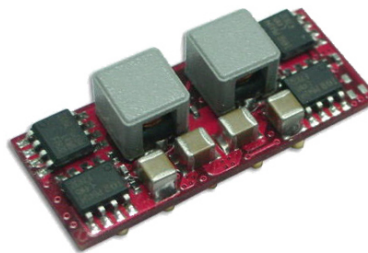


## Non-Isolated DC/DC Converter (POL)

## TOS 30SM Series, 30 A

- Small size, low profile
- SMT package
- Cost-efficient open frame design
- Wide input voltage ranges
- Output voltages trim from 0.8 VDC to 3.6 VDC
- Delivers up to 30 A with minimal derating
- Ultra high efficiency to 93 %
- Fast transient response
- Remote On/Off control
- Wide temperature range  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$
- 3-year product warranty



The TOS 30SM series is a range of high performance non-isolated DC/DC converters with very high efficiency that can supply up to 30 A of output current. These modules provide precisely regulated output voltages which can be set via an external resistor to a value from 0.8 VDC to 3.6 VDC. These converters work over a wide input voltage range of 4.5 to 5.5 VDC or 6.0 to 14.0 VDC. Further features include remote On/Off, under voltage lockout, over temperature and over current protection. These products have an open-frame construction with very small footprint and are available in an SMT package. The TOS 30SM 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 30-05SM	30'000 mA	4.5 - 5.5 VDC (5 VDC nom.)	0.8 VDC (0.8 - 3.63 VDC)	93 %
TOS 30-12SM		6 - 14 VDC (12 VDC nom.)	0.8 VDC (0.8 - 3.63 VDC)	92 %

### Options

<b>on demand</b> (backorder with MOQ non stocking item)	- Optional models with Load Share function
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Note - 12 Vin model: 20 A output voltage higher than 2.75 VDC

## Input Specifications

Input Current	- At no load	5 Vin models: 180 mA typ. 12 Vin models: 200 mA typ. (at Vout max.)
Under Voltage Lockout		5 Vin models: 3 VDC min. / 4 VDC typ. / 4.4 VDC max. 12 Vin models: 4 VDC min. / 4.5 VDC typ. / 5.5 VDC max.
Reflected Ripple Current		100 mAp-p typ. (with input filter, see application note)
Recommended Input Fuse		5 Vin models: 35'000 mA (fast acting) 12 Vin models: 30'000 mA (fast acting) (The need of an external fuse has to be assessed in the final application.)
Input Filter		See application note: <a href="http://www.tracopower.com/overview/tos30sm">www.tracopower.com/overview/tos30sm</a>

## Output Specifications

Output Voltage Adjustment		0.8 Vout models: 0.8 - 3.63 VDC 0.8 - 3.63 VDC (By external trim resistor) See application note: <a href="http://www.tracopower.com/overview/tos30sm">www.tracopower.com/overview/tos30sm</a> (Vout < Vin - 0.5 VDC)
Voltage Set Accuracy		±1.5% max.
Regulation	- Input Variation (Vmin - Vmax) - Load Variation (0 - 100%)	0.1% max. 0.4% max.
Ripple and Noise	- 20 MHz Bandwidth	75 mVp-p typ. (w/ 1 µF MLCC    10 µF T/C)
Capacitive Load		10'000 µF max. (ESR ≥ 10 mOhm)
Minimum Load		Not required
Temperature Coefficient		±0.5 %/K max.
Start-up Time		2.5 ms typ.
Start-up Overshoot Voltage		3% max.
Short Circuit Protection		Continuous, Automatic recovery
Output Current Limitation		150% typ. of Iout max.
Transient Response	- Peak Variation - Response Time	350 mV typ. (50% to 100% Load Step) 25 µs typ. (50% to 100% Load Step) (1 µF MLCC    10 µF T/C)
Load Share Function	- Refer to application note	<a href="http://www.tracopower.com/overview/tos30sm">www.tracopower.com/overview/tos30sm</a>
Load Share Accuracy		10%

## General Specifications

Relative Humidity		95% max. (non condensing)
Temperature Ranges	- Operating Temperature - Case Temperature - Storage Temperature	-40°C to +85°C +115°C max. -55°C to +125°C
Power Derating	- High Temperature	Depending on model See application note: <a href="http://www.tracopower.com/overview/tos30sm">www.tracopower.com/overview/tos30sm</a>
Over Temperature Protection Switch Off	- Protection Mode - Measurement Point	125°C typ. (Automatic recovery) See application note: <a href="http://www.tracopower.com/overview/tos30sm">www.tracopower.com/overview/tos30sm</a>
Cooling System		Natural convection (20 LFM)
Sense Function		62.5% max. of Vout nom. (equals 0.5 VDC max.) (If sense function is not used, sense pins should be connected to output pins.)

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: 3.0 VDC to Vin max. or open circuit Off: -0.3 to 1.2 VDC Refers to 'Remote' and 'GND' Pin 3.3 mA max.
	- Off Idle Input Current	
Switching Frequency		261 - 339 kHz (PWM) 300 kHz typ. (PWM)
Insulation System		Non-isolated
Reliability	- Calculated MTBF	1'260'000 h (MIL-HDBK-217F, ground benign)
Moisture Sensitivity (MSL)		Level 2a (J-STD-033C)
Washing Process		According to Cleaning Guideline <a href="http://www.tracopower.com/info/cleaning.pdf">www.tracopower.com/info/cleaning.pdf</a>
Environment	- Vibration	MIL-STD-810F
	- Thermal Shock	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		SMD (Surface-Mount Device)
Soldering Profile		Lead-Free Reflow Soldering (acc. J-STD-020E) 245°C max. (Tp) 30 s max. (tp, at Tp - 5°C) See application note: <a href="http://www.tracopower.com/info/reflow-soldering.pdf">www.tracopower.com/info/reflow-soldering.pdf</a>
Weight		6 g
Environmental Compliance	- REACH Declaration	<a href="http://www.tracopower.com/info/reach-declaration.pdf">www.tracopower.com/info/reach-declaration.pdf</a> REACH SVHC list compliant REACH Annex XVII compliant
	- RoHS Declaration	<a href="http://www.tracopower.com/info/rohs-declaration.pdf">www.tracopower.com/info/rohs-declaration.pdf</a> Exemptions: 7a, 7c-I (RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (O5A rule).)
	- SCIP Reference Number	e7a6fd65-90ea-4967-a6fb-57a98cb52e59

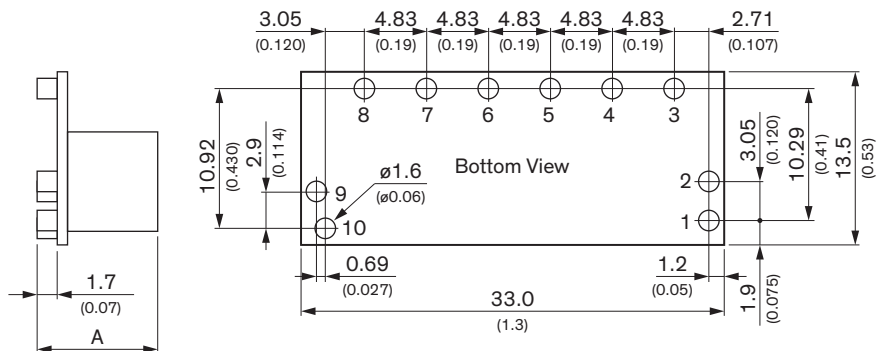
## Supporting Documents

Overview Link (for additional Documents)

[www.tracopower.com/overview/tos30sm](http://www.tracopower.com/overview/tos30sm)

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

## Outline Dimensions



TOS 30-05SM:  $A = 9.40$  (0.37)  
TOS 30-12SM:  $A = 7.80$  (0.31)

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

## Pinout

Pin	Function
1	Remote On/Off
2	GND (option)
3	Share (option)
4	+Sense
5	Trim
6	+Vout
7	GND
8	SEQ
9	GND (option)
10	+Vin

For SEQ description see Application-Note

### Recommended Solder Pad Layout

