GAPTEC®
GREEN TECHNOLOGY

15DMWE4_D1.5 Series

15W - Single Output - Wide Input - Isolated & Regulated
1" x 1" DC-DC Converter

DC-DC Converter 15 Watt

- Wide 4:1 input voltage range
- High efficiency up to 90%
- Short circuit protection (SCP)
- Isolation voltage: 1.5K VDC
- Over-current, over-voltage, under-voltage protection
- RoHS compliant
- Operating temperature range: -40°C to +105°C
- Meet CISPR32/EN55032 CLASS A, no external components
- International standard pin-out
- Wiring and rail mounting products featuring anti-reverse connection for input
- Meets EN62368 standards (pending)

The 15DMWE4_1.5 series are isolated 15W DC/DC converters with 2:1 input voltage. They feature efficiency up to 91%, 1500VDC isolation, operating temperature of -40°C to +105°C, input under-voltage protection, output over-voltage, output over-current, output short circuit protection and EMI meets CISPR32/EN55032 CLASS A.

They are widely applied in industrial control, electric power, instruments and communication fields. Extension packages with wiring mounting and rail mounting also enable them with reverse voltage protection.

Common specifications

Short circuit protection:	Continuous, self-recovery
Cooling:	Free air convection
Operation temperature range:	-40°C~+105°C (see temperature derating curve)
Storage temperature range:	-55°C~+125°C
Storage humidity range:	95% MAX
Lead temperature:	300°C MAX, 1.5mm from case for 10 sec
Vibration:	10-150Hz, 5G, 0.75mm. along X, Y and Z
Case material:	Aluminium alloy
MTBF (MIL-HDBK-217F @25°C):	1,000,000 hours
Weight:	15g / 35g (wiring) / 55g (rail)

Output specifications

Item	Test condition	Min	Typ	Max	Units
Voltage accuracy*	5%-100% load		±1	±3	%
Line regulation	Full load, low to high • positive output • negative output		 ±0.2 ±0.4	 ±0.5 ±1	 % %
Load regulation	5% load to full load		±0.5	±1	%
Cross regulation	Dual output, main circuit with 50% load, auxiliary circuit with 10%-100% load			±5	%
Transient recovery time	25% load step change		300	500	μs
Transient response deviation	25% load step change • 5V output • Others		 ±3 ±3	 ±8 ±5	 % %
Temperature drift	Full load			±0.03	%/°C
Ripple and noise*	20MHz Bandwidth		100	200	mVp-p
Over current protection	Input voltage range	110	200	270	%Io
Over voltage protection	Input voltage range	110		160	%Vo

* At 0%-5% load, the Max. output voltage accuracy converter is ±5%.
** 0%-5% load ripple&noise is no more than 5%Vo.
Ripple and noise are measured by "parallel cable" method.

Input specifications

Item	Test condition	Min	Typ	Max	Units
Input current* (full load/no load)	• 24VDC • 48VDC		958/10 969/5	-/20 -/11	mA mA
Reflected ripple current	Nominal input series		30		mA
Surge voltage	• 24VDC input • 48VDC input	-0.7 -0.7		50 100	VDC VDC
Starting voltage	• 24VDC input • 48VDC input			9 18	VDC VDC
Input under-voltage protection	• 24VDC input • 48VDC input	5.5 12	6.5 15.5		VDC VDC
Starting time			10		ms
Input filter	Pi Type				
Hot plug	Unavailable				
Switching frequency	PWM mode		270		KHz
Ctrl (The voltage of Ctrl pin is relative to input pin GND)	• Module switch on • Module switch off • Input current when switched off	Ctrl suspended or connected to TTL high level (3.5-12VDC) Ctrl pin connected to GND or low level (0-1.2VDC) 	 2	 7	 mA

* Nominal input series, nominal input voltage

Isolation specifications

Item	Test condition	Min	Typ	Max	Units
Isolation voltage	Input to output	1500			VDC
Isolation voltage	Input to output, respectively on the shell	1000			VDC
Isolation resistance	Test at 500VDC	1000			MΩ
Isolation capacitance	Input-output, 100KHz/0.1V		2000		pF

Example:
15DMWE4_2415D1.5
15= 15Watt; D= DIP; M= series; W4= wide input (4:1); E= cost effective; 9-36Vin; ±15Vout; D= dual output; 1.5= 1500VDC

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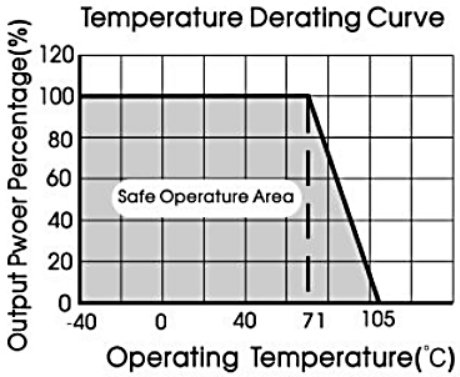
EMC specifications				
EMI	CE	CISPR32/EN55032	CLASS A (without external components) CLASS B (see EMC solution recommended circuit, ②)	
EMI	RE	CISPR32/EN55032	CLASS A (without external components) CLASS B (see EMC solution recommended circuit, ②)	
EMS	ESD	IEC/EN61000-4-2	Contact ±4KV	perf. Criteria B
EMS	RS	IEC/EN61000-4-3	10V/m	perf. Criteria A
EMS	EFT	IEC/EN61000-4-4	±2KV (see EMC solution recommended circuit, ①)	perf. Criteria B
EMS	Surge	IEC/EN61000-4-5	line to line ±2KV (see EMC solution recommended circuit, ①)	perf. Criteria B
EMS	CS	IEC/EN61000-4-6	3 Vr.m.s	perf. Criteria A

Part Number	Input Voltage [VDC]			Output Voltage [VDC]	Output Current [mA]	Efficiency [%, Typ.]***	Capacitive load [µF, Max.]
	Nominal	Range*	Max**		Full load		
15DMWE4_2405D1.5	24	9-36	40	±5	±1500	87	1500
15DMWE4_2412D1.5	24	9-36	40	±12	±625	90	470
15DMWE4_2415D1.5	24	9-36	40	±15	±500	90	330
15DMWE4_2424D1.5	24	9-36	40	±24	±312	89	200
15DMWE4_4805D1.5	48	18-75	80	±5	±1500	86	1500
15DMWE4_4812D1.5	48	18-75	80	±12	±625	90	470
15DMWE4_4815D1.5	48	18-75	80	±15	±500	90	330
15DMWE4_4824D1.5	48	18-75	80	±24	±312	90	200

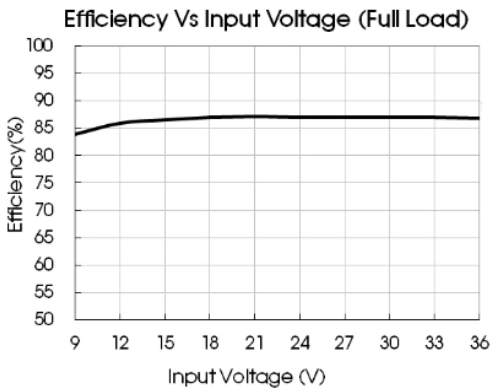
Add suffix CM for chassis mounting, f.ex. 15DMWE4_1203D1.5CM, or suffix RM for rail mounting, f.ex. 15DMWE4_1203D1.5RM.

* The minimum input voltage and starting voltage of wring or rail models are 1VDC higher than those of DIP package due to input reverse polarity protection function.
** Absolute maximum rating without damage on the converter, but it isn't recommended.
*** Efficiency is measured in nominal input voltage and rated output load; for wiring and rail mounting models, due to input reverse polarity protection, a minimum efficiency greater than Min.-2 is qualified.

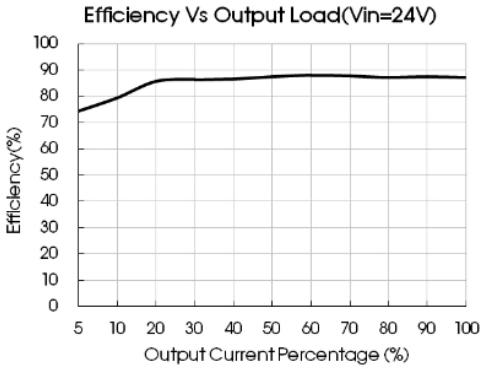
Typical characteristics



Efficiency



15DMWE4_2405D1.5



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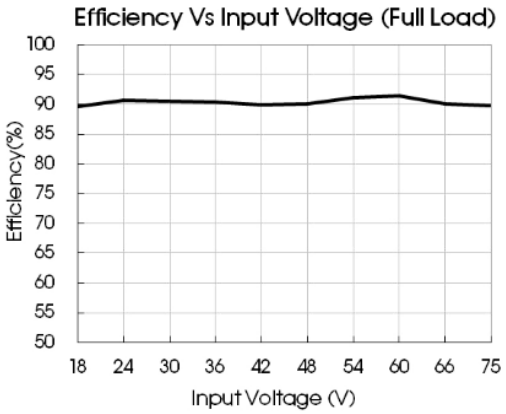

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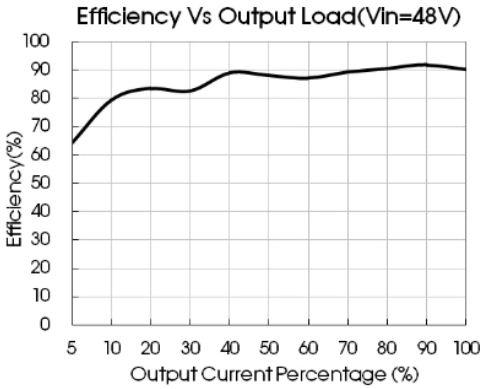


15DMWE4_2415D1.5

Typical application

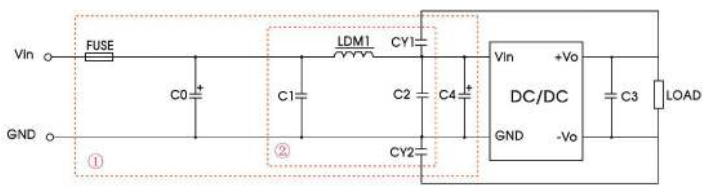
All the DC/DC converters of this series are tested according to the recommended circuit before delivery.

If it is required to further reduce input and output ripple, properly increase the input & output of additional capacitors Cin and Cout or select capacitors of low equivalent impedance provided that the capacitance is no larger than the max. capacitive load of the product.

Dual Output

Vin	24V	48V
Cin1	100μF	10μF -47μF
Cout	10μF	

EMC solution-recommended circuit



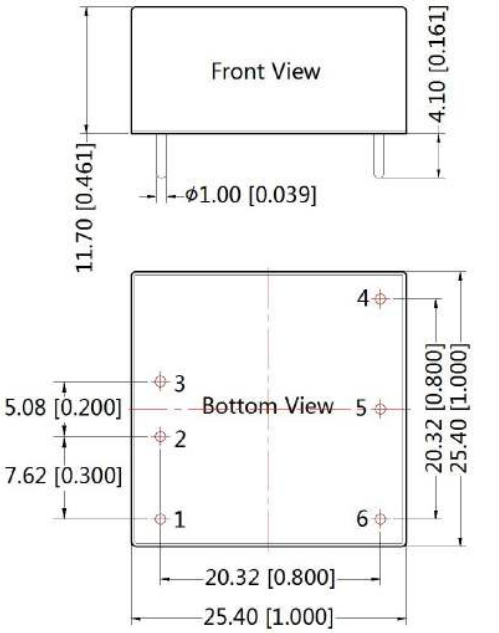
Notes: Part ① in the Fig. 3 is used for EMC test and part ② for EMI filtering; selected based on needs.

Parameter description:

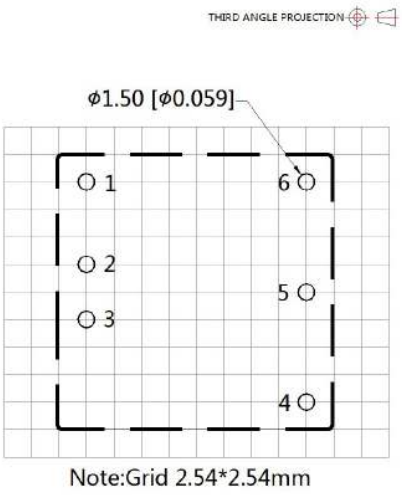
Model	Vin:24V	Vin:48V
FUSE	Choose according to actual input current	
C0, C4	330μF/50V	330μF/100V
C1, C2	4.7μF/50V	4.7μF/100V
C3	Refer to the Cout in typical application	
LDM1	4.7μH	
CY1, CY2	1nF/2KV	

It is not allowed to connect modules output in parallel to enlarge the power.

Mechanical dimensions and footprint



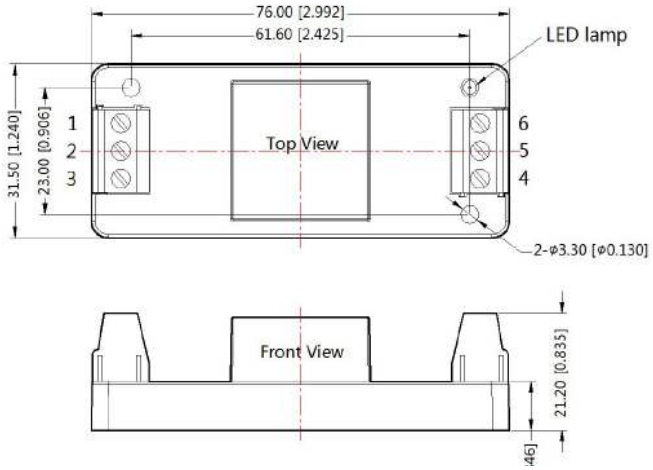
Note:
Unit: mm[inch]
Pin diameter tolerances: ±0.10[±0.004]
General tolerances: ±0.50[±0.020]



Note:Grid 2.54*2.54mm

Pin-Out	
Pin	Dual
1	Ctrl
2	GND
3	Vin
4	+Vo
5	0V
6	-Vo

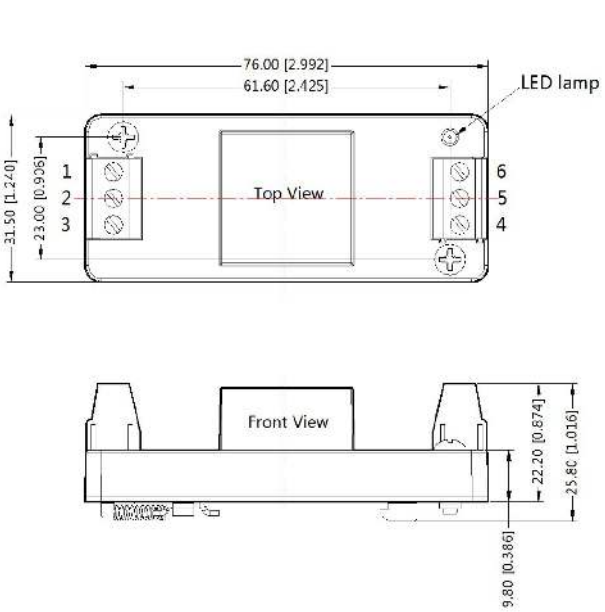
Wiring mounting



Pin-Out						
Pin	1	2	3	4	5	6
Function	Ctrl	GND	Vin	+Vo	0V	-Vo

Note:
Unit: mm[inch]
Wire range: 24-12 AWG
Tightening torque: Max 0.4 N·m
General tolerances: ±1.00[±0.039]

Rail mounting



Pin-Out						
Pin	1	2	3	4	5	6
Function	Ctrl	GND	Vin	+Vo	0V	-Vo

Note:
Unit: mm[inch]
Mounting rail: TS35
Wire range: 24-12 AWG
Tightening torque: Max 0.4 N·m
General tolerances: ±1.00[±0.039]

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 measured at TA=25°C, humidity<75%, nominal input voltage and rated output load unless otherwise specified.
3. In this datasheet, all the test methods of indications are based on corporate standards.