

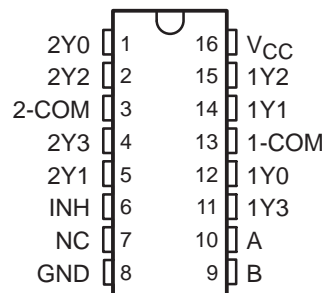
SN74HC4852

DUAL 4-TO-1 CHANNEL ANALOG MULTIPLEXER/DEMULTIPLEXER WITH INJECTION-CURRENT EFFECT CONTROL

SCLS573 – MARCH 2004

- Injection Current Cross-Coupling <math><1\text{mV}/\text{mA}</math> (see Figure 1)
- Low Crosstalk Between Switches
- Pin Compatible with SN74HC4052, SN74LV4052A, and CD4052B
- 2-V to 6-V V_{CC} Operation
- Latch-Up Performance Exceeds 100 mA Per JESD 78, Class II
- ESD Protection Exceeds JESD 22
 - 2000-V Human-Body Model (A114-A)
 - 200-V Machine Model (A115-A)
 - 1000-V Charged-Device Model (C101)

D, DGV, N, OR PW PACKAGE
(TOP VIEW)



NC – No internal connection

description/ordering information

This dual 4-to-1 CMOS analog multiplexer/demultiplexer is pin compatible with the 4052 function and also features injection-current effect control. This feature has excellent value in automotive applications where voltages in excess of normal supply voltages are common.

The injection-current effect control allows signals at disabled analog input channels to exceed the supply voltage 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.

ORDERING INFORMATION

T_A	PACKAGE†		ORDERABLE PART NUMBER	TOP-SIDE MARKING
–40°C to 125°C	PDIP – N	Tube	SN74HC4852N	SN74HC4852N
	SOIC – D	Tube	SN74HC4852D	HC4852
		Tape and reel	SN74HC4852DR	
	TSSOP – PW	Tube	SN74HC4852PW	HC4852
		Tape and reel	SN74HC4852PWR	
	TVSOP – DGV	Tape and reel	SN74HC4852DGV	HC4852

† Package drawings, standard packing quantities, thermal data, symbolization, and PCB design guidelines are available at www.ti.com/sc/package.

FUNCTION TABLE

INPUTS			ON CHANNEL
INH	B	A	
L	L	L	1Y0, 2Y0
L	L	H	1Y1, 2Y1
L	H	L	1Y2, 2Y2
L	H	H	1Y3, 2Y3
H	X	X	None



Please be aware that an important notice concerning availability, standard warranty, and use in critical applications of Texas Instruments semiconductor products and disclaimers thereto appears at the end of this data sheet.

PRODUCTION DATA information is current as of publication date. Products conform to specifications per the terms of Texas Instruments standard warranty. Production processing does not necessarily include testing of all parameters.



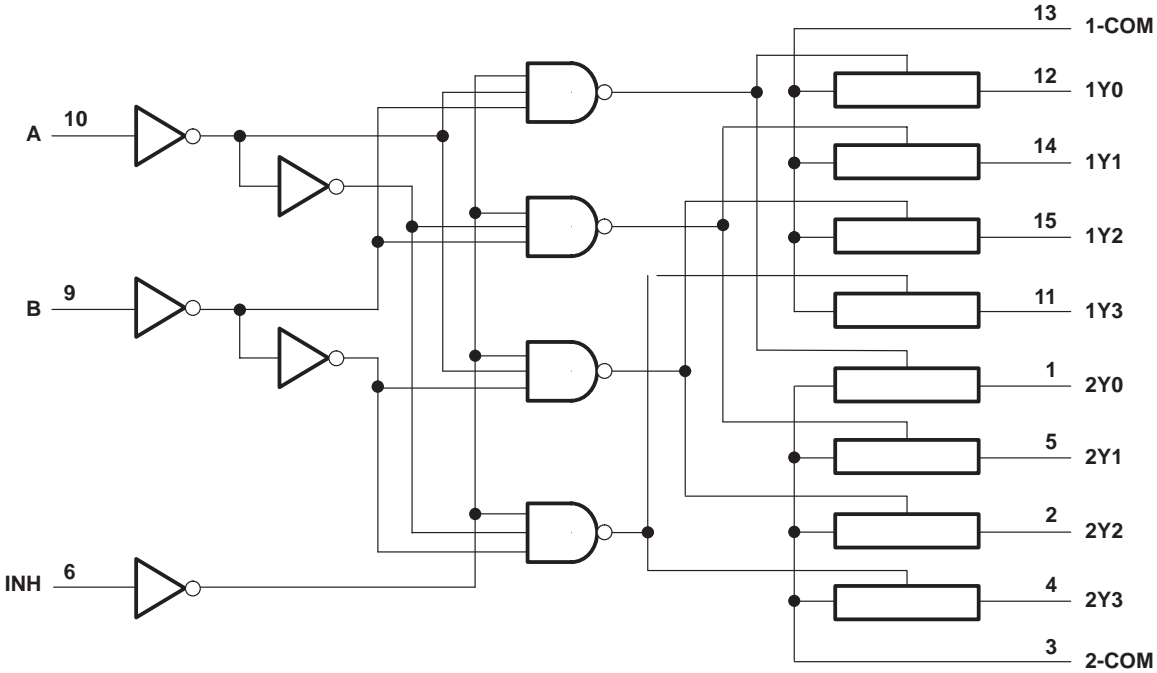
POST OFFICE BOX 655303 • DALLAS, TEXAS 75265

Copyright © 2004, Texas Instruments Incorporated

SN74HC4852
DUAL 4-TO-1 CHANNEL ANALOG MULTIPLEXER/DEMULTIPLEXER
WITH INJECTION-CURRENT EFFECT CONTROL

SCLS573 – MARCH 2004

logic diagram (positive logic)



absolute maximum ratings over operating free-air temperature range (unless otherwise noted)†

Supply voltage range, V_{CC}	-0.5 V to 7.0 V
Input voltage range, V_I (see Note 1)	-0.5 V to $V_{CC} + 0.5$ V
Switch I/O voltage range, V_{IO} (see Notes 1 and 2)	-0.5 V to $V_{CC} + 0.5$ V
Input clamp current, I_{IK} ($V_I < 0$ or $V_I > V_{CC}$)	± 20 mA
I/O diode current, I_{IOK} ($V_{IO} < 0$ or $V_{IO} > V_{CC}$)	± 20 mA
Switch through current, I_S ($V_{IO} = 0$ to V_{CC})	± 25 mA
Continuous current through V_{CC} or GND	± 50 mA
Package thermal impedance, θ_{JA} (see Note 3):	
D package	73°C/W
DGV package	120°C/W
N package	67°C/W
PW package	108°C/W
Storage temperature range, T_{stg}	-65°C to 150°C

† 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 under "recommended operating conditions" is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

- NOTES:
1. The input and output voltage ratings may be exceeded if the input and output current ratings are observed.
 2. This value is limited to 5.5 V maximum.
 3. The package thermal impedance is calculated in accordance with JESD 51-7.



SN74HC4852
DUAL 4-TO-1 CHANNEL ANALOG MULTIPLEXER/DEMULTIPLEXER
WITH INJECTION-CURRENT EFFECT CONTROL

SCLS573 – MARCH 2004

recommended operating conditions (see Note 4)

		MIN	MAX	UNIT
V _{CC}	Supply voltage	2	6	V
V _{IH}	High-level input voltage, control inputs	V _{CC} = 2 V	1.5	V
		V _{CC} = 3 V	2.1	
		V _{CC} = 3.3 V	2.3	
		V _{CC} = 4.5 V	3.15	
		V _{CC} = 6 V	4.2	
V _{IL}	Low-level input voltage, control inputs	V _{CC} = 2 V	0.5	V
		V _{CC} = 3 V	0.9	
		V _{CC} = 3.3 V	1	
		V _{CC} = 4.5 V	1.35	
		V _{CC} = 6 V	1.8	
V _I	Control input voltage	0	V _{CC}	V
V _{IO}	Input/output voltage	0	V _{CC}	V
Δt/Δv	Input transition rise or fall rate	V _{CC} = 2 V	1000	ns
		V _{CC} = 3 V	800	
		V _{CC} = 3.3 V	700	
		V _{CC} = 4.5 V	500	
		V _{CC} = 6 V	400	
T _A	Operating free-air temperature	-40	125	°C

NOTE 4: All unused control inputs of the device must be held at V_{CC} or GND to ensure proper device operation. Refer to the TI application report, *Implications of Slow or Floating CMOS Inputs*, literature number SCBA004.

SN74HC4852

DUAL 4-TO-1 CHANNEL ANALOG MULTIPLEXER/DEMULTIPLEXER WITH INJECTION-CURRENT EFFECT CONTROL

SCLS573 – MARCH 2004

electrical characteristics over recommended operating free-air temperature range (unless otherwise noted)

PARAMETER	TEST CONDITIONS	V _{CC}	T _A = 25°C			-40 TO 85°C		-40 TO 125°C		UNIT	
			MIN	TYP	MAX	MIN	MAX	MIN	MAX		
r _{on} On-state switch resistance	I _S ≤ 2 mA V _I = V _{CC} to GND, V _{INH} = V _{IL} (see Figure 5)	2. V		500	650		670		700	Ω	
		3 V		215	280		320		360		
		3.3 V		210	270		305		345		
		4.5 V		160	210		240		270		
		6 V		150	195		220		250		
Δr _{on} Difference in on-state resistance between switches	I _S ≤ 2 mA V _I = V _{CC} /2 V _{INH} = V _{IL}	2. V		4	18		22		24	Ω	
		3 V		2	12		14		16		
		3.3 V		2	12		14		16		
		4.5 V		2	8		12		16		
		6 V		3	9		13		18		
I _I Control input current	V _I = V _{CC} or GND	6 V			±0.1		±0.1		±1	μA	
I _{S(off)} Off-state switch leakage current (any one channel)	V _I = V _{CC} or GND V _{INH} = V _{IH} (see Figure 6)	6 V			±0.1		±0.5		±1	μA	
	V _I = V _{CC} or GND V _{INH} = V _{IH} (see Figure 7)				±0.2		±2		±4		
I _{S(on)} On-state switch leakage current	V _I = V _{CC} or GND, V _{INH} = V _{IL} (see Figure 8)	6 V			±0.1		±0.5		±1	μA	
I _{CC} Supply current	V _I = V _{CC} or GND	6 V			2		5		10	μA	
C _{IC} Control input capacitance	A, B, INH				3.5	10		10		10	pF
C _{IS} Common terminal capacitance	Switch off				22	40		40		40	pF
C _{OS} Switch terminal capacitance	Switch off				6.7	15		15		15	pF

injection-current coupling specifications, T_A = -40°C to 125°C (see Figure 1)

PARAMETER	V _{CC}	TEST CONDITIONS	TYP†	MAX	UNIT
V _{Δout} Maximum shift of output voltage of enabled analog channel	3.3 V	I _I ‡ ≤ 1 mA, R _S ≤ 3.9 kΩ	0.05	1	mV
	5 V		0.1	1	
	3.3 V	I _I ‡ ≤ 10 mA, R _S ≤ 3.9 kΩ	0.345	5	
	5 V		0.067	5	
	3.3 V	I _I ‡ ≤ 1 mA, R _S ≤ 20 kΩ	0.05	2	
	5 V		0.11	2	
	3.3 V	I _I ‡ ≤ 10 mA, R _S ≤ 20 kΩ	0.05	20	
	5 V		0.024	20	

† Typical values are measured at T_A = 25°C.

‡ I_I = total current injected into all disabled channels.



SN74HC4852

**DUAL 4-TO-1 CHANNEL ANALOG MULTIPLEXER/DEMULTIPLEXER
WITH INJECTION-CURRENT EFFECT CONTROL**

SCLS573 – MARCH 2004

switching characteristics over recommended operating free-air temperature range,
V_{CC} = 2 V, C_L = 50 pF (unless otherwise noted) (see Figures 9–14)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	T _A = 25°C			–40 TO 85°C		–40 TO 125°C		UNIT	
			MIN	TYP	MAX	MIN	MAX	MIN	MAX		
t _{PLH} t _{PHL}	Propagation delay time	COM or Y _n	Y _n or COM	14.5	19.5	33	12	34	11	35	ns
t _{PLH} t _{PHL}	Propagation delay time	Channel Select	COM or Y _n	19.6	24.5	38	15.4	40	13.8	42	ns
t _{PZH} t _{PZL}	Enable delay time	INH	COM or Y _n	19.4	23.6	47.5	15.8	52.5	14.5	57.5	ns
t _{PHZ} t _{PLZ}	Disable delay time	INH	COM or Y _n	39.5	48.4	100	39.3	105	39	115	ns

switching characteristics over recommended operating free-air temperature range,
V_{CC} = 3 V, C_L = 50 pF (unless otherwise noted) (see Figures 9–14)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	T _A = 25°C			–40 TO 85°C		–40 TO 125°C		UNIT	
			MIN	TYP	MAX	MIN	MAX	MIN	MAX		
t _{PLH} t _{PHL}	Propagation delay time	COM or Y _n	Y _n or COM	8.6	12	16.5	6.5	18	5.8	19.5	ns
t _{PLH} t _{PHL}	Propagation delay time	Channel Select	COM or Y _n	12.4	14.6	20	9.3	21.5	8.2	23	ns
t _{PZH} t _{PZL}	Enable delay time	INH	COM or Y _n	12.1	13.8	45	9.2	50	8.5	55	ns
t _{PHZ} t _{PLZ}	Disable delay time	INH	COM or Y _n	35.2	44.5	90	35.5	100	35	110	ns

switching characteristics over recommended operating free-air temperature range,
V_{CC} = 3.3 V, C_L = 50 pF (unless otherwise noted) (see Figures 9–14)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	T _A = 25°C			–40 TO 85°C		–40 TO 125°C		UNIT	
			MIN	TYP	MAX	MIN	MAX	MIN	MAX		
t _{PLH} t _{PHL}	Propagation delay time	COM or Y _n	Y _n or COM	7.9	11	15	5.8	16.5	5	18.5	ns
t _{PLH} t _{PHL}	Propagation delay time	Channel Select	COM or Y _n	11.4	13.5	17.5	8.5	19	7.5	22	ns
t _{PZH} t _{PZL}	Enable delay time	INH	COM or Y _n	11.2	12.7	42.5	8.4	47.5	7.4	52.5	ns
t _{PHZ} t _{PLZ}	Disable delay time	INH	COM or Y _n	34.6	43.9	85	34.6	95	34.5	105	ns



SN74HC4852

DUAL 4-TO-1 CHANNEL ANALOG MULTIPLEXER/DEMULTIPLEXER WITH INJECTION-CURRENT EFFECT CONTROL

SCLS573 – MARCH 2004

switching characteristics over recommended operating free-air temperature range, $V_{CC} = 4.5\text{ V}$, $C_L = 50\text{ pF}$ (unless otherwise noted) (see Figures 9–14)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	$T_A = 25^\circ\text{C}$			$-40\text{ TO }85^\circ\text{C}$		$-40\text{ TO }125^\circ\text{C}$		UNIT	
			MIN	TYP	MAX	MIN	MAX	MIN	MAX		
t _{PLH} t _{PHL}	Propagation delay time	COM or Y _n	Y _n or COM	6.3	8.6	11.6	4.6	12.5	4.5	13.5	ns
t _{PLH} t _{PHL}	Propagation delay time	Channel Select	COM or Y _n	9.3	11	14	6.5	15	5.6	17	ns
t _{PZH} t _{PZL}	Enable delay time	INH	COM or Y _n	8	9.9	40	5.3	45	4.4	50	ns
t _{PHZ} t _{PLZ}	Disable delay time	INH	COM or Y _n	28.5	41.4	80	28.2	90	28	100	ns

switching characteristics over recommended operating free-air temperature range, $V_{CC} = 6\text{ V}$, $C_L = 50\text{ pF}$ (unless otherwise noted) (see Figures 9–14)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	$T_A = 25^\circ\text{C}$			$-40\text{ TO }85^\circ\text{C}$		$-40\text{ TO }125^\circ\text{C}$		UNIT	
			MIN	TYP	MAX	MIN	MAX	MIN	MAX		
t _{PLH} t _{PHL}	Propagation delay time	COM or Y _n	Y _n or COM	5.5	8	10.2	4.1	11	3.6	12	ns
t _{PLH} t _{PHL}	Propagation delay time	Channel Select	COM or Y _n	7.4	9.5	12.6	4.7	14.5	3.8	16.5	ns
t _{PZH} t _{PZL}	Enable delay time	INH	COM or Y _n	6.8	8.4	39	4.8	40	3.8	40	ns
t _{PHZ} t _{PLZ}	Disable delay time	INH	COM or Y _n	14.4	38	78	13.5	80	13	80	ns

operating characteristics, $T_A = 25^\circ\text{C}$ (see Figure 15)

PARAMETER	V_{CC}	TEST CONDITIONS	TYP	UNIT
C _{pd} Power dissipation capacitance	3.3 V	No load	48	pF
	5 V		60	

APPLICATION INFORMATION

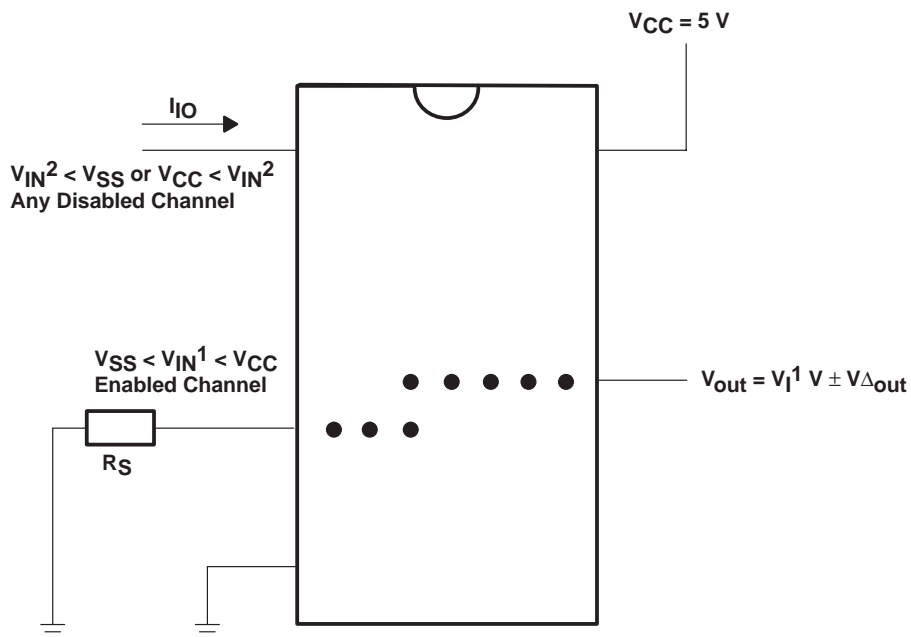


Figure 1. Injection-Current Coupling Specification

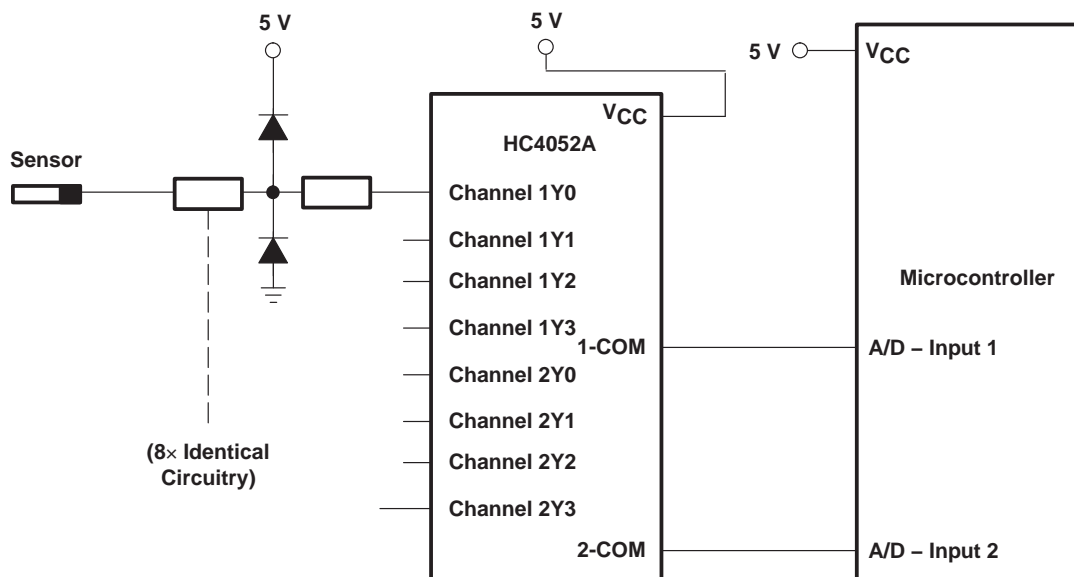


Figure 2. Actual Technology Requires 32 Passive Components and One Extra 6-V Regulator to Suppress Injection Current Into a Standard HC4052 Multiplexer

SN74HC4852
DUAL 4-TO-1 CHANNEL ANALOG MULTIPLEXER/DEMULTIPLEXER
WITH INJECTION-CURRENT EFFECT CONTROL

SCLS573 – MARCH 2004

APPLICATION INFORMATION

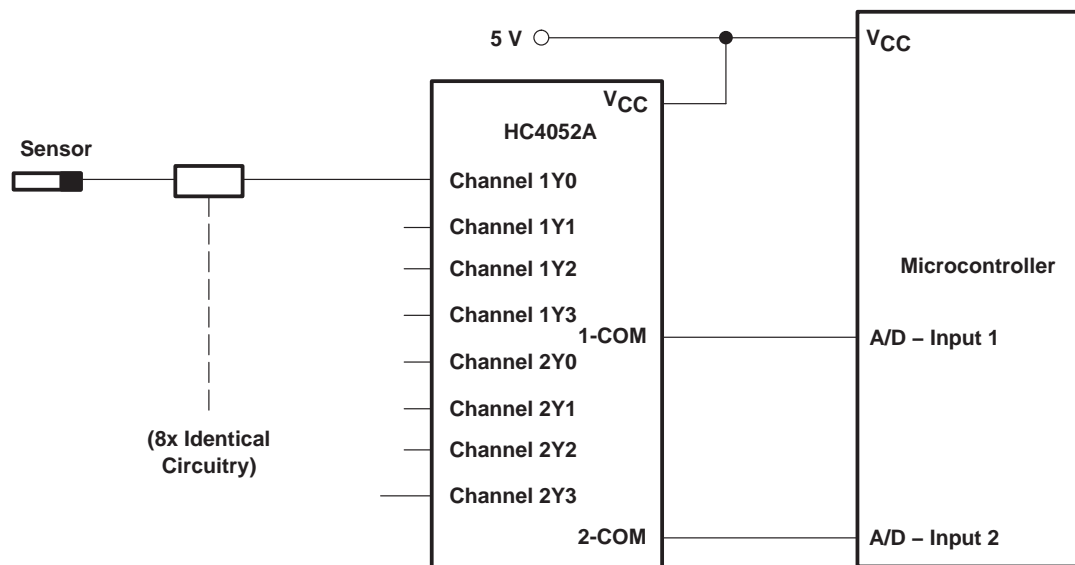


Figure 3. Solution by Applying the HC4852 Multiplexer

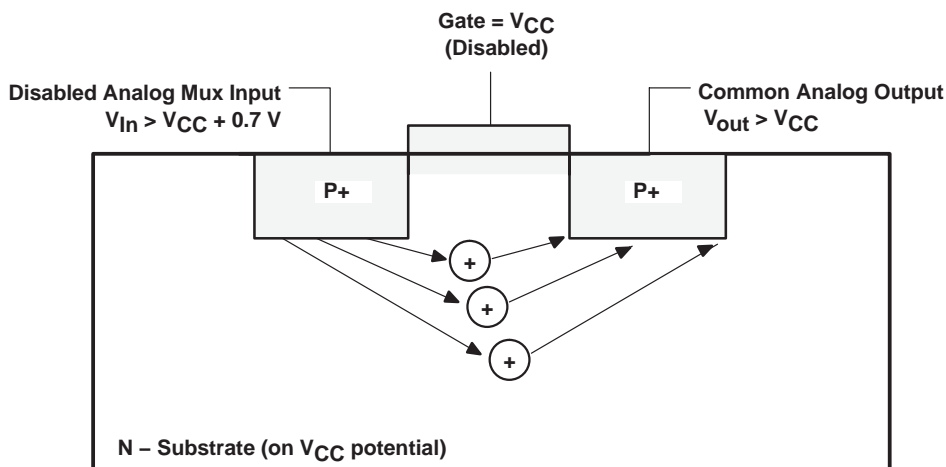


Figure 4. Diagram of Bipolar Coupling Mechanism
(Appears if V_{In} Exceeds V_{CC} , Driving Injection Current Into the Substrate)

PARAMETER MEASUREMENT INFORMATION

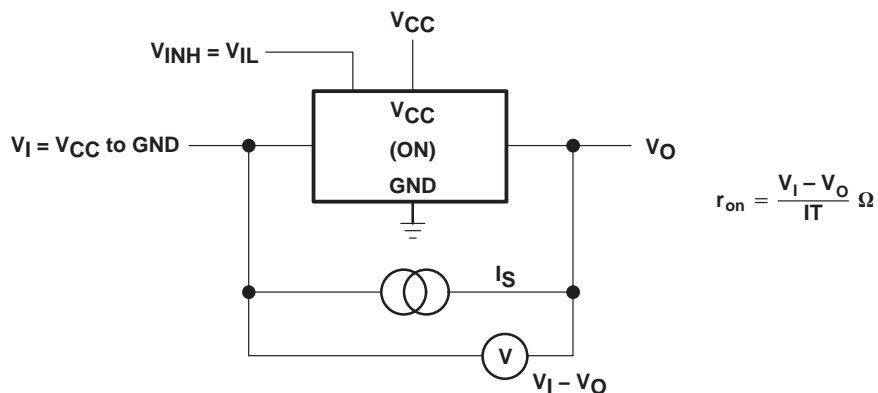


Figure 5. On-State Resistance Test Circuit

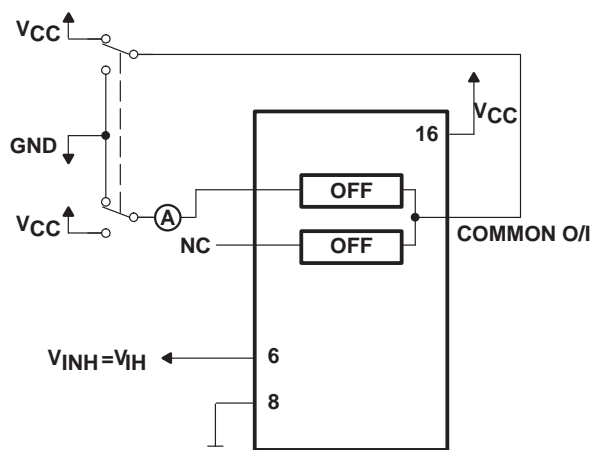


Figure 6. Maximum Off-Channel Leakage Current, Any One Channel, Test Setup

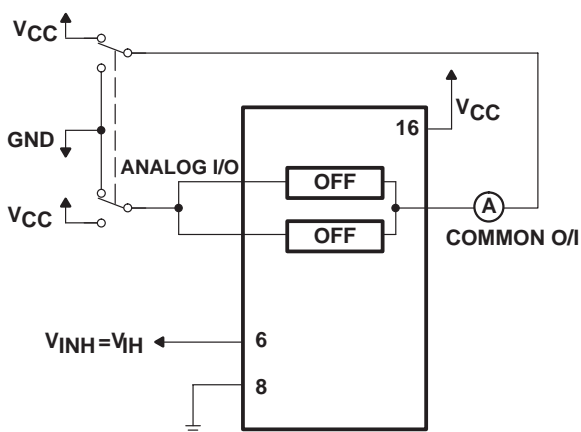


Figure 7. Maximum Off-Channel Leakage Current, Common Channel, Test Setup

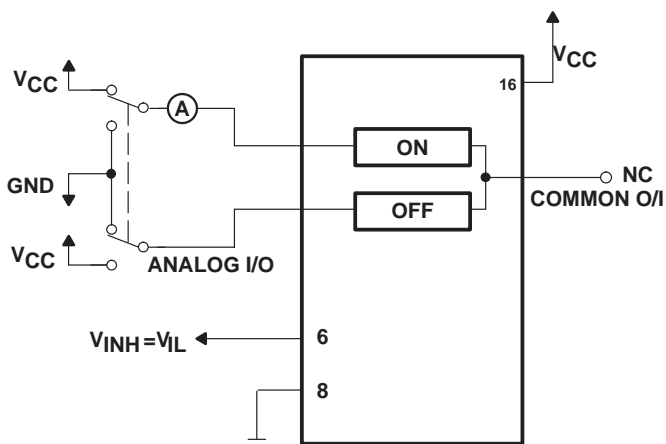


Figure 8. Maximum On-Channel Leakage Current, Channel to Channel, Test Setup

SN74HC4852
DUAL 4-TO-1 CHANNEL ANALOG MULTIPLEXER/DEMULTIPLEXER
WITH INJECTION-CURRENT EFFECT CONTROL

SCLS573 – MARCH 2004

PARAMETER MEASUREMENT INFORMATION

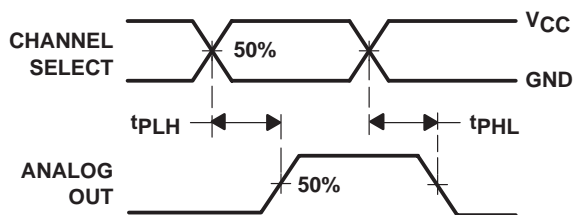
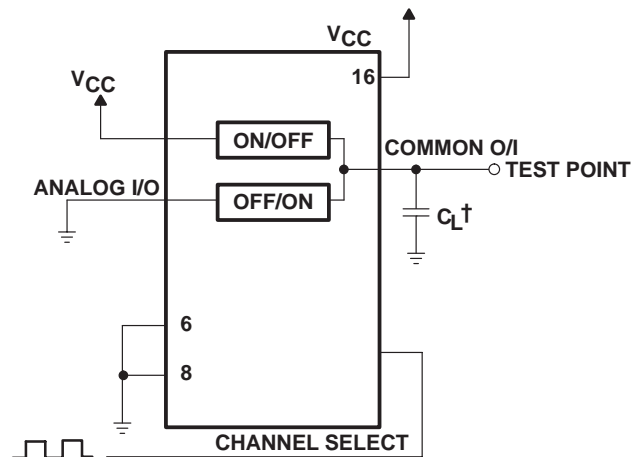


Figure 9. Propagation Delays, Channel Select to Analog Out



† Includes all probe and jig capacitance

Figure 10. Propagation Delay, Channel Select to Analog Out, Test Setup

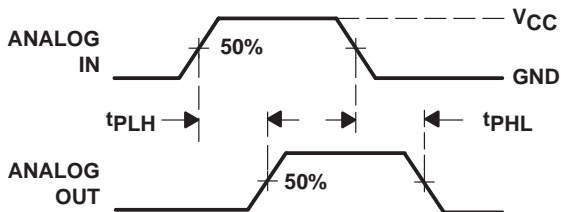
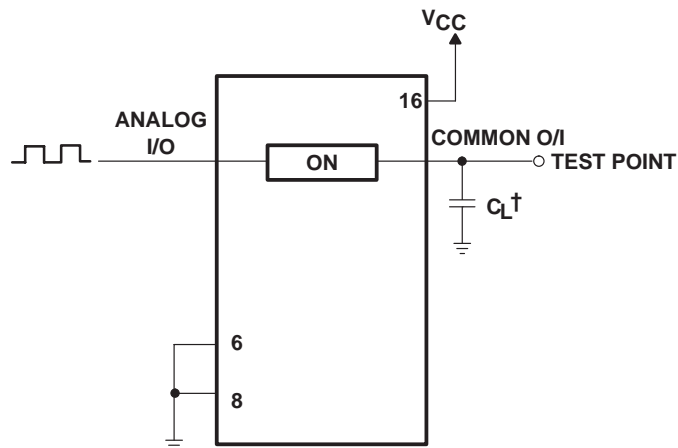


Figure 11. Propagation Delays, Analog In to Analog Out



† Includes all probe and jig capacitance

Figure 12. Propagation Delay, Analog In to Analog Out, Test Setup

SN74HC4852

DUAL 4-TO-1 CHANNEL ANALOG MULTIPLEXER/DEMULTIPLEXER WITH INJECTION-CURRENT EFFECT CONTROL

SCLS573 – MARCH 2004

PARAMETER MEASUREMENT INFORMATION

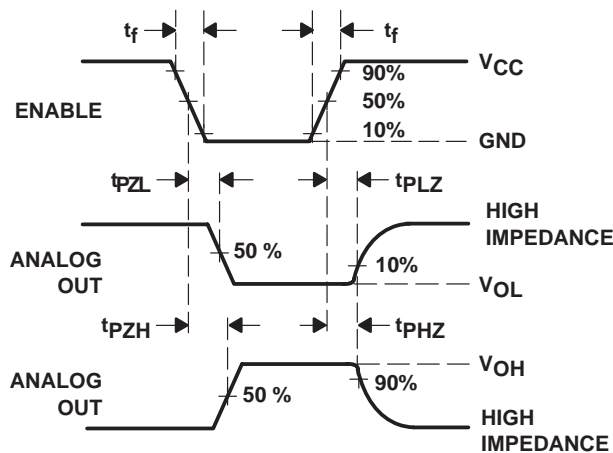


Figure 13. Propagation Delays, Enable to Analog Out

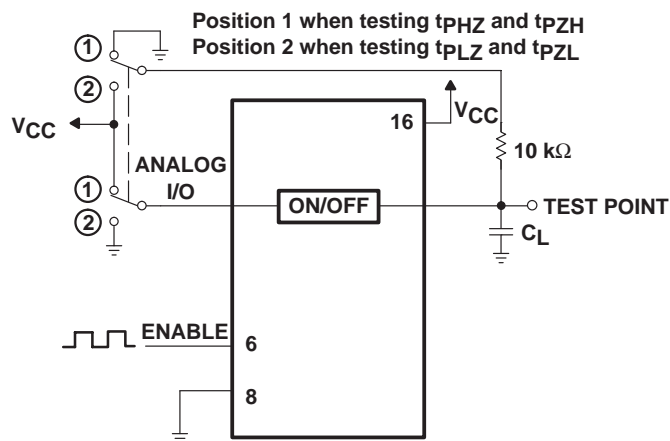


Figure 14. Propagation Delay, Enable to Analog Out, Test Setup

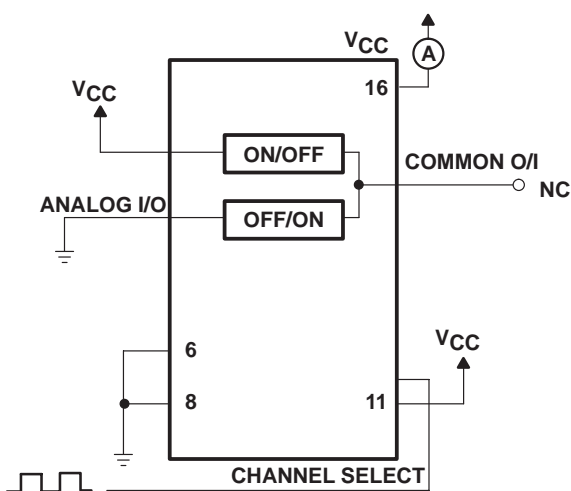


Figure 15. Power-Dissipation Capacitance, Test Setup

IMPORTANT NOTICE

Texas Instruments Incorporated and its subsidiaries (TI) reserve the right to make corrections, modifications, enhancements, improvements, and other changes to its products and services at any time and to discontinue any product or service without notice. Customers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. All products are sold subject to TI's terms and conditions of sale supplied at the time of order acknowledgment.

TI warrants performance of its hardware products to the specifications applicable at the time of sale in accordance with TI's standard warranty. Testing and other quality control techniques are used to the extent TI deems necessary to support this warranty. Except where mandated by government requirements, testing of all parameters of each product is not necessarily performed.

TI assumes no liability for applications assistance or customer product design. Customers are responsible for their products and applications using TI components. To minimize the risks associated with customer products and applications, customers should provide adequate design and operating safeguards.

TI does not warrant or represent that any license, either express or implied, is granted under any TI patent right, copyright, mask work right, or other TI intellectual property right relating to any combination, machine, or process in which TI products or services are used. Information published by TI regarding third-party products or services does not constitute a license from TI to use such products or services or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property of the third party, or a license from TI under the patents or other intellectual property of TI.

Reproduction of information in TI data books or data sheets is permissible only if reproduction is without alteration and is accompanied by all associated warranties, conditions, limitations, and notices. Reproduction of this information with alteration is an unfair and deceptive business practice. TI is not responsible or liable for such altered documentation.

Resale of TI products or services with statements different from or beyond the parameters stated by TI for that product or service voids all express and any implied warranties for the associated TI product or service and is an unfair and deceptive business practice. TI is not responsible or liable for any such statements.

TI products are not authorized for use in safety-critical applications (such as life support) where a failure of the TI product would reasonably be expected to cause severe personal injury or death, unless officers of the parties have executed an agreement specifically governing such use. Buyers represent that they have all necessary expertise in the safety and regulatory ramifications of their applications, and acknowledge and agree that they are solely responsible for all legal, regulatory and safety-related requirements concerning their products and any use of TI products in such safety-critical applications, notwithstanding any applications-related information or support that may be provided by TI. Further, Buyers must fully indemnify TI and its representatives against any damages arising out of the use of TI products in such safety-critical applications.

TI products are neither designed nor intended for use in military/aerospace applications or environments unless the TI products are specifically designated by TI as military-grade or "enhanced plastic." Only products designated by TI as military-grade meet military specifications. Buyers acknowledge and agree that any such use of TI products which TI has not designated as military-grade is solely at the Buyer's risk, and that they are solely responsible for compliance with all legal and regulatory requirements in connection with such use.

TI products are neither designed nor intended for use in automotive applications or environments unless the specific TI products are designated by TI as compliant with ISO/TS 16949 requirements. Buyers acknowledge and agree that, if they use any non-designated products in automotive applications, TI will not be responsible for any failure to meet such requirements.

Following are URLs where you can obtain information on other Texas Instruments products and application solutions:

Products		Applications	
Amplifiers	amplifier.ti.com	Audio	www.ti.com/audio
Data Converters	dataconverter.ti.com	Automotive	www.ti.com/automotive
DSP	dsp.ti.com	Broadband	www.ti.com/broadband
Interface	interface.ti.com	Digital Control	www.ti.com/digitalcontrol
Logic	logic.ti.com	Military	www.ti.com/military
Power Mgmt	power.ti.com	Optical Networking	www.ti.com/opticalnetwork
Microcontrollers	microcontroller.ti.com	Security	www.ti.com/security
Low Power Wireless	www.ti.com/lpw	Telephony	www.ti.com/telephony
		Video & Imaging	www.ti.com/video
		Wireless	www.ti.com/wireless

Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265
Copyright © 2007, Texas Instruments Incorporated

PACKAGING INFORMATION

Orderable Device	Status ⁽¹⁾	Package Type	Package Drawing	Pins	Package Qty	Eco Plan ⁽²⁾	Lead/Ball Finish	MSL Peak Temp ⁽³⁾
SN74HC4852D	ACTIVE	SOIC	D	16	40	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74HC4852DE4	ACTIVE	SOIC	D	16	40	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74HC4852DG4	ACTIVE	SOIC	D	16	40	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74HC4852DGV	ACTIVE	TVSOP	DGV	16	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74HC4852DGVRE4	ACTIVE	TVSOP	DGV	16	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74HC4852DR	ACTIVE	SOIC	D	16	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74HC4852DRE4	ACTIVE	SOIC	D	16	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74HC4852DRG4	ACTIVE	SOIC	D	16	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74HC4852N	ACTIVE	PDIP	N	16	25	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type
SN74HC4852NE4	ACTIVE	PDIP	N	16	25	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type
SN74HC4852PW	ACTIVE	TSSOP	PW	16	90	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74HC4852PWE4	ACTIVE	TSSOP	PW	16	90	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74HC4852PWR	ACTIVE	TSSOP	PW	16	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74HC4852PWRE4	ACTIVE	TSSOP	PW	16	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM

⁽¹⁾ The marketing status values are defined as follows:

ACTIVE: Product device recommended for new designs.

LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.

NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.

PREVIEW: Device has been announced but is not in production. Samples may or may not be available.

OBSOLETE: TI has discontinued the production of the device.

⁽²⁾ Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS), Pb-Free (RoHS Exempt), or Green (RoHS & no Sb/Br) - please check <http://www.ti.com/productcontent> for the latest availability information and additional product content details.

TBD: The Pb-Free/Green conversion plan has not been defined.

Pb-Free (RoHS): TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.

Pb-Free (RoHS Exempt): This component has a RoHS exemption for either 1) lead-based flip-chip solder bumps used between the die and package, or 2) lead-based die adhesive used between the die and leadframe. The component is otherwise considered Pb-Free (RoHS compatible) as defined above.

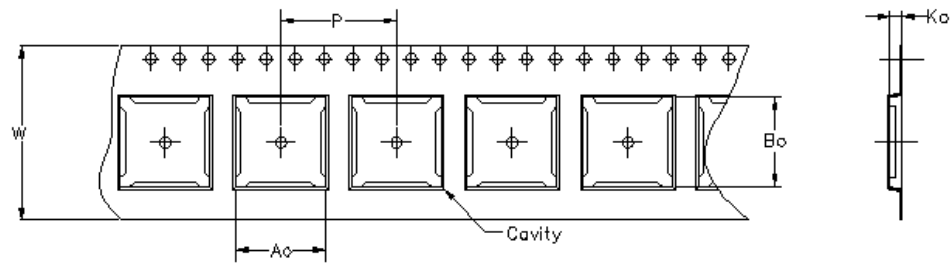
Green (RoHS & no Sb/Br): TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

⁽³⁾ MSL, Peak Temp. -- The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

Important Information and Disclaimer:The information provided on this page represents TI's knowledge and belief as of the date that it is

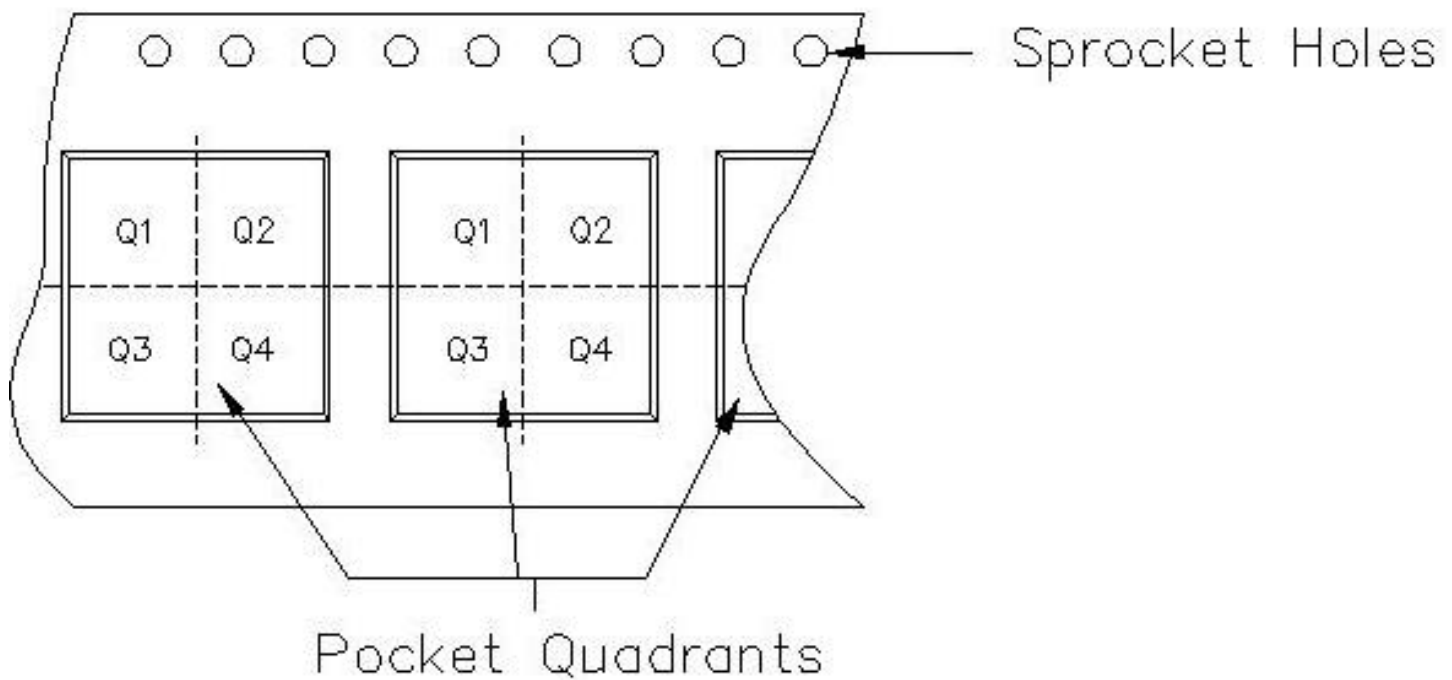
provided. TI bases its knowledge and belief on information provided by third parties, and makes no representation or warranty as to the accuracy of such information. Efforts are underway to better integrate information from third parties. TI has taken and continues to take reasonable steps to provide representative and accurate information but may not have conducted destructive testing or chemical analysis on incoming materials and chemicals. TI and TI suppliers consider certain information to be proprietary, and thus CAS numbers and other limited information may not be available for release.

In no event shall TI's liability arising out of such information exceed the total purchase price of the TI part(s) at issue in this document sold by TI to Customer on an annual basis.



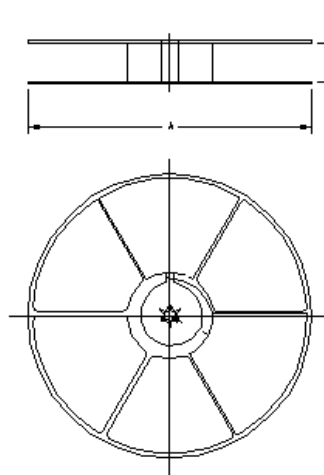
Carrier tape design is defined largely by the component length, width, and thickness.

A_0 = Dimension designed to accommodate the component width.
B_0 = Dimension designed to accommodate the component length.
K_0 = Dimension designed to accommodate the component thickness.
W = Overall width of the carrier tape.
P = Pitch between successive cavity centers.



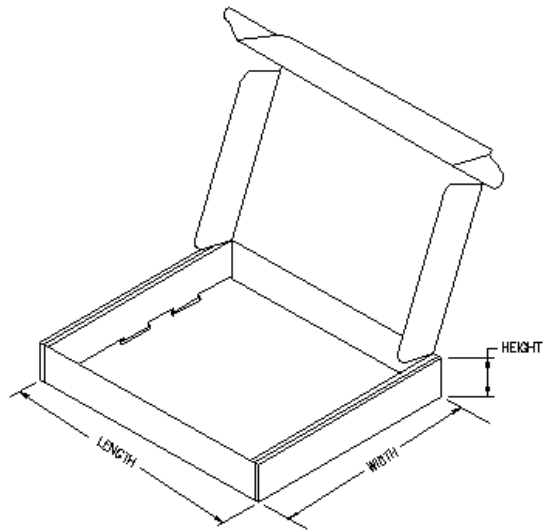
TAPE AND REEL INFORMATION

Device	Package	Pins	Site	Reel Diameter (mm)	Reel Width (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
SN74HC4852DGVR	DGV	16	MLA	330	12	6.8	4.0	1.6	8	16	Q1
SN74HC4852DR	D	16	FMX	0	16	6.5	10.3	12.1	2	16	Q1
SN74HC4852PWR	PW	16	MLA	330	12	7.0	5.6	1.6	8	12	Q1



TAPE AND REEL BOX INFORMATION

Device	Package	Pins	Site	Length (mm)	Width (mm)	Height (mm)
SN74HC4852DGVR	DGV	16	MLA	338.1	340.5	20.64
SN74HC4852DR	D	16	FMX	333.2	333.2	28.58
SN74HC4852PWR	PW	16	MLA	338.1	340.5	20.64



N (R-PDIP-T**)

PLASTIC DUAL-IN-LINE PACKAGE

16 PINS SHOWN



- NOTES:
- A. All linear dimensions are in inches (millimeters).
 - B. This drawing is subject to change without notice.
 - Falls within JEDEC MS-001, except 18 and 20 pin minimum body length (Dim A).
 - The 20 pin end lead shoulder width is a vendor option, either half or full width.

DGV (R-PDSO-G**)

PLASTIC SMALL-OUTLINE

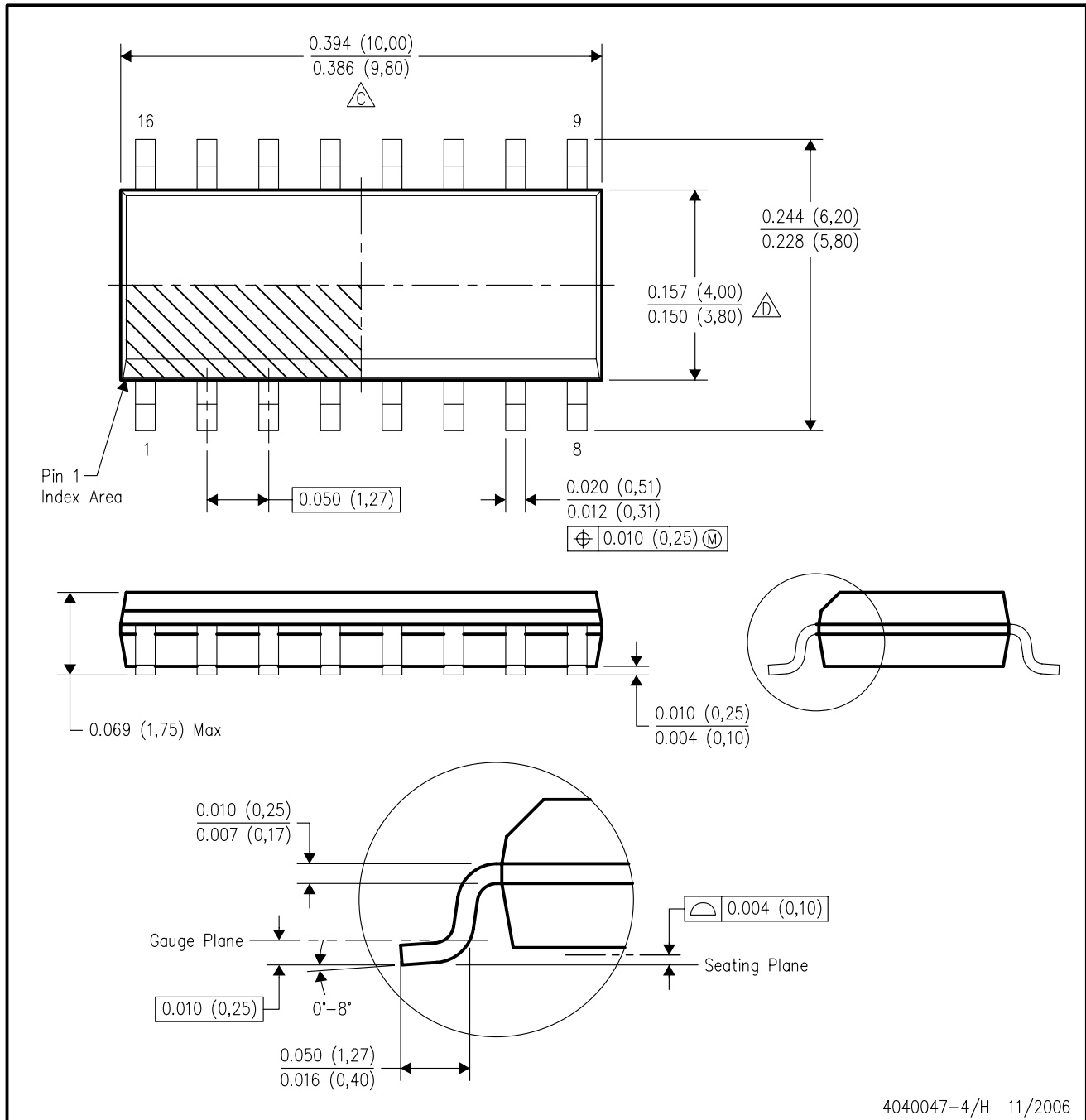
24 PINS SHOWN



- NOTES: A. All linear dimensions are in millimeters.
 B. This drawing is subject to change without notice.
 C. Body dimensions do not include mold flash or protrusion, not to exceed 0,15 per side.
 D. Falls within JEDEC: 24/48 Pins – MO-153
 14/16/20/56 Pins – MO-194

D (R-PDSO-G16)

PLASTIC SMALL-OUTLINE PACKAGE



- NOTES:
- A. All linear dimensions are in inches (millimeters).
 - B. This drawing is subject to change without notice.
 - C. Body length does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed .006 (0,15) per end.
 - D. Body width does not include interlead flash. Interlead flash shall not exceed .017 (0,43) per side.
 - E. Reference JEDEC MS-012 variation AC.

PW (R-PDSO-G**)

PLASTIC SMALL-OUTLINE PACKAGE

14 PINS SHOWN



4040064/F 01/97

- NOTES: A. All linear dimensions are in millimeters.
 B. This drawing is subject to change without notice.
 C. Body dimensions do not include mold flash or protrusion not to exceed 0,15.
 D. Falls within JEDEC MO-153

IMPORTANT NOTICE

Texas Instruments Incorporated and its subsidiaries (TI) reserve the right to make corrections, modifications, enhancements, improvements, and other changes to its products and services at any time and to discontinue any product or service without notice. Customers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. All products are sold subject to TI's terms and conditions of sale supplied at the time of order acknowledgment.

TI warrants performance of its hardware products to the specifications applicable at the time of sale in accordance with TI's standard warranty. Testing and other quality control techniques are used to the extent TI deems necessary to support this warranty. Except where mandated by government requirements, testing of all parameters of each product is not necessarily performed.

TI assumes no liability for applications assistance or customer product design. Customers are responsible for their products and applications using TI components. To minimize the risks associated with customer products and applications, customers should provide adequate design and operating safeguards.

TI does not warrant or represent that any license, either express or implied, is granted under any TI patent right, copyright, mask work right, or other TI intellectual property right relating to any combination, machine, or process in which TI products or services are used. Information published by TI regarding third-party products or services does not constitute a license from TI to use such products or services or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property of the third party, or a license from TI under the patents or other intellectual property of TI.

Reproduction of information in TI data books or data sheets is permissible only if reproduction is without alteration and is accompanied by all associated warranties, conditions, limitations, and notices. Reproduction of this information with alteration is an unfair and deceptive business practice. TI is not responsible or liable for such altered documentation.

Resale of TI products or services with statements different from or beyond the parameters stated by TI for that product or service voids all express and any implied warranties for the associated TI product or service and is an unfair and deceptive business practice. TI is not responsible or liable for any such statements.

TI products are not authorized for use in safety-critical applications (such as life support) where a failure of the TI product would reasonably be expected to cause severe personal injury or death, unless officers of the parties have executed an agreement specifically governing such use. Buyers represent that they have all necessary expertise in the safety and regulatory ramifications of their applications, and acknowledge and agree that they are solely responsible for all legal, regulatory and safety-related requirements concerning their products and any use of TI products in such safety-critical applications, notwithstanding any applications-related information or support that may be provided by TI. Further, Buyers must fully indemnify TI and its representatives against any damages arising out of the use of TI products in such safety-critical applications.

TI products are neither designed nor intended for use in military/aerospace applications or environments unless the TI products are specifically designated by TI as military-grade or "enhanced plastic." Only products designated by TI as military-grade meet military specifications. Buyers acknowledge and agree that any such use of TI products which TI has not designated as military-grade is solely at the Buyer's risk, and that they are solely responsible for compliance with all legal and regulatory requirements in connection with such use.

TI products are neither designed nor intended for use in automotive applications or environments unless the specific TI products are designated by TI as compliant with ISO/TS 16949 requirements. Buyers acknowledge and agree that, if they use any non-designated products in automotive applications, TI will not be responsible for any failure to meet such requirements.

Following are URLs where you can obtain information on other Texas Instruments products and application solutions:

Products		Applications	
Amplifiers	amplifier.ti.com	Audio	www.ti.com/audio
Data Converters	dataconverter.ti.com	Automotive	www.ti.com/automotive
DSP	dsp.ti.com	Broadband	www.ti.com/broadband
Interface	interface.ti.com	Digital Control	www.ti.com/digitalcontrol
Logic	logic.ti.com	Military	www.ti.com/military
Power Mgmt	power.ti.com	Optical Networking	www.ti.com/opticalnetwork
Microcontrollers	microcontroller.ti.com	Security	www.ti.com/security
Low Power Wireless	www.ti.com/lpw	Telephony	www.ti.com/telephony
		Video & Imaging	www.ti.com/video
		Wireless	www.ti.com/wireless

Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265
Copyright © 2007, Texas Instruments Incorporated