



1W Isolated Single Output DC/DC Converters

DESCRIPTION

The TPE series of DC/DC Converters is particularly suited to isolating and/or converting DC power rails. The wide temperature range guarantees startup from -40°C and full 1 watt output at 85°C .

FEATURES

RoHS compliant	Single isolated output	1kVDC isolation
Efficiency up to 80%	Wide temperature performance at full 1 watt load, -40°C to 85°C	Power density $1.53\text{W}/\text{cm}^3$
UL 94V-0 package material	Footprint from 0.69cm^2	Industry standard pinout
Input voltage: 5V & 12V	Output voltage: 5V, 9V, 12V and 15V	

SELECTION GUIDE

Order Code	Nominal Input Voltage	Output Voltage	Output Current	Input Current at Rated Load	Efficiency	Isolation Capacitance	Package Style
	V	V	mA	mA	%	pF	
TPE0505D	5	5	200	288	68	30	DIP
TPE0509D	5	9	110	261	78	37	
TPE0512D	5	12	83	255	77	34	
TPE0515D	5	15	66	250	81	40	
TPE0524D	5	24	42	248	80	48	
TPE0505S	5	5	200	288	70	30	SIP
TPE0509S	5	9	110	261	78	36	
TPE0512S	5	12	83	256	78	33	
TPE0515S	5	15	66	250	80	41	
TPE0524S	5	24	42	248	79	48	
TPE1205D	12	5	200	120	69	33	DIP
TPE1209D	12	9	110	114	74	49	
TPE1212D	12	12	83	105	76	55	
TPE1215D	12	15	66	110	75	53	
TPE1205S	12	5	200	121	68	33	SIP
TPE1209S	12	9	110	115	73	48	
TPE1212S	12	12	83	110	76	56	
TPE1215S	12	15	66	110	74	53	

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

OUTPUT CHARACTERISTICS					
Parameter	Conditions	Min.	Typ.	Max.	Units
Rated Power	T _A =-40°C to 120°C			1.0	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 output		14	15	%
	9V output		9	10	
	12V output		7.5	9.5	
	15V output		7.0	8.5	
	24V output		5.5	7.5	

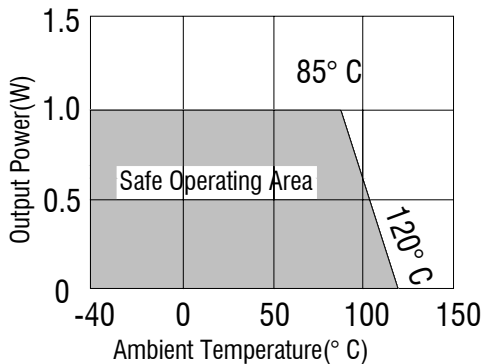
All specifications typical at TA=25°C, nominal input voltage and rated output current unless otherwise specified.

ISOLATION CHARACTERISTICS					
Parameter	Conditions	Min.	Typ.	Max.	Units
Isolation test voltage	Flash tested for 1 second	1000			VDC
Resistance	Viso= 1000VDC		10		GΩ

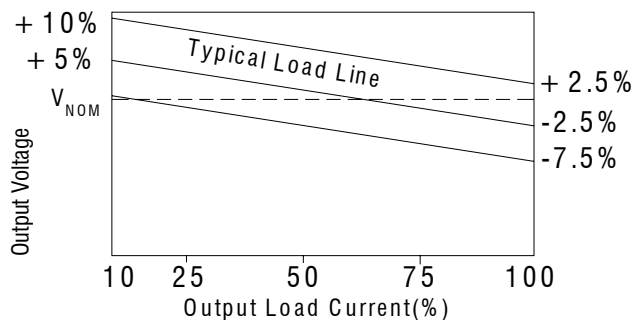
GENERAL CHARACTERISTICS					
Parameter	Conditions	Min.	Typ.	Max.	Units
Switching frequency	5V input		110		kHz
	12V input		145		

TEMPERATURE CHARACTERISTICS					
Parameter	Conditions	Min.	Typ.	Max.	Units
Specification	All output	-40		85	°C
Storage		-50		130	
Case Temperature above ambient	5V output			41	
	All other output			32	
Cooling	Free air convection				

TEMPERATURE DERATING GRAPHS



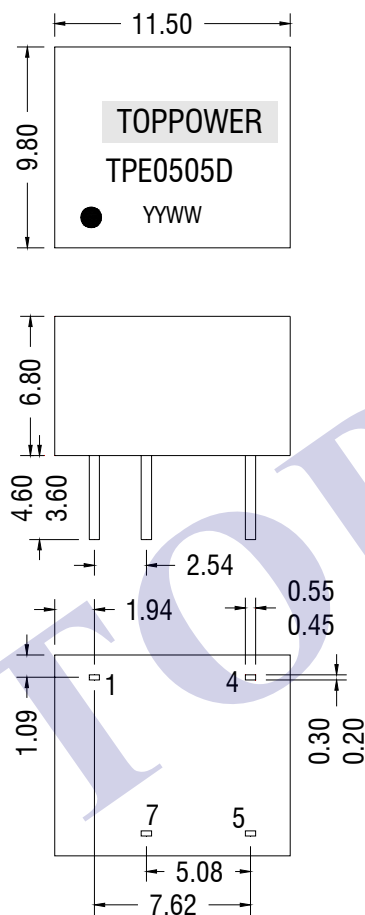
TOLERANCE ENVELOPES



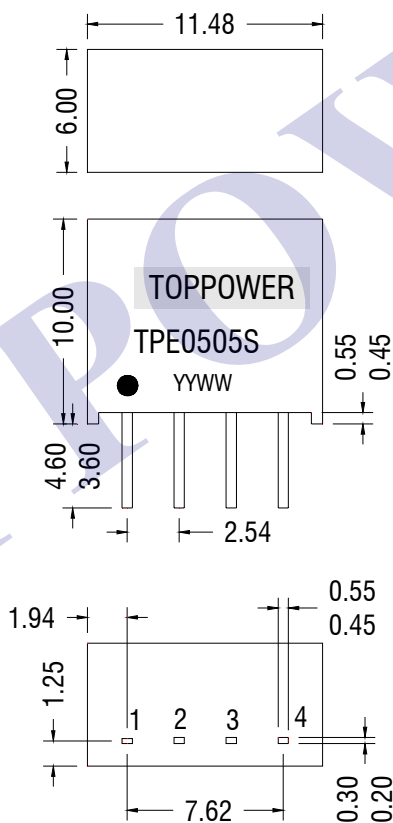
PACKAGE SPECIFICATIONS

MECHANICAL DIMENSIONS

DIP Package



SIP Package



PIN CONNECTIONS-8PIN DIP

PIN	Function
1	-VIN
4	+VIN
5	+VOUT
7	-VOUT

PIN CONNECTIONS-4PIN SIP

PIN	Function
1	-VIN
2	+VIN
3	-VOUT
4	+VOUT

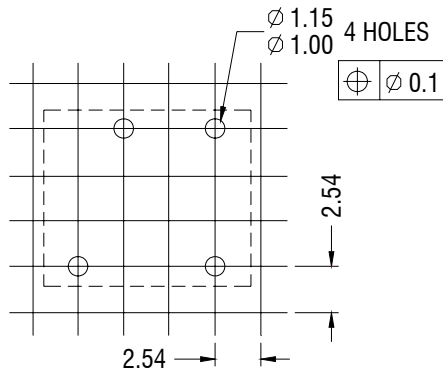
All dimensions in mm ± 0.25 mm. All pins on a 2.54 mm pitch and within ± 0.25 mm of true position

Weight: 1.30g (SIP) 1.48g (DIP)

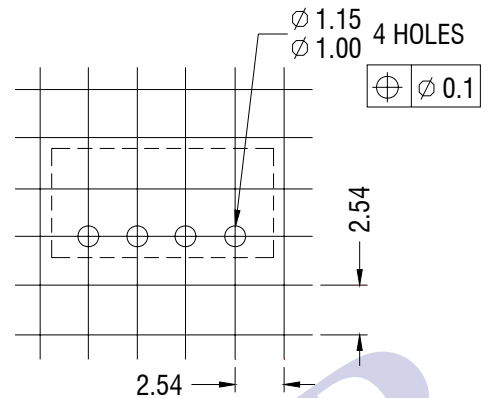
PACKAGE SPECIFICATIONS (continued)

RECOMMENDED FOOTPRINT DETAILS

8Pin DIP Package

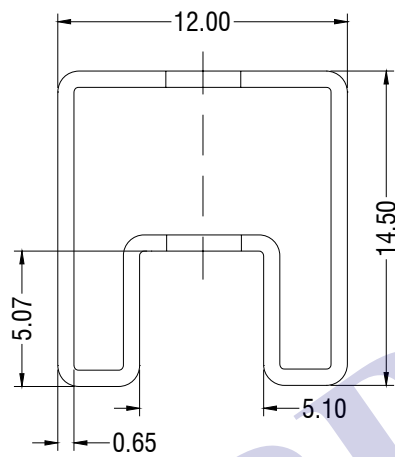


4Pin SIP Package

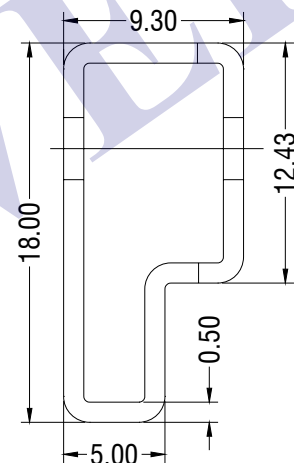


TUBE OUTLINE DIMENSIONS

8Pin DIP Tube



4Pin SIP Tube



Unless otherwise stated all dimensions in mm ± 0.5 mm.

Tube length (8 Pin DIP) : 520mm ± 2 mm.

Tube length (4 Pin DIP) : 520mm ± 2 mm.

Tube Quantity : 35

RoHS COMPLIANCE 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.

DESCRIPTION

The TPE series of DC/DC Converters is particularly suited to isolating and/or converting DC power rails.



FEATURES

RoHS Compliant	Single Isolated Output	1kVDC Isolation
Efficiency up to 80%	Power Density 1.45W/cm ³	UL 94V-0 Package Material
Footprint from 0.69cm ²	Industry Standard Pinout	24V & 48V Input
5V, 9V, 12V and 15V Output	Custom Solutions Available	

SELECTION GUIDE

Order Code	Nominal Input Voltage	Output Voltage	Output Current	Efficiency	Isolation Capacitance	Package Style
	V	V	mA	%	pF	
TPE2405D	24	5	200	70	41	DIP
TPE2409D	24	9	111	75	59	
TPE2412D	24	12	83	81	79	
TPE2415D	24	15	66	81	79	
TPE2405S	24	5	200	71	41	SIP
TPE2409S	24	9	111	75	59	
TPE2412S	24	12	83	80	78	
TPE2415S	24	15	66	80	79	
TPE4805D	48	5	200	70	32	DIP
TPE4809D	48	9	111	75	50	
TPE4812D	48	12	83	80	76	
TPE4815D	48	15	66	80	75	
TPE4805S	48	5	200	70	32	SIP
TPE4809S	48	9	111	75	51	
TPE4812S	48	12	83	81	76	
TPE4815S	48	15	66	81	76	

INPUT CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Voltage range	24V input	21.6	24	26.4	V
	48V input	43.2	48	52.8	

OUTPUT CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Rated Power	T _A =0°C to 70°C			1.0	W
Voltage Set Point Accuracy	See tolerance envelope				
Line regulation	High V _{IN} to low V _{IN}			1.2	%/%
Load Regulation (10% load to rated load)	5V output			15	%
	all other output			10	

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

ABSOLUTE MAXIMUM RATINGS

Short-circuit protection	1 second
Lead temperature 1.5mm from case for 10 seconds	300°C
Input voltage V _{IN} , TPE24	28V
Input voltage V _{IN} , TPE48	54V

ISOLATION CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Isolation test voltage	Flash tested for 1 second	1000			VDC
Resistance	Viso= 500VDC	1			GΩ

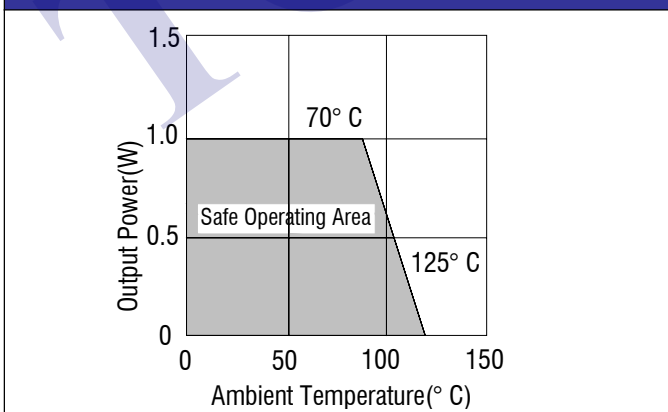
GENERAL CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Switching frequency	All types		100		kHz

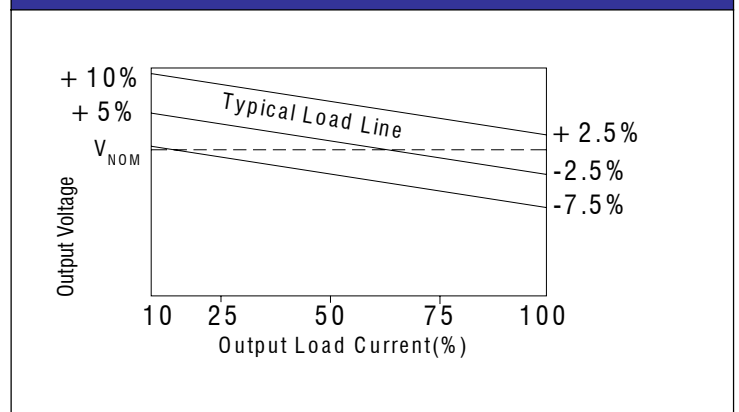
TEMPERATURE CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Specification	All output types	0		70	°C
Storage		-55		150	
Cooling	Free air convection				

TEMPERATURE DERATING GRAPHS

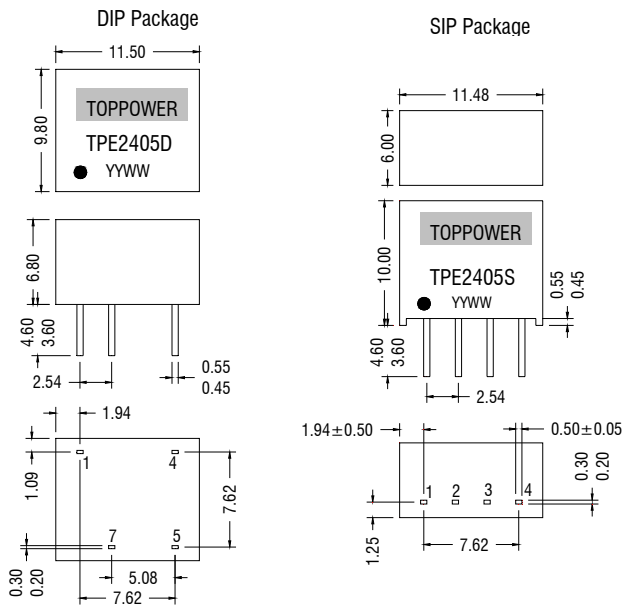


TOLERANCE ENVELOPES



PACKAGE SPECIFICATIONS

MECHANICAL DIMENSIONS



* 0.303 (7.70) for 48V variants ** 0.3 (7.50) for 48V variants Weight: 1.48g (DIP) 1.30g (SIP)
 All dimensions in mm ± 0.25 mm. All pins on a 2.54mm pitch and within ± 0.25 mm of true position.

PIN CONNECTIONS-8PIN DIP

PIN	Function
1	-VIN
4	+VIN
5	+VOUT
7	-VOUT

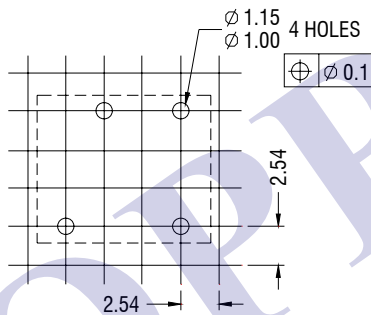
PIN CONNECTIONS-4PIN SIP

PIN	Function
1	-VIN
2	+VIN
3	-VOUT
4	+VOUT

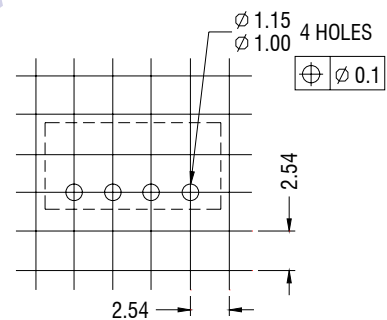
PACKAGE SPECIFICATIONS (continued)

RECOMMENDED FOOTPRINT DETAILS

8Pin DIP Package

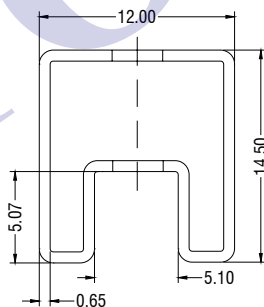


4Pin SIP Package

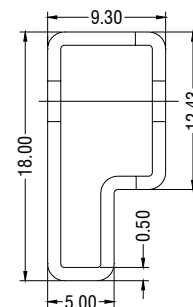


TUBE OUTLINE DIMENSIONS

8Pin DIP Tube



4Pin SIP Tube



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

Tube Quantity : 35

RoHS COMPLIANCE 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.

TOPPOWER