EV5022A-QV-00A

16V, 12A, 3mΩ R$_{DS\_ON}$ Hot Swap Protection Device With Current Monitoring

The Future of Analog IC Technology

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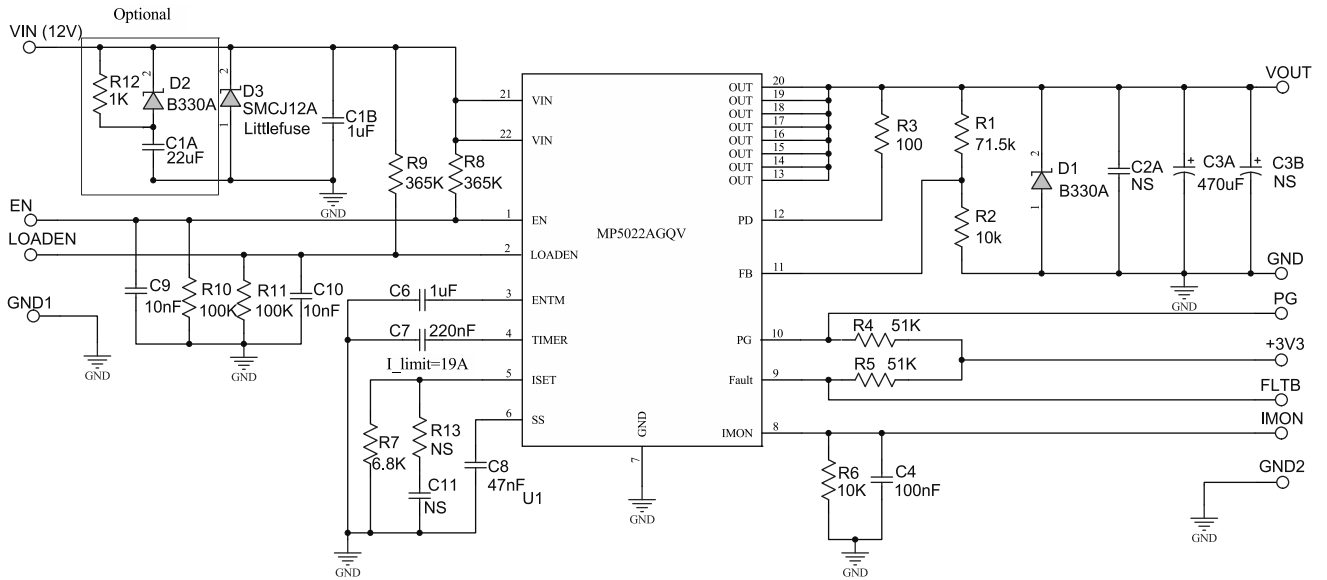
- Hot Swap
- PC Cards
- Disk Drives
- Servers
- Networking
- Laptops

EV5022A-QV-00A EVALUATION BOARD
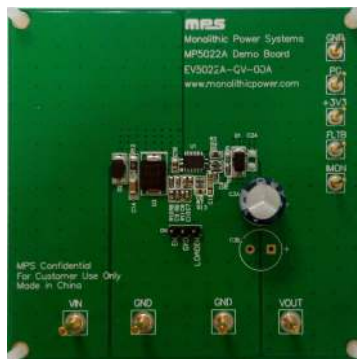
(L × W × H) 8.55cm × 8.55cm × 1.6mm

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	SYNTON-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

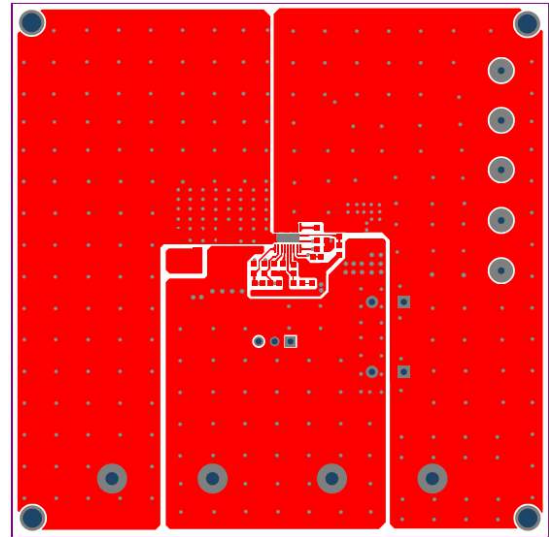# PRINTED CIRCUIT BOARD LAYOUT
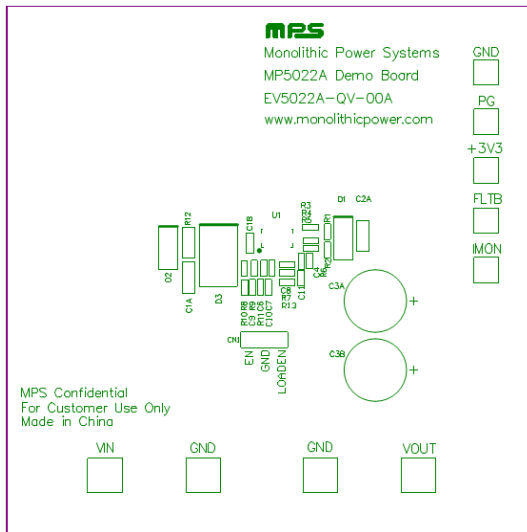
Figure 1—Top Silk Layer

Figure 2—Top Layer

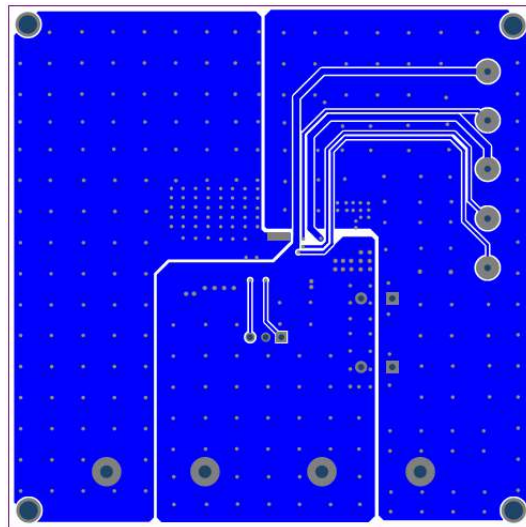

Figure3—Bottom Layer

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.