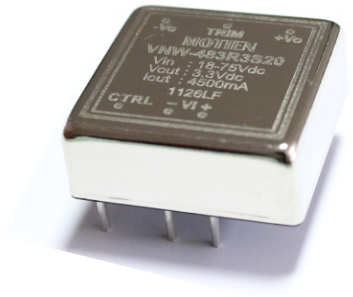
VNW -20W Series

20W 4:1 Regulated Single & Dual output

MOTIEN TECHNOLOGY

Features

- Ultra Wide 4:1 Input Range
- 1600 VDC Isolation
- No Minimum Load Required
- Efficiency up to 89%
- Extended Operating Temperature Range -40 ~ 75°C max.
- Adjustable Output Voltage
- Remote On/Off Control (CTRL)
- Continuous Short Circuit Protection
- Over Current Protection
- Over Voltage Protection
- Soft Start



CE

The VNW series is a family of cost effective 20W single & dual output DC-DC converters. These converters combine nickle-coated copper package in a 1"x1" case with high performance features , continuous short circuit protection with automatic restart and tight line / load regulation. Devices are encapsulated using flame retardant resin. Input voltages of 24 and 48 with output voltage of 3.3, 5, 12, 15, ±12, ±15Vdc. High performance features include high efficiency operation up to 90% and output voltage accuracy of ±1% maximum.

ALL SPECIFICATIONS ARE TYPICAL AT 25°C, NOMINAL INPUT AND FULL LOAD UNLESS OTHERWISE NOTED.

OUTPUT SPECIFICATIONS

Output Voltage Accuracy		±1%
Output Voltage Adjustability(Trim)		Single output: ±10%, max
Maximum Output Current		See table
Line Regulation		±0.5%, max
Load Regulation(Io=0% to 100%)		Single: ±0.5%, max Dual:±1%, max(balanced load)
Cross Regulation (Dual Output) (1)		±5%
Ripple&Noise(20MHz bandwidth) (2)		3.3 & 5.0V models:75mVp-p, max Other models:100mVp-p, max
Over Voltage Protection (Zener diode clamp)	3.3V output	3.9V
	5V output	6.2V
	12V output	15V
	15V output	18V
	±12V output	±15V
	±15V output	±18V
Over Current Protection		140% of FL, typ
Short Circuit Protection		Indefinite(hiccup) (Automatic Recovery)
Temperature Coefficient		±0.02%/°C
Capacitive Load (3)		See table
Transient Recovery Time (4)		250us, typ
Transient Response Deviation(4)		±3%, max

INPUT SPECIFICATIONS

Input Voltage Range		See table
Under Voltage Lockout		
24V Modes	Module ON / OFF	8.6Vdc / 7.9Vdc, typ
48V Modes	Module ON / OFF	17.8Vdc / 15.5Vdc, typ
Start up Time (Nominal Vin and constant resistive load)		30mS, typ
Input Filter		Pi Type
Input Current(No-Load)		See table, max
Input Current(Full-Load)		See table, typ
Input Reflected Ripple Current(5)		30mAp-p, typ
Remote On/Off (Positive logic)(6)		
ON:		3.0 ... 12Vdc or open circuit
OFF:		0 ... 1.2Vdc or Short circuit pin2 and pin 3
OFF idle current:		5 mA, typ

ENVIRONMENTAL SPECIFICATIONS

Operating Ambient Temperature	-40°C ~ +75°C(See Derating Curve) -40°C ~ +55°C(For 100% load)
Maximum Case Temperature	105°C
Storage Temperature	-55°C ~ +125°C
Cooling(7)	Nature Convection

GENERAL SPECIFICATIONS

Efficiency	See table, typ
I/O Isolation Voltage(3 sec)	
Input/Output	1600Vdc
Case/Input & Output	1600Vdc
Isolation Resistance	1000 MΩ, min
Isolation Capacitance	1500 pF, typ.
Switching frequency	330kHz, typ
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>560 khrs
Safety Standard (designed to meet)	IEC/EN 60950-1

PHYSICAL SPECIFICATIONS

Case Material	Nickel-coated Copper
Base Material	Non-conductive Black Plastic(UL94V-0 rated)
Pin Material	Φ1.0mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	19.0g
Dimensions	1.00"x1.00"x0.40"

ABSOLUTE SPECIFICATIONS (8)

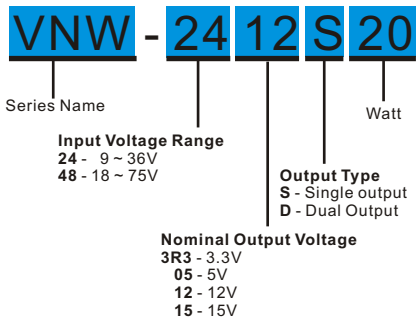
These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

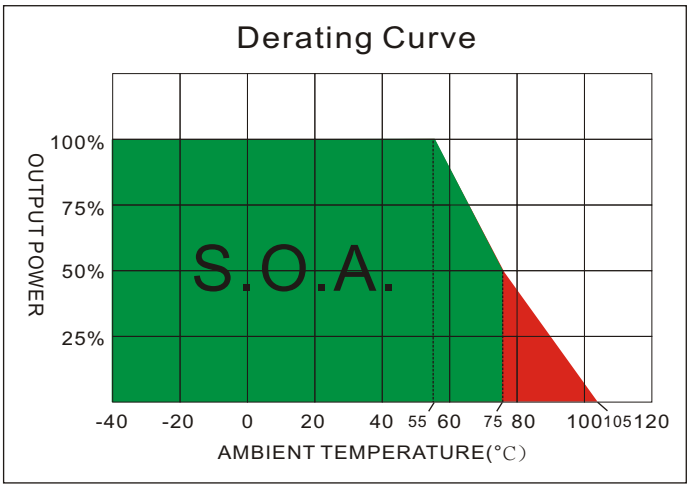
Input Surge Voltage(100mS)	
24 Models	50 Vdc,max.
48 Models	100 Vdc,max.
Soldering Temperature (1.5mm from case 10 sec. Max.)	260°C max.

EMC CHARACTERISTICS

Radiated Emissions	EN55022	CLASS A
Conducted Emissions(9)	EN55022	CLASS A
ESD	IEC61000-4-2	Perf. Criteria A
RS	IEC61000-4-3	Perf. Criteria A
EFT(10)	IEC61000-4-4	Perf. Criteria A
Surge (10)	IEC61000-4-5	Perf. Criteria A
CS	IEC61000-4-6	Perf. Criteria A
PFMF	IEC61000-4-8	Perf. Criteria A

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)
VNW-243R3S20	9-36	50	703	3.3	0	4500	88	10000
VNW-2405S20	9-36	50	936	5	0	4000	89	5000
VNW-2412S20	9-36	22	936	12	0	1670	89	850
VNW-2415S20	9-36	22	936	15	0	1330	89	700
VNW-483R3S20	18-75	30	352	3.3	0	4500	88	10000
VNW-4805S20	18-75	30	468	5	0	4000	89	5000
VNW-4812S20	18-75	15	468	12	0	1670	89	850
VNW-4815S20	18-75	15	468	15	0	1330	89	700
VNW-2412D20	9-36	25	936	±12	0	±833	89	±470
VNW-2415D20	9-36	25	936	±15	0	±667	89	±330
VNW-4812D20	18-75	15	468	±12	0	±833	89	±470
VNW-4815D20	18-75	15	468	±15	0	±667	89	±330

NOTE

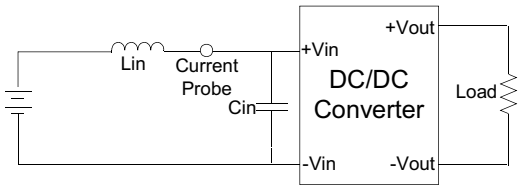
1. One load is 25% to 100% load, the other load is 100% load, the output voltage variable rate is within ±5%.
2. Measured with a 1.0uF ceramic capacitor and 10uF tantalum capacitor.
3. Tested by minimal Vin and constant resistive load.
4. Tested by normal Vin and 25% load step change (75%-50%-25% of Io).
5. Measured Input reflected ripple current with a simulated source inductance of 12uHand a source capacitor Cin(47uF, ESR<1.0Ω at 100KHz).
6. The remote on/off control pin is referenced to -Vin(pin2).
7. "Nature Convection" is usually about 30-65 LFM but is not equal to still air (0 LFM).
8. Exceeding the absolute ratings of the unit could cause damage.
   It is not allowed for continuous operating.
9. Input filter meets EN 55022 Class A without external components.
10. 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, 220uF/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

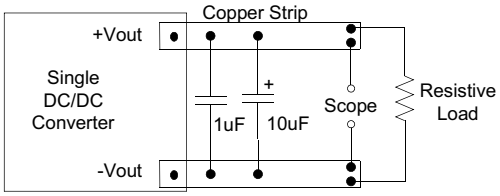
Input Reflected Ripple Current Test Step

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.



Output Ripple & Noise Measurement Test

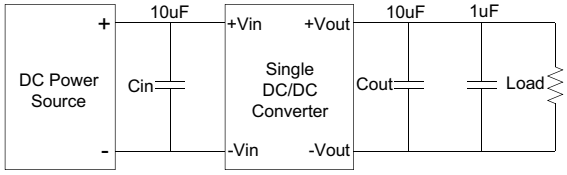
Measured with a 1.0uF MLCC capacitor and a 10uF tantalum capacitor .
The Scope measurement bandwidth is 0-20MHz.



DESIGN & FEATURE CONFIGURATIONS

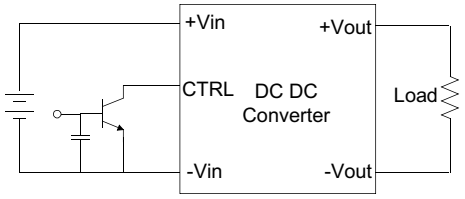
Output Ripple & Noise Reduction

To reduce ripple and noise, it is recommended to use a 1uF ceramic disk capacitor and a 10uF electrolytic capacitor to at the output.



CTRL Module ON / OFF

Positive logic turns on the module during high logic and off during low logic.
Ctrl module on/off can be controlled by an external switch between the ctrl terminal and -Vin terminal.
The switch can be an open collector or open drain
For positive logic if the ctrl feature is not used, please leave the ctrl pin floating.



Over Voltage Protection

The module includes an internal output over voltage protection circuit, which monitors the voltage on the output terminals. If this voltage exceeds the over voltage set point, the module will activate the control loop of internal circuit to clamp the output voltage.

Over Current Protection

The module includes an internal over current protection circuit, which will endure current limiting for an unlimited duration during output over load condition. If the output current exceeds the OCP set point, the module will shut down automatically (hiccup).
The module will try to restart after shut down. If the over load condition still exists, the module will shut down again.

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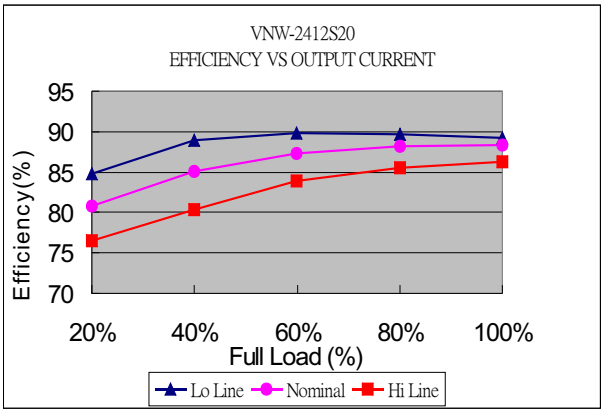
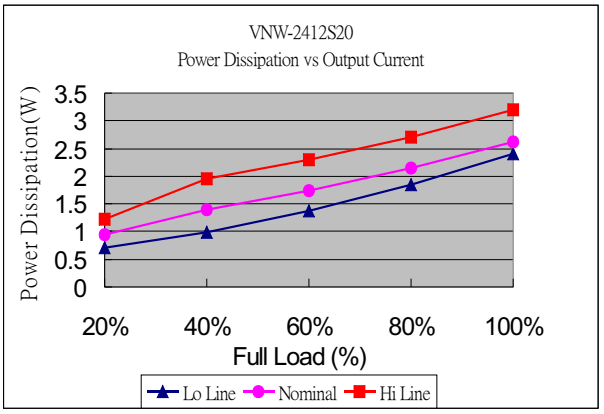
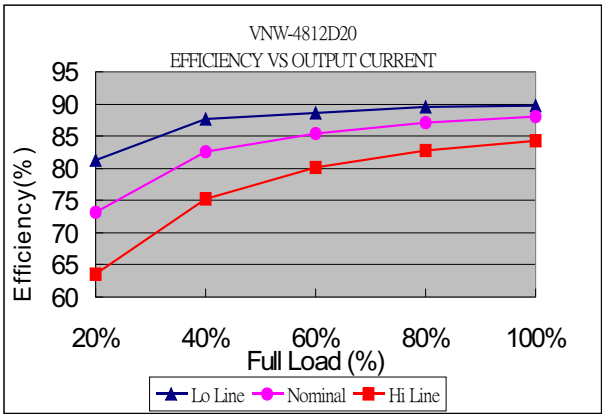
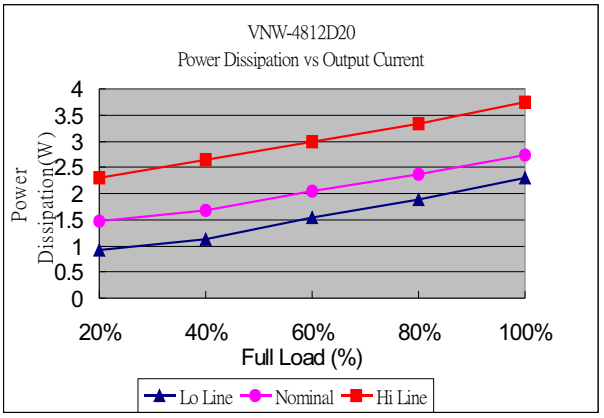
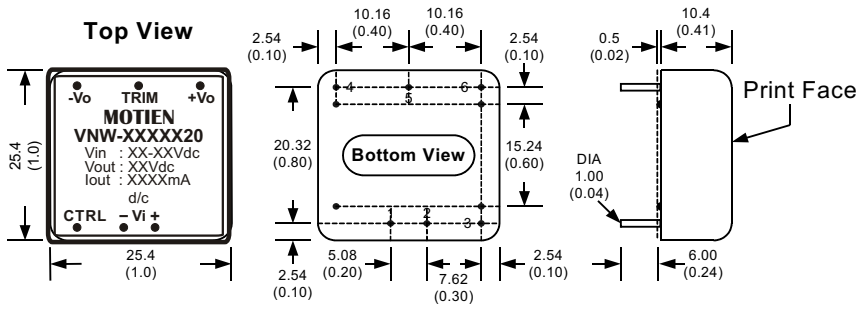








MECHANICAL SPECIFICATIONS

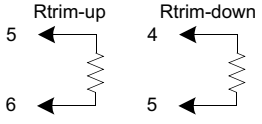


All dimensions are typical in millimeters (inches).
1. Pin diameter: 1.0 ±0.05 (0.04 ±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)
4. Stand-off tolerance: ±0.1 (±0.004)

PIN CONNECTIONS		
PIN NUMBER	SINGLE	DUAL
1	+Vin	+Vin
2	-Vin	-Vin
3	CTRL	CTRL
4	+Vout	+Vout
5	Trim	Com
6	-Vout	-Vout

EXTERNAL OUTPUT TRIMMING

Output can be externally trimmed by using the method as below. (single output models only)



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