

Quad bilateral switches

74LV4066

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FEATURES

- Optimized for Low Voltage applications: 1.0V to 6.0V
- Accepts TTL input levels between  $V_{CC} = 2.7\text{ V}$  and  $V_{CC} = 3.6\text{ V}$
- Typical  $V_{OLP}$  (output ground bounce)  $< 0.8\text{ V}$  at  $V_{CC} = 3.3\text{ V}$ ,  $T_{amb} = 25\text{ }^{\circ}\text{C}$ .
- Very low typ "ON" resistance:  
25 $\Omega$  at  $V_{CC} - V_{EE} = 4.5\text{ V}$   
35 $\Omega$  at  $V_{CC} - V_{EE} = 3.0\text{ V}$   
60 $\Omega$  at  $V_{CC} - V_{EE} = 2.0\text{ V}$
- Output capability: non-standard
- $I_{CC}$  category: SSI

DESCRIPTION

The 74LV4066 is a low-voltage Si-gate CMOS device that is pin and function compatible with 74HC/HCT4066.

QUICK REFERENCE DATA

GND = 0 V;  $T_{amb} = 25^{\circ}\text{C}$ ;  $t_r = t_f \leq 2.5\text{ ns}$

| SYMBOL            | PARAMETER                                | CONDITIONS                                                                  | TYPICAL | UNIT |
|-------------------|------------------------------------------|-----------------------------------------------------------------------------|---------|------|
| $t_{pZH}/t_{pZL}$ | Turn "ON" time: nE to $V_{OS}$           | $C_L = 15\text{ pF}$<br>$R_L = 1\text{ K}\Omega$<br>$V_{CC} = 3.3\text{ V}$ | 10      | ns   |
| $t_{pHZ}/t_{pLZ}$ | Turn "OFF" time: nE to $V_{OS}$          |                                                                             | 13      | ns   |
| $C_I$             | Input capacitance                        |                                                                             | 3.5     | pF   |
| $C_{PD}$          | Power dissipation capacitance per switch | Notes 1, 2                                                                  | 11      | pF   |
| $C_S$             | Maximum switch capacitances              |                                                                             | 8       | pF   |

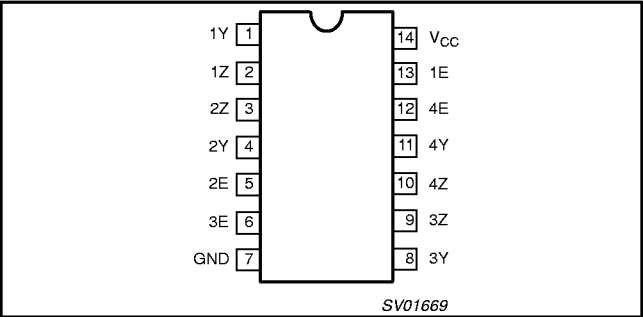
NOTES:

1.  $C_{PD}$  is used to determine the dynamic power dissipation ( $P_D$  in  $\mu\text{W}$ )  
 $P_D = C_{PD} \times V_{CC}^2 \times f_i + \sum (C_L \times V_{CC}^2 \times f_o)$  where:  
 $f_i$  = input frequency in MHz;  $C_L$  = output load capacity in pF;  
 $f_o$  = output frequency in MHz;  $C_S$  = maximum switch capacitance in pF;  
 $\sum \{(C_L + C_S) \times V_{CC}^2 \times F_o\}$  = sum of the outputs.  
 $V_{CC}$  = supply voltage in V.
2. The condition is  $V_i = \text{GND to } V_{CC}$ .

ORDERING AND PACKAGE INFORMATION

| TYPE NUMBER | PACKAGES |         |          |          |
|-------------|----------|---------|----------|----------|
|             | PINS     | PACKAGE | MATERIAL | CODE     |
| 74LV4066N   | 16       | DIL     | Plastic  | SOT27-1  |
| 74LV4066D   | 16       | SO      | Plastic  | SOT108-1 |
| 74LV4066DB  | 16       | SSOP    | Plastic  | SOT337-1 |
| 74LV4066PW  | 16       | TSSOP   | Plastic  | SOT402-1 |

PIN CONFIGURATION



The 74LV4066 has four independent analog switches. Each switch has two input/output terminals (nY, nZ) and an active HIGH enable input (nE). When nE is LOW the corresponding analog switch is turned off.

The 74LV4066 has an on resistance which is dramatically reduced in comparison with 74HCT4066.

FUNCTION TABLE

| INPUTS | SWITCH |
|--------|--------|
| nE     |        |
| L      | off    |
| H      | on     |

NOTES:

- H = HIGH voltage level  
L = LOW voltage level

PIN DESCRIPTION

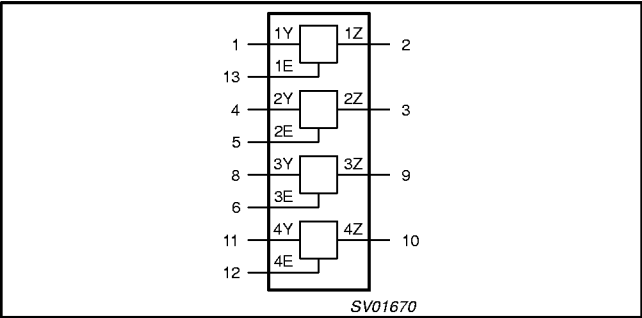
| PIN NUMBER   | SYMBOL   | FUNCTION                   |
|--------------|----------|----------------------------|
| 1, 4, 8, 11  | 1Y – 4Y  | Independent inputs/outputs |
| 2, 3, 9, 10  | 1Z – 4Z  | Independent inputs/outputs |
| 13, 5, 6, 12 | 1E to 4E | Enable input (active HIGH) |
| 7            | GND      | Ground (0V)                |
| 14           | $V_{CC}$ | Positive supply voltage    |

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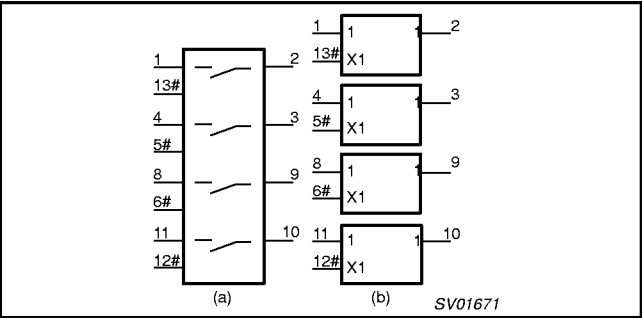
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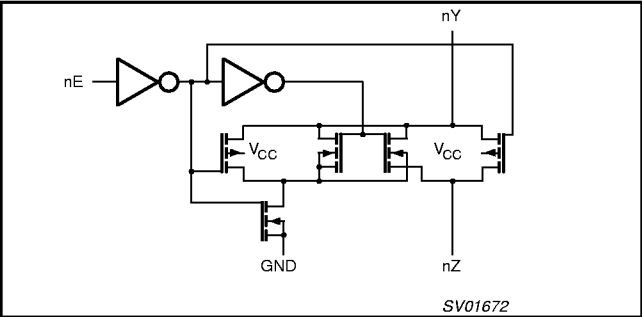
FUNCTIONAL DIAGRAM



IEC LOGIC SYMBOL



SCHEMATIC DIAGRAM (ONE SWITCH)



RECOMMENDED OPERATING CONDITIONS

| SYMBOL     | PARAMETER                                       | CONDITIONS                                                                                                       | MIN              | TYP              | MAX                     | UNIT |
|------------|-------------------------------------------------|------------------------------------------------------------------------------------------------------------------|------------------|------------------|-------------------------|------|
| $V_{CC}$   | DC supply voltage                               | See Note 1                                                                                                       | 1.0              | 3.3              | 6                       | V    |
| $V_I$      | Input voltage                                   |                                                                                                                  | 0                | —                | $V_{CC}$                | V    |
| $V_O$      | Output voltage                                  |                                                                                                                  | 0                | —                | $V_{CC}$                | V    |
| $T_{amb}$  | Operating ambient temperature range in free air | See DC and AC characteristics                                                                                    | −40<br>−40       |                  | +85<br>+125             | °C   |
| $t_r, t_f$ | Input rise and fall times                       | $V_{CC} = 1.0V$ to $2.0V$<br>$V_{CC} = 2.0V$ to $2.7V$<br>$V_{CC} = 2.7V$ to $3.6V$<br>$V_{CC} = 3.6V$ to $5.5V$ | —<br>—<br>—<br>— | —<br>—<br>—<br>— | 500<br>200<br>100<br>50 | ns/V |

**NOTE:**  
1. The LV is guaranteed to function down to  $V_{CC} = 1.0V$  (input levels GND or  $V_{CC}$ ); DC characteristics are guaranteed from  $V_{CC} = 1.2V$  to  $V_{CC} = 5.5V$ .

**ABSOLUTE MAXIMUM RATINGS<sup>1, 2</sup>**  
In accordance with the Absolute Maximum Rating System (IEC 134).  
Voltages are referenced to GND (ground = 0 V).

| SYMBOL       | PARAMETER                                                                                                                 | CONDITIONS                                                                                                                                                               | RATING            | UNIT |
|--------------|---------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|------|
| $V_{CC}$     | DC supply voltage                                                                                                         |                                                                                                                                                                          | −0.5 to +7.0      | V    |
| $\pm I_{IK}$ | DC input diode current                                                                                                    | $V_I < -0.5$ or $V_I > V_{CC} + 0.5V$                                                                                                                                    | 20                | mA   |
| $\pm I_{OK}$ | DC output diode current                                                                                                   | $V_O < -0.5$ or $V_O > V_{CC} + 0.5V$                                                                                                                                    | 50                | mA   |
| $\pm I_O$    | DC switch current                                                                                                         | $-0.5V < V_O < V_{CC} + 0.5V$                                                                                                                                            | 25                | mA   |
| $T_{stg}$    | Storage temperature range                                                                                                 |                                                                                                                                                                          | −65 to +150       | °C   |
| $P_{TOT}$    | Power dissipation per package<br>— plastic DIL<br>— plastic mini-pack (SO)<br>— plastic shrink mini-pack (SSOP and TSSOP) | for temperature range: −40 to +125°C<br>above +70°C derate linearly with 12 mW/K<br>above +70°C derate linearly with 8 mW/K<br>above +60°C derate linearly with 5.5 mW/K | 750<br>500<br>400 | mW   |

**NOTES:**  
1. Stresses beyond those listed 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 under “recommended operating conditions” is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.  
2. The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

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## DC ELECTRICAL CHARACTERISTICS

Over recommended operating conditions. Voltages are referenced to GND (ground = 0 V).

| SYMBOL           | PARAMETER                                                   | TEST CONDITIONS                                                                                                                                                            | LIMITS         |                  |            |                 |            | UNIT |
|------------------|-------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|------------------|------------|-----------------|------------|------|
|                  |                                                             |                                                                                                                                                                            | -40°C to +85°C |                  |            | -40°C to +125°C |            |      |
|                  |                                                             |                                                                                                                                                                            | MIN            | TYP <sup>1</sup> | MAX        | MIN             | MAX        |      |
| V <sub>IH</sub>  | HIGH level Input voltage                                    | V <sub>CC</sub> = 1.2 V                                                                                                                                                    | 0.90           |                  |            | 0.90            |            | V    |
|                  |                                                             | V <sub>CC</sub> = 2.0 V                                                                                                                                                    | 1.40           |                  |            | 1.4             |            |      |
|                  |                                                             | V <sub>CC</sub> = 2.7 to 3.6 V                                                                                                                                             | 2.00           |                  |            | 2.0             |            |      |
|                  |                                                             | V <sub>CC</sub> = 4.5 V                                                                                                                                                    | 3.15           |                  |            | 3.15            |            |      |
|                  |                                                             | V <sub>CC</sub> = 6.0 V                                                                                                                                                    | 4.20           |                  |            | 4.20            |            |      |
| V <sub>IL</sub>  | LOW level Input voltage                                     | V <sub>CC</sub> = 1.2 V                                                                                                                                                    |                |                  | 0.30       |                 | 0.30       | V    |
|                  |                                                             | V <sub>CC</sub> = 2.0 V                                                                                                                                                    |                |                  | 0.60       |                 | 0.60       |      |
|                  |                                                             | V <sub>CC</sub> = 2.7 to 3.6 V                                                                                                                                             |                |                  | 0.80       |                 | 0.80       |      |
|                  |                                                             | V <sub>CC</sub> = 4.5 V                                                                                                                                                    |                |                  | 1.35       |                 | 1.35       |      |
|                  |                                                             | V <sub>CC</sub> = 6.0 V                                                                                                                                                    |                |                  | 1.80       |                 | 1.80       |      |
| ±I <sub>I</sub>  | Input leakage current                                       | V <sub>CC</sub> = 3.6 V; V <sub>I</sub> = V <sub>CC</sub> or GND<br>V <sub>CC</sub> = 6.0 V; V <sub>I</sub> = V <sub>CC</sub> or GND                                       |                |                  | 1.0<br>2.0 |                 | 1.0<br>2.0 | μA   |
| ±I <sub>S</sub>  | Analog switch OFF-state current per channel                 | V <sub>CC</sub> = 3.6 V; V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub><br>V <sub>CC</sub> = 6.0 V; V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>               |                |                  | 1.0<br>2.0 |                 | 1.0<br>2.0 | μA   |
| ±I <sub>S</sub>  | Analog switch ON-state current per channel                  | V <sub>CC</sub> = 3.6 V; V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub><br>V <sub>CC</sub> = 6.0 V; V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>               |                |                  | 1.0<br>2.0 |                 | 1.0<br>2.0 | μA   |
| I <sub>CC</sub>  | Quiescent supply current                                    | V <sub>CC</sub> = 3.6V; V <sub>I</sub> = V <sub>CC</sub> or GND; I <sub>O</sub> = 0<br>V <sub>CC</sub> = 6.0V; V <sub>I</sub> = V <sub>CC</sub> or GND; I <sub>O</sub> = 0 |                |                  | 20<br>40   |                 | 40<br>80   | μA   |
| ΔI <sub>CC</sub> | Additional quiescent supply current per input               | V <sub>CC</sub> = 2.7 V to 3.6 V; V <sub>I</sub> = V <sub>CC</sub> – 0.6 V                                                                                                 |                |                  | 500        |                 | 850        | μA   |
| R <sub>ON</sub>  | ON-resistance (peak)                                        | V <sub>CC</sub> = 1.2 V; V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>                                                                                               |                | 300              | —          |                 | —          | Ω    |
|                  |                                                             | V <sub>CC</sub> = 2.0 V; V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>                                                                                               |                | 60               | 130        |                 | 150        |      |
|                  |                                                             | V <sub>CC</sub> = 2.7 V; V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>                                                                                               |                | 41               | 60         |                 | 90         |      |
|                  |                                                             | V <sub>CC</sub> = 3.0 to 3.6 V; V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>                                                                                        |                | 37               | 72         |                 | 83         |      |
|                  |                                                             | V <sub>CC</sub> = 4.5 V; V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>                                                                                               |                | 25               | 52         |                 | 60         |      |
|                  |                                                             | V <sub>CC</sub> = 6.0 V; V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>                                                                                               |                | 23               | 47         |                 | 54         |      |
| R <sub>ON</sub>  | ON-resistance (rail)                                        | V <sub>CC</sub> = 1.2 V; V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>                                                                                               |                | 75               | —          |                 | —          | Ω    |
|                  |                                                             | V <sub>CC</sub> = 2.0 V; V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>                                                                                               |                | 35               | 98         |                 | 115        |      |
|                  |                                                             | V <sub>CC</sub> = 2.7 V; V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>                                                                                               |                | 26               | 60         |                 | 68         |      |
|                  |                                                             | V <sub>CC</sub> = 3.0 to 3.6 V; V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>                                                                                        |                | 24               | 52         |                 | 60         |      |
|                  |                                                             | V <sub>CC</sub> = 4.5 V; V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>                                                                                               |                | 15               | 40         |                 | 45         |      |
|                  |                                                             | V <sub>CC</sub> = 6.0 V; V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>                                                                                               |                | 13               | 35         |                 | 40         |      |
| R <sub>ON</sub>  | ON-resistance (rail)                                        | V <sub>CC</sub> = 1.2 V; V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>                                                                                               |                | 75               | —          |                 | —          | Ω    |
|                  |                                                             | V <sub>CC</sub> = 2.0 V; V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>                                                                                               |                | 40               | 110        |                 | 130        |      |
|                  |                                                             | V <sub>CC</sub> = 2.7 V; V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>                                                                                               |                | 35               | 72         |                 | 85         |      |
|                  |                                                             | V <sub>CC</sub> = 3.0 to 3.6 V; V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>                                                                                        |                | 30               | 65         |                 | 75         |      |
|                  |                                                             | V <sub>CC</sub> = 4.5 V; V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>                                                                                               |                | 22               | 47         |                 | 55         |      |
|                  |                                                             | V <sub>CC</sub> = 6.0 V; V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>                                                                                               |                | 20               | 40         |                 | 47         |      |
| ΔR <sub>ON</sub> | Maximum variation of ON-resistance between any two channels | V <sub>CC</sub> = 1.2 V; V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>                                                                                               |                | —                |            |                 |            | Ω    |
|                  |                                                             | V <sub>CC</sub> = 2.0 V; V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>                                                                                               |                | 5                |            |                 |            |      |
|                  |                                                             | V <sub>CC</sub> = 2.7 V; V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>                                                                                               |                | 4                |            |                 |            |      |
|                  |                                                             | V <sub>CC</sub> = 3.0 to 3.6 V; V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>                                                                                        |                | 4                |            |                 |            |      |
|                  |                                                             | V <sub>CC</sub> = 4.5 V; V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>                                                                                               |                | 3                |            |                 |            |      |
|                  |                                                             | V <sub>CC</sub> = 6.0 V; V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>                                                                                               |                | 2                |            |                 |            |      |

### NOTE:

1. All typical values are measured at  $T_{amb} = 25^\circ\text{C}$ .
2. At supply voltage approaching 1.2V, the analog switch ON-resistance becomes extremely non-linear. Therefore it is recommended that these devices be used to transmit digital signals only, when using these supply voltages.

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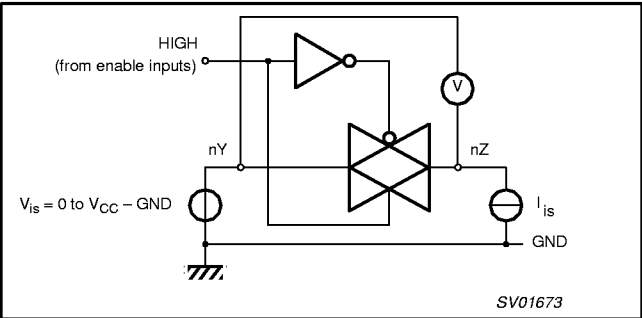


Figure 1. Test circuit for measuring ON-resistance ( $R_{ON}$ ).

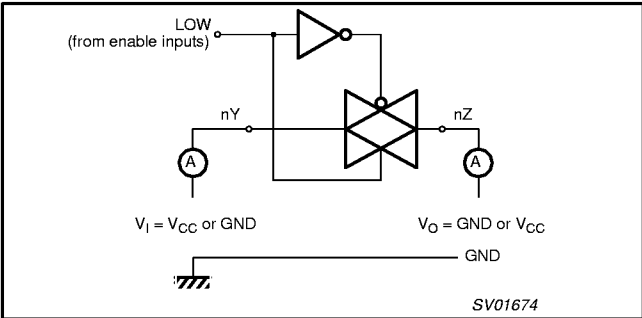


Figure 2. Test circuit for measuring OFF-state current.

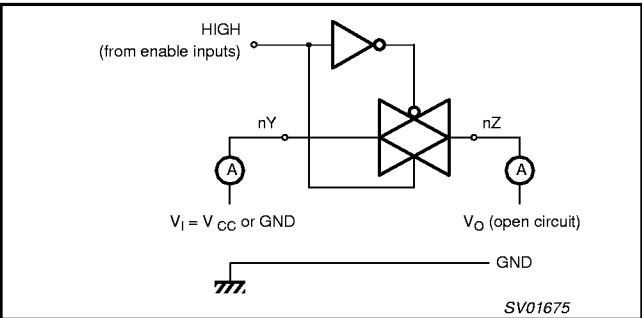


Figure 3. Test circuit for measuring ON-state current.

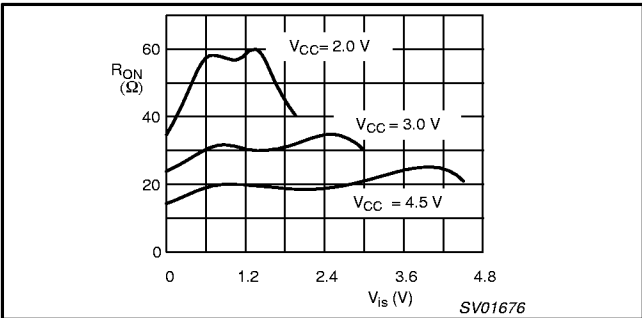


Figure 4. Typical ON-resistance ( $R_{ON}$ ) as a function of input voltage ( $V_{is}$ ) for  $V_{is} = 0$  to  $V_{CC} - V_{EE}$ .

AC CHARACTERISTICS

GND = 0 V;  $t_r = t_f \leq 2.5\text{ns}$ ;  $C_L = 50\text{pF}$

| SYMBOL                             | PARAMETER                                               | LIMITS        |                  |     |                |     | UNIT | CONDITION           |                                                                       |
|------------------------------------|---------------------------------------------------------|---------------|------------------|-----|----------------|-----|------|---------------------|-----------------------------------------------------------------------|
|                                    |                                                         | −40 to +85 °C |                  |     | −40 to +125 °C |     |      | V <sub>CC</sub> (V) | OTHER                                                                 |
|                                    |                                                         | MIN           | TYP <sup>1</sup> | MAX | MIN            | MAX |      |                     |                                                                       |
| t <sub>PHL</sub> /t <sub>PLH</sub> | Propagation delay<br>V <sub>is</sub> to V <sub>os</sub> |               | 8                |     |                |     | ns   | 1.2                 | R <sub>L</sub> = ∞;<br>C <sub>L</sub> = 50 pF<br>Figure 12            |
|                                    |                                                         |               | 5                | 26  |                | 31  |      | 2.0                 |                                                                       |
|                                    |                                                         |               | 3 <sup>2</sup>   | 15  |                | 18  |      | 2.7 to 3.6          |                                                                       |
|                                    |                                                         |               | 2                | 13  |                | 15  |      | 4.5                 |                                                                       |
|                                    |                                                         |               | 2                | 10  |                | 12  |      | 6.0                 |                                                                       |
| t <sub>PZH</sub> /t <sub>PZL</sub> | Turn-on time<br>nE to V <sub>os</sub>                   |               | 40               |     |                |     | ns   | 1.2                 | R <sub>L</sub> = 1 kΩ;<br>C <sub>L</sub> = 50 pF<br>Figures 13 and 14 |
|                                    |                                                         |               | 22               | 43  |                | 51  |      | 2.0                 |                                                                       |
|                                    |                                                         |               | 12 <sup>2</sup>  | 25  |                | 30  |      | 2.7 to 3.6          |                                                                       |
|                                    |                                                         |               | 10               | 21  |                | 26  |      | 4.5                 |                                                                       |
|                                    |                                                         |               | 8                | 16  |                | 20  |      | 6.0                 |                                                                       |
| t <sub>PHZ</sub> /t <sub>PLZ</sub> | Turn-off time<br>nE to V <sub>os</sub>                  |               | 50               |     |                |     | ns   | 1.2                 | R <sub>L</sub> = 1 kΩ;<br>C <sub>L</sub> = 50 pF<br>Figures 13 and 14 |
|                                    |                                                         |               | 27               | 65  |                | 81  |      | 2.0                 |                                                                       |
|                                    |                                                         |               | 15 <sup>2</sup>  | 38  |                | 47  |      | 2.7 to 3.6          |                                                                       |
|                                    |                                                         |               | 13               | 32  |                | 40  |      | 4.5                 |                                                                       |
|                                    |                                                         |               | 12               | 28  |                | 34  |      | 6.0                 |                                                                       |

NOTES:

1. All typical values are measured at  $T_{amb} = 25^\circ\text{C}$ .
2. All typical values are measured at  $V_{CC} = 3.3\text{V}$ .

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ADDITIONAL AC CHARACTERISTICS

GND = 0 V;  $t_r = t_f \leq 2.5\text{ns}$ ;  $C_L = 50\text{pF}$

| SYMBOL      | PARAMETER                                                                            | TYP  | UNIT | $V_{CC}$<br>(V) | $V_{IS(P-P)}$<br>(V) | CONDITIONS                                                                                                                                                 |
|-------------|--------------------------------------------------------------------------------------|------|------|-----------------|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
|             | Sine-wave distortion $f = 1\text{ kHz}$                                              | 0.04 | %    | 3.0             | 2.75                 | $R_L = 10\text{ k}\Omega$ ; $C_L = 50\text{ pF}$<br>Figure 15                                                                                              |
|             |                                                                                      | 0.02 |      | 6.0             | 5.50                 |                                                                                                                                                            |
|             | Sine-wave distortion $f = 10\text{ kHz}$                                             | 0.12 | %    | 3.0             | 2.75                 | $R_L = 10\text{ k}\Omega$ ; $C_L = 50\text{ pF}$<br>Figure 15                                                                                              |
|             |                                                                                      | 0.06 |      | 6.0             | 5.50                 |                                                                                                                                                            |
|             | Switch "OFF" signal feed through                                                     | -50  | dB   | 3.0             | Note 1               | $R_L = 600\text{ k}\Omega$ ; $C_L = 50\text{ pF}$ ; $f = 1\text{ MHz}$<br>Figures 10 and 16                                                                |
|             |                                                                                      | -50  |      | 6.0             |                      |                                                                                                                                                            |
|             | Crosstalk between any two switches                                                   | -60  | dB   | 3.0             | Note 1               | $R_L = 600\text{ k}\Omega$ ; $C_L = 50\text{ pF}$ ; $f = 1\text{ MHz}$<br>Figure 12                                                                        |
|             |                                                                                      | -60  |      | 6.0             |                      |                                                                                                                                                            |
| $V_{(p-p)}$ | Crosstalk voltage between enable or address input to any switch (peak-to-peak value) | 110  | mV   | 3.0             |                      | $R_L = 600\text{ k}\Omega$ ; $C_L = 50\text{ pF}$ ; $f = 1\text{ MHz}$<br>(nE, square wave between $V_{CC}$ and GND, $T_r = t_f = 6\text{ ns}$ ) Figure 13 |
|             |                                                                                      | 220  |      | 6.0             |                      |                                                                                                                                                            |
| $f_{max}$   | Minimum frequency response (-3 dB)                                                   | 180  | mHz  | 3.0             | Note 2               | $R_L = 50\text{ k}\Omega$ ; $C_L = 50\text{ pF}$<br>Figures 11 and 14                                                                                      |
|             |                                                                                      | 200  |      | 6.0             |                      |                                                                                                                                                            |
| $C_S$       | Maximum switch capacitance                                                           | 8    | pF   |                 |                      |                                                                                                                                                            |

GENERAL NOTES:

$V_{IS}$  is the input voltage at nY or nZ terminal, whichever is assigned as an input.  
 $V_{OS}$  is the output voltage at nY or nZ terminal, whichever is assigned as an output.

NOTES:

- 1. Adjust input voltage  $V_{IS}$  is 0 dBm level (0 dBm = 1 mW into 600  $\Omega$ ).
- 2. Adjust input voltage  $V_{IS}$  is 0 dBm level at  $V_{OS}$  for 1 MHz (0 dBm = 1 mW into 50  $\Omega$ ).

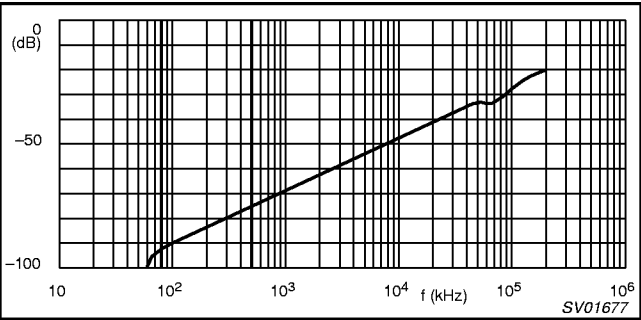


Figure 5. Typical switch "OFF" signal feed-through as a function of frequency.

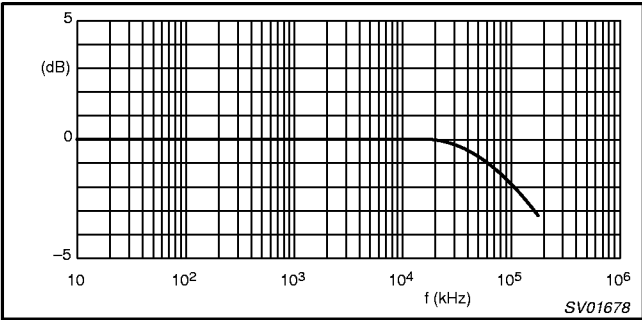


Figure 6. Typical frequency response.

NOTES TO FIGURES 5 AND 6:

Test conditions:  $V_{CC} = 3.0\text{ V}$ ; GND = 0 V;  $R_L = 50\text{ }\Omega$ ;  $R_{SOURCE} = 1\text{ k}\Omega$ .

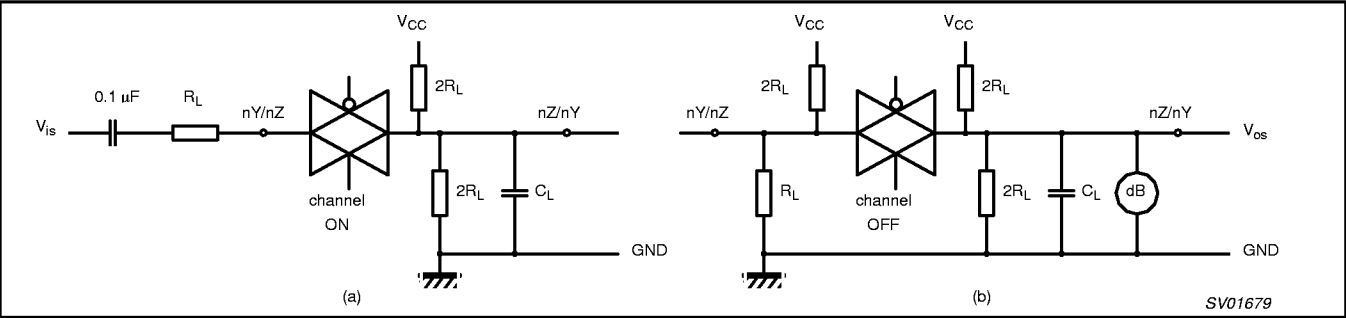


Figure 7. Test circuit for measuring crosstalk between any two switches.  
(a) channel ON condition; (b) channel OFF condition.

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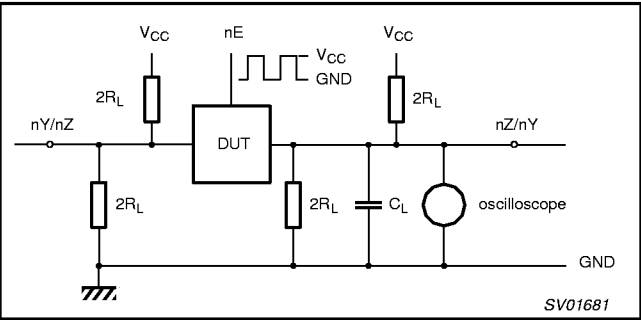


Figure 8. Test circuit for measuring crosstalk between control and any switch.

**NOTE TO FIGURE 8:**  
The crosstalk is defined as follows (oscilloscope output):

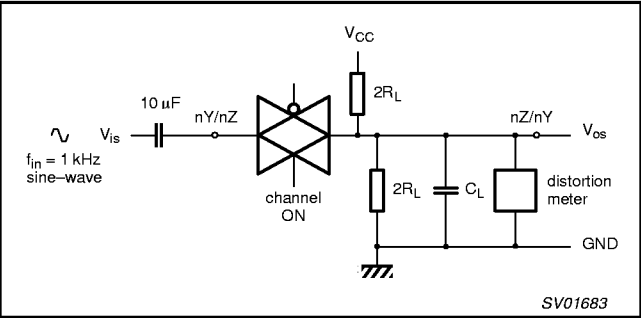
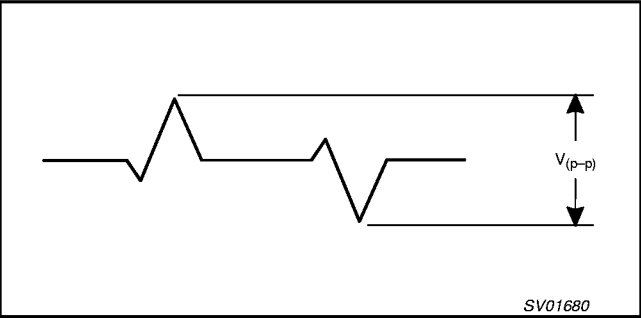


Figure 10. Test circuit for measuring sine-wave distortion.

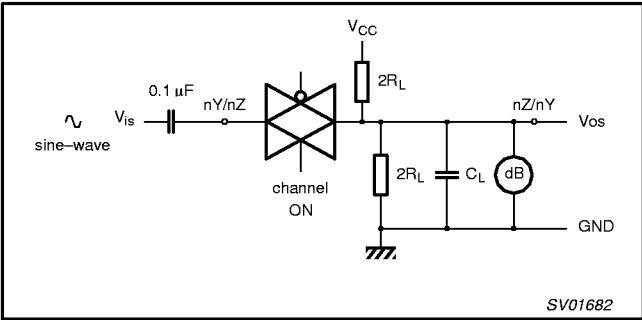


Figure 9. Test circuit for measuring minimum frequency response.

**NOTE TO FIGURE 9:**  
Adjust input voltage to obtain 0 dBm at VOS when Fin = 1 MHz. After set-up frequency of fin is increased to obtain a reading of -3 dB at VOS.

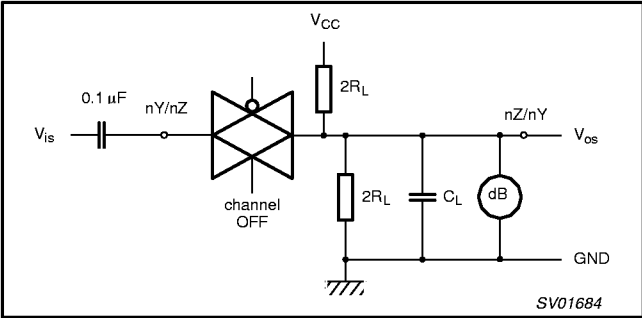


Figure 11. Test circuit for measuring switch "OFF" signal feed-through.

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WAVEFORMS

$V_M = 1.5\text{ V}$  at  $V_{CC} \geq 2.7\text{ V}$   
 $V_M = 0.5 \times V_{CC}$  at  $V_{CC} \leq 2.7\text{ V}$   
 $V_{OL}$  and  $V_{OH}$  are the typical output voltage drop that occur with the output load  
 $V_X = V_{OL} + 0.3\text{ V}$  at  $V_{CC} \geq 2.7\text{ V}$   
 $V_X = V_{OL} + 0.1 \times V_{CC}$  at  $V_{CC} < 2.7\text{ V}$   
 $V_Y = V_{OH} - 0.3\text{ V}$  at  $V_{CC} \geq 2.7\text{ V}$   
 $V_Y = V_{OH} - 0.1 \times V_{CC}$   $V_{CC} < 2.7\text{ V}$

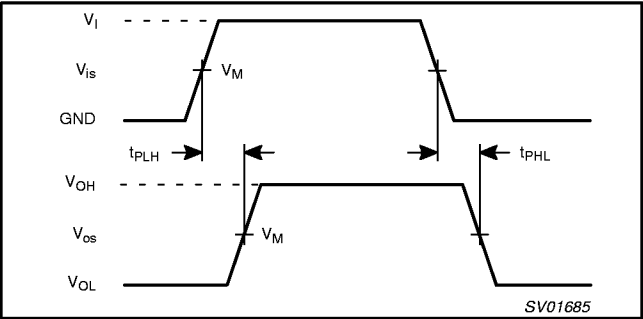


Figure 12. Input ( $V_{is}$ ) to output ( $V_{os}$ ) propagation delays.

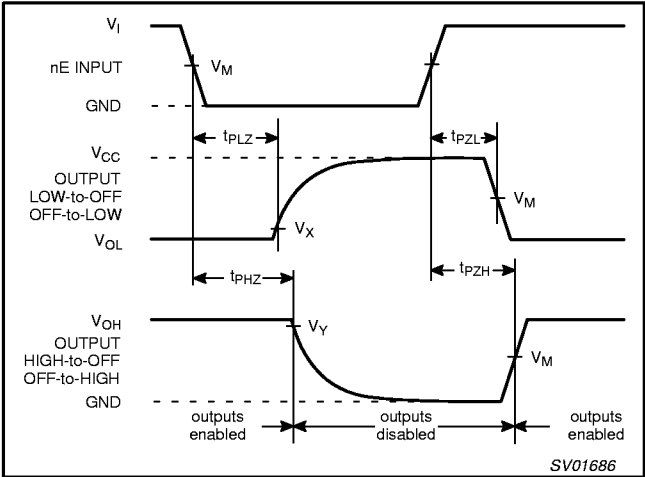


Figure 13. Turn-on and turn-off times for the inputs (nS, E) to the output ( $V_{os}$ ).

TEST CIRCUIT

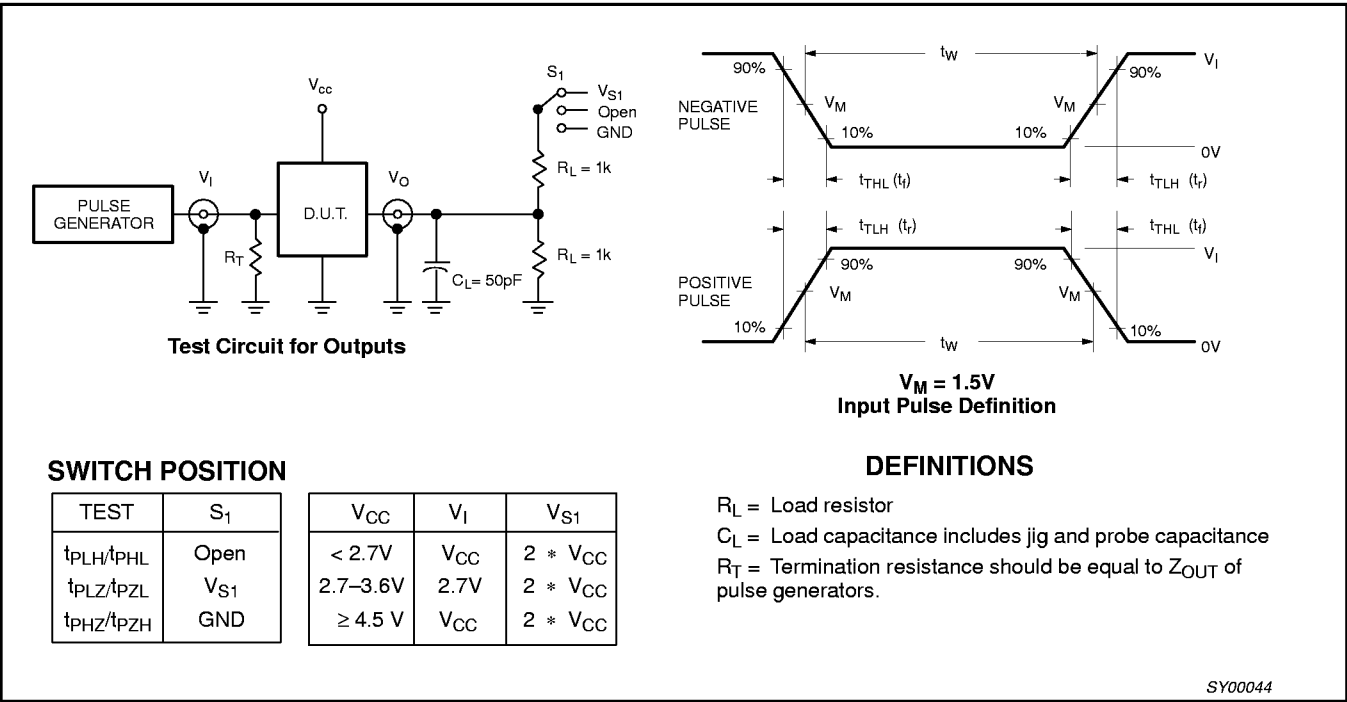


Figure 14. Load circuitry for switching times.