

SM 3300 with Power Sink Option

2 Quadrant operation: Source and Sink

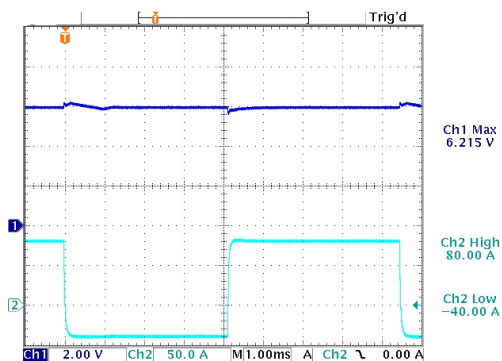
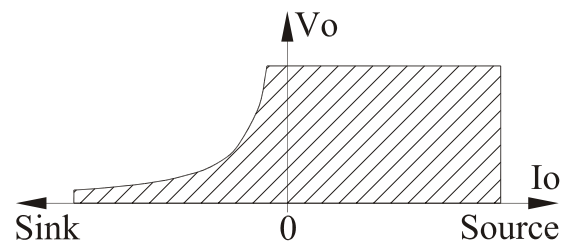


SM66-AR-110

Models	Order Code
SM 18-220	P306
SM 66-AR-110	P308
SM 100-AR-75	P309
SM 330-AR-22	P310
SM 660-AR-11	P311

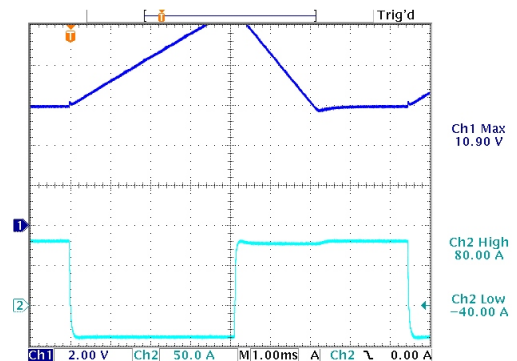
The Power Sink Option permits the power supply to absorb bursts of power fed back to the unit. An internal module senses the status of power supply and sinks current across the output terminals, thus maintaining a constant output voltage. The Power Sink Option allows a faster response when the power supply is step programmed to a lower voltage at low load conditions.

- Can absorb up to 300 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)



SM18-220 **with** Power Sink Option
 Current – 40 A means the load delivers 40 A to the power supply (sink operation)

Upper trace: output voltage
 Lower trace: output current
 (current switching from +80 A to –40 A at $V_o=6$ V)

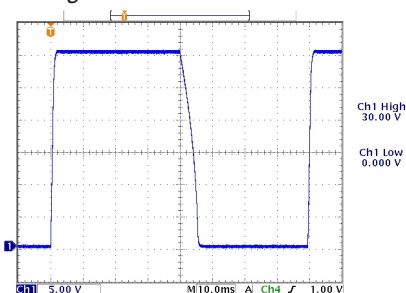


SM18-220 **without** Power Sink Option
 The output voltage is out of control when the output current is **negative**

Upper trace: output voltage
 Lower trace: output current
 (current switching from +80 A to –40 A at $V_o=6$ V)

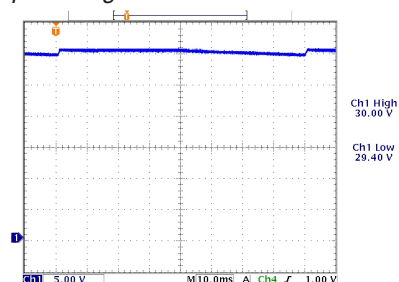
Power Sink Specifications	SM18-220 <i>Option P306</i>	SM66-AR-110 <i>Option P308</i>	SM100-AR-75 <i>Option P309</i>	SM330-AR-22 <i>Option P310</i>	SM660-AR-11 <i>Option P311</i>
Sink Power Rating max. peak power (electronically limited) max. continuous power ($T_{amb.} = 25\text{ }^{\circ}\text{C}$) max. continuous power ($T_{amb.} = 50\text{ }^{\circ}\text{C}$)	300W 300W <i>t.b.d</i>				
Max. duration Sink Peak Power $P_{sink} = P_{max}$, $T_{amb.} = 25\text{ }^{\circ}\text{C}$	continuous @ $P_{sink} = 300\text{ W}$				
Duty Cycle for use at Peak Power $P_{sink} = P_{max}$, $T_{amb.} = 25\text{ }^{\circ}\text{C}$	100% @ $P_{sink} = 300\text{ W}$				
Max. Sink Current ($V_o \geq 2\text{ V}$ and $P \leq P_{max}$)	Limited at 75A	Limited at 75A	Limited at 75A	Limited at 10A	Limited at 10A
Protection	Electronic Power Limit limits the current. The temperature of the power sink is fan controlled and the circuit shuts down in case of thermal overload.				
Recovery time / Deviation $V_o = 6\text{ V}$, $I_o: +100\text{ A} \rightarrow -30\text{ A}$ recovery within 100 mV / deviation: $V_o = 15\text{ V}$, $I_o: +100\text{ A} \rightarrow -10\text{ A}$ recovery within 100 mV / deviation: $V_o = 24\text{ V}$, $I_o: +70\text{ A} \rightarrow -7.5\text{ A}$ recovery within 100 mV / deviation: $V_o = 60\text{ V}$, $I_o: +35\text{ A} \rightarrow -3\text{ A}$ recovery within 100 mV / deviation: $V_o = 300\text{ V}$, $I_o: +8\text{ A} \rightarrow -0.5\text{ A}$ recovery within 1 V / deviation: $V_o = 600\text{ V}$, $I_o: +4\text{ A} \rightarrow -0.25\text{ A}$ recovery within 1 V / deviation: <i>(load current switches from positive to negative)</i>	$di/dt = -2.5\text{ A}/\mu\text{s}$ 400 $\mu\text{s}/0.30\text{ V}$	$di/dt = -2.5\text{ A}/\mu\text{s}$ 750 $\mu\text{s}/1.20\text{ V}$	-	-	-
	$di/dt = -2.5\text{ A}/\mu\text{s}$ 450 $\mu\text{s}/0.30\text{ V}$	$di/dt = -2.5\text{ A}/\mu\text{s}$ 600 $\mu\text{s}/0.85\text{ V}$	-	-	-
	-	$di/dt = -1.5\text{ A}/\mu\text{s}$ 1.1 ms/0.90V	$di/dt = -1.8\text{ A}/\mu\text{s}$ 600 $\mu\text{s}/0.65\text{ V}$	-	-
	-	$di/dt = -1.0\text{ A}/\mu\text{s}$ 2.0 ms/0.90V	$di/dt = -0.8\text{ A}/\mu\text{s}$ 2.2 ms/0.60V	-	-
	-	-	-	$di/dt = -0.3\text{ A}/\mu\text{s}$ 1.0 ms/1.9V	$di/dt = -0.15\text{ A}/\mu\text{s}$ 0.5 ms/3.0V
	-	-	-	-	$di/dt = -0.07\text{ A}/\mu\text{s}$ 1.5 ms/3.0V
	<i>note: values are typical</i>	<i>note: values are typical</i>	<i>note: values are typical</i>	<i>note: values are typical</i>	<i>note: values are typical</i>
Programming Down Speed Fall time at no load (90 - 10%) Fall time at no load <i>without Power Sink</i>	(6 \rightarrow 0V) 2.3ms 1.2 s	(33 \rightarrow 0V) 5.6ms 3.5 s	(50 \rightarrow 0V) 11.5ms 2.3 s	(165 \rightarrow 0V) 14ms 3.5 s	(330 \rightarrow 0V) 12ms 3.5 s
Fall time at no load (90 - 10%) Fall time at no load <i>without Power Sink</i>	(18 \rightarrow 0V) 14.8ms 4.2 s	(66 \rightarrow 0V) 23ms 5.0 s	(100 \rightarrow 0V) 45.0ms 9.4 s	(330 \rightarrow 0V) 50ms 12 s	(660 \rightarrow 0V) 45ms 11 s
Unit with Fast Programming Option Fall time at no load (90 - 10%) Fall time at no load <i>without Power Sink</i>	P306+P300 (6 \rightarrow 0V) 0.09ms 23ms	P308+P302 (33 \rightarrow 0V) 0.55ms 150ms	P309+P303 (50 \rightarrow 0V) 0.48ms 60.6ms	P310+P304 (165 \rightarrow 0V) 1.5 ms 600ms	P311+P305 (330 \rightarrow 0V) 2.2 ms 720ms
Fall time at no load (90 - 10%) Fall time at no load <i>without Power Sink</i>	(18 \rightarrow 0V) 0.3ms 34ms	(66 \rightarrow 0V) 1.5ms 600ms	(100 \rightarrow 0V) 1.4ms 425ms	(330 \rightarrow 0V) 4.8ms 2s	(660 \rightarrow 0V) 8ms 3.8s
Parallel and Series operation Refer to power sink manual for details and restrictions.	Using multiple units in parallel operation, only one unit can have a power sink. Using multiple units in series operation, all units must have a power sink.				

- Notes:
- The maximum sink current at higher voltages will not be the maximum specified current due to the power limit. For example for an SM66-AR-110 at 30V, the max sink current will be 10 A ($30\text{ V} \times 10\text{ A} = 300\text{ W} = \text{max power}$).
 - A higher sink current than the maximum current will cause the output voltage to rise.



SM66-AR-110 with Power Sink Option
fast discharge of output capacitors
by Power Sink circuit

Trace: output voltage
Voltage Programming Speed at NO LOAD



SM66-AR-110 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