



**DESCRIPTION:**

**1W 3KVDC Isolated Single and Dual Output DC/DC Converters**

The TPA series are miniature, isolated 1W DC/DC converters in a SIP and DIP package. They offer the ideal solution in many space critical applications for board level power distribution. The internal SMD construction makes it possible to offer a product with high performance at low cost. The series offers smaller size, improved efficiency, lower output ripple noise and 3KVDC isolation.

**FEATURES**

RoHS compliant	Efficiency up to 80%	Power density up to 0.85W/cm <sup>3</sup>
Operating temperature :-40°C to 105°C	Single and dual output from a single input rail	UL 94V-0 package material
Power sharing on output	3KVDC isolation	Industry standard pinout
Input voltage: 3.3V, 5V, 12V, 15V	Output voltage :3.3V,5V,9V,12V,15V,24V / ±5V,±9V,±12V,±15V,±24V	CE certification

**SELECTION GUIDE**

Part Number	Nominal Input Voltage	Output Voltage	Output Current (Max./Min)	Efficiency	Package Style
	V	V	mA	%	
TPA0303DA	3.3	3.3	303/30.3	72	DIP
TPA0305DA	3.3	5	200/20	74	DIP
TPA0505DA	5	5	200/20	68	DIP
TPA0509DA	5	9	111/11.1	76	DIP
TPA0512DA	5	12	83/8.3	79	DIP
TPA0515DA	5	15	67/6.7	78	DIP
TPA0524DA	5	24	42/4.2	81	DIP
TPA1203DA	12	3.3	303/30.3	73	DIP
TPA1205DA	12	5	200/20	68	DIP
TPA1209DA	12	9	111/11.1	74	DIP
TPA1212DA	12	12	83/8.3	77	DIP
TPA1215DA	12	15	67/6.7	75	DIP
TPA1505DA	15	5	200/20	71	DIP
TPA1512DA	15	12	111/11.1	77	DIP
TPA1515DA	15	15	67/6.7	80	DIP
TPA0505D	5	±5	±100/±10	67	DIP
TPA0509D	5	±9	±56/±5.6	76	DIP
TPA0512D	5	±12	±43/±4.3	79	DIP
TPA0515D	5	±15	±33/±3.3	78	DIP
TPA0524D	5	±24	±21/±2.1	81	DIP
TPA0505S	5	±5	±100/±10	67	SIP
TPA0509S	5	±9	±56/±5.6	76	SIP
TPA0512S	5	±12	±43/±4.3	79	SIP
TPA0515S	5	±15	±33/±3.3	78	SIP
TPA0524S	5	±24	±21/±2.1	81	SIP
TPA1205D	12	±5	±100/±10	68	DIP
TPA1209D	12	±9	±56/±5.6	74	DIP
TPA1212D	12	±12	±43/±4.3	77	DIP
TPA1215D	12	±15	±33/±3.3	75	DIP
TPA1224D	12	±24	±21/±2.1	81	DIP
TPA1205S	12	±5	±100/±10	68	SIP
TPA1209S	12	±9	±56/±5.6	74	SIP
TPA1212S	12	±12	±43/±4.3	77	SIP
TPA1215S	12	±15	±33/±3.3	75	SIP
TPA1505D	15	±5	±100/±10	71	DIP
TPA1509D	15	±9	±56/±5.6	74	DIP
TPA1512D	15	±12	±43/±4.3	77	DIP
TPA1515D	15	±15	±33/±3.3	80	DIP
TPA1524D	15	±24	±21/±2.1	81	DIP
TPA1505S	15	±5	±100/±10	71	SIP
TPA1512S	15	±12	±43/±4.3	77	SIP
TPA1515S	15	±15	±33/±3.3	80	SIP

Add suffix "P" for continuous short circuit protection, for example TPA0505SP.

## INPUT CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Voltage range	3.3V input variants	2.9	3.3	3.6	V
Voltage range	5V input variants	4.5	5	5.5	V
Voltage range	12V input variants	10.7	12	13.1	V
Voltage range	15V input variants	13.5	15	16.5	V
Reflected ripple current			22	45	mA p-p

## ABSOLUTE MAXIMUM RATINGS

Lead temperature 1.5mm from case for 10 seconds	300°C
Internal power dissipation	450mW
Input voltage $V_{in}$ , TPA03 variants	5.5V
Input voltage $V_{in}$ , TPA05 variants	7V
Input voltage $V_{in}$ , TPA12 variants	15V
Input voltage $V_{in}$ , TPA15 variants	18V

All specifications typical at  $T_A=25^{\circ}\text{C}$ , nominal input voltage and rated output current unless otherwise specified.

## OUTPUT CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Rated Power	$T_A=-40^{\circ}\text{C}$ to $85^{\circ}\text{C}$			1	W
Voltage Set Point Accuracy	See tolerance envelope				
Line regulation	High $V_{in}$ to low $V_{in}$		1.0	1.2	%/%
Load Regulation 10% load to rated load	5V & 12V input	5V output	10	13	%
Load Regulation 10% load to rated load	5V & 12V input	9V output	9	10	%
Load Regulation 10% load to rated load	5V & 12V input	12V output	7	8	%
Load Regulation 10% load to rated load	5V & 12V input	15V output	6	7.0	%
Load Regulation 10% load to rated load	15V input	5V output	6	10	%
Load Regulation 10% load to rated load	15V input	12V output	3	4	%
Load Regulation 10% load to rated load	15V input	15V output	3	4	%

## ISOLATION CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Isolation test voltage	Tested for 1 second	3000			VDC
Resistance	Viso= 1000VDC	1			G $\square$

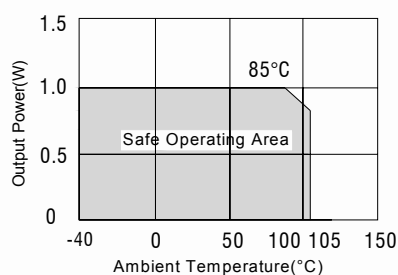
## GENERAL CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Switching frequency	3.3V input		95		kHz
Switching frequency	5V input		110		kHz
Switching frequency	12V input		130		kHz
Switching frequency	15V input		90		kHz

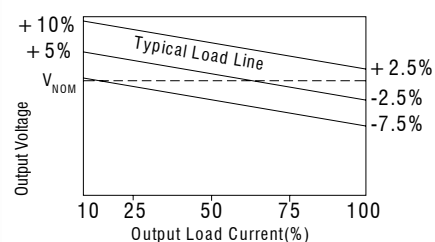
## TEMPERATURE CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Specification	Derating if the temperature $\geq 85^{\circ}\text{C}$	-40		105	$^{\circ}\text{C}$
Storage		-50		130	$^{\circ}\text{C}$
Cooling	Free air convection				

## TEMPERATURE DERATING GRAPHS

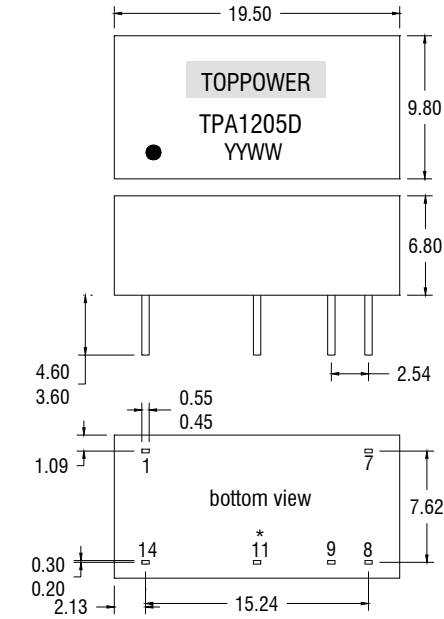


## TOLERANCE ENVELOPES

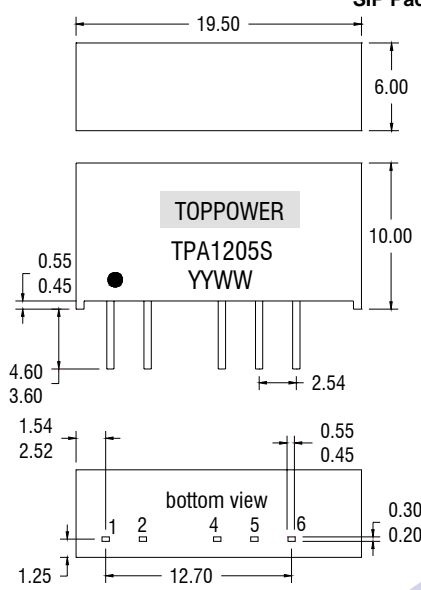


**MECHANICAL DIMENSIONS**

**DIP Package**



**SIP Package**



**PIN CONNECTIONS**

14 PIN DIP	
Pin	Function
1	-Vin
7	NC
8	OV
9	+Vout
11*	-Vout
14	+Vin

7 PIN SIP	
Pin	Function
1	+Vin
2	-Vin
4	-Vout
5	OV
6	+Vout

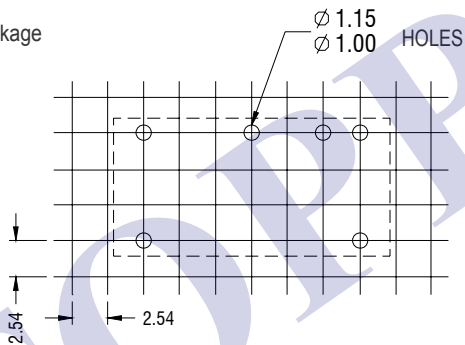
All dimensions in mm±0.25mm. All pins on a 2.54mm pitch and within ±0.25mm of true position.

Weight: 2.4g (DIP) 2.1g (SIP)

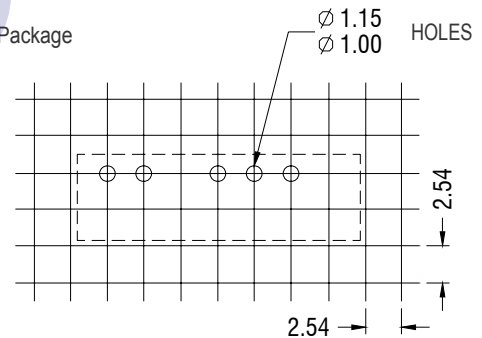
\*Pin not fitted on single output variants

**RECOMMENDED FOOTPRINT DETAILS**

**14 Pin DIP Package**

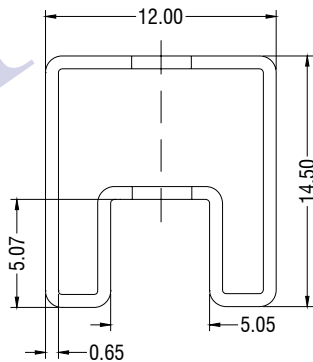


**7 Pin SIP Package**

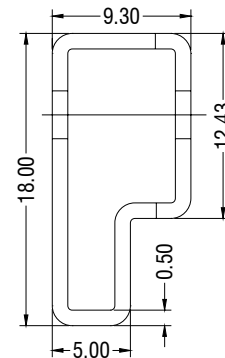


**TUBE OUTLINE DIMENSIONS**

**14Pin DIP Tube**



**7Pin SIP Tube**



Tube length (14 Pin DIP) : 520mm±2mm.

Tube Quantity : 25PCS

**SOLDERING INFORMATION**

This series is compatible with RoHS soldering systems with a peak wave solder temperature of 300°C for 10 seconds. Both SIP and DIP types in this series are backward compatible with Sn/Pb soldering systems.