



### General Description

The DE-SW0XX family of switch mode voltage regulators are designed to be the easiest possible way to add the benefits of switch-mode power to a new or existing project. The DE-SW0XX family is Pin-compatible with the common 78XX family of linear voltage regulators. They have integrated decoupling capacitors, so external capacitors are not generally necessary. Available voltages are 3.3 and 5 volts.

The DE-SW0XX family operates over a wide input voltage range, from (Vout+1.3V) to 30v, at up to one amp of continuous output current. Efficiencies are up to 87% (Figure 2) Ripple is less than 2% of output.

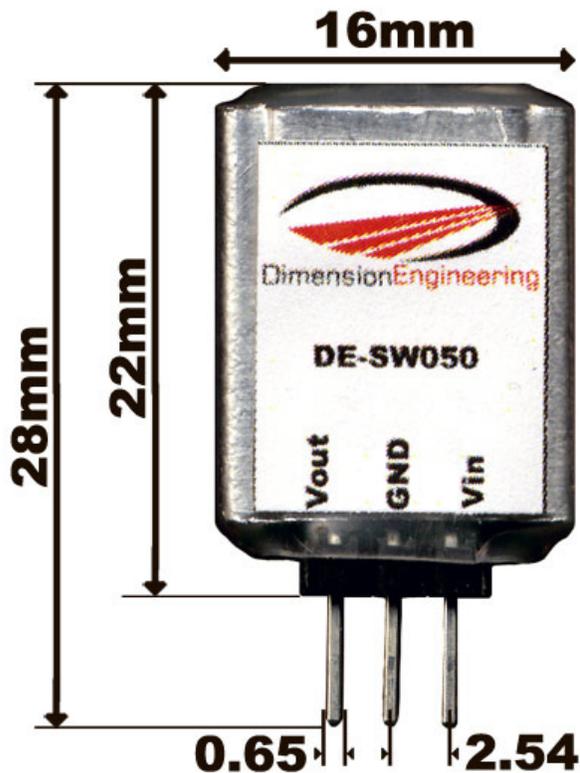
The DE-SW0XX family works on a breadboard, making it an ideal solution for prototyping and one-off circuits.

### Features

- Drop-in replacement for LM78XX
- Up to 30V input voltage
- 1.3V dropout voltage
- 3.3V and 5V output voltages available
- 1A continuous output current
- Efficiency up to 87%
- Integrated bypass capacitors
- Integrated heat spreader
- Weights only 3.8g
- Can drive inductive loads

### Applications

- Battery powered applications
- Robots
- Servo power
- Small DC motors
- Lithium battery charging and maintenance
- Point of load voltage regulation
- Any application where a 78XX regulator is dissipating too much heat or a large heatsink is undesirable



## Typical Performance Characteristics

The device can be expected to perform as characterized within these parameters

Characteristic	Min	Typical	Max
Input voltage	V <sub>out</sub> +1.3V		30V
Output Current (RMS) <sup>1</sup>	0A		1A
Pulsed Output Current (5 sec)			1.5A
Output Ripple	30mV	70mV	100mV
Efficiency (See Figure 2 and Figure 3)	65%	83%	87%
Transient response in load regulation (0-1A pulses, 1ms, V <sub>p-p</sub> )		4%	
Power dissipation	100mW	800mW	1.2W
Power output in still air	0W		5W
Quiescent current draw (V <sub>in</sub> = 12V)		16mA	
Switching frequency	230kHz	270kHz	290kHz
Thermal Derating in still air	See Figure 4		

<sup>1</sup>For input voltages above 25V, an output current of at least 40mA is needed to maintain the regulated output voltage. This can be accomplished by adding a 1k $\Omega$  load resistor, or by simply connecting the load you wanted to use anyway.

## Absolute Maximum ratings

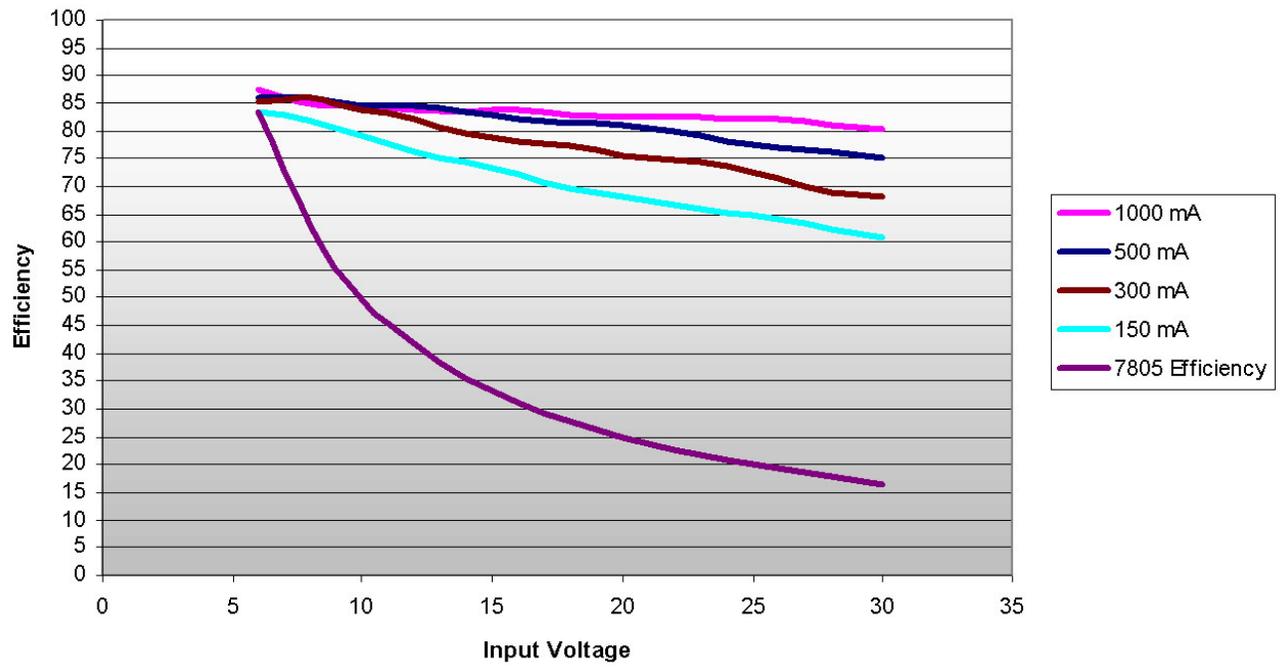
Operation beyond these parameters may permanently damage the device

Characteristic	Min	Max
Input voltage	0V	35v
Output Current	0A	1.5A
Power dissipation		1.5W
Ambient Temperature	-20C	70C

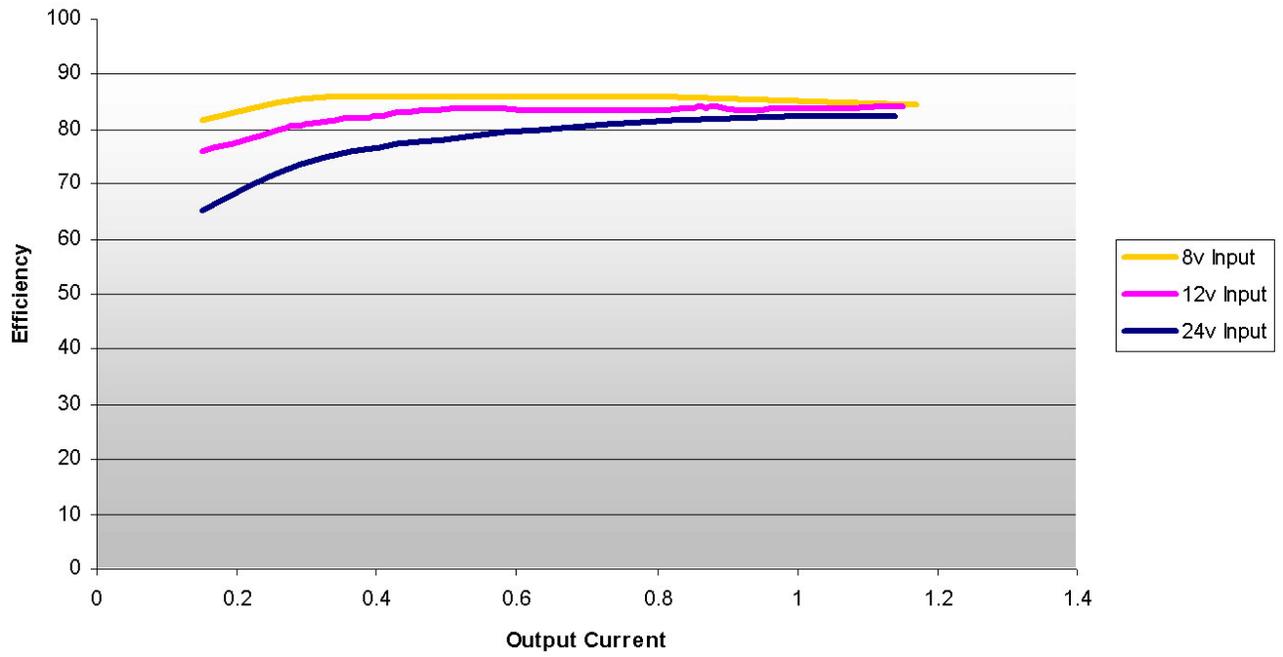
## Overcurrent/overtemperature behavior

If the current limit has been considerably exceeded or if the device is overheated the product will gradually reduce the output voltage in an attempt to reduce the load on the device. Once the extra load is removed or the temperature is brought down, the desired output voltage will be restored. It is unlikely that you will destroy the regulator by exceeding the current/temperature ratings but we still recommend practicing good engineering techniques and do not overload the device beyond the recommended operating parameters.

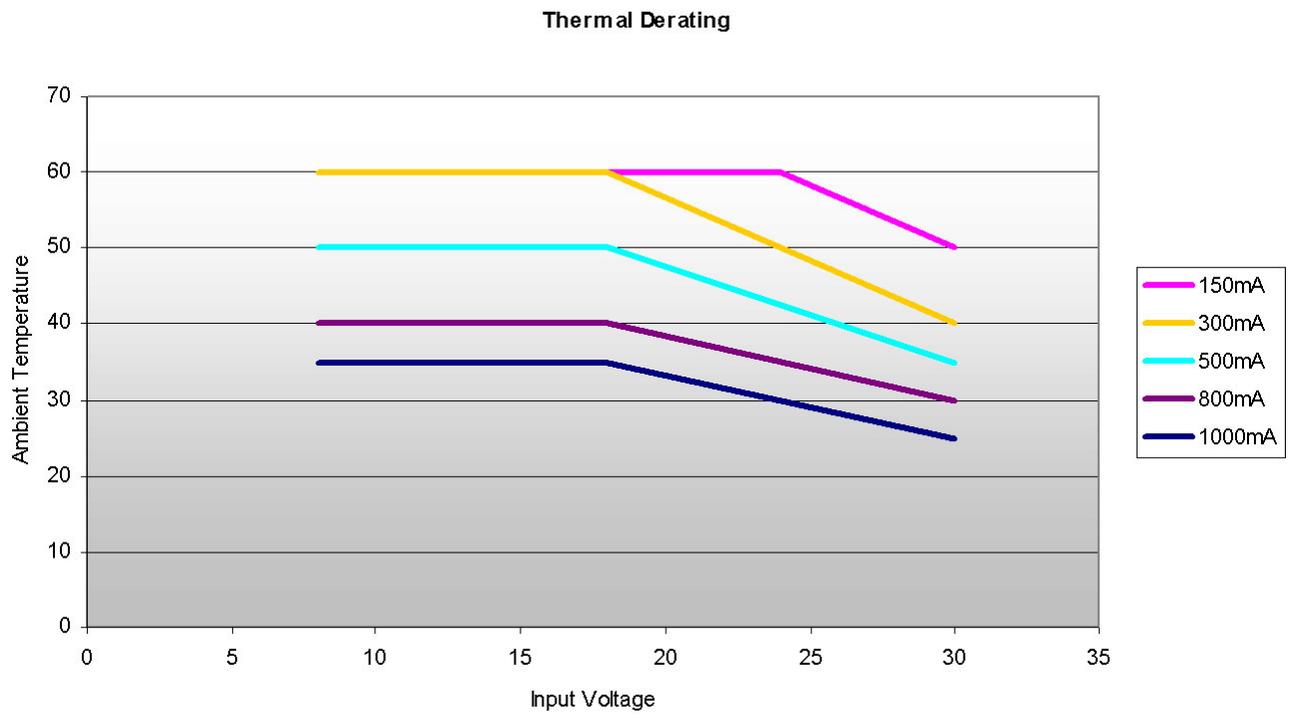
**Figure 2: Efficiency vs. Input Voltage**



**Figure 3: Efficiency vs. Output Current**

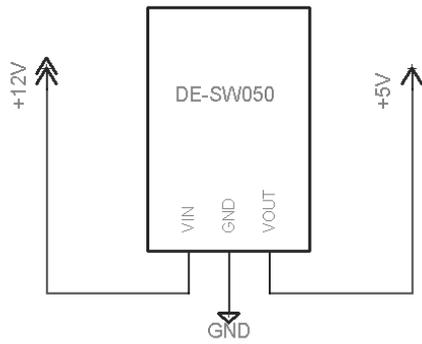


**Figure 4: Thermal Derating in Still Air**



## Typical Applications

### General-purpose regulator



### Regulator for ripple sensitive devices

