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DC-DC Converter Qone CompactPCI®-100



Output Power up to 100 Watt

Isolated

Quad-Output

For standard euro-rack size 19"



Its merits are:

- High power density
- Overtemperature shutdown
- Short circuit protection
- Remote on/off
- Coated assembly
- Glued parts for better vibration resistance
- Fixed switching frequency
- Yellow LED to indicate operating mode
- According to Railway Standard EN 50155 and 50121-3-2 (EMC)
- Inrush current limiting
- Reverse polarity protection
- Hold up time of 10ms
- Supply Fail (FAL)
- Derating Signal (DEG)
- Sense (S)
- Enable Signal (EN)

Order Numbers and Specific Characteristics

Other type on request.

						Order Number			
V_{out}	V_{out}	I_{out}	P_{out}	η	I_{in}	HEC-4DB/M/L	HEC-4DB/M/R		
nom	nom	nom	max	typ	max	system slot left	system slot right		
(V)	(V)	(A)	(W)	(%) ¹⁾	(A) ⁵⁾				
$V_{in\ nom} = 24\ V$									
$V_{in\ betriebl} = 16\ to\ 30\ V, V_{in\ grenz} = 14,4\ to\ 36\ V$ ^{2) 3)}									
1	5 ⁴⁾	14							
2	3,3 ⁴⁾	14	100 ⁵⁾	≥ 78	9	82 81 89 0422 1	82 82 89 0422 6		
3	12	2							
4	-12	1							
$V_{in\ nom} = 36\ V$									
$V_{in\ betriebl} = 24\ to\ 45\ V, V_{in\ grenz} = 21,6\ to\ 51\ V$ ^{2) 3)}									
1	5 ⁴⁾	14							
2	3,3 ⁴⁾	14	100 ⁵⁾	≥ 77	6,2	84 81 89 0422 5	84 82 89 0422 1		
3	12	2							
4	-12	1							
$V_{in\ nom} = 72\ V$									
$V_{in\ betriebl} = 48\ to\ 90\ V, V_{in\ grenz} = 43,2\ to\ 101\ V$ ^{2) 3)}									
1	5 ⁴⁾	14							
2	3,3 ⁴⁾	14	100 ⁵⁾	≥ 77	3	86 81 89 0422 9	86 82 89 0422 5		
3	12	2							
4	-12	1							
$V_{in\ nom} = 110\ V$									
$V_{in\ betriebl} = 77\ to\ 138\ V, V_{in\ grenz} = 66\ to\ 160\ V$ ^{2) 3)}									
1	5 ⁴⁾	14							
2	3,3 ⁴⁾	14	100 ⁵⁾	≥ 76	2	87 81 89 0422 2	87 82 89 0422 7		
3	12	2							
4	-12	1							

¹⁾ $P_{out} = 0,8 P_{out\ max}; V_{in} = V_{in\ nom}$

²⁾ Converter input **and** critical input according to Railway Standard EN 50155 ($V_{in\ operating}, V_{in\ range}$ and hold-up S2).

³⁾ Converter switches on at $V_{in\ operating\ min}$

⁴⁾ 3,3 V adjusted to 3,4 V and 5 V adjusted to 5,1 V

⁵⁾ Derating $\geq +60\ ^\circ C$; Derating-Factor: ca. 2W/K

⁶⁾ Recommended fuse: Quick-acting wire fuse $I_{rat} = 1,5 \times I_{in\ max}$; high switching off capacity; for disconnecting from the preceding supply, sufficient current of the supply point to trigger the fuse in case of short-circuit has to be made sure ($t < 300\ ms$).

Technical Data

For $T_{amb}=25^{\circ}\text{C}$, $V_{in\ nom}$, $P_{out\ max}$, unless otherwise specified.

	Symbol	Unit	min	typ	max	Notes
Input Characteristics						
Input voltages	V_{in}	V				
Nominal input voltages	$V_{in\ nom}$	V				1)
Input voltage range						
– Min. input voltage	$V_{in\ min}$	V				1)
– Max. input voltage	$V_{in\ max}$	V				1)
Threshold						
– Voltages on threshold	$V_{in\ on}$	V		$1,05 V_{in\ min}$		
– Voltage off threshold	$V_{in\ off}$	V		$V_{in\ min}$		
Input current	I_{in}	A				
– Max. input current	$I_{in\ max}$	A				1)
– No load input current	$I_{in\ off}$	mA_{off}	30		170	switched off by EN or INH
Output Characteristics						
Output voltages	V_{out}	V				short circuit protected and zero load operation
Nominal output voltages	$V_{out\ nom}$	V				1)
– Accuracy		%		$\pm 0,2$		for all outputs at no-load operation; for 3,3 and 5 V double value
Regulation						
– Line regulation		mV		0		$V_{in\ operating\ min} - V_{in\ operating\ max}; I_{out\ nom}$
– Static load regulation ($V_{out\ 1}$ and 2)		mV		30		0 % – 100 % $I_{out\ nom}$
– Static load regulation ($V_{out\ 3}$ and 4)		mV		30		0 % – 100 % $I_{out\ nom}$
– Dynamic load change						25% - 75% - 25% $I_{out\ nom}$
– Voltage deviation ($V_{out\ 1}$ and 2)		mV		15		per A load change; without ext. capacitor
– Voltage deviation ($V_{out\ 1}$ and 2)		mV		10		per A load change; with ext. capacitor 1500 μF
– Voltage deviation ($V_{out\ 3}$ and 4)		mV		90		per A load change
– Recovery time ($V_{out\ 1}$ and 2)		ms		1		
– Recovery time ($V_{out\ 3}$ and 4)		ms		0,4		
– Temperature coeff. ($V_{out\ 1}$ and 2)		%/K		0,01		
– Temperature coeff. ($V_{out\ 3}$ and 4)		%/K		0,01		
Rising characteristics						
– Rise time ($V_{out\ 1}$ and 2)		ms		500	1000	after connecting V_{in}
– Overshoot		%		4		for no-load operation and I_{nom} at measured output
Ripple and noise		mVss		50		$V_{ss} / 20$ MHz bandwidth
Overvoltage protection ($V_{out\ 1}$ and 2)		V		$1,2 V_{out\ nom}$		external supply not permissible
Output current	I_{out}	A				
– Nominal output current	$I_{out\ nom}$	A				1)
Overcurrent protection						automatical restart after ca. 1,5 s
– Overcurrent protection ($V_{out\ 1}$ and 2)		A	$1,05 I_{out\ nom}$		$1,3 I_{out\ nom}$	common shutdown
– Overcurrent protection ($V_{out\ 3}$ and 4)		A	$1,05 I_{out\ nom}$		$1,5 I_{out\ nom}$	
Output power	P_{out}	W				
– Max. output power	$P_{out\ max}$	W				1)
Derating						1)
Efficiency	η	%				Mix: $I_{out\ 1, 3, 4} = 0,6 I_{out\ nom\ 1, 3, 4}; I_{out\ 2} = 0,3 I_{out\ nom\ 2}$ 1)
Overtemperature shutdown		$^{\circ}\text{C}$		100		converter temperature restart after colling-off ca. 5K, min. 1,5 s.

Derate Signal (DEG)

Warning criteria Temperature > 95 $^{\circ}\text{C}$ (typ.). Risk of overtemperature exists.

Ambient Temperature Range

Operating -40 up to +85 $^{\circ}\text{C}$
Storage/Transport -40 up to +100 $^{\circ}\text{C}$

MTBF

500.000 h at $T_{amb} = 25^{\circ}\text{C}$

Isolation

Input/Output 1.500 V_{eff}
Input/Case 1.500 V_{eff}
Output/Case 500 V_{eff}

EMC

Product standard	EN 61204 :1993
Emission	conducted emission acc. to EN 55011 ²⁾ Class A
Immunity	
– Electrostatic discharge (ESD)	EN 61000-4-2, Criterion A (6kV / 8kV)
– Electric field	EN 61000-4-3, Criterion A (10V/m)
– HF-current injection	EN 61000-4-6, Criterion B (10V)
– Fast transient (Burst)	EN 61000-4-4, Criterion B (2kV)
– Transient (Surge)	EN 61000-4-5, Criterion B (0,5kV / 1,8kV)

Mechanical Stress

Shock	IEC 68-2-27
Continuous shock	IEC 68-2-29
Vibration	IEC 68-2-6

¹⁾ See table „Order Numbers and Specific Characteristics“ (page 2).

²⁾ In built-in-condition our devices may show different EMC properties.



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