



**THE DATASHEET OF
SI9706DY-T1-E3**





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

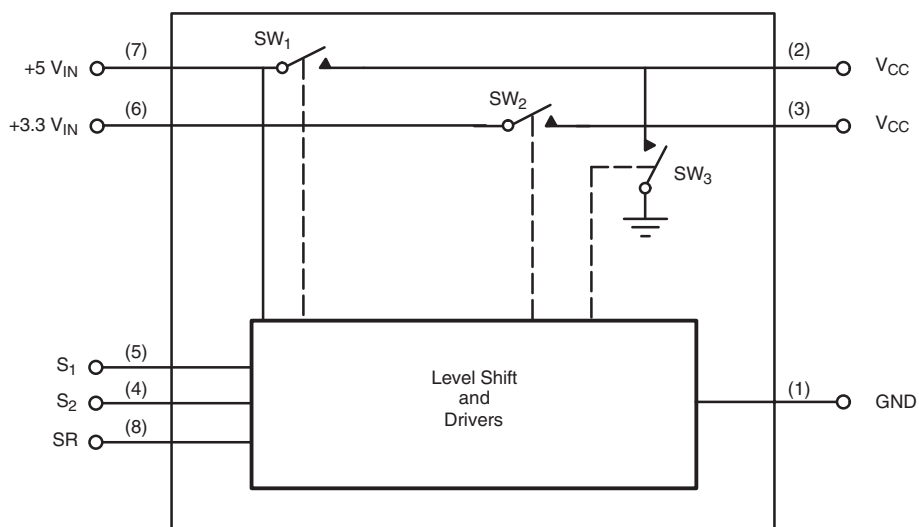
The Si9706DY offers an integrated solution for PC Card power interfaces that only require V_{CC} switching. This part is ideal for systems that operate at 5 V and provide V_{PP} from the main supply or from a dedicated Flash RAM 12-V supply.

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°C . The Si9706DY is available in lead free.

FUNCTIONAL BLOCK DIAGRAM





ABSOLUTE MAXIMUM RATINGS

| | |
|---|--------|
| Voltages Referenced to Ground | |
| +5 V _{IN} | 7 V |
| +3.3 V _{IN} | 7 V |
| S ₁ , S ₂ (CMOS Inputs) | 7 V |
| All Pins | -0.5 V |
| I _{OUT} V _{CC} ^a | 4 A |

| | |
|---|---------|
| PD Max ^b : (T _A = 25°C) | 1.59 W |
| (T _A = 85°C) | 0.63 W |
| Junction Temperature | 125°C |
| Thermal Ratings ^b : R _{ΘJA} | 63 °C/W |

Notes

- Pins 2, 3 connected together externally.
- Mounted on 1-IN², FR4 PC Board.

RECOMMENDED OPERATING CONDITIONS

| | |
|---|-------------|
| +5 V _{IN} (must be present) | 5 V ± 10% |
| +3.3 V _{IN} | 3.3 V ± 10% |
| C _{SR} | 33 nF |
| I _{OUT} V _{CC} ^a | 2 A |

| | |
|--|------------|
| V _{CC} Load Capacitance | 150 μF Max |
|--|------------|

Notes

- Pins 2, 3 connected together externally.

| SPECIFICATIONS | | | | | | | |
|--|-----------------------|---|-----------------------|------------------|------------------|------------------|------|
| Parameter | Symbol | Test Conditions Unless Otherwise Specified C _{SR} = 33 nF, +5 V _{IN} = 5 V +3.3 V _{IN} = 3.3 V, Low ≤ 0.8 V, High ≥ 2.2 V | | Limits | | | Unit |
| | | | | Min ^a | Typ ^b | Max ^a | |
| Switch SW₁ | | | | | | | |
| On-Resistance | R _{ON} | I = 500 mA, S ₁ = High S ₂ = Low | T _A = 25°C | 58 | 70 | mΩ | |
| | | | T _A = 85°C | 73 | 90 | | |
| Off Current (V _{CC}) | I _{OFF} | +5 V _{IN} = 5.5 V, V _{CC} = 0 V S ₁ = S ₂ = Low | T _A = 25°C | | 1 | μA | |
| | | | T _A = 85°C | | 10 | | |
| Rise Time | t _{S1(on)} | S ₂ = Low, See Figure 1 | | 0.2 | 1.7 | ms | |
| Fall Time | t _{S1(off)} | | | 10 | 30 | | 50 |
| Switch SW₂ | | | | | | | |
| On-Resistance | R _{ON} | I = 500 mA, S ₂ = High S ₁ = Low | T _A = 25°C | 44 | 55 | mΩ | |
| | | | T _A = 85°C | 55 | 70 | | |
| Off Current (+3.3 V _{IN}) | I _{OFF} | +3.3 V _{IN} = 3.6 V, V _{CC} = 0 V S ₁ = S ₂ = Low | T _A = 25°C | | 1 | μA | |
| | | | T _A = 85°C | | 10 | | |
| Rise Time | t _{S2(on)} | S ₁ = Low, See Figure 1 | | 0.1 | 0.9 | ms | |
| Fall Time | t _{S2(off)} | | | 5 | 20 | | 40 |
| Switch SW₃ | | | | | | | |
| On-Resistance | R _{ON} | I = 2 mA, S ₁ = S ₂ = Low | T _A = 25°C | 140 | 400 | Ω | |
| | | | T _A = 85°C | 200 | 500 | | |
| Power Supply | | | | | | | |
| +5 V _{IN} Current Input (on) | I _{+5VIN(1)} | S ₁ = 0 V, S ₂ = 3 V | | 20 | 50 | μA | |
| | I _{+5VIN(2)} | S ₁ = 3 V, S ₂ = 0 V | | 20 | 50 | | |
| +5 V _{IN} Current Input (off) | I _{+5VIN(3)} | S ₁ = S ₂ = 0 V | | < 1 | 10 | | |
| Input Voltage High | V _{I(H)} | +5 V _{IN} = 5.5 V | 2.2 | 1.8 | V | | |
| | | +5 V _{IN} = 4.5 V | 2.2 | 1.6 | | | |
| Input Voltage Low | V _{I(L)} | +5 V _{IN} = 5.5 V | | 1.6 | 0.8 | | |
| | | +5 V _{IN} = 4.5 V | | 1.4 | 0.8 | | |
| Input Current High | I _{I(H)} | S ₁ , S ₂ = 5 V | | | 1.0 | μA | |
| Input Current Low | I _{I(L)} | S ₁ , S ₂ = GND | -1.0 | | | | |

Notes

- 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 WAVEFORMS

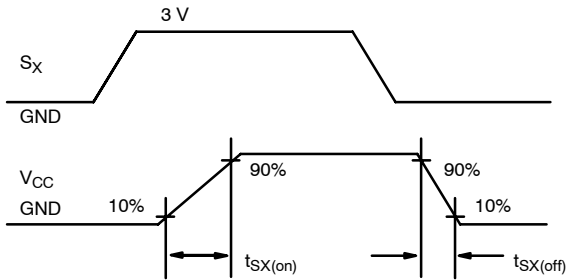


FIGURE 1. Switch Ramp

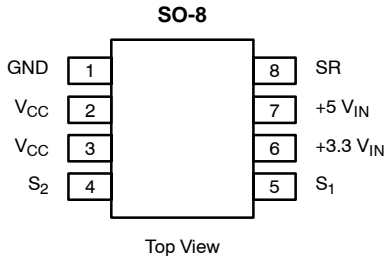
TRUTH TABLE

| S_1 | S_2 | Switch 1 | Switch 2 | Switch 3 |
|-------|-------|----------|----------|----------|
| 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

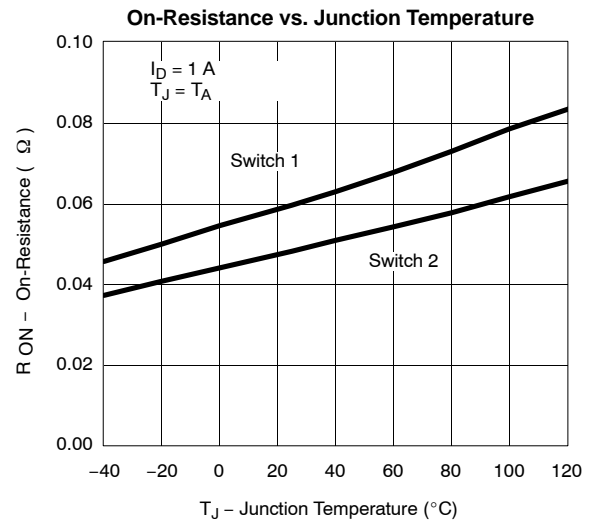
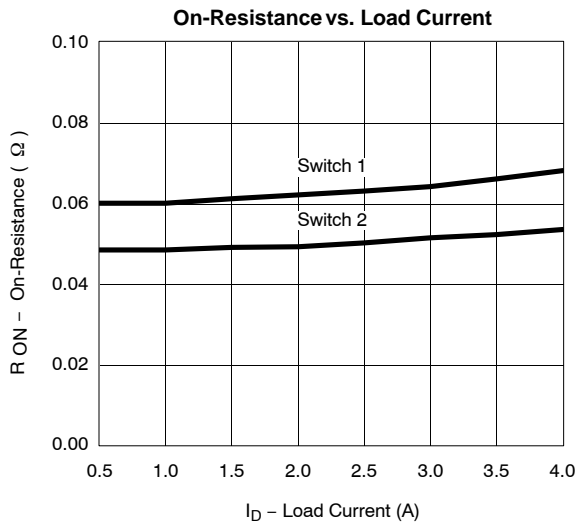


| Pin | Function | Description |
|------|---------------|---|
| 1 | GND | Ground connection. |
| 2, 3 | V_{CC} | Supply voltage to slot. |
| 4 | S_2 | Control input for selecting $+3.3 V_{IN}$ to V_{CC} . |
| 5 | S_1 | Control input for selecting $+5 V_{IN}$ to V_{CC} . |
| 6 | $+3.3 V_{IN}$ | $+3.3$ -V supply. |
| 7 | $+5 V_{IN}$ | $+5$ -V supply. |
| 8 | SR | Slew rate control pin. |

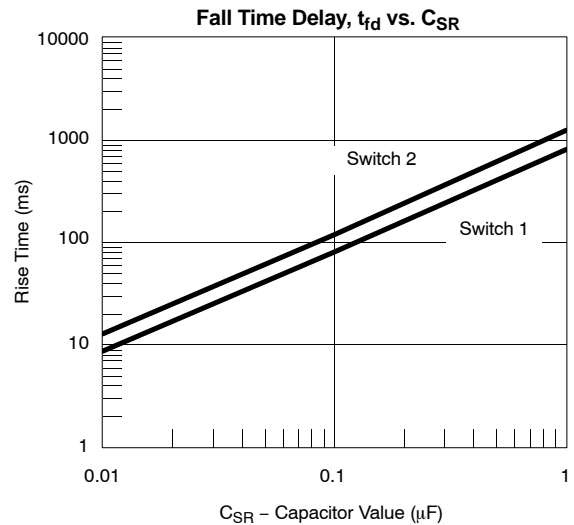
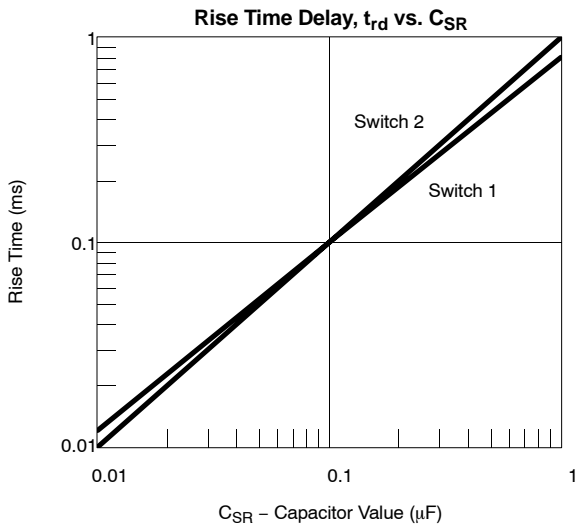
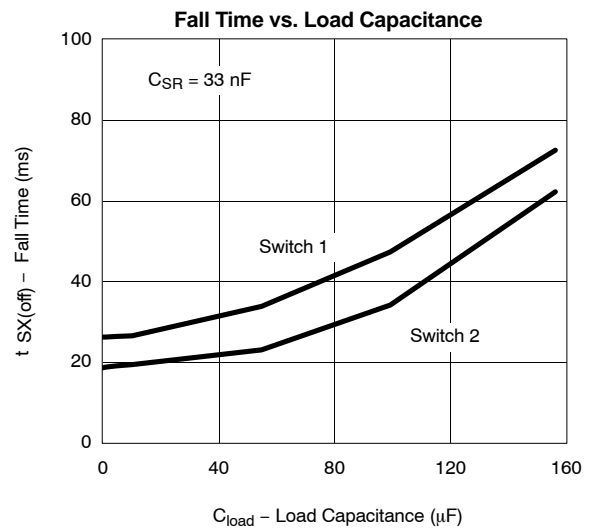
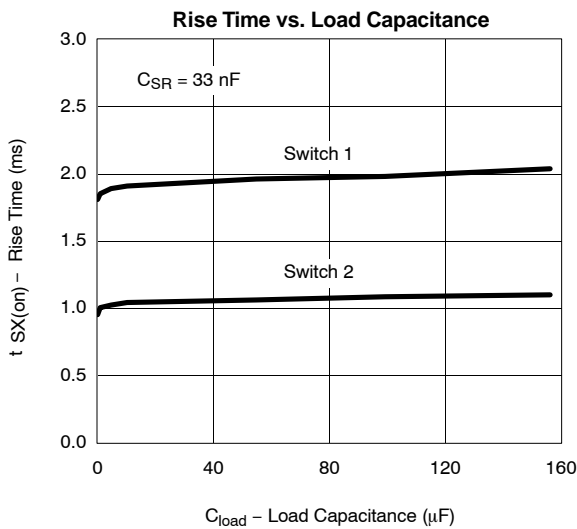
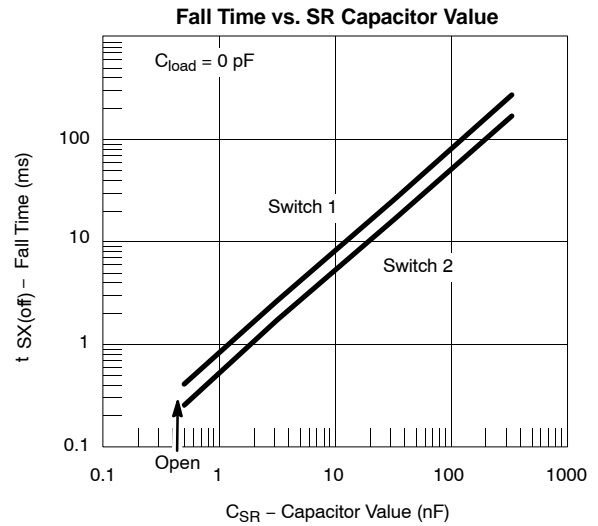
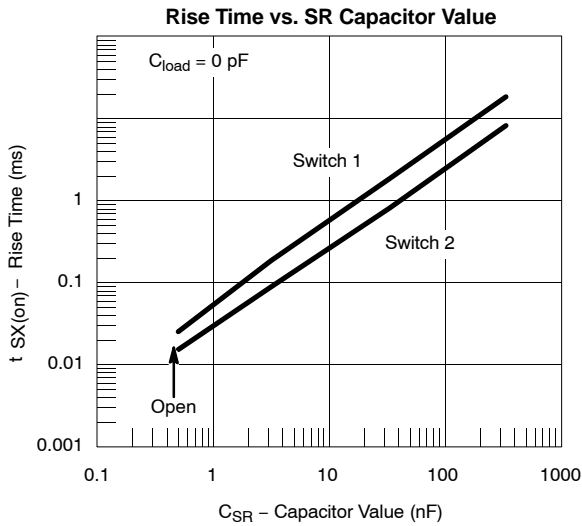
ORDERING INFORMATION

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

TYPICAL CHARACTERISTICS (25 °C UNLESS OTHERWISE NOTED)

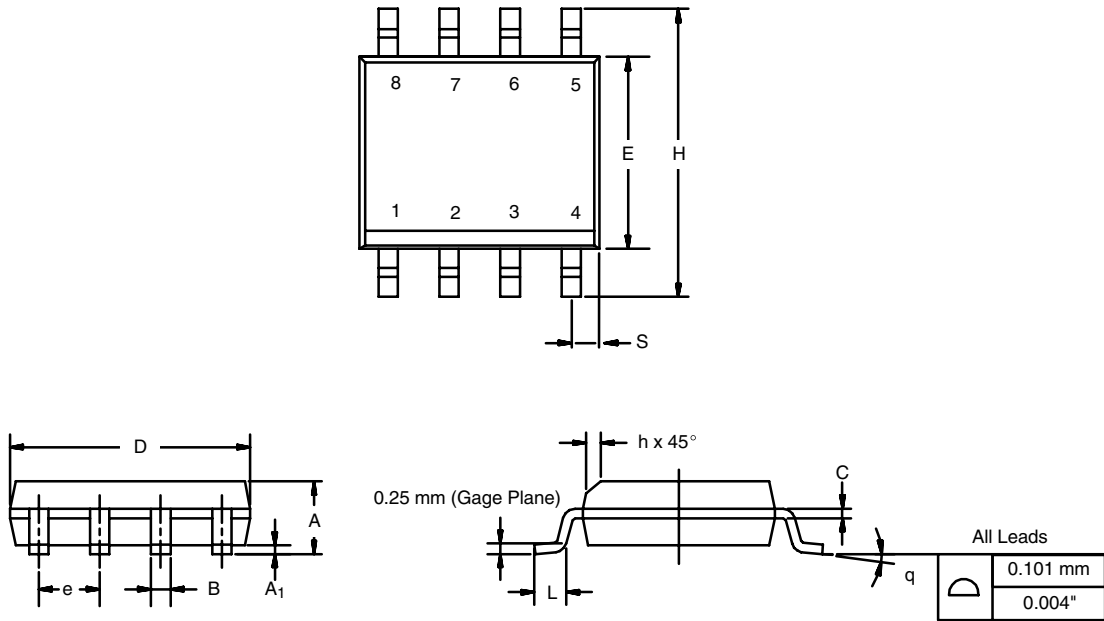


TYPICAL CHARACTERISTICS (25 °C UNLESS OTHERWISE NOTED)



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 ₁ | 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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