



# SM 800 with Power Sink Option

## 2 Quadrant operation: Source and Sink



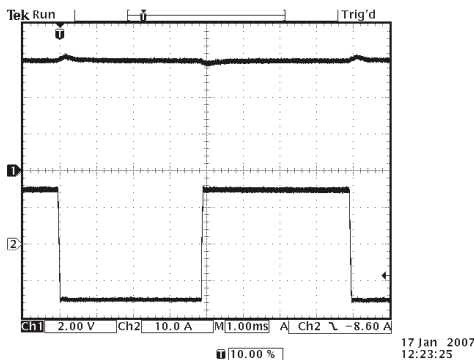
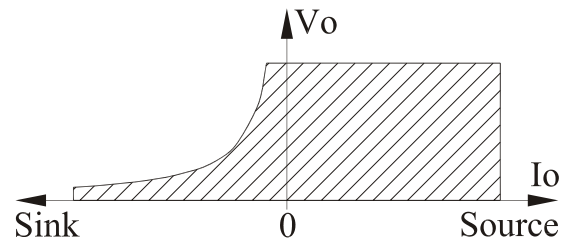
SM70-AR-24

The power sink option permits the power supply to absorb bursts of power fed back to the unit. An internal module senses the status of power supply and sinks current across the output terminals, thus maintaining a constant output voltage.

The Power Sink Option allows a faster response when the power supply is step programmed to a lower voltage at small load conditions.

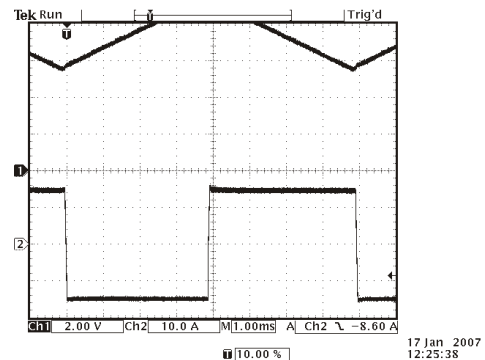
- Can absorb 140 W peak power
- Maintains output voltage setting regardless output power is positive or negative (source and sink)
- Ideal solution for supplying electric motors with PWM-speed control. These systems often return power to the power supply during a braking action
- Ideal solution for ATE systems requiring fast down programming at no load conditions
- Generation Automotive waveforms (fast)

| Models      | Order Code |
|-------------|------------|
| SM 7.5-80   | P245       |
| SM 18-50    | P246       |
| SM 70-AR-24 | P247       |
| SM 400-AR-4 | P248       |



SM18-50 **with** Power Sink Option  
Current - 15 A means the load delivers 15 A to the power supply (sink operation)

Upper trace: output voltage  
Lower trace: output current  
(current switching from +15 A to -15 A at  $V_o=6$  V)

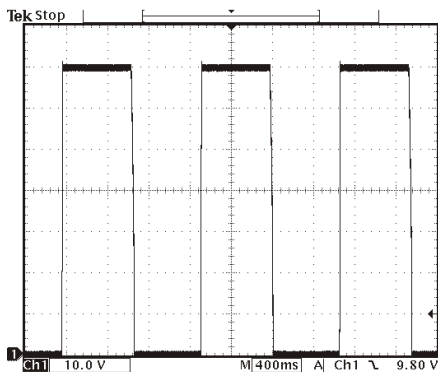


SM18-50 **without** Power Sink Option  
The output voltage is out of control when the output current is **negative**

Upper trace: output voltage  
Lower trace: output current  
(current switching from +15 A to -15 A at  $V_o=6$  V)

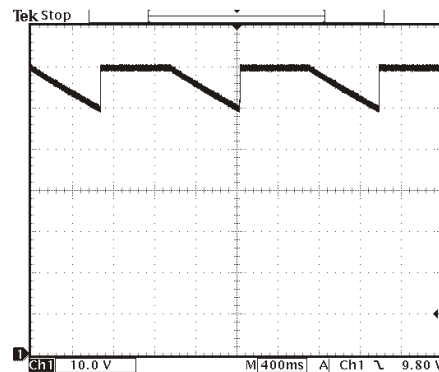
| Power Sink Specifications   | SM7.5-80<br><i>option P245</i>   | SM18-50<br><i>option P246</i>   | SM70-AR-24<br><i>option P247</i>   | SM400-AR-4<br><i>option P248</i>  |
|---|--|---|--|---|
| <b>Sink Power Rating</b><br>max. peak power (electronically limited)<br>max. continuous power (T <sub>amb.</sub> = 25 °C)<br>max. continuous power (T <sub>amb.</sub> = 50 °C)  | 140 W<br>140 W<br>110 W  |   |  |   |
| <b>Max. duration Sink Peak Power</b><br>P <sub>sink</sub> = 140 W, T <sub>amb.</sub> = 25 °C  | continuous   |   |  |   |
| <b>Duty Cycle for use at Peak Power</b><br>P <sub>sink</sub> = 140 W, T <sub>amb.</sub> = 25 °C   | 100%   |   |  |   |
| <b>Max. Sink Current</b><br>(V <sub>o</sub> ≥ 2 V and P ≤ 140 W)  | Limited at<br>36 A   | Limited at<br>36 A  | Limited at<br>25 A   | Limited at<br>5 A   |
| <b>Protection</b>   | Electronic Power Limit (140 W) limits the current.<br>The temperature of the power sink is fan controlled and<br>the circuit shuts down in case of thermal overload. |   |  |   |
| <b>Recovery time / Deviation</b><br>V <sub>o</sub> = 6 V, I <sub>o</sub> : +30 A → -10 A<br>recovery within 100 mV / deviation:<br><br>V <sub>o</sub> = 15 V, I <sub>o</sub> : +20 A → -4 A<br>recovery within 100 mV / deviation:<br><br>V <sub>o</sub> = 24 V, I <sub>o</sub> : +15 A → -2 A<br>recovery within 100 mV / deviation:<br><br>V <sub>o</sub> = 60 V, I <sub>o</sub> : +9 A → -1 A<br>recovery within 100 mV / deviation:<br><br>V <sub>o</sub> = 150 V, I <sub>o</sub> : +3 A → -0.5 A<br>recovery within 1.0 V / deviation:<br><br>V <sub>o</sub> = 350 V, I <sub>o</sub> : +1 A → -0.1 A<br>recovery within 1.0 V / deviation:<br><br><i>(load current switches from positive<br/>to negative)</i> | di/dt = -0.7 A/μs<br>200 μs / 0.15 V<br><br>-<br><br>-<br><br>-<br><br>-<br><br>-<br><br><i>note: values<br/>are typical</i>   | di/dt = -0.7 A/μs<br>400 μs / 0.25 V<br><br>di/dt = -0.5 A/μs<br>700 μs / 0.20 V<br><br>-<br><br>-<br><br>-<br><br>-<br><br><i>note: values<br/>are typical</i> | -<br><br>di/dt = -0.5 A/μs<br>700 μs / 0.85 V<br><br>di/dt = -0.4 A/μs<br>800 μs / 0.75 V<br><br>di/dt = -0.3 A/μs<br>4.0 ms / 0.65 V<br><br>-<br><br>-<br><br><i>note: values<br/>are typical</i> | -<br><br>-<br><br>-<br><br>di/dt = -0.1 A/μs<br>800 μs / 4.0 V<br><br>di/dt = -0.05 A/μs<br>2.0 ms / 2.7 V<br><br><i>note: values<br/>are typical</i> |
| <b>Programming Down Speed</b><br>Fall time at <b>no load</b> (90 - 10%)<br>Fall time at no load <i>without Power Sink</i><br><br>Unit with Fast Programming Option<br>Fall time at <b>no load</b> (90 - 10%)<br>Fall time at no load <i>without Power Sink</i>  | (7.5 → 0 V)<br>6.5 ms<br>5 s<br><br><b>P245+P250</b><br>120 μs<br>65 ms  | (18 → 0 V)<br>17 ms<br>6 s<br><br><b>P246+P251</b><br>390 μs<br>210 ms  | (70 → 0 V)<br>25 ms<br>4 s<br><br><b>P247+P252</b><br>1 ms<br>760 ms   | (400 → 0 V)<br>19 ms<br>4.5 s<br><br><b>P248+P253</b><br>Not<br>possible.   |

- Notes:
- The maximum sink current at higher voltages will not be the maximum specified current due to the power limit. For example at 30 V the maximum sink current will only be 4.7 A (30 V x 4.7 A = 140 W = maximum power).
  - A higher sink current than the maximum current will cause the output voltage to rise.



SM70-AR-24 with Power Sink Option  
fast discharge of output capacitors  
by the power sink circuit

trace: output voltage  
Voltage Programming Speed at NO LOAD



SM70-R-24 without Power Sink Option  
slow response time during voltage step down,  
time needed to discharge the output capacitors

trace: output voltage  
Voltage Programming Speed at NO LOAD