MD-6W Series

MOTIEN TECHNOLOGY

6W 2:1 Regulated Single & Dual output

Features

- Wide 2:1 Input Range
- Full SMD Technology
- 1500 VDC Isolation, Up to 3000 VDC
- Continuous Short Circuit Protection
- Efficiency up to 85%
- -40°C ~ 85°C Operation Temperature Range
- EMC filter meets EN55022 Class A without adding external components
- Non-conductive Black Plastic DIL24-pin case

CE FC c UL us CB

The MD series is a family of cost effective 6W single & dual output DC-DC converters. These converters combine Plastic case in a 24-pin DIL package with high performance features such as 1500 VDC ~ 3000VDC input/output isolation voltage, continuous short circuit protection with automatic restart and high line / load regulation. Devices are encapsulated using flame retardant resin. Input voltages are 12Vdc, 24Vdc and 48Vdc with output voltages of 3.3,5,12,15,24, ±3.3, ±5, ±12, ±15 and ±24 Vdc. Featuring high efficiency operation up to 85% and output voltage accuracy of ±2% maximum. Also , no additional components adding required to comply with EN55022 Class A.

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

OUTPUT SPECIFICATIONS

Output Voltage Accuracy	±2%
Output Voltage Blance(Dual Output)	±2%
Maximum Output Current	See table
Line Regulation	±0.5%, max.
Load Regulation(0% to 100%)	±1.2%, max.
Cross Regulation (Dual Output) **(1)**	±5%
Ripple&Noise (20MHz Bandwidth)**(2)**	80mVpk-pk, max. Dual Output 24V:100mVpk-pk, max.
Over Load Protection	160% of Iout, typ.
Short Circuit Protection	Indefinite(hiccup) (Automatic Recovery)
Temperature Coefficient	±0.02%/°C
Capacitive Load **(3)**	See table
Transient Recovery Time **(4)**	300us, typ.
Transient Response Deviation **(4)**	±3%, max. Single Output 3.3V:±5%, max.

INPUT SPECIFICATIONS

Input Voltage Range		See table
Under Voltage Lockout		
12V Models	Module ON / OFF	8.5 Vdc / 7.0Vdc, typ.
24V Models	Module ON / OFF	16.5Vdc / 14.5Vdc, typ.
48V Models	Module ON / OFF	34.5Vdc / 30.0Vdc, typ.
Start up Time (Nominal Vin and constant resistive load)		20mS, typ.
Input Filter		Pi Type
Input Current (No-Load)		See table, max.
Input Current (Full-Load)		See table, typ.
Input Reflected Ripple Current **(5)**		20mApk-pk, typ.

EMC SPECIFICATIONS

Radiated Emissions	EN55022	CLASS A
Conducted Emissions	EN55022	CLASS A
ESD	IEC 61000-4-2	Perf. Criteria A
RS	IEC 61000-4-3	Perf. Criteria A
EFT	IEC 61000-4-4	Perf. Criteria A
Surge**(6)**	IEC 61000-4-5	Perf. Criteria A
CS	IEC 61000-4-6	Perf. Criteria A
PFMF	IEC 61000-4-8	Perf. Criteria A

GENERAL SPECIFICATIONS

Efficiency	See table, typ.
I/O Isolation Voltage(60 sec)	
Input/Output	1500~3000Vdc
I/O Isolation Capacitance	1000 pF, typ.
I/O Isolation Resistance	1000M Ohm
Switching Frequency	330kHz, typ.
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>800 Khrs
Safety Standard	UL/cUL 60950-1 , IEC/EN 60950-1
Safety Approvals	UL/cUL 60950-1 , IEC/EN 60950-1

PHYSICAL SPECIFICATIONS

Case Material	Non-conductive Black Plastic(UL94V-0 rated)
Base Material	Non-conductive Black Plastic(UL94V-0 rated)
Pin Material	Φ0.5mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	13g
Dimensions	1.25"x0.8"x0.4"

ENVIRONMENT SPECIFICATIONS

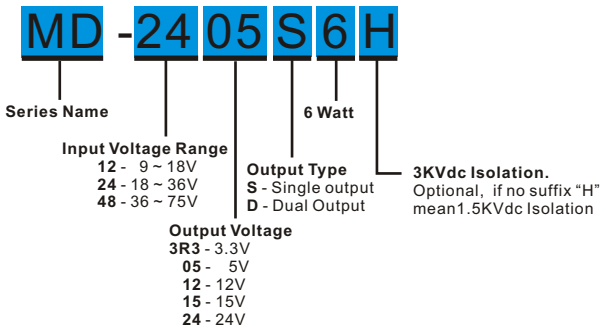
Operating Temperature	-40°C~85°C(See Derating Curve) -40°C ~ +60°C (For 100% load)
Maximum Case Temperature	100°C
Storage Temperature	-55°C~125°C
Cooling	Nature Convection

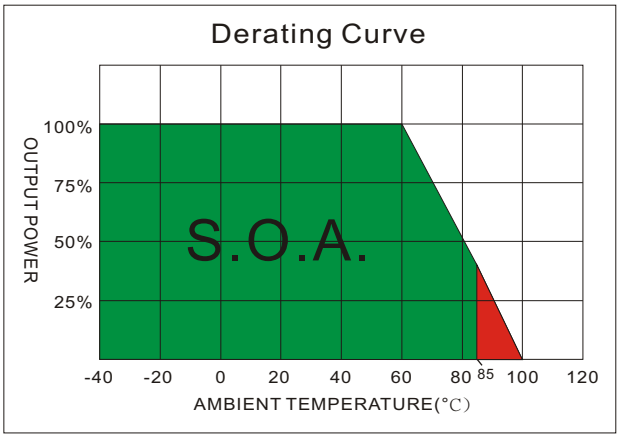
ABSOLUTE MAXIMUM RATINGS(7)

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

Input Surge Voltage(100mS)	
12 Models	25 Vdc, max.
24 Models	50 Vdc, max.
48 Models	100 Vdc, max.
Soldering Temperature (1.5mm from case 10 sec. max.)	260C, max.

PART NUMBER STRUCTURE





MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Min. load (mA)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
MD-123R3S6	9-18	7	513	3.3	0	1400	76	470
MD-1205S6	9-18	7	633	5	0	1200	80	470
MD-1212S6	9-18	10	602	12	0	500	84	100
MD-1215S6	9-18	10	595	15	0	400	85	100
MD-1224S6	9-18	20	610	24	0	250	83	47
MD-123R3D6	9-18	10	658	±3.3	0	±909	77	±220
MD-1205D6	9-18	10	625	±5	0	±600	81	±220
MD-1212D6	9-18	15	602	±12	0	±250	84	±100
MD-1215D6	9-18	20	602	±15	0	±200	84	±100
MD-1224D6	9-18	35	625	±24	0	±125	81	±47
MD-243R3S6	18-36	7	260	3.3	0	1400	75	470
MD-2405S6	18-36	7	316	5	0	1200	80	470
MD-2412S6	18-36	7	301	12	0	500	84	100
MD-2415S6	18-36	7	301	15	0	400	84	100
MD-2424S6	18-36	10	305	24	0	250	83	47
MD-243R3D6	18-36	7	329	±3.3	0	±909	77	±220
MD-2405D6	18-36	7	316	±5	0	±600	80	±220
MD-2412D6	18-36	10	305	±12	0	±250	83	±100
MD-2415D6	18-36	15	301	±15	0	±200	84	±100
MD-2424D6	18-36	20	309	±24	0	±125	82	±47
MD-483R3S6	36-75	7	127	3.3	0	1400	77	470
MD-4805S6	36-75	7	152	5	0	1200	83	470
MD-4812S6	36-75	7	149	12	0	500	85	100
MD-4815S6	36-75	7	149	15	0	400	85	100
MD-4824S6	36-75	7	149	24	0	250	85	47
MD-483R3D6	36-75	7	160	±3.3	0	±909	79	±220
MD-4805D6	36-75	7	152	±5	0	±600	83	±220
MD-4812D6	36-75	7	151	±12	0	±250	84	±100
MD-4815D6	36-75	7	151	±15	0	±200	84	±100
MD-4824D6	36-75	15	156	±24	0	±125	81	±47

Suffix "H" means 3000Vdc isolation

The models listed above is just for standard type. If you need the special specification product, please contact our service member by telephone presented in shortform cover or e-mail to : sales@motien.com.tw

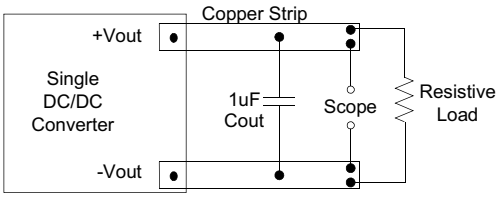
NOTE

1. One load is 25% to 100% load, the other load is 100% load, the output voltage variable rate is within ±5%.
2. Ripple/Noise measured with a 1uF ceramic capacitor.
3. Tested by minimal Vin and constant resistive load.
4. Tested by normal Vin and 25% load step change (75%-50%-25% of Io).
5. Measured Input reflected ripple current with a simulated source inductance of 12uH and a source capacitor Cin(47uF, ESR<1.0Ω at 100KHz).
6. An external filter capacitor is required if the module has to meet IEC61000-4-5. The filter capacitor Motien suggest: Nippon chemi-con KY series, 220uF/100V.
7. Exceeding the absolute ratings of the unit could cause damage. It is not allowed for continuous operating.

TEST CONFIGURATIONS

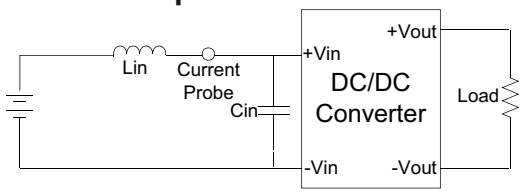
Output Ripple & Noise Measurement Test

Use a capacitor Cout(1.0uF) measurement.
The Scope measurement bandwidth is 0-20MHz.



Input Reflected Ripple Current Test Step

Input reflected ripple current is measured through a source inductor Lin(12uH) and a source capacitor Cin(47uF, ESR<1.0Ω at 100KHz) at nominal input and full load.



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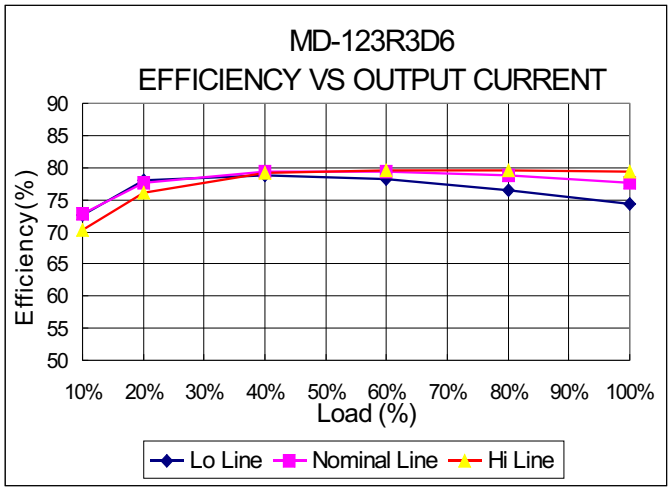
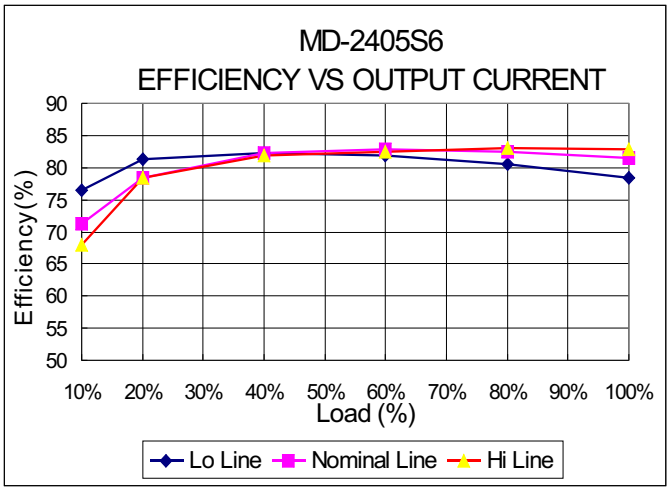
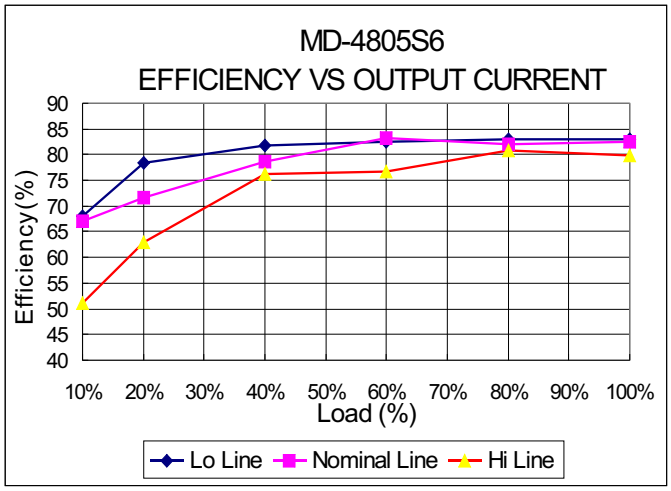
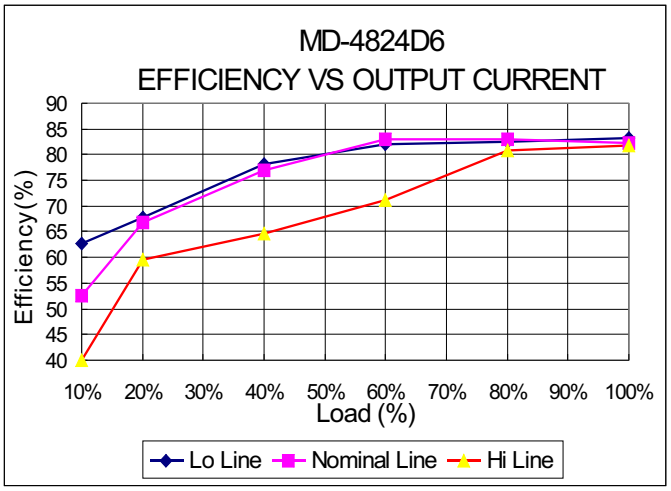
ELECTRICAL CHARACTERISTIC CURVES

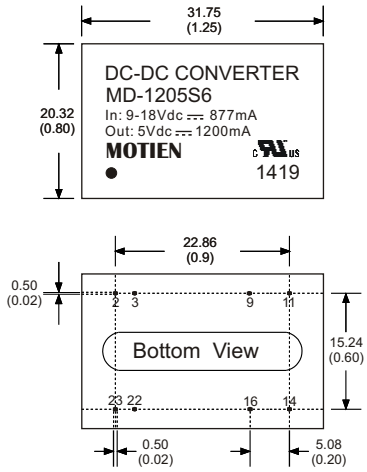


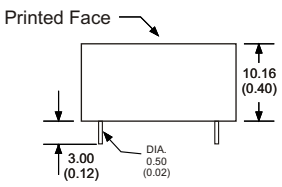






MECCHANICAL SPECIFICATIONS





24 Pin DIL Package
Non-Conductive Plastic

Notes: All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5 ±0.05 (0.02 ±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

PIN CONNECTIONS		
PIN NUMBER	SINGLE	DUAL
2	-V Input	-V Input
3	-V Input	-V Input
9	N.P.	Common
11	N.C.	-V Output
14	+V Output	+V Output
16	-V Output	Common
22	+V Input	+V Input
23	+V Input	+V Input

(The Pin Connection of high isolation one is the same with normal one.)

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