19-1513; Rev 0; 7/99

MAXIM

# 1.25Ω, Dual SPST, CMOS Analog Switches



## General Description

The MAX4680/MAX4690/MAX4700 dual analog switches feature low on-resistance of 1.25Ω max. On-resistance is matched between switches to 0.3Ω max and is flat (0.3Ω max) over the specified signal range. Each switch can handle Rail-to-Rail® analog signals. Off-leakage current is only 5nA max at +85°C. These analog switches are ideal in low-distortion applications and are the preferred solution over mechanical relays in automatic test equipment or applications where current switching is required. They have low power requirements, require less board space, and are more reliable than mechanical relays.

The MAX4680 has two NC (normally closed) switches, and the MAX4690 has two NO (normally open) switches. The MAX4700 has one NC and one NO switch and features guaranteed break-before-make switching.

These devices operate from a +4.5V to +36V single supply or from ±4.5V to ±20V dual supplies. A separate logic supply pin guarantees TTL/CMOS-logic compatibility while operating across the entire supply voltage range.

## Applications

Reed Relay Replacement
Test Equipment
Communication Systems
PBX, PABX Systems
Data Acquisition Systems
Sample-and-Hold Circuits

## Features

- **Low On-Resistance (1.25Ω max)**
- **Guaranteed $R_{ON}$ Match Between Channels (0.3Ω max)**
- **Guaranteed $R_{ON}$ Flatness Over Specified Signal Range (0.3Ω max)**
- **Rail-to-Rail Signal Handling**
- **Guaranteed Break-Before-Make (MAX4700)**
- **+4.5V to +36V Single-Supply Operation ±4.5V to ±20V Dual-Supply Operation**
- **TTL/CMOS-Compatible Control Inputs**
- **>2kV ESD Protection per Method 3015.7**

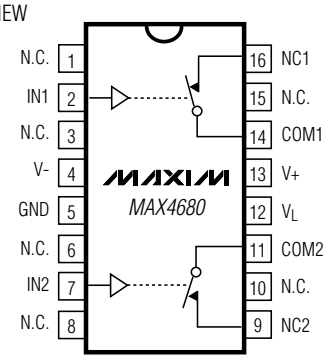
## Ordering Information

| PART | TEMP. RANGE | PIN-PACKAGE |
|---|---|---|
| **MAX4680**CAE | 0°C to +70°C | 16 SSOP |
| MAX4680CWE | 0°C to +70°C | 16 Wide SO |
| MAX4680CPE | 0°C to +70°C | 16 Plastic DIP |
| MAX4680EAE | -40°C to +85°C | 16 SSOP |
| MAX4680EWE | -40°C to +85°C | 16 Wide SO |
| MAX4680EPE | -40°C to +85°C | 16 Plastic DIP |

***Ordering Information continued at end of data sheet.***

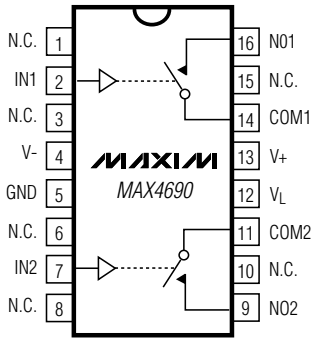
## Pin Configurations/Functional Diagrams/Truth Tables

TOP VIEW



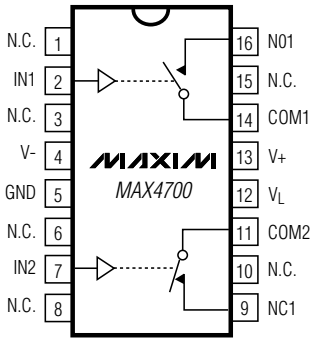

**SSOP/SO/DIP**

| MAX4680 | |
|---|---|
| LOGIC | SWITCH |
| 0 | ON |
| 1 | OFF |




**SSOP/SO/DIP**

| MAX4690 | |
|---|---|
| LOGIC | SWITCH |
| 0 | OFF |
| 1 | ON |




**SSOP/SO/DIP**

| MAX4700 | | |
|---|---|---|
| LOGIC | SWITCH 1 | SWITCH 2 |
| 0 | OFF | ON |
| 1 | ON | OFF |

N.C. = NOT INTERNALLY CONNECTED

SWITCHES SHOWN FOR LOGIC "0" INPUT

*Rail-to-Rail is a registered trademark of Nippon Motorola, Ltd.*

# 1.25Ω, Dual SPST, CMOS Analog Switches

## ABSOLUTE MAXIMUM RATINGS

V+ to GND .....-0.3V to +44V
V- to GND .....+0.3V to -44V
V+ to V- .....-0.3V to +44V
$V_L$ to GND ..... -0.3V to (V+ + 0.3V)
All Other Pins to GND (Note 1) ..... (V- - 0.3V) to (V+ + 0.3V)
Continuous Current (COM_, NO_, NC_) ..... ±200mA
Peak Current (COM_, NO_, NC_)
(pulsed at 1ms, 10% duty cycle) ..... ±300mA

Continuous Power Dissipation ($T_A$ = +70°C)
SSOP (derate 7.1mW/°C above +70°C) .....571mW
Wide SO (derate 9.52mW/°C above +70°C) .....762mW
Plastic DIP (derate 10.53mW/°C above +70°C) .....842mW
Operating Temperature Ranges
MAX4_ _0C_E .....0°C to +70°C
MAX4_ _0E_E .....-40°C to +85°C
Storage Temperature Range ..... -65°C to +150°C
Lead Temperature (soldering, 10sec) .....+300°C

**Note 1:** Signals on NC_, NO_, COM_, or IN_ exceeding V+ or V- are clamped by internal diodes. Limit forward diode current to maximum current rating.

*Stresses beyond those listed under "Absolute Maximum Ratings" 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 in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.*

## ELECTRICAL CHARACTERISTICS—Dual Supplies

(V+ = +15V, V- = -15V, $V_L$ = +5V, $V_{IN\_H}$ = +2.4V, $V_{IN\_L}$ = +0.8V, $T_A$ = $T_{MIN}$ to $T_{MAX}$, unless otherwise noted. Typical values are at $T_A$ = +25°C.) (Note 2)

| PARAMETER | SYMBOL | CONDITIONS | | MIN | TYP | MAX | UNITS |
|---|---|---|---|---|---|---|---|
| **ANALOG SWITCH** | | | | | | | |
| Input Voltage Range (Note 3) | $V_{COM\_}$, $V_{NO\_}$, $V_{NC\_}$ | | | V- | | V+ | V |
| COM_ to NO_ or NC_ On-Resistance | $R_{ON}$ | $I_{COM\_}$ = 10mA, $V_{NO\_}$ or $V_{NC\_}$ = ±10V, | $T_A$ = +25°C | | 0.9 | 1.25 | Ω |
| | | | $T_A$ = $T_{MIN}$ to $T_{MAX}$ | | | 1.5 | |
| COM_ to NO_ or NC_ On-Resistance Match Between Channels (Notes 3, 4) | $\Delta R_{ON}$ | $I_{COM\_}$ = 10mA, $V_{NO\_}$ or $V_{NC\_}$ = ±10V | $T_A$ = +25°C | | 0.09 | 0.3 | Ω |
| | | | $T_A$ = $T_{MIN}$ to $T_{MAX}$ | | | 0.5 | |
| COM_ to NO_ or NC_ On-Resistance Flatness (Notes 3, 5) | $R_{FLAT(ON)}$ | $I_{COM\_}$ = 10mA; $V_{NO\_}$ or $V_{NC\_}$ = -5V, 0, 5V | $T_A$ = +25°C | | 0.06 | 0.3 | Ω |
| | | | $T_A$ = $T_{MIN}$ to $T_{MAX}$ | | | 0.5 | |
| Off-Leakage Current (NO_ or NC_) (Note 6) | $I_{NO\_}$, $I_{NC\_}$ | $V_{COM\_}$ = ±10V, $V_{NO\_}$ or $V_{NC\_}$ = ∓10V | $T_A$ = +25°C | -0.5 | 0.01 | 0.5 | nA |
| | | | $T_A$ = $T_{MIN}$ to $T_{MAX}$ | -5 | | 5 | |
| COM_ Off-Leakage Current (Note 6) | $I_{COM\_(OFF)}$ | $V_{COM\_}$ = ±10V, $V_{NO\_}$ or $V_{NC\_}$ = ∓10V | $T_A$ = +25°C | -0.5 | 0.01 | 0.5 | nA |
| | | | $T_A$ = $T_{MIN}$ to $T_{MAX}$ | -2.5 | | 2.5 | |
| COM_ On-Leakage Current (Note 6) | $I_{COM\_(ON)}$ | $V_{COM\_}$ = ±10V, $V_{NO\_}$ or $V_{NC\_}$ = ±10V or floating | $T_A$ = +25°C | -1 | 0.01 | 1 | nA |
| | | | $T_A$ = $T_{MIN}$ to $T_{MAX}$ | -20 | | 20 | |
| **LOGIC INPUT** | | | | | | | |
| Input Current with Input Voltage High | $I_{IN\_H}$ | IN_ = 2.4V, all others = 0.8V | | -0.5 | 0.001 | 0.5 | µA |
| Input Current with Input Voltage Low | $I_{IN\_L}$ | IN_ = 0.8V, all others = 2.4V | | -0.5 | 0.001 | 0.5 | |

## ELECTRICAL CHARACTERISTICS—Dual Supplies (continued)

(V+ = +15V, V- = -15V, $V_L$ = +5V, $V_{IN\_H}$ = +2.4V, $V_{IN\_L}$ = +0.8V, $T_A$ = $T_{MIN}$ to $T_{MAX}$, unless otherwise noted. Typical values are at $T_A$ = +25°C.) (Note 2)

| PARAMETER | SYMBOL | CONDITIONS | | MIN | TYP | MAX | UNITS |
|---|---|---|---|---|---|---|---|
| Logic Input Voltage High | $V_{IN\_H}$ | | | 2.4 | | | V |
| Logic Input Voltage Low | $V_{IN\_L}$ | | | | | 0.8 | V |
| **POWER SUPPLY** | | | | | | | |
| Power-Supply Range | | | | ±4.5 | | ±20.0 | V |
| Positive Supply Current | I+ | $V_{IN\_}$ = 0 or 5V | $T_A$ = +25°C | -0.5 | 0.01 | 0.5 | µA |
| | | | $T_A$ = $T_{MIN}$ to $T_{MAX}$ | -5 | | 5 | |
| Negative Supply Current | I- | $V_{IN\_}$ = 0 or 5V | $T_A$ = +25°C | -0.5 | 0.01 | 0.5 | µA |
| | | | $T_A$ = $T_{MIN}$ to $T_{MAX}$ | -5 | | 5 | |
| Logic Supply Current | $I_L$ | $V_{IN\_}$ = 0 or 5V | $T_A$ = +25°C | -0.5 | 0.01 | 0.5 | µA |
| | | | $T_A$ = $T_{MIN}$ to $T_{MAX}$ | -5 | | 5 | |
| Ground Current | $I_{GND}$ | $V_{IN\_}$ = 0 or 5V | $T_A$ = +25°C | -0.5 | 0.01 | 0.5 | µA |
| | | | $T_A$ = $T_{MIN}$ to $T_{MAX}$ | -5 | | 5 | |
| **SWITCH DYNAMIC CHARACTERISTICS** | | | | | | | |
| Turn-On Time | $t_{ON}$ | $V_{COM\_}$ = ±10V, Figure 2 | $T_A$ = +25°C | | 130 | 275 | ns |
| | | | $T_A$ = $T_{MIN}$ to $T_{MAX}$ | | | 400 | |
| Turn-Off Time | $t_{OFF}$ | $V_{COM\_}$ = ±10V, Figure 2 | $T_A$ = +25°C | | 90 | 175 | ns |
| | | | $T_A$ = $T_{MIN}$ to $T_{MAX}$ | | | 300 | |
| Break-Before-Make Time (MAX4700 only) | $t_{OPEN}$ | $V_{COM\_}$ = ±10V, Figure 3, $T_A$ = +25°C | | 5 | 30 | | ns |
| Charge Injection | Q | $C_L$ = 1.0nF, $V_{GEN}$ = 0, $R_{GEN}$ = 0, Figure 4 | | | 550 | | pC |
| Off-Isolation (Note 7) | $V_{ISO}$ | $R_L$ = 50Ω, $C_L$ = 5pF, f = 1MHz, Figure 5 | | | -53 | | dB |
| Crosstalk (Note 8) | $V_{CT}$ | $R_L$ = 50Ω, $C_L$ = 5pF, f = 1MHz, Figure 6 | | | -65 | | dB |
| NC_ or NO_ Capacitance | $C_{OFF}$ | f = 1MHz, Figure 7 | | | 115 | | pF |
| COM Off-Capacitance | $C_{COM}$ | f = 1MHz, Figure 7 | | | 115 | | pF |
| On-Capacitance | $C_{COM}$ | f = 1MHz, Figure 8 | | | 520 | | pF |

# 1.25Ω, Dual SPST, CMOS Analog Switches

## ELECTRICAL CHARACTERISTICS–Single Supply

(V+ = +12V, V- = 0, $V_L$ = +5V, $V_{INH}$ = 2.4V, $V_{INL}$ = 0.8V, $T_A$ = $T_{MIN}$ to $T_{MAX}$, unless otherwise noted. Typical values are at $T_A$ = +25°C.) (Note 2)

| PARAMETER | SYMBOL | CONDITIONS | | MIN | TYP | MAX | UNITS |
|---|---|---|---|---|---|---|---|
| **ANALOG SWITCH** | | | | | | | |
| Input Voltage Range (Note 3) | $V_{COM\_}$, $V_{NO\_}$, $V_{NC\_}$ | | | GND | | V+ | V |
| COM_ to NO_ or NC_ On-Resistance | $R_{ON}$ | $I_{COM\_}$ = 10mA, $V_{NO\_}$ or $V_{NC\_}$ = 10V | $T_A$ = +25°C | | 1.6 | 3 | Ω |
| | | | $T_A$ = $T_{MIN}$ to $T_{MAX}$ | | | 3.5 | |
| COM_ to NO_ or NC_ On-Resistance Match Between Channels (Notes 3, 4) | $\Delta R_{ON}$ | $I_{COM\_}$ = 10mA, $V_{NO\_}$ or $V_{NC\_}$ = 10V | $T_A$ = +25°C | | 0.1 | 0.4 | Ω |
| | | | $T_A$ = $T_{MIN}$ to $T_{MAX}$ | | | 0.5 | |
| COM_ to NO_ or NC_ On-Resistance Flatness (Notes 3, 5) | $R_{FLAT(ON)}$ | $I_{COM\_}$ = 10mA; $V_{NO\_}$ or $V_{NC\_}$ = 3V, 6V, 9V | $T_A$ = +25°C | | 0.2 | 0.4 | Ω |
| | | | $T_A$ = $T_{MIN}$ to $T_{MAX}$ | | | 0.5 | |
| Off-Leakage Current (NO_ or NC_) (Notes 6, 9) | $I_{NO\_}$, $I_{NC\_}$ | $V_{COM\_}$ = 1V, 10V; $V_{NO\_}$ or $V_{NC\_}$ = 10V, 1V | $T_A$ = +25°C | -0.5 | 0.01 | 0.5 | nA |
| | | | $T_A$ = $T_{MIN}$ to $T_{MAX}$ | -5 | | 5 | |
| COM_ Off-Leakage Current (Notes 6, 9) | $I_{COM\_(OFF)}$ | $V_{NO\_}$ or $V_{NC\_}$ = 10V, 1V; $V_{COM\_}$ = 1V, 10V | $T_A$ = +25°C | -0.5 | 0.01 | 0.5 | nA |
| | | | $T_A$ = $T_{MIN}$ to $T_{MAX}$ | -5 | | 5 | |
| COM_ On-Leakage Current (Notes 6, 9) | $I_{COM\_(ON)}$ | $V_{COM\_}$ = 1V, 10V; $V_{NO\_}$ or $V_{NC\_}$ = 1V, 10V, or floating | $T_A$ = +25°C | -1 | 0.02 | 1 | nA |
| | | | $T_A$ = $T_{MIN}$ to $T_{MAX}$ | -20 | | 20 | |
| **LOGIC INPUT** | | | | | | | |
| Input Current with Input Voltage High | $I_{IN\_H}$ | IN_ = 2.4V, all others = 0.8V | | -0.5 | 0.001 | 0.5 | µA |
| Input Current with Input Voltage Low | $I_{IN\_L}$ | IN_ = 0.8V, all others = 2.4V | | -0.5 | 0.001 | 0.5 | µA |
| Logic Input Voltage High | $V_{IN\_H}$ | | | 2.4 | | | V |
| Logic Input Voltage Low | $V_{IN\_L}$ | | | | | 0.8 | V |
| **POWER SUPPLY** | | | | | | | |
| Power-Supply Range | | | | +4.5 | | +36.0 | V |
| Positive Supply Current | I+ | $V_{IN\_}$ = 0 or 5V | $T_A$ = +25°C | -0.5 | 0.001 | 0.5 | µA |
| | | | $T_A$ = $T_{MIN}$ to $T_{MAX}$ | 5 | | 5 | |
| Logic Supply Current | $I_L$ | $V_{IN\_}$ = 0 or 5V | $T_A$ = +25°C | -0.5 | 0.001 | 0.5 | µA |
| | | | $T_A$ = $T_{MIN}$ to $T_{MAX}$ | 5 | | 5 | |
| Ground Current | $I_{GND}$ | $V_{IN\_}$ = 0 or 5V | $T_A$ = +25°C | -0.5 | 0.001 | 0.5 | µA |
| | | | $T_A$ = $T_{MIN}$ to $T_{MAX}$ | 5 | | 5 | |

## ELECTRICAL CHARACTERISTICS—Single Supply (continued)

(V+ = +12V, V- = 0, $V_L$ = +5V, $V_{IN\_H}$ = 2.4V, $V_{IN\_L}$ = 0.8V, $T_A$ = $T_{MIN}$ to $T_{MAX}$, unless otherwise noted. Typical values are at $T_A$ = +25°C.) (Note 2)

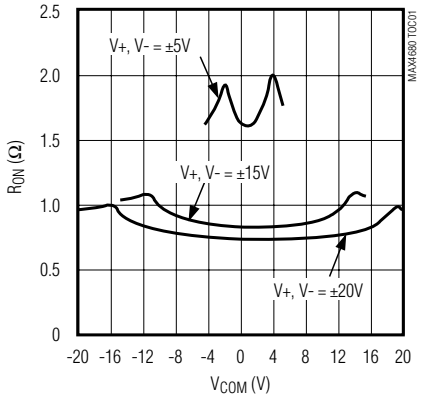
| PARAMETER | SYMBOL | CONDITIONS | | MIN | TYP | MAX | UNITS |
|---|---|---|---|---|---|---|---|
| **SWITCH DYNAMIC CHARACTERISTICS** | | | | | | | |
| Turn-On Time (Note 3) | $t_{ON}$ | $V_{COM\_}$ = 10V, Figure 2 | $T_A$ = +25°C | | 225 | 400 | ns |
| | | | $T_A$ = $T_{MIN}$ to $T_{MAX}$ | | | 500 | |
| Turn-Off Time (Note 3) | $t_{OFF}$ | $V_{COM\_}$ = 10V, Figure 2 | $T_A$ = +25°C | | 100 | 250 | ns |
| | | | $T_A$ = $T_{MIN}$ to $T_{MAX}$ | | | 350 | |
| Break-Before-Make Time (Note 3) | $t_{OPEN}$ | $V_{COM\_}$ = 10V, Figure 3, $T_A$ = +25°C | | 5 | 125 | | ns |
| Charge Injection | Q | $C_L$ = 1.0nF, $V_{GEN}$ = 0, $R_{GEN}$ = 0, Figure 4 | | | -60 | | pC |
| Crosstalk (Note 8) | $V_{CT}$ | $R_L$ = 50Ω, $C_L$ = 5pF, f = 1MHz, Figure 6 | | | -65 | | dB |
| NC_ or NO_ Capacitance | $C_{OFF}$ | f = 1MHz, Figure 7 | | | 175 | | pF |
| COM Off-Capacitance | $C_{COM}$ | f = 1MHz, Figure 7 | | | 175 | | pF |
| On-Capacitance | $C_{COM}$ | f = 1MHz, Figure 8 | | | 275 | | pF |

**Note 2:** The algebraic convention, where the most negative value is a minimum and the most positive value a maximum, is used in this data sheet.
**Note 3:** Guaranteed by design.
**Note 4:** $\Delta R_{ON} = R_{ON(MAX)} - R_{ON(MIN)}$.
**Note 5:** Flatness is defined as the difference between the maximum and minimum value of on-resistance as measured over the specified analog signal range.
**Note 6:** Leakage parameters are 100% tested at maximum-rated hot temperature and guaranteed by correlation at +25°C.
**Note 7:** Off-isolation = $20\log_{10}$ [$V_{COM}$ / ($V_{NC}$ or $V_{NO}$)], $V_{COM}$ = output, $V_{NC}$ or $V_{NO}$ = input to off switch.
**Note 8:** Between any two switches.
**Note 9:** Leakage testing at single supply is guaranteed by testing with dual supplies.

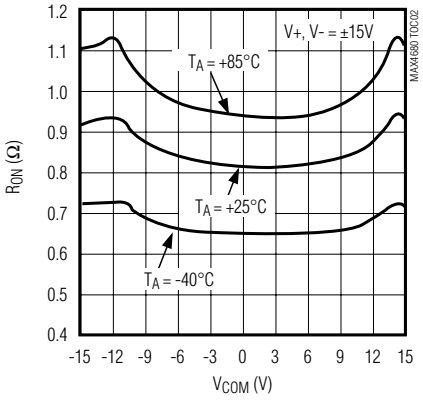
## Typical Operating Characteristics

($T_A$ = +25°C, unless otherwise noted.)

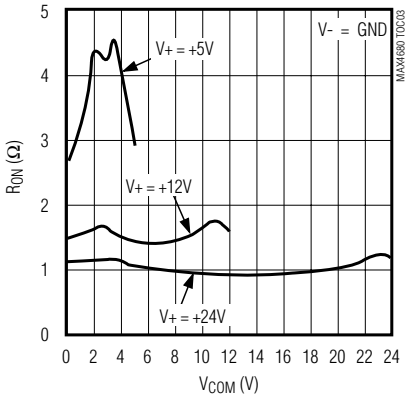
**ON-RESISTANCE vs. $V_{COM}$ (DUAL SUPPLIES)**




**ON-RESISTANCE vs. $V_{COM}$ AND TEMPERATURE (DUAL SUPPLIES)**




**ON-RESISTANCE vs. $V_{COM}$ (SINGLE SUPPLY)**

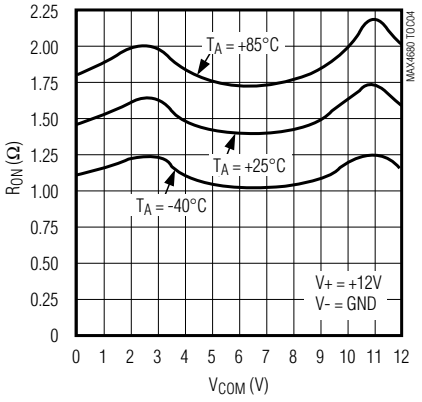


# 1.25Ω, Dual SPST, CMOS Analog Switches

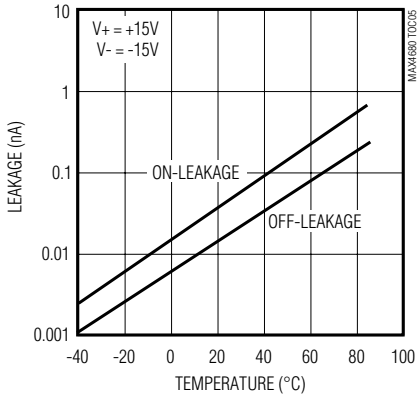
## Typical Operating Characteristics (continued)

($T_A$ = +25°C, unless otherwise noted.)

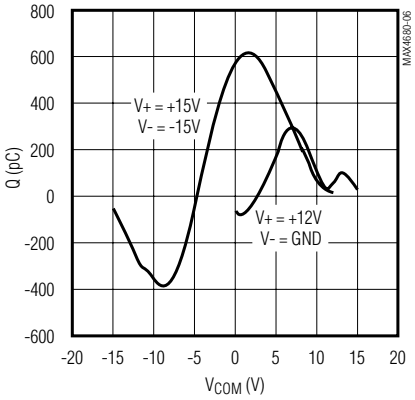
**ON-RESISTANCE vs. $V_{COM}$ AND TEMPERATURE (SINGLE SUPPLY)**



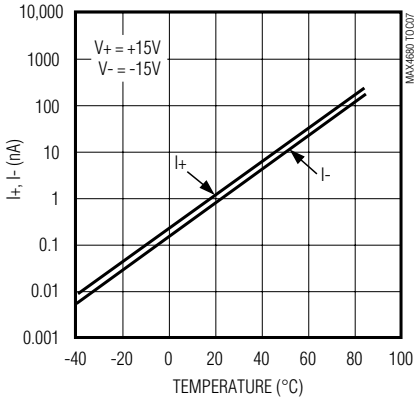

**ON/OFF-LEAKAGE vs. TEMPERATURE**



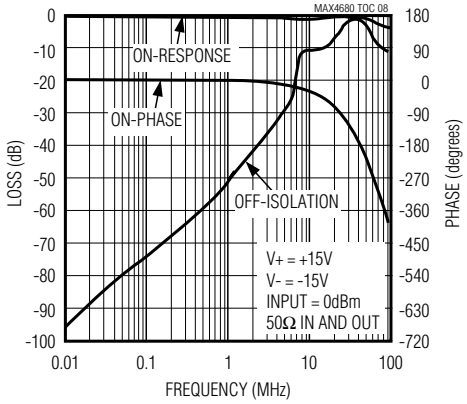

**CHARGE INJECTION vs. $V_{COM}$**




**POWER-SUPPLY CURRENT vs. TEMPERATURE**




**FREQUENCY RESPONSE**



## Pin Description

| PIN | | | NAME | FUNCTION |
|---|---|---|---|---|
| MAX4680 | MAX4690 | MAX4700 | | |
| 1, 3, 6, 8, 10, 15 | 1, 3, 6, 8, 10, 15 | 1, 3, 6, 8, 10, 15 | N.C. | No connection. Not internally connected. Connect to GND or low-impedance point to improve on/off-isolation. |
| 2, 7 | 2, 7 | 2, 7 | IN1, IN2 | Logic-Control Digital Inputs |
| 4 | 4 | 4 | V- | Negative Analog Supply Voltage Input. Connect to GND for single-supply operation. |
| 5 | 5 | 5 | GND | Ground |
| 9, 16 | – | – | NC2, NC1 | Analog Switch Normally Closed Terminals |
| 11, 14 | 11, 14 | 11, 14 | COM2, COM1 | Analog Switch Common Terminals |
| 12 | 12 | 12 | $V_L$ | Logic Supply Input |
| 13 | 13 | 13 | V+ | Positive Analog Supply Input |
| – | 9, 16 | – | NO2, NO1 | Analog Switch Normally Open Terminals |
| – | – | 9 | NC1 | Analog Switch Normally Closed Terminal |
| – | – | 16 | NO1 | Analog Switch Normally Open Terminal |

# 1.25Ω, Dual SPST, CMOS Analog Switches

## Applications Information

### Overvoltage Protection

Proper power-supply sequencing is recommended for all CMOS devices. Do not exceed the absolute maximum ratings because stresses beyond the listed ratings can cause permanent damage to the devices. Always sequence V+ on first, then V-, followed by the logic inputs, NO, or COM. If power-supply sequencing is not possible, add two small signal diodes (D1, D2) in series with the supply pins and a Schottky diode between V+ and $V_L$ for overvoltage protection (Figure 1). Adding diodes reduces the analog signal range to one diode drop below V+ and one diode drop above V-, but does not affect the devices' low switch resistance and low-leakage characteristics. Device operation is unchanged, and the difference between V+ and V- should not exceed 44V.

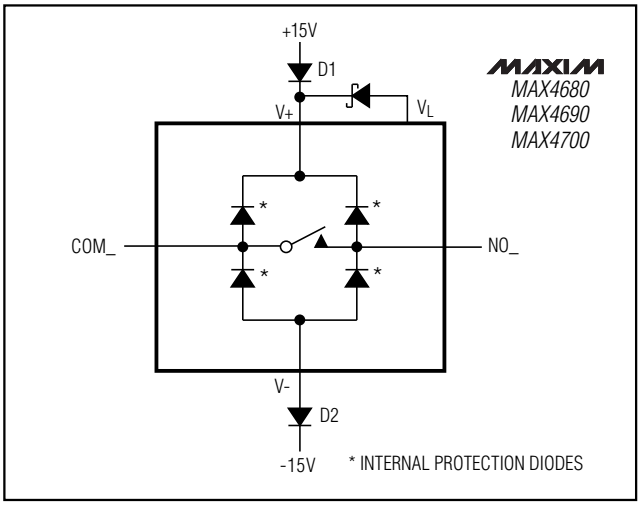



*Figure 1. Overvoltage Protection Using External Blocking Diodes*

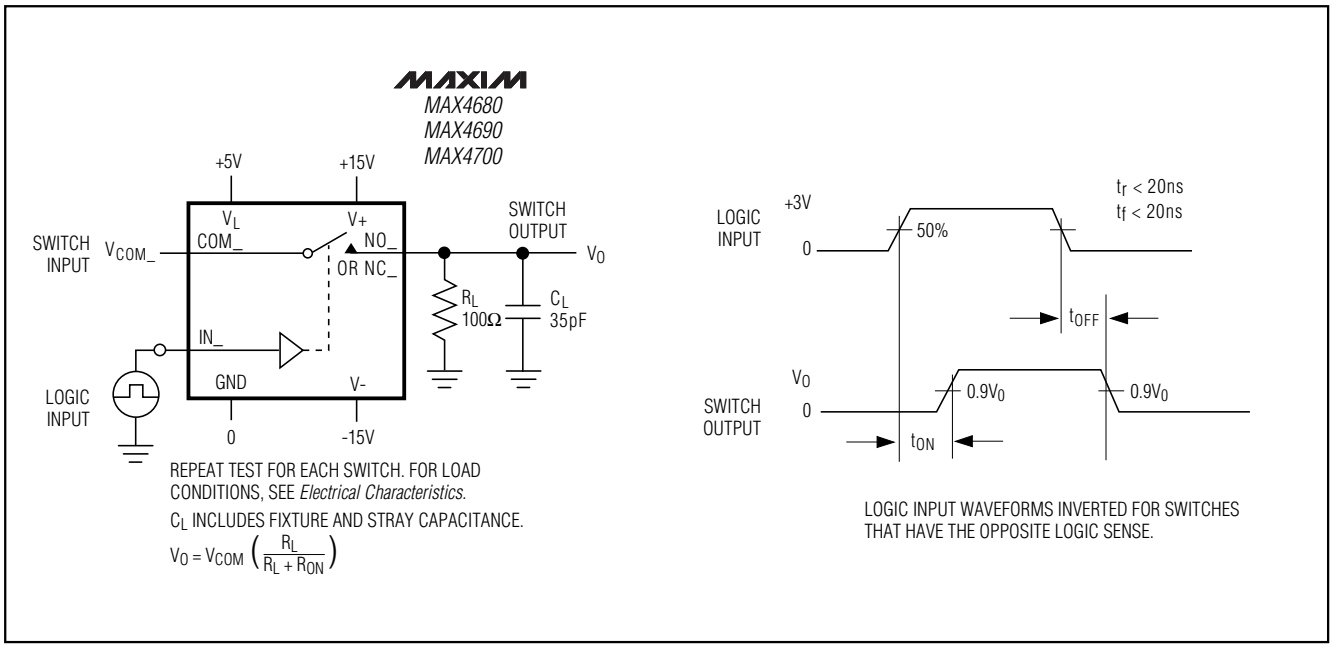



*Figure 2. Switching-Time Test Circuit*

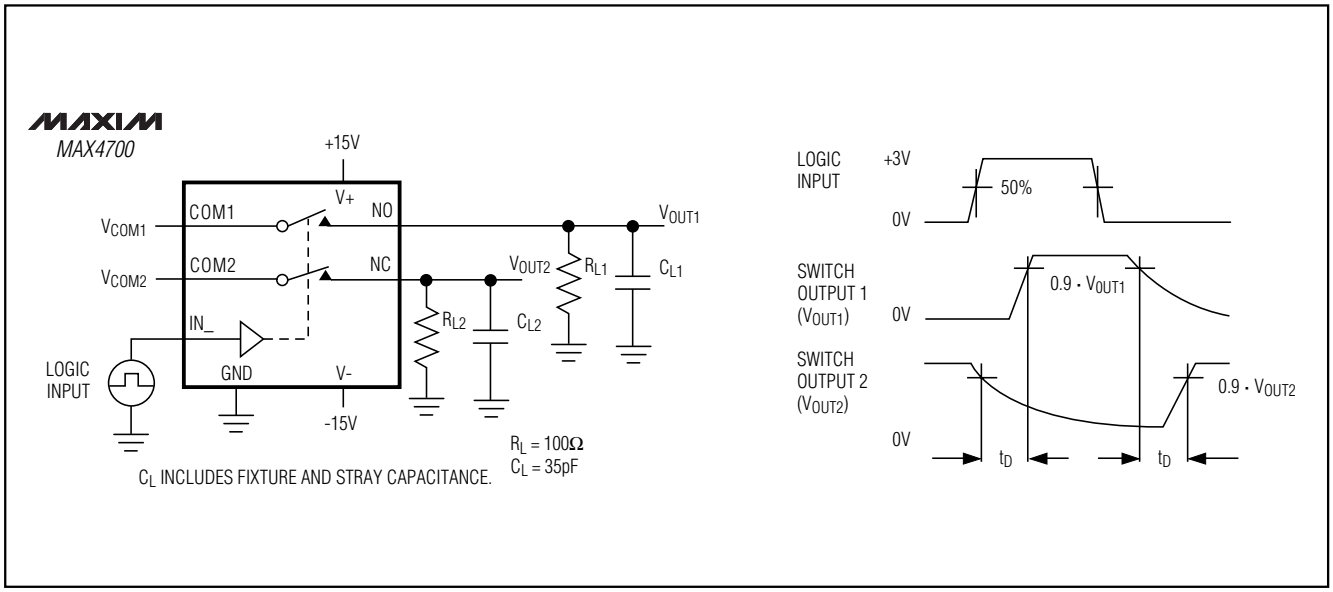



*Figure 3. Break-Before-Make Interval (MAX4700 only)*

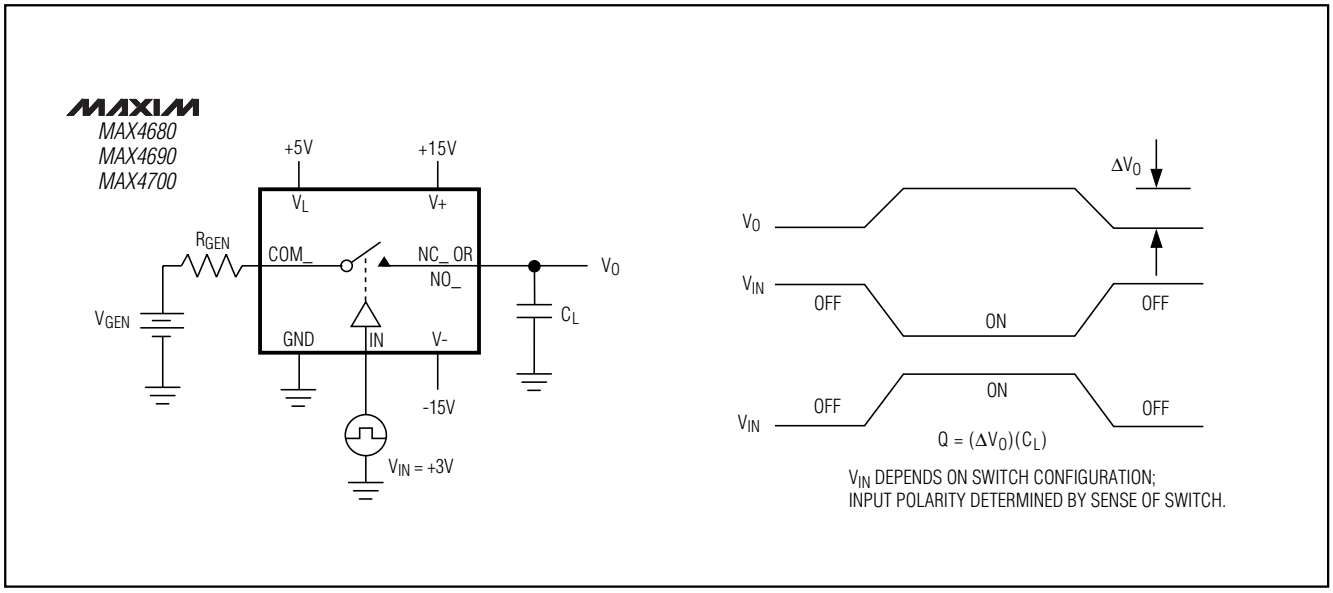



*Figure 4. Charge-Injection Test Circuit*

# 1.25Ω, Dual SPST, CMOS Analog Switches

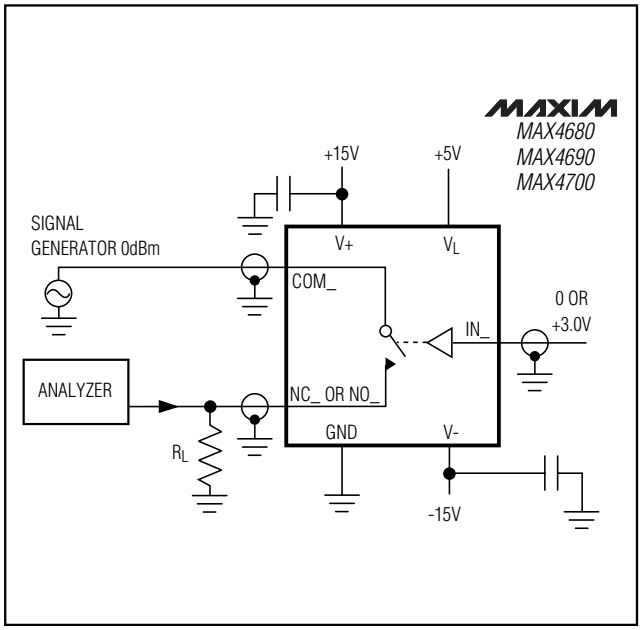



Figure 5. Off-Isolation Test Circuit

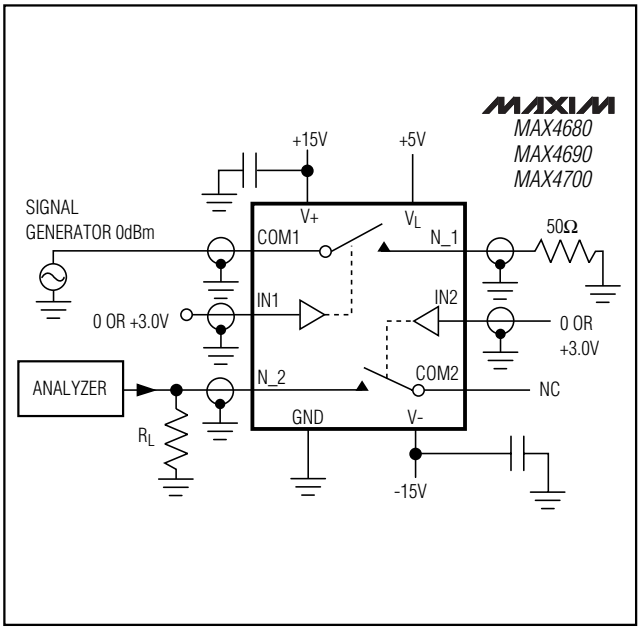



Figure 6. Crosstalk Test Circuit

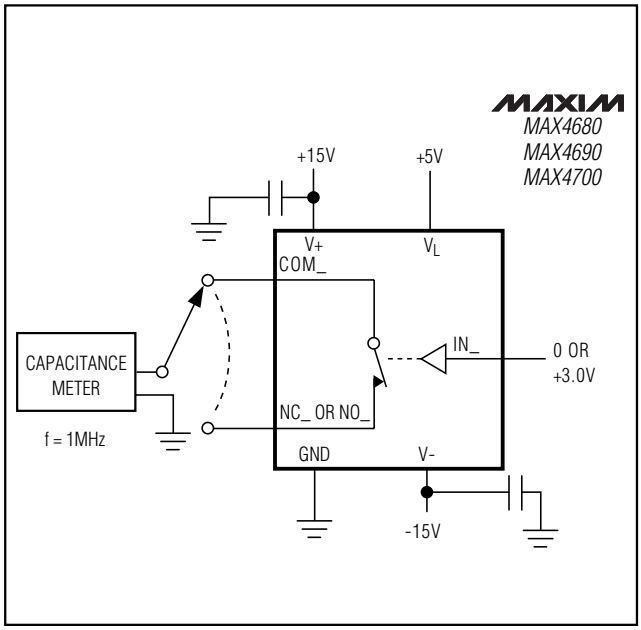



Figure 7. Switch Off-Capacitance Test Circuit

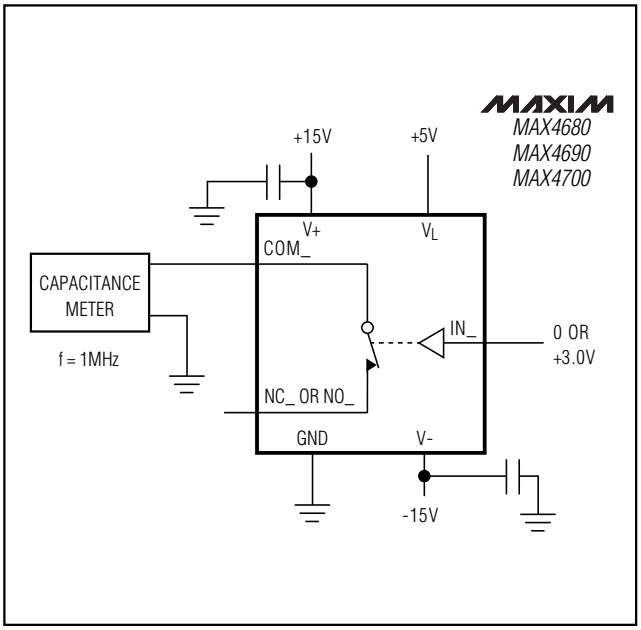



Figure 8. Switch On-Capacitance Test Circuit

## Ordering Information (continued)

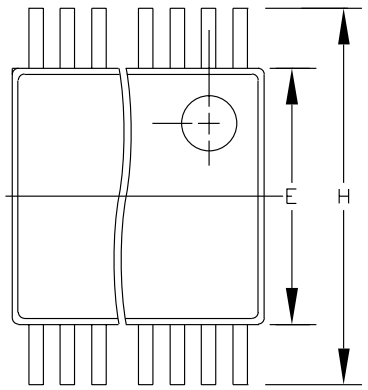
| PART | TEMP. RANGE | PIN-PACKAGE |
|---|---|---|
| **MAX4690**CAE | 0°C to +70°C | 16 SSOP |
| MAX4690CWE | 0°C to +70°C | 16 Wide SO |
| MAX4690CPE | 0°C to +70°C | 16 Plastic DIP |
| MAX4690EAE | -40°C to +85°C | 16 SSOP |
| MAX4690EWE | -40°C to +85°C | 16 Wide SO |
| MAX4690EPE | -40°C to +85°C | 16 Plastic DIP |
| **MAX4700**CAE | 0°C to +70°C | 16 SSOP |
| MAX4700CWE | 0°C to +70°C | 16 Wide SO |
| MAX4700CPE | 0°C to +70°C | 16 Plastic DIP |
| MAX4700EAE | -40°C to +85°C | 16 SSOP |
| MAX4700EWE | -40°C to +85°C | 16 Wide SO |
| MAX4700EPE | -40°C to +85°C | 16 Plastic DIP |

## Chip Information

TRANSISTOR COUNT: 108

## Package Information

SSOP.EPS




| DIM | INCHES MIN | INCHES MAX | MILLIMETERS MIN | MILLIMETERS MAX |
|---|---|---|---|---|
| A | 0.068 | 0.078 | 1.73 | 1.99 |
| A1 | 0.002 | 0.008 | 0.05 | 0.21 |
| B | 0.010 | 0.015 | 0.25 | 0.38 |
| C | 0.004 | 0.008 | 0.09 | 0.20 |
| D | SEE VARIATIONS | | | |
| E | 0.205 | 0.209 | 5.20 | 5.38 |
| e | 0.0256 BSC | | 0.65 BSC | |
| H | 0.301 | 0.311 | 7.65 | 7.90 |
| L | 0.025 | 0.037 | 0.63 | 0.95 |
| α | 0° | 8° | 0° | 8° |

| | INCHES MIN | INCHES MAX | MILLIMETERS MIN | MILLIMETERS MAX | |
|---|---|---|---|---|---|
| D | 0.239 | 0.249 | 6.07 | 6.33 | 14L |
| D | 0.239 | 0.249 | 6.07 | 6.33 | 16L |
| D | 0.278 | 0.289 | 7.07 | 7.33 | 20L |
| D | 0.317 | 0.328 | 8.07 | 8.33 | 24L |
| D | 0.397 | 0.407 | 10.07 | 10.33 | 28L |

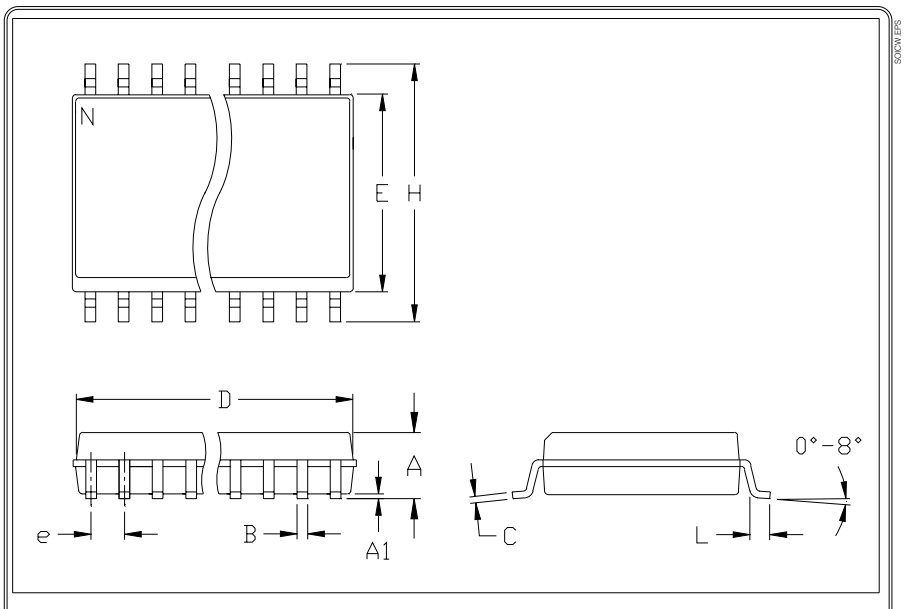
NOTES:
1. D&E DO NOT INCLUDE MOLD FLASH.
2. MOLD FLASH OR PROTRUSIONS NOT TO EXCEED .15mm (.006")
3. CONTROLLING DIMENSION: MILLIMETER

MAXIM
PROPRIETARY INFORMATION
TITLE:
PACKAGE OUTLINE, SSOP, 5.3X.65mm

| APPROVAL | DOCUMENT CONTROL NO. | REV | |
|---|---|---|---|
| | 21-0056 | A | 1/1 |

# 1.25Ω, Dual SPST, CMOS Analog Switches

## Package Information (continued)




| | INCHES | | MILLIMETERS | |
|---|---|---|---|---|
| | MIN | MAX | MIN | MAX |
| A | 0.093 | 0.104 | 2.35 | 2.65 |
| A1 | 0.004 | 0.012 | 0.10 | 0.30 |
| B | 0.014 | 0.019 | 0.35 | 0.49 |
| C | 0.009 | 0.013 | 0.23 | 0.32 |
| e | 0.050 | | 1.27 | |
| E | 0.291 | 0.299 | 7.40 | 7.60 |
| H | 0.394 | 0.419 | 10.00 | 10.65 |
| h | 0.010 | 0.030 | 0.25 | 0.75 |
| L | 0.016 | 0.050 | 0.40 | 1.27 |

| | INCHES | | MILLIMETERS | | | |
|---|---|---|---|---|---|---|
| | MIN | MAX | MIN | MAX | N | MS013 |
| D | 0.398 | 0.413 | 10.10 | 10.50 | 16 | AA |
| D | 0.447 | 0.463 | 11.35 | 11.75 | 18 | AB |
| D | 0.496 | 0.512 | 12.60 | 13.00 | 20 | AC |
| D | 0.598 | 0.614 | 15.20 | 15.60 | 24 | AD |
| D | 0.697 | 0.713 | 17.70 | 18.10 | 28 | AE |

NOTES:
1. D&E DO NOT INCLUDE MOLD FLASH
2. MOLD FLASH OR PROTRUSIONS NOT TO EXCEED .15mm (.006")
3. LEADS TO BE COPLANAR WITHIN .102mm (.004")
4. CONTROLLING DIMENSION: MILLIMETER
5. MEETS JEDEC MS013-XX AS SHOWN IN ABOVE TABLE
6. N = NUMBER OF PINS

MAXIM 120 SAN GABRIEL DR SUNNYVALE CA 94086 FAX (408) 737 7194 PROPRIETARY INFORMATION | PACKAGE FAMILY OUTLINE: SOIC .300" TITLE | 1/1 | 21-0042 A DOCUMENT CONTROL NUMBER REV

Общество с ограниченной ответственностью «МосЧип» ИНН 7719860671 / КПП 771901001
Адрес: 105318, г.Москва, ул.Щербаковская д.3, офис 1107

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