

HYBRID IC VLA130-24205QR

4OUTPUT ISOLATED DC-DC CONVERTER

DISCRIPTIONS

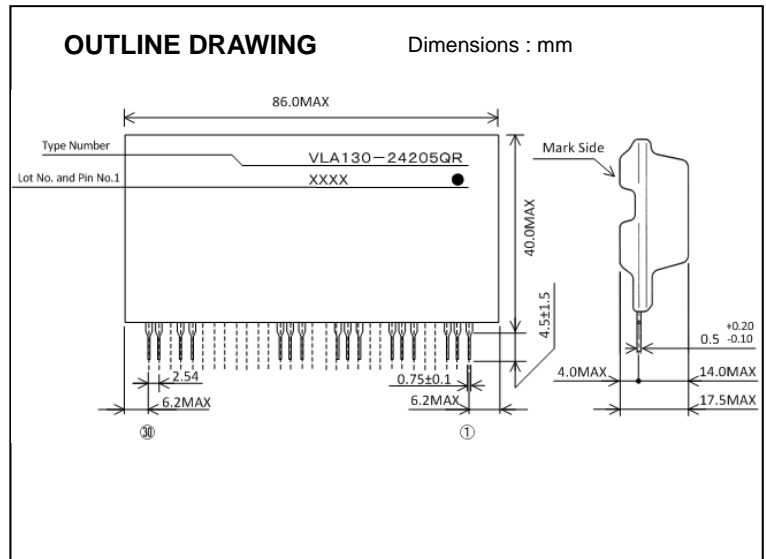
The VLA130-24205QR is an isolated type DC-DC converter which has 4 outputs for inverter drive. Isolation strength is 2500Vrms between the input and outputs, also each outputs.

FEATURES

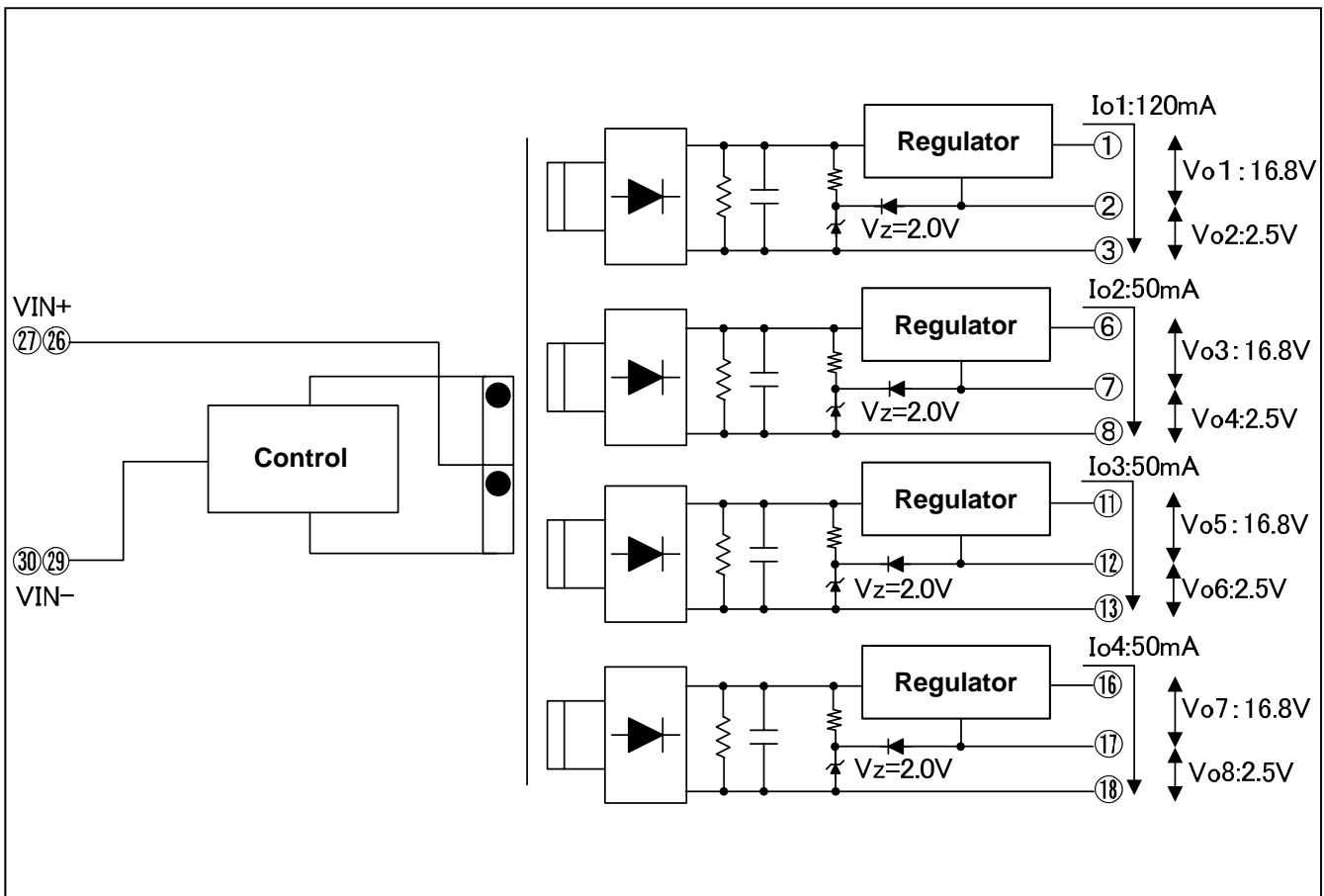
- Input voltage DC24V
- Output +16.8V,-2.5V/120mA x 1
 +16.8V,-2.5V/50mA x 3
- Isolation strength between Input to output
 2500Vrms, 1min.
- Isolation strength between Each outputs
 2500Vrms, 1min.
- RoHS compliance

APPLICATION

Power supply for IGBT etc.



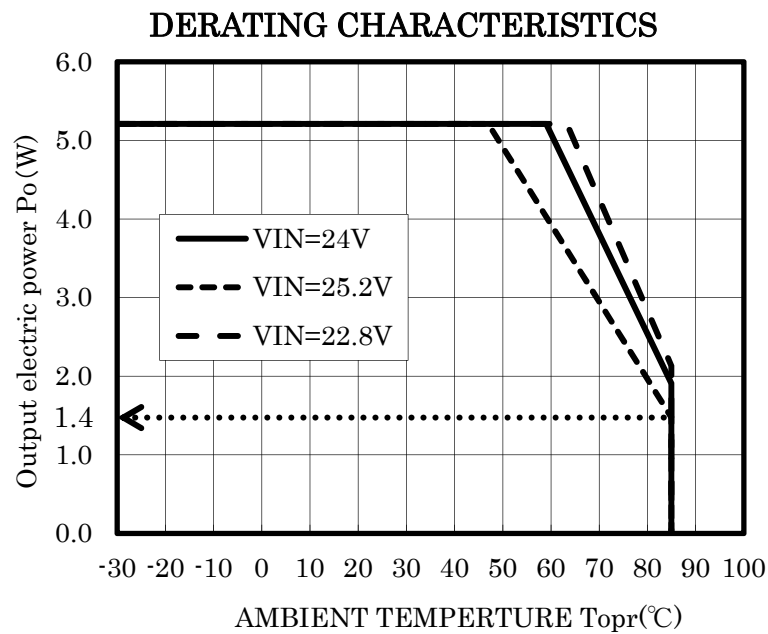
BLOCK DIAGRAM



MAXIMUM RATINGS (unless otherwise noted, $V_{IN}=24V, T_a=25^{\circ}C$)

| Symbol | Parameter | Conditions | Ratings | Unit |
|-----------|--|-------------------------------|---------------|-------------|
| V_{IN} | Input voltage | Between pins 26,27 and 29,30 | 26.0 | V |
| I_o | Output current | Between pins 6-8,11-13,16-18 | 50 | mA |
| | | Between pins 1-3 | 120 | |
| T_{opr} | Operating temperature | No condensation | -30 ~ +85(*1) | $^{\circ}C$ |
| T_{stg} | Storage temperature | No condensation | -40 ~ +85 | $^{\circ}C$ |
| Viso1 | Isolation voltage between input and output | Sine wave voltage, 60Hz, 1min | 2500 | Vrms |
| Viso2 | Isolation voltage between each output | Sine wave voltage, 60Hz, 1min | 2500 | Vrms |

(*1) Please refer to de-rating characteristics.



HYBRID IC
VLA130-24205QR

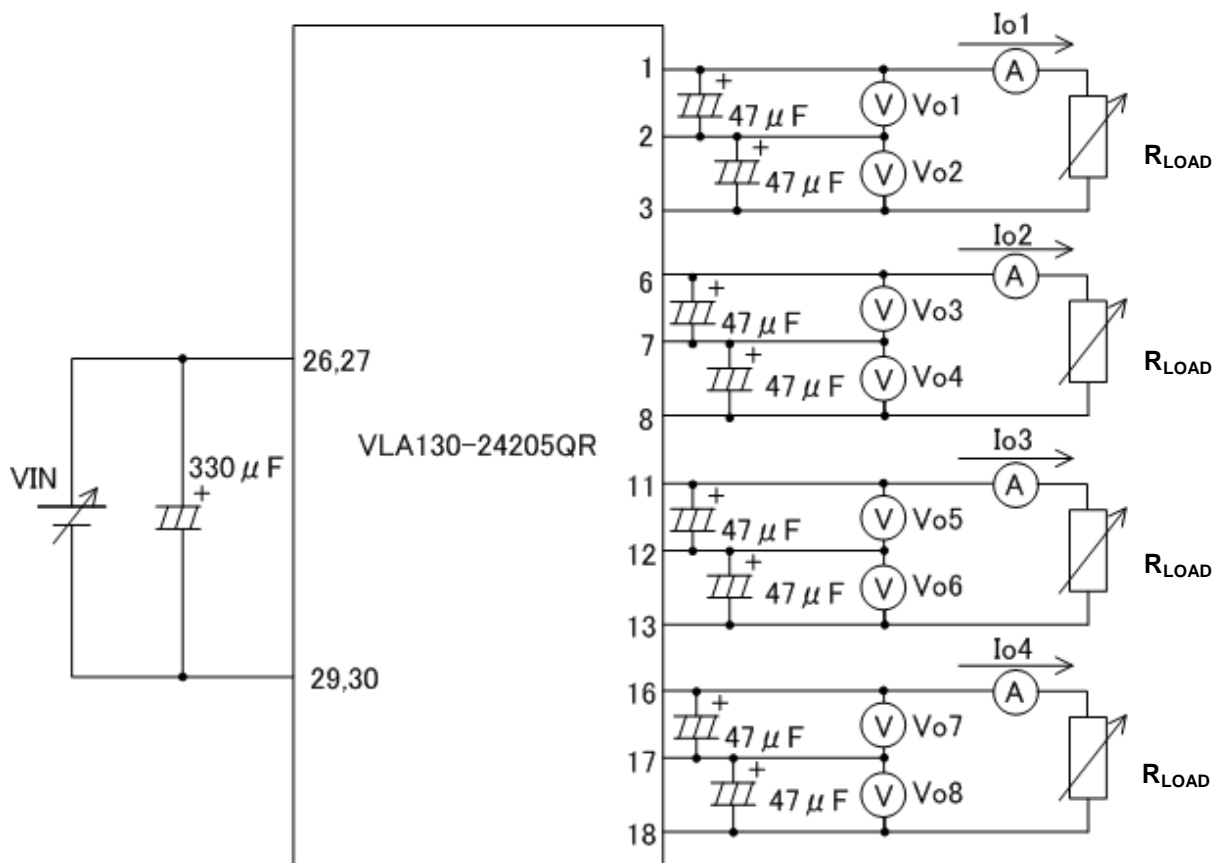
4OUTPUT ISOLATED DC-DC CONVERTER

• **ELECTRICAL CHARACTERISTICS** (unless otherwise noted, $V_{IN}=24V, T_a=25^{\circ}C$)

| Symbol Symbol | Parameter | Test conditions | Limits | | | Unit |
|------------------|-------------------|--|--------|-------------|--------|-------|
| | | | Limits | Unit | Symbol | |
| V_{IN} | Input voltage | Recommended range | 22.8 | 24 | 25.2 | V |
| $V_o I$ | Output current I | Between pins1-2,6-7,11-12,16-17 $I_{o1}=0\sim 120mA, I_{o2}\sim 4=0\sim 50mA$ | 15.8 | 16.8 | 17.8 | V |
| $V_o II$ | Output current II | Between pins2-3,7-8,12-13,17-18 $I_{o1}\sim 4=0mA$ | 1.5 | 2.5 | 3.5 | V |
| Reg_{-L} | Load regulation | Between pins1-2,6-7,11-12,16-17 $I_{o1}=120mA, I_{o2}\sim 4=0\sim 50mA$ | - | - | 450 | mV |
| | | Between pins1-2,6-7,11-12,16-17 $I_{o1}=0\sim 120mA, I_{o2}\sim 4=50mA$ | - | - | 600 | mV |
| V_{p-p} | Output ripple | Between pins1-2,6-7,11-12,16-17 $I_{o1}=120mA, I_{o2}\sim 4=0\sim 50mA$ | - | 180 (*2) | - | mVp-p |
| η | Efficiency | $I_{o1}=120mA, I_{o2}\sim 4=50mA$ | - | 65 | - | % |

(*2) Not contain the spike noise.

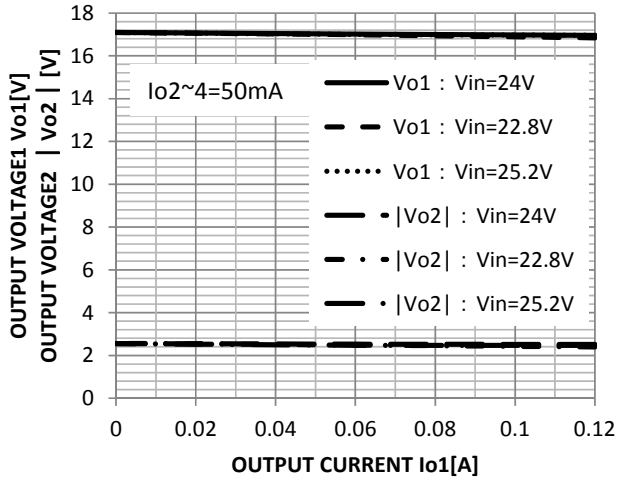
TEST CIRCUIT



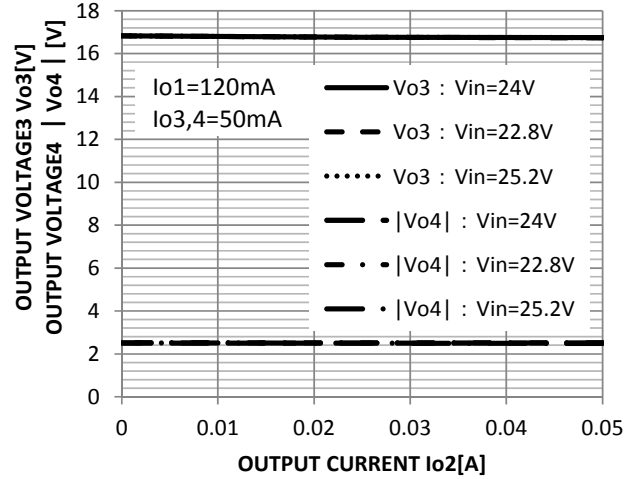
The capacitors are low impedance article.

· TYPICAL CHARACTERISTIC CURVES(Ta=25°C)

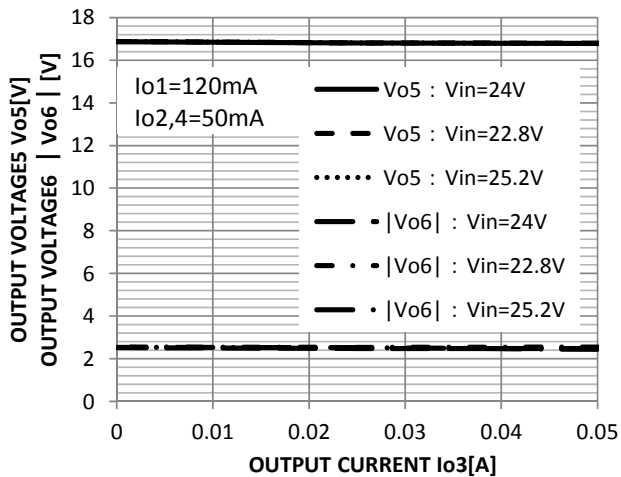
OUTPUT VOLTAGE1,2 - OUTPUT CURRENT1



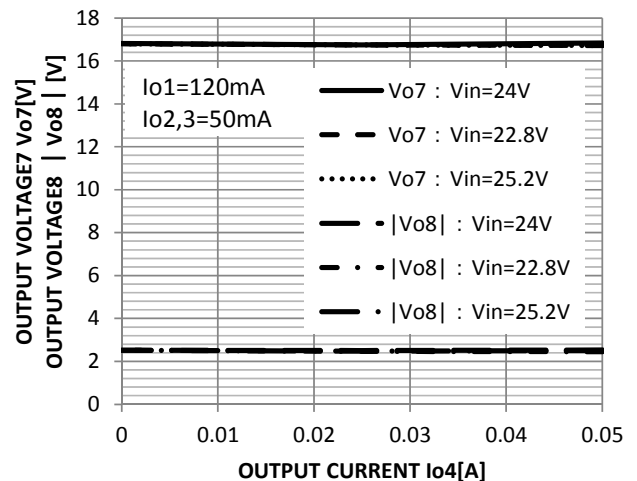
OUTPUT VOLTAGE3,4 - OUTPUT CURRENT2



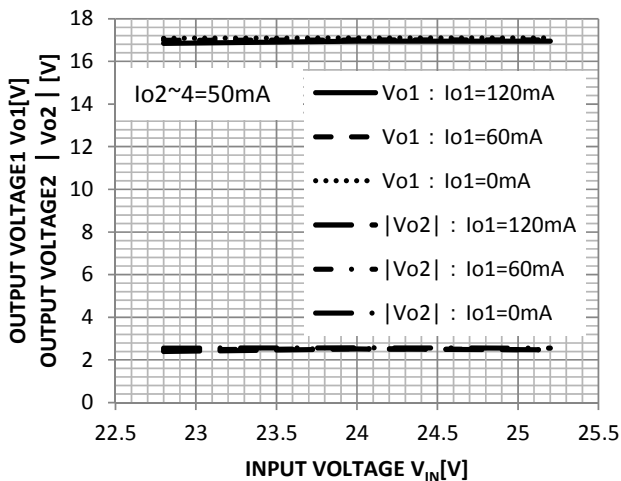
OUTPUT VOLTAGES5,6 - OUTPUT CURRENT3



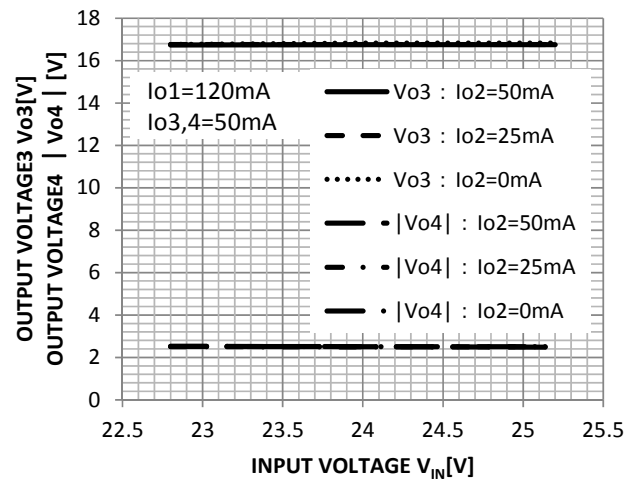
OUTPUT VOLTAGE7,8 - OUTPUT CURRENT4



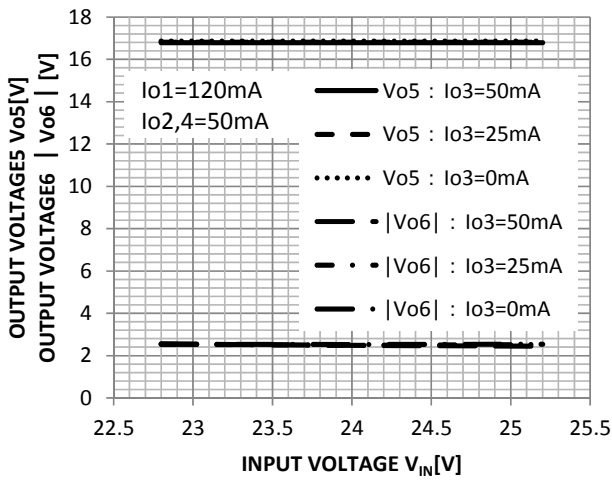
OUTPUT VOLTAGE1,2 - INPUT VOLTAGE



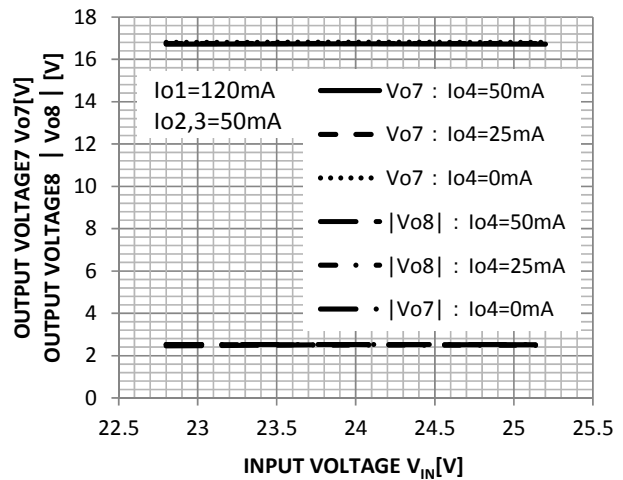
OUTPUT VOLTAGE3,4 - INPUT VOLTAGE



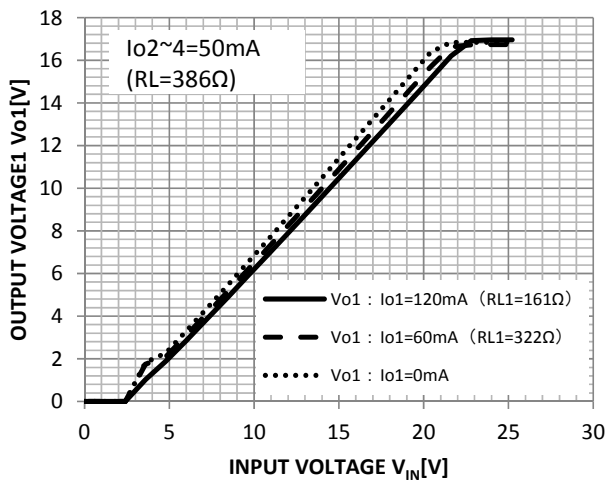
OUTPUT VOLTAGE5,6 - INPUT VOLTAGE



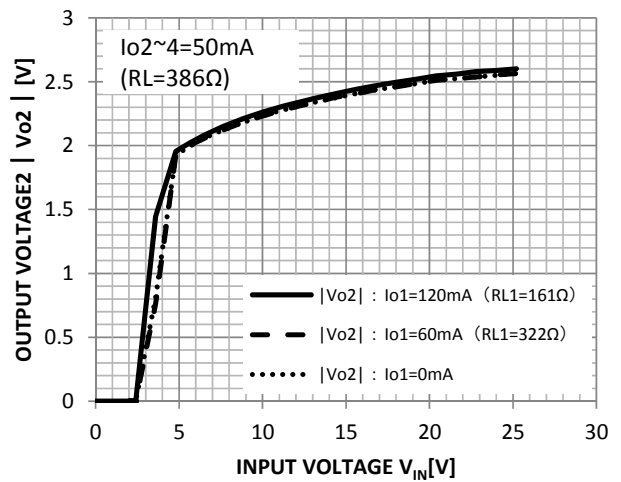
OUTPUT VOLTAGE7,8 - INPUT VOLTAGE



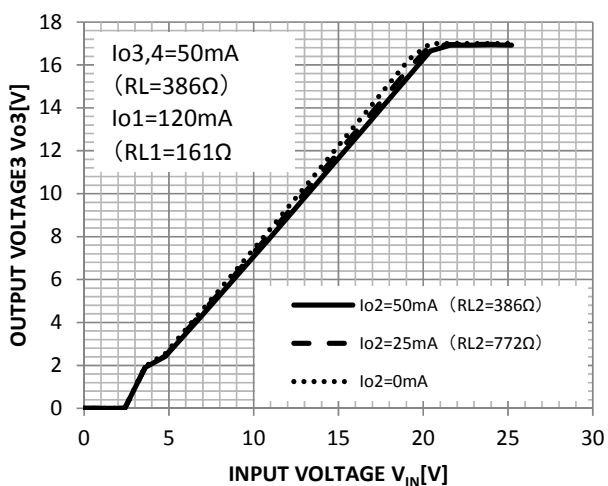
OUTPUT VOLTAGE1 - INPUT VOLTAGE



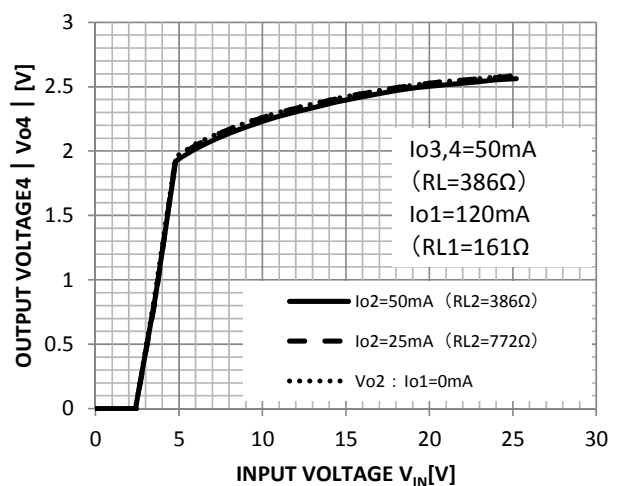
OUTPUT VOLTAGE2 - INPUT VOLTAGE



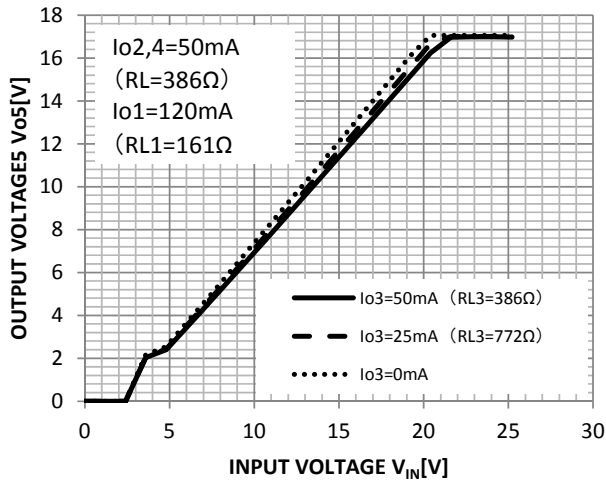
OUTPUT VOLTAGE3 - INPUT VOLTAGE



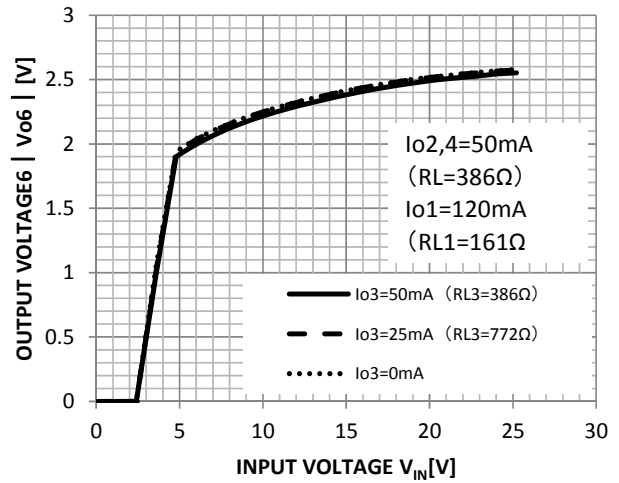
OUTPUT VOLTAGE4 - INPUT VOLTAGE



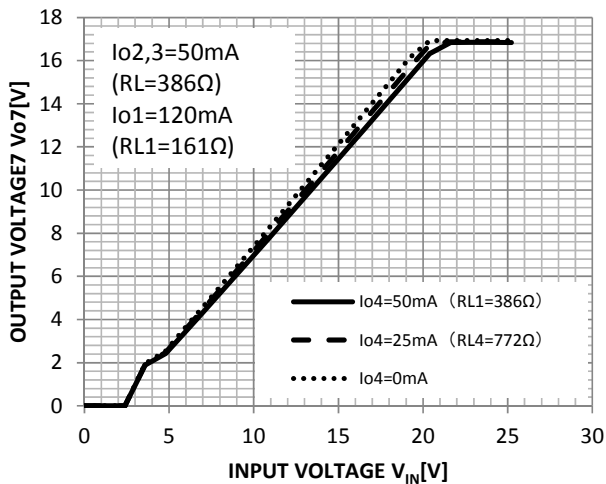
OUTPUT VOLTAGE5 - INPUT VOLTAGE



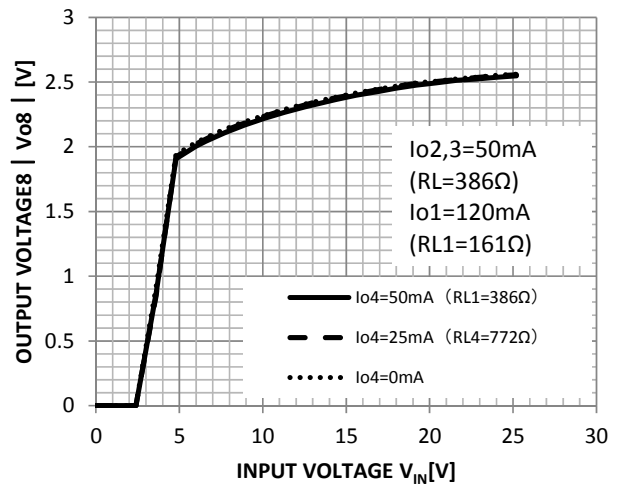
OUTPUT VOLTAGE6 - INPUT VOLTAGE



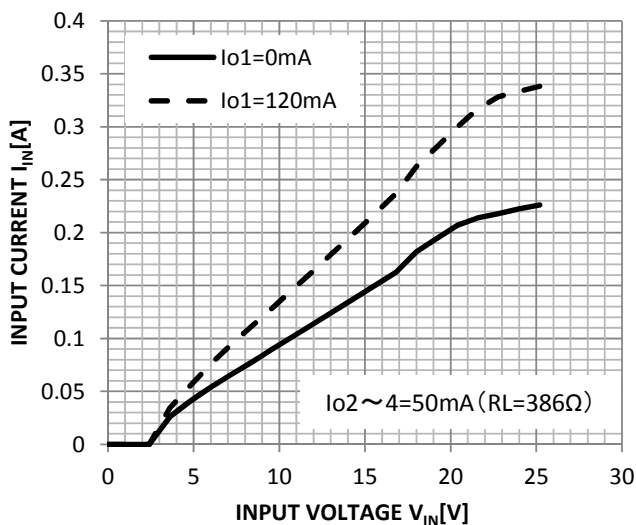
OUTPUT VOLTAGE7 - INPUT VOLTAGE



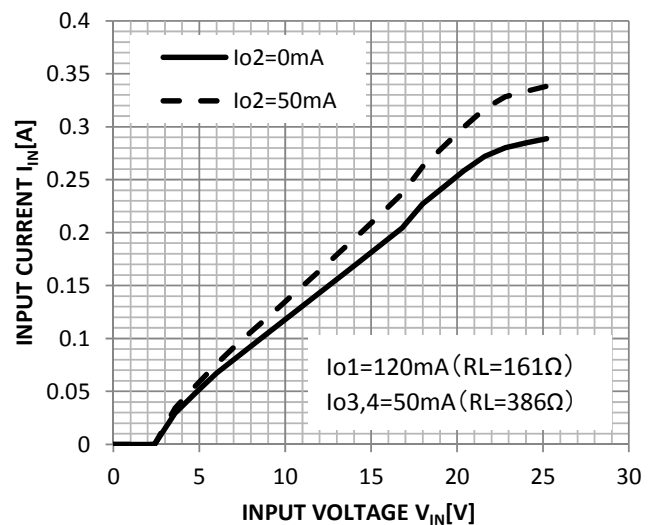
OUTPUT VOLTAGE8 - INPUT VOLTAGE



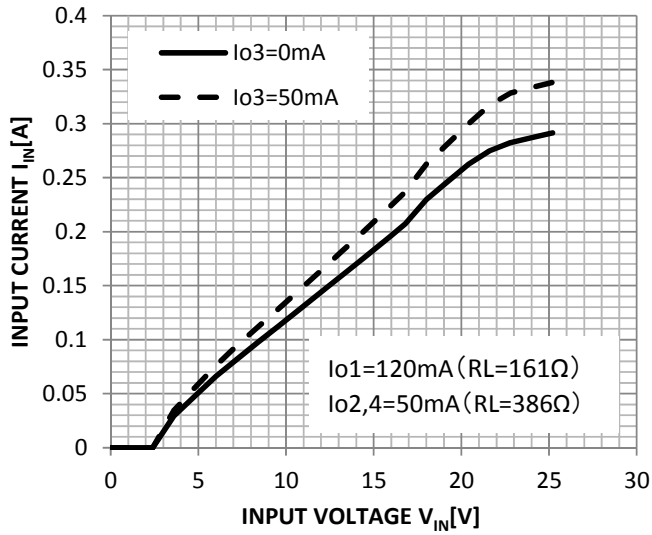
INPUT CURRENT - INPUT VOLTAGE



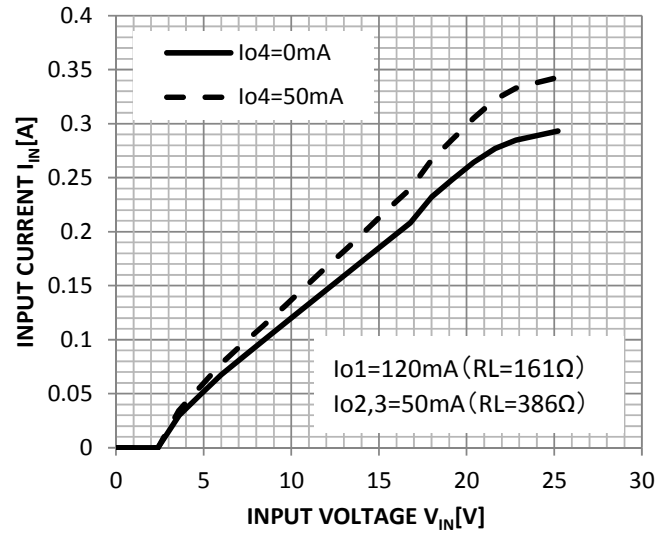
INPUT CURRENT - INPUT VOLTAGE



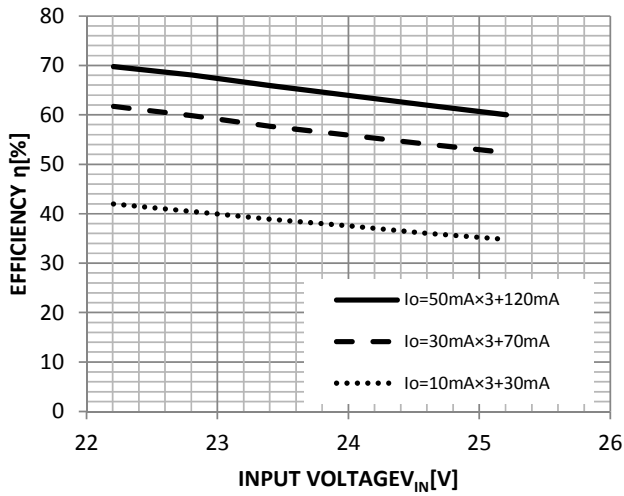
INPUT CURRENT - INPUT VOLTAGE



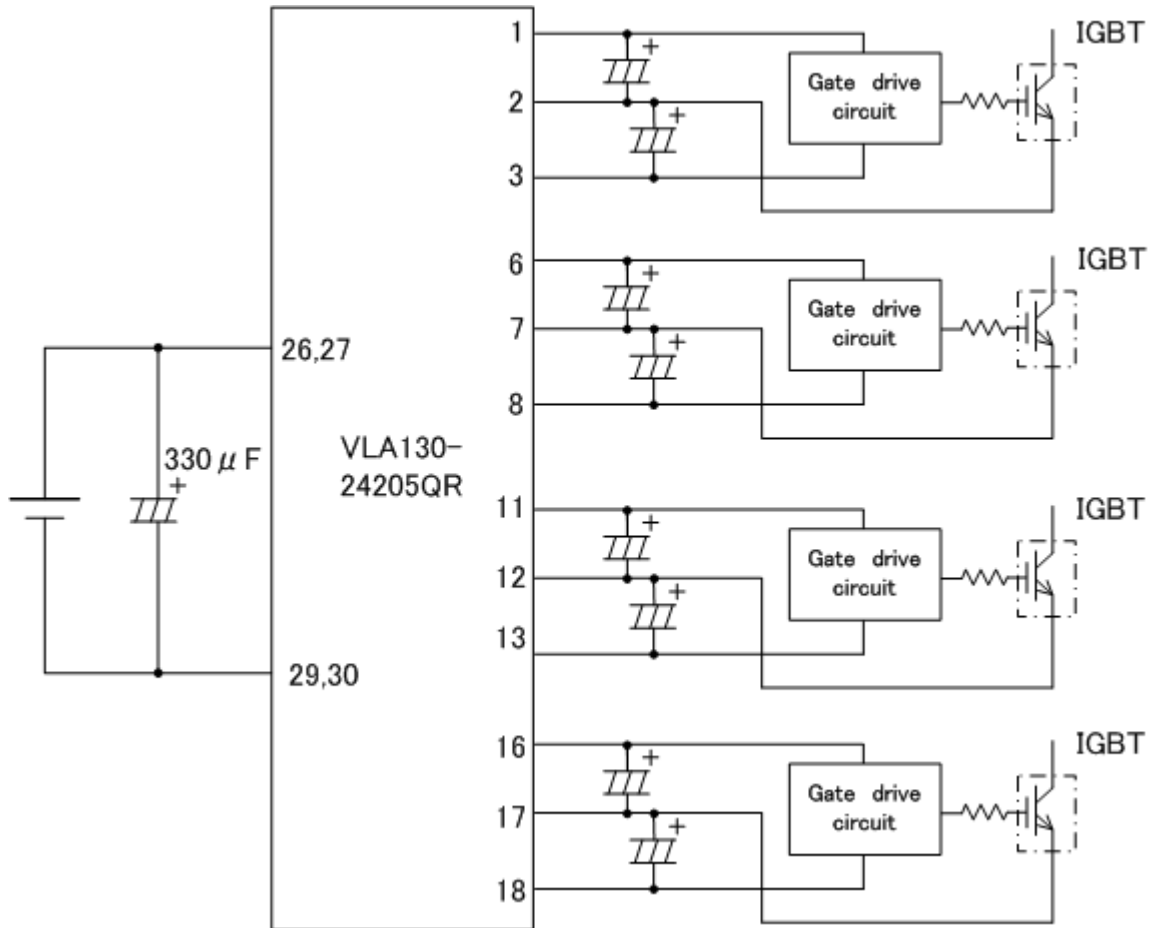
INPUT CURRENT - INPUT VOLTAGE



EFFICIENCY - INPUT VOLTAGE



• APPLICATION EXAMPLE



PRECAUTION

Voltage compensate capacitors are expected to be located as close as possible to the Hybrid IC.

FOR SAFETY USING

Great detail and careful attention are given to the production activity of products, such as the development, the quality of production, and in its reliability. However the reliability of products depends not only on their own factors but also in their condition of usage. When handling products, please note the following cautions.

| CAUTIONS | |
|------------------|--|
| Packing | The materials used in packing products can only withstand normal external conditions. When exposed to outside shocks, rain and certain environmental contaminators, the packing materials will deteriorates. Please take care in handling. |
| Carrying | <ol style="list-style-type: none"> 1) Don't stack boxes too high. Avoid placing heavy materials on boxes. 2) Boxes must be positioned correctly during transportation to avoid breakage. 3) Don't throw or drop boxes. 4) Keep boxes dry. Avoid rain or snow. 5) Minimal vibration and shock during transportation is desirable. |
| Storage | <p>When storing products, please observe the following notices or possible deterioration of their electrical characteristics, risk of solderability, and external damage may occur.</p> <ol style="list-style-type: none"> 1) Devices must be stored where fluctuation of temperature and humidity is minimal, and must not be exposed to direct sunlight. Store at the normal temperature of 5 to 30 degrees Celsius with humidity at 40 to 60%. 2) Avoid locations where corrosive gasses are generated or where much dust accumulates. 3) Storage cases must be static proof. 4) Avoid putting weight on boxes. |
| Extended storage | When extended storage is necessary, products must be kept non-processed. When using products which have been stored for more than one year or under severe conditions, be sure to check that the exterior is free from flaw and other damages. |
| Maximum ratings | To prevent any electrical damages, use products within the maximum ratings. The temperature, current, voltage, etc. must not exceed these conditions. |
| Polarity | To protect products from destruction and deterioration due to wrong insertion, make sure of polarity in inserting leads into the board holes, conforming to the external view for the terminal arrangement. |

Keep safety first in your circuit designs!

- ISAHAYA Electronics Corporation puts the maximum effort into making semiconductor products better and more reliable, but there is always the possibility that trouble may occur with them. Trouble with semiconductors may lead to personal injury, fire or property damage. Remember to give due consideration to safety when making your circuit designs, with appropriate measures such as (1)placement of substitutive, auxiliary circuits, (2)use of non-flammable material or (3)prevention against any malfunction or mishap.

Notes regarding these materials

- These materials are intended as a reference to our customers in the selection of the ISAHAYA products best suited to the customer's application; they don't convey any license under any intellectual property rights, or any other rights, belonging to ISAHAYA Electronics Corporation or a third party.
- ISAHAYA Electronics Corporation assumes no responsibility for any damage, or infringement of any third party's rights, originating in the use of any product data, diagrams, charts or circuit application examples contained in these materials.
- All information contained in these materials, including product data, diagrams and charts, represent information on products at the time of publication of these materials, and are subject to change by ISAHAYA Electronics Corporation without notice due to product improvements or other reasons. It is therefore recommended that customers contact ISAHAYA Electronics Corporation or an authorized ISAHAYA products distributor for the latest product information before purchasing a product listed herein.
- ISAHAYA Electronics Corporation products are not designed or manufactured for use in a device or system that is used under circumstances in which human life is potentially at stake. Please contact ISAHAYA Electronics Corporation or an authorized ISAHAYA products distributor when considering the use of a product contained herein for any specific purposes, such as apparatus or systems for transportation, vehicular, medical, aerospace, nuclear, or undersea repeater use.
- The prior written approval of ISAHAYA Electronics Corporation is necessary to reprint or reproduce in whole or in part these materials.
- If these products or technologies are subject to the Japanese export control restrictions, they must be exported under a license from the Japanese government and cannot be imported into a country other than the approved destination. Any diversion or reexport contrary to the export control laws and regulations of Japan and/or the country of destination is prohibited.
- Please contact ISAHAYA Electronics Corporation or an authorized ISAHAYA products distributor for further details on these materials or the products contained therein.