THE DATASHEET OF

SD02S2405A

SD02S/D Sries

2W DC/DC CONVERTER, SMD-Package, 2:1 Wide Input Range

FEATURES

- Efficiency up to 81%
- 2:1 Wide Input Range
- Fully regulated Output
- Operating Temperature Range –40°C to +85°C
- Moisture sensitivity level (MSL) 2
- Isolation Voltage 1500 V_{DC}
- Conducted EMI meets EN55022,class A
- Lead free, RoHs Compliant
- Short circuit protection
- 3 Years Product Warranty

Security Lab Medical Metro Data Center Telecom Industrial Network

The SD02S/D series are miniature, SMD Package, isolated 2W DC/DC converters with 1500VDC isolation. The SD02S/D series features fully regulated output and wide 2:1 input voltage ranges. The most convenient advantage is the modules with a small footprint and low package height of 8.0 mm (0.31 inch) on the PCB. These isolated DC/DC converters are the latest offering from a world leader in power systems technology and manufacturing — Delta Electronics, Inc.

Model List

Model Number	Input Voltage (Range)	Output Voltage	Output Current		Input Current		Reflected Ripple Current	Max. capacitive Load	Efficiency (typ.)
			Max.	Min.	@Max. Load	@No Load			@Max. Load
	VDC	VDC	mA	mA	mA(typ.)	mA(typ.)	mA(typ.)	uF	%
SD02S0503A	5 (4.5 ~ 9)	3.3	500	125	471	40	100	2200	70
SD02S0505A		5	400	100	548			1000	73
SD02S0512A		12	167	42	534			170	75
SD02S0515A		15	134	33	582			110	73
SD02D0505A		±5	±200	±50	667			470*	64
SD02D0512A		±12	±83	±21	615			100*	69
SD02D0515A		±15	±67	±17	598			47*	71
SD02S1203A	12 (9 ~ 18)	3.3	500	125	184	20	25	2200	73
SD02S1205A		5	400	100	217			1000	77
SD02S1212A		12	167	42	209			170	80
SD02S1215A		15	134	33	220			110	80
SD02D1205A		±5	±200	±50	242			470*	73
SD02D1212A		±12	±83	±21	224			100*	78
SD02D1215A		±15	±67	±17	226			47*	78
SD02S2403A	24 (18 ~ 36)	3.3	500	125	96	10	15	2200	72
SD02S2405A		5	400	100	109			1000	77
SD02S2412A		12	167	42	109			170	80
SD02S2415A		15	134	33	108			110	81
SD02D2405A		±5	±200	±50	119			470*	74
SD02D2412A		±12	±83	±21	112			100*	78
SD02D2415A		±15	±67	±17	110			47*	80
SD02S4803A	48 (36 ~ 75)	3.3	500	125	49	8	10	2200	71
SD02S4805A		5	400	100	57			1000	73
SD02S4812A		12	167	42	53			170	79
SD02S4815A		15	134	33	55			110	79
SD02D4805A		±5	±200	±50	62			470*	71
SD02D4812A		±12	±83	±21	57			100*	77
SD02D4815A		±15	±67	±17	57			47*	77

* For each output

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Input Characteristics

Parameter	Model	Min.	Typ.	Max.	Unit
Input Surge Voltage (1 sec. max.)	5V Input Models	-0.7	---	11	V_{DC}
	12V Input Models	-0.7	---	25	
	24V Input Models	-0.7	---	50	
	48V Input Models	-0.7	---	100	
Start-Up Voltage	5V Input Models	3.5	4	4.5	
	12V Input Models	4.5	7	9	
	24V Input Models	8	12	18	
	48V Input Models	16	24	36	
Under Voltage Shutdown	5V Input Models	---	3.5	4	
	12V Input Models	---	6.5	8.5	
	24V Input Models	---	11	17	
	48V Input Models	---	22	34	
Reverse Polarity Input Current	All Models	---	---	1	A
Short Circuit Input Power		---	---	1500	mW
Internal Power Dissipation		---	---	1800	mW
Conducted EMI		Compliance to EN 55022,class A			

Output Characteristics

Parameter	Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy		---	±1.0	±2.0	%
Output Voltage Balance	Dual Output, Balanced Loads	---	±1.0	±2.0	%
Line Regulation	Vin=Min. to Max.	---	±0.3	±0.5	%
Load Regulation	Io=25% to 100%	---	±0.5	±0.75	%
Ripple & Noise (20MHz)		---	30	50	mV_{P-P}
Ripple & Noise (20MHz)	Over Line, Load & Temp.	---	---	75	mV_{P-P}
Ripple & Noise (20MHz)		---	---	15	mV rms
Transient Recovery Time	25% Load Step Change	---	100	300	uS
Transient Response Deviation		---	±3	±5	%
Temperature Coefficient		---	±0.01	±0.02	%/℃
Short Circuit Protection		Continuous, Automatic Revery			

General Characteristics

Parameter	Conditions	Min.	Typ.	Max.	Unit
I/O Isolation Voltage (rated)	60 Seconds	1500	---	---	VDC
I/O Isolation Resistance	500 VDC	1000	---	---	MΩ
I/O Isolation Capacitance	100KHz, 1V	---	250	420	pF
Switching Frequency		---	300	---	KHz
MTBF (calculated)	MIL-HDBK-217F@25℃, Ground Benign	1,000,000			Hours
Moisture Sensitivity Level (MSL)	IPC/JEDEC J-STD-020D.1	Level 2			

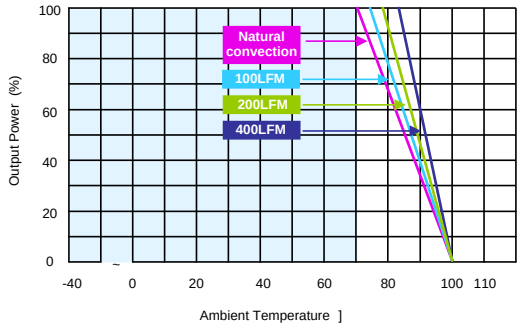
Recommended Input Fuse

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

Environmental Specifications

Parameter	Conditions	Min.	Max.	Unit
Operating Temperature Range (with Derating)	Ambient	-40	+85	℃
Case Temperature		---	+90	℃
Storage Temperature Range		-50	+125	℃
Humidity (non condensing)		---	95	% rel. H
Lead-free Reflow Solder Process		IPC/JEDEC J-STD-020D.1		℃

Power Derating Curve

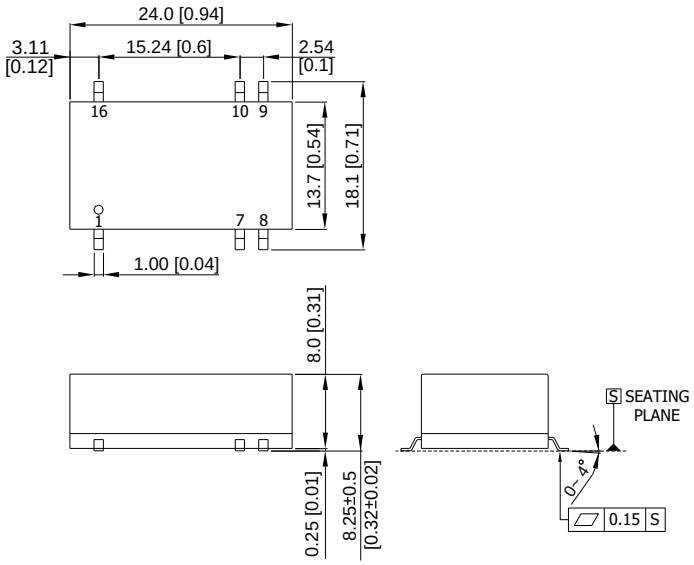


Notes

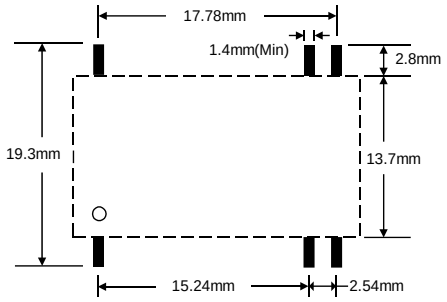
1 Specifications typical at Ta=+25℃, resistive load, nominal input voltage and rated output current unless otherwise noted.
2 Transient recovery time is measured to within 1% error band for a step change in output load of 75% to 100%
3 Ripple & Noise measurement bandwidth is 0-20MHz.
4 These power converters 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.
5 We recommend to protect the converter by a slow blow fuse in the input supply line for protection.
6 Specifications subject to change without notice.
7 It is not recommended to use water-washing process on SMT units.

Mechanical Drawing

Mechanical Dimensions



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
7	NC	NC
8	NC	Common
9	+Vout	+Vout
10	-Vout	-Vout
16	+Vin	+Vin

NC : No Connection

Physical Outline

Case Size	:	24.0x13.7x8.0mm (0.94x0.54x0.31 Inches)
Case Material	:	Non-Conductive Black Plastic (flammability to UL 94V-0 rated)
Weight	:	5.1g

Part Numbering System

S	D	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	ATR - Std. Functions with Tape and Reel
S-SMD		03:3W		12:12V	12:12V	
		04:4W		24: 24V	15: 15V	
		06:6W		48:48V	24: 24V	

WARRANTY

Delta offers a three (2) years limited warranty. Complete warranty information is listed on our web site or is available upon request from Delta.

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