

# DC/DC Converter

150 Watt

## 150 BSB 110 T24 E10

$V_{IN} = 72V, 110 V_{DC}$      $V_{O1} = 24V, I_{O1} = 4.0 A$      $V_{O2} = +15V, I_{O2} = 1.67A$      $V_{O3} = -15V, I_{O3} = 1.67A$

SYMBOL	PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>INPUT</b>						
$V_{IN}$	Input voltage range	Continuously	50.4		137.5	$V_{DC}$
	Input voltage range dynamic	$43.2V \leq V_{IN} \leq 50.4V \quad t \leq 0,1 s$ $137.5V \leq V_{IN} \leq 154V \quad t \leq 1 s$	43.2 137.5		50.4 154	$V_{DC}$ $V_{DC}$
$V_{IN \min}$	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	$43.2V \leq V_{IN} \leq 154V, \sum I_{Out} = 0 A$ $V_{IN} = 110 V_{DC}, \sum P_{Out} = 150 W$ $V_{IN} = 72 V_{DC}, \sum P_{Out} = 150 W$ $V_{IN} = 66 V_{DC}, \sum P_{Out} = 150 W$	25	1.8 3.8	75	mA A A A
	Input current integral	$V_{IN} = 154 V_{DC}$			5.0	A <sup>2</sup> s
	Input fuse		10 AF			
$C_E$	Input capacitance			20		$\mu F$
	Max. allowed input line inductivity				50	$\mu H$
	Reverse protection	fuse + MOSFET in – input line	50 BZW 50 – 150			

<b>OUTPUT: power Unit</b>		43.2 V $\leq$ $V_{IN} \leq$ 154 V				
$P_{Out \text{ Nom}}$	Output power continuously	$\sum P_{Out}$		100		W
$V_{Out 1}$	Factory adjust output voltage		23.9	24.0	24.2	$V_{DC}$
$\Delta V_{Out1}$	Regulation accuracy $V_{O1}$ static	$0 W \leq P_{O1} \leq 96 W$	$\leq 2.5 \% V_{O1 \text{ Nom}}$			
$V_{Out 2}$	Factory adjust output voltage		+ 14.9	+ 15.0	+ 15.1	$V_{DC}$
$\Delta V_{Out}$	Regulation accuracy $V_{O2}$ static	$0 W \leq P_{O2} \leq 25 W$	$\leq 2.5 \% V_{O2 \text{ Nom}}$			
$V_{Out 3}$	Factory adjust output voltage		- 14.9	- 15.0	- 15.1	$V_{DC}$
$\Delta V_{out}$	Regulation accuracy $V_{O3}$ static	$0 W \leq P_{O3} \leq 25 W$	$\leq 2.5 \% V_{O3 \text{ Nom}}$			
$V_{outi \text{ rms}}$	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 <sub>pp</sub>
$t_{on}$	Start up time $V_{O1 - O3}$	$0 W \leq P_{Out} \leq 100 W$	20	50	250	ms
$t_H$	Hold up time nominal load, recharge time $t \leq 5 \text{ sec @ } 20\% \text{ load } V_{O1}$		10			ms
$I_{O1}$	Output current	$V_{Out1} = + 24 V$		2.0	2.5	A
$I_{O2}$	Output current	$V_{Out2} = + 15 V$		1.67	2.0	A
$I_{O3}$	Output current	$V_{Out3} = - 15 V$		1.67	2.0	A
	Output current limitation threshold $I_{O1 / O2 / O3}$	$43.2 V_{DC} \leq V_{IN} \leq 154 V_{DC}$	$105 \% \times I_{A1 / A2 / A3 \text{ Nenn}}$			
$I_{osc}$	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 $V_{O1}$	$0 W \leq I_{O1} \leq 4.0 A$		32.0		$V_{DC}$

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

<b>GENERELL DATAS</b>					
f	Switching frequency	Fly back back converter		130	kHz
$\eta$	Efficiency	$P_O \geq 0,7 \times P_{O \text{ Nom}}$		85	%
	MTBF (SN 29500)	$V_{IN} = 110 V_{DC}, P_O = 150 W, T_A = + 40^\circ C$		425 000	h
	No load and short circuit proofed			continuously	

\* values on request

SYMBOL	PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
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### SAFETY / DIMENSIONS

	Clearance & creepage for PD2 and OV 2 PCB FR4, V0, T <sub>G</sub> = + 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 Input - Chassis Output - Output			2'100 1'500 700	V <sub>DC</sub> V <sub>DC</sub> V <sub>DC</sub>
	Connecting	Input: + V <sub>IN</sub> , - V <sub>IN</sub>	Male connector 15 poles			
		Output: ± V <sub>O1</sub> , ± V <sub>O2</sub> , ± V <sub>O3</sub>	Male connector 32 poles			
		Protection Earth: PE				
	Protection class, - degree		I, IP 20			
	Dimensions incl. Mounting plate	B x H x T	On request			
	Mounting	19" rack mounting 10TE, 6HE	incl. front plate			
	Weight			850		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	6 kV / 8 kV performance criteria - A -			
		Hochfrequentes Feld EN 61000 - 4 - 3	20 V / m 80 MHz ... 2,5 GHz performance criteria - A -			
		Burst EN 61000 - 4 - 4	Level 4 asym., sym. performance criteria - A -			
		Surge EN 61000 - 4 – 5	2 kV asym. / 1 kV sym. performance criteria - A -			
		HF - Einströmung EN 61000 - 4 - 6	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, 50.4 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

Input X1 Front site Top 15 poles

Pin	Fkt.	Pin	Fkt.
z32	Chassis	d30	Chassis
z28	n.c.	d26	n.c.
z24	n.c.	d22	+V <sub>IN</sub>
z20	+V <sub>IN</sub>	d18	+V <sub>IN</sub>
z16	+V <sub>IN</sub>	d14	n.b.
z12	-V <sub>IN</sub>	d10	-V <sub>IN</sub>
z8	-V <sub>IN</sub>	d6	-V <sub>IN</sub>
z4	n.c.		

#### Pin Assignment

Output X2 Back Panel Top 32 poles

Pin	a	b
2	+ 24V	+ 24V
4	+ 24V	+ 24V
6	GND	GND
8	GND	GND
10	GND	GND
12	GND	GND
14	GND	GND
16	GND	GND
18	GND	GND
20	+ 24V	- Sense
22	+ 24V	+ 24V
24	+ 24V	+ 24V
26	V <sub>O_min</sub>	+ Sense
28	n.b.	n.b.
30	Chassis	Chassis
32	Chassis	Chassis

#### Pin assignment

Output X3 Back Panel Below 32 poles

Pin	a	b
2	+ 15V	+ 15V
4	- 15V	- 15V
6	GND	GND
8	GND	GND
10	GND	GND
12	GND	GND
14	GND	GND
16	GND	GND
18	GND	GND
20	- 15V	- 15V
22	+ 15V	+ 15V
24	+ 15V	+ 15V
26	n.b.	n.b.
28	n.b.	n.b.
30	Chassis	Chassis
32	Chassis	Chassis