

FEATURES

1. Wide input voltage range 3:1
2. Efficiency 87% (Typ.)
3. Low standby power consumption
4. Operating Temperature from -40°C to +105°C
5. High isolation voltage 2500VAC(input-output) & 2100VAC(input-case)
6. Input under voltage protection, output over current, over voltage, over temp. & short circuit protections
7. Standard 1/2 brick size



3 years
Warranty

Selection Guide

Part No.	Input voltage range(VDC)	Output Power (W)	Output Voltage (VDC)	Output Current (A)	Ripple & Noise (mVp-p)Max(1)	Full load Efficiency(%) Min/Typ.	Input Current (A) Max.@36VDC Full load
NQ200-12HB	85-264	200	12	16.6	120	83/85	3.5
NQ200-15HB	85-264	200	15	13.5	150	83/85	3.5
NQ200-24HB	85-264	200	24	8.3	240	83/85	3
NQ200-28HB	85-264	200	28	7.15	280	83/85	3
NQ200-36HB	85-264	200	36	5.55	360	85/87	3
NQ200-48HB	85-264	200	48	4.17	480	85/87	3

Note:

(1)Ripple and noise is tested under 20M bandwidth, with external capacitor $\geq 470\mu\text{F}$

Input Specifications

Item	Operating conditions	Min.	Typ.	Max.	Unit
Input Surge current Max	Input 220Vac, NTC (5.6R/Ø20mm) connected in series	--	--	20	A
Standby power consumption	Rated input voltage	--	--	2	W
Start-up voltage		--	--	85	VAC
Input inrush voltage (1sec. max.)	Unit could be permanently broken over this voltage	--	--	315	
Input under-voltage protection	No load	--	--	80	
Input voltage frequency		47	--	63	Hz
PF value	220Vac input, full load	95	--	--	%

Output Specifications

Item	Operating conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy	Nominal input voltage, 10% load	--	±0.2	±1.0	%
Line Regulation	Full load, input voltage from low to high	--	±0.1	±0.2	
Load Regulation	Nominal input voltage, 10%-100% load	--	±0.1	±0.2	
Transient recovery time	25% load step change (step rate 1A/50uS)	--	200	250	uS
Transient Response Deviation		-5	--	5	%
Temperature Drift Coefficient	Full load	-0.02	--	+0.02	%/°C
Output voltage adjustment (TRIM)		-10	--	+10	%
Distal end compensation (Sense)		--	--	105	%
Over temperature protection	Maximum temperature of the Metal Base	105	115	125	°C
Output over voltage protection		125	--	140	%
Output over current protection		17.5	--	22	A
Output short circuit protection		Hiccup, continuous, self-recovery			

General Specifications

Item	Operating conditions		Min.	Typ.	Max.	Unit
Isolation voltage	I/P-O/P	Test 1min, leakage current <3mA	--	--	2500	VAC
	I/P-Case	Test 1min, leakage current <3mA	--	--	2100	VAC
	O/P-Case	Test 1min, leakage current <3mA	--	--	500	VAC
Insulation resistance	I/P-O/P	@ 500VDC	100	--	--	MΩ
Switching frequency			--	280	--	KHz
MTBF	MIL-HDBK-217F@25°C		150	--	--	K hours

Environmental characteristics

Item	Operating conditions	Min.	Typ.	Max.	Unit
Operating Temperature	Refer to the temperature derating graph	-40	--	+105	°C
Storage Humidity	No condensing	5	--	95	%RH
Storage Temperature		-40	--	+125	°C
Pin Soldering temperature	1.5mm from the case, <1.5S	--	--	+350	
Cooling requirement		EN60068-2-1			
Dry and heat requirement		EN60068-2-2			
Moisture and heat requirement		EN60068-2-30			
Shock and vibration		IEC/EN 61373 C1/Body Mounted Class B			

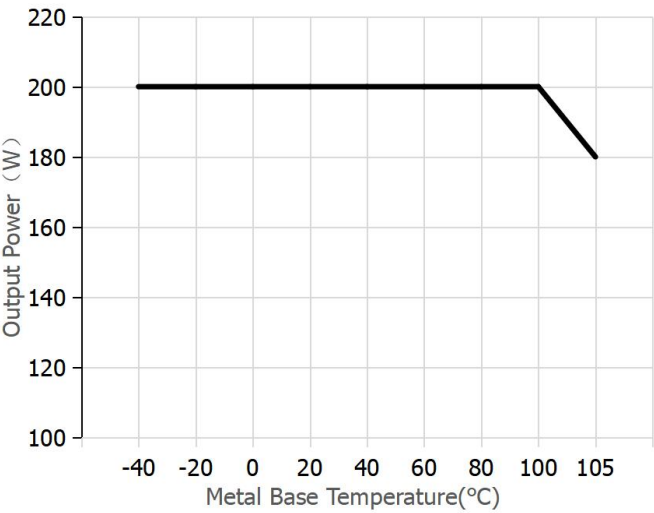
Mechanical Specifications

Case Materials	Metal base + Plastic case in black, flame class UL94-V0				
Cooling Method	Conduction cooling or forced air cooling with fan				
Weight	Standard	125g			
	With heatsink	203g			
Size	Standard	116.8*61*12.7mm			
	With heatsink	116.8*61*32.7mm			

Electromagnetic compatibility (EMC EN55032)

EMI	CE	EN50121-3-2	150kHz-500kHz 79dBuV	
		EN55016-2-1	500kHz-30MHz 73dBuV	
	RE	EN50121-3-2	30MHz-230MHz 40dBuV/m at 10m	
		EN55016-2-1	230MHz-1GHz 47dBuV/m at 10m	
EMS	ESD	EN50121-3-2	Contact ±6KV / Air ±8KV	perf. Criteria A
	RS	EN50121-3-2	10V/m	perf. Criteria A
	EFT	EN50121-3-2	±2kV 5/50ns 5kHz	perf. Criteria A
	Surge	EN50121-3-2	Line to line ±1KV (42Ω, 0.5μF)	perf. Criteria A
	CS	EN50121-3-2	0.15MHz-80MHz 10 V r.m.s	perf. Criteria A

Typical Characteristic Curves



Note:

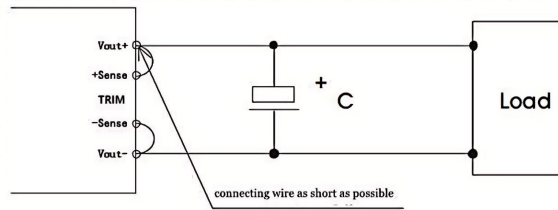
1. Both the output power and efficiency in the graphs have been tested with typical values.

2.The data in the temperature derating graph have been tested at laboratory test conditions. It is recommended to keep the temperature of the Metal base not more than 105 °C when the converter operates at the rated load for the application.

If this recommended circuit is not adopted, C3X should be $\geq 0.47\mu\text{F}$, E1 should be $\geq 100\mu\text{F}$, NTC must be used, C1 should be $\geq 1\mu\text{F}$ at the temperature $\leq -25^\circ\text{C}$. The power supply could be broken if these conditions are not met.

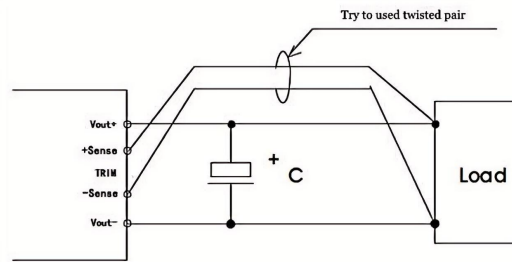
3. Application for Sense

1) With NO distal end compensation



- Note:
1. Vout+ & Sense+, Vout- & Sense- should be shorted when distal end compensation is not needed
 2. The lead wire between Vout+ and Sense+, Vout- and Sense- should be as short as possible, and close to the pins, or else the output may be unstable.

2) With distal end compensation



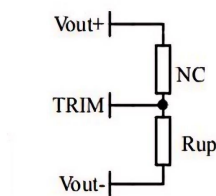
- Notes:
1. The output voltage may be unstable if the compensation cables are too long.
 2. The twisted pair or shielded cables are recommended, the cable length should be as short as possible.
 3. Wide copper path on PCB or thick lead wires between the power supply and the load should be used to achieve the line voltage drop <0.3V. The target is to keep output voltage within the specified range.
 1. The leads wire resistance may create the output voltage oscillation or larger ripples. Please verify it before to use.

4. Use of TRIM and calculation of TRIM resistance

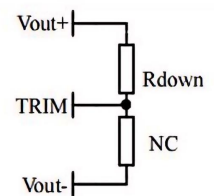
The calculation of ΔU and R_{up} & R_{down} :

$$R_{up} = 70 / \Delta U - 5.1 \text{ (K}\Omega\text{)}$$

$$R_{down} = 28 * (21.5 - \Delta U) / \Delta U - 5.1 \text{ (K}\Omega\text{)}$$



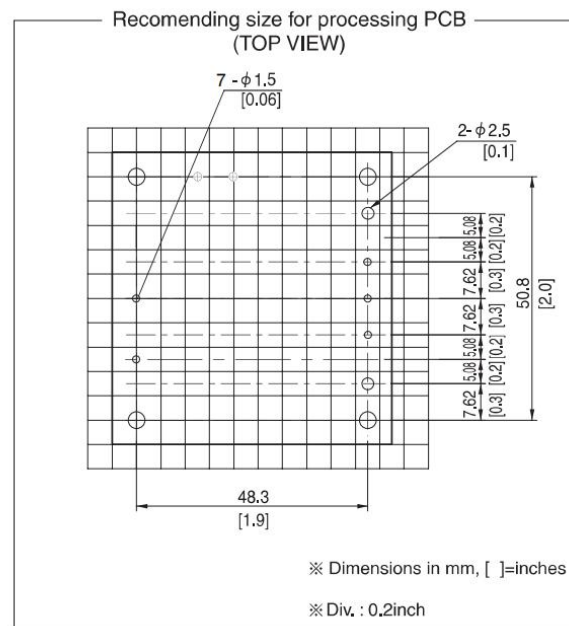
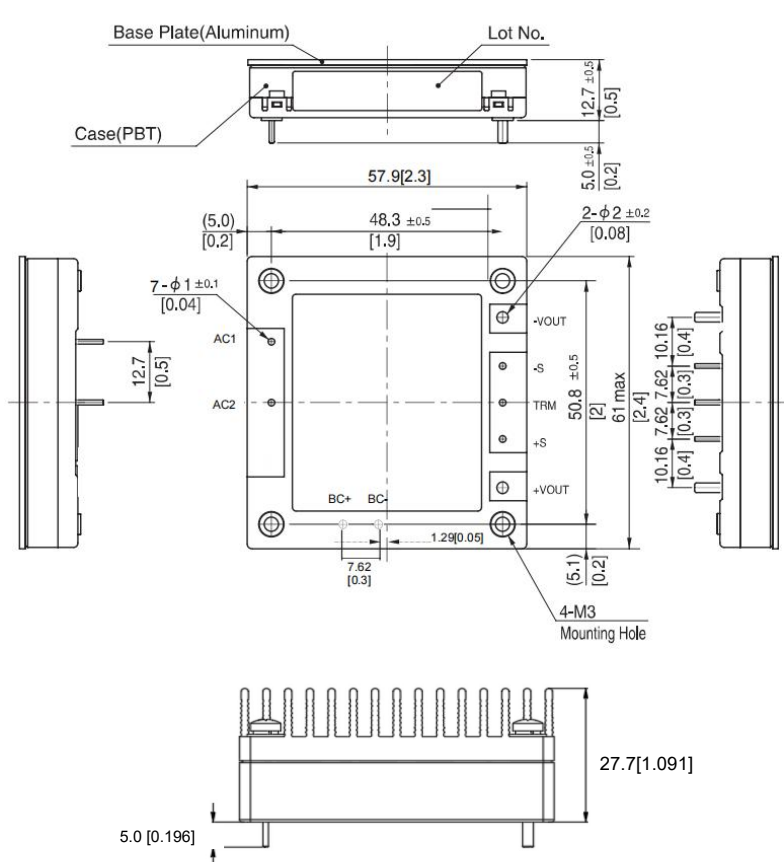
Voltage-up: Add R_{up} between Trim and Vout-



Voltage-down: Add R_{down} between Trim and Vout+

5. This product is not available for connecting in parallel to increase the output power.

Dimensions



※ Tolerance : ± 0.5 [± 0.02]

※ Dimensions in mm, []=inches

※ Mounting hole screwing torque : 0.4 N · m

Notes & Instructions

1. If the product works under the minimum required load, it cannot guarantee that the performance of the product complies with all the performance indicators in this manual;
2. The maximum capacitive load is tested under the input voltage range and full load condition;
3. Unless otherwise stated, all indexes in this manual are measured at Ta=25°C, humidity <75%RH, nominal input voltage and rated output load;
4. All index testing methods in this manual are based on the enterprise standards of the company;
5. Our company can provide product customization, specific needs can directly contact our technical staff;

NORPAS-POWER TECHNOLOGY CO., LTD.

www.norpas-power.com Mail: info@norpas-power.com

Specifications can be changed without notice! Make sure you are using the latest documentation, downloadable at www.norpas-power.com

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