

## Using the **ADM1073** Hot Swap Controller Evaluation Kit

### FEATURES

- Evaluation kit for the **ADM1073** hot swap controller
- External FET to control load current
- Programmable current limit (default 6 A)
- Programmable operating voltage range (UV/OV resistors)
- SOA timing values using external TIMER capacitor
- LEDs on all logic inputs and outputs
- Push-buttons for asserting logic inputs
- Drops into a user's system, replacing the current hot swap device

### EVALUATION KIT CONTENTS

- EVAL-ADM1073MEBZ** evaluation board
- EVAL-ADM1073MEBZ** user guide

### GENERAL DESCRIPTION

The **EVAL-ADM1073MEBZ** is a compact, full feature evaluation board for the **ADM1073** device. The layout provides users with a clear visual of all the peripheral components and the hot swap power path. The layout also maximizes the ability of the board

to dissipate heat for some of the key components on the power path, allowing evaluation of high current hot swap setups.

One sense resistor footprint and one FET footprint provides users with flexibility and allows them to simulate a wide range of application setups.

Multiple test points allow easy access to all critical points and pins. There is one LED to provide users with a direct visual indication of IC power good output.

This evaluation kit allows the **ADM1073** negative-voltage hot swap controller to be easily evaluated. The **ADM1073** provides undervoltage and overvoltage protection by monitoring the supply voltage and provides robust current limiting by monitoring the load current. The device uses an FET in the power path to control the load current.

Complete specifications for the **ADM1073** can be found in the **ADM1073** data sheet, available at [www.analog.com](http://www.analog.com), and should be consulted in conjunction with this user guide when using the evaluation board

### PHOTOGRAPH OF THE EVALUATION BOARD

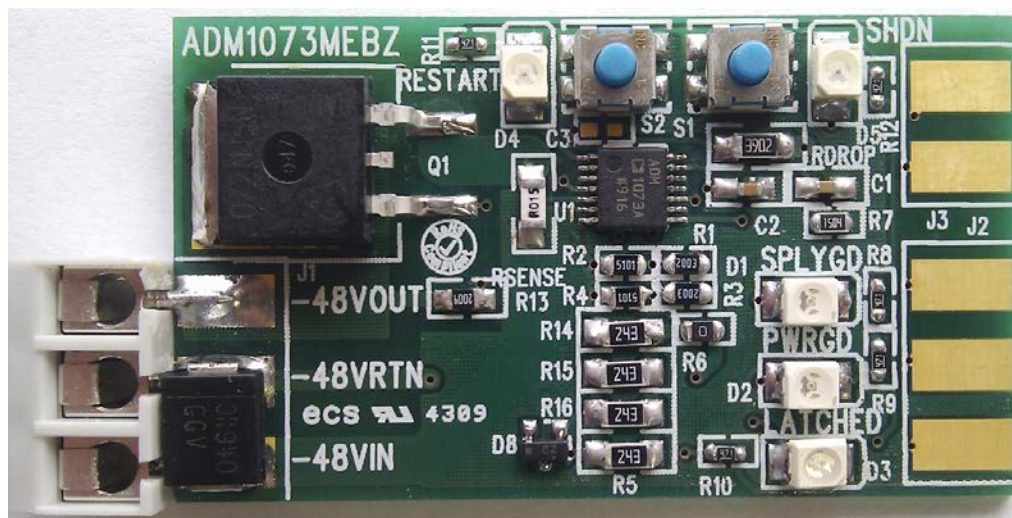


Figure 1.

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**REVISION HISTORY**

5/13—Revision 0: Initial Version

## IMPORTANT SAFETY INFORMATION

Take the following precautions when using the [EVAL-ADM1073MEBZ](#) evaluation kit under high voltage conditions:

- Do not work alone.
- Always check the grounding when working with negative voltages.
- Always keep one hand in your pocket or behind your back when around a high voltage system.
- Wear footwear with a rubber sole if possible.
- Wear eye protection (safety goggles).
- Do not wear any jewelry or other articles that could accidentally contact circuitry and conduct current.
- Set up your work area away from possible grounds that you might accidentally contact.
- With the power off and the equipment unplugged, connect/disconnect any test leads. Use clip leads or solder temporary wires to reach locations that are difficult to access.
- Perform as many tests as possible with the power off and the equipment unplugged.
- After performing tests that require the power to be turned on, turn off the power and disconnect the power supply from the board.
- Fully discharge large load capacitors with an appropriate resistor.



### INTEGRATING THE EVALUATION BOARD INTO THE SYSTEM

The current system must be modified to disconnect or remove the existing hot swap circuitry and replace it with the ADM1073 evaluation board. The following steps describe a situation in which the hot swap circuitry resides on a plug-in module. The same method applies when a hot swap system is implemented on the backplane side.

1. Locate the existing hot swap device and its accompanying components, and disconnect this portion of the system by cutting the relevant tracks on the board. Alternatively, you can desolder and remove the relevant components, as shown in Figure 3.

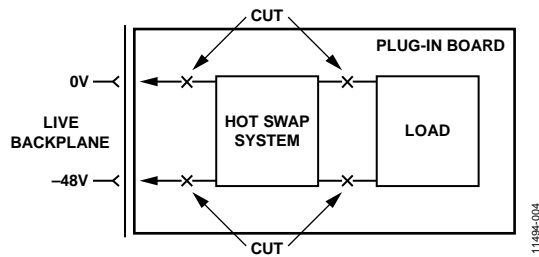


Figure 3. Removing Existing Hot Swap Circuitry from the System

2. To integrate the ADM1073 evaluation board into your system in place of the original hot swap circuitry, clamp three wires into the J1 terminal block of the ADM1073 evaluation board and solder them into position on the board. If you need to access the logic I/Os, there are blank pads on the board that can be used for this purpose. The ADM1073 evaluation board now acts as a substitute for the old hot swap circuitry, as shown in Figure 4.

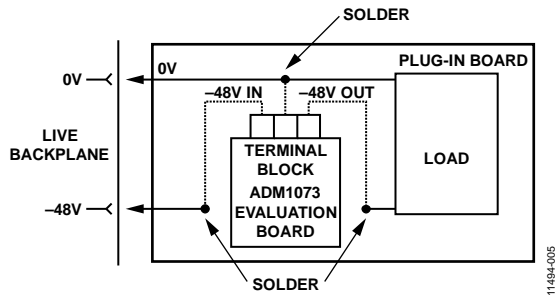


Figure 4. Integrating the ADM1073 Evaluation Board into the System

The ADM1073 evaluation board has an insulating coating on its underside to protect the system. If the underside of the board were not protected, shorts could occur on the module or backplane below it.

### LOAD CAPACITANCE

The ADM1073 can accommodate a limited multiple retry scheme to charge up larger load capacitance while keeping the FET within the programmed safe operating area (SOA) limits. There is a maximum of seven attempts allowed. Table 1 can be used as a guide for nominal load capacitance limits for this particular design.

Table 1. Nominal Load Capacitance Limits<sup>1</sup>

V <sub>IN</sub> (V)	Number of Attempts	~Maximum C <sub>LOAD</sub> (μF)
48	1	250
48	7	1800
75	1	150
75	7	1000

<sup>1</sup> Excluding tolerances and assuming no dc load current enabled during power-up.

## EVALUATION BOARD HARDWARE

### SWITCH, JUMPER, AND LED FUNCTIONS

#### EVAL-ADM1073MEBZ

Table 2. Connector Functions

Connector	Description
-48VRTN, -48VIN	Hot swap line voltage inputs that also power the board components. The input voltage ranges from -18 V to -75 V.
-48VOUT	Hot swap line voltage output.

Table 3. Switch Functions

Switch	Description
S1	Push-button for shutdown.
S2	Push-button for restart.

Table 4. LED Functions

LED	Description
D1	SPLYGD, green.
D2	PWRGD, green.
D3	LATCHED, red.
D4	RESTART, yellow.
D5	SHDN, yellow.

Table 5. On-Board ICs

IC	Description
U1	<a href="#">ADM1073</a> main IC.

# EVALUATION BOARD SCHEMATICS

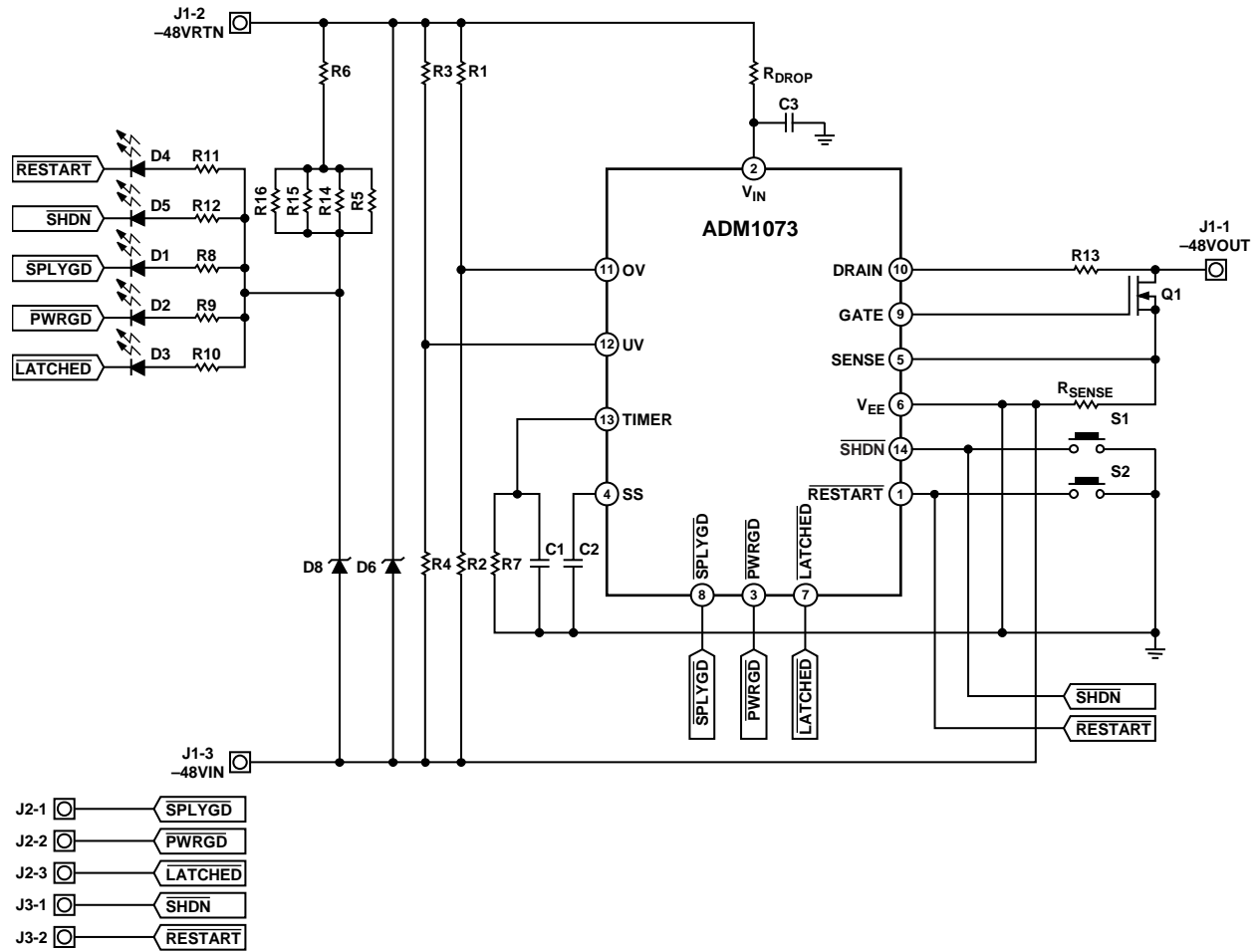


Figure 5. EVAL-ADM1073MEBZ Evaluation Board Circuit Diagram

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## BILL OF MATERIALS

### EVAL-ADM1073MEBZ

Table 2. Bill of Materials

Qty	Reference Designator	Part Type	Value	Part Decal	Part No.	Source
1	U1	Hot swap controller		14-lead TSSOP	<a href="#">ADM1073ARUZ</a>	Analog Devices, Inc.
1	C1	Capacitor (C <sub>TIMER</sub> nom)	22 nF	0603	881-9998	Farnell
1	C2	Capacitor (C <sub>SS</sub> nom)	0.82 nF	0603	175-9086	Farnell
1	C3	Capacitor	100 nF	0603	182-8899	Farnell
2	R1, R3	Resistor	200 kΩ	0805	165-2950	Farnell
1	R2	Resistor	5.1 kΩ	0805	146-9937	Farnell
1	R4	Resistor	5.36 kΩ	0805	2305132	Farnell
4	R5, R14, R15, R16	Resistor	24 kΩ	1206	184-1781	Farnell
1	R6	Resistor	0 Ω	0805	9333681	Farnell
1	R7	Resistor (R <sub>TIMER</sub> nom)			Do not insert	
5	R8 to R12	Resistor	470 Ω	0805	923-3962	Farnell
1	R13	Resistor (R <sub>DRAIN</sub> )	2 MΩ	0805	150-6150	Farnell
1	RDROP	Resistor (R <sub>SHUNT(NOM)</sub> )	39 kΩ	1206	923-6910	Farnell
1	RSENSE	Resistor	15 mΩ	1206	WSLP1206R0150FEA	Vishay
1	Q1	FET	7.2 mΩ	D2PAK	IPP075N15N3 G	Infineon
2	D4, D5	LED		LED SMT yellow	121-2751	Farnell
2	D1, D2	LED		LED SMT green	122-6375	Farnell
1	D3	LED		LED SMT red	122-6394	Farnell
1	D6	TVS diode	85 V	SMC	SMCJ85A-FDICT-ND	Digi-Key
1	D8	Zener diode		3-pin SOT23	984-4392	Farnell
2	S1, S2	SW-PUSH-SMD		Push-button switch	112-3624	Farnell
1	J1	Connector/power		3-way terminal block	151-786	Farnell
1	J2	Connector/power		3-way terminal block	Do not insert	
1	J3	Connector/power		2-way terminal block	Do not insert	



#### ESD Caution

**ESD (electrostatic discharge) sensitive device.** Charged devices and circuit boards can discharge without detection. Although this product features patented or proprietary protection circuitry, damage may occur on devices subjected to high energy ESD. Therefore, proper ESD precautions should be taken to avoid performance degradation or loss of functionality.

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