



FEATURES

- Efficiency up to 81%
- SIP Package with Industry Pinout
- Small Footprint: 21.8 x 9.3 mm (0.86"x 0.37"inch)
- Wide 2:1 Input Range
- Operating Temperature Range -40°C to +85°C
- Isolation Voltage 1000VDC
- Fully Regulated Output
- Short circuit protection
- Lead free, RoHs Compliant
- 3 Years Product Warranty



The PG02S series are miniature, SIP Package, isolated 2W DC/DC converters with 1,000VDC isolation. The PG02S series features fully regulated output and wide 2:1 input voltage ranges. The most convenient advantage is the modules with a small footprint occupying only 2.0 cm² (0.3 square in.) on the PCB. 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

Model Selection Guide

| Model Number | Input Voltage (Range) VDC | Output Voltage VDC | Output Current | | Input Current | | Reflected Ripple Current mA(typ.) | Max.capacitive Load uF | Efficiency (typ.) |
|--------------|------------------------------|-----------------------|----------------|------|---------------|----------|--------------------------------------|---------------------------|-------------------|
| | | | Max. | Min. | @Max. Load | @No Load | | | @Max. Load |
| | | | mA | mA | mA(typ.) | mA(typ.) | | | % |
| PG02S0503A | 5 (4.5 ~ 9) | 3.3 | 500 | 125 | 471 | 40 | 400 | 2200 | 70 |
| PG02S0505A | | 5 | 400 | 100 | 548 | | | 1000 | 73 |
| PG02S0512A | | 12 | 167 | 42 | 534 | | | 170 | 75 |
| PG02S1203A | 12 (9 ~ 18) | 3.3 | 500 | 125 | 184 | 20 | 300 | 2200 | 73 |
| PG02S1205A | | 5 | 400 | 100 | 217 | | | 1000 | 77 |
| PG02S1212A | | 12 | 167 | 42 | 209 | | | 170 | 80 |
| PG02S2403A | 24 (18 ~ 36) | 3.3 | 500 | 125 | 96 | 10 | 200 | 2200 | 72 |
| PG02S2405A | | 5 | 400 | 100 | 109 | | | 1000 | 77 |
| PG02S2412A | | 12 | 167 | 42 | 103 | | | 170 | 81 |
| PG02S4803A | 48 (36 ~ 75) | 3.3 | 500 | 125 | 49 | 8 | 500 | 2200 | 71 |
| PG02S4805A | | 5 | 400 | 100 | 57 | | | 1000 | 73 |
| PG02S4812A | | 12 | 167 | 42 | 53 | | | 170 | 79 |



Input Characteristics

| Parameter | Model | Min. | Typ. | Max. | Unit |
|-----------------------------------|------------------|----------------|------|------|------|
| Input Surge Voltage (1 sec. max.) | 5V Input Models | -0.7 | --- | 15 | VDC |
| | 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 |
| Input Filter | | Capacitor type | | | |
| Internal Power Dissipation | | --- | --- | 3500 | mW |

Output Characteristics

| Parameter | Conditions | Min. | Typ. | Max. | Unit |
|------------------------------|-------------------------|------|-------|-------|-------------------|
| Output Voltage Accuracy | | --- | ±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 | µS |
| Transient Response Deviation | | --- | ±3 | ±5 | % |
| Temperature Coefficient | | --- | ±0.01 | ±0.02 | %/°C |
| Short Circuit Protection | Continuous | | | | |

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 | --- | 65 | 120 | pF |
| Switching Frequency | | 100 | 300 | 650 | KHz |
| MTBF (calculated) | MIL-HDBK-217F@25°C, Ground | 1,000,000 | --- | --- | Hours |

Recommended Outside input Fuse

| 5V Input Models | 12V Input Models | 24V Input Models | 48V Input Models |
|----------------------|----------------------|----------------------|----------------------|
| 150mA Slow-Blow Type | 700mA Slow-Blow Type | 350mA Slow-Blow Type | 135mA Slow-Blow Type |

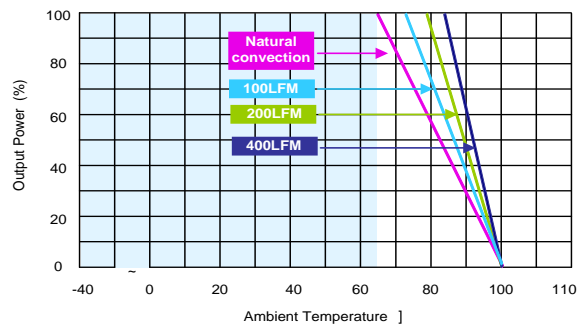
Remote On/Off Control

| Parameter | Conditions | Min. | Typ. | Max. | Unit |
|-------------------------------|---|------|------|------|------|
| Converter On | Under 0.6 VDC or Open Circuit, drops down to 0VDC by 2mV/°C | | | | |
| Converter Off | 2.7 to 15 VDC | | | | |
| Standby Input Current | | --- | 0.1 | 0.2 | mA |
| Control Input Current (on) | Vin = 0V | --- | --- | -0.4 | mA |
| Control Input Current (off) | Vin = 5.0V | --- | --- | 1 | mA |
| Control Common | Referenced to Negative Input | | | | |

Environmental Specifications

| Parameter | Conditions | Min. | Max. | Unit |
|--|---------------------|------|------|----------|
| Operating Temperature Range (with Derating) | Ambient | -40 | +85 | °C |
| Case Temperature | | --- | +90 | °C |
| Storage Temperature Range | | -55 | +105 | °C |
| Humidity (non condensing) | | --- | 95 | % rel. H |
| Cooling | Free-Air convection | | | |
| Lead Temperature (1.5mm from case for 10Sec.) | | --- | 260 | °C |

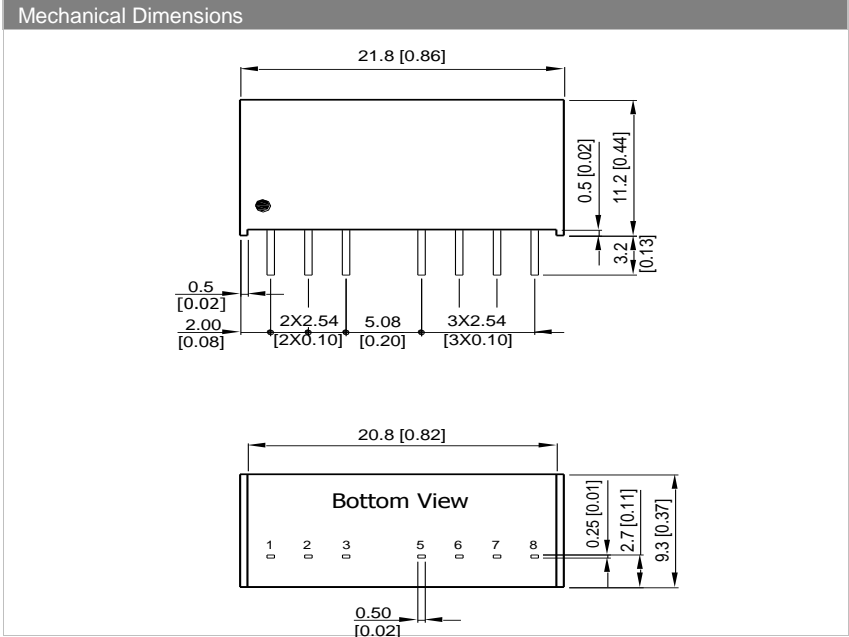
Power Derating Curve



Notes

- 1 Specifications typical at $T_a = +25^\circ\text{C}$, 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 0-20 MHz.
- 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 All DC/DC converters should be externally fused at the front end for protection.
- 6 Specifications subject to change without notice.

Mechanical Drawing



Pin Connections

| Pin | Function |
|-----|---------------|
| 1 | -Vin |
| 2 | +Vin |
| 3 | Remote On/Off |
| 5 | NC |
| 6 | +Vout |
| 7 | -Vout |
| 8 | NC |

NC: No Connection

- ▶ All dimensions in mm (inches)
- ▶ Tolerance: X.X±0.5 (X.XX±0.02)
X.XX±0.25 (X.XXX±0.01)
- ▶ Pins ±0.1(±0.004)

Physical

| | |
|---------------|---|
| Case Size | : 21.8x9.3x11.2 mm (0.86x0.37x0.44) |
| Case Material | : Non-Conductive Black Plastic (flammability to UL 94V-0 rated) |
| Weight | : 4.8g |



| Part Numbering System | | | | | | |
|-----------------------|---------------|-------|-------------------|---------------|----------------|--------------------|
| P | 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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