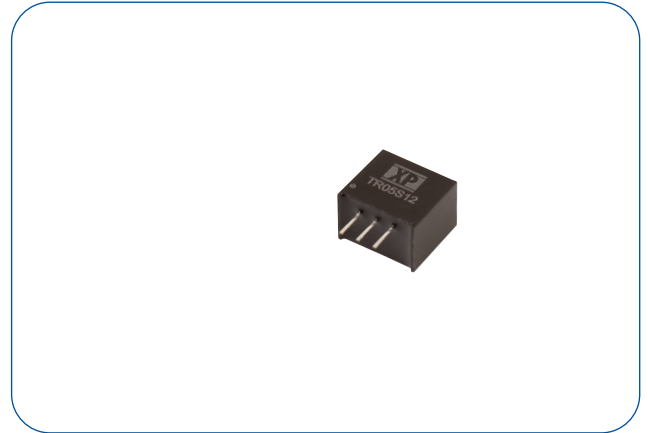


### 0.5 Amp

- 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



#### Dimensions:

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

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.

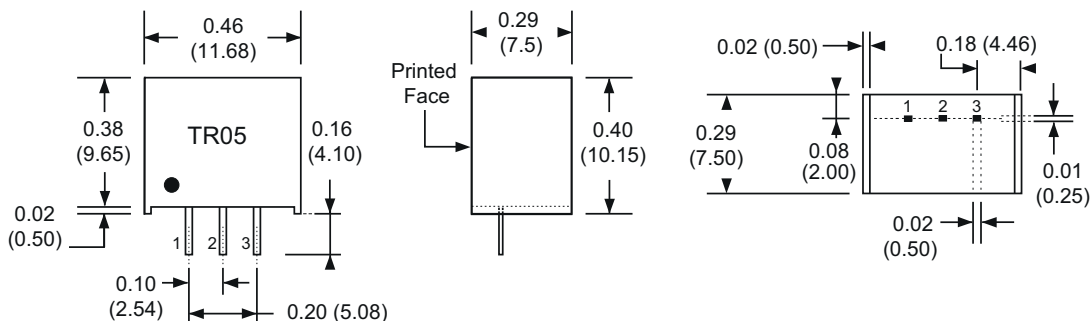
### Models & Ratings

Input Voltage	Output Voltage	Output Current	Input Current			Maximum Capacitive Load $\mu\text{F}$	Efficiency $V_{in}$ (Min) with full load	Efficiency $V_{in}$ (Max) with full load	Model Number
			No Load	Full Load $V_{in}$ (Min)	Full Load $V_{in}$ (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

- Standard tube quantity 30 pcs

### Mechanical Details



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

### Notes

- All dimensions are in inches (mm)
- Weight: 0.004lbs (2.0g) approx.
- Pin diameter: 0.02±0.002 (0.5±0.05)
- Pin pitch tolerance: ±0.014 (±0.35)
- 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

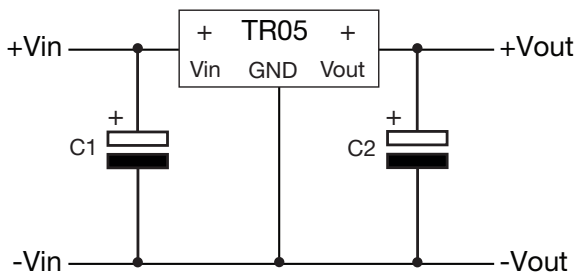
Phenomenon	Standard	Test Level	Notes & Conditions
Conducted	EN55032	Class B	See Application Notes
Radiated	EN55032	Class B	

### 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	External input capacitor required 330 μF/100 V
EFT/Burst	EN61000-4-4	±2.0kV	A	
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	

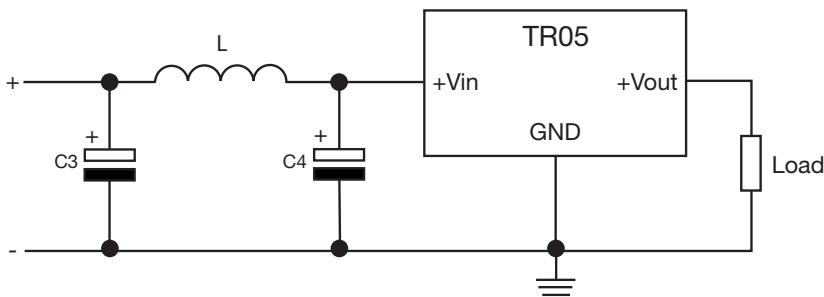
### Application Note

#### Standard Application



C1	C2
22 μF	47 μF

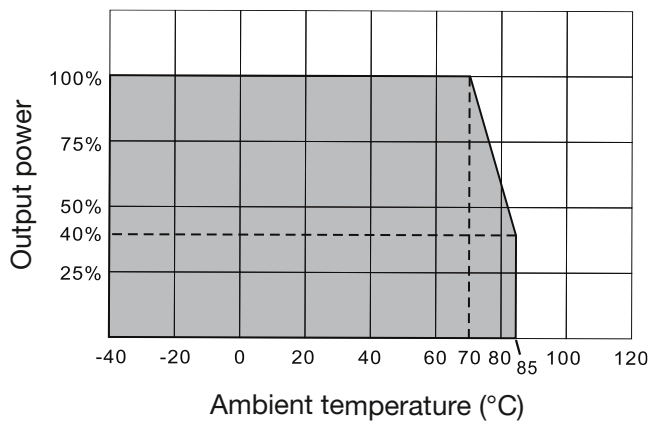
#### Input Filter to meet Class B Conducted Emissions



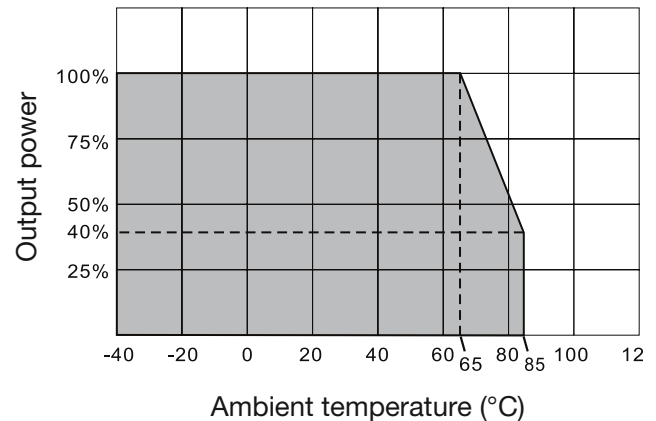
C3	L	C4
10 μF, 35 V	6.8 μH	10 μF, 35 V

#### Derating Curves

##### TR05S3V3/05



##### TR05S12/15



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