

DESCRIPTION

The M57182N-415AF is an un-insulated type DC-DC converter designed for direct input of rectified voltage from 200V AC.

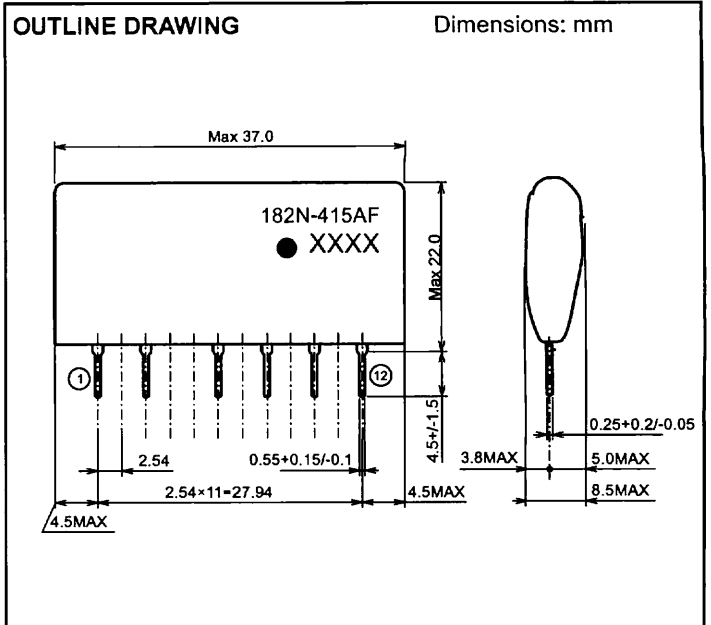
This hybrid IC provides +15.5V/300mA with fewer external components such as electrolytic capacitors and choke coils only.

FEATURES

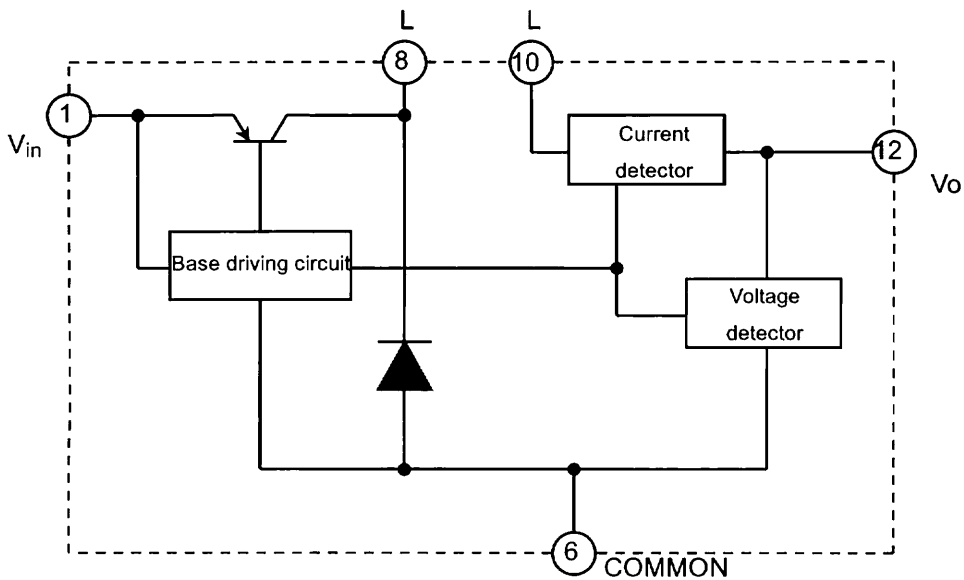
- Input voltage rage DC 180V ~ 450V
- Output specifications..... 15.5V, 300mA

APPLICATIONS

Best suited to power supply for DIP-IPM drive etc.



BLOCK DIAGRAM



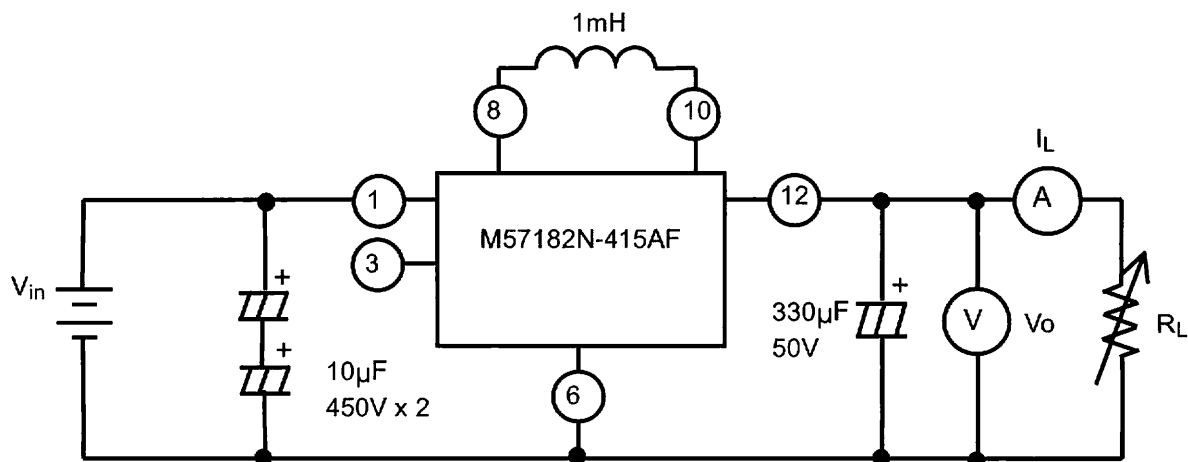
UNINSULATED DC-DC CONVERTER

MAXIMUM RATINGS (unless otherwise noted, $T_a=25^\circ\text{C}$)

| Symbol | Parameter | Conditions | Ratings | Unit |
|-----------|-----------------------|-----------------|------------|------------------|
| V_{in} | Input voltage | — | 550 | V |
| I_L | Load current | — | 300 | mA |
| T_{opr} | Operating temperature | No condensation | -15 ~ +80 | $^\circ\text{C}$ |
| T_{stg} | Storage temperature | — | -25 ~ +105 | $^\circ\text{C}$ |

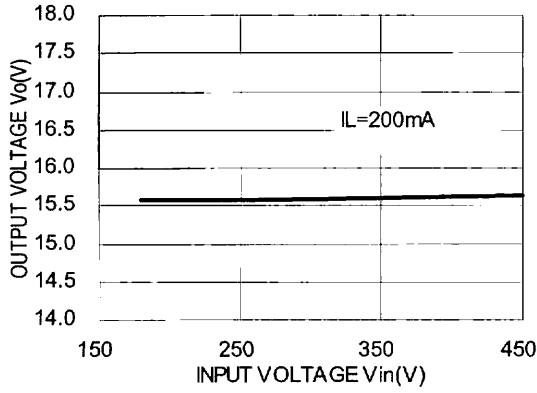
ELECTRICAL CHARACTERISTICS (Unless otherwise noted, $T_a=25^\circ\text{C}$, $V_{in} = 280\text{V}$)

| Symbol | Parameter | Conditions | Limits | | | Unit |
|-----------|------------------|--------------------------------------------------------|--------|------|------|------|
| | | | Min | Typ | Max | |
| V_{in} | Input voltage | Recommended range | 180 | 280 | 450 | V |
| V_O | Output voltage | $I_L = 0 \sim 300\text{mA}$ | 14.7 | 15.5 | 16.3 | V |
| Reg_I | Input regulation | $I_L = 200\text{mA}$, $V_{in} = 180 \sim 450\text{V}$ | - | 150 | 300 | mV |
| Reg_L | Load regulation | $I_L = 0 \sim 300\text{mA}$ | - | 100 | 200 | mV |
| η | Efficiency | $I_L = 200\text{mA}$ | 70 | 77 | - | % |
| V_{P-P} | Ripple voltage | $I_L = 200\text{mA}$ | - | 50 | 100 | mV |

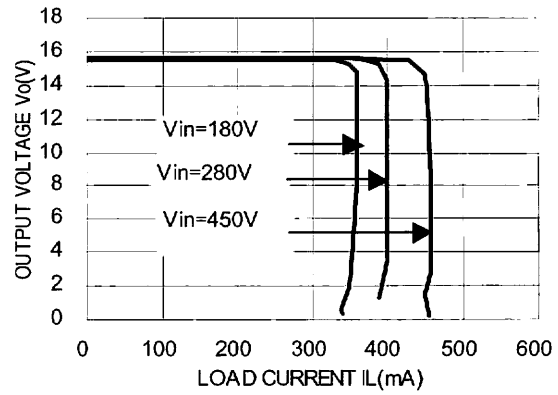
MEASUREMENT CIRCUIT

TYPICAL CHARACTERISTICS

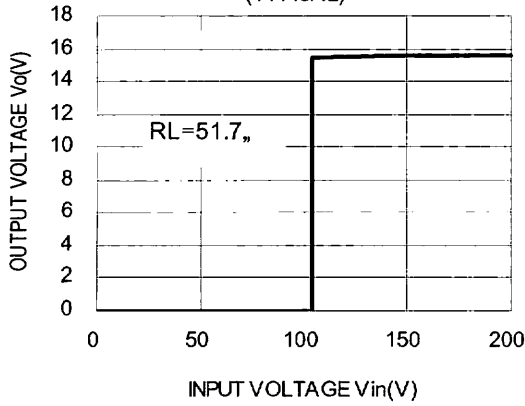
OUTPUT VOLTAGE-INPUT VOLTAGE CHARACTERISTICS(TYPICAL)



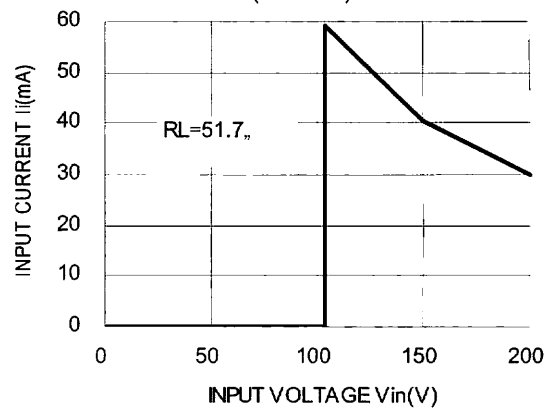
OUTPUT VOLTAGE-LOAD CURRENT CHARACTERISTICS(TYPICAL)



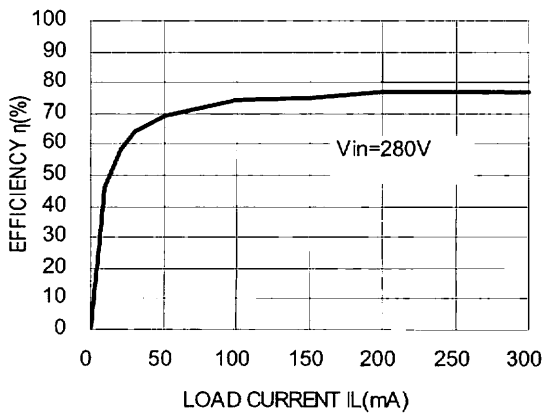
START-UP CHARACTERISTICS-1 (TYPICAL)



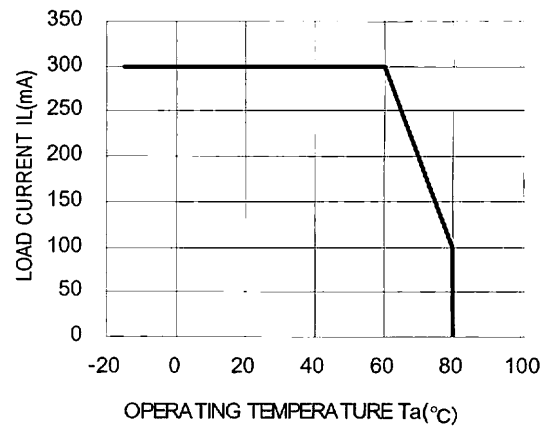
START-UP CHARACTERISTICS-2 (TYPICAL)



EFFICIENCY-LOAD CURRENT (TYPICAL)



DERATING CURVE



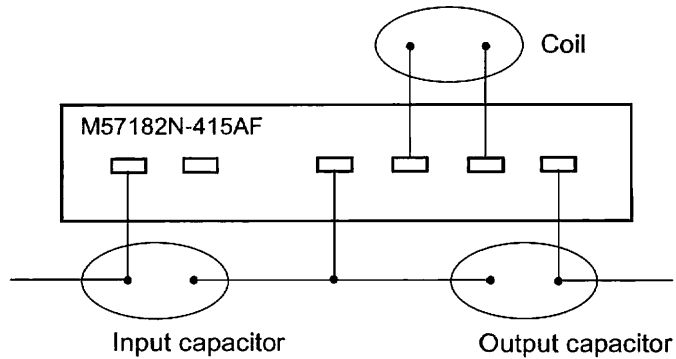
THE CAUTIONS ON USE

1. About an over-current and a load short circuit

Although this hybrid IC has prepared protection circuit for an over-current, please use a fuse, taking the safety of a product into consideration.

2 About parts placement

Please place input/output capacitors near this hybrid IC. And Place a coil on the opposite side of capacitors as follows



3. The capacitor for smoothing output voltage

Please use electrolytic capacitor of output side with low impedance.

4. Coil

Please use power inductors with good performance of DC superimposition.

(We used C13 – FR –102: made in MITSUMI ELECTRIC CO., LTD.)

FOR SAFETY USING

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

| CAUTIONS | |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Packing | <p>The materials used in packing Hics 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.</p> |
| 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 Hics, 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 | <p>When extended storage is necessary, Hics must be kept non-processed. When using Hics 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.</p> |
| Maximum ratings | <p>To prevent any electrical damages, use Hics within the maximum ratings. The temperature, current, voltage, etc. must not exceed these conditions.</p> |
| Polarity | <p>To protect Hics 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.</p> |

ISAHAYA ELECTRONICS CORPORATION

Marketing division, Marketing planning department

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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.

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