

TDD25 SERIES

DC - DC CONVERTER

23 ~ 25W SINGLE & DUAL OUTPUT



FEATURES

- EFFICIENCY UP TO 86%
- 2:1 & 3:1 WIDE INPUT RANGE
- I/O ISOLATION
- INPUT π FILTER
- SHORT CIRCUIT PROTECTION
- HIGH PERFORMANCE
- 3 YEARS WARRANTY

MODEL LIST

MODEL NO.	INPUT VOLTAGE	INPUT CURRENT (typ.)	OUTPUT WATTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT	EFF. (min.)	EFF. (typ.)	CAPACITOR LOAD (max.)
Single Output Models								
TDD25 - 03S2	18~60 VDC	1.17 A	23 WATTS	+3.3 VDC	7000 mA	78%	80%	3500 μ F
TDD25 - 05S2	18~60 VDC	1.20 A	25 WATTS	+ 5 VDC	5000 mA	84%	86%	3500 μ F
TDD25 - 12S2	18~60 VDC	1.13 A	24 WATTS	+ 12 VDC	2000 mA	84%	86%	470 μ F
TDD25 - 15S2	18~60 VDC	1.18 A	25 WATTS	+ 15 VDC	1700 mA	84%	86%	300 μ F
TDD25 - 03S3	35~75 VDC	0.58 A	23 WATTS	+3.3 VDC	7000 mA	78%	80%	3500 μ F
TDD25 - 05S3	35~75 VDC	0.60 A	25 WATTS	+ 5 VDC	5000 mA	84%	86%	3500 μ F
TDD25 - 12S3	35~75 VDC	0.56 A	24 WATTS	+ 12 VDC	2000 mA	84%	86%	470 μ F
TDD25 - 15S3	35~75 VDC	0.59 A	25 WATTS	+ 15 VDC	1700 mA	84%	86%	300 μ F
Dual Output Models								
TDD25 - 12D2	18~60 VDC	1.11 A	25 WATTS	$\pm$ 12 VDC	$\pm$ 1000 mA	84%	86%	$\pm$ 220 μ F
TDD25 - 15D2	18~60 VDC	1.21 A	25 WATTS	$\pm$ 15 VDC	$\pm$ 850 mA	84%	86%	$\pm$ 100 μ F
TDD25 - 12D3	35~75 VDC	0.59 A	25 WATTS	$\pm$ 12 VDC	$\pm$ 1000 mA	84%	86%	$\pm$ 220 μ F
TDD25 - 15D3	35~75 VDC	0.61 A	25 WATTS	$\pm$ 15 VDC	$\pm$ 850 mA	84%	86%	$\pm$ 100 μ F

SPECIFICATION

All Specifications Typical At Nominal Line, Full Load, 25°C Unless Otherwise Noticed

GENERAL

Characteristics	Conditions	min.	typ.	max.	unit
Switching frequency	Vi nom, Io nom		300		KHz
Isolation voltage	Input - Output	1500			VDC
Isolation resistance	Input - Output, @ 500VDC	100			MΩ
Isolation capacitance	100KHz / 1V			1000	PF
Ambient temperature	Vi nom, 3.3V & 5V output models	-25		+ 61	°C
	Io nom 12V, 15V & dual output models	-25		+ 71	°C
Case temperature	Operating at Vi nom, Io nom			+ 100	°C
Derating	Vi nom	See derating curve			
Storage temperature	Non operational	-40		+ 100	°C
Relative humidity	Vi nom, Io nom	20		95	% RH
Temperature coefficient	Vi nom, Io min			± 0.02	% / °C
Dimension		L76.2 x W50.8 x H12			mm
MTBF	Belcore issue 6@40°C, GB		701800		Hours
Cooling	Free air convection				

INPUT SPECIFICATIONS

Characteristics	Conditions	min.	typ.	max.	unit
Input voltage range	Ta min ... Ta max, Io nom	18	24	60	VDC
		35	48	75	VDC
No load input current	Vi nom, Io = 0	24V models		20	mA
		48V models		15	mA
Input voltage w/o damage	Io nom	24V models		65	VDC
		48V models		80	VDC
Startup voltage	Io nom	24V models		16	VDC
		48V models		30	VDC
Input filter	Pi type				

OUTPUT SPECIFICATIONS

Characteristics	Conditions	min.	typ.	max.	unit
Output voltage accuracy	Vi nom, Io nom			± 2	%
Minimum load	Vi nom single output models	0			%
	Vi nom dual output models (each output)	20			%
Line regulation	Io nom, Vi min ... Vi max			± 1	%
Load regulation	Vi nom, Io 0 ... Io nom, single output models			± 2	%
	Vi nom, Io min ... Io nom, dual output models			± 5	%
Cross regulation (Dual model)	Aymmetrical load 20% - 100% FL			± 5	%
Startup time	Vi nom, Io nom			30	ms
Transient recovery time	Vi nom, I ~ 0.5 Io nom			500	μs
Ripple & noise	Vi nom, Io nom, 3.3V & 5V models			150	mV
	BW = 20MHz 12V, 15V & dual			Vout x ± 1%	mV
Voltage trim range *	Vi nom 3.3V model		± 5		%
	5V, 12V, 15V & dual		± 10		%
Efficiency	Vi nom, Io nom, Po / Pi	Up to 86%, See model list and efficiency curve			

* NOTE : Pls refer to Fig 1 & Table 1 for connection resistance recommended.

CONTROL AND PROTECTION

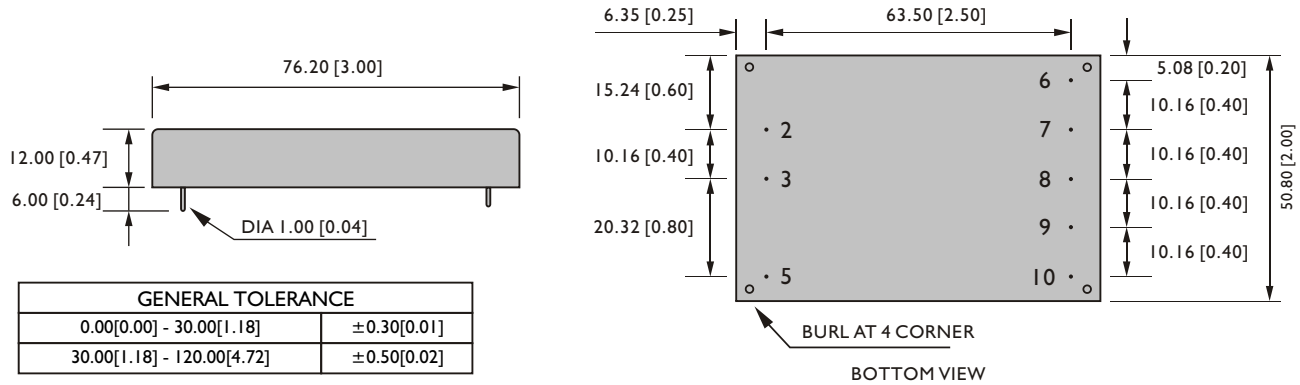
Remote ON / OFF	ON: opened or 8 ~ 10VDC applied, reference to input GND OFF: -0.3 ~ 2VDC applied, reference to input GND
Input reversed	Shunt diode built in, external fuse recommended (24Vin : 2A, 48Vin : 1.5A)
Output short circuit	Current limited (Auto-recovery)
Rated over load protection	110%min....140%max

PHYSICAL CHARACTERISTICS

Case size	76.2 x 50.8 x 12 mm (3 x 2 x 0.47 inches)
Case material	Plastic base / Metal case
Weight	105 g
Potting material	Epoxy

MECHANISM & PIN CONFIGURATION

mm [inch]

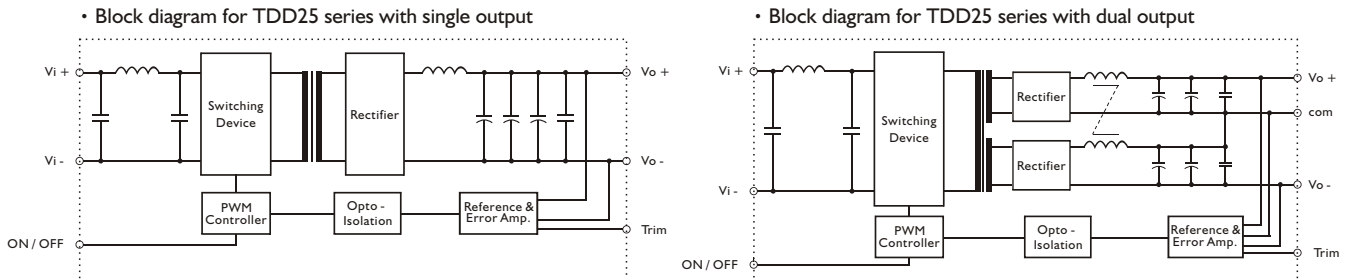


PIN ASSIGNMENT

GENERAL

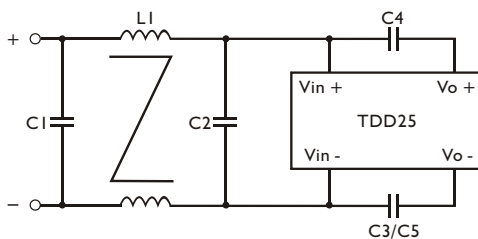
PIN NO.	2	3	5	6	7	8	9	10
SINGLE	Vi -	Vi +	ON / OFF	N. C.	N. C.	Vo -	Vo +	Trim
DUAL	Vi -	Vi +	ON / OFF	Vo -	N. C.	com	Vo +	Trim

CIRCUIT SCHEMATIC



RECOMMENDED CIRCUIT

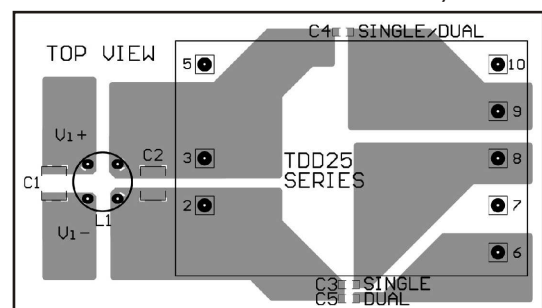
- Recommended filter for EN55022 Class B compliance.



- The components used in the above figure, together with the manufacturer part numbers for these components, are as follows.

	C1	C2	C3/C4/C5	L1
TDD25-XXSX	6.8 μ F / 100V MLCC	6.8 μ F / 100V MLCC	1nF / 2KV MLCC	500 μ H Command Chock
TDD25-XXDX	6.8 μ F / 100V MLCC	6.8 μ F / 100V MLCC	2.2nF / 2KV MLCC	500 μ H Command Chock

- Recommended EN 55022 Class B filter circuit layout.



DERATING AND EFFICIENCY CURVE

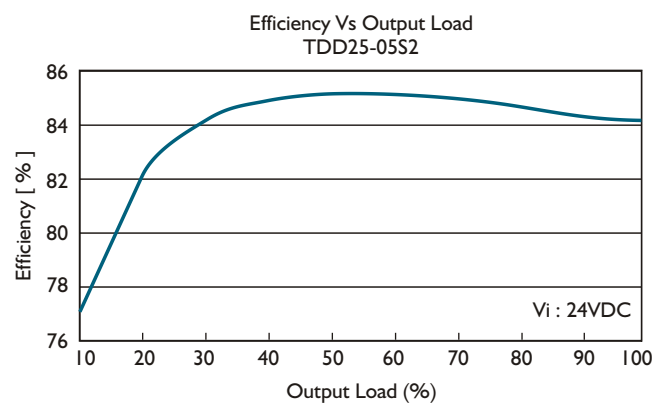
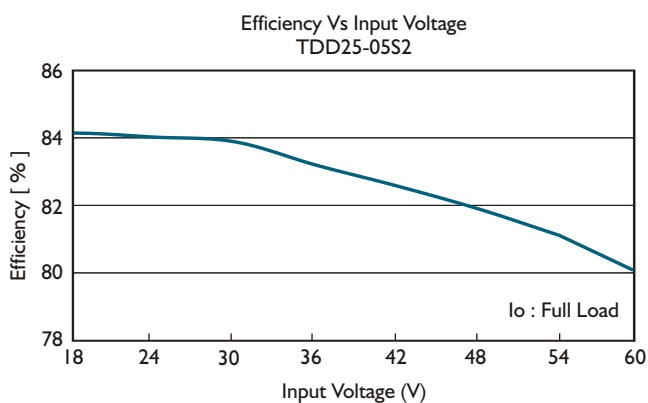
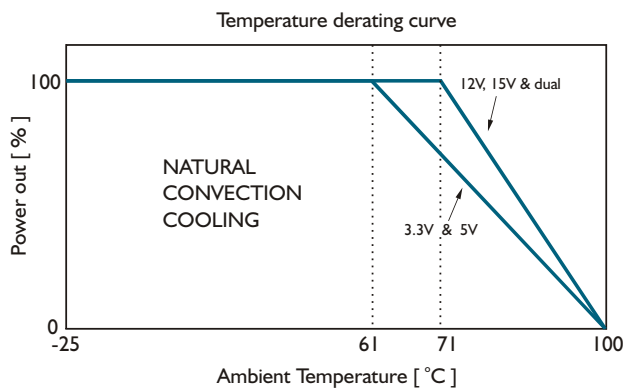
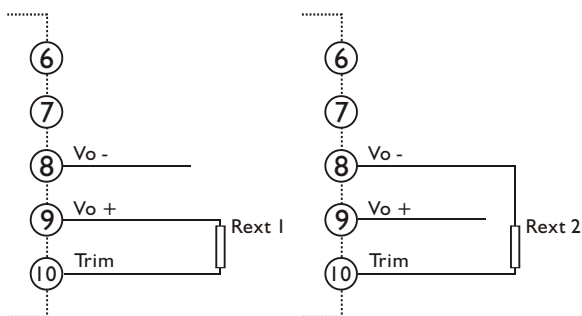


Fig. 1 Trim connection

(For Single output)



(For Dual output)

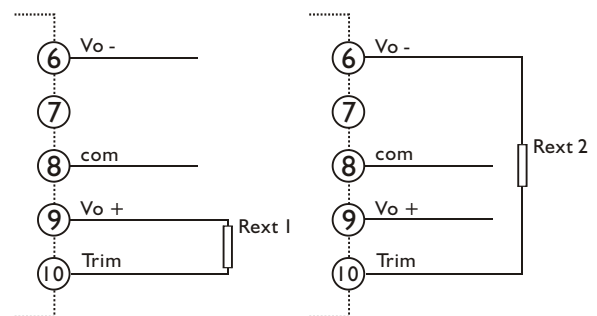


Table I Typical resistor values for various output voltage adjustment settings

Type	Rext 1		Rext 2	
	Vo nom -2.5%	Vo nom -5%	Vo nom +2.5%	Vo nom +5%
TDD25-03SX	1KΩ	0Ω	6.8KΩ	3.9KΩ
Type	Vo nom -5%	Vo nom -10%	Vo nom +5%	Vo nom +10%
TDD25-05SX	1KΩ	0Ω	1KΩ	0Ω
TDD25-12SX	62KΩ	20KΩ	8.2KΩ	1KΩ
TDD25-15SX	180KΩ	62KΩ	20KΩ	0Ω
TDD25-12DX	100KΩ	51KΩ	10KΩ	1KΩ
TDD25-15DX	180KΩ	68KΩ	10KΩ	0Ω