- **Nine Differential Channels for the Data and Control Paths of the Differential Small Computer Systems Interface (SCSI) and Intelligent Peripheral Interface (IPI-2)**
- **Meets or Exceeds the Requirements of ANSI Standard RS-485 and ISO 8482:1987(E)**
- **Packaged in 380-mil Fine Pitch Ceramic Flat (WD) Package Using 25-mil Center-to-Center Spacing**
- **Designed to Operate at 10 Million Transfers Per Second**
- **Low Disabled Supply Current 1.4 mA Typical**
- **Thermal Shutdown Protection**
- **Power-Up/Power-Down Glitch Protection**
- **Positive and Negative Output Current Limiting**
- **Open-Circuit Fail-Safe Receiver Design**

WD PACKAGE
(TOP VIEW)

GND	1	56	CDE2
BSR	2	55	CDE1
$\overline{\text{CRE}}$	3	54	CDE0
1A	4	53	9B+
1DE/$\overline{\text{RE}}$	5	52	9B−
2A	6	51	8B+
2DE/$\overline{\text{RE}}$	7	50	8B−
3A	8	49	7B+
3DE/$\overline{\text{RE}}$	9	48	7B−
4A	10	47	6B+
4DE/$\overline{\text{RE}}$	11	46	6B−
V_{CC}	12	45	V_{CC}
GND	13	44	GND
GND	14	43	GND
GND	15	42	GND
GND	16	41	GND
GND	17	40	GND
V_{CC}	18	39	V_{CC}
5A	19	38	5B+
5DE/$\overline{\text{RE}}$	20	37	5B−
6A	21	36	4B+
6DE/$\overline{\text{RE}}$	22	35	4B−
7A	23	34	3B+
7DE/$\overline{\text{RE}}$	24	33	3B−
8A	25	32	2B+
8DE/$\overline{\text{RE}}$	26	31	2B−
9A	27	30	1B+
9DE/$\overline{\text{RE}}$	28	29	1B−

description

The SN55LBC976 is a 9-channel differential transceiver based on the SN55LBC176 LinASIC™ cell. Use of TI's LinBiCMOS™† process technology allows the power reduction necessary to integrate nine differential transceivers. On-chip enabling logic makes this device applicable for the data path (eight data bits plus parity) and the control path (nine bits) for both the Small Computer Systems Interface (SCSI) and the Intelligent Peripheral Interface (IPI-2) standard data interfaces.

The switching speed and testing capabilities of the SN55LBC976 are sufficient to transfer data over the data bus at 10 million transfers per second. Each of the nine channels conforms to the requirements of the ANSI RS-485 and ISO 8482:1987(E) standards referenced by ANSI X3.129-1986 (IPI), ANSI X3.131-1993 (SCSI-2), and the proposed SCSI-3 standards.

The SN55LBC976 is characterized for operation from −55°C to 125°C.

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.

† Patent pending
LinASIC and LinBiCMOS are trademarks of Texas Instruments Incorporated.

TEXAS INSTRUMENTS

SN55LBC976
9-CHANNEL DIFFERENTIAL TRANSCEIVER

logic diagram (positive logic)†
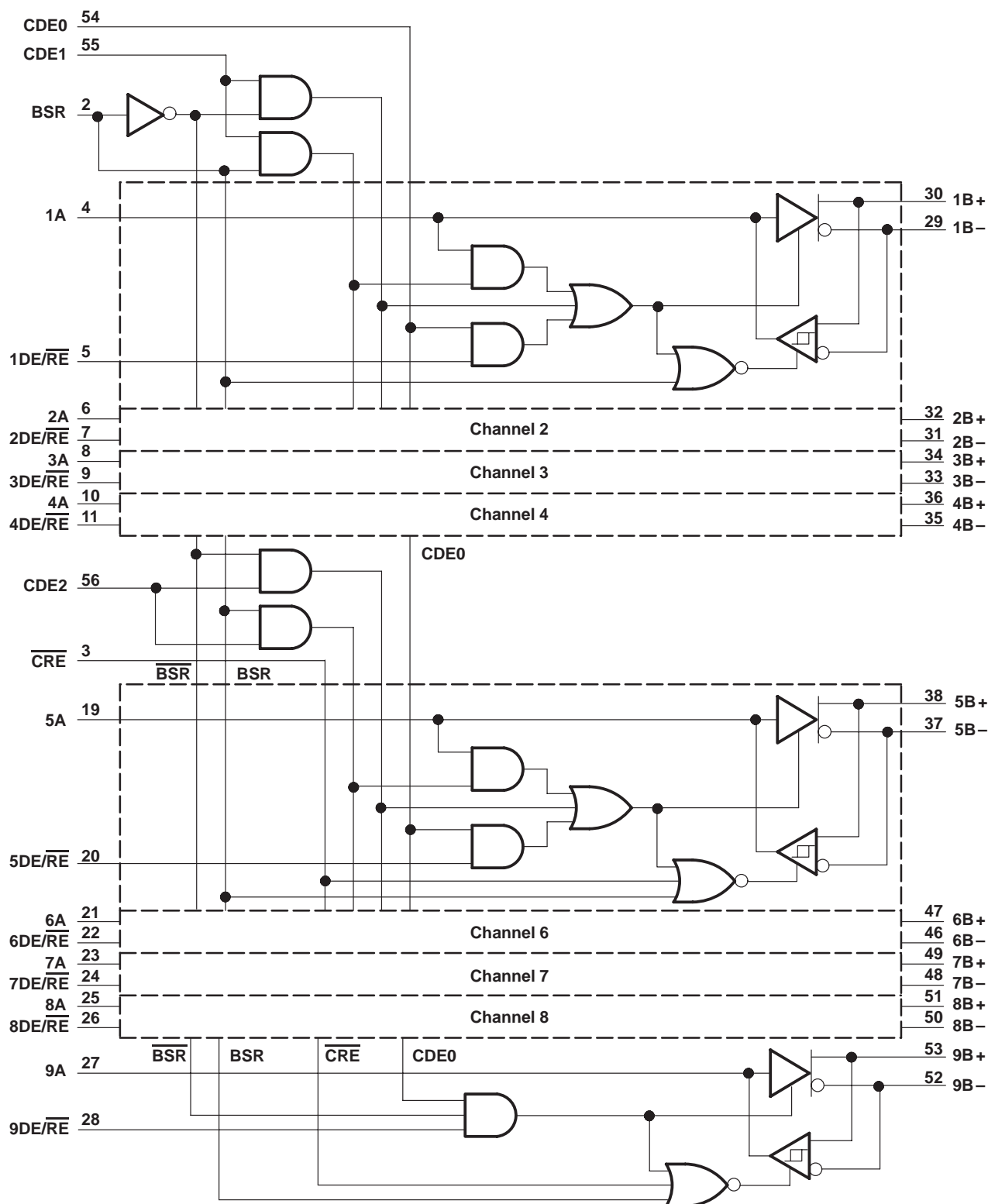
† For additional logic diagrams, see Application Information, Table 1, and Figures 7 through 44.

schematics of inputs and outputs

ALL INPUTS EXCEPT CDE0, CDE1, AND CDE2

INPUTS CDE0, CDE1, AND CDE2

B+ AND B− I/O PORTS

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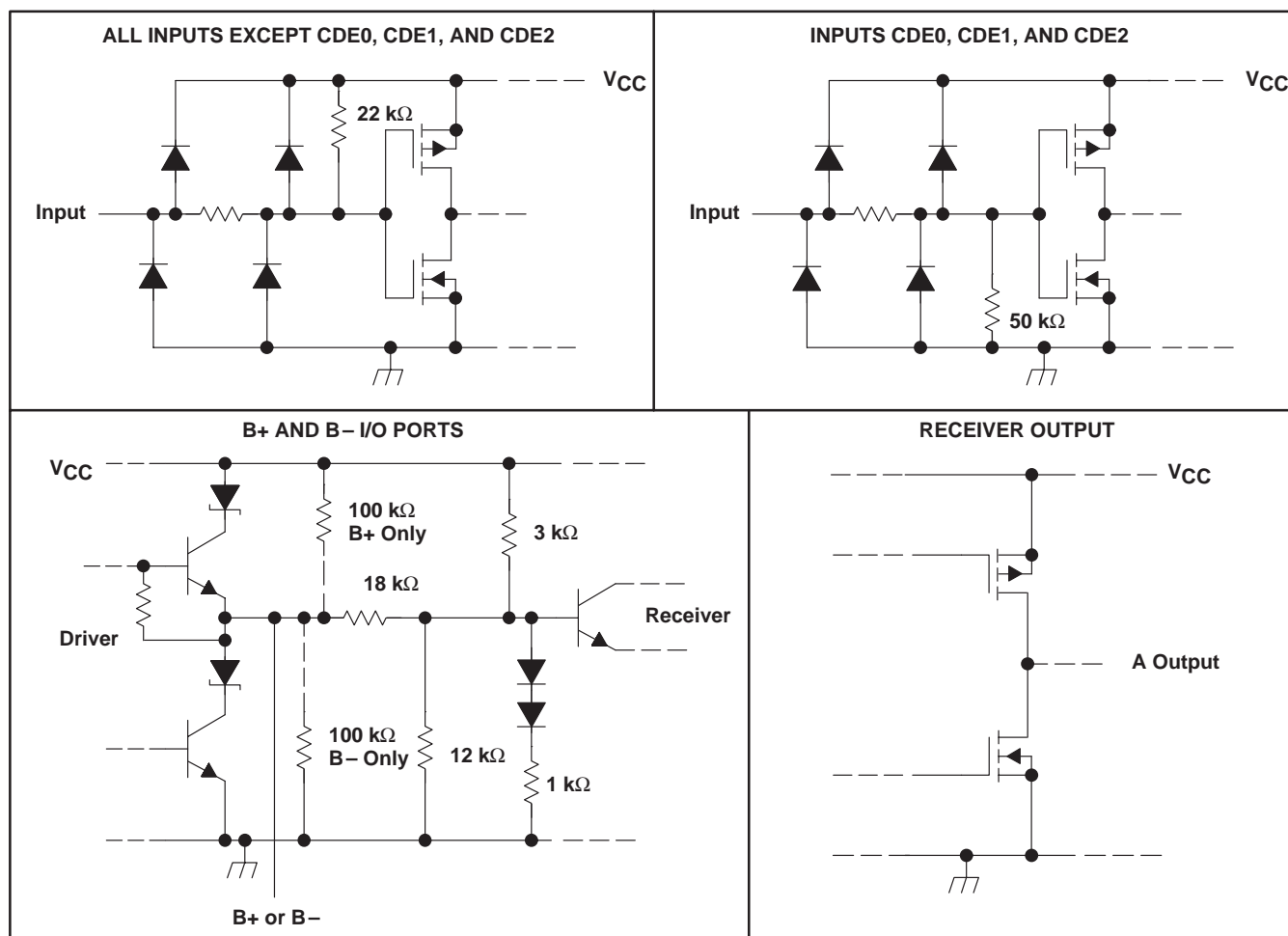
absolute maximum ratings over operating free-air temperature range (unless otherwise noted)†

Supply voltage range, V_{CC} (see Note 1) .... −0.3 V to 7 V
Bus voltage range .... −10 V to 15 V
Data I/O and control (A-side) voltage range .... −0.3 V to 7 V
Continuous total power dissipation .... internally limited
Operating free-air temperature range, T_A .... −55°C to 125°C
Storage temperature range, T_{stg} .... −65°C to 150°C
Lead temperature 1,6 mm (1/16 inch) from case for 10 seconds .... 260°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.
NOTE 1:   All voltage values are with respect to GND.

trecommended operating conditions

		MIN	NOM	MAX	UNIT
Supply voltage, V_{CC}		4.75	5	5.25	V
Voltage at any bus terminal (separately or common-mode), V_O, V_I, or V_{IC}	B+ or B−			12	V
				−7	
High-level input voltage, V_{IH}	All except B+ and B−	2			V
Low-level input voltage, V_{IL}	All except B+ and B−			0.8	V
High-level output current, I_{OH}	B+ or B−			−60	mA
	A			−8	mA
Low-level output current, I_{OL}	B+ or B−			60	mA
	A			8	mA
Operating free-air temperature, T_A		−55		125	°C

device electrical characteristics over recommended ranges of operating conditions (unless otherwise noted)

PARAMETER			TEST CONDITIONS		MIN	TYP†	MAX	UNIT
I_{IH}	High-level input current	BSR, A, DE/$\overline{RE}$, and $\overline{CRE}$	See Figure 3	V_{IH} = 2 V			−200	µA
		CDE0, CDE1, and CDE2					100	µA
I_{IL}	Low-level input current	BSR, A, DE/$\overline{RE}$, and $\overline{CRE}$		V_{IL} = 0.8 V			−200	µA
		CDE0, CDE1, and CDE2					100	µA
I_{CC}	Supply current	All drivers and receivers disabled	BSR and CDE0 at 5 V, Other inputs at 0 V			1.4	5	mA
		All receivers enabled	No load, V_{ID} = 5 V, All other inputs at 0 V			29	50	mA
		All drivers enabled	BSR at 0 V, No load, All other inputs at 5 V			4.8	15	mA
C_O	Bus-port output capacitance		B+ or B−			16		pF
C_{pd}	Power dissipation capacitance‡		One driver			460		pF
			One receiver			50		pF

† All typical values are at V_{CC} = 5 V, T_A = 25°C.
‡ C_{pd} determines the no-load dynamic current consumption; $I_S = C_{pd} \times V_{CC} \times f + I_{CC}$.

driver electrical characteristics over recommended ranges of operating conditions (unless otherwise noted)

PARAMETER		TEST CONDITIONS	MIN	TYP	MAX	UNIT
$|V_{OD}|$	Differential output voltage	V_{test} = −7 V to 12 V, See Figure 2	1	2		V
I_{OS}	Output short-circuit current	See Figure 1			±250	mA
I_{OZ}	High-impedance-state output current	See receiver input current				

receiver electrical characteristics over recommended ranges of operating conditions (unless otherwise noted)

PARAMETER		TEST CONDITIONS		MIN	TYP†	MAX	UNIT
V_{OH}	High-level output voltage	V_{ID} = 200 mV, See Figure 3	I_{OH} = −8 mA,	2.5			V
V_{OL}	Low-level output voltage	V_{ID} = −200 mV, See Figure 3	I_{OL} = 8 mA,			0.8	V
V_{IT+}	Positive-going input threshold voltage‡	I_{OH} = −8 mA,	See Figure 3			0.2	V
		I_{OH} = −8 mA, See Figure 3	T_A = −55°C,			0.5	
V_{IT-}	Negative-going input threshold voltage	I_{OL} = 8 mA,	See Figure 3	−0.2			V
V_{hys}	Receiver input hysteresis ($V_{IT+} - V_{IT-}$)				45		mV
I_I	Receiver input current	B+ and B−	V_I = 12 V, Other input at 0 V,	V_{CC} = 5 V, See Figure 3		0.7	1.5	mA
			V_I = 12 V, Other input at 0 V,	V_{CC} = 0 V, See Figure 3		0.8	1.5	mA
			V_I = −7 V, Other input at 0 V,	V_{CC} = 5 V, See Figure 3		−0.5	−1	mA
			V_I = −7 V, Other input at 0 V,	V_{CC} = 0 V, See Figure 3		−0.4	−1	mA
I_{OZ}	High-impedance-state output current	See Figure 3	V_O = GND			−200	μA
			V_O = V_{CC}			50	

† All typical values are at V_{CC} = 5 V, T_A = 25°C.
‡ This parameter is not tested to meet RS-485 or SCSI standards at −55°C.

driver switching characteristics over recommended operating conditions (unless otherwise noted) (see Figure 4)

PARAMETER		TEST CONDITIONS	MIN	TYP†	MAX	UNIT
t_{dD}	Differential delay time, high-to-low-level output (t_{dDH}) or low-to-high-level output (t_{dDL})		4		30	ns
		V_{CC} = 5 V, T_A = 25°C	9		17	
$t_{sk(lim)}$	Skew limit, the maximum difference in propagation delay times between any two drivers on any two devices				12	ns
		V_{CC} = 5 V, See Note 2			8	
$t_{sk(p)}$	Pulse skew ($|t_{dDL} - t_{dDH}|$)				6	ns
t_t	Transition time (t_r or t_f)			10		ns

† All typical values are at V_{CC} = 5 V, T_A = 25°C.
NOTE 2: This specification applies to any 5°C band within the operating temperature range.

TEXAS
INSTRUMENTS

## receiver switching characteristics over recommended operating conditions (see Figure 5) (unless otherwise noted)

PARAMETER		TEST CONDITIONS	MIN	TYP[†]	MAX	UNIT
t_{pd}	Propagation delay time, high-to-low-level output (t_{PHL}) or low-to-high-level output (t_{PLH})		16		36	ns
		$V_{CC} = 5$ V, $T_A = 25°C$	21		31	
$t_{sk(lim)}$	Skew limit, the maximum difference in propagation delay times between any two drivers on any two devices				12	ns
		$V_{CC} = 5$ V, See Note 2			9	
$t_{sk(p)}$	Pulse skew ($|t_{PHL} - t_{PLH}|$)			2	6	ns
		$T_A = -55°C$			10	ns
t_t	Transition time (t_r or t_f)				3	ns

[†] All typical values are at $V_{CC} = 5$ V, $T_A = 25°C$.
NOTE 2:   This specification applies to any 5°C band within the operating temperature range.

transceiver switching characteristics over recommended operating conditions

PARAMETER		TEST CONDITIONS	MIN	MAX	UNIT
$t_{en(RXL)}$	Enable time, transmit-to-receive to low-level output			180*	ns
$t_{en(RXH)}$	Enable time, transmit-to-receive to high-level output			180*	ns
$t_{en(TXL)}$	Enable time, receive-to-transmit to low-level output	See Figure 6		110*	ns
$t_{en(TXH)}$	Enable time, receive-to-transmit to high-level output			110*	ns
t_{su}	Setup time, CDE0, CDE1, CDE2, BSR, or $\overline{CRE}$ to active input(s) or output(s)		180*		ns

*   This parameter is not production tested.

thermal characteristics

PARAMETER		TEST CONDITIONS	MIN	TYP	MAX	UNIT
$R_{\theta JA}$	Junction-to-free-air thermal resistance	Board mounted, No air flow		95.4		°C/W
$R_{\theta JC}$	Junction-to-case thermal resistance			5.67		°C/W

PARAMETER MEASUREMENT INFORMATION
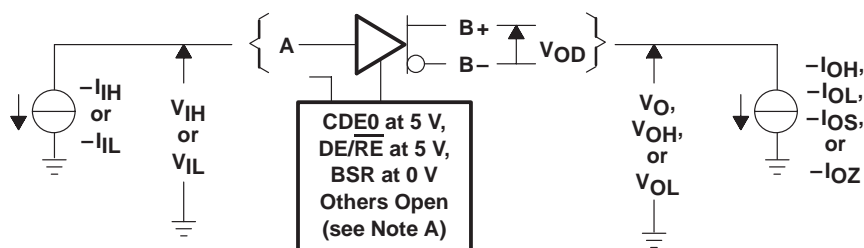
NOTE A: For the I_{OZ} test, the BSR input is at 5 V and all others are at 0 V.

Figure 1. Driver Test Circuit and Input Conditions

TEXAS
INSTRUMENTS

POST OFFICE BOX 655303 • DALLAS, TEXAS 75265

PARAMETER MEASUREMENT INFORMATION

Figure 2. Driver V$_{OD}$ Test Circuit
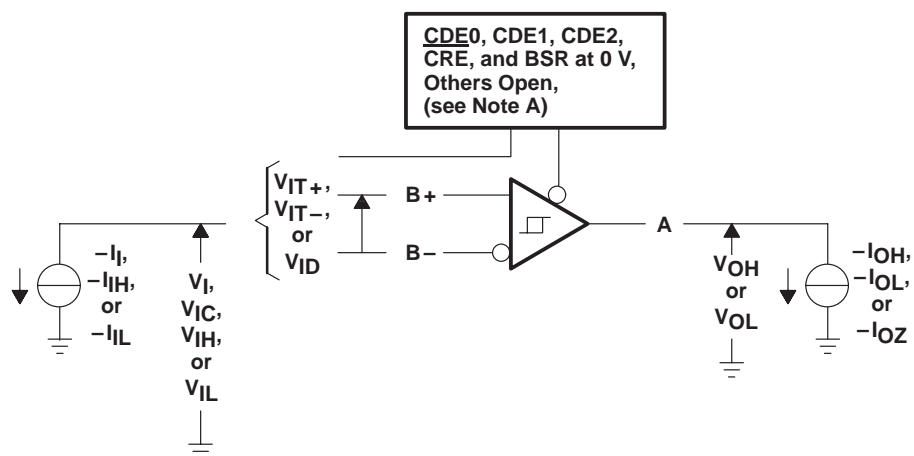
NOTE A: For the I$_{OZ}$ measurement, BSR is at 5 V and CDE0, CDE1, and CDE2 are at 0 V.

Figure 3. Receiver Test Circuit and Input Conditions

PARAMETER MEASUREMENT INFORMATION
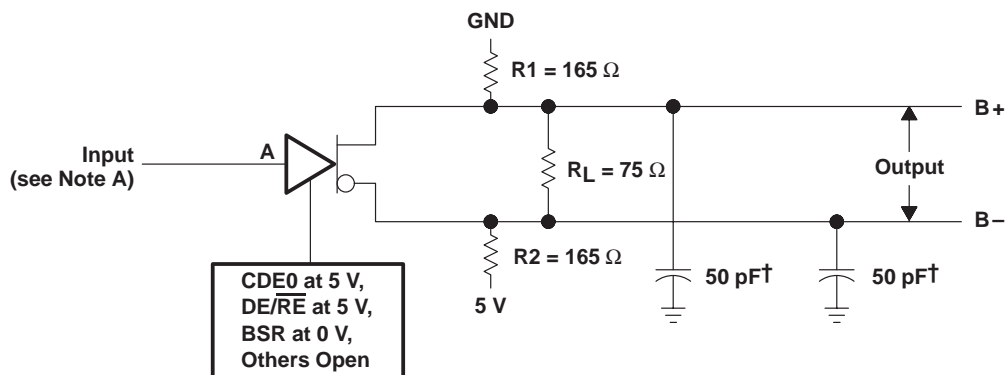
† Includes probe and jig capacitance.

NOTE A: The input is provided by a pulse generator with an output of 0 V to 3 V, PRR of 1 MHz, 50% duty cycle, t_r and t_f < 6 ns, and Z_O = 50 Ω.
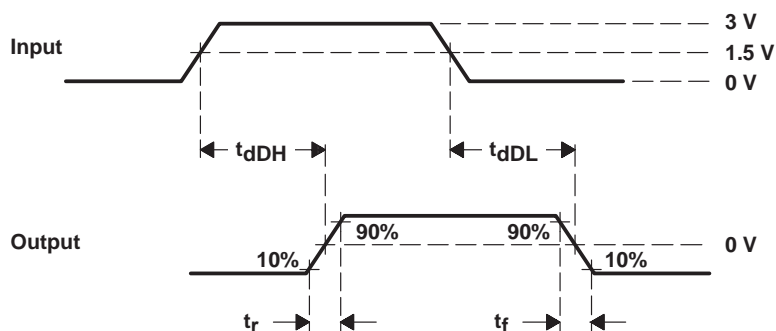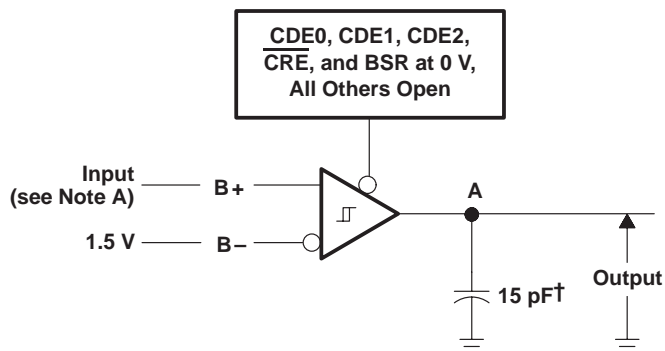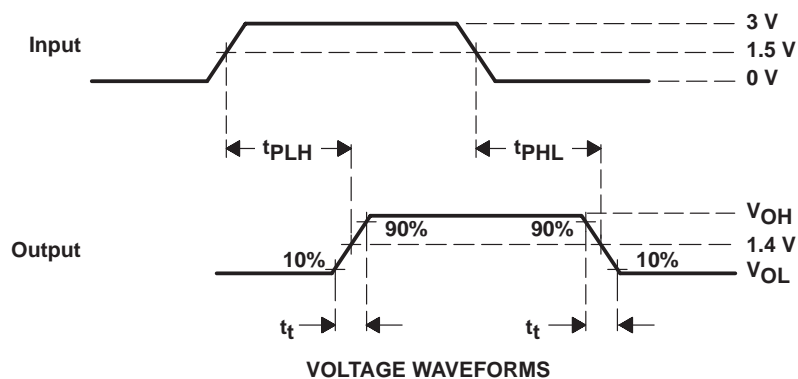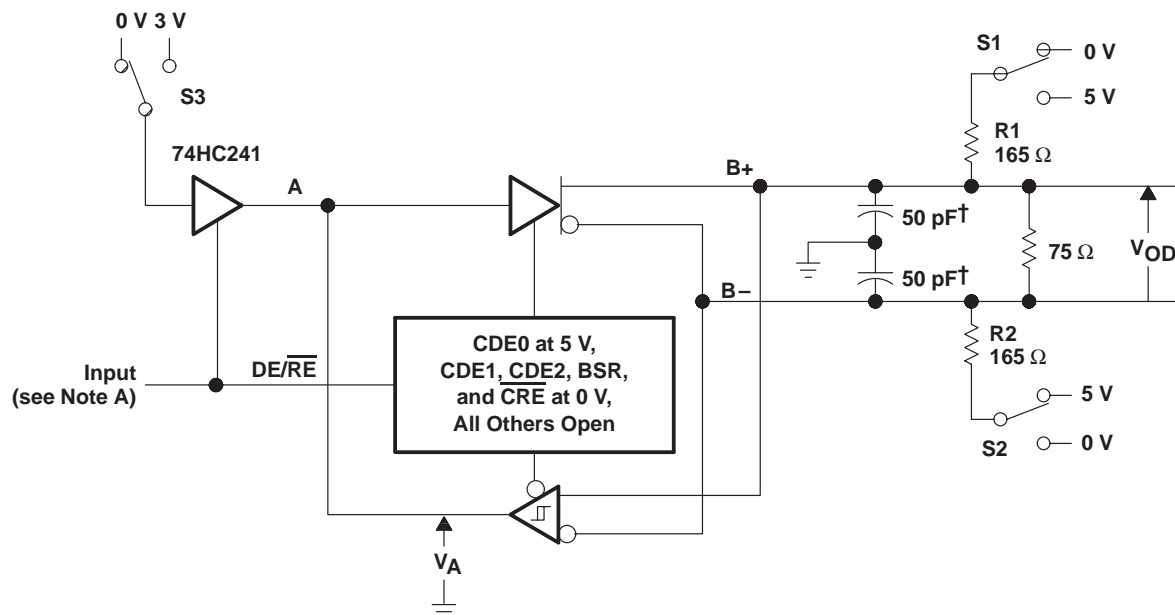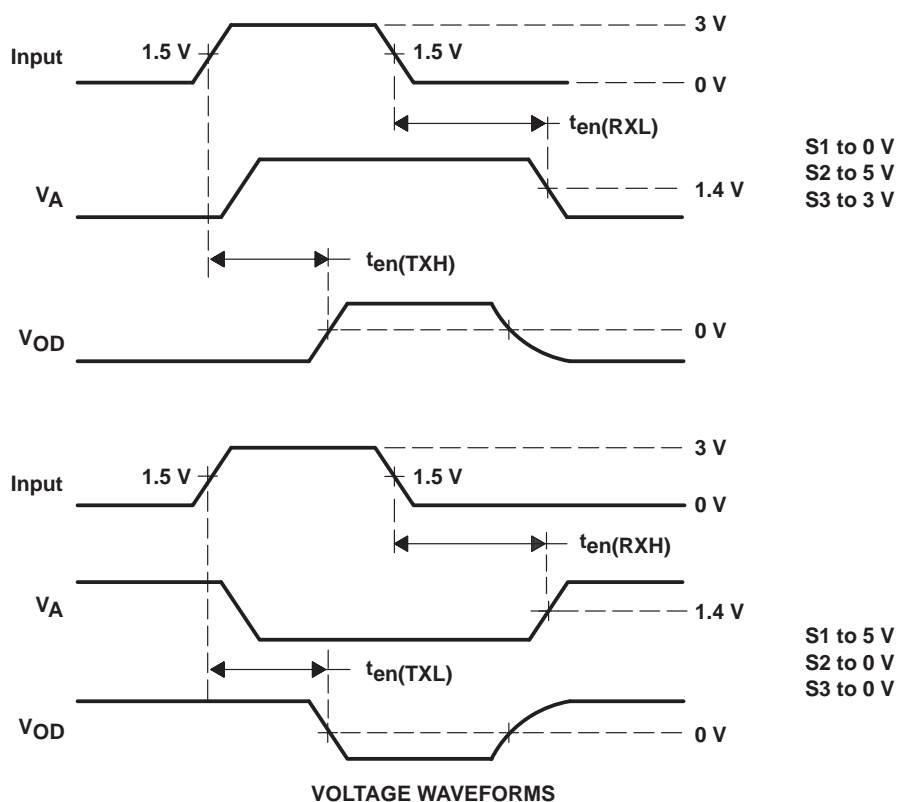
TEST CIRCUIT

VOLTAGE WAVEFORMS

Figure 4. Driver Test Circuit and Voltage Waveforms

PARAMETER MEASUREMENT INFORMATION

† Includes probe and jig capacitance.

NOTE A: The input is provided by a pulse generator with an output of 0 to 3 V, PRR of 1 MHz, 50% duty cycle, t_r and t_f < 6 ns, and Z_O = 50 Ω.

TEST CIRCUIT

VOLTAGE WAVEFORMS

Figure 5. Receiver Test Circuit and Voltage Waveforms

PARAMETER MEASUREMENT INFORMATION

TEST CIRCUIT

† Includes probe and jig capacitance.

NOTE A: The input is provided by a pulse generator with an output of 0 V to 3 V, PRR of 1 MHz, 50% duty cycle, t_r and t_f < 6 ns, and Z_O = 50 Ω.

VOLTAGE WAVEFORMS

Figure 6. Enable Time Test Circuit and Voltage Waveforms

![Texas Instruments logo] **TEXAS INSTRUMENTS**
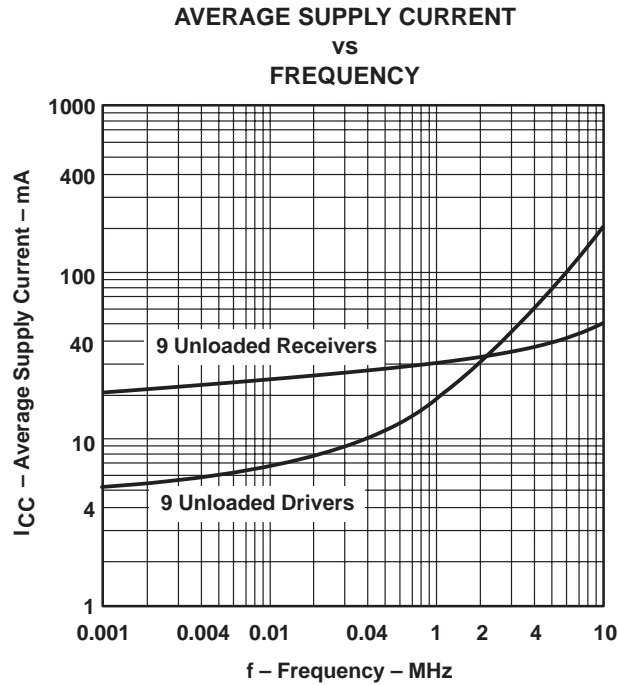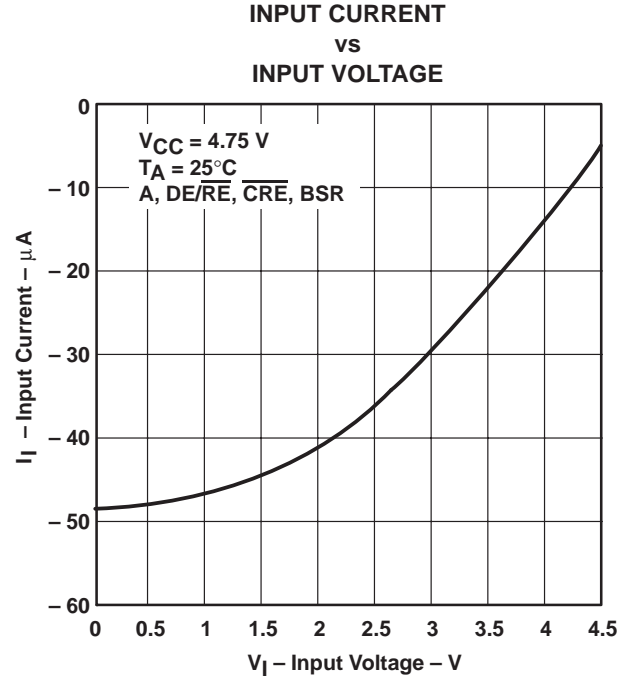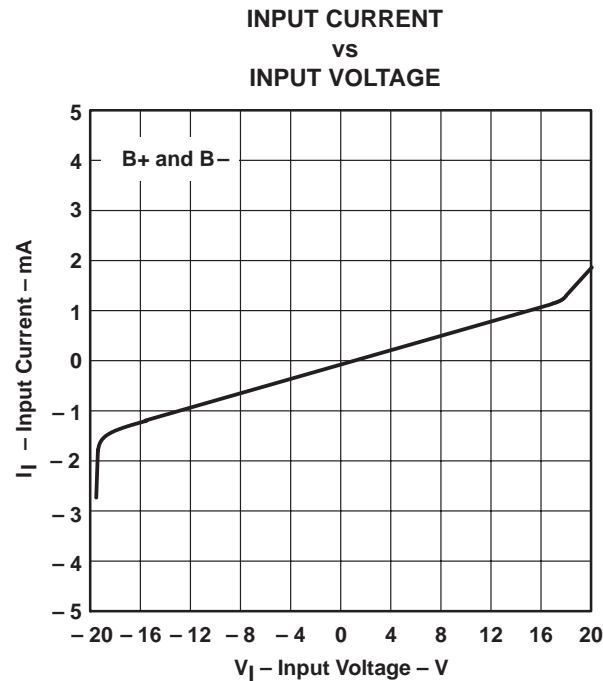
POST OFFICE BOX 655303 • DALLAS, TEXAS 75265

TYPICAL CHARACTERISTICS

AVERAGE SUPPLY CURRENT
vs
FREQUENCY

Figure 7

INPUT CURRENT
vs
INPUT VOLTAGE

Figure 8

INPUT CURRENT
vs
INPUT VOLTAGE

Figure 9

TYPICAL CHARACTERISTICS

**DRIVER
LOW-LEVEL OUTPUT VOLTAGE
vs
LOW-LEVEL OUTPUT CURRENT**

Figure 10

**DRIVER
HIGH-LEVEL OUTPUT VOLTAGE
vs
HIGH-LEVEL OUTPUT CURRENT**

Figure 11

**DRIVER
DIFFERENTIAL OUTPUT VOLTAGE
vs
OUTPUT CURRENT**

Figure 12

TEXAS INSTRUMENTS

POST OFFICE BOX 655303 ● DALLAS, TEXAS 75265

TYPICAL CHARACTERISTICS

DRIVER
LOW-LEVEL OUTPUT CURRENT
vs
SUPPLY VOLTAGE

Figure 13

DRIVER
HIGH-LEVEL OUTPUT CURRENT
vs
SUPPLY VOLTAGE

Figure 14

RECEIVER
HIGH-LEVEL OUTPUT VOLTAGE
vs
HIGH-LEVEL OUTPUT CURRENT

Figure 15

RECEIVER
LOW-LEVEL OUTPUT VOLTAGE
vs
LOW-LEVEL OUTPUT CURRENT

Figure 16

TYPICAL CHARACTERISTICS

DRIVER
DIFFERENTIAL OUTPUT VOLTAGE
vs
FREE-AIR TEMPERATURE

Figure 17

RECEIVER
PROPAGATION DELAY TIME
vs
FREE-AIR TEMPERATURE

Figure 18

DRIVER
PROPAGATION DELAY TIME
vs
FREE-AIR TEMPERATURE

Figure 19

TEXAS
INSTRUMENTS

POST OFFICE BOX 655303 ● DALLAS, TEXAS 75265
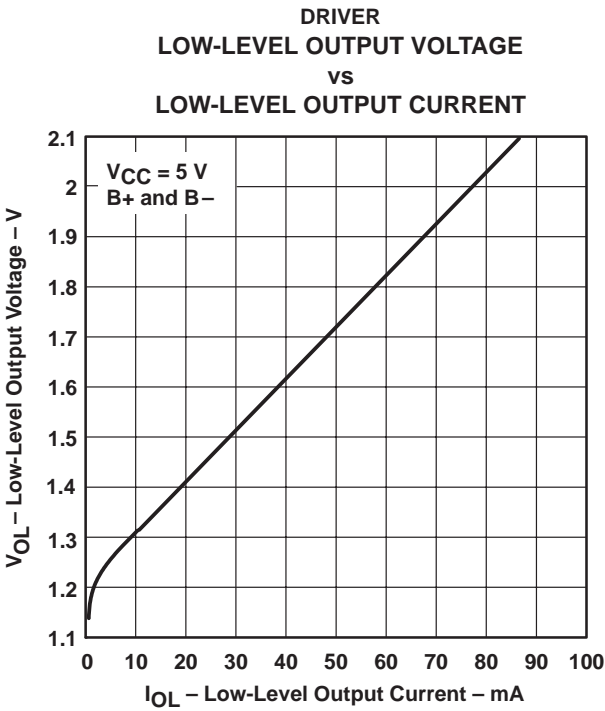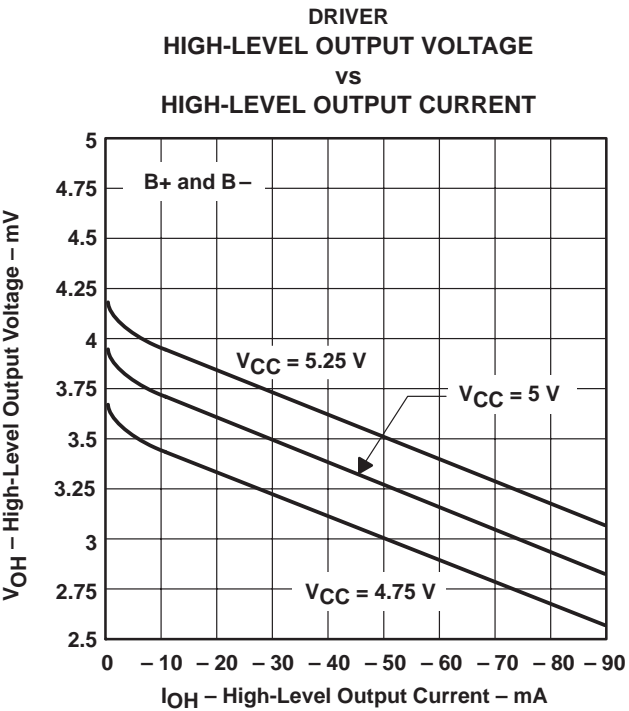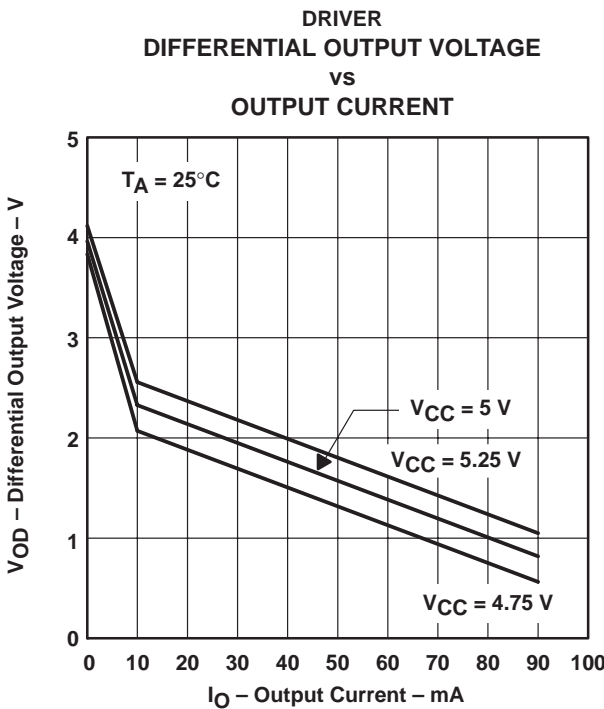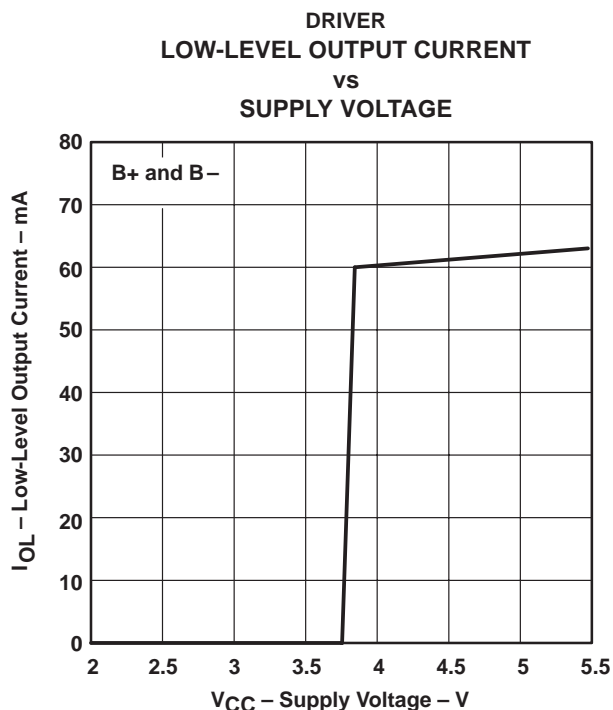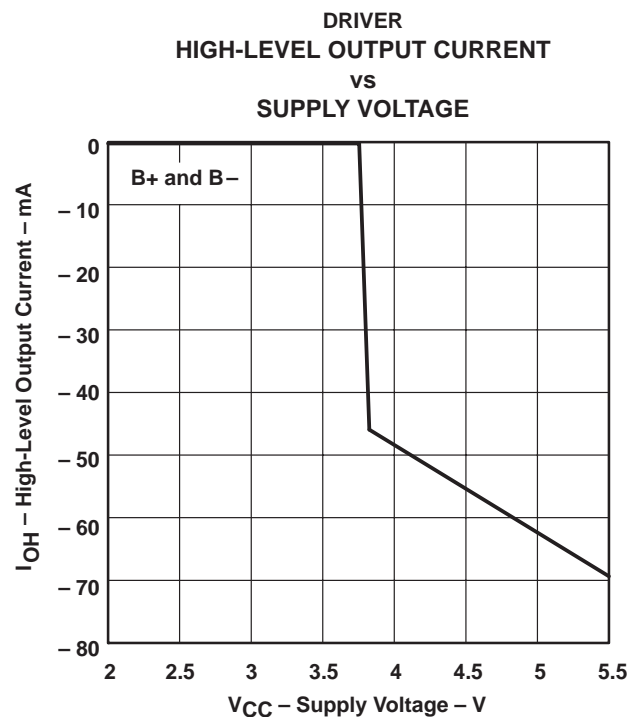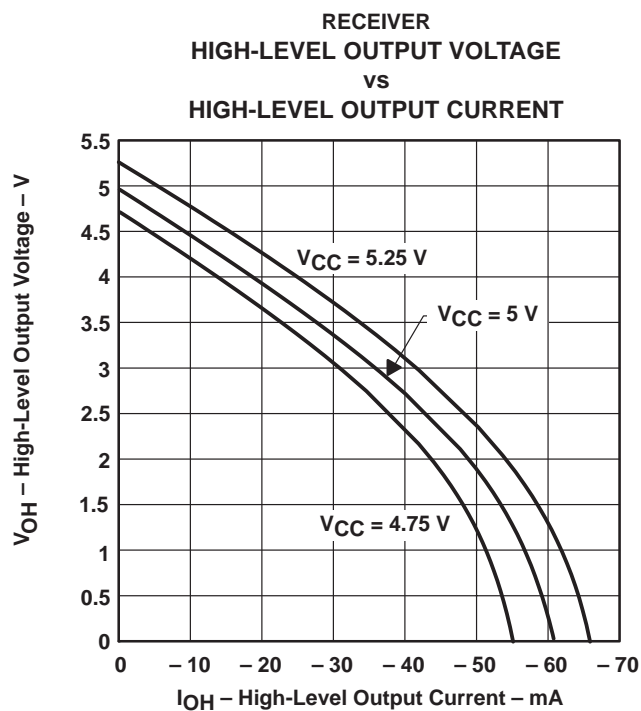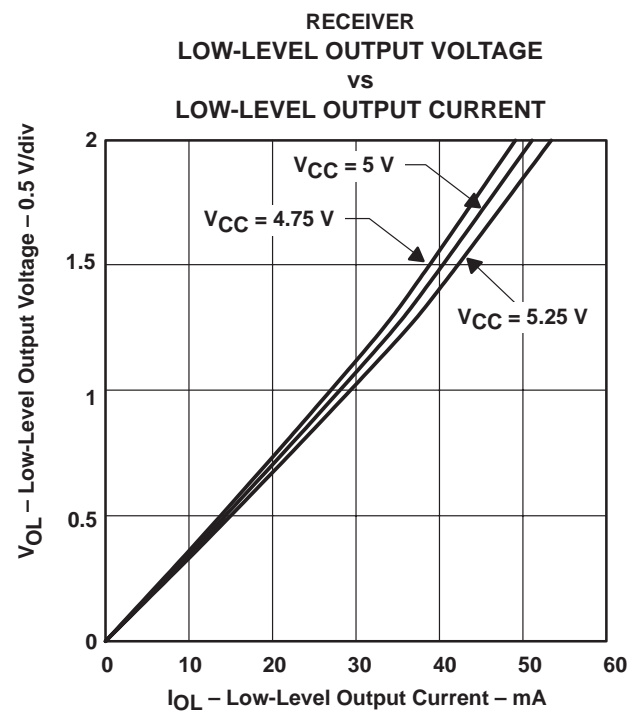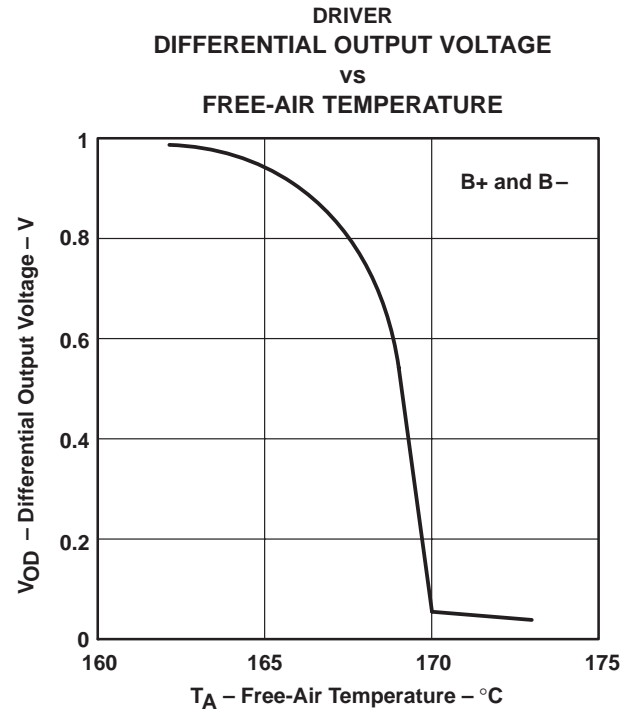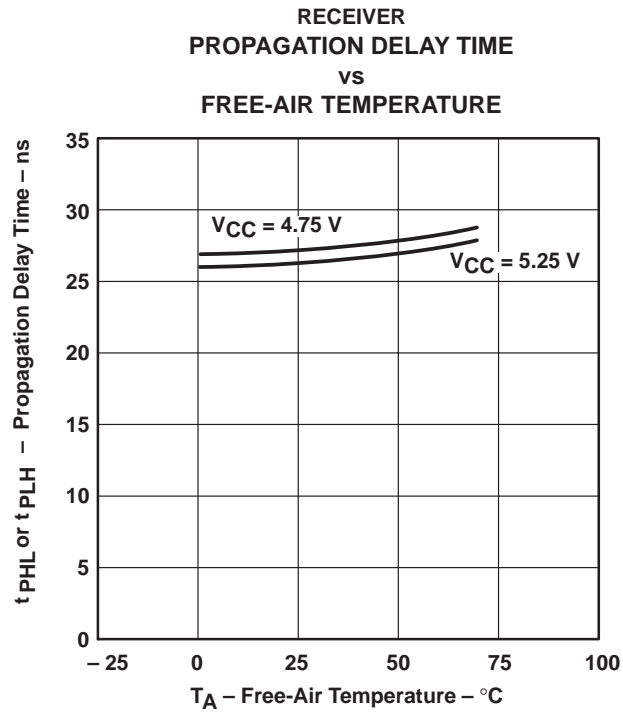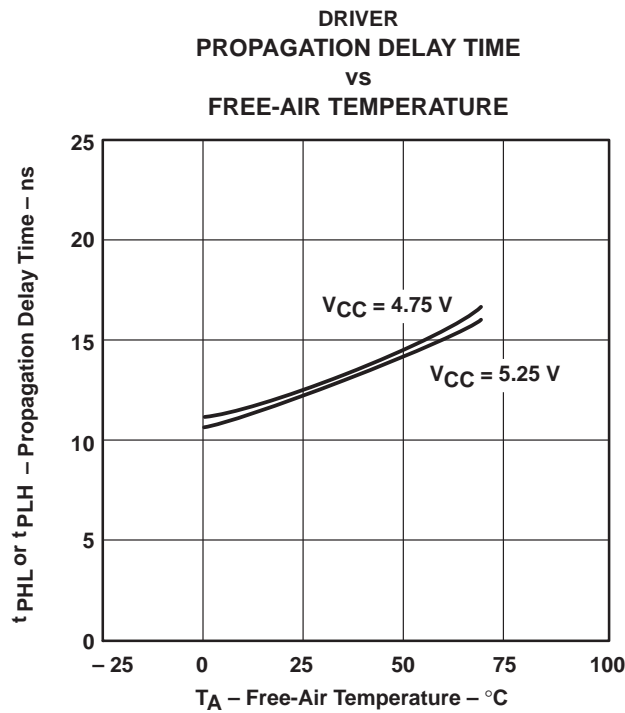
APPLICATION INFORMATION

Table 1. Typical Signal and Terminal Assignments

SIGNAL	TERMINAL	SCSI DATA	SCSI CONTROL	IPI DATA	IPI CONTROL
CDE0	54	DIFFSENSE	DIFFSENSE	V_{CC}	V_{CC}
CDE1	55	GND	GND	XMTA, XMTB	GND
CDE2	56	GND	GND	XMTA, XMTB	SLAVE/MASTER
BSR	2	GND	GND	GND, BSR	GND
$\overline{CRE}$	3	GND	GND	GND	V_{CC}
1A	4	DB0, DB8	ATN	AD7, BD7	NOT USED
1DE/$\overline{RE}$	5	DBE0, DBE8	INIT EN	GND	GND
2A	6	DB1, DB9	BSY	AD6, BD6	NOT USED
2DE/$\overline{RE}$	7	DBE1, DBE9	BSY EN	GND	GND
3A	8	DB2, DB10	ACK	AD5, BD5	SYNC IN
3DE/$\overline{RE}$	9	DBE2, DBE10	INIT EN	GND	GND
4A	10	DB3, DB11	RST	AD4, BD4	SLAVE IN
4DE/$\overline{RE}$	11	DBE3, DBE11	GND	GND	GND
5A	19	DB4, DB12	MSG	AD3, BD3	NOT USED
5DE/$\overline{RE}$	20	DBE4, DBE12	TARG EN	GND	GND
6A	21	DB5, DB13	SEL	AD2, BD2	SYNC OUT
6DE/$\overline{RE}$	22	DBE5, DBE13	SEL EN	GND	GND
7A	23	DB6, DB14	C/D	AD1, BD1	MASTER OUT
7DE/$\overline{RE}$	24	DBE6, DBE14	TARG EN	GND	GND
8A	25	DB7, DB15	REQ	AD0, BD0	SELECT OUT
8DE/$\overline{RE}$	26	DBE7, DBE15	TARG EN	GND	GND
9A	27	DBP0, DBP1	I/O	AP, BP	ATTENTION IN
9DE/$\overline{RE}$	28	DBPE0, DBPE1	TARG EN	XMTA, XMTB	V_{CC}

ABBREVIATIONS:

DBn, data bit n, where n = (0,1, . . . ,15)
DBEn, data bit n enable, where n = (0,1, . . . ,15)
DBP0, parity bit for data bits 0 through 7 or IPI bus A
DBPE0, parity bit enable for P0
DBP1, parity bit for data bits 8 through 15 or IPI bus B
DBPE1, parity bit enable for P1
ADn or BDn, IPI Bus A – Bit n (ADn) or Bus B – Bit n (BDn), where n = (0,1, . . . ,7)
AP or BP, IPI parity bit for bus A or bus B
XMTA or XMTB, transmit enable for IPI bus A or B
BSR, bit significant response
INIT EN, common enable for SCSI initiator mode
TARG EN, common enable for SCSI target mode

NOTE 3: Signal inputs are shown as active high. When only active-low inputs are available, logic inversion is accomplished by reversing the B+ and B– connecter terminal assignments.

APPLICATION INFORMATION

Function Tables

RECEIVER

INPUTS		OUTPUT
B+†	B−†	A
L	H	L
H	L	H

DRIVER

INPUT	OUTPUTS	
A	B+	B−
L	L	H
H	H	L

TRANSCEIVER

INPUTS				OUTPUTS		
DE/RE	A	B+†	B−†	A	B+	B−
L	–	L	H	L	–	–
L	–	H	L	H	–	–
H	L	–	–	–	L	H
H	H	–	–	–	H	L

DRIVER WITH ENABLE

INPUTS		OUTPUTS	
DE/RE	A	B+	B−
L	L	Z	Z
L	H	Z	Z
H	L	L	H
H	H	H	L

WIRED-OR DRIVER

INPUT	OUTPUTS	
A	B+	B−
L	Z	Z
H	H	L

TWO-ENABLE INPUT DRIVER

INPUTS		OUTPUTS	
DE/RE	A	B+	B−
L	L	Z	Z
L	H	H	L
H	L	L	H
H	H	H	L

H = high level,   L = low level,   X = irrelevant,   Z = high impedance (off)
† An H in this column represents a voltage that is 200 mV higher than the other bus input. An L represents a voltage that is 200 mV lower than the other bus input. Any voltage less than 200 mV results in an indeterminate receiver output.

APPLICATION INFORMATION
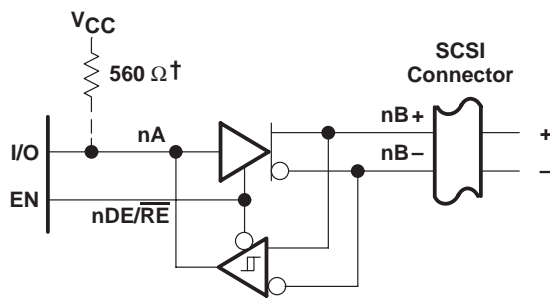
**(a) ACTIVE-HIGH BIDIRECTIONAL I/O
WITH SEPARATE ENABLE**
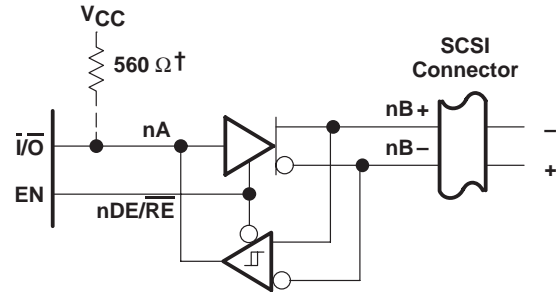
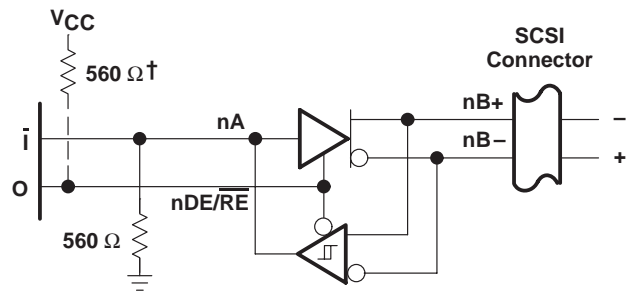**(b) ACTIVE-LOW BIDIRECTIONAL I/O
WITH SEPARATE ENABLE**
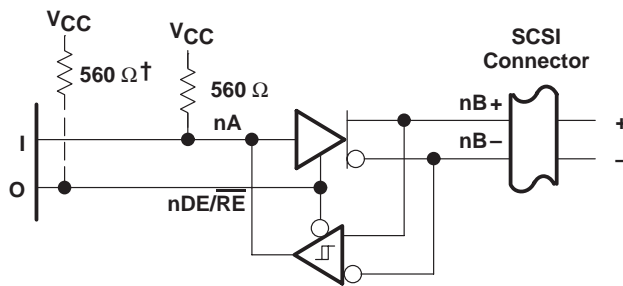
(c) WIRED-OR DRIVER AND ACTIVE-HIGH INPUT
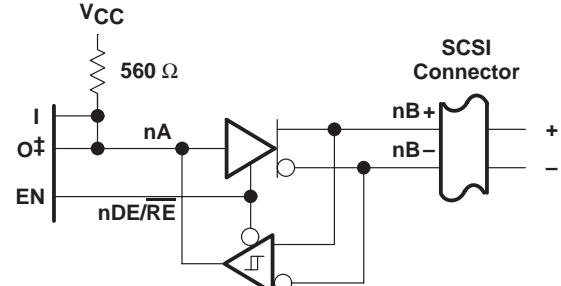
**(d) SEPARATE ACTIVE-HIGH INPUT, OUTPUT,
AND ENABLE**
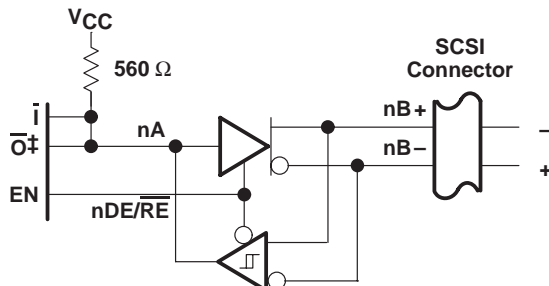
**(e) SEPARATE ACTIVE-LOW INPUT AND
OUTPUT AND ACTIVE-HIGH ENABLE**

(f) WIRED-OR DRIVER AND ACTIVE-LOW INPUT

† When this resistor is 0 Ω, the circuit is open drain.
‡ Must be open-drain or 3-state output
NOTE A: The BSR, $\overline{CRE}$, A, and DE/$\overline{RE}$ inputs have internal pullups. CDE0, CDE1, and CDE2 have internal pulldowns.

Figure 20. Typical SCSI Transceiver Connections

APPLICATION INFORMATION

channel logic configurations with control input logic

The following logic diagrams show the positive-logic representation for all combinations of control inputs. The control inputs are from MSB to LSB; the BSR, CDE0, CDE1, CDE2, and $\overline{\text{CRE}}$ bit values are shown below the diagrams. Channel 1 is at the top of the logic diagrams; channel 9 is at the bottom of the logic diagrams.
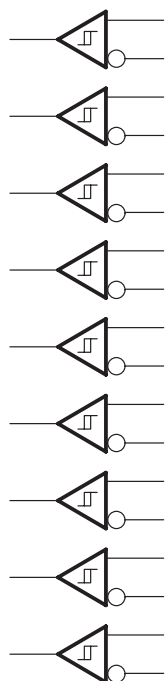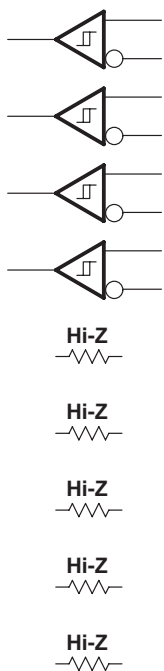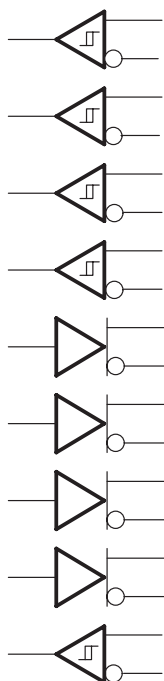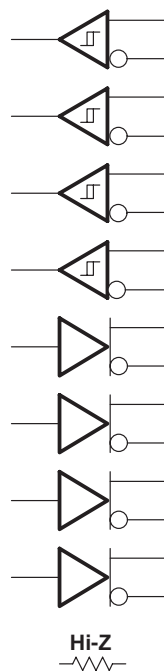
Figure 21. 00000	Figure 22. 00001	Figure 23. 00010	Figure 24. 00011	Figure 25. 00100

TEXAS
INSTRUMENTS

POST OFFICE BOX 655303 • DALLAS, TEXAS 75265
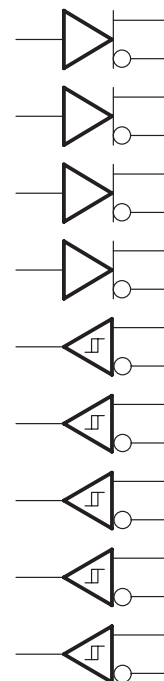
APPLICATION INFORMATION
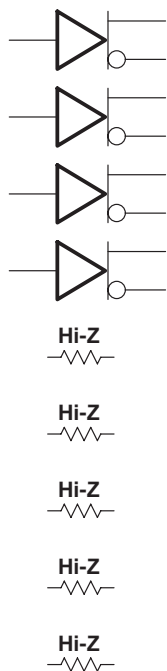
Figure 26. 00101
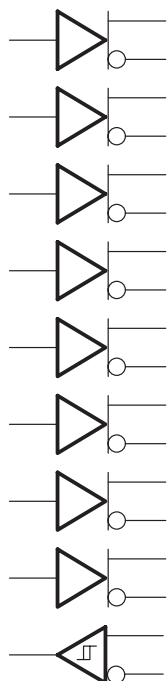
Figure 27. 00110
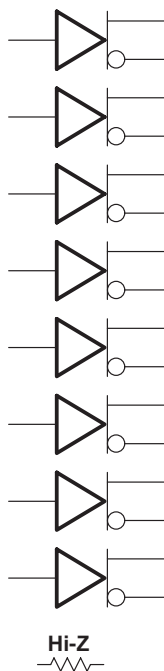
Figure 28. 00111

Figure 30. 01001
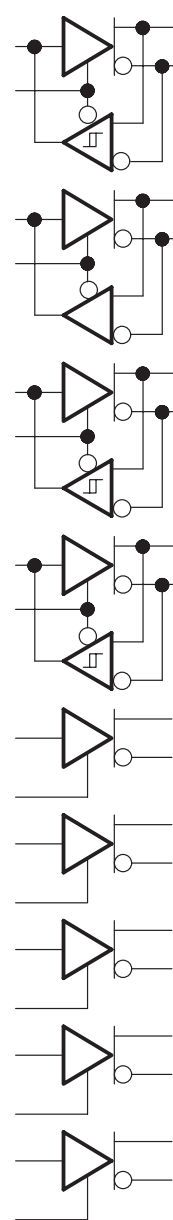
Figure 29. 01000

APPLICATION INFORMATION

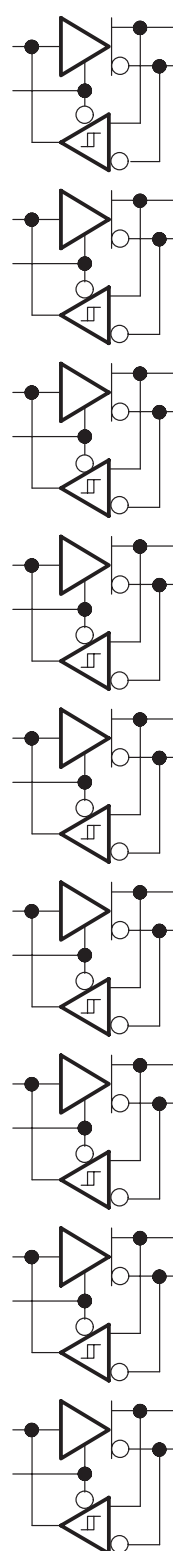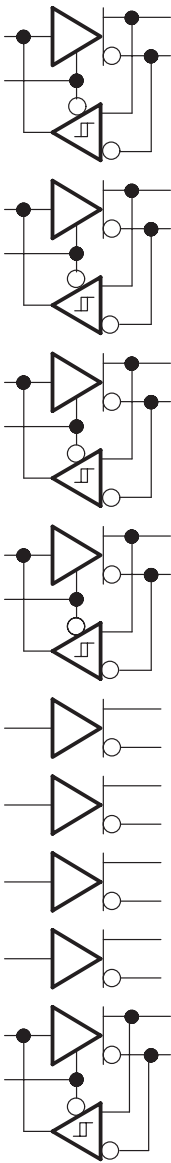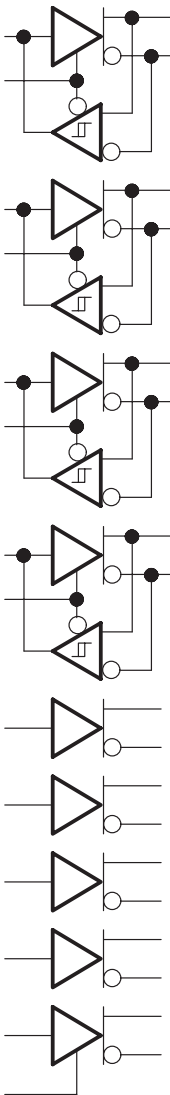**Figure 31. 01010**   **Figure 32. 01011**   **Figure 33. 01100**
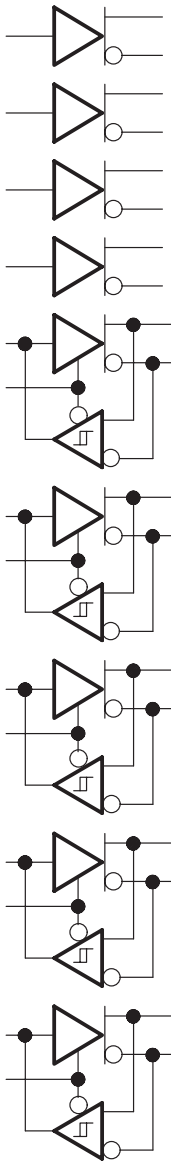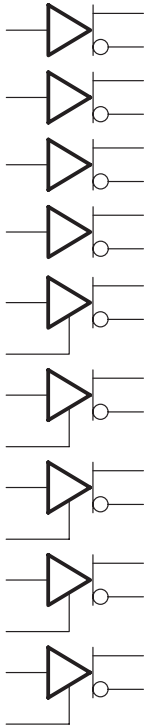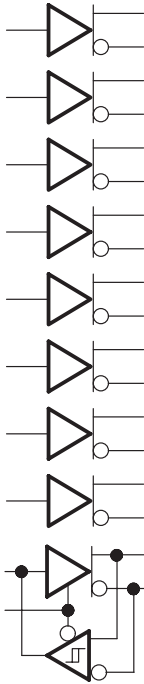
Figure 34. 01101   **Figure 35. 01110**

APPLICATION INFORMATION
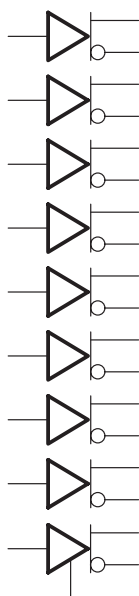
Figure 36. 01111

Figure 37.
10000
and 10001
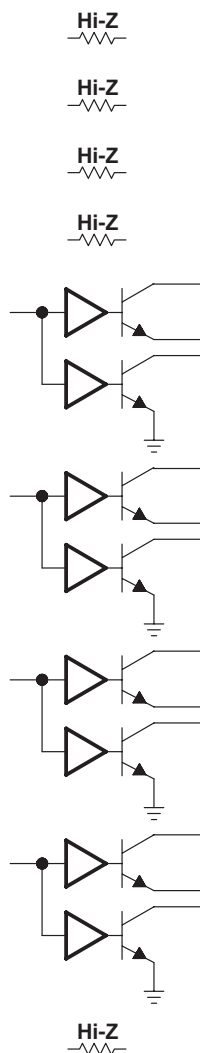
Figure 38. 10010
and 10011
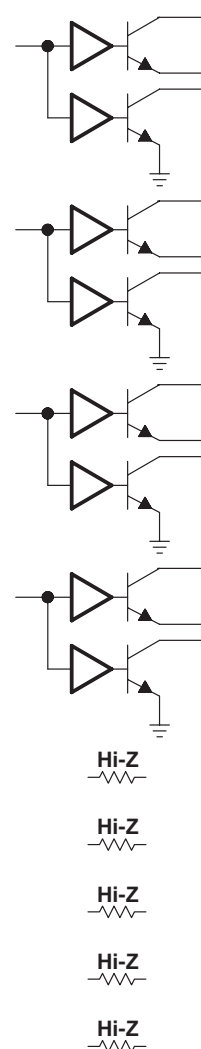
Figure 39. 10100
and 10101
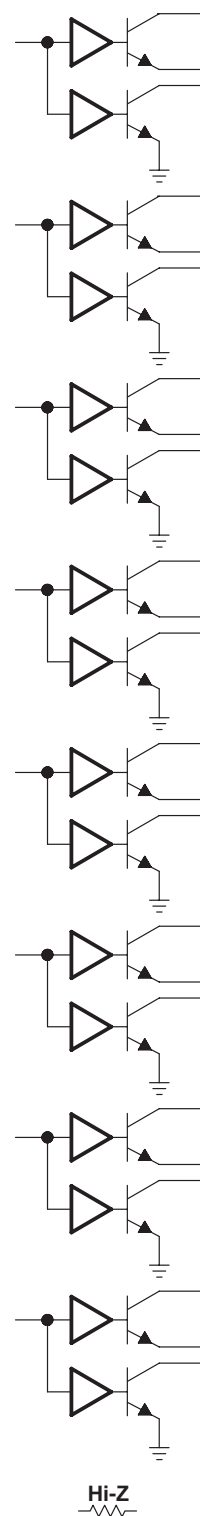
Figure 40. 10110
and 10111

APPLICATION INFORMATION
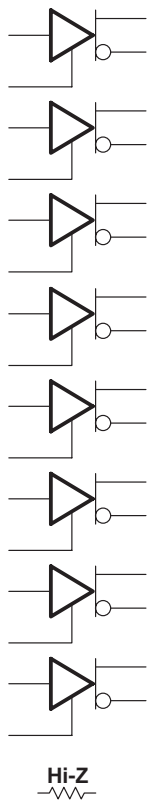
**Figure 41. 11000
and 11001**
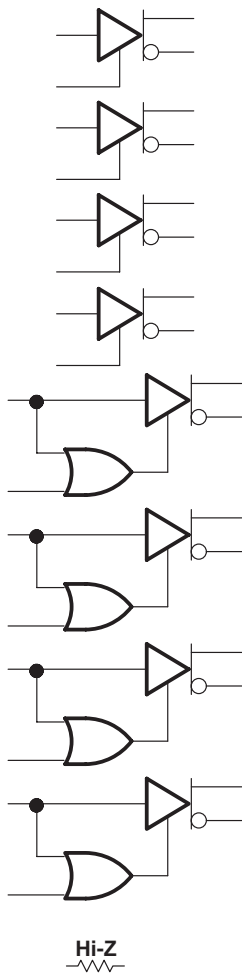
**Figure 42. 11010
and 11011**
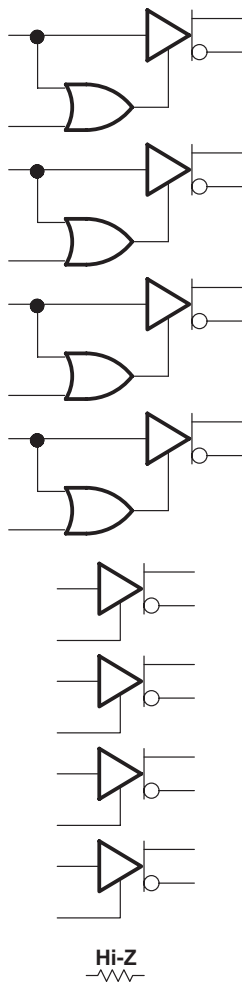
**Figure 43. 11100
and 11101**
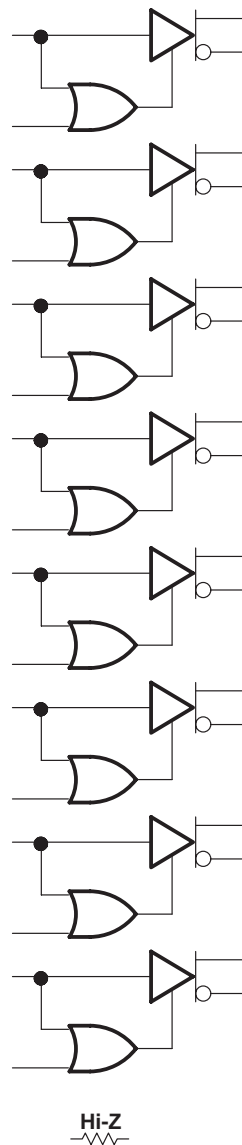
**Figure 44. 11110
and 11111**

TEXAS
INSTRUMENTS

POST OFFICE BOX 655303 • DALLAS, TEXAS 75265

MECHANICAL INFORMATION

WD (R-GDFP-F)**   **CERAMIC DUAL FLATPACK**

48 PIN SHOWN

NO. OF PINS**	A	
	MIN	**MAX**
48	0.630 (16,00)	0.730 (18,54)
56	0.610 (15,49)	0.710 (18,03)

0.120 (3,05)
0.075 (1,91)

0.005 (0,13) NOM

1.200 (30,50)
0.950 (24,13)

0.390 (9,91)
0.370 (9,40)

1   48

A

24   25

0.025 (0,64)

0.010 (0,25) TYP

4040176/B 03/95
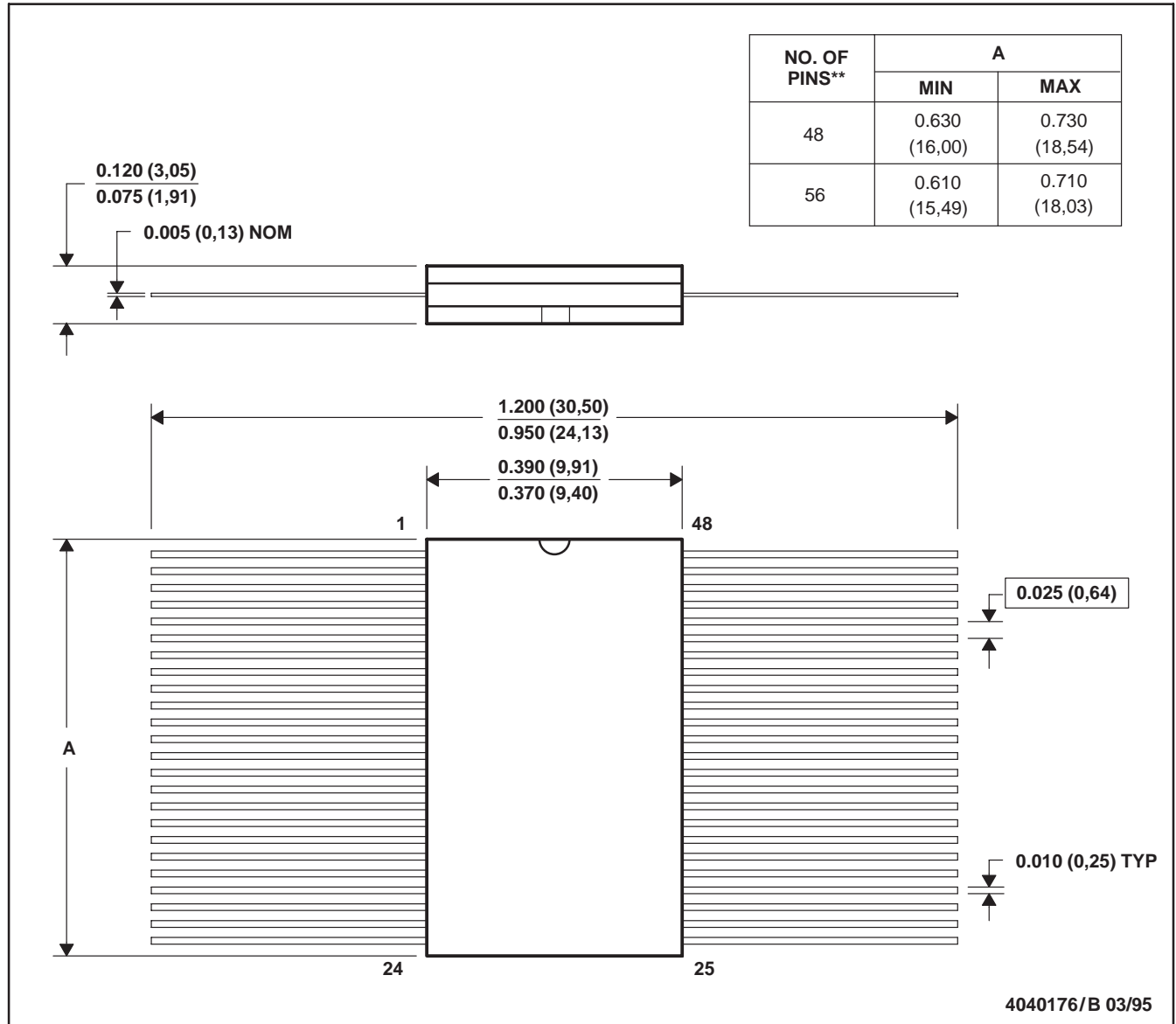
NOTES: A. All linear dimensions are in inches (millimeters).
      B. This drawing is subject to change without notice.
      C. This package can be hermetically sealed with a ceramic lid using glass frit.
      D. Index point is provided on cap for pin identification only
      E. Falls within MIL-STD-1835: GDFP1-F48 and JEDEC MO-146AA
                              GDFP1-F56 and JEDEC MO-146AB

TEXAS INSTRUMENTS

PACKAGING INFORMATION

Orderable Device	Status [1]	Package Type	Package Drawing	Pins	Package Qty	Eco Plan [2]	Lead/Ball Finish	MSL Peak Temp [3]
SNJ55LBC976WD	OBSOLETE	CFP	WD	56		TBD	Call TI	Call TI

[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.

OTHER QUALIFIED VERSIONS OF SN55LBC976 :
● Catalog: SN75LBC976

NOTE: Qualified Version Definitions:
 ● Catalog - TI's standard catalog product

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 TI 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. Information of third parties may be subject to additional restrictions.

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
Clocks and Timers	www.ti.com/clocks	Digital Control	www.ti.com/digitalcontrol
Interface	interface.ti.com	Medical	www.ti.com/medical
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
RFID	www.ti-rfid.com	Telephony	www.ti.com/telephony
RF/IF and ZigBee® Solutions	www.ti.com/lprf	Video & Imaging	www.ti.com/video
		Wireless	www.ti.com/wireless

Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265
Copyright © 2008, Texas Instruments Incorporated