

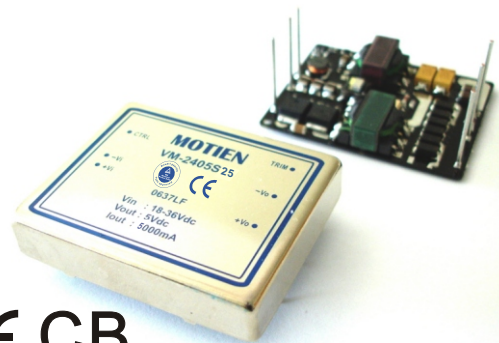
# VM Series

## 25/30W 2:1 Regulated Single & Dual output



### Features

- Wide 2:1 Input Range
- Full SMD Technology
- 1500 VDC Isolation
- Efficiency up to 91%
- -40 ~ 85°C Operation Temperature Range
- Adjustable Output Voltage
- Remote On/Off Control (CTRL)
- Continuous Short Circuit Protection
- Over Current Protection
- Over Voltage Protection
- Over Temperature Protection
- Soft Start



CE CB

The VM series is a family of cost effective 25/30W single & dual output DC-DC converters. These converters combine nickel-coated copper package in a 2"x1.6" 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 12, 24 and 48 with output voltage of 3.3, 5, 12, 15, ±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)	±10%, max
Maximum Output Current	See table
Line Regulation	±0.5%, max
Load Regulation( I <sub>o</sub> =10% to 100%) (1)	±0.5%, max
Cross Regulation (Dual Output) (2)	±5%
Ripple&Noise (3)	75mVpk-pk, max
	3.3V output 3.9V
	5V output 6.2V
Over Voltage Protection ( Zener diode clamp)	12V output 15V
	15V output 18V
	±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 (4)	See table
Transient Recovery Time (5)	200us, typ
Transient Response Deviation(5)	±3%, max

INPUT SPECIFICATIONS	
Input Voltage Range	See table
Under Voltage Lockout	
12V Modes	Module ON / OFF 8.6Vdc / 7.9Vdc, typ
24V Modes	Module ON / OFF 17.6Vdc / 16Vdc, typ
48V Modes	Module ON / OFF 33.5Vdc / 30.5Vdc, 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(6)	20mApk-pk, typ
Remote On/Off (CTRL)	
ON:	2.5 ... 5.5Vdc or open circuit
OFF:	-0.7 ... 0.8Vdc or Short circuit pin2 and pin 3
OFF idle current:	2.5 mA, typ

PHYSICAL SPECIFICATIONS	
Case Material	Nickel-coated Copper
Pin Material	Ø1.0mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	48.0g
Dimensions	2.00"x1.60"x0.40"

GENERAL SPECIFICATIONS	
Efficiency	See table, typ
I/O Isolation Voltage(3 sec)	
Input/Output	1500Vdc
Case/Input & Output	1000Vdc
Isolation Resistance	1000 MΩ, min
Isolation Capacitance	1200 pF, typ
Switching frequency	270kHz, typ
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>1 Mhrs
Safety Standard	IEC/EN 60950-1
Safety Approvals	TUV,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

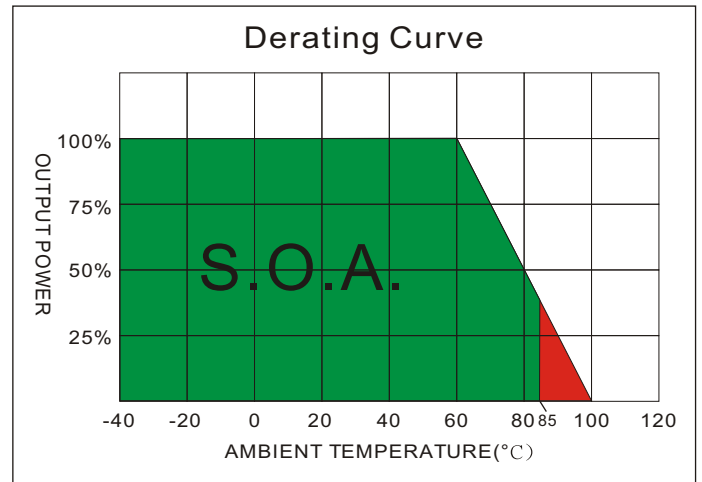
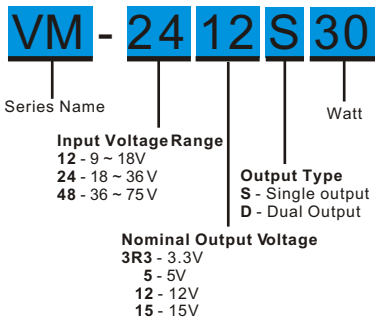
ENVIRONMENTAL SPECIFICATIONS	
Operating Ambient Temperature	-40°C ~ +85°C(See Derating Curve) -40°C ~ +60°C(For 100% load)
Maximum Case Temperature	100°C
Storage Temperature	-40°C ~ +125°C
Over Temperature Protection (Case)	110°C, typ
Cooling	Nature Convection

ABSOLUTE SPECIFICATIONS (9)	
These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.	
Input Voltage(100mS)	
12 Modes	-0.7~25 Vdc
24 Modes	-0.7~50 Vdc
48 Modes	-0.7~100 Vdc
Lead Soldering Temperature (1.5mm from case 10sec. Max.)	260°C max.

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# VM - 25/30W 2:1 Regulated Single & Dual output

## PART NUMBER STRUCTURE

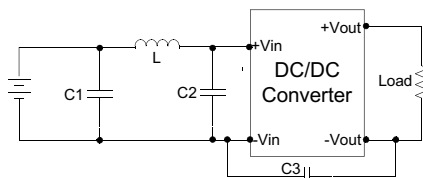


## MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current		OUTPUT Voltage (Vdc)	OUTPUT Current		EFFICIENCY @FL(%)	Capacitor Load(uF)
		No-Load (mA)	Full Load (mA)		Min. load (mA)	Full load (mA)		
VM-123R3S25	9-18	30	1867	3.3	0	5500	83	15000
VM-1205S25	9-18	30	2480	5	0	5000	86	10000
VM-1212S30	9-18	30	2841	12	0	2500	90	2200
VM-1215S30	9-18	30	2841	15	0	2000	90	1000
VM-243R3S25	18-36	25	922	3.3	0	5500	84	15000
VM-2405S25	18-36	25	1225	5	0	5000	87	10000
VM-2412S30	18-36	25	1404	12	0	2500	91	2200
VM-2415S30	18-36	25	1404	15	0	2000	91	1000
VM-483R3S25	36-75	20	461	3.3	0	5500	84	15000
VM-4805S25	36-75	20	613	5	0	5000	87	10000
VM-4812S30	36-75	20	702	12	0	2500	91	2200
VM-4815S30	36-75	20	702	15	0	2000	91	1000
VM-1212D30	9-18	30	2841	±12	0	±1250	90	±1000
VM-1215D30	9-18	30	2841	±15	0	±1000	90	±680
VM-2412D30	18-36	25	1404	±12	0	±1250	91	±1000
VM-2415D30	18-36	25	1404	±15	0	±1000	91	±680
VM-4812D30	36-75	20	710	±12	0	±1250	90	±1000
VM-4815D30	36-75	20	710	±15	0	±1000	90	±680

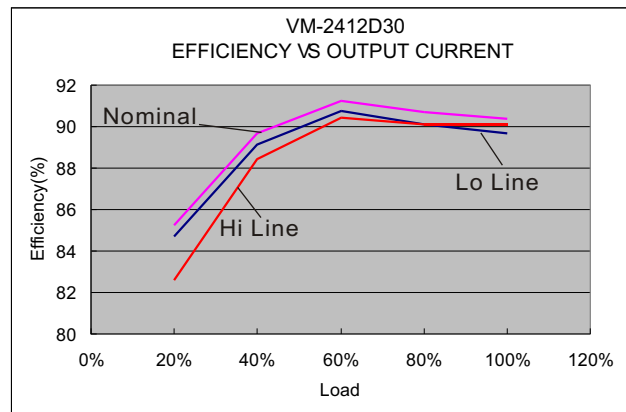
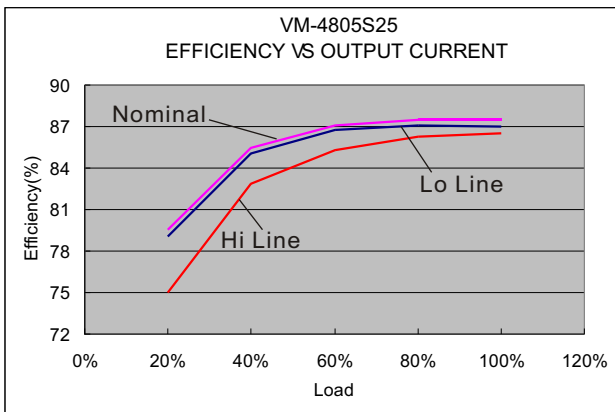
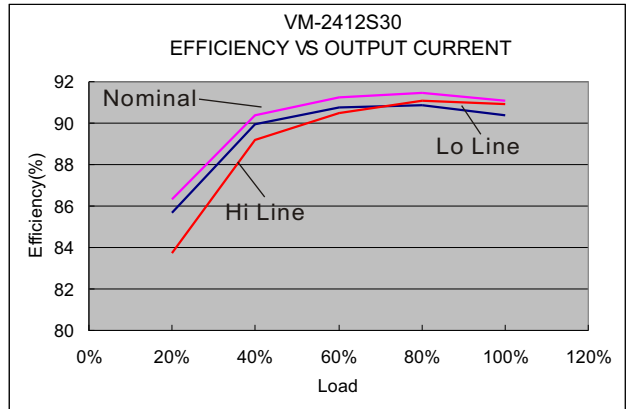
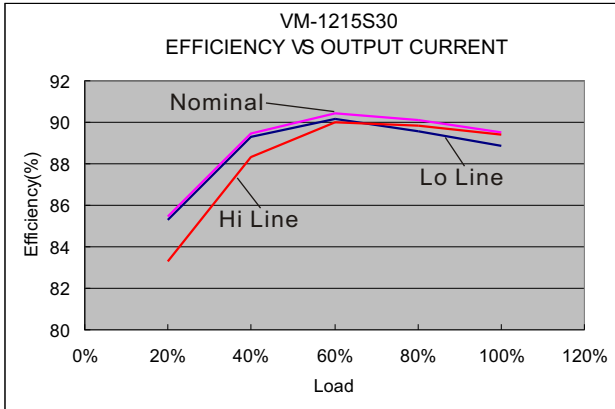
## NOTE

- Operation between no-load and 10% load conditions will not damage the module, but it may not meet all specifications listed.
- One load is 25% to 100% load, the other load is 100% load, the output voltage variable rate is within ±5%.
- Measured with 20MHz bandwidth and 1.0uF ceramic 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 12uH.
- 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 EN61000-4-4 and EN61000-4-5.  
The filter capacitor Motien suggest: Nichicon FW series, 1000uF/100V.
- Exceeding the absolute ratings of the unit could cause damage.  
It is not allowed for continuous operating.

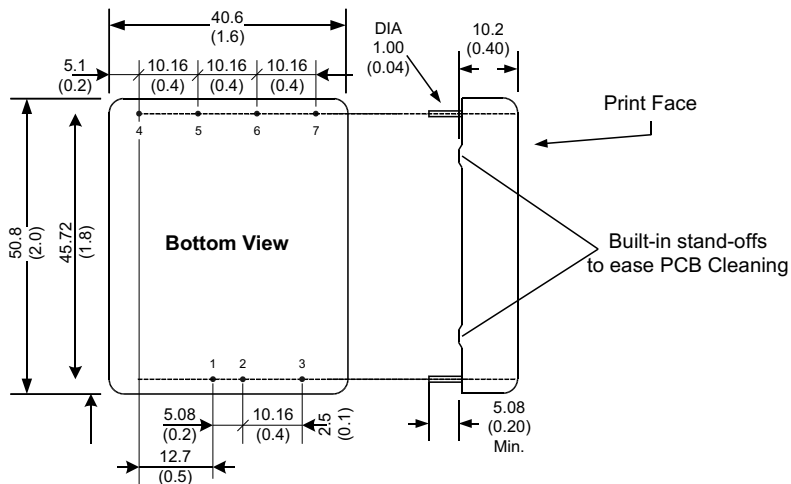


	C1	L	C2	C3
VM-12XXXXX	330uF, 100V	12uH	100uF, 100V	N/A
VM-24XXXXX	330uF, 100V	12uH	100uF, 100V	N/A
VM-48XXXXX	330uF, 100V	12uH	100uF, 100V	1000pF/2KV

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	CTRL	CTRL
4	No pin	+Vout
5	+Vout	Com
6	-Vout	-Vout
7	Trim	Trim

- All dimensions are typical in millimeters ( inches ).
1. Pin diameter:  $1.0 \pm 0.05$  (  $0.04 \pm 0.002$  )
  2. Pin pitch tolerance:  $\pm 0.35$  (  $\pm 0.014$  )
  3. Case Tolerance:  $\pm 0.5$  (  $\pm 0.02$  )

**EXTERNAL OUTPUT TRIMMING**

Output can be externally trimmed by using the method as below. ( ) for dual output trim.