



Description

M-PSW modules are single output multi-range programmable switching DC power supplies covering a power range up to 1080 W. There are 15 available modules with the combination of 30 V, 80 V, 160 V, 250 V and 800 V rated voltages and 360 W, 720 W and 1080 W maximum output powers. The multi-range feature allows the flexible and efficient configuration of voltage and current within the rated power range.

The adjustable slew rate of the M-PSW modules allows user to set for either output voltage or output current, a specific rise time from low to high level transition, and a specific fall time from high to low level transition. This facilitates the characteristic verification of a DUT during voltage or current level changes with controllable slew rates.

The C.V/C.C priority selection of the M-PSW modules is a very useful feature for DUT protection. The conventional power supply normally operates under C.V mode when the power output is turned on. This could bring a high inrush current to the capacitive load or current-intensive load at the power output-on stage. Taking the I-V curve verification of LED as an example, it becomes a very challenging task to perform this measurement using a conventional power supply. With LED connected to a power supply under C.V mode as the initial setting, when the power output is turned on and the voltage rises to the LED forward voltage, the current will suddenly peak up and exceed the preset value of current limit.

Upon detecting this high current, the power supply starts the transition from C.V mode to C.C mode. Though the current becomes stable after the C.C mode being activated, the current spike occurred at the C.V and C.C crossover point may possibly damage the DUT. At the power output-on stage, the M-PSW modules are able to operate under C.C priority to limit the current spike occurred at the threshold voltage and therefore protects DUT from the inrush current damage.

The OVP and OCP protections are provided with the M-PSW modules. Both OVP and OCP levels can be selected within the range of 10% to 110%, with default level set at 110%, of the rated voltage/current of the power supply.

When any of the protection levels is tripped, the power output will be switched off to protect the DUT. Each module provides USB and LAN interfaces (connected internally if required with the control centre module). The LabView driver and the Data Logging PC software are supported on all the available interfaces. An analog control/monitoring connector is also available at the rear panel for external control of power On/Off and external monitoring of power output Voltage and Current.

Features

- Voltage Ranges: 30 V / 80 V / 160 V / 250 V / 800 V
- Output Power Rating: 360 W / 720 W / 1080 W
- Constant Power Output
- C.V / C.C Priority
- Adjustable Slew Rate
- Series & Parallel Operation (multiple modules)
- High Efficiency & High Power Density
- LAN, USB, Analog Control Interface

Models

- M-PSW30-36: 0~30 V / 0~36 A / 360 W
- M-PSW30-72: 0~30 V / 0~72 A / 720 W
- M-PSW30-108: 0~30 V / 0~108 A / 1080 W
- M-PSW80-13.5: 0~80 V / 0~13.5 A / 360 W
- M-PSW80-27: 0~80 V / 0~27 A / 720 W
- M-PSW80-40.5: 0~80 V / 0~40.5 A / 1080 W
- M-PSW160-7.2: 0~160 V / 0~7.2 A / 360 W
- M-PSW160-14.4: 0~160 V / 0~14.4 A / 720 W
- M-PSW160-21.6: 0~160 V / 0~21.6 A / 1080 W
- M-PSW250-4.5: 0~250 V / 0~4.5 A / 360 W
- M-PSW250-9: 0~250 V / 0~9 A / 720 W
- M-PSW250-13.5: 0~250 V / 0~13.5 A / 1080 W
- M-PSW800-1.44: 0~800 V / 0~1.44 A / 360 W
- M-PSW800-2.88: 0~800 V / 0~2.88 A / 720 W
- M-PSW800-4.32: 0~800 V / 0~4.32 A / 1080 W



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M-PSW Multi Range DC Power Supply Modules

M-PSW-360 W (360 Watt Modules) *Notes shown on last page of specifications

Module	M-PSW	30-36	80-13.5	160-7.2	250-4.5	800-1.44
Rated Output Voltage	V	30	80	160	250	800
Rated Output Current	A	36	13.5	7.2	4.5	1.44
Rated Output Power	W	360	360	360	360	360
Power Ratio	--	3	3	3.2	3.125	3.2
Constant Voltage Mode	M-PSW	30-36	80-13.5	160-7.2	250-4.5	800-1.44
Line Regulation (*1)	mV	18	43	83	128	403
Load Regulation (*2)	mV	20	45	85	130	405
Ripple and Noise (*3)						
p-p (*4)	mV	60	60	60	80	150
r.m.s (*5)	mV	7	7	12	15	30
Temperature coefficient	ppm/°C	100 ppm/°C of rated output voltage, after a 30 minute warm-up.				
Remote sense compensation voltage	V/wire	0.6	0.6	0.6	1	1
Rise Time (*6)						
Rated Load	ms	50	50	100	100	150
No Load	ms	50	50	100	100	150
Fall Time (*7)						
Rated Load	ms	50	50	100	150	300
No Load	ms	500	500	1000	1200	2000
Transient response time (*8)	ms	1	1	2	2	2
Constant Current Mode	M-PSW	30-36	80-13.5	160-7.2	250-4.5	800-1.44
Line regulation (*1)	mA	41	18.5	12.2	9.5	6.44
Load regulation (*9)	mA	41	18.5	12.2	9.5	6.44
Ripple and noise						
r.m.s (*5)	mA	72	27	15	10	5
Temperature coefficient	ppm/°C	200 ppm/°C of rated output current, after a 30 minute warm-up.				
Protection Function	M-PSW	30-36	80-13.5	160-7.2	250-4.5	800-1.44
Over voltage protection (OVP)						
Setting range	V	3-33	8-88	16-176	20-275	20-880
Setting accuracy	--	± (2 % of rated output voltage)				
Over current protection (OCP)						
Setting range	A	3.6-39.6	1.35-14.85	0.72-7.92	0.45-4.95	0.144-1.584
Setting accuracy	--	± (2 % of rated output current)				
Over temperature protection (OTP)						
Operation	--	Turn the output off.				
Low AC input protection (AC-FAIL)						
Operation	--	Turn the output off.				
Power limit (POWER LIMIT)						
Operation	--	Over power limit.				
Value (fixed)	--	Approx. 105 % of rated output power				
Front Panel	M-PSW	30-36	80-13.5	160-7.2	250-4.5	800-1.44
Display, 4 digits						
Voltage accuracy 0.1 % +	mV	20	20	100	200	400
Current accuracy 0.1 % +	mA	40	20	5	5	2
Programming & Measurement (Interface)	M-PSW	30-36	80-13.5	160-7.2	250-4.5	800-1.44
Voltage programming accuracy 0.1 % +	mV	10	10	100	200	400
Current programming accuracy 0.1 % +	mA	30	10	5	5	2
Voltage programming resolution	mV	1	2	3	5	14
Current programming resolution	mA	1	1	1	1	1
Voltage measurement accuracy 0.1 % +	mV	10	10	100	200	400
Current measurement accuracy 0.1 % +	mA	30	10	5	5	2
Voltage measurement resolution	mV	1	2	3	5	14



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M-PSW Multi Range DC Power Supply Modules

M-PSW-720 W (720 Watt Modules) *Notes shown on last page of specifications

Module	M-PSW	30-72	80-27	160-14.4	250-9	800-2.88
Rated Output Voltage	V	30	80	160	250	800
Rated Output Current	A	72	27	14.4	9	2.88
Rated Output Power	W	720	720	720	720	720
Power Ratio	--	3	3	3.2	3.125	3.2
Constant Voltage Mode	M-PSW	30-72	80-27	160-14.4	250-9	800-2.88
Line Regulation (*1)	mV	18	43	83	128	403
Load Regulation (*2)	mV	20	45	85	130	405
Ripple and Noise (*3)						
p-p (*4)	mV	80	80	80	100	200
r.m.s (*5)	mV	11	11	15	15	30
Temperature coefficient	ppm/°C	100 ppm/°C of rated output voltage, after a 30 minute warm-up.				
Remote sense compensation voltage	V/wire	0.6	0.6	0.6	1	1
Rise Time (*6)						
Rated Load	ms	50	50	100	100	150
No Load	ms	50	50	100	100	150
Fall Time (*7)						
Rated Load	ms	50	50	100	150	300
No Load	ms	500	500	1000	1200	2000
Transient response time (*8)	ms	1	1	2	2	2
Constant Current Mode	M-PSW	30-72	80-27	160-14.4	250-9	800-2.88
Line regulation (*1)	mA	77	32	19.4	14	7.88
Load regulation (*9)	mA	77	32	19.4	14	7.88
Ripple and noise						
r.m.s (*5)	mA	144	54	30	20	10
Temperature coefficient	ppm/°C	200 ppm/°C of rated output current, after a 30 minute warm-up.				
Protection Function	M-PSW	30-72	80-27	160-14.4	250-9	800-2.88
Over voltage protection (OVP)						
Setting range	V	3-33	8-88	16-176	20-275	20-880
Setting accuracy	--	± (2 % of rated output voltage)				
Over current protection (OCP)						
Setting range	A	5-79.2	2.7-29.7	1.44-15.84	0.9-9.9	0.288-3.168
Setting accuracy	--	± (2 % of rated output current)				
Over temperature protection (OTP)						
Operation	--	Turn the output off.				
Low AC input protection (AC-FAIL)						
Operation	--	Turn the output off.				
Power limit (POWER LIMIT)						
Operation	--	Over power limit.				
Value (fixed)	--	Approx. 105 % of rated output power				
Front Panel	M-PSW	30-72	80-27	160-14.4	250-9	800-2.88
Display, 4 digits						
Voltage accuracy 0.1 % +	mV	20	20	100	200	400
Current accuracy 0.1 % +	mA	70	40	30	10	4
Programming & Measurement (Interface)	M-PSW	30-72	80-27	160-14.4	250-9	800-2.88
Voltage programming accuracy 0.1 % +	mV	10	10	100	200	400
Current programming accuracy 0.1 % +	mA	60	30	15	10	4
Voltage programming resolution	mV	1	2	3	5	14
Current programming resolution	mA	2	2	2	1	1
Voltage measurement accuracy 0.1 % +	mV	10	10	100	200	400
Current measurement accuracy 0.1 % +	mA	60	30	15	10	4
Voltage measurement resolution	mV	1	2	3	5	14
Current measurement resolution	mA	2	2	2	1	1



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M-PSW Multi Range DC Power Supply Modules

M-PSW-1080 W (1080 Watt Modules) *Notes shown on last page of specifications

Module	M-PSW	30-108	80-40.5	160-21.6	250-13.5	800-4.32
Rated Output Voltage	V	30	80	160	250	800
Rated Output Current	A	108	40.5	21.6	13.5	4.32
Rated Output Power	W	1080	1080	1080	1080	1080
Power Ratio	--	3	3	3.2	3.125	3.2
Constant Voltage Mode	M-PSW	30-108	80-40.5	160-21.6	250-13.5	800-4.32
Line Regulation (*1)	mV	18	43	83	128	403
Load Regulation (*2)	mV	20	45	85	130	405
Ripple and Noise (*3)						
p-p (*4)	mV	100	100	100	120	200
r.m.s (*5)	mV	14	14	20	15	30
Temperature coefficient	ppm/°C	100 ppm/°C of rated output voltage, after a 30 minute warm-up.				
Remote sense compensation voltage	V/wire	0.6	0.6	0.6	1	1
Rise Time (*6)						
Rated Load	ms	50	50	100	100	150
No Load	ms	50	50	100	100	150
Fall Time (*7)						
Rated Load	ms	50	50	100	150	300
No Load	ms	500	500	1000	1200	2000
Transient response time (*8)	ms	1	1	2	2	2
Constant Current Mode	M-PSW	30-108	80-40.5	160-21.6	250-13.5	800-4.32
Line regulation (*1)	mA	113	45.5	26.6	18.5	9.32
Load regulation (*9)	mA	113	45.5	26.6	18.5	9.32
Ripple and noise						
r.m.s (*5)	mA	216	81	45	30	15
Temperature coefficient	ppm/°C	200 ppm/°C of rated output current, after a 30 minute warm-up.				
Protection Function	M-PSW	30-108	80-40.5	160-21.6	250-13.5	800-4.32
Over voltage protection (OVP)						
Setting range	V	3-33	8-88	16-176	20-275	20-880
Setting accuracy	--	± (2 % of rated output voltage)				
Over current protection (OCP)						
Setting range	A	5-118.8	4.05-44.55	2.16-23.76	1.35-14.85	0.432-4.752
Setting accuracy	--	± (2 % of rated output current)				
Over temperature protection (OTP)						
Operation	--	Turn the output off.				
Low AC input protection (AC-FAIL)						
Operation	--	Turn the output off.				
Power limit (POWER LIMIT)						
Operation	--	Over power limit.				
Value (fixed)	--	Approx. 105 % of rated output power				
Front Panel	M-PSW	30-108	80-40.5	160-21.6	250-13.5	800-4.32
Display, 4 digits						
Voltage accuracy 0.1% +	mV	20	20	100	200	400
Current accuracy 0.1% +	mA	100	50	30	20	6
Programming & Measurement (Interface)	M-PSW	30-108	80-40.5	160-21.6	250-13.5	800-4.32
Voltage programming accuracy 0.1 % +	mV	10	10	100	200	400
Current programming accuracy 0.1 % +	mA	100	40	20	15	6
Voltage programming resolution	mV	1	2	3	5	14
Current programming resolution	mA	3	3	3	1	1
Voltage measurement accuracy 0.1 % +	mV	10	10	100	200	400
Current measurement accuracy 0.1 % +	mA	100	40	20	15	6
Voltage measurement resolution	mV	1	2	3	5	14
Current measurement resolution	mA	3	3	3	1	1



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M-PSW Multi Range DC Power Supply Modules

Common Specifications

Input Characteristics	M-PSW	30 V	80 V	160 V	250 V	800 V
Nominal input rating	--	100 Vac to 240 Vac, 50 Hz to 60 Hz, single phase				
Input voltage range	--	85 Vac ~ 265 Vac				
Input voltage range	--	47 Hz ~ 63 Hz				
Maximum input current						
100 Vac	A	360 W: 5 A, 720 W: 10 A, 1080 W: 15 A				
200 Vac	A	360 W: 2.5 A, 720 W: 5 A, 1080 W: 7.5 A				
Inrush current	A	< 25 A for 360 W, < 50 A for 720 W, < 75 A for 1080 W				
Maximum input power	VA	360 W: 500 VA, 720 W: 1000 VA, 1080 W: 1500 VA				
Power factor						
100 Vac	A	0.99				
200 Vac	A	0.97				
Efficiency						
100 Vac	%	77	78	79	79	80
200 Vac	%	79	80	81	81	82
Hold-up time	--	20ms or greater				

Analog Programming and Monitoring	M-PSW	30 V	80 V	160 V	250 V	800 V
External voltage control output voltage	--	Accuracy and linearity: $\pm 0.5\%$ of rated output voltage.				
External voltage control output current	--	Accuracy and linearity: $\pm 1\%$ of rated output current.				
External resistor control output voltage	--	Accuracy and linearity: $\pm 1.5\%$ of rated output voltage.				
External resistor control output current	--	Accuracy and linearity: $\pm 1.5\%$ of rated output current.				
Output voltage monitor						
Accuracy	%	± 1	± 1	± 1	± 2	± 2
Output current monitor						
Accuracy	%	± 1	± 1	± 1	± 2	± 2
Shutdown control	--	Turns the output off with a LOW (0 V to 0.5 V) or short-circuit.				
Output on/off control	--	Possible logic selections: - Turn the output on using a LOW (0 V to 0.5 V) or short-circuit, turn the output off using a HIGH (4.5 V to 5 V) or open-circuit. - Turn the output on using a HIGH (4.5 V to 5 V) or open-circuit, turn the output off using a LOW (0 V to 0.5 V) or short-circuit.				
CV/CC/ALM/PWR ON/OUT ON indicator	--	Photocoupler open collector output; Maximum voltage 30 V, maximum sink current 8 mA.				

Series and Parallel Capability	M-PSW	30 V	80 V	160 V	250 V	800 V
Parallel number	Units	3	3	3	3	3
Series Number	Units	2	2	2	None	None

Front Panel						
Indications	--	GREEN LED's: CV, CC, VSR, ISR, DLY, RMT, 20, 40, 60, 80, 100, %W, W, V, A RED LED's: ALM				
Buttons	--	Function, OVP/OCP, Set, Test, Lock/Local, PWR DSPL, Output				
Knobs	--	Voltage, Current				
USB port	--	Type A USB connector				

Interface Capabilities						
USB	--	TypeA: Host, TypeB: Slave, Speed: 1.1/2.0, USB Class: CDC(Communications Device Class)				
LAN	--	MAC Address, DNS IP Address, User Password, Gateway IP Address, Instrument IP Address, Subnet Mask				
GPIB	--	Optional: GUG-001 (GPIB to USB Adapter)				

Environmental Conditions						
Operating temperature	--	0 °C to 50 °C				
Storage temperature	--	-25 °C to 70 °C				
Operating humidity	--	20 % to 85 % RH; No condensation				
Storage humidity	--	90 % RH or less; No condensation				
Altitude	--	Maximum 2000m				

General Specifications						
Module Widths	mm	360 W: 115 mm, 720 W: 225 mm, 1080 W: 295 mm = Primary Console fitting only				
Cooling	--	Forced air cooling by internal fan.				
EMC	--	Complies with the European EMC directive 2004/108 /EC for Class A test and measurement products.				
Safety	--	Complies with the European Low Voltage Directive 2006 /95/EC and carries the CE-marking.				
Withstand voltage	--	Between input and chassis: No abnormalities at 1500 Vac for 1 minute. Between input and output: No abnormalities at 3000 Vac for 1 minute. Between output and chassis: No abnormalities at 500 Vdc for 1 minute for 30V, 80V, 160V modules.				
Insulation resistance	--	Between input and chassis: 500 Vdc, 100 M Ω or more Between input and output: 500 Vdc, 100 M Ω or more Between output and chassis: 500 Vdc, 100 M Ω or more for 30 V, 80 V, 160 V and 250 V modules. 1000 Vdc, 100 M Ω or more for 800 V models.				



Specification Notes

- *1: At 85 ~ 132 Vac or 170 ~ 265 Vac, constant load.
- *2: From No-load to Full-load, constant input voltage. Measured at the sensing point in Remote Sense.
- *3: Measure with JEITA RC-9131B (1:1) probe
- *4: Measurement frequency bandwidth is 10 Hz to 20 MHz.
- *5: Measurement frequency bandwidth is 5 Hz to 1 MHz.
- *6: From 10 % to 90 % of rated output voltage, with rated resistive load.
- *7: From 90 % to 10 % of rated output voltage, with rated resistive load.
- *8: Time for output voltage to recover within 0.1 % + 10 mV of its rated output for a load change from 50 to 100 % of its rated output current.
- *9: For load voltage change, equal to the unit voltage rating, constant input voltage.

Ordering Information

Module Name	Voltage	Current	Power
M-PSW30-36 Multi-Range DC Power Supply Module	0 ~ 30 V	0 ~ 36 A	360 W
M-PSW30-72 Multi-Range DC Power Supply Module	0 ~ 30 V	0 ~ 72 A	720 W
M-PSW30-108 Multi-Range DC Power Supply Module	0 ~ 30 V	0 ~ 108 A	1080 W
M-PSW80-13.5 Multi-Range DC Power Supply Module	0 ~ 80 V	0 ~ 13.5A	360 W
M-PSW80-27 Multi-Range DC Power Supply Module	0 ~ 80 V	0 ~ 27 A	720 W
M-PSW80-40.5 Multi-Range DC Power Supply Module	0 ~ 80 V	0 ~ 40.5 A	1080 W
M-PSW160-7.2 Multi-Range DC Power Supply Module	0 ~ 160 V	0 ~ 7.2 A	360 W
M-PSW160-14.4 Multi-Range DC Power Supply Module	0 ~ 160 V	0 ~ 14.4 A	720 W
M-PSW160-21.6 Multi-Range DC Power Supply Module	0 ~ 160 V	0 ~ 21.6 A	1080 W
M-PSW250-4.5 Multi-Range DC Power Supply Module	0 ~ 250 V	0 ~ 4.5 A	360 W
M-PSW250-9 Multi-Range DC Power Supply Module	0 ~ 250 V	0 ~ 9 A	720 W
M-PSW250-13.5 Multi-Range DC Power Supply Module	0 ~ 250 V	0 ~ 13.5 A	1080 W
M-PSW800-1.44 Multi-Range DC Power Supply Module	0 ~ 800 V	0 ~ 1.44 A	360 W
M-PSW800-2.88 Multi-Range DC Power Supply Module	0 ~ 800 V	0 ~ 2.88 A	720 W
M-PSW800-4.32 Multi-Range DC Power Supply Module	0 ~ 800 V	0 ~ 4.32 A	1080 W

Due to continuous development Time Electronics reserves the right to change specifications without prior notice.