

### FIXED INPUT, ISOLATED & REGULATED Dual Output DC/DC Converters



## FEATURES

- ◆ RoHS compliant
- ◆ Efficiency up to 86%
- ◆ SIP Package
- ◆ Wide temperature performance at full 2 Watt load, -40°C to 85°C
- ◆ UL 94V-0 package material
- ◆ No heatsink required
- ◆ Small Footprint
- ◆ Industry standard pinout
- ◆ Power sharing on output
- ◆ 1KVDC isolation
- ◆ 3.3V, 5V, 9V, 12V and 15V output
- ◆ Internal SMD construction
- ◆ No external components required
- ◆ MTTF up to 1.5 million hours

## MODEL SELECTION

2A<sup>①</sup>05<sup>②</sup>05<sup>③</sup>X<sup>④</sup>S<sup>⑤</sup>R<sup>⑥</sup>

- ① Product Series
- ② Input Voltage
- ③ Output Voltage
- ④ Fixed Input
- ⑤ SIP Package
- ⑥ Regulated output

## APPLICATIONS

The 2A\_XSR series are specially designed for applications where a group of polar power supplies are isolated from the input power supply in a distributed power supply system on a circuit board.

These products apply to:

- 1) where the voltage of the input power supply is fixed (voltage variation  $\leq \pm 5\%$ );
- 2) where isolation is necessary between input and output (isolation voltage  $\geq 1000\text{VDC}$ );
- 3) where the regulation of the output voltage and the output ripple noise are demanded.

## SELECTION GUIDE

Order code	Input		Output			Efficiency (% Typ)	Switching Frequency (KHz Typ)
	Voltage (VDC)		Voltage (VDC)	Current			
	Nominal	Range		Max	Min		
2A0503XSR	5	4.75-5.25	$\pm 3.3$	$\pm 150$	$\pm 15$	69	100
2A0505XSR	5	4.75-5.25	$\pm 5$	$\pm 200$	$\pm 20$	70	55
2A0509XSR	5	4.75-5.25	$\pm 9$	$\pm 100$	$\pm 10$	62	67
2A0512XSR	5	4.75-5.25	$\pm 12$	$\pm 83$	$\pm 9$	64	67
2A0515XSR	5	4.75-5.25	$\pm 15$	$\pm 67$	$\pm 7$	65	200
2A1205XSR	12	11.4-12.6	$\pm 5$	$\pm 150$	$\pm 15$	70	83
2A1209XSR	12	11.4-12.6	$\pm 9$	$\pm 100$	$\pm 10$	63	91
2A1212XSR	12	11.4-12.6	$\pm 12$	$\pm 83$	$\pm 9$	65	91
2A1215XSR	12	11.4-12.6	$\pm 15$	$\pm 67$	$\pm 7$	68	200
2A2405XSR	24	22.8-25.2	$\pm 5$	$\pm 150$	$\pm 15$	70	83
2A2409XSR	24	22.8-25.2	$\pm 9$	$\pm 100$	$\pm 10$	63	100
2A2412XSR	24	22.8-25.2	$\pm 12$	$\pm 83$	$\pm 9$	67	200
2A2415XSR	24	22.8-25.2	$\pm 15$	$\pm 67$	$\pm 7$	69	91

## ISOLATION SPECIFICATIONS

Parameter	Test conditions	Min.	Typ.	Max.	Units
Isolation test voltage	Flash tested for 1 minute and 1mA max	1000			VDC
Isolation resistance	Test at Viso=500VDC	1000			MΩ

## OUTPUT SPECIFICATIONS

Parameter	Test conditions	Min	Typ.	Max.	Units
Output power		0.2		2	W
Line regulation	For Vin change of $\pm 5\%$			$\pm 0.25$	%
Load regulation	10% to 100% full load			$\pm 1$	%
Output voltage accuracy	100% full load			$\pm 3$	%
Temperature drift	100% full load			0.03	%/°C
Output Ripple*	20MHz Bandwidth		20	30	MV p-p
Output Noise*	20MHz Bandwidth		75	150	MV p-p

\* Test ripple and noise by "parallel cable" method. See detailed operation instructions at Testing of Power Converter section, application notes.



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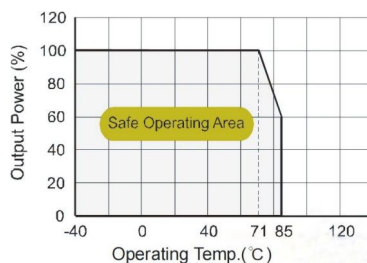
### TEMPERATURE CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Storage humidity range				95	%
Operating temperature		-40		80	°C
Storage temperature		-55		125	°C
Lead temperature	1.5mm from case for 10 seconds			30	°C
Temp.rise at full load			20	300	°C
Cooling	Free air convection				
Case material	Plastic(UL94-V0)				
Short circuit protection	05V output	Continuous			
	Others*			1	S
MTBF		3500			K hours
Weight			5.2		g

\*Supply voltage must be discontinued at the end of short circuit duration.

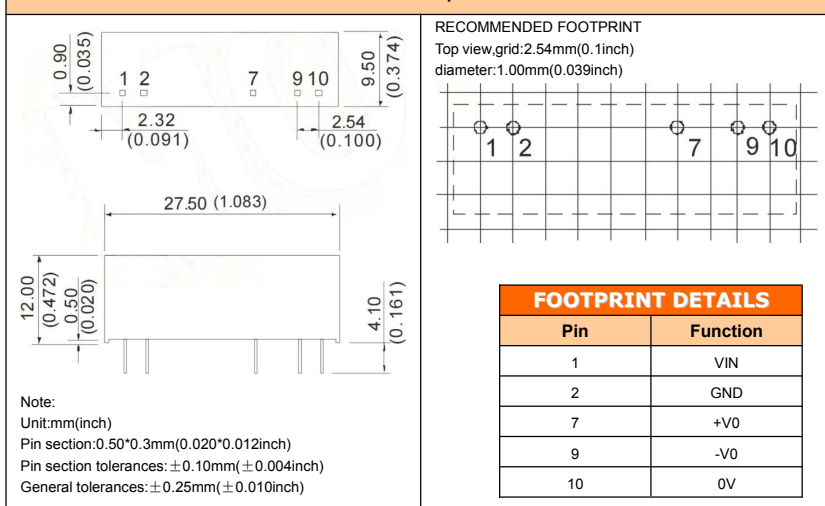
### TYPICAL CHARACTERISTICS

Temperature Derating Graph



### OUTLINE DIMENSIONS & PIN CONNECTIONS

SIZE Graph



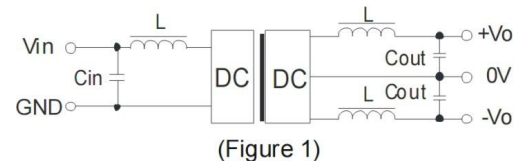
All specifications typical at TA=25°C, nominal input voltage and rated output current unless otherwise specified. Another 24V products, please inquire Our technical department!

#### Requirement on output load

To ensure this module can operate efficiently and reliably, During operation, the minimum output load is not less than 10% of the full load, and that this product should never be operated under no load! If the actual output power is very small, please connect a resistor with proper resistance at the output end in parallel to increase the load, or use our company's products with a lower rated output power (IA\_XS-1W series).

### Recommended circuit

To get an extreme low ripple, an "LC" filtering network may be connected to the input and output ends of the DC/DC converter, which may produce a more significant filtering effect. It should also be noted that the inductance and the frequency of the "LC" filtering network should be staggered with the DC/DC frequency to avoid mutual interference (see figure 1).



(Figure 1)

In some circuits which are sensitive to noise and ripple, a filtering capacitor may be added to the DC/DC output end and input end to reduce the noise and ripple. However, the capacitance of the output filter capacitor must be proper. If the capacitance is too big, a startup problem might arise. For every channel of output, provided the safe and reliable operation is ensured, the greatest capacitance of its filter capacitor sees the EXTERNAL CAPACITOR TABLE (see Table 1).

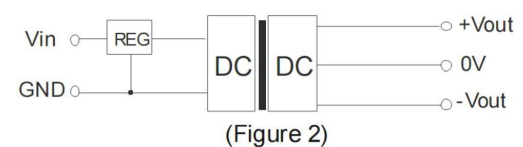
EXTERNAL CAPACITOR TABLE (TABLE 1)

Vin (VDC)	Cin (μF)	Vout (VDC)	Cout (μF)
5	4.7	±5	4.7
12	2.2	±9	2.2
24	0.47	±12	1
-	-	±15	0.47

It's not recommend to connect any external capacitor in the application field with less than 0.5 watt output.

### Input Over-voltage Protection Circuit

The simplest device for input over-voltage protection is a linear voltage regulator with overheat protection that is connected to the input end in series (Figure 2).



(Figure 2)

When the environment temperature is higher than 71°C, the product output power should be less than 60% of the rated power.

### No parallel connection or plug and play.

Use dual output simultaneously, forbid opening output pin (0V) to use as single output.

#### 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.