

## **TPI Series**



**DESCRIPTION: 1W 3KVDC Isolation & Regulated Dual Output DC-DC Converters** TPI series are specially designed for 3KVDC isolation & regulated dual output application, the input

voltage range within ±5%, 3KVDC isolation and regulated output with very low ripple noise.

FEATURES							
Small footprint			3KVDC isolation		Regulated dual output		
Operating temperature: -40 $^\circ \rm C$ to 105 $^\circ \rm C$			Industry standard pinout		Internal SMD construction		
Continuous short circuit protection			No external component Required RoHS compliance、CE certification				
SELECTION GUIDE							
Part Number	Nominal Input Voltage	Input voltage range	Output voltage	Output current(Max)	Output current(Min)	Efficiency	Package
	VDC	VDC	VDC	mA	mA	%, Тур.	Style
TPI0505S	5	4.75-5.25	±5	±100	±10	54	SIP
TPI0509S	5	4.75-5.25	±9	±56	±6	63	SIP
TPI0512S	5	4.75-5.25	±12	±42	±5	63	SIP
TPI0515S	5	4.75-5.25	±15	±33	±4	65	SIP
TD140050	10	11 1 10 0		. 100	140	50	SID

TPI0515S	5	4.75-5.25	±15	±33	±4	65	SIP
TPI1205S	12	11.4-12.6	±5	±100	±10	56	SIP
TPI1209S	12	11.4-12.6	±9	±56	±6	62	SIP
TPI1212S	12	11.4-12.6	±12	±42	±5	65	SIP
TPI1215S	12	11.4-12.6	±15	±33	±4	66	SIP
TPI2405S	24	22.8-25.2	±5	±100	±10	54	SIP
TPI2409S	24	22.8-25.2	±9	±56	±6	62	SIP
TPI2412S	24	22.8-25.2	±12	±42	±5	64	SIP
TPI2415S	24	22.8-25.2	±15	±33	±4	66	SIP

Add suffix "P" for continuous short circuit protection, for example TPI0505SP.

### OUTPUT SPECIFICATIONS

Parameter	Conditions	Min.	Тур.	Max.	Units	
Output power	Conditions	0.1	ryp.	1	W	
Line regulation	For Vin change of $\pm 5\%$	0.1		±0.25	%	
-						
Load regulation	10% to 100% full load			±1	%	
Output voltage accuracy	100% full load			±3	%	
Temperature drift	100% full load			0.03	%/°C	
Output ripple	20MHz Bandwidth		10	20	Мvр-р	
Output Noise	20MHz Bandwidth		50	100	Mvp-p	
COMMON SPECIFICATIONS						
Parameter	Conditions	Min.	Тур.	Max.	Units	
Storage humidity range				95	%	
Operating temperature	Derating if the temperature ≥85°C	-40		105	°C	
Storage temperature		-55		125	°C	
Temp. rise at full load			20	30	°C	
Lead temperature	1.5mm from case for 10 seconds			300	°C	
Cooling			Free air convection			
Case material			Plastic(UL94-V0)			
Short circuit protection				1	S	
MTBF		3500			K hours	
Weight			5.2		g	

### TOPPOWER

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### **ISOLATION CHARACTERISTICS**

Parameter	Conditions	Min.	Тур.	Max.	Units	
Isolation voltage	Tested for 1 minute and 1mA max	3000			VDC	
Isolation resistance	Test at 1000VDC	1			GΩ	

Note:

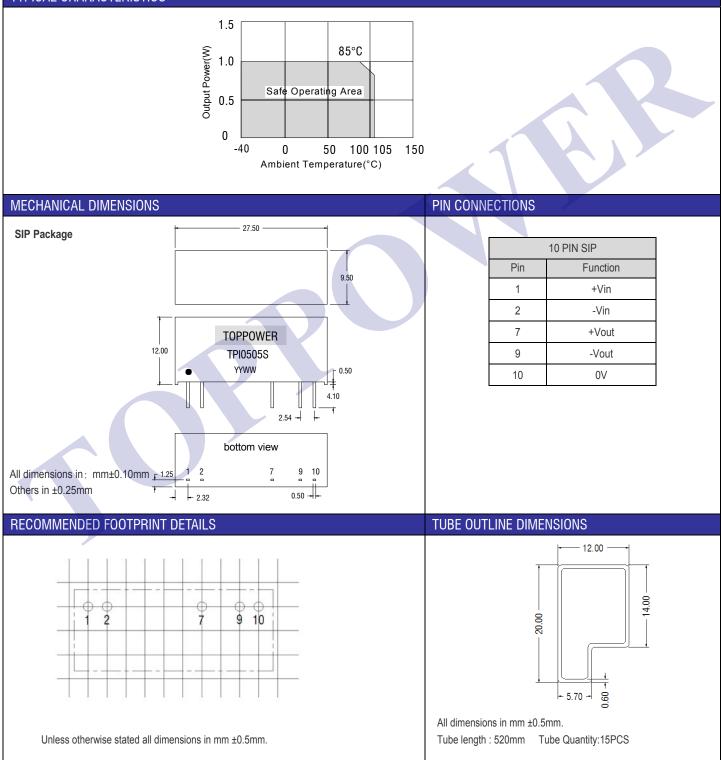
1. All specifications measured at TA=25° C, humidity<75%, nominal input voltage and rated output load unless otherwise specified.

2. See below recommended circuits for more details;

3. Operation under minimum load will not damage the converter; However, they may not meet all

specification listed, and that will reduce the life of product.

#### TYPICAL CHARACTERISTICS



### TOP<mark>POWER</mark>

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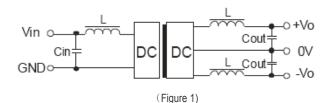
### APPLICATION NOTE

### 1.Requirement on output load

To ensure this module can operate efficiently and reliably, During operation, the minimum output load could not be less than 10% of the full 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.

### 2.Recommended 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).



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	Cin	Vout	Cout
(VDC)	( µ F)	(VDC)	( µ F)
5	4.7	±5	4.7
12	2.2	±9	2.2
24	0.47	±12	1
· ·	-	±15	0.47

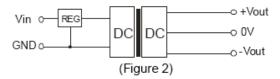
### 3. Overload Protection

Under normal operating conditions, the output circuit of these products has no protection against over-current and short-circuits. The simplest method is to connect a

self-recovery fuse in series at the input end or add a circuit breaker to the circuit.

### 4.Input Over-voltage Protection Circuit

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



When the environment temperature is higher than 71°C, the product output power should be less then 60% of the rated power.

No parallel connection or plug and play.

Use dual output simultaneously , forbid opening output pin (0V) to use as single output.