V9 Series

20W 4:1 Regulated Single & Dual output

MOTIEN TECHNOLOGY

Features

- Ultra Wide 4:1 Input Range
- Full SMD Technology
- 1600 VDC Isolation
- No Minimum Load Required
- Efficiency up to 91%
- Extended Operating Temperature Range -40 ~ 85°C max.
- Adjustable Output Voltage
- Remote On/Off Control (CTRL)
- Continuous Short Circuit Protection
- Over Current Protection
- Over Voltage Protection
- Soft Start

CE CB

The V9 series is a family of cost effective 20W single & dual output DC-DC converters. These converters combine nickle-coated copper package in a 2"x1" case with high performance features such as Active Clamp Technology, 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, ±5, ±12, ±15Vdc. High performance features include high efficiency operation up to 91% 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 (2)		75mVp-p, max
Over Voltage Protection (Zener diode clamp)	3.3V output	3.9V
	5V output	6.2V
	12V output	15V
	15V output	18V
	±5V output	±6.2V
	±12V output	±15V
	±15V output	±18V
Over Current Protection		120% 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 / 16Vdc, typ
Start up Time (Nominal Vin and constant resistive load)		20mS, typ
Input Filter		Pi Type
Input Current(No-Load)		See table, typ
Input Current(Full-Load)		See table, max
Input Reflected Ripple Current(5)		20mAp-p, typ
Remote On/Off (CTRL)(6)		
ON:		3.0 ... 12Vdc or open circuit
OFF:		0 ... 1.2Vdc or Short circuit pin2 and pin 6
OFF idle current:		5 mA, typ

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	-40°C ~ +125°C
Cooling	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	1200 pF, typ
Switching frequency	330kHz, typ
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>560 khrs
Safety Standard	IEC/EN 60950-1
Safety Approvals	CB

EMC CHARACTERISTICS

Radiated Emissions	EN55022	CLASS A
Conducted Emissions(7)	EN55022	CLASS A
ESD	EN61000-4-2	Perf. Criteria B
RS	EN61000-4-3	Perf. Criteria A
EFT(8)	EN61000-4-4	Perf. Criteria B
Surge (8)	EN61000-4-5	Perf. Criteria B
CS	EN61000-4-6	Perf. Criteria A
PFMF	EN61000-4-8	Perf. Criteria A

PHYSICAL SPECIFICATIONS

Case Material	Nickel-coated Copper
Base Material	Non-conductive Black Plastic(UL94V-0 rated)
Pin Material	Ø1.0mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	30.0g
Dimensions	2.00"x1.00"x0.40"

ABSOLUTE SPECIFICATIONS (9)

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

Input Voltage(100mS)	
24 Modes	-0.7~50 Vdc
48 Modes	-0.7~100 Vdc
Lead Soldering Temperature (1.5mm from case 10 sec. Max.)	260°C max.

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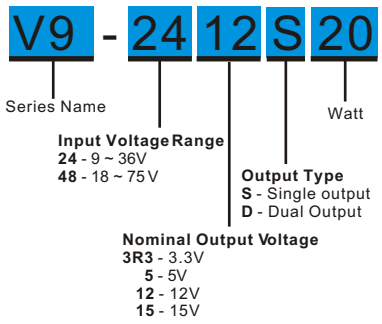
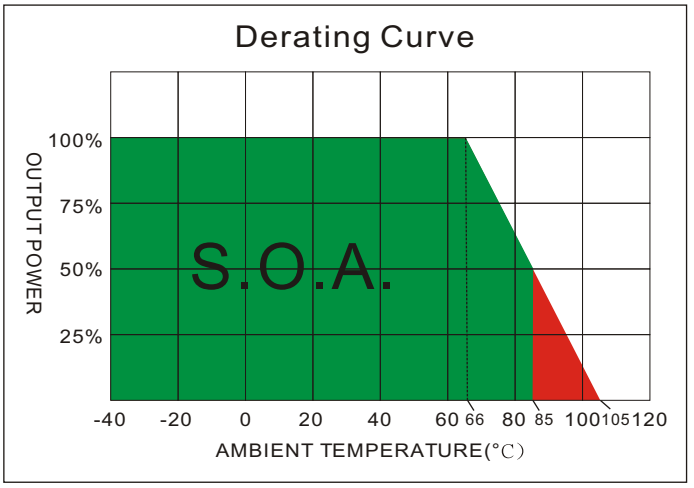
PART NUMBER STRUCTURE



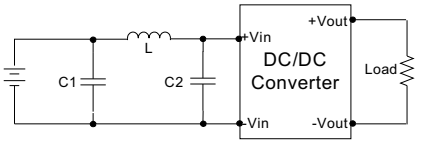


MODEL SELECTION GUIDE

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)
V9-243R3S20	9-36	50	879	3.3	0	5500	89	10000
V9-2405S20	9-36	50	957	5	0	4000	91	6800
V9-2412S20	9-36	22	980	12	0	1670	89	1000
V9-2415S20	9-36	22	968	15	0	1330	89	680
V9-483R3S20	18-75	30	440	3.3	0	5500	89	10000
V9-4805S20	18-75	30	473	5	0	4000	91	6800
V9-4812S20	18-75	15	484	12	0	1670	89	1000
V9-4815S20	18-75	15	484	15	0	1330	89	680
V9-2405D20	9-36	65	969	±5	0	±2000	89	±2200
V9-2412D20	9-36	25	980	±12	0	±835	88	±470
V9-2415D20	9-36	25	980	±15	0	±665	89	±330
V9-4805D20	18-75	40	484	±5	0	±2000	89	±2200
V9-4812D20	18-75	15	490	±12	0	±835	88	±470
V9-4815D20	18-75	15	490	±15	0	±665	89	±330

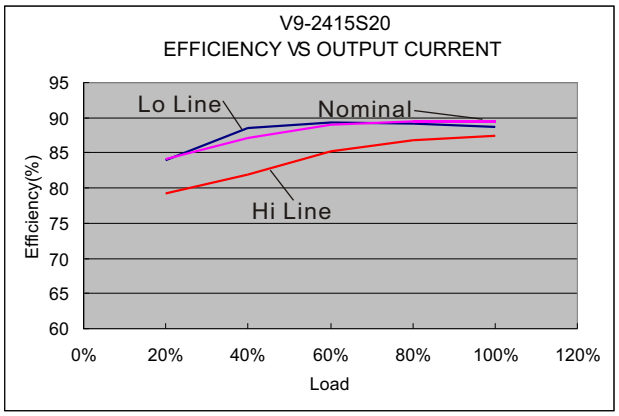
NOTE

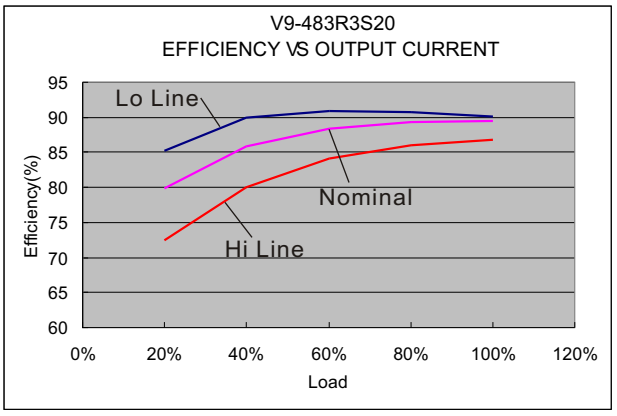
1. One load is 25% to 100% load, the other load is 100% load, the output voltage variable rate is within ±5%.
2. Measured with 20MHz bandwidth and 1.0uF ceramic capacitor.
3. Tested by minimal Vin and constant resistive load.
4. Tested by normal Vin and 25% load step change (75%-50%-25% of Io).
5. Measured Input reflected ripple current with a simulated source inductance of 12uH.
6. The remote on/off control pin is referenced to -Vin(pin2).
7. 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.
8. An external filter capacitor is required if the module has to meet EN61000-4-4 and EN61000-4-5.
   The filter capacitor Motien suggest: Nippon chemi-con KY series, 220uF/100V.
9. Exceeding the absolute ratings of the unit could cause damage.

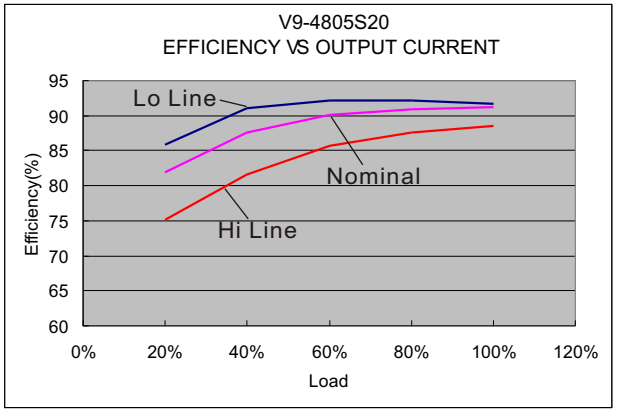


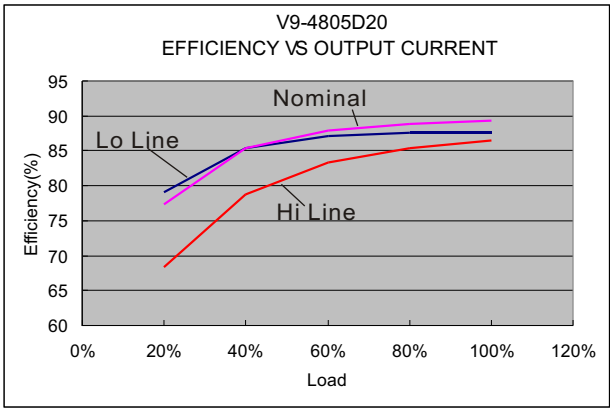
	C1	L	C2
V9-24XXXXX	1210, 2.2uF/100V	12uH	1210, 2.2uF/100V
V9-48XXXXX	1210, 2.2uF/100V	12uH	1210, 2.2uF/100V

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

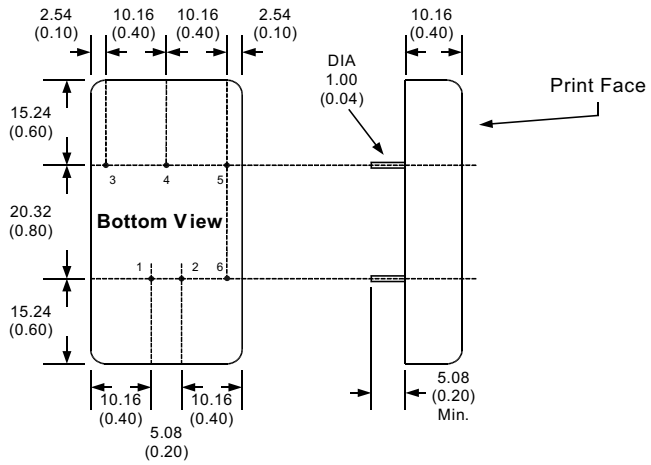








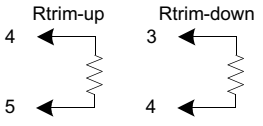
MECHANICAL SPECIFICATIONS



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

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 tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

MOTIEN ISO 9001:2000 REGISTERED
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