

Non-Isolated DC/DC Converter (POL)

TOS 06SIL Series, 6 A

Not recommended for new designs

- Small size, low profile
- SIP version
- Cost-efficient open frame design
- Wide input voltage ranges
- Output voltages trim from 0.75 VDC to 5.0 VDC
- Delivers up to 6 A with minimal derating
- Ultra high efficiency to 94 %
- Fast transient response
- Remote On/Off control
- Wide temperature range -40°C to $+85^{\circ}\text{C}$
- 3-year product warranty



UL 62368-1

The TOS 06SIL series is a range of high performance non-isolated DC/DC converters with very high efficiency that can supply up to 6 A of output current. These modules provide precisely regulated output voltages which can be set via an external resistor to a value from 0.75 VDC to 5.0 VDC. These converters work over a wide input voltage range of 2.4 to 5.5 VDC or 8.3 to 14.0 VDC. Further features include remote On/Off, under voltage lockout and over current protection. These products have an open-frame construction with very small footprint and are available in an industry standard SIP package. The TOS 06SIL series is fully RoHS compliant and can withstand industry standard handling, cleaning and the high temperatures of lead-free reflow solder processes.

Models

Order Code	Output Current max.	Input Voltage Range	Output Voltage nom. (adjustable)	Efficiency typ.
TOS 06-05SIL *	6'000 mA	2.4 - 5.5 VDC (5 VDC nom.)	0.75 VDC (0.75 - 3.3 VDC)	94 %
TOS 06-12SIL *		8.3 - 14 VDC (12 VDC nom.)	0.75 VDC (0.75 - 5.0 VDC)	89 %

Note * Not recommended for new designs

Input Specifications

Input Current	- At no load	5 Vin models: 45 mA typ. 12 Vin models: 100 mA typ. (at Vout max.)
Start-up Voltage		5 Vin models: 2.2 VDC typ. / 2.4 VDC max. 12 Vin models: 7.9 VDC typ. / 8.3 VDC max.
Under Voltage Lockout		5 Vin models: 1.6 VDC min. / 2 VDC typ. / 2.2 VDC max. 12 Vin models: 6.5 VDC min. / 7.5 VDC typ. / 8 VDC max.
Reflected Ripple Current		5 Vin models: 35 mA _{p-p} typ. 12 Vin models: 30 mA _{p-p} typ. (with input filter, see application note)
Recommended Input Fuse		5 Vin models: 8'000 mA (fast acting) 12 Vin models: 6'300 mA (slow blow) (The need of an external fuse has to be assessed in the final application.)
Input Filter		See application note: www.tracopower.com/overview/tos06sil

Output Specifications

Output Voltage Adjustment	0.75 Vout models: 0.75 - 3.3 VDC 0.75 - 5.0 VDC (By external trim resistor)
See application note: www.tracopower.com/overview/tos06sil	(Vin must be at least 0.5 V higher than Vout)
Voltage Set Accuracy	±2% max.
Regulation	- Input Variation (Vmin - Vmax) - Load Variation (0 - 100%)
0.3% max. 0.4% max.	
Ripple and Noise	- 20 MHz Bandwidth
50 mV _{p-p} max.	
Capacitive Load	3'000 µF max. (ESR >10 mOhm)
Minimum Load	Not required
Temperature Coefficient	±0.4 %/K max.
Start-up Time	8 ms typ.
Start-up Overshoot Voltage	3% max.
Short Circuit Protection	Continuous, Automatic recovery
Output Current Limitation	210% typ. of Iout max.
Transient Response	- Peak Variation - Response Time
	130 mV typ. (50% Load Step) (5 Vin model) 200 mV typ. (50 % Load Step) (12 Vin model) 25 µs typ. (50% Load Step) (with 1 µF MLCC 10 µF TC)

Safety Specifications

Standards	- IT / Multimedia Equipment	UL 60950-1 UL 62368-1
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General Specifications

Relative Humidity		95% max. (non condensing)
Temperature Ranges	- Operating Temperature - Case Temperature - Storage Temperature	-40°C to +85°C +125°C max. -55°C to +125°C
Power Derating	- High Temperature	Depending on model
		See application note: www.tracopower.com/overview/tos06sil
Cooling System		Natural convection (20 LFM)

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

Remote Control	- Voltage Controlled Remote (passive = on)	On: open circuit or Vin max. Off: 0 to 0.3 VDC or short circuit Refers to 'Remote' and 'GND' Pin 1 mA typ. (12 Vin model: Open circuit or (Vin – 4 V) to Vin max. for on state)
Regulator Topology		Buck Converter
Switching Frequency		270 - 330 kHz (PWM) 300 kHz typ. (PWM)
Insulation System		Non-isolated
Reliability	- Calculated MTBF	9'300'000 h (MIL-HDBK-217F, ground benign)
Washing Process		According to Cleaning Guideline www.tracopower.com/info/cleaning.pdf
Environment	- Vibration - Thermal Shock	MIL-STD-810F MIL-STD-810F
Pin Material		Copper
Pin Foundation Plating		Nickel (3 - 5 µm)
Pin Surface Plating		Gold (50 - 75 nm), matte
Housing Type		Open Frame
Mounting Type		PCB Mount
Connection Type		THD (Through-Hole Device)
Footprint Type		SIP9
Soldering Profile		Lead-Free Wave Soldering 265°C / 10 s max.
Weight		2.8 g
Environmental Compliance	- REACH Declaration - RoHS Declaration - SCIP Reference Number	www.tracopower.com/info/reach-declaration.pdf REACH SVHC list compliant REACH Annex XVII compliant www.tracopower.com/info/rohs-declaration.pdf Exemptions: 7(a), 7(c)-I (RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (O5A rule).) 393a2fb2-8e5e-4e3a-bfda-ccff4badd059

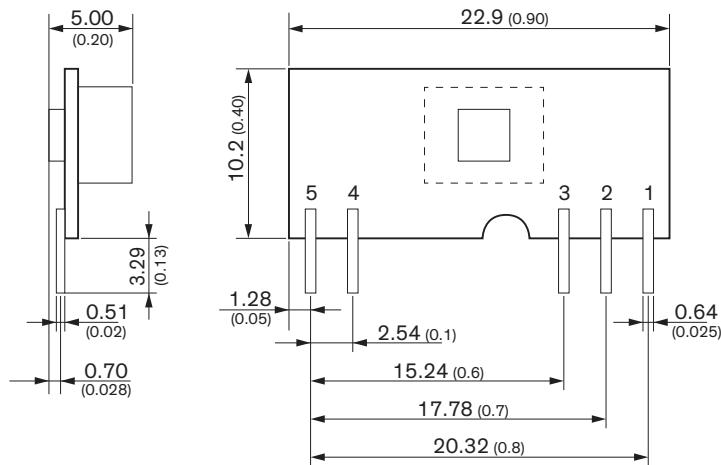
Additional Information

Supporting Documents	www.tracopower.com/overview/tos06sil
Frequently Asked Questions	www.tracopower.com/glossary-faq
Glossary	www.tracopower.com/info/glossary.pdf

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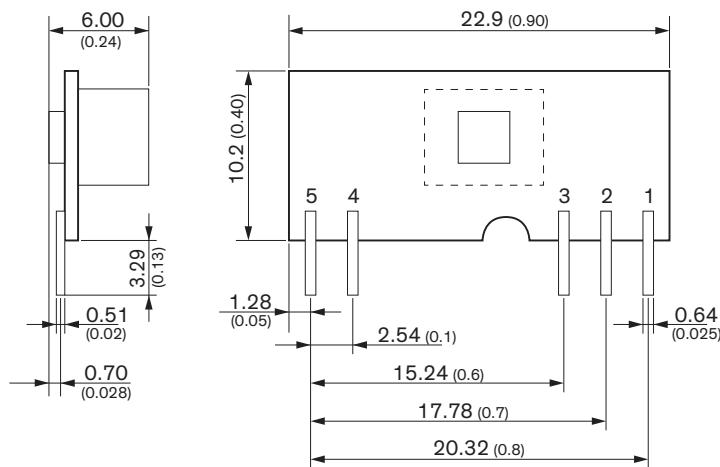
Outline Dimensions

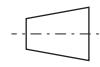
TOS 06-05SIL



Pinout	
Pin	Function
1	+Vout
2	Trim
3	GND
4	+Vin
5	Remote On/Off

TOS 06-12SIL



 Dimensions in mm (inch)
 Tolerances x.x ± 0.5 (x.xx ± 0.02)
 Tolerances x.xx ± 0.25 (xxx ± 0.01)
 Pin dimension tolerance ± 0.1 (± 0.004)