

# 0.5 Amps TR Series



- 3 Pin SIP 3T Switching Regulator
- Wide Input Range
- Continuous Short-circuit Protection
- Pin Compatible with LM78MXX
- Efficiency up to 94%
- -40 °C to +85 °C Operating Temperature
- 3 Year Warranty

## Specification

### Input

- Input Voltage Range • See table
- Input Current • See table
- Input Reflected Ripple • 35 mA pk-pk through 12  $\mu$ H inductor and 47  $\mu$ F capacitor, 5 Hz to 20 MHz
- Input Filter • External capacitor (see application notes)

### Output

- Output Voltage • See table
- Minimum Load • 5 mA
- Line Regulation •  $\pm 0.5\%$  max
- Load Regulation •  $\pm 0.8\%$  from 10% to 100% load
- Setpoint Accuracy •  $\pm 3\%$
- Turn-on Time • See note 6
- Ripple & Noise • 60 mV pk-pk with 10% minimum load, 20 MHz bandwidth
- Maximum Capacitive Load • 110  $\mu$ F for S3V3, S05 and S12 models, 47  $\mu$ F for S15 models
- Short Circuit Protection • Indefinite (automatic recovery)
- Temperature Coefficient • 0.02% / $^{\circ}$ C

### General

- Efficiency • See table
- Isolation Voltage • Non-isolated
- Switching Frequency • 570 kHz typical
- Package Style • 3 pin SIP
- MTBF • >4.0 Mhrs to MIL-HDBK-217F at 25  $^{\circ}$ C, GB

### Environmental

- Operating Temperature • -40  $^{\circ}$ C to +85  $^{\circ}$ C, S3V3 and S05, derate from 100% load at 70  $^{\circ}$ C to 40% load at 85  $^{\circ}$ C, S12 and S15 derate from 100% load at 65  $^{\circ}$ C to 40% load at 85  $^{\circ}$ C
- Operating Humidity • 95% RH
- Case Temperature • +100  $^{\circ}$ C max
- Storage Temperature • -40  $^{\circ}$ C to +125  $^{\circ}$ C
- Cooling • Convection-cooled

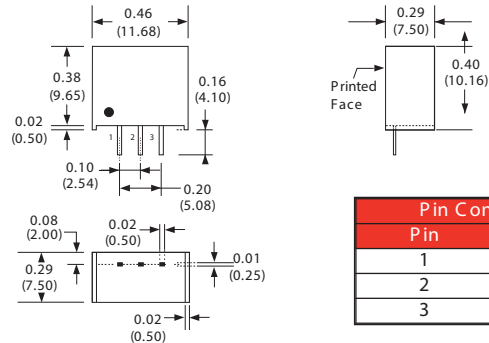
### Notes

1. All dimensions in inches (mm)
2. Weight: 0.004 lbs (1.8 g)
3. Pin pitch tolerance:  $\pm 0.014$  ( $\pm 0.35$ )
4. Case tolerance:  $\pm 0.02$  ( $\pm 0.5$ )
5. Efficiency range given for maximum  $V_{in}$  to minimum  $V_{in}$
6. For maximum reliability, ensure turn on time is >1 ms by placing a 22  $\mu$ F capacitor between +Vin and GND

## Model Numbers

Input Voltage	No Load Input Current	Output Voltage	Output Current	Efficiency <sup>(5)</sup>	Model Number
4.5-28.0 VDC	1.0 mA	3.3 V	500 mA	75-89%	TR05S3V3
7.0-28.0 VDC	1.0 mA	5.0 V	500 mA	80-92%	TR05S05
14.0-28.0 VDC	1.5 mA	12.0 V	500 mA	90-94%	TR05S12
17.0-28.0 VDC	2.0 mA	15.0 V	500 mA	92-94%	TR05S15

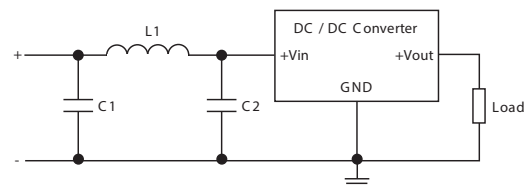
## Mechanical Details



Pin Connections	
Pin	Function
1	+Vin
2	GND
3	+Vout

## Application Notes

### Input Filter to meet Class B Conducted Emissions



C1	L1	C2
10 $\mu$ F, 35 V	6.8 $\mu$ H	10 $\mu$ F, 35 V