

VV-10W Series



10W 4:1 Regulated Single & Dual output

Features

- Wide 4:1 Input Range
- 1600VDC Isolation
- Efficiency up to 91%
- Operating Temperature Range -40 ~ 100°C max.
- Continuous Short Circuit Protection
- Over Voltage Protection
- Over Load Protection
- DIP24 Package
- Soft Start
- Remote ON/OFF Control (CTRL)



PART NUMBER STRUCTURE

VV - **24** **05** **S** **10**
(1) (2) (3) (4) (5)

(1) Series

(2) Input Voltage Range

24 - 9-36 V
48 - 18-75 V

(4) Output Type

S - Single Output
D - Dual Output

(3) Output Voltage

3R3 - 3.3 V
05 - 5.0 V
12 - 12 V
15 - 15 V

(5) Watt

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

Model Number	Input Voltage Range (VDC)	Input Current		Output Voltage (VDC)	Output Current		Efficiency @FL (%, typ.)	Capacitive Load @FL (μF, max.)
		No-Load (mA, max.)	Full Load (mA, typ.)		Min. load (mA)	Full load (mA)		
VV-243R3S10	9-36	15	427	3.3	0	2700	87	1330
VV-2405S10	9-36	15	468	5	0	2000	89	1330
VV-2412S10	9-36	15	463	12	0	833	90	288
VV-2415S10	9-36	15	468	15	0	667	89	200
VV-2405D10	9-36	10	479	±5	0	±1000	87	±900
VV-2412D10	9-36	15	463	±12	0	±417	90	±133
VV-2415D10	9-36	15	468	±15	0	±330	89	±90
VV-483R3S10	18-75	10	213	3.3	0	2700	87	1330
VV-4805S10	18-75	10	234	5	0	2000	89	1330
VV-4812S10	18-75	10	231	12	0	833	90	288
VV-4815S10	18-75	10	234	15	0	667	89	200
VV-4805D10	18-75	10	239	±5	0	±1000	87	±900
VV-4812D10	18-75	10	229	±12	0	±417	91	±133
VV-4815D10	18-75	10	231	±15	0	±330	90	±90

INPUT SPECIFICATIONS					
Parameter	Conditions	Min.	Typ.	Max.	Unit
Input Voltage Range	24V Input	9	24	36	VDC
	48V Input	18	48	75	
Input Filter		Pi Type			
Input Reflected Ripple Current (1)			20		mApk-pk
Start up Time	Nominal Vin and constant resistive load		20		ms
Remote ON/OFF Control (2)	Module ON (Open Circuit)	3.0		12	VDC
	Module OFF (Short circuit pin 2 and pin 3)	0		1.2	
		OFF idle current		5.0	
Recommended input fuse (slow blow)	24V Input	2.0			A
	48V Input	1.0			
Note :					
1. Measured with a simulated source inductance of 12μH and a source capacitor Cin (47μF, ESR<1.0Ω at 100kHz).					
2. The remote ON/OFF control pin is referenced to –Vin (pin2).					

OUTPUT SPECIFICATIONS						
Parameter	Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy			-1.2		+1.2	%
Line Regulation			-0.2		+0.2	%
Load Regulation	From 0% to 100% Load	Single Output	-0.5		+0.5	%
		Dual Output	-1.0		+1.0	
Cross Regulation	Asymmetrical Load 25% / 100% for Dual Output		-5		+5	%
Ripple & Noise (1)	20MHz bandwidth				85	mVpk-pk
Over Voltage Protection (Zener diode clamp)	3.3V Output			3.9		VDC
	5V Output			6.2		
	12V Output			15		
	15V Output			18		
Over Current Protection				170		% of FL
Short Circuit Protection			Indefinite (hiccup) (Automatic Recovery)			
Temperature Coefficient			-0.02		+0.02	%/°C
Maximum Capacitive Load	Minimum Vin and constant resistive load		See Table			
Transient Recovery Time	Nominal Vin and 25% load step change (75%-50%-25% of Io)	For All models		250		μs
Transient Response Deviation		3.3V Single Output	-5		+5	%
		Other Output	-3		+3	
Note : 1. Measured with a 1μF MLCC.						

ABSOLUTE MAXIMUM RATINGS					
Parameter	Conditions	Min.	Typ.	Max.	Unit
Input Surge Voltage (100 ms)	24V Input			50	VDC
	48V Input			100	
Soldering Temperature	1.5mm from case 10sec max.			260	°C
Note : These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.					

GENERAL SPECIFICATIONS					
Parameter	Conditions	Min.	Typ.	Max.	Unit
Isolation Voltage	Input-output, and rated for 60sec	1600			VDC
	Case-I/O, and rated for 60sec	1600			
Isolation Resistance	Input-output	1000			MΩ
Isolation Capacitance	Input-output		1500		pF
Switching Frequency			270		kHz
MTBF	MIL-HDBK-217 F @ 25°C	1			M hours
Safety Approval	IEC / EN / UL 62368-1	DK-64825-UL, E252573			
Environmental compliance		RoHS			

ENVIRONMENT SPECIFICATIONS					
Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating Ambient Temperature	See the Derating Curve	-40		100	°C
Maximum Case Temperature				105	°C
Thermal Impedance		20.5			°C/W
Storage Humidity				95	% rel. H
Storage Temperature		-55		125	°C
Cooling	Natural Convection	30-65 LFM			

EMC SPECIFICATIONS			
Parameter	Standard	Condition	Criterion
Conducted Emissions	EN55032	with external components	A
Radiated Emissions	EN55032		A
ESD	IEC 61000-4-2	Air: ± 8kV / Contact: ± 6kV	B
RS	IEC 61000-4-3	10V/m	A
EFT	IEC 61000-4-4	±2kV with external components	A
Surge	IEC 61000-4-5	±1kV with external components	A
CS	IEC 61000-4-6	10Vrms	A
PFMF	IEC 61000-4-8	1A/m	A

PHYSICAL SPECIFICATIONS	
Parameter	Value
Case Material	Aluminum
Base Material	Nonconductive Black Plastic (UL94V-0 rated)
Pin Material	Ø0.5mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	14.0 g, typ.
Dimensions	1.25" x 0.8" x 0.4"

ELECTRICAL CHARACTERISTIC CURVES	
Derating Curve	Derating Curve
Efficiency 87% Models	Vout : 3.3V & Efficiency 89% Models
Derating Curve	Derating Curve
Efficiency 90% Models	Efficiency 91% Models

TEST CONFIGURATIONS

Input Reflected Ripple Current Test Step

Input reflected ripple current is measured with a source inductor L_{in} (12 μ H) and a source capacitor C_{in} (47 μ F, ESR<1.0 Ω at 100kHz) at nominal input and full load.

The information and specifications contained in this data sheet are believed to be correct at time of publication. However, **MOTIEN Technology** accepts no responsibility for consequences arising from printing errors or inaccuracies. Specifications are subject to change without notice. No rights under any patent accompany the sale of any such product(s) or information contained herein.

DESIGN & FEATURE CONFIGURATIONS**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.

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.

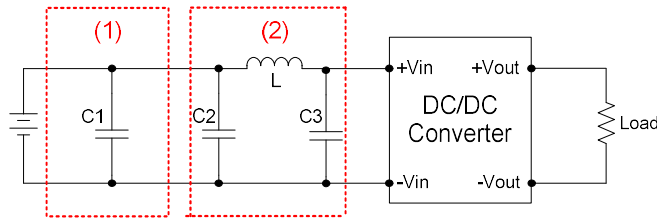
Note

1. Exceeding the absolute ratings of the unit could cause damage. It is not allowed for continuous operating.

DESIGN & FEATURE CONFIGURATIONS

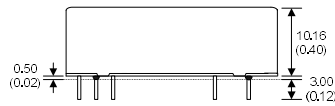
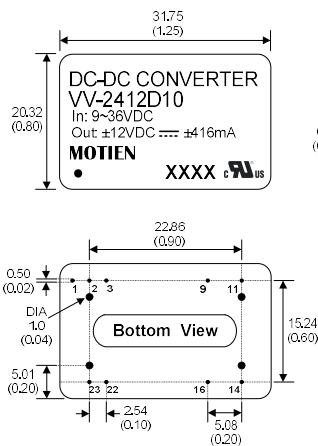
EMC Filter

The part (1) Circuit is used to meet Surge & EFT test, and the part (2) Circuit is used to meet EMI test.



	C1	C2, C3	L
VV-24XXX10	NIPPON Chemi-con	MLCC	12 μ H
VV-48XXX10	KY series 330 μ F, 100V	2.2 μ F, 100V	

MECHANICAL SPECIFICATIONS



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. Case Tolerance: ± 0.5 (± 0.02)
4. Stand-off tolerance: ± 0.1 (± 0.004)

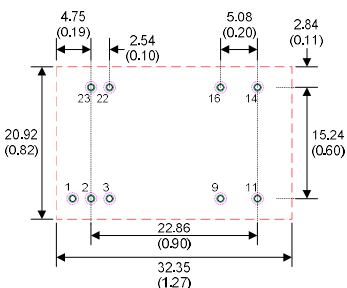
PIN CONNECTIONS

PIN NUMBER	SINGLE	DUAL
1	CTRL	CTRL
2	-Vin	-Vin
3	-Vin	-Vin
9	N.P.	COM
11	N.C.	-Vout
14	+Vout	+Vout
16	-Vout	COM
22	+Vin	+Vin
23	+Vin	+Vin

*N.P. : No PIN

*N.C. : No Connection

RECOMMENDED FOOTPRINT DETAILS



Notes : 1. All dimensions are typical in millimeters (inches).

Through hole (black) 1~23: $\varnothing 0.80$ (0.031)

Top view pad (green) 1~23: $\varnothing 1.00$ (0.039)

Bottom view pad (pink) 1~23: $\varnothing 1.60$ (0.063)