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 x 0.29 x 0.38" (11.68 x 7.5 x 9.65mm)

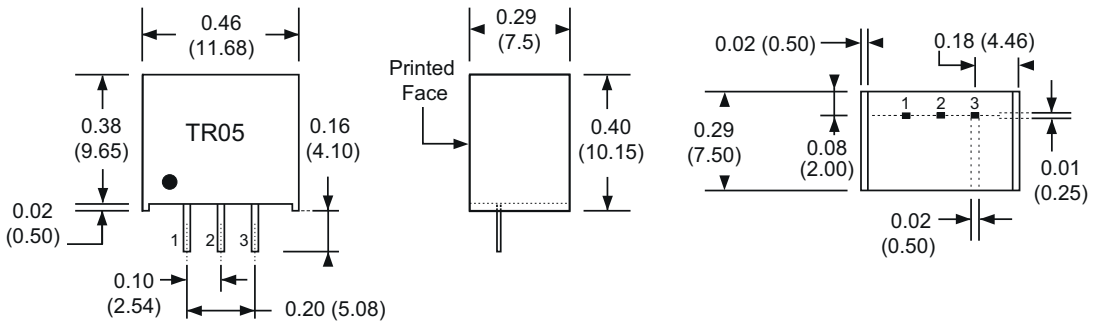
Models & Ratings

Input Voltage	Output Voltage	Output Current	Input Current			Maximum Capacitive Load µF	Efficiency Vin (Min) with full load	Efficiency Vin (Max) with full load	Model Number
			No Load	Full Load Vin (Min)	Full Load Vin (Max)				
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



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

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)

Input

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Input Voltage Range	4.5		28	VDC	See Models and Ratings table.
Input Filter	Integral capacitor				
Input Reflected Ripple			35	mA pk-pk	Measured with 12µH inductor and 10µF capacitor 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 auto recovery				
Maximum Capacitive Load	See Models and 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 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				

Safety Approvals

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

EMC: Emissions

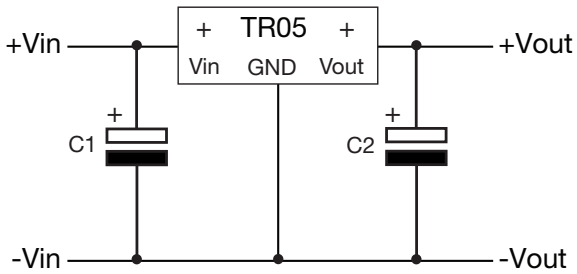
Phenomenon	Standard	Test Level	Notes & Conditions
Conducted	EN55032	Class B	See Application Notes
Radiated	EN55032	Class B	

EMC: Immunity

Phenomenon	Standard	Test Level	Criteria	Notes & Conditions
ESD Immunity	EN61000-4-2	+-6kV / +-8kV	A	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 µF/100 V
Surges	EN61000-4-5	±0.5kV	A	
Conducted Immunity	EN61000-4-6	0.15 - 80MHz, 3V, 80% AM	A	
Magnetic Fields	EN61000-4-8	1A/m	A	

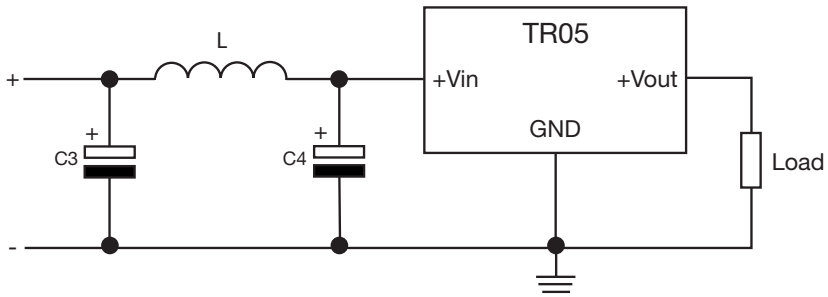
Application Note

Standard Application



C1	C2
22 µF	47 µF

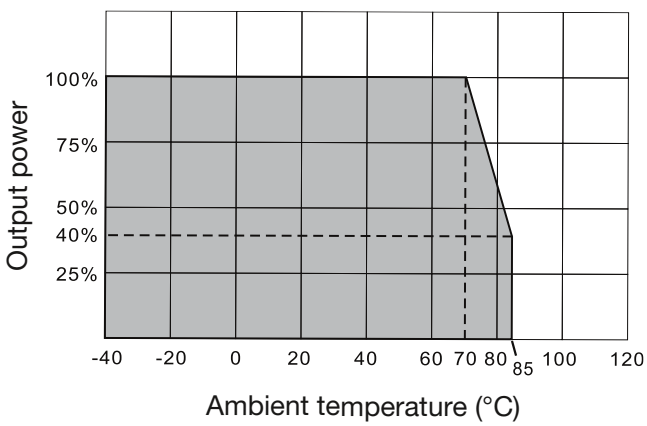
Input Filter to meet Class B Conducted Emissions



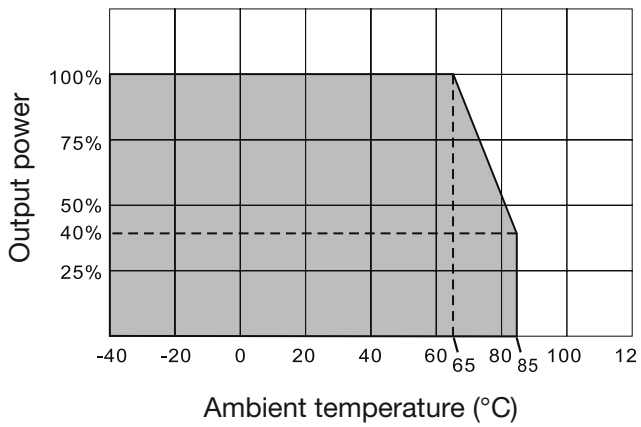
C3	L	C4
10 µF, 35 V	6.8 µH	10 µF, 35 V

Derating Curves

TR05S3V3/05



TR05S12/15



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