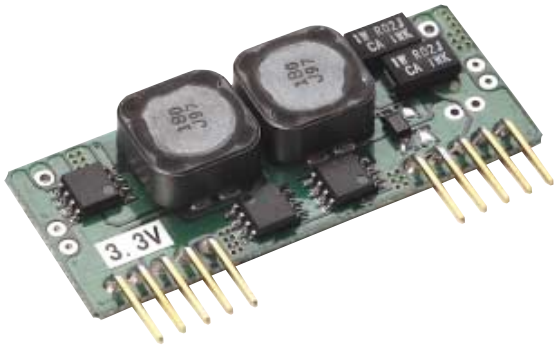
DC/DC Converter

TSI-24 Series 15 Watt

Features

- Step-down Converter with very high Efficiency (>91%)
- Input Voltage Range +8 VDC to +27 VDC
- 1.2 VDC to 5.1 VDC Output, up to 3 A
- Fast Transient Response
- Remote ON/OFF
- Overload Protection
- Low Output Noise
- Standby Current only 100 µA
- Small SIL- or DIP-Package
- 2 Years Product Warranty



This new generation of step-down converters provides designers with a cost-effective solution for converting 8 VDC to 27 VDC voltage down to 1.25 VDC to 5 VDC. To achieve highest efficiency, these dc/dc converters are using adwanced circuit techniques , as amorphous ferrite, solid aluminum capacitors and a synchronous commutation IC.

The TSI-24 series needs no further external components to operate within its specifications. A very high efficiency allows operation without additional heatsink. This product finds many applications in distributed powersystems where voltage conversion at the point of load is required.

Models

Ordercode	Input voltage range	Output voltage	Output current max.	Efficiency typ.	Package
TSI-24-5.0S3R0P TSI-24-5.0S3R0F	8 – 27 VDC	* + 3.3 VDC	3000 mA	91.0 %	SIP DIP

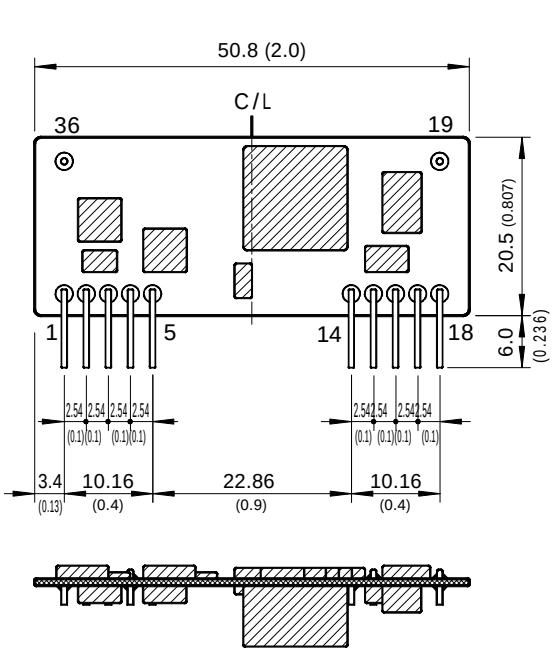
* Output adjustable 1.2 to 5.1 VDC

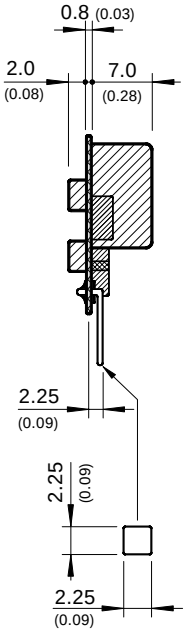
Input Specifications		
Input current (no load) Input current (at full load)		1 mA max. 1350 mA max. (12 Vin)
Stand-by current		100 µA typ
Output Specifications		
Output voltage tolerance		± 3.0 %
Output voltage adjustment		+1.2 VDC to +5.1 VDC
Output voltage selection	+1.2 Vout +3.3 Vout +5.0 Vout	V.ADJ (pin 14) link wire to +Vout (pin 17,18) V.ADJ (pin 14) = open VADJ (pin 14) connected via 20 kOhm resistor to +Vout (pin 17,18)
Regulation – Input variation – Load variation 0 – 100 %		± 0.3 % < 3.0 %
Ripple and noise (20 MHz Bandwidth)		35 mVpk-pk typ.
Transient response time (with 220 µF output cap.)	50 % Load change: Vout over- / undershoot:	80 µsec typ. 70 mV typ.
Temperature coefficient		± 0.01 % / °C
Short circuit protection		>105% constant current
Capacitive load		20'000 µF
Remote ON / OFF control	ON = Pin 5 (ON / OFF Pin) to pin 4 (GND) open OFF = Pin 5 (ON / OFF Pin) to pin 4 (GND) short	
General Specifications		
Temperature ranges – Operating – Storage Derating above 50 °C		– 10 °C ... +71 °C – 25 °C ... +85 °C 3 % / °C
Humidity (non condensing)		30 – 95 % rel H
Reliability, calculated MTBF (MIL-HDBK-217 F)		>350'000 h at 40 °C
Isolation Input / Output		none
Switching frequency		150 kHz typ. (PWM modulation)
Physical Specifications		
Vibration		5 to 10 Hz amplitude 10 mm pk-pk 10 to 55 Hz acceleration 2 G
Shock		acceleration 20 G max. time 11 ms
Package weight		13 g (0.46 oz)
Soldering temperature		max. 260°C max. / 10 sec.

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

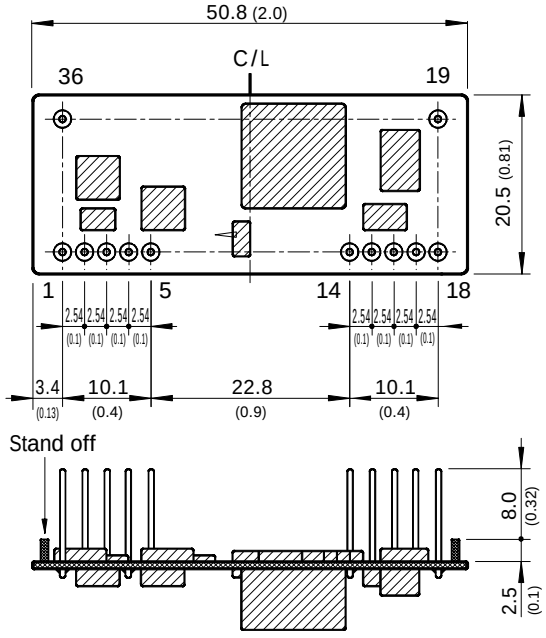
Outline Dimensions mm (inches)

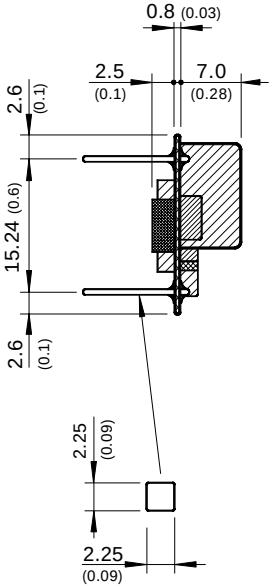
SIP package





DIP package



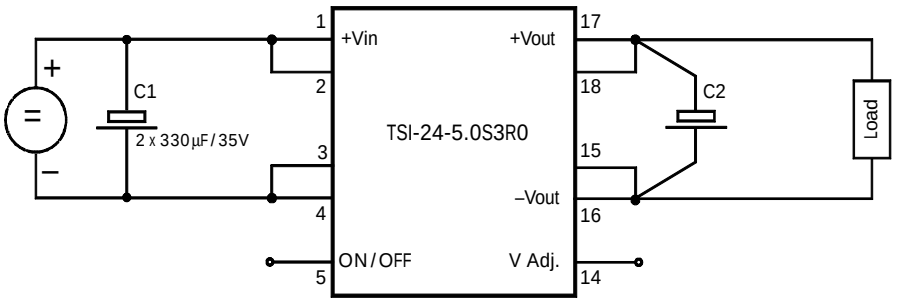


Pin-Out		
Pin	**DIP**	**SIP**
1	+V Input (Vcc)	+V Input (Vcc)
2	+V Input (Vcc)	+V Input (Vcc)
3	–V Input (GND)	–V Input (GND)
4	–V Input (GND)	–V Input (GND)
5	Remote on/off	Remote on/off
14	V Output adj	V Output adj
15	-V Output	-V Output
16	-V Output	-V Output
17	+V Output	+V Output
18	+V Output	+V Output
19	No function	No pin
36	No function	No pin

Specifications can be changed without notice

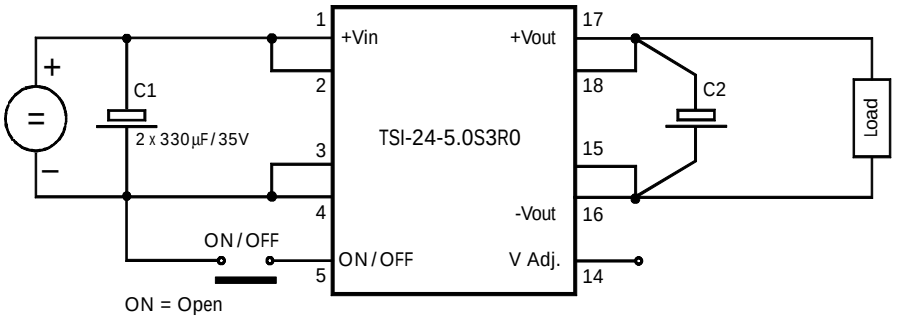
Connections

Normal Connection (Standard)



Value of C2:
Vout: 1.2 V...2.1V 2 x 330 µF / 35V
Vout: 2.1 V...3.1V 2 x 220 µF / 35V
Vout: 3.1V...5.1V 2 x 150 µF / 35V

Remote ON/OFF Connection



ON = Open
OFF = Short

Value of C2:
Vout: 1.2 V...2.1V 2 x 330 µF / 35V
Vout: 2.1 V...3.1V 2 x 220 µF / 35V
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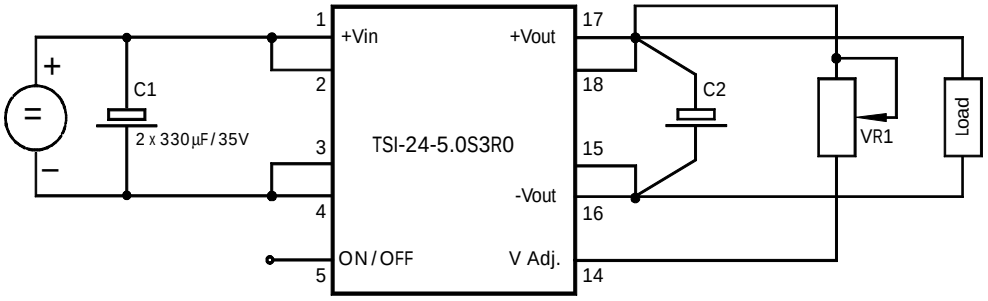
Output Voltage Adjustement Connection



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Capacitors:
C1 ==> SXE series Mfg. Nippon Chemi-Con
C2 ==> SH series Mfg. Sanyo OS-CON
C2 ==> FH series Mfg. Nippon Chemi-Con

$$VR1 = 5.1 \bullet (Vout - 1.0) - 1.2$$

VR1 = kOhm

Vout = VDC

Specifications can be changed without notice