

100 DDB 110 M24 W □ □

$V_{In, nom} = 72 V, 110 V$      $V_{Onom} = 24 V$      $I_o = 4.25 A$

SYMBOL	PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>INPUT</b>						
$V_{In}$	Operating input voltage range	continuously	50.4		137.5	$V_{DC}$
$V_{In}$		Dynamic $t \leq 0.1s$ $t \leq 1.0s$	43.2 137.5		50.4 154	$V_{DC}$ $V_{DC}$
$V_{In min}$	Converter ON	$0 A \leq I_o \leq 4.25 A$	46.0		50.0	$V_{DC}$
$V_{In min}$	Converter OFF	$0 A \leq I_o \leq 4.25 A$	38.0	41	43.0	$V_{DC}$
$V_{In max}$	Converter OFF	$0 A \leq I_o \leq 4.25 A$	154.5		160	$V_{DC}$
$V_{Enable}$	Enable Function Reference potential: $-V_{In}$	converter ON: EN = High (V at Pin 7) converter OFF: EN = Low (V at Pin 7)	43.2 0		154.0 6	$V_{DC}$ $V_{DC}$
	Stand by current	$43.2 V \leq V_{In} \leq 154.0 V$ , Enable = Low			3.0	mA
$I_{In}$	Input current: no load at the output Nominal load Nominal load Nominal load @ $V_{In, min}$	$V_{In} = 154 V$ , $I_o = 0 A$ $V_{In} = 110 V$ , $I_o = 4.25 A$ $V_{In} = 72 V$ , $I_o = 4.25 A$ $V_{In} = 43.2 V$ , $I_o = 4.25 A$		25 1.0 1.5 2.6	40   3.0	mA A A A
	Inrush current	$V_{In} = 154 V$			10	A <sup>2</sup> s
$I_{In max}$	Max. input current	$V_{In} = 50.4V \dots 154 V$ , $I_o = 4.25 A$ $\Delta t \leq 250 ms$			8	A
	Input fuse	Internal: yes		10 AF		
$C_{In}$	Input capacity			20	30	$\mu F$
	Max. allowed external line inductance				50	$\mu H$
	Input reverse protection	yes, MOSFET in minus $V_{In}$ line		- 154.0		$V_{DC}$
	Input transient protection	Varistor + Transil diode		S20K115, 1.5KE150CA		

<b>OUTPUT: Power Stage</b>		$43.2 V \leq V_{In} \leq 154.0 V$				
$P_o$	Output power	$T_A = -40^\circ C \dots +70^\circ C$		100		W
$V_{O nom}$	Output voltage: factory adjust		23.9	24.0	24.2	$V_{DC}$
$\Delta V_o$	Output voltage regulation TL 431 @ $\Delta T$ , t (aging)	$0 A \leq I_o \leq 4.25 A$ $T_A = -40^\circ C \dots +70^\circ C$ $T_A = +70^\circ C \dots +85^\circ C$	$\leq 2.5 \% \text{ von } V_{O nom}$ $\leq 3.0 \% \text{ von } V_{O nom}$			
$\Delta V_{A dyn}$	Load regulation dynamic	Load: 20 - 80 - 20 % x $I_{O nom}$		100	250	mV
$t_{dyn}$	Response time	Load: 20 - 80 - 20 % x $I_{O nom}$		1	3	ms
$V_{O rms}$	Ripple voltage	Nominal load BW 300 kHz		100	250	mV <sub>rms</sub>
$V_{O ss}$	Spikes	Nominal load BW 20 MHz			350	mV <sub>pp</sub>
$t_{On}$	Switch ON time $V_o$	$50.4 V \leq V_{In} \leq 137.5 V$ $0 A \leq I_o \leq 4.25 A$ Resistive load	20		200	ms
$t_s$	Hold up time @ $P_o = 100 W$ Recovery time: $t \leq 5 s$ , @ $0.5 A \leq I_o \leq 6.25 A$ (minimum load)	$0 A \leq I_o \leq 4.25 A$ class S2 @ EN 50155	10			ms
	Overvoltage switch OFF $V_{O, max}$	$0 A \leq I_o \leq 4.25 A$		converter OFF: $V_o \leq 33.2 V$		V
$I_o$	Output current	$T_A = -40^\circ C \dots +70^\circ C$ no derating,	4.25	4.3		A
	Threshold value current limitation	$T_A = -40^\circ C \dots +85^\circ C$	4.5		4.8	A
	Short circuit current VI - characteristic	Short circuit current betw. $+V_o / -V_o$	4.5		7.0	A
$C_A$	Internal capacity			8		mF
	Max. allowed external capacity	On request			100	mF

<b>SIGNALING</b>				
PF	Power Fail Open Collector Transistor $U_{CEmax} \leq 70 V$ , $I_{CEmax} \leq -20mA$ Reference: $-U_A$	Transistor ON: PF = Low, $V_o < V_{O min}$ Transistor OFF: PF = High, $V_o \geq V_{O min}$	$V_o < 0.95 \times V_{O nom} \pm 3 \%$ $V_o \geq 0.95 \times V_{O nom} \pm 3 \%$	$V_{DC}$ $V_{DC}$
	Displayed signals	Signal defined for $V_o \geq 0.6 \times V_{O nom}$ input: $43.2 V \leq V_{In} \leq 154.0 V$ output: $22.8 V \leq V_o \leq 25.2 V$	LED yellow LED yellow	

<b>COMMON DATA</b>						
f	Switching frequency	$V_{In} = 110 V$ , $I_o = 4.25 A$		125		kHz
$\eta$	Efficiency	$P_A \geq 0,7 \times P_{A nenn}$	87	91		%
	MTBF (SN 29500)	$V_{In} = 110 V$ , $I_o = 4.25 A$ , $T_A = +40^\circ C$		500 000		h
	No load- & short circuit proofed	Continuously		yes		

\*ENABLE (EN) High:  $0 \leq I_{EN} \leq 1 mA$   
(EN) Low:  $0 \leq I_{EN} \leq 5 mA$

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<b>SAFETY / DIMENSIONS</b>						
	Clearance - and creepage distances for PD2, OV2 *) PCB FR4, V0, T <sub>G</sub> = + 140°C (+150°C on request), IPC 6012E class 3	input   output input   housing output   housing	2.0 2.0 2.0			mm mm mm
	Isolation voltage Unit test: rampe function 2s - 3s - 2s Type test: 1 Minute	input   output input   housing output   housing			2'100 1'500 750	V <sub>DC</sub> V <sub>DC</sub> V <sub>DC</sub>
	Isolation resistance	input   output	30			MΩ
	Connector	input , output: 11 Pins necessary counter connector	MSTBT 2,5/11-STF-5,08 MSTB 2,5/11-STF-5,08			
	Protection degree, - class	SE M4 Al – Metal housing	I, IP 30			
	Dimensions	B x H x T incl. Mounting plate	172 x 165 x 56			mm
	Mounting	Wall mounting with screws	6 x M4			
	Weight			1100		g

### AMBIENT CONDITIONS

T <sub>A</sub>	Operating temperature range	EN 50155 class Tx 10 min. (Option: continuous)	- 40 + 70		+ 70 + 85	°C °C
T <sub>Store</sub>	Storage temperature range		- 40		+ 85	°C
	Cooling		Free convection			
	Humidity	EN 50155, IEC 60571	75% averaged per year, 95% 30 days			
	Vibration / Shock	IEC 61373, IEC 68-2-27 Kat. I: 3 Shocks each Axis	50 m / s <sup>2</sup> , 30 ms			

### EMC

	Emission	Line referenced and radiated	EN 50121 - 3 - 2: 2006			
	Immunity	ESD EN 61000 - 4 - 2	6 kV / 8 kV Performance criteria - B -			
		High frequency HF-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 - A -			
		HF – current injection EN 61000 - 4 - 6	10 V <sub>eff</sub> , R <sub>i</sub> = 150 Ω Performance criteria - A -			

### STANDARDS

	referenced standards:	EN 50155: 2008	EN 60529	EN 50124 - 1: 2006	EN 50121 - 3 - 2: 2006	IEC 60571
		SN 29500	EN 50121 - 1	EN 50125 - 1	EN 60068 - 2 - 6, 2...27	EN 61000 - 4 - 2...6
		IEC 571	IEC 61373: 1999	EN 60721 - 3 - 5	EN 61373 : 1999	

Technical data valid for: - 40° C ≤ T<sub>A</sub> ≤ + 70° C, 50.4 V ≤ V<sub>in</sub> ≤ 137.5 V, if not otherwise specified.

\*) coordination acc. DIN EN 61010-1 Basisisol. \*\*) HF Feld: 80MHz – 1GHz 20V/m, 1400 MHz – 2100MHz 10V/m 2100MHz – 2500MHz 5V/m

### Pinning

Pin		recommended wire gauge
11	+ V <sub>in</sub>	1.5 mm <sup>2</sup>
10	- V <sub>in</sub>	1.5 mm <sup>2</sup>
9	+ V <sub>in</sub>	1.5 mm <sup>2</sup>
8	- V <sub>in</sub>	1.5 mm <sup>2</sup>
7	ENABLE	1.0 mm <sup>2</sup>
6	N.B.	Not connected
5	Power Fail	1.0mm <sup>2</sup>
4	- V <sub>O</sub>	2.5 mm <sup>2</sup>
3	+ V <sub>O</sub>	2.5 mm <sup>2</sup>
2	- V <sub>O</sub>	2.5 mm <sup>2</sup>
1	+ V <sub>O</sub>	2.5 mm <sup>2</sup>

SE: ≥ 4.0mm<sup>2</sup> connected with housing  
Necessary distance for free air convection below converter unit: ≥ 25 mm.  
Recommendation: for optimal heating transfer take care for good thermal contact between converter mounting plate and external wall or!

### Order key:

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W = Wall mounting

0 0 = cl. S1 0ms

0 1 = cl. S1 and external connector

1 0 = cl. S2 10ms

1 1 = cl. S2 and external connector

IP 20

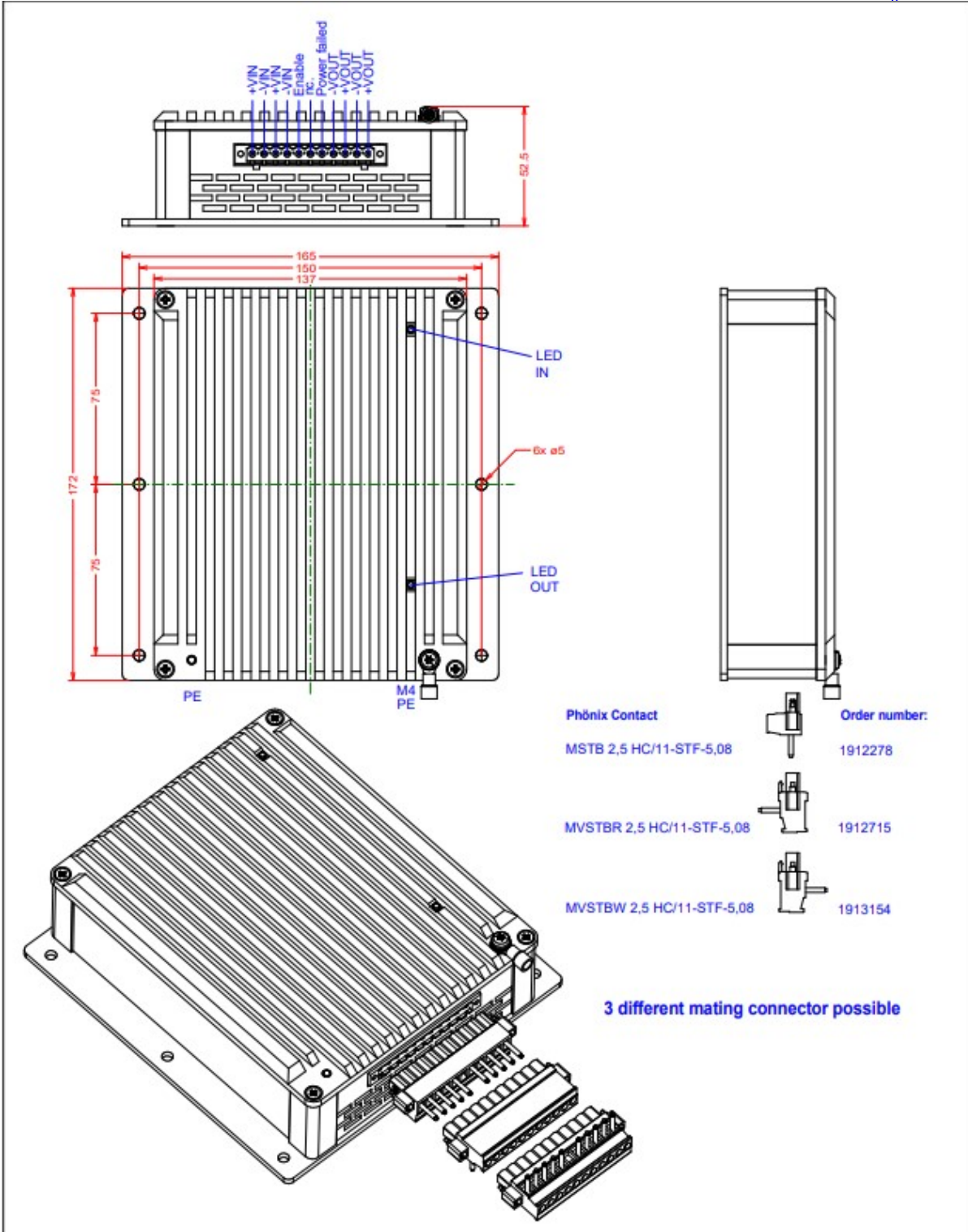
2 converters may be switched in parallel at output side for increasing output power. No exact symmetrical power distribution. No internal decoupling diode implemented.



Isolation testing with DC voltage,  
AC test voltage on request 2,1kVeff I/O. We recommend reducing voltage to values < 80% by repeating test procedure.

# DC/DC Converter

100 W

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Schutzvermerk nach DIN 34	Maßstab	Gewicht	Oberfläche	Werkstoff	Freimaßtoleranz DIN 2768m 
			Datum Name	Bezeichnung <b>100 DDB 110 M24 Mechanical Drawing</b>	
			Bearb. 05.08.14 Feuring		
			Gepr. - -		
			Norm - -	Artikelnummer <b>1304-02</b>	
Z02 Einzelzeichnung 15.04.19 Le.				Blatt 1	
Z01 Höhe reduziert 18.12.14 Feuring				Blätter 1	
Zust. Änderung Datum Name				Ers. für:	