

## PC Card (PCMCIA) Interface Switch

### FEATURES

- Single SO-8 Package
- CMOS-Logic Compatible Inputs
- Slow  $V_{CC}$  Ramp Time
- Smart Switching
- Extremely Low  $R_{ON}$
- Reverse Blocking Switches
- Low Power Consumption
- Safe Power Up

### DESCRIPTION

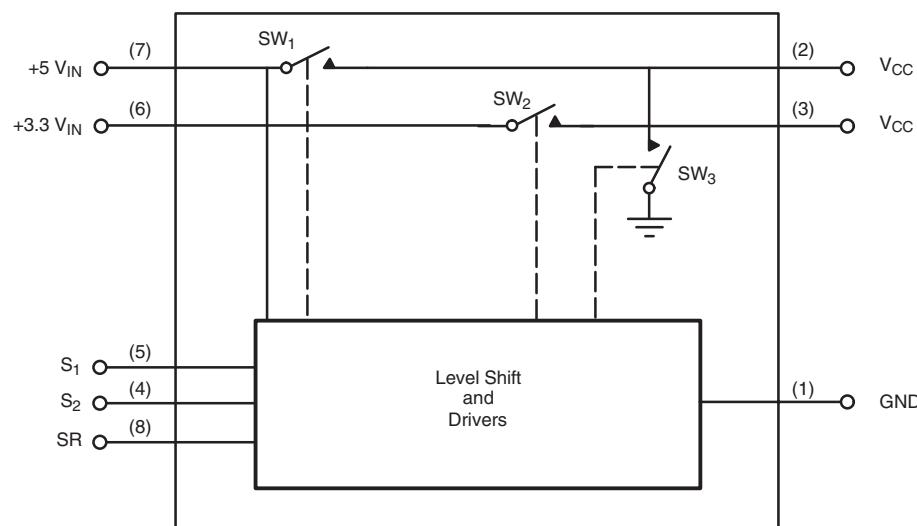
The Si9706DY offers an integrated solution for PC Card power interfaces that only require  $V_{CC}$  switching. This part is ideal for systems that operate at 5 V and provide  $V_{PP}$  from the main supply or from a dedicated Flash RAM 12-V supply.

The Si9706DY operates off the 5-V supply and has built-in level shifting for gate drive. Internal logic protects against a control logic error that would short 5 V to the 3.3-V supply. This protection logic also allows the Si9706DY to be configured for

positive or negative control logic for compatibility with a variety of PC Card controllers. These control inputs are CMOS logic compatible and can be driven to 3.3 V or 5 V.

The Si9706DY PC Card interface switch is packaged in a narrow body SO-8 package and is rated over the industrial temperature range  $-40$  to  $85^{\circ}\text{C}$ . The Si9706DY is available in lead free.

### FUNCTIONAL BLOCK DIAGRAM



## ABSOLUTE MAXIMUM RATINGS

Voltages Referenced to Ground	
+5 V <sub>IN</sub>	7 V
+3.3 V <sub>IN</sub>	7 V
S <sub>1</sub> , S <sub>2</sub> (CMOS Inputs)	7 V
All Pins	-0.5 V
I <sub>OUT</sub> V <sub>CC</sub> <sup>a</sup>	4 A

PD Max <sup>b</sup> :	(T <sub>A</sub> = 25°C) . . . . .	1.59 W
	(T <sub>A</sub> = 85°C) . . . . .	0.63 W
Junction Temperature . . . . .		125°C
Thermal Ratings <sup>b</sup> : R <sub>θJA</sub> . . . . .		63 °C/W

### Notes

- a. Pins 2, 3 connected together externally.
- b. Mounted on 1-IN<sup>2</sup>, FR4 PC Board.

## RECOMMENDED OPERATING CONDITIONS

+5 V <sub>IN</sub> (must be present)	5 V ± 10%
+3.3 V <sub>IN</sub>	3.3 V ± 10%
C <sub>SR</sub>	33 nF
I <sub>OUT</sub> V <sub>CC</sub> <sup>a</sup>	2 A

V <sub>CC</sub> Load Capacitance	150 μF Max
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### Notes

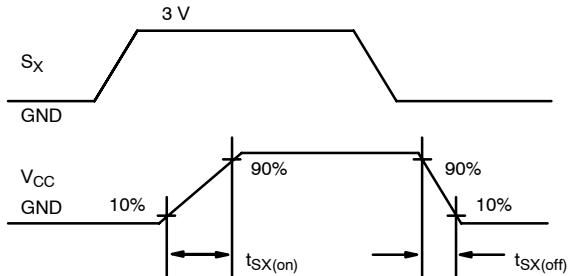
- a. Pins 2, 3 connected together externally.

## SPECIFICATIONS

Parameter	Symbol	Test Conditions Unless Otherwise Specified  C <sub>SR</sub> = 33 nF, +5 V <sub>IN</sub> = 5 V +3.3 V <sub>IN</sub> = 3.3 V, Low ≤ 0.8 V, High ≥ 2.2 V	Limits			Unit	
			Min <sup>a</sup>	Typ <sup>b</sup>	Max <sup>a</sup>		
<b>Switch SW<sub>1</sub></b>							
On-Resistance	R <sub>ON</sub>	I = 500 mA, S <sub>1</sub> = High S <sub>2</sub> = Low	T <sub>A</sub> = 25°C		58	70	mΩ
			T <sub>A</sub> = 85°C		73	90	
Off Current (V <sub>CC</sub> )	I <sub>OFF</sub>	+5 V <sub>IN</sub> = 5.5 V, V <sub>CC</sub> = 0 V S <sub>1</sub> = S <sub>2</sub> = Low	T <sub>A</sub> = 25°C		1		μA
			T <sub>A</sub> = 85°C			10	
Rise Time	t <sub>S1(on)</sub>	S <sub>2</sub> = Low, See Figure 1		0.2	1.7	5	ms
Fall Time	t <sub>S1(off)</sub>			10	30	50	
<b>Switch SW<sub>2</sub></b>							
On-Resistance	R <sub>ON</sub>	I = 500 mA, S <sub>2</sub> = High S <sub>1</sub> = Low	T <sub>A</sub> = 25°C		44	55	mΩ
			T <sub>A</sub> = 85°C		55	70	
Off Current (+3.3 V <sub>IN</sub> )	I <sub>OFF</sub>	+3.3 V <sub>IN</sub> = 3.6 V, V <sub>CC</sub> = 0 V S <sub>1</sub> = S <sub>2</sub> = Low	T <sub>A</sub> = 25°C		1		μA
			T <sub>A</sub> = 85°C			10	
Rise Time	t <sub>S2(on)</sub>	S <sub>1</sub> = Low, See Figure 1		0.1	0.9	5	ms
Fall Time	t <sub>S2(off)</sub>			5	20	40	
<b>Switch SW<sub>3</sub></b>							
On-Resistance	R <sub>ON</sub>	I = 2 mA, S <sub>1</sub> = S <sub>2</sub> = Low	T <sub>A</sub> = 25°C		140	400	Ω
			T <sub>A</sub> = 85°C		200	500	
<b>Power Supply</b>							
+5 V <sub>IN</sub> Current Input (on)	I <sub>+5VIN(1)</sub>	S <sub>1</sub> = 0 V, S <sub>2</sub> = 3 V			20	50	μA
			I <sub>+5VIN(2)</sub>	S <sub>1</sub> = 3 V, S <sub>2</sub> = 0 V		20	50
+5 V <sub>IN</sub> Current Input (off)	I <sub>+5VIN(3)</sub>	S <sub>1</sub> = S <sub>2</sub> = 0 V			<1	10	
Input Voltage High	V <sub>I(H)</sub>	+5 V <sub>IN</sub> = 5.5 V		2.2	1.8		V
			+5 V <sub>IN</sub> = 4.5 V		2.2	1.6	
Input Voltage Low	V <sub>I(L)</sub>	+5 V <sub>IN</sub> = 5.5 V			1.6	0.8	V
			+5 V <sub>IN</sub> = 4.5 V			1.4	
Input Current High	I <sub>I(H)</sub>	S <sub>1</sub> , S <sub>2</sub> = 5 V				1.0	μA
Input Current Low	I <sub>I(L)</sub>	S <sub>1</sub> , S <sub>2</sub> = GND		-1.0			

### Notes

- a. The algebraic convention whereby the most negative value is a minimum and the most positive a maximum.
- b. Typical values are for DESIGN AID ONLY, not guaranteed nor subject to production testing.

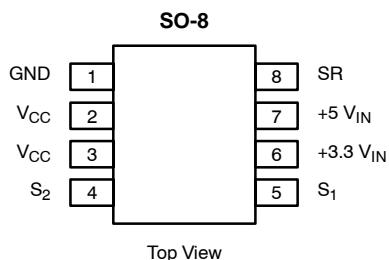
**TIMING WAVEFORMS**

**FIGURE 1.** Switch Ramp

**TRUTH TABLE**

<b>S<sub>1</sub></b>	<b>S<sub>2</sub></b>	<b>Switch 1</b>	<b>Switch 2</b>	<b>Switch 3</b>
0	0	Off	Off	On
0	1	Off	On	Off
1	0	On	Off	Off
1	1	Off	Off	On

**Notes**

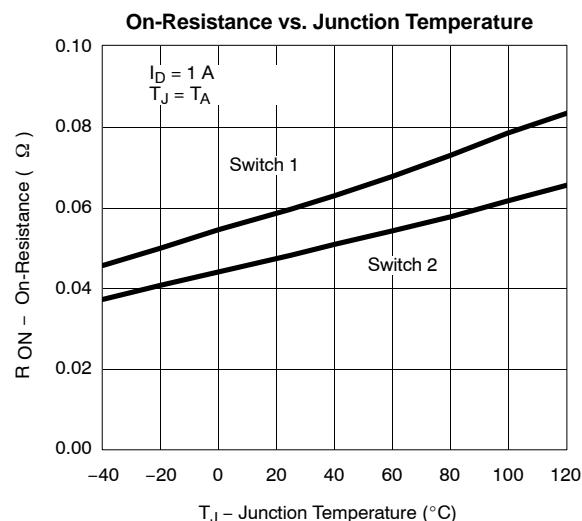
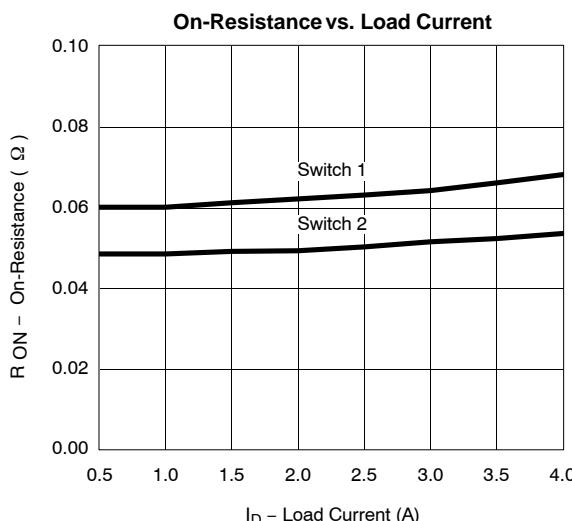
a. The smart switching of the Si9706DY avoids potential host damage by defaulting to off during error conditions.

**PIN CONFIGURATION AND DESCRIPTION**


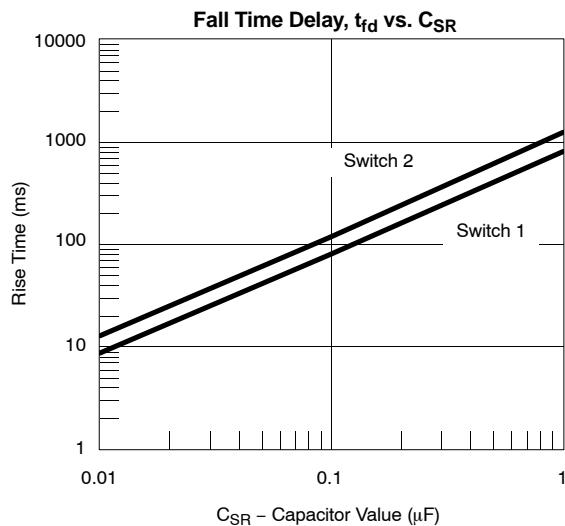
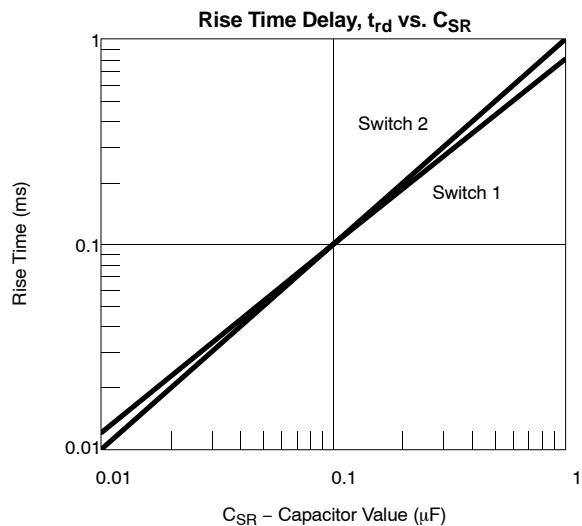
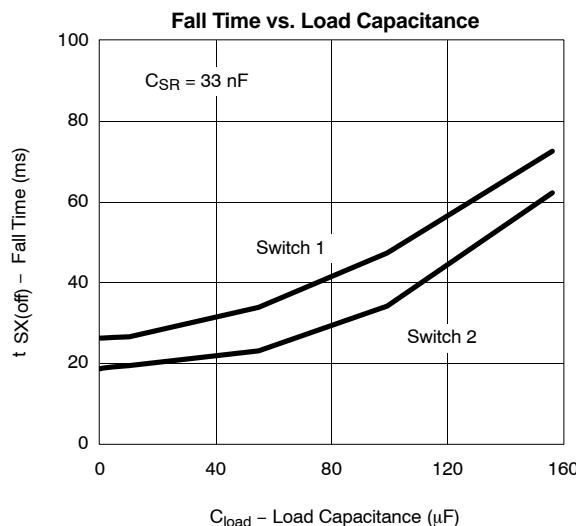
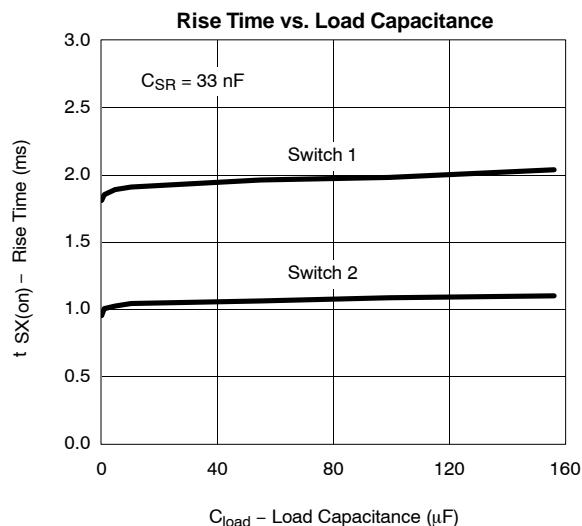
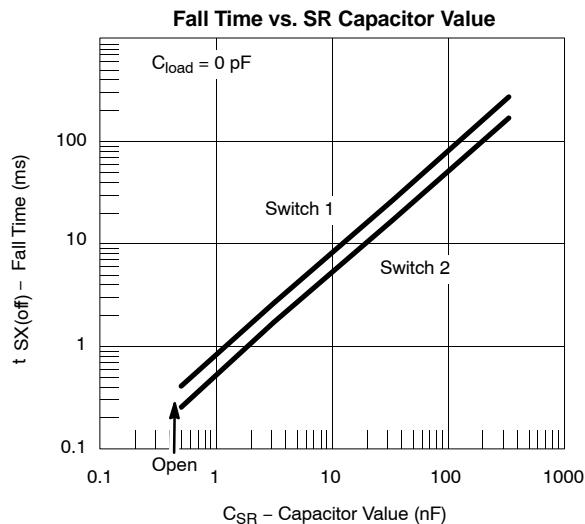
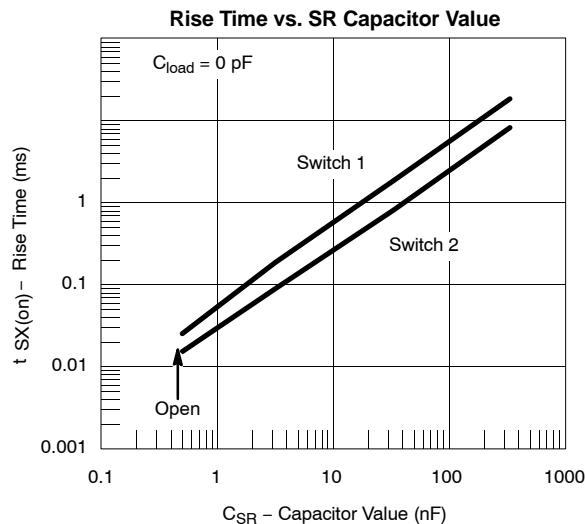
<b>Pin</b>	<b>Function</b>	<b>Description</b>
1	GND	Ground connection.
2, 3	V <sub>CC</sub>	Supply voltage to slot.
4	S <sub>2</sub>	Control input for selecting +3.3 V <sub>IN</sub> to V <sub>CC</sub> .
5	S <sub>1</sub>	Control input for selecting +5 V <sub>IN</sub> to V <sub>CC</sub> .
6	+3.3 V <sub>IN</sub>	+3.3-V supply.
7	+5 V <sub>IN</sub>	+5-V supply.
8	SR	Slew rate control pin.

**ORDERING INFORMATION**

Part Number	Temperature Range
Si9706DY-T1	-40 to 85°C
Si9706DY-T1—E3 (Lead Free)	

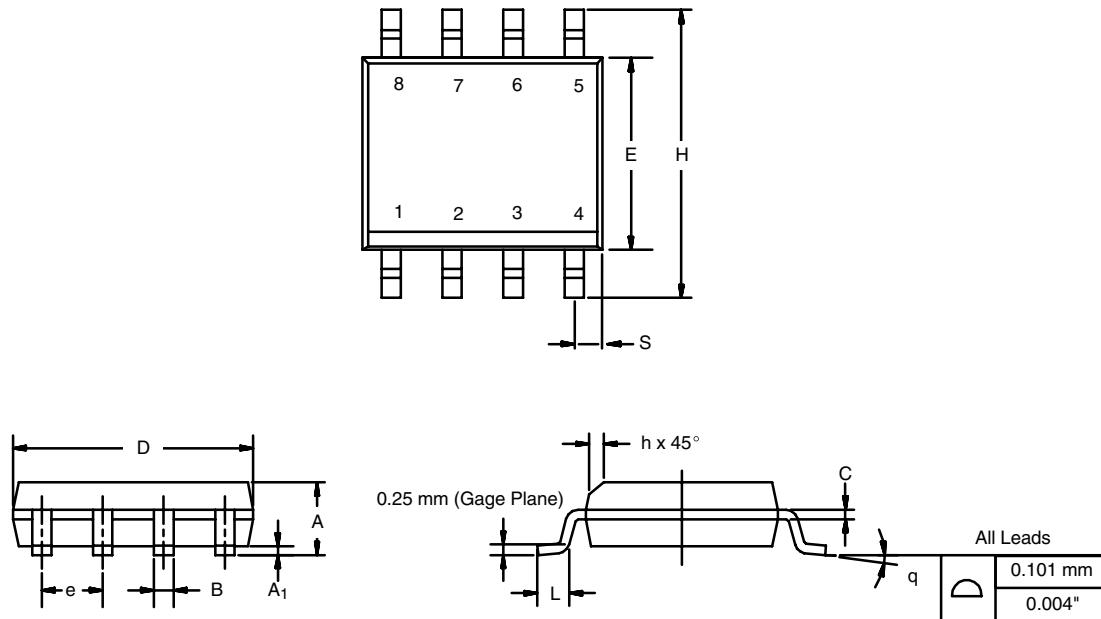
**TYPICAL CHARACTERISTICS (25°C UNLESS OTHERWISE NOTED)**


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



### SOIC (NARROW): 8-LEAD

JEDEC Part Number: MS-012



DIM	MILLIMETERS		INCHES	
	Min	Max	Min	Max
A	1.35	1.75	0.053	0.069
A <sub>1</sub>	0.10	0.20	0.004	0.008
B	0.35	0.51	0.014	0.020
C	0.19	0.25	0.0075	0.010
D	4.80	5.00	0.189	0.196
E	3.80	4.00	0.150	0.157
e	1.27 BSC		0.050 BSC	
H	5.80	6.20	0.228	0.244
h	0.25	0.50	0.010	0.020
L	0.50	0.93	0.020	0.037
q	0°	8°	0°	8°
S	0.44	0.64	0.018	0.026
ECN: C-06527-Rev. I, 11-Sep-06				
DWG: 5498				

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