SM 3300 with Power Sink Option

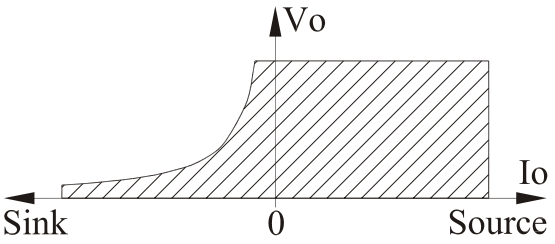
2 Quadrant operation: Source and Sink

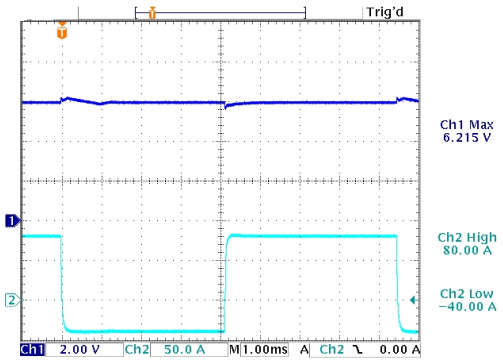
SM66-AR-110

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.

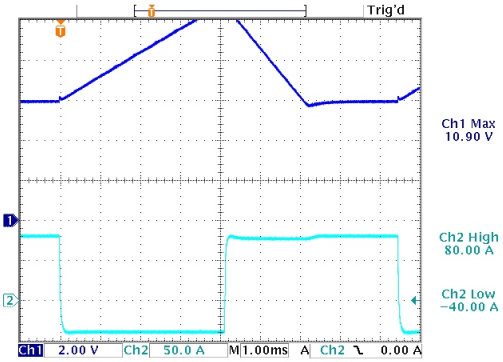
- Can absorb up to 300 W peak power
- Maintains output voltage setting regardless output power is positive or negative (source and sink)
- Ideal solution for supplying electric motors with PWM-speed control. These systems often return power to the power supply during a braking action
- Ideal solution 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 Vo=6 V)

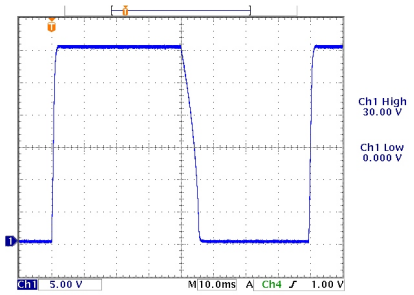


SM18-220 **without** Power Sink Option
*The output voltage is out of control when the output current is **negative***

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

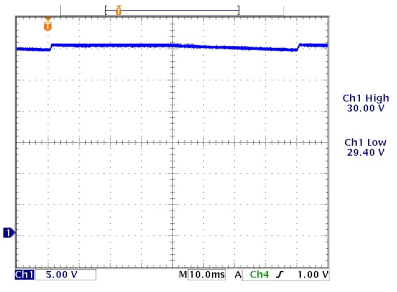
Power Sink Specifications	SM18-220 ***Option P306***	SM66-AR-110 ***Option P308***	SM100-AR-75 ***Option P309***	SM330-AR-22 ***Option P310***	SM660-AR-11 ***Option P311***
Sink Power Rating max. peak power (electronically limited) max. continuous power ($T_{amb.}$ = 25 °C) max. continuous power ($T_{amb.}$ = 50 °C)	300W 300W *t.b.d*				
Max. duration Sink Peak Power $P_{sink} = P_{max}$, $T_{amb.}$ = 25 °C	continuous @ P_{sink} = 300 W				
Duty Cycle for use at Peak Power $P_{sink} = P_{max}$, $T_{amb.}$ = 25 °C	100% @ P_{sink} = 300 W				
Max. Sink Current (V_o >= 2 V and P <= P_{max})	Limited at 75 A	Limited at 75 A	Limited at 75 A	Limited at 10 A	Limited at 10 A
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 Vo = 6 V, I_o: +100 A → –30 A recovery within 100 mV / deviation:	di/dt = – 2.5A/µs 400 µs / 0.30 V	di/dt = – 2.5A/µs 750 µs / 1.20 V	-	-	-
Vo = 15 V, I_o: +100 A → –10 A recovery within 100 mV / deviation:	di/dt = – 2.5A/µs 450 µs / 0.30 V	di/dt = – 2.5A/µs 600 µs / 0.85 V	-	-	-
Vo = 24 V, I_o: +70 A → –7.5 A recovery within 100 mV / deviation:	-	di/dt = – 1.5A/µs 1.1 ms / 0.90 V	di/dt = – 1.8A/µs 600 µs / 0.65 V	-	-
Vo = 60 V, I_o: +35 A → –3 A recovery within 100 mV / deviation:	-	di/dt = – 1.0A/µs 2.0 ms / 0.90 V	di/dt = – 0.8A/µs 2.2 ms / 0.60 V	-	-
Vo = 300 V, I_o: +8 A → –0.5 A recovery within 1 V / deviation:	-	-	-	di/dt = – 0.3A/µs 1.0 ms / 1.9 V	di/dt = – 0.15A/µs 0.5 ms / 3.0 V
Vo = 600 V, I_o: +4 A → –0.25 A recovery within 1 V / deviation:	-	-	-	-	di/dt = – 0.07A/µs 1.5 ms / 3.0 V
(load current switches from positive to negative)	*note: values are typical*	*note: values are typical*	*note: values are typical*	*note: values are typical*	*note: values are typical*
Programming Down Speed Fall time at **no load** (90 - 10%) Fall time at no load *without Power Sink*	(6 → 0 V) 2.3 ms 1.2 s	(33 → 0 V) 5.6 ms 3.5 s	(50 → 0 V) 11.5 ms 2.3 s	(165 → 0 V) 14 ms 3.5 s	(330 → 0 V) 12 ms 3.5 s
Fall time at no **load** (90 - 10%) Fall time at no load *without Power Sink*	(18 → 0 V) 14.8 ms 4.2 s	(66 → 0 V) 23 ms 5.0 s	(100 → 0 V) 45.0 ms 9.4 s	(330 → 0 V) 50 ms 12 s	(660 → 0 V) 45 ms 11 s
Unit with Fast Programming Option	***P306+P300***	***P308+P302***	***P309+P303***	***P310+P304***	***P311+P305***
Fall time at **no load** (90 - 10%) Fall time at no load *without Power Sink*	(6 → 0 V) 0.09 ms 23 ms	(33 → 0 V) 0.55 ms 150 ms	(50 → 0 V) 0.48 ms 60.6 ms	(165 → 0 V) 1.5 ms 600 m s	(330 → 0 V) 2.2 ms 720 ms
Fall time at no **load** (90 - 10%) Fall time at no load *without Power Sink*	(18 → 0 V) 0.3 ms 34 ms	(66 → 0 V) 1.5 ms 600 ms	(100 → 0 V) 1.4 ms 425 ms	(330 → 0 V) 4.8 ms 2 s	(660 → 0 V) 8 ms 3.8 s
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 V x 10 A = 300 W = 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