

■ TYPICAL APPLICATION

Fig.1 R1287xxxxy

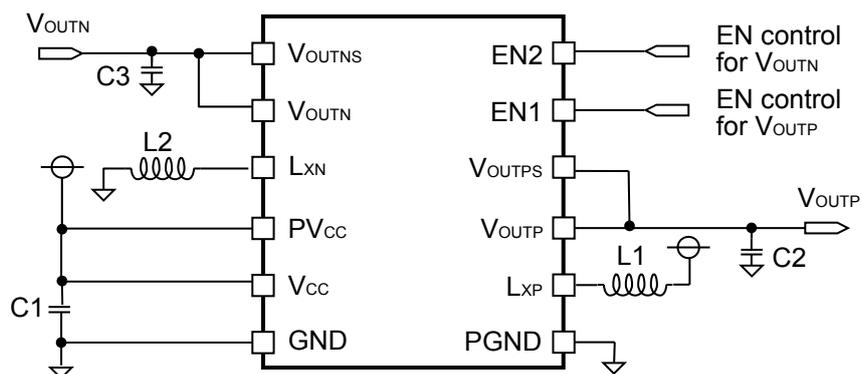
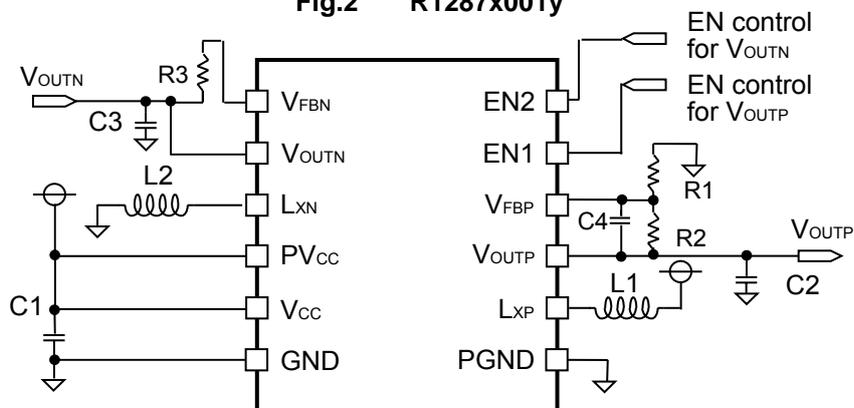


Fig.2 R1287x001y



■ RECOMMENDED EXTERNAL COMPONENTS

L1	DFE252010C(TOKO1269AS-H-4R7M=P2)
L2	DFE252010C(TOKO1269AS-H-4R7M=P2)
C1	10uF (C2012X5R0J106M)
C2	10uF (C2012X5R0J106M)
C3	10uF (C2012X5R0J106M)

TYPICAL BOARD LAYOUT

●Current Path on PCB

The current paths of boost DC/DC converter are shown in Fig.3 and Fig.4, and the current path of inverting DC/DC converter are shown in Fig.5 and Fig. 6.

The parasitic impedance, inductance, and the capacitance in the parts pointed with red arrows in Fig.4 and Fig.6 have an influence against the stability of the DC/DC converters and become a cause of the noise. Therefore, such parasitic elements must be made as small as possible.

Wiring of the current paths shown in Fig3 to Fig6 must be short and thick.

●Layout Guide for PCB

- Make the wiring of the bypass capacitor (C1) between V_{CC} , PV_{CC} pin and GND pin. The GND pin should be connected to the GND plane of the PCB.
- Place the input capacitor (C1) and the output capacitors (C2 and C3) as close as possible to the GND pin of the IC.
- The wiring between L_{XP} pin, L_{XN} pin and inductor each should be as short as possible and mount output capacitors (C2 and C3) as close as possible to the V_{OUTP} , V_{OUTN} each.
- Input impedance of V_{OUTPS} pin, V_{OUTNS} pin, V_{FBP} pin, and V_{FBN} pin is high, therefore, the external noise may affect on the performance. The coupling capacitance between these nodes and switching lines must be as short as possible.
- Protection Resistors between V_{OUTN} and V_{OUTNS} in Fixed Output Voltage Type (R1287Lxxxxy)
If the V_{OUTNS} pin and the V_{OUTN} pin are connected to each other on PCB while the V_{OUTNS} pin and the V_{CC} pin or the $EN2$ pin are short-circuited due to some failure, the voltage higher than the rated voltage will be Applied to the V_{OUTN} pin. To prevent this, it is recommended that an approximately $100\ \Omega$ protection resistor (R4) Be connected between the V_{OUTN} pin and the V_{OUTNS} pin.

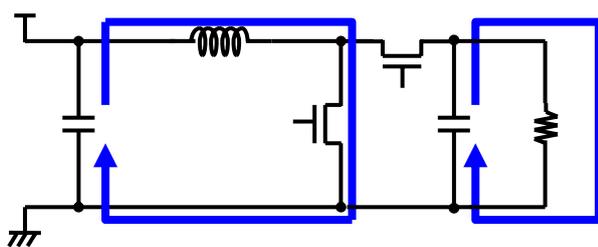


Fig.3 NMOSFET-ON (BOOST)

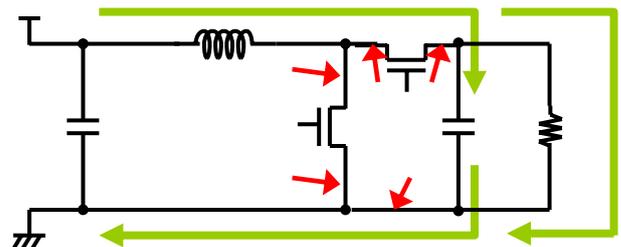


Fig.4 PMOSFET-ON (BOOST)

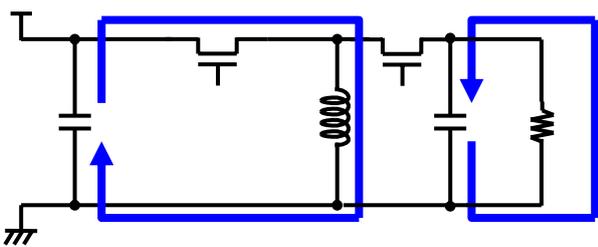


Fig.5 PMOSFET-ON (INVERTING)

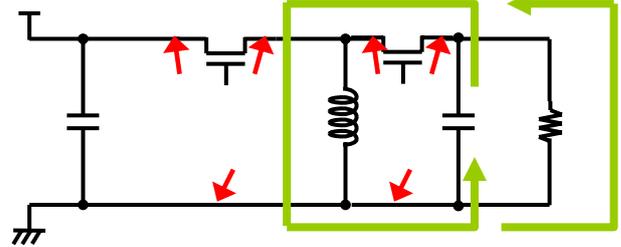
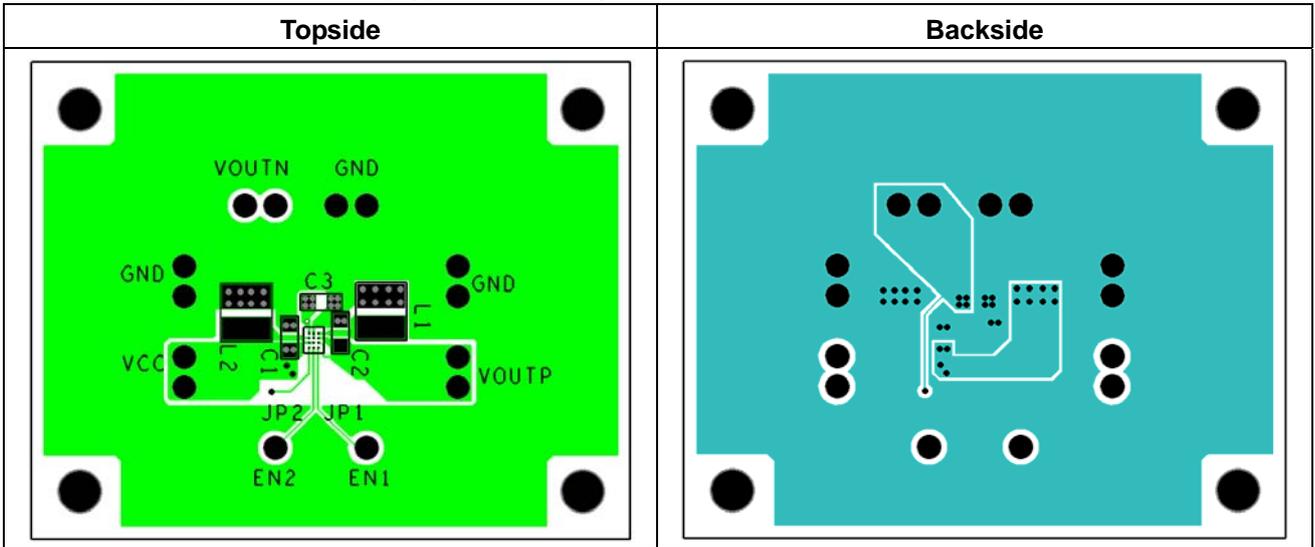


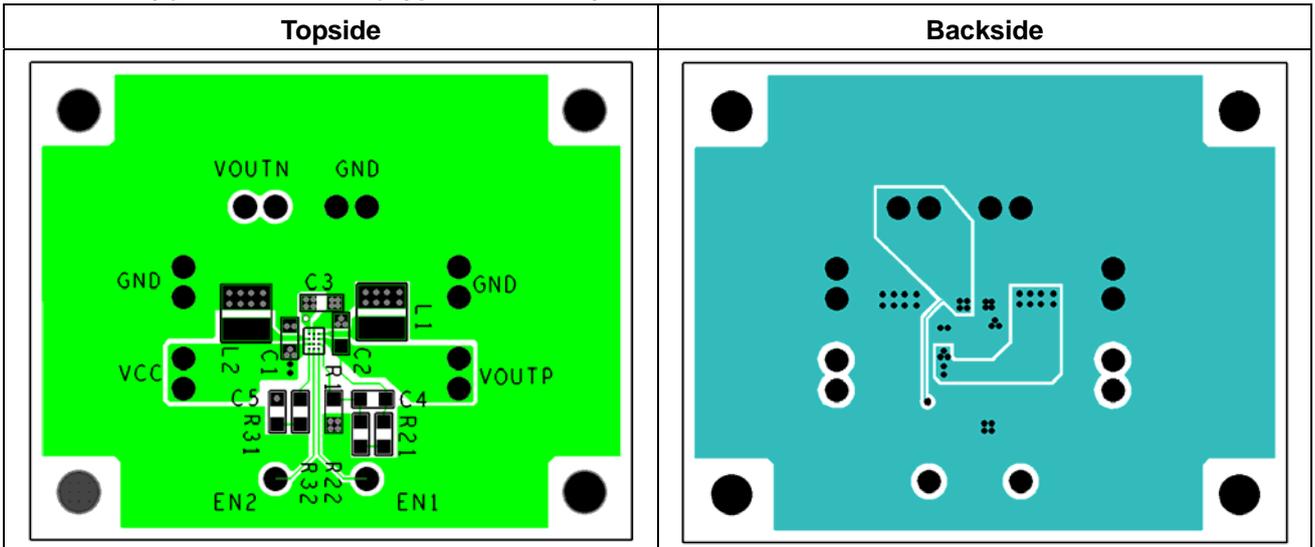
Fig.6 NMOSFET-ON (INVERTING)

● Board Layout

R1287Zxxx (PKG:WLCSP-12) typical board layout

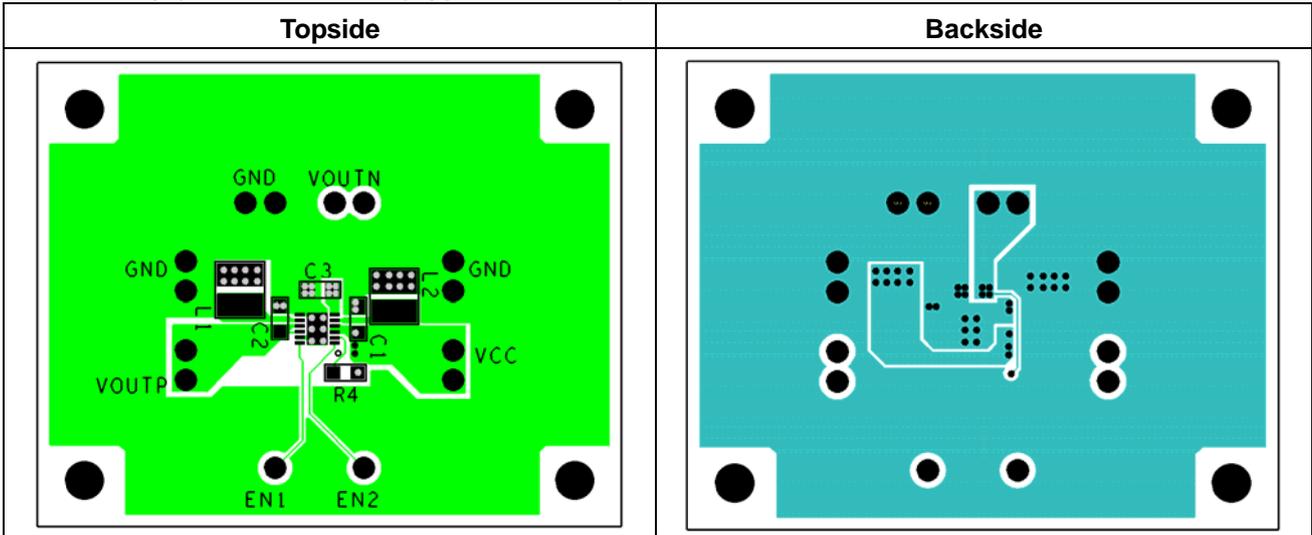


R1287Z001y(PKG:WLCSP-12) typical board layout



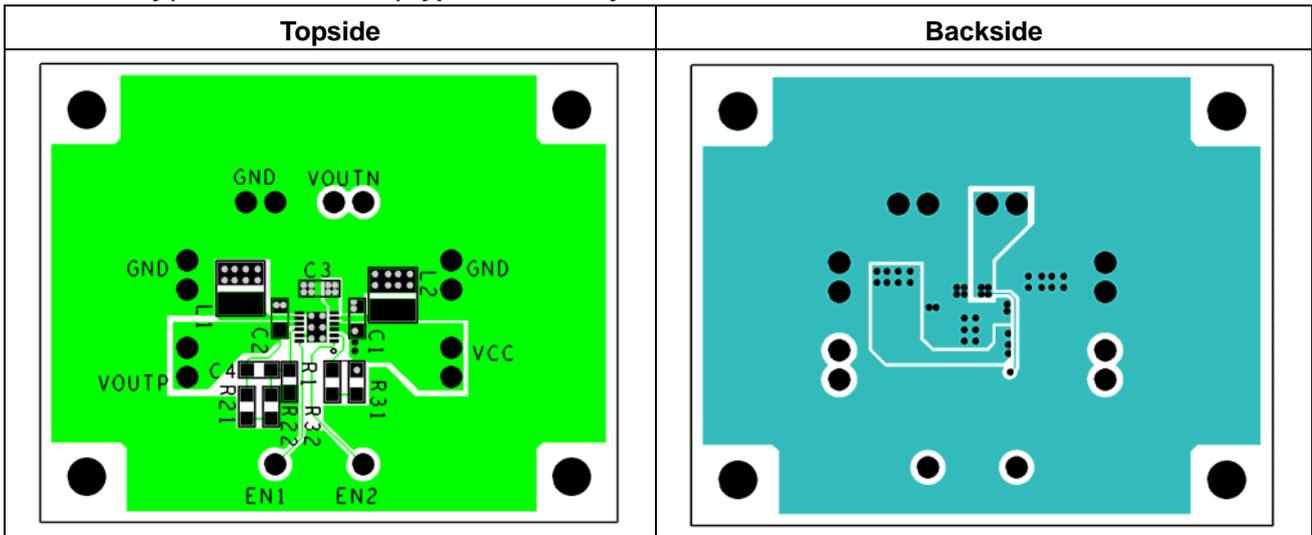
R1287x SERIES

R1287Lxxx (PKG:DFN3030-12) typical board layout



R4 is protection resistor, see Layout Guide for PCB.

R1287L001y(PKG:DFN3030-12) typical board layout





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. 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.

<http://www.e-devices.ricoh.co.jp/en/>

Sales & Support Offices

RICOH ELECTRONIC DEVICES CO., LTD.

Higashi-Shinagawa Office (International Sales)
3-32-3, Higashi-Shinagawa, Shinagawa-ku, Tokyo 140-8655, Japan
Phone: +81-3-5479-2857 Fax: +81-3-5479-0502

RICOH EUROPE (NETHERLANDS) B.V.

Semiconductor Support Centre
Prof. W.H. Keesomlaan 1, 1183 DJ Amstelveen, The Netherlands
Phone: +31-20-5474-309

RICOH ELECTRONIC DEVICES KOREA CO., LTD.

3F, Haesung Bldg. 504, Teheran-ro, Gangnam-gu, Seoul, 135-725, Korea
Phone: +82-2-2135-5700 Fax: +82-2-2051-5713

RICOH ELECTRONIC DEVICES SHANGHAI CO., LTD.

Room 403, No.2 Building, No.690 Bilbo Road, Pu Dong New District, Shanghai 201203,
People's Republic of China
Phone: +86-21-5027-3200 Fax: +86-21-5027-3299

RICOH ELECTRONIC DEVICES CO., LTD.

Taipei office
Room 109, 10F-1, No.51, Hengyang Rd., Taipei City, Taiwan (R.O.C.)
Phone: +886-2-2313-1621/1622 Fax: +886-2-2313-1623