



DESCRIPTION: 1W 3KVDC Isolated Single & Dual Output DC/DC Converters

The TPV 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 and 3KVDC isolation.

FEATURES

RoHS compliant	Efficiency to 80%	Power density up to 0.85W/cm ³
Operating temperature: -40°C to 105°C	Single or dual output	UL 94V-0 package material
Power sharing on dual output	3KVDC isolation (1 minute)	Input voltage: 3.3V,5V,9V,12V,15V
CE certification	/	Output voltage: 3.3V,5V,9V,12V,15V,24V ±5V,±9V,±12V,±15V, ±24V

SELECTION GUIDE

Part Number	Nominal Input Voltage	Output Voltage	Output Current (Max./Min)	Efficiency	Max. Capacitive Load(μF)	Package Style
	V	V	mA	%		
TPV0303DA	3.3	3.3	303/30.3	72	220	DIP
TPV0305DA	3.3	5	200/20	72	220	DIP
TPV0503DA	5	3.3	303/30.3	73	220	DIP
TPV0505DA	5	5	200/20	72	220	DIP
TPV0509DA	5	9	111/11.1	75	220	DIP
TPV0512DA	5	12	84/8.4	76	220	DIP
TPV0515DA	5	15	67/6.7	78	220	DIP
TPV0524DA	5	24	42/4.2	79	220	DIP
TPV0303SA	3.3	3.3	303/30.3	72	220	SIP
TPV0305SA	3.3	5	200/20	72	220	SIP
TPV0503SA	5	3.3	303/30.3	73	220	SIP
TPV0505SA	5	5	200/20	75	220	SIP
TPV0509SA	5	9	111/11.1	75	220	SIP
TPV0512SA	5	12	84/8.4	76	220	SIP
TPV0515SA	5	15	67/6.7	78	220	SIP
TPV0524SA	5	24	42/4.2	79	220	SIP
TPV0909SA	9	9	111/11.1	79	220	SIP
TPV0915SA	9	15	67/6.7	82	220	SIP
TPV1205DA	12	5	200/20	72	220	DIP
TPV1209DA	12	9	111/11.1	75	220	DIP
TPV1212DA	12	12	84/8.4	77	220	DIP
TPV1215DA	12	15	67/6.7	78	220	DIP
TPV1203SA	12	3.3	303/30.3	70	220	SIP
TPV1205SA	12	5	200/20	72	220	SIP
TPV1209SA	12	9	111/11.1	75	220	SIP
TPV1212SA	12	12	84/8.4	77	220	SIP
TPV1215SA	12	15	67/6.7	78	220	SIP
TPV1224SA	12	24	42/4.2	79	220	SIP
TPV1505DA	15	5	200/20	69	220	DIP
TPV1505SA	15	5	200/20	72	220	SIP
TPV1509SA	15	9	111/11.1	73	220	SIP
TPV1512SA	15	12	84/8.4	74	220	SIP
TPV1515SA	15	15	67/6.7	78	220	SIP
TPV0505D	5	±5	±100/±10	72	110	DIP
TPV0509D	5	±9	±55/±5.5	77	110	DIP
TPV0512D	5	±12	±43/±4.3	78	110	DIP
TPV0515D	5	±15	±33/±3.3	80	110	DIP
TPV0305S	3.3	±5	±100/±10	72	110	SIP
TPV0315S	3.3	±15	±33/±3.3	80	110	SIP
TPV0505S	5	±5	±100/±10	72	110	SIP
TPV0509S	5	±9	±55/±5.5	77	110	SIP
TPV0512S	5	±12	±43/4.3	78	110	SIP
TPV0515S	5	±15	±33/±3.3	80	110	SIP
TPV0524S	5	±24	±21/±2.1	75	110	SIP
TPV1205D	12	±5	±100/±10	72	110	DIP
TPV1209D	12	±9	±55/±5.5	74	110	DIP
TPV1212D	12	±12	±43/±4.3	76	110	DIP
TPV1215D	12	±15	±33/±3.3	77	110	DIP

SELECTION GUIDE

Part Number	Nominal Input Voltage	Output Voltage	Output Current (Max./Min)	Efficiency	Max. Capacitive Load(μF)	Package Style
	V	V	mA	%		
TPV1205S	12	±5	±100/±10	72	110	SIP
TPV1209S	12	±9	±55/±5.5	74	110	SIP
TPV1212S	12	±12	±43/±4.3	76	110	SIP
TPV1215S	12	±15	±33/±3.3	77	110	SIP
TPV1505S	15	±5	±100/±10	72	110	SIP
TPV1512S	15	±12	±43/±4.3	74	110	SIP
TPV1515S	15	±15	±33/±3.3	78	110	SIP

Add suffix "P" for continuous short circuit protection, for example TPV0505SAP.

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	4.4	5	5.6	V
Voltage range	9V input variants	8.03	9	10	V
Voltage range	12V input variants	11	12	13.3	V
Voltage range	15V input variants	13.4	15	16.4	V

ABSOLUTE MAXIMUM RATINGS

Short-circuit protection	1 second
Lead temperature 1.5mm from case for 10 seconds	300°C
Internal power dissipation	540mW
Input voltage Vin, TPV03 variants	5.5V
Input voltage Vin, TPV05 variants	6.6V
Input voltage Vin, TPV09 variants	11.5V
Input voltage Vin, TPV12 variants	14.5V
Input voltage Vin, TPV15 variants	18V

OUTPUT CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Rated Power	TA=-45°C to 85°C			1	W
Voltage Set Point Accuracy	See tolerance envelope				
Line regulation	High VIN to low VIN (voltage variation +/-5%)		1.0	1.2	%/%
Ripple & Noise	20MHz bandwidth			80	mVp-p
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	%

ISOLATION CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Isolation test voltage	Tested for 1 minute	3000			VDC
Resistance	Viso= 1000VDC	1			G°C

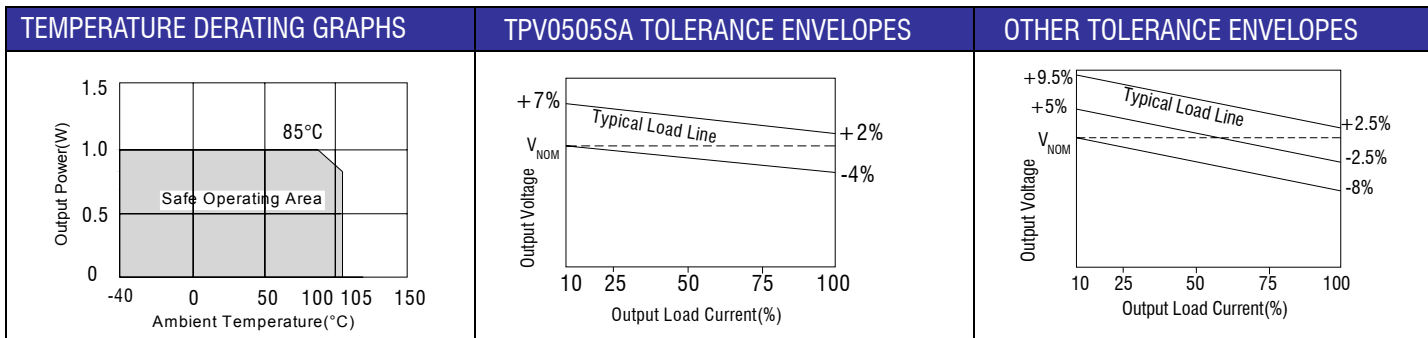
GENERAL CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Switching frequency	3.3V input variants		95		kHz
Switching frequency	5V input variants		120	140	kHz
Switching frequency	9V input variants		120	140	kHz
Switching frequency	12V input variants		145	180	kHz
Switching frequency	15V input variants		90	180	kHz
MTBF	MIL-HDBK-217F@25°C		3500		K hours

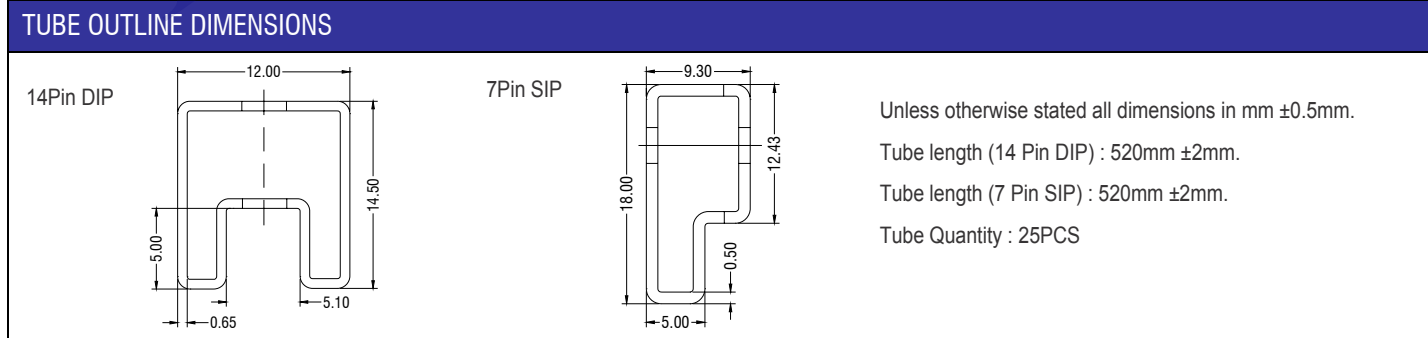
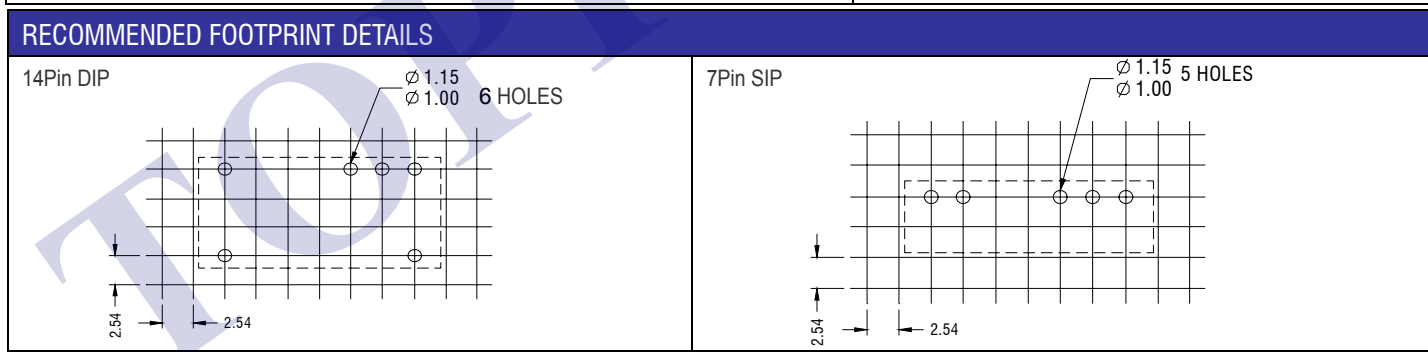
TEMPERATURE CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Specification	Derating if the temperature ≥85°C	-40		105	°C
Storage		-50		130	°C
Case Temperature above ambient	5V output variants			30	°C
Case Temperature above ambient	All other output variants			30	°C
Cooling	Free air convection				

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



MECHANICAL DIMENSIONS	PIN CONNECTIONS																																														
<div style="display: flex; justify-content: space-around;"> <div style="width: 45%;"> <p>DIP Package</p> </div> <div style="width: 45%;"> <p>SIP Package</p> </div> </div> <p>* Pin not fitted on single output variants. Weight: 2.4g (DIP) 2.1g (SIP) All dimensions in mm ±0.25mm. All pins on a 2.54 mm pitch and within ±0.25mm of true position.</p>	<table border="1"> <thead> <tr> <th colspan="2">Dual output variants 14 PIN DIP</th> <th colspan="2">Single output variants 14 PIN DIP</th> </tr> <tr> <th>Pin</th> <th>Function</th> <th>Pin</th> <th>Function</th> </tr> </thead> <tbody> <tr><td>1</td><td>-Vin</td><td>1</td><td>-Vin</td></tr> <tr><td>7</td><td>NC</td><td>7</td><td>NC</td></tr> <tr><td>8</td><td>+Vout</td><td>8</td><td>+Vout</td></tr> <tr><td>9</td><td>0V</td><td>10</td><td>-Vout</td></tr> <tr><td>10</td><td>-Vout</td><td>14</td><td>+Vin</td></tr> <tr><td>14</td><td>+Vin</td><td></td><td></td></tr> </tbody> </table> <table border="1"> <thead> <tr> <th colspan="2">7 PIN SIP</th> </tr> <tr> <th>Pin</th> <th>Function</th> </tr> </thead> <tbody> <tr><td>1</td><td>+Vin</td></tr> <tr><td>2</td><td>-Vin</td></tr> <tr><td>5</td><td>-Vout</td></tr> <tr><td>6</td><td>0V</td></tr> <tr><td>7</td><td>+Vout</td></tr> </tbody> </table>	Dual output variants 14 PIN DIP		Single output variants 14 PIN DIP		Pin	Function	Pin	Function	1	-Vin	1	-Vin	7	NC	7	NC	8	+Vout	8	+Vout	9	0V	10	-Vout	10	-Vout	14	+Vin	14	+Vin			7 PIN SIP		Pin	Function	1	+Vin	2	-Vin	5	-Vout	6	0V	7	+Vout
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SOLDERING INFORMATION

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