

# TPE 3.3V, 5V & 12V Series



## DESCRIPTION: 1W 1.5KVDC and 2KVDC Isolated Single Output DC/DC Converters

The TPE 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.

## FEATURES

RoHS compliant	Single isolated output	SIP: 1.5KVDC /3KVDC isolation    DIP: 2KVDC/3KVDC isolation
Efficiency up to 81%	Operating temperature: -40°C to 105°C	Power density 1.53W/cm <sup>3</sup>
UL 94V-0 package material	Footprint from 0.69cm <sup>2</sup>	Industry standard pinout
Input voltage: 3.3V, 5V, 12V	Output voltage: 3.3V, 5V, 9V, 12V, 15V & 24V	CE certification

## SELECTION GUIDE

Part Number	Nominal Input Voltage	Output Voltage	Output Current (Max./Min)	Efficiency	Max. Capacitive Load (μF)	Package Style
	V	V	mA	%		
TPE0303D	3.3	3.3	303/30.3	72	220	DIP
TPE0305D	3.3	5	200/20	74	220	DIP
TPE0309D	3.3	9	110/11	78	220	DIP
TPE0312D	3.3	12	83/8.3	78	220	DIP
TPE0315D	3.3	15	66/6.6	80	220	DIP
TPE0324D	3.3	24	42/4.2	79	220	DIP
TPE0303S	3.3	3.3	303/30.3	72	220	SIP
TPE0305S	3.3	5	200/20	74	220	SIP
TPE0309S	3.3	9	110/11	78	220	SIP
TPE0312S	3.3	12	83/8.3	78	220	SIP
TPE0315S	3.3	15	66/6.6	80	220	SIP
TPE0324S	3.3	24	42/4.2	79	220	SIP
TPE0503D	5	3.3	303/30.3	72	220	DIP
TPE0505D	5	5	200/20	68	220	DIP
TPE0509D	5	9	110/11	78	220	DIP
TPE0512D	5	12	83/8.3	77	220	DIP
TPE0515D	5	15	66/6.6	81	220	DIP
TPE0524D	5	24	42/4.2	80	220	DIP
TPE0503S	5	3.3	303/30.3	72	220	SIP
TPE0505S	5	5	200/20	70	220	SIP
TPE0509S	5	9	110/11	78	220	SIP
TPE0512S	5	12	83/8.3	78	220	SIP
TPE0515S	5	15	66/6.6	80	220	SIP
TPE0524S	5	24	42/4.2	79	220	SIP
TPE1203D	12	3.3	303/30.3	72	220	DIP
TPE1205D	12	5	200/20	69	220	DIP
TPE1209D	12	9	110/11	74	220	DIP
TPE1212D	12	12	83/8.3	76	220	DIP
TPE1215D	12	15	66/6.6	75	220	DIP
TPE1224D	12	24	42/4.2	79	220	DIP
TPE1203S	12	3.3	303/30.3	72	220	SIP
TPE1205S	12	5	200/20	71	220	SIP
TPE1209S	12	9	110/11	73	220	SIP
TPE1212S	12	12	83/8.3	76	220	SIP
TPE1215S	12	15	66/6.6	74	220	SIP
TPE1224S	12	24	42/4.2	79	220	SIP

Add suffix "P" for continuous short circuit protection, for example TPE0505SP.

Add suffix "3H" for 3KVDC isolated, for example TPE0505S/3H.

## INPUT CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Voltage range	3.3V input	2.9	3.3	3.6	V
Voltage range	5V input	4.5	5.0	5.5	V
Voltage range	12V input	10.8	12.0	13.2	V
Reflected ripple current			26	48	mA p-p

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## ISOLATION CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Isolation test voltage SIP package	Tested for 1 second	1500/3000			VDC
Isolation test voltage DIP package	Tested for 1 second	2000/3000			VDC
Resistance	Viso= 1000VDC	1			GΩ

## OUTPUT CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Rated Power	TA= - 40°C to 85°C			1.0	W
Voltage Set Point Accuracy	See tolerance envelope				
Line regulation	High VIN to low VIN (voltage variation +/-5%)		1.0	1.2	%/%
Load Regulation (10%load to rated load)	3.3V output		14	15	%
Load Regulation (10%load to rated load)	5V output		12	15	%
Load Regulation (10%load to rated load)	9V output		9	10	%
Load Regulation (10%load to rated load)	12V output		7.5	9.5	%
Load Regulation (10%load to rated load)	15V output		7.0	8.5	%
Load Regulation (10%load to rated load)	24V output		5.5	7.5	%
Ripple & Noise	20MHz bandwidth		70	100	mvp-p

All specifications typical at TA=25°C, nominal input voltage and rated output current unless otherwise specified.

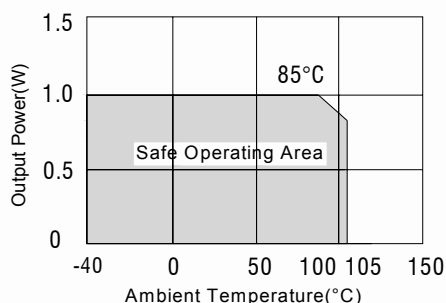
## GENERAL CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Switching frequency	3.3V input		95		kHz
Switching frequency	5V input		110		kHz
Switching frequency	12V input		145		kHz
MTBF	MIL-HDBK-217F@25°C		3500		K hours

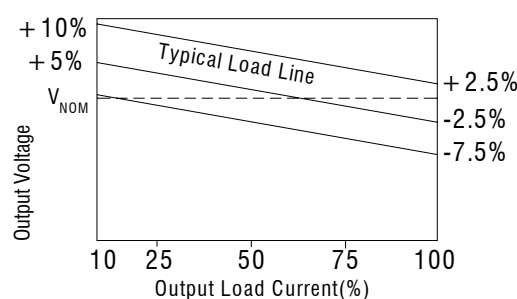
## TEMPERATURE CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Specification	Derating if the temperature ≥85°C	-40		105	°C
Storage		-55		150	°C
Case Temperature above ambient	5V output			41	°C
Case Temperature above ambient	All other output			32	°C
Cooling	Free air convection				

## TEMPERATURE DERATING GRAPHS



## TOLERANCE ENVELOPES

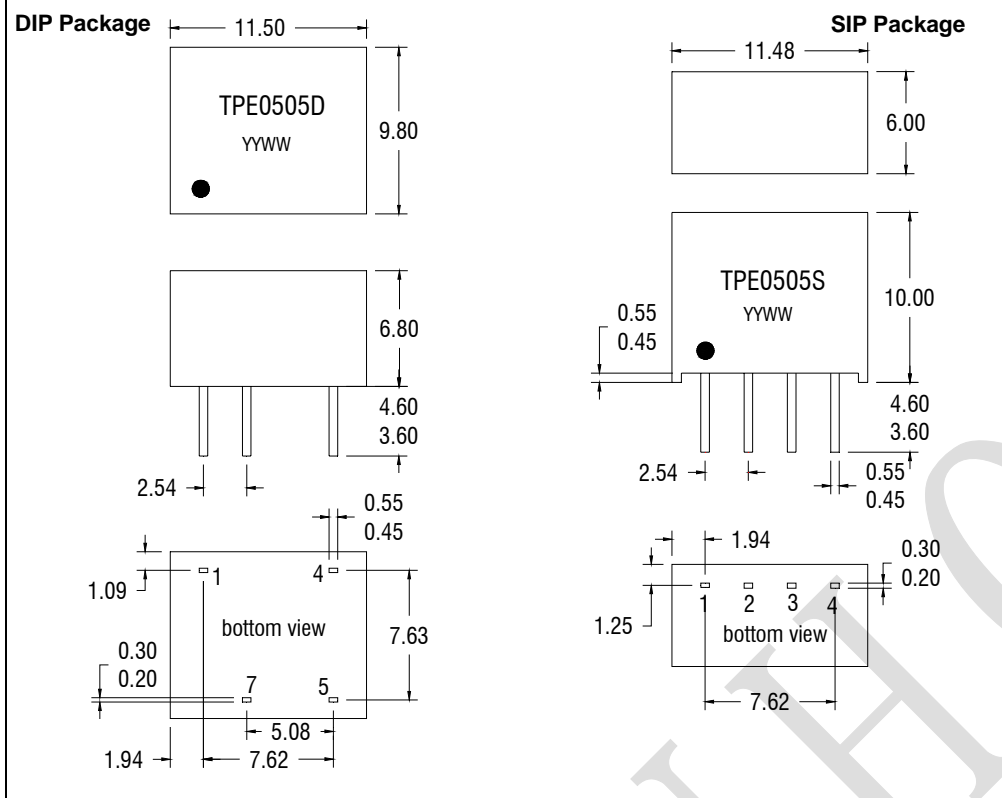


## SOLDERING INFORMATION

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

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## MECHANICAL DIMENSIONS



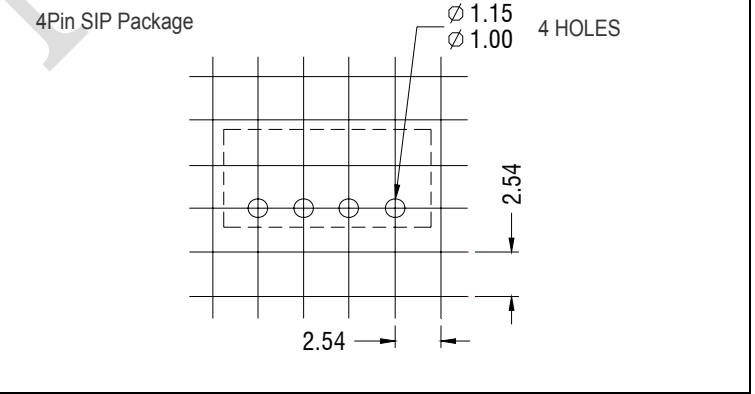
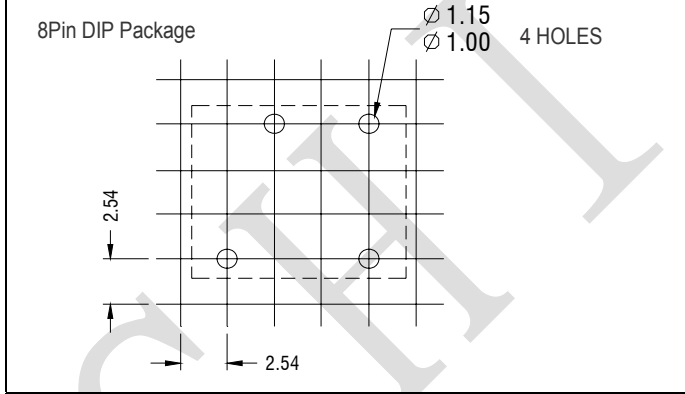
## PIN CONNECTIONS

8 PIN DIP	
Pin	Function
1	-Vin
4	+Vin
5	+Vout
7	-Vout

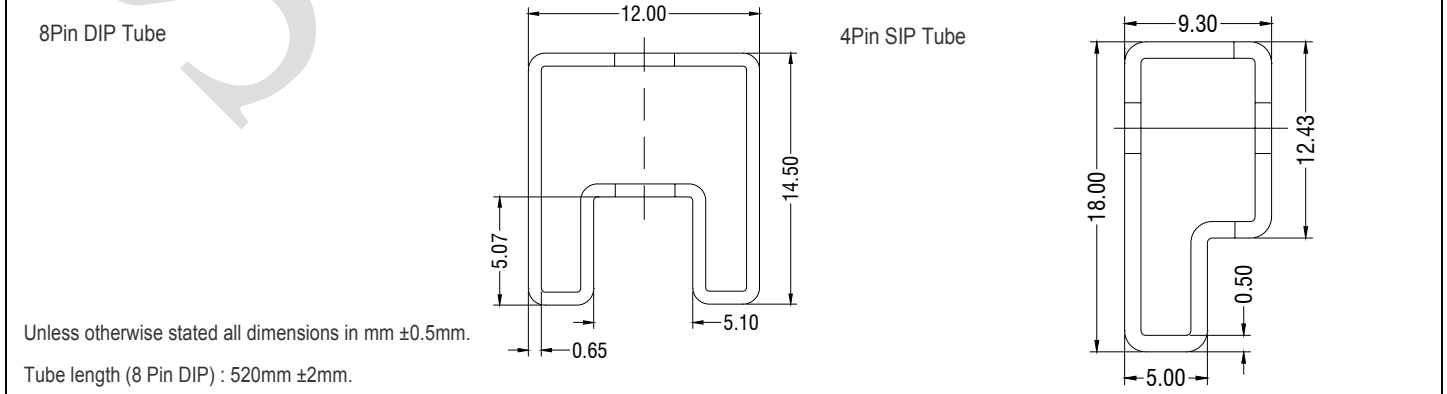
4 PIN SIP	
Pin	Function
1	-Vin
2	+Vin
3	-Vout
4	+Vout

All dimensions in mm  $\pm 0.25$ mm. All pins on a 2.54 mm pitch and within  $\pm 0.25$ mm of true position  
 Weight: 1.30g (SIP) 1.48g (DIP)

## RECOMMENDED FOOTPRINT DETAILS



## TUBE OUTLINE DIMENSIONS



Unless otherwise stated all dimensions in mm  $\pm 0.5$ mm.  
 Tube length (8 Pin DIP) : 520mm  $\pm 2$ mm.  
 Tube length (4 Pin SIP) : 520mm  $\pm 2$ mm.

Tube Quantity : 35PCS