

四路低功耗差动接收器

查询样品: [SN55LBC173-HIREL](#)

特性

- 符合 EIA 标准 **RS-422-A**, **RS-423-A**, **RS-485** 和 **CCITT V.11**
- 被设计成支持脉冲时长运行最短 **20ns**
- 针对嘈杂环境中的长距离总线线路上的多点总线传输
- 输入灵敏度: **±200mV**
- 低功耗: **20mA** (最大值)
- 开路故障安全设计

说明

SN55LBC173 是一款具有 3 态输出的单片四路差动线路接收器, 此接收器被设计成符合 EIA 标准 RS-422-A, RS-423-A, RS-485 和 CCITT V.11。这个器件针对数据速率高达且超过每秒 1 千万位的平衡多点总线传输进行了优化。4 个接收器共用 2 个进行或操作的使能输入, 一个在高电平时有效, 一个在低电平时有效。每个接收器在 12V 至 -7V 的共模输入电压范围内特有高输入阻抗、输入滞后以增加抗扰度, 以及 ±200mV 的输入灵敏度。故障安全设计确保了在输入为开路时, 输出始终为高电平。SN55LBC173 使用德州仪器 (TI) 已获专利的 LinBiCMOS™ 技术进行设计, 这个技术提供了低功耗、高开关速度和稳健耐用性。



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.

LinBiCMOS is a trademark of Texas Instruments.

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

Copyright © 2013, Texas Instruments Incorporated
English Data Sheet: [SGLS415](#)



These devices have limited built-in ESD protection. The leads should be shorted together or the device placed in conductive foam during storage or handling to prevent electrostatic damage to the MOS gates.

ORDERING INFORMATION⁽¹⁾

T _A	PACKAGE	ORDERABLE PART NUMBER	TOP-SIDE MARKING
-55°C to 125°C	KGD	SN55LBC173MKGD1	NA
		SN55LBC173MKGD2	NA

(1) For the most current package and ordering information, see the Package Option Addendum at the end of this document, or see the TI website at www.ti.com.

BARE DIE INFORMATION

DIE THICKNESS	BACKSIDE FINISH	BACKSIDE POTENTIAL	BOND PAD METALLIZATION COMPOSITION	BOND PAD THICKNESS
10.5 mils.	Silicon with backgrind	Floating	AlSi(1%)Cu(0.5%)TiW	1850 nm

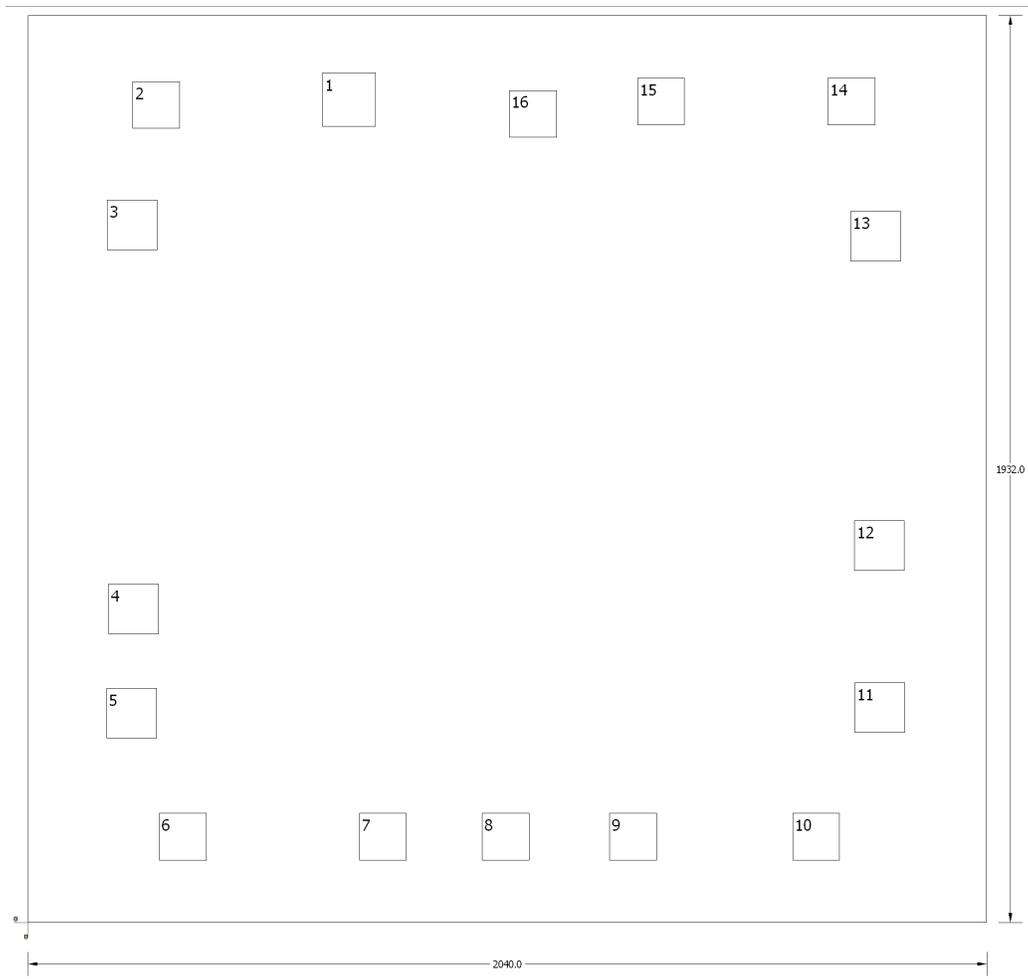


Table 1. Bond Pad Coordinates in Microns

DESCRIPTION	PAD NUMBER	X MIN	Y MIN	X MAX	Y MAX
1B	1	626.5	1695	740.5	1809.5
1A	2	222.5	1690.7	323	1791.3
1Y	3	167.9	1432.1	274.8	1539
G	4	171.4	614.1	278.3	721
2Y	5	166.6	392.1	273.5	499
2A	6	279.2	132	379.7	232.6
2B	7	704.8	132	805.3	232.6
GND	8	966.2	132	1066.7	232.6
3B	9	1237.2	132	1337.7	232.6
3A	10	1626.7	132	1727.2	232.6
3Y	11	1758.7	403.7	1865.6	510.6
\bar{G}	12	1758.5	749	1865.4	855.9
4Y	13	1750.1	1408.4	1857	1515.3
4A	14	1702.2	1698.4	1802.7	1799
4B	15	1296.7	1698.4	1397.2	1799
VCC	16	1024.2	1671.9	1124.7	1772.5

ABSOLUTE MAXIMUM RATINGS⁽¹⁾

over operating free-air temperature range unless otherwise noted

	Value	UNIT
V _{CC} Supply voltage range ⁽²⁾	–0.3 to 7	V
V _I Input voltage range, (A or B inputs)	±25	V
V _{ID} Differential input voltage ⁽³⁾	±25	V
Data and control voltage range	–0.3 to 7	V
T _A Operating free-air temperature range	–55 to 125	°C
T _{stg} Storage temperature range	–65 to 150	°C

- (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 network ground terminal.
- (3) Differential input voltage is measured at the noninverting input with respect to the corresponding inverting input.

RECOMMENDED OPERATING CONDITIONS

	MIN	TYP	MAX	UNIT
V _{CC} Supply voltage	4.75	5	5.25	V
V _{IC} Common-mode input voltage	–7		12	
V _{IH} High-level input voltage	2			
V _{IL} Low-level input voltage			0.8	
V _{ID} Differential input voltage	–6		6	
I _{OH} High-level output current			–8	mA
I _{OL} Low-level output current			16	mA
T _A Operating free-air temperature	–55		125	°C

ELECTRICAL CHARACTERISTICS

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

PARAMETER		TEST CONDITIONS	MIN	TYP ⁽¹⁾	MAX	UNIT	
V _{IT+}	Positive-going input threshold voltage	I _O = -8 mA			0.2	V	
V _{IT-}	Negative-going input threshold voltage	I _O = 8 mA	-0.2			V	
V _{hys}	Hysteresis voltage (V _{IT+} - V _{IT-})			45		mV	
V _{IK}	Enable input clamp voltage	I _I = -18 mA	-0.9	-1.5		V	
V _{OH}	High-level output voltage	V _{ID} = -200 mV, I _{OH} = -8 mA	3.5	4.5		V	
V _{OL}	Low-level output voltage	V _{ID} = -200 mV, I _{OL} = 8 mA		0.3	0.5	V	
		V _{ID} = -200 mV, I _{OL} = 8 mA, T _A = 125°			0.7		
I _{OZ}	High-impedance-state output current	V _O = 0 V to V _{CC}			±20	μA	
I _I	Bus input current	A or B inputs	Other inputs at 0 V	V _{IH} = 12 V, V _{CC} = 5 V	0.7	1.15	mA
				V _{IH} = 12 V, V _{CC} = 0 V	0.8	1.15	
				V _{IH} = -7 V, V _{CC} = 5 V	-0.5	-0.9	
				V _{IH} = -7 V, V _{CC} = 0 V	-0.4	-0.9	
I _{IH}	High-level input current	V _{IH} = 5 V			±20	μA	
I _{IL}	Low-level input current	V _{IL} = 0 V			-20	μA	
I _{OS}	Short-circuit output current	V _O = 0	-80	-120		mA	
I _{CC}	Supply current	Outputs enabled, I _O = 0, V _{ID} = 5 V		11	20	mA	
		Outputs disabled		0.9	1.4		

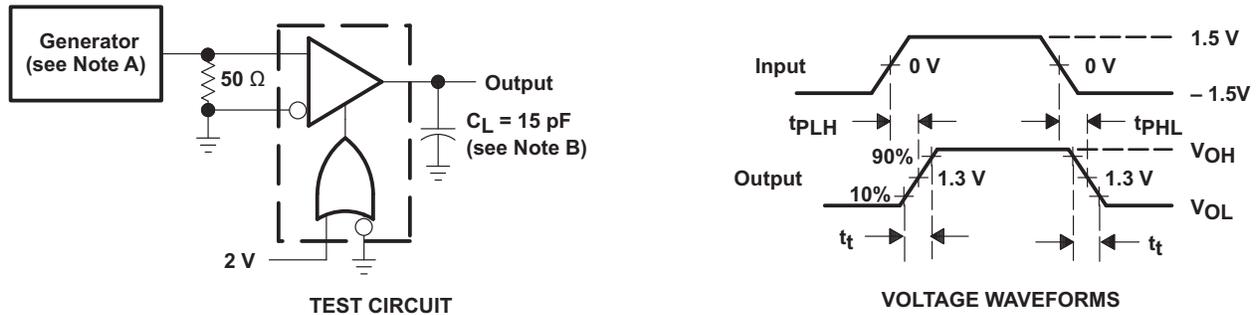
(1) All typical values are at 25°C and with a 5 V supply.

SWITCHING CHARACTERISTICS

V_{CC} = 5 V, C_L = 15 pF, over operating free-air temperature range (unless otherwise noted)

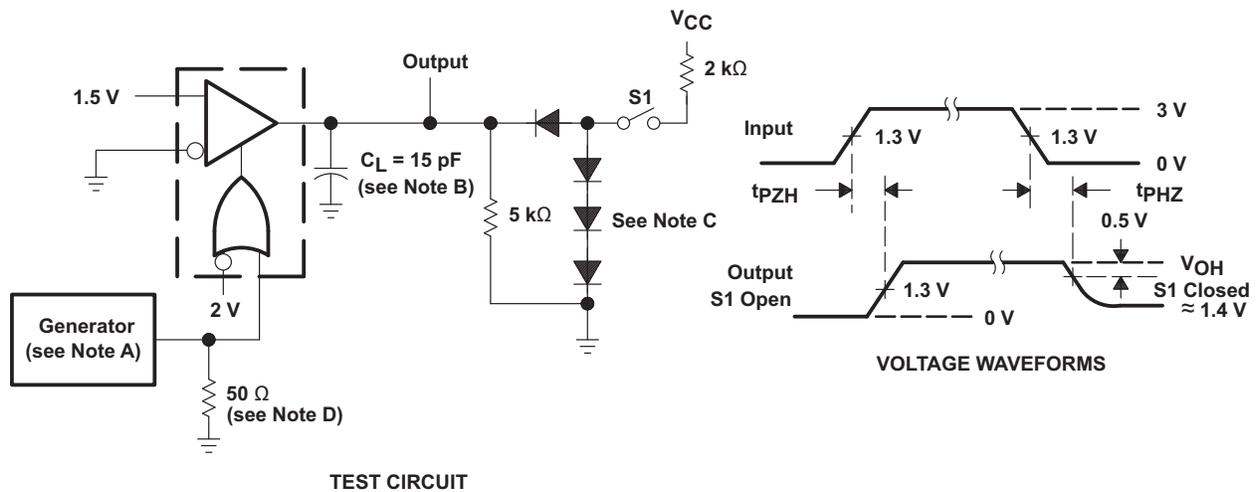
PARAMETER		TEST CONDITIONS	T _A	MIN	TYP	MAX	UNIT
t _{PHL}	Propagation delay time, high-to-low-level output	V _{ID} = -1.5 V to 1.5 V, See Figure 1	25°C	11	22	30	ns
			-55°C to 125°C	11		35	
t _{PLH}	Propagation delay time, low-to-high-level output	V _{ID} = -1.5 V to 1.5 V, See Figure 1	25°C	11	22	35	ns
			-55°C to 125°C	11		35	
t _{PZH}	Output enable time to high level	See Figure 2	25°C		17	40	ns
			-55°C to 125°C			45	
t _{PZL}	Output enable time to low level	See Figure 3	25°C		18	30	ns
			-55°C to 125°C			35	
t _{PHZ}	Output disable time from high level	See Figure 2	25°C		30	40	ns
			-55°C to 125°C			55	
t _{PLZ}	Output disable time from low level	See Figure 3	25°C		25	40	ns
			-55°C to 125°C			45	
t _{sk(p)}	Pulse skew (t _{PHL} - t _{PLH})	See Figure 1	25°C		0.5	6	ns
			-55°C to 125°C			7	
t _t	Transition time	See Figure 1	25°C		5	10	ns
			-55°C to 125°C			16	

PARAMETER MEASUREMENT INFORMATION



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

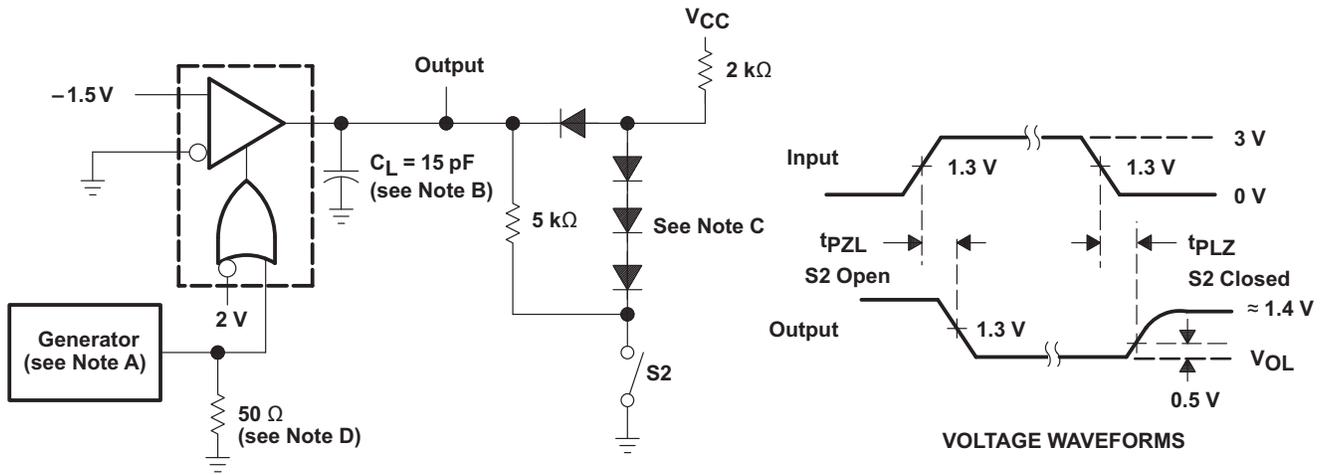
Figure 1. t_{pd} and t_t Test Circuit and Voltage Waveforms



- A. The input pulse is supplied by a generator having the following characteristics: PRR = 1 MHz, duty cycle ≤ 50%, $t_r \leq 6$ ns, $t_f \leq 6$ ns, $Z_O = 50 \Omega$.
- B. C_L includes probe and jig capacitance.
- C. All diodes are 1N916 or equivalent.
- D. To test the active-low enable \overline{G} , ground G and apply an inverted input waveform to \overline{G} .

Figure 2. t_{pHZ} and t_{pZH} Test Circuit and Voltage Waveforms

PARAMETER MEASUREMENT INFORMATION (continued)



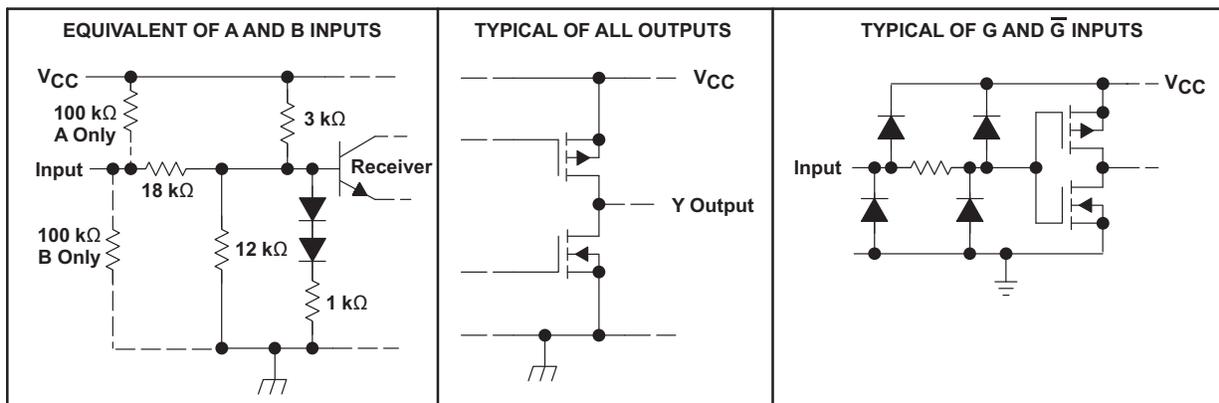
TEST CIRCUIT

- A. The input pulse is supplied by a generator having the following characteristics: PRR = 1 MHz, duty cycle ≤ 50%, $t_r \leq 6$ ns, $t_f \leq 6$ ns, $Z_O = 50 \Omega$.
- B. C_L includes probe and jig capacitance.
- C. All diodes are 1N916 or equivalent.
- D. To test the active-low enable \overline{G} , ground G and apply an inverted input waveform to \overline{G} .

Figure 3. t_{pZL} and t_{pLZ} Test Circuit and Voltage Waveforms

DEVICE INFORMATION

EQUIVALENT INPUT AND OUTPUT SCHEMATIC DIAGRAMS



FUNCTION TABLE (EACH RECIEVER)

DIFFERENTIAL INPUTS	ENABLES		OUTPUT
	G	\bar{G}	
$V_{ID} \geq 0.2 V$	H	X	H
$V_{ID} < 0.2 V$	X	L	H
$-0.2 < V_{ID} < 0.2 V$	H	X	?
$V_{ID} < -0.2 V$	X	L	?
$V_{ID} \leq -0.2 V$	H	X	L
X	X	L	L
X	L	H	Z
Open circuit	H	X	H
	X	L	H

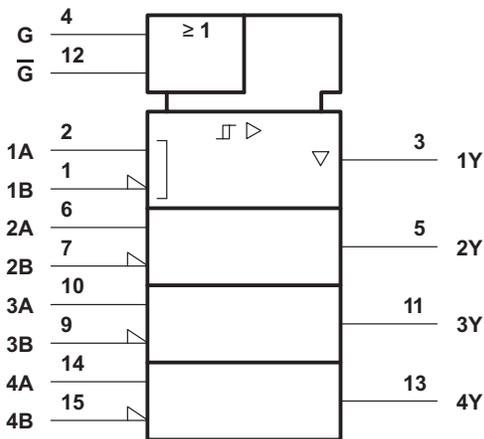


Figure 4. Logic Symbol

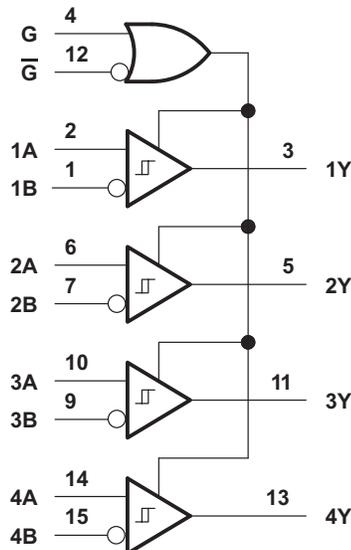


Figure 5. Logic Diagram (Positive Logic)

TYPICAL CHARACTERISTICS

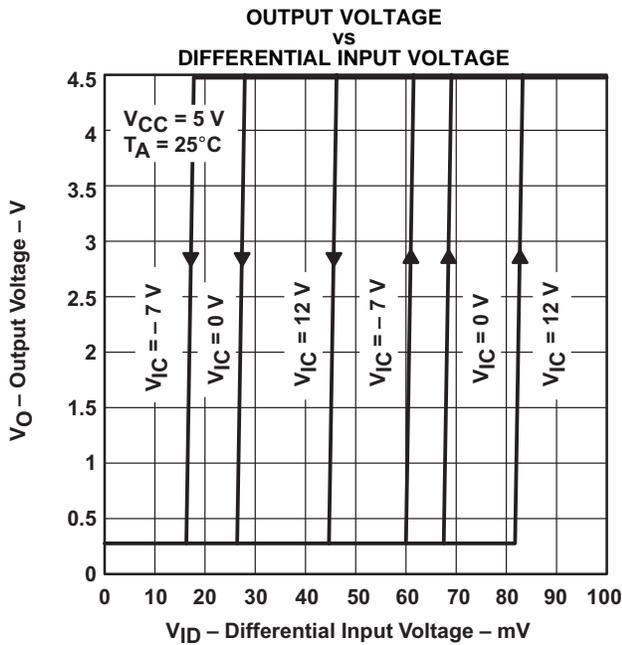


Figure 6.

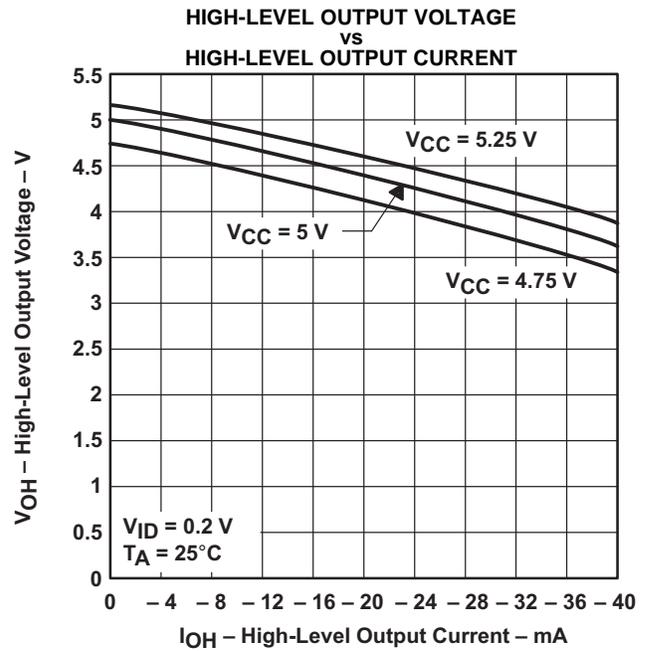


Figure 7.

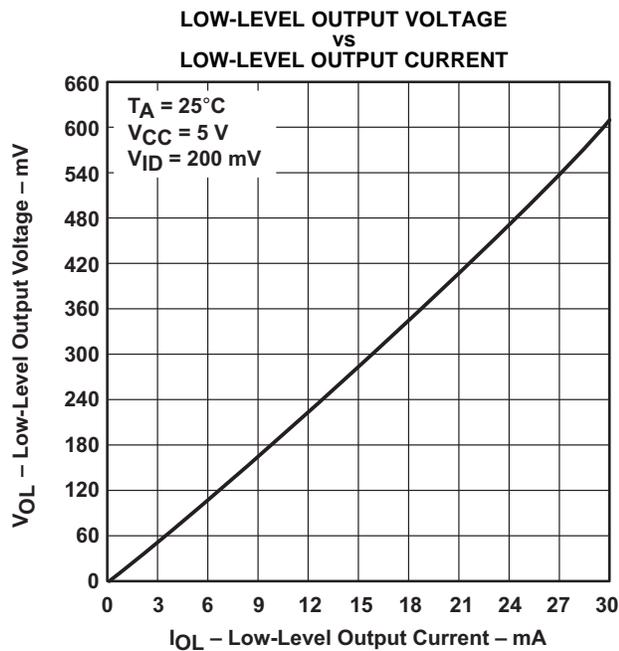


Figure 8.

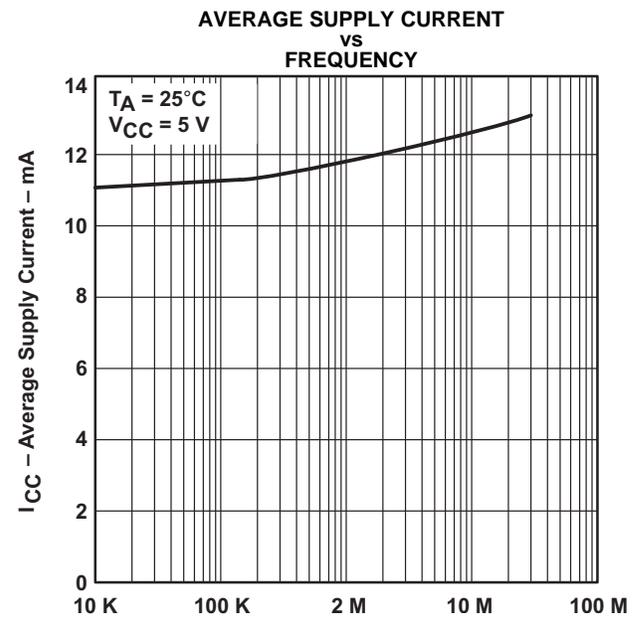
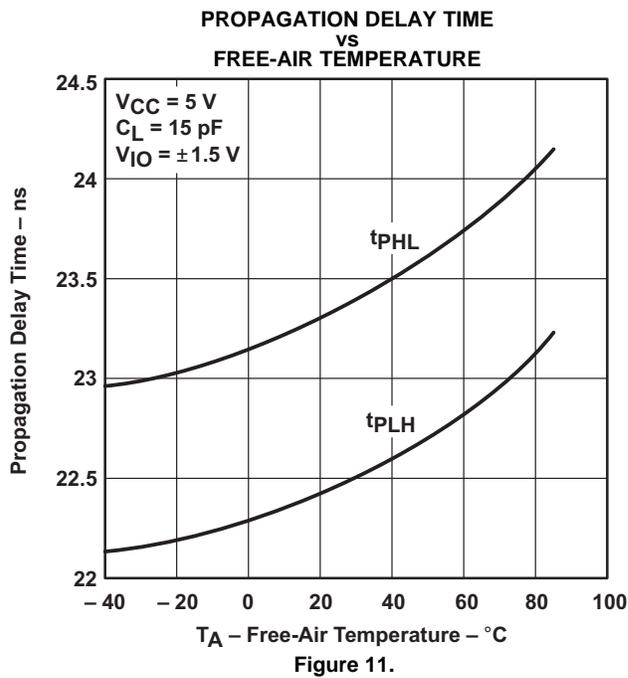
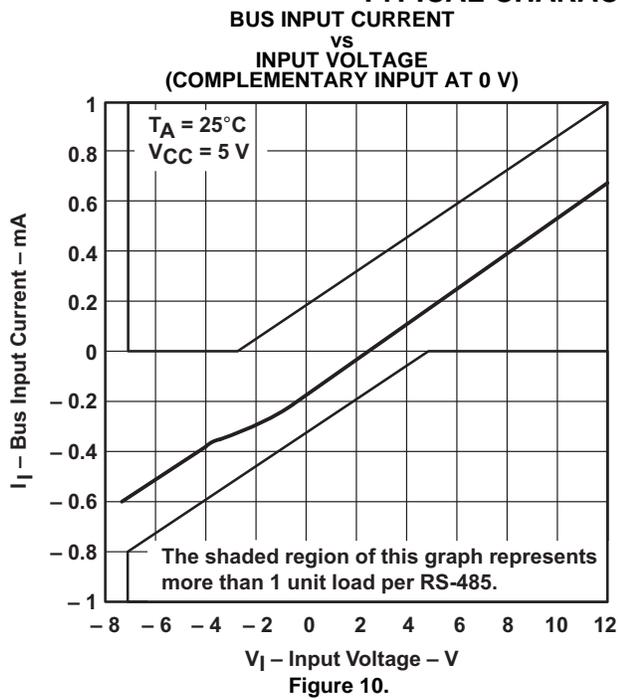


Figure 9.

TYPICAL CHARACTERISTICS (continued)



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)
SN55LBC173MKGD1	Active	Production	XCEPT (KGD) 0	100 TUBE	Yes	Call TI	N/A for Pkg Type	-55 to 125	
SN55LBC173MKGD1.A	Active	Production	XCEPT (KGD) 0	100 TUBE	Yes	Call TI	N/A for Pkg Type	-55 to 125	
SN55LBC173MKGD2	Active	Production	XCEPT (KGD) 0	10 TUBE	-	Call TI	Call TI	-55 to 125	
SN55LBC173MKGD2.A	Active	Production	XCEPT (KGD) 0	10 TUBE	-	Call TI	Call TI	-55 to 125	

⁽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.

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.

重要通知和免责声明

TI“按原样”提供技术和可靠性数据（包括数据表）、设计资源（包括参考设计）、应用或其他设计建议、网络工具、安全信息和其他资源，不保证没有瑕疵且不做任何明示或暗示的担保，包括但不限于对适销性、与某特定用途的适用性或不侵犯任何第三方知识产权的暗示担保。

这些资源可供使用 TI 产品进行设计的熟练开发人员使用。您将自行承担以下全部责任：(1) 针对您的应用选择合适的 TI 产品，(2) 设计、验证并测试您的应用，(3) 确保您的应用满足相应标准以及任何其他安全、安保法规或其他要求。

这些资源如有变更，恕不另行通知。TI 授权您仅可将这些资源用于研发本资源所述的 TI 产品的相关应用。严禁以其他方式对这些资源进行复制或展示。您无权使用任何其他 TI 知识产权或任何第三方知识产权。对于因您对这些资源的使用而对 TI 及其代表造成的任何索赔、损害、成本、损失和债务，您将全额赔偿，TI 对此概不负责。

TI 提供的产品受 [TI 销售条款](#)、[TI 通用质量指南](#) 或 [ti.com](#) 上其他适用条款或 TI 产品随附的其他适用条款的约束。TI 提供这些资源并不会扩展或以其他方式更改 TI 针对 TI 产品发布的适用的担保或担保免责声明。除非德州仪器 (TI) 明确将某产品指定为定制产品或客户特定产品，否则其产品均为按确定价格收入目录的标准通用器件。

TI 反对并拒绝您可能提出的任何其他或不同的条款。

版权所有 © 2026，德州仪器 (TI) 公司

最后更新日期：2025 年 10 月