



**DESCRIPTION :** 0.25W 3KVDC Isolated Single and Dual Output DC/DC Converters

Miniature surface mounted DC/DC Converters are an ideal and economical solution for many applications where noise reduction, voltage isolation, voltage conversion in distributed power systems is required. these converters are qualified for the higher temperatures requested by lead-free reflow solder processes, especially for automated SMD production lines.

**FEATURES**

RoHS compliant	Efficiency up to 80%	Operating temperature: -40°C to 105°C
CE certification	Footprint over pins 1.64cm <sup>2</sup>	Power density 1.36W/cm <sup>3</sup>
Input voltage: 3.3V, 5V, 12V,15V	Output voltage: ±3.3V, ±5V, ±9V, ±12V,±15V/ 3.3V, 5V, 9V,12V,15V	UL 94V-0 package material
3KVDC isolation	Custom solutions available	/

**SELECTION GUIDE**

Part Number	Nominal Input Voltage	Output Voltage	Output Current (Max./Min)	Efficiency
	V	V	mA	%
TPAT0303-W2	3.3	±3.3	±37.9/±3.79	70
TPAT0305-W2	3.3	±5	±25/±2.5	70
TPAT0309-W2	3.3	±9	±13.75/±1.375	72
TPAT0312-W2	3.3	±12	±10.5/±1.05	75
TPAT0315-W2	3.3	±15	±8.33/±0.833	80
TPAT0503-W2	5	±3.3	±37.9/±3.79	70
TPAT0505-W2	5	±5	±25/±2.5	70
TPAT0509-W2	5	±9	±13.75/±1.375	72
TPAT0512-W2	5	±12	±10.5/±1.05	75
TPAT0515-W2	5	±15	±8.33/±0.833	80
TPAT1203-W2	12	±3.3	±37.9/±3.79	70
TPAT1205-W2	12	±5	±25/±2.5	70
TPAT1209-W2	12	±9	±13.75/±1.375	76
TPAT1212-W2	12	±12	±10.5/±1.05	75
TPAT1215-W2	12	±15	±8.33/±0.833	80
TPAT1515-W2	15	±15	±8.33/±0.833	80
TPAT0303A-W2	3.3	3.3	75.8/7.58	70
TPAT0305A-W2	3.3	5	50/5	70
TPAT0309A-W2	3.3	9	27.8/2.78	72
TPAT0312A-W2	3.3	12	21/2.1	75
TPAT0315A-W2	3.3	15	16.7/1.67	80
TPAT0503A-W2	5	3.3	75.8/7.58	70
TPAT0505A-W2	5	5	50/5	70
TPAT0509A-W2	5	9	27.8/2.78	72
TPAT0512A-W2	5	12	21/2.1	75
TPAT0515A-W2	5	15	16.7/1.67	80
TPAT1203A-W2	12	3.3	75.8/7.58	70
TPAT1205A-W2	12	5	50/5	70
TPAT1209A-W2	12	9	27.8/2.78	26
TPAT1212A-W2	12	12	21/2.1	75
TPAT1215A-W2	12	15	16.7/1.67	80
TPAT1515A-W2	15	15	16.7/1.67	80

Add suffix "P" for continuous short circuit protection, for example TPAT0505P-W2. Add suffix "X" has not 5,10,14,16 pin, for example TPAT0505X-W2.

**INPUT CHARACTERISTICS**

Parameter	Conditions	Min.	Typ.	Max.	Units
Voltage range	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	11	12	13.3	V
Voltage range	15V input variants	13.4	15	16.4	V
Reflected ripple current			40	50	mA p-p

**ISOLATION CHARACTERISTICS**

Parameter	Conditions	Min.	Typ.	Max.	Units
Isolation voltage	Tested for 1 second	3000			VDC
Resistance	Viso= 1000VDC	1			GΩ

**GENERAL CHARACTERISTICS**

Parameter	Conditions	Min.	Typ.	Max.	Units
Switching frequency	0312, 0315		110		kHz
Switching frequency	0303, 0305, 0503		115		kHz
Switching frequency	All other variants		120		kHz

**ABSOLUTE MAXIMUM RATINGS**

Short-circuit protection	1 second
Lead temperature 1.5mm from case for 10 seconds	300°C
Internal power dissipation	680mW
Input voltage Vin, TPAT03	5.5V
Input voltage Vin, TPAT05	7V
Input voltage Vin, TPAT12	15V
Input voltage Vin, TPAT15	18V

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

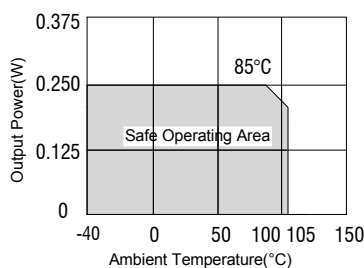
**OUTPUT CHARACTERISTICS**

Parameter	Conditions	Min.	Typ.	Max.	Units
Rated Power	TA=-40°C to 85°C			0.25	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)	0303 & 0503		9		%
Load Regulation(10% load to rated load)	5V output		9		%
Load Regulation(10% load to rated load)	0309		9.0		%
Load Regulation(10% load to rated load)	0509, 1209		7		%
Load Regulation(10% load to rated load)	0312, 0315		12		%
Load Regulation(10% load to rated load)	0512, 1212		7		%
Load Regulation(10% load to rated load)	0515, 1215, 1515		7		%

**TEMPERATURE CHARACTERISTICS**

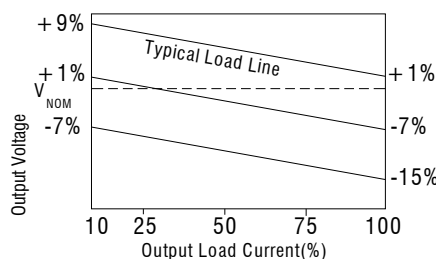
Parameter	Conditions	Min.	Typ.	Max.	Units
Specification	Derating if the temperature ≥85°C	-40		105	°C
Storage		-55		125	°C
Reflow Soldering Temperature		Peak temp. ≤260°C, maximum duration times ≤90s at 220°C. For actual application, please refer to IPC/JEDEC J-STD-020D.1.			
Cooling	Free air convection				

**TEMPERATURE DERATING GRAPHS**

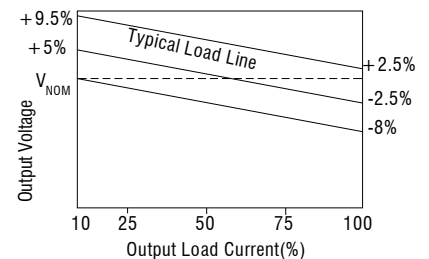


**TOLERANCE ENVELOPES**

Tolerance Envelope 3.3V output types

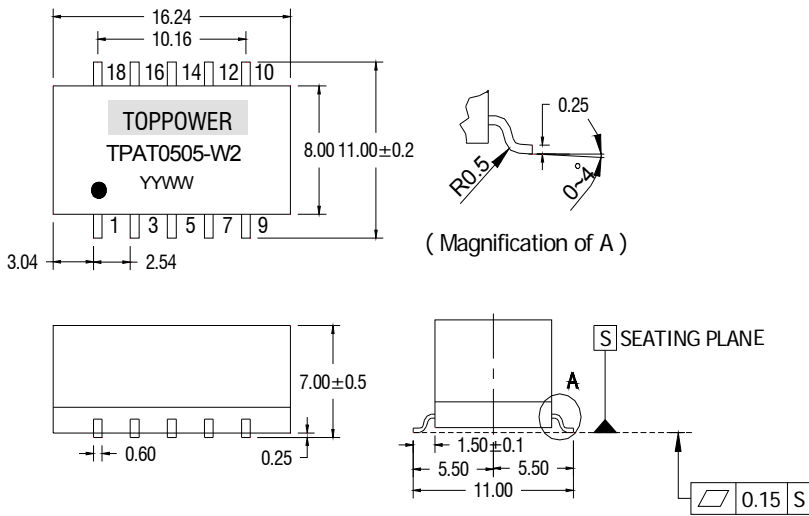


All other types



**MECHANICAL DIMENSIONS**

**SMD Package**



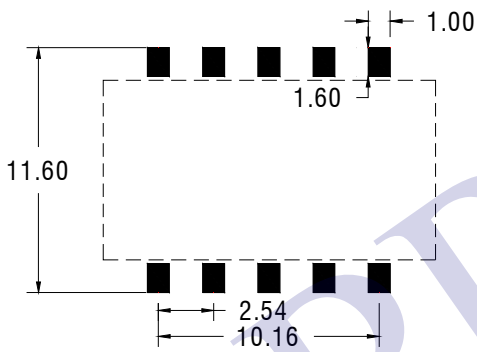
All dimensions in mm  $\pm 0.25$ mm. All pins on a 2.54 pitch. Weight: 1.53g

**PIN CONNECTIONS**

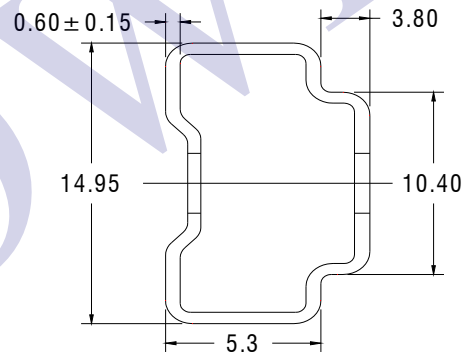
10 PIN SMD				
Pin	Dual Output		Single Output	
	Function	Add suffix "X" function	Function	Add suffix "X" function
1	-Vin	-Vin	-Vin	-Vin
3	+Vin	+Vin	+Vin	+Vin
5	NA	No Pin	NA	No Pin
7	OV	OV	OV	OV
9	-Vout	-Vout	NA	NA
10	NA	No Pin	NA	No Pin
12	+Vout	+Vout	+Vout	+Vout
14	NA	No Pin	NA	No Pin
16	NA	No Pin	NA	No Pin
18	NA	NA	NA	NA

NA - Not available for electrical connection.

**RECOMMENDED FOOTPRINT DETAILS**



**TUBE OUTLINE DIMENSIONS**

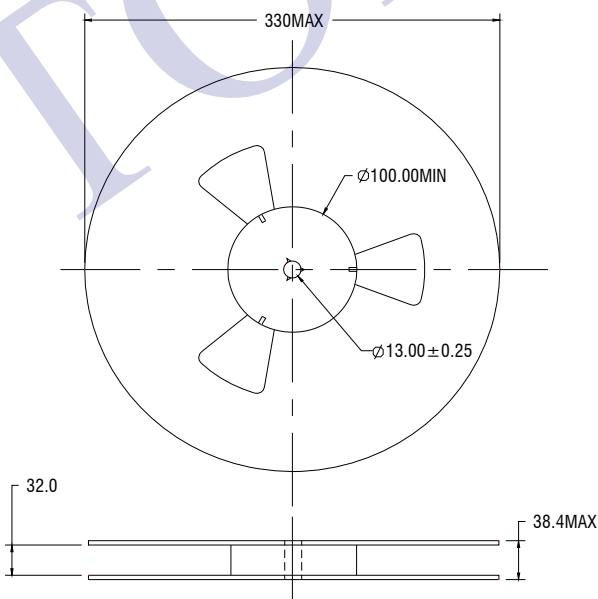


Unless otherwise stated all dimensions in mm  $\pm 0.5$ mm.

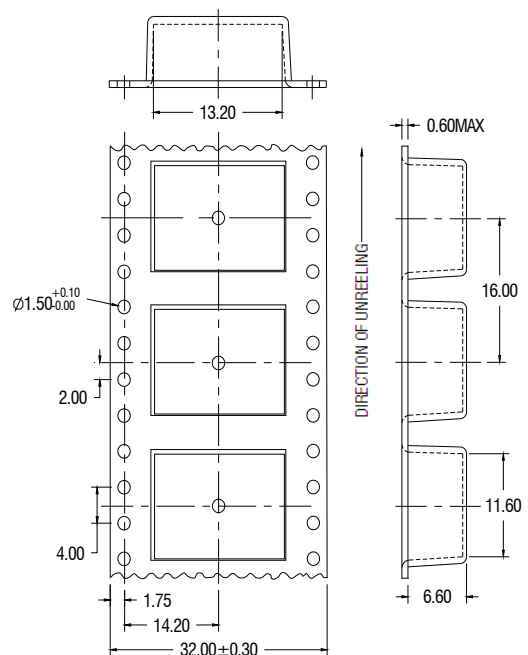
Tube length: 475mm  $\pm 2.0$ mm

Tube Quantity: 25PCS

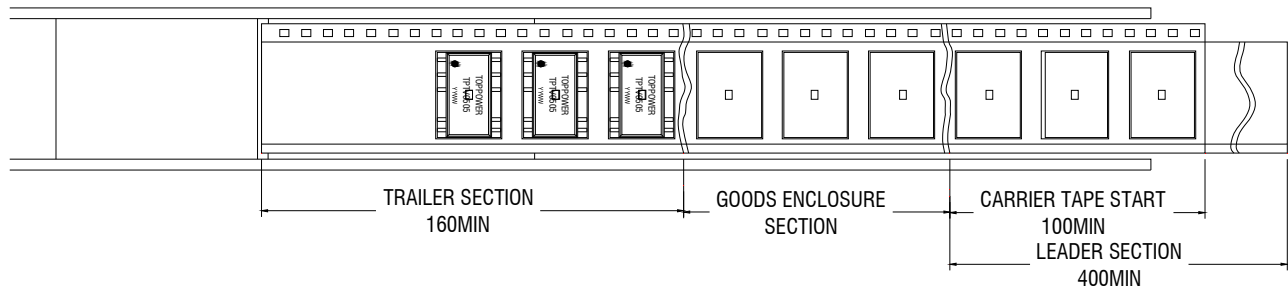
**REEL OUTLINE DIMENSIONS**



**TAPE OUTLINE DIMENSIONS**



REEL PACKAGING DETAILS



Product Orientation

Pin 1, located nearest to carrier drive sprocket

Reel quantity : 500 PCS

ENVELOPE

TOPPOWER