1TM14R1_3UP series

1W - Single Output DC-DC converter - Isolated & Unregulated

DC-DC Converter 1 Watt

- DFN package type
- Operating temperature range: -40°C to +105°C
- 3000VDC isolation
- Up to 81% efficiency
- International standard pinning
- MTBF: 3,500,000 hours

Introducing our new 1TM14R1_3UP series, a compact and highly reliable isolated DC-DC converter platform designed for space-constrained and globally deployed applications. Housed in a miniature DFN package measuring just 9.00 × 7.00 × 4.20 mm and weighing only 0.5 grams (typ.), the series combines high power density with robust electrical performance. It provides 3000 VDC isolation, operates reliably across a wide temperature range from –40°C to +105°C, and achieves efficiencies of up to 82 percent. With international standard pinning and an MTBF of 3,500,000 hours, the 1TM14R1_3UP series ensures long-term reliability and seamless integration into industrial and high-performance systems worldwide.

Common specifications

Short circuit protection	Continuous, self recovery
Switching frequency	220kHz (typ.) full load, nominal input voltage
Operating temperature	-40°C - +105°C (with derating)
Storage temperature	-55°C - +125°C
Case temperature rise	+15°C typ. (Ta = 25°C, Input nominal, output full load)
Pin solder temperature resistance	300°C, solder joint distance from housing: 1.5mm for 10s
Storage humidity	95% RH (non condensing)
Input filter	Capacitance filter
Hot plug	Unavailable
MTBF (MIL-HDBK-217F@25°C)	> 3,500,000 hours
Case material	Black plastic; flame-retardant and heat-resistant (UL94V-0 rated)
Mechanical dimensions	9.00 x 7.00 x 4.20mm
Weight	0.5g (typ.)
Cooling method	Free air convection

Input specifications

Item	Operating condition	Min	Typ	Max	Units
Input current (full load/no load)	5VDC input		238/8	260/15	mA
Reflected ripple current			15		mA
Impulse voltage	5VDC input	-0.7		9	VDC

Example:
1TM14R1_0505S3UP
1 = 1Watt; TM14 = DFN; R1 = Revised; 05 = 05Vin; 05 = 05Vout; S = Single Output; 3 = 3kVDC isolation; U = Unregulated Output; P = Short circuit protection.

Output specifications

Item	Operating condition	Min	Typ	Max	Units
Output voltage accuracy	See envelope curve figure. 1				
Linear regulation	Input voltage variation ±1% 5VDC output		±1.2		%
Load regulation	10% - 100% load 5VDC output		8		%
Ripple & noise	20MHz bandwidth		50	100	mV
Temperature coeffcient	Full load		±0.02		%/°C

Isolation specifications

Item	Operating conditions	Min	Typ	Max	Units
Isolation voltage	Input-output, test time 1 minute, leakage current less than 1mA	3000			VDC
Isolation resistance	Input-output, isolated voltage 500VDC	1000			MΩ
Isolation capacitance	Input-output, 100kHz/0.1V		20		pF

EMC specifications

EMI	CE	CISPR32/EN55032 CLASS B (see figure. 4 for EMC recommended circuit)
EMI	RE	CISPR32/EN55032 CLASS B (see figure. 4 for EMC recommended circuit)
EMS	ESD	IEC/EN61000-4-2 contact ±6kV perf. criteria B

1. The soldering design of this product may refer to IPC7093
2. The input votage should not exceed the specified range value, otherwise it may cause permanent and irreparable damage:
3. 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;
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 datasheet are measured at Ta = 25°C, humidity <75% RH, nominal input voltage, and output rated load;
6. Indicator testing methods in the datasheet are based on our company's standards;
7. For specific requirements please contact our technical team directly;
8. Product specifications are subject to change without prior notice.

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

Product Selection Guide

Approval	Model	Input Voltage (VDC) Nominal	Output Voltage (VDC)	Output Current max./min. (mA)	Full Load Efficiency % (typ.)	Capacitive Load (µF) max.
	1TM14R1_0505S3UP	5	5	200/20	81	2400

Product characteristic curve

Output regulation curve

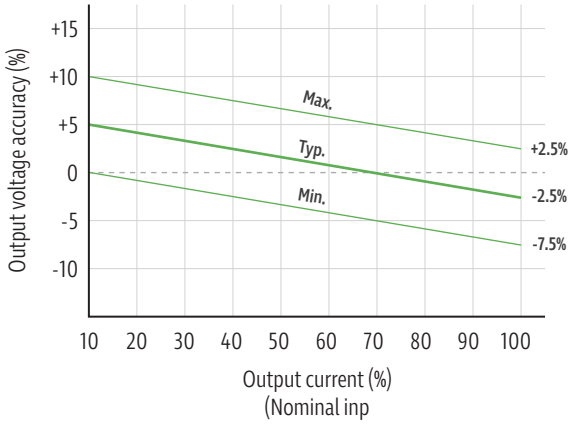


Figure 1

Temperature derating graph

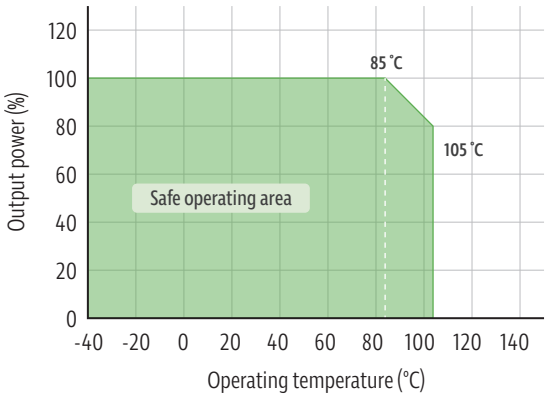


Figure 2

Recommended circuits for application

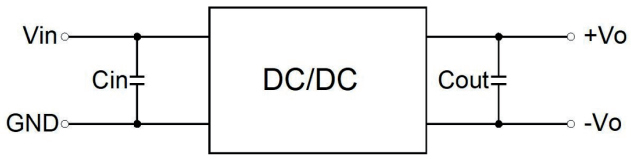


Figure 3

Recommended capacitive load value table

Vin	Cin	Vo	Cout
5VDC	4.7uF/16V	5VDC	10µF/16V

Recommended EMC circuit

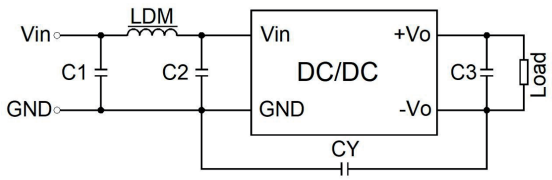


Figure 4

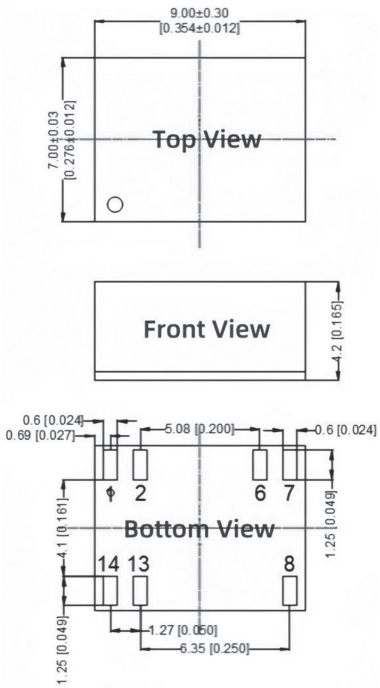
EMC recommended parameter table		
EMI	C1, C2	4.7µF /25V
	C3	Refer to the Cout parameter in Figure. 3
	CY	1000pF/3kV
	LDM	6.8µH

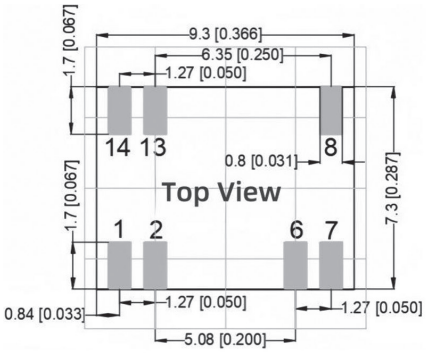
1. Typical applications
To further reduce input and output ripple, a capacitor filtering network can be connected at the input and output terminals. The application circuit is shown in figure 3. However, care should be taken to select a suitable filter capacitor. If the capacitance is too large, it is likely to cause start-up problems. For each output, the recommended capacitive load values are shown in "Recommended capacitive load value table" for safe and reliable operation.

2. See figure 4 for EMC recommended circuit.

3. Output load requirements
In order to ensure that the module can work efficiently and reliably, the minimum output load should not be less than 10% of the rated load when used. If the power required is really small, connect a resistor in parallel to the output end (the sum of the power consumed by the resistance and the power actually used is greater than or equal to 10% of the rated power).

Mechanical Dimensions





The grid distance is 2.54mm x2.54mm

Pin Definition Table

Pin	Function
1,2	GND
6,7	-Vo
8	+Vo
13,14	Vin

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