TR05 Series

DC-DC Converter

XP Power

0.5 Amp

- 0.5A Switching Regulator
- Regulated Single Outputs from 3.3V to 15VDC
- Wide Input Range to 28V
- SIP3 Package
- Non Isolated
- High Efficiency to 94%
- Class B Conducted & Radiated Emissions
- Short Circuit Protection
- Low Standby Input Current
- -40°C to +85°C Operation
- MTBF >4.0MHrs
- 3 Year Warranty

The TR05 provides a compact efficient switching regulator solution operating from a wide range DC input. Output voltages start from 3.3V and the TR05 features short circuit protection and an industrial operating temperature range.



Dimensions:

TR05: 0.46 × 0.29 × 0.38" (11.68 × 7.5 × 9.65mm)

Models & Ratings

			Input Current			Maximum	Efficiency Vin	Efficiency Vin	
Input Voltage	Output Voltage	Output Current	No Load	Full Load Vin (Min)	Full Load Vin (Max)	Capacitive Load µF	(Min) with full load	(Max) with full load	Model Number
4.5 - 28V	3.3V	0.5A	1.0mA	412mA	79mA	100	89	75	TR05S3V3
7 - 28V	5.0V	0.5A	1.0mA	388mA	112mA	100	92	80	TR05S05
14 - 28V	12.0V	0.5A	1.5mA	456mA	238mA	100	94	90	TR05S12
17 - 28V	15.0V	0.5A	2.0mA	469mA	292mA	47	94	92	TR05S15

Notes

1. Standard tube quantity 30 pcs

Mechanical Details



Notes

- 1. All dimensions are in inches (mm)
- 2. Weight: 0.004lbs (2.0g) approx.

3. Pin diameter: 0.02±0.002 (0.5±0.05)

- 4. Pin pitch tolerance: ± 0.014 (± 0.35)
- 5. Case & pin tolerance: ±0.02 (±0.5)

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Input Units Characteristic Minimum Typical Maximum Notes & Conditions Input Voltage Range 4.5 28 VDC See Models and Ratings table. Integral capacitor Input Filter Measured with $12 \mu H$ inductor and $10 \mu F$ capacitor Input Reflected Ripple 35 mA pk-pk source values. Input Surge 30 VDC for 100 ms

Output					
Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Output Voltage	3.3		15	VDC	See Models and Ratings table.
Initial Set Accuracy			±3.0	%	At full load.
Minimum Load	0			mA	No minimum load required.
Line Regulation			±0.5	%	
Load Regulation			+/-8.0	%	From 0% to full load.
Transient Response			±3	%	For 50% load change. Recovery in 250µs.
Ripple & Noise		60		mV pk-pk	20MHzbandwidth measured from 10% to 100% load
Short Circuit Protection	Continuous, with	n auto recovery			
Maximum Capacitive Load	See Models and	l Ratings table			
Temperature Coefficient			0.02	%/°C	
Startup Time		10		ms	Nominal Vin with resistive load.
Overload Protection		2		A	

General							
Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions		
Efficiency		92		%	See models and ratings table.		
Isolation: Input to Output	0			VDC	Non isolated.		
Switching Frequency		570		kHz			
Mean Time Between Failure	4.0			MHrs	MIL-HDBK-217F.		
Weight		0.0044 (2.0)		lb (g)			
Case Material	Non-conductive	Non-conductive black plastic UL94V-0					
Pin Material	Solder coated C5191R-H						
Potting Material	UL94V-0 rated, Epoxy						
Soldering Temperature			260	°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	°C	See derating curves.
Storage Temperature	-55		+125	°C	
Case Temperature			+85	°C	
Humidity			95	%RH	Non-condensing.
Cooling	Natural convection	on			

Safety Approvals

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

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EMC: Emissions

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

EMC: Immunity

Phenomenon	Standard	Test Level	Criteria	Notes & Conditions
ESD Immunity	EN61000-4-2	+-6kV / +-8kV	А	Contact discharge/Air discharge
Radiated Immunity	EN61000-4-3	80-1000MHz, 3V/m, 80% AM (1kHZ)	A	
EFT/Burst	EN61000-4-4	±2.0kV	A	External input capacitor required 330 uE/100 V
Surges	EN61000-4-5	±0.5kV	A	External input capacitor required 350 pr / 100 V
Conducted Immunity	EN61000-4-6	0.15 - 80MHz, 3V, 80% AM	A	
Magnetic Fields	EN61000-4-8	1A/m	A	

Application Note

Standard Application



C1	C2
22 µF	47 µF

XP Power

C4

Input Filter to meet Class B Conducted Emissions



Derating Curves TR05S3V3/05



TR05S12/15

