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DVC953

DC/DC converter

galvanically isolated

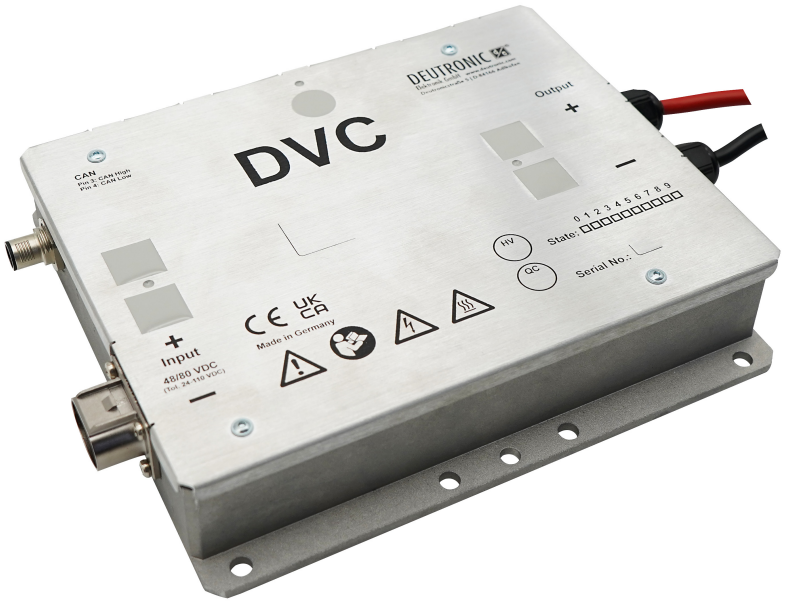

Abbildung ähnlich / device similar to figure

DVC953-derivate table

Type	Input voltage		Output voltage	Output current	Cat. No.
	Nom.	*Tol.*	*Nom.*	*Continuous*	
DVC953-48/80-13,8-CAN	48 / 80 VDC	24 - 110 VDC	13,8 VDC	80 A	105167/x/yyy

*Order option:

.../x/...: Accessory variant
.../0/...without accessory
More on request

.../yyy: Setting (Standard setting or customized)
.../000 DC-Standard CAN 2.0A
.../001 DC-Standard CAN J1939
Customer-specific parameterization on request

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1 Input

Input voltage range	-	see DVC953-derivate table
Undervoltage range	0 - 24 VDC	Class C*
Lower restricted operation range	24 - 34 VDC	Continuous operation, class B*
Unrestricted operation range	34 - 110 VDC	Continuous operation, class A*
Upper restricted operation range	110 - 112 VDC	≤ 5 s, class B*
Overvoltage range	112 - 120 VDC	≤ 100 ms, class B*
Max. current consumption	< 39,5 A	@U_{set} = 16 VDC, I_{max} see fig 10.3
Input capacity	approx. 19 µF	Attention: No inrush current limitation in the device. Provide a pre-charging section in the application, otherwise there is a risk of a over-voltage damage to the input of the DC/DC converter.
No-load current consumption	< 30 mA < 100 mA	device in standby mode device in Buck-mode see fig. 10.1
No-load input power	< 1,6 W < 3,8 W	device in standby mode device in Buck-mode see fig. 10.2

* Evaluation criteria for the operation behavior

The following evaluation criteria describe the functional state of the DC/DC converter as a function of the operation input voltage.

Class A	Unrestricted operation range	The DC/DC converter operates as designed in compliance with the tolerances specified in the data sheet.
Class B	Lower and upper restricted operation range	One or more functions may go beyond the specified tolerance. After returning to the unrestricted operation range, the DC/DC converter operates again as designed.
Class C	Undervoltage and overvoltage range	One or more functions do not work as intended. After returning to the unrestricted operation range, the DC/DC converter operates again as designed.

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2 Output

Nominal output voltage U_{nom}	13,8 VDC	see DVC953-derivate table
Output voltage range U_{set}	2 - 16 VDC	for an set value below 10,5 VDC see also chapter 8
Initial accuracy $N_{initial}$	+0,2% / -0,8% U_{nom}	includes adjust accuracy and component tolerances
Input regulation tolerance N_{input}	±0,6% U_{nom}	-
Load regulation tolerance N_{load}	+0,8% / -0,5% U_{nom}	-
Overall tolerance $N_{overall}$ (0-20Hz)	+1,6% / -1,9% U_{nom}	$N_{overall} = N_{initial} + N_{input} + N_{load}$ Value represents worst case scenario for a bandwidth from 0 Hz up to 20 Hz.
Ripple & Noise N_{RN}	< ±3% U_{nom}	U_{RN} < 828 mVpp Measurement bandwidth 20 MHz
Overall tolerance $N_{overall}$ (0-20MHz)	+4,6% / -4,9% U_{nom}	$N_{overall} = N_{initial} + N_{input} + N_{load} + N_{RN}$ Value represents worst case scenario for a bandwidth from 0 Hz up to 20 MHz.
Ambient temperature tolerance N_{temp}	+2% / -1,5% U_{nom}	-
Max. continuous output current I_{max}	80 A	-
Max. continuous output power P_{max}	< 1280 W	@U_{set} = 16 VDC
Current limiting	< I_{max} + 10 %	From 1.0 x I_{max} U_{out} can drop

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3 Environment

Working temperature (environment)	-20°C ... +75°C	-
Max. permissible temperature of the mounting surface	< +45°C	-
Overtemperature protection	+90°C (internal)	Automatic switch-off in case of overtemperature. Automatic turn on after 5°C hysteresis, see also chapter 8
Storage temperature	-40°C ... +85°C	-
Humidity	< 95%	-
Dewing	allowed	-
Shock test acc. to DIN EN 60068-2-27	-	half sinusoidal (excitation) 250m/s^2 (peak acceleration) 6ms (duration) 3.000 shocks to each axis (quantity) ±X, ±Y, ±Z (axis)
Vibration test acc. to DIN EN 60068-2-6	-	sinusoidal (excitation) 30m/s^2 (acceleration) 10 - 500Hz (frequency, floating) 2h per axis (duration), 1 Oct/min X, Y, Z (axis)
Degree of protection acc. to EN60529	IP67	Limited by connection technology

4 General data

Insulation strength	1 kVDC 1 kVDC 1kVDC 500VDC	Input / Enclosure Input / Output Input / CAN Output / Enclosure
Max. efficiency	< 94,5%	see fig. 10.4
Average efficiency	< 93%	Averaging of the efficiency values at 25%, 50%, 75% and 100% of the nominal output power. See fig. 10.5
Dimensions	214 x 189 x 42,7 mm	without connections, see fig. 9.1
Enclosure	Aluminium	-
Weight	approx. 4,5 kg	-

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5 Standards

EMC (Electromagnetic Compatibility)

Title	Standard	Data
Emitted interference	EN12895 EN61204-3	- according to 6.4.2, table H.3, for industrial environment (class A, cable length < 3 m)
Immunity	EN12895 EN61204-3	- according to 7.2.3: Immunity level for industrial environment (cable length < 3 m)

Electrical safety

Title	Standard	Data
Low-voltage switch mode power supplies - Safety requirements	DIN EN 61204-7	-
Safety of industrial trucks - Electrical requirements	designed according to DIN EN 1175*	-

* The system integrator is responsible for compliance of all product-specific requirements in the final application.

6 Installation and safety instructions

In addition to the general installation and safety instructions for DC/DC converters, the following values and supplements apply:

Mounting points	-	Mounting over 4x M6 threads Tightening torque: 6 Nm see fig. 9.1
Installation orientation	-	any
Connection input / output	-	see chapter 7
Input fuse	-	No integrated input fuse. A fuse must be provided externally by the customer application.
Reverse polarity protection	-	No reverse polarity protection at the input or output of the device. If the polarity at the input is reversed, the upstream input fuse trips.
Precharge section	-	Attention: No inrush current limitation in the device. Provide precharge section in the application.

The general installation and safety instructions for DC/DC converters can be found at: www.deutronic.com

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7 Connections

Input

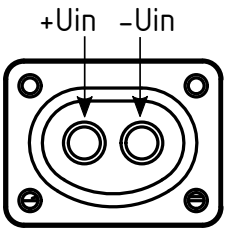

Figure 7.1: Pin assignment input

AMPHENOL, PL082X-61-6:

- 2 pole connector
- Matching mating connector: AMPHENOL, PL182X-61-6
- cable cross section: 6 mm²

Output

Cables with lugs

- 2 integrated cables with cable lug
- cable cross section: 16 mm²

+Uout red, length: 1000 mm, ends with M8 not isolated cable lug

-Uout black, length: 1000 mm, ends with M10 not isolated cable lug

Signal (CAN)

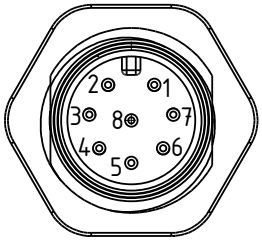

Figure 7.2: Pin assignment signal (CAN)

AMPHENOL, M12A-08PMMR-SF7003:

- 8 pin connector
- Matching mating connector: PHOENIX CONTACT, SACC-DSI-M12MS-8CON-M16

PIN 1: n.C.
PIN 2: n.C.
PIN 3: CAN High
PIN 4: CAN Low
PIN 5: n.C.
PIN 6: n.C.
PIN 7: n.C.
PIN 8: n.C.

Between Pin 3 (CAN High) and Pin 4 (CAN Low), a CAN bus termination is externally needed.

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8 Operating condition

Following errors and warnings are also transmitted via CAN (J1939)

operating condition	operating status		threshold value	unit	note
	error (device off)	warning (power derating possible)			
input voltage above maximum threshold value		X	110	V	hysteresis at 100 V
input voltage below minimum threshold value	X		21	V	no hysteresis
output voltage above maximum threshold value		X	16	V	no set point greater than 16V accepted; external voltage greater than 16V triggers warning
output voltage below minimum threshold value		X	10,5	V	
output current equal to or greater than maximum threshold value		X	80	A	
internal converter temperature above warning level, but below maximum threshold value		X	85	°C	
internal converter temperature above maximum threshold value	X		90	°C	hysteresis at 85°C

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9 Dimensions

All dimensions are given in millimeters and have a general tolerance according to DIN ISO 2768 - m.

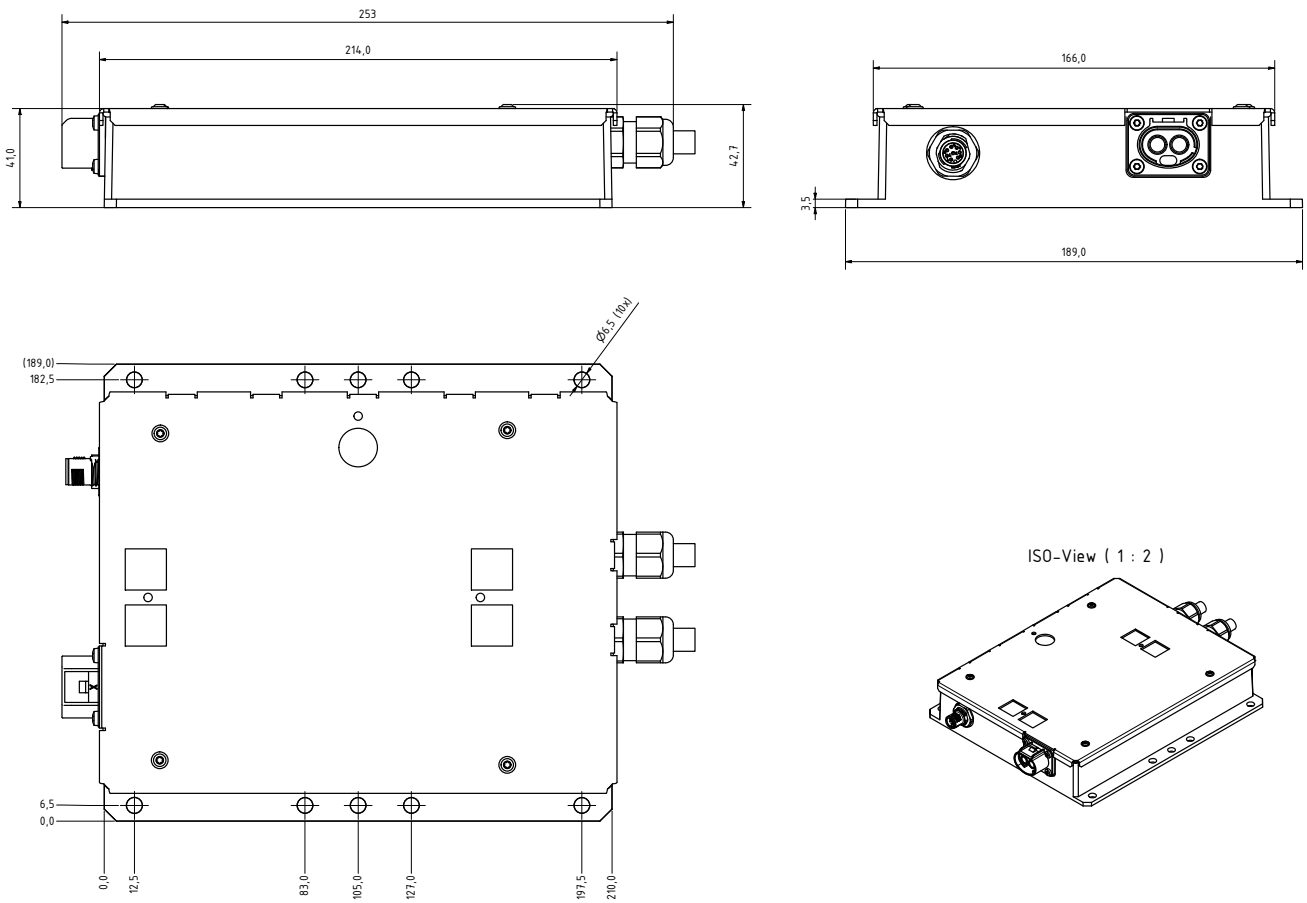

Figure 9.1: Dimensions

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10 Characteristics

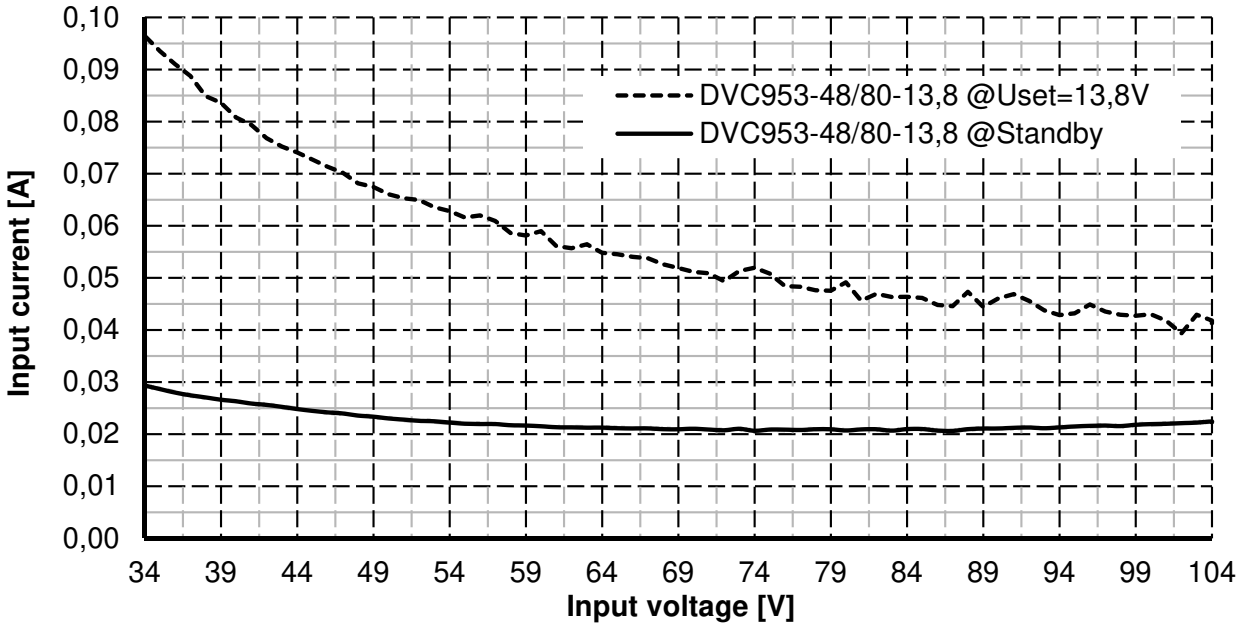

Figure 10.1: No-load current consumption

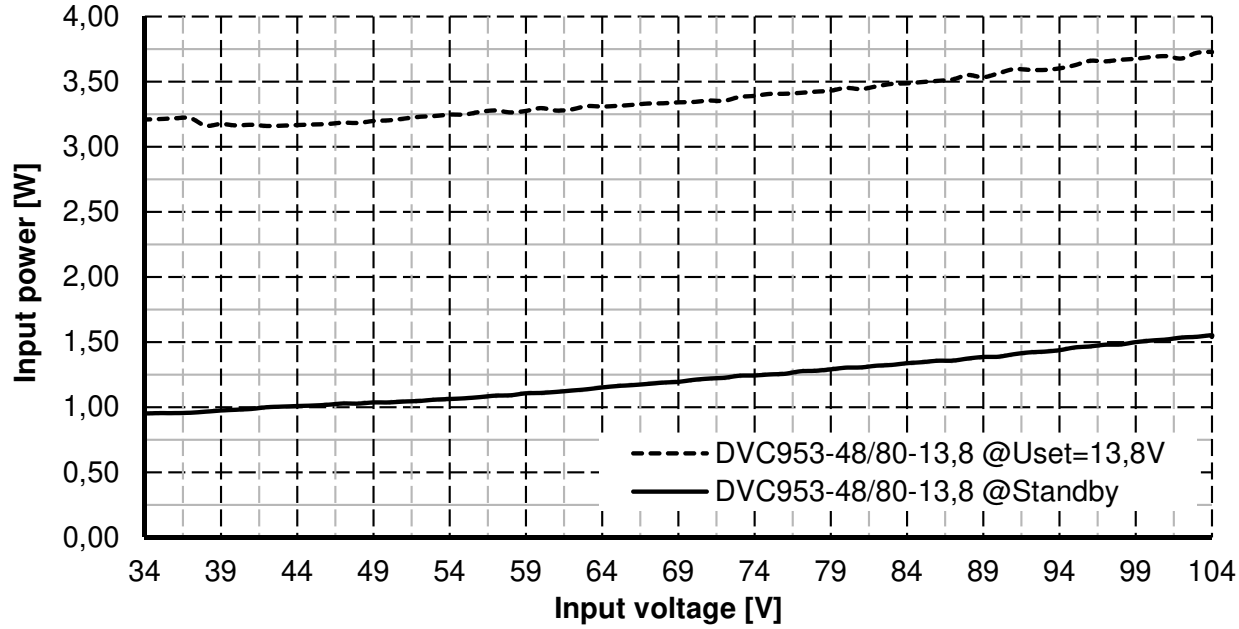

Figure 10.2: No-load input power

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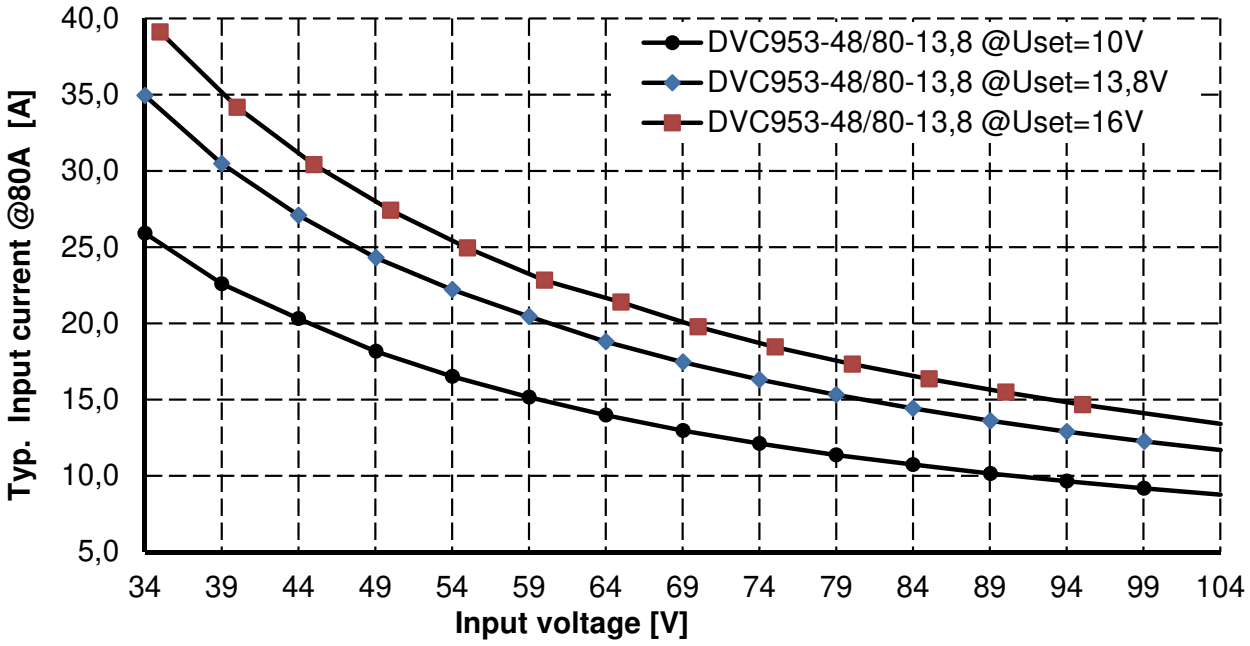

Figure 10.3: current consumption at maximum output current

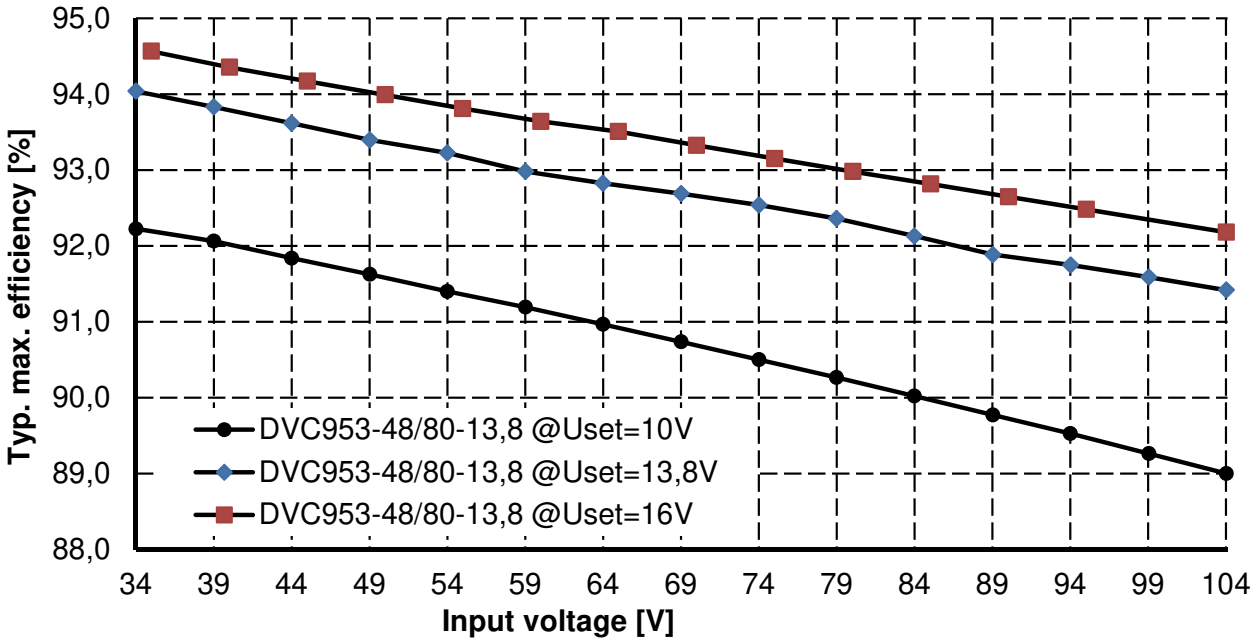

Figure 10.4: Maximum efficiency depending on input voltage

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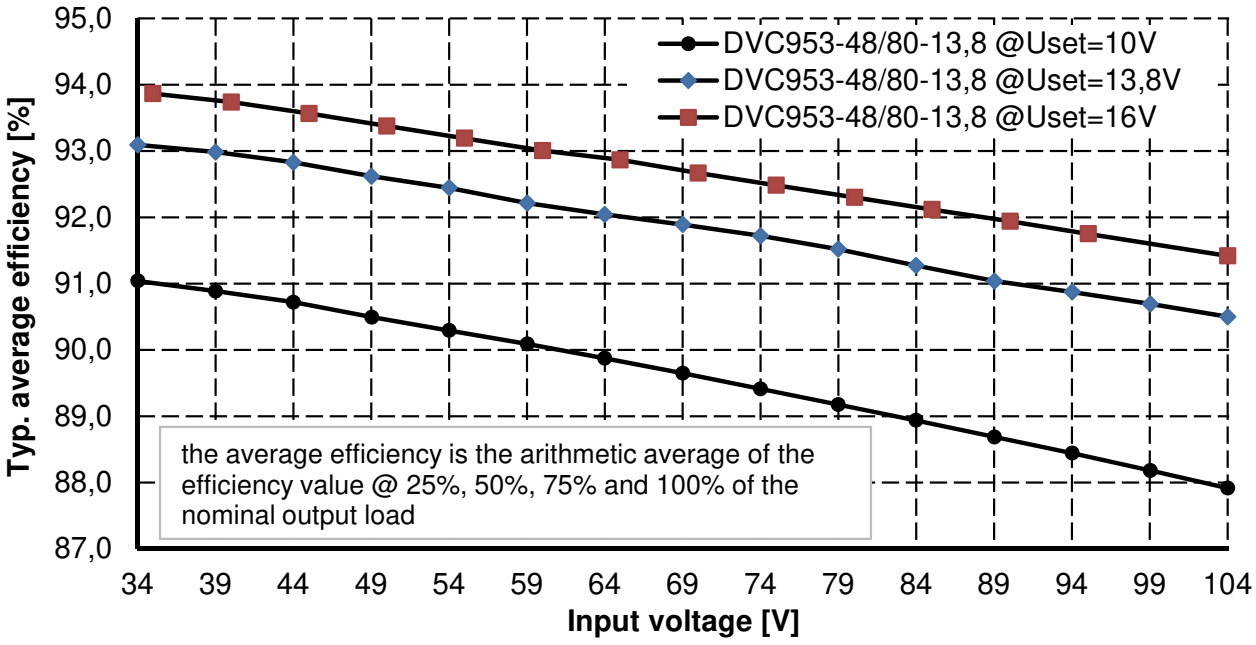

Figure 10.5: Average efficiency depending on input voltage