

single output
up to 15 Watt

DC/DC-Regenerators
without potential isolation



- Input range up to > 1:10
- U_{in} lower and higher als U_{out}
- security relevant topology
- Frontend supply (application)
- Over voltage protection (Thyristor)
- Low heat development
- Very high life time
- Suitable for mobile use
- 100% function test of all parameters

for Vehicle applications / Railway technology / Installation technology



US Pat. no. 6.094.366
D Pat. no. 195 05 417

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Series NSR-V

Regenerator switching topology!
Input voltage lower, equal
or higher than the output voltage!

Main points:

Output:

- Accuracy absolute $\pm 1\%$
- Regulation $\Sigma(U_{in} + I_{out} + T_U) < \pm 1,5\%$
- Ripple $< 40 \text{ mV}_{pp}$ (typ. 20 mV_{ss})
- Spikes $< 60 \text{ mV}_{pp}$ (T 1:1/50MHz)
- Regulation time $\Delta I = 50\% \leq 2 \text{ ms}$
- No-load-, static over load- and static short circuit protected
- Short circuit current $\leq 1,2 I_{Amax}$
- Over voltage protection (Thyristor)
- Parallel operation possible

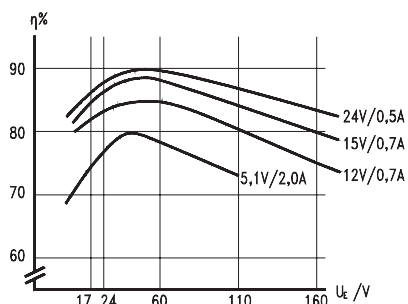
Input:

- No-load power approx. 0,1 - 0,4 Watt
- ON-OFF-Remote (E.A)
- Transient adapted
- Very low input capacity
- Low inrush current ($< C_E$)
- Switch-on current limited

General:

- Easy Noise suppressible (application)
- Ambient temperature $-25^\circ\text{C} / +70^\circ\text{C}$,
Option: $-40^\circ\text{C} / +85^\circ\text{C}$ (H)
Derating $2\%/^\circ\text{C} > 70^\circ\text{C}$
- Air convection cooled
- Common 0V input - output
- MTBF $G_F(40^\circ) > 800000 \text{ h}$
- Plastic housing
- Dimension $48 \times 51 \times 15 \text{ mm}^3$
- Shock/vibration in acc. EN 50155/50121
- No breakthrough of U_{in} to U_{out}

Efficiency:



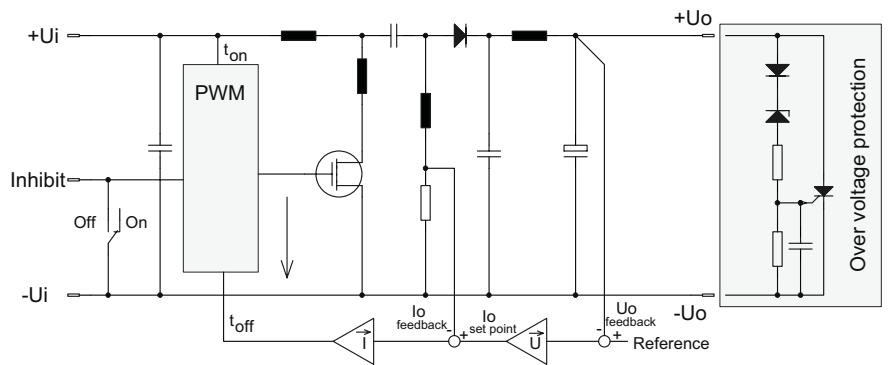
U_{in}	U_{out}	I_{out}	Model
V	V	A	number
6 - 38			
5-45V dyn	5,1	1,2	NSR-V 19-05-120
5-60V dyn	12	0,6	NSR-V 19-12-060
5-60V dyn	15	0,5	NSR-V 19-15-050
5-60V dyn	24	0,3	NSR-V 19-24-030
9 - 85			
	5,1	2,0	NSR-V 85-05-200
	12	0,8	NSR-V 85-12-080
	15	0,6	NSR-V 85-15-060
	24	0,5	NSR-V 85-24-050
36 - 63			
	15	2,0	NSR-V 48-15-200
14,4 - 85			
	12	1,0	NSR-V 50-12-100
	15	1,0	NSR-V 50-15-080
	24	0,6	NSR-V 50-24-060
14,4 - 158			
	5,1	0,7	NSR-V 03-05-070
	12	0,7	NSR-V 03-12-070
	15	0,7	NSR-V 03-15-070
	24	0,5	NSR-V 03-24-050
(H)	-40°C up to $+85^\circ\text{C}$		Additional charge

Modification costs for possible changes above values: on request

On customer request this converter can be modified to a open circuit with U_{in} : 4 - 38V corresponding to the the spcification. With integrated outputsided chopper-circuits it is possible to build-up any quantity of isolated, no-load and short circuit protected output voltages.

Regenerators of the **NSR-V** series are especially designed to regenerate a 12V - 110V industrial DC-network or a on-board DC-network to its nominal value.

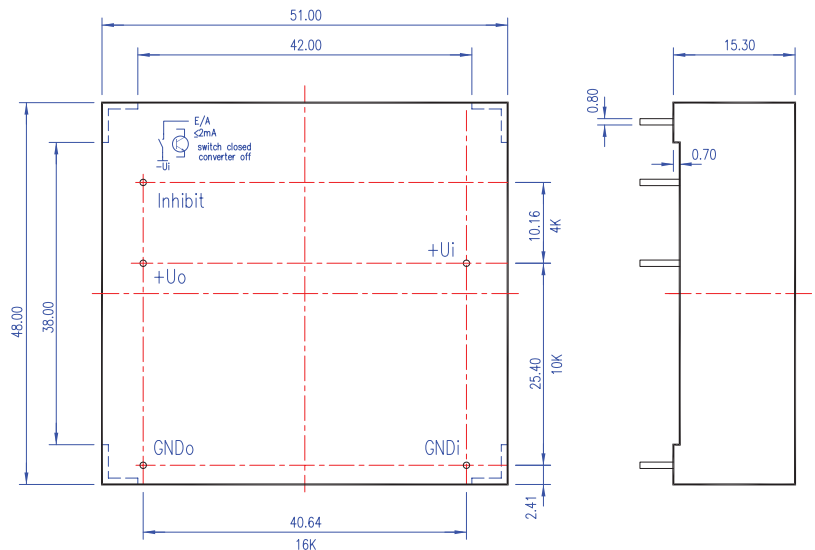
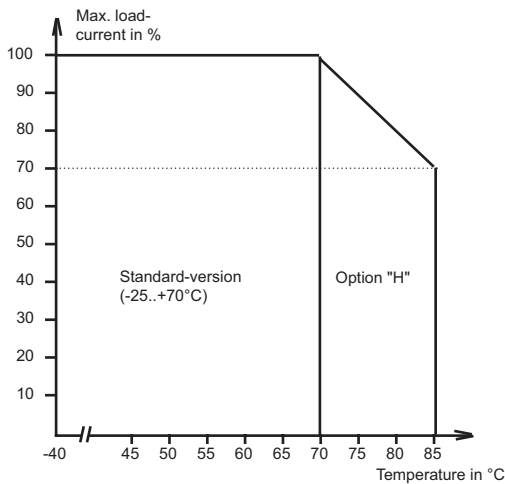
Extreme wide input voltage ranges are processed/regenerated. In compare with the stable and short circuit proof output voltage, this switching regulator works with higher and lower input voltages. Even with the extreme wide input voltage range of $>1:10$ this converter works with an almost constant efficiency. The switching topology is security relevant, because a break-trough of the input voltage to the output is not possible, even in the case of a component failure.



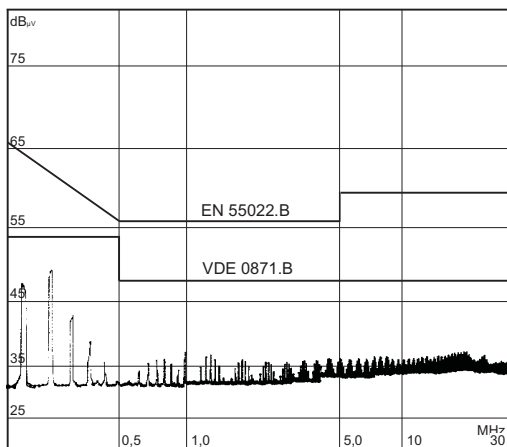
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All electrical parameters (voltages, currents, frequencies, efficiency, ripple, spikes etc.) are 100%-tested at all internal points as well as on all customer interface points. The result is that the modules can guarantee a very high quality level. The choice of components and the manufacturing technology in this series lead to the regulator's especially high functional security.

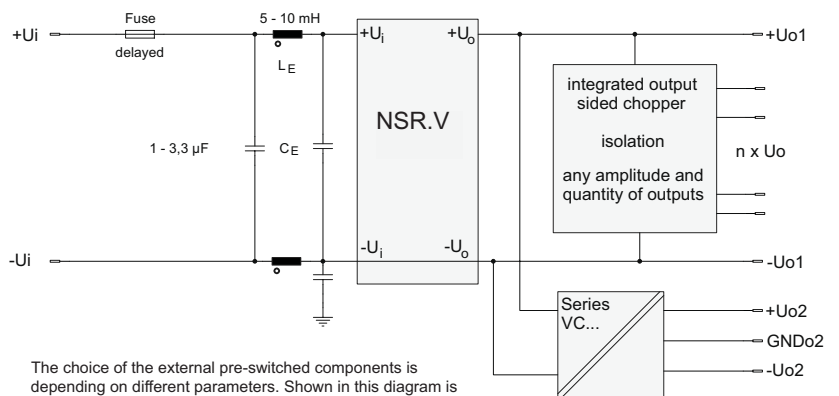
Derating-curve



Measurement of radio interference with pre-filter



application (Noise suppression / multiple outputs)



The choice of the external pre-switched components is depending on different parameters. Shown in this diagram is just a typical application circuit.

A detailed measurement of the radio interference with filter-components chosen by the customer is available on request

Special capacitors and filters are shown in product line M