

# DC/DC Converter

100 W

100 SBB 110 M24 □□□

$V_{I\text{ nom}} = 72\text{ V}$      $V_{O\text{ nom}} = 24\text{ V}$      $I_{O\text{ nom}} = 4.25\text{ A}$   
 $V_{I\text{ nom}} = 110\text{ V}$

SYMBOL	PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNITS
<b>Input</b>						
$V_I$	Input voltage range	Continuously	50.4		137.5	$V_{DC}$
	Input voltage range dynamic	$V_I = 43.2\text{ V} \dots 50.4\text{ V}$ for $t \leq 0.1\text{ s}$ $V_I = 137.5\text{ V} \dots 154\text{ V}$ for $t \leq 1\text{ s}$	43.2		154	$V_{DC}$
$V_{I\text{ min}}$	Converter shutdown				43	$V_{DC}$
$V_{I\text{ max}}$	Converter shutdown		156		158	$V_{DC}$
$V_{\text{Enable}}$	Enable Function, PIN d22 Reference potential: $-V_I$	Converter on: Enable = low $V_{\text{Enable}} \leq 0.8\text{ V}$ , $I \leq 1.5\text{ mA}$ Converter off: Enable = high $V_{\text{Enable}} \geq 3.0\text{ V}$ , $I \leq -50\text{ }\mu\text{A}^*$	0		0.8	V
	Stand by current	$43.2\text{ V} \leq V_I \leq 154\text{ V}$ , Enable = high			18	mA
$I_I$	Input current	No load $V_I = 154\text{ V}$ , $I_O = 0\text{ A}$ Nominal load $V_I = 72\text{ V}$ , $I_O = 4.25\text{ A}$ Nominal load $V_I = 110\text{ V}$ , $I_O = 4.25\text{ A}$ Nominal load $V_I = 43.2\text{ V}$ , $I_O = 4.25\text{ A}$		1.6 1.1	70	mA A A A
	Input current integral	$V_I = 154\text{ V}$			5	$\text{A}^2\text{s}$
$I_{I\text{ max}}$	Max. input switch on current $V_I \geq V_{I\text{ min}}$ , $V_{\text{Enable}} \rightarrow \leq 0.8\text{ V}$	$I_O = 4.25\text{ A}$ $\Delta t \leq 100\text{ ms}$			6	A
	Input fuse		10 A Pico Fuse			
$C_I$	Converter input capacitance				25	$\mu\text{F}$
	External line inductance				50	$\mu\text{H}$
	Reverse input protection	Parallel diode + fuse	1.5KE160A			

## OUTPUT: Power unit

$P_{O\text{ nom}}$	Output power	$43.2\text{ V} \leq V_I \leq 154\text{ V}$		100		W
$V_{O\text{ nom}}$	Output voltage adjustment, factory set	$50.4\text{ V} \leq V_I \leq 137.5\text{ V}$	+ 23.9	+ 24.0	+ 24.2	V
$\Delta V_O$	Load regulation	$43.2\text{ V} \leq V_I \leq 154\text{ V}$ $0\text{ A} \leq I_O \leq 4.25\text{ A}$ $T_A = -40^\circ\text{C} \dots +85^\circ\text{C}$	$\pm 2.5\% V_{O\text{ nom}}$			V
$\Delta V_{O\text{ dyn}}$	Load regulation dynamic	$43.2\text{ V} \leq V_I \leq 154\text{ V}$ Puls load: 20 - 80 - 20 % x $I_{O\text{ nom}}$			$\pm 250$	mV
$t_{\text{dyn}}$	Response time	$43.2\text{ V} \leq V_I \leq 154\text{ V}$ Puls load: 20 - 80 - 20 % x $I_{O\text{ nom}}$		1	2	ms
$V_{O\text{ rms}}$	Ripple	$43.2\text{ V} \leq V_I \leq 154\text{ V}$ Nominal load BW 300 kHz		100	250	mV
$V_{O\text{ pp}}$	Noise	$43.2\text{ V} \leq V_I \leq 154\text{ V}$ Nominal load BW 20 MHz			350	mV
$t_{\text{on}}$	Turn on time $V_O$	$50.4\text{ V} \leq V_I \leq 154\text{ V}$ , $0\text{ A} \leq I_O \leq 4.25\text{ A}$ Resistive load 1.) $V_I \geq V_{I\text{ min}}$ , $V_{\text{Enable}} \rightarrow \leq 0.8\text{ V}$ 2.) $V_{\text{Enable}} \leq 0.8\text{ V}$ , $V_I \rightarrow \geq V_{I\text{ min}}$	25		200	ms
$t_h$	Option: Hold up time	$50.4\text{ V} \leq V_I \leq 154\text{ V}$ $0\text{ A} \leq I_O \leq 4.25\text{ A}$ Class S2 @ EN 50155	10			ms
	Overvoltage shutdown $V_O$	$43.2\text{ V} \leq V_I \leq 154\text{ V}$ $0\text{ A} \leq I_O \leq 4.25\text{ A}$	Converter off: $V_O \leq 32\text{ V}$			
$I_O$	Output current	$43.2\text{ V} \leq V_I \leq 154\text{ V}$		4.25		A
	Output current limitation	$43.2\text{ V} \leq V_I \leq 154\text{ V}$	4.3			A
	Output short circuit current	Short circuit between $+V_O$ and $-V_O$ $43.2\text{ V} \leq V_I \leq 154\text{ V}$			5.0	A
	Sense lines	Max. voltage drop compensation			0.25	V
$C_O$	Output capacity converter	Output stage		10		mF

## OUTPUT: Signals

PF	Power Fail, PIN z20 Open Collector Transistor $V_{CE\text{ max}} \leq 70\text{ V}$ , $I_{CE\text{ max}} \leq -20\text{ mA}^*$ Reference potential: - Sense	Transistor on: PF= low, $V_O < V_{O\text{ min}}$ Transistor off: PF= high, $V_O \geq V_{O\text{ min}}$  Signal defined for $V_O \geq 0.6 \times V_{O\text{ nom}}$	$V_O < 0.95 \times V_{O\text{ nom}} \pm 2\%$ $V_O \geq 0.95 \times V_{O\text{ nom}} \pm 2\%$		V V
	Signals	$V_O > 22.80\text{ V} \pm 2\%$	LED yellow on		

## GENERAL SPECIFICATIONS

f	Switching frequency	$V_I = 110\text{ V}$ , $I_O = 4.25\text{ A}$		75		kHz
$\eta$	Efficiency	$P_O \geq 0.7 \times P_{O\text{ nom}}$	86	88		%
	MTBF (SN 29500)	$V_I = 110\text{ V}$ , $I_O = 4.25\text{ A}$ , $T_A = +40^\circ\text{C}$		500 000		h
	No load, short circuit proof		Continuously			

\* - Sign: sink current

100 SBB 110 M24□□□

SYMBOL	PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNITS
--------	-----------	-----------------	-----	-----	-----	-------

**SAFETY / DIMENSIONS**

	Creepage, Clearance PD2 PCB: FR4, V0	Input – output Input – case Output – case	2.0 2.0 1.0			mm mm mm
	Converter dielectric strength test every unit for 1 minute	Input – output Input – case Output – case			2100 2100 750	V <sub>DC</sub> V <sub>DC</sub> V <sub>DC</sub>
	Connectors DIN 41612	H15, Pin 24 leading				
	Pin assignment			see table		
	Protection class, protection system			I, IP 20		
	Dimensions w x h x d see figure	Plug - in unit incl. front panel Wall mounting, Din rail mounting TS35	61 x 128.4 x 160 (12 T / 3 U) 217 x 104 x 71			mm mm
	Weight	Plug - in unit incl. front panel Wall mounting, Din rail mounting TS35		0.95 1.5		kg kg

**ENVIROMENTAL CONDITIONS**

T <sub>A</sub>	Operating temperature range	EN 50155 Class: Tx	- 40		+ 85	°C
T <sub>Storage</sub>	Storage temperature range		- 50		+ 100	°C
	Cooling		Free air convection			
	Humidity	EN 50155, IEC 60571	75% averaged year, 95% 30 days			
	Vibration / shock	IEC 61373, IEC 68-2-27, BN 411002 Cat. I 3 shocks per axes	50 m / s <sup>2</sup> , 30 ms			

**EMC**

	Emission	Line conducted and radiated	EN 50121 - 3 - 2: 2006			
	Immunity	ESD EN 61000 - 4 - 2	6 kV / 8 kV Performance criteria - B -			
		High frequency field EN 61000 - 4 - 3	20 V / m 80 MHz ... 1 GHz Performance criteria - A -			
		Burst EN 61000 - 4 - 4	Level 3 asym., sym. Performance criteria - A -			
		Surge EN 61000 - 4 - 5	2 kV asym. / 1 kV sym. R <sub>i</sub> = 42 Ω Performance criteria - B -			
		HF – Current injection EN 61000 - 4 - 6	10 V <sub>eff</sub> , R <sub>i</sub> = 150 Ω Performance criteria - A -			

**STANDARDS**

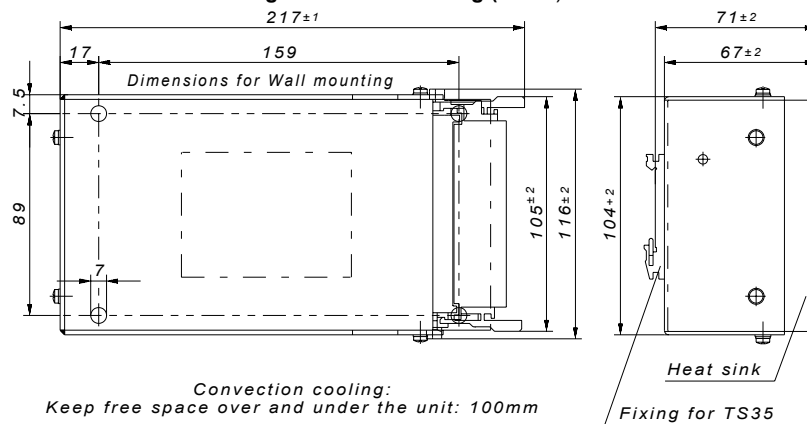
Applied Standards:	EN 50155: 2007	BN 411 002	EN 50124 - 1: 2006	EN 50121 - 3 - 2: 2006	IEC 60571
	SN 29 500	prEN 50 121 - 1	prEN 50125 - 1	EN 60068 - 2 - 6, 2...27	EN 61000 - 4 - 2...6
	IEC 571	IEC 61373	EN 60721 - 3 - 5	EN 61373	EN 60529

Technical specifications valid for: - 40° C ≤ T<sub>A</sub> ≤ + 85° C, 50.4 V ≤ V<sub>I</sub> ≤ 137.5 V, unless otherwise noted.

**H15 – Pin Assignment**

Pin	
z 4	+ V <sub>o</sub>
d 6	+ V <sub>o</sub>
z 8	- V <sub>o</sub>
d 10	- V <sub>o</sub>
z 12	n. c.
d 14	n. c.
z 16	+ Sense
d 18	- Sense
z 20	Power Fail
d 22	Enable
z 24	PE
d 26	+ V <sub>I</sub>
z 28	+ V <sub>I</sub>
d 30	- V <sub>I</sub>
z 32	- V <sub>I</sub>

**Dimensions Wall mounting or Din rail mounting (in mm)**



Order code: 100 SBB 110 M24 □□□ select

- x = individual customised front panel
- 0 = without Hold up time
- 1 = Hold up time (10 ms)
- E = Plug - in unit
- W = Wall mounting
- H = Din rail mounting TS35