TR05 series

XP Power

0.5A

DC-DC converters

The TR05 provides a compact efficient switching regulator solution operating from a wide range DC input.

Output voltages start from 3.3VDC and the TR05 features short circuit protection and an industrial operating temperature range.

Features

- Non-isolated 0.5A switching regulator
- Regulated outputs 3.3 to 15VDC
- Wide input range
- SIP3 compatible with LM78MXX
- Efficiency up to 94%
- Continuous short-circuit protection
- -40 °C to +85 °C operating temperature
- 3 year warranty

Applications

Robotics
Instrumentation
Technology
Industrial
Process control

Dimensions

11.68 x 7.5 x 9.65mm (0.46” x 0.29” x 0.38”)

Documentation

For further information click the link or scan the code

→ xppower.com

Models & ratings

Model number	Input voltage	Output voltage	Output current	Input current			Efficiency		Max. capacitive load
				No load	Full load, min. Vin	Full load, max. Vin	Min. Vin	Max. Vin	
TR05S3V3	4.5 - 28VDC	3.3VDC	0.5A	1.0mA	412mA	79mA	89%	75%	100µF
TR05S05	7 - 28VDC	5.0VDC	0.5A	1.0mA	388mA	112mA	92%	80%	100µF
TR05S12	14 - 28VDC	12.0VDC	0.5A	1.5mA	456mA	238mA	94%	90%	100µF
TR05S15	17 - 28VDC	15.0VDC	0.5A	2.0mA	469mA	292mA	94%	92%	47µF

Notes:

1. Standard tube quantity 30 pcs

Input

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Input voltage range	4.5		28	VDC	See models and ratings
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 100ms	

Output

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Output voltage	3.3		15	VDC	See models and ratings
Initial set accuracy			±3.0	%	At full load
Minimum load	No minimum load required				
Line regulation			±0.5	%	
Load regulation			±8	%	From 0% to full load.
Transient response			±3	%	For 50% load change. Recovery in 250µs.
Ripple & noise		60		mV pk-pk	20MHz bandwidth measured from 10% to 100% load
Short circuit protection	Continuous, with auto recovery				
Maximum capacitive load	See models and ratings				
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		2.0 (0.0044)		g (lb)	
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 curve
Storage temperature	-55		+125	°C	
Case temperature			+85	°C	
Humidity			95	%RH	Non-condensing
Cooling	Natural convection				

Safety approvals

Safety Agency	Standard	Notes & conditions
CE	Meets all applicable directives	
UKCA	Meets all applicable legislation	

EMC: emissions

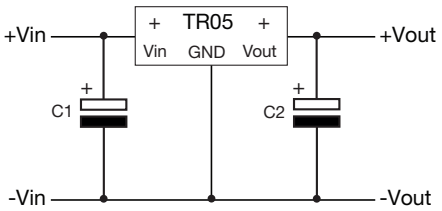
Phenomenon	Standard	Test level	Notes & conditions
Conducted	EN55032	Class B	See application notes
Radiated	EN55032	Class B	

Emissions - immunity

Phenomenon	Standard	Test level	Criteria	Notes & conditions
ESD immunity	EN61000-4-2	±6kV contact/±8kV air	A	
Radiated immunity	EN61000-4-3	80-1000MHz, 3V/m, 80% AM (1kHZ)	A	
EFT/burst	EN61000-4-4	±2.0kVDC	A	External input capacitor required 330µF/100VDC
Surge	EN61000-4-5	±0.5kVDC	A	
Conducted	EN61000-4-6	0.15 - 80MHz, 3VDC, 80% AM	A	
Magnetic fields	EN61000-4-8	1A/m	A	

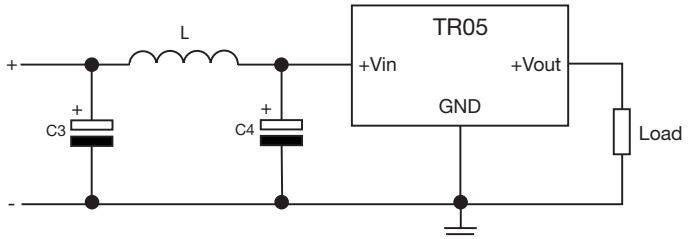
Application notes

Standard application



C1	C2
22µF	47µF

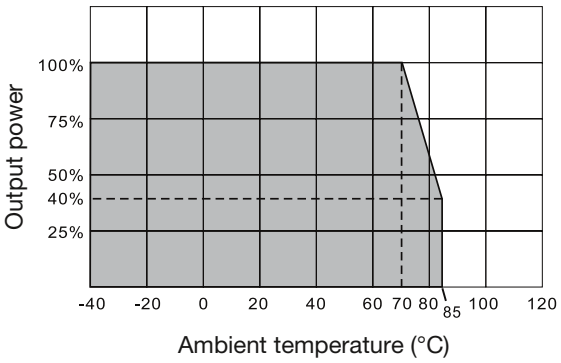
Input filter to meet Class B conducted emissions



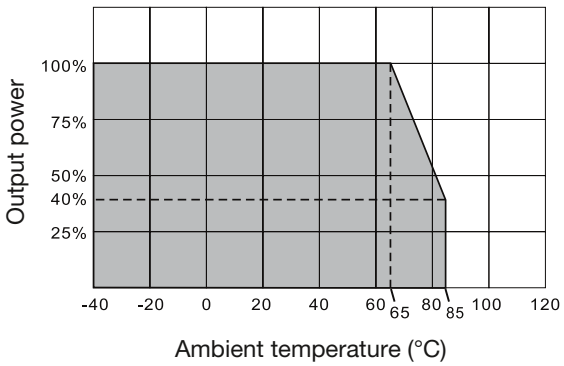
C3	L1	C4
10 µF, 35VDC	6.8µH	10µF, 35VDC

Derating curve

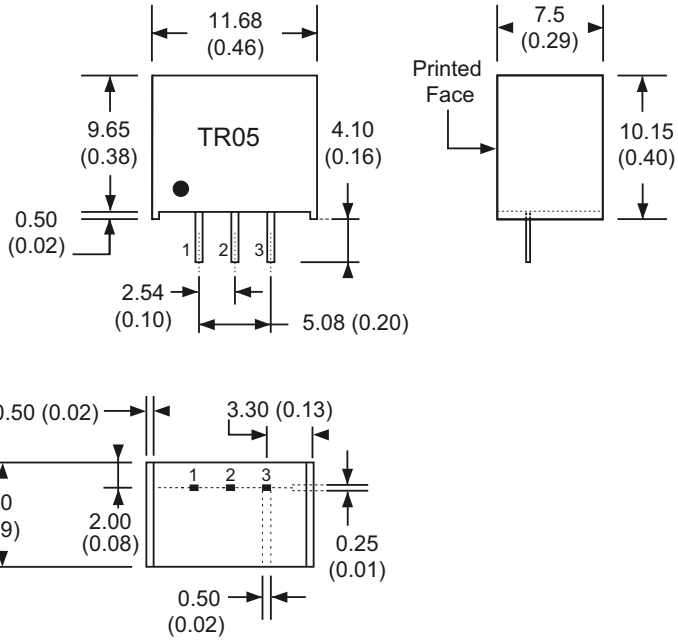
TR05S3V3/05



TR05S12/15



Mechanical details



Pin connections	
Pin	**Function**
1	+Vin
2	Ground
3	+Vout

Notes:

1. All dimensions are in mm (inches).
2. Weight: 2.0g (0.004lbs) typical.
3. Pin diameter 0.5±0.05 (0.02±0.002)
3. Pin pitch tolerance: ±0.35 (±0.014)
5. Case and pin tolerances: ±0.5 (±0.02).