

Battery Disconnect Switch

FEATURES

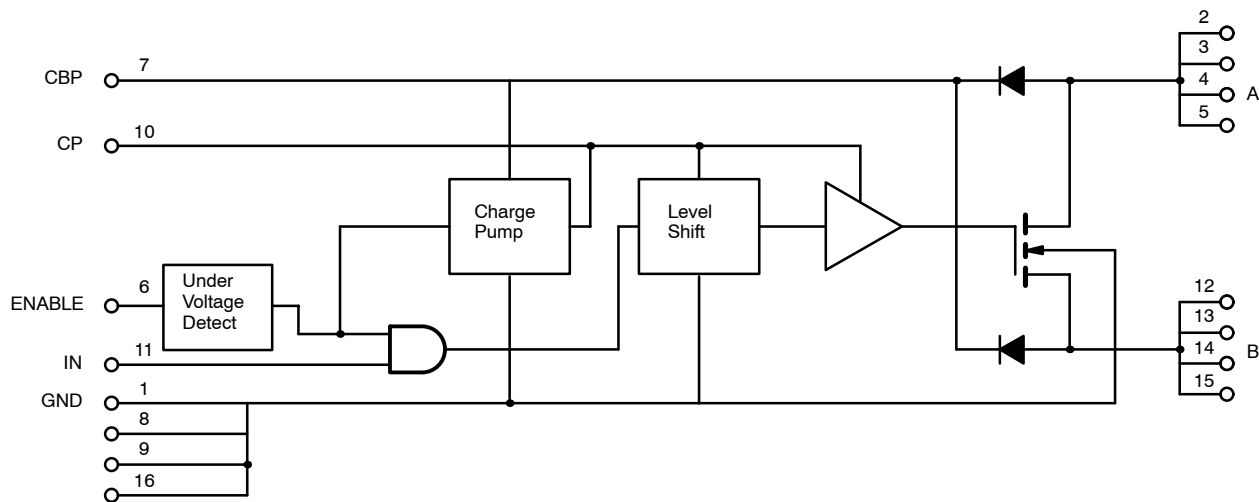
- 6- to 18-V Operation
- Separate Logic Voltage Input
- Undervoltage Lockout (UVL) @ $V_L = 3\text{ V}$
- Shutdown Control Capability
- Safe Power Down

DESCRIPTION

The **ADP1055** is a reverse blocking switch for battery disconnect applications. It is an integrated solution for multiple battery technology designs or designs that require isolation from the power bus during charging. The **ADP1055** is available in a 16-pin SOIC package and is rated for the commercial temperature range of 0 to 70°C.

The Si9717 is available in both standard and lead (Pb)-free packages.

FUNCTIONAL BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Voltage Referenced to GND

V_A, V_B		-0.3 to 20 V
V_{IN}		-0.3 to 10 V
V_{ENABLE}		-0.3 to 10 V

Storage Temperature	–65 to 125°C
Power Dissipation	2 W

Notes: Device mounted with all leads soldered to PC board.

RECOMMENDED OPERATING RANGE

V_A, V_B (see note)	6 to 18 V
V_{IN}	0 to 5 V
I_{AB} (continuous)	0 to 4 A
$I_{AB} \times V_A$ (continuous)	0 to 40 W
Minimum Cycle Time (turn-on to turn-on)	10 ms
V_{ENAB1E}	0 to 5 V

Operating Temperature	0 to 70°C
Junction Temperature	0 to 150°C

Notes:

- a. is functional at $V_A, V_B = 5$ to 6 V with higher supply current. See $I_{A(on)}$ specification.

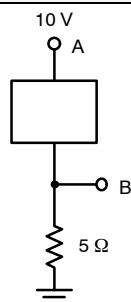
SPECIFICATIONS

Parameter	Symbol	Test Conditions Unless Otherwise Specified $6\text{ V} \leq V_A \leq 18\text{ V}$ $C_{VDD} = 0.1\text{ }\mu\text{F}$, $CP = 0.02\text{ }\mu\text{F}$	Temp ^a	Limits ^d			Unit
				Min ^b	Typ ^c	Max ^b	
On-Resistance	R_{AB}	$V_A = 10\text{ V}$, $I_A = 1\text{ A}$	Room			0.06	Ω
Leakage Current	$I_{AB(off)}$	$V_A = 16\text{ V}$, $V_B = 0\text{ V}$	Room			10	μA
IN Low Threshold	$V_{IN(L)}$		Full			1	V
IN High Threshold	$V_{IN(H)}$		Full	4.0			
IN Input Current	$I_{IN(H)}$	$V_{IN} = 5.0\text{ V}$	Full			1	μA
Turn-On Delay IN to A or B	$t_{ON(IN)}$	ENABLE = 5 V, $V_A = 10\text{ V}$, $R_L = 5\text{ }\Omega$ Test Circuit 1	Full			10	μs
Turn-Off Delay IN to A or B	$t_{OFF(IN)}$		Full			10	
ENABLE Low Threshold	$V_{ENABLE(L)}$		Full			3.0	V
ENABLE High Threshold	$V_{ENABLE(H)}$		Full	4.4			
ENABLE Input Current	$I_{ENABLE(H)}$	$V_{ENABLE} = 5\text{ V}$	Full			50	μA
Setup Time from ENABLE to Switch	$t_{ENABLE(H)}$	$V_A = 10\text{ V}$, $V_{IN} = 0\text{ V}$, Test Circuit 2	Room			2.0	ms
		$V_A = 6\text{ V}$, $V_{IN} = 0\text{ V}$, Test Circuit 2	Full			10	
On-State Drain	$I_{A(on)}$	AB Shorted, $V_A = 10\text{ V}$, $V_{ENABLE} = 5\text{ V}$	Full			60	μA
		AB Shorted, $V_A = 5\text{ V}$, $V_{ENABLE} = 5\text{ V}$	Full			300	
Off-State Drain	$I_{A(off)}$	AB Shorted, $V_A = 10\text{ V}$, $V_{ENABLE} = 0\text{ V}$	Full			10	

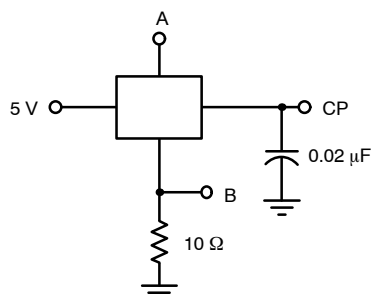
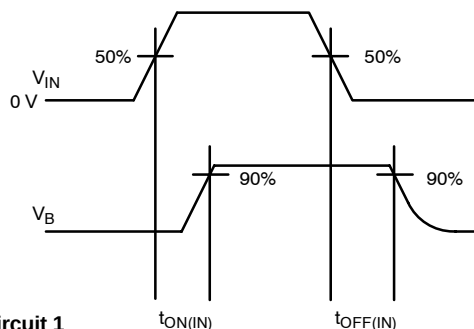
Notes:

- Room = 25°C, Full = as determined by the operating temperature suffix.
- The algebraic convention whereby the most negative value is a minimum and the most positive a maximum, is used in this data sheet.
- Typical values are for DESIGN AID ONLY, not guaranteed nor subject to production testing.
- Tested at room temperature, high temperature guaranteed by statistical data correlation techniques.

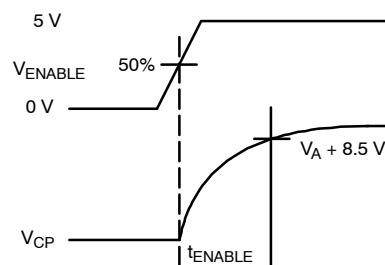
TEST CIRCUITS



Test Circuit 1



Test Circuit 2





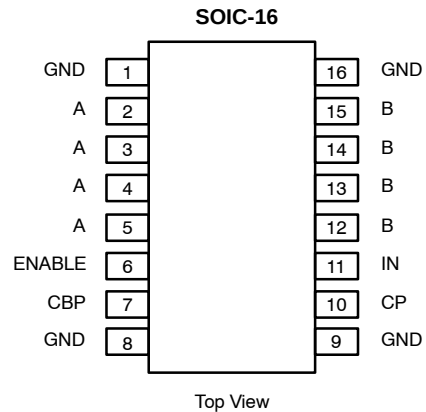
PIN CONFIGURATION, TRUTH TABLE AND ORDERING INFORMATION

TRUTH TABLE

ENABLE	IN	Switch Controller State	Switch
0	0	Inactive	X
0	1	Inactive	X
1	0	Set-Up	Off
1	1	Active	On

ORDERING INFORMATION

Part Number	Temperature Range	Package
Si9717CY	0 to 70°C	SOIC-16
Si9717CY-T1		
Si9717CY-T1—E3		



PIN DESCRIPTION

Pin Number	Symbol	Description
1, 8, 9, 16	GND	Common connection for negative battery terminals.
2, 3, 4, 5	A	A-terminal of the battery switch, bidirectional.
6	ENABLE	Logic input, ENABLE. Activates charge pump and switch drive logic.
7	CBP	Internally generated logic power supply, V_{DD} . Requires external bypass capacitor connected to pin 8.
10	CP	Charge pump output terminal. Requires external capacitor connected to pin 9.
11	IN	Logic input, IN. A high level turns on the switch.
12, 13, 14, 15	B	B-terminal of the battery switch, bidirectional.

APPLICATION DIAGRAM

