

# Analog Multiplexers/ Demultiplexers with Injection Current Effect Control with LSTTL Compatible Inputs

Automotive Customized



ON Semiconductor®

[www.onsemi.com](http://www.onsemi.com)

## MC74HCT4851A, MC74HCT4852A

This device is pin compatible to standard HC405x and MC1405xB analog mux/demux devices, but feature injection current effect control. This makes them especially suited for usage in automotive applications where voltages in excess of normal logic voltage are common.

The injection current effect control allows signals at disabled analog input channels to exceed the supply voltage range without affecting the signal of the enabled analog channel. This eliminates the need for external diode/ resistor networks typically used to keep the analog channel signals within the supply voltage range.

The devices utilize low power silicon gate CMOS technology. The Channel Select and Enable inputs are compatible with standard CMOS or LSTTL outputs.

### Features

- Injection Current Cross-Coupling Less than 1mV/mA (See Figure 6)
- Pin Compatible to HC405x and MC1405xB Devices
- Power Supply Range ( $V_{CC} - GND$ ) = 4.5 to 5.5 V
- In Compliance With the Requirements of JEDEC Standard No. 7 A
- Chip Complexity: 154 FETs or 36 Equivalent Gates
- NLV Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q100 Qualified and PPAP Capable
- These Devices are Pb-Free and are RoHS Compliant

### MARKING DIAGRAMS



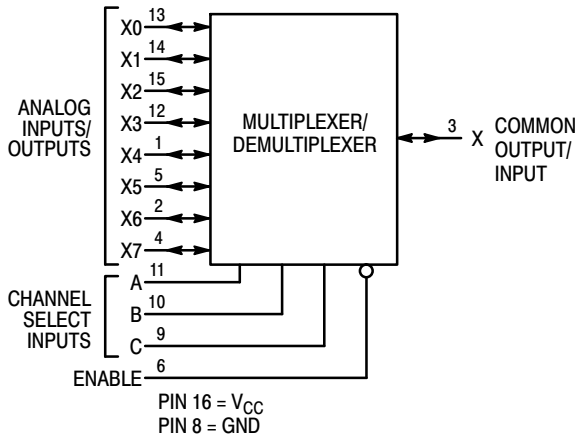
X = 1 or 2  
A = Assembly Location  
WL, L = Wafer Lot  
YY, Y = Year  
WW, W = Work Week  
G or ▪ = Pb-Free Package

(Note: Microdot may be in either location)

### ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 11 of this data sheet.

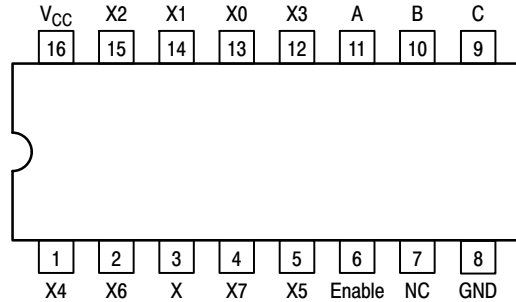
# MC74HCT4851A, MC74HCT4852A



**Figure 1. MC74HCT4851A Logic Diagram Single-Pole, 8-Position Plus Common Off**

**FUNCTION TABLE - MC74HCT4851A**

| Control Inputs |        |   |   | ON Channels |
|----------------|--------|---|---|-------------|
| Enable         | Select |   |   |             |
|                | C      | B | A |             |
| L              | L      | L | L | X0          |
| L              | L      | L | H | X1          |
| L              | L      | H | L | X2          |
| L              | L      | H | H | X3          |
| L              | H      | L | L | X4          |
| L              | H      | L | H | X5          |
| L              | H      | H | L | X6          |
| L              | H      | H | H | X7          |
| H              | X      | X | X | NONE        |

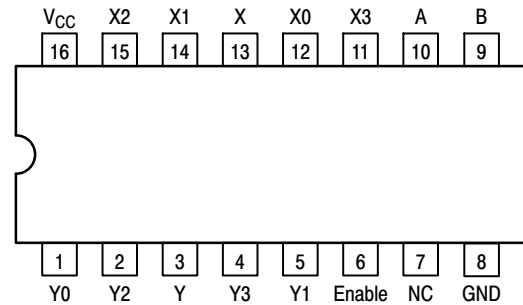


**Figure 2. MC74HCT4851A 16-Lead Pinout (Top View)**

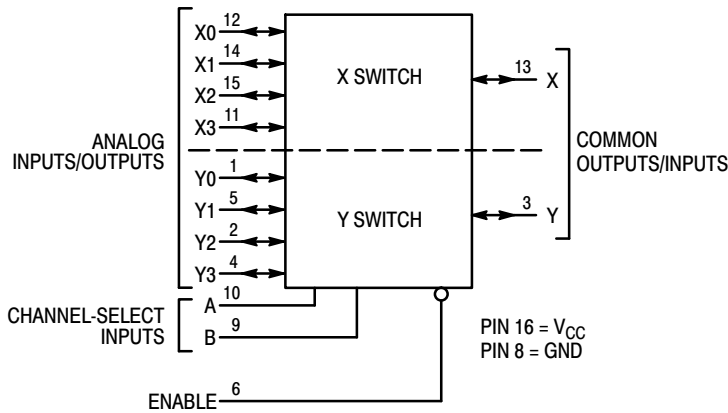
**FUNCTION TABLE - MC74HCT4852A**

| Control Inputs |        |   | ON Channels |    |
|----------------|--------|---|-------------|----|
| Enable         | Select |   |             |    |
|                | B      | A |             |    |
| L              | L      | L | Y0          | X0 |
| L              | L      | H | Y1          | X1 |
| L              | H      | L | Y2          | X2 |
| L              | H      | H | Y3          | X3 |
| H              | X      | X | NONE        |    |

X = Don't Care



**Figure 4. MC74HCT4852A 16-Lead Pinout (Top View)**



**Figure 3. MC74HCT4852A Logic Diagram Double-Pole, 4-Position Plus Common Off**

# MC74HCT4851A, MC74HCT4852A

## MAXIMUM RATINGS

| Symbol    | Parameter                                                                | Value                  | Unit |
|-----------|--------------------------------------------------------------------------|------------------------|------|
| $V_{CC}$  | Positive DC Supply Voltage (Referenced to GND)                           | -0.5 to + 7.0          | V    |
| $V_{in}$  | DC Input Voltage (Any Pin) (Referenced to GND)                           | -0.5 to $V_{CC} + 0.5$ | V    |
| I         | DC Current, Into or Out of Any Pin                                       | $\pm 25$               | mA   |
| $P_D$     | Power Dissipation in Still Air, SOIC Package†<br>TSSOP Package†          | 500<br>450             | mW   |
| $T_{stg}$ | Storage Temperature Range                                                | -65 to + 150           | °C   |
| $T_L$     | Lead Temperature, 1 mm from Case for 10 Seconds<br>SOIC or TSSOP Package | 260                    | °C   |

This device contains protection circuitry to guard against damage due to high static voltages or electric fields. However, precautions must be taken to avoid applications of any voltage higher than maximum rated voltages to this high-impedance circuit. For proper operation,  $V_{in}$  and  $V_{out}$  should be constrained to the range  $GND \leq (V_{in} \text{ or } V_{out}) \leq V_{CC}$ . Unused inputs must always be tied to an appropriate logic voltage level (e.g., either GND or  $V_{CC}$ ). Unused outputs must be left open.

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

## RECOMMENDED OPERATING CONDITIONS

| Symbol     | Parameter                                                 | Min                                                                              | Max         | Unit               |    |
|------------|-----------------------------------------------------------|----------------------------------------------------------------------------------|-------------|--------------------|----|
| $V_{CC}$   | Positive DC Supply Voltage (Referenced to GND)            | 4.5                                                                              | 5.5         | V                  |    |
| $V_{in}$   | DC Input Voltage (Any Pin) (Referenced to GND)            | GND                                                                              | $V_{CC}$    | V                  |    |
| $V_{IO}^*$ | Static or Dynamic Voltage Across Switch                   | 0.0                                                                              | 1.2         | V                  |    |
| $T_A$      | Operating Temperature Range, All Package Types            | -55                                                                              | + 125       | °C                 |    |
| $t_r, t_f$ | Input Rise/Fall Time<br>(Channel Select or Enable Inputs) | $V_{CC} = 2.0 \text{ V}$<br>$V_{CC} = 4.5 \text{ V}$<br>$V_{CC} = 6.0 \text{ V}$ | 0<br>0<br>0 | 1000<br>500<br>400 | ns |

Functional operation above the stresses listed in the Recommended Operating Ranges is not implied. Extended exposure to stresses beyond the Recommended Operating Ranges limits may affect device reliability.

\*For voltage drops across switch greater than 1.2 V (switch on), excessive  $V_{CC}$  current may be drawn; i.e., the current out of the switch may contain both  $V_{CC}$  and switch input components. The reliability of the device will be unaffected unless the Maximum Ratings are exceeded.

## DC CHARACTERISTICS — Digital Section (Voltages Referenced to GND) $V_{EE} = GND$ , Except Where Noted

| Symbol   | Parameter                                                         | Condition                                                                 | $V_{CC}$<br>V | Guaranteed Limit |           |           | Unit          |
|----------|-------------------------------------------------------------------|---------------------------------------------------------------------------|---------------|------------------|-----------|-----------|---------------|
|          |                                                                   |                                                                           |               | -55 to 25°C      | ≤85°C     | ≤125°C    |               |
| $V_{IH}$ | Minimum High-Level Input Voltage, Channel-Select or Enable Inputs | $R_{on} = \text{Per Spec}$                                                | 4.5 to 5.5    | 2.0              | 2.0       | 2.0       | V             |
| $V_{IL}$ | Maximum Low-Level Input Voltage, Channel-Select or Enable Inputs  | $R_{on} = \text{Per Spec}$                                                | 4.5 to 5.5    | 0.8              | 0.8       | 0.8       | V             |
| $I_{in}$ | Maximum Input Leakage Current on Digital Pins (Enable/A/B/C)      | $V_{in} = V_{CC}$ or GND                                                  | 5.5           | $\pm 0.1$        | $\pm 1.0$ | $\pm 1.0$ | $\mu\text{A}$ |
| $I_{CC}$ | Maximum Quiescent Supply Current (per Package)                    | $V_{in(\text{digital})} = V_{CC}$ or GND<br>$V_{in(\text{analog})} = GND$ | 5.5           | 2.0              | 20        | 40        | $\mu\text{A}$ |

# MC74HCT4851A, MC74HCT4852A

## DC CHARACTERISTICS — Analog Section

| Symbol           | Parameter                                                              | Condition                                                                                                                                  | V <sub>CC</sub> | Guaranteed Limit |       |        | Unit |
|------------------|------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|-----------------|------------------|-------|--------|------|
|                  |                                                                        |                                                                                                                                            |                 | -55 to 25°C      | ≤85°C | ≤125°C |      |
| R <sub>on</sub>  | Maximum "ON" Resistance                                                | V <sub>in</sub> = V <sub>IL</sub> or V <sub>IH</sub> ; V <sub>IS</sub> = V <sub>CC</sub> to GND (Note 1); I <sub>S</sub> ≤ 2.0 mA (Note 2) | 4.5             | 550              | 650   | 750    | Ω    |
|                  |                                                                        |                                                                                                                                            | 5.5             | 400              | 500   | 600    |      |
| ΔR <sub>on</sub> | Delta "ON" Resistance                                                  | V <sub>in</sub> = V <sub>IL</sub> or V <sub>IH</sub> ; V <sub>IS</sub> = V <sub>CC</sub> /2 (Note 1); I <sub>S</sub> ≤ 2.0 mA (Note 2)     | 4.5             | 80               | 100   | 120    | Ω    |
|                  |                                                                        |                                                                                                                                            | 5.5             | 60               | 80    | 100    |      |
| I <sub>off</sub> | Maximum Off-Channel Leakage Current, Any One Channel<br>Common Channel | V <sub>in</sub> = V <sub>CC</sub> or GND                                                                                                   | 5.5             | ±0.1             | ±0.1  | ±0.1   | μA   |
|                  |                                                                        |                                                                                                                                            |                 | ±0.1             | ±0.1  | ±0.1   |      |
| I <sub>on</sub>  | Maximum On-Channel Leakage Channel-to-Channel                          | V <sub>in</sub> = V <sub>CC</sub> or GND                                                                                                   | 5.5             | ±0.1             | ±0.1  | ±0.1   | μA   |

- V<sub>IS</sub> is the input voltage of an analog I/O pin.
- I<sub>S</sub> is the current flowing in or out of analog I/O pin.

## AC CHARACTERISTICS (C<sub>L</sub> = 50 pF, Input t<sub>r</sub> = t<sub>f</sub> = 6 ns, V<sub>CC</sub> = 5.0 V ± 10%)

| Symbol                                                                                     | Parameter                                                            | V <sub>CC</sub>       | -55 to 25°C | ≤85°C | ≤125°C | Unit |
|--------------------------------------------------------------------------------------------|----------------------------------------------------------------------|-----------------------|-------------|-------|--------|------|
| t <sub>PHL</sub> ,<br>t <sub>PLH</sub>                                                     | Maximum Propagation Delay, Analog Input to Analog Output             | 5.0                   | 40          | 45    | 50     | ns   |
| t <sub>PHL</sub> ,<br>t <sub>PHZ,PZH</sub> ,<br>t <sub>PLH</sub> ,<br>t <sub>PLZ,PZL</sub> | Maximum Propagation Delay, Enable or Channel-Select to Analog Output | 5.0                   | 80          | 90    | 100    | ns   |
| C <sub>in</sub>                                                                            | Maximum Input Capacitance<br>(All Switches Off)                      | Digital Pins          | 10          | 10    | 10     | pF   |
|                                                                                            |                                                                      | Any Single Analog Pin | 35          | 35    | 35     |      |
|                                                                                            |                                                                      | Common Analog Pin     | 40          | 40    | 40     |      |
| C <sub>PD</sub>                                                                            | Power Dissipation Capacitance                                        | Typical               | 5.0         | 20    |        | pF   |

## INJECTION CURRENT COUPLING SPECIFICATIONS (V<sub>CC</sub> = 5V, T<sub>A</sub> = -55°C to +125°C)

| Symbol            | Parameter                                                 | Condition                                          | Typ | Max | Unit |
|-------------------|-----------------------------------------------------------|----------------------------------------------------|-----|-----|------|
| VΔ <sub>out</sub> | Maximum Shift of Output Voltage of Enabled Analog Channel | I <sub>in</sub> * ≤ 1 mA, R <sub>S</sub> ≤ 3,9 kΩ  | 0.1 | 1.0 | mV   |
|                   |                                                           | I <sub>in</sub> * ≤ 10 mA, R <sub>S</sub> ≤ 3,9 kΩ | 1.0 | 5.0 |      |
|                   |                                                           | I <sub>in</sub> * ≤ 1 mA, R <sub>S</sub> ≤ 20 kΩ   | 0.5 | 2.0 |      |
|                   |                                                           | I <sub>in</sub> * ≤ 10 mA, R <sub>S</sub> ≤ 20 kΩ  | 5.0 | 20  |      |

\* I<sub>in</sub> = Total current injected into all disabled channels.

# MC74HCT4851A, MC74HCT4852A

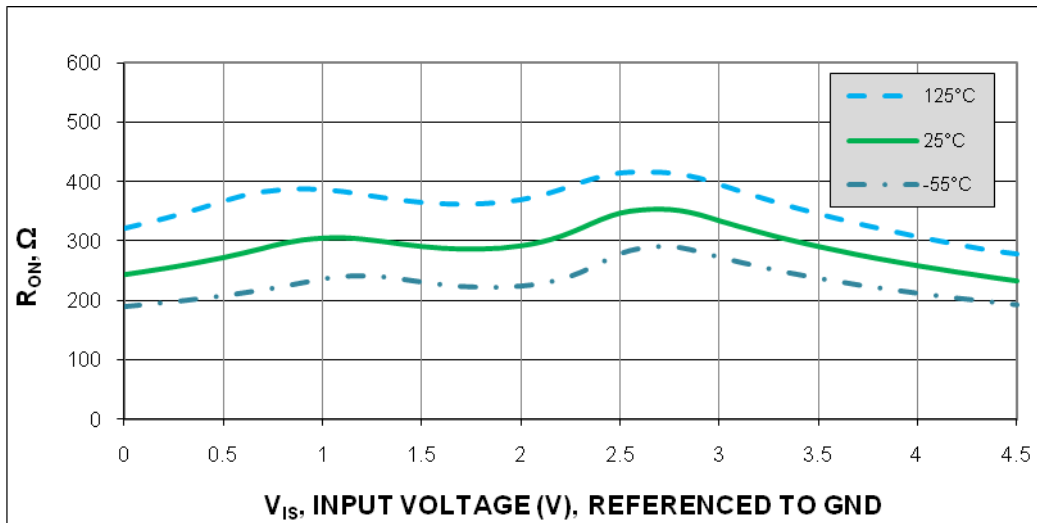


Figure 5. Typical On Resistance  $V_{CC} = 4.5V$

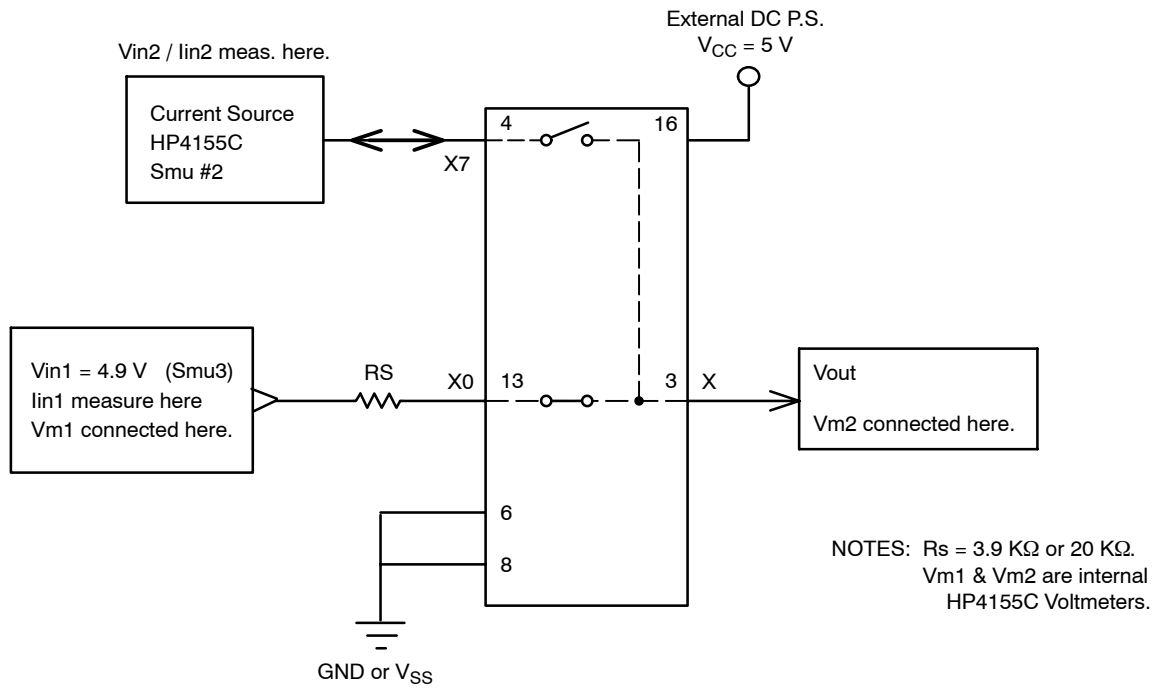
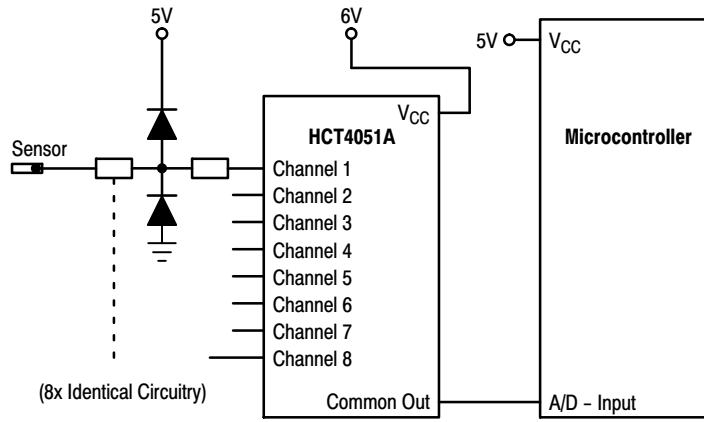


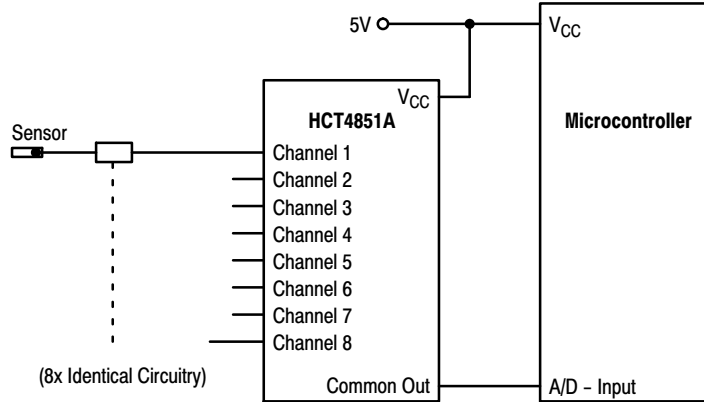
Figure 6. Injection Current Coupling Specification

# MC74HCT4851A, MC74HCT4852A



**Figure 7. Actual Technology**

Requires 32 passive components and one extra 6V regulator to suppress injection current into a standard HCT4051 multiplexer



**Figure 8. MC74HCT4851A Solution**

Solution by applying the HCT4851A multiplexer

# MC74HCT4851A, MC74HCT4852A

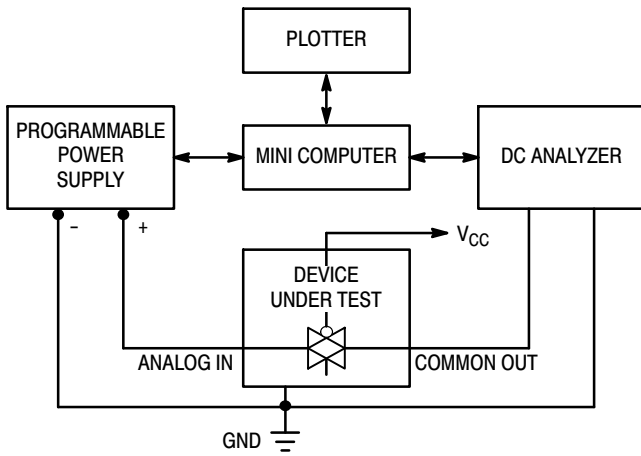


Figure 9. On Resistance Test Set-Up

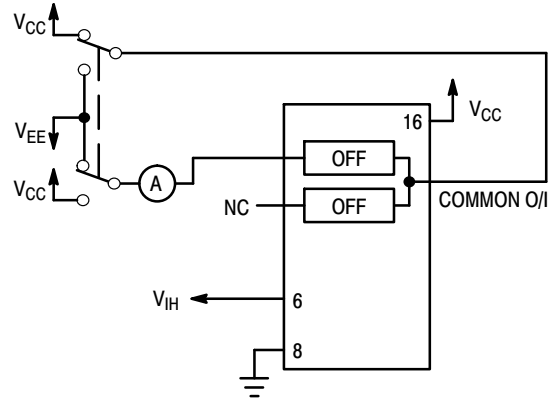


Figure 10. Maximum Off Channel Leakage Current, Any One Channel, Test Set-Up

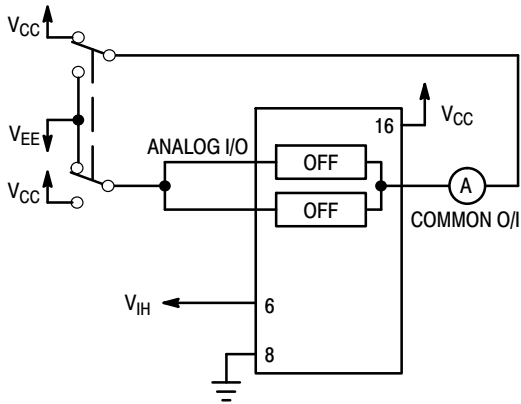


Figure 11. Maximum Off Channel Leakage Current, Common Channel, Test Set-Up

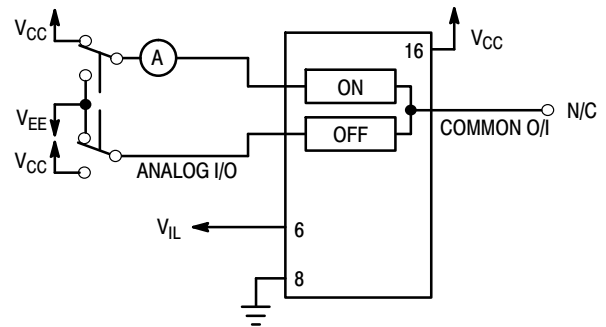


Figure 12. Maximum On Channel Leakage Current, Channel to Channel, Test Set-Up

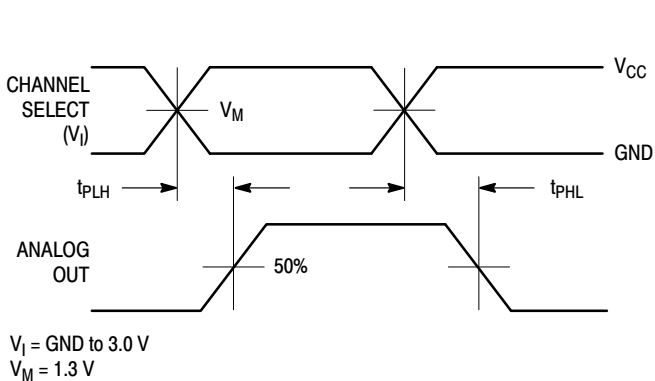
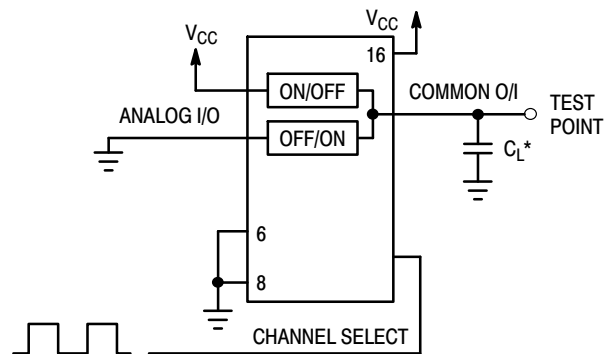


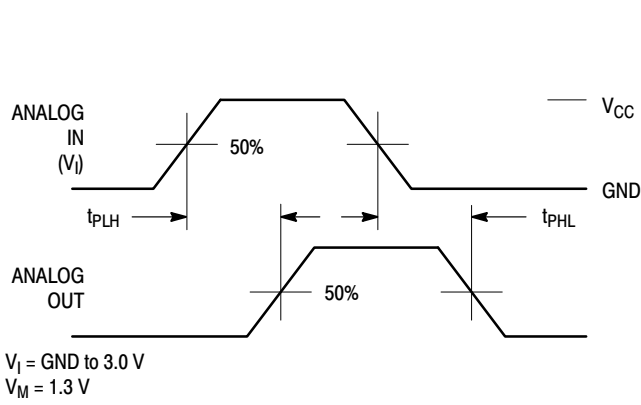
Figure 13. Propagation Delays, Channel Select to Analog Out



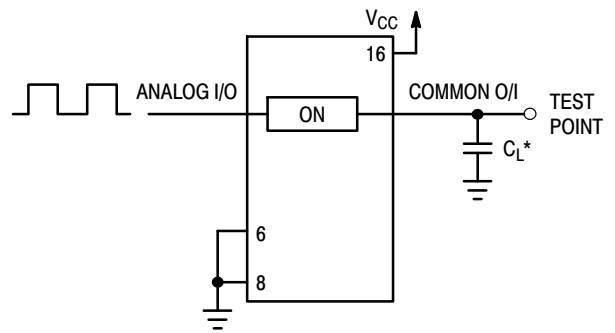
\*Includes all probe and jig capacitance

Figure 14. Propagation Delay, Test Set-Up Channel Select to Analog Out

# MC74HCT4851A, MC74HCT4852A

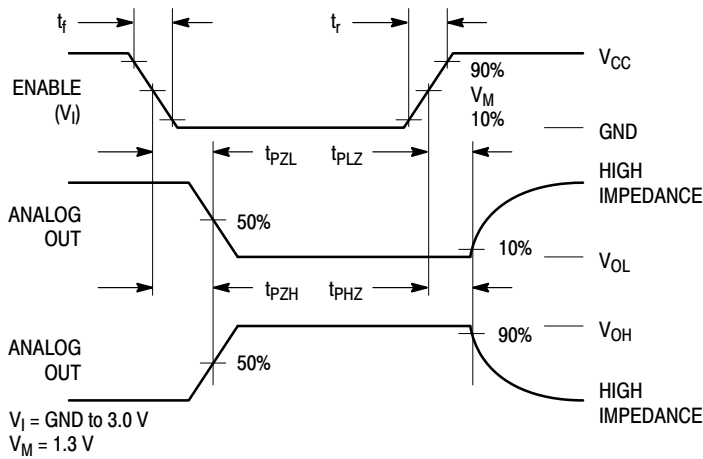


**Figure 15. Propagation Delays, Analog In to Analog Out**

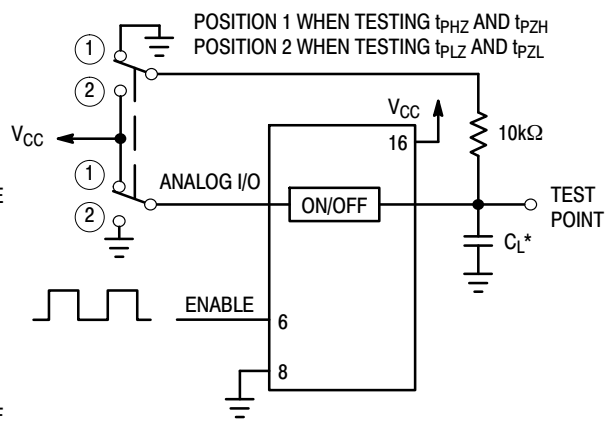


\*Includes all probe and jig capacitance

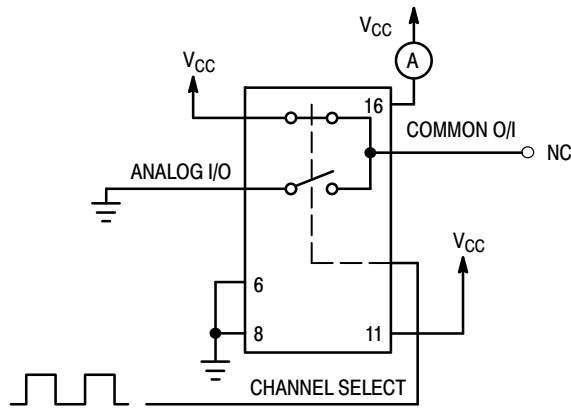
**Figure 16. Propagation Delay, Test Set-Up Analog In to Analog Out**



**Figure 17. Propagation Delays, Enable to Analog Out**



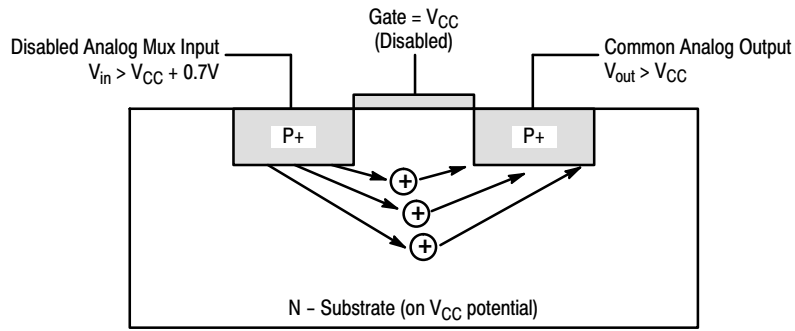
**Figure 18. Propagation Delay, Test Set-Up Enable to Analog Out**



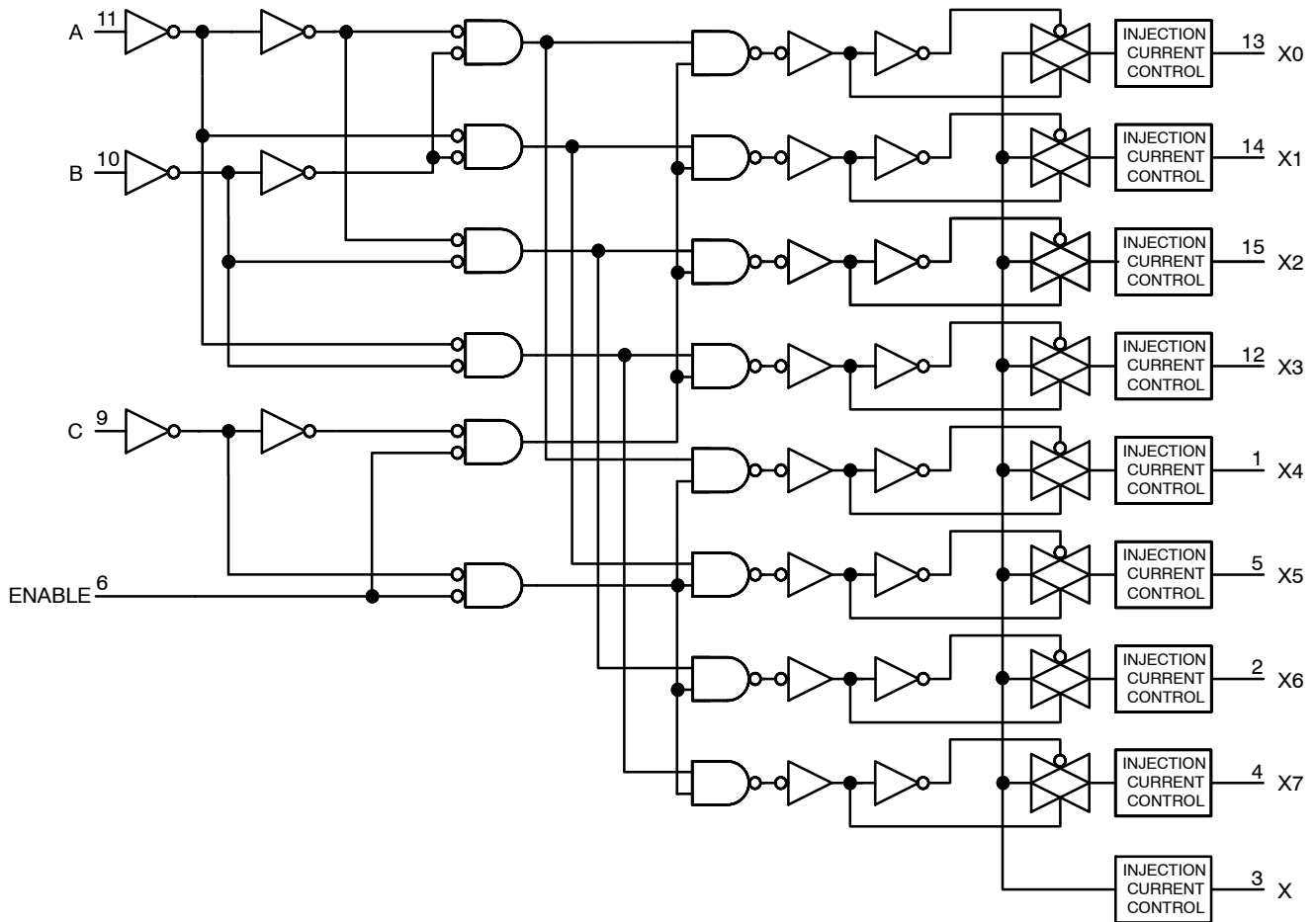
**Figure 19. Power Dissipation Capacitance, Test Set-Up**



# MC74HCT4851A, MC74HCT4852A



**Figure 20. Diagram of Bipolar Coupling Mechanism**  
Appears if V<sub>in</sub> exceeds V<sub>CC</sub>, driving injection current into the substrate



**Figure 21. Function Diagram, HCT4851A**

MC74HCT4851A, MC74HCT4852A

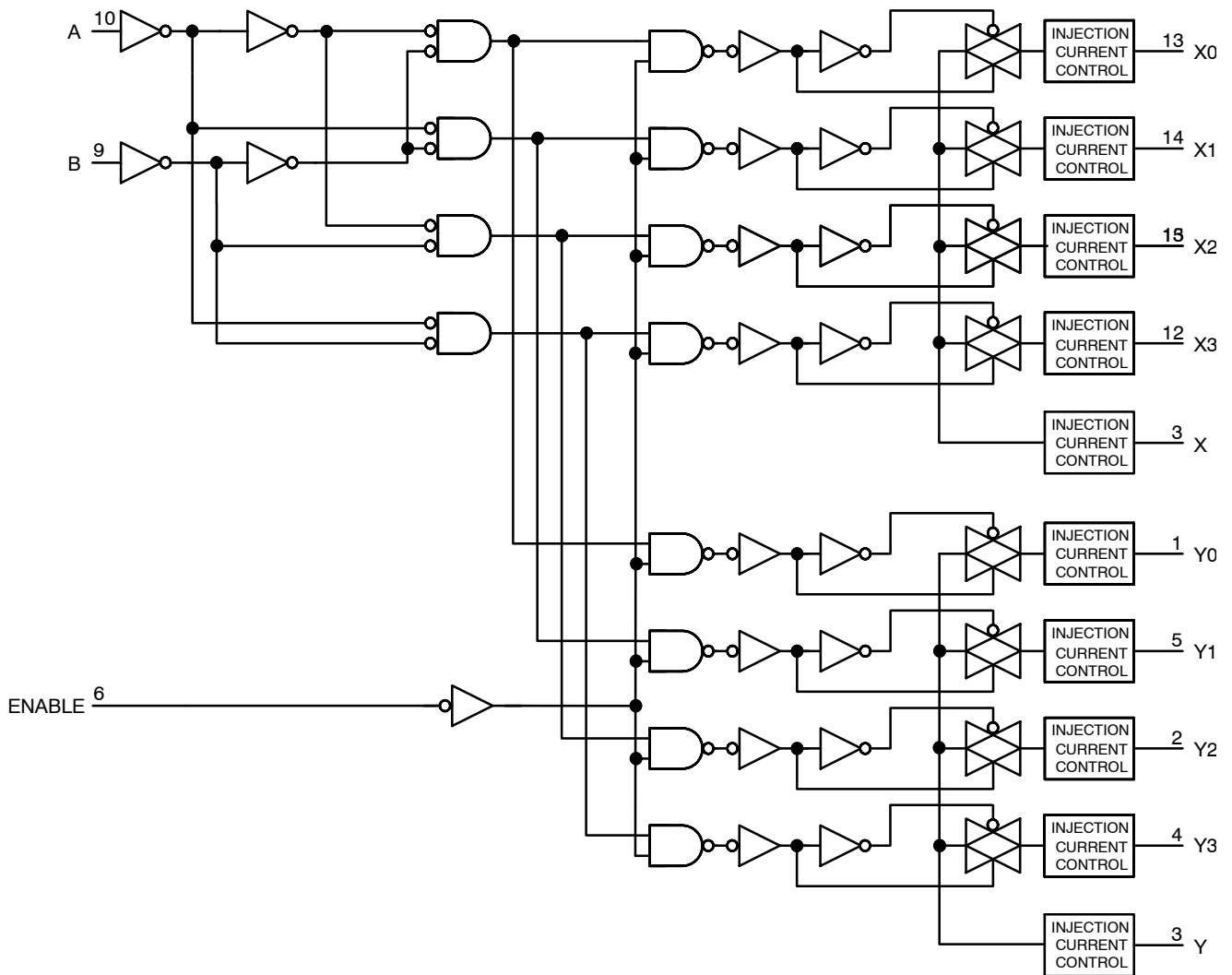


Figure 22. Function Diagram, HCT4852A

## MC74HCT4851A, MC74HCT4852A

### ORDERING INFORMATION

| Device            | Package                   | Shipping†                |
|-------------------|---------------------------|--------------------------|
| MC74HCT4851ADG    | SOIC-16<br>(Pb-Free)      | 48 Units / Rail          |
| MC74HCT4851ADR2G  |                           | 2500 Units / Tape & Reel |
| NLV74HCT4851ADRG* |                           | 2500 Units / Tape & Reel |
| MC74HCT4851AADR2G |                           | 2500 Units / Tape & Reel |
| MC74HCT4851ADTG   | TSSOP-16<br>(Pb-Free)     | 48 Units / Rail          |
| M74HCT4851ADTR2G  |                           | 2500 Units / Tape & Reel |
| NLVHCT4851ADTR2G* |                           | 2500 Units / Tape & Reel |
| M74HCT4851ADWR2G  | SOIC-16 WIDE<br>(Pb-Free) | 1000 Units / Tape & Reel |
| MC74HCT4852ADG    | SOIC-16<br>(Pb-Free)      | 48 Units / Rail          |
| MC74HCT4852ADR2G  |                           | 2500 Units / Tape & Reel |
| MC74HCT4852ADTG   | TSSOP-16<br>(Pb-Free)     | 48 Units / Rail          |
| M74HCT4852ADTR2G  |                           | 2500 Units / Tape & Reel |
| NLVHCT4852ADTR2G* |                           | 2500 Units / Tape & Reel |

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

\*NLV Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q100 Qualified and PPAP Capable.

# MECHANICAL CASE OUTLINE PACKAGE DIMENSIONS

ON Semiconductor®



SCALE 1:1

## SOIC-16 CASE 751B-05 ISSUE K

DATE 29 DEC 2006



NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSIONS A AND B DO NOT INCLUDE MOLD PROTRUSION.
4. MAXIMUM MOLD PROTRUSION 0.15 (0.006) PER SIDE.
5. DIMENSION D DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.127 (0.005) TOTAL IN EXCESS OF THE D DIMENSION AT MAXIMUM MATERIAL CONDITION.

| DIM | MILLIMETERS |       | INCHES    |       |
|-----|-------------|-------|-----------|-------|
|     | MIN         | MAX   | MIN       | MAX   |
| A   | 9.80        | 10.00 | 0.386     | 0.393 |
| B   | 3.80        | 4.00  | 0.150     | 0.157 |
| C   | 1.35        | 1.75  | 0.054     | 0.068 |
| D   | 0.35        | 0.49  | 0.014     | 0.019 |
| F   | 0.40        | 1.25  | 0.016     | 0.049 |
| G   | 1.27 BSC    |       | 0.050 BSC |       |
| J   | 0.19        | 0.25  | 0.008     | 0.009 |
| K   | 0.10        | 0.25  | 0.004     | 0.009 |
| M   | 0°          | 7°    | 0°        | 7°    |
| P   | 5.80        | 6.20  | 0.229     | 0.244 |
| R   | 0.25        | 0.50  | 0.010     | 0.019 |

- |                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>STYLE 1:</p> <p>PIN 1. COLLECTOR</p> <p>2. BASE</p> <p>3. EMITTER</p> <p>4. NO CONNECTION</p> <p>5. EMITTER</p> <p>6. BASE</p> <p>7. COLLECTOR</p> <p>8. COLLECTOR</p> <p>9. BASE</p> <p>10. EMITTER</p> <p>11. NO CONNECTION</p> <p>12. EMITTER</p> <p>13. BASE</p> <p>14. COLLECTOR</p> <p>15. EMITTER</p> <p>16. COLLECTOR</p>                           | <p>STYLE 2:</p> <p>PIN 1. CATHODE</p> <p>2. ANODE</p> <p>3. NO CONNECTION</p> <p>4. CATHODE</p> <p>5. CATHODE</p> <p>6. NO CONNECTION</p> <p>7. ANODE</p> <p>8. CATHODE</p> <p>9. CATHODE</p> <p>10. ANODE</p> <p>11. NO CONNECTION</p> <p>12. CATHODE</p> <p>13. CATHODE</p> <p>14. NO CONNECTION</p> <p>15. ANODE</p> <p>16. CATHODE</p> | <p>STYLE 3:</p> <p>PIN 1. COLLECTOR, DYE #1</p> <p>2. BASE, #1</p> <p>3. EMITTER, #1</p> <p>4. COLLECTOR, #1</p> <p>5. COLLECTOR, #2</p> <p>6. BASE, #2</p> <p>7. EMITTER, #2</p> <p>8. COLLECTOR, #2</p> <p>9. COLLECTOR, #3</p> <p>10. BASE, #3</p> <p>11. EMITTER, #3</p> <p>12. COLLECTOR, #3</p> <p>13. COLLECTOR, #4</p> <p>14. BASE, #4</p> <p>15. EMITTER, #4</p> <p>16. COLLECTOR, #4</p>                                                                                         | <p>STYLE 4:</p> <p>PIN 1. COLLECTOR, DYE #1</p> <p>2. COLLECTOR, #1</p> <p>3. COLLECTOR, #2</p> <p>4. COLLECTOR, #2</p> <p>5. COLLECTOR, #3</p> <p>6. COLLECTOR, #3</p> <p>7. COLLECTOR, #4</p> <p>8. COLLECTOR, #4</p> <p>9. BASE, #4</p> <p>10. EMITTER, #4</p> <p>11. BASE, #3</p> <p>12. EMITTER, #3</p> <p>13. BASE, #2</p> <p>14. EMITTER, #2</p> <p>15. BASE, #1</p> <p>16. EMITTER, #1</p> |
| <p>STYLE 5:</p> <p>PIN 1. DRAIN, DYE #1</p> <p>2. DRAIN, #1</p> <p>3. DRAIN, #2</p> <p>4. DRAIN, #2</p> <p>5. DRAIN, #3</p> <p>6. DRAIN, #3</p> <p>7. DRAIN, #4</p> <p>8. DRAIN, #4</p> <p>9. GATE, #4</p> <p>10. SOURCE, #4</p> <p>11. GATE, #3</p> <p>12. SOURCE, #3</p> <p>13. GATE, #2</p> <p>14. SOURCE, #2</p> <p>15. GATE, #1</p> <p>16. SOURCE, #1</p> | <p>STYLE 6:</p> <p>PIN 1. CATHODE</p> <p>2. CATHODE</p> <p>3. CATHODE</p> <p>4. CATHODE</p> <p>5. CATHODE</p> <p>6. CATHODE</p> <p>7. CATHODE</p> <p>8. CATHODE</p> <p>9. ANODE</p> <p>10. ANODE</p> <p>11. ANODE</p> <p>12. ANODE</p> <p>13. ANODE</p> <p>14. ANODE</p> <p>15. ANODE</p> <p>16. ANODE</p>                                 | <p>STYLE 7:</p> <p>PIN 1. SOURCE N-CH</p> <p>2. COMMON DRAIN (OUTPUT)</p> <p>3. COMMON DRAIN (OUTPUT)</p> <p>4. GATE P-CH</p> <p>5. COMMON DRAIN (OUTPUT)</p> <p>6. COMMON DRAIN (OUTPUT)</p> <p>7. COMMON DRAIN (OUTPUT)</p> <p>8. SOURCE P-CH</p> <p>9. SOURCE P-CH</p> <p>10. COMMON DRAIN (OUTPUT)</p> <p>11. COMMON DRAIN (OUTPUT)</p> <p>12. COMMON DRAIN (OUTPUT)</p> <p>13. GATE N-CH</p> <p>14. COMMON DRAIN (OUTPUT)</p> <p>15. COMMON DRAIN (OUTPUT)</p> <p>16. SOURCE N-CH</p> |                                                                                                                                                                                                                                                                                                                                                                                                    |

### SOLDERING FOOTPRINT



DIMENSIONS: MILLIMETERS

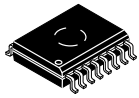
|                  |             |                                                                                                                                                                                     |
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# MECHANICAL CASE OUTLINE

## PACKAGE DIMENSIONS

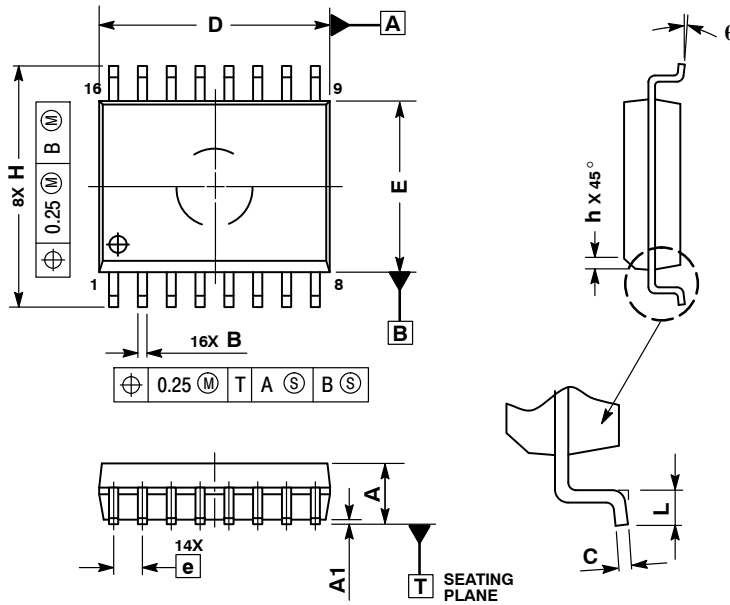
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1  
SCALE 1:1

SOIC-16 WB  
CASE 751G-03  
ISSUE D

DATE 12 FEB 2013

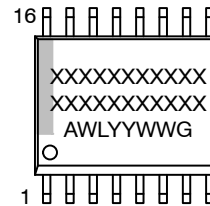


NOTES:

1. DIMENSIONS ARE IN MILLIMETERS.
2. INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M, 1994.
3. DIMENSIONS D AND E DO NOT INCLUDE MOLD PROTRUSION.
4. MAXIMUM MOLD PROTRUSION 0.15 PER SIDE.
5. DIMENSION B DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.13 TOTAL IN EXCESS OF THE B DIMENSION AT MAXIMUM MATERIAL CONDITION.

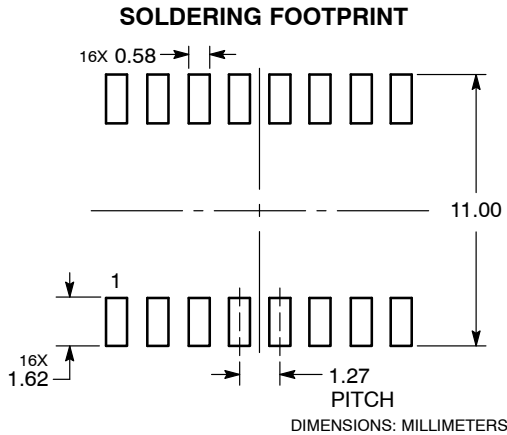
| MILLIMETERS |          |       |
|-------------|----------|-------|
| DIM         | MIN      | MAX   |
| A           | 2.35     | 2.65  |
| A1          | 0.10     | 0.25  |
| B           | 0.35     | 0.49  |
| C           | 0.23     | 0.32  |
| D           | 10.15    | 10.45 |
| E           | 7.40     | 7.60  |
| e           | 1.27 BSC |       |
| H           | 10.05    | 10.55 |
| h           | 0.25     | 0.75  |
| L           | 0.50     | 0.90  |
| q           | 0°       | 7°    |

GENERIC MARKING DIAGRAM\*



- XXXXXX = Specific Device Code
- A = Assembly Location
- WL = Wafer Lot
- YY = Year
- WW = Work Week
- G = Pb-Free Package

\*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "▪", may or may not be present.



|                         |                    |                                                                                                                                                                                  |
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# MECHANICAL CASE OUTLINE

## PACKAGE DIMENSIONS

ON Semiconductor®



TSSOP-16  
CASE 948F-01  
ISSUE B

DATE 19 OCT 2006



NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSION A DOES NOT INCLUDE MOLD FLASH. PROTRUSIONS OR GATE BURRS. MOLD FLASH OR GATE BURRS SHALL NOT EXCEED 0.15 (0.006) PER SIDE.
4. DIMENSION B DOES NOT INCLUDE INTERLEAD FLASH OR PROTRUSION. INTERLEAD FLASH OR PROTRUSION SHALL NOT EXCEED 0.25 (0.010) PER SIDE.
5. DIMENSION K DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.08 (0.003) TOTAL IN EXCESS OF THE K DIMENSION AT MAXIMUM MATERIAL CONDITION.
6. TERMINAL NUMBERS ARE SHOWN FOR REFERENCE ONLY.
7. DIMENSION A AND B ARE TO BE DETERMINED AT DATUM PLANE -W-.

| DIM | MILLIMETERS |      | INCHES    |       |
|-----|-------------|------|-----------|-------|
|     | MIN         | MAX  | MIN       | MAX   |
| A   | 4.90        | 5.10 | 0.193     | 0.200 |
| B   | 4.30        | 4.50 | 0.169     | 0.177 |
| C   | ---         | 1.20 | ---       | 0.047 |
| D   | 0.05        | 0.15 | 0.002     | 0.006 |
| F   | 0.50        | 0.75 | 0.020     | 0.030 |
| G   | 0.65 BSC    |      | 0.026 BSC |       |
| H   | 0.18        | 0.28 | 0.007     | 0.011 |
| J   | 0.09        | 0.20 | 0.004     | 0.008 |
| J1  | 0.09        | 0.16 | 0.004     | 0.006 |
| K   | 0.19        | 0.30 | 0.007     | 0.012 |
| K1  | 0.19        | 0.25 | 0.007     | 0.010 |
| L   | 6.40 BSC    |      | 0.252 BSC |       |
| M   | 0°          | 8°   | 0°        | 8°    |

SOLDERING FOOTPRINT



GENERIC MARKING DIAGRAM\*



- XXXX = Specific Device Code
- A = Assembly Location
- L = Wafer Lot
- Y = Year
- W = Work Week
- G or ■ = Pb-Free Package

\*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "■", may or may not be present.

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