



EV5025C-QV-00A

16V, 15A, 3mΩ R_{DS(ON)}, Hot-Swap Protection Device with Current Monitoring Evaluation Board

DESCRIPTION

The EV5025C-QV-00A is an evaluation board designed to demonstrate the capabilities of the MP5025C, a hot-swap protection device designed to protect circuitry on its output from transients on its input. The device also protects its input from undesired shorts and transients originating at the output.

An internal charge pump drives the gate of the power device, which allows for a power MOSFET with an ultra-low on resistance (about 3mΩ). The MP5025C includes an optional discharge function that provides a discharge path for the external output capacitor once the part shuts down. Fault protections include current limiting, thermal shutdown, damaged MOSFET detection, over-voltage protection (OVP), and under-voltage lockout (UVLO).

The MP5025C is available in a QFN-22 (3mmx5mm) package.

ELECTRICAL SPECIFICATIONS

Parameter	Symbol	Value	Units
Input voltage range	V _{IN}	12	V
Output voltage	V _{OUT}	12	V
Max load current	I _{OUT}	15	A

FEATURES

- 4.5V to 16V Operating Input Range
- 3mΩ Integrated Power MOSFET
- Adjustable Current Limit
- Output Current Measurement
- ±3% Current Limit and Accuracy Monitoring
- Fast Short Protection Response (<200ns)
- PG Detection and FLTB Indication
- PG Asserts Low when V_{IN} = 0V
- Damaged MOSFET Detection
- External Soft Start (SS)
- Configurable Enable (EN) Blanking Time
- Over-Voltage Protection and UVLO
- Thermal Shutdown
- Available in a QFN-22 (3mmx5mm) Package

APPLICATIONS

- Hot-Swap Protection
- Personal Computer (PC) Cards
- Disk Drives
- Servers
- Networking
- Laptops

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EV5025C-QV-00A EVALUATION BOARD



LxWxH (8.55mmx8.55mmx1.66mm)

Board Number	MPS IC Number
EV5025C-QV-00A	MP5025CGQV

QUICK START GUIDE

The evaluation board layout accommodates most commonly used Schottky and output capacitors.

1. Attach the load terminals to:
 - a. Positive (+): VOUT
 - b. Negative (-): GND
2. Preset the power supply output to 12V, then turn off the power supply.
3. Attach the power supply terminals to:
 - a. Positive (+): VIN
 - b. Negative (-): GND
4. Turn on the power supply. The board should automatically start up.
5. To use the enable (EN) function, apply a digital input to the EN pin. Drive EN above 2V to turn the device on; drive EN below 0.4V to turn it off.
6. To use the PG and FLTB indication function, connect the +3V3 and GND terminals to a 3.3V power supply.

EVALUATION BOARD SCHEMATIC

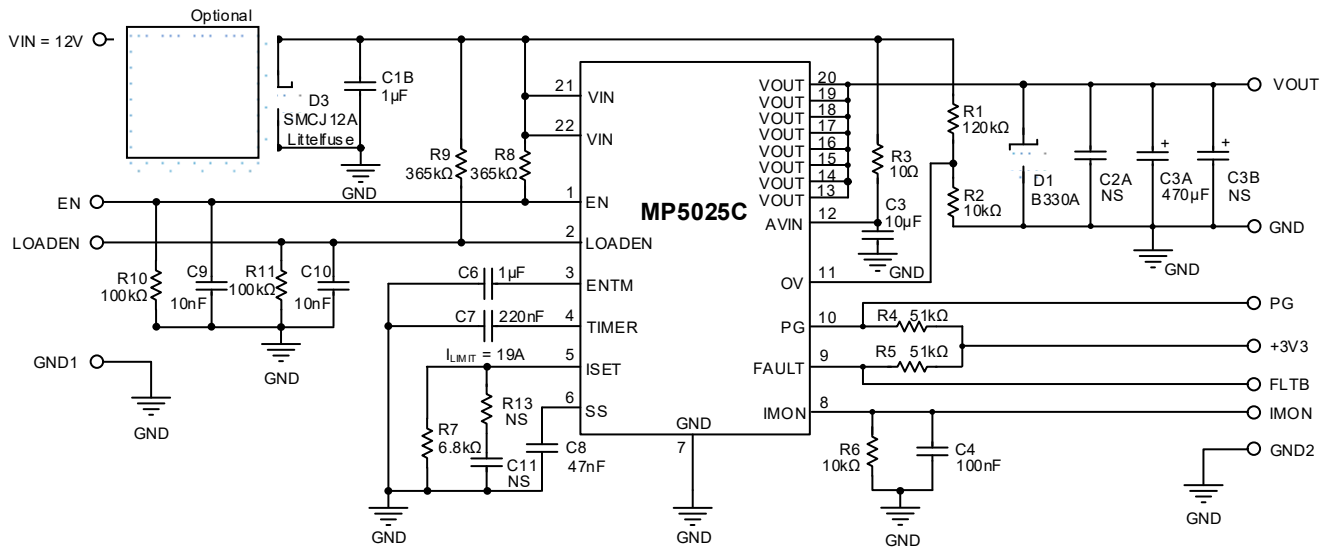


Figure 1: Evaluation Board Schematic

EV5025C-QV-00A BILL OF MATERIALS

Qty	Ref	Value	Description	Package	Manufacturer	Manufacturer PN
1	C1A	22 μ F	Ceramic capacitor, 25V, 10%, X5R	1206	Murata	GRM31CR61E226KE15
1	C1B	1 μ F	Ceramic capacitor, 50V, 10%, X7R	0805	Murata	GRM21BR71H105KA12L
1	C3A	470 μ F	Electrolytic capacitor, 35V	DIP	Jianghai	CD263-35V470
1	C3	10 μ F	Ceramic capacitor, 25V, 10%, X6S	0805	Murata	GRM21BC81E106KE11L
1	C4	0.1 μ F	Ceramic capacitor, 25V, 10%, X7R	0603	Murata	GRM188R71E104KA01D
1	C6	1 μ F	Ceramic capacitor, 16V, 10%, X7R	0603	Murata	GRM188R71C105KA12D
1	C7	220nF	Ceramic capacitor, 16V, 10%, X7R	0603	Murata	GRM188R71C224KA01D
1	C8	47nF	Ceramic capacitor, 50V, 10%, X7R	0603	Murata	GRM188R71H473KA61D
2	C9, C10	10nF	Ceramic capacitor, 50V, 10%, X7R	0603	Murata	GRM188R71H103KA61D
1	C11	NS				
1	R1	120k Ω	Film resistor, 1%	0603	Yageo	RC0603FR-07120KL
2	R2, R6	10k Ω	Film resistor, 1%	0603	Yageo	RC0603FR-0710KL
1	R3	10 Ω	Film resistor, 1%	0603	Yageo	RC0603FR-0710RL
2	R4, R5	51k Ω	Film resistor, 1%	0603	Yageo	RC0603FR-0751KL
1	R7	6.8k Ω	Film resistor, 1%	0603	Yageo	RC0603FR-076K8L
2	R8, R9	365k Ω	Film resistor, 1%	0603	Yageo	RC0603FR-07365KL
2	R10, R11	100k Ω	Film resistor, 1%	0603	Yageo	RC0603FR-07100KL
1	R12	1k Ω	Film resistor, 1%	1206	Hottech	RI1206L1001FT
1	R13	NS				
2	D1, D2	30V	Schottky diode, 3A	SMA	Diodes, Inc.	B330A
1	D3	12V	TVS diode	SMC	Littelfuse	SMCJ12A
4	VIN, VOUT, GND, GND	20A	Power pin connector	DIP	Any	
5	PG, +3.3V, GND, FLT, IMON	10A	Test point connector	DIP	Any	
1	CN1	3A	5-pin connector	DIP	Any	
1	U1	MP5025C	Hot-swap protection device	QFN-22 (3mmx5mm)	MPS	MP5025CGQV

PCB LAYOUT

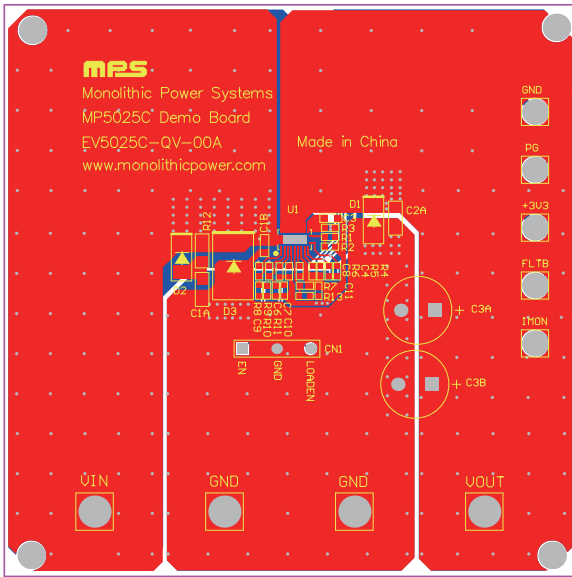


Figure 2: Top Silk and Top Layer

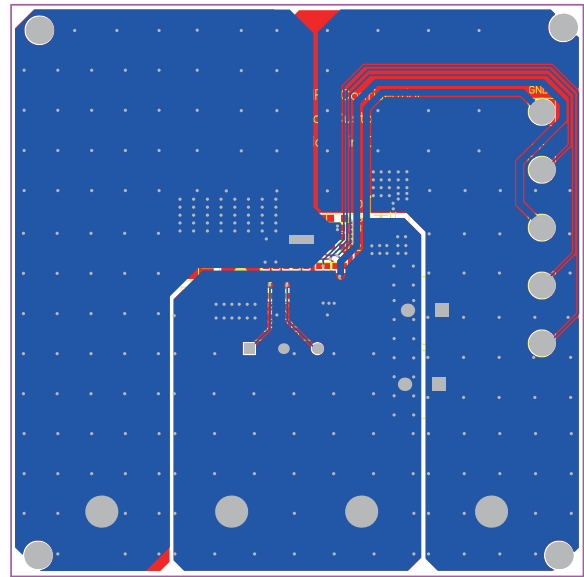


Figure 3: Bottom Layer



REVISION HISTORY

Revision #	Revision Date	Description	Pages Updated
1.0	4/20/2021	Initial Release	-

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