

### FEATURES

- ◆ Ultra-wide 2:1 input range
- ◆ DIP-16 package
- ◆ Efficiency up to 81%
- ◆ Temperature range -40°C to +85°C
- ◆ HMTBF > 1,000,000 Hours
- ◆ Low Ripple and Noise
- ◆ Short Circuit Protection
- ◆ I/O isolation 1500 VDC
- ◆ Complies with EN55022 Class A
- ◆ Fully RoHS compliant
- ◆ UL 94 V-0 Package Material
- ◆ Internal SMD Construction

### MODEL SELECTION

2A<sup>①</sup>24<sup>②</sup>05<sup>③</sup>Y<sup>④</sup>JD<sup>⑤</sup>

- ① Product Series
- ② Input Voltage
- ③ Output Voltage
- ④ Wide (2:1) Input Range
- ⑤ DIP16 Package Style

### DESCRIPTION

The 2A-YJD & 2B-YJD Series power modules are low-profile dc-dc converters that operate over input voltage of 4.5-9VDC, 9-18VDC, 18-36VDC and 36-75VDC which provide precisely regulated output voltages of 3.3V, 5V, 12V, 15V, ±5V, ±12V and ±15VDC.

The 2A-YJD & 2B-YJD Series is an excellent for data communication equipments, mobile battery driven equipments, distributed power systems, telecommunication equipments, mixed analog/machine control equipments, computer peripheral systems and industrial robot systems.

The modules have a maximum power rating of 2W and a typical full-load efficiency of 81%, continuous short circuit, 30mV output ripple, built-in filtering for both input and output minimize the need for external filtering.



### Absolute Maximum Ratings

Parameter	Min.	Max.	Unit.	
Input Sure Voltage (1000 mS)	5VDC Input Models	-0.7	11	VDC
	12VDC Input Models	-0.7	25	VDC
	24VDC Input Models	-0.7	50	VDC
	48VDC Input Models	-0.7	100	VDC
Lead Temperature(1.5mm from case for 10 Sec.)	---	260	°C	
Internal Power Dissipation	---	1,800	mW	

### Environmental Specifications

Parameter	Conditions	Min.	Max.	Unit.
Operating Temperature	Ambient	-40	+65	°C
Operating Temperature	Case	-40	+90	°C
Storage Temperature		-40	+125	°C
Humidity		---	95	%
Cooling	Free-Air Convection			
Conducted	EN55022 Class A			

Exceeding the absolute maximum ratings of the unit could cause damage.  
These are not continuous operating ratings.

### Capacitive Load

Models by Vout	3.3V	5V	12V	15V	±5V *	±12V *	±15V*	Unit
Maximum Capacitive Load	2200	1000	110	470	100	20	47	uF

\* For each output

### Input Fuse Selection Guide

5V Input Models	12V Input Models	24V Input Models	48V Input Models
1000mA Slow - Blow Type	500mA Slow - Blow Type	250mA Slow - Blow Type	120mA Slow - Blow Type

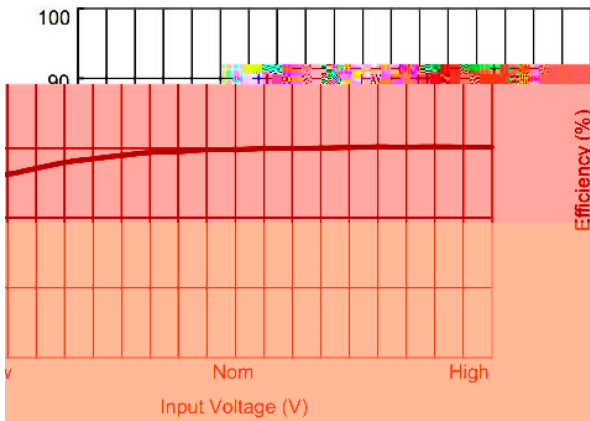
**SELECTION GUIDE**

Model Number	Input Voltage	Output Voltage	Output Current	Input Current	
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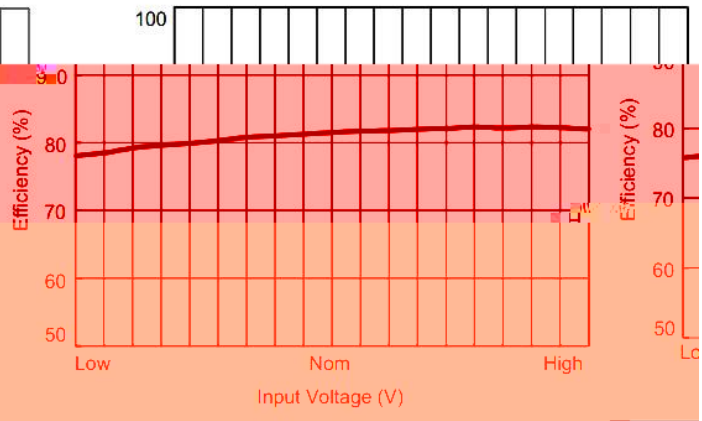
**General Specifications**

Parameter	Conditions	Min.	Typ.	Max.	Unit.
Isolation Voltage Rated	60 Seconds	1500	---	---	VDC
Isolation Voltage Test	Flash Tested for 1 Second	1650	---	---	VDC
Isolation Resistance	500VDC	1000	---	---	M

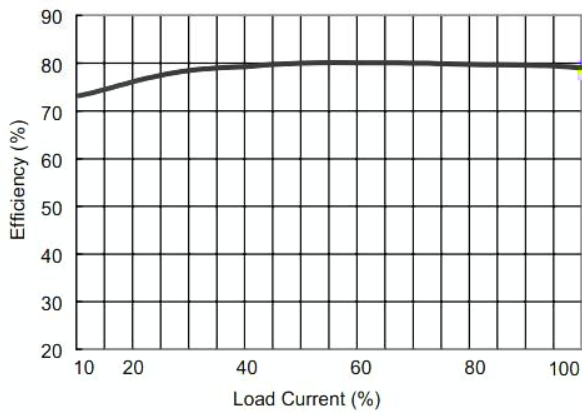
**Input Voltage Transient Rating**



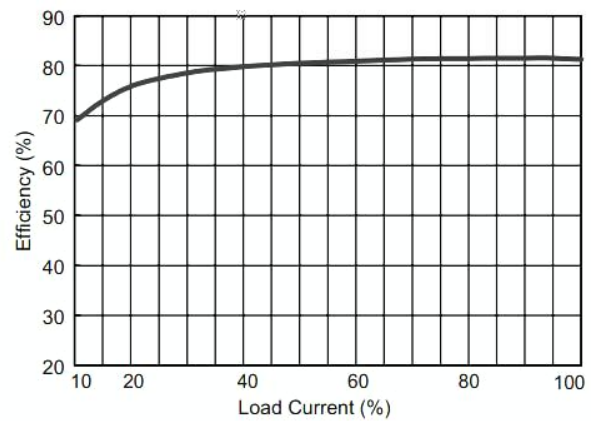
Efficiency vs Input Voltage ( Single Output )



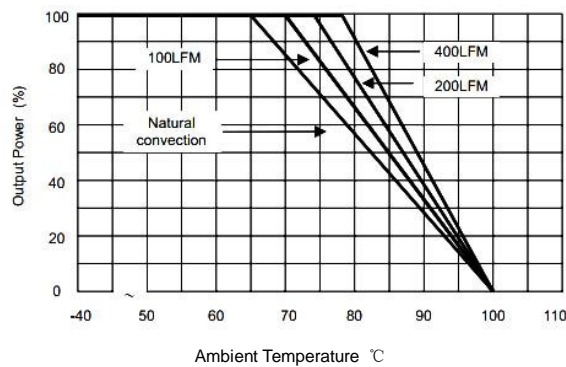
Efficiency vs Input Voltage ( Dual Output )



Efficiency vs Output Load ( Single Output )



Efficiency vs Output Load ( Dual Output )



**Derating Curve**

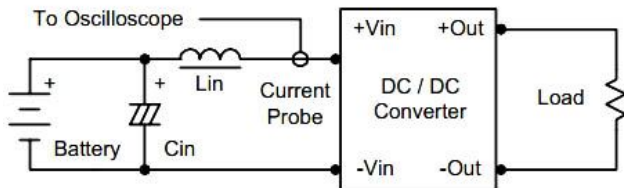
### Test Configurations

#### Input Reflected-Ripple Current Test Setup

Input reflected-ripple current is measured with an inductor  $L_{in}$  (4.7 $\mu$ H) and  $C_{in}$  (220 $\mu$ F, ESR < 1.0 $\Omega$  at 100 kHz) to simulated source impedance.

Capacitor  $C_{in}$ , offsets possible battery impedance.

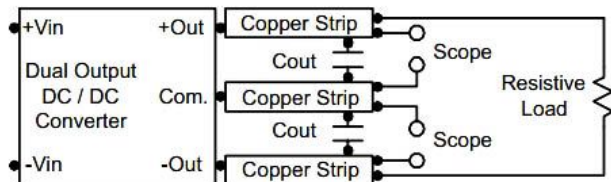
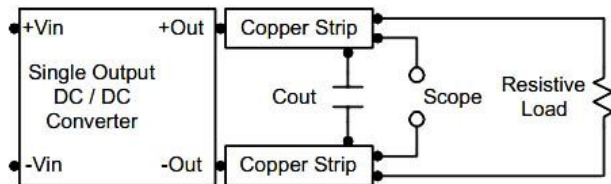
Current ripple is measured at the input terminals of the module, measurement bandwidth is 0-500KHz.



#### Peak-to-Peak Output Noise Measurement Test

Use a  $C_{out}$  0.47 $\mu$ F ceramic capacitor.

Scope measurement should be made by using a BNC socket, measurement bandwidth is 0-20 MHz. Position the load between 50 mm and 75 mm from the DC/DC Converter.



### Design & Feature Considerations

#### Maximum Capacitive Load

The 2A(B)-YJD series has limitation of maximum connected capacitance on the output.

The power module may operate in current limiting mode during start-up, affecting the ramp-up and the startup time.

The maximum capacitance can be found in the data sheet.

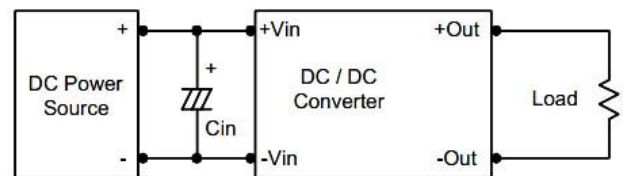
To provide protection in a fault (output overload) condition, the unit is equipped with internal current limiting circuitry and can endure current limiting for an unlimited duration. At the point of current-limit inception, the unit shifts from voltage control to current control. The unit operates normally once the output current is brought back into its specified range.

#### Input Source Impedance

The power module should be connected to a low ac-impedance input source. Highly inductive source impedances can affect the stability of the power module.

In applications where power is supplied over long lines and output loading is high, it may be necessary to use a capacitor on the input to insure startup.

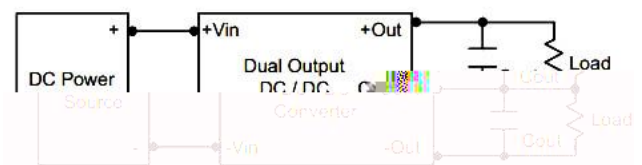
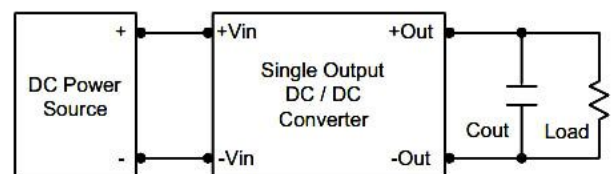
By using a good quality low Equivalent Series Resistance (ESR < 1.0 $\Omega$  at 100 kHz) capacitor of a 8.2 $\mu$ F for the 5V input devices, a 3.3 $\mu$ F for the 12V input devices and a 1.5 $\mu$ F for the 24V and 48V devices, capacitor mounted close to the power module helps ensure stability of the unit.



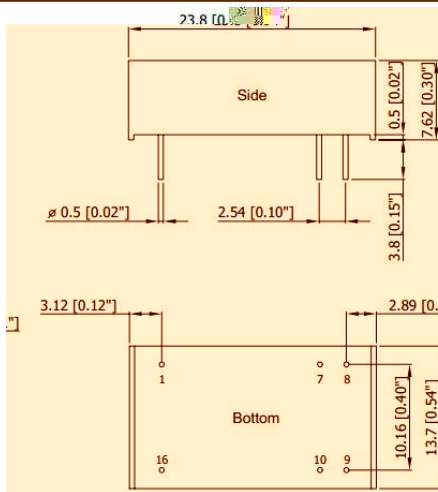
#### Output Ripple Reduction

A good quality low ESR capacitor placed as close as practicable across the load will give the best ripple and noise performance.

To reduce output ripple, it is recommended that 3.3 $\mu$ F capacitors are used on output.



**Mechanical Dimensions**



Tolerance	Millimeters	Inches
	X.X±0.25	X.XX±0.01
	X.XX±0.13	X.XXX±0.005
Pin	±0.05	±0.002

**Physical Characteristics**

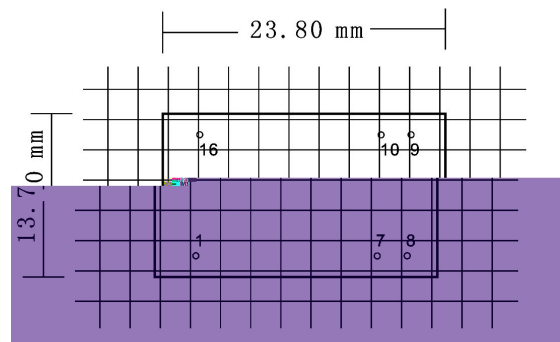
Case Size :	23.8*13.7*7.62 mm 0.94*0.54*0.30 inches
Case Material:	Non-Conductive Black Plastic
Weight:	5.1g
Flammability:	UL94V-0

**Pin Connections**

Pin	Single Output	Dual Output
1	-Vin	-Vin
7	NC	NC
8	NC	Common
9	+Vout	+Vout
10	-Vout	-Vout
16	+Vin	+Vin

NC: No Connection

**RECOMMENDED FOOTPRINT DETAILS**



All dimensions in inches ±0.01 (mm ±0.25mm)

**RoHS COMPLIANT INFORMATION**

This series is compatible with RoHS soldering systems with a peak wave solder temperature of 300° C for 10 seconds.  
The pin termination finish on the SIP package type is Tin Plate, Hot Dipped over Matte Tin with Nickel Preplate. The DIP types are Matte Tin over Nickel Preplate. Both types in this series are backward compatible with Sn/Pb soldering systems.

**REACH COMPLIANT INFORMATION**

This series has proven that this product does not contain harmful chemicals, it also has harmful chemical substances through the registration, inspection and approval.