



# Battery Disconnect Switch

## FEATURES

- Solution for Bi-Directional Blocking Bi-Directional Conduction Switch
- 6- to 30-V Operation
- Ground Referenced Logic Level Inputs
- Integrated Low  $r_{DS(on)}$  MOSFET
- Level-Shifted Gate Drive with Internal MOSFET
- Ultra Low Power Consumption in Off State (Leakage Current Only)
- Logic Supply Voltage is Not Required

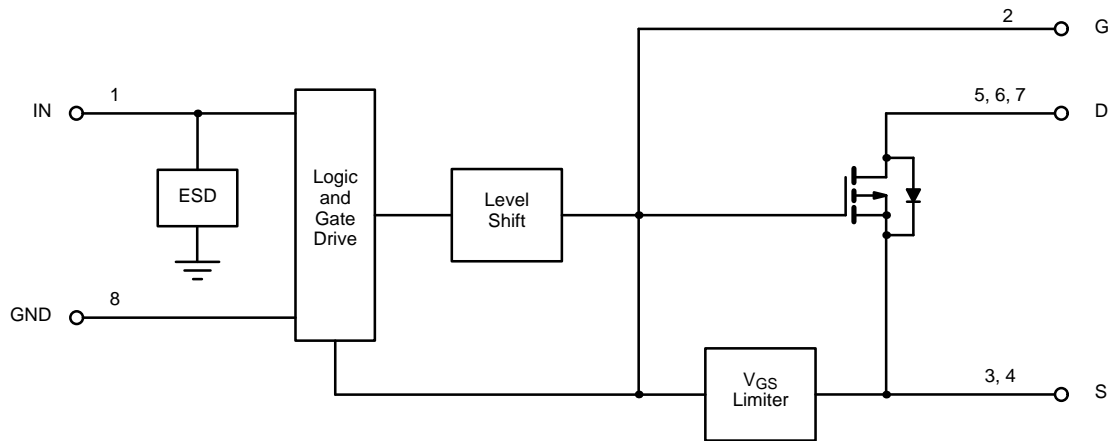
## DESCRIPTION

The Si4710CY is a level-shifted p-channel MOSFET. Operating two in a series, these MOSFETs can be used as a reverse blocking switch for battery disconnect applications. It is a solution for multiple battery technology designs or designs that require

isolation from the power bus during charging.

The Si4710CY is available in a 8-pin SOIC package and is rated for the commercial temperature range of  $-25$  to  $85^{\circ}\text{C}$ .

## FUNCTIONAL BLOCK DIAGRAM AND PIN CONFIGURATION



Half a circuit shown here.



www.DataSheet4U.com

**ABSOLUTE MAXIMUM RATINGS**

Voltage Referenced to GND		(t = steady state) . . . . . 1.4 W
$V_S, V_D^a$ . . . . .	-0.3 V to 30 V	Thermal Resistance
$V_{SD}$ . . . . .	-0.3 V to 30 V	Max Junction-Ambient <sup>b</sup> (t = 10 sec) . . . . . 55 C/W
$V_{IN1}, V_{IN2}$ . . . . .	-0.3 V to 15 V	(t = steady state) . . . . . 90 C/W
$V_{GS}$ . . . . .	20 V	Max Junction-Foot (t = steady state) . . . . . 27 C/W
Storage Temperature . . . . .	-55 to 150°C	Notes
Power Dissipation <sup>b</sup> (t = 10 sec) . . . . .	2.3 W	a. $V_{SD} \leq 30 V_{DC}$
		b. Device mounted with all leads soldered to 1" x 1" FR4 with laminated copper PC board.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

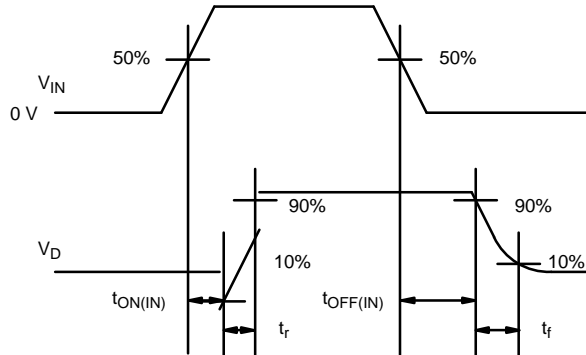
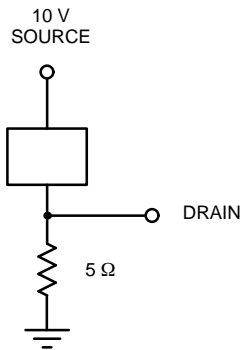
**RECOMMENDED OPERATING RANGE**

$V_S, V_D$ . . . . .	6 V to 30 V	Operating Temperature Range . . . . .	-25 to 85°C
$V_{IN1}, V_{IN2}$ . . . . .	0 V to 13.2 V	Junction Temperature . . . . .	-25 to 150°C
$I_{DS}$ . . . . .	0 A to 6 A		

SPECIFICATIONS							
Parameter	Symbol	Specific Test Conditions	Limits				Unit
			Temp <sup>a</sup>	Min <sup>b</sup>	Typ <sup>c</sup>	Max <sup>b</sup>	
On-Resistance	$r_{DS}$	$V_S = 10 V, I_D = 1 A, V_{IN} = H$	Room		0.014	0.018	$\Omega$
Leakage Current	$I_{DS(off)}$	$V_{DS} = 10 V$	Room			1	$\mu A$
Power Consumption	$I_S$ GND(off)	$V_S = 17 V$	Room			1	
	$I_S$ GND(on)		Room		1.1	6	
Input Voltage Low	$V_{INL}$	$V_S = 10 V$	Full			0.8	V
Input Voltage High	$V_{INH}$		Full	2.5			
Input Leakage Current	$I_{INH}$	$V_{IN} = 5.0 V$	Full			5	$\mu A$
Turn-On Delay	IN to D or S	$V_S = 10 V, R_L = 5 \Omega, \text{Test Circuit 1}$	Room		3.0	6	$\mu s$
Turn-Off Delay			Room		1.5	3	
Rise Time			Room		1.25	3	
Fall Time			Room		50	150	
Voltage Across Pin 6 and 7	$V_{GS}$	$V_S = 30 V$	Room		10.2	18	V
Forward Diode	$V_{SD}$	$I_D = -1 A$	Room			1.1	

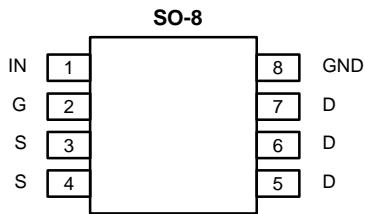
- Notes
- Room = 25°C, Full = as determined by the operating temperature suffix.
  - The algebraic convention whereby the most negative value is a minimum and the most positive a maximum.
  - Typical values are for DESIGN AID ONLY, not guaranteed nor subject to production testing.

**TIMING DIAGRAMS**



TEST CIRCUIT 1

**PIN CONFIGURATION**



Order Number: Si4710CY

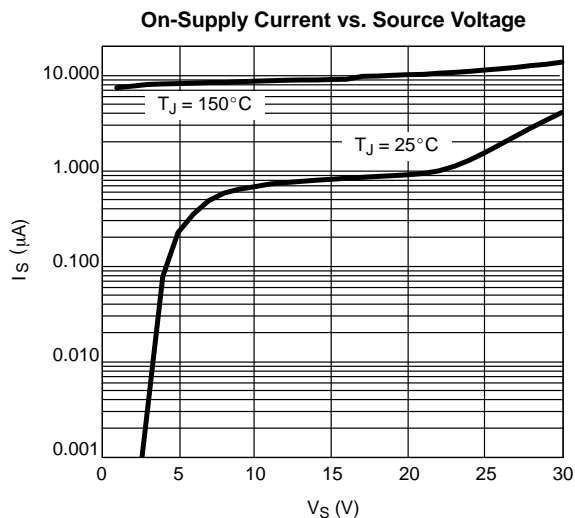
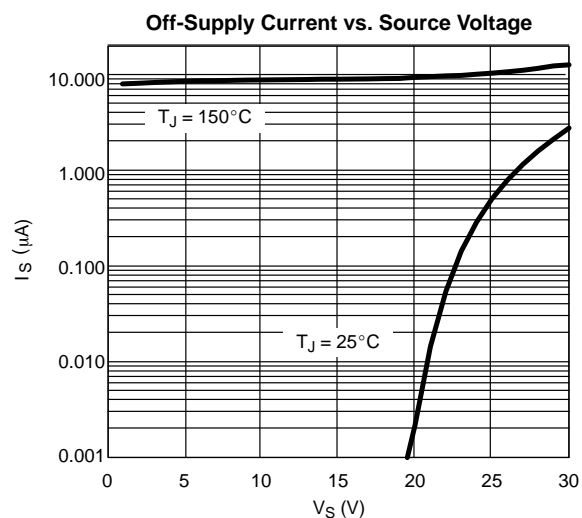
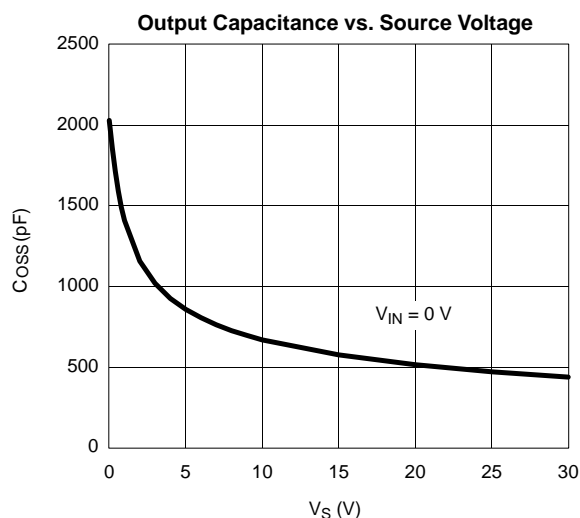
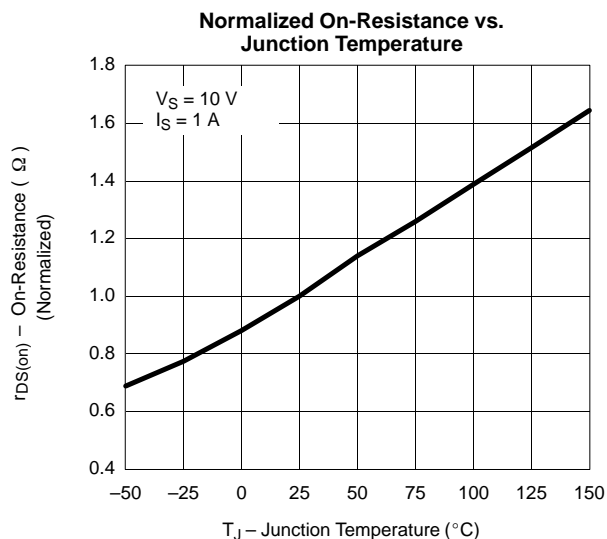
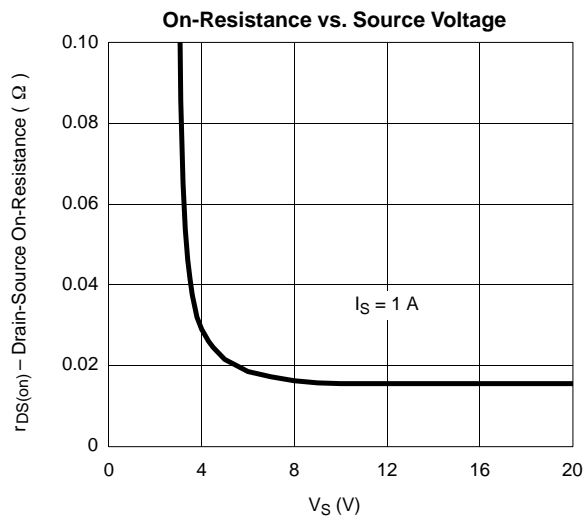
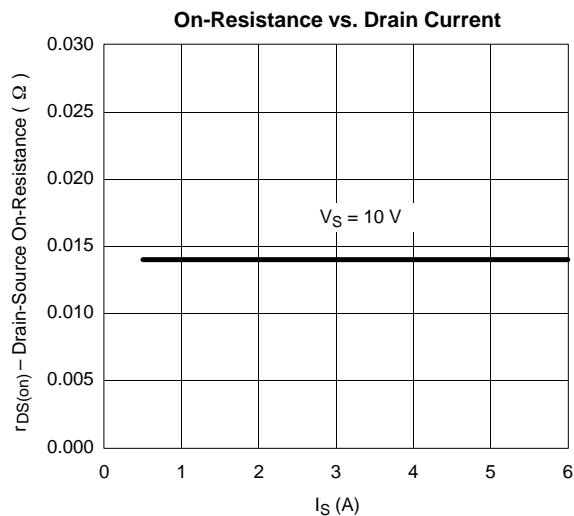
TRUTH TABLE	
V <sub>IN</sub>	Switch
0	Off
0	Off
1	On
1	On

PIN DESCRIPTION		
Pin Number	Symbol	Description
5, 6	D	Drain connection for MOSFET.
8	GND	Ground
1	IN	Logic input, IN. High level turns on the switch.
2	G	Gate output to MOSFET.
3, 4	S	Source connection for MOSFET.



www.DataSheet4U.com

### TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

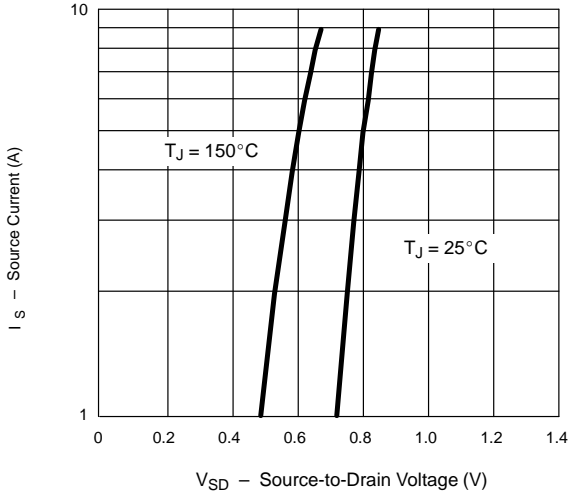




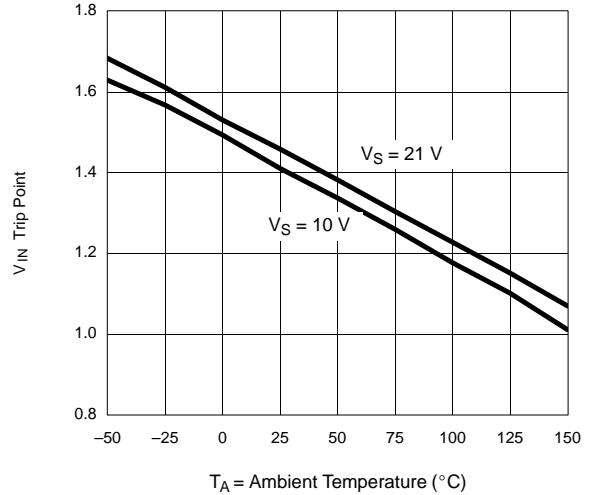
www.DataSheet4U.com

**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**

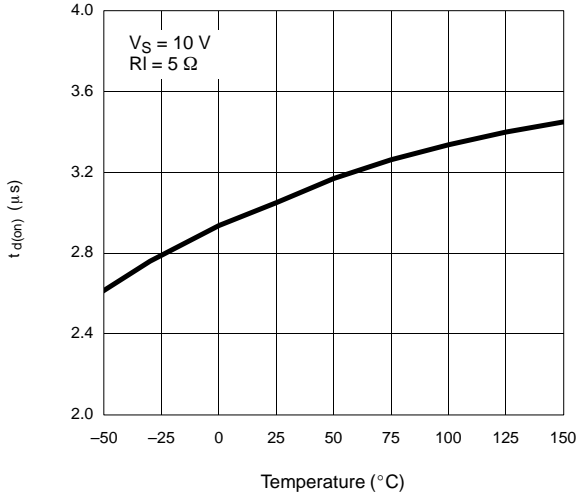
Drain-Source Diode Forward Voltage



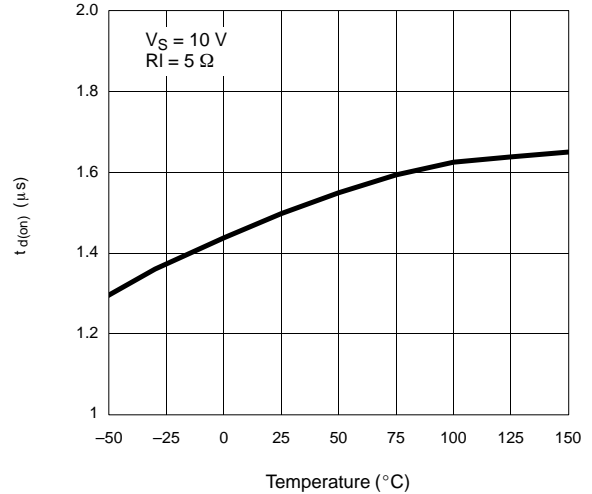
Input Voltage Trip Point vs. Temperature



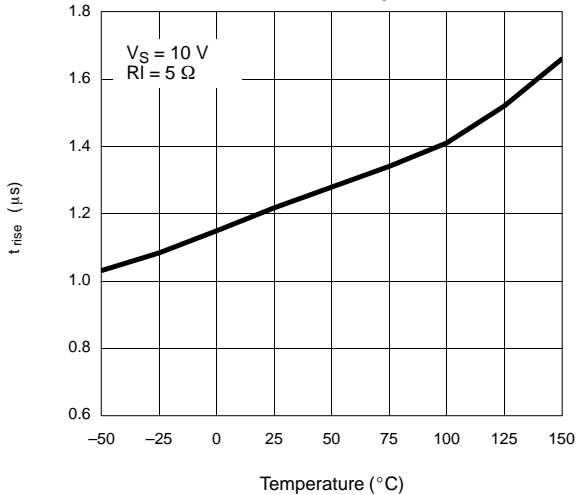
Turn-On Delay vs. Temperature



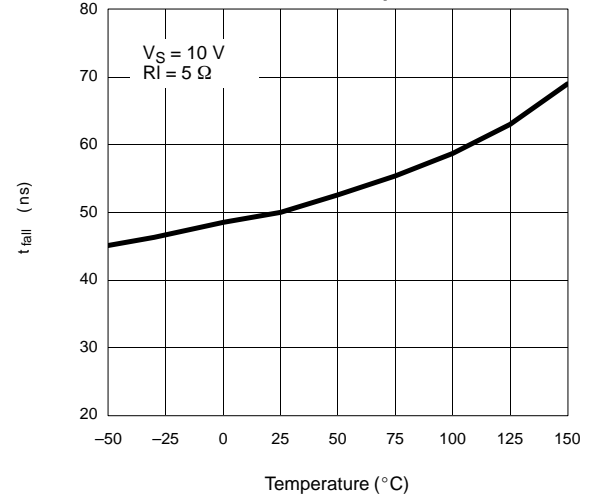
Turn-off Delay vs. Temperature



Rise Time vs. Temperature



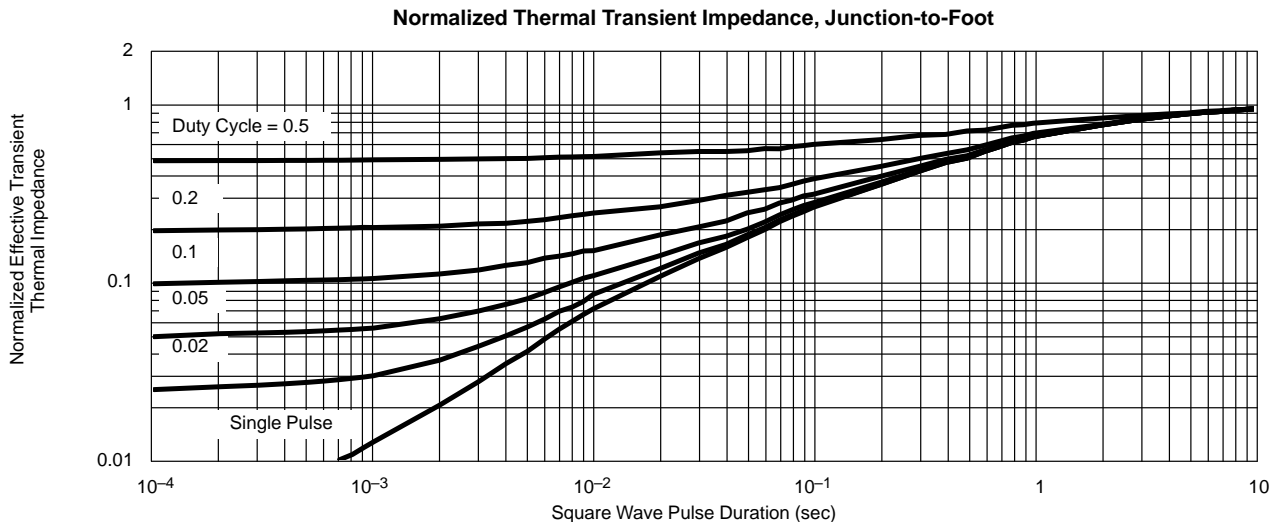
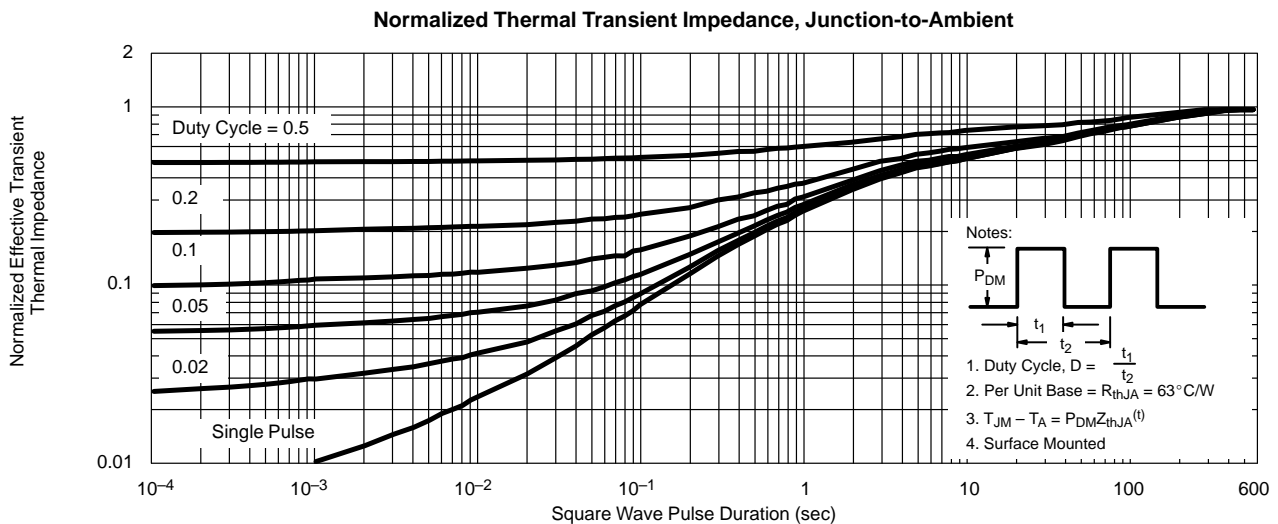
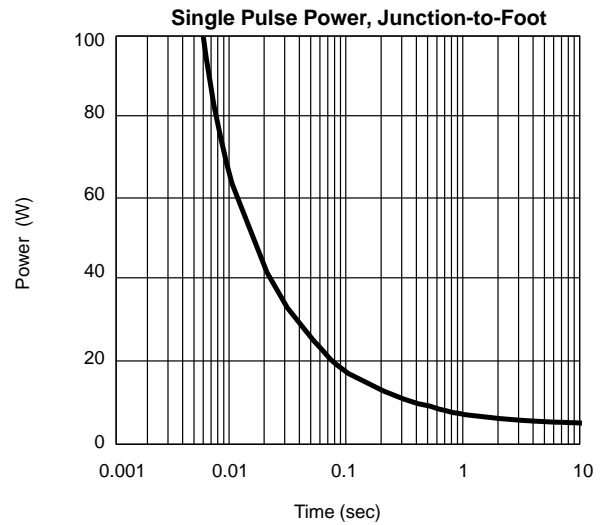
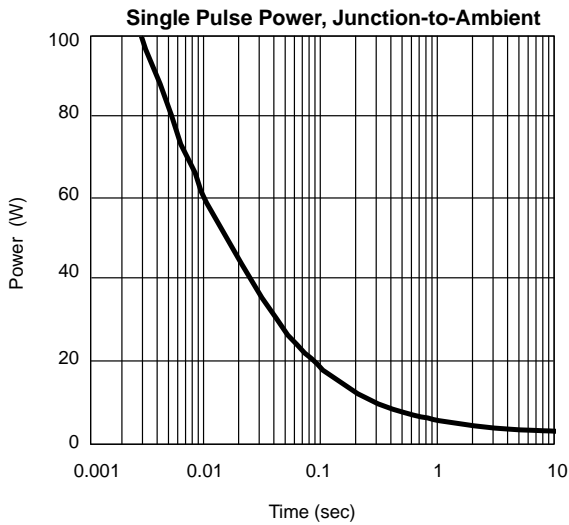
Fall Time vs. Temperature



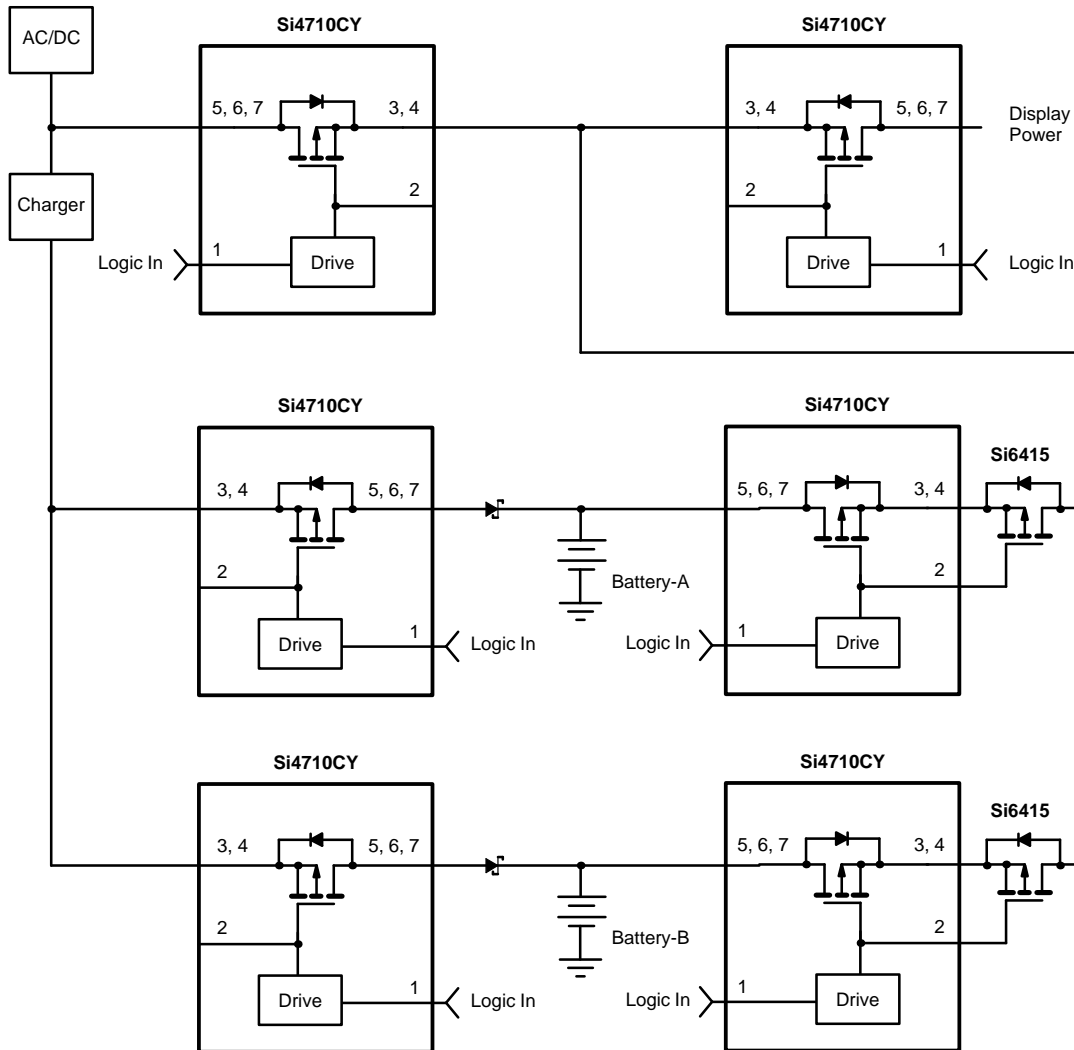


www.DataSheet4U.com

**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**

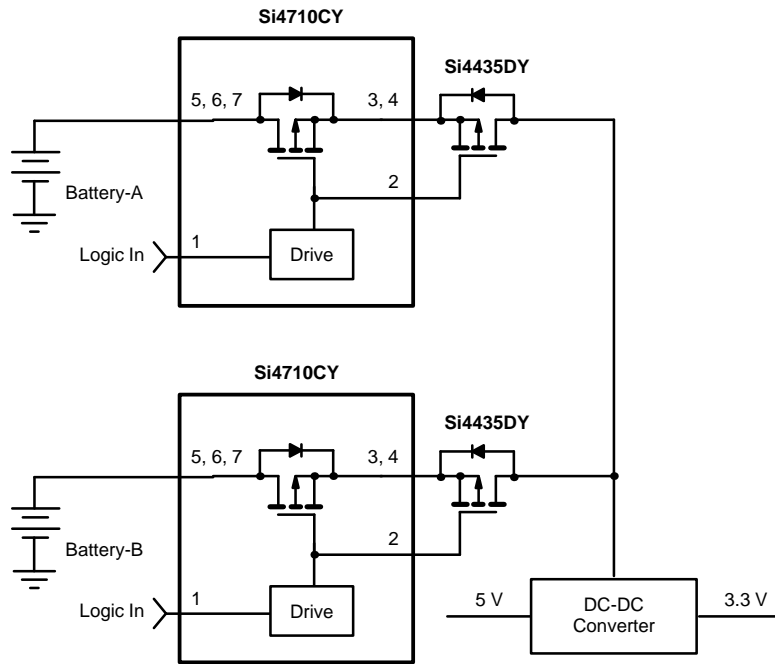


**APPLICATION DRAWINGS**

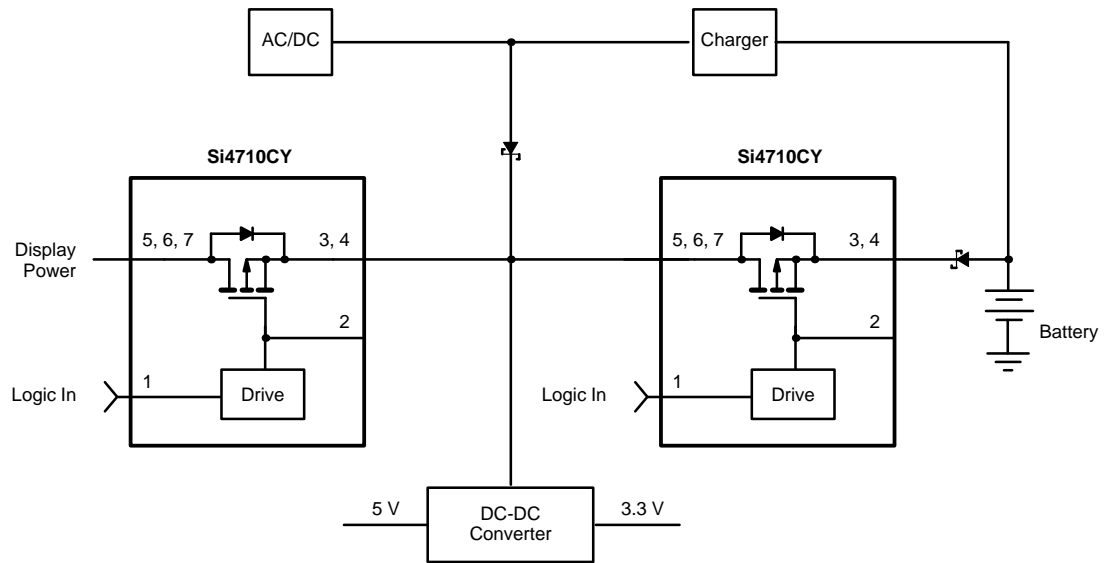


**Figure 1:** High-Performance Laptop PC

**APPLICATION DRAWINGS**



**Figure 2:**



**Figure 3: Low-Cost Laptop PC**



**APPLICATION DRAWINGS**

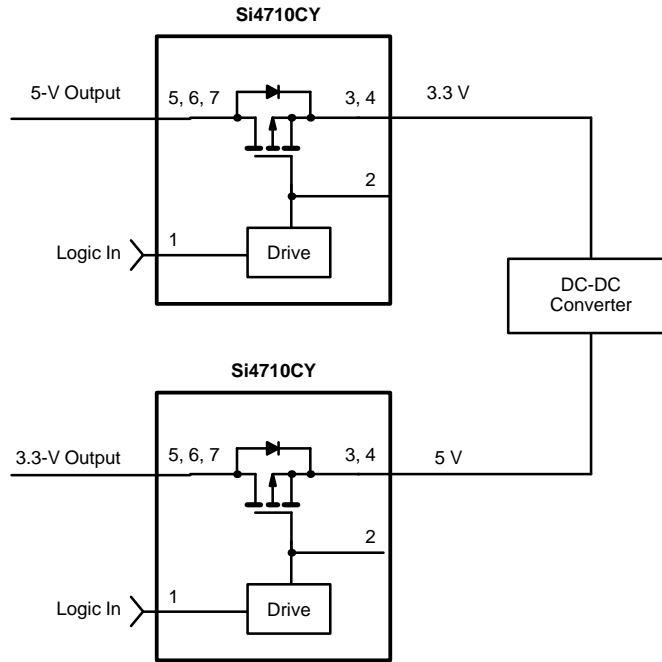


Figure 4: ACPI Power Saving Switcher