



**THE DATASHEET OF  
SC02S2405A**





### FEATURES

- Efficiency up to 82%
- SMD Package with Industry Standard Pinout
- Package size :
  - Single Output  
12.7 x 9.3 x 8.9 mm (0.5" x 0.37" x 0.35")
  - Dual Outputs  
15.3 x 9.3 x 8.9 mm (0.6" x 0.37" x 0.35")
- Isolation Voltage 1000 VDC
- Operating Temperature Range -40° to +85°C
- Low ripple and noise
- Lead free, RoHs Compliant
- 3 Years Product Warranty

The SC02S/D series are miniature, SMD Package, isolated 2W DC/DC converters with 1,000VDC isolation. It offers short circuit protection and allows a wide operating temperature range of -40°C to +85°C. These isolated DC/DC converters are the latest offering from a world leader in power systems technology and manufacturing — Delta Electronics, Inc. With creative design technology and optimization of component placement, these converters possess outstanding electrical and thermal performance, as well as extremely high reliability under highly stressful operating conditions

### Model List

Model Number	Input Voltage (Range) VDC	Output Voltage VDC	Output Current		Input Current		Load Regulation % (max.)	Max. capacitive Load uF	Efficiency (typ.)
			Max.	Min.	@Max. Load	@No Load			@Max. Load
			mA	mA	mA(typ.)	mA(typ.)			%
SC02S0505A	5 (4.5 ~ 5.5)	5	400	8	519	60	11	47	77
SC02S0512A		12	165	3	488		11	10	81
SC02D0505A		±5	±200	±4	519		12	10*	77
SC02D0512A		±12	±83	±1.5	504		7	4.7*	79
SC02D0515A		±15	±66	±1	501		7	4.7*	79
SC02S1205A	12 (10.8 ~ 13.2)	5	400	8	213	30	8	47	78
SC02S1212A		12	165	3	201		6	10	82
SC02D1212A		±12	±83	±1.5	202		5	4.7*	82
SC02D1215A		±15	±66	±1	201		5	4.7*	82
SC02S2405A		5	400	8	106		15	8	47
SC02S2412A	12	165	3	101	5	10		81	
SC02D2412A	±12	±83	±1.5	102	5	4.7*		81	
SC02D2415A	±15	±66	±1	100	5	4.7*		82	

\* For each output

### Input Characteristics

Parameter	Model	Min.	Typ.	Max.	Unit
Input Voltage Range	5V Input Models	4.5	5	5.5	VDC
	12V Input Models	10.8	12	13.2	
	24V Input Models	21.6	24	26.4	
Input Surge Voltage (1 sec. max.)	5V Input Models	-0.7	---	9	VDC
	12V Input Models	-0.7	---	18	
	24V Input Models	-0.7	---	30	
Reverse Polarity Input Current	All Models	---	---	0.3	A
Input Filter		Internal Capacitor			
Internal Power Dissipation		---	---	650	mW

## Output Characteristics

Parameter	Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy		---	±1.5	±4.0	%
Output Voltage Balance	Dual Output, Balanced Loads	---	±0.1	±1.0	%
Line Regulation	For Vin Change of 1%	---	±1.2	±1.5	%
Load Regulation	Io=20% to 100%	See Model Selection Guide			
Ripple & Noise (20MHz)		---	100	120	mV <sub>P-P</sub>
Ripple & Noise (20MHz)	Over Line, Load & Temp.	---	---	200	mV <sub>P-P</sub>
Ripple & Noise (20MHz)		---	---	15	mV <sub>rms</sub>
Temperature Coefficient		---	±0.01	±0.02	%/°C
Short Circuit Protection		0.5 Second Max.			

## General Characteristics

Parameter	Conditions	Min.	Typ.	Max.	Unit
I/O Isolation Voltage (rated)	60 Seconds	1000	---	---	VDC
I/O Isolation Resistance	500 VDC	1000	---	---	MΩ
I/O Isolation Capacitance	100KHz, 1V	---	60	100	pF
Switching Frequency		50	100	120	KHz
MTBF (calculated)	MIL-HDBK-217F@25°C, Ground Benign	2,000,000	---	---	Hours
Moisture Sensitivity Level (MSL)	IPC/JEDEC J-STD-020D	Level 3			

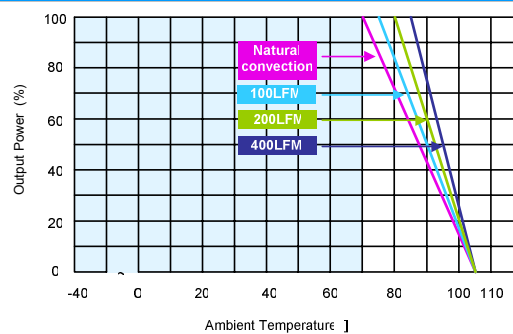
## Recommended Input Fuse

5V Input Models	12V Input Models	24V Input Models
1000mA Slow-Blow Type	500mA Slow-Blow Type	200mA Slow-Blow Type

## Environmental Specifications

Parameter	Conditions	Min.	Max.	Unit
Operating Temperature Range (with Derating)	Ambient	-40	+85	°C
Case Temperature		---	+90	°C
Storage Temperature Range		-50	+125	°C
Humidity (non condensing)		---	95	% rel. H
Cooling	Free-Air convection			
Lead Temperature (1.5mm from case for 10Sec.)		---	300	°C

## Power Derating Curve

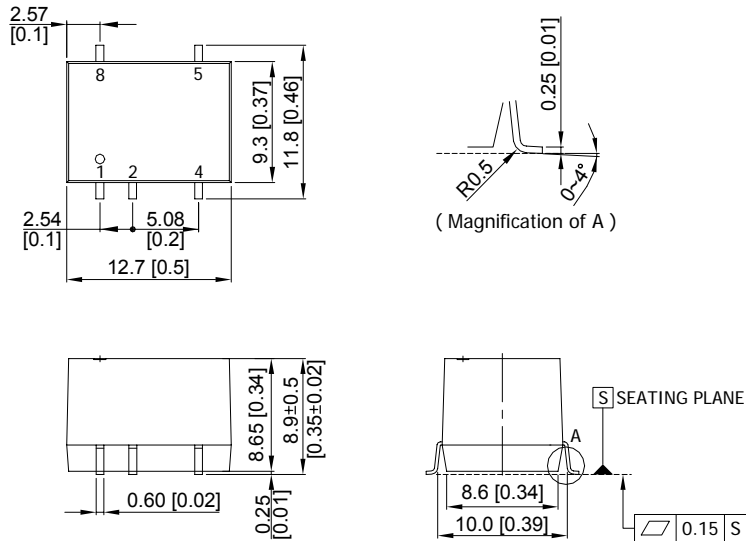


## Notes

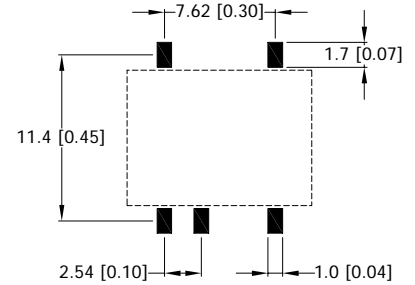
- Specifications typical at Ta=+25°C, resistive load, nominal input voltage and rated output current unless otherwise noted.
- Ripple & Noise measurement bandwidth is 0-20MHz.
- These power converters require a minimum output loading to maintain specified regulation, operation under no-load conditions will not damage these modules; however they may not meet all specifications listed.
- All DC/DC converters should be externally fused at the front end for protection.
- Specifications subject to change without notice.

## Mechanical Drawing I

### Mechanical Dimensions (Single Output)

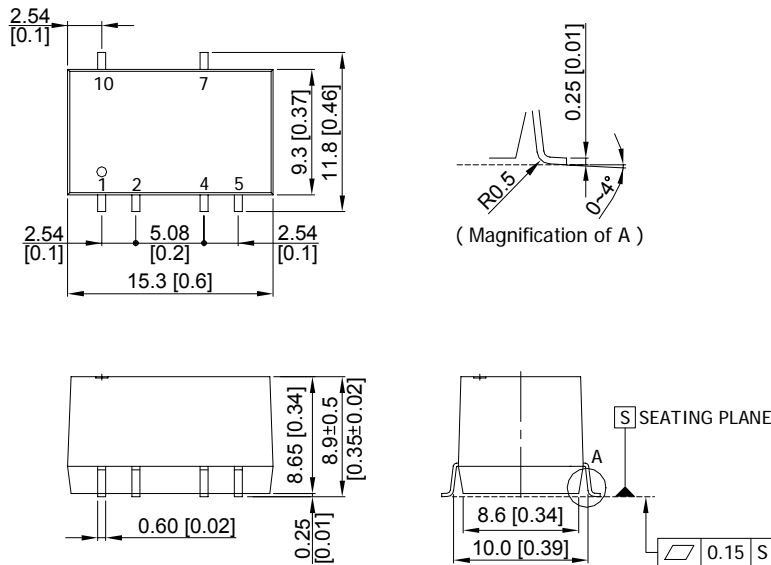


### Connecting Pin Patterns

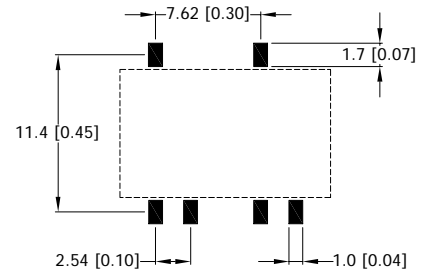


## Mechanical Drawing II

### Mechanical Dimensions (Dual Output)



### Connecting Pin Patterns



- ▶ All dimensions in mm (inches)
- ▶ Tolerance: X.X±0.25 (X.XX±0.01)  
X.XX±0.13 (X.XXX±0.005)
- ▶ Pins ±0.05(±0.002)

### Pin Connections

Pin	Single Output	Dual Output
1	-Vin	-Vin
2	+Vin	+Vin
4	-Vout	Common
5	+Vout	-Vout
7	No Pin	+Vout
8	N/A	No Pin
10	No Pin	NA

N/A : Not Available for Electrical Connection

### Physical Outline

Case Size (Single Output)	: 12.7x9.3x8.65mm (0.50x0.37x0.34 Inches)
Case Size (Dual Output)	: 15.3x9.3x8.65mm (0.60x0.37x0.34 Inches)
Case Material	: Molding (flammability to UL 94V-0 rated)
Weight (Single Output)	: 1.5g
Weight (Dual Output)	: 2.2g



Part Numbering System						
S	C	02	S	05	05	A
Form factor	Family series	Watt	Number of Outputs	Input Voltage	Output Voltage	Option Code
D-DIP	A~Z	01:1W	S - Single	03:3.3V	03:3.3V	A - Std. Functions
P-SIP		02:2W	D- Dual	05: 5V	05: 5V	
S-SMD		03:3W		12:12V	12:12V	
		04:4W		24: 24V	15: 15V	
		06:6W		48:48V	24: 24V	

### WARRANTY

Delta offers a two (3) years limited warranty. Complete warranty information is listed on our web site or is available upon request from Delta.

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