10D16W4_1.5RP series

10W - Single/Dual Output DC-DC Converter - Wide Input - Isolated & Regulated

DC-DC Converter 10 Watt

- DIP16 package
- 4:1 input voltage range
- Operating temperature range: -40°C to +85°C
- 1500VDC isolation
- Up to 86% efficiency
- Input undervoltage protection
- Short circuit protection (SCP)
- Overvoltage protection
- Overcurrent protection

Introducing our new 10D16W4_1.5RP series — a compact and robust DC-DC converter line designed in a space-efficient DIP16 package and engineered for reliable performance in demanding environments. With a wide 4:1 input voltage range and an operating temperature span from –40°C to +85°C, this series ensures stable operation under harsh conditions. A reinforced 1500 VDC isolation barrier provides solid electrical protection, while efficiency levels of up to 86% offer an optimal balance between power capability and energy usage. The converters feature input undervoltage protection, short-circuit protection, overvoltage protection and overcurrent protection, delivering a comprehensive safety suite for sensitive applications. The 10D16W4_1.5RP series combines durability, protection and excellent performance — ideal for modern, space-constrained system designs.

Common specifications	
Short circuit protection	Input voltage range, continuous, self recovery
Switching frequency	300 kHz
Operation temperature	-40°C ~ +85°C (with derating)
Storage temperature	-55°C ~+125°C
Soldering temperature*	+300°C (1.5mm from case for 10 sec)
Storage humidity	5~95% RH (noncondensing)
MTBF: (MIL-HDBK-217F@25°C)	>800,000 hours
Input filter	PI filter
Hot plug	Unavailable
Case material	Aluminum alloy
Package dimensions	23.80 x 13.70 x 10.20mm
Weight	6.5g (typ.)
Cooling method	Free air convection

Note: * Note: This series of products adopts frequency reduction technology, and the switching frequency value is the test value at full load. When the load decreases, the switching frequency decreases as the load decreases.

Output specifications					
Item	Test condition	Min	Typ	Max	Units
Output voltage accuracy (0% - 100% load)	Main road Side road		±1 ±3	±3 ±5	%
Linear regulation (Input voltage from low to high limit, full load)	Positive output Secondary output		±0.2 ±0.5	±0.5 ±1	%
Load regulation* (5% - 100% load)	Positive output Secondary output		±0.5 ±0.5	±1 ±1.5	%
Ripple & noise**	20MHz bandwidth, 5% - 100% load		60	100	mVp-p
Transient recovery time	25% load step change, nominal input voltage	--	300	500	µs
Transient response deviation (25% load step change, nominal input)	3.3V/5V/±5V Output Other output		±5 ±3	±8 ±5	%
Temperature Coefficient	Full Load	--	--	±0.03	%/°C
Over Current Protection	Input voltage range	110	140	--	%lo

Note: *When tested under 0% - 100% load working conditions, the indicator of load regulation rate is ± 5%;
** 0% - 5% load ripple&noise less than or equal to 5% Vo.

Input specifications					
Item	Test condition	Min	Typ	Max	Units
Input Current (full load/no-load)	24VDC nominal input 48VDC nominal input		500/10 251/8	525/15 258/12	mA
Reflected ripple current	Nominal input series, nominal input voltage		20		mA
Input impulse voltage	24VDC Input 48VDC Input	-0.7 -0.7		50 100	VDC
Starting voltage	24VDC Input 48VDC Input			9 18	VDC
Input undervoltage protection	24VDC Input 48VDC Input	5.5 12			VDC

Example:
10D16W4_2405S1.5RP
10 = 10Watt; D16 = DIP; W4 = Wide input; 24 = 24Vin; 05 = 5Vout; S = Single Output; 1.5 = 1500VDC isolation; R = Regulated Output; P = Short circuit protection

Isolation specifications					
Item	Test condition	Min	Typ	Max	Units
Isolation voltage	Input-output, test time 1 minute, leakage current less than 1mA	1500			VDC
Isolation resistance	Input-output, isolated voltage 500VDC	1000			MΩ
Isolation capacitance	Input-output, 100kHz/0.1V		1000		pF

1. The input voltage should not exceed the specified range value, otherwise it may cause permanent and irreparable damage;
2. It is recommended to use at a load of over 5%. If the load is below 5%, the ripple index of the product may exceed the specifications, but it does not affect the reliability of the product;
3. Suggested dual output module load imbalance: ≤ ± 5%. If it exceeds ± 5%, it cannot be guaranteed that the product performance meets all performance indicators in this datasheet;
4. The maximum capacitive load is tested within the input voltage range and under full load conditions;
5. Unless otherwise specified, all indicators in this manual are measured at Ta = 25°C, humidity <75% RH, nominal input voltage, and output rated load;
6. All indicator testing methods in this datasheet are based on our company's corporate standards;
7. Product specifications are subject to change without prior notice.

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

EMC specifications						
EMC	EMI	CE	CISPR32/EN55032 CLASS A (without extra components)/ CLASS B (recommended circuit diagram 3-②)			
EMC	EMI	RE	CISPR32/EN55032 CLASS A (without extra components)/ CLASS B (recommended circuit diagram 3-②)			
EMC	EMS	ESD	IEC/EN61000-4-2	Contact ±4kV	Perf. criteria	B
EMC	EMS	RS	IEC/EN61000-4-3	10V/m	Perf. criteria	A
EMC	EMS	EFT	IEC/EN61000-4-4	±2kV (Recommended circuit diagram 3-①)	Perf. criteria	B
EMC	EMS	Surge	IEC/EN61000-4-5	line to line ±2kV (recommended circuit diagram 3-①)	Perf. criteria	B
EMC	EMS	CS	IEC/EN61000-4-6	3Vr.m.s	Perf. criteria	A

Product Selection Guide

Approval	Part number	Input Voltage Nominal Range (VDC)	Input Current Full load (mA) Typ.	Input Current No-live load (mA) Typ.	Output Voltage (VDC)	Output Current Max./Min. (mA)	Full Load Efficiency (%) typ.	Capacitive Load (µF) max.
	10D16W4_2403S1.5RP	24 (9-36)	476	10	3.3	2700/0	80	2600
	10D16W4_2405S1.5RP	24 (9-36)	514	10	5	2000/0	83	1300
	10D16W4_2406S1.5RP	24 (9-36)	514	10	5.5	1818/0	83	1000
	10D16W4_2412S1.5RP	24 (9-36)	496	10	12	833/0	86	560
	10D16W4_2415S1.5RP	24 (9-36)	496	10	15	666/0	86	560
	10D16W4_2424S1.5RP	24 (9-36)	496	10	24	416/0	86	200
	10D16W4_4803S1.5RP	48 (18-75)	238	8	3.3	2700/0	80	2600
	10D16W4_4805S1.5RP	48 (18-75)	257	8	5	2000/0	83	1300
	10D16W4_4812S1.5RP	48 (18-75)	248	8	12	833/0	86	560
	10D16W4_4815S1.5RP	48 (18-75)	248	8	15	666/0	86	560
	10D16W4_4824S1.5RP	48 (18-75)	248	8	24	416/0	86	200

Approval	Part number	Input Voltage Nominal Range (VDC)	Input Current Full load (mA) Typ.	Input Current No-live load (mA) Typ.	Output Voltage (VDC)	Output Current Max./Min. (mA)	Full Load Efficiency (%) typ.	Capacitive Load (µF) max.
	10D16W4_2405D1.5RP	24 (9-36)	514	10	±5	±1000/0	83	560
	10D16W4_2412D1.5RP	24 (9-36)	496	10	±12	±416/0	86	390
	10D16W4_2415D1.5RP	24 (9-36)	496	10	±15	±333/0	86	200
	10D16W4_4805D1.5RP	48 (18-75)	257	8	±5	±1000/0	83	560
	10D16W4_4812D1.5RP	48 (18-75)	248	8	±12	±416/0	86	390
	10D16W4_4815D1.5RP	48 (18-75)	248	8	±15	±333/0	86	200

Typical characteristics

Temperature derating graph

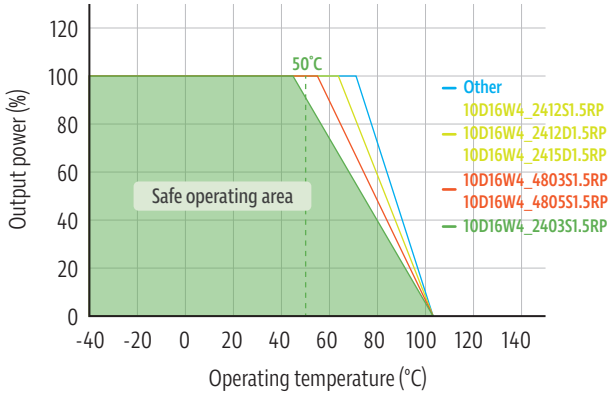


Figure 1

Typical circuit design and application

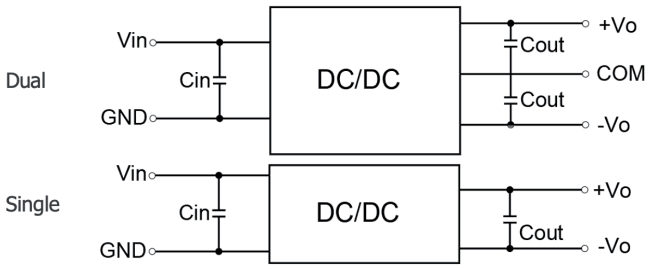


Figure 2

Recommended component parameters

Vin	24V	48V
Cin	220μF, ESR < 1.0Ω at 100 kHz	
Cout	10uF	10uF

Recommended EMC circuit diagram

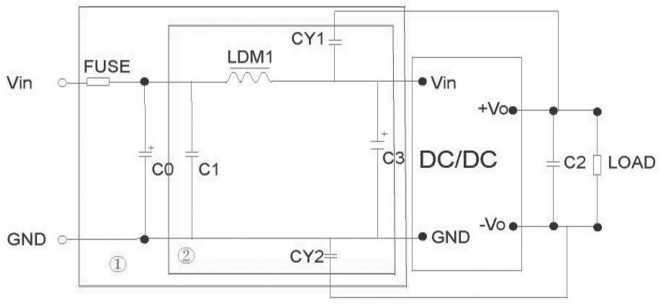


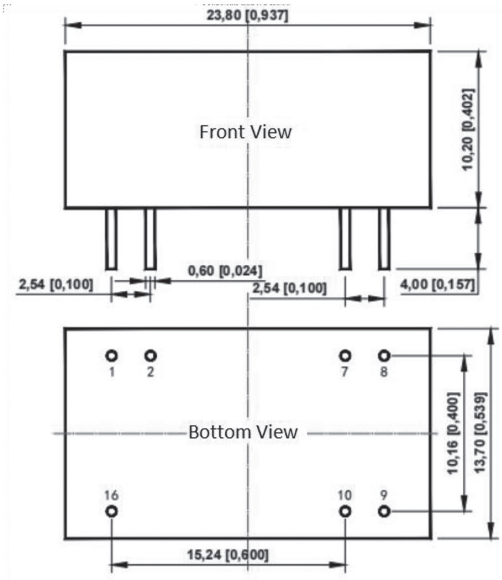
Figure 3

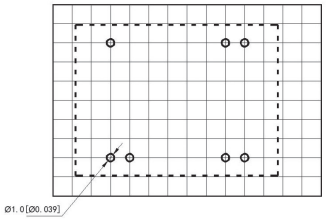
EMI Recommended component parameters

Vin (VDC)	24VDC	48VDC
FUSE	Choose according to actual input current	
C0, C3	330uF/50V	330uF/100V
C1	1uF/50V	1uF/100V
C2	Refer to the Cout in Fig.2	
LDM1	4.7uH	
CY1, CY2	1nF/2kV	

Note: Part ① of Figure 3 is used for EMS testing; Part 2 is used for EMI filtering and can be selected according to requirements.

Mechanical dimensions





The grid distance is 2.54 x 2.54mm

Pin Definition Table

Pin	Single	Dual
1	GND	GND
2	NO PIN	NO PIN
7	NC	NC
8	NC	COM
9	+Vo	+Vo
10	-Vo	-Vo
16	+Vin	+Vin

Note:
Unit: mm [inch]
Pin section tolerances: ±0.10 [±0.004]
General tolerances: ±0.50 [±0.020]