

PRELIMINARY

Notice: This is not a final specification
Some parametric limits are subject to change

HIGH VOLTAGE INPUT DC-DC CONVERTER**DESCRIPTION**

VLA400-204 is a non-isolated type DC-DC converter with a built-in transformer. Wide range of input voltage (DC113V-380V) enables direct connection to rectified 120V and 240V AC.

This device is best suited for use as a pre-regulator for standard DC-DC converters.

FEATURES

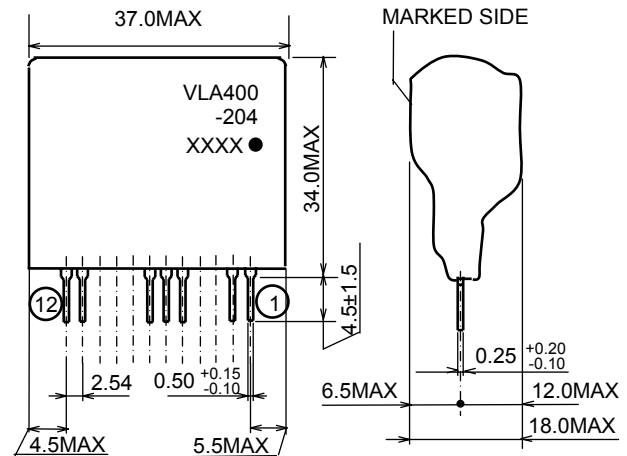
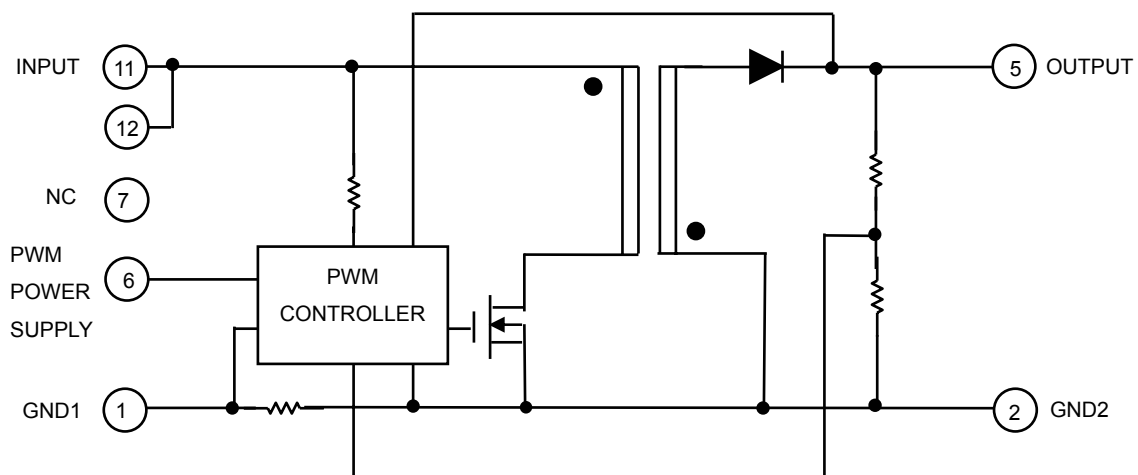
- Wide Range of Input Source Voltage(113V-380V DC)
- Built-in Surface-mount Transformer
- SIP Structure Enables Efficient use of PCB Area.

APPLICATIONS

- Power Source for Standard DC-DC Converters
- Pre-regulator

OUTLINE DRAWING

Dimensions: mm

**BLOCK DIAGRAM**

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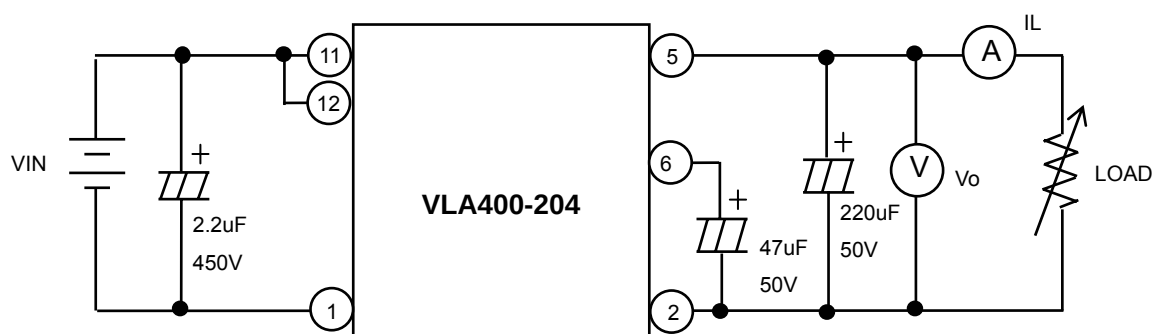
HIGH VOLTAGE INPUT DC-DC CONVERTER**MAXIMUM RATINGS** (unless otherwise noted, Ta=25°C)

Symbol	Parameter	Conditions	Ratings	Units
V_{IN}	Input voltage	11,12-1 pin	390	V
P_{omax}	Output power	-	4.4	W
T_c	Surface temperature	Highest surface temperature point	100	°C
T_{opr}	Operating temperature	No condensation (*1)	-10 ~ +75	°C
T_{stg}	Storage temperature	No condensation	-20 ~ +85	°C

(*1) Please refer to derating characteristics.

ELECTRICAL CHARACTERISTICS (unless otherwise noted, $V_{IN}=280V$, Ta=25°C)

Symbol	Parameter	Test conditions	Limits			Units
			Min.	Typ.	Max.	
V_{IN}	Input voltage	DC	113	280	380	V
I_B	Circuit current	-	-	1.5	-	mA
V_O	Output voltage	$I_L = 0 \sim 200mA$	18	20	22	V
I_L	Load current	$V_{IN}=113 \sim 380V$	-	200	220	mA
$Reg-I$	Input regulation	$V_{IN}=113 \sim 380V$	-	0.8	1.4	V
$Reg-L$	Load regulation	$I_L = 0 \sim 200mA$	-	1.0	2.0	V
η	Efficiency	$I_L = 220mA$	-	75	-	%

TEST CIRCUIT DIAGRAM

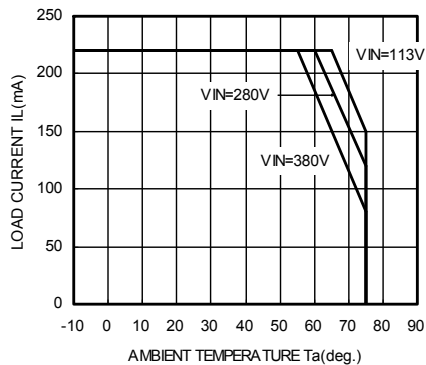
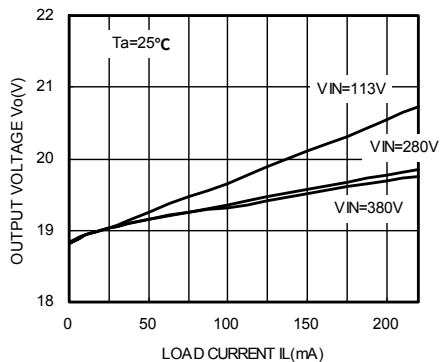
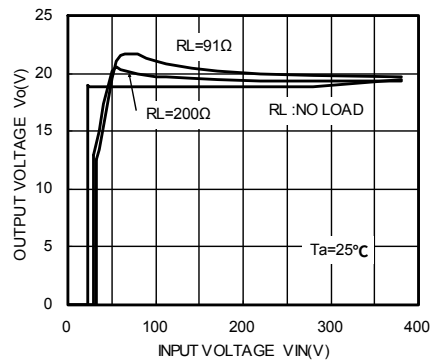
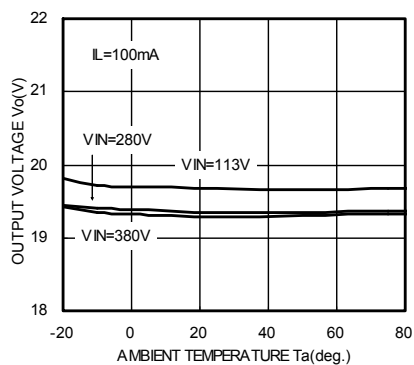
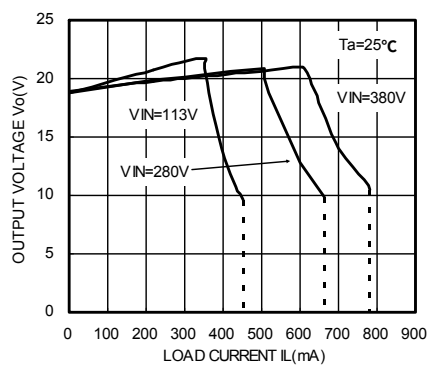
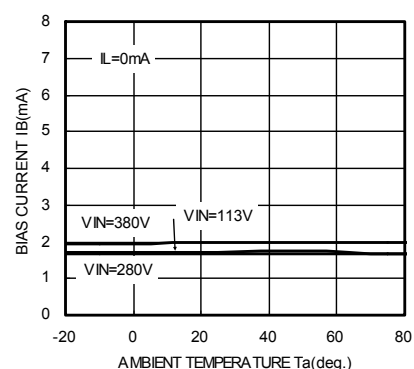
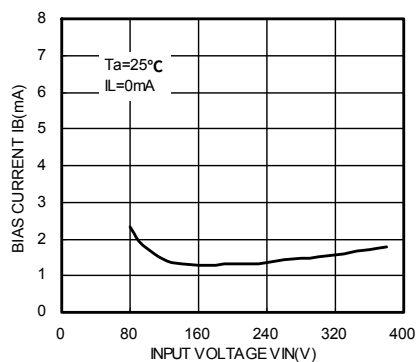
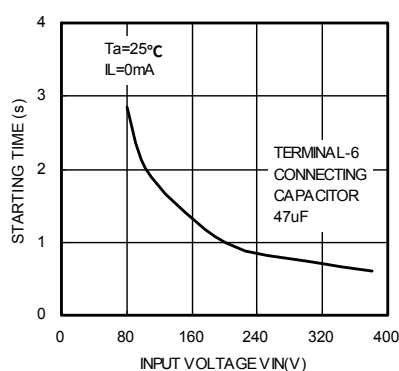
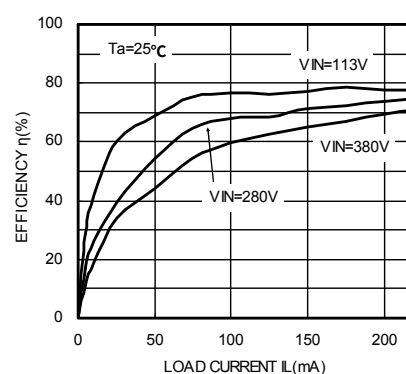
* Please use electrolytic capacitor of output side with low impedance.

** Although this device is not insulated between input and output, please do not use GND of input side and output side in common. (in the state where 1pin and 2pin is connected)
If it is used in that state, there is a possibility that this device may break when this device is a state of an over-load current or a short circuit or a starting.

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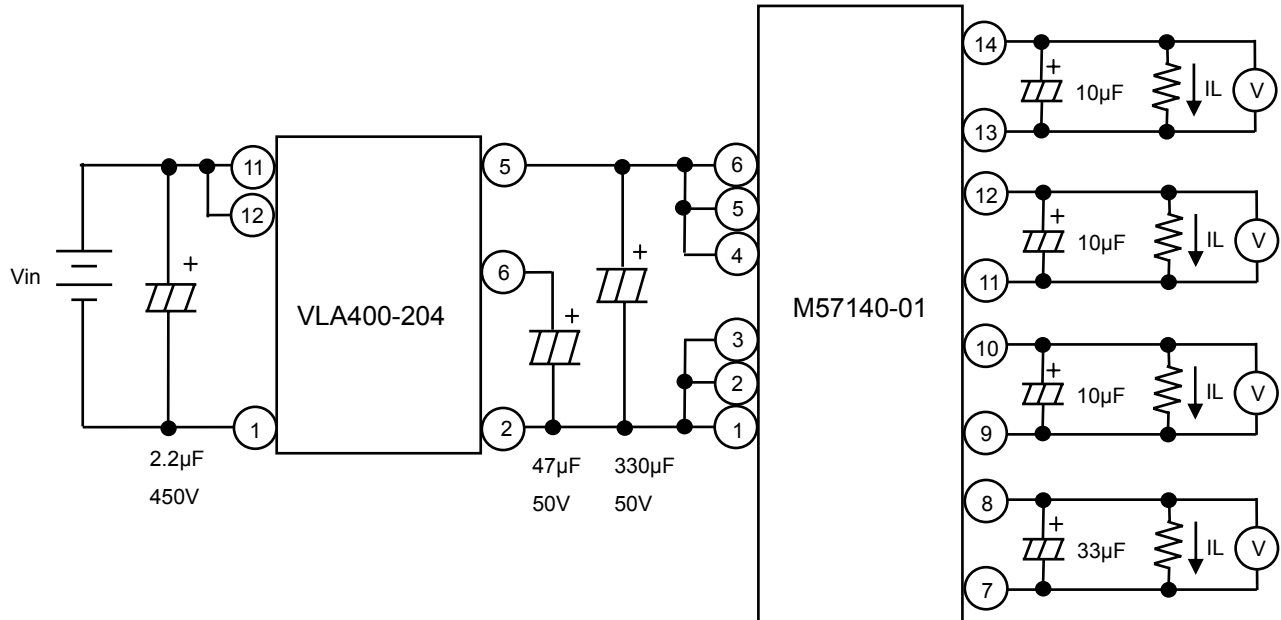
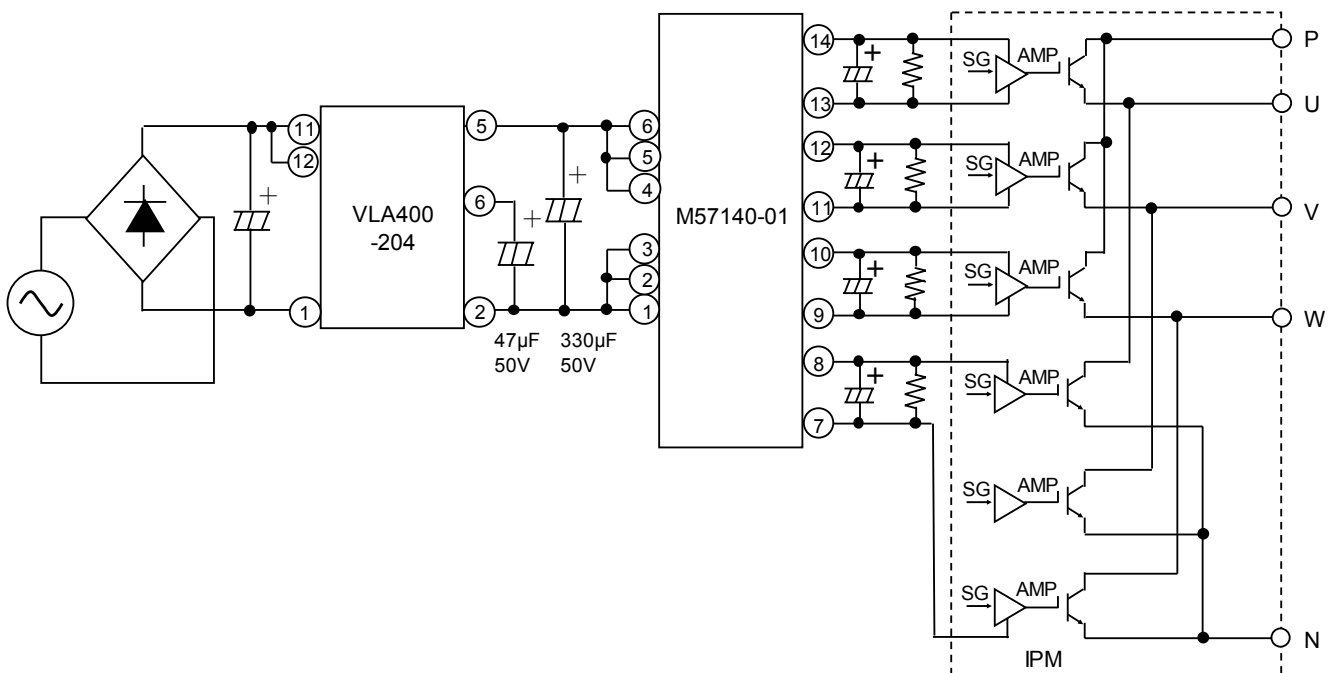
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HIGH VOLTAGE INPUT DC-DC CONVERTER**TYPICAL CHARACTERISTICS****DERATING CURVE****OUTPUT VOLTAGE VS LOAD CURRENT CHARACTERISTICS****OUTPUT VOLTAGE VS INPUT VOLTAGE CHARACTERISTICS****OUTPUT VOLTAGE VS AMBIENT TEMPERATURE CHARACTERISTICS****OUTPUT REGULATION****BIAS CURRENT VS AMBIENT TEMPERATURE CHARACTERISTICS****BIAS CURRENT VS INPUT VOLTAGE CHARACTERISTICS****START-UP TIME VS INPUT VOLTAGE CHARACTERISTICS****EFFICIENCY VS LOAD CURRENT CHARACTERISTICS**

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HIGH VOLTAGE INPUT DC-DC CONVERTER**APPLICATION CIRCUIT -1 (WHEN M57140-01 IS COMBINED)****APPLICATION CIRCUIT -2**

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HIGH VOLTAGE INPUT DC-DC CONVERTER**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	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.
Carrying	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	When storing Hics, please observe the following notices or possible deterioration of their electrical characteristics, risk of solderability, and external damage may occur. 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, 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.
Maximum ratings	To prevent any electrical damages, use Hics within the maximum ratings. The temperaqtue, current, voltage, etc. must not exceed these conditions.
Polarity	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.

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HIGH VOLTAGE INPUT DC-DC CONVERTER

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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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