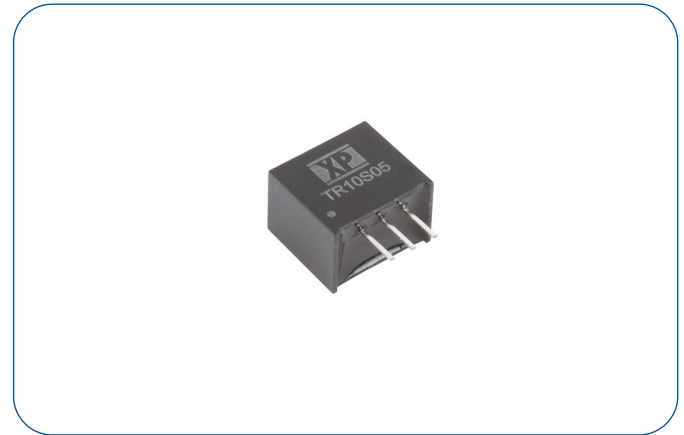


1 Amp

- 1A Switching Regulator
- Regulated Single Outputs of 3.3V and 5V DC
- Wide Input Range to 28V
- SIP3 Package
- Non Isolated
- High Efficiency to 93%
- Class B Conducted & Radiated Emissions
- Short Circuit Protection
- Low 1.5mA Standby Input Current
- -40°C to +85°C Operation
- MTBF >3.8Mhrs
- 3 Year Warranty



Dimensions:

TR10:
0.46 x 0.29 x 0.4" (11.68 x 7.5 x 10.16 mm)

The TR10 provides a compact efficient switching regulator solution operating from a wide range DC input with popular regulated output voltages of 3.3V and 5V. This convenient, cost-effective solution features short circuit protection and an industrial operating temperature range.

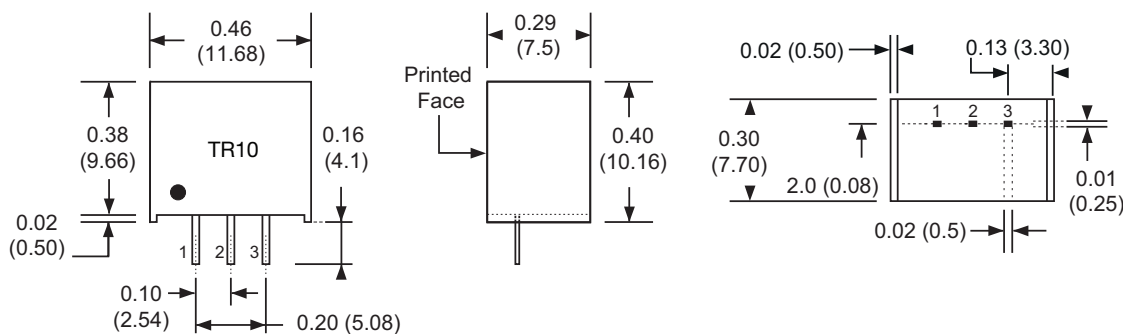
Models & Ratings

Input Voltage	Output Voltage	Output Current	Input Current			Max. Capacitive Load	Efficiency with full load		Model Number
			No Load	Full Load, min. Vin	Full Load, max. Vin		Min. Vin	Max. Vin	
7-28 V	3.3 V	1000 mA	1.5 mA	530 mA	145 mA	220 μ F	89%	82%	TR10S3V3
8-28 V	5.0 V	1000 mA	1.5 mA	670 mA	210 mA	220 μ F	93%	86%	TR10S05

Notes

1. Standard tube quantity 30 pcs

Mechanical Details



Pin Connections	
Pin	Single
1	+Vin
2	Ground
3	+Vout

Notes

1. All dimensions are in inches (mm)
2. Weight: 0.004 lbs (2.1 g) approx.
3. Pin diameter: 0.02±0.002 (0.5±0.05)
4. Pin pitch tolerance: ±0.014 (±0.35)
5. Case tolerance: ±0.02 (±0.5)

Input

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Input Voltage Range	7		28	VDC	See Models and Ratings table
Input Filter	Integral capacitor				
Input Reflected Ripple			35	mA pk-pk	Through 12 μ H inductor and 47 μ F capacitor
Input Surge			30	VDC for 100 ms	

Output

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Output Voltage	3.3		5	VDC	See Models and Ratings table
Initial Set Accuracy			2.5	%	At full load
Minimum Load	100			mA	Minimum load required to meet specification. Operation at no load will not cause damage.
Line Regulation			1.0	%	
Load Regulation			1.5	%	From 10% to full load
Transient Response			\pm 3	%	For 25% load change
Ripple & Noise			100	mV pk-pk	20 MHz bandwidth
Short Circuit Protection					Continuous, with auto recovery
Maximum Capacitive Load					See Models and Ratings table
Temperature Coefficient			0.02	%/ $^{\circ}$ C	

General

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Efficiency		90		%	See models and ratings table
Isolation: Input to Output	0			VDC	Non isolated
Switching Frequency		330		kHz	
Mean Time Between Failure	3.8			MHrs	MIL-HDBK-217F, +25 $^{\circ}$ C GB
Weight		0.004 (2.1)		lb (g)	
Case Material	Non-conductive black plastic UL94V-0				
Pin Material	Solder Coated C5191R-H				
Potting Material	Silicon, UL94V-0 rated				
Water Washing	Use de-ionised water, do not soak, dry thoroughly				
Soldering Temperature			260	$^{\circ}$ C	Wave solder peak, 1.5mm from case 10s max. Not suitable for vapour phase soldering. For further details contact XP Power applications team.

Environmental

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Operating Temperature	-40		+85	$^{\circ}$ C	Derate from 100% load at +60 $^{\circ}$ C to 40% at +85 $^{\circ}$ C
Storage Temperature	-55		+125	$^{\circ}$ C	
Case Temperature			+105	$^{\circ}$ C	
Humidity			95	%RH	Non-condensing
Cooling	Natural convection				

EMC: Emissions

Phenomenon	Standard	Test Level	Notes & Conditions
Conducted	EN55032	Class B	See Application Note
Radiated	EN55032	Class B	

EMC: Immunity

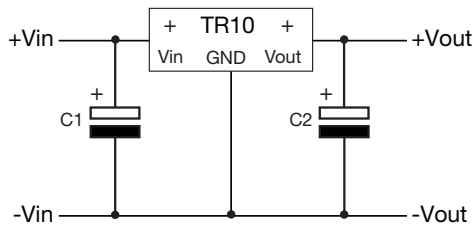
Phenomenon	Standard	Test Level	Criteria	Notes & Conditions
ESD Immunity	EN61000-4-2	\pm 6 kV/ \pm 8 kV	A	Contact discharge/Air discharge
Radiated Immunity	EN61000-4-3	20 Vrms	A	
EFT/Burst	EN61000-4-4	\pm 2.0 kV	A	External input capacitor required 330 μ F/100 V
Surges	EN61000-4-5	\pm 0.5 kV	A	External input capacitor required 330 μ F/100 V
Conducted Immunity	EN61000-4-6	10 V rms	A	
Magnetic Fields	EN61000-4-8	100 A/m	A	

Safety Approvals

Agency	Standard	Test Level	Notes & Conditions
CE	Meets all applicable directives		
UKCA	Meets all applicable legislation		

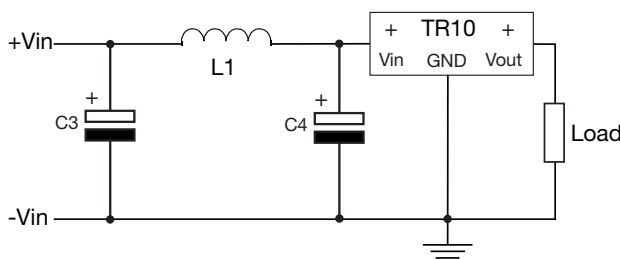
Application Notes

Standard Application



C1	C2
22 μ F	47 μ F (optional) to improve transient response

Input Filter to meet Class B Conducted Emissions



C3	L1	C4
10 μ F, 50 V	22 μ H	10 μ F, 50 V
C3, C4 and L1 should be placed as close to the TR10 as possible		

Notes

Suggested capacitor type MLCC with low ESR
For inductor use saturation current higher than 2A with a low DCR rating. Suggested size to be 5 x 5mm minimum.

Derating Curve

