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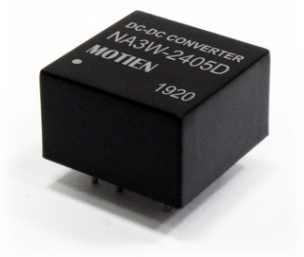
NA3W Series

MOTIEN TECHNOLOGY

3W 4:1 Regulated Single & Dual output

Features

- Highest Power Density In 8 Pin DIL Package
- Wide 4:1 Input Range
- Full SMD Technology
- 1600 VDC Isolation
- Continuous Short Circuit Protection
- Under Voltage Lock-Out Circuit
- Remote on/off Control
- Efficiency up to 84%
- -40 ~ 80°C Operation Temperature Range



CE

The NA3W series is a family of cost effective and high performanced 3W single & dual output DC-DC converters. These converters are built in non-conductive black plastic package in a 8-pin DIL miniature compact case with high performance features wide range devices operate over 4:1 input voltage range providing stable output voltage. Devices are encapsulated using flame retardant resin. Input voltages of 12, 24, 48 Vdc with output voltage of 3.3, 5, 12, 15, ±5, ±12, ±15 Vdc. High performance features include high efficiency operation up to 84% and output voltage accuracy of ±1% maximum.

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

OUTPUT SPECIFICATIONS

Voltage Accuracy		±1%
Maximun Output Current		See table
Line Regulation		±0.2%,max.
Load Regulation	(From 0% to 100% Load)	±1.0%,max.
Cross Regulation (Dual Output) (1)		±5%
Ripple & Noise (20 MHz bandwidth)(2)	Single	150mVpp,max.
	Dual	100mVpp,max.
Short Circuit Protection	Indefinite (Automatic Recovery)	
Temperature Coefficient		±0.02%/°C
Capacitive Load(3)		See table
Transient Recovery Time (4)		500us, typ.
Transient Response Deviation(4)		±3%, max.
		Single Output 3.3V, 5V:±5%, max.

INPUT SPECIFICATIONS

Voltage Range		See table
Start up Time(Nominal Vin and constant resistive load)		30mS, typ.
Input Current		See table
No-Load Input Current		See table
Input Filter		Capacitor
Input Reflected Ripple Current(5)		20mA pk-pk
Remote on/off		
ON:		open or high impedance
OFF:		2-4mA input current (via 1K)
Off stand by input current(Nominal Vin)		2.5mA, max.
Under Voltage Lockout		
12V Modes	Module ON / OFF	4.2Vdc / 3.5Vdc, typ.
24V Modes	Module ON / OFF	8.5Vdc / 7.0Vdc, typ.
48V Modes	Module ON / OFF	17.5Vdc / 15.5Vdc, typ.

GENERAL SPECIFICATIONS

Efficiency	See table,typ.
I/O Isolation Voltage (60 sec)	1600Vdc
I/O Isolation Capacity	2000 pF,typ.
I/O Isolation Resistance	1000M Ohm,min.
Switching Frequency	100kHz,min.
Humidity	95%relH
Reliability Calculated MTBF (MIL-HDBK-217 F)	>820Khrs@25°C
Safety Standard(designed to meet)	IEC/UL/EN 60950-1
	IEC/UL/EN 62368-1

PHYSICAL SPECIFICATIONS

Case Material	Non conductive black plastic(UL94V-0 rated)
Base Material	Non conductive black plastic(UL94V-0 rated)
Potting Material	Silicon (UL94V-0 rated)
Pin Material	Φ0.5mm Brass Solder-coated
Weight	3.6g
Dimensions	0.55"x0.55"x0.32"

ENVIRONMENT SPECIFICATIONS

Operating Temperature	-40°C~80°C (See Derating Curve)
Maximum Case Temperature	100°C
Storage Temperature	-55°C~125°C
Cooling(6)	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 max)	
12 Models	25Vdc,max.
24 Models	50Vdc,max.
48 Models	100Vdc,max.
Soldering Temperature (1.5mm from case 10 sec. max.)	260°C max.

EMC CHARACTERISTICS

Radiated Emissions	EN55032	CLASS A
Conducted Emissions(8)	EN55032	CLASS A
ESD	IEC61000-4-2	Perf. Criteria A
RS	IEC61000-4-3	Perf. Criteria A
EFT(9)	IEC61000-4-4	Perf. Criteria A
Surge(9)	IEC61000-4-5	Perf. Criteria A
CS	IEC61000-4-6	Perf. Criteria A
PFMF	IEC61000-4-8	Perf. Criteria A

PART NUMBER STRUCTURE

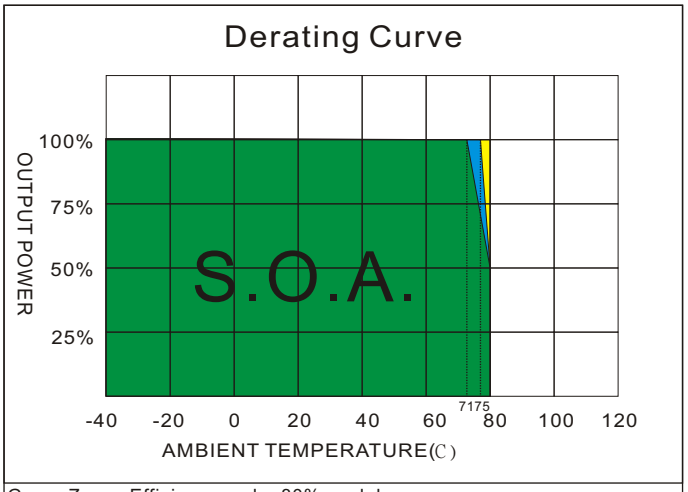
NA3W - 24 05 S

Series Name

Input Voltage Range
12 -4.5 ~ 18V
24 -9 ~ 36V
48 -18 ~ 75V

Nominal Output Voltage
3R3 - 3.3V
5 - 5V
12 - 12V
15 - 15V

Case Type
S - Single Output
D - Dual Output



Green Zone : Efficiency under 80% models
Blue Zone : Others
Yellow Zone : Efficiency over 83% models

MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA,max)	INPUT Current Full Load (mA,typ.)	OUTPUT Voltage (Vdc)	OUTPUT Current Min. load (mA)	OUTPUT Current Full load (mA)	EFFICIENCY @FL (%,typ)	Capacitor Load @FL (uF,max)
NA3W-123R3S	12 (4.5-18)	30	257	3.3	0	700	75	3300
NA3W-1205S	12 (4.5-18)	45	309	5	0	600	81	1680
NA3W-1212S	12 (4.5-18)	55	301	12	0	250	83	470
NA3W-1215S	12 (4.5-18)	60	301	15	0	200	83	330
NA3W-1205D	12 (4.5-18)	30	313	±5	0	±300	80	±1000
NA3W-1212D	12 (4.5-18)	55	305	±12	0	±125	82	±220
NA3W-1215D	12 (4.5-18)	60	301	±15	0	±100	83	±220
NA3W-243R3S	24 (9-36)	25	127	3.3	0	700	76	3300
NA3W-2405S	24 (9-36)	20	152	5	0	600	82	1680
NA3W-2412S	24 (9-36)	30	149	12	0	250	84	470
NA3W-2415S	24 (9-36)	35	149	15	0	200	84	330
NA3W-2405D	24 (9-36)	25	154	±5	0	±300	81	±1000
NA3W-2412D	24 (9-36)	30	151	±12	0	±125	83	±220
NA3W-2415D	24 (9-36)	35	149	±15	0	±100	84	±220
NA3W-483R3S	48 (18-75)	10	65	3.3	0	700	74	3300
NA3W-4805S	48 (18-75)	10	77	5	0	600	81	1680
NA3W-4812S	48 (18-75)	15	77	12	0	250	81	470
NA3W-4815S	48 (18-75)	15	76	15	0	200	82	330
NA3W-4805D	48 (18-75)	20	79	±5	0	±300	79	±1000
NA3W-4812D	48 (18-75)	20	78	±12	0	±125	80	±220
NA3W-4815D	48 (18-75)	25	78	±15	0	±100	80	±220

NOTE

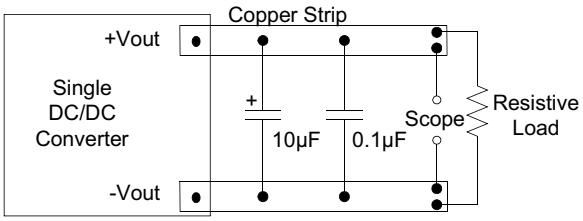
1. One load is 25% to 100% load, the other load is 100% load, the output voltage variable rate is within ±5%.
2. Ripple/Noise measured with a 10μF electrolytic capacitor and 0.1μF ceramic capacitor.
3. Test by minimal Vin and constant resistive load.
4. Test by normal Vin and 100%-25% load,25% load step change.
5. Measured Input reflected ripple current with a simulated source inductance of 27μH and a source capacitor Cin(47μF, ESR<1.0Ω at 100KHz).
6. "Nature Convection" is usually about 30-65 LFM but is not equal to still air (0 LFM).
7. Exceeding the absolute ratings of the unit could cause damage. It's not allowed for continuous operating ratings.
8. Input filter components are required to help meet conducted emission class A, Which application refer to the EMI Filter(Conducted Emissions).
9. An external filter capacitor is required if the module has to meet IEC61000-4-4 and IEC61000-4-5. The filter capacitor Motien suggest: Nippon - chemi - con KY series, 220μF/100V.

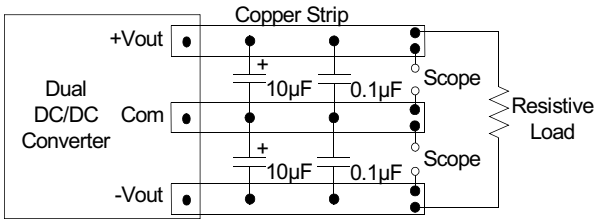
The models listed above is just for standard type. If you need the special specification product, please contact our service member by telephone presented in shortform cover or e-mail to : sales@motien.com.tw

TEST CONFIGURATIONS

Output Ripple & Noise Measurement Test

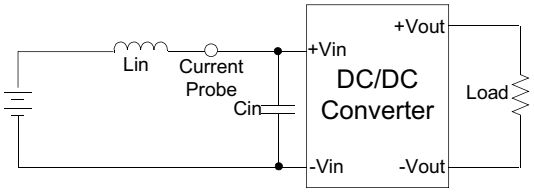
Use a 10μF electrolytic capacitor and 0.1μF ceramic capacitor.
The Scope measurement bandwidth is 20MHz.





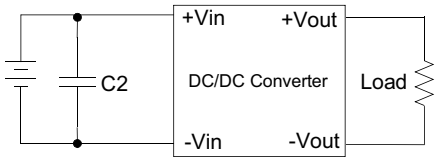
Input Reflected Ripple Current Test Step

Input reflected ripple current is measured through a source inductor Lin(27μH) and a source capacitor Cin(47μF, ESR<1.0Ω at 100KHz) at nominal input and full load.



EFT/Surge Filter

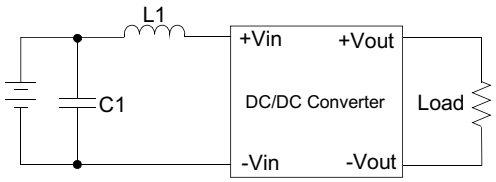
Input filter components (C2) is used to help meet IEC61000-4-4 and IEC61000-4-5 .



	C2
NA3W-XXXXXX	220μF,100V

EMI Filter(Conducted Emissions)

Input filter components (C1,L1) are used to meet EMI test criterial A.
These components should be mounted as close as possible to the module; and all leads should be minimized to decrease radiated noise.

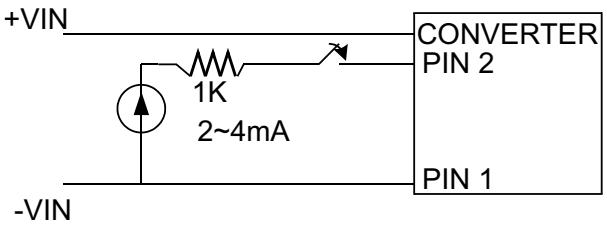


	C1	L1
NA3W-12XXXX	1210,10μF,35V	2.2μH
NA3W-24XXXX	1210,2.2μF,100V	
NA3W-48XXXX	1210,4.7μF,100V	

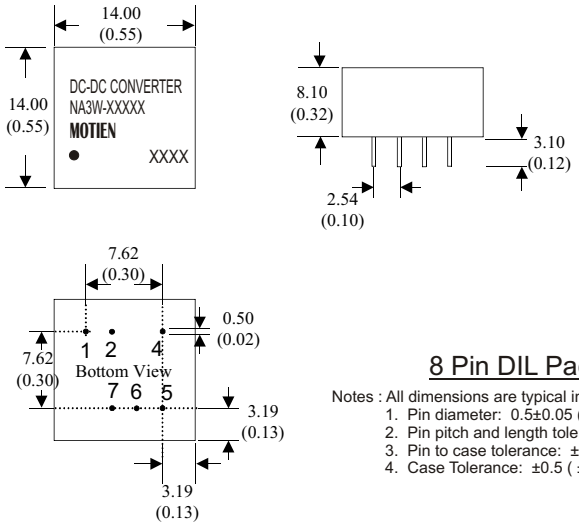
TEST CONFIGURATIONS

Remote ON / OFF Test Step

Input current(2~4mA) via 1KΩ to Pin2 , converter OFF.
open or high impedance , converter ON.



MECHANICAL SPECIFICATION



8 Pin DIL Package

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. Pin to case tolerance: ±0.5 (±0.02)
4. Case Tolerance: ±0.5 (±0.02)

PIN CONNECTIONS		
PIN NUMBER	SINGLE	DUAL
1	-V Input	-V Input
2	Remote On/Off	Remote On/Off
4	+V Input	+V Input
5	+V Output	+V Output
6	N.P.	Common
7	-V Output	-V Output