

FEATURES

1. Wide input voltage range 3:1
2. Efficiency 88% (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 1/4 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.@90VAC Full load
NQ100-12QB	90-264	100	12	8.3	120	85/87	1
NQ100-15QB	90-264	100	15	6.6	150	86/88	1
NQ100-24QB	90-264	100	24	4.15	240	86/88	1
NQ100-28QB	90-264	100	28	4.15	240	86/88	1
NQ100-48QB	90-264	100	48	2.08	480	86/88	1

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	--	--	40	W
Start-up voltage		--	--	1	VAC
Input inrush voltage (1sec. max.)	Unit could be permanently broken over this voltage	--	--	300	
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	--	±0.5	±1.0	%
Line Regulation	Full load, input voltage from low to high	--	±0.2	±0.5	
Load Regulation	Nominal input voltage, 10%-100% load	--	±0.2	±0.5	
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	%
Over temperature protection	Maximum temperature of the Metal Base	105	115	125	°C
Output over current protection		9.1	--	11.6	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
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			

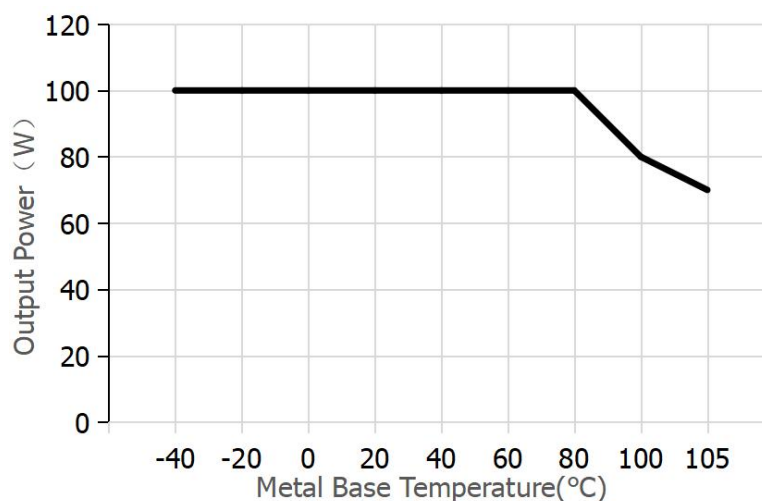
Mechanical Specifications

Case Materials	Metal base + Plastic case in black, flame class UL94-V0				
Cooling Method	Conduction cooling or forced air cooling with fan				
Weight	Standard	90g			
	With heatsink	145g			
Size	Standard	60.4*39.0*12.7mm			
	With heatsink	61.5*39*27.7mm			

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	IEC/EN61000-4-2/GB/T 17626.2-2006	Contact $\pm 6\text{KV}$ /Air $\pm 8\text{KV}$	perf. Criteria A
	RS	IEC/EN61000-4-3/GB/T 17626.3-2006	10V/m	perf. Criteria A
	EFT	IEC/EN61000-4-4/GB/T 17626.4-2008	$\pm 2\text{kV}$ 5/50ns 5kHz	perf. Criteria A
	Surge	IEC/EN61000-4-5/GB/T 17626.5-2008	line to line $\pm 1\text{KV}$ (42 Ω , 0.5 μF)	perf. Criteria A
	CS	IEC/EN61000-4-6/GB/T 17626.6-2008	0.15MHz-80MHz 10 Vr.m.s	perf. Criteria A

Typical Characteristic Curves



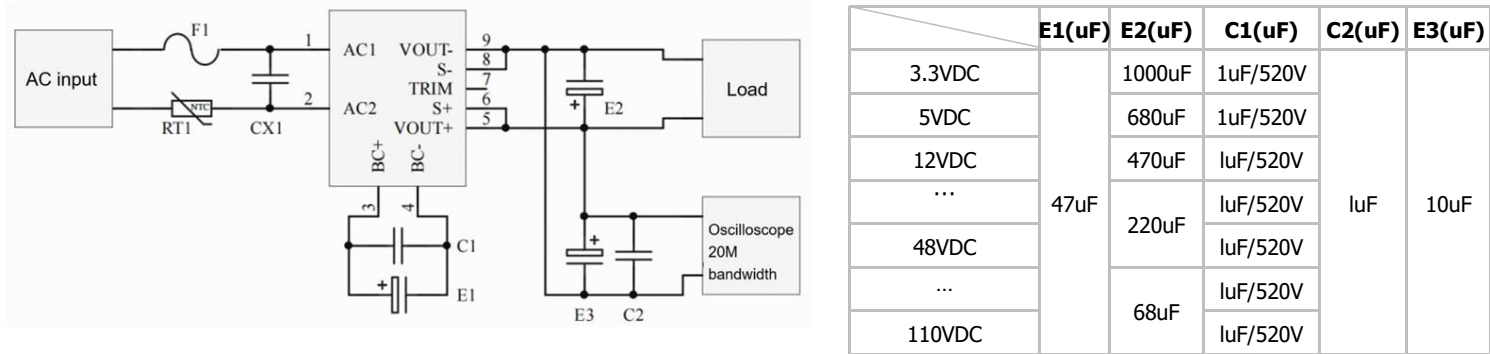
Note:

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

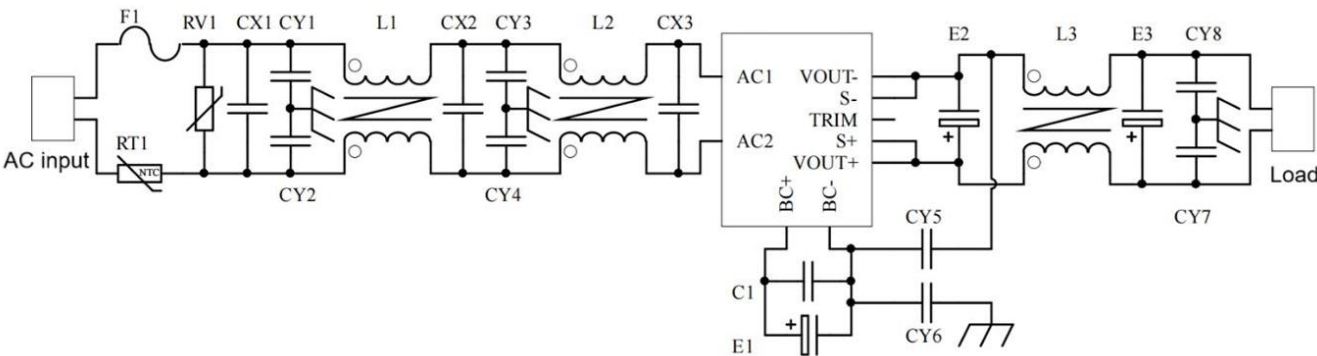
Recommended circuits for application

1. Ripple & Noise

All this series of products will be tested according to this circuit diagram below before shipping.



2. Recommended application circuit.



F1	T3.15A/250V FUSE
RV1	14D 620V TVS
RT1	5.6Ω/20mm NTC
CX1, CX2, CX3	105/250VAC/X2 Capacitor
CY1, CY2, CY3, CY4, CY5	102/250Vac/Y2 Capacitor
CY7, CY8	103/2KV Ceramic SMD Capacitor
CY6	471/250Vac/Y1 Capacitor
C1	105/520V Polyester Film Capacitor
E1	68μF/450V Electrolytic capacitor
E2, E3	470μF/16V Electrolytic capacitor
L1, L2	>6mH, the temperature rise <25°@1A
L3	>47mH, the temperature rise <25°@8.3A

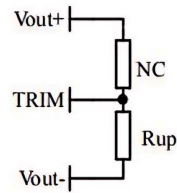
If this recommended circuit is not adopted, C3X should be ≥0.47uF, E1 should be ≥100uF, NTC must be used, C1 should be ≥1uF at the temperature ≤ -25°C. The power supply could be broken if these conditions are not met.

3. Use of TRIM and calculation of TRIM resistance

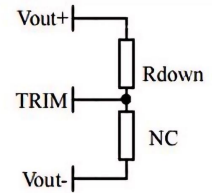
The calculation of ΔU and R_{up} & R_{down} :

$$R_{up} = 31 / \Delta U - 5.1 \text{ (K}\Omega\text{)}$$

$$R_{down} = 12.4 * (12 - 2.5 - \Delta U) / \Delta U - 5.1 \text{ (K}\Omega\text{)}$$



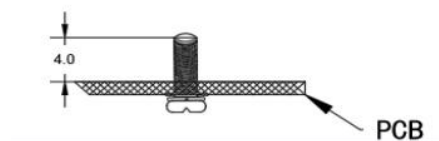
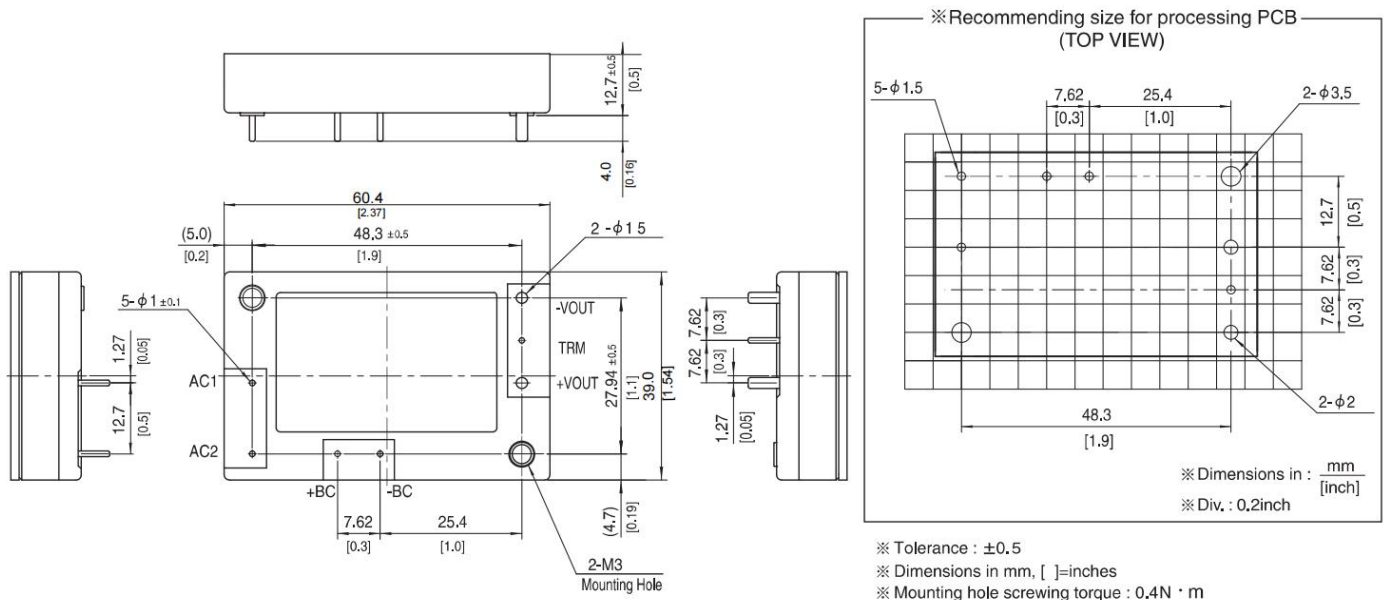
Voltage-up: Add R_{up} between Trim and Vout-



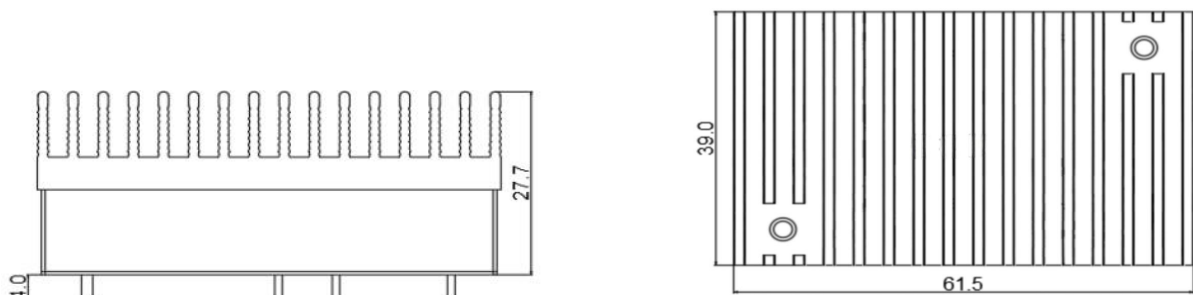
Voltage-down: Add R_{down} between Trim and Vout+

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

Dimensions



Heatsink



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 $T_a=25^{\circ}\text{C}$, humidity $<75\%\text{RH}$, 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;

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

REV:07/2025