

VA-1.5W Series

1.5W Unregulated Single output

Features

- 4 Pin SIL / 8 Pin DIL Package
- 1000 VDC Isolation
- Up to 3000 VDC Isolation
- Low Ripple and Noise
- Efficiency up to 88%
- -40 ~ 85°C Operation Temperature Range
- Non-Conductive Black Plastic Case

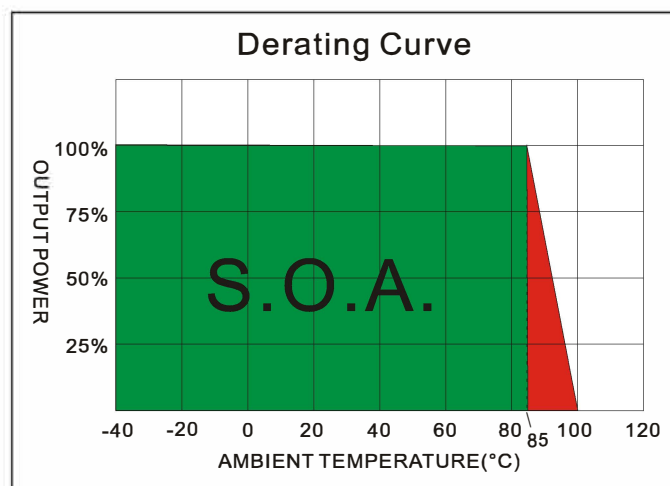
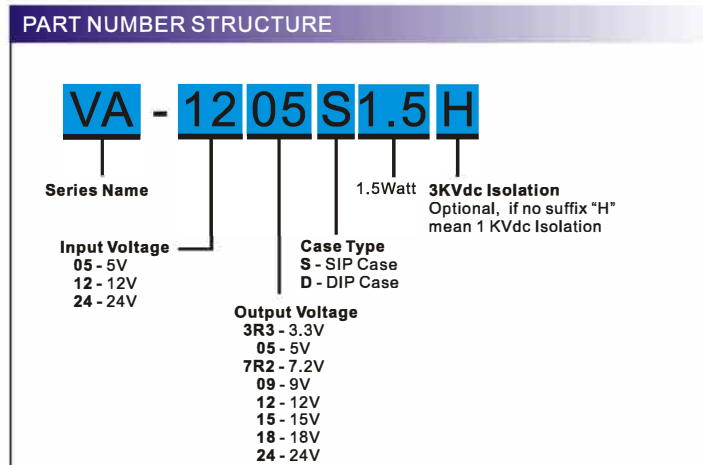


The VA series is a family of cost effective 1.5W single output DC-DC converters. These converters achieve low cost and ultra-miniature SIP 4 pin or DIP 8 pin size. Devices are encapsulated using flame retardant resin. The models operate from input voltage of 5, 12, 24 Vdc with output voltage of 3.3, 5, 7.2, 9, 12, 15, 18, 24 Vdc. High performance features include 1000Vdc~3000Vdc input/output isolation, high efficiency operation and output voltage accuracy of $\pm 3\%$ maximum. Standard features include an input range of $\pm 10\%$ tolerance and low output noise and ripple.

All specifications typical at $T_a=25^\circ\text{C}$, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS		PHYSICAL SPECIFICATIONS	
Voltage accuracy	$\pm 3\%$	Case Material	Non-conductive Black Plastic (UL94V-0 rated)
Line regulation	$\pm 1.2\%$ / Per 1% Vin Change	Pin Material	
Load regulation	(From 20% to 100% Load) $\pm 10\%$ (Output 3.3V Model) $\pm 20\%$	SIP Case	0.5mm Alloy42 Solder-coated
Ripple & noise (20 MHz bandwidth)(1)	100mV pk-pk	DIP Case	$\Phi 0.5\text{mm}$ Brass Solder-coated
Temperature coefficient	$\pm 0.02\%/^\circ\text{C}$	Potting Material	Epoxy (UL94V-0 rated)
Capacitor load(2)	See table	Weight	(SIP/1.5g) (SIP/1.9g) (DIP/1.8g)
		Dimensions(6)	SIP Case 0.46"x0.24"x0.40" SIP Case 0.46"x0.29"x0.40" DIP Case 0.50"x0.40"x0.27"
INPUT SPECIFICATIONS		ENVIRONMENT SPECIFICATIONS	
Voltage Range	$\pm 10\%$	Operating Temperature	$-40^\circ\text{C} \sim 85^\circ\text{C}$ (See Derating Curve)
Max. Input Current	See table	Maximum Case Temperature	100°C
No-Load Input Current	See table	Storage Temperature	$-40^\circ\text{C} \sim 125^\circ\text{C}$
Input Filter	Capacitors	Cooling	Nature Convection
Input Reflected Ripple Current(3)	20mA pk-pk		
ABSOLUTE MAXIMUM RATINGS(4)		GENERAL SPECIFICATIONS	
These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.		Efficiency	See table
Input Surge Voltage(100mS)		I/O Isolation Voltage(60sec)	
5 Models	7 Vdc, max.	Input/Output	1000~3000Vdc
12 Models	15 Vdc, max.	I/O Isolation Capacitance	60 pF Typ.
24 Models	28 Vdc, max.	I/O Isolation Resistance	1000M Ohm
Soldering Temperature	260°C, max.	Switching Frequency	Variable 80kHz
(1.5mm from case 10sec max.)		Humidity	95% rel H
		Reliability Calculated MTBF (MIL-HDBK-217 F)	>1.121Mhrs
		Safety Standard : (designed to meet)	IEC/EN 60950-1 , 62368-1 UL/cUL 60950-1 , 62368-1

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MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current		OUTPUT Voltage (Vdc)	OUTPUT Current Full load (mA)	EFFICIENCY @FL (% , typ.)	Capacitor Load @FL (µF, max.)
		No-Load (mA, max.)	Full Load (mA, typ.)				
VA-053R3S1.5	5	30	296	3.3	363.6	81	220
VA-0505S1.5	5	35	380	5	300	79	220
VA-057R2S1.5	5	35	366	7.2	208	82	220
VA-0509S1.5	5	25	400	9	166	75	220
VA-0512S1.5	5	25	385	12	125	78	220
VA-0515S1.5	5	30	375	15	100	80	220
VA-0518S1.5	5	30	353	18	83	85	220
VA-0524S1.5	5	35	357	24	62.5	84	220
VA-123R3S1.5	12	15	133	3.3	363.6	75	220
VA-1205S1.5	12	25	156	5	300	80	220
VA-127R2S1.5	12	25	167	7.2	208	75	220
VA-1209S1.5	12	20	151	9	166	83	220
VA-1212S1.5	12	15	152	12	125	82	220
VA-1215S1.5	12	15	156	15	100	80	220
VA-1218S1.5	12	15	156	18	83	80	220
VA-1224S1.5	12	15	164	24	62.5	76	220
VA-243R3S1.5	24	15	67	3.3	363.6	75	220
VA-2405S1.5	24	15	76	5	300	82	220
VA-247R2S1.5	24	10	78	7.2	208	80	220
VA-2409S1.5	24	10	78	9	167	80	220
VA-2412S1.5	24	15	74	12	125	84	220
VA-2415S1.5	24	10	74	15	100	84	220
VA-2418S1.5	24	10	78	18	83	80	220
VA-2424S1.5	24	8	71	24	62.5	88	220

Suffix "H" means 3 KVdc isolation

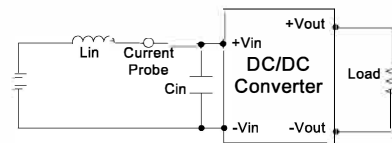
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MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current		OUTPUT Voltage (Vdc)	OUTPUT Current Full load (mA)	EFFICIENCY @FL (% , typ.)	Capacitor Load @FL (µF, max.)
		No-Load (mA, max.)	Full Load (mA, typ.)				
VA-053R3D1.5	5	35	312	3.3	363.6	77	220
VA-0505D1.5	5	35	385	5	300	78	220
VA-057R2D1.5	5	30	400	7.2	208	75	220
VA-0509D1.5	5	25	400	9	167	75	220
VA-0512D1.5	5	25	370	12	125	81	220
VA-0515D1.5	5	25	366	15	100	82	220
VA-0518D1.5	5	25	375	18	83	80	220
VA-0524D1.5	5	30	361	24	62.5	83	220
VA-123R3D1.5	12	15	135	3.3	363.6	74	220
VA-1205D1.5	12	15	154	5	300	81	220
VA-127R2D1.5	12	25	164	7.2	208	76	220
VA-1209D1.5	12	15	149	9	167	84	220
VA-1212D1.5	12	15	156	12	125	80	220
VA-1215D1.5	12	15	156	15	100	80	220
VA-1218D1.5	12	15	156	18	83	80	220
VA-1224D1.5	12	15	164	24	62.5	76	220
VA-243R3D1.5	24	10	67	3.3	363.6	75	220
VA-2405D1.5	24	9	76	5	300	82	220
VA-247R2D1.5	24	10	75	7.2	208	83	220
VA-2409D1.5	24	10	74	9	167	85	220
VA-2412D1.5	24	10	78	12	125	80	220
VA-2415D1.5	24	8	76	15	100	82	220
VA-2418D1.5	24	8	78	18	83	80	220
VA-2424D1.5	24	9	76	24	62.5	82	220

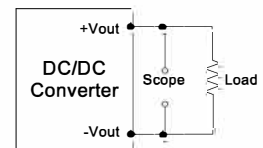
Suffix "H" means 3 KVdc isolation

TEST CONFIGURATIONS
Input Reflected Ripple Current Test Step

Input reflected ripple current is measured through a source inductor L_{in} (12uH) and a source capacitor C_{in} (47uF, ESR<1.0Ω at 100KHz) at nominal input and full load.


Output Ripple & Noise Measurement Test

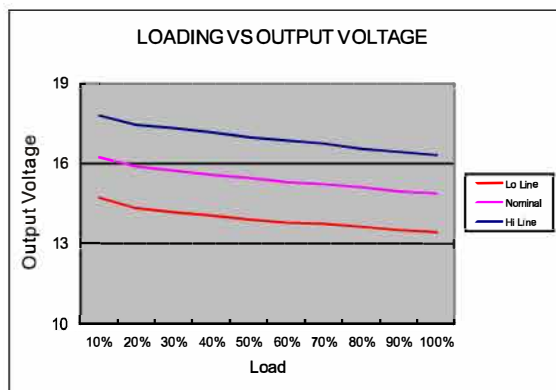
The Scope measurement bandwidth is 20MHz .


NOTE

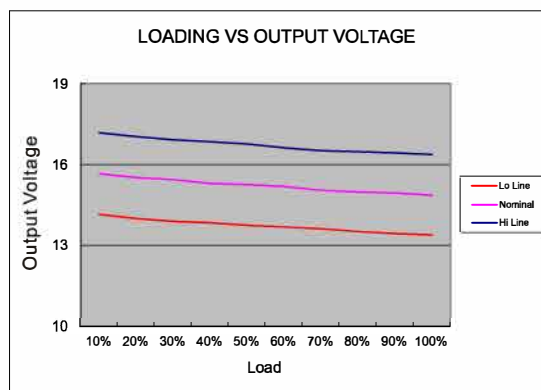
1. Ripple/Noise measured with 20MHz bandwidth.
2. Tested by minimal V_{in} and constant resistive load.
3. Measured Input reflected ripple current with a simulated source inductance of 12uH and a source capacitor C_{in} (47uF, ESR<1.0Ω at 100KHz)
4. Exceeding the absolute ratings of the unit could cause damage. It is not allowed for continuous operating.
5. Operation under no-load conditions will not damage these devices, however they may not meet all listed specifications.
6. Except the following standard models are used SIP case of 0.46"x0.24"x0.40". All other standard models are used SIP case of 0.46"x0.29"x0.40".

VA-0505S1.5	VA-0509S1.5	VA-0512S1.5	VA-0515S1.5	VA-1212S1.5(H)	VA-2409S1.5	VA-2415S1.5
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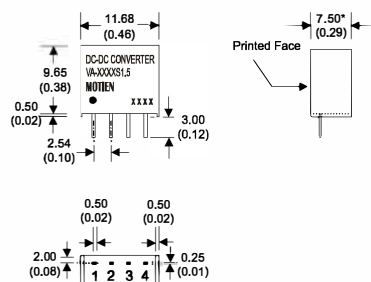


5 Models



12 Models

MECHANICAL SPECIFICATIONS



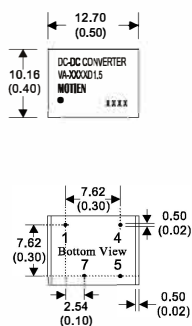
* Please see NOTE for the actual thickness of standard model

4 Pin SIL Package

- 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)

PIN CONNECTIONS	
PIN NUMBER	SINGLE
1	-V Input
2	+V Input
3	-V Output
4	+V Output

(The Pin Connection of high isolation one is the same with normal one.)



8 Pin DIL Package

- 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)

PIN CONNECTIONS	
PIN NUMBER	SINGLE
1	-V Input
4	+V Input
5	+V Output
7	-V Output

(The Pin Connection of high isolation one is the same with normal one.)