3T14W4_1.5RP series

3W - Single Output DC-DC Converter - Wide Input - Isolated & Regulated

DC-DC Converter 3 Watt

- 4:1 Wide input voltage range
- Operating temperature: -40°C ~ +85°C
- Efficiency up to 84%
- 1.5kVDC isolation
- No-load power consumption as low as 0.10W
- Int. standard pin-out
- Short circuit protection (automatic recovery)
- Input under-voltage protection
- Over-current protection
- IEC60950, UL60950, EN60950 approved

The 3T14W4_1.5RP series are of 3W output power, extremely wide range of voltage input of 9-36VDC, 18-75VDC, isolation voltage of 1500VDC, Input under-voltage protection, output short circuit protection and over-current protection.

These products are widely used in fields such as industrial control, electric power, instruments and communication.

UL-60950-1 (E347551)

Common specifications

Short circuit protection:	Hiccup, automatic recovery
Temperature rise at full load:	40°C TYP
Cooling:	Free air convection
Operation temperature range:	-40°C~+85°C
Storage temperature range:	-55°C ~+125°C
Lead temperature range:	300°C MAX, 1.5mm from case for 10 sec
Storage humidity range:	< 95%
Reflow Soldering Temperature:	Peak temp. ≤245°C, maximum duration time ≤60sat 217°C. For actual application, refer to IPC/JEDEC J-STD-020D.1.
Vibrating:	10-55Hz, 10G, 30 Min. along X, Y and Z
Case material:	Epoxy Resin [UL94-V0]
MTBF (MIL-HDBK-217F@25°C):	>1,000,000 hours
Weight/Dimensions:	3.5g - 19.20 x 18.10 x 10.16 mm

Input specifications

Item	Test condition	Min	Typ	Max	Units
Input current (full load/no load)	• 24VDC input - 3.3V output - 24V output - others • 48VDC input - 3.3V output - others		 134/4 152/4 154/4 67/4 77/4	 138/7 156/12 161/7 69/7 82/7	 mA mA mA mA mA
Reflected ripple current	• 24VDC input • 48VDC input		120 60		mA mA
Surge voltage (1sec. max.)	• 24VDC input • 48VDC input	-0.7 -0.7		50 100	VDC VDC
Start-up voltage	• 24VDC input • 48VDC input			9 18	VDC VDC
Input under-voltage protection	• 24VDC input • 48VDC input	5.5 13	6.5 15.5		VDC VDC
Start-up time	Nominal input & constant resistance load		10		ms
Input filter	Pi				
Hot plug	Unavailable				
Ctrl [1]	• Models ON • Models OFF • Input current (Models OFF)	Ctrl suspended or connected to TTL high level (3.5-12VDC) Ctrl pin connected to GND or low level (0-1.2VDC)			
			6	10	mA

[1] Please refer to „Application note“ as the direction for use of Ctrl .

Output specifications

Item	Test condition	Min	Typ	Max	Units
Output voltage accuracy			±1	±3	%
Line regulation	Full load, Input voltage from low to high		±0.2	±0.5	%
Load regulation	5% to 100% load		±0.5	±1	%
Transient recovery time	25% load step change		300	500	µs
Transient response deviation	25% load step change		±3	±5	%
Temperature drift	100% full load			±0.03	%/°C
Ripple & Noise[1]	20MHz Bandwidth		30	120	mVp-p
Over current protection	Input voltage range	150		250	%Io

1) Ripple & noise are measured by “parallel cable” method, please see DC-DC Converter Application Notes for specific operation. 0%-5% load ripple&Noise is no more than 5%Vo.

Isolation specifications

Item	Test condition	Min	Typ	Max	Units
Isolation voltage	Tested for 1 minute, leakage current less than 1 mA	1500			VDC
Isolation resistance	Test at 500VDC	1000			MΩ
Isolation capacitance	Input/Output, 100KHz/0.1V		1000		pF

Example:
3T14W4_2405S1.5RP
3 = 3Watt; T14 = SMT14; W4 = Wide Input (4:1); 24Vin; 5Vout;
S = Single Output; 1.5 = 1.5kVDC; R = Regulated Output;
P = Short Circuit Protection

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sales@gaptec-electronic.com – www.gaptec-electronic.com

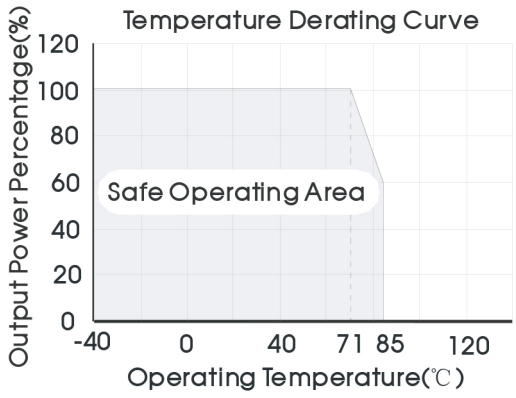
EMC specifications				
EMI	CE	CISPR22/EN55022	CLASS B (External Circuit Refer to EMC recommended circuit ②)	
EMI	RE	CISPR22/EN55022	CLASS B (External Circuit Refer to EMCrecommended circuit ②)	
EMS	ESD	IEC/EN61000-4-2	Contact ±4KV	perf. Criteria B
EMS	RS	IEC/EN61000-4-3	10V/m	perf. Criteria A
EMS	EFT	IEC/EN61000-4-4	±2KV	perf. Criteria B (External Circuit Refer to EMC recommended circuit ①)
EMS	Surge	IEC/EN61000-4-5	±2KV	perf. Criteria B (External Circuit Refer to EMC recommended circuit ①)
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

Product Selection Guide

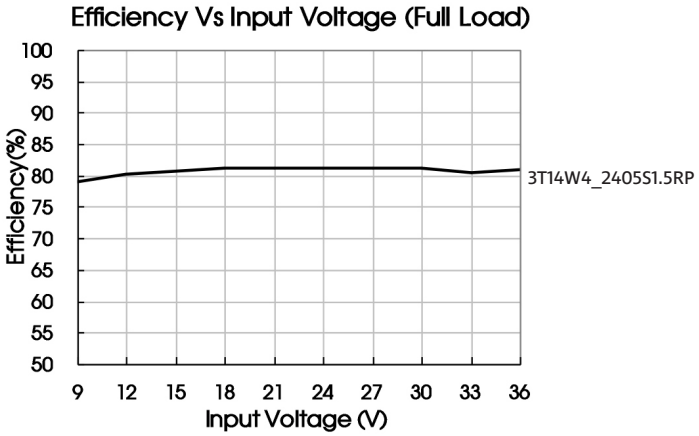
Part Number	Input Voltage [VDC]			Output Voltage [VDC]	Output Current [mA, Max]	Efficiency** [%, Typ.]	Capacitive load [µF, Max]
	Nominal	Range	Max*				
3T14W4_2403S1.5RP	24	9-36	40	3.3	728	75	2200
3T14W4_2405S1.5RP	24	9-36	40	5	600	80	2200
3T14W4_2409S1.5RP	24	9-36	40	9	333	80	1000
3T14W4_2412S1.5RP	24	9-36	40	12	250	82	680
3T14W4_2415S1.5RP	24	9-36	40	15	200	83	470
3T14W4_2424S1.5RP	24	9-36	40	24	125	82	100
3T14W4_4803S1.5RP	48	18-75	80	3.3	728	75	2200
3T14W4_4805S1.5RP	48	18-75	80	5	600	79	2200
3T14W4_4812S1.5RP	48	18-75	80	12	250	82	680
3T14W4_4815S1.5RP	48	18-75	80	15	200	84	470
3T14W4_4815S1.5RP	48	18-75	80	24	125	82	100

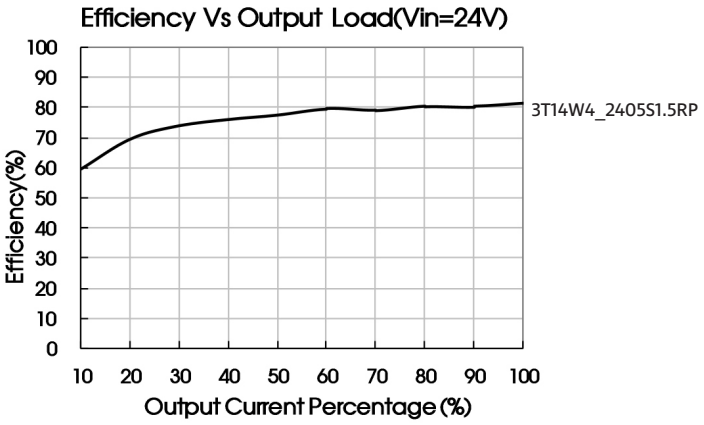
* Input voltage can't exceed this value, or will cause the permanent damage.
** The efficiency value is measured in the input nominal voltage and output rated load.

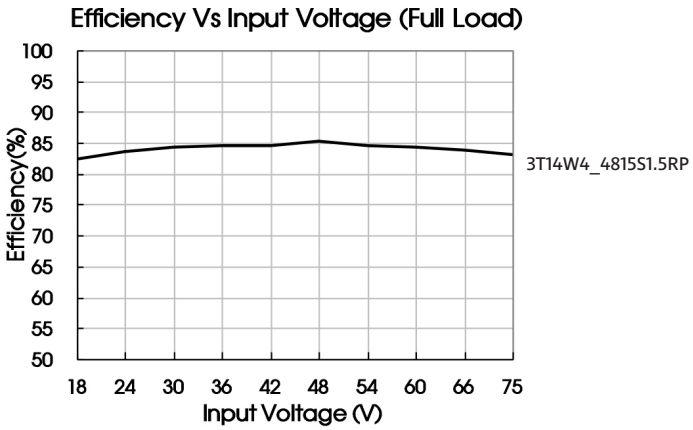
Typical characteristics

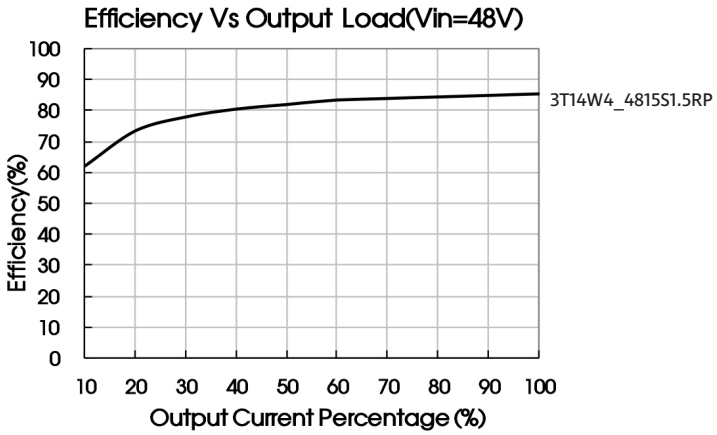


Efficiency









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 in-cease the input & output of additional capacitors Cin and Cout or select capacitors of low equivalent impedance provided that the capa-citance is no larger than the max. capacitive load of the product.

Vin(VDC)	Cin	Vo(VDC)	Cout
24	100μF/50V	3.3/5/9	10μF/16V
		12/15	10μF/25V
		24	10μF/50V
48	10μF/100V -47μF/100V	3.3/5	10μF/16V
		12/15	10μF/25V
		24	10μF/50V

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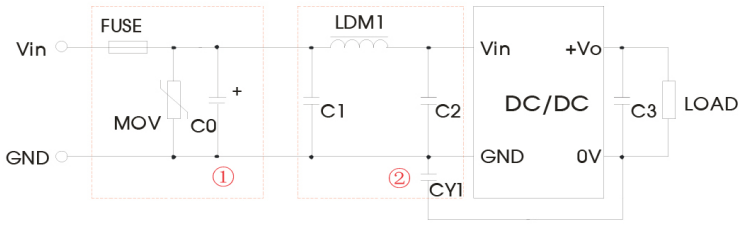
EMC solution-recommended circuit

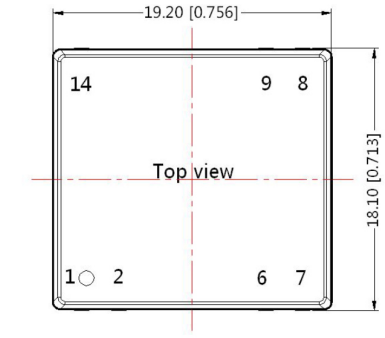


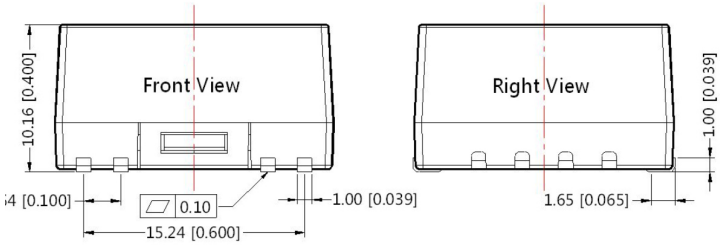
Notes: We use Part „1" in Fig. 3 for immunity and part „2" for emissions test.
Selecting based on needs.

Parameter description

Model	Vin: 24V	Vin: 48V
FUSE	Choose according to actual input current	
MOV	S20K30	S14K60
C0	680μF/50V	680μF/100V
C1, C2	4.7μF/50V	4.7μF/100V
C3	Refer to the Cout in Typical aplication	
LDM1	12μH	
CY1	1nF/2KV	

Mechanical dimensions

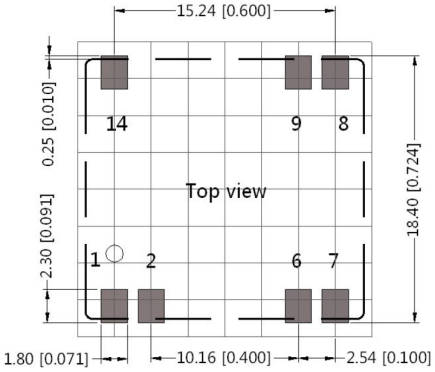




Note:
Unit: mm[inch]
Pin section tolerances: ± 0.10mm[± 0.04inch]
General tolerances: ± 0.50mm[± 0.020inch]

Recommended footprint

THIRD ANGLE PROJECTION



Note: Grid 2.54*2.54mm

Pin-Out	
Pin	Function
1	GND
2	Ctrl
6	NC
7	NC
8	+Vo
9	0V
14	Vin

NC: Pin to be isolated from circuitry

Note:
1. The max. capacitive load should be tested within the input voltage range and under full load conditions;
2. If the product needs to be cleaned after welding, please wait to completely dried before electrical use it;
3. 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;
4. All index testing methods in this datasheet are based on our Company's corporate standards;
5. We can provide product customization service, please directly contact our technicians for specific information;
6. Specifications of this product are subject to changes without prior notice.

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sales@gaptec-electronic.com – www.gaptec-electronic.com