

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 μ A
- 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 advanced 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)	1 mA max.
Input current (at full load)	1350 mA max. (1.2 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)	

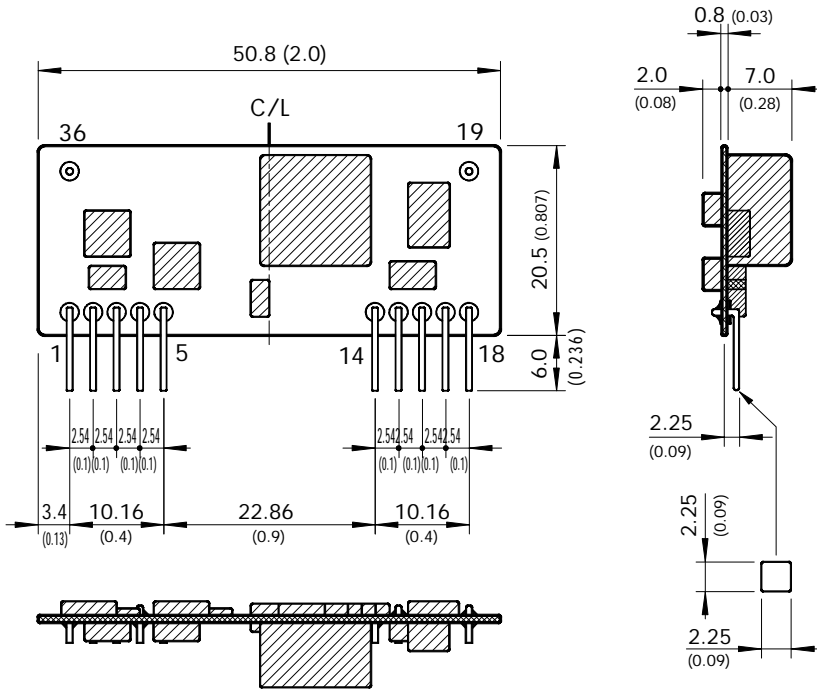
Physical Specifications

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)

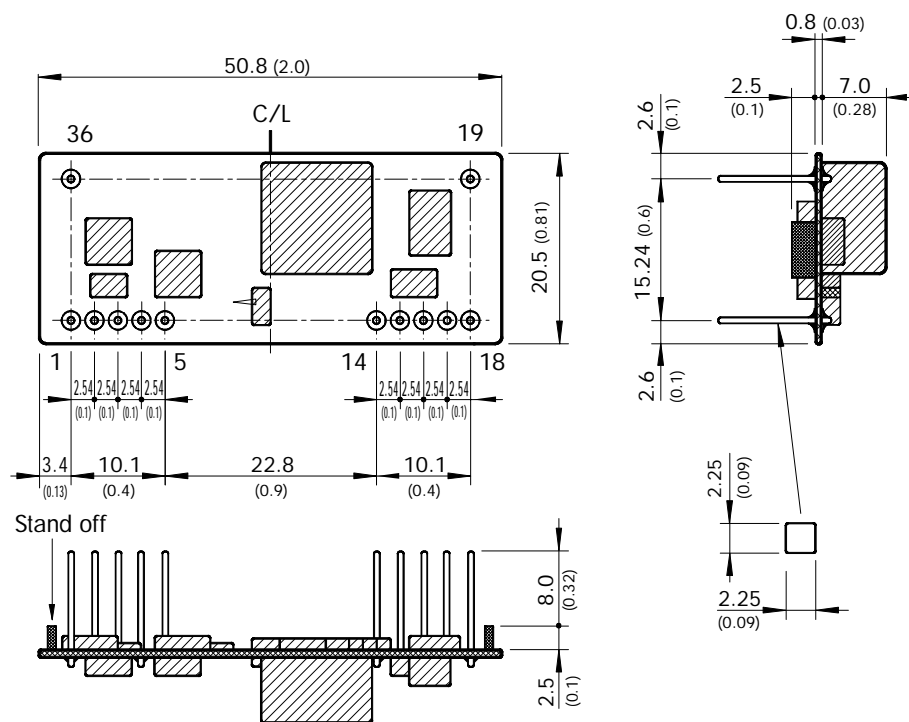
SIP package



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

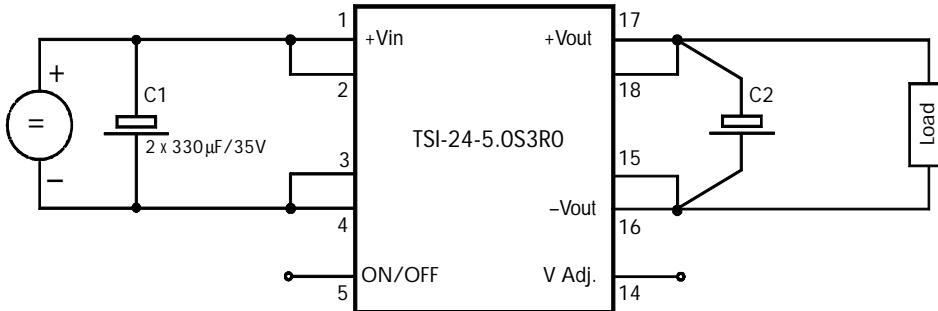
DIP package



Specifications can be changed without notice

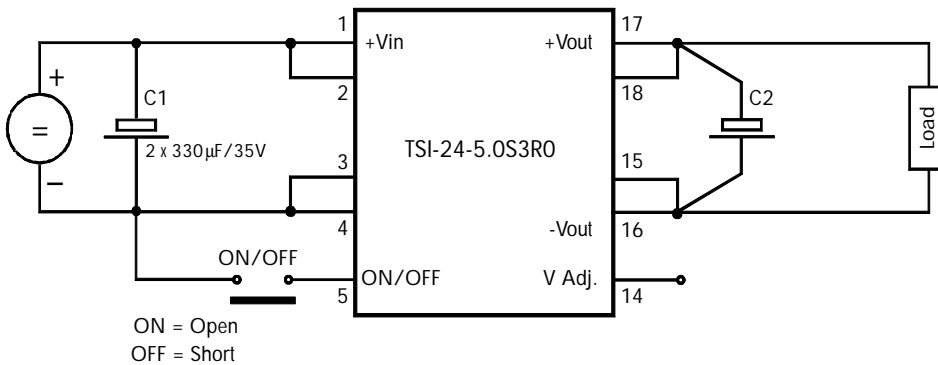
Connections

Normal Connection (Standard)



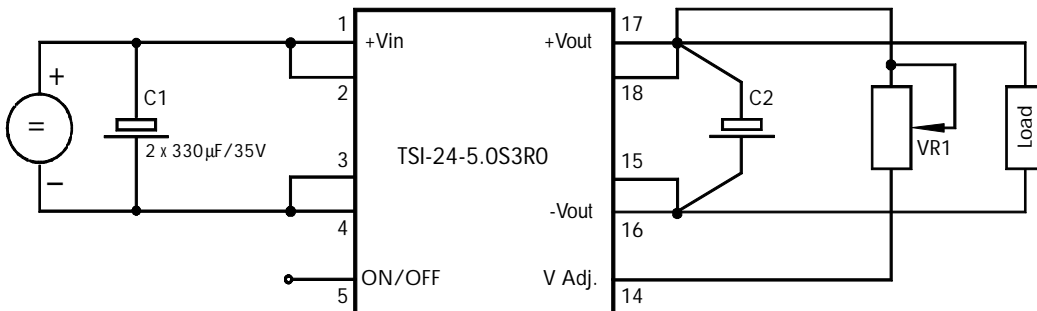
Value of C2:
 Vout: 1.2 V...2.1V 2 x 330 µF /35V
 Vout: 2.1 V...3.1V 2 x 220 µF /35V
 Vout: 3.1V...5.1V 2 x 150 µF /35V

Remote ON/OFF Connection



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

Output Voltage Adjustment Connection



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

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

$$VR1 = 5.1 \cdot (V_{out} - 1.0) - 1.2$$

VR1 = kOhm

Vout = VDC

Specifications can be changed without notice