

1FS02P series Data Sheet

Abstract

The 1FS02P is a single-output, isolated DC/DC power supply based on a planar transformer design that meets reinforced insulation requirements. This product is primarily used for gate driving and is ideally suited for a wide range of SiC MOSFET and IGBT applications. Additionally, it complies with the reinforced insulation requirements of the UL 61800 standard, ensuring the overall safety and reliability of the system.

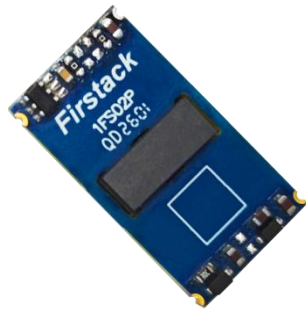
Core Features

- Complies with UL 61800
- Compact size, suitable for various applications
- 24V input voltage
- 15V output voltage
- Partial discharge testing completed
- Insulation withstand voltage test: 8.5 kVac
- Surface-mount design, compatible with reflow soldering
- Integrated short-circuit protection and over-temperature protection

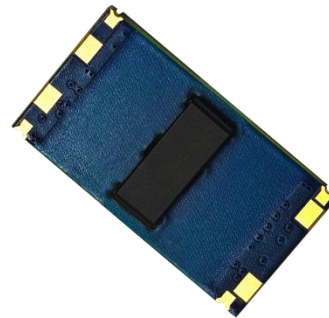
Typical application

- Isolation Gate Driver

Front

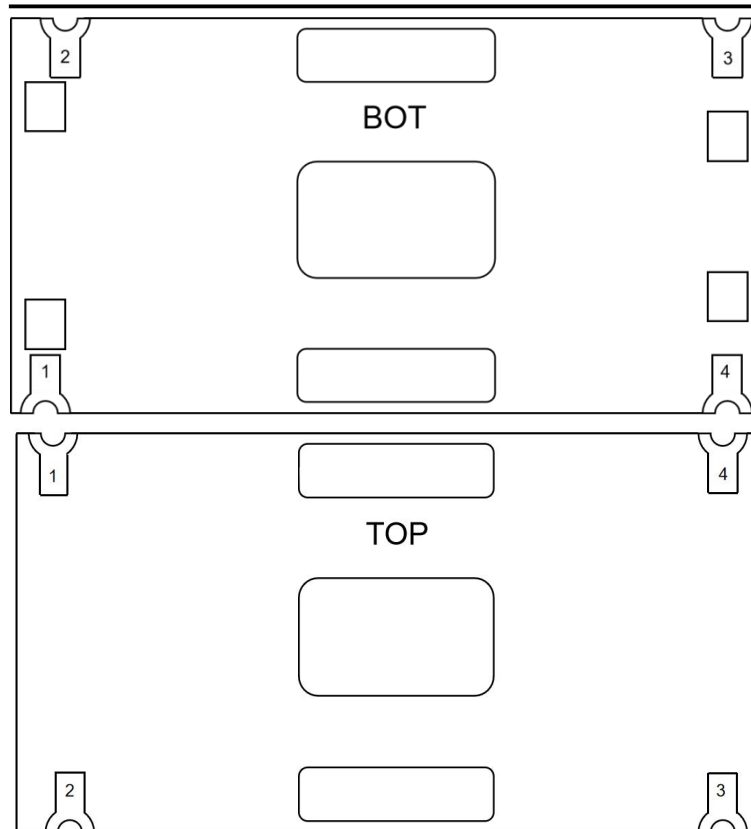


Back

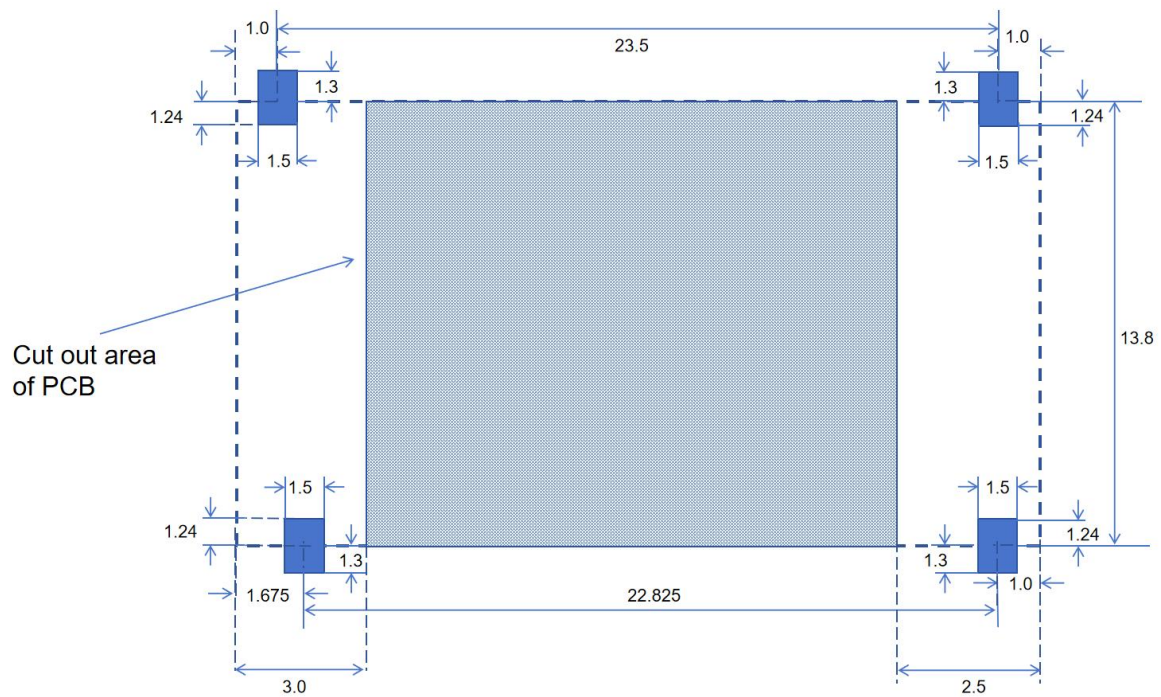


Pin Definitions

Pin	Function	Description
1	V _{CC}	Primary-side input
2	GND	Reference ground
3	V _{out} -	Secondary-side output (-)
4	V _{out} +	Secondary-side output (+)



Recommended Layout



Notes:

1. Pins 1 and 2 are Vcc and GND, respectively, and feature a Poka-Yoke design to prevent incorrect insertion.
2. The area within the blue box indicates where a slot (cutout) is required on the PCB. This area may be appropriately reduced in size, but the minimum required dimensions are 6 mm × 12 mm (length × width).
3. Tolerances refer to GB/T1804-m.

Technical Parameters

Absolute Maximum Ratings

Parameter	Remarks	Max	Unit
Power supply V_{DC} , Note1		30	V
Output Power	Maximum Rated Power	1	W
Reflow Soldering Temperature, Note 2		250	°C
Storage Temperature		-50~125	°C

Input Characteristics

Output level	Remarks	Min	Typ	Max	Unit
Input Voltage, Note 3			24		V
Static Current	Under no-load conditions (20K dummy load)		20		mA
Full-Load Current	1W		75		mA

Output Characteristics

Output level	Remarks	Min	Typ	Max	Unit
Rated Power			1		W
Voltage Setpoint Accuracy	Under rated power conditions, Note 4	-8%		+13%	\
Load Regulation				7	%
Efficiency	2W		86.3		%

Electrical Characteristics

Output level	Remarks	Min	Typ	Max	Unit
Switching Frequency	Note 5	315	350	385	kHz
Coupling Capacitance	Note 6		7.5		pf
Overcurrent Protection	Note 7	2.35	3	3.5	W

Short-Circuit Delay	Protection	Note 8	15	μs
Ripple			30	mV
Maximum Load	Capacitive		200	μF

Isolation Characteristics

Output level	Remarks	Min	Typ	Max	Unit
Insulation Test Voltage				8.5	KV _{AC}
Resistance		100			GΩ
Creepage Distance	Actual Measurement		14.6		mm
Clearance					
PDEV	Based on IEC 61800, Note 9			2969	V _{DC}

Temperature Characteristics

Output level	Remarks	Min	Typ	Max	Unit
Operating Temperature		-40	25	85	
Storage Temperature		-50	25	85	°C
Product Temperature Rise	Note 10	15		32	

Unless otherwise specified, the parameter and performance data above are based on the recommended layout (with support capacitors added), a 12V input, and an ambient temperature of 25°C.

Note:

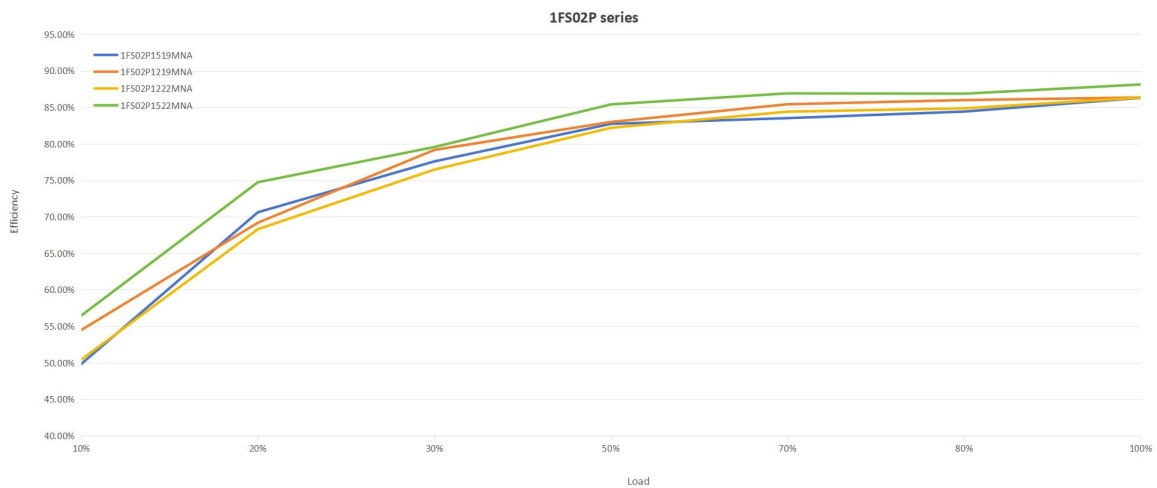
1. The maximum input voltage refers to the theoretical maximum value at which no components in this power supply module will be damaged. 12V and 15V are standard input voltages; under these conditions, the rated output voltages can be achieved. If other input voltages are applied, the output voltages will no longer be 19V and 22V; they can be calculated using the following formula:

$$V_o = \left((V_{IN} - \frac{P_o}{\eta \times V_{IN}}) \times (R_{LSP} + R_{LNV}) \right) \times \frac{N_3}{N_1} - V_f \times 2$$

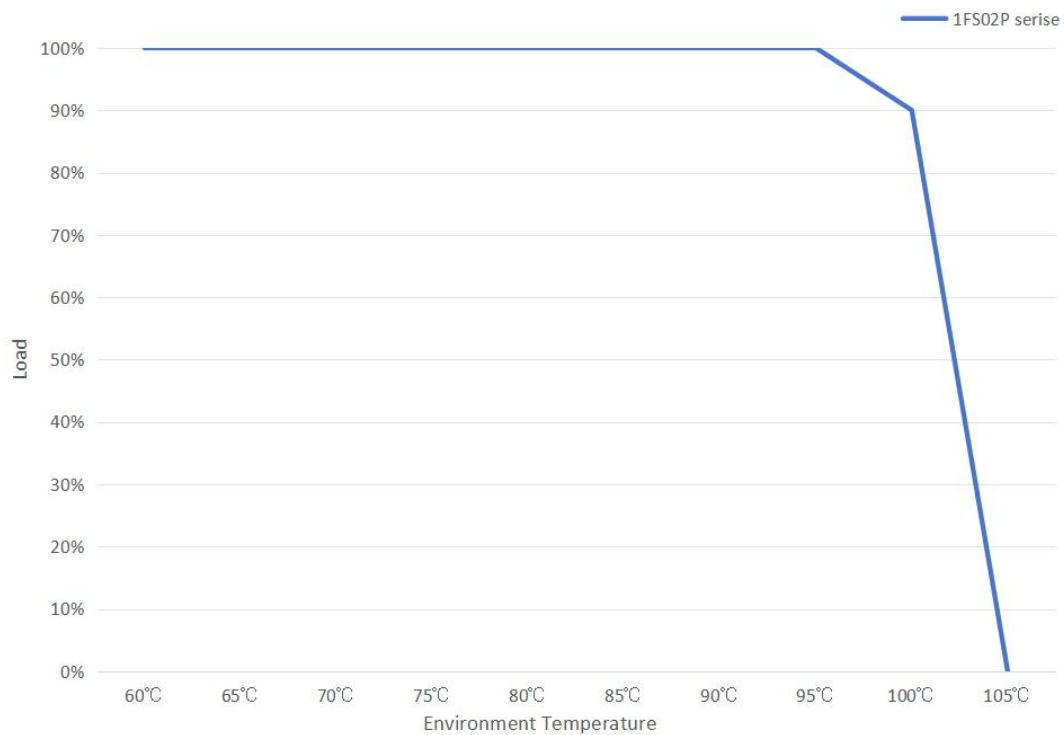
Where VIN is the input voltage, η is 85%, RDSP = 0.6, RDSN = 0.25, and Vf = 0.55 V. N1 and N3 are the transformer turns ratios, which can be adjusted via a custom PCB. If you have such requirements, please contact us for the necessary support;

2. The SMT temperature indicates the maximum temperature allowed during the surface mount (SMT) process;
3. This is the standard input voltage;
4. These results apply to all products in the 1FS02P series and were measured at output voltages of 19V and 22V;
5. This is the maximum switching frequency achievable during actual operation, determined by the IC used;
6. This is the coupling capacitance between the primary and secondary sides of the 1FS02P;
7. This power value triggers the overcurrent protection; the minimum value is the result of a bare board test (without support capacitors), while the maximum value is the result of actual testing under recommended layout conditions;
8. This is the delay from the occurrence of a short circuit to the power supply's response;
9. Partial discharge testing was conducted in accordance with the IEC 61800 standard, based on a complete power supply test;
10. Since the module is surface-mounted, heat dissipation capacity depends on the heat sink's surface area; therefore, product temperature rise may vary. The maximum value represents bare board test data (without support capacitors and not soldered to a heat sink), while the minimum value represents test data under recommended layout conditions at full load with no forced airflow;

Efficiency vs Load

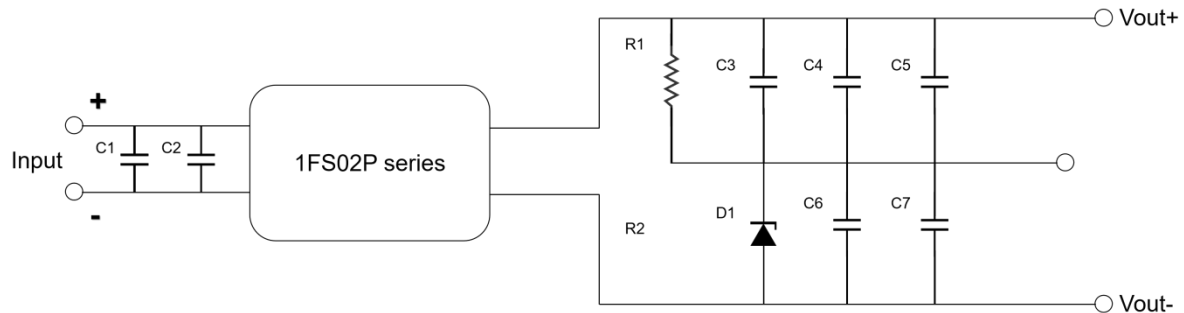


Decreasing Curve



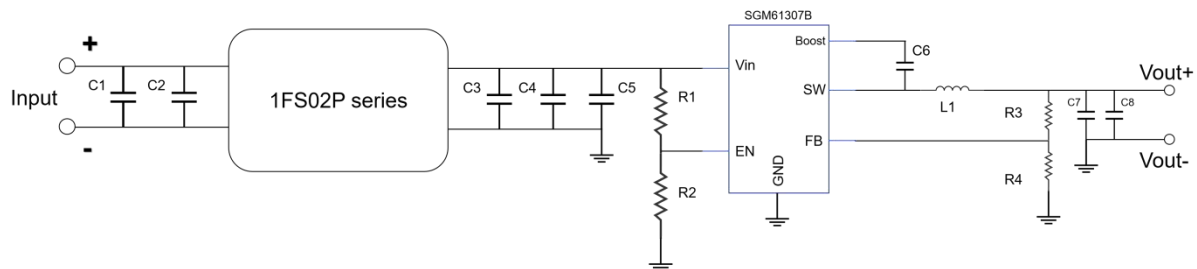
Recommended Peripheral Circuits

Zener diode



Part Number	Device Description
C1, C2, C3, C4, C5, C6, C7	4.7uF X7R ceramic chip capacitor; a rated voltage of 50V is recommended; used as a module bypass capacitor to suppress ripple and maintain voltage stability
R1	Current-limiting resistor; select a value based on actual requirements
D1	Zener diode; select a voltage value based on actual requirements

Buck Circuit

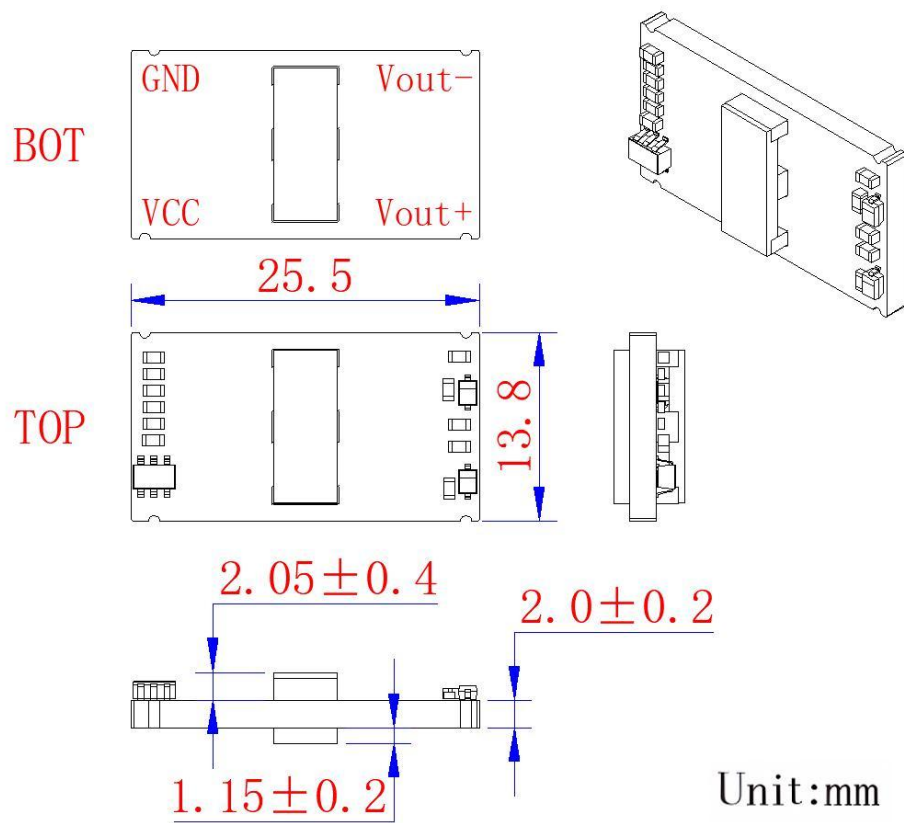


Part Number	Device Description
C1, C2, C3, C4, C7	4.7uF X7R ceramic chip capacitor; a rated voltage of 50V is recommended; used as a module support capacitor to suppress ripple and maintain voltage stability
C5, C8	100nF X7R ceramic chip capacitor; a rated voltage of 50V is recommended; used as a decoupling capacitor to filter out high-frequency noise
C6	100 nF X7R ceramic chip capacitor, used as a bootstrap capacitor to provide the high-side power switch with a drive voltage higher than the input voltage.
R1	100 kΩ, pull-up resistor for the EN pin

R2	24 k Ω , pull-down resistor for the EN pin
R3	100 k Ω , pull-up resistor for the FB pin
R4	3.65 k Ω , pull-down resistor for the FB pin

Note: This circuit and device model are for reference only

3D and Mechanical Dimension Drawings



Note: 1. Plate thickness tolerance: $\pm 10\%$;

2. For other dimensional tolerances, refer to GB/T 1804-m.

Update Information

Date	Description	Version
2026.07.28	Preliminary version	V1.0

Ordering Information

The 1FS02P series is a line of compact driver power supplies designed for SiC MOSFETs and IGBTs, supporting a variety of drive voltage configurations. If you are interested in purchasing these products, please contact our staff, and we will provide the power supply modules that best meet your needs.

Part number	Input Voltage (V)	Output Voltage(V)
1FS02P2415MNA	24	15

Legal Disclaimer

- 1.All parameters listed in this Specification Sheet were measured under specific laboratory conditions and are provided for reference only. Due to variations in installation conditions and operating environments, the actual performance of the Product may deviate from the nominal values. Users are advised to conduct independent verification under their own operating conditions.
- 2.This Specification Sheet reflects the product characteristics as of the date of issuance, based on the then-existing condition and to the best of our knowledge. No representation or warranty is made that all performance characteristics under all operating conditions have been exhaustively tested or verified.
- 3.We reserve the right to modify this Specification Sheet and technical parameters for product improvement without prior notice. Products already sold shall be governed by the Sales Contract between the parties and the Specification Sheet effective at the time of delivery.
- 4.This Specification Sheet is a technical descriptive document. Its binding effect is limited to the Sales Contract, and it shall not create any independent warranty obligation outside the Contract.

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