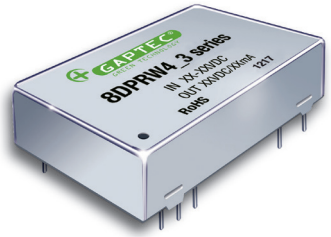
GAPTEC®
GREEN TECHNOLOGY

8DPRW4_3 Series

8W - Single/Dual Output - Wide Input - Isolated & Regulated DC-DC Converter



DC-DC Converter 8 Watt

- Wide 4:1 input voltage range
- Input/Output Isolation Voltage: 3000 VDC
- Operating Temperature Range: -40°C to +85°C
- Short circuit protection (SCP)
- Remote On/Off
- Efficiency up to 86%
- 8W DIL package
- EN50155 approval for railway applications
- Under voltage lock-out circuit
- Over voltage protection
- Over load protection

The 8DPRW4_3 Series is high performance isolated 8W DC/DC converters. Designed with high efficiency, they allow the operating temperature range of these units to be -40°C to +85°C with industry-standard footprint. Further features include wide 4:1 input voltage range, remote on/off control, short-circuit protection and over voltage protection.

These converters are well suitable for battery operated equipment, measurement equipment, telecom, wireless network and industry control systems. Everywhere where isolated, tightly regulated voltages and compact size are required.

Common specifications

Short circuit protection:	Indefinite (hiccup), automatic recovery
Cooling:	Nature convection
Thermal shock:	IEC60068
Shock:	EN61373
Vibration:	EN61373
Operation temperature range:	-40°C~+85°C (see derating curve) -40°C~+70°C (100% load)
Storage temperature range:	-55°C~+125°C
Maximum case temperature:	105°C
Soldering temperature:	260°C max, 1.5mm from case for 10 sec
Switching frequency:	• 24V models: 330kHz TYP • 110V models 220kHz TYP
Storage humidity range:	95% MAX
Safety standards:	IEC/EN 60950-1; EN50155
Safety approvals:	IEC/EN 60950-1; EN50155
Case material:	Nickel coated copper
Potting material:	Epoxy (UL94V-0)
MTBF (MIL-HDBK-217F @25°C):	>800,000 hours
Weight:	18g

Output specifications

Item	Test condition	Min	Typ	Max	Units
Voltage accuracy				±1	%
Line regulation				±0.5	%
Load regulation				±0.5	%
Cross regulation	Dual (25% to 100% load)			±5	%
Ripple and noise*	20MHz Bandwidth			75	mVp-p
Over load protection	of Iout		160		%
Over voltage protection	• 3.3V output • 5V output • 12V output • 15V output • ±5V output • ±12V output • ±15V output		3.9 6.2 15 18 ±6.2 ±15 ±18		V V V V V V V
Temperature coefficient			±0.02		%/°C
Transient recovery time	25% load step change		250		µs
Transient response deviation	25% load step change • single output 3.3V:			±3 ±5	% %

* Measured with a 0.1uF ceramic capacitor and 10uF electrolytic capacitor.

Input specifications

Item	Test condition	Min	Typ	Max	Units
Under voltage lockout (Module ON/OFF)	• 24V models • 110V models		12.6/11.4 41/37		VDC VDC
Start-up time	Nominal Vin and constant resistive load		30		ms
Input filter	Pi Type				
Input reflected ripple current*	Nominal Vin and full load		20		mAp-p
Remote ON/OFF**	• ON • OFF • OFF idle current		Open or 3.0V ... 12V Short or 0V ... 1.2V or short circuit pin1 and pin2/3 5		 mA
Input surge voltage	• 24V models • 110V models			100 185	VDC VDC

* Measured with a simulated source inductance of 12uH and a source capacitor Cin (22uF, ESR<1.0Ω at 100KHz)
** Control pin is referenced to -Vin (pin2, pin3)

Isolation specifications

Item	Test condition	Min	Typ	Max	Units
Isolation voltage	Input to output	3000			VDC
Isolation resistance	Test at 500VDC	1000			MΩ
Isolation capacitance			1000		pF

Model selection:
WCTV_xxyyN##
W= Watt; **C=** Case; **T=** Type; **V=** Voltage Variation (omitted ± 10%);
xx= Vin; **yy=** Vout; **N=** Numbers of Output; **##=** Isolation (kVDC)

Example:
8DPRW4_2415S3
8= 8Watt; D= DIP; PR= series; W4= wide input (4:1) 13-70Vin; 15Vout; S= single output; 3= 3000VDC

GAPTEC-Electronic GmbH & Co. KG
sales@gaptec-electronic.com – www.gaptec-electronic.com

EMC specifications				
EMI	Conducted Emission*	EN50121-3-2	40dBuV from 30-230MHZ 47dBuV from 230-1000MHZ	
EMI	Radiated Emission	EN50121-3-2	99dBuV from 0.15-0.5MHZ 93dBuV from 0.5-30MHZ	
EMS	Electrostatic Discharge	EN50121-3-2	Air ±8KV Contact ±6KV	perf. Criteria A
EMS	RS	EN50121-3-2	20V/m	perf. Criteria A
EMS	EFT**	EN50121-3-2	2.0KV	perf. Criteria A
EMS	Surge**	EN50121-3-2	2.0KV	perf. Criteria A
EMS	CS	EN50121-3-2	10V	perf. Criteria A
EMS	PFMF	EN50121-3-2	10A/m	perf. Criteria A

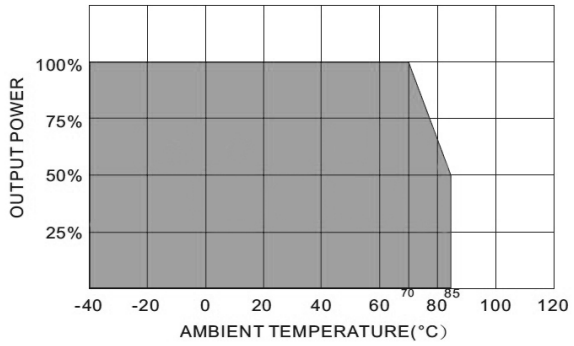
* Input filter components are used to help meet conducted emissions 79dBuV from 0.15-0.5MHZ and 73dBuV from 0.5-30MHZ requirement for the module (refer to EMI filter of design & feature configuration).

** Requires an external filter capacitor if the model has to meet EFT and surge in EN50121-3-2.

Part Number	Input Voltage [VDC]		Input Current [mA, Typ.]		Output Voltage [VDC]	Output Current [mA]	Capacitor load [uF]	Efficiency [%, Typ.]
	Nom	Range	No load	Full load		Full load	Full load	
8DPRW4_2403S3	24	13-70	30	397.59	3.3	2400	1330	83
8DPRW4_2405S3	24	13-70	20	387.60	5	1600	1330	86
8DPRW4_2412S3	24	13-70	10	391.18	12	665	330	85
8DPRW4_2415S3	24	13-70	10	388.18	15	535	220	86
8DPRW4_11003S3	110	42-176	10	88.89	3.3	2400	1330	81
8DPRW4_11005S3	110	42-176	10	86.58	5	1600	1330	84
8DPRW4_11012S3	110	42-176	5	86.36	12	665	330	84
8DPRW4_11015S3	110	42-176	5	87.90	15	535	220	83
8DPRW4_2405D3	24	13-70	10	401.61	±5	±800	±900	83
8DPRW4_2412D3	24	13-70	10	394.12	±12	±335	±220	85
8DPRW4_2415D3	24	13-70	10	385.17	±15	±265	±100	86
8DPRW4_11005D3	110	42-176	5	90.91	±5	±800	±900	80
8DPRW4_11012D3	110	42-176	5	89.14	±12	±335	±220	82
8DPRW4_11015D3	110	42-176	5	87.08	±15	±265	±100	83

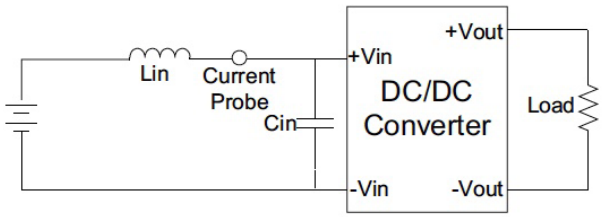
Typical characteristics

Temperature derating graph

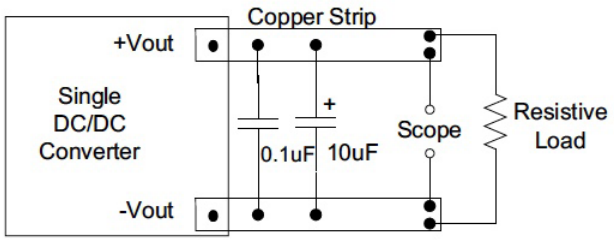


Test configurations

Input Reflected Ripple Current Test Step
Input reflected ripple current is measured through a source inductor Lin (12µH) and a source capacitor Cin (33µF, ESR<1.0Ω at 100KHz) at nominal input and full load.



Output ripple & noise measurement test
Use a 0.1µF ceramic capacitor and a 10µF electrolytic capacitor measurement. The Scope measurement bandwidth is 0-20MHz.

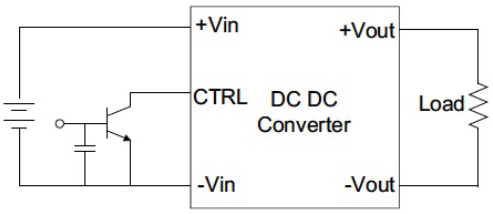


Design and feature configurations

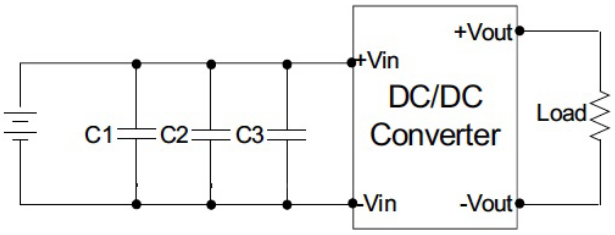
CTRL Module ON/OFF
Positive logic turns on the module during high logic and off during low logic.

Ctrl module on/off can be controlled by an external switch between the ctrl terminal and -Vin terminal. The switch can be an open collector or open drain.

For positive logic if the ctrl feature is not used, please leave the ctrl pin floating.



EMI filter
Input filter components (C1, C2, C3) are used to help meet conducted emissions 79dBuV from 0.15-0.5MHZ and 73dBuV from 0.5-30MHZ requirement for the module. These components should be mounted as close as possible to the module; and all leads should be minimized to decrease radiated noise.

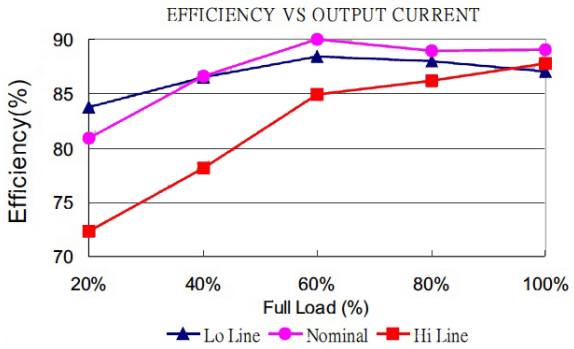


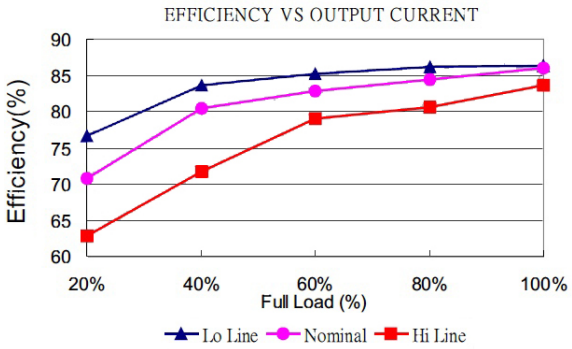
	C1, C2, C3
8DPRW4_24xx3	None
8DPRW4_110xx3	MLCC, 1µF, 250V

Over voltage protection
The module includes an internal output over voltage protection circuit, which monitors the voltage on the output terminals. If this voltage exceeds the over voltage set point, the module will activate the control loop of internal circuit to clamp the output voltage.

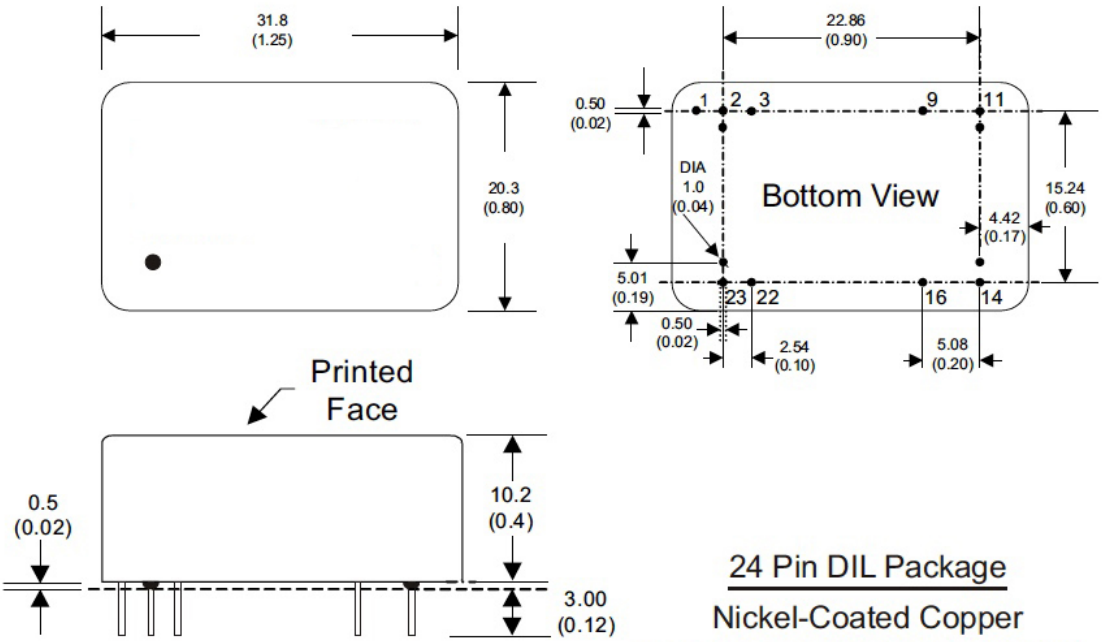
Over current protection
The module includes an internal over current protection circuit, which will endure current limiting for an unlimited duration during output over load condition. If the output current exceeds the OCP set point, the module will shut down automatically (hiccup).
The module will try to restart after shutdown. If the over load condition still exists, the module will shut down again.

Efficiency





Mechanical specifications



24 Pin DIL Package

Nickel-Coated Copper

All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5 ±0.05 (0.02 ±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)
4. Stand-off tolerance: ±0.1 (±0.004)

PIN connection									
PIN	1	2	3	9	11	14	16	22	23
Single	CTRL	-Vin	-Vin	NP	NC	+Vout	-Vout	+Vin	+Vin
Dual	CTRL	-Vin	-Vin	Common	-Vout	+Vout	Common	+Vin	+Vin

Note:
1. Only typical model listed. Non-standard models will be different from the above, please contact us for more details.
2. All specifications are typical at nominal input, full load and 25°C unless otherwise stated.
3. In this datasheet, all the test methods of indications are based on corporate standards.