

M1 Series

2W Semi-regulated Single & Dual output



electronic powersolutions

Features

- 7 Pin SIL Package
- Semi-regulated output
- 1000 VDC Isolation
- Up to 3000 VDC Isolation
- Low Ripple and Noise
- Efficiency up to 89%
- -40 ~ 85°C Operation Temperature Range
- Non-Conductive Black Plastic Case



The M1 series is a family of cost effective 2W single & dual output DC-DC converters. These converters achieve low cost, high efficiency, semi-regulated and ultra-miniature SIP 7 pin size. Devices are encapsulated using flame retardant resin. The models operate from input voltage of 5, 12, 15, 24Vdc with output voltage of 5, 9, 12, 15, ±5, ±9, ±12, ±15 Vdc. High efficiency operation and output voltage accuracy of +2%~-4% maximum. Standard features include an input range of ±10% tolerance and low output noise and ripple.

All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

GENERAL CHARACTERISTICS

Voltage accuracy	+2~-4%
Line regulation	±1.2% / Per 1% Vin Change
Load regulation(From 10% to 100% Load)	See table
Ripple & noise (20 MHz bandwidth)(1)	50mV pk-pk
Temperature coefficient	±0.02%/°C
Capacitor load(2)	See table

EMI/EMC CHARACTERISTICS

Radiated Emissions	EN55032	CLASS B
Conducted Emissions (3)	EN55032	CLASS B
ESD	IEC 61000-4-2	Perf. Criteria A
RS	IEC 61000-4-3	Perf. Criteria A
EFT(4)	IEC 61000-4-4	Perf. Criteria A
CS	IEC 61000-4-6	Perf. Criteria A
PFMF	IEC 61000-4-8	Perf. Criteria A

INPUT CHARACTERISTICS

Voltage Range	±10%
Max. Input Current	See table
No-Load Input Current	See table
Input Filter	Capacitors
Input Reflected Ripple Current	5V 25mA pk-pk
	12V 25mA pk-pk
	15V 30mA pk-pk
	24V 40mA pk-pk

ENVIRONMENTAL CHARACTERISTICS

Case Material	Non-conductive Black Plastic(UL94V-0 rated)
Pin Material	C519 R-H Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	2.8g, yp.
Dimensions	SIP Case 0.76"x0.28"x0.39"

TEMPERATURE CHARACTERISTICS

Efficiency	See table
I/O Isolation Voltage(60 sec)	1000~3000Vdc
Input/Output	60 pF Typ.
I/O Isolation Capacitance	1G Ohm
I/O Isolation Resistance	Variable 70kHz
Switching Frequency	95% rel H
Humidity	>1.9 Mhrs
Reliability Calculated MTBF(MIL-HDBK-217 F)	IEC 60950-1
Safety Standard : (designed to meet)	

OPERATING CHARACTERISTICS

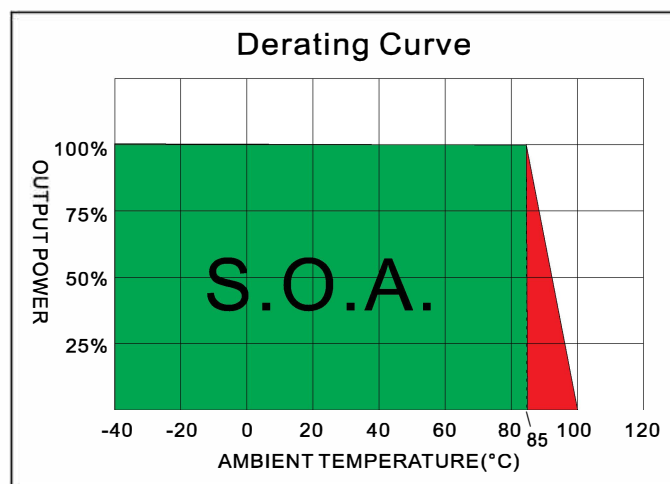
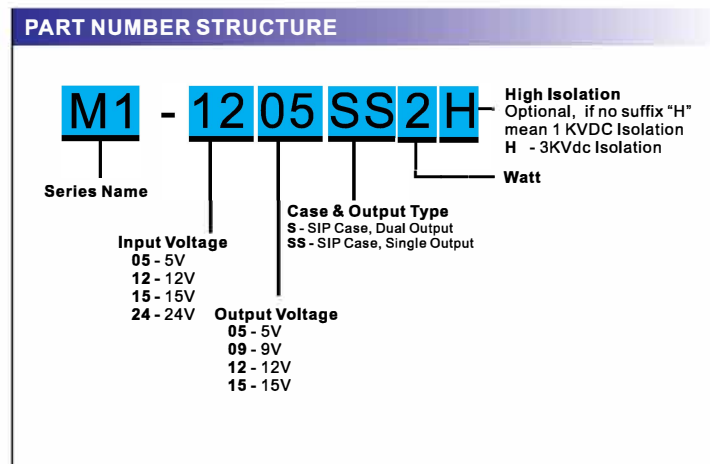
Operating Temperature	-40°C~85°C(See Derating Curve)
Maximum Case Temperature	100°C
Storage Temperature	-40°C~125°C
Cooling	Nature Convection

STRESS RATINGS AND LIMITS

These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

Input Surge Voltage(100mS)	5 Models 9 Vdc, max.
	12 Models 18 Vdc, max.
	15 Models 20 Vdc, max.
	24 Models 30 Vdc, max.
Soldering Temperature (1.5mm from case 10 sec.)	260°C

M1 - 2W Semi-regulated Single & Dual output



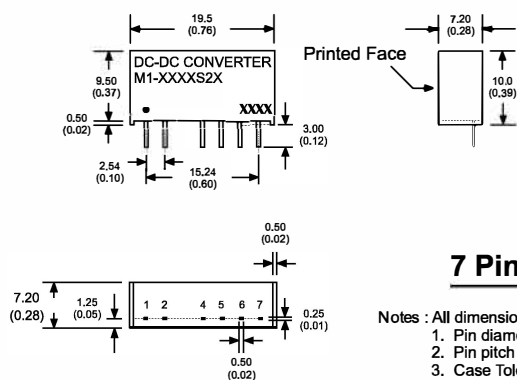
MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current		OUTPUT Voltage (Vdc)	OUTPUT Current Full load (mA)	LOAD Regulation %	EFFICIENCY @FL (% typ.)	Capacitor Load @FL (µF, max.)
		No-Load (mA, max.)	Full Load (mA, max.)					
M1-0505S2	5	50	488	±5	±200	5	82	±100
M1-0509S2	5	50	471	±9	±111.1	3.9	85	±100
M1-0512S2	5	50	465	±12	±83.3	3.7	86	±47
M1-0515S2	5	50	460	±15	±66.6	4	87	±47
M1-1205S2	12	40	200	±5	±200	3.4	84	±100
M1-1209S2	12	40	189	±9	±111.1	2.4	88	±100
M1-1212S2	12	40	187	±12	±83.3	2.2	89	±47
M1-1215S2	12	40	187	±15	±66.6	1.9	89	±47
M1-1505S2	15	30	157	±5	±200	3.4	85	±100
M1-1509S2	15	30	152	±9	±111.1	2.4	88	±100
M1-1512S2	15	30	152	±12	±83.3	2.2	88	±47
M1-1515S2	15	30	152	±15	±66.6	1.9	88	±47
M1-2405S2	24	20	102	±5	±200	3.5	82	±100
M1-2409S2	24	20	98	±9	±111.1	2.4	85	±100
M1-2412S2	24	20	97	±12	±83.3	2.2	86	±47
M1-2415S2	24	20	96	±15	±66.6	1.9	87	±47
M1-0505SS2	5	50	494	5	400	6	81	220
M1-0509SS2	5	50	471	9	222.2	4.2	85	220
M1-0512SS2	5	50	471	12	166.6	3.8	85	100
M1-0515SS2	5	50	465	15	133.3	4.5	86	100
M1-1205SS2	12	40	198	5	400	4.2	84	220
M1-1209SS2	12	40	194	9	222.2	2.8	86	220
M1-1212SS2	12	40	189	12	166.6	2.4	88	100
M1-1215SS2	12	40	189	15	133.3	2.2	88	100
M1-1505SS2	15	30	157	5	400	4	85	220
M1-1509SS2	15	30	153	9	222.2	2.6	87	220
M1-1512SS2	15	30	153	12	166.6	2.4	87	100
M1-1515SS2	15	30	152	15	133.3	2	88	100
M1-2405SS2	24	20	102	5	400	4.5	82	220
M1-2409SS2	24	20	99	9	222.2	3.5	84	220
M1-2412SS2	24	20	97	12	166.6	3	86	100
M1-2415SS2	24	20	96	15	133.3	2.8	87	100

Suffix "H" means 3 K Vdc isolation

NOTE

- Ripple/Noise measured with 20MHz bandwidth and 1.0uF ceramic capacitor.
- Tested by minimal Vin and constant resistive full load.
- Input filter components (C1, L, C2, C3) are used to help meet conducted emissions requirement for the module. These components should be mounted as close as possible to the module; and all leads should be minimized to decrease radiated noise.
- An external filter capacitor is required if the module has to meet IEC61000-4-4
The filter capacitor Motien suggest: Nippon chemi-con KY series, 220uF/100V.
- Exceeding the absolute ratings of the unit could cause damage. It is not allowed for continuous operating.
- Operation under no-load conditions will not damage these devices, however they may not meet all listed specifications.

M1 - 2W Semi-regulated Single & Dual output
MECHANICAL SPECIFICATIONS

PIN CONNECTIONS

PIN NUMBER	SINGLE	DUAL	SINGLE-H	DUAL-H
1	+V Input	+V Input	+V Input	+V Input
2	-V Input	-V Input	-V Input	-V Input
4	-V Output	-V Output	N.P.	N.P.
5	N.P.	Common	-V Output	-V Output
6	+V Output	+V Output	N.P.	Common
7	N.P.	N.P.	+V Output	+V Output

ALL PSU LTD, Unit D6 Laser Quay, Culpeper Close
 Medway City Estate, Rochester, Kent, ME2 4HU

Tel: 01634 725527, Email: sales@allpsu.co.uk, Web: www.allpsu.co.uk

DRAWING:

APPROVED:

Last Update : 16.FEB.2017