

M57184N-515AF

NON-ISOLATED DC-DC CONVERTER

DESCRIPTION

The M57184N-515AF is a non-isolated type DC-DC converter designed for direct input of rectified voltage from 240V AC.

This hybrid IC provides +15V, 200mA and +5V, 450mA with fewer external components such as electrolytic capacitors and choke coils only.

FEATURES

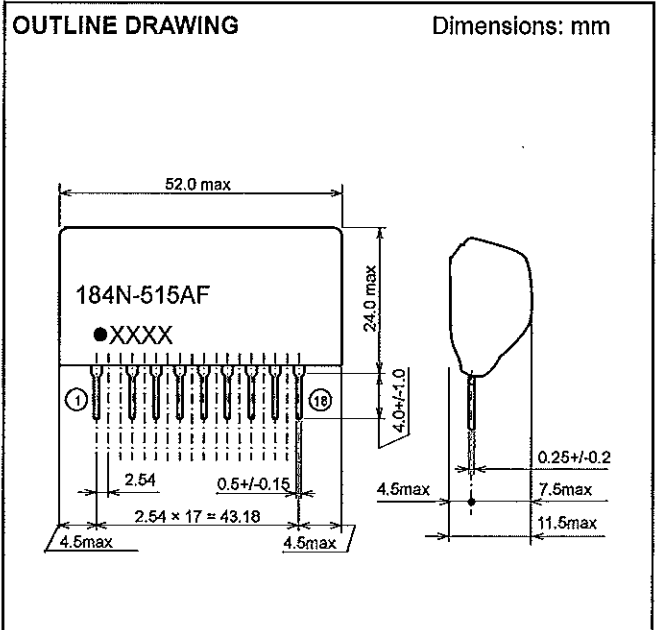
- Input voltage range DC 220V ~ 410V
- Output specifications 15V, 200mA
5V, 450mA

APPLICATIONS

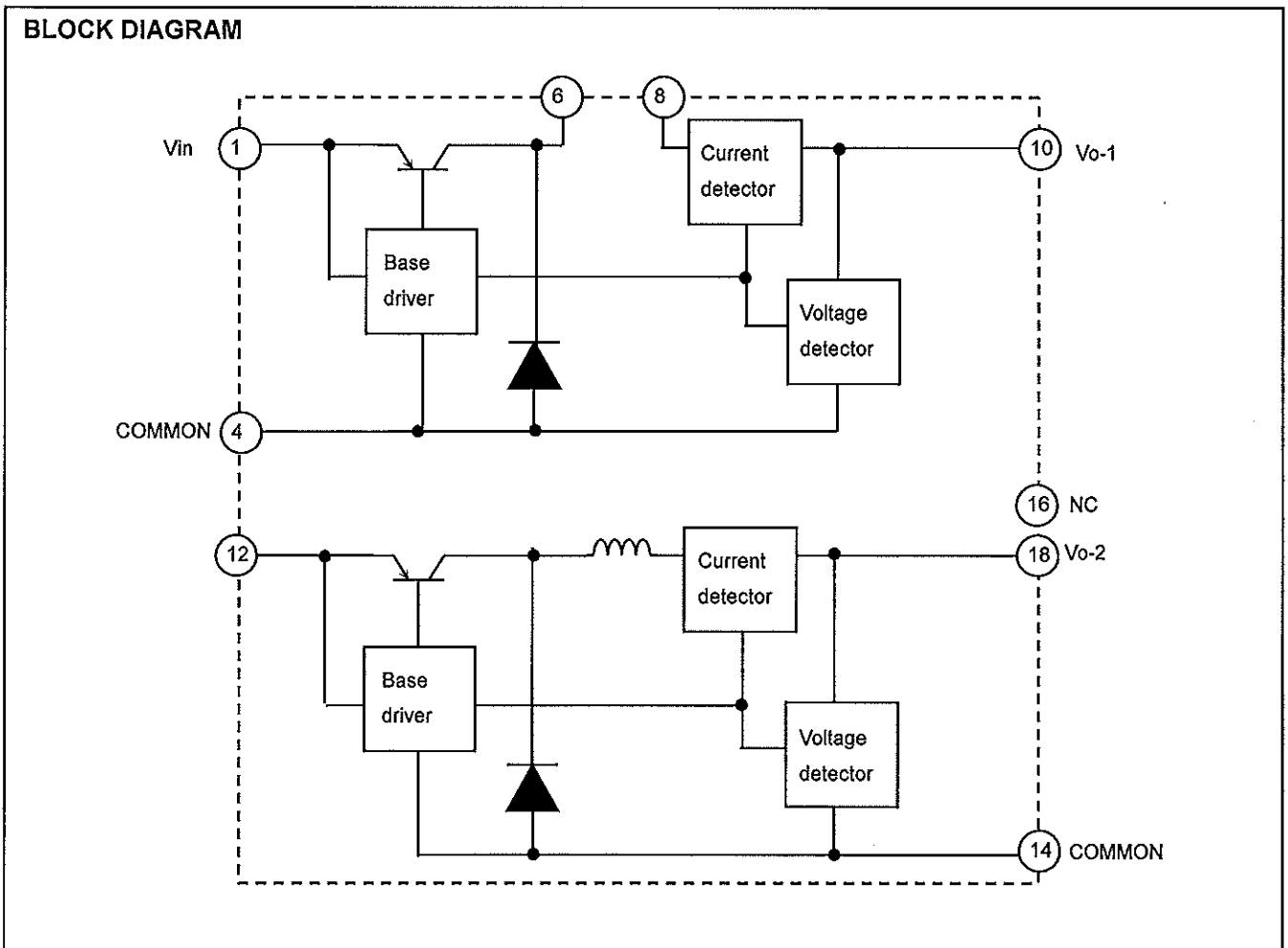
Power supply for non-isolated inverter control .

OUTLINE DRAWING

Dimensions: mm



BLOCK DIAGRAM



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

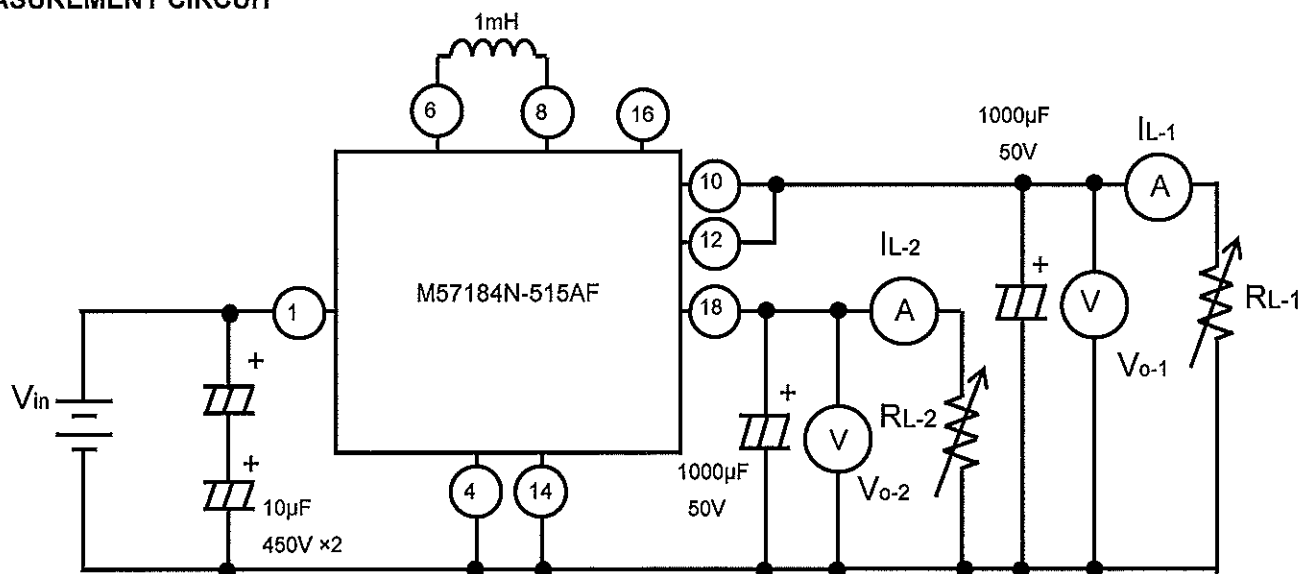
| Symbol | Parameter | Conditions | Ratings | Unit |
|-----------|-----------------------|---|------------|------------------|
| V_{in} | Input voltage | ————— | 570 | V |
| I_{L-1} | Load current-1 | $V_{in}=282\text{V}$ | 200 | mA |
| I_{L-2} | Load current-2 | $V_{in}=282\text{V}$ | 450 | mA |
| P_{max} | Maximum output power | $V_{in}=282\text{V}$ | 5.4 | W |
| T_{opr} | Operating temperature | No condensation allowable $V_{in}=220\sim 410\text{V}$ (*1) | -20 ~ +80 | $^\circ\text{C}$ |
| T_{stg} | Storage temperature | No condensation allowable | -25 ~ +100 | $^\circ\text{C}$ |

(*1): There is the necessity for derating with circumference temperature.

ELECTRICAL CHARACTERISTICS (Unless otherwise noted, $T_a=25^\circ\text{C}$, $V_{in}=282\text{V}$)

| Symbol | Parameter | Conditions | Limits | | | Unit |
|-------------|----------------------|--|--------|------|------|-------|
| | | | Min | Typ | Max | |
| V_{in} | Input voltage | Recommended range | 220 | 282 | 410 | V |
| V_{O-1} | Output voltage - 1 | $I_{L-1}=200\text{mA}$, $I_{L-2}=0\text{mA}$ | 14.3 | 15.0 | 15.7 | V |
| V_{O-2} | Output voltage - 2 | $I_{L-1}=0\text{mA}$, $I_{L-2}=450\text{mA}$ | 4.8 | 5.0 | 5.2 | V |
| Reg_{-i1} | Input regulation - 1 | $V_{in}=220\sim 410\text{V}$, $I_{L-1}=200\text{mA}$, $I_{L-2}=0\text{mA}$ | — | 60 | 160 | mV |
| Reg_{-i2} | Input regulation - 2 | $V_{in}=220\sim 410\text{V}$, $I_{L-1}=0\text{mA}$, $I_{L-2}=450\text{mA}$ | — | 60 | 160 | mV |
| Reg_{-L1} | Load regulation - 1 | $I_{L-1}=0\sim 200\text{mA}$, $I_{L-2}=0\text{mA}$ | — | 80 | 200 | mV |
| Reg_{-L2} | Load regulation - 2 | $I_{L-1}=0\text{mA}$, $I_{L-2}=0\sim 450\text{mA}$ | — | 80 | 200 | mV |
| η | Efficiency | $I_{L-1}=200\text{mA}$, $I_{L-2}=450\text{mA}$ | — | 68 | — | % |
| V_{p-p} | Ripple voltage | $I_{L-1}=200\text{mA}$, $I_{L-2}=450\text{mA}$ (*2) | — | 80 | 200 | mVp-p |

(*2) Spike noise is not included in output ripple voltage.

MEASUREMENT CIRCUIT

(*) Please use power inductors with good performance of DC superimposition.

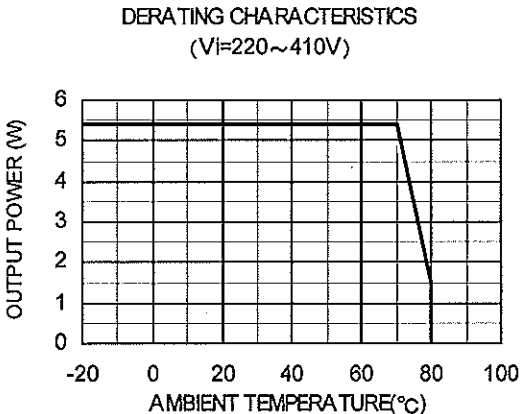
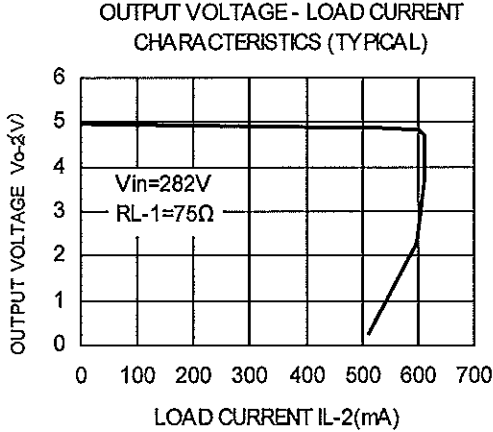
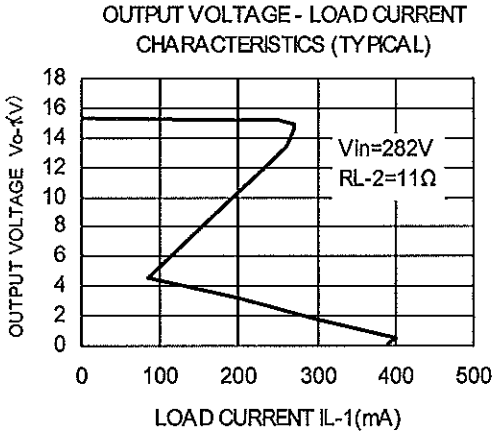
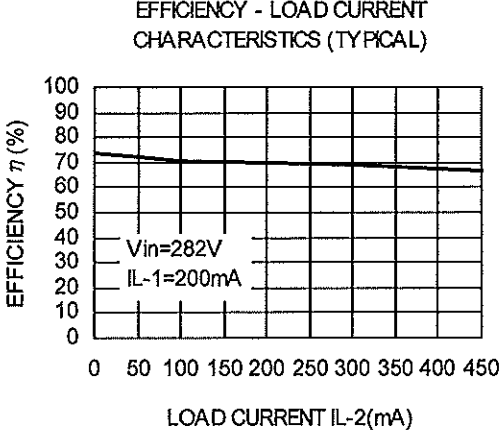
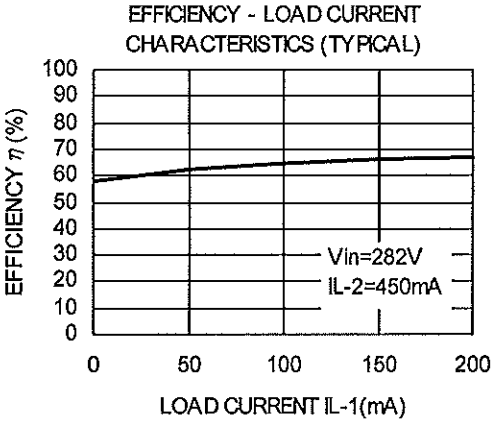
(We used C13 -FR -102: made in MITSUMI ELECTRIC CO., LTD.)

(**) Please use electrolytic capacitor of output side with high frequency and low impedance.

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NON-ISOLATED DC-DC CONVERTER

TYPICAL CHARACTERISTICS(unless otherwise noted, Ta=25°C)



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 contaminants, 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 temperaqtue, 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

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