DC/DC Converter

TSI-10N Series 10 Watt

Features

- Step-down Switching Regulator with very high Efficiency
- Adjustable Output 1.8 – 3.3 VDC or 3.0 – 5.0 VDC
- Remote ON/OFF
- Overload Protection
- Low Output Noise
- Standby Current only 100 µA
- Small SIL- or DIL-Package
- 3 Year Product Warranty

not recommended for new design in

This new generation of step-down converters provides designers with a cost-effective solution for converting a 5, 12 or 24 VDC voltage. To achieve highest efficiency, these dc/dc converters are using newest technologies , as amorphous ferrite, solid aluminum capacitors and a synchronous commutation IC. A very high efficiency allows operation without additional heatsink. This product finds many applications in distributed powersystems where a voltage conversion at the point of load is an required.

Models

Ordercode	Input voltage range	Output voltage	Output current max.	Efficiency typ.	Package
TSI 10N-0510	4.75 – 13.6 VDC	* + 3.3 VDC	2000 mA	92.0 %	SIP
TSI 10N-0510D	4.75 – 13.6 VDC	* + 3.3 VDC	2000 mA	92.0 %	DIP
TSI 10N-1211	6.0 – 16.5 VDC	** + 5 VDC	2000 mA	93.0 %	SIP
TSI 10N-1211D	6.0 – 16.5 VDC	** + 5 VDC	2000 mA	93.0 %	DIP
TSI 10N-2410	16.0 – 28.0 VDC	* + 3.3 VDC	2000 mA	83.0 %	SIP
TSI 10N-2410D		* + 3.3 VDC	2000 mA	83.0 %	DIP
TSI 10N-2411		** + 5 VDC	2000 mA	85.0 %	SIP
TSI 10N-2411D		** + 5 VDC	2000 mA	85.0 %	DIP

* Output adjustable 1.8 to 3.3 VDC
** Output adjustable 3.0 to 5.0 VDC

Input Specifications

Input current (no load / full load)	TSI 10N-0510	21mA / 1435 mA typ.
	TSI 10N-1211	27 mA / 895 mA typ.
	TSI 10-N2410	45 mA / 330 mA typ.
	TSI 10N-2411	45 mA / 485 mA typ.
Surge voltage (1 sec max.)	5 Vin models	16 V max.
	12 Vin models	25 V max.
	24 Vin models	30 V max.
Stand-by current		100 µA typ.

Output Specifications

Voltage adjustment	TSI 10N-0510 & TSI 10N-2410	+1.8 VDC to +3.3 VDC
	TSI 10N-1211 & TSI 10N-2411	+3.0 VDC to +5.0 VDC
Regulation	– Input variation	0.5 %
	– Load variation 10 – 100 %	< 1.5 %
Ripple and noise (20 MHz Bandwidth)		50 mVpk-pk max. (with 2.2µF capacitor on output)
Transient response time (50% Load change)		100 µsec typ.
Temperature coefficient		± 0.02 % / °C
Short circuit protection		indefinite foldback
Remote ON / OFF control		ON=Pin 1 (ON / OFF Pin) to pin 3 (GND) open (3 – 5 VDC) OFF=Pin 1 (ON / OFF Pin) to pin 3 (GND) short (– 0.3 – 1.2 VDC)

General Specifications

Temperature ranges	– Operating	– 25 °C ... + 70 °C
	– Storage	– 25 °C ... +125 °C
Humidity (non condensing)		95 % rel H max.
Reliability, calculated MTBF (MIL-HDBK-217 E)		>1'500'000 h @ 25 °C
Isolation Input / Output		none
Switching frequency		300 kHz typ. (PWM modulation)

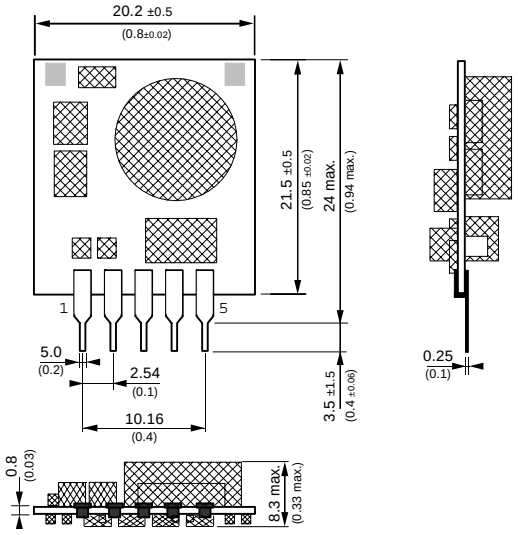
Physical Specifications

Vibration (IEC 60068-3-6)	5 to 10 Hz amplitude 10 mm pk-pk 10 to 55 Hz acceleration 2 G
Shock (IEC 6068-2-27)	acceleration 20 G max. time 11 ms
Package weight	4 g (0.14 oz)
Soldering temperature	235°C max. / 10 sec.

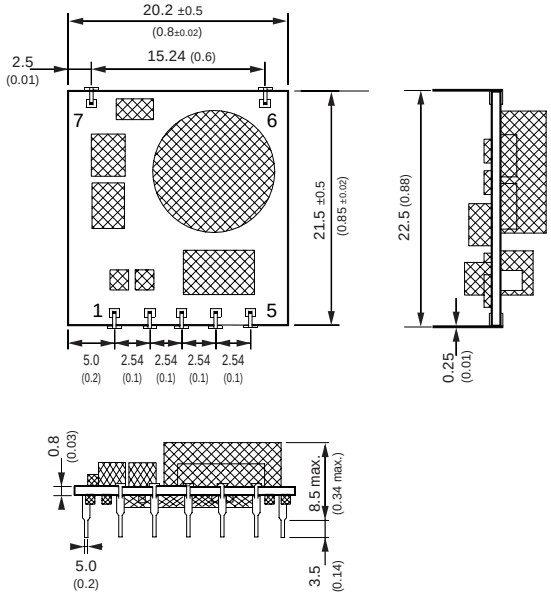
All specifications valid at nominal input voltage, full load and +25°C after warm-up time unless otherwise stated.

Outline Dimensions mm (inches)

SIP Package



DIP Package

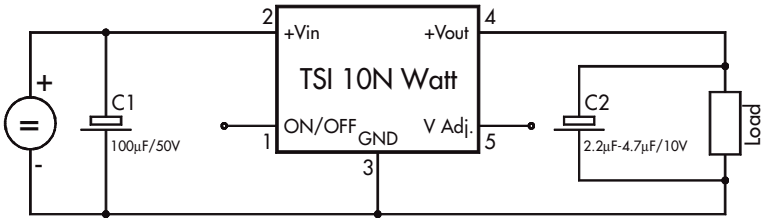


Pin-Out		
Pin	**SIP**	**DIP**
1	Remote on / off	Remote on / off
2	+V Input (Vcc)	+V Input (Vcc)
3	–V Input (GND) –V Output	–V Input (GND) –V Output
4	+V Output	+V Output
5	V Output adj.	V Output adj.
6		No Con.
7		No Con.

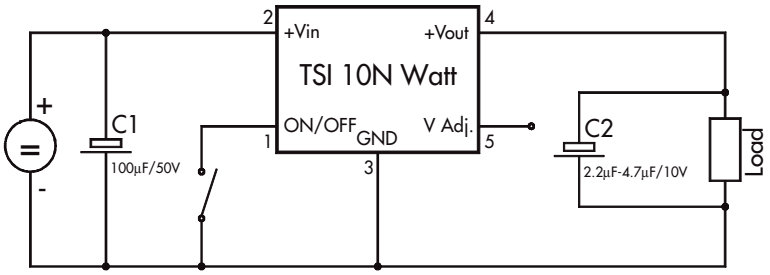
Specifications can be changed without notice

Connections

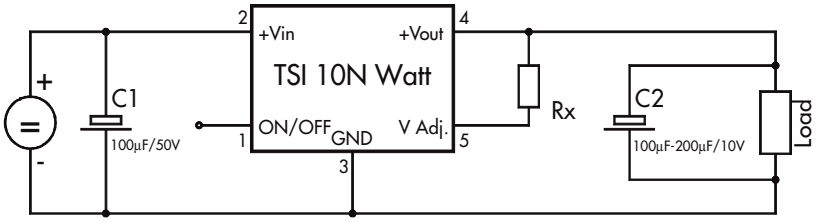
Normal Connection (Standard)



Remote ON/OFF Connection



Output Voltage Adjustement Connection



$$Rx = \frac{R1 \cdot 1200 \cdot (Vout - 1.195)}{R1 \cdot 1.195 - 1200 \cdot (Vout - 1.195)}$$

TSI 10N-xx10 ==> R1 = 2130 Ohm
Output Voltage (Vout) = 1.8 - 3.3VDC

TSI 10N-xx11 ==> R1 = 3840 Ohm
Output Voltage (Vout) = 3.0 - 5.0VDC

Vout = adjusted output voltage

Specifications can be changed without notice

Jenatschstrasse 1 • CH-8002 Zurich • Switzerland
Tel. +41-1284 2911 • Fax +41-1201 1168 • e-mail: sales@traco.ch • internet: http://www.tracopower.com