

VN Series

15W 2:1 Regulated Single & Dual output



Features

- Wide 2:1 Input Range
- Full SMD Technology
- Soft Start
- No Minimum Load Required
- Efficiency up to 89%
- Adjustable Output Voltage
- Remote On/Off Control (CTRL)
- Over Current Protection
- Over Voltage Protection
- 1600 VDC Isolation
- Operating Temperature Range -40 ~ 85°C max.



The VN series is a family of compact and high power density 15W single & dual output DC-DC converters. The compact nickel-coated copper package in an 1"x1" case reduces the size of 50% from conventional 2"x1", superior Line / Load Regulation with over current & over voltage protection. Input voltages of 12, 24 and 48 with output voltage of 3.3, 5, 12, 15, ± 5 , ± 12 , ± 15 Vdc. High performance features include high efficiency operation up to 89% and output voltage accuracy of $\pm 1\%$ maximum with adjustable output.

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

OUTPUT SPECIFICATIONS	
Output Voltage Accuracy	$\pm 1\%$
Output Voltage Adjustability(Trim)	Single output: $\pm 10\%$, max.
Maximum Output Current	See table
Line Regulation	$\pm 0.2\%$, max.
Load Regulation($I_o=0\%$ to 100%)	Single: $\pm 0.5\%$, max. Dual: $\pm 1\%$, max(balanced load)
Cross Regulation (Dual Output) (1)	$\pm 5\%$
Ripple&Noise(20MHz bandwidth) (2)	100mVpk-pk, max.
	3.3V output 3.9V
	5V output 6.2V
Over Voltage Protection	12V output 15V
(Zener diode clamp)	15V output 18V
	± 5 V output ± 6.2 V
	± 12 V output ± 15 V
	± 15 V output ± 18 V
Over Current Protection	150% of FL, typ.
Short Circuit Protection	Indefinite(hiccup) (Automatic Recovery)
Temperature Coefficient	$\pm 0.02\%/^{\circ}\text{C}$
Capacitive Load (3)	See table
Transient Recovery Time (4)	250us, typ.
Transient Response Deviation(4)	$\pm 3\%$, max.

INPUT SPECIFICATIONS	
Input Voltage Range	See table
Start up Time	20mS, typ.
(Nominal V_{in} and constant resistive load)	
Input Filter	Pi Type
Input Current(No-Load)	See table, typ.
Input Current(Full-Load)	See table, max.
Input Reflected Ripple Current(5)	20mApk-pk, typ.
Remote On/Off (Positive logic)(6)	
	ON: 3.0 ~ 12Vdc or open circuit
	OFF: 0 ~ 1.2Vdc or Short circuit pin 2 and pin 3
	OFF idle current: 5 mA, typ.

GENERAL SPECIFICATIONS	
Efficiency	See table, typ.
I/O Isolation Voltage(60 sec)	
Input/Output	1600Vdc
Case/Input & Output	1600Vdc
Isolation Resistance	1000 M Ω , min.
Isolation Capacitance	1200 pF, max.
Switching frequency	375kHz, typ.
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>560 khrs
Safety Standard (designed to meet)	IEC/EN 60950-1

EMC CHARACTERISTICS		
Radiated Emissions	EN55022	CLASS A
Conducted Emissions(7)	EN55022	CLASS A
ESD	IEC61000-4-2	Perf. Criteria A
RS	IEC61000-4-3	Perf. Criteria A
EFT(8)	IEC61000-4-4	Perf. Criteria A
Surge (8)	IEC61000-4-5	Perf. Criteria A
CS	IEC61000-4-6	Perf. Criteria A
PFMF	IEC61000-4-8	Perf. Criteria A

PHYSICAL SPECIFICATIONS	
Case Material	Nickel-coated Copper
Base Material	Non-conductive Black Plastic(UL94V-0 rated)
Pin Material	$\phi 1.0$ mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	18.0g
Dimensions	1.00"x1.00"x0.40"

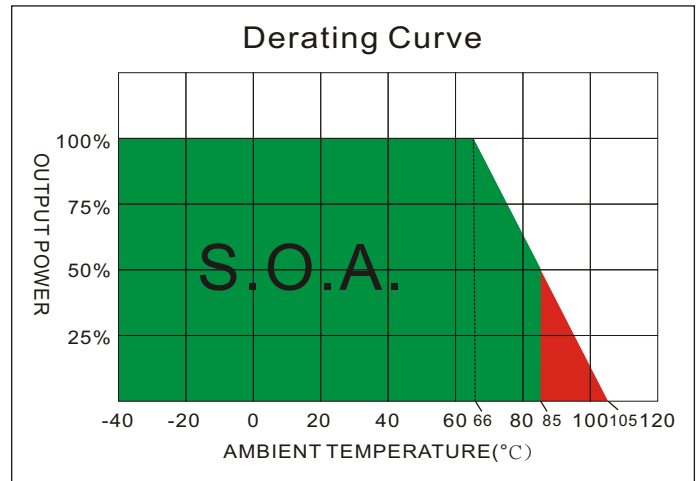
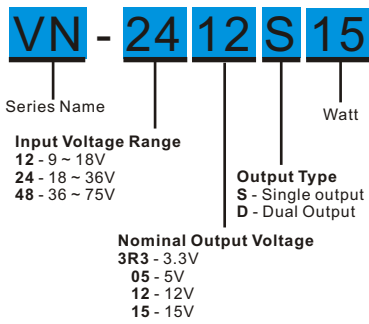
ENVIRONMENTAL SPECIFICATIONS	
Operating Ambient Temperature	-40°C ~ +85°C(See Derating Curve) -40°C ~ +66°C(For 100% load)
Maximum Case Temperature	105°C
Storage Temperature	-55°C ~ +125°C
Cooling(9)	Nature Convection

ABSOLUTE SPECIFICATIONS (10)	
These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.	
Input Surge Voltage(100mS)	
12 Models	36 Vdc, max.
24 Models	50 Vdc, max.
48 Models	100 Vdc, max.
Soldering Temperature	260C, max.
(1.5mm from case 10 sec. max.)	

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PART NUMBER STRUCTURE

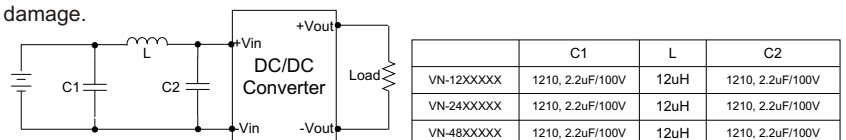


MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current		OUTPUT Voltage (Vdc)	OUTPUT Current		EFFICIENCY @FL(%)	Capacitor Load(μF)
		No-Load (mA)	Full Load (mA)		Nin. load (mA)	Full load (mA)		
VN-123R3S15	9-18	20	1310	3.3	0	4000	85	1000
VN-1205S15	9-18	20	1471	5	0	3000	86	1000
VN-1212S15	9-18	20	1494	12	0	1300	88	330
VN-1215S15	9-18	20	1420	15	0	1000	89	220
VN-243R3S15	18-36	15	647	3.3	0	4000	86	1000
VN-2405S15	18-36	15	727	5	0	3000	87	1000
VN-2412S15	18-36	15	747	12	0	1300	88	330
VN-2415S15	18-36	15	710	15	0	1000	89	220
VN-483R3S15	36-75	10	327	3.3	0	4000	85	1000
VN-4805S15	36-75	10	368	5	0	3000	86	1000
VN-4812S15	36-75	10	374	12	0	1300	88	330
VN-4815S15	36-75	10	359	15	0	1000	88	220
VN-1205D15	9-18	20	1488	±5	0	±1500	85	±470
VN-1212D15	9-18	20	1420	±12	0	±625	89	±220
VN-1215D15	9-18	20	1437	±15	0	±500	89	±100
VN-2405D15	18-36	15	744	±5	0	±1500	85	±470
VN-2412D15	18-36	15	718	±12	0	±625	88	±220
VN-2415D15	18-36	15	710	±15	0	±500	89	±100
VN-4805D15	36-75	10	377	±5	0	±1500	84	±470
VN-4812D15	36-75	10	363	±12	0	±625	87	±220
VN-4815D15	36-75	10	359	±15	0	±500	88	±100

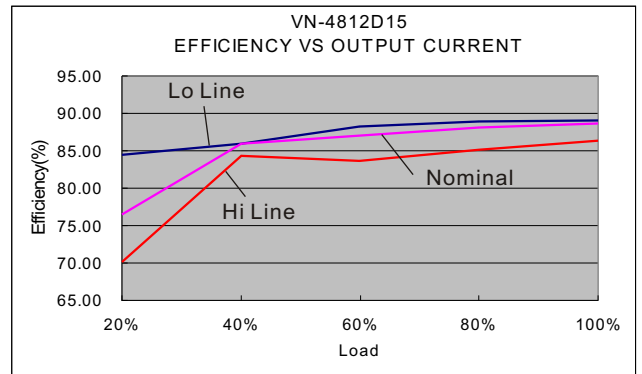
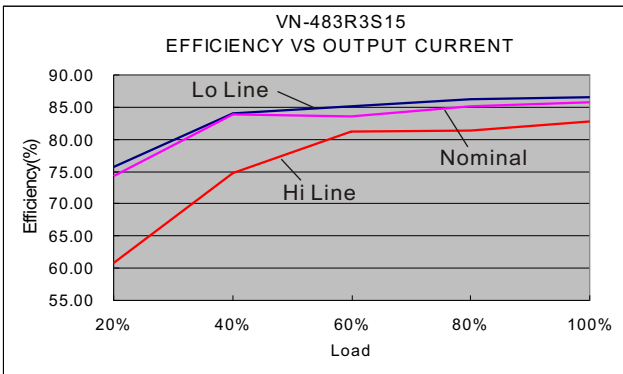
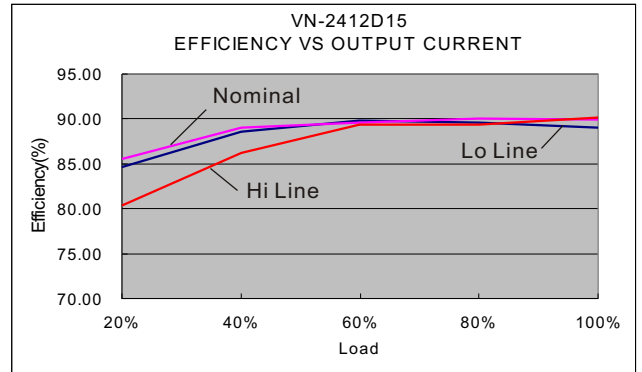
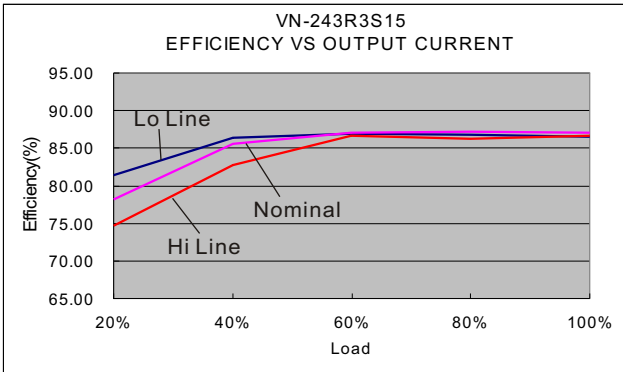
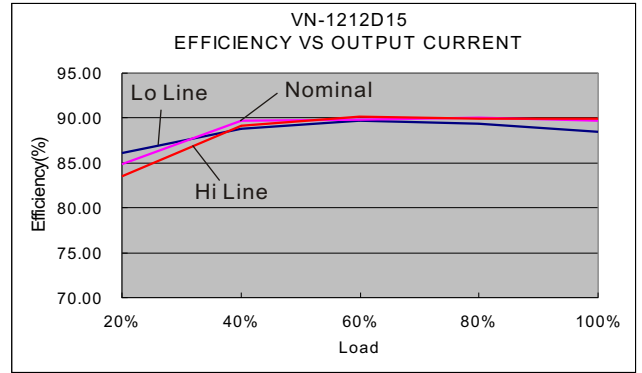
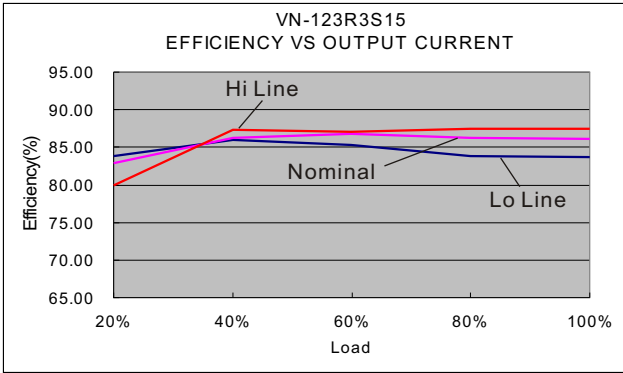
NOTE

- One load is 25% to 100% load, the other load is 100% load, the output voltage variable rate is within ±5%.
- Measured with a 1.0μF ceramic capacitor and 10μF tantalum capacitor.
- Tested by minimal Vin and constant resistive load.
- Tested by normal Vin and 25% load step change (75%-50%-25% of Io).
- Measured Input reflected ripple current with a simulated source inductance of 12uHand a source capacitor Cin(47uF, ESR<1.0Ω at 100KHz).
- The remote on/off control pin is referenced to -Vin(pin2).
- Input filter components (C1, C2, L) 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 and IEC61000-4-5. The filter capacitor Motien suggest: Nippon chemi-con KY series, 220uF/100V.
- Nature Convection" is usually about 30-65 LFM but is not equal to still air (0 LFM).
- Exceeding the absolute ratings of the unit could cause damage. It is not allowed for continuous operating.

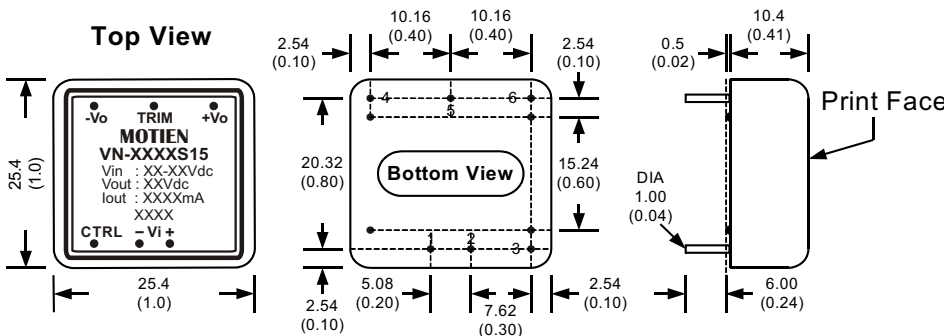


The models listed above is just for standard type. If you need the special specification product, please contact our service member by telephone presented in shortform cover or e-mail to : sales@motien.com.tw

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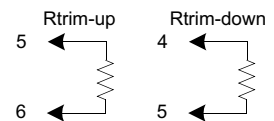
MECHANICAL SPECIFICATIONS



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)



- 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)