VV-12W Series

12W 4:1 Regulated Single & Dual output

Features

- Wide 4:1 Input Range
- Full SMD Technology
- 1600 VDC Isolation
- Efficiency up to 90%
- -40 ~ 85 °C Operation Temperature Range
- No Minimum Load Required
- Continuous Short Circuit Protection
- Over Voltage Protection
- Over Load Protection
- Low no load Input Current
- Soft Start
- High Power Density:12W in DIL-24 Package
- Remote On/Off

The VV series are high performance 12W single & dual output DC-DC converters. These converters are consisted with nickle-coated copper 24-pin DIL package with high performance features such as synchronous rectification, high efficiency and tight line / load regulation. Devices are encapsulated using flame retardant resin. Input voltages of 24 and 48 with output voltage of 3.3, 5.1, 12, 15, ±5, ±12, ±15Vdc. Features include high efficiency operation up to 90% .

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

OUTPUT SPECIFICATIONS

Output Voltage Accuracy		±1.2%
Maximum Output Current		See table
Line Regulation		±0.2%, max.
Load Regulation (0% Load to Full Load)	Singe	±0.5%, max.
Load Regulation (0% Load to Full Load)	Dual	±1.0%, max.
Cross Regulation (Dual Output) (1)		±5%
Ripple&Noise (2)		85mVpk-pk, max.
Over Voltage Protection (Zener diode clamp)	3.3V output	3.9V
	5.1V output	6.2V
	12V output	15V
	15V output	18V
	± 5V output	±6.2V
	±12V output	±15V
	±15V output	±18V
Over Load Protection		170% 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
Start up Time (Nominal Vin and constant resistive load)	20mS, typ.
Input Filter	Pi Type
Input Current(No-Load)	See table, max.
Input Current (Full-Load)	See table, typ.
Input Reflected Ripple Current	20mApk-pk
Remote On/Off (CTRL)	
ON: 3.0 ... 12Vdc or open circuit	
OFF: 0 ... 1.2Vdc or Short circuit pin1 and pin 2/3	
OFF idle current: 5.0 mA typ.	

ENVIRONMENTAL SPECIFICATIONS

Operating Ambient Temperature	-40°C ~ +85°C(See Derating Curve)
	-40°C ~ +60°C(For 100% load)
Maximum Case Temperature	105°C
Storage Temperature	-55°C ~ +125°C
Cooling	Nature Convection

GENERAL SPECIFICATIONS

Efficiency	See table, min.
I/O Isolation Voltage(60sec)	
Input/Output	1600Vdc
Case/Input & Output	1600Vdc
Isolation Resistance	1000 MΩ, min.
Isolation Capacitance	1500 pF, max.
Switching frequency	270kHz, typ.
Humidity	95% rel H
Reliability Calculated MTBF (MIL-HDBK-217 F)	>1 Mhrs
Safety Standard	UL/cUL 60950-1 , 62368-1
	IEC/EN 60950-1 , 62368-1
Safety Approvals	UL/cUL 60950-1 , 62368-1
	IEC/EN 60950-1 , 62368-1

EMC CHARACTERISTICS

Radiated Emissions	EN55032	CLASSA
Conducted Emissions(5)	EN55032	CLASSA
ESD	IEC61000-4-2	Perf. Criteria B
RS	IEC61000-4-3	Perf. Criteria A
EFT (6)	IEC61000-4-4	Perf. Criteria A
Surge (6)	IEC61000-4-5	Perf. Criteria A
CS (6)	IEC61000-4-6	Perf. Criteria A
PFMF	IEC61000-4-8	Perf. Criteria A

PHYSICAL SPECIFICATIONS

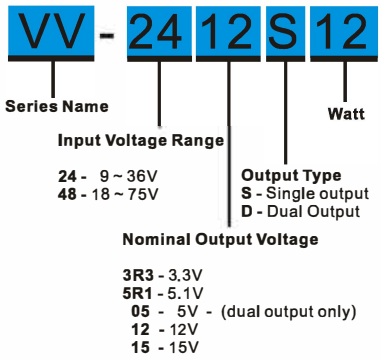
Case Material	Copper with nickel plated
Base Material	Non-conductive black plastic (UL94V-0 rated)
Pin Material	Φ0.5mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	18.0g
Dimensions	1.25"x0.8"x0.40"

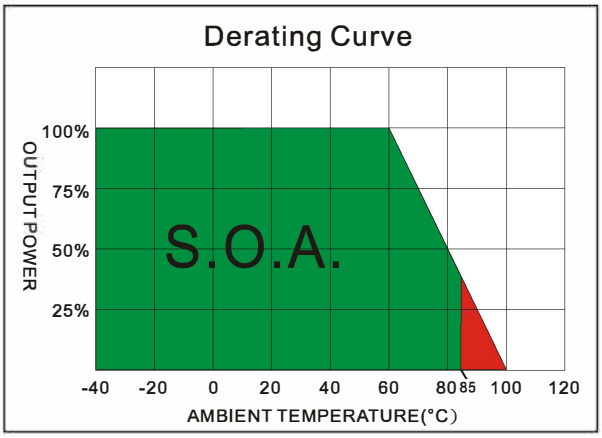
ABSOLUTE SPECIFICATIONS (7)

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

Input Surge Voltage(1000mS)	24 Models	50Vdc, max.
	48 Models	100Vdc, max.
Soldering Temperature (1.5mm from case 10sec max.)		260°C, max.

PART NUMBER STRUCTURE



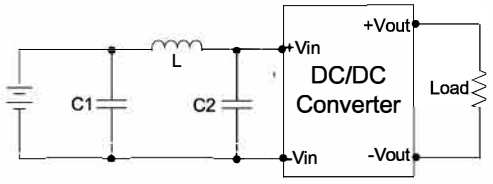


MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA, max.)	INPUT Current Full Load (mA, typ.)	OUTPUT Voltage (Vdc)	OUTPUT Current Min. load (mA)	OUTPUT Current Full load (mA)	EFFICIENCY @FL (%, typ.)	Capacitor Load @FL (μF, max.)
VV-243R3S12	9-36	15	573	3.3	0	3500	87	2000
VV-245R1S12	9-36	15	581	5.1	0	2400	89	2000
VV-2412S12	9-36	15	574	12	0	1000	90	430
VV-2415S12	9-36	15	574	15	0	800	90	300
VV-2405D12	9-36	15	595	±5	0	±1200	87	±1250
VV-2412D12	9-36	15	574	±12	0	±500	90	±200
VV-2415D12	9-36	15	574	±15	0	±400	90	±120
VV-483R3S12	18-75	15	286	3.3	0	3500	87	2000
VV-485R1S12	18-75	15	290	5.1	0	2400	89	2000
VV-4812S12	18-75	15	287	12	0	1000	90	430
VV-4815S12	18-75	15	287	15	0	800	90	300
VV-4805D12	18-75	15	297	±5	0	±1200	87	±1250
VV-4812D12	18-75	15	287	±12	0	±500	90	±200
VV-4815D12	18-75	15	287	±15	0	±400	90	±120

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. Input filter components (C1, L, C2) 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.
6. An external filter capacitor is required if the module has to meet IEC61000-4-4 and IEC61000-4-5 and IEC61000-4-6 . The filter capacitor suggest: Nippon - chemi - con KY series, 330uF/100V.
7. Exceeding the absolute ratings of the unit could cause damage. It is not allowed for continuous operating.

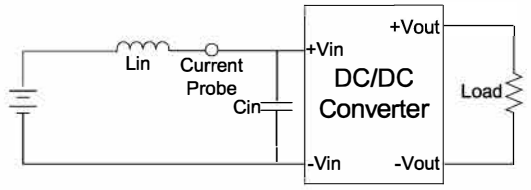


	C1	L	C2
VV-24XXXXX	2.2uF, 100V	12uH	2.2uF, 100V
VV-48XXXXX	2.2uF, 100V	12uH	2.2uF, 100V

TEST CONFIGURATIONS

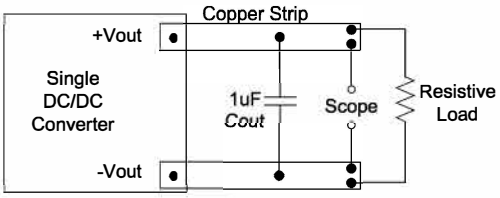
Input Reflected Ripple Current Test Step

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.

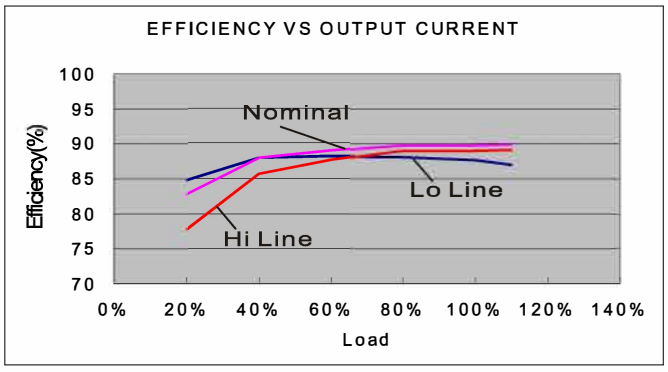


Output Ripple & Noise Measurement Test

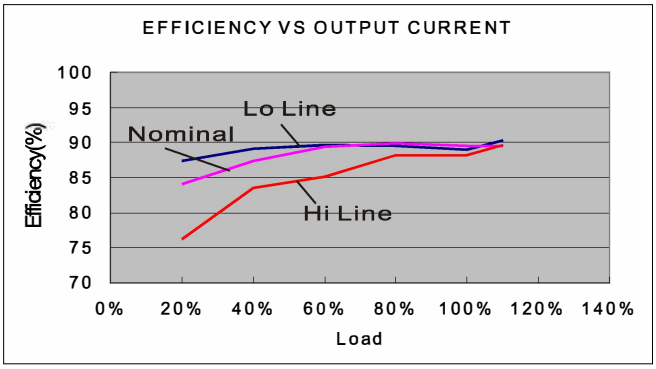
Use a capacitor Cout(1.0uF) measurement.
The Scope measurement bandwidth is 0-20MHz.



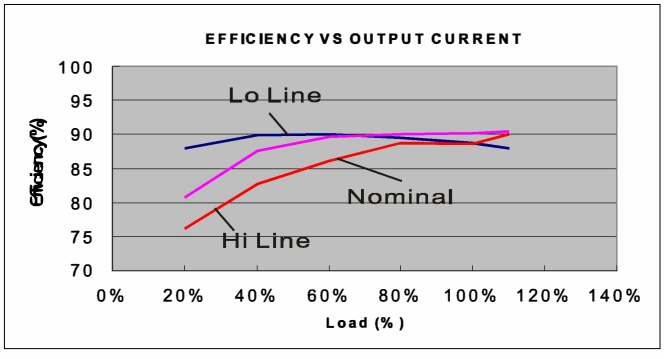
ELECTRICAL CHARACTERISTIC CURVES



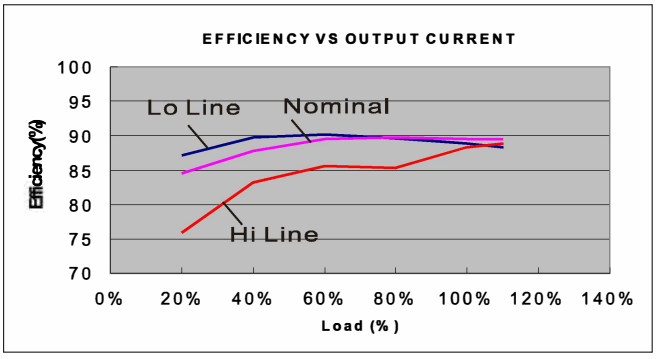
VV-245R1S12



VV-4812S12

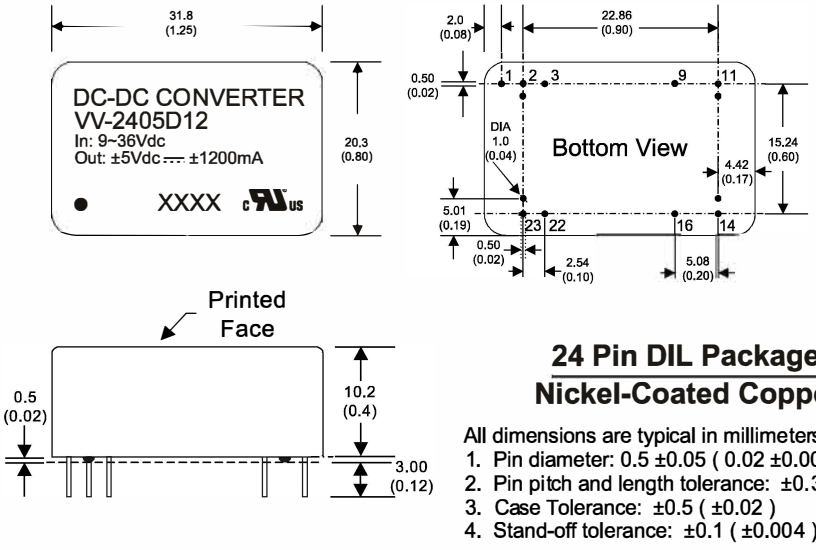


VV-2412D12



VV-4815D12

MECHANICAL SPECIFICATIONS



24 Pin DIL Package
Nickel-Coated Copper

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	Remote On/Off	Remote On/Off
2	-V Input	-V Input
3	-V Input	-V Input
9	N.P.	Common
11	N.C.	-V Output
14	+V Output	+V Output
16	-V Output	Common
22	+V Input	+V Input
23	+V Input	+V Input

ALL PSU LTD, Unit D6 Laser Quay, Culpeper Close
Medway City Estate, Rochester, Kent, ME2 4HU
Tel: 01634 725527, Email: sales@allpsu.co.uk, Web: www.allpsu.co.uk

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