

2D16A & 2T16A Series

2W- Single Output DC-DC Converter - Fixed Input - Isolated & Unregulated
 ULTRAMINIATURE SMD PACKAGE



DC-DC Converter

2 Watt

- ⊕ High Efficiency up to 80%
- ⊕ DIP/SMD Package
- ⊕ 6KVDC Isolation
- ⊕ Temperature Range: -40°C to +85°C
- ⊕ Internal SMD Construction
- ⊕ No Heat Sink Required
- ⊕ No External Component Required
- ⊕ Continuous Short Circuit Protection (SCP)
- ⊕ Industry Standard Pinout
- ⊕ RoHS Compliance



RoHS

The 2D16A & 2T16A Series are specially designed for applications where a group of polar 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 fixed (voltage variation $\leq \pm 10\%$)
- 2) Where isolation is necessary between input and output (isolation voltage $\leq 6000\text{VDC}$)
- 3) Where the regulation of the output voltage and the output ripple noise are not demanding

Such as: purely digital circuits, ordinary low frequency analog circuits, and IGBT power device driving circuits.

Common specifications

Short circuit protection*:	Continuous, automatic recovery
Temperature rise at full load:	25°C MAX, 15°C TYP
Cooling:	Free air convection
Operation temperature range:	-40°C – +85°C
Storage temperature range:	-55°C – +125°C
Lead temperature	260°C MAX, 1.5mm from case for 10 sec
Storage humidity range:	< 95%
Package material:	Epoxy Resin [UL94-V0]
MTBF:	>3,500,000 hours
Weight:	3.8g

Isolation specifications

Item	Test condition	Min	Typ	Max	Units
Isolation voltage	Tested for 1 minute and 1mA max	6000			VDC
Isolation resistance	Test at 500VDC	1000			MΩ
Isolation capacitance			10		pF

Model selection:

WCTP_xxyyN##O**

W= Watt; **C**= Case; **T**= Type; **P**= Pinning; ******= Voltage Variation (omitted $\pm 10\%$); **xx**= Vin; **yy**= Vout; **N**= Numbers of Output; **##**= Isolation (kVDC); **O**= output regulation

Example:

2D16A_0505S6UP

2=2Watt; **D16**= DIP16; **A**=Pinning; **5Vin**; **5Vout**; **S**=Single Output; **6**=6kVDC; **U**=Unregulated Output; **P**=Short Curcuit Protection

Note:

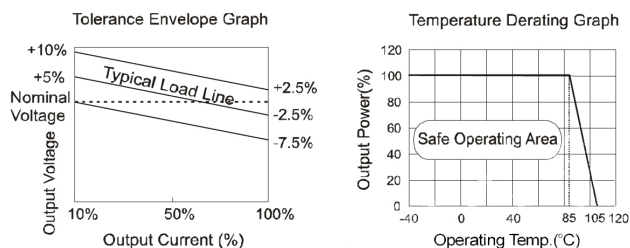
1. Operation under minimum load will not damage the converter; However, they may not meet all specification listed.
2. All specifications measured at Ta=25°C, humidity<75%, nominal input voltage and rated output load unless otherwise specified.
3. In this datasheet, all the test methods of indications are based on corporate standards.
4. Only typical models listed, other models may be different, please contact our technical person for more details.

Part Number	Input Voltage [V]	Output Voltage [VDC]	Current [mA]	Efficiency [%, max]	Package
2D16A_0505S6UP	5	5	400	76	DIP16
2D16A_0512S6UP	5	12	167	79	DIP16
2D16A_0515S6UP	5	15	133	78	DIP16
2D16A_1205S6UP	12	5	400	76	DIP16
2D16A_1212S6UP	12	12	167	80	DIP16
2D16A_1215S6UP	12	15	133	79	DIP16
2D16A_2405S6UP	24	5	400	77	DIP16
2D16A_2412S6UP	24	12	167	80	DIP16
2D16A_2415S6UP	24	15	133	78	DIP16
2T16A_0505S6UP	5	5	400	76	SMT16
2T16A_0512S6UP	5	12	167	79	SMT16
2T16A_0515S6UP	5	15	133	78	SMT16
2T16A_1205S6UP	12	5	400	76	SMT16
2T16A_1212S6UP	12	12	167	80	SMT16
2T16A_1215S6UP	12	15	133	79	SMT16
2T16A_2405S6UP	24	5	400	77	SMT16
2T16A_2412S6UP	24	12	167	80	SMT16
2T16A_2415S6UP	24	15	133	78	SMT16

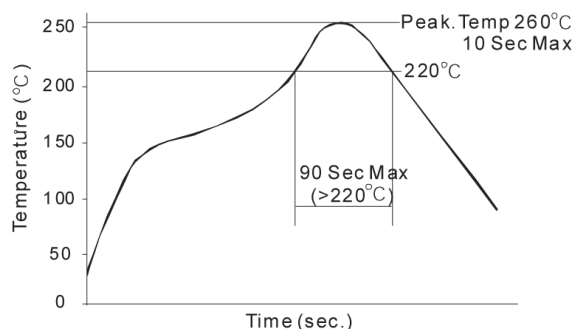
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Typical characteristics



Recommended reflow soldering profile



Output specifications

Item	Test condition	Min	Typ	Max	Units
Output power		0.2		2	W
Line regulation	For Vin change of 1%			± 1.2	%
Load regulation	10% to 100% load				
	• 5V output		12.8	15	%
	• 12V output		6.8	15	%
	• 15V output		6.3	15	%
Output voltage accuracy	See tolerance envelope graph				
Temperature drift	100% full load			0.03	%/°C
Output Ripple & Noise*	20MHz Bandwidth		150	200	mVp-p
Switching frequency	Full load, nominal input		50		KHz

*Test ripple and noise by "parallel cable" method. See detailed operation instructions at Testing of Power Converter section, application notes.

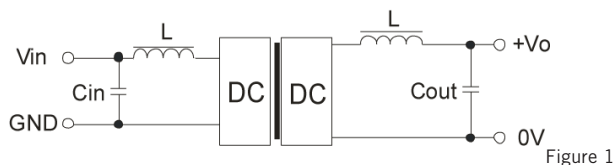
Application note

1) Requirement on output load

To ensure this module can operate efficiently and reliably, a minimum load is specified for this kind of DC/DC converter in addition to a maximum load (namely full load). During operation, make sure the specified range of input voltage is not exceeded, the minimum output load is not less than 10% of the full load, and that this product should never be operated under no load! If the actual output power is very small, please connect a resistor with proper resistance at the output end in parallel to increase the load, or use our company's products with a lower rated output power.

2) Recommended testing circuit

If you want to further decrease the input/output ripple, an "LC" filtering network may be connected to the input and output ends of the DC/DC converter, see (Figure 1).



Vin (VDC)	Cin (μF)	Single Vout (VDC)	Cout (μF)
5	4.7	5	10
12	2.2	12	2.2
24	0.47	15	1

Table 1

It's not recommended to connect any external capacitor in the application field with less than 0.5 watt output.

It should also be noted that the inductance and the frequency of the "LC" filtering network should be staggered with the DC/DC frequency to avoid mutual interference. However, the capacitance of the output filter capacitor must be proper. If the capacitance is too big, a startup problem might arise. For every channel of output, provided the safe and reliable operation is ensured, the recommended capacitance of its filter capacitor sees (Table 1).

3) Output Voltage Regulation and Over-voltage Protection Circuit

The simplest device for output voltage regulation, over-voltage and over-current protection is a linear voltage regulator with overheat protection that is connected to the input or output end in series (Figure 2).

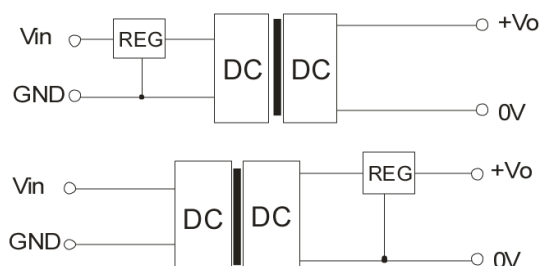


Figure 2

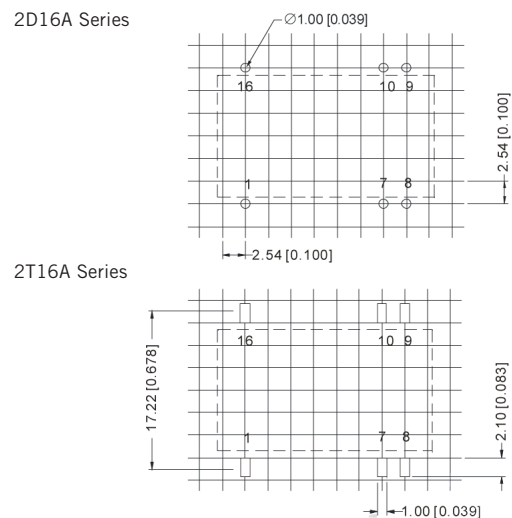
4) Overload Protection

Under normal operating conditions, the output circuit of these products has no protection against overload. The simplest method is to connect a self-recovery fuse in series at the input end or add a circuit breaker to the circuit.

5) No parallel connection or plug and play

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Recommended footprint



FOOTPRINT DETAILS	
Pin	Function
1	GND
7	NC
8	NC
9	+Vo
10	0V
16	Vin

NC:No Connection

Unit: mm[inch]
Pin section tolerances: $\pm 0.10\text{mm}$ [$\pm 0.039\text{inch}$]
General tolerances: $\pm 0.25\text{mm}$ [$\pm 0.010\text{inch}$]

Technical drawing of a stepped shaft with the following dimensions (mm) and tolerances (in brackets):

- Overall length: 20.70 [0.815]
- Distance from left end to first step: 13.80 [0.543]
- Distance from left end to second step: 11.30 [0.445]
- Distance from left end to third step: 0.60 [0.024]
- Distance from left end to fourth step: 10.00 [0.394]
- Distance from left end to fifth step: 8.80 [0.346]
- Distance from left end to sixth step: 14.40 [0.567]

L=220mm[8.661inch]
Devices per tube quantity: 8pcs