MORNSUN

D_T-2W Series

2W, FIXED INPUT, ISOLATED & UNREGULATED TWIN OUTPUT ULTRAMINIATURE SMD PACKAGE

multi-country patent protection **RoHS**

FEATURES

Efficiency up to 85%
Small Footprint
SMD Package
Twin Independent Output
Industry Standard Pinout
No Heat sink Required
1KVDC Isolation
High Power Density
Temperature Range: -40°C to +85°C
No External Component Required
Internal SMD construction
RoHS Compliance

APPLICATIONS

The D_T-2W 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 ≤±10%);

2) Where isolation is necessary between input and output (isolation voltage ≤1000VDC);

3) Where the regulation of the output voltage and the output ripple and noise are not demanding.

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

MODEL SELECTION

D0505 05 T - 2W

- Rated Power
- Package Style
- The 2nd Output Voltage
- The 1st Output Voltage
- Input Voltage
- Product Series

PRODUCT PROGRAM

Part Number	Input		Output			Efficiency (%, Typ)	Package Style
	Voltage (VDC)		Voltage (VDC)	Current (mA)			
	Nominal	Range		Max	Min		
D050505T-2W	5	4.5-5.5	5	200	20	82	SMD
D050909T-2W *			9	112	12	83	SMD
D051212T-2W *			12	84	9	84	SMD
D051515T-2W *			15	67	7	85	SMD
D120505T-2W	12	10.8-13.2	5	200	20	82	SMD
D120909T-2W *			9	112	12	83	SMD
D121212T-2W *			12	84	9	84	SMD
D121515T-2W *			15	67	7	85	SMD

Designing.
Note: The D_T-1W series also are available in our company.

ISOLATION SPECIFICATIONS

Item	Test condition	Min	Typ	Max	Units
Isolation voltage	Tested for 1 minute and 1 mA max(Vin/Vout)	1000			VDC
	Tested for 1 minute and 1 mA max(Vo1/Vo2)	1000			
Isolation resistance	Test at 500VDC(Vin/Vout)	1000			MΩ
	Test at 500VDC(Vo1/Vo2)	1000			
Isolation capacitance	(Vin/Vout)		60		pF
	(Vo1/Vo2)		60		

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% full load(5V Output)		12.8	15	
	10% to 100% full load(9V Output)		8.3	10	
	10% to 100% full load(12V Output)		6.8	10	
	10% to 100% full load(15V Output)		6.0	10	
Output voltage accuracy	See tolerance envelope graph				
Temperature drift	100% full load			0.03	%/°C
Ripple & Noise	20MHz Bandwidth		75	150	mVp-p
Switching frequency	Full load, nominal input		100		KHz

Note:
1. All specifications measured at TA=25°C, humidity<75%, nominal input voltage and rated output load unless otherwise specified.
2. See below recommended circuits for more details.

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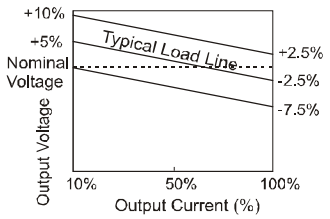
COMMON SPECIFICATIONS

Item	Test Conditions	Min	Typ	Max	Units
Storage humidity				95	%
Operating temperature		-40		85	°C
Storage temperature		-55		125	
Temp. rise at full load			15	25	
Lead temperature	1.5mm from case for 10 seconds			260	
Short circuit protection*				1	S
Cooling		Free air convection			
package material		Plastic (UL94-V0)			
MTBF		3500			K hours
Weight			2.1		g

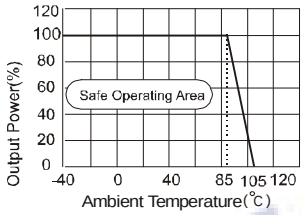
*Supply voltage must be discontinued at the end of short circuit duration.

TYPICAL CHARECTERISTICS

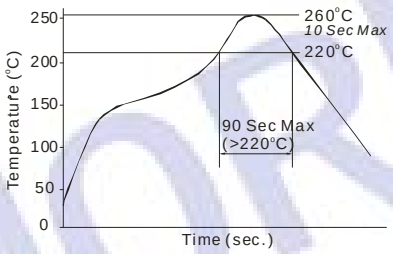
Tolerance Envelope Graph



Temperature Derating Graph

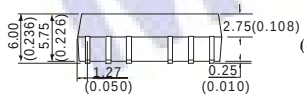


RECOMMENDED REFLOW SOLDERING PROFILE



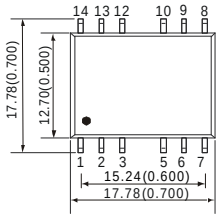
OUTLINE DIMENSIONS& RECOMMENDED FOOTPRINT

First Angle Projection

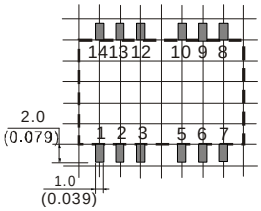


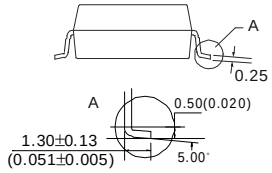
(Side View)

RECOMMENDED FOOTPRINT
Top view,grid:2.54mm(0.1inch)



(Top View)





FOOTPRINT DETAILS

Pin	Function
1	GND
2	Vin
5	0V1
6	Vo1
9	Vo2
10	0V2
Others	NC

NC:No connection

Note:
Unit:mm(inch)
Pin section:0.60*0.25mm(0.024*0.010inch)
Pin section tolerances:±0.10mm(±0.004inch)
General tolerances:±0.15mm(±0.006inch)

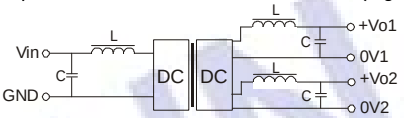
APPLICATION NOTE

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 (D_T –1W).

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 (Figure1).



(Figure 1)

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 greatest capacitance of its filter capacitor sees (Table 1).

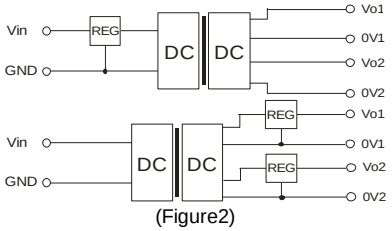
EXTERNAL CAPACITOR TABLE (TABLE 1)

Vin (VDC)	Cin (uF)	Vout (VDC)	Cout (uF)
5	4.7	5	4.7
12	2.2	9	2.2
-	-	12	1
-	-	15	0.74

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

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 (Figure2).



(Figure2)

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.

No parallel connection or plug and play.