VLA107-644/-655/-666/-677R

4 OUTPUTS ISOLATED DC-DC CONVERTER

DESCRIPTION

The VLA107 is an isolated DC-DC converter module which has 4 outputs designed to inverter control. Isolation strength is 2500Vrms between the input and outputs, also each outputs.

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FEATURES

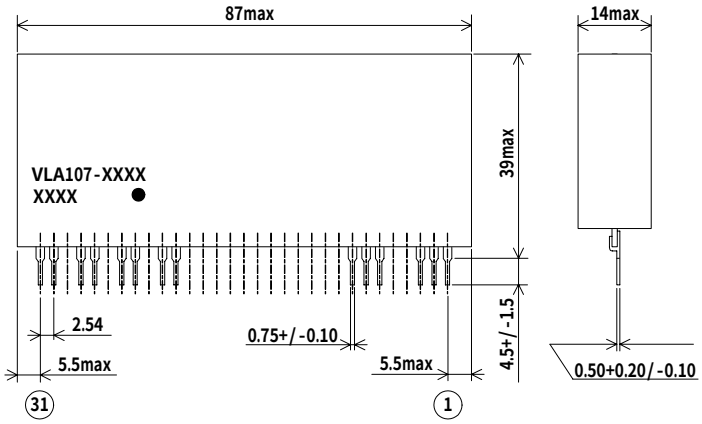
-Input voltage 12 ~ 24V
-Output 12 ~ 24V / 120mA x4
-Isolation voltage strength
--- 2500Vrms, 1 minute (Input to output)
---2500Vrms, 1minute (Each outputs)
-Low noise
-No optical coupler
-ROHS compliance

APPLICATIONS

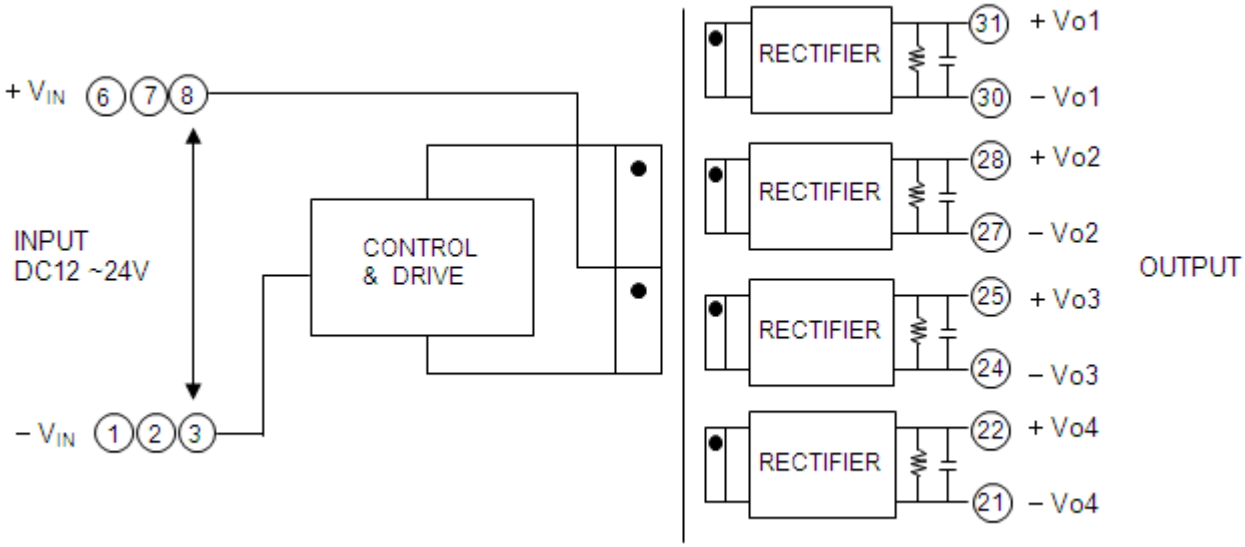
-3 phase inverter control

OUTLINE DRAWING

Dimensions : mm



BLOCK DIAGRAM

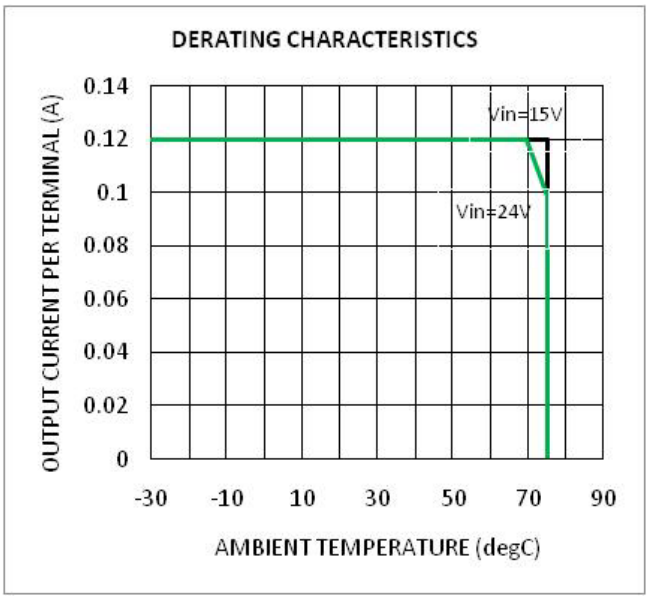


<<VLA107-644R>>

MAXIMUM RATINGS (unless otherwise noted, V_{IN}=24V,Ta=25°C)

Symbol	Parameter	Conditions	Ratings	Unit
V_{IN}	Input voltage	Between pins 1,2,3 and 6,7,8	26.4	V
I_O	Output current	Between pins 21-22,24-25,27-28,30-31	120	mA
Topr	Operating temperature	No condensation	-30 ~ +75(*1)	°C
Tstg	Storage temperature	No condensation	-40 ~ +85	°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.

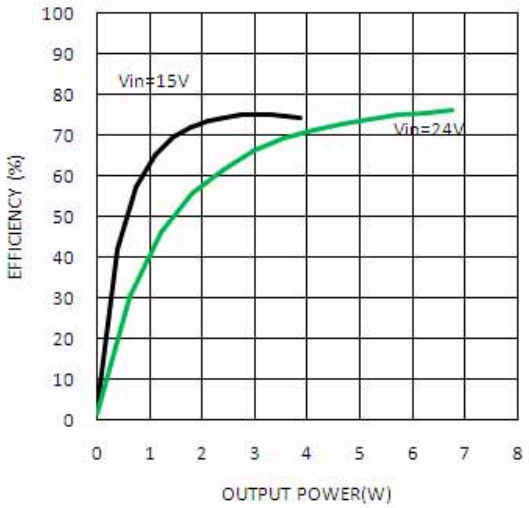


ELECTRICAL CHARACTERISTICS (unless otherwise noted, Ta=25°C)

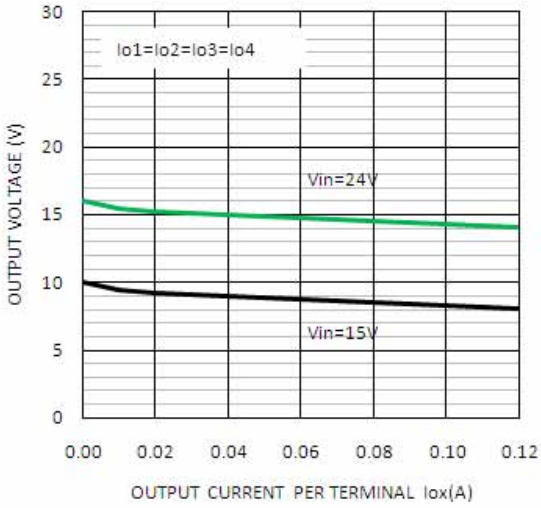
Symbol	Parameter	Test conditions	Limits			Unit
			MIN.	TYP.	MAX.	
V_{IN}	Input voltage	Recommended range	12	-	24	V
Vox	Output voltage	V_{IN}=24V, Io1=Io2=Io3=Io4=0mA	15.5	16.5	17.5	V
		V_{IN}=24V, Io1=Io2=Io3=Io4=120mA	13	14	15	
		V_{IN}=24V, Io1=Io2=Io3=10mA, Io4=30mA	14.5	15.5	16.5	
		V_{IN}=24V, Io1=Io2=Io3=30mA, Io4=90mA	14	15	16	
Reg-L	Load regulation	V_{IN}=24V, Io1=Io2=Io3=Io4=0 ~120mA	-	13	-	%
		V_{IN}=24V,Io1=Io2=Io3=0mA, Io4=0~120mA	-	6	-	
Vp-p	Output ripple	V_{IN}=24V, Iox=120mA	-	40	-	mVp-p
η	Efficiency	V_{IN}=24V, Io1=Io2=Io3=Io4=120mA	-	75	-	%

<<VLA107-644R>> TYPICAL CHARACTERISTIC CURVES

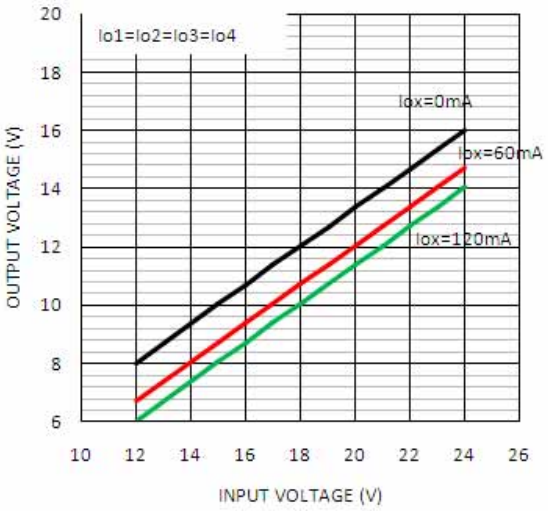
EFFICIENCY - OUTPUT POWER



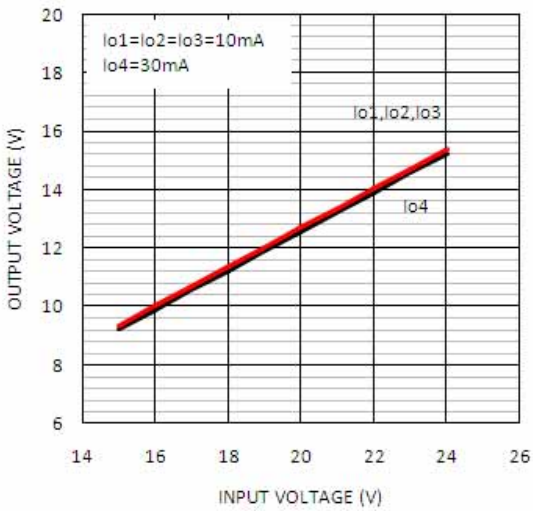
OUTPUT VOLTAGE - OUTPUT CURRENT



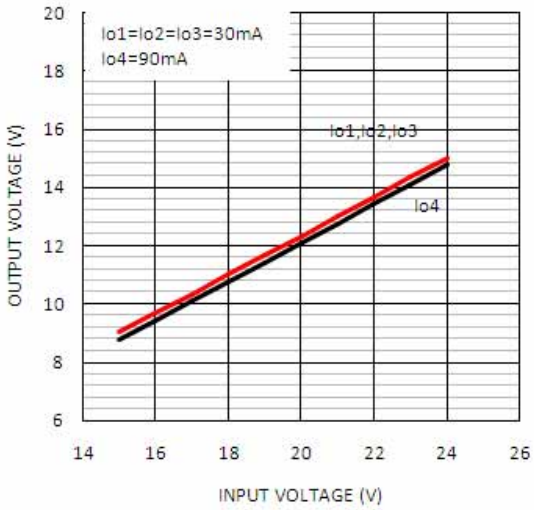
OUTPUT VOLTAGE - INPUT VOLTAGE



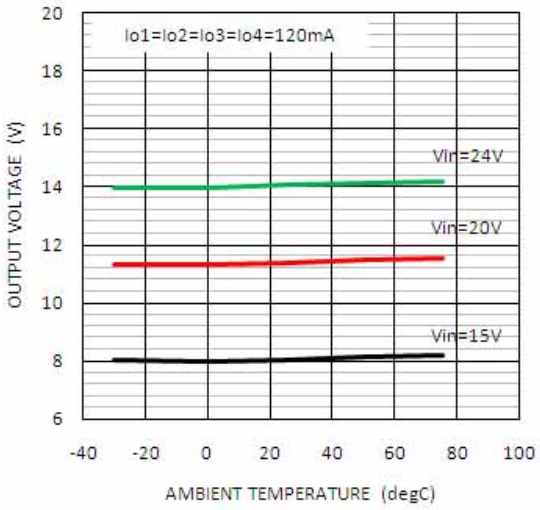
OUTPUT VOLTAGE - INPUT VOLTAGE



OUTPUT VOLTAGE - INPUT VOLTAGE



OUTPUT VOLTAGE - AMBIENT TEMPERATURE

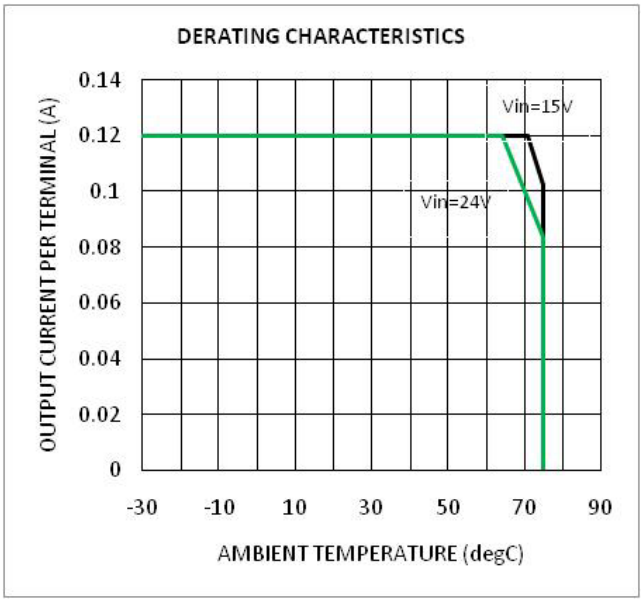


<<VLA107-655R>>

MAXIMUM RATINGS (unless otherwise noted, V_{IN}=24V,Ta=25°C)

Symbol	Parameter	Conditions	Ratings	Unit
V_{IN}	Input voltage	Between pins 1,2,3 and 6,7,8	26.4	V
I_O	Output current	Between pins 21-22,24-25,27-28,30-31	120	mA
Topr	Operating temperature	No condensation	-30 ~ +75(*1)	°C
Tstg	Storage temperature	No condensation	-40 ~ +85	°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.

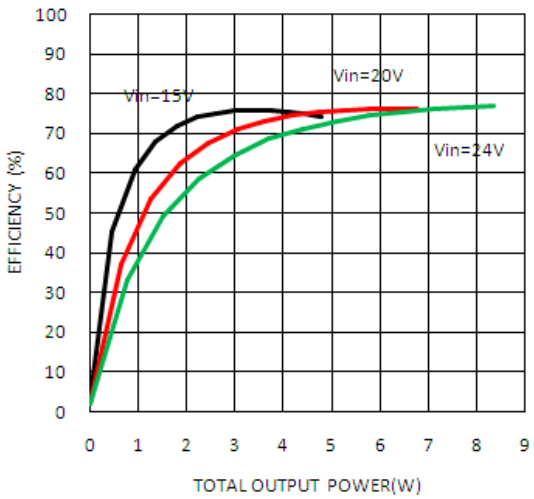


ELECTRICAL CHARACTERISTICS (unless otherwise noted, Ta=25°C)

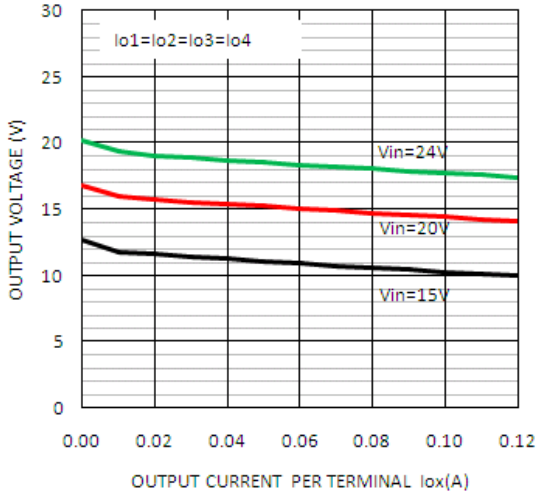
Symbol	Parameter	Test conditions	Limits			Unit
			MIN.	TYP.	MAX.	
V_{IN}	Input voltage	Recommended range	12	-	24	V
Vox	Output voltage	V_{IN}=24V, Io1=Io2=Io3=Io4=0mA	18.5	20	21.5	V
		V_{IN}=24V, Io1=Io2=Io3=Io4=120mA	16	17.5	19	
Reg-$_L$	Load regulation	V_{IN}=24V, Io1=Io2=Io3=Io4=0 ~120mA	-	15	-	%
		V_{IN}=24V,Io1=Io2=Io3=0mA, Io4=0~120mA	-	7	-	
Vp-p	Output ripple	V_{IN}=24V, Iox=120mA	-	40	-	mVp-p
η	Efficiency	V_{IN}=24V, Io1=Io2=Io3=Io4=120mA	-	75	-	%

<<VLA107-655R>> TYPICAL CHARACTERISTIC CURVES

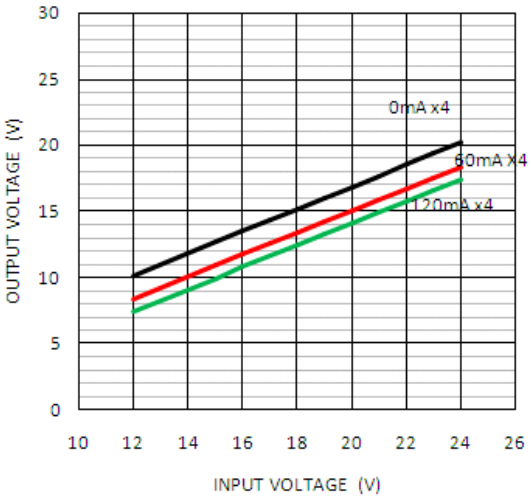
EFFICIENCY - OUTPUT POWER



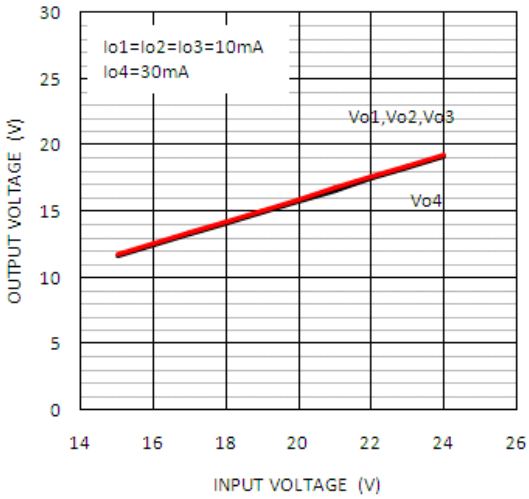
OUTPUT VOLTAGE - OUTPUT CURRENT



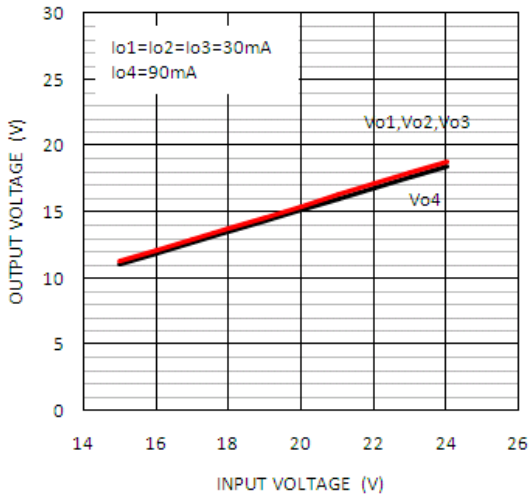
OUTPUT VOLTAGE - INPUT VOLTAGE



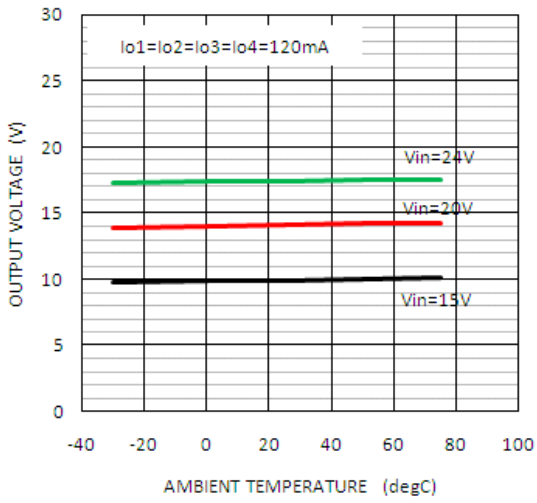
OUTPUT VOLTAGE - INPUT VOLTAGE



OUTPUT VOLTAGE - INPUT VOLTAGE



OUTPUT VOLTAGE - AMBIENT TEMPERATURE

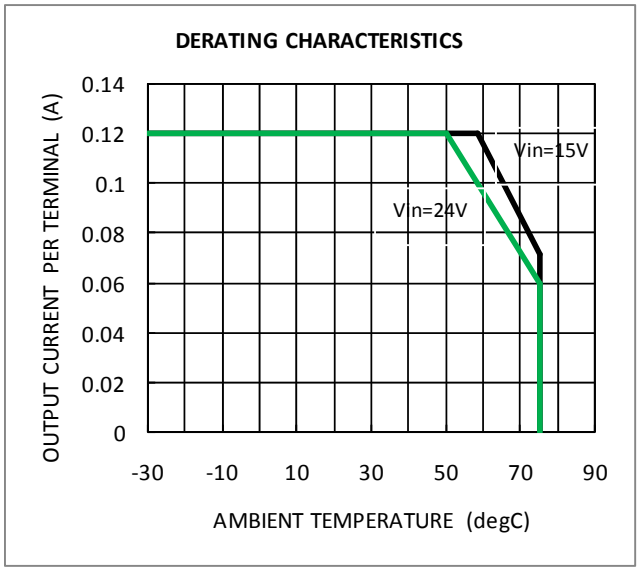


<<VLA107-666R>>

MAXIMUM RATINGS (unless otherwise noted, V_{IN}=24V,Ta=25°C)

Symbol	Parameter	Conditions	Ratings	Unit
V_{IN}	Input voltage	Between pins 1,2,3 and 6,7,8	26.4	V
I_O	Output current	Between pins 21-22,24-25,27-28,30-31	120	mA
Topr	Operating temperature	No condensation	-30 ~ +75(*1)	°C
Tstg	Storage temperature	No condensation	-40 ~ +85	°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.

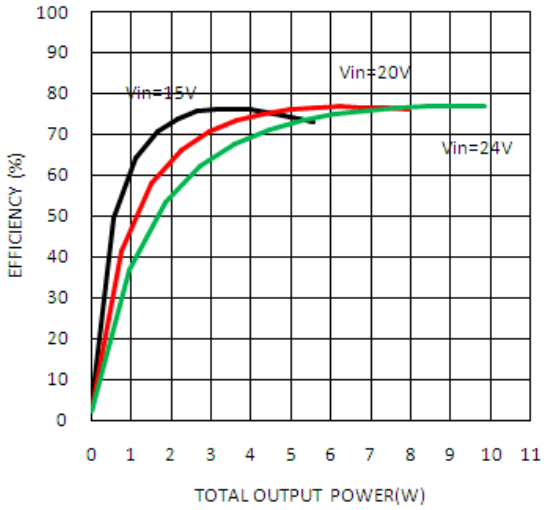


ELECTRICAL CHARACTERISTICS (unless otherwise noted, Ta=25°C)

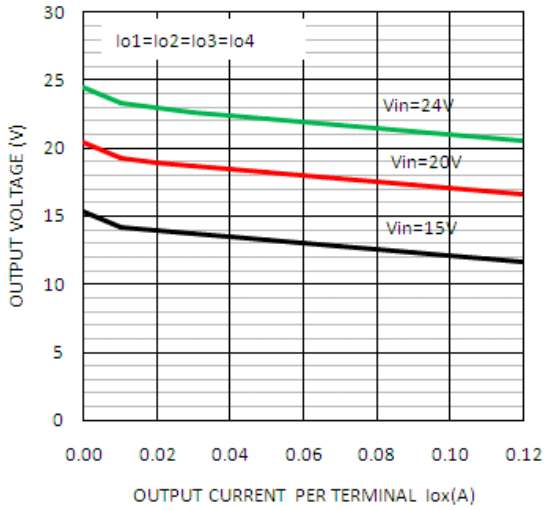
Symbol	Parameter	Test conditions	Limits			Unit
			MIN.	TYP.	MAX.	
V_{IN}	Input voltage	Recommended range	12	-	24	V
Vox	Output voltage	V_{IN}=24V, Io1=Io2=Io3=Io4=0mA	23	24.5	26	V
		V_{IN}=24V, Io1=Io2=Io3=Io4=120mA	20	21.5	23	
Reg_{-L}	Load regulation	V_{IN}=24V, Io1=Io2=Io3=Io4=0 ~120mA	-	16	-	%
		V_{IN}=24V,Io1=Io2=Io3=0mA, Io4=0~120mA	-	8	-	
Vp-p	Output ripple	V_{IN}=24V, Iox=120mA	-	40	-	mVp-p
η	Efficiency	V_{IN}=24V, Io1=Io2=Io3=Io4=120mA	-	75	-	%

<<VLA107-666R>> TYPICAL CHARACTERISTIC CURVES

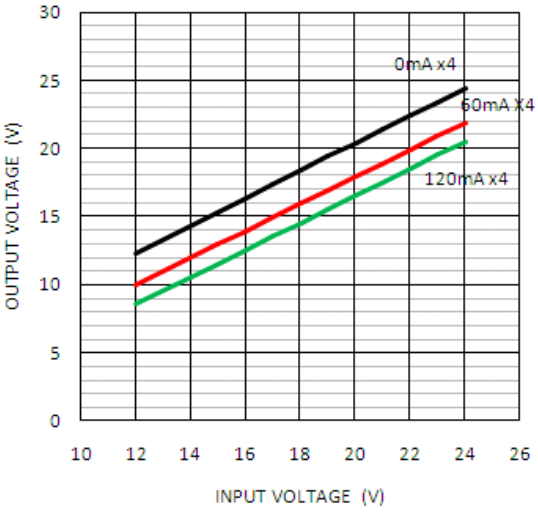
EFFICIENCY - OUTPUT POWER



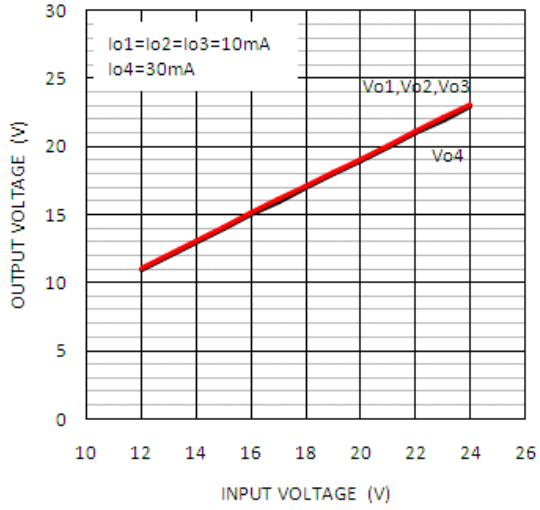
OUTPUT VOLTAGE - OUTPUT CURRENT



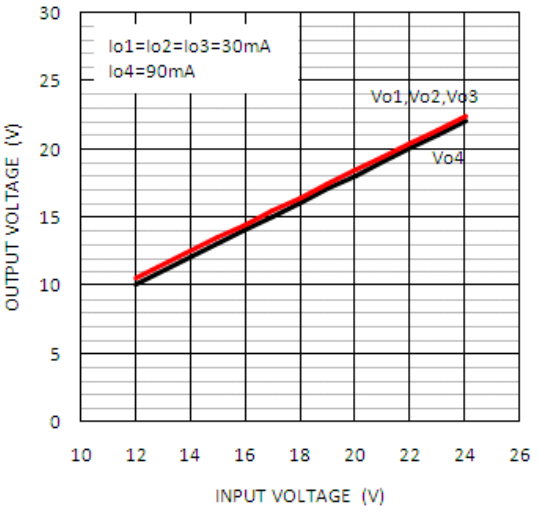
OUTPUT VOLTAGE - INPUT VOLTAGE



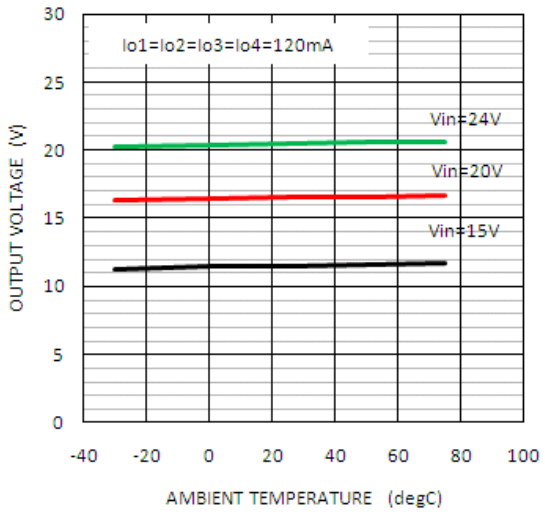
OUTPUT VOLTAGE - INPUT VOLTAGE



OUTPUT VOLTAGE - INPUT VOLTAGE



OUTPUT VOLTAGE - AMBIENT TEMPERATURE



<<VLA107-677R>>

MAXIMUM RATINGS (unless otherwise noted, V_{IN}=24V,Ta=25°C)

Symbol	Parameter	Conditions	Ratings	Unit
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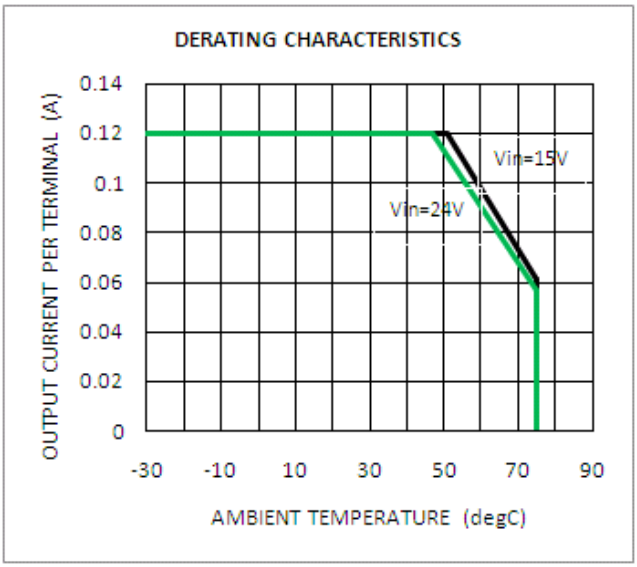
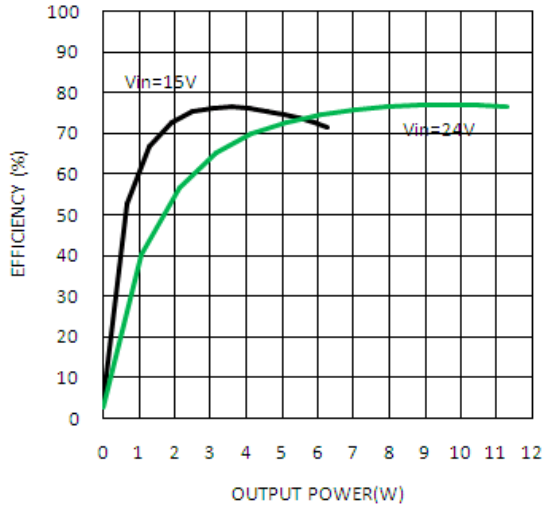


ELECTRICAL CHARACTERISTICS (unless otherwise noted, Ta=25°C)

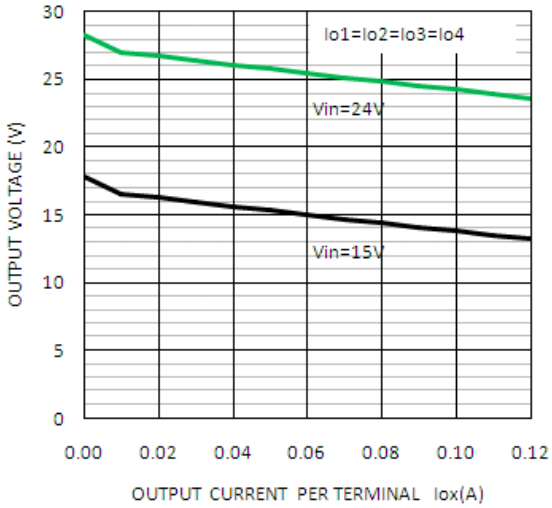
Symbol	Parameter	Test conditions	Limits			Unit
			MIN.	TYP.	MAX.	
V_{IN}	Input voltage	Recommended range	12	-	24	V
Vox	Output voltage	V_{IN}=24V, Io1=Io2=Io3=Io4=0mA	27	28.5	30	V
		V_{IN}=24V, Io1=Io2=Io3=Io4=120mA	22	23.5	25	
		V_{IN}=15V, Io1=Io2=Io3=Io4=0mA	17	18	19	
		V_{IN}=15V, Io1=Io2=Io3=Io4=120mA	12	13	14	
		V_{IN}=15V, Io1=Io2=Io3=10mA, Io4=30mA	15.5	16.5	17.5	
		V_{IN}=15V, Io1=Io2=Io3=30mA, Io4=90mA	14.5	15.5	16.5	
Reg_{-L}	Load regulation	V_{IN}=24V, Io1=Io2=Io3=Io4=0 ~120mA	-	16	-	%
		V_{IN}=24V,Io1=Io2=Io3=0mA, Io4=0~120mA	-	8	-	
Vp-p	Output ripple	V_{IN}=24V, Iox=120mA	-	40	-	mVp-p
η	Efficiency	V_{IN}=24V, Io1=Io2=Io3=Io4=120mA	-	75	-	%

<<VLA107-677R>> TYPICAL CHARACTERISTIC CURVES

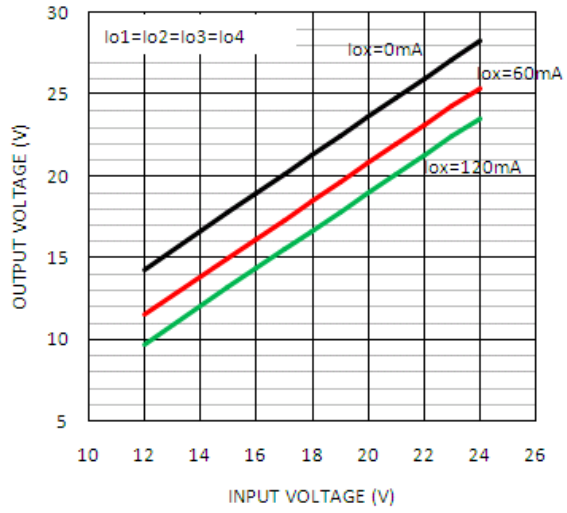
EFFICIENCY - OUTPUT POWER



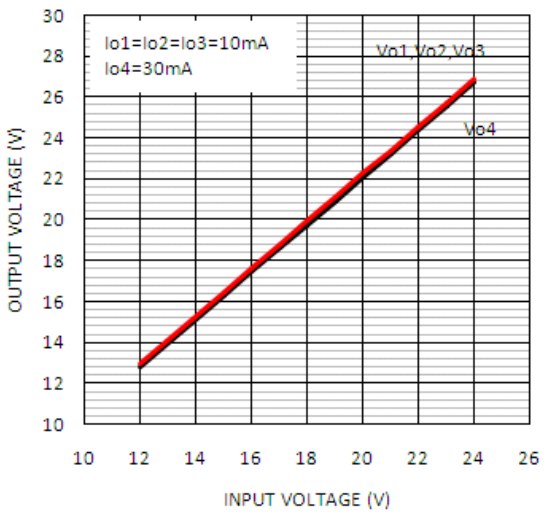
OUTPUT VOLTAGE - OUTPUT CURRENT



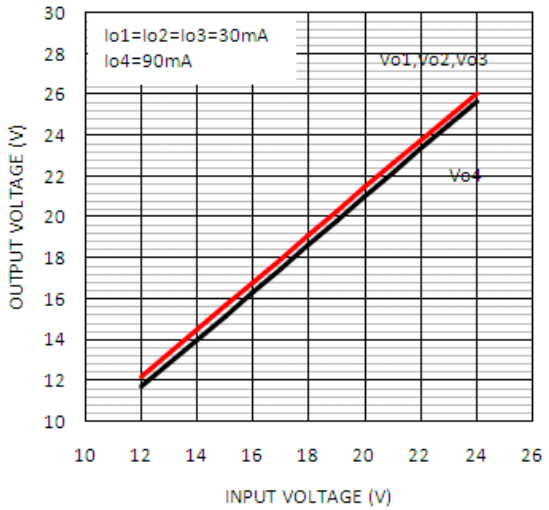
OUTPUT VOLTAGE - INPUT VOLTAGE



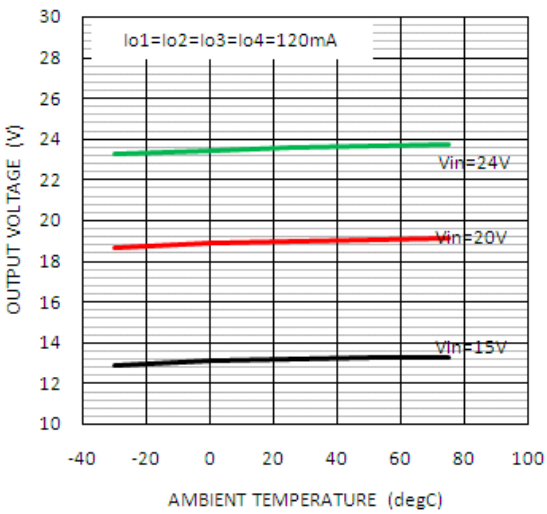
OUTPUT VOLTAGE - INPUT VOLTAGE



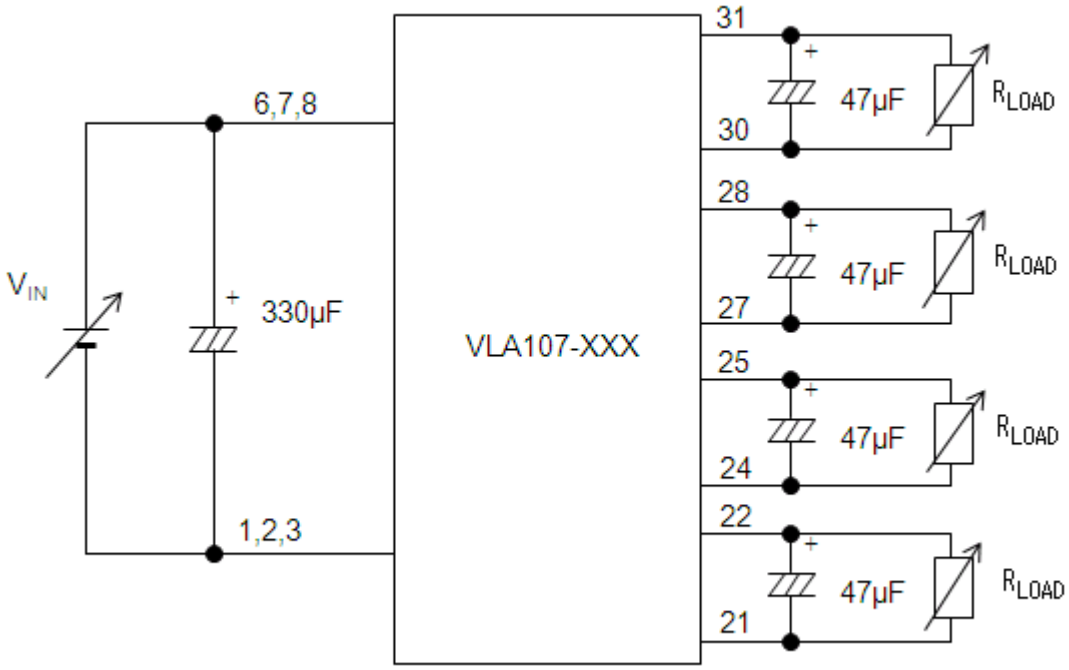
OUTPUT VOLTAGE - INPUT VOLTAGE



OUTPUT VOLTAGE - AMBIENT TEMPERATURE



TEST CIRCUIT



HANDLING PRECAUTIONS

•When the VLA107 is used under excessive load condition, output side rectifying diodes will be destroyed. Care should be exercised so as not to operate the device above the rated maximum load current

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 it's 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 contaminators, 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 temperature, 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.

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

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