EV5035-J-00A

2.9V to 22V, 50mA to 2A Current Limit Switch

DESCRIPTION

The EV5035-J-00A Evaluation Board is designed to demonstrate the capabilities of MPS' MP5035, a protection device designed to protect circuitry on the output from transients on input. It also protects input from undesired shorts and transients coming from the output.

At startup, the inrush current is limited by limiting the slew rate at the output. The slew rate is controlled by a capacitor at the DV/DT pin.

The maximum load at the output is current limited. The magnitude of the current limit is controlled by an external resistor from ILIMIT to GND. There is a fixed 300mA current limit when floating ILIMIT pin.

The MP5035 is available in a space-saving TSOT23-6 package.

ELECTRICAL SPECIFICATION

Parameter	Symbol	Value	Units
Input Voltage	V_{IN}	12	V
Output Current	I_{OUT}	1.5	A
Current Limit	I_{LIMIT}	2	A

FEATURES

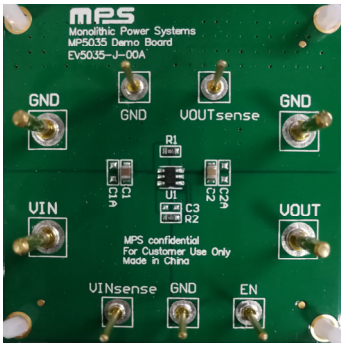
- Wide 2.9V to 22V Continued Operating Input Voltage (V_{IN}) Range
- 26V Absolute Maximum Transient Input Voltage
- Integrated 82mΩ Power MOSFET
- Adjustable Current-Limit or Fixed Current Limit when floating ILIMIT pin
- Soft Start Time Programmable through DV/DT pin
- Fast Response for Hard Short Protection
- OCP Hiccup Protection
- Thermal Shutdown and Auto Retry
- Available in TSOT23-6 Package

APPLICATIONS

- Hot Swap
- Power Meter
- IP Camera
- USB Power Distribution
- USB Protection
- USB3.1 Power Delivery

All MPS parts are lead-free, halogen-free, and adhere to the RoHS directive. For MPS green status, please visit the MPS website under Quality Assurance. "MPS", the MPS logo, and "Simple, Easy Solutions" are trademarks of Monolithic Power Systems, Inc. or its subsidiaries.

EV5035-J-00A EVALUATION BOARD

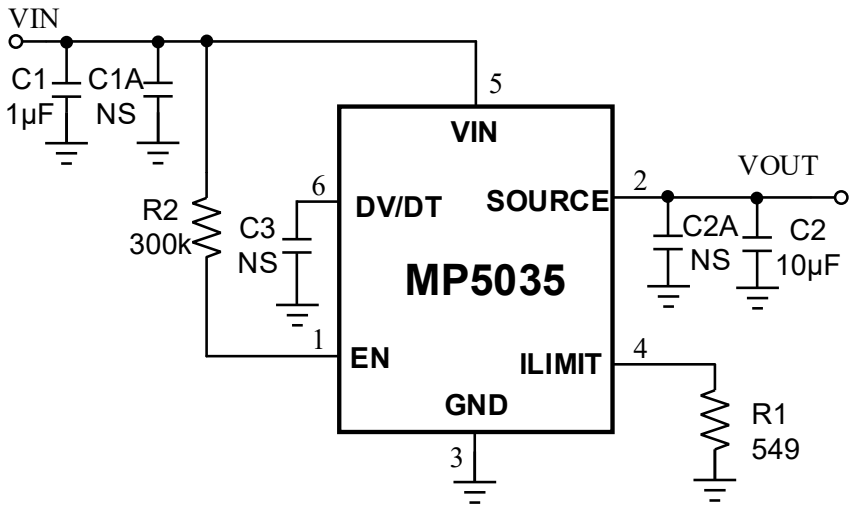


(L × W × H) 50mm x 50mm x 6.4mm

Board Number	MPS IC Number
EV5035-J-00A	MP5035GJ

MPS Proprietary Information. Patent Protected. Unauthorized Photocopy and Duplication Prohibited.
© 2025 MPS. All Rights Reserved.

EVALUATION BOARD SCHEMATIC



EV5035-J-00A BILL OF MATERIALS

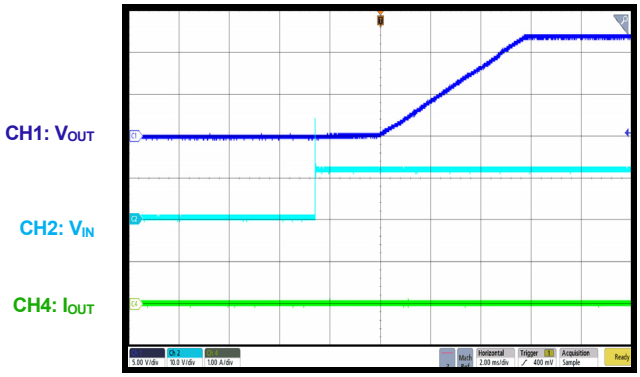
Qty	Ref	Value	Description	Package	Manufacturer	Part Number
1	C1	1µF	Ceramic Cap.,25V,X7R	0805	Murata	GRM21BR71E105KA99L
1	C2	10µF	Ceramic Cap.,25V,X5R	0805	Murata	GRM21BR61E106KA73L
0	C1A, C2A, C3	NS				
1	R1	549Ω	Thick Film Res., 1%	0603	Yageo	RC0603FR-07549RL
1	R2	300kΩ	Thick Film Res., 1%	0603	Yageo	RC0603FR-07300KL
1	U1	MP5035GJ	Current limit switch	TSOT23-6	MPS	MP5035GJ

MPS Proprietary Information. Patent Protected. Unauthorized Photocopy and Duplication Prohibited.
© 2025 MPS. All Rights Reserved.

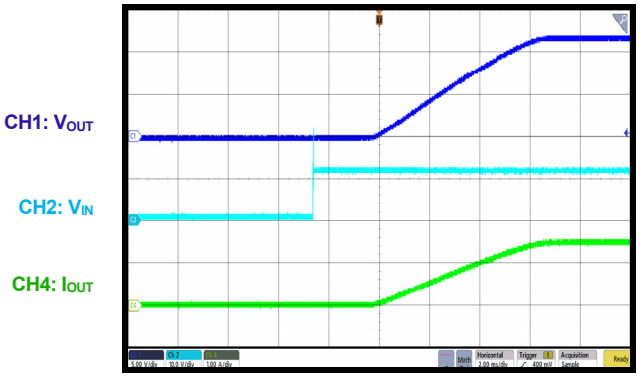
EVB TEST RESULTS

V_{IN}=12V, V_{EN}=5V, R_{LIMIT}=549Ω, DV/DT float, C_{OUT}=10μF, T_A=25°C, unless otherwise noted.

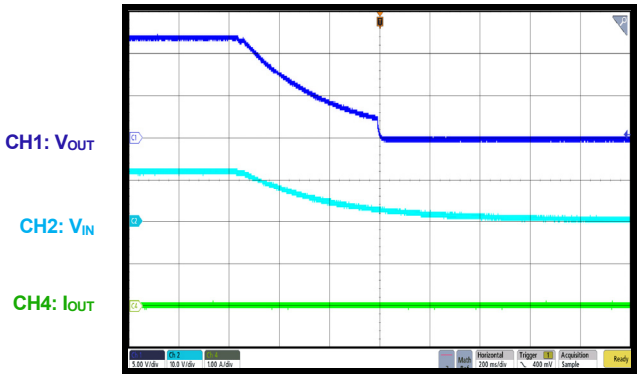
Start-Up through Input Voltage
I_{OUT} = 0A



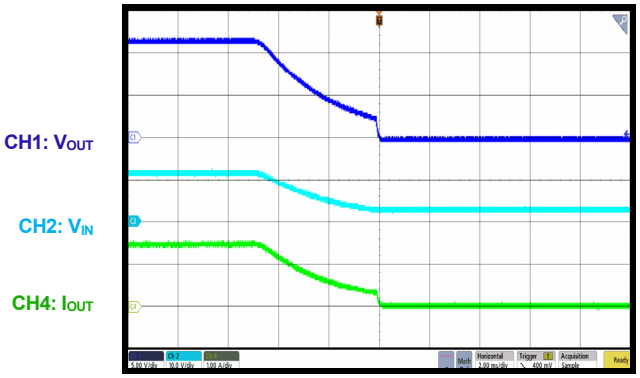
Start-Up through Input Voltage
I_{OUT} = 1.5A



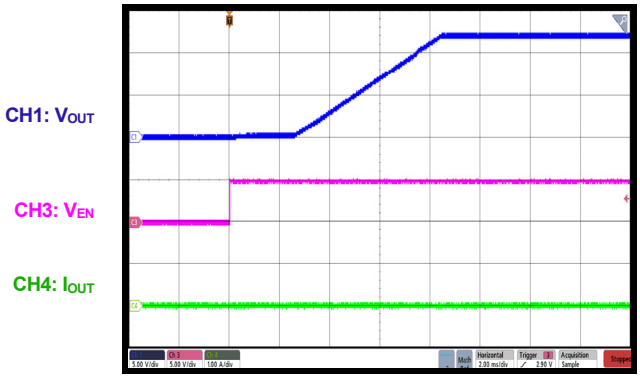
Shutdown through Input Voltage
I_{OUT} = 0A



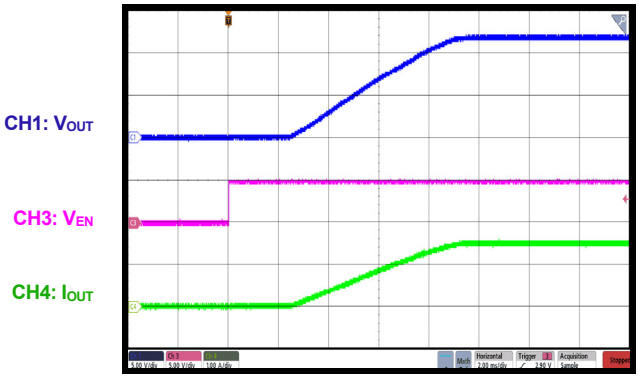
Shutdown through Input Voltage
I_{OUT} = 1.5A



Start-Up through Enable
I_{OUT} = 0A



Start-Up through Enable
I_{OUT} = 1.5A

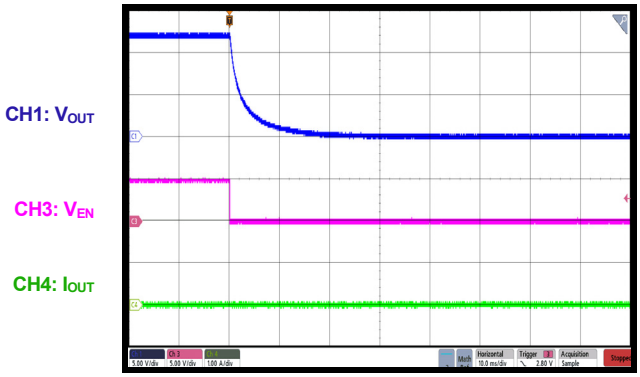


MPS Proprietary Information. Patent Protected. Unauthorized Photocopy and Duplication Prohibited.
© 2025 MPS. All Rights Reserved.

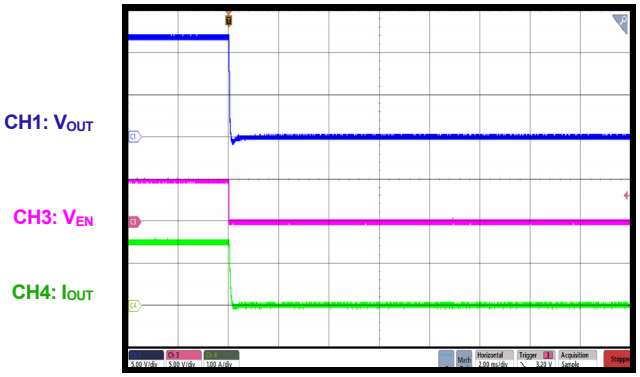
EVB TEST RESULTS *(continued)*

V_{IN}=12V, V_{EN}=5V, R_{LIMIT}=549Ω, DV/DT float, C_{OUT}=10µF, T_A=25°C, unless otherwise noted.

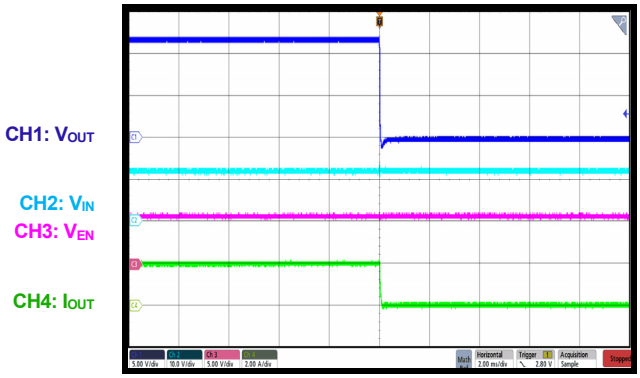
Shutdown through Enable
I_{OUT} = 0A



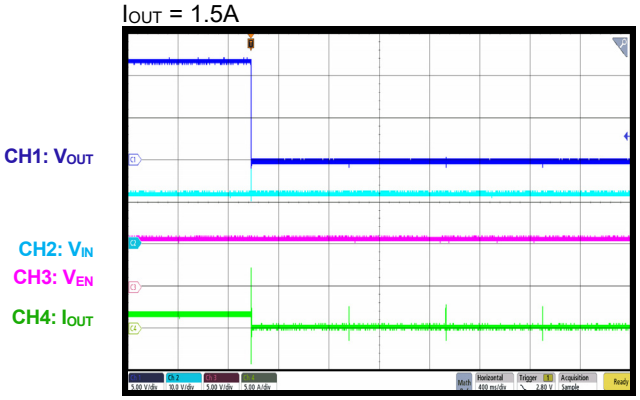
Shutdown through Enable
I_{OUT} = 1.5A



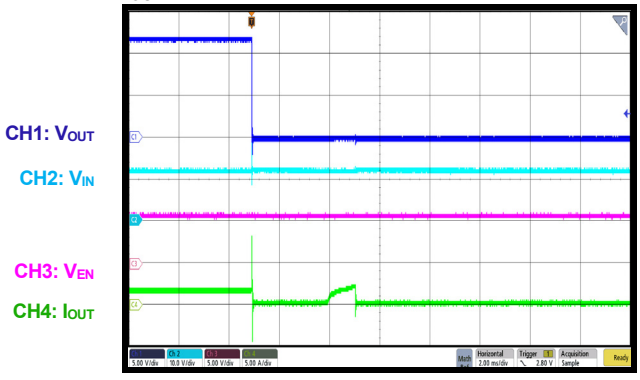
Current Limit
Increase I_{OUT} slowly



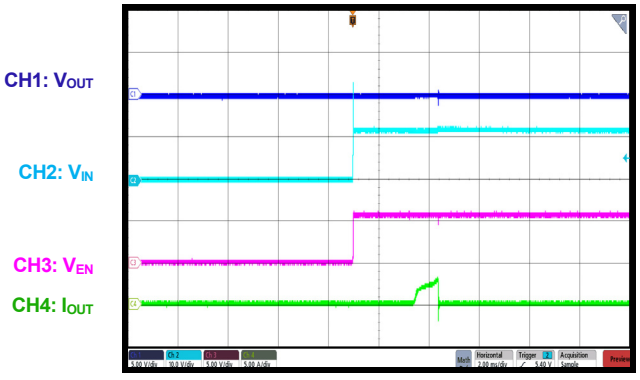
Short Circuit during Normal Operation and Hiccup
I_{OUT} = 1.5A



Short Circuit Entry during Normal Operation
I_{OUT} = 1.5A



Short Circuit before Input Voltage Start-Up



MPS Proprietary Information. Patent Protected. Unauthorized Photocopy and Duplication Prohibited.
© 2025 MPS. All Rights Reserved.

PRINTED CIRCUIT BOARD LAYOUT

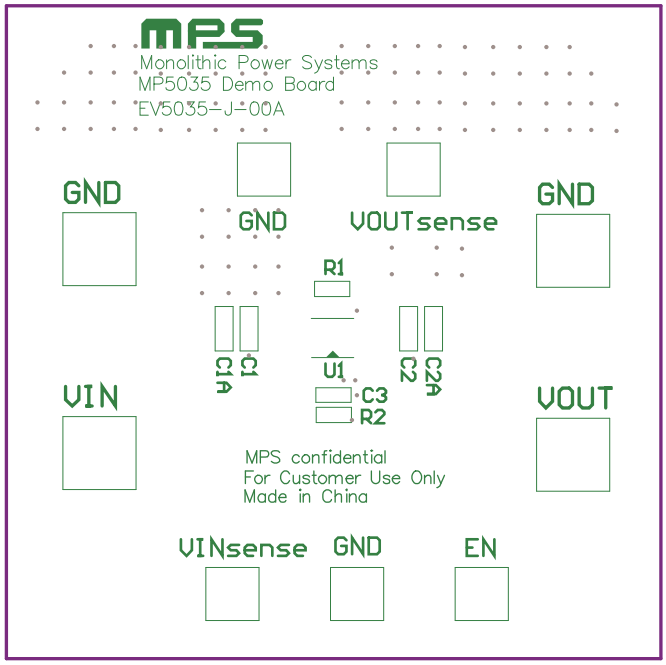


Figure 1: Top Silk Layer

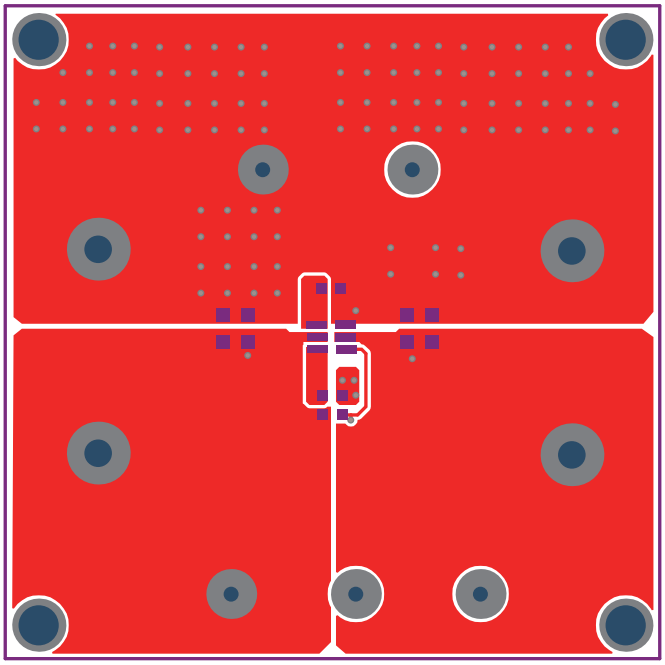


Figure 2: Top Layer

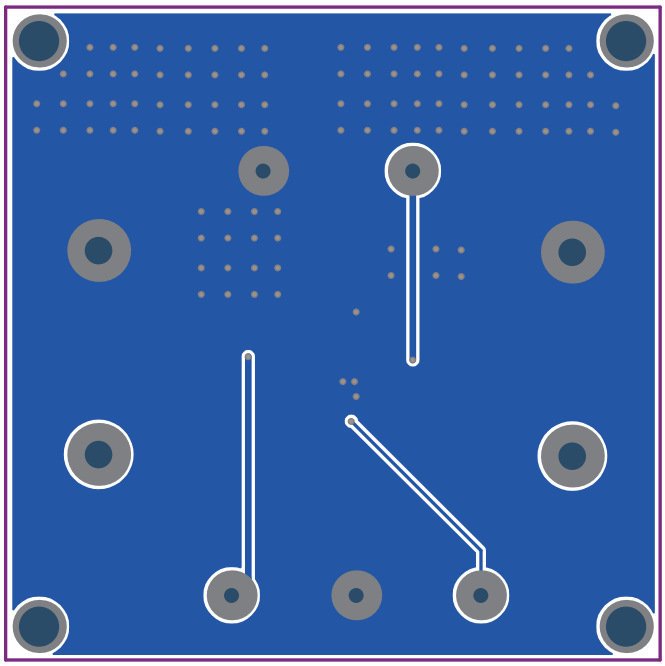


Figure 3: Bottom Layer

MPS Proprietary Information. Patent Protected. Unauthorized Photocopy and Duplication Prohibited.
© 2025 MPS. All Rights Reserved.

QUICK START GUIDE

1. Preset V_{IN} Power Supply to 12V.
2. Turn Power Supply off.
3. Connect Power Supply terminals to:
    a. Positive (+): VIN
    b. Negative (–): GND
4. Connect Load to:
    a. Positive (+): VOUT
    b. Negative (–): GND
5. Turn Power Supply on after making connections. The board will automatically start up.
6. To use the Enable function, apply a digital input to the EN pin. Drive EN higher than 2.2V to turn on the regulator, or less than 1.5V to turn it off.

MPS Proprietary Information. Patent Protected. Unauthorized Photocopy and Duplication Prohibited.
© 2025 MPS. All Rights Reserved.

REVISION HISTORY

Revision #	Revision Date	Description	Pages Updated
1.0	10/31/2019	Initial Release	-
1.01	7/1/2025	Updated headers to “2.9V to 22V” and “50mA to 2A,” updated header formatting.	All

		• Updated last sentence of Description section to “The MP5035 is available in a space-saving TSOT23-6 package.”
		• Updated Features:
		  • Updated first bullet to “Integrated 82mΩ Power MOSFET”
		  • Updated third bullet to “Wide 2.9V to 22V Continued Operating Input Voltage (V_{IN}) Range”
			1

Notice: The information in this document is subject to change without notice. Users should warrant and guarantee that third-party Intellectual Property rights are not infringed upon when integrating MPS products into any application. MPS will not assume any legal responsibility for any said applications.

MPS Proprietary Information. Patent Protected. Unauthorized Photocopy and Duplication Prohibited.
© 2025 MPS. All Rights Reserved.