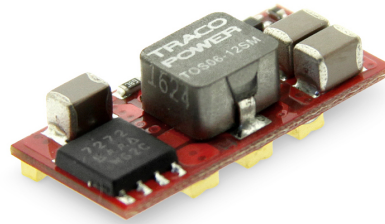


- Small size, low profile
- SMT package
- Cost-efficient open frame design
- Wide input voltage ranges
- Output voltages trim from 0.75 VDC to 5.0 VDC
- Delivers up to 6 A with minimal derating
- Ultra high efficiency to 94 %
- Fast transient response
- Remote On/Off control
- Wide temperature range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



UL 62368-1

The TOS 06SM 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 a SMT package. The TOS 06SM 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 06-05SM | 6'000 mA | 2.4 - 5.5 VDC (5 VDC nom.) | 0.75 VDC (0.75 - 3.3 VDC) | 94 % |
| TOS 06-12SM | | 8.3 - 14 VDC (12 VDC nom.) | 0.75 VDC (0.75 - 5.0 VDC) | 89 % |

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/tos06sm |

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/tos06sm (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

| | | |
|------------------|-----------------------------|--|
| Safety Standards | - IT / Multimedia Equipment | UL 60950-1 UL 62368-1 |
|------------------|-----------------------------|--|

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/tos06sm |
| 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.

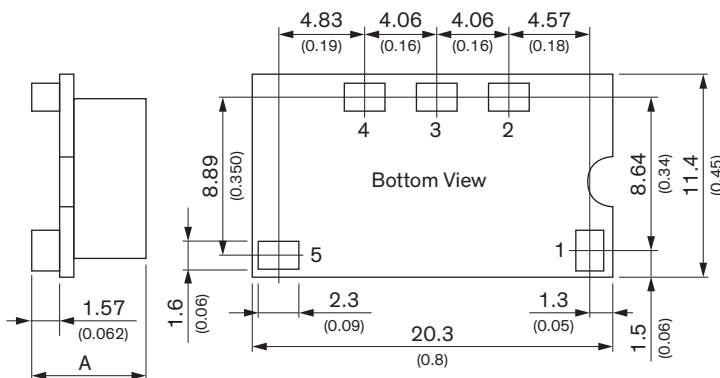
| | | |
|----------------------------|---|--|
| Remote Control | - Voltage Controlled Remote - Off Idle Input Current | On: open circuit or Vin max. Off: 0 to 0.3 VDC Refers to 'Remote' and 'GND' Pin 1 mA typ. (12 Vin model: Open circuit or (Vin - 4 V) to Vin max. for on state) |
| Switching Frequency | | 270 - 330 kHz (PWM) 300 kHz typ. (PWM) |
| Insulation System | | Non-isolated |
| Reliability | - Calculated MTBF | 9'300'000 h (MIL-HDBK-217F, ground benign) |
| Moisture Sensitivity (MSL) | | Level 2a (J-STD-033C) |
| 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 | | SMD (Surface-Mount Device) |
| Soldering Profile | | Reflow Soldering (J-STD-020E) 245°C / 10 s max. |
| Weight | | 2.8 g |
| Environmental Compliance | - REACH Declaration - RoHS Declaration | www.tracopower.com/info/reach-declaration.pdf REACH SVHC list compliant REACH Annex XVII compliant www.tracopower.com/info/rohs-declaration.pdf Exemptions: 7a, 7c-1 (RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (O5A rule). The SCIP number is provided on request.) |

Supporting Documents

Overview Link (for additional Documents)

www.tracopower.com/overview/tos06sm

Outline Dimensions



TOS 06-05SM: A = 5.40 (0.21)
TOS 06-12SM: A = 6.40 (0.25)

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

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

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

Recommended Solder Pad Layout

