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## REVISION HISTORY

### 3/15—Rev. C to Rev. D

|                                          |    |
|------------------------------------------|----|
| Changes to Figure 12 and Figure 15 ..... | 9  |
| Updated Outline Dimensions .....         | 16 |
| Changes to Ordering Guide .....          | 16 |

### 10/06—Rev. B to Rev. C

|                                    |           |
|------------------------------------|-----------|
| Updated Format .....               | Universal |
| Changes to Table 3 .....           | 6         |
| Inserted Table 4 and Table 5 ..... | 7         |
| Updated Outline Dimensions .....   | 14        |
| Changes to Ordering Guide .....    | 15        |

### 3/03—Rev. A to Rev. B

|                                  |    |
|----------------------------------|----|
| Changes to Ordering Guide .....  | 4  |
| Updated Outline Dimensions ..... | 11 |

### 2/01—Revision 0: Initial Version

## SPECIFICATIONS

## DUAL SUPPLY

$V_{DD} = 15\text{ V}$ ,  $V_{SS} = -15\text{ V}$ ,  $GND = 0\text{ V}$ , unless otherwise noted.

Table 1.

| Parameter                                               | B Version |                                    | T Version |                                    | Unit   | Test Conditions/Comments                                                          |
|---------------------------------------------------------|-----------|------------------------------------|-----------|------------------------------------|--------|-----------------------------------------------------------------------------------|
|                                                         | +25°C     | −40°C to +85°C                     | +25°C     | −55°C to +125°C                    |        |                                                                                   |
| ANALOG SWITCH                                           |           |                                    |           |                                    |        |                                                                                   |
| Analog Signal Range                                     |           | V <sub>SS</sub> to V <sub>DD</sub> |           | V <sub>SS</sub> to V <sub>DD</sub> | V      |                                                                                   |
| R <sub>ON</sub>                                         | 40        |                                    | 40        |                                    | Ω typ  | V <sub>D</sub> = ±10 V, I <sub>S</sub> = −10 mA                                   |
|                                                         | 100       | 125                                | 100       | 125                                | Ω max  |                                                                                   |
| ΔR <sub>ON</sub>                                        | 15        |                                    | 15        |                                    | Ω max  | V <sub>D</sub> = +10 V, −10 V                                                     |
| LEAKAGE CURRENTS                                        |           |                                    |           |                                    |        |                                                                                   |
| Source Off Leakage I <sub>S</sub> (Off)                 | ±0.5      | ±50                                | ±0.5      | ±50                                | nA max | V <sub>D</sub> = ±10 V, V <sub>S</sub> = ∓ 10 V; see Figure 19                    |
| Drain Off Leakage I <sub>D</sub> (Off)                  |           |                                    |           |                                    |        | V <sub>D</sub> = ±10 V, V <sub>S</sub> = ∓ 10 V; see Figure 20                    |
| ADG408                                                  | ±1        | ±100                               | ±1        | ±100                               | nA max |                                                                                   |
| ADG409                                                  | ±1        | ±50                                | ±1        | ±50                                | nA max |                                                                                   |
| Channel On Leakage I <sub>D</sub> , I <sub>S</sub> (On) |           |                                    |           |                                    |        | V <sub>S</sub> = V <sub>D</sub> = ±10 V; see Figure 21                            |
| ADG408                                                  | ±1        | ±100                               | ±1        | ±100                               | nA max |                                                                                   |
| ADG409                                                  | ±1        | ±50                                | ±1        | ±50                                | nA max |                                                                                   |
| DIGITAL INPUTS                                          |           |                                    |           |                                    |        |                                                                                   |
| Input High Voltage, V <sub>INH</sub>                    |           | 2.4                                |           | 2.4                                | V min  |                                                                                   |
| Input Low Voltage, V <sub>INL</sub>                     |           | 0.8                                |           | 0.8                                | V max  |                                                                                   |
| Input Current                                           |           |                                    |           |                                    |        |                                                                                   |
| I <sub>INL</sub> or I <sub>INH</sub>                    |           | ±10                                |           | ±10                                | μA max | V <sub>IN</sub> = 0 or V <sub>DD</sub>                                            |
| C <sub>IN</sub> , Digital Input Capacitance             | 8         |                                    | 8         |                                    | pF typ | f = 1 MHz                                                                         |
| DYNAMIC CHARACTERISTICS <sup>1</sup>                    |           |                                    |           |                                    |        |                                                                                   |
| t <sub>TRANSITION</sub>                                 |           | 120                                |           | 120                                | ns typ | R <sub>L</sub> = 300 Ω, C <sub>L</sub> = 35 pF;                                   |
|                                                         |           | 250                                |           | 250                                | ns max | V <sub>S1</sub> = ±10 V, V <sub>S8</sub> = ∓ 10 V; see Figure 22                  |
| t <sub>OPEN</sub>                                       | 10        | 10                                 | 10        | 10                                 | ns min | R <sub>L</sub> = 300 Ω, C <sub>L</sub> = 35 pF;                                   |
|                                                         |           |                                    |           |                                    |        | V <sub>S</sub> = 5 V; see Figure 23                                               |
| t <sub>ON</sub> (EN)                                    | 85        | 125                                | 85        | 125                                | ns typ | R <sub>L</sub> = 300 Ω C <sub>L</sub> = 35 pF;                                    |
|                                                         | 150       | 225                                | 150       | 225                                | ns max | V <sub>S</sub> = 5 V; see Figure 24                                               |
| t <sub>OFF</sub> (EN)                                   |           | 65                                 |           | 65                                 | ns typ | R <sub>L</sub> = 300 Ω, C <sub>L</sub> = 35 pF;                                   |
|                                                         |           | 150                                |           | 150                                | ns max | V <sub>S</sub> = 5 V; see Figure 24                                               |
| Charge Injection                                        | 20        |                                    | 20        |                                    | pC typ | V <sub>S</sub> = 0 V, R <sub>S</sub> = 0 Ω, C <sub>L</sub> = 10 nF; see Figure 25 |
| OFF Isolation                                           | −75       |                                    | −75       |                                    | dB typ | R <sub>L</sub> = 1 kΩ, f = 100 kHz;                                               |
|                                                         |           |                                    |           |                                    |        | V <sub>EN</sub> = 0 V; see Figure 26                                              |
| Channel-to-Channel Crosstalk                            | 85        |                                    | 85        |                                    | dB typ | R <sub>L</sub> = 1 kΩ, f = 100 kHz; see Figure 27                                 |
| C <sub>S</sub> (OFF)                                    | 11        |                                    | 11        |                                    | pF typ | f = 1 MHz                                                                         |
| C <sub>D</sub> (OFF)                                    |           |                                    |           |                                    |        | f = 1 MHz                                                                         |
| ADG408                                                  | 40        |                                    | 40        |                                    | pF typ |                                                                                   |
| ADG409                                                  | 20        |                                    | 20        |                                    | pF typ |                                                                                   |
| C <sub>D</sub> , C <sub>S</sub> (ON)                    |           |                                    |           |                                    |        | f = 1 MHz                                                                         |
| ADG408                                                  | 54        |                                    | 54        |                                    | pF typ |                                                                                   |
| ADG409                                                  | 34        |                                    | 34        |                                    | pF typ |                                                                                   |

| Parameter          | B Version |                | T Version |                 | Unit              | Test Conditions/Comments                     |
|--------------------|-----------|----------------|-----------|-----------------|-------------------|----------------------------------------------|
|                    | +25°C     | –40°C to +85°C | +25°C     | –55°C to +125°C |                   |                                              |
| POWER REQUIREMENTS |           |                |           |                 |                   |                                              |
| $I_{DD}$           |           | 1              |           | 1               | $\mu\text{A typ}$ | $V_{IN} = 0\text{ V}, V_{EN} = 0\text{ V}$   |
|                    |           | 5              |           | 5               | $\mu\text{A max}$ |                                              |
| $I_{SS}$           |           | 1              |           | 1               | $\mu\text{A typ}$ |                                              |
|                    |           | 5              |           | 5               | $\mu\text{A max}$ |                                              |
| $I_{DD}$           | 100       |                | 100       |                 | $\mu\text{A typ}$ | $V_{IN} = 0\text{ V}, V_{EN} = 2.4\text{ V}$ |
|                    | 200       | 500            | 200       | 500             | $\mu\text{A max}$ |                                              |

<sup>1</sup> Guaranteed by design, not subject to production test.

## SINGLE SUPPLY

$V_{DD} = 12\text{ V}$ ,  $V_{SS} = 0\text{ V}$ ,  $\text{GND} = 0\text{ V}$ , unless otherwise noted.

Table 2.

| Parameter                            | B Version |                | T Version |                 | Unit                | Test Conditions/Comments                                                                                                      |
|--------------------------------------|-----------|----------------|-----------|-----------------|---------------------|-------------------------------------------------------------------------------------------------------------------------------|
|                                      | +25°C     | –40°C to +85°C | +25°C     | –55°C to +125°C |                     |                                                                                                                               |
| ANALOG SWITCH                        |           |                |           |                 |                     |                                                                                                                               |
| Analogue Signal Range                |           | 0 to $V_{DD}$  |           | 0 to $V_{DD}$   | V                   |                                                                                                                               |
| $R_{ON}$                             | 90        |                | 90        |                 | $\Omega\text{ typ}$ | $V_D = 3\text{ V}, 10\text{ V}, I_S = -1\text{ mA}$                                                                           |
| LEAKAGE CURRENTS                     |           |                |           |                 |                     |                                                                                                                               |
| Source Off Leakage $I_S$ (Off)       | $\pm 0.5$ | $\pm 50$       | $\pm 0.5$ | $\pm 50$        | nA max              | $V_D = 8\text{ V}/0\text{ V}, V_S = 0\text{ V}/8\text{ V}$ ; see Figure 19                                                    |
| Drain Off Leakage $I_D$ (Off)        |           |                |           |                 |                     | $V_D = 8\text{ V}/0\text{ V}, V_S = 0\text{ V}/8\text{ V}$ ; see Figure 20                                                    |
| ADG408                               | $\pm 1$   | $\pm 100$      | $\pm 1$   | $\pm 100$       | nA max              |                                                                                                                               |
| ADG409                               | $\pm 1$   | $\pm 50$       | $\pm 1$   | $\pm 50$        | nA max              |                                                                                                                               |
| Channel On Leakage $I_D, I_S$ (On)   |           |                |           |                 |                     | $V_S = V_D = 8\text{ V}/0\text{ V}$ ; see Figure 21                                                                           |
| ADG408                               | $\pm 1$   | $\pm 100$      | $\pm 1$   | $\pm 100$       | nA max              |                                                                                                                               |
| ADG409                               | $\pm 1$   | $\pm 50$       | $\pm 1$   | $\pm 50$        | nA max              |                                                                                                                               |
| DIGITAL INPUTS                       |           |                |           |                 |                     |                                                                                                                               |
| Input High Voltage, $V_{INH}$        |           | 2.4            |           | 2.4             | V min               |                                                                                                                               |
| Input Low Voltage, $V_{INL}$         |           | 0.8            |           | 0.8             | V max               |                                                                                                                               |
| Input Current                        |           |                |           |                 |                     |                                                                                                                               |
| $I_{INL}$ or $I_{INH}$               |           | $\pm 10$       |           | $\pm 10$        | $\mu\text{A max}$   | $V_{IN} = 0$ or $V_{DD}$                                                                                                      |
| $C_{IN}$ , Digital Input Capacitance | 8         |                | 8         |                 | pF typ              | $f = 1\text{ MHz}$                                                                                                            |
| DYNAMIC CHARACTERISTICS <sup>1</sup> |           |                |           |                 |                     |                                                                                                                               |
| $t_{TRANSITION}$                     | 130       |                | 130       |                 | ns typ              | $R_L = 300\ \Omega, C_L = 35\text{ pF}$ ;<br>$V_{S1} = 8\text{ V}/0\text{ V}, V_{S8} = 0\text{ V}/8\text{ V}$ ; see Figure 22 |
| $t_{OPEN}$                           | 10        |                | 10        |                 | ns typ              | $R_L = 300\ \Omega, C_L = 35\text{ pF}$ ;<br>$V_S = 5\text{ V}$ ; see Figure 23                                               |
| $t_{ON}$ (EN)                        | 140       |                | 140       |                 | ns typ              | $R_L = 300\ \Omega, C_L = 35\text{ pF}$ ;<br>$V_S = 5\text{ V}$ ; see Figure 24                                               |
| $t_{OFF}$ (EN)                       | 60        |                | 60        |                 | ns typ              | $R_L = 300\ \Omega, C_L = 35\text{ pF}$ ;<br>$V_S = 5\text{ V}$ ; see Figure 24                                               |
| Charge Injection                     | 5         |                | 5         |                 | pC typ              | $V_S = 0\text{ V}, R_S = 0\ \Omega, C_L = 10\text{ nF}$ ; see Figure 25                                                       |
| Off Isolation                        | –75       |                | –75       |                 | dB typ              | $R_L = 1\text{ k}\Omega, f = 100\text{ kHz}$ ;<br>$V_{EN} = 0\text{ V}$ ; see Figure 26                                       |

| Parameter                    | B Version |                   | T Version |                    | Unit              | Test Conditions/Comments                                        |
|------------------------------|-----------|-------------------|-----------|--------------------|-------------------|-----------------------------------------------------------------|
|                              | +25°C     | –40°C to<br>+85°C | +25°C     | –55°C to<br>+125°C |                   |                                                                 |
| Channel-to-Channel Crosstalk | 85        |                   | 85        |                    | dB typ            | $R_L = 1\text{ k}\Omega$ , $f = 100\text{ kHz}$ ; see Figure 27 |
| $C_S$ (Off)                  | 11        |                   | 11        |                    | pF typ            | $f = 1\text{ MHz}$                                              |
| $C_D$ (Off)                  |           |                   |           |                    |                   | $f = 1\text{ MHz}$                                              |
| ADG408                       | 40        |                   | 40        |                    | pF typ            |                                                                 |
| ADG409                       | 20        |                   | 20        |                    | pF typ            |                                                                 |
| $C_D$ , $C_S$ (On)           |           |                   |           |                    |                   | $f = 1\text{ MHz}$                                              |
| ADG408                       | 54        |                   | 54        |                    | pF typ            |                                                                 |
| ADG409                       | 34        |                   | 34        |                    | pF typ            |                                                                 |
| POWER REQUIREMENTS           |           |                   |           |                    |                   |                                                                 |
| $I_{DD}$                     |           | 1                 |           | 1                  | $\mu\text{A typ}$ | $V_{IN} = 0\text{ V}$ , $V_{EN} = 0\text{ V}$                   |
|                              |           | 5                 |           | 5                  | $\mu\text{A max}$ |                                                                 |
| $I_{DD}$                     | 100       |                   | 100       |                    | $\mu\text{A typ}$ | $V_{IN} = 0\text{ V}$ , $V_{EN} = 2.4\text{ V}$                 |
|                              | 200       | 500               | 200       | 500                | $\mu\text{A max}$ |                                                                 |

<sup>1</sup> Guaranteed by design, not subject to production test.

## ABSOLUTE MAXIMUM RATINGS

$T_A = 25^\circ\text{C}$ , unless otherwise noted.

Table 3.

| Parameter                                                        | Rating                                                                          |
|------------------------------------------------------------------|---------------------------------------------------------------------------------|
| $V_{DD}$ to $V_{SS}$                                             | 44 V                                                                            |
| $V_{DD}$ to GND                                                  | −0.3 V to +32 V                                                                 |
| $V_{SS}$ to GND                                                  | +0.3 V to −32 V                                                                 |
| Analog, Digital Inputs                                           | $V_{SS} - 2\text{ V}$ to $V_{DD} + 2\text{ V}$ or 20 mA, whichever occurs first |
| Continuous Current, S or D                                       | 20 mA                                                                           |
| Peak Current, S or D<br>(Pulsed at 1 ms, 10% Duty Cycle Maximum) | 40 mA                                                                           |
| Operating Temperature Range                                      |                                                                                 |
| Industrial (B Version)                                           | −40°C to +85°C                                                                  |
| Extended (T Version)                                             | −55°C to +125°C                                                                 |
| Storage Temperature Range                                        | −65°C to +150°C                                                                 |
| Junction Temperature                                             | 150°C                                                                           |
| CERDIP Package, Power Dissipation                                | 900 mW                                                                          |
| $\theta_{JA}$ , Thermal Impedance                                | 76°C/W                                                                          |
| Lead Temperature, Soldering<br>(10 sec)                          | 300°C                                                                           |
| PDIP Package, Power Dissipation                                  | 470 mW                                                                          |
| $\theta_{JA}$ , Thermal Impedance                                | 117°C/W                                                                         |
| Lead Temperature, Soldering<br>(10 sec)                          | 260°C                                                                           |
| TSSOP Package, Power Dissipation                                 | 450 mW                                                                          |
| $\theta_{JA}$ , Thermal Impedance                                | 155°C/W                                                                         |
| $\theta_{JC}$ , Thermal Impedance                                | 50°C/W                                                                          |
| SOIC Package, Power Dissipation                                  | 600 mW                                                                          |
| $\theta_{JA}$ , Thermal Impedance                                | 77°C/W                                                                          |
| Lead Temperature, Soldering                                      |                                                                                 |
| Vapor Phase (60 sec)                                             | 215°C                                                                           |
| Infrared (15 sec)                                                | 220°C                                                                           |

Stresses at or above those listed under Absolute Maximum Ratings may cause permanent damage to the product. This is a stress rating only; functional operation of the product at these or any other conditions above those indicated in the operational section of this specification is not implied. Operation beyond the maximum operating conditions for extended periods may affect product reliability.

### ESD CAUTION



**ESD (electrostatic discharge) sensitive device.** Charged devices and circuit boards can discharge without detection. Although this product features patented or proprietary protection circuitry, damage may occur on devices subjected to high energy ESD. Therefore, proper ESD precautions should be taken to avoid performance degradation or loss of functionality.

## PIN CONFIGURATIONS AND FUNCTION DESCRIPTIONS

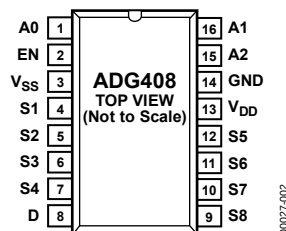


Figure 2. ADG408 Pin Configuration

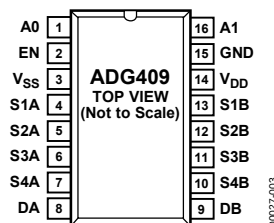


Figure 3. ADG409 Pin Configuration

Table 4. ADG408 Pin Function Descriptions

| Pin No. | Mnemonic        | Description                                                                                                                             |
|---------|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| 1       | A0              | Logic Control Input.                                                                                                                    |
| 2       | EN              | Active High Digital Input. When low, the device is disabled and all switches are off. When high, Ax logic inputs determine on switches. |
| 3       | V <sub>SS</sub> | Most Negative Power Supply Potential in Dual Supplies. In single-supply applications, it can be connected to ground.                    |
| 4       | S1              | Source Terminal 1. Can be an input or an output.                                                                                        |
| 5       | S2              | Source Terminal 2. Can be an input or an output.                                                                                        |
| 6       | S3              | Source Terminal 3. Can be an input or an output.                                                                                        |
| 7       | S4              | Source Terminal 4. Can be an input or an output.                                                                                        |
| 8       | D               | Drain Terminal. Can be an input or an output.                                                                                           |
| 9       | S8              | Source Terminal 8. Can be an input or an output.                                                                                        |
| 10      | S7              | Source Terminal 7. Can be an input or an output.                                                                                        |
| 11      | S6              | Source Terminal 6. Can be an input or an output.                                                                                        |
| 12      | S5              | Source Terminal 5. Can be an input or an output.                                                                                        |
| 13      | V <sub>DD</sub> | Most Positive Power Supply Potential.                                                                                                   |
| 14      | GND             | Ground (0 V) Reference.                                                                                                                 |
| 15      | A2              | Logic Control Input.                                                                                                                    |
| 16      | A1              | Logic Control Input.                                                                                                                    |

Table 6. ADG408 Truth Table

| A2 | A1 | A0 | EN | On Switch |
|----|----|----|----|-----------|
| X  | X  | X  | 0  | None      |
| 0  | 0  | 0  | 1  | 1         |
| 0  | 0  | 1  | 1  | 2         |
| 0  | 1  | 0  | 1  | 3         |
| 0  | 1  | 1  | 1  | 4         |
| 1  | 0  | 0  | 1  | 5         |
| 1  | 0  | 1  | 1  | 6         |
| 1  | 1  | 0  | 1  | 7         |
| 1  | 1  | 1  | 1  | 8         |

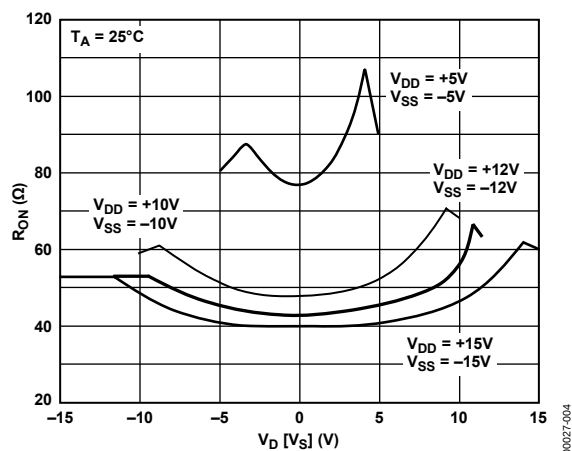
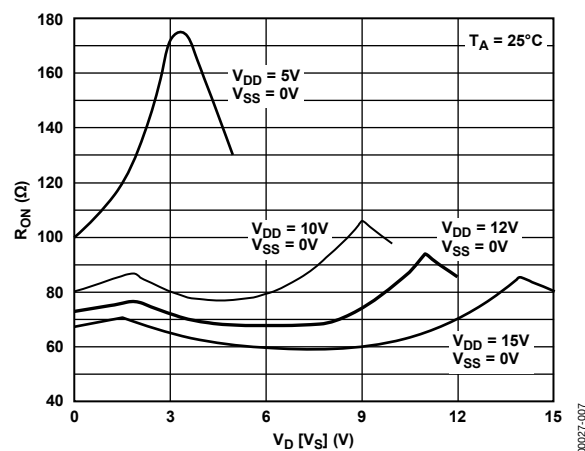
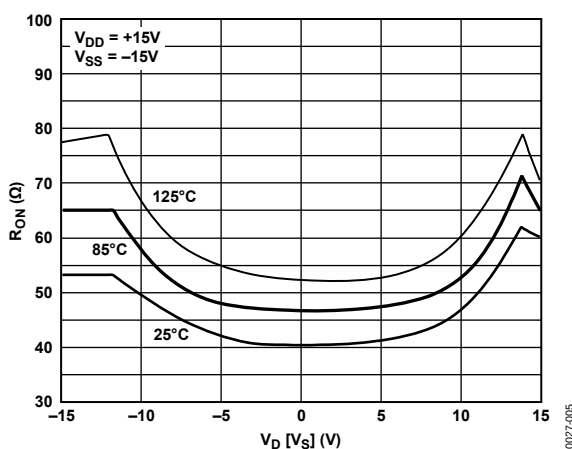
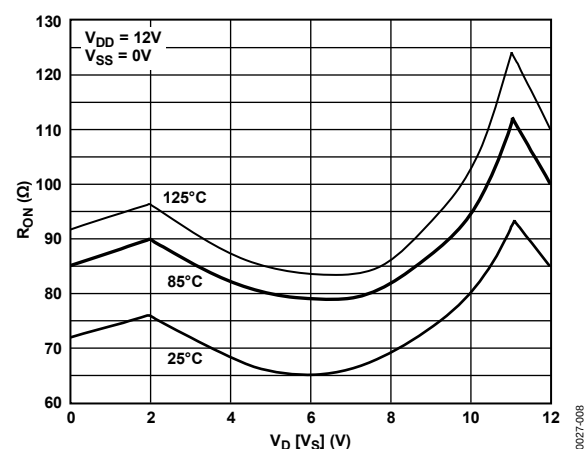
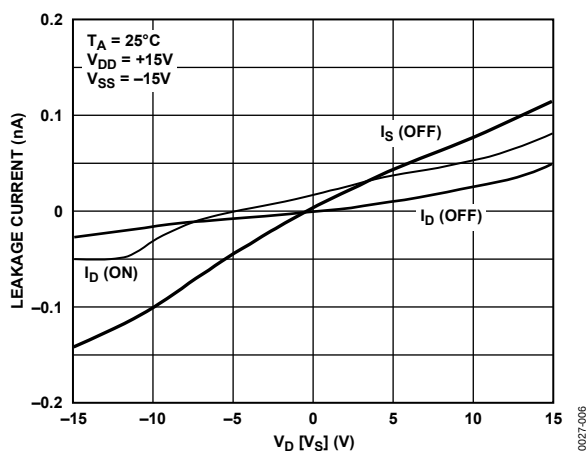
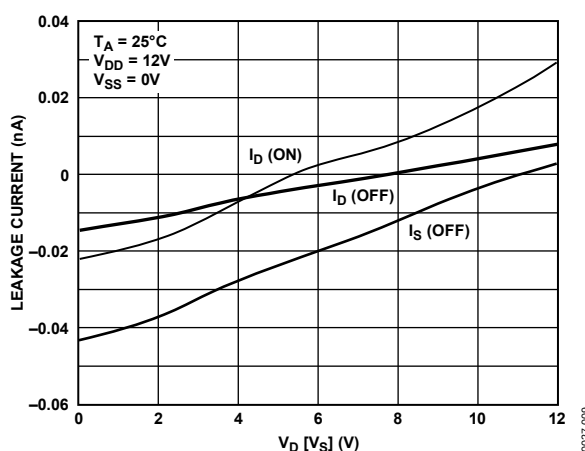
Table 5. ADG409 Pin Function Descriptions

| Pin No. | Mnemonic        | Description                                                                                                                             |
|---------|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| 1       | A0              | Logic Control Input.                                                                                                                    |
| 2       | EN              | Active High Digital Input. When low, the device is disabled and all switches are off. When high, Ax logic inputs determine on switches. |
| 3       | V <sub>SS</sub> | Most Negative Power Supply Potential in Dual Supplies. In single-supply applications, it can be connected to ground.                    |
| 4       | S1A             | Source Terminal 1A. Can be an input or an output.                                                                                       |
| 5       | S2A             | Source Terminal 2A. Can be an input or an output.                                                                                       |
| 6       | S3A             | Source Terminal 3A. Can be an input or an output.                                                                                       |
| 7       | S4A             | Source Terminal 4A. Can be an input or an output.                                                                                       |
| 8       | DA              | Drain Terminal A. Can be an input or an output.                                                                                         |
| 9       | DB              | Drain Terminal B. Can be an input or an output.                                                                                         |
| 10      | S4B             | Source Terminal 4B. Can be an input or an output.                                                                                       |
| 11      | S3B             | Source Terminal 3B. Can be an input or an output.                                                                                       |
| 12      | S2B             | Source Terminal 2B. Can be an input or an output.                                                                                       |
| 13      | S1B             | Source Terminal 1B. Can be an input or an output.                                                                                       |
| 14      | V <sub>DD</sub> | Most Positive Power Supply Potential.                                                                                                   |
| 15      | GND             | Ground (0 V) Reference.                                                                                                                 |
| 16      | A1              | Logic Control Input.                                                                                                                    |

Table 7. ADG409 Truth Table

| A1 | A0 | EN | On Switch Pair |
|----|----|----|----------------|
| X  | X  | 0  | None           |
| 0  | 0  | 1  | 1              |
| 0  | 1  | 1  | 2              |
| 1  | 0  | 1  | 3              |
| 1  | 1  | 1  | 4              |

## TYPICAL PERFORMANCE CHARACTERISTICS

Figure 4.  $R_{ON}$  as a Function of  $V_D$  ( $V_S$ ): Dual-Supply VoltageFigure 7.  $R_{ON}$  as a Function of  $V_D$  ( $V_S$ ): Single-Supply VoltageFigure 5.  $R_{ON}$  as a Function of  $V_D$  ( $V_S$ ) for Different TemperaturesFigure 8.  $R_{ON}$  as a Function of  $V_D$  ( $V_S$ ) for Different TemperatureFigure 6. Leakage Currents as a Function of  $V_D$  ( $V_S$ )Figure 9. Leakage Currents as a Function of  $V_D$  ( $V_S$ )

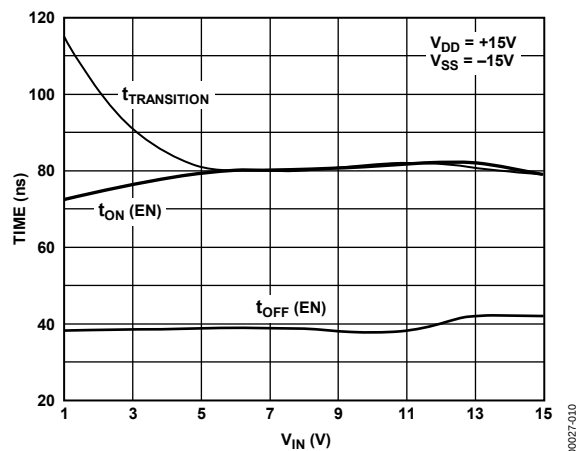
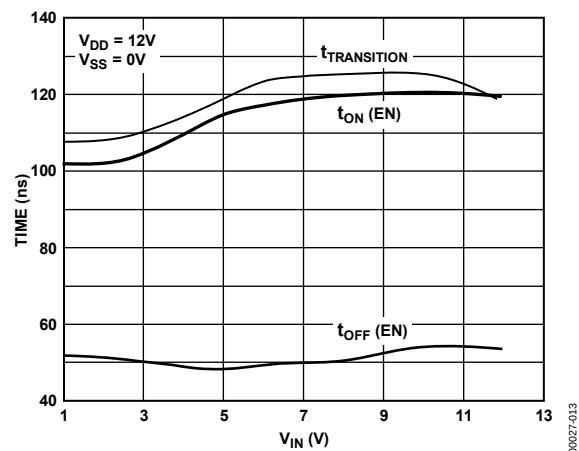
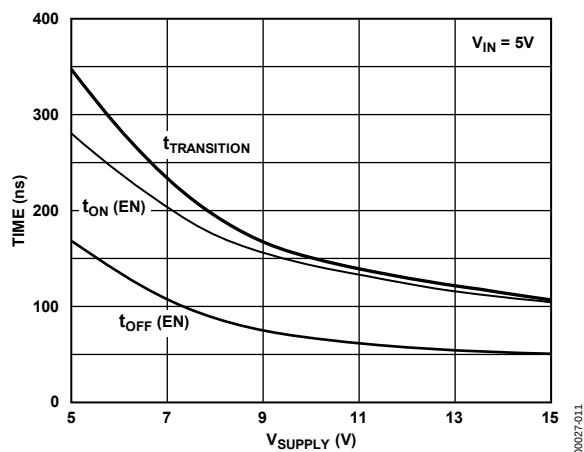
Figure 10. Switching Time vs.  $V_{IN}$  (Bipolar Supply)Figure 13. Switching Time vs.  $V_{IN}$  (Single Supply)

Figure 11. Switching Time vs. Single Supply

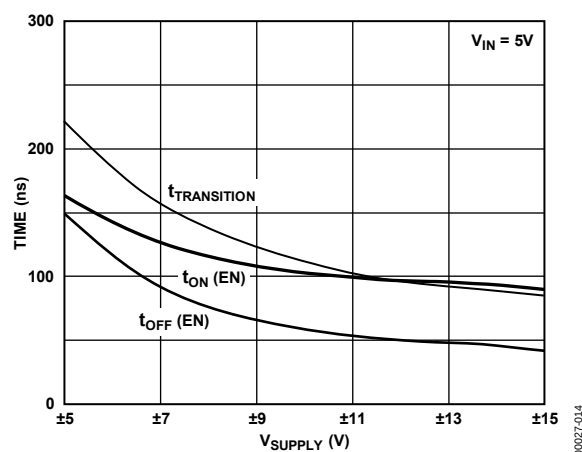


Figure 14. Switching Time vs. Bipolar Supply

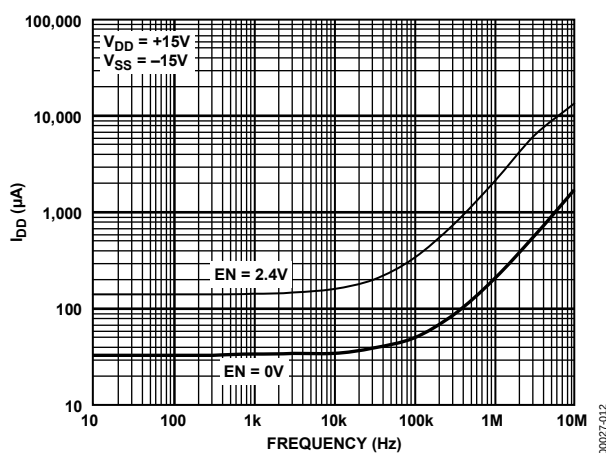


Figure 12. Positive Supply Current vs. Switching Frequency

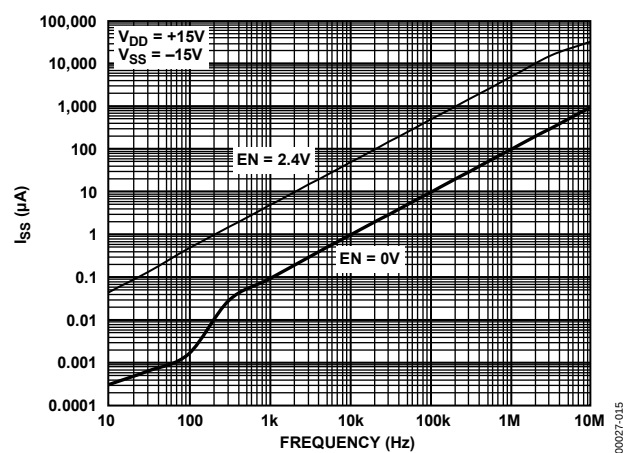


Figure 15. Negative Supply Current vs. Switching Frequency

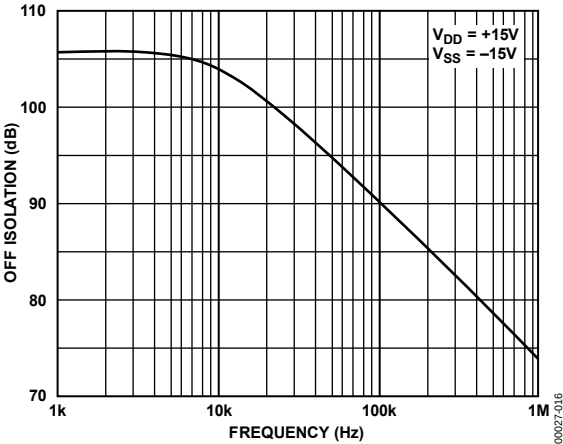


Figure 16. Off Isolation vs. Frequency

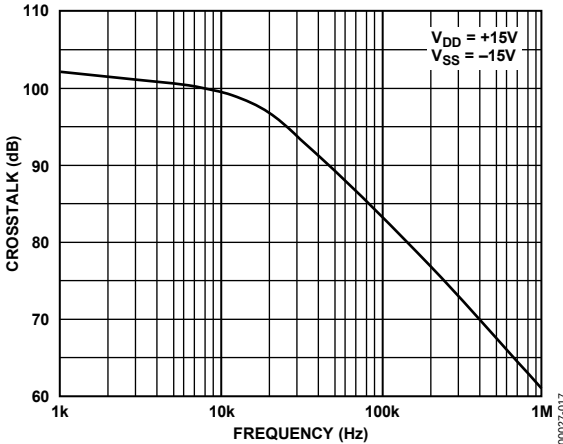


Figure 17. Crosstalk vs. Frequency

## TEST CIRCUITS

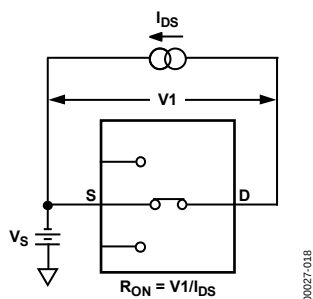
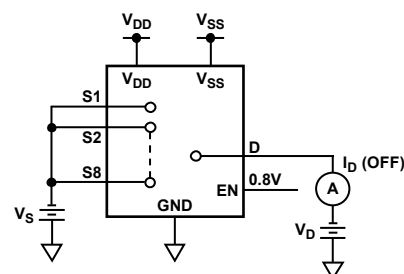
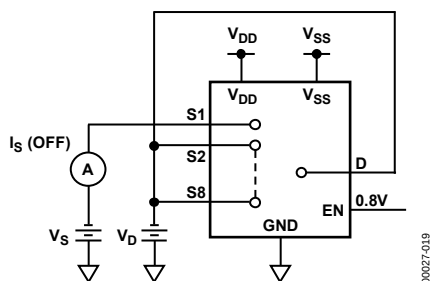
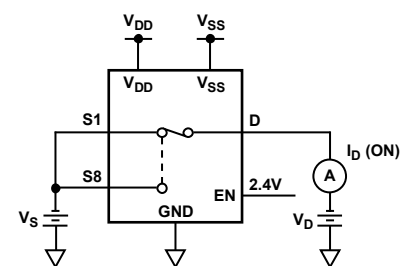
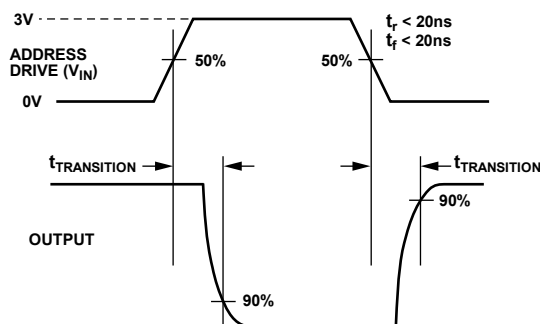
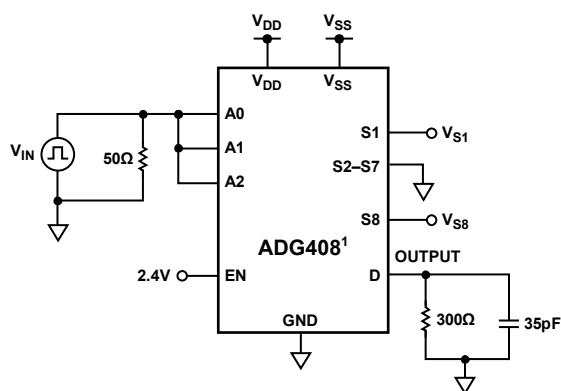
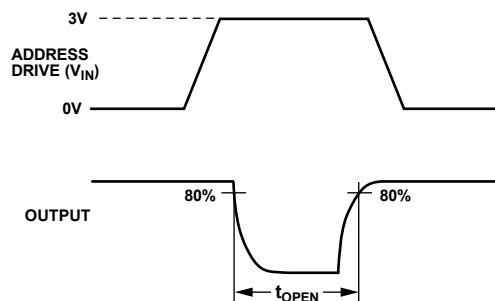
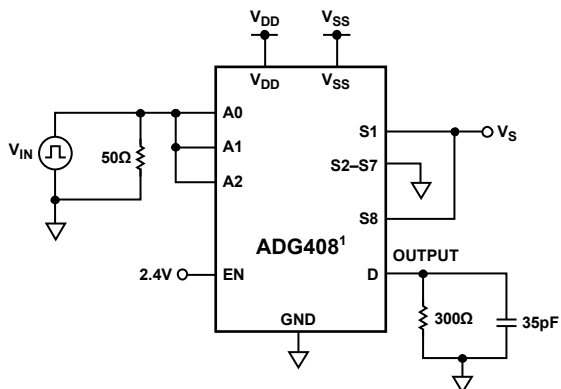
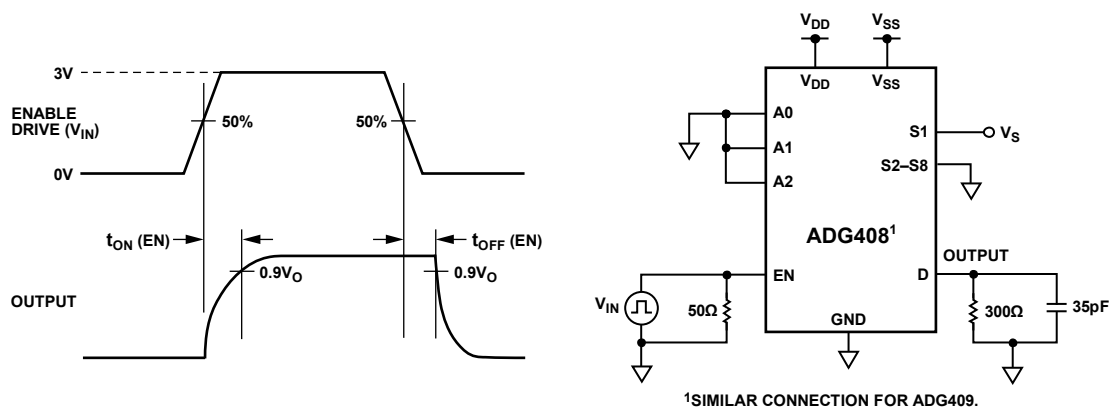
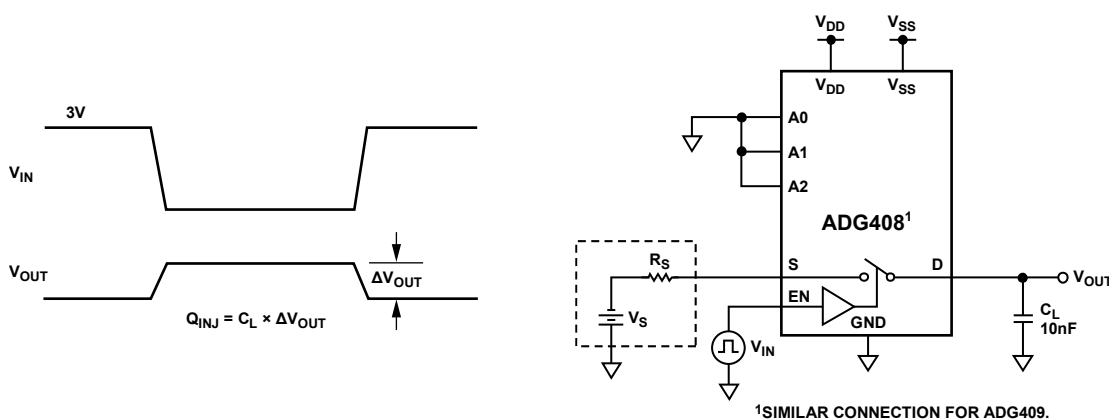


Figure 18. On Resistance

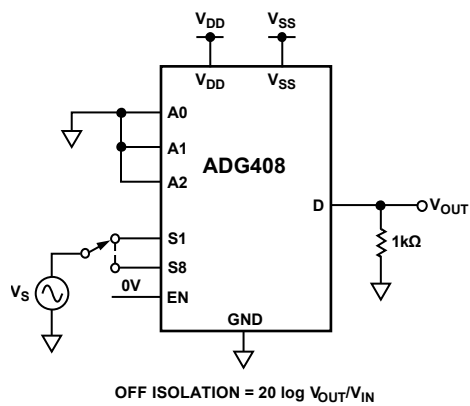
Figure 20.  $I_D$  (Off)Figure 19.  $I_S$  (Off)Figure 21.  $I_D$  (On)Figure 22. Switching Time of Multiplexer,  $t_{\text{TRANSITION}}$ <sup>1</sup>SIMILAR CONNECTION FOR ADG409.Figure 23. Break-Before-Make Delay,  $t_{\text{OPEN}}$ <sup>1</sup>SIMILAR CONNECTION FOR ADG409.



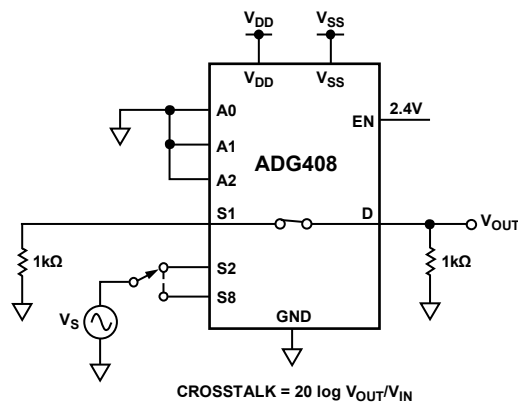
00027-024



00027-025



00027-026



00027-027

## TERMINOLOGY

**R<sub>ON</sub>**

Ohmic resistance between D and S.

**ΔR<sub>ON</sub>**

Difference between the R<sub>ON</sub> of any two channels.

**I<sub>S</sub> (Off)**

Source leakage current when the switch is off.

**I<sub>D</sub> (Off)**

Drain leakage current when the switch is off.

**I<sub>D</sub>, I<sub>S</sub> (On)**

Channel leakage current when the switch is on.

**V<sub>D</sub> (V<sub>S</sub>)**

Analog voltage on Terminal D and Terminal S.

**C<sub>S</sub> (Off)**

Channel input capacitance for off condition.

**C<sub>D</sub> (Off)**

Channel output capacitance for off condition.

**C<sub>D</sub>, C<sub>S</sub> (On)**

On switch capacitance.

**C<sub>IN</sub>**

Digital input capacitance.

**t<sub>ON</sub> (EN)**

Delay time between the 50% and 90% points of the digital input and switch on condition.

**t<sub>OFF</sub> (EN)**

Delay time between the 50% and 90% points of the digital input and switch off condition.

**t<sub>TRANSITION</sub>**

Delay time between the 50% and 90% points of the digital inputs and the switch on condition when switching from one address state to another.

**t<sub>OPEN</sub>**

Off time measured between the 80% point of both switches when switching from one address state to another.

**V<sub>INL</sub>**

Maximum input voltage for Logic 0.

**V<sub>INH</sub>**

Minimum input voltage for Logic 1.

**I<sub>INL</sub> (I<sub>INH</sub>)**

Input current of the digital input.

**Crosstalk**

A measure of unwanted signal that is coupled through from one channel to another as a result of parasitic capacitance.

**Off Isolation**

A measure of unwanted signal coupling through an off channel.

**Charge Injection**

A measure of the glitch impulse transferred from the digital input to the analog output during switching.

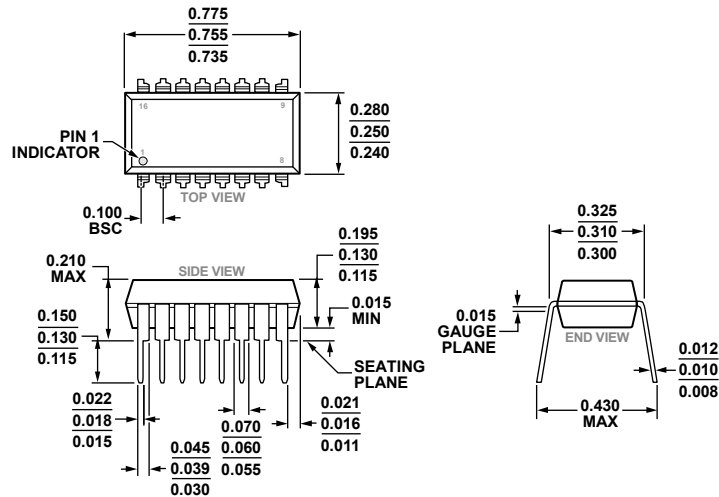
**I<sub>DD</sub>**

Positive supply current.

**I<sub>SS</sub>**

Negative supply current.

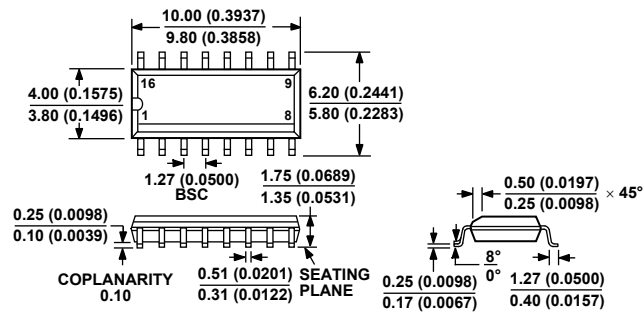
## OUTLINE DIMENSIONS



COMPLIANT TO JEDEC STANDARDS MS-001-BB

Figure 28. 16-Lead Plastic Dual In-Line Package [PDIP]  
Narrow Body  
(N-16)

Dimensions shown in inches and (millimeters)

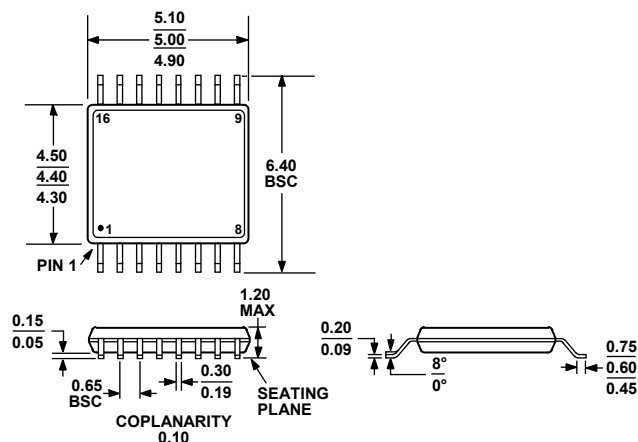


COMPLIANT TO JEDEC STANDARDS MS-012-AC

CONTROLLING DIMENSIONS ARE IN MILLIMETERS; INCH DIMENSIONS  
(IN PARENTHESES) ARE ROUNDED-OFF MILLIMETER EQUIVALENTS FOR  
REFERENCE ONLY AND ARE NOT APPROPRIATE FOR USE IN DESIGN.

Figure 29. 16-Lead Standard Small Outline Package [SOIC\_N]  
Narrow Body  
(R-16)

Dimensions shown in millimeters and (inches)



COMPLIANT TO JEDEC STANDARDS MO-153-AB

Figure 30. 16-Lead Thin Shrink Small Outline Package [TSSOP]  
(RU-16)

Dimensions shown in millimeters

## ORDERING GUIDE

| Model <sup>1</sup> | Temperature Range | Package Description                                | Package Option |
|--------------------|-------------------|----------------------------------------------------|----------------|
| ADG408BN           | −40°C to +85°C    | 16-Lead Plastic Dual In-Line Package [PDIP]        | N-16           |
| ADG408BNZ          | −40°C to +85°C    | 16-Lead Plastic Dual In-Line Package [PDIP]        | N-16           |
| ADG408BR           | −40°C to +85°C    | 16-Lead Narrow Body Small Outline Package [SOIC_N] | R-16           |
| ADG408BR-REEL      | −40°C to +85°C    | 16-Lead Narrow Body Small Outline Package [SOIC_N] | R-16           |
| ADG408BR-REEL7     | −40°C to +85°C    | 16-Lead Narrow Body Small Outline Package [SOIC_N] | R-16           |
| ADG408BRU          | −40°C to +85°C    | 16-Lead Thin Shrink Small Outline Package [TSSOP]  | RU-16          |
| ADG408BRU-REEL     | −40°C to +85°C    | 16-Lead Thin Shrink Small Outline Package [TSSOP]  | RU-16          |
| ADG408BRU-REEL7    | −40°C to +85°C    | 16-Lead Thin Shrink Small Outline Package [TSSOP]  | RU-16          |
| ADG408BRUZ         | −40°C to +85°C    | 16-Lead Thin Shrink Small Outline Package [TSSOP]  | RU-16          |
| ADG408BRUZ-REEL    | −40°C to +85°C    | 16-Lead Thin Shrink Small Outline Package [TSSOP]  | RU-16          |
| ADG408BRUZ-REEL7   | −40°C to +85°C    | 16-Lead Thin Shrink Small Outline Package [TSSOP]  | RU-16          |
| ADG408BRZ          | −40°C to +85°C    | 16-Lead Narrow Body Small Outline Package [SOIC_N] | R-16           |
| ADG408BRZ-REEL     | −40°C to +85°C    | 16-Lead Narrow Body Small Outline Package [SOIC_N] | R-16           |
| ADG408BRZ-REEL7    | −40°C to +85°C    | 16-Lead Narrow Body Small Outline Package [SOIC_N] | R-16           |
| ADG408BCHIPS       |                   | DIE                                                |                |
| ADG409BNZ          | −40°C to +85°C    | 16-Lead Plastic Dual In-Line Package [PDIP]        | N-16           |
| ADG409BR           | −40°C to +85°C    | 16-Lead Narrow Body Small Outline Package [SOIC_N] | R-16           |
| ADG409BR-REEL7     | −40°C to +85°C    | 16-Lead Narrow Body Small Outline Package [SOIC_N] | R-16           |
| ADG409BRUZ         | −40°C to +85°C    | 16-Lead Thin Shrink Small Outline Package [TSSOP]  | RU-16          |
| ADG409BRUZ-REEL7   | −40°C to +85°C    | 16-Lead Thin Shrink Small Outline Package [TSSOP]  | RU-16          |
| ADG409BRZ          | −40°C to +85°C    | 16-Lead Narrow Body Small Outline Package [SOIC_N] | R-16           |
| ADG409BRZ-REEL     | −40°C to +85°C    | 16-Lead Narrow Body Small Outline Package [SOIC_N] | R-16           |
| ADG409BRZ-REEL7    | −40°C to +85°C    | 16-Lead Narrow Body Small Outline Package [SOIC_N] | R-16           |

<sup>1</sup> Z = RoHS Compliant Part