

SNx5LBC180A 低功耗差分线路驱动器和接收器对

1 特性

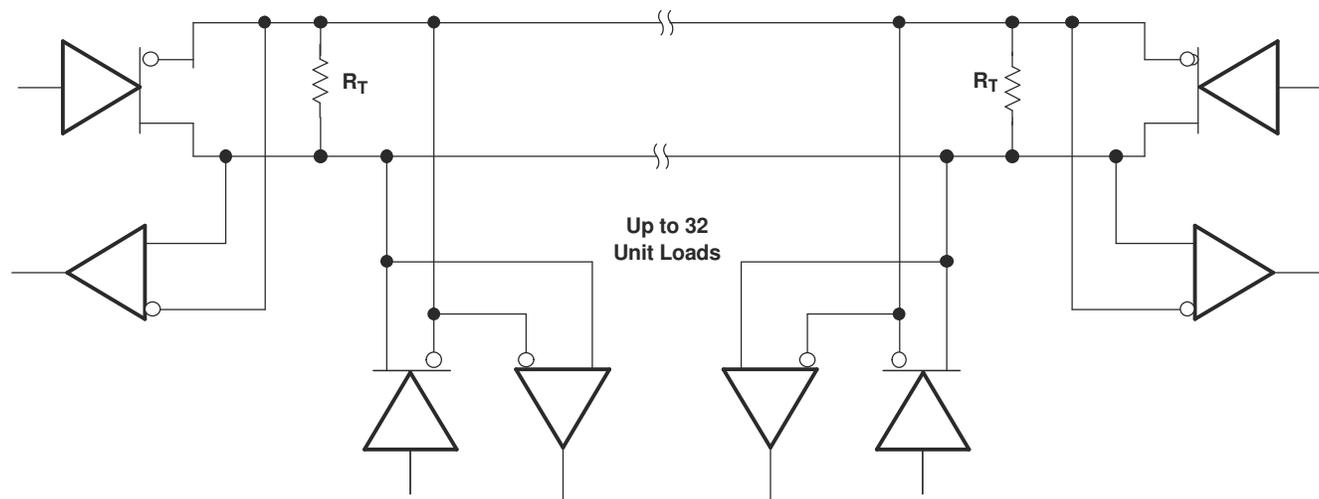
- 高速低功耗 LinBICMOS™ 电路专为高达 30Mbps 的信号传输速率⁽¹⁾ 而设计
- 总线引脚 ESD 保护 15kV HBM
- 低禁用电源电流要求：
700 μ A (最大值)
- 专为通过长电缆进行高速多点数据传输而设计
- -7V 至 12V 的共模电压范围
- 低电源电流：15 mA (最大值)
- 符合 ANSI 标准 TIA/EIA-485-A 和 ISO 8482:1987(E)
- 正负输出电流限制
- TIA/EIA-485-A 定义¹

2 说明

SN65LBC180A 和 SN75LBC180A 差分驱动器和接收器对是单片集成电路，设计用于通过具有传输线特性的长电缆进行双向数据通信。它们是符合 ANSI 标准 TIA/EIA-485-A 和 ISO 8482:1987(E) 的平衡或差分电压模

SN65LBC180A
SN75LBC180A

SN65LBC180A
SN75LBC180A



典型应用

式器件。与前代产品相比，A 版本可提供更高的开关性能，而不会显著降低功耗。

这些器件将一个差分线路驱动器和一个差分输入线路接收器组合在一起，这两个器件由一个 5V 电源供电。驱动器差分输出和接收器差分输入连接到单独的端子以实现全双工工作，并且用于在断电 ($V_{CC} = 0$) 时为总线提供最小负载。这些器件具有较宽的正负共模电压范围，因此适用于点对点或多点数据总线应用。这些器件还提供正负电流限制，避免出现线路故障状况。SN65LBC180A 的额定工作温度范围为 -40°C 至 85°C ，SN75LBC180A 的额定工作温度范围为 0°C 至 70°C 。

封装信息

器件型号	封装 ⁽¹⁾	封装尺寸 (标称值)
SN65LBC180ASN75LBC180A	D (SOIC)	4.9 mm x 3.91 mm
	N (PDIP)	9.81mm x 6.35mm

(1) 要了解所有可用封装，请见数据表末尾的可订购产品附录。

¹ 规定的驱动器热关断保护信号传输速率将转换时间限制在位持续时间的 30%，在没有此要求的情况下可以实现更高的信号传输速率，如此器件的典型特性所示。



3 Revision History

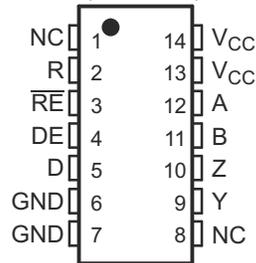
注：以前版本的页码可能与当前版本的页码不同

Changes from Revision D (April 2009) to Revision E (January 2023)	Page
• 将文档更改为了最新 TI 格式.....	1
• Added the <i>Pin Configuration and Functions</i>	3
• Added the <i>Thermal Information</i> table.....	5
• Changed the Typical Characteristics graphs.....	7

Changes from Revision C (June 2002) to Revision D (April 2009)	Page
• 从特性中删除了超出，并将 12kV 更改为了 15kV.....	1
• Deleted storage temperature and lead temperature from the absolute maximum ratings table.....	4
• Added receiver output current to the absolute maximum ratings table.....	4
• Changed the ESD rows in the absolute maximum ratings table.....	4

4 Pin Configuration and Functions

SN65LBC180AD (Marked as BL180A)
 SN65LBC180AN (Marked as 65LBC180A)
 SN75LBC180AD (Marked as LB180A)
 SN75LBC180AN (Marked as 75LBC180A)
 (TOP VIEW)



NC – No internal connection
 Pins 6 and 7 are connected together internally
 Pins 13 and 14 are connected together internally

表 4-1. Pin Functions

PIN		TYPE	DESCRIPTION
NAME	NO.		
NC	1, 8	No Connect	Not electrically connected
R	2	Digital Output	Logic output RS485 data
RE	3	Digital Input	Receiver enable, active low
DE	4	Digital Input	Driver enable, active high
D	5	Digital Input	Driver data input
GND	6, 7	Ground	Device ground
Y	9	Bus Output	Bus Output Y (Complementary to Z)
Z	10	Bus Output	Bus Output Z (Complementary to Y)
B	11	Bus Input	Bus Input B (Complementary to A)
A	12	Bus Input	Bus Input A (Complementary to B)
V _{CC}	13, 14	Power	5 V Supply

5 Reference

5.1 Absolute Maximum Ratings

over operating free-air temperature range (unless otherwise noted) ⁽¹⁾

			UNIT
V _{CC}	Supply voltage range ⁽²⁾		- 0.3 V to 6 V
V _I	Input voltage range	A, B	- 10 V to 15 V
	Voltage range	D, R, DE, RE	- 0.3 V to V _{CC} + 0.5 V
I _O	Receiver output current		±10 mA
	Continuous total power dissipation ⁽³⁾		Internally limited
	Total power dissipation		See Dissipation Rating Table
ESD	Bus terminals and GND	HBM (Human Body Model) EIA/JESD22-A114 ⁽⁴⁾	±15 kV
	All pins	HBM (Human Body Model) EIA/JESD22-A114 ⁽⁴⁾	±3 kV
		MM (Machine Model) EIA/JESD22-A115	±400 V
		CDM (Charge Device Model) EIA/JESD22-C101	±1.5 kV

- (1) 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.
- (2) All voltage values are with respect to GND except for differential input or output voltages.
- (3) The maximum operating junction temperature is internally limited. Use the dissipation rating table to operate below this temperature.
- (4) Tested in accordance with MIL-STD-883C, Method 3015.7.

5.2 Dissipation Ratings

PACKAGE	T _A ≤ 25°C POWER RATING	DERATING FACTOR ⁽¹⁾ ABOVE T _A = 25°C	T _A = 70°C POWER RATING	T _A = 85°C POWER RATING
D	950 mW	7.6 mW/°C	608 mW	494 mW
N	1150 mW	9.2 mW/°C	736 mW	598 mW

- (1) This is the inverse of the junction-to-ambient thermal resistance when board-mounted and with no air flow.

5.3 RECOMMENDED OPERATING CONDITIONS

			MIN	NOM	MAX	UNIT
V _{CC}	Supply voltage		4.75	5	5.25	V
V _{IH}	High-level input voltage	D, DE, and RE	2		V _{CC}	V
V _{IL}	Low-level input voltage	D, DE, and RE	0		0.8	V
V _{ID}	Differential input voltage ⁽¹⁾		- 12 ⁽²⁾		12	V
V _O	Voltage at any bus terminal (separately or common mode)	A, B, Y, or Z	- 7		12	V
V _I						
V _{IC}						
I _{OH}	High-level output current	Y or Z	- 60			mA
		R	- 8			
I _{OL}	Low-level output current	Y or Z			60	mA
		R			8	
T _A	Operating free-air temperature	SN65LBC180A	- 40		85	°C
		SN75LBC180A	0		70	

- (1) Differential input/output bus voltage is measured at the noninverting terminal with respect to the inverting terminal.
- (2) The algebraic convention, where the least positive (more negative) limit is designated minimum, is used in this data sheet.

5.4 Thermal Information

THERMAL METRIC ⁽¹⁾		N (PDIP)	D (SOIC) SN75 Devices	D (SOIC) SN65 Devices	UNIT
		14-Pins	14-Pins	14-Pins	
$R_{\theta JA}$	Junction-to-ambient thermal resistance	54.2	88.6	93.2	°C/W
$R_{\theta JB}$	Junction-to-board thermal resistance	41.6	49.12	49.4	°C/W
ψ_{JT}	Junction-to-top characterization parameter	34.0	14.17	11.2	°C/W
ψ_{JB}	Junction-to-board characterization parameter	21.1	48.6	48.9	°C/W
$R_{\theta JC(bot)}$	Junction-to-case (bottom) thermal resistance	N/A	N/A	N/A	°C/W

(1) For more information about traditional and new thermal metrics, see the [Semiconductor and IC package thermal metrics](#) application report.

5.5 Driver Electrical Characteristics

over recommended operating conditions (unless otherwise noted)

PARAMETER		TEST CONDITIONS		MIN	TYP ⁽¹⁾	MAX	UNIT
V_{IK}	Input clamp voltage	$I_I = -18 \text{ mA}$		-1.5	-0.8		V
$ V_{OD} $	Differential output voltage magnitude	$R_L = 54 \Omega$, See 图 6-1	SN65LBC180A	1	1.5	3	V
			SN75LBC180A	1.1	1.5	3	
		$R_L = 60 \Omega$, See 图 6-2	SN65LBC180A	1	1.5	3	V
			SN75LBC180A	1.1	1.5	3	
$\Delta V_{OD} $	Change in magnitude of differential output voltage ⁽²⁾	See 图 6-1 and 图 6-2		-0.2		0.2	V
$V_{OC(ss)}$	Steady-state common-mode output voltage	See 图 6-1		1.8	2.4	2.8	V
ΔV_{OC}	Change in steady-state common-mode output voltage ⁽²⁾			-0.1		0.1	V
I_O	Output current with power off	$V_{CC} = 0$,	$V_O = -7 \text{ V to } 12 \text{ V}$	-10		10	μA
I_{IH}	High-level input current	$V_I = 2 \text{ V}$		-100			μA
I_{IL}	Low-level input current	$V_I = 0.8 \text{ V}$		-100			μA
I_{OS}	Short-circuit output current	$-7 \text{ V} \leq V_O \leq 12 \text{ V}$		-250	± 70	250	mA
I_{CC}	Supply current	$V_I = 0$ or V_{CC} , No load	Receiver disabled and driver enabled		5.5	9	mA
			Receiver disabled and driver disabled		0.5	1	
			Receiver enabled and driver enabled		8.5	15	

(1) All typical values are at $V_{CC} = 5 \text{ V}$, $T_A = 25^\circ\text{C}$.

(2) $\Delta |V_{OD}|$ and $\Delta |V_{OC}|$ are the changes in the steady-state magnitude of V_{OD} and V_{OC} , respectively, that occur when the input is changed from a high level to a low level.

5.6 Driver Switching Characteristics

over recommended operating conditions (unless otherwise noted)

PARAMETER		TEST CONDITIONS	MIN	TYP	MAX	UNIT
t_{PLH}	Propagation delay time, low-to-high-level output	$R_L = 54 \Omega$, $C_L = 50 \text{ pF}$, See 图 6-3	2	6	12	ns
t_{PHL}	Propagation delay time, high-to-low-level output		2	6	12	ns
$t_{sk(p)}$	Pulse skew ($ t_{PLH} - t_{PHL} $)		0.3	1	ns	
t_r	Differential output signal rise time		4	7.5	11	ns
t_f	Differential output signal fall time		4	7.5	11	ns
t_{PZH}	Propagation delay time, high-impedance-to-high-level output	$R_L = 110 \Omega$, See 图 6-4		12	22	ns
t_{PZL}	Propagation delay time, high-impedance-to-low-level output	$R_L = 110 \Omega$, See 图 6-5		12	22	ns
t_{PHZ}	Propagation delay time, high-level-to-high-impedance output	$R_L = 110 \Omega$, See 图 6-4		12	22	ns
t_{PLZ}	Propagation delay time, low-level-to-high-impedance output	$R_L = 110 \Omega$, See 图 6-5		12	22	ns

5.7 Receiver Electrical Characteristics

over recommended operating conditions (unless otherwise noted)

PARAMETER		TEST CONDITIONS	MIN	TYP ⁽¹⁾	MAX	UNIT
V_{IT+}	Positive-going input threshold voltage	$I_O = -8 \text{ mA}$			0.2	V
V_{IT-}	Negative-going input threshold voltage	$I_O = 8 \text{ mA}$	-0.2			V
V_{hys}	Hysteresis voltage ($V_{IT+} - V_{IT-}$)			50		mV
V_{IK}	Enable-input clamp voltage	$I_I = -18 \text{ mA}$	-1.5	-0.8		V
V_{OH}	High-level output voltage	$V_{ID} = 200 \text{ mV}$, $I_{OH} = -8 \text{ mA}$	4	4.9		V
V_{OL}	Low-level output voltage	$V_{ID} = -200 \text{ mV}$, $I_{OL} = 8 \text{ mA}$		0.1	0.8	V
I_{OZ}	High-impedance-state output current	$V_O = 0 \text{ V to } V_{CC}$	-1		1	μA
I_{IH}	High-level enable-input current	$V_{IH} = 2.4 \text{ V}$	-100			μA
I_{IL}	Low-level enable-input current	$V_{IL} = 0.4 \text{ V}$	-100			μA
I_I	Bus input current	$V_I = 12 \text{ V}$, $V_{CC} = 5 \text{ V}$	Other input at 0 V	0.4	1	mA
		$V_I = 12 \text{ V}$, $V_{CC} = 0$		0.5	1	
		$V_I = -7 \text{ V}$, $V_{CC} = 5 \text{ V}$		-0.8	-0.4	
		$V_I = -7 \text{ V}$, $V_{CC} = 0$		-0.8	-0.3	
I_{CC}	Supply current	$V_I = 0 \text{ or } V_{CC}$, No load	Receiver enabled and driver disabled	4.5	7.5	mA
			Receiver disabled and driver disabled	0.5	1	
			Receiver enabled and driver enabled	8.5	15	

(1) All typical values are at $V_{CC} = 5 \text{ V}$ and $T_A = 25^\circ\text{C}$.

5.8 Receiver Switching Characteristics

over recommended operating conditions (unless otherwise noted)

PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
t_{PLH} Propagation delay time, low-to-high-level output	$V_{ID} = -1.5\text{ V to }1.5\text{ V}$, See 图 6-7	7	13	20	ns
t_{PHL} Propagation delay time, high-to-low-level output		7	13	20	ns
$t_{sk(p)}$ Pulse skew ($ t_{PHL} - t_{PLH} $)		0.5	1.5		ns
t_r Output signal rise time		2.1	3.3		ns
t_f Output signal fall time	See 图 6-7	2.1	3.3		ns
t_{PZH} Output enable time to high level	$C_L = 10\text{ pF}$, See 图 6-8		30	45	ns
t_{PZL} Output enable time to low level			30	45	ns
t_{PHZ} Output disable time from high level			20	40	ns
t_{PLZ} Output disable time from low level			20	40	ns

Typical Characteristics

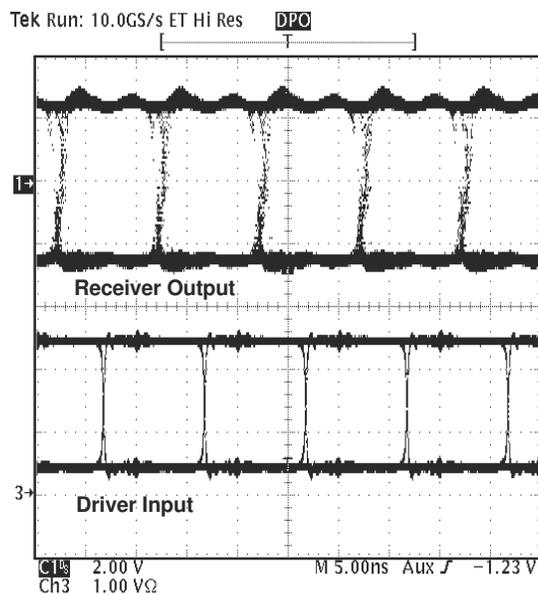


图 5-1. Typical Waveform of Nonreturn-to-Zero (NRZ), Pseudorandom Binary Sequence (PRBS) Data at 100 Mbps Through 15m, of CAT 5 Unshielded Twisted Pair (UTP) Cable

TIA/EIA-485-A defines a maximum signaling rate as that in which the transition time of the voltage transition of a logic-state change remains less than or equal to 30% of the bit length. Transition times of greater length perform quite well even though they do not meet the standard by definition.

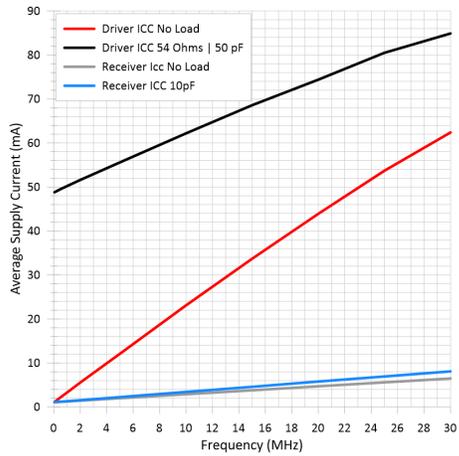


图 5-2. Average Supply Current vs Frequency

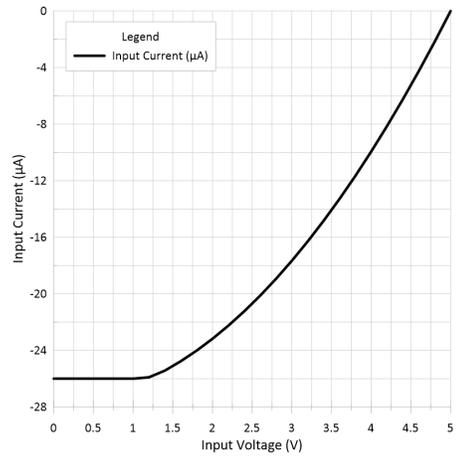


图 5-3. Logic Input Current vs Input Voltage

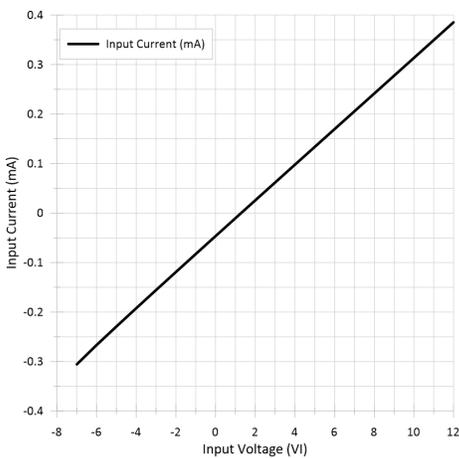


图 5-4. Bus Input Current vs Input Voltage

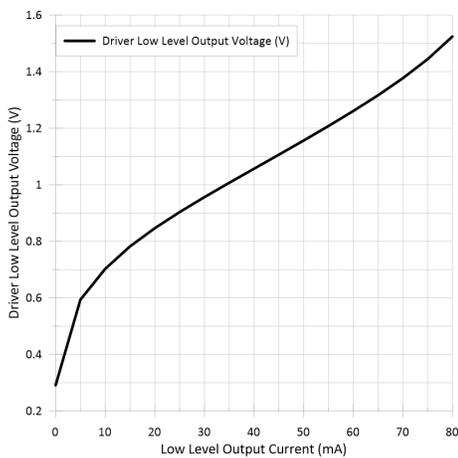


图 5-5. Driver Low-Level Output Voltage vs Low-Level Output Current

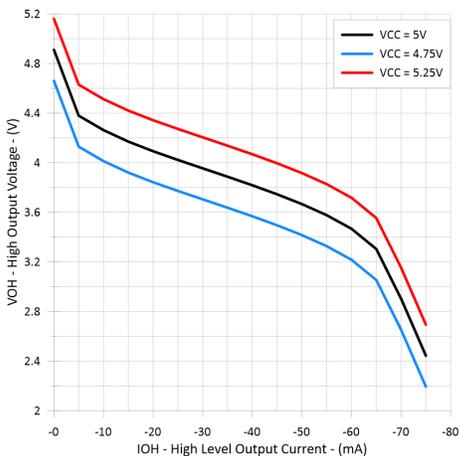


图 5-6. Driver High-Level Output Voltage vs High-Level Output Current

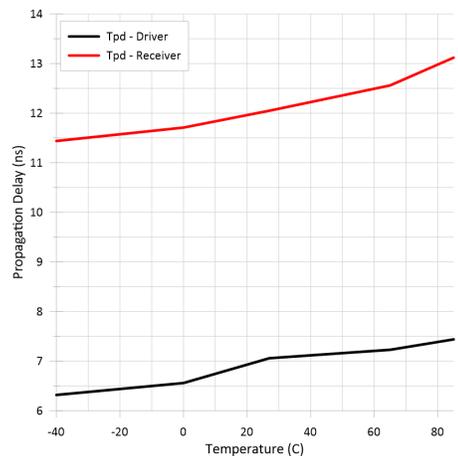


图 5-7. Propagation Delay Time vs Case Temperature

Parameter Measurement Information

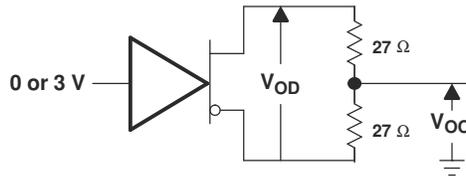


图 6-1. Driver V_{OD} and V_{OC}

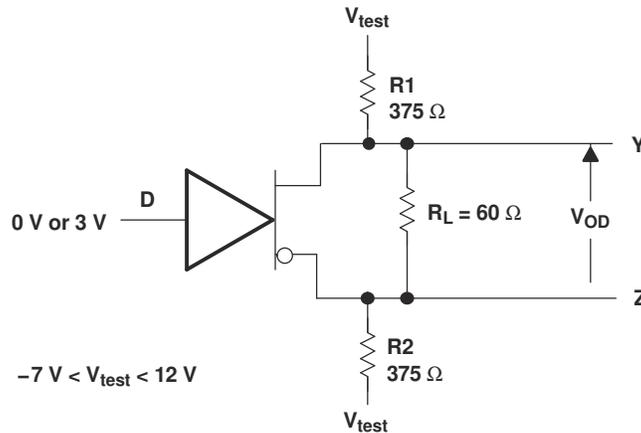
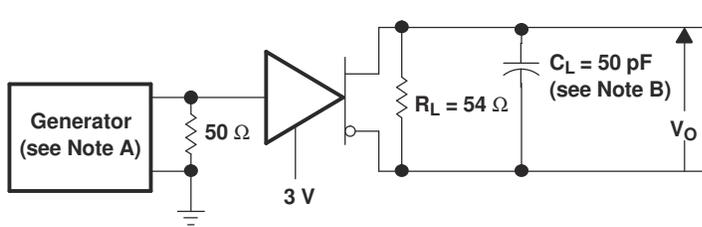
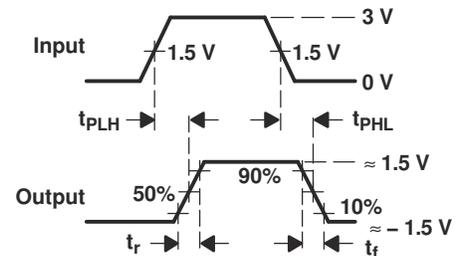


图 6-2. Driver V_{OD}



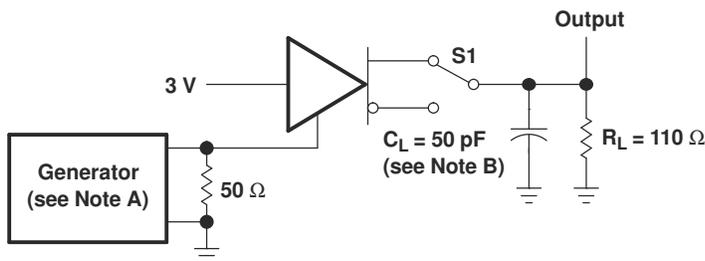
TEST CIRCUIT



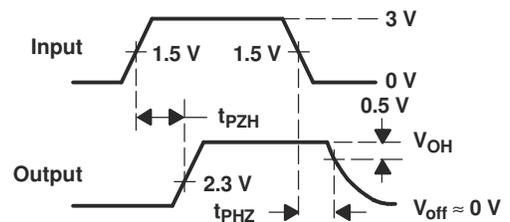
VOLTAGE WAVEFORMS

- A. The input pulse is supplied by a generator having the following characteristics: $PRR \leq 1$ MHz, 50% duty cycle, $t_r \leq 6$ ns, $t_f \leq 6$ ns, $Z_0 = 50 \Omega$.
- B. C_L includes probe and jig capacitance.

图 6-3. Driver Test Circuit and Voltage Waveforms



TEST CIRCUIT

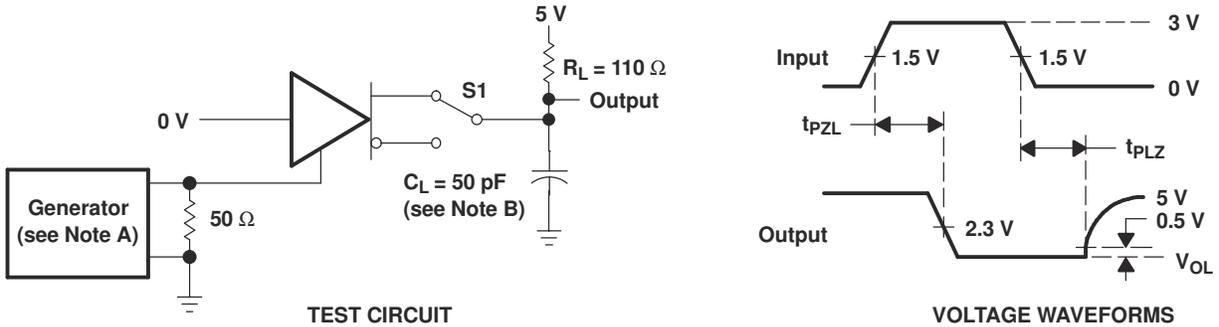


VOLTAGE WAVEFORMS

- A. The input pulse is supplied by a generator having the following characteristics: $PRR \leq 1$ MHz, 50% duty cycle, $t_r \leq 6$ ns, $t_f \leq 6$ ns, $Z_0 = 50 \Omega$.

B. C_L includes probe and jig capacitance.

图 6-4. Driver Test Circuit and Voltage Waveforms



- A. The input pulse is supplied by a generator having the following characteristics: $PRR \leq 1$ MHz, 50% duty cycle, $t_r \leq 6$ ns, $t_f \leq 6$ ns, $Z_0 = 50 \Omega$.
- B. C_L includes probe and jig capacitance.

图 6-5. Driver Test Circuit and Voltage Waveforms

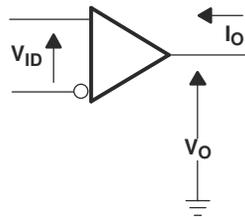
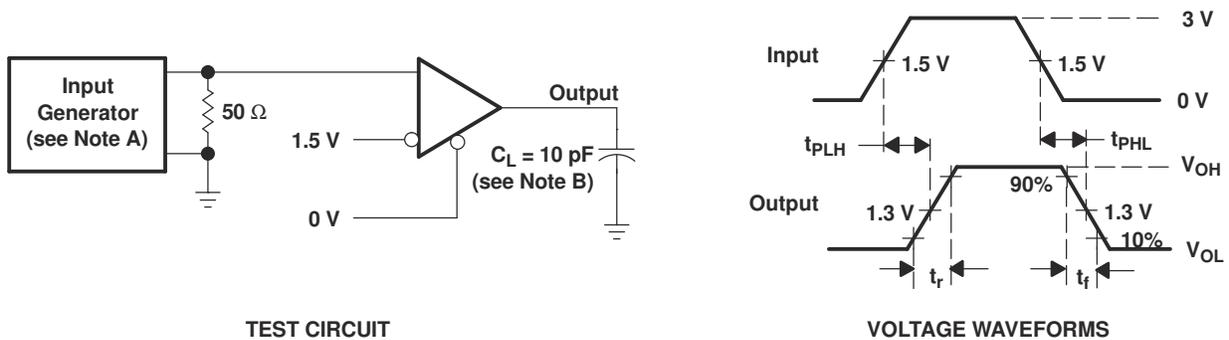
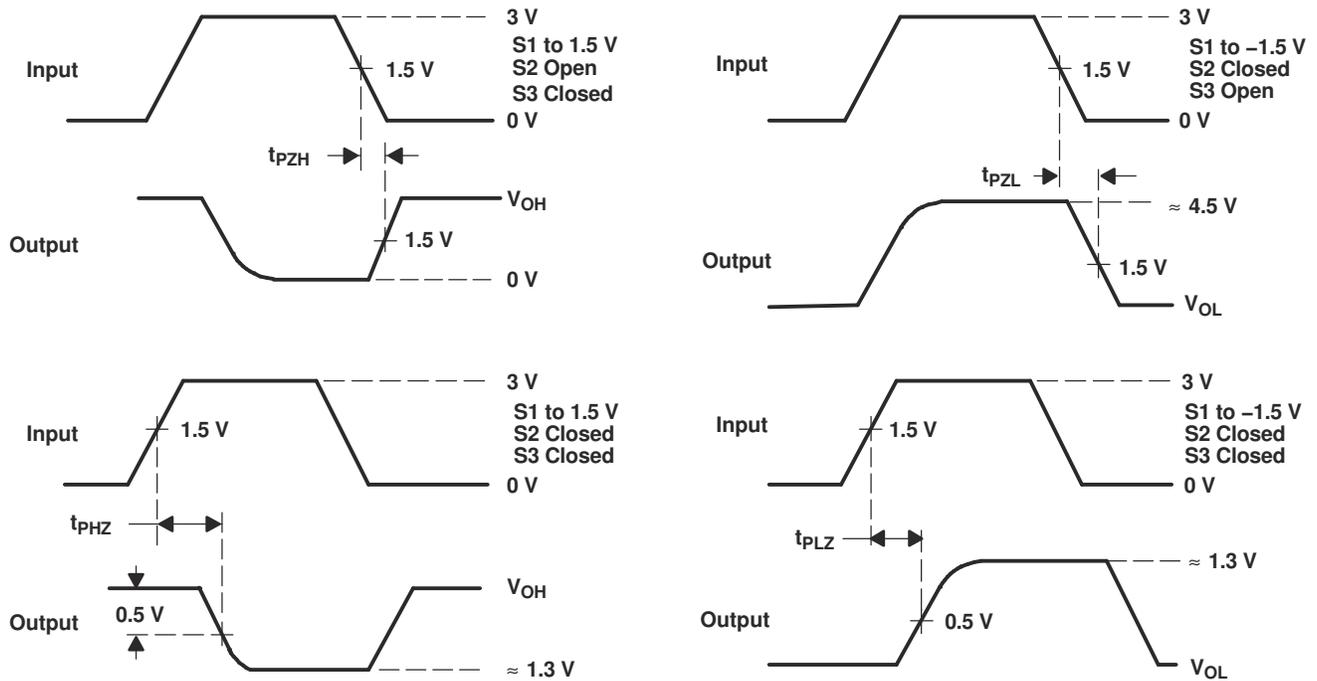
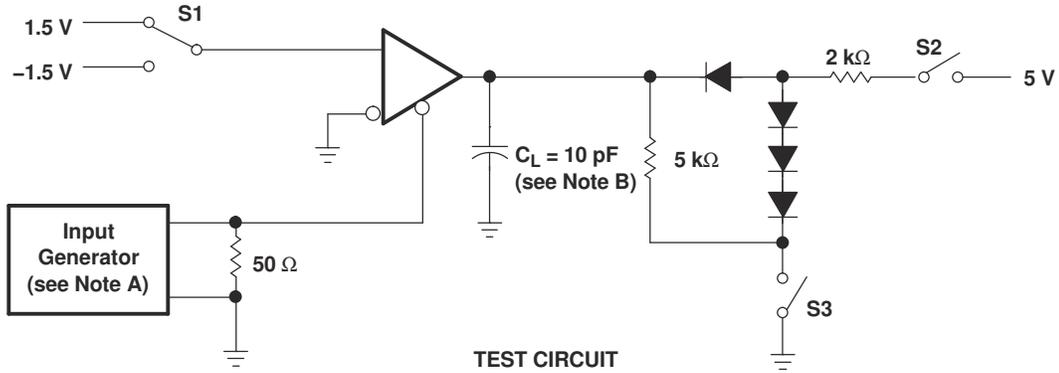


图 6-6. Receiver V_{OH} and V_{OL}



- A. The input pulse is supplied by a generator having the following characteristics: $PRR \leq 1$ MHz, 50% duty cycle, $t_r \leq 6$ ns, $t_f \leq 6$ ns, $Z_0 = 50 \Omega$.
- B. C_L includes probe and jig capacitance.

图 6-7. Receiver Test Circuit and Voltage Waveforms



VOLTAGE WAVEFORMS

- A. The input pulse is supplied by a generator having the following characteristics: $PRR \leq 1 \text{ MHz}$, 50% duty cycle, $t_r \leq 6 \text{ ns}$, $t_f \leq 6 \text{ ns}$, $Z_O = 50 \Omega$.
- B. C_L includes probe and jig capacitance.

图 6-8. Receiver Output Enable and Disable Times

6 Detailed Description

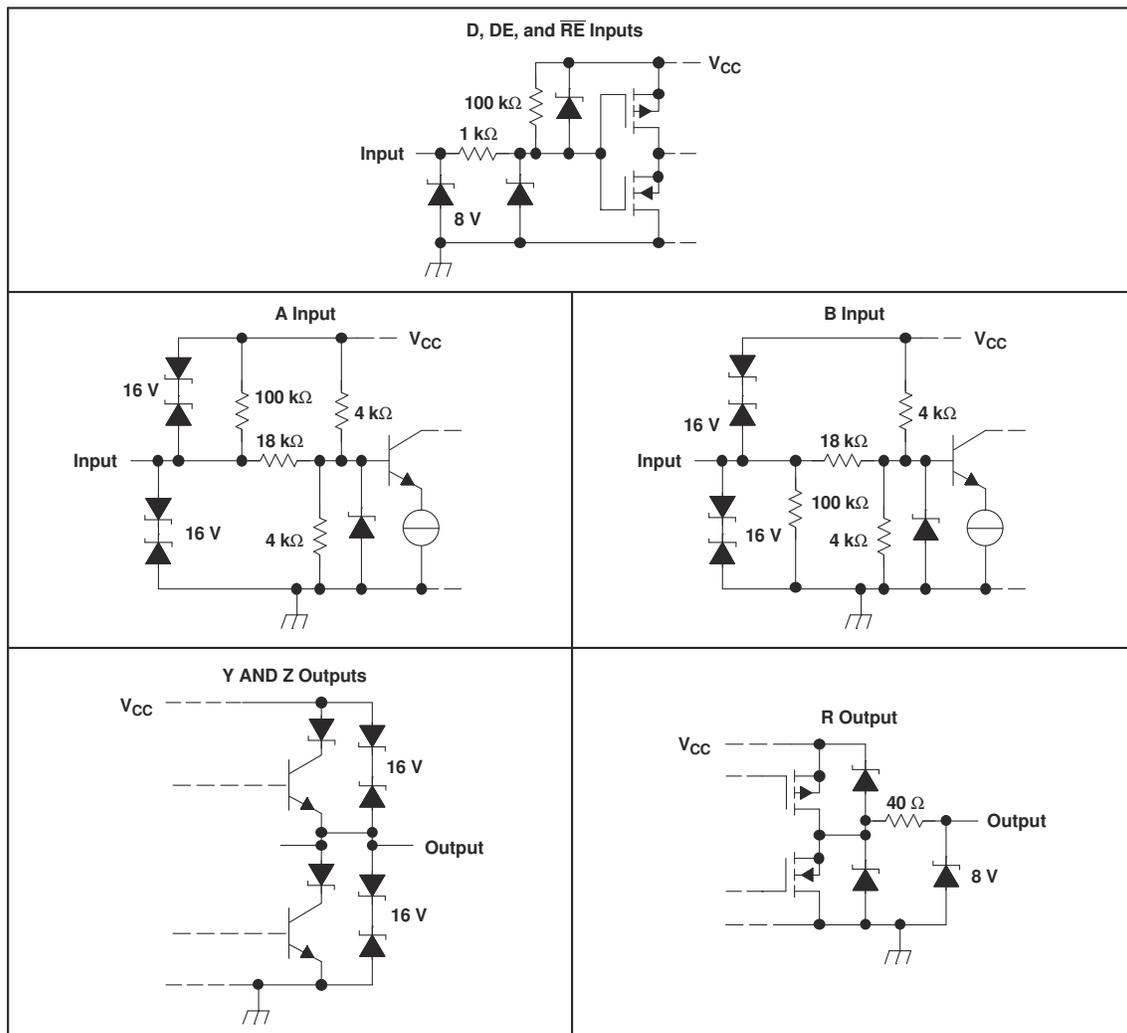
6.1 Device Functional Modes

6.1.1 Functional Tables

DRIVER ⁽¹⁾				RECEIVER		
INPUT D	ENABLE DE	OUTPUTS		DIFFERENTIAL INPUTS A - B	ENABLE RE	OUTPUT R
		Y	Z			
H	H	H	L	$V_{ID} \geq 0.2 V$	L	H
L	H	L	H	$-0.2 V < V_{ID} < 0.2 V$	L	?
X	L	Z	Z	$V_{ID} \leq -0.2 V$	L	L
X	L	Z	Z	X	H	Z
OPEN	H	H	L	Open circuit	L	H

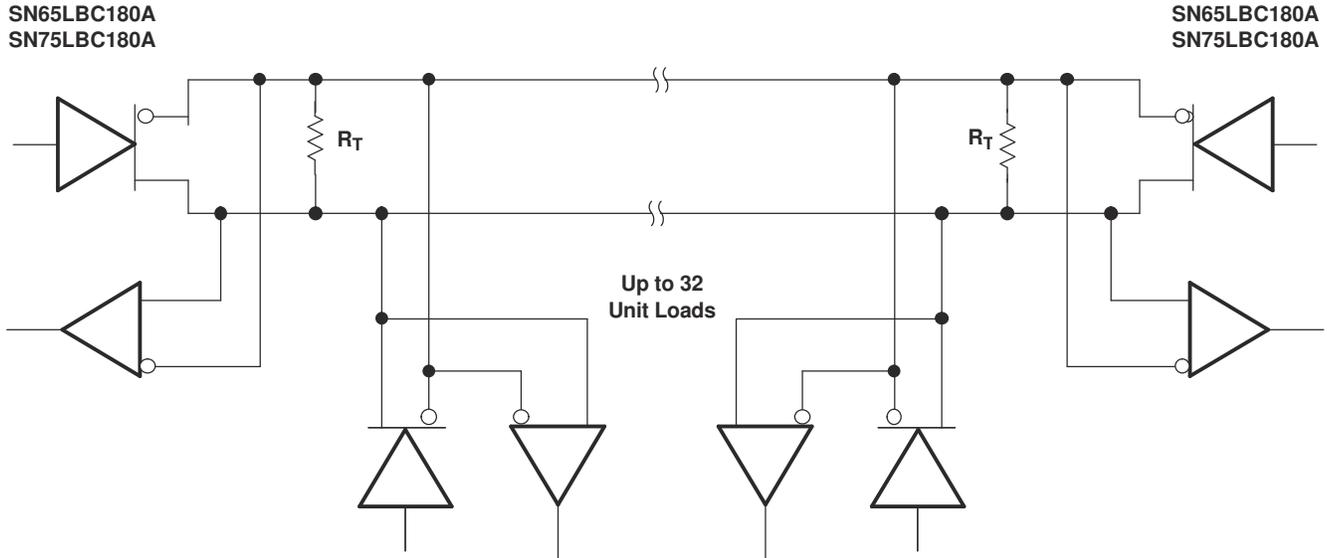
(1) H = high level, L = low level, ? = indeterminate, X = irrelevant, Z = high impedance (off)

6.1.2 Schematics of Inputs and Outputs



7 Application Information

7.1 Typical Application Circuit



- A. The line should be terminated at both ends in its characteristic impedance ($R_T = Z_0$). Stub lengths off the main line should be kept as short as possible. One SN65LBC180A typically represents less than one unit load.

8 Device and Documentation Support

8.1 接收文档更新通知

要接收文档更新通知，请导航至 ti.com 上的器件产品文件夹。点击 [订阅更新](#) 进行注册，即可每周接收产品信息更改摘要。有关更改的详细信息，请查看任何已修订文档中包含的修订历史记录。

8.2 支持资源

[TI E2E™ 支持论坛](#) 是工程师的重要参考资料，可直接从专家获得快速、经过验证的解答和设计帮助。搜索现有解答或提出自己的问题可获得所需的快速设计帮助。

链接的内容由各个贡献者“按原样”提供。这些内容并不构成 TI 技术规范，并且不一定反映 TI 的观点；请参阅 TI 的《[使用条款](#)》。

8.3 商标

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8.4 Electrostatic Discharge Caution



This integrated circuit can be damaged by ESD. Texas Instruments recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage.

ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.

8.5 术语表

[TI 术语表](#) 本术语表列出并解释了术语、首字母缩略词和定义。

9 Mechanical, Packaging, and Orderable Information

The following pages include mechanical, packaging, and orderable information. This information is the most current data available for the designated devices. This data is subject to change without notice and revision of this document. For browser-based versions of this data sheet, refer to the left-hand navigation.

PACKAGING INFORMATION

Orderable part number	Status (1)	Material type (2)	Package Pins	Package qty Carrier	RoHS (3)	Lead finish/ Ball material (4)	MSL rating/ Peak reflow (5)	Op temp (°C)	Part marking (6)
SN65LBC180AD	Obsolete	Production	SOIC (D) 14	-	-	Call TI	Call TI	-40 to 85	BL180A
SN65LBC180ADR	Active	Production	SOIC (D) 14	2500 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	BL180A
SN65LBC180ADR.A	Active	Production	SOIC (D) 14	2500 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	BL180A
SN65LBC180ADRG4	Active	Production	SOIC (D) 14	2500 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	BL180A
SN65LBC180ADRG4.A	Active	Production	SOIC (D) 14	2500 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	BL180A
SN65LBC180AN	Active	Production	PDIP (N) 14	25 TUBE	Yes	NIPDAU	N/A for Pkg Type	-40 to 85	65LBC180A
SN65LBC180AN.A	Active	Production	PDIP (N) 14	25 TUBE	Yes	NIPDAU	N/A for Pkg Type	-40 to 85	65LBC180A
SN75LBC180AD	Obsolete	Production	SOIC (D) 14	-	-	Call TI	Call TI	0 to 70	LB180A
SN75LBC180AN	Active	Production	PDIP (N) 14	25 TUBE	Yes	NIPDAU	N/A for Pkg Type	0 to 70	75LBC180A
SN75LBC180AN.A	Active	Production	PDIP (N) 14	25 TUBE	Yes	NIPDAU	N/A for Pkg Type	0 to 70	75LBC180A

(1) **Status:** For more details on status, see our [product life cycle](#).

(2) **Material type:** When designated, preproduction parts are prototypes/experimental devices, and are not yet approved or released for full production. Testing and final process, including without limitation quality assurance, reliability performance testing, and/or process qualification, may not yet be complete, and this item is subject to further changes or possible discontinuation. If available for ordering, purchases will be subject to an additional waiver at checkout, and are intended for early internal evaluation purposes only. These items are sold without warranties of any kind.

(3) **RoHS values:** Yes, No, RoHS Exempt. See the [TI RoHS Statement](#) for additional information and value definition.

(4) **Lead finish/Ball material:** Parts may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead finish/Ball material values may wrap to two lines if the finish value exceeds the maximum column width.

(5) **MSL rating/Peak reflow:** The moisture sensitivity level ratings and peak solder (reflow) temperatures. In the event that a part has multiple moisture sensitivity ratings, only the lowest level per JEDEC standards is shown. Refer to the shipping label for the actual reflow temperature that will be used to mount the part to the printed circuit board.

(6) **Part marking:** There may be an additional marking, which relates to the logo, the lot trace code information, or the environmental category of the part.

Multiple part markings will be inside parentheses. Only one part marking contained in parentheses and separated by a "~" will appear on a part. If a line is indented then it is a continuation of the previous line and the two combined represent the entire part marking for that device.

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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.

TAPE AND REEL INFORMATION

QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE


*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
SN65LBC180ADR	SOIC	D	14	2500	330.0	16.4	6.5	9.0	2.1	8.0	16.0	Q1
SN65LBC180ADRG4	SOIC	D	14	2500	330.0	16.4	6.5	9.0	2.1	8.0	16.0	Q1

TAPE AND REEL BOX DIMENSIONS


*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
SN65LBC180ADR	SOIC	D	14	2500	340.5	336.1	32.0
SN65LBC180ADRG4	SOIC	D	14	2500	353.0	353.0	32.0

TUBE


*All dimensions are nominal

Device	Package Name	Package Type	Pins	SPQ	L (mm)	W (mm)	T (μm)	B (mm)
SN65LBC180AN	N	PDIP	14	25	506	13.97	11230	4.32
SN65LBC180AN.A	N	PDIP	14	25	506	13.97	11230	4.32
SN75LBC180AN	N	PDIP	14	25	506	13.97	11230	4.32
SN75LBC180AN.A	N	PDIP	14	25	506	13.97	11230	4.32

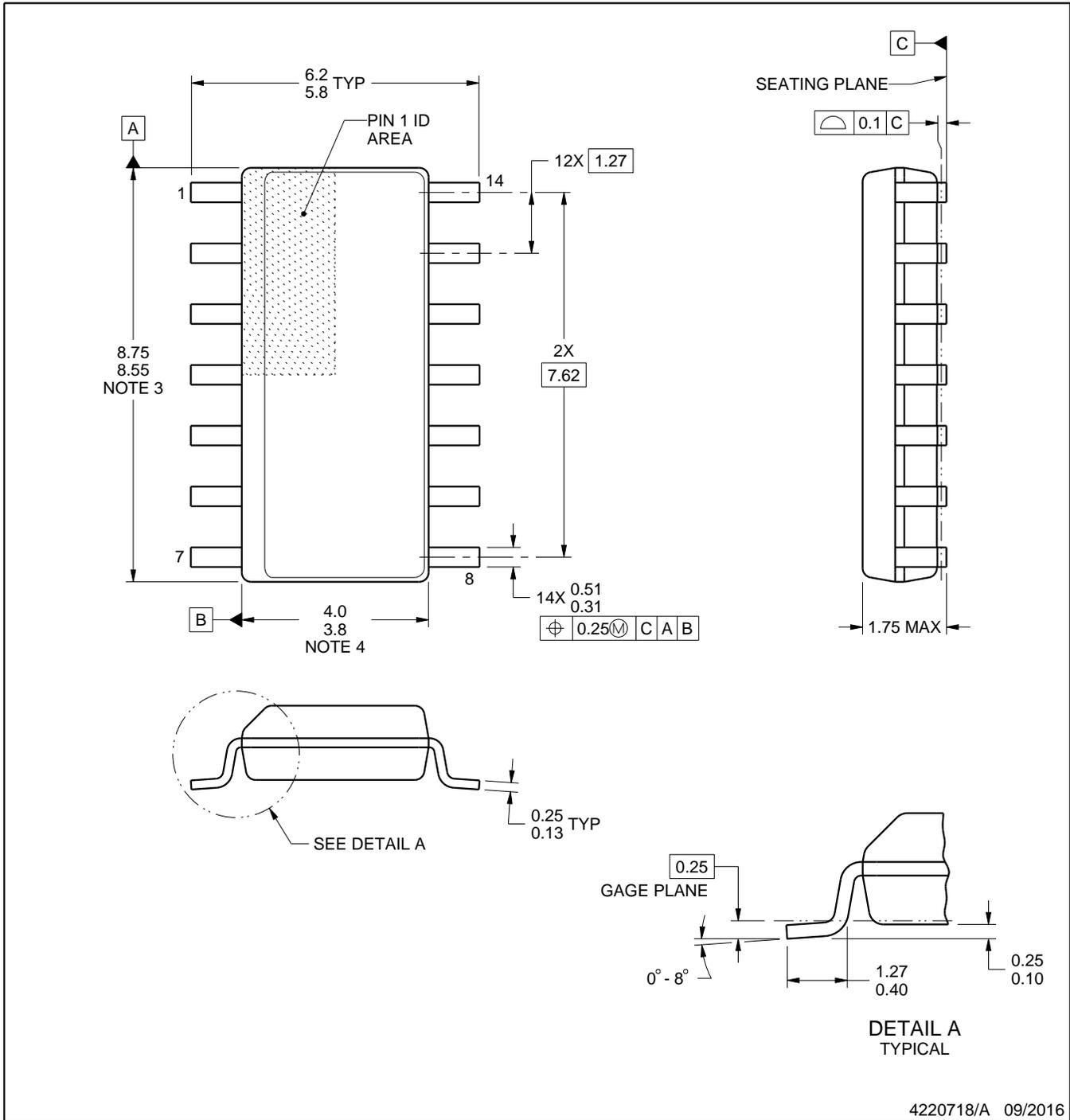
D0014A



PACKAGE OUTLINE

SOIC - 1.75 mm max height

SMALL OUTLINE INTEGRATED CIRCUIT



4220718/A 09/2016

NOTES:

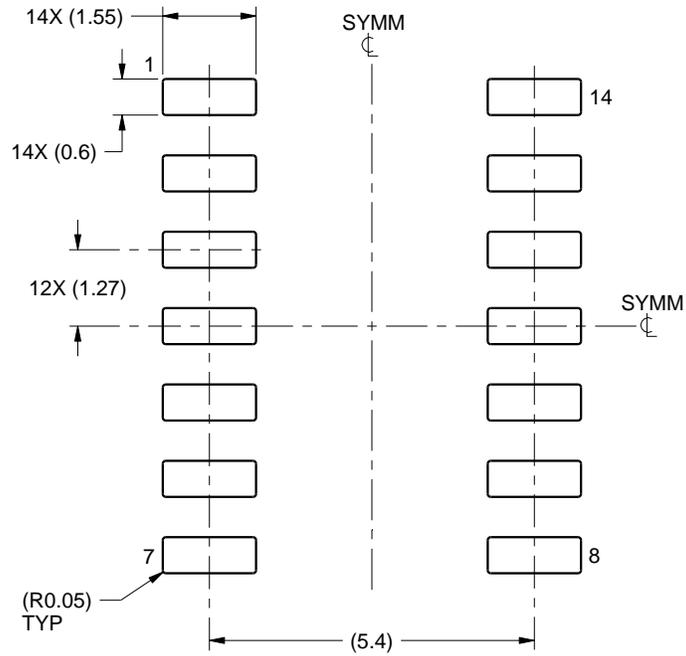
1. All linear dimensions are in millimeters. Dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. This dimension does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.15 mm, per side.
4. This dimension does not include interlead flash. Interlead flash shall not exceed 0.43 mm, per side.
5. Reference JEDEC registration MS-012, variation AB.

EXAMPLE BOARD LAYOUT

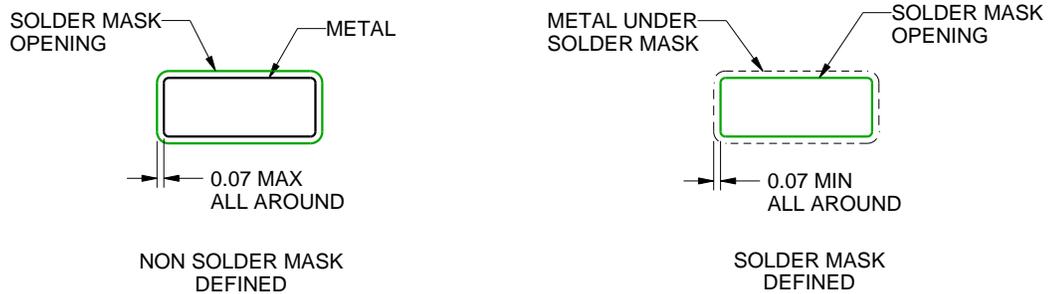
D0014A

SOIC - 1.75 mm max height

SMALL OUTLINE INTEGRATED CIRCUIT



LAND PATTERN EXAMPLE
SCALE:8X



SOLDER MASK DETAILS

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NOTES: (continued)

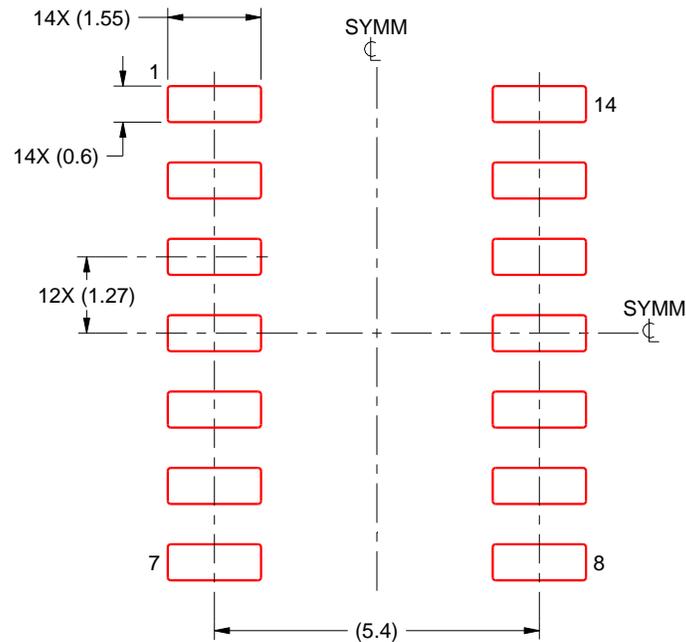
- 6. Publication IPC-7351 may have alternate designs.
- 7. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

EXAMPLE STENCIL DESIGN

D0014A

SOIC - 1.75 mm max height

SMALL OUTLINE INTEGRATED CIRCUIT



SOLDER PASTE EXAMPLE
BASED ON 0.125 mm THICK STENCIL
SCALE:8X

4220718/A 09/2016

NOTES: (continued)

8. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.
9. Board assembly site may have different recommendations for stencil design.

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.

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