SG02S/D Series

2W DC/DC CONVERTER, SMD-Package, High isolation

FEATURES

- Efficiency up to 75%
- SMD Package with Industry Standard Pinout
- UL/EN60601-1&EN60950-1 Safety Approval
- Isolation Voltage 4000 VDC
- Operating Temperature Range –25°C to +80°C
- Reflow Solder Temperature up to 245°C
- Reinforced Insulation rated for 300VAC Working Voltage
- Lead free, RoHs Compliant
- 3 Years Product Warranty

The SG02S/D series is miniature, SMD Package, isolated 2W DC/DC converters with 4,000VDC isolation .The SG02S/D series has industrial and medical safety approval. 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)	Output Voltage	Output Current		Input Current		Load Regulation	Max. capacitive Load	Efficiency (typ.)
			Max.	Min.	@Max. Load	@No Load			@Max. Load
	VDC	VDC	mA	mA	mA(typ.)	mA(typ.)	% (max.)	uF	%
SG02S0505A	5 (4.5 ~ 5.5)	5	400	8	606	90	12	330	66
SG02S0512A		12	165	3	600		10		66
SG02S0515A		15	133	2.5	605		10		66
SG02D0512A		±12	±83	±1.5	553		10	100*	72
SG02D0515A		±15	±66	±1	542		10		73
SG02S1205A	12 (10.8 ~ 13.2)	5	400	8	253	40	12	330	66
SG02S1212A		12	165	3	250		10		66
SG02S1215A		15	133	2.5	252		10		66
SG02D1212A		±12	±83	±1.5	224		10	100*	74
SG02D1215A		±15	±66	±1	220		10		75
SG02S2405A	24 (21.6 ~ 26.4)	5	400	8	126	30	12	330	66
SG02S2412A		12	165	3	125		10		66
SG02S2415A		15	133	2.5	126		10		66
SG02D2412A		±12	±83	±1.5	112		10	100*	74
SG02D2415A		±15	±66	±1	110		10		75

* 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	
	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

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Output Characteristics

Parameter	Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy		---	±2.0	±4.0	%
Output Voltage Balance	Dual Output, Balanced Loads	---	±0.1	±1.0	%
Line Regulation	Vin=Min. to Max.	---	±1.2	±1.5	%
Load Regulation	Io=20% to 100%	See Model Selection Guide			
Ripple & Noise (20MHz)		---	100	150	mV $_{P-P}$
Ripple & Noise (20MHz)	Over Line, Load & Temp.	---	---	200	mV $_{P-P}$
Ripple & Noise (20MHz)		---	---	15	mV rms
Temperature Coefficient		---	±0.01	±0.02	%/℃
Short Circuit Protection		0.5 Second Max.			

Isolation, Safety Approvals

Parameter	Conditions	Min.	Typ.	Max.	Unit
I/O Isolation Voltage (rated)	60 Seconds	4000	---	---	VACrms
I/O Isolation Test Voltage	Flash tested for 1 Second	6000	---	---	V_{PK}
Leakage Current	240VAC, 60Hz	---	---	2	uA
I/O Isolation Resistance	500 VDC	10	---	---	GΩ
I/O Isolation Capacitance	100KHz, 1V	---	15	20	pF
Safety Standards	cUL/UL60950-1, CSA C22.2 No. 60950-1-03				
	UL60601-1,CSA C22.2 No.601-1				
	IEC/EN 60950-1, IEC/EN 60601-1				
Safety Approvals	IEC60950-1 CB report, cUL/UL 60950-1 certificate				
	UL60601-1 UL certificate				

General Characteristics

Parameter	Conditions	Min.	Typ.	Max.	Unit
Switching Frequency		50	80	100	KHz
MTBF (calculated)	MIL-HDBK-217F@25℃, Ground Benign	2,000,000	---	---	Hours
Moisture Sensitivity Level (MSL)	IPC/JEDEC J-STD-020D	Level 2			

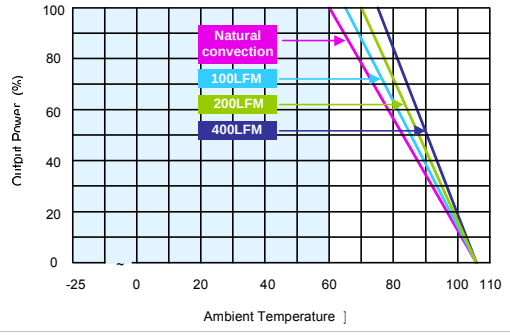
Recommended Input Fuse

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

Environmental Characteristics

Parameter	Conditions	Min.	Max.	Unit
Operating Temperature Range (with Derating)	Ambient	-25	+80	℃
Case Temperature		---	+90	℃
Storage Temperature Range		-50	+125	℃
Humidity (non condensing)		---	95	% rel. H
Cooling	Free-Air convection			
Lead Temperature (1.5mm from case for 10Sec.)		---	260	℃

Power Derating Curve



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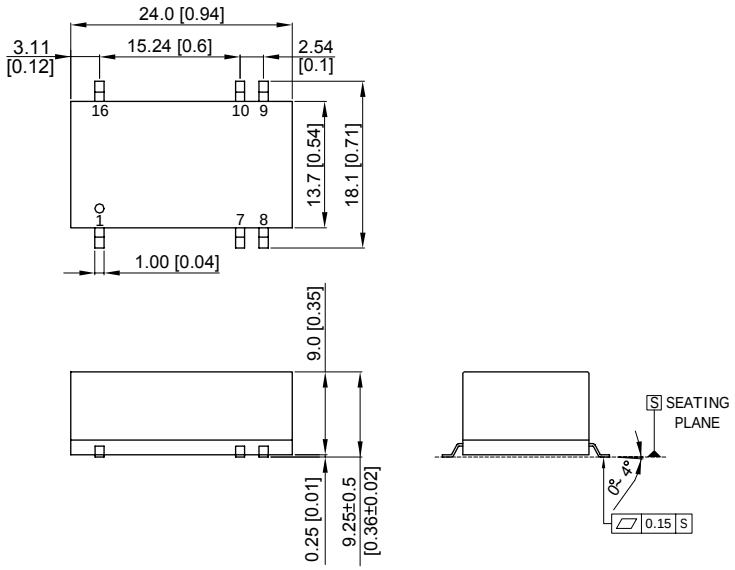
Notes

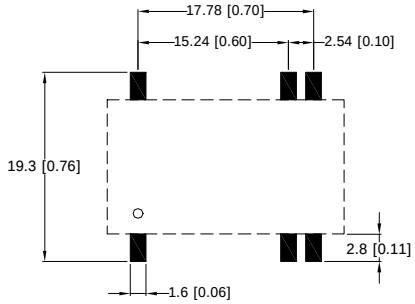
1 Specifications typical at Ta=+25℃, resistive load, nominal input voltage and rated output current unless otherwise noted.
2 Ripple & Noise measurement bandwidth is 0-20MHz.
3 These power converters require a minimum output loading to maintain specified regulation, operation under no-load conditions will not damage these modules; however they may not meet all specifications listed.
4 All DC/DC converters should be externally fused at the front end for protection.
5 That “natural convection” is about 20LFM but is not equal to still air (0 LFM).
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	:	24.0x13.7x9.0mm (0.94x0.54x0.35 Inches)
Case Material	:	Non-Conductive Black Plastic (flammability to UL 94V-0 rated)
Weight	:	3.75g

Part Numbering System

S	G	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 three(3) years limited warranty. Complete warranty information is listed on our web site or is available upon request from Delta.

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