GAPTEC®
GREEN TECHNOLOGY

10DMW4_DS1.5 Series

10W - Dual separate Output - 4:1 Wide Input - Isolated & Regulated DC-DC Converter

DC-DC Converter 10 Watt

- 4:1 wide input voltage range
- Efficiency up to 84%
- 1.5KVDC isolation
- Short circuit protection (SCP)
- Output over voltage protection
- Output over current protection
- Operating Temperature range: -40°C ~ +85°C
- Input under-voltage protection
- Low no-load power consumption
- Industry standard pinout

The 10DMW4 series, with wide input of 18-75VDC, are specially designed for applications where a wide range input voltage power supplies are isolated from the input power supply in a distributed power supply system on a circuit board.

These products apply to:
1) Where the voltage of the input power supply is wide range (voltage range ≤ 4:1)
2) Where isolation is necessary between input and output (Isolation Voltage ≤ 1500VDC)
3) Where the regulation of the output voltage and the output ripple noise are demanded

Common specifications

Short circuit protection:	Continuous, automatic recovery
Cooling:	Free air convection
Operation temperature range:	-40°C~+85°C
Storage temperature range:	-55°C ~+125°C
Pin soldering resistance temperature:	300°C MAX, 1.5mm from case for 10 sec
Switching frequency* (PWM mode):	350KHz TYP
Storage humidity range:	< 95%
Vibration:	10-55Hz,10G,30 Min. along X, Y and Z
Case material:	Aluminium alloy
MTBF (MIL-HDBK-217F@25°C):	>1,000,000 hours
Weight:	13g
Dimensions:	25.40 × 25.40 × 11.70 mm

* Switching frequency is measured at full load. The module reduces the switching frequency for light load (below 50%) efficiency improvement.

Input specifications

Item	Test condition	Min	Typ	Max	Units
Input current (full load/no load)	Nominal input voltage		248/4	258/10	mA
Refl. ripple current			30		mA
Surge Voltage	1sec. max.	-0.7		100	VDC
Start-up voltage				18	VDC
Under-voltage protection		12	15.5		VDC
Input filter	Pi filter				
Ctrl [1]	• Models ON	Ctrl open or connect TTL high level(3.5-12VDC)			
	• Models OFF	Ctrl connect GND or low level (0-1.2VDC)			
	• Input current when switched OFF		3	10	mA
Hot plug	Unavailable				

1. The CTRL pin voltage is referenced to GND.

Output specifications

Item	Test condition	Min	Typ	Max	Units
Output voltage accuracy	• primary output, 0%-100% load		±1	±3	%
	• secondary output, input voltage, any balanced load		±3	±6	%
Linear regulation (at full load)	Input voltage variation from low to high				
	• primary output		±0.3	±0.5	%
	• secondary output		±2	±3	%
Load regulation	10%-100% load, dual output, balanced power				
	• primary output		±0.5	±1	%
	• secondary output		±3	±6	%
Transient recovery time [1]	25% load step change		300	500	µs
Transient response deviation [1]	25% load step change		±5	±8	%
Temperature coefficient	100% load			±0.03	%/°C
Ripple & Noise [2]	5%-100% load		75	150	mVp-p
Over voltage protection	Input voltage range	110		160	%Vo
Over current protection [3]	Input voltage range	110	150	200	%Io

1) Dynamic load only for primary output.
2) Ripple and noise tested by "parallel cable" method.
3) Dual output with balanced-load.

Isolation specifications

Item	Test condition	Min	Typ	Max	Units
Isolation voltage	• Input-output Electric Strength Test*	1500			VDC
	• Primary-Secondary Electric Strength Test*	500			VDC
Isolation resistance	Test at 500VDC	1000			MΩ
Isolation capacitance	Input/Output, 100KHz/0.1V		1000		pF

* for 1 minute with a leakage current of 1mA max.

Example:
10DMW4_480505DS1.5
10= 10Watt; D= DIP; M=series; W4= wide input (4:1) 18-75Vin; 5Vout; DS= dual separate output; 1.5=1500VDC

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10DMW4_DS1.5 Series

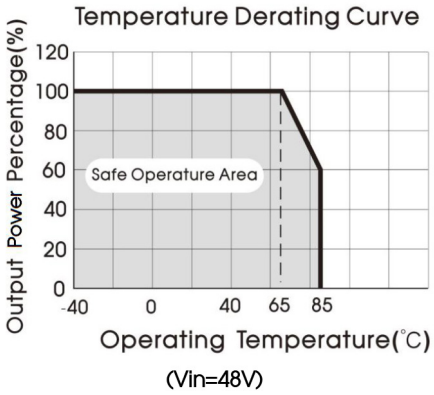
10W - Dual separate Output - 4:1 Wide Input - Isolated & Regulated
DC-DC Converter

EMC specifications				
EMI	CE	CISPR32/EN55032	CLASS B (External Circuit Refer to EMC recommended circuit, ②)	
EMI	RE	CISPR32/EN55032	CLASS B (External Circuit Refer to recommended circuit, ②)	
EMS	ESD	IEC/EN61000-4-2	Contact ±4KV/Air ±6KV	perf. Criteria B
EMS	RS	IEC/EN61000-4-3	10V/m	perf. Criteria A
EMS	EFT	IEC/EN61000-4-4	±2KV (See EMC recommended circuit, ①)	perf. Criteria B
EMS	Surge	IEC/EN61000-4-5	±2KV (See EMC recommended circuit, ①)	perf. Criteria B
EMS	CS	IEC/EN61000-4-6	3 Vr.m.s	perf. Criteria A
EMS	Voltage dips, short and interruptions immunity	IEC/EN61000-4-29	0%-70%	perf. Criteria B

Part Number [1]	Input Voltage [VDC]			Output Voltage [VDC]		Output current [mA]		Capacitive load [µF, Max.]		Efficiency [2]
	Nominal	Range	Max[1]	Primary (Vo1)	Secondary (Vo2)	Primary (Vo1)	Secondary (Vo2)	Primary (Vo1)	Secondary (Vo2)	[%, Typ.]
10DMW4_480505DS1.5	48	18-75	80	5	5	1000	1000	1000/1000		84
10DMW4_480512DS1.5	48	18-75	80	5	12	1000	417	1000/470		84
10DMW4_480524DS1.5	48	18-75	80	5	24	1000	209	1000/100		84

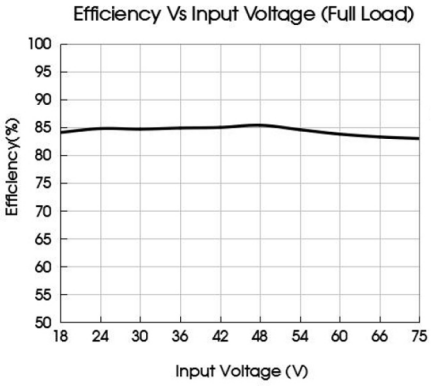
1) Absolute maximum rating without damage on the converter, but it isn't recommended;
2) Efficiency is measured In nominal input voltage and rated output load.

Typical characteristics

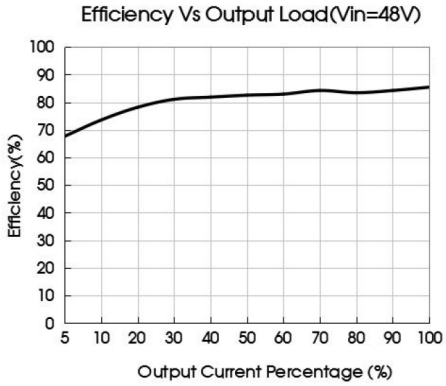


(Vin=48V)

Efficiency



10DMW4_480505DS1.5



10DMW4_480505DS1.5

Typical application

All the DC-DC converters of this series are tested before delivery using the recommended circuit shown in Fig. 1.
Input and/or output ripple can be further reduced by appropriately increasing the input & output capacitor values Cin and Cout and/or by selecting capacitors with a low ESR (equivalent series resistance).
Also make sure that the capacitance is not exceeding the max. capacitive load value of the product.

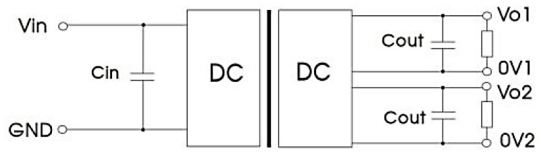
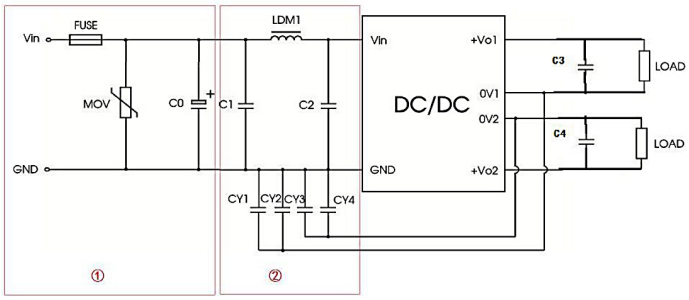


Figure 1

Vou t(VDC)	Cin (μF)	Cout (μF)
5	100	100
12	100	22
24	100	22

EMC compliance circuit



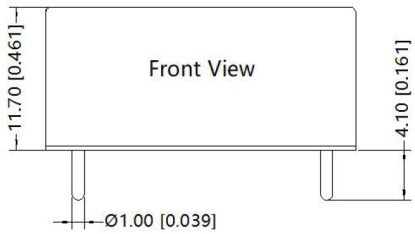
List of components:

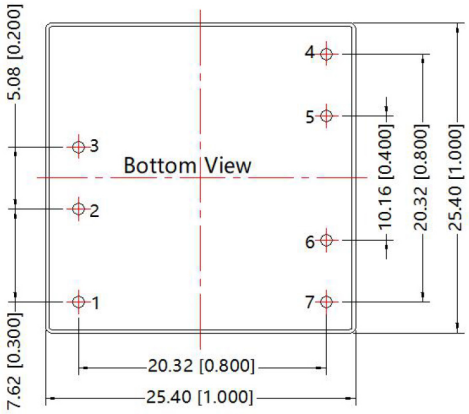
Model	Vin:48V
FUSE	Choose according to actual input current
MOV	S14K60
C0	330μF/100V
C1/ C2	4.7μF/100V
C3/ C4	
LDM1	15uH
CY1/ CY2/ CY3/ CY4	2.2nF/2000V

Note:
Part ① in the Fig. 3 is used for EMS test and part ② for EMI test

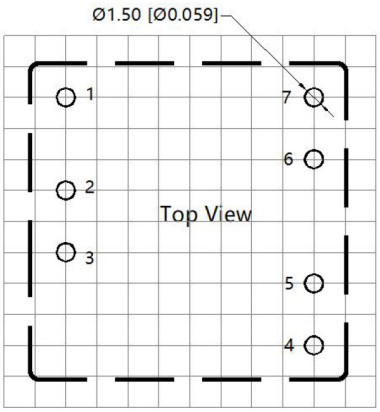
The product does not support output in parallel with power per liter.

Mechanical dimensions





THIRD ANGLE PROJECTION



Note:Grid 2.54*2.54mm

Pin-Out	
Pin	Function
1	Ctrl
2	GND
3	Vin
4	+Vo2
5	0V2
6	0V1
7	+Vo1

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

Note:
1. The maximum capacitive load offered were tested at input voltage range and full load;
2. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25°C, humidity<75%RH with nominal input voltage and rated output load;
3. All index testing methods in this datasheet are based on Company's corporate standards;
4. We can provide product customization service, please contact our technicians directly for specific information;
5. Products are related to laws and regulations: see „Features" and „EMC";
6. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.