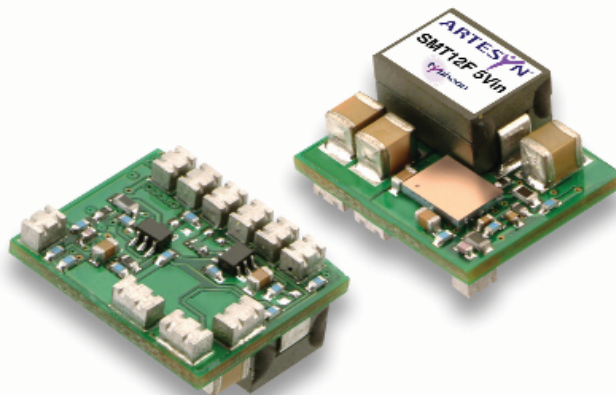


SMT12F Series

3.3 Vin and 5 Vin
single output

Total Power: 31.2W
Input Voltage: 2.97-3.63 Vdc
of Outputs: Single



Rev.06.27.07
SMT12F
1 of 5

Special Features

- Designed to meet ultra fast transient requirements up to 300 A/ μ s step load transients
- 12 A current rating
- Input voltage range: 2.97 Vdc to 5.5 Vdc
- Output voltage range: 0.9 Vdc to 3.3 Vdc
- Extremely low internal power dissipation
- Minimal thermal design concerns
- Ideal solution where board space is at a premium or tighter card pitch is required
- Available RoHS compliant
- 2 year warranty

Safety

UL/cUL CAN/CSA 22.2
No. E174104
UL 60950 File No. E174104

TÜV Product Service (EN60950)
Certificate No. B 04 04 38572 041

CB Report and Certificate to
IEC60950 DE3-52484

The SMT12F series is a new range of ultra-compact non-isolated point-of-load converters for space-critical applications. The new SMT12F Typhoon™ family surface-mount converter has a footprint of just 13.5 x 16 mm - and unlike competitive products on the market, requires only the addition of a small number of ceramic output capacitors to realise a complete high-performance point-of-load (POL) solution. The SMT12F is primarily intended for use on very densely packed, high functionality boards and for powering advanced silicon including network and communication processors, DSPs, FPGAs and ASICs. A key advantage of the SMT12F is that it only needs the addition of five 22 μ F ceramic output capacitors to provide a complete full-specification, high efficiency POL solution with transient response capabilities that extend up to 300 A/ μ s. The total board space required for the module and capacitors is a mere 300 mm², facilitating easy co-location with the load.



Specifications

All specifications are typical at nominal input, full load at 25°C unless otherwise stated.

OUTPUT SPECIFICATIONS

| | | |
|-----------------------------------|---------------------|---|
| Voltage adjustability | 5.0 Vin | 0.9-3.3 Vdc |
| Wide trim (See Note 6) | 3.3 Vin | 0.9-2.6 Vdc |
| Setpoint accuracy | ±0.5% typ. | |
| Line regulation | ±1.0% typ. | |
| Load regulation | ±1.0% typ. | |
| Total error band | ±3.0% typ. | |
| Minimum load | 0 A | |
| Overshoot/undershoot | None | |
| Ripple and noise (See Note 5) | 5 Hz to 20 MHz | 40 mV pk-pk 25 mV rms |
| Temperature co-efficient | ±0.01%/°C | |
| Transient response (Vout = 3.3 V) | di/dt 300 A/μs | 12 A load step 100 mV deviation <15 μs settling time to within ±1.0% |
| Remote sense | 10% Vo compensation | |

INPUT SPECIFICATIONS

| | | |
|----------------------------------|--|------------------------------|
| Input voltage range (See Note 6) | 5 Vin 3.3 Vin | 3.0-5.5 Vdc 2.97-3.63 Vdc |
| Input current | No load | 100 mA |
| Input current (max.) | 8.5 A max. @ Io max. and Vout = 3.3 V | |
| Input reflected ripple | 100 mA rms | |
| Remote ON/OFF | (See Note 1) | |
| Start-up time | 15 ms | |

EMC CHARACTERISTICS

| | |
|-------------------------|-----------------------|
| Electrostatic discharge | EN61000-4-2, IEC801-2 |
| Conducted immunity | EN61000-4-6 |
| Radiated immunity | EN61000-4-3 |

GENERAL SPECIFICATIONS

| | | |
|-------------------------|------------------------|--|
| Efficiency | 5 Vin 3.3 Vin | 95% typ. 92% typ. |
| Insulation voltage | Non-isolated | |
| Switching frequency | 600 kHz | |
| Approvals and standards | EN60950 UL/cUL60950 | |
| Material flammability | UL94V-0 | |
| Dimensions | (LxWxH) | 16.00 x 13.46 x 7.93 mm 0.63 x 0.52 x 0.31 inches |
| Weight | 3 g (0.11 oz) | |
| Coplanarity | 100 μm | |
| MTBF | Telcordia SR-332 | 10,000,000 hours |

ENVIRONMENTAL SPECIFICATIONS

| | | |
|----------------------------------|---|---------------------------------------|
| Thermal performance (See Note 2) | Operating ambient, temperature Non-operating | -40 °C to +85 °C -40 °C to +125 °C |
|----------------------------------|---|---------------------------------------|

PROTECTION

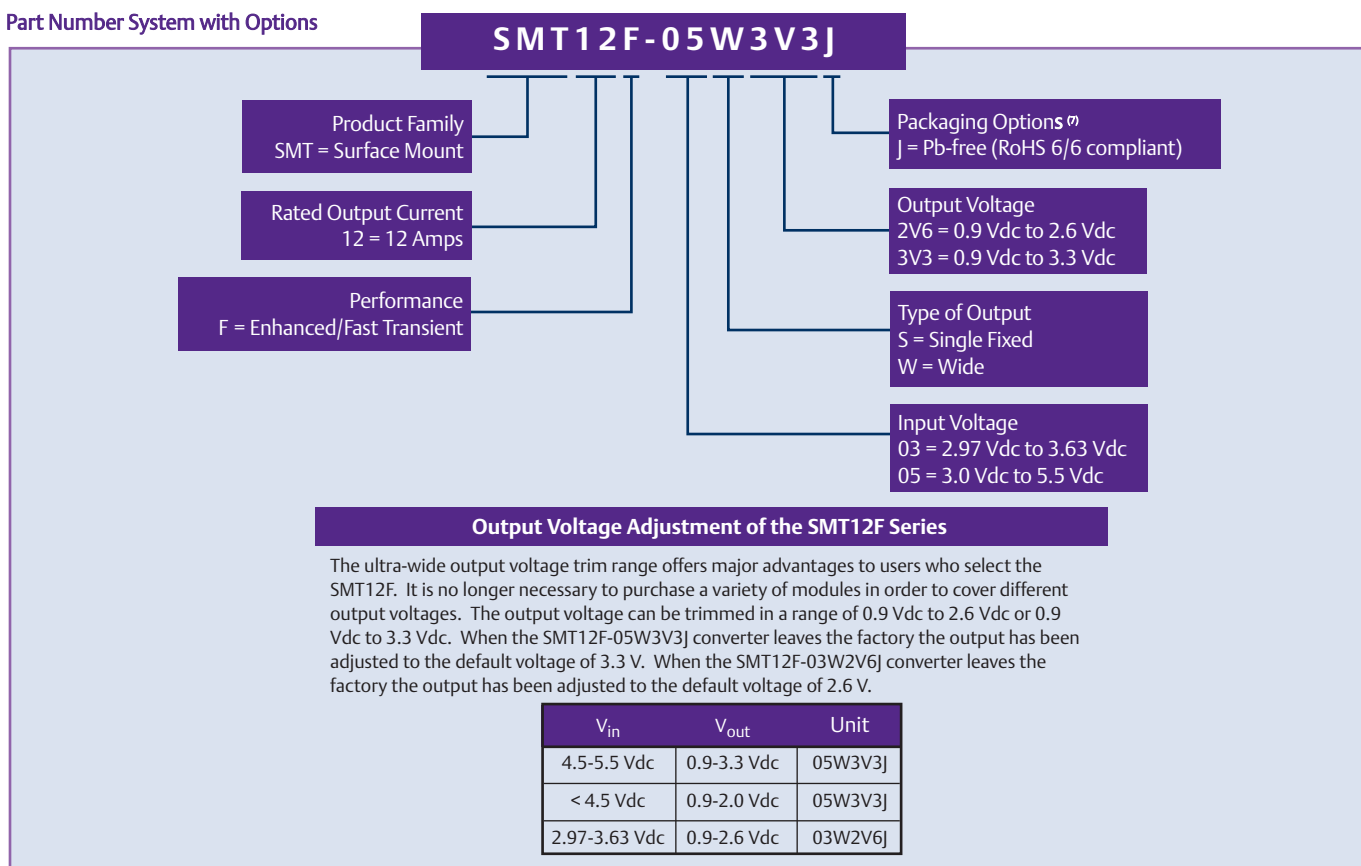
| | |
|---------------|--------------------|
| Short-circuit | Continuous |
| Thermal | Automatic recovery |

Specifications

All specifications are typical at nominal input, full load at 25°C unless otherwise stated.

| OUTPUT POWER (MAX.) | INPUT VOLTAGE | OUTPUT VOLTAGE | OUTPUT CURRENT (MIN.) | OUTPUT CURRENT (MAX.) | EFFICIENCY (TYP.) | REGULATION | | MODEL NUMBER ^(7,8) |
|---------------------|---------------|----------------|-----------------------|-----------------------|-------------------|------------|-------|-------------------------------|
| | | | | | | LINE | LOAD | |
| 31.2 W | 2.97-3.63 Vdc | 0.9-2.6 Vdc | 0 A | 12 A | 92% | ±1.0% | ±1.0% | SMT12F-03W2V6J |
| 39.6 W | 3.0-5.5 Vdc | 0.9-3.3 Vdc | 0 A | 12 A | 95% | ±1.0% | ±1.0% | SMT12F-05W3V3J |

Part Number System with Options



Notes

- The SMT12F features an 'Active Low' Remote ON/OFF operation. If you are not using the Remote ON/OFF pin, leave the pin open (the converter will be on). The Remote ON/OFF pin is referenced to ground.

The following conditions apply for the SMT12F:

Configuration

Remote pin open circuit
Remote pin pulled low
Remote pin pulled high

Converter Operation

Unit is ON
Unit is ON
Unit is OFF

An 'Active High' Remote ON/OFF version is also possible with this converter. To order please place the suffix 'R' towards the end of the part number, e.g. SMT12F-05W3V3RJ.

- See Figures 1 and 2 for sample derating curves. For the full set of derating curves see Application Note 165.
- A 22 µF ceramic input capacitor may be required for test purposes only. See

- Application Note 165 for further details.
- An external output capacitor is required for basic operation. Required capacitance is a minimum of 110 µF to meet the performance parameters. This can be made up of any combination of 22 µF or 44 µF multi-layer ceramic capacitors in the appropriate voltage rating.
- Ripple and Noise is worst case measurement. Typical value is 26 mV pk-pk.
- When V_{in} < 4.5 V, V_{out} max = 2.5 V for model SMT12F-03W2V6.
- TSE RoHS 5/6 (non Pb-free) compliant versions may be available on special request, please contact your local sales representative for details.
- NOTICE: Some models do not support all options. Please contact your local Artesyn representative or use the on-line model number search tool at <http://www.artesyn.com/powergroup/products.htm> to find a suitable alternative.

Specifications

All specifications are typical at nominal input, full load at 25°C unless otherwise stated.

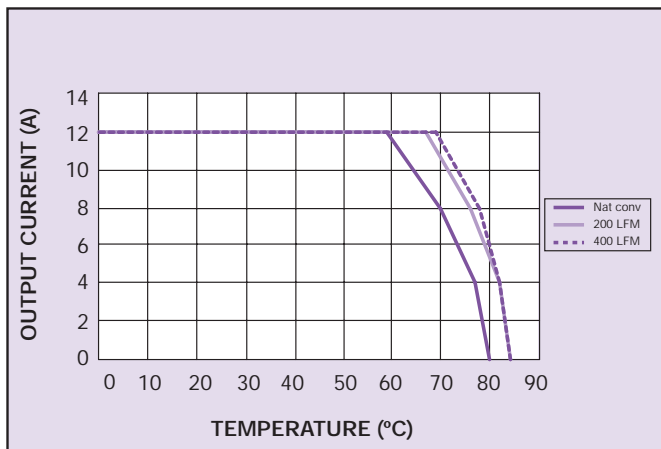


Figure 1 - Derating Curve
Vin = 5 V, Output Voltage = 1.8 V (See Note A)

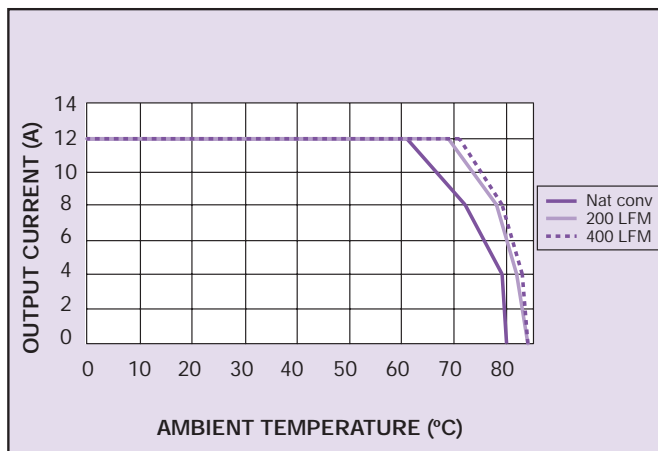


Figure 2 - Derating Curve
Vin = 5 V, Output Voltage = 1.5 V (See Note A)

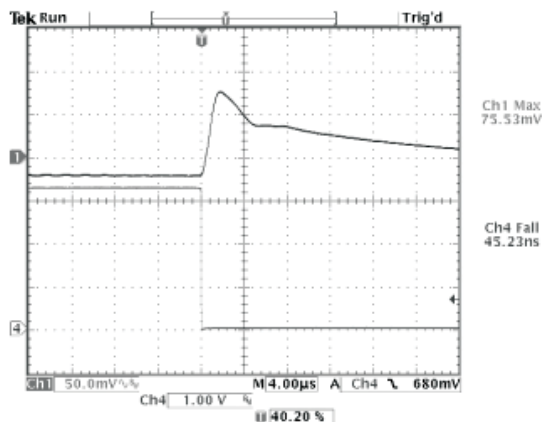


Figure 3 - Typical Transient Response (source)
12 A load Step $di/dt = 300 \text{ A}/\mu\text{s}$
Channel 1: Deviation on unit = 2.3%, Settling Time = 16 μs
Vin = 5 V, Vout = 1.5 V

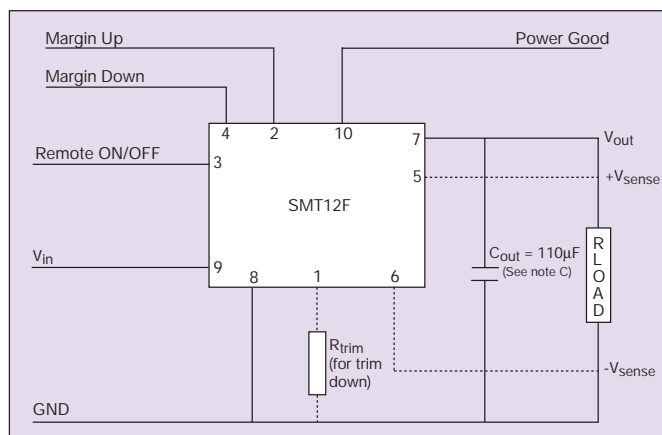


Figure 4 - Standard Application Drawing

Notes

- A Derating curves represent the conditions at which internal components are within the Artesyn derating guidelines.
- B Vin = 5 V, Vout = 1.5 V.

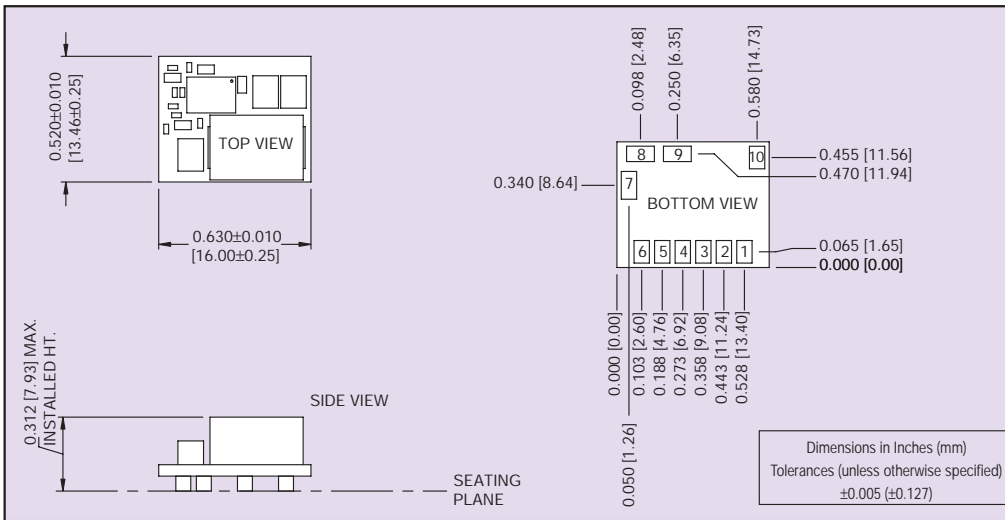


Figure 5 - Mechanical Drawing

Pin No. Pin Description

- 1 **Trim:** A 1% 0.1 W resistor must be directly connected between this pin and pin 8 (GND) to set the output voltage to a lower value than 3.3 V. The temperature stability of the resistor should be 100 ppm/°C or better. The set point range for the 3.3 V model is from 3.3 V to 0.9 V. The resistor required for a given output voltage
- $$R_{\text{trim}} = \frac{110 \times V_{\text{out}}(\text{Desired})}{3.28 - V_{\text{out}}(\text{Desired})} \text{ k}\Omega$$
- may be calculated from the following formula. If left open circuit the output voltage will default to 3.3 V. The set point range for the 2.6 V model is from 2.6-0.9 V. The resistor required for a given output voltage may be
- $$R_{\text{trim}} = \frac{60.4 \times V_{\text{out}}(\text{Desired})}{2.6 - V_{\text{out}}(\text{Desired})} \text{ k}\Omega$$
- calculated from the following formula. If left open circuit the output voltage will default to 2.6 V. For further information on output voltage adjustment consult the Application Note 165.
- 2 **Margin+:** When this input is asserted to High, the output voltage is increased by 5%. This function is independent of trim and sense.

Pin No. Pin Description

- 3 **Remote ON/OFF:** Applying a high level signal to this input disables the module's output and turns off the output voltage. When the Remote ON/OFF control is active, the input current drawn by the regulator is significantly reduced. If the Remote ON/OFF pin is left open-circuit, the module will produce an output whenever a valid input source is applied.
- 4 **Margin-:** When this input is asserted high, the output voltage is decreased by 5% from the nominal. This functions is independent of trim and sense.
- 5 **V sense +:** The sense input allows the regulation circuit to compensate for voltage drop between the module and the load. For optimal voltage accuracy V_o Sense should be connected to V_{out} node of bypass capacitor. It can also be left disconnected.
- 6 **V sense -:** The V_{Sense} should be connected to the ground of a bypass capacitor near the load or left open circuit.
- 7 **+V_{out}:** The regulated positive power output with respect to the GND node.
- 8 **Ground:** This is the common ground connection for the Vin and V_{out} power connections. It is also the 0 V_{dc} reference for the control inputs.
- 9 **+Vin:** The positive input voltage power node to the module, which is referenced to common GND.
- 10 **Power Good:** This pin indicates the status of the output voltage. Power Good is driven low if output voltage deviates outside of specified limits.

Americas

5810 Van Allen Way
Carlsbad, CA 92008
USA
Telephone: +1 760 930 4600
Facsimile: +1 760 930 0698

Europe (UK)

Waterfront Business Park
Merry Hill, Dudley
West Midlands, DY5 1LX
United Kingdom
Telephone: +44 (0) 1384 842 211
Facsimile: +44 (0) 1384 843 355

Asia (HK)

16th - 17th Floors, Lu Plaza
2 Wing Yip Street, Kwun Tong
Kowloon, Hong Kong
Telephone: +852 2176 3333
Facsimile: +852 2176 3888

For global contact, visit:

www.powerconversion.com
technicalsupport@powerconversion.com

While every precaution has been taken to ensure accuracy and completeness in this literature, Emerson Network Power assumes no responsibility, and disclaims all liability for damages resulting from use of this information or for any errors or omissions.

Emerson Network Power.
The global leader in enabling business-critical continuity.

- AC Power
- Connectivity
- DC Power
- Embedded Power**
- Inbound Power
- Integrated Cabinet Solutions
- Outside Plant
- Precision Cooling
- Site Monitoring and Services

EmersonNetworkPower.com

Emerson Network Power and the Emerson Network Power logo are trademarks and service marks of Emerson Electric Co. ©2007 Emerson Electric Co.