

# DC/DC Converter

100 W

100 DDB 024 M24 □ □ □ A

$V_{I\text{ nom}} = 24\text{ V}$      $V_{O\text{ nom}} = 24\text{ V}$      $I_O = 4.25\text{ A}$

SYMBOL	PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNITS
<b>INPUT</b>						
$V_I$	Input voltage range	Continuously	9.0		36.0	$V_{DC}$
$V_{I\text{ min}}$	Converter shutdown			8.5		$V_{DC}$
$V_{I\text{ max}}$	Converter shutdown		36.0		38.0	$V_{DC}$
$V_{\text{Enable}}$	Enable Function Reference: - $V_I$	Converter on: Enable = low $V_{\text{Enable}} \leq 0.8\text{ V}$ , $I \leq 1.5\text{ mA}$	0		0.8	V
		Converter off: Enable = high $V_{\text{Enable}} \geq 3.0\text{ V}$ , $I \leq -50\text{ }\mu\text{A}^*$	3.0		20	V
	Stand by current	$9.0\text{ V} \leq V_I \leq 36.0\text{ V}$ , Enable = high			25	mA
$I_I$	Input current No load Nominal load Nominal load	$V_{I\text{ n}} = 36.0\text{ V}$ , $I_O = 0\text{ A}$		4.9 10.0	125	mA
		$V_{I\text{ n}} = 24.0\text{ V}$ , $I_O = 4.25\text{ A}$				A
		$V_{I\text{ n}} = 12.0\text{ V}$ , $I_O = 4.25\text{ A}$				A
		$V_{I\text{ n}} = 9.0\text{ V}$ , $I_O = 4.25\text{ A}$			14.0	A
	Input current integral	$V_I = 36.0\text{ V}$			15	A <sup>2</sup> s
$I_{I\text{ max}}$	Max. input switch on current $V_I \geq V_{I\text{ min}}$ , ( $V_{\text{Enable}} \rightarrow \leq 0.8\text{ V}$ )	$I_O = 4.25\text{ A}$ $\Delta t \leq 100\text{ ms}$	on request			
	Input fuse	Yes, Pico Fuse	10AF			
$C_I$	Converter input capacity			100		$\mu\text{F}$
	External line inductance				15	$\mu\text{H}$
	Reverse input protection	Serial MOSFET Minus Input	IRFB4710			
	Transient Voltage Protection (Surge)		1.5KE36A			

## OUTPUT: Power Unit

$P_{O\text{ nom}}$	Output power	$9.0\text{ V} \leq V_I \leq 36.0\text{ V}$		100		W
$V_{O\text{ nom}}$	Output voltage adjustment, factory set	$9.0\text{ V} \leq V_I \leq 36.0\text{ V}$	23.8	24.0	24.1	V
$\Delta V_O$	Regulation	$9.0\text{ V} \leq V_I \leq 36.0\text{ V}$ $0\text{ A} \leq I_O \leq 4.25\text{ A}$ $T_A = -40^\circ\text{C} \dots +70^\circ\text{C}$	$\leq 3.0\% V_{O\text{ nom}}$			V
$\Delta V_{O\text{ dyn}}$	Load regulation dynamic	$12.0\text{ V} \leq V_I \leq 36.0\text{ V}$ Load: 20 - 80 - 20 % $\times I_{O\text{ nom}}$		200	500	mV
$t_{\text{dyn}}$	Response time	$9.0\text{ V} \leq V_I \leq 36.0\text{ V}$ Load: 20 - 80 - 20 % $\times I_{O\text{ nom}}$		1	2	ms
$V_{O\text{ rms}}$	Ripple	$12.0\text{ V} \leq V_I \leq 36.0\text{ V}$ Nom. load BW 300 kHz		50	150	$\text{mV}_{\text{rms}}$
$V_{O\text{ pp}}$	Noise	$12.0\text{ V} \leq V_I \leq 36.0\text{ V}$ Nom. load BW 20 MHz			250	$\text{mV}_{\text{pp}}$
$t_{\text{on}}$	Turn on time $V_O$	$10.5\text{ V} \leq V_I \leq 36.0\text{ V}$ , $0\text{ A} \leq I_O \leq 4.25\text{ A}$ Resistive load	20		200	ms
$t_{\text{h}}$	Option: Hold up time	$12.0\text{ V} \leq V_I \leq 36.0\text{ V}$ $0\text{ A} \leq I_O \leq 4.25\text{ A}$ Class S2 @ EN 50155	10			ms
	Overvoltage shutdown $V_O$	$12.0\text{ V} \leq V_I \leq 33.6\text{ V}$ $0\text{ A} \leq I_O \leq 4.25\text{ A}$	Converter off: $V_O \leq 32.4\text{ V}$			V
$I_O$	Output current	$12.0\text{ V} \leq V_I \leq 36.0\text{ V}$		4.25		A
	Output current limitation of $I_O$	$12.0\text{ V} \leq V_I \leq 36.0\text{ V}$	4.3			A
	Output short circuit current	Short circuit between + $V_O$ and - $V_O$ $9.0\text{ V} \leq V_I \leq 36.0\text{ V}$			6.0	A
$C_O$	Output capacity			8		mF

## OUTPUT: Signals

PF	Power Fail Open Collector Transistor $V_{CE\text{ max}} \leq 70\text{ V}$ , $I_{CE\text{ max}} \leq -20\text{ mA}^*$ Reference: - $V_O$	Transistor on: PF= low, $V_O < V_{O\text{ min}}$ Transistor off: PF= high, $V_O \geq V_{O\text{ min}}$	$V_O < 0.95 \times V_{O\text{ nom}} \pm 3\%$ $V_O \geq 0.95 \times V_{O\text{ nom}} \pm 3\%$	V V
		Signal defined for $V_O \geq 0.6 \times V_{O\text{ nom}}$		
	Signals	Input: Output:	LED yellow LED yellow	

## GENERAL SPECIFICATIONS

f	Switching frequency	$V_I = 24\text{ V}$ , $I_O = 4.25\text{ A}$		90		kHz
$\eta$	Efficiency	$P_O \geq 0.7 \times P_{O\text{ nom}}$	85	90		%
	MTBF (SN 29500)	$V_I = 24\text{ V}$ , $I_O = 4.25\text{ A}$ , $T_A = +40^\circ\text{C}$		400 000		h
	No load, short circuit proof		Continuously			

\* - sign: sink current

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

### SAFETY / DIMENSIONS

	Creepage / clearance distances PD2 PCB FR4, V0, TG = + 140°C	Input – output Input – case Output – case	4.0 2.0 2.0			mm mm mm
	Converter dielectric strength test every unit ramp function 2 s - 3 s - 2 s	Input – output Input – case Output – case			2100 1500 750	V <sub>DC</sub> V <sub>DC</sub> V <sub>DC</sub>
	Connectors	Input , Output, SE: 5 pins Required femal plug Enable Signal, Power Fail each 2 pins Required femal plug	Combicon PC 6-16/5-G1F-10,16 Combicon PC 6/5-STF-10,16			
	Protection class, protection system		I, IP 20			
	Dimensions with mounting plate <i>see drawing</i>	w x h x d Chassis mounting or Din rail monting TS35	210 x 160 x 71.5			mm
	Assembling	Chassis mounting with screws or Din rail monting TS35	4 x M5			
	Weight			1.8		kg

### ENVIROMENTAL CONDITIONS

T <sub>A</sub>	Operating temperature range T <sub>A</sub>	Continuously EN 50155 Classe Tx 10 minutes	- 40 + 70		+ 70 + 85	°C °C
T <sub>Storage</sub>	Storage Temperature		- 40		+ 85	°C
	Cooling		free air convection			
	Humidity	EN 50155, IEC 60571	75% averaged year, 95% 30 days			
	Vibration / Shock valid only for chassis mounting	IEC 61373, IEC 68-2-27 Cat. I 3 Shocks per axis	50 m / s <sup>2</sup> , 30 ms			

### EMC

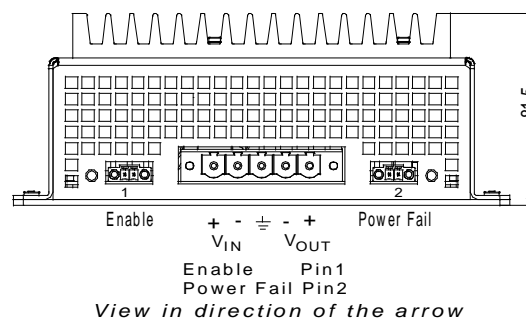
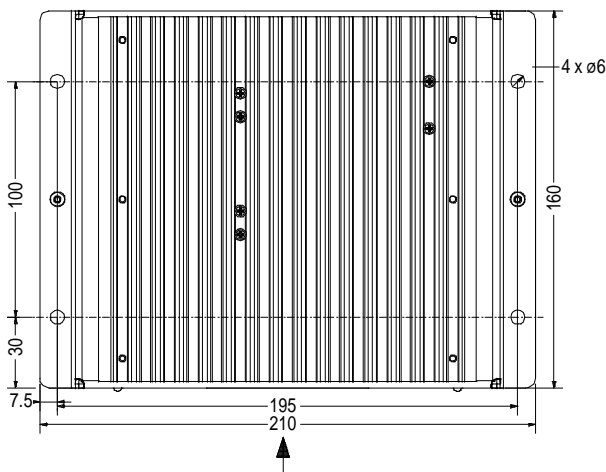
	Emission	Line conducted and radiated	EN 50121 - 3 - 2: 2006		
	Immunity	ESD EN 61000 - 4 - 2	6 kV / 8 kV Performance criteria - B -		
		High frequency field EN 61000 - 4 - 3	20 V / m 80 MHz ... 1 GHz Performance criteria - A -		
		Burst EN 61000 - 4 - 4	Level 3 asym., sym. Performance criteria - A -		
		Surge EN 61000 - 4 - 5	2 kV asym. / 1 kV sym. R <sub>i</sub> = 42 Ω, Perf. criteria - A -		
		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: 2006	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 specifications valid for: - 40° C ≤ T<sub>A</sub> ≤ + 70° C, 9.0 V ≤ V<sub>i</sub> ≤ 36.0 V, unless otherwise noted.

### Dimensions (in mm) and Pin Assignment



#### Order Code:

100 DDB 024 M24 □ □ □ A *select*

- 0 = without femal plugs
- 1 = with femal plugs
- 0 = without Hold up time
- 1 = with Hold up time 10 ms
- H = Din rail mounting TS35
- W = Chassis mounting

Keep free space over and under the unit: ≥ 100 mm.

Attention: Take care to a close thermal connection between mounting plate and case.