



The Future of Analog IC Technology®

EV5022A-QV-00A

16V, 12A, 3mΩ R_{DS_ON} Hot Swap Protection
Device With Current Monitoring

DESCRIPTION

The MP5022A is a hot-swap protection device designed to protect circuitry on its output from transients on its input. It also protects its input from undesired shorts and transients coming from its output.

An internal charge pump drives the gate of the power device, allowing for a power FET with a very low ON resistance of 3mΩ. The MP5022A includes an optional discharge function that provides a discharge path for the external output capacitor when the part is disabled. Fault protection includes current limit, thermal shutdown and damaged MOSFET detection. The device also features over-voltage protection and under-voltage protection.

The MP5022A is available in 3mmx5mm QFN package.

ELECTRICAL SPECIFICATIONS

| Parameter | Symbol | Value | Units |
|---------------------|------------------|-------|-------|
| Input Voltage Range | V _{IN} | 12 | V |
| Output Voltage | V _{OUT} | 12 | V |
| Load Max | I _{OUT} | 15 | A |

FEATURES

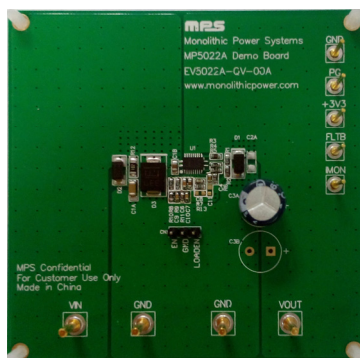
- 8V to 16V Operating Input Range
- Integrated 3mΩ Power FET
- Adjustable Current Limit
- Output Current Measurement
- +/-3% Current Limit and Monitor Accuracy
- Fast Response(<200ns) for Short Protection
- PG Detector and FLT B Indication
- PG Assert Low at VIN=0
- Damaged MOSFET Detection
- External Soft Start
- Programmable EN Blanking Time
- Under/Over Voltage Lockout
- Thermal Protection
- Small 3mmx5mm QFN Package

APPLICATIONS

- Hot Swap
- PC Cards
- Disk Drives
- Servers
- Networking
- Laptops

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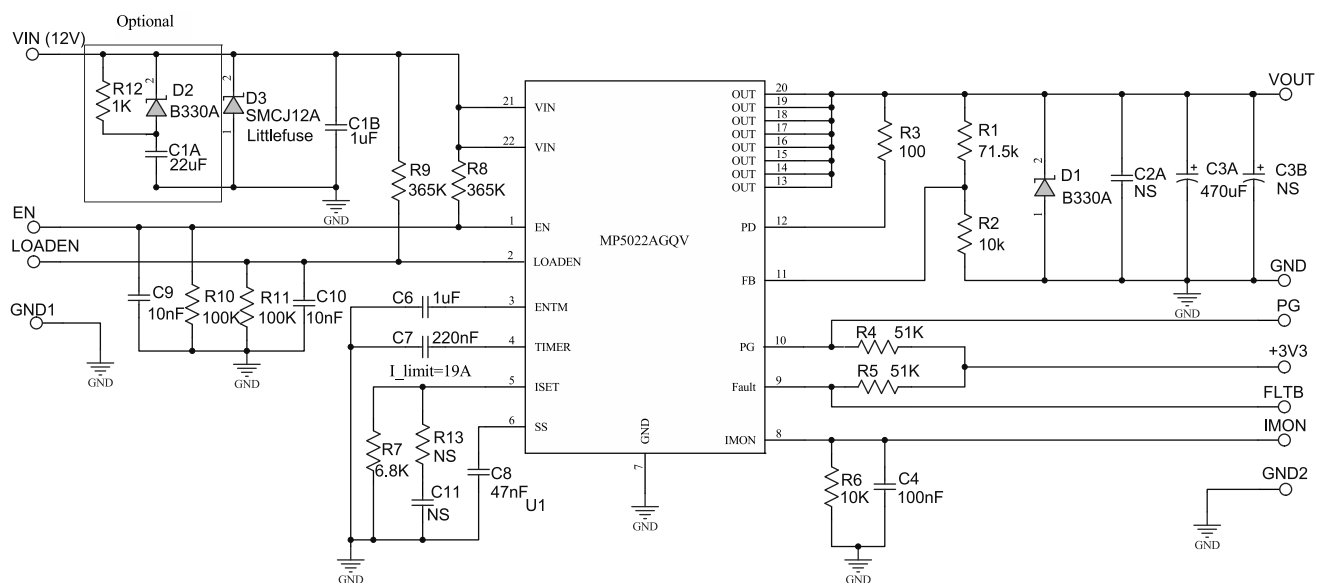
EV5022A-QV-00A EVALUATION BOARD



(L × W × H) 8.55cm × 8.55cm × 1.6mm

| Board Number | MPS IC Number |
|----------------|---------------|
| EV5022A-QV-00A | MP5022AGQV |

EVALUATION BOARD SCHEMATIC



EV5022A-QV-00A BILL OF MATERIALS

| Qty | RefDes | Value | Description | Package | Manufacture | Manufature P/N |
|-----|----------|---------|-----------------------------|------------|----------------------|--------------------|
| 1 | C1A | 22uF | Ceramic Cap.,25V, 10%, X5R | 1206 | muRata | GRM31CR61E227KE15 |
| 1 | C1B | 1uF | Ceramic Cap.,50V, 10%, X7R | 0805 | muRata | GRM21BR71H105KA12L |
| 1 | C3A | 470uF | Electrolytic Cap., 35V | DIP | 江海 | CD263-35V470 |
| 1 | C4 | 100nF | Ceramic Cap., 25V, 10%,X7R | 0603 | muRata | GRM188R71C104KA01D |
| 1 | C6 | 1uF | Ceramic Cap., 16V, 10%, X7R | 0603 | muRata | GRM188R71C105KA12D |
| 1 | C7 | 220nF | Ceramic Cap.,16V, 10%, X7R | 0603 | muRata | GRM188R71C224KA01D |
| 1 | C8 | 47nF | Ceramic Cap., 50V, 10%, X7R | 0603 | muRata | GRM188R71H473KA61D |
| 2 | C9, C10 | 10nF | Ceramic Cap., 50V, 10%, X7R | 0603 | muRata | GRM188R71E103JA01D |
| 1 | C11 | NS | | | | |
| 2 | D1,D2 | B330A | Schottky Diodes, 30V, 3A | SMA | Diodes | B330A |
| 1 | D3 | SMCJ12A | TVS Diode,12V | SMC | Littlefuse | SMCJ12A |
| 1 | R1 | 71.5k | Film Res., 1% | 0603 | Yageo | RC0603FR-0771K5L |
| 2 | R2,R6 | 10k | Film Res., 1% | 0603 | Yageo | RC0603FR-0710KL |
| 1 | R3 | 100 | Film Res., 1% | 0603 | Yageo | RC0603FR-07100RL |
| 2 | R4,R5 | 51k | Film Res., 1% | 0603 | SYN- TON- TECH | RC0603FR-0751KL |
| 1 | R7 | 6.8k | Film Res., 1% | 0603 | Yageo | RC0603FR-076K8L |
| 2 | R8, R9 | 365k | Film Res., 1% | 0603 | Yageo | RC0603FR-07365KL |
| 2 | R10, R11 | 100k | Film Res., 1% | 0603 | Yageo | RC0603FR-07100KL |
| 1 | R12 | 1k | Film Res., 1% | 1206 | Hottechohm | RI1206L1001FT |
| 1 | R13 | NS | | | | |
| 1 | U1 | IC | Hot Swap Protection device | QFN22(3*5) | MPS | MP5022AGQV |

PRINTED CIRCUIT BOARD LAYOUT

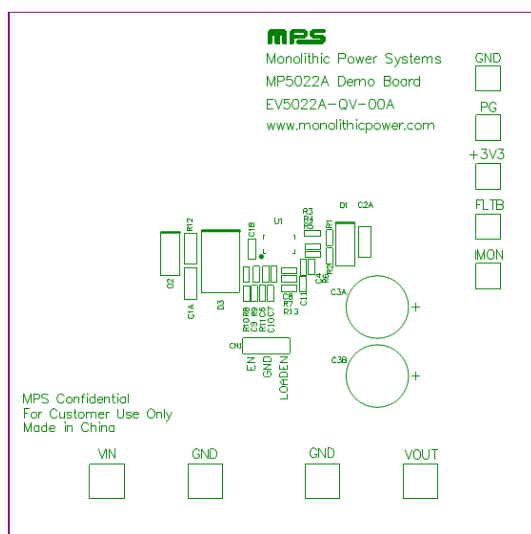


Figure 1—Top Silk Layer

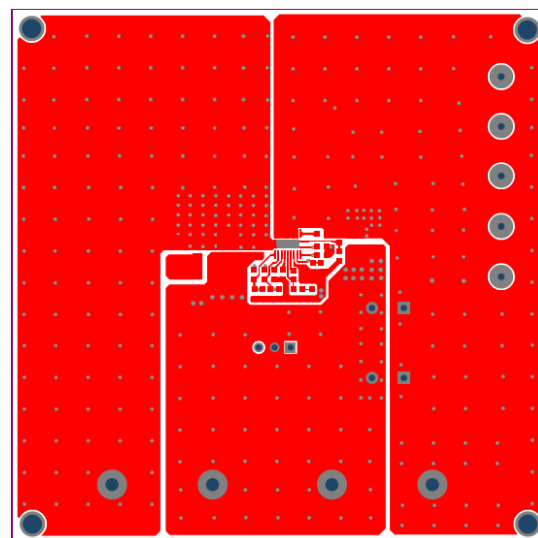


Figure 2—Top Layer

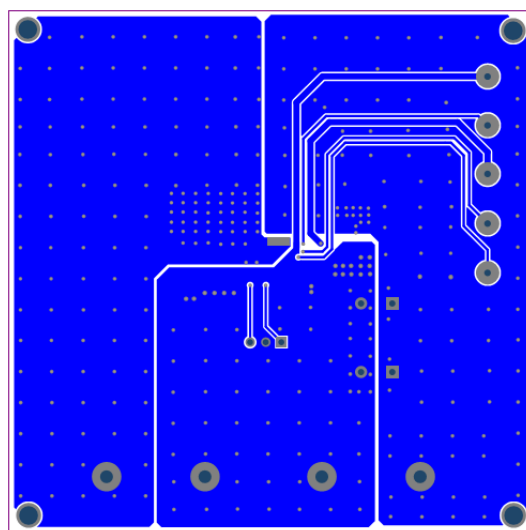


Figure 3—Bottom Layer

QUICK START GUIDE

The board layout accommodates most commonly used schottky and output capacitors.

1. Attach the positive and negative terminals of the load to the VOUT and GND terminals on demo board, respectively.
2. Preset the power supply output to be 12V, and then turn off the power supply.
3. Attach the positive and negative terminals of the power supply to the VIN and GND terminals on demo board, respectively.
4. Turn on the power supply. The MP5022A will automatically start up.
5. To use the EN turning on function, apply a digital input to the EN pin. Drive EN higher than 2V to turn on the hot swap or less than 0.4V to turn it off.
6. To use PG and FLTB indicating function, connect +3V3 and GND terminals on demo board to a 3.3V power supply.

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