GLF4033
13 V, 4 A Power Mux IC with Manual Input Selection

DESCRIPTION

The GLF4033 is an integrated power multiplexer IC featuring dual independent power switches connected to a single output, enabling seamless transitions between two input power sources. The device supports a manual selection mode, configurable via the logic input pins S1 and S2. These pins allow system designers to manually select VIN1 only or VIN2 or and disable both switches.

The GLF4033 features low conduction resistance, enabling robust 4 A continuous current handling capability per channel. The device incorporates advanced cross-conduction protection that actively prevents current flow between input sources, maintaining isolation regardless of which power supply is active. The GLF4033 is ideally suited for power systems requiring an internal backup power supply.

FEATURES

- Two-Input and Single-Output Power Multiplexer Switch
- Manual Input Selection Mode
- Wide Input Range:
  - V_{IN1} = 3 V to 13 V
  - V_{IN2} = 3 V to 13 V
- Low R_{ON}: 27 mΩ Typ
- I_{OUT} Max: 4 A Per Channel, VIN1 and VIN2
- Quiescent Current, I_Q:
  - 44 μA Typ at V_{IN1} & V_{IN2} = 3 V
  - 56 μA Typ at V_{IN1} & V_{IN2} = 5 V
  - 76 μA Typ at V_{IN1} & V_{IN2}= 12 V
- Stand-by Current, I_{SD}:
  - 11 μA Typ at V_{IN1} & V_{IN2} = 3 V
  - 14 μA Typ at V_{IN1} & V_{IN2} = 5 V
  - 17 μA Typ at V_{IN1} & V_{IN2}= 12 V
- No Cross Conduction Between Two Input Sources
- Programmable Over-voltage Protection
- Thermal Shutdown Protection
- State Indication Function
- Operating Temperature Range:
  - 0 °C to 85 °C

PIN CONFIGURATION AND DEFINITION

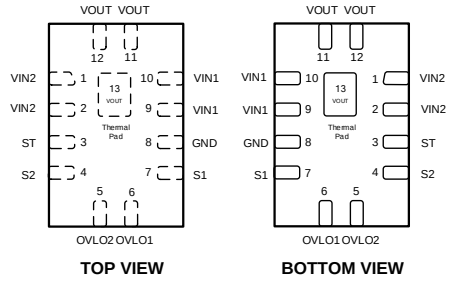

Figure 1. Package: 2 mm x 3 mm QFN-13L

Pin #	Name	Description
1, 2	VIN2	IC Input 2
3	ST	State indication
4	S2	Control logic input. Do not leave the S2 pin floating.
5	OVLO2	Programmable OVP for channel 2. Tie the OVLO2 pin to GND can disable OVP function
6	OVLO1	Programmable OVP for channel 1. Tie the OVLO1 pin to GND can disable OVP function
7	S1	Control logic input. Do not leave the S1 pin floating.
8	GND	Ground
9, 10	VIN1	IC Input 1
11, 12, 13	VOUT	IC Output

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TRUTH TABLE

S1	S2	VOUT	ST	Function
High	High	VIN1	High	VIN1 is selected
Low	High	VIN2	Low	VIN2 is selected
High	Low	High-Z	Low	Both channels are off

Note） Input Logic High Voltage : ≥ 1.2 V
Input Logic Low Voltage : ≤ 0.85 V

Table 1. Truth Table for Input Source Selection

APPLICATION DIAGRAM

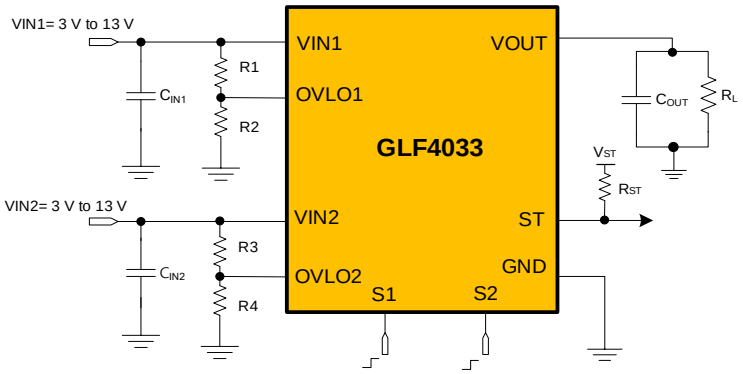

Figure 2. Programmable Over Voltage Protection

Notes:
1. VIN1 OVP trigger Voltage ≈ V_{OVP_TH} x (1 + R1 / R2), Recommended R2 ≤ 1 MΩ.
2. VIN2 OVP trigger Voltage ≈ V_{OVP_TH} x (1 + R3 / R4), Recommended R4 ≤ 1 MΩ.
3. V_{OVP_TH} of OVLO1 and OVLO2 = 1.02 V.
4. Recommended R_{ST} ≤ 1 MΩ and V_{ST} voltage is less than 5 V.

TEST SETUP

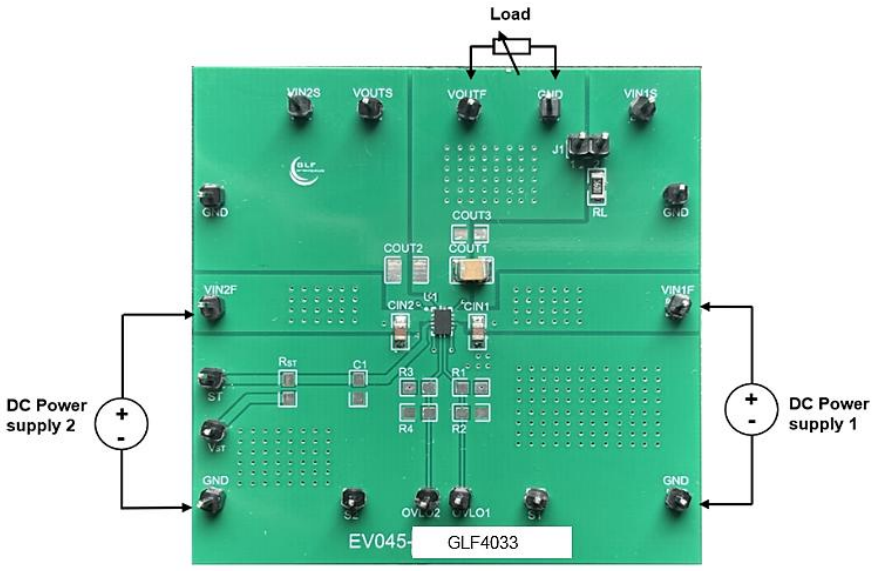

Figure 3. EVB Setup

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QUICK START GUIDE

1. Both input power suppliers need to be connected before testing the board.
2. Set the VIN1F DC supply between 3 V and 13 V and the VIN2F DC supply between 3 V and 13 V.
3. The load resistor RL=560 Ω, has been populated on the top of the PCB board. Short the J1 to use the RL. To increase the output current, connect an electronic load to VOUTF and GND. The output current for the GLF4033 is rated for 4 A maximum output continuous current per each channel. Please ensure this absolute maximum is not exceeded.
4. When OVLO1 and OVLO2 are connected to GND, Channel 1 and Channel 2 OVP functions will be disabled. If the OVP function is used, it can be configured based on Figure 2. When the input voltage rises, the OVLO voltage exceeds 1.03 V (Typ.), the main switch immediately shuts down, and the input voltage drops so that the OVLO voltage is less than 0.97 V (Typ.) to resume normal operation.
5. VIN1S, VIN2S, and VOUTS can be used for measurement point.
6. The input source selection function is set by the combination of S1 and S2. See Table 1.
7. The ST Pin is an open-drain output and requires an external pull-up resistor connected to a DC source below 5 V.
8. Turn on the input power supply. GLF4033 S1, S2, OVLO1 and OVLO2 pins do not have pull-down resistors inside, make sure not to float.

SCHEMATIC

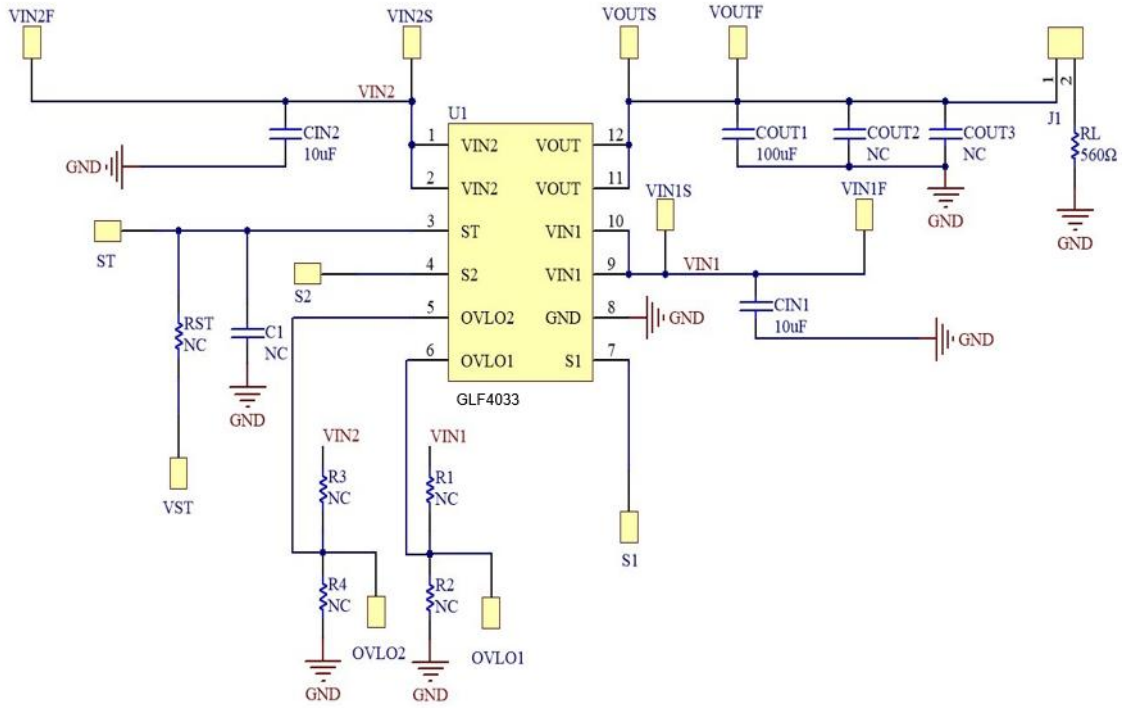

Figure 4. EVB Schematic

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BILL OF MATERIALS

Designator	Value	QTY	Description	Manufacturer/Part Number
U1	GLF4033	1	Power Multiplexer IC	GLF Integrated Power
C3, C5	10 μF	2	Cap., X5R, 25V, 10% 0805	YAGEO, CC0805KKX5R8BB106
C1	100 μF	1	Cap., X5R, 16V, 20% 1210	Chinocera, HGC1210R5107M160 NSVK
RL	560 Ω	1	Res. 5% 1206	YAGEO, RC1206JR-07560RL
J1, J2	Jumper	2	Jumper	

Table 2. Bill of Materials

OPERATING WAVEFORMS

Conditions:

VIN1 = 8.4 V
VIN2 = 4.2 V
Cin1 = Cin2 = 10 μF
Cout = 100 μF

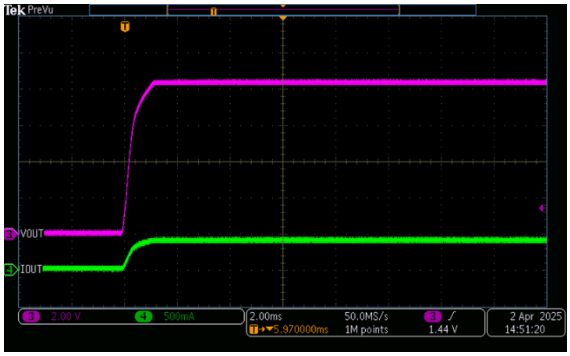

Figure 5. Turn-on Response

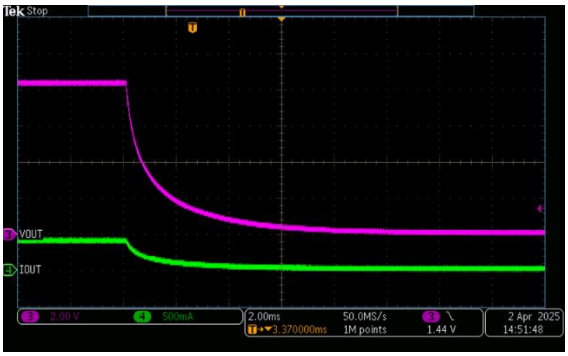

Figure 6. Turn-off Response

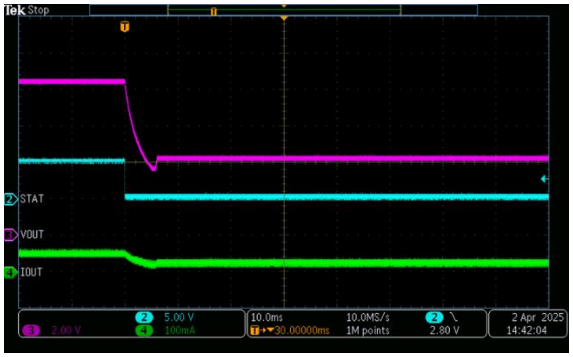

Figure 7. V_{OUT} Switch Over from V_{IN1} to V_{IN2}

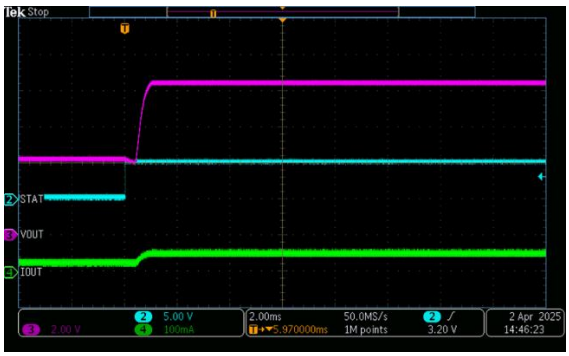

Figure 8. V_{OUT} Switch Over from V_{IN2} to V_{IN1}

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PRINTED CIRCUIT BOARD LAYOUT

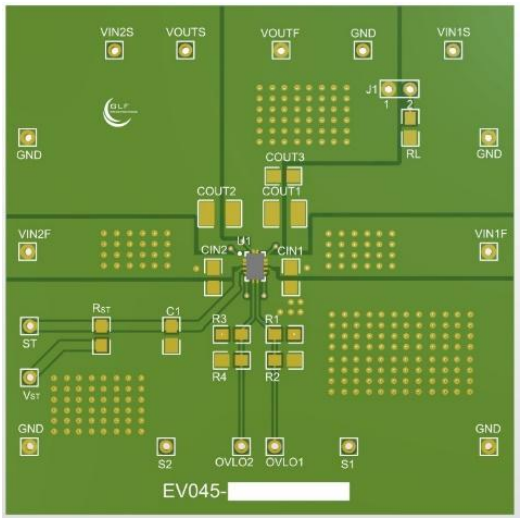

Figure 9. Top Layer

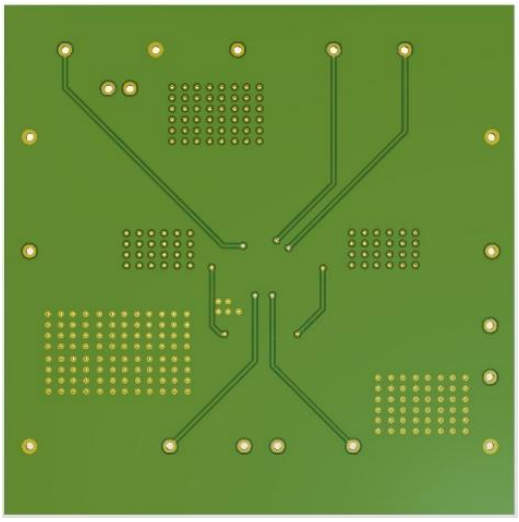

Figure 10. Bottom Layer

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