AA SERIES (1 x 1 Package)

Up to 10 Watt DC-DC Converter

PRODUCT OVERVIEW

The AA series offer 10 watts of output power in standard 1.00 x 1.00 x 0.4 inches packages. This series features high efficiency and 1500 Volts of DC isolation. The AA series provides a 2:1 wide input voltage range of 4.7-9, 9-18, 18-36 or 36-75 VDC, and delivers a precisely regulated output. These modules operate over the ambient operating temperature range of –40°C to +85°C. All devices offer input Under Voltage Lock Out (UVLO), output over-current and are protected against over-voltage, continuous short circuit conditions and over-temperature. They are designed to be used without tantalum capacitors. In addition, the standard control functions of this series include Remote On/Off and adjustable output voltage.

FEATURES

- Industry standard footprint (1 inch X 1 inch)
- Regulated Outputs, Fixed Switching Frequency
- Up to 87 % Efficiency
- Low No Load Power Consumption
- Designed for use without tantalum capacitors
- -40°C to +85°C industrial temperature range
- Negative and positive On/Off logic control, Trim options
- Continuous Short Circuit Protection
- Sense Compensation, Over-temperature protection
- Over-current and output 0V protection
- Designed to meet conductive EMI EN55022 class A without external components

APPLICATIONS:

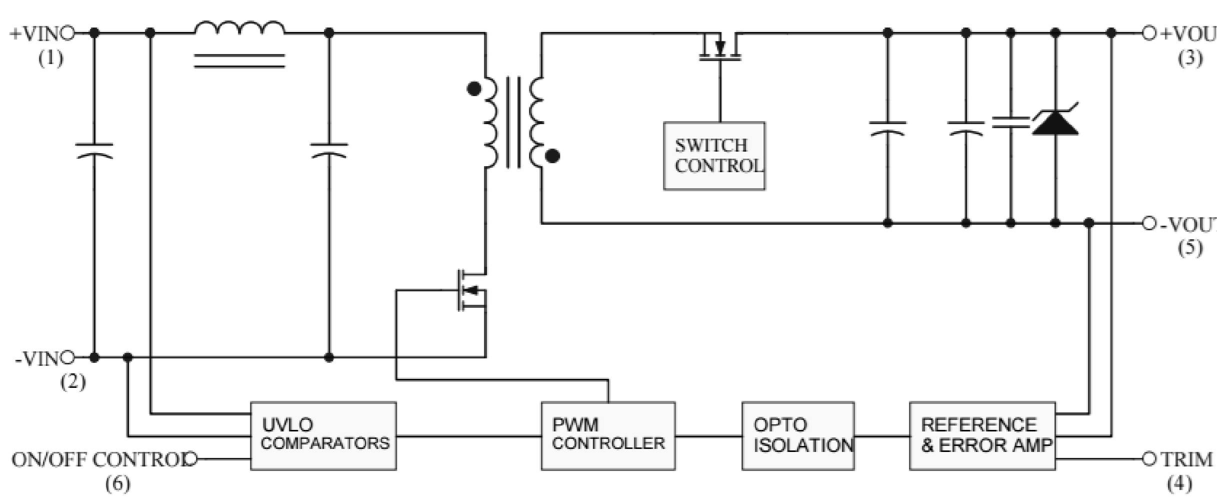
- Distributed Power Architectures
- Mobile telecommunication
- Industrial applications
- Battery operated equipment

AVAILABLE OPTIONS

- Customizable output voltages
- CE Mark 2004/108/EC certification
- UL60950-1, EN60950-1, and IEC60950-1 safety

Contact DATEL for other series of in 1" x 1" footprint, 4:1 Input Ranges, Cost Saving, Lower Power, different output voltage, etc.

Block Diagram



MODEL DESIGNATIONS

MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT MAX	EFFICIENCY %	LOAD REGULATION	OPTIONS
AA5S3.3-2.5	4.7-9 VDC	3.3VDC	2.5 A	87	± 0.2 %	S
AA5S5-2	4.7-9 VDC	5.0 VDC	2 A	87	± 0.2 %	S
AA5S12-0.83	4.7-9 VDC	12 VDC	0.833 A	87	± 0.2 %	S
AA5S15-0.66	4.7-9 VDC	15 VDC	0.666 A	87	± 0.2 %	S
AA5D5-1	4.7-9 VDC	±5.0 VDC	±1 A	85	± 1 %	S
AA5D12-0.41	4.7-9 VDC	±12 VDC	±0.41 A	87	± 1 %	S
AA5D15-0.33	18-36 VDC	±15 VDC	±0.33 A	87	± 1 %	S
AA12S3.3-2.5	9-18 VDC	3.3VDC	2.5 A	82	± 0.2 %	S
AA12S5-2	9-18 VDC	5.0 VDC	2 A	85	± 0.2 %	S
AA12S12-0.83	9-18 VDC	12 VDC	0.833 A	87	± 0.2 %	S
AA12S15-0.66	9-18 VDC	15 VDC	0.666 A	87	± 0.2 %	S
AA12D5-1	9-18 VDC	±5.0 VDC	±1 A	85	± 1 %	S
AA12D12-0.41	9-18 VDC	±12 VDC	±0.41 A	87	± 1 %	S
AA12D15-0.33	18-36 VDC	±15 VDC	±0.33 A	87	± 1 %	S
AA24S3.3-2.5	18-36 VDC	3.3VDC	2.5 A	82	± 0.2 %	S
AA24S5-2	18-36 VDC	5.0 VDC	2 A	85	± 0.2 %	S
AA24S12-0.83	18-36 VDC	12 VDC	0.833 A	87	± 0.2 %	S
AA24S15-0.66	18-36 VDC	15 VDC	0.666 A	87	± 0.2 %	S
AA24D5-1	18-36 VDC	±5.0 VDC	1 A	85	± 1 %	S
AA24D12-0.41	18-36 VDC	±12 VDC	±0.41 A	87	± 1 %	S
AA24D15-0.33	18-36 VDC	±15 VDC	±0.33 A	87	± 1 %	S
AA48S3.3-2.5	36-75VDC	3.3 VDC	2.5 A	81	± 0.2 %	S
AA485S5-2	36-75VDC	5 VDC	2 A	85	± 0.2 %	S
AA48S12-0.83	36-75VDC	12 VDC	0.83 A	87	± 0.2 %	S
AA48S15-0.66	36-75VDC	15 VDC	0.66A	87	± 0.1 %	S
AA48D5-1	36-75VDC	±5.0 VDC	1 A	85	± 1 %	S
AA48D12-0.41	36-75VDC	±12 VDC	±0.41 A	87	± 1 %	S
AA48D15-0.33	36-75VDC	±15 VDC	±0.33 A	87	± 1 %	S

ABSOLUTE MAXIMUM RATINGS

PARAMETER	CONDITIONS	MODEL	Min.	Typical	Max.	Units
Input Voltage						
Continuous	DC	$5V_{in}$ $12V_{in}$ $24V_{in}$ $48V_{in}$	4.7 9 18 36		9 18 36 75	Volts
Transient	100ms, DC	5Vin 12Vin $24V_{in}$ $48V_{in}$			12 25 50 100	Volts
Operating Ambient Temperature	Derating, Above 51°C	All	-40		+85	°C
Case Temperature		All			+105	°C
Storage Temperature		All	-55		+125	°C
Input / Output Isolation Voltage	1 minute	All			1500	Volts

INPUT CHARACTERISTICS

Note: All specifications are typical at nominal input, full load at 25°C unless otherwise noted

PARAMETER	CONDITIONS	MODEL	Min.	Typical	Max.	Units
Operating Input Voltage		5Vin 12Vin 24V_{in} 48V_{in}	4.7 9 18 36	5 12 24 48	9 18 36 75	Volts
Input Under Voltage Lockout						
Turn-On Voltage Threshold		5Vin 12Vin 24V_{in} 48V_{in}	4.2 8.0 16.5 33.5	4.4 8.5 17 34	4.6 9.0 17.5 34.5	Volts
Turn-Off Voltage Threshold		5Vin 12Vin 24V_{in} 48V_{in}	4 7.7 15.5 32.5	4.2 8 16 33	4.4 8.3 16.7 33.5	Volts
Lockout Hysteresis Voltage		5Vin 12Vin 24V_{in} 48V_{in}		0.3 5 1 1		Volts
Maximum Input Current	100% Load, Vin =5V	5Vin			2700	mA
	100% Load, Vin =12V	12Vin			1350	
	100% Load, V_{in} =18V	24Vin			675	
	100% Load, V_{in} =36V	48Vin			338	
No-Load Input Current	V_{in} =Nominal input	AA5S3.3-2.5 AA5S5-2 AA5S12-0.83 AA5S15-0.66 AA5D5-1 AA5D12-0.41 AA5D15-0.33 AA12S3.3-2.5 AA12S5-2 AA12S12-0.83 AA12S15-0.66 AA12D5-1 AA12D12-0.41 AA12D15-0.33 AA24S3.3-2.5 AA24S5-2 AA24S12-0.83 AA24S15-0.66 AA24D5-1 AA24D12-0.41 AA24D15-0.33 AA48S3.3-2.5 AA48S5-2 AA48S12-0.83 AA48S15-0.66 AA48D5-1 AA48D12-0.41 AA48D15-0.33		120 120 50 50 50 50 50 30 30 30 35 45 45 45 25 25 25 25 25 25 25 20 20 20 20 20 20 20		mA
Inrush Current (I^2t)	As per ETS300 132-2	All			0.1	A^2s
Input Reflected-Ripple Current	P-P thru 12uH inductor, 5Hz to 20MHz	All			30	mA

OUTPUT CHARACTERISTIC

PARAMETER	CONDITIONS	MODEL	Min.	Typical	Max.	Units
Output Voltage Set Point	V_{in} =Nominal V_{in} , $I_o = I_{o\_max}$, Tc=25°C	Vo=3.3 Vo=5.0 Vo=12 Vo=15 Vo=±5.0 Vo=±12 Vo=±15	3.2505 4.925 11.82 14.775 4.925 11.82 14.775	3.3 5 12 15 5 12 15	3.3495 5.075 12.18 15.225 5.075 12.18 15.225	Volts
Output Voltage Regulation						
Line Regulation	V_{in} =High line to Low line Full Load	Single DIP Single SMD Dual			±0.2 ±0.3 ±0.5	% %
Load Regulation	I_o = Full Load to min. Load	Single DIP Single SMD Dual			±0.2 ±0.5 ±1.0	% %
Cross Regulation	Load cross variation 10%/100%	Dual			±5	%
Temperature Coefficient	TC=-40°C to 80°C				±0.03	%/°C
Output Voltage Ripple and Noise						
Peak-to-Peak	Full Load	DIP SMD			50 100	mV
Operating Output Current Range		Vo=3.3V Vo=5V Vo=12V Vo=15V Vo=±5V Vo=±12V Vo=±15V	0 0 0 0 0 0 0		2500 2000 833 666 ±1000 ±416 ±330	mA
Output DC Current-Limit Inception	Output Voltage=90% $V_{O,\ nominal}$		110	130	140	%
Maximum Output Capacitance	Full load, Resistance	Vo=3.3V Vo=5V Vo=12V Vo=15V Vo=±5V Vo=±12V Vo=±15V			2470 2000 940 690 1000 440 330	μF

DYNAMIC CHARACTERISTICS

PARAMETER	CONDITIONS	MODEL	Min.	Typical	Max.	Units
Output Voltage Current Transient	0.1A/μs					
Step Change in Output Current	50% to 75% and 75% to 100% of I_{o_max} di/dt=0.1A/us	All			±4	%
Setting Time (within 1% $Vo_{nominal}$)		All			500	μs
Turn-On Delay and Rise Time						
Turn-On Delay Time, From On/Off Control	$V_{on/off}$ to 10%V_{o_set}	All		10		ms
Turn-On Delay Time, From Input	V_{in_min} to 10%V_{o_set}	All		10		ms
Output Voltage Rise Time	10% V_{o_set} to 90% V_{o_set}	All		5		ms

FEATURE CHARACTERISTICS

PARAMETER	CONDITIONS	Device	Min.	Typical	Max.	Units
Efficiency 100% Load	Vin =5 Volts, Io = Io_max, Tc=25℃	AA5S3.3-2.5		87		%
		AA5S5-2		87		
		AA5S12-0.83		87		
		AA5S15-0.66		87		
		AA5D5-1		85		
		AA5D12-0.41		87		
		AA5D15-0.33		87		
	Vin =12 Volts, Io = Io_max, Tc=25℃	AA12S3.3-2.5		82		
		AA12S5-2		85		
		AA12S12-0.83		87		
		AA12S15-0.66		87		
		AA12D5-1		85		
		AA12D12-0.41		87		
		AA12D15-0.33		87		
	V_{in} =24 Vdc, I_o = I_{o_max}, Tc=25°C	AA24S3.3-2.5		82		
		AA24S5-2		85		
		AA24S12-0.83		87		
		AA24S15-0.66		87		
		AA24D5-1		85		
		AA24D12-0.41		87		
		AA24D15-0.33		87		
	V_{in} =48 Vdc, I_o = I_{o_max}, Tc=25°C	AA48S3.3-2.5		81		
		AA48S5-2		85		
		AA48S12-0.83		87		
		AA48S15-0.66		87		
		AA48D5-1		85		
		AA48D12-0.41		87		
		AA48D15-0.33		87		
ISOLATION CHARACTERISTICS						
Input to Output	1 minutes	All	1500			Volts
Isolation Resistance		All	1000			MΩ
Isolation Capacitance		All		1500		pF
Switching Frequency				350		KHz
On/Off Control, Positive Remote On/Off logic						
Logic High (Module On)	$V_{on/off}$ at $I_{on/off}$=0.1uA	All	5.5 or Open Circuit		75	Volts
Logic Low (Module Off)	$V_{on/off}$ at $I_{on/off}$=1.0mA	All			1.2	Volts
On/Off Current (for both remote on/off logic)	$I_{on/off}$ at $V_{on/off}$=0V	All		0.3	1	mA
Leakage Current (for both remote on/off logic)	Logic High, $V_{on/off}$=15V				30	uA
Output Voltage Trim Range	Pout = max Rated Power		-10		+10	%
Off Converter Input Current	Shutdown input idle current	AA12 series		10	15	mA
		others		5	10	mA
Output Over Voltage Protection	Zener or TVS Clamp	Vo=3.3V		3.9		Volts
		Vo=5.0V		6.2		
		Vo=12V		15		
		Vo=15V		18		
		Vo=±5V		±6.2		
		Vo=±12V		±15		
		Vo=±15V		±18		
MTBF	I_o =100% of I_{omax}; Ta=25°C per MIL-HDBK-217F	All		1.2		M hours
Weight		All		18.4		grams

Operating Temperature Range

The AA series converters operate over a wide ambient temperature range from -40°C to +85°C (de-rating above +71°C). The module operate normally up to +105°C.

Remote On/Off

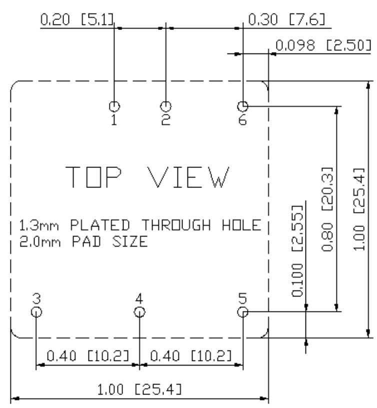
The AA series offers a Remote On/Off feature in order for the user to switch the module on and off electronically. All standard models are available as “positive logic” versions. The converter turns on if the Remote On/Off pin is high (Greater than 3.5VDC to 75VDC or open circuit). When the Remote On/Off pin is low (Less than 1.2VDC) the converter will turn off. The signal level of the Remote On/Off input is defined with respect to ground. If not using the Remote On/Off pin, leave the pin open and the converter will be on.

Over Current Protection

All models have internal over current and continuous short circuit protection. The unit operates normally once the fault condition is removed. At the point of current limit inception, the converter will go into hiccup mode protection.

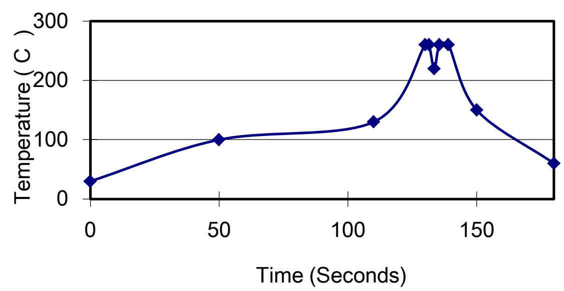
Recommended Layout PCB Footprints and Soldering Information

The end user of the converter must ensure that other components and metal in the vicinity of the converter meet the spacing requirements to which the system is approved. Low resistance and low inductance PCB layout traces should be used where possible. Careful consideration must also be given to proper low impedance tracks between power module, input and output grounds. The recommended footprints and soldering profiles are shown in the next two figures



Recommended PCB Layout Footprints

Note that all dimensions are in inches (millimeters)



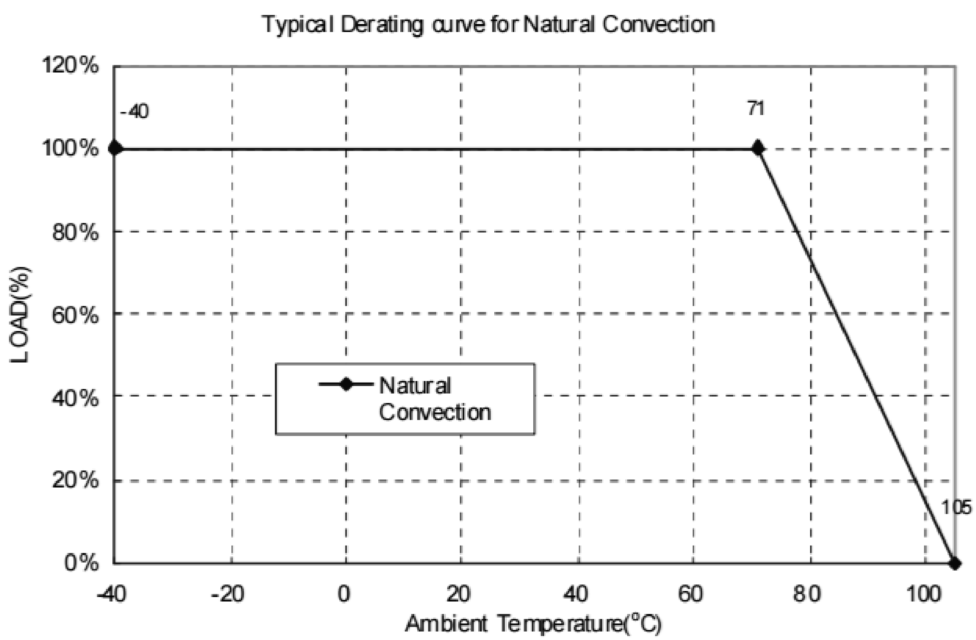
Note：

1. Soldering Materials: Sn/Cu/Ni
2. Ramp up rate during preheat: 1.4 °C/Sec (From 50°C to 100°C)
3. Soaking temperature: 0.5 °C/Sec (From 100°C to 130°C), 60±20 seconds
4. Peak temperature: 260°C, above 250°C 3~6 Seconds
5. Ramp up rate during cooling: -10.0 °C/Sec (From 260°C to 150°C)

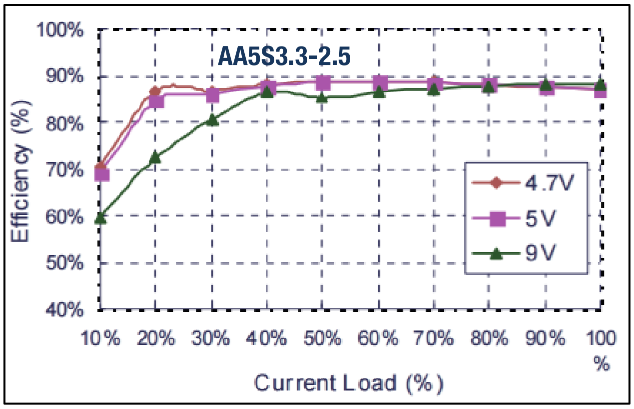
Recommended PCB Layout Footprints and Wave Soldering Profiles

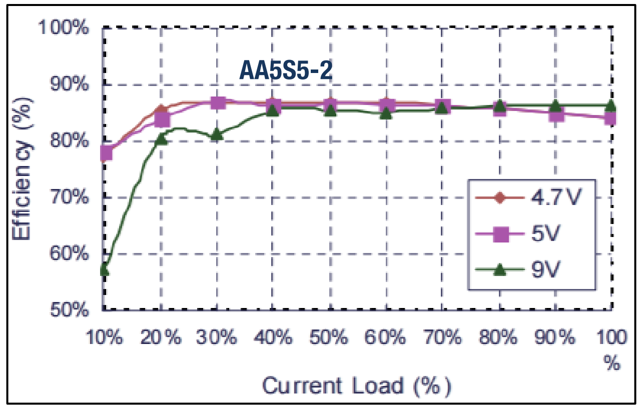
AA Series power de-rating Curves

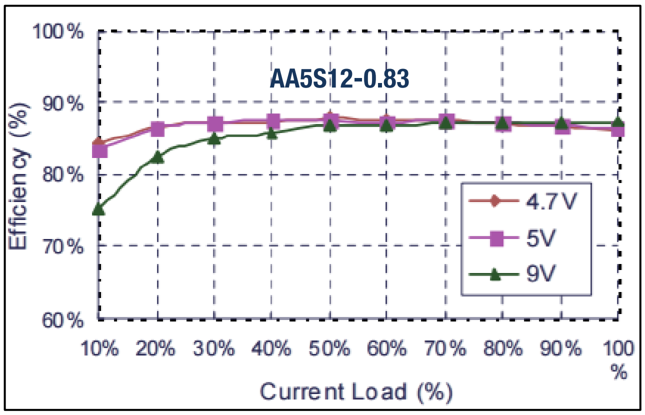
Note that operating ambient temperature range is -40°C to + 85°C with derating above 71°C. Also, maximum case temperature under any operating condition should not exceed +105°C.

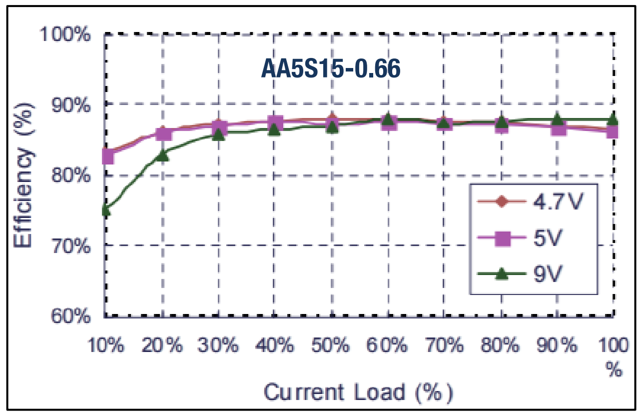


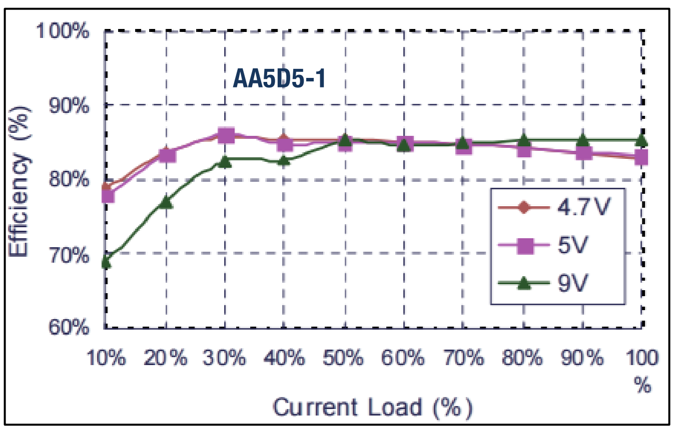
Efficiency vs. Load Curves

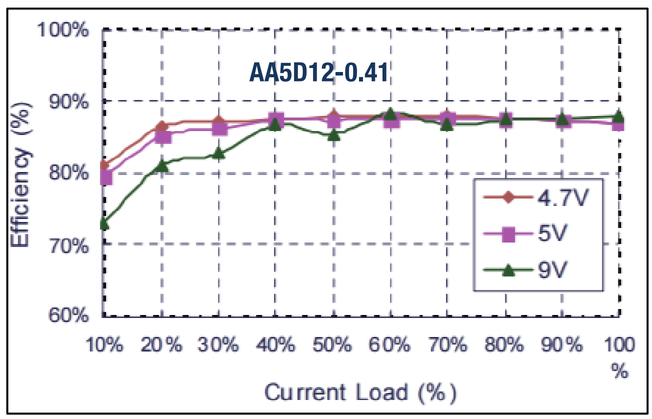

AA5S3.3-2.5
Efficiency (%)
Current Load (%)
4.7V
5V
9V

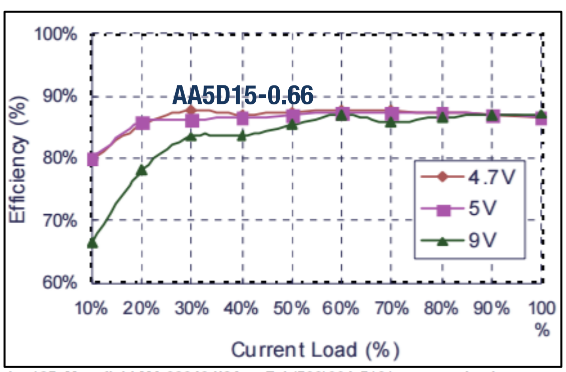

AA5S5-2
Efficiency (%)
Current Load (%)
4.7V
5V
9V


AA5S12-0.83
Efficiency (%)
Current Load (%)
4.7V
5V
9V

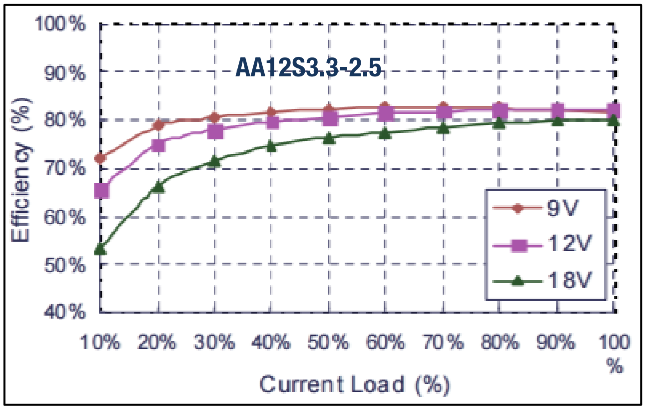

AA5S15-0.66
Efficiency (%)
Current Load (%)
4.7V
5V
9V

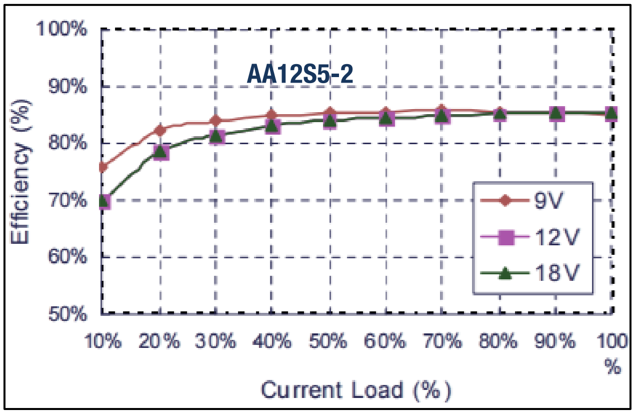

AA5D5-1
Efficiency (%)
Current Load (%)
4.7V
5V
9V

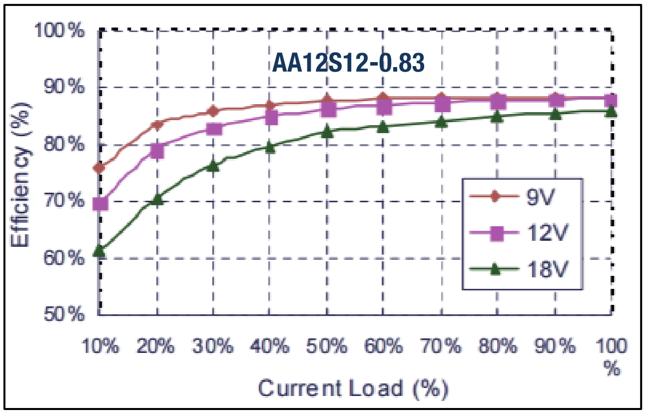

AA5D12-0.41
Efficiency (%)
Current Load (%)
4.7V
5V
9V

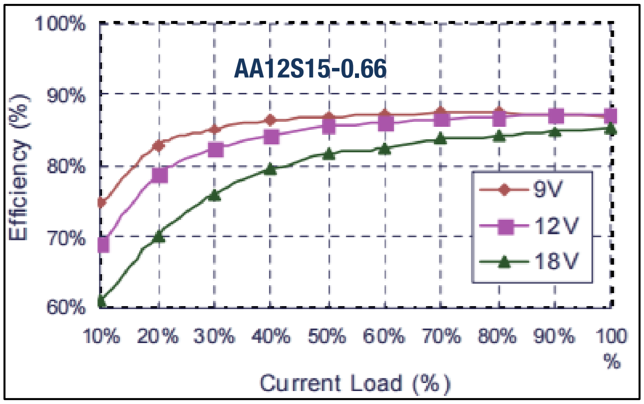

AA5D15-0.66
Efficiency (%)
Current Load (%)
4.7V
5V
9V

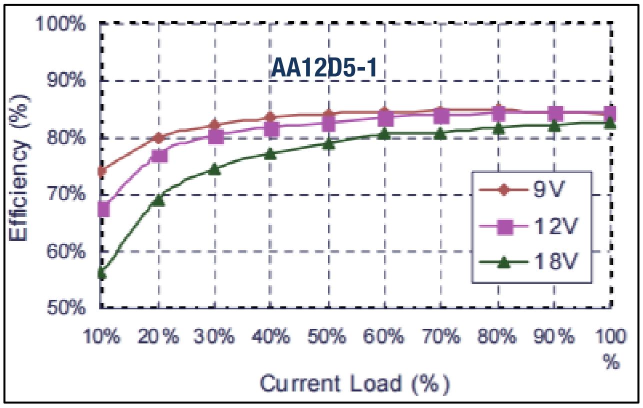
Efficiency vs. Load Curves

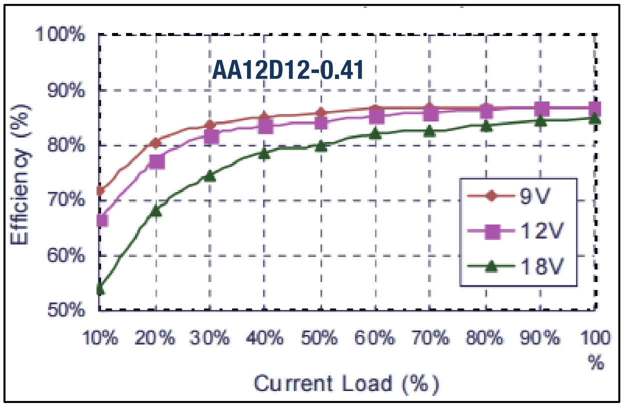


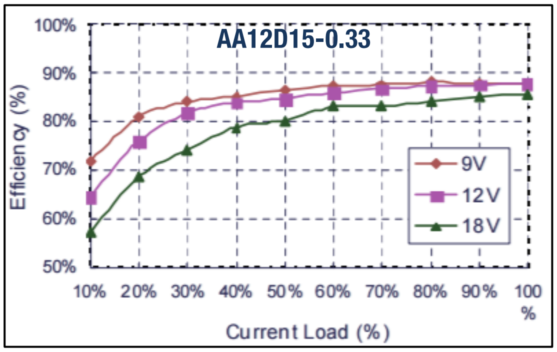




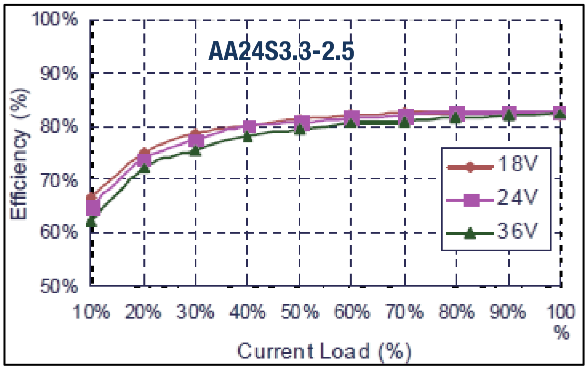


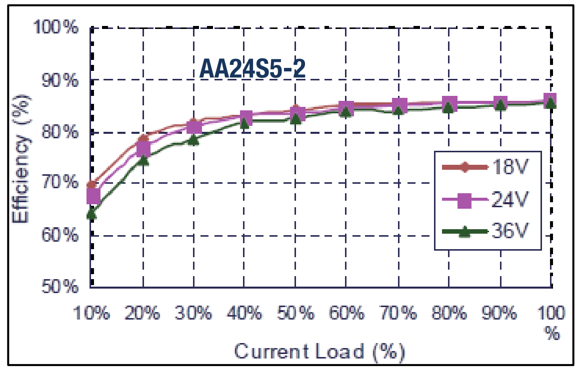


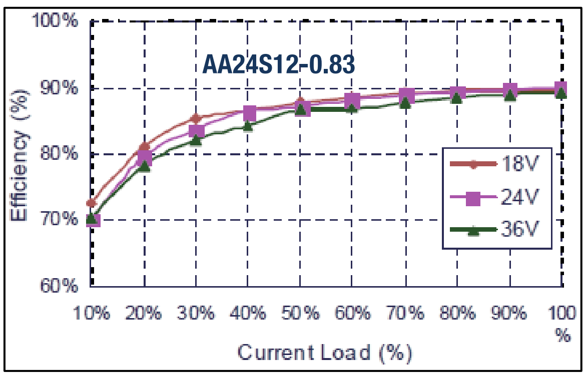


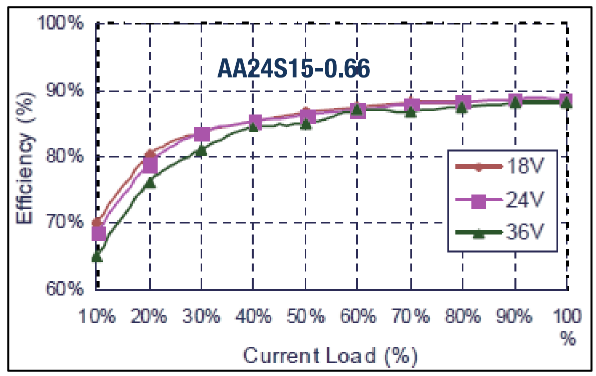


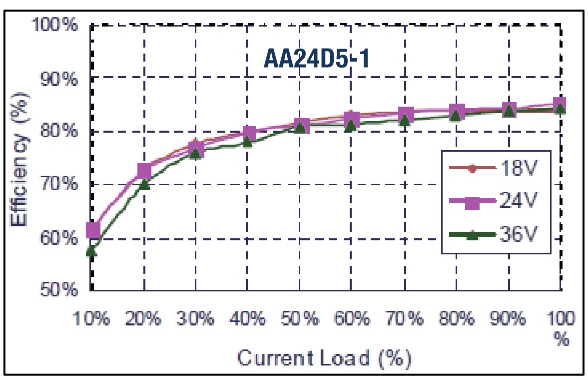
Efficiency vs. Load Curves

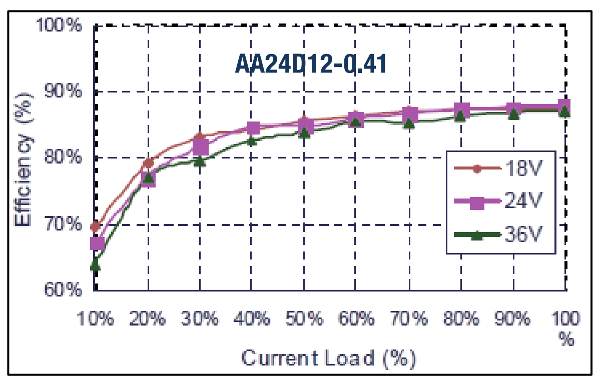


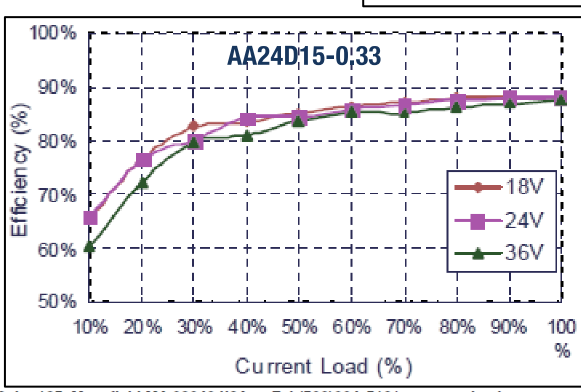




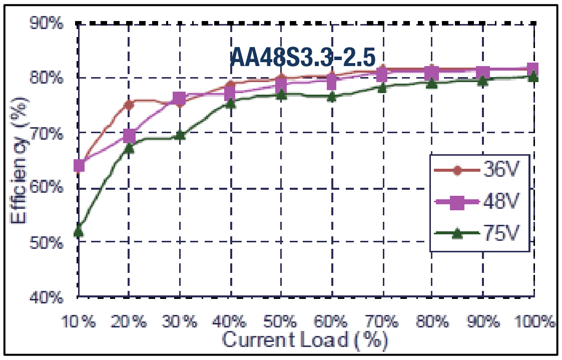


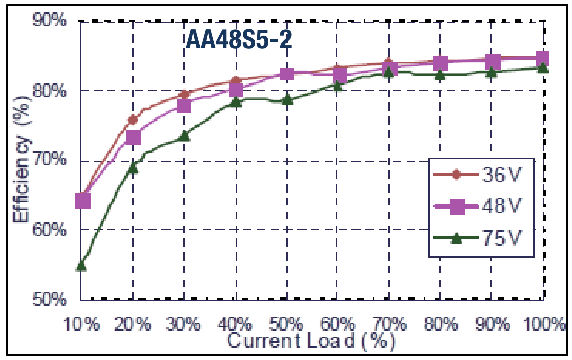


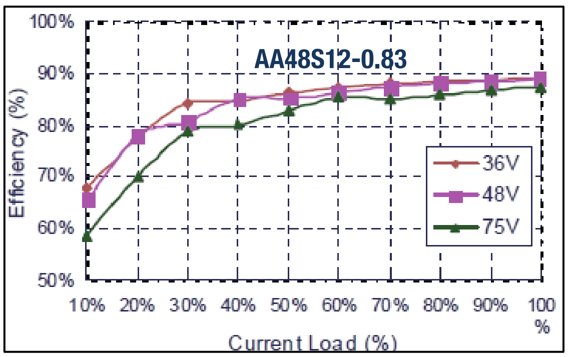


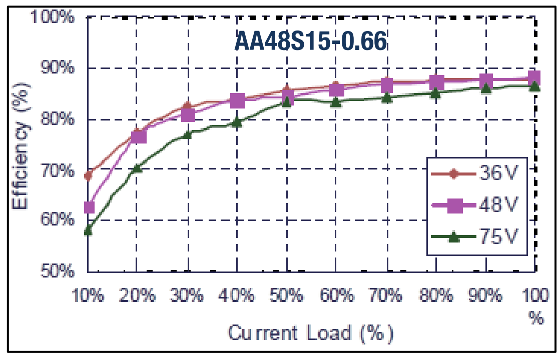


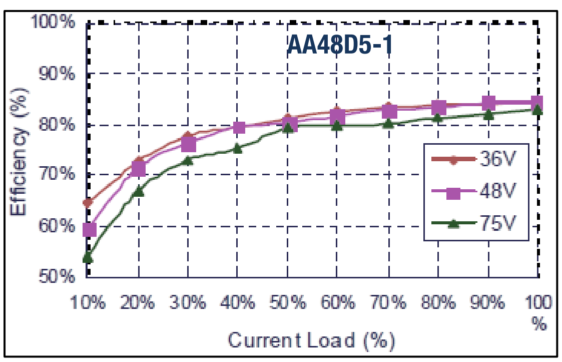
Efficiency vs. Load Curves

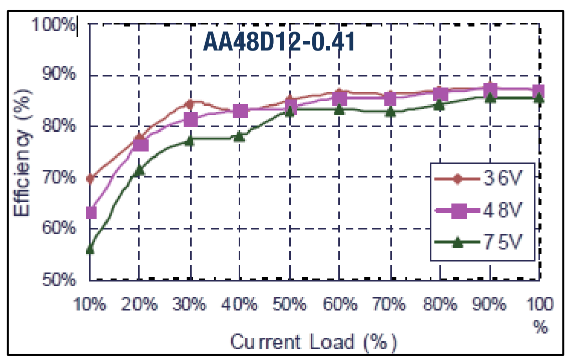


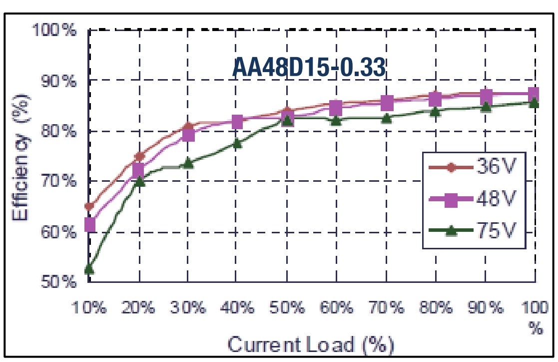






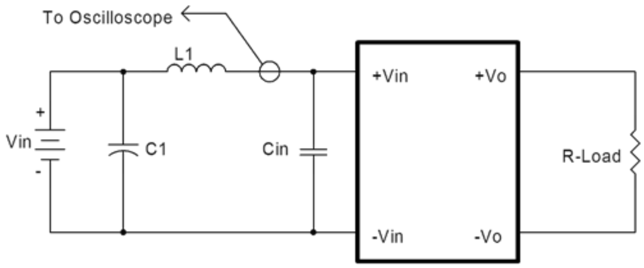






Input Capacitance at the Converter

In order to avoid problems with loop stability, the converter must be connected to a low impedance AC source and a low inductance source. The input capacitors (Cin) should be placed close to the converter input pins to de-couple distribution inductance. The external input capacitors should have low ESR in order to quiet any ripple. Circuit as shown in the figure below represents typical measurement methods for reflected ripple current. The capacitor C1 and inductor L1 simulate the typical DC source impedance. The input reflected-ripple current is measured by a current probe oscilloscope with a simulated source Inductance (L1).



L1: 10uH
C1: None ESR < 0.1ohm @100KHz
Cin: 22μF ESR < 0.66ohm @100KHz

Input Reflected-Ripple Test Setup

Test Set-Up

The basic test set-up to measure efficiency, load regulation, line regulation and other parameters is shown in the next figure. When testing the converter under any transient conditions, the user should ensure that the transient response of the source is sufficient to power the equipment under test. Below is the calculation of:

1- Efficiency
2- Load regulation
3- Line regulation

The value of efficiency is defined as:

$$\eta = \frac{V_O \times I_O}{V_{IN} \times I_{IN}} \times 100\%$$

Where

V_O is output voltage,
I_O is output current,
VIN is input voltage,
I_{IN} is input current.

The value of load regulation is defined as:

$$Load.reg = \frac{V_{FL} - V_{NL}}{V_{NL}} \times 100\%$$

Where

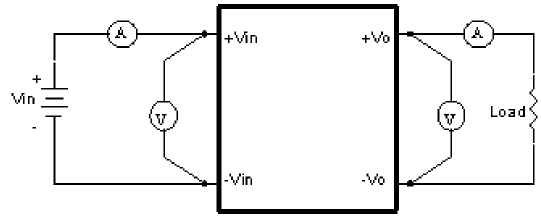
V_{FL} is the output voltage at full load
V_{NL} is the output voltage at 10% load

The value of line regulation is defined as:

$$Line.reg = \frac{V_{HL} - V_{LL}}{V_{LL}} \times 100\%$$

Where

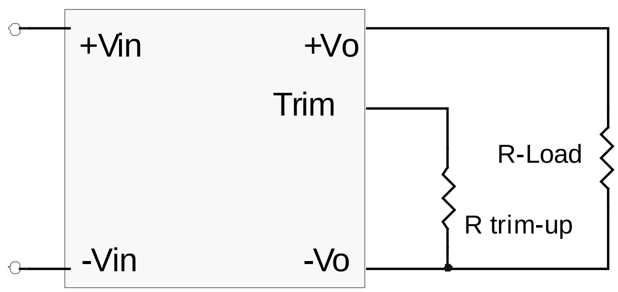
V_{HL} is the output voltage of maximum input voltage at full load.
V_{LL} is the output voltage of minimum input voltage at full load.



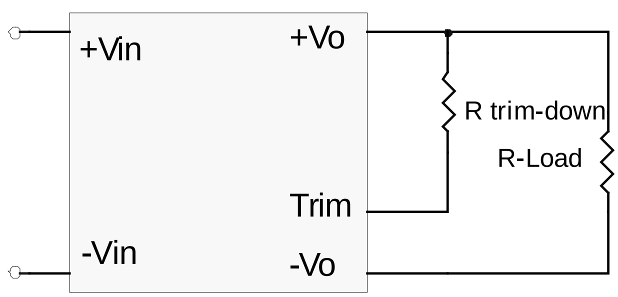
AA Series Test Setup

Output Voltage Adjustment

In order to trim the voltage up or down one needs to connect the trim resistor either between the trim pin and -Vo for trim-up and between trim pin and +Vo for trim-down. The output voltage trim range is ±10%. This is shown in the next two figures:



Trim-up Voltage Setup



Trim-down Voltage Setup

1. The value of Rtrim-up defined as:

$$R_{trim-up} = \left(\frac{V_r \times R1 \times (R2+R3)}{(V_o - V_{o,nom}) \times R2}\right) - R_t \ \ (K\Omega)$$

Where

R trim-up is the external resistor in Kohm.

$V_{0,nom}$ is the nominal output voltage.

V_0 is the desired output voltage.

R1, R_t, R2, R3 and V_r are internal to the unit and are defined in the table below

Trim up and Trim down Resistor Values

Model Number	Output Voltage(V)	R1 (KΩ)	R2 (KΩ)	R3 (KΩ)	Rt (KΩ)	Vr (V)
AA5S3.3-2.5 AA12S3.3-2.5 AA24S3.3-2.5 AA48S3.3-2.5	3.3	2.74	1.8	0.27	9.1	1.24
AA5S5-2 AA12S5-2 AA24S5-2 AA48S5-2	5.0	2.32	2.32	0	8.2	2.5
AA5S12-0.83 AA12S12-0.83 AA24S12-0.83 AA48S12-0.83	12.0	6.8	2.4	2.32	22	2.5
AA5S15-0.66 AA12S15-0.66 AA24S15-0.66 AA48S15-0.66	15.0	8.06	2.4	3.9	27	2.5

For example, to trim-up the output voltage of 5.0V module (AA24S5-2) by 10% to 5.5V, R trim-up is calculated as follows:

$V_o - V_{o,nom} = 5.5 - 5.0 = 0.5V$

R1 = 2.32 KΩ

R2 = 2.32 KΩ

R3 = 0 KΩ

Rt = 8.2 KΩ,

Vr= 2.5 V

$$R_{trim-up} = \left(\frac{2.5 \times 2.32 \times (2.32+0)}{0.5 \times 2.32}\right) - 8.2 = 3.4(K\Omega)$$

2. The value of R trim-down defined as:

$$R_{trim-down} = R1 \times \left(\frac{Vr \times R1}{(V_{o,nom} - V_o) \times R2} - 1\right) - R_t \ \ (K\Omega)$$

Where

R trim-down is the external resistor in Kohm.

$V_{0,nom}$ is the nominal output voltage.

V_0 is the desired output voltage.

R1, R_t, R2, R3 and V_r are internal to the unit and are defined in the table above.

For example, to trim-down the output voltage of 5.0V module (AA22S5-2) by 10% to 4.5V, R trim-down is calculated as follows:

$V_{0,nom} - V_o = 5.0 - 4.5 = 0.5V$

R1 = 2.32 KΩ
R2 = 2.32 KΩ
R3 = 0 KΩ
Rt = 8.2 KΩ
Vr= 2.5 V

$$R_{trim-down} = 2.32 \times \left(\frac{(2.5 \times 2.32)}{0.5 \times 2.32} - 1\right) - 8.2 = 1.08 \ \ (K\Omega)$$

Noise Measurement and Output Ripple

The test set-up for noise and ripple measurements is shown in the figure below. A coaxial cable was used to prevent impedance mismatch reflections disturbing the noise readings at higher frequencies. Measurements are taken with the output appropriately loaded and all ripple/noise specifications are from D.C. to 20MHz Bandwidth.

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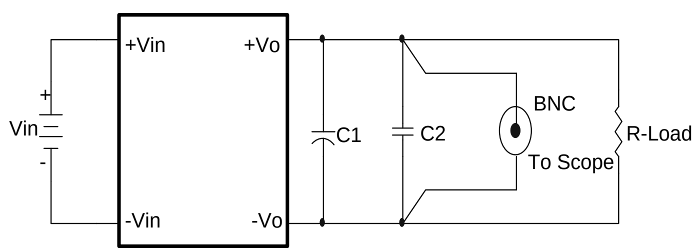


Note: C1: 10μF tantalum capacitor
C2: 1μF ceramic capacitor

Output Voltage Ripple and Noise Measurement Set-Up

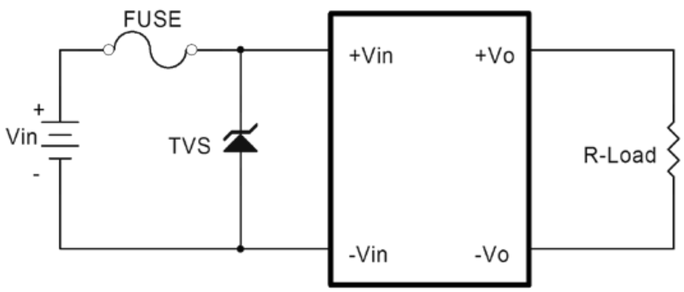
Output Capacitance

The AA series converters provide unconditional stability with or without external capacitors. For good transient response, low ESR output capacitors should be located closer to the point of load.

SAFETY and EMC

Input Fusing and Safety Considerations

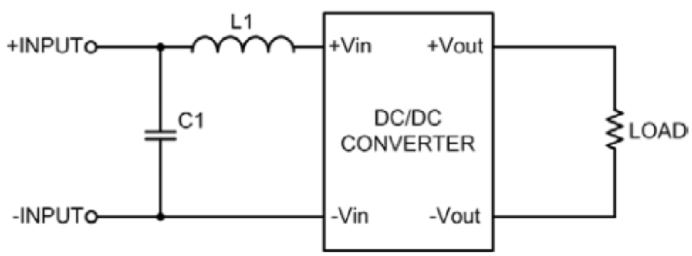
The AA series of converters do not have an internal fuse. However, to achieve maximum safety and system protection, always use an input line fuse. We recommended a time delay fuse 6A for 24Vin models and 3A for 48Vin modules. The circuit in the figure below is recommended by a Transient Voltage Suppressor diode across the input terminal to protect the unit against surge or spike voltage and input reverse voltage.



Input Protection Circuit

EMC Considerations

EMI Test standard: EN55022 Class A and Class B Conducted Emission
Test Condition: Input Voltage: Nominal, Output Load: Full Load

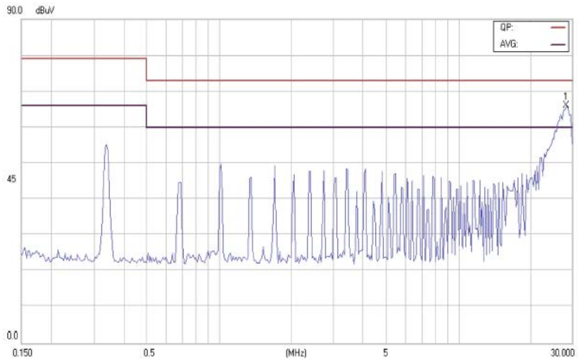


Connection circuit for conducted EMI testing

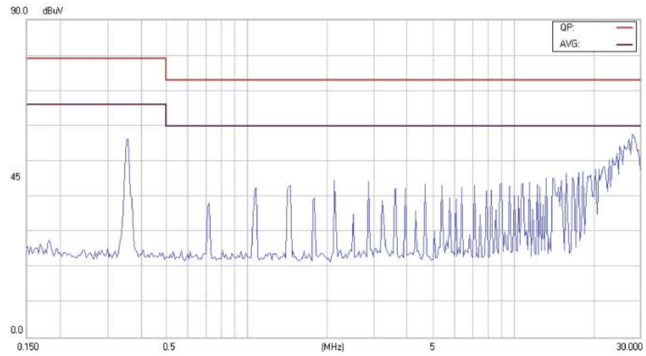
EN55022 class A			EN55022 class B		
Model No.	C1	L1	Model No.	C1	L1
AA24S3.3-2.5	NC	Short	AA24S3.3-2.5	1µF /100V 1812	3.9µH
AA24S5-2	NC	Short	AA24S5-2	1µF /100V 1812	3.9µH
AA2412-0.83	NC	Short	AA2412-0.83	1µF /100V 1812	3.9µH
AA24S15-0.66	NC	Short	AA24S15-0.66	1µF /100V 1812	3.9µH
AA24D5-1	NC	Short	AA24D5-1	1µF /100V 1812	3.9µH
AA24D12-0.41	NC	Short	AA24D12-0.41	1µF /100V 1812	3.9µH
AA24D15-0.33	NC	Short	AA24D15-0.33	1µF /100V 1812	3.9µH
AA48S3.3-2.5	NC	Short	AA48S3.3-2.5	1µF /100V 1812	3.9µH
AA48S5-2	NC	Short	AA48S5-2	1µF /100V 1812	3.9µH
AA48S12-0.83	NC	Short	AA48S12-0.83	1µF /100V 1812	3.9µH
AA48S15-0.66	NC	Short	AA45S15-0.66	1µF /100V 1812	3.9µH
AA48D5-1	NC	Short	AA48D5-1	1µF /100V 1812	3.9µH
AA48D12-0.41	NC	Short	AA48D12-0.41	1µF /100V 1812	3.9µH
AA48D15-0.33	NC	Short	AA48D15-0.33	1µF /100V 1812	3.9µH

Note: All of capacitors are ceramic capacitors.

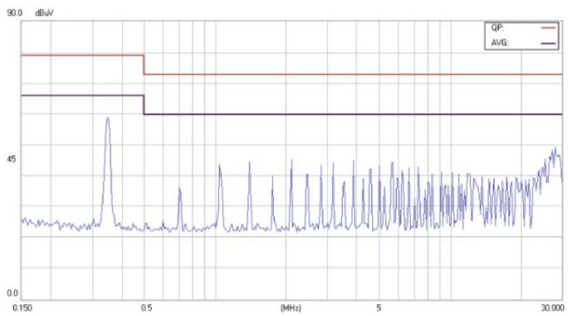
EMI and conducted noise meet EN55022 Class A



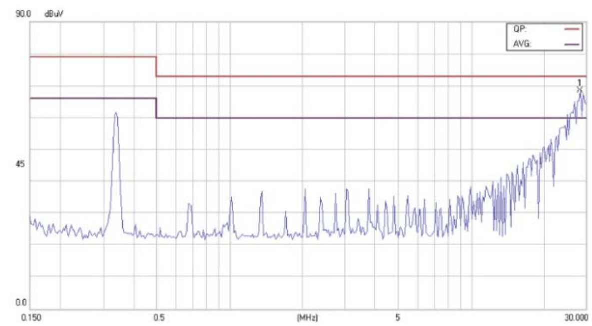
Class A Test conducted for AA24S3.3-2.5



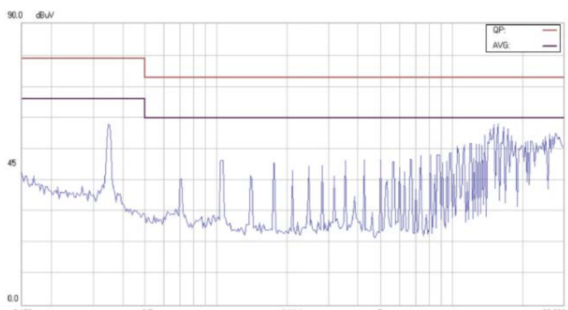
Class A Test conducted for AA24S5-1



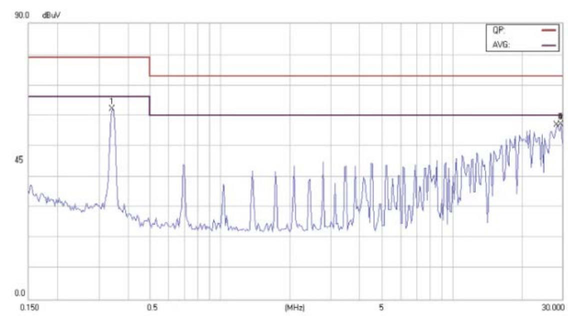
Class A Test conducted for AA24S12-0.83



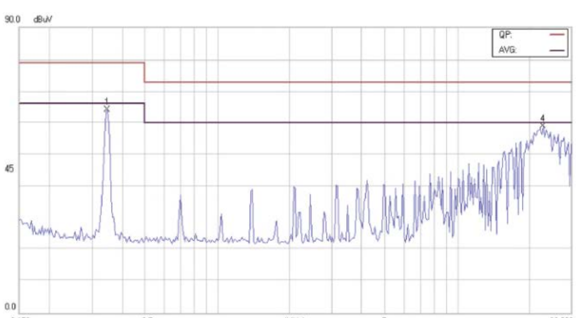
Class A Test conducted for AA24S15-0.66



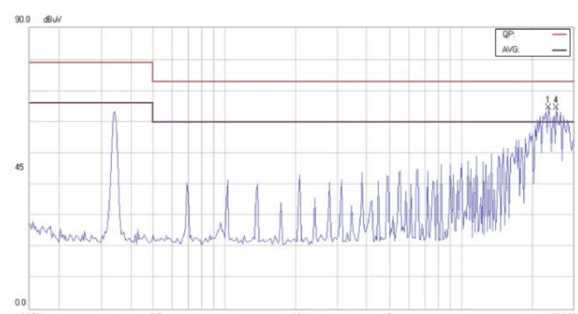
Class A Test conducted for AA48S3.3-2.5



Class A Test conducted for AA48D5-2



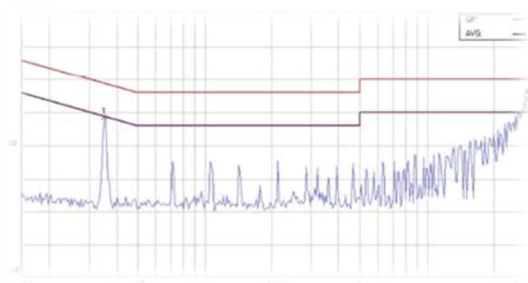
Class A Test conducted for AA48S12-0.83



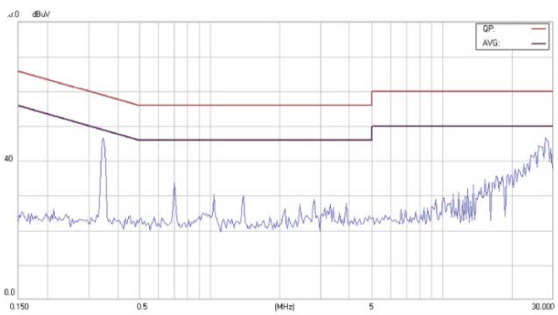
Class A Test conducted for AA48S15-0.66

EMI and conducted noise meet EN55022 Class B

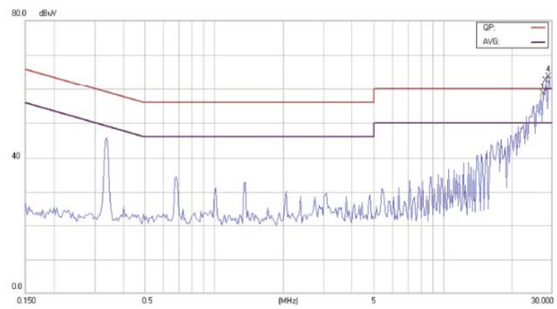
Class B Test conducted for AA24S3.3-2.5



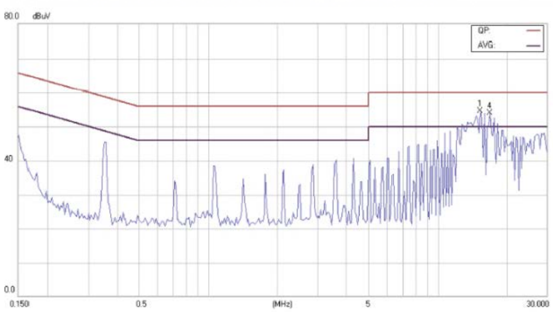
Class B Test conducted for AA24S5-2



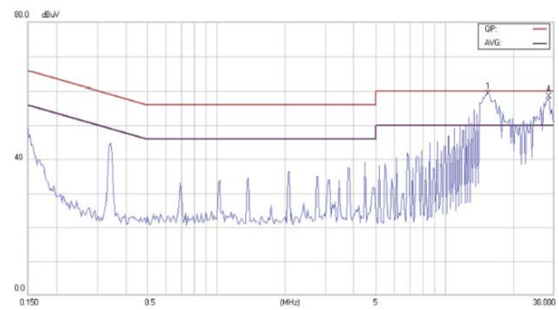
Class B Test conducted for AA24S12-0.83



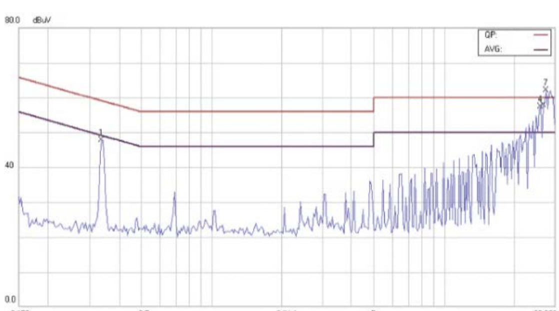
Class B Test conducted for AA24S15-0.66



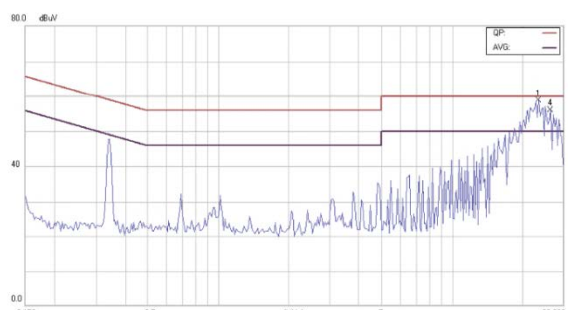
Class B Test conducted for AA48S3.3-2.5



Class B Test conducted for AA48S5-2



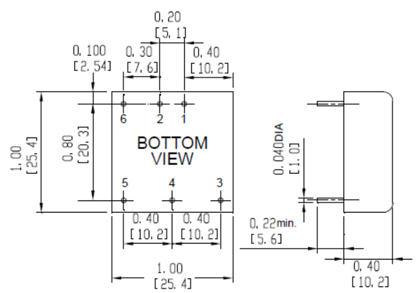
Class B Test conducted for AA484S12-0.83



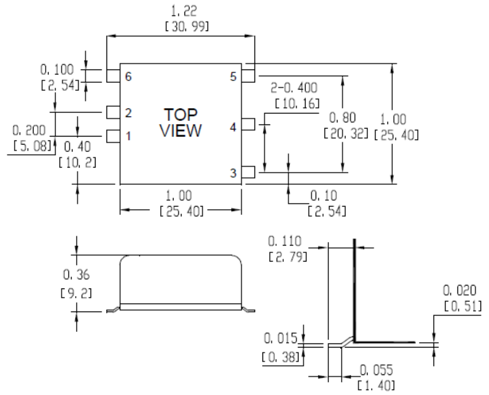
Class B Test conducted for AA48S15-0.66

MECHANICAL SPECIFICATIONS

STANDARD PACKAGE



SMD- PACKAGE



Note: All dimensions are in inches (millimiters). Tolerance: x.xx ±0.02 in. (0.5mm), x.xxx ±0.010 in. (0.25 mm) unless otherwise noted

PIN CONNECTIONS

PIN CONNECTION		
PIN	**SINGLE**	**DUAL**
1	+ V Input	+ V Input
2	- V Input	- V Input
3	+ V Output	+ V Output
4	Trim	Common
5	- V Output	- V Output
6	Remote	Remote

PART NUMBER ORDERING INFORMATION

Family, Form-Factor. Package	Nominal Input Voltage	Number of Outputs	Voltage Output		Current Output (A)	Options
AA	**24**	**S**	**5**	**-**	**2**	**S**

Nominal Input Voltage:
- (4.7-9) 5 Volts
- (9-18) 12 Volts
- (18-36) 24 Volts
- (36-75) 48 Volts

Number of Outputs:
- S- Single
- D- Dual

Voltage Output:
- 3.3 Volts
- 5 Volts
- 12 Volts
- 15 Volts

Current Output (A):
- 3.3 Volts – 2.5 A
- 5 Volts – 2 A
- 12 Volts – 0.83A
- 15 Volts – 0.66A
- ±5 Volts – ±1A
- ±12 Volts – ±0.41A
- ±15 Volts – ±0.33A

Options:
- None – DIP Package
- S – Surface Mount Package

Note: For proper part ordering, enter option suffixes in order listed in table above