

# DC/DC Converter

50 Watt

## 50 BSB 110 T05 E01

$V_{IN} = 110 V_{DC}$      $V_{Out1} = 5V, I_{Out1} = 6.0 A$      $V_{Out2} = +15V, I_{Out2} = 0.7A$      $V_{Out3} = -15V, I_{Out3} = 0.7A$

SYMBOL	PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>INPUT</b>						
$V_{IN}$	Input voltage range	Continuously	77		137,5	$V_{DC}$
	Input voltage range dynamic	$66.0V \leq V_{IN} \leq 77 V \quad t \leq 0,1 s$ $137.5V \leq V_{IN} \leq 154V \quad t \leq 1 s$	66 137.5		77 154	$V_{DC}$ $V_{DC}$
$V_{IN \min}$	Converter Shut down		60		65	$V_{DC}$
$V_{IN \max}$	Converter Shut down		155		165	$V_{DC}$
$I_{IN}$	Input current	no load at output Nominal load at output Nominal load at output	25	0.55	75	mA A A
	Input current integral	$V_{IN} = 154 V_{DC}$			8	$A^2s$
	Input fuse			2 AF		
$C_E$	Input capacitance			15		$\mu F$
	Max. allowed input line inductivity				50	$\mu H$
	Reverse protection	fuse + transil diode			50 BZW 50 - 150	

### OUTPUT: power Unit

$66 V \leq V_{IN} \leq 154 V$

$P_{Out \text{ Nom}}$	Output power continuously	$\sum P_{Out}$		50		W
$V_{Out 1}$	Factory adjust output voltage		5.0	5.1	5.2	$V_{DC}$
$\Delta V_{Out1}$	Regulation accuracy $V_{O1}$ static	$0 W \leq P_{O1} \leq 30 W$		$\leq 2,5 \% V_{O1 \text{ Nom}}$		
$V_{Out 2}$	Factory adjust output voltage		+ 14,9	+ 15.0	+ 15.1	$V_{DC}$
$\Delta V_{Out}$	Regulation accuracy $V_{O2}$ static	$0 W \leq P_{O2} \leq 10.5 W$		$\leq 2,5 \% V_{O2 \text{ Nom}}$		
$V_{Out 3}$	Factory adjust output voltage		- 14,9	- 15.0	- 15.1	$V_{DC}$
$\Delta V_{out}$	Regulation accuracy $V_{O3}$ static	$0 W \leq P_{O3} \leq 10.5 W$		$\leq 2,5 \% V_{O3 \text{ Nom}}$		
$V_{outi \text{ rms}}$	Ripple & noise	$U_{A1 - A3}$ : Nominal load BW 300 kHz			200	mV
$V_{outi \text{ pp}}$	Spikes	$U_{A1 - A3}$ : Nominal load BW 20 MHz			250	mV
$t_{on}$	Start up time $V_{O1 - O3}$	$0 W \leq P_{Out} \leq 45 W$	20	50	250	ms
$t_H$	Hold up time nominal load, recharge time $t \leq 5 \text{ sec}$ @ 20% load $V_{O1}$		10			ms
$I_{O1}$	Output current	$V_{Out1} = + 5 V$		6,0		A
$I_{O2}$	Output current	$V_{Out2} = + 15 V$		0,7		A
$I_{O3}$	Output current	$V_{Out3} = - 15 V$		0,7		A
	Output current limitation threshold $I_{O1 / O2 / O3}$	$66 V_{DC} \leq V_{IN} \leq 154 V_{DC}$		$105 \% \times I_{A1 / A2 / A3 \text{ Nenn}}$		
$I_{Osc}$	Output current short circuit condition	Short circuit between + $V_O$ and - $V_O$		$150 \% \times I_{A1 / A2 / A3 \text{ Nenn}}$		
$V_{Out \text{ max}}$	Output overvoltage limitation $V_{O1}$	$0 W \leq I_{O1} \leq 6.0 A$		6.5		V

### Signaling

$V_{IN}$	Signaling input voltage	$V_{IN}$		none		
$V_{Out}$	Signaling output voltage	$V_{O1},$ $V_{O2}, V_{O3},$		LED yellow LED yellow		

### GENERELL DATAS

f	Switching frequency	Fly back back converter		100		kHz
$\eta$	Efficiency	$P_O \geq 0,7 \times P_{O \text{ Nom}}$		80		%
	MTBF (SN 29500)	$V_{IN} = 110 V_{DC}, P_O = 50 W, T_A = + 40^\circ C$		400 000		h
	No load and short circuit proofed			continuously		

\* values on request

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### SAFETY / DIMENSIONS

	Clearance & creepage for PD2 and OV 2 PCB FR4, V0, TG = + 140°C	Input – Output Input – Chassis Output - Output and Output – Chassis	4.0 3.0 1.0			mm mm mm
	Isolation Tests: Rampe function 2 s – 3 s – 2 s Type Test: 1 Minute	Input – Output Primär – Gehäuse Sekundär – Sekundär			2'100 1'500 700	V <sub>DC</sub> V <sub>DC</sub> V <sub>DC</sub>
	Connecting	Eingang: + U <sub>E</sub> , - U <sub>E</sub> Ausgang: + U <sub>A1</sub> , + U <sub>A1</sub> , + U <sub>A2</sub> , - U <sub>A2</sub> + U <sub>A3</sub> , - U <sub>A3</sub> Schutzerde: SE			connector H15  Pin z32 leading	
	Protection class, - degree	Platine			I, IP 20	
	Dimensions incl. Mounting plate	B x H x T			45.3 x 128.4 x 160	mm
	Mounting	19" rack mounting 9TE, 3HE			incl. front plate	
	Weight			650		g

### AMBIENT CONDITIONS

T <sub>A</sub>	Operating temperature range	EN 50155 Klasse T3	- 40		+ 70	°C
T <sub>storage</sub>	Storage temperature range		- 40		+ 85	°C
	Cooling				Free convection	
	Humidity				75% averaged per year, 95% 30 days	
	Vibration / Shock	IEC 61373, IEC 68-2-27, BN 411002 Kat. I 3 Shocks each Axis			50 m / s <sup>2</sup> , 30 ms	

### EMC

	Emission	Line and radiated	EN 61000 – 6 – 4 A	
	Immunity	ESD EN 61000 - 4 - 2 Hochfrequentes Feld EN 61000 - 4 - 3 Burst EN 61000 - 4 - 4 Surge EN 61000 - 4 – 5 HF - Einströmung EN 61000 - 4 - 6	6 kV / 8 kV performance criteria - A - 20 V / m 80 MHz ... 2,5 GHz performance criteria - A - Level 4 asym., sym. performance criteria - A - 2 kV asym. / 1 kV sym. performance criteria - A - 10 V <sub>eff</sub> , R <sub>i</sub> = 150 Ω performance criteria - A -	*)

### STANDARDS

Applied Standards:	SN 29500	EN 50155: 2007	EN 50124 - 1: 2006	EN 50121-3-2: 2006	EN 50529
	IEC/EN 60255-5	IEC/EN 60255-6	EN 50125 - 1	EN 60068 - 2 - 6, 2...32	IEC/EN60707
	IEC 60255-11	IEC 61373: 1999	EN 60721 - 3 - 5	IEC 60068-2-1 / 2 / 14	IEC 61373

Technical Data referenced at: - 40° C ≤ T<sub>A</sub> ≤ + 70° C, 77 V<sub>DC</sub> ≤ V<sub>IN</sub> ≤ 137.5 V<sub>DC</sub>, if not otherwise specified.

\*) HF Field: 80MHz – 1GHz 20V/m, 1400 MHz – 2100MHz 10V/m 2100MHz – 2500MHz 5V/m

### Pin Assignment

Pin	Designation	Recommended
Output		
z 4	+ V <sub>Out1</sub>	1,5 mm <sup>2</sup>
d10	- V <sub>Out1</sub>	1,5 mm <sup>2</sup>
d18	+ V <sub>Out2</sub>	1,5 mm <sup>2</sup>
z20	- V <sub>O2</sub> / + V <sub>O3</sub>	1,5 mm <sup>2</sup>
d22	- V <sub>A3</sub>	1,5 mm <sup>2</sup>
Input		
d26	- V <sub>IN</sub>	1,5 mm <sup>2</sup>
d30	+ V <sub>IN</sub>	1,5 mm <sup>2</sup>
z32	PE	1,5 mm <sup>2</sup>