symbol	Parameter		Rating	Unit
V_{IN}	Input Pin Voltage		-0.3 to 6.5	V
V_{LX}	LX Pin Voltage		-0.3 to $V_{IN} + 0.3$	V
V_{CE}	CE Pin Voltage		-0.3 to 6.5	V
V_{OUT}	VOUT Pin Voltage		-0.3 to 6.5	V
P_D	Power Dissipation ⁽¹⁾	DFN(PLP)2527-10, JEDEC STD. 51	2500	mW
T_j	Junction Temperature Range		-40 to 125	°C
T_{stg}	Storage Temperature Range		-55 to 125	°C

ABSOLUTE MAXIMUM RATINGS

Electronic and mechanical stress momentarily exceeded absolute maximum ratings may cause permanent damage and may degrade the lifetime and safety for both device and system using the device in the field. The functional operation at or over these absolute maximum ratings is not assured.

RECOMMENDED OPERATING CONDITIONS

Recommended Operating Conditions

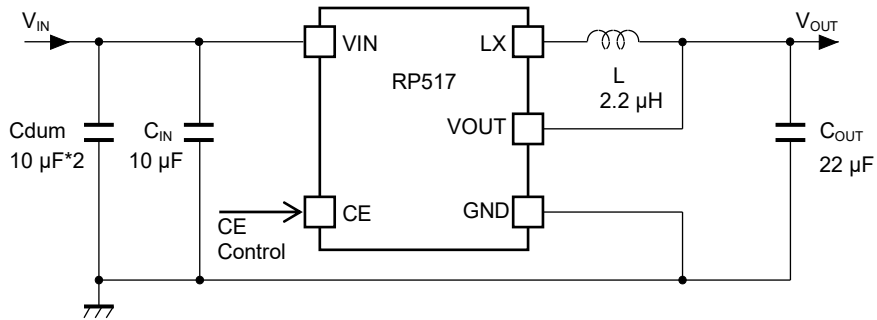
Symbol	Parameter	Rating	Unit
V_{IN}	Input Voltage	1.8 to 5.5	V
T_a	Operating Temperature Range	-40 to 85	°C

RECOMMENDED OPERATING CONDITIONS

All of electronic equipment should be designed that the mounted semiconductor devices operate within the recommended operating conditions. The semiconductor devices cannot operate normally over the recommended operating conditions, even if they are used over such conditions by momentary electronic noise or surge. And the semiconductor devices may receive serious damage when they continue to operate over the recommended operating conditions.

⁽¹⁾ Refer to *POWER DISSIPATION* in the product data sheet.

TYPICAL APPLICATION



RP517 Typical Application Circuit

※Testing with this EV board, an external attachment might be necessary for evaluation of the correct performance of the RP517 and already has been attached as C_{dum}.

For evaluation, wiring for power supply or GND will be used. Considering the voltage drop or noise by the wiring, C_{dum} has been mounted on the EV board to obtain the right performance of the RP517.

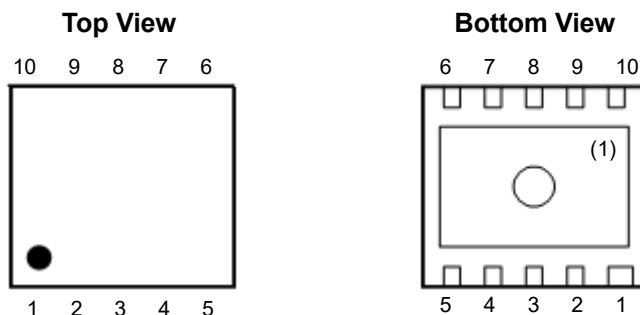
In the actual PCB layout or measurement unit's wire is very short, and C_{dum} will be unnecessary.

Recommended External Components*1

Symbol	Value
C _{IN}	10 μF
C _{OUT}	22 μF
C _{dum}	10 μF x 2
L	2.2 μH

*1 The bill of materials will be attached on the shipment of each purchased evaluation board.

PIN DESCRIPTIONS



RP517K [DFN(PLP)2527-10] Pin Configuration

RP517K [DFN(PLP)2527-10] Pin Descriptions

Pin No.	Symbol	Description
1	VOUT	Output Pin
2	GND	Ground Pin
3	GND	Ground Pin
4	LX	Switching Pin
5	LX	Switching Pin
6	VIN	Input Pin
7	VIN	Input Pin
8	NC	No connection
9	CE	Chip Enable Pin (Active-high)
10	NC	No connection
5	CE	Chip Enable Pin (Active-high)

⁽¹⁾ The tab on the bottom of the package enhances thermal performance and is electrically connected to GND (substrate level). It is recommended that the tab be connected to the ground plane on the board, or otherwise be left floating.

TECHNICAL NOTES

The performance of a power source circuit using this device is highly dependent on the peripheral circuit. A peripheral component or the device mounted on PCB should not exceed a rated voltage, a rated current or a rated power. When designing a peripheral circuit, please be fully aware of the following points.

- When an intermediate voltage other than V_{IN} and GND is input to the CE pin, a supply current may be increased by a through current of a logic circuit in the IC. The CE pin is neither pulled up nor pulled down, therefore the operation is not stable at open.



1. The products and the product specifications described in this document are subject to change or discontinuation of production without notice for reasons such as improvement. Therefore, before deciding to use the products, please refer to Ricoh sales representatives for the latest information thereon.
2. The materials in this document may not be copied or otherwise reproduced in whole or in part without prior written consent of Ricoh.
3. Please be sure to take any necessary formalities under relevant laws or regulations before exporting or otherwise taking out of your country the products or the technical information described herein.
4. The technical information described in this document shows typical characteristics of and example application circuits for the products. The release of such information is not to be construed as a warranty of or a grant of license under Ricoh's or any third party's intellectual property rights or any other rights.
5. The products listed in this document are intended and designed for use as general electronic components in standard applications (office equipment, telecommunication equipment, measuring instruments, consumer electronic products, amusement equipment etc.). Those customers intending to use a product in an application requiring extreme quality and reliability, for example, in a highly specific application where the failure or misoperation of the product could result in human injury or death (aircraft, spacevehicle, nuclear reactor control system, traffic control system, automotive and transportation equipment, combustion equipment, safety devices, life support system etc.) should first contact us.
6. We are making our continuous effort to improve the quality and reliability of our products, but semiconductor products are likely to fail with certain probability. In order to prevent any injury to persons or damages to property resulting from such failure, customers should be careful enough to incorporate safety measures in their design, such as redundancy feature, fire containment feature and fail-safe feature. We do not assume any liability or responsibility for any loss or damage arising from misuse or inappropriate use of the products.
7. Anti-radiation design is not implemented in the products described in this document.
8. The X-ray exposure can influence functions and characteristics of the products. Confirm the product functions and characteristics in the evaluation stage.
9. WLCSP products should be used in light shielded environments. The light exposure can influence functions and characteristics of the products under operation or storage.
10. There can be variation in the marking when different AOI (Automated Optical Inspection) equipment is used. In the case of recognizing the marking characteristic with AOI, please contact Ricoh sales or our distributor before attempting to use AOI.
11. Please contact Ricoh sales representatives should you have any questions or comments concerning the products or the technical information.



Ricoh is committed to reducing the environmental loading materials in electrical devices with a view to contributing to the protection of human health and the environment.

Ricoh has been providing RoHS compliant products since April 1, 2006 and Halogen-free products since April 1, 2012.

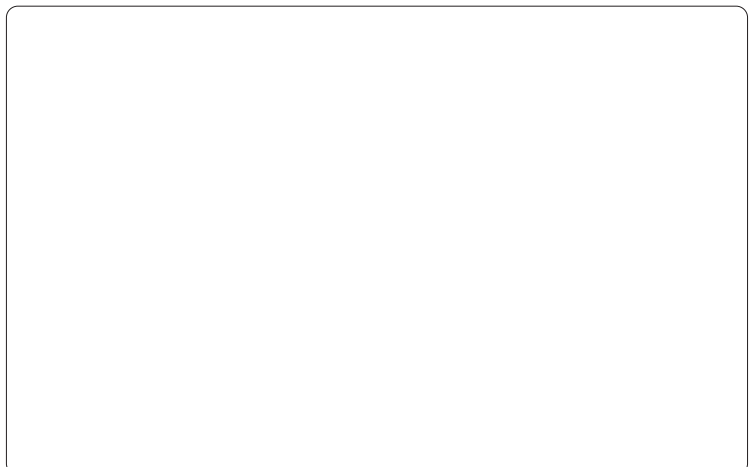
RICOH RICOH ELECTRONIC DEVICES CO., LTD.

Official website

<https://www.n-redc.co.jp/en/>

Contact us

<https://www.n-redc.co.jp/en/buy/>



X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for [Power Management IC Development Tools](#) category:

Click to view products by [Nisshinbo](#) manufacturer:

Other Similar products are found below :

[EVAL-ADM1168LQEBZ](#) [EVB-EP5348UI](#) [MIC23451-AAAYFL EV](#) [MIC5281YMME EV](#) [DA9063-EVAL](#) [ADP122-3.3-EVALZ](#) [ADP130-0.8-EVALZ](#) [ADP130-1.2-EVALZ](#) [ADP130-1.5-EVALZ](#) [ADP130-1.8-EVALZ](#) [ADP1714-3.3-EVALZ](#) [ADP1716-2.5-EVALZ](#) [ADP1740-1.5-EVALZ](#) [ADP1752-1.5-EVALZ](#) [ADP1828LC-EVALZ](#) [ADP1870-0.3-EVALZ](#) [ADP1871-0.6-EVALZ](#) [ADP1873-0.6-EVALZ](#) [ADP1874-0.3-EVALZ](#) [ADP1882-1.0-EVALZ](#) [ADP199CB-EVALZ](#) [ADP2102-1.25-EVALZ](#) [ADP2102-1.875EVALZ](#) [ADP2102-1.8-EVALZ](#) [ADP2102-2-EVALZ](#) [ADP2102-3-EVALZ](#) [ADP2102-4-EVALZ](#) [ADP2106-1.8-EVALZ](#) [ADP2147CB-110EVALZ](#) [AS3606-DB](#) [BQ24010EVM](#) [BQ24075TEVM](#) [BQ24155EVM](#) [BQ24157EVM-697](#) [BQ24160EVM-742](#) [BQ24296MEVM-655](#) [BQ25010EVM](#) [BQ3055EVM](#) [NCV891330PD50GEVB](#) [ISLUSBI2CKIT1Z](#) [LM2744EVAL](#) [LM2854EVAL](#) [LM3658SD-AEV/NOPB](#) [LM3658SDEV/NOPB](#) [LM3691TL-1.8EV/NOPB](#) [LM4510SDEV/NOPB](#) [LM5033SD-EVAL](#) [LP38512TS-1.8EV](#) [EVAL-ADM1186-1MBZ](#) [EVAL-ADM1186-2MBZ](#)