- **Input range up to > 1:10**
- **U_{in} lower and higher as U_{out}**
- **Security relevant topology**
- **Frontend supply (application)**
- **Low heat development**
- **Very high life time**
- **Suitable for mobile use**
- **100% function test of all parameters**
- **Dyn. and static short circuit protected**

Vehicle applications / Railway technology / Installation technology

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

Series MSR·V

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

Main points:

Output:

- Accuracy absolute ± 1%
- Regulation $\Sigma(U_{in}+I_{out}+T_U)$ <±1,5%
- Ripple <40 mV_{pp} (typ. 20mV_{ss})
- Spikes <60 mV_{pp} (T 1:1/50MHz)
- Regulation time ΔI=50% ≤ 2 ms
- No-load-, static over load- and static short circuit protected
- Short circuit current ≤ 1,2 I_{outmax}
- Parallel operation possible

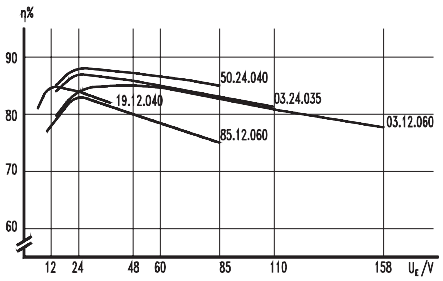
Input:

- No-load power approx. 0,25 Watt
- ON-OFF-Remote (Inhibit)
- Transient adapted
- Very low input capacity
- Low inrush current (<C_E)
- Switch-on current limited / integral

General:

- Easy Noise suppressible (application)
- Ambient temperature -25°C / +70°C,
  Option: -40°C / +85°C (H)
  Derating 2%/°C > 70°C
- Air convection cooled
- Common 0V input - output
- MTBF G_F (40°) > 800000 h
- Plastic housing
- Dimension 40 x 40 x 13 mm³
- Shock/vibration in acc. EN 50155/50121
- No breakthrough of
  U_{in} to U_{out} / U_{out} to U_{in}

Efficiency:



Uin	Uin dyn.	Uout	Iout	Model
V	V	V	A	number
6 - 38	50	5,1	1,20	MSR·V 19·05·120
	50	12	0,40	MSR·V 19·12·040
	50	15	0,40	MSR·V 19·15·040
	50	24	0,30	MSR·V 19·24·030
9 - 85		5,1	1,20	MSR·V 85·05·120
		12	0,60	MSR·V 85·12·060
		15	0,50	MSR·V 85·15·050
		24	0,35	MSR·V 85·24·035
14,4 - 85		12	0,70	MSR·V 50·12·070
		15	0,60	MSR·V 50·15·060
		24	0,40	MSR·V 50·24·040
14,4 - 158		5,1	0,50	MSR·V 03·05·050
		12	0,60	MSR·V 03·12·060
		15	0,50	MSR·V 03·15·050
		24	0,35	MSR·V 03·24·035

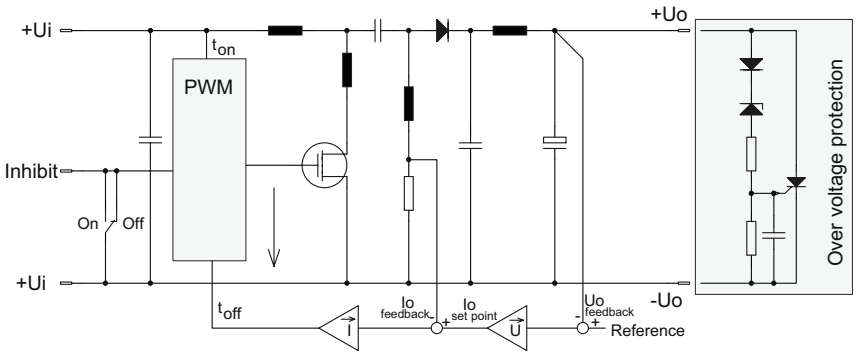
(H) -40°C up to +85°C Additional charge

Modification costs for possible changes above values: on request

1) This converter's input voltage range can be adapted to the surge requirements in acc. to EN61000-4-5 level 3 with corresponding filter circuit on request.

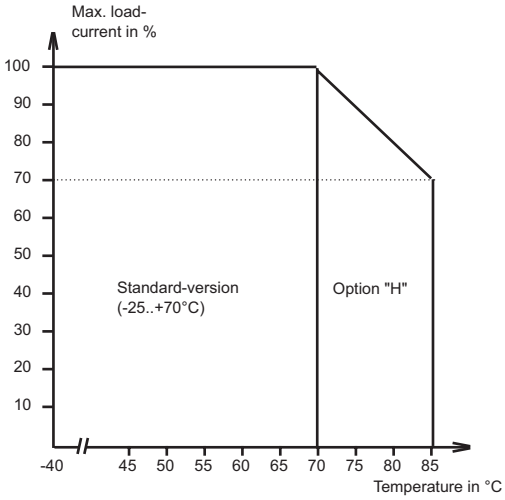
Regenerators of the ***MSR·V*** series are especially designed to regenerate a 12V - 110V industrial DC-network or a on-board DC-network to its nominal value.

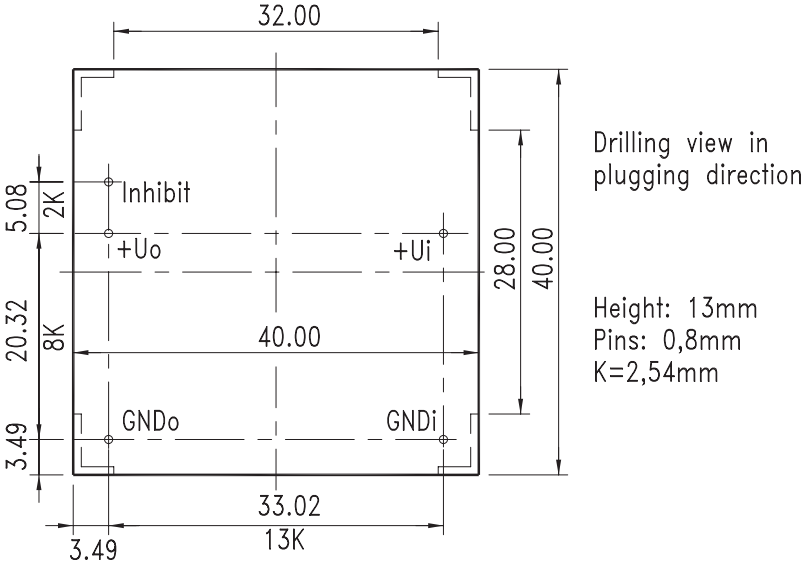
Extreme wide input voltage ranges are processed/regenerated. In compare with the stable and short circuit proof output voltage, this switching regulator works with higher and lower input voltages. Even with the extreme wide input voltage range of >1:10 this converter works with an almost constant efficiency.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



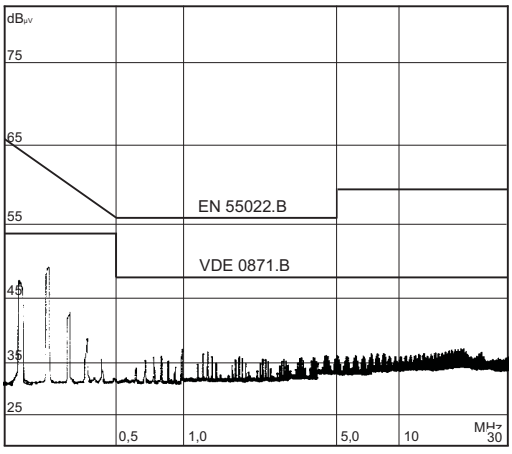
All electrical parameters (voltages, currents, frequencies, efficiency, ripple, spikes etc.) are 100%-tested at all internal points as well as on all customer interface points. The result is that the modules can guarantee a very high quality level. The choice of components and the manufacturing technology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

Derating-curve

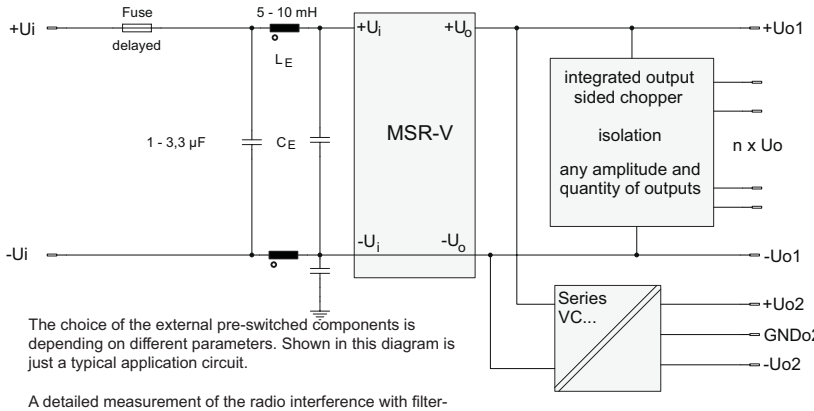




Measurement of radio interference
with pre-filter



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