

具有 ±15kV IEC ESD 保护功能的 AM26LV32E 低电压高速四路差分线路接收器

1 特性

- 达到或超出 TIA/EIA-422-B 和 ITU Recommendation V.11 标准的要求
- 由 3.3V 单电源供电运行
- 开关频率高达 32MHz
- RS422 总线引脚的 ESD 保护 (参阅 ESD 等级)
- 低功率损耗: 27mW (典型值)
- 开路失效防护
- 具有 ±200mV 灵敏度的 ±7V 共模输入电压范围
- 接受 5V 逻辑输入及 3.3V 电源 (使能输入)
- 输入迟滞: 35 mV (典型值)
- 与 AM26C32、AM26LS32 引脚兼容
- I_{off} 支持局部断电模式运行

2 应用

- 高可靠性汽车应用
- 配置控制和打印支持
- ATM 和点钞机
- 智能电网
- 交流和伺服电机驱动器

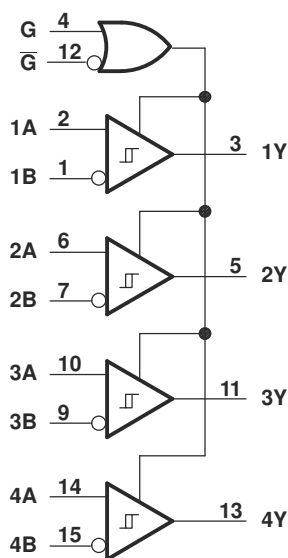
3 说明

AM26LV32E 器件由四个差分线路接收器组成, 且具有三态输出。该器件旨在以较小的电源电压满足 TIA/EIA-422-B 和 ITU Recommendation V.11 驱动器的要求。这款器件经过优化, 可在高达 32MHz 的开关速率下实现平衡总线传输。通过三态输出, 该器件可直接连接至总线组织式系统。AM26LV32E 具有失效防护电路, 该电路可防止该器件在接收器输出端放置未知电压信号。在开路失效防护中, 会在相应的输出端产生高电平状态。该器件支持使用 I_{off} 的局部断电应用。I_{off} 电路可禁用输出, 以防在器件断电时电流回流对器件造成损坏。

封装信息

器件型号	封装 ⁽¹⁾	封装尺寸 ⁽²⁾
AM26LV32E	SO (16)	10.2mm × 7.8mm
	SOIC (16)	9.9mm × 6mm
	VQFN (16)	4mm × 3.5mm
	TSSOP (16)	5mm × 6.4mm

- (1) 如需了解所有可用封装, 请参阅数据表末尾的可订购产品附录。
- (2) 封装尺寸 (长 × 宽) 为标称值, 并包括引脚 (如适用)。



逻辑图 (正逻辑)



Table of Contents

1 特性.....	1	8.3 Feature Description.....	8
2 应用.....	1	8.4 Device Functional Modes.....	9
3 说明.....	1	9 Application Information Disclaimer.....	10
4 Revision History.....	2	9.1 Application Information.....	10
5 Pin Configuration and Functions.....	3	9.2 Typical Application.....	10
6 Specifications.....	4	10 Power Supply Recommendations.....	11
6.1 Absolute Maximum Ratings.....	4	11 Layout.....	12
6.2 ESD Ratings.....	4	11.1 Layout Guidelines.....	12
6.3 Recommended Operating Conditions.....	4	11.2 Layout Example.....	12
6.4 Thermal Information.....	5	12 Device and Documentation Support.....	13
6.5 Electrical Characteristics.....	5	12.1 接收文档更新通知.....	13
6.6 Switching Characteristics.....	6	12.2 支持资源.....	13
6.7 Typical Characteristics.....	6	12.3 商标.....	13
7 Parameter Measurement Information.....	7	12.4 静电放电警告.....	13
8 Detailed Description.....	8	12.5 术语表.....	13
8.1 Overview.....	8	13 Mechanical, Packaging, and Orderable Information.....	13
8.2 Functional Block Diagram.....	8		

4 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 (December 2020) to Revision E (August 2023)	Page
• 将“器件信息”表更改为封装信息表.....	1
• Changed the <i>Thermal Information</i>	5
• Changed the <i>Typical Characteristics</i>	6

Changes from Revision C (July 2018) to Revision D (December 2020)	Page
• 将“特性”从开路、短路及终止失效防护更改为开路失效防护.....	1
• 删除了“说明”中的文本：短路失效防护和终止失效防护，更改为开路失效防护.....	1
• Deleted text from the last paragraph in Input Fail-Safe Circuitry: <i>terminated or short</i>	8
• Deleted text from 表 8-1: <i>shorted, or terminated</i>	9

Changes from Revision B (July 2015) to Revision C (July 2018)	Page
• Changed the pinout image appearance	3
• Changed the A and B Input signals on the waveform of 图 7-1	7

Changes from Revision A (May 2008) to Revision B (July 2015)	Page
• 添加了“引脚配置和功能”部分、“ESD 等级”表、“特性说明”部分、“器件功能模式”、“应用和实施”部分、“电源相关建议”部分、“布局”部分、“器件和文档支持”部分以及“机械、封装和可订购信息”部分.....	1

5 Pin Configuration and Functions

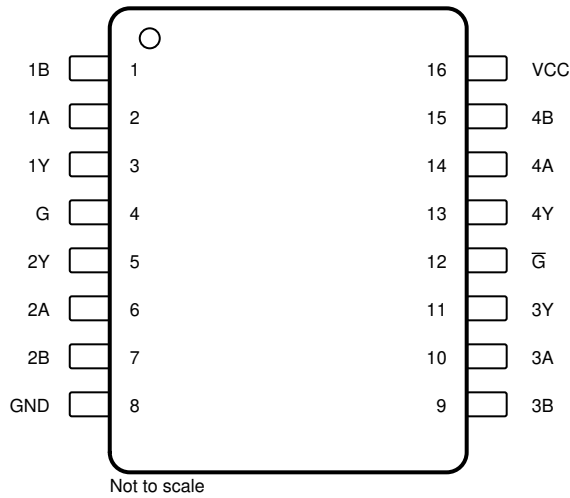


图 5-1. D, NS, or PW Package, 16-Pin SOIC, SO, or TSSOP (Top View)

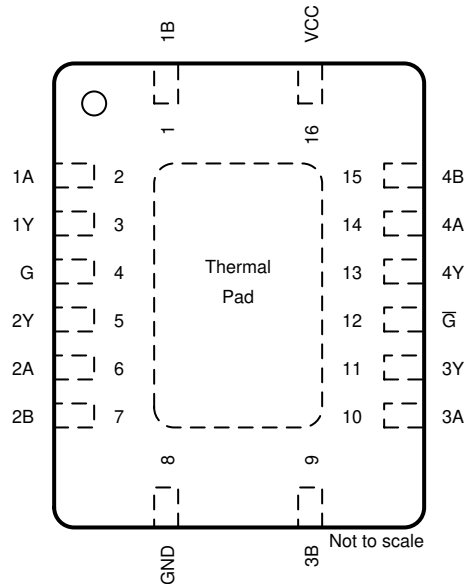


图 5-2. RGY Package 16-Pin VQFN (Top View)

表 5-1. Pin Functions

PIN		TYPE	DESCRIPTION
NAME	NO.		
1A	2	I	RS422/RS485 differential input (noninverting)
1B	1	I	RS422/RS485 differential input (inverting)
1Y	3	O	Logic level output
2A	6	I	RS422/RS485 differential input (noninverting)
2B	7	I	RS422/RS485 differential input (inverting)
2Y	5	O	Logic level output
3A	10	I	RS422/RS485 differential input (noninverting)
3B	9	I	RS422/RS485 differential input (inverting)
3Y	11	O	Logic level output
4A	14	I	RS422/RS485 differential input (noninverting)
4B	15	I	RS422/RS485 differential input (inverting)
4Y	13	O	Logic level output
G	4	I	Active-high select
\bar{G}	12	I	Active-low select
GND	8	—	Ground
V _{CC}	16	—	Power Supply

6 Specifications

6.1 Absolute Maximum Ratings

over operating free-air temperature range (unless otherwise noted) ⁽¹⁾ ⁽³⁾

		MIN	MAX	UNIT	
V _{CC}	Supply voltage ⁽²⁾	-0.5	6	V	
V _I	Input voltage	A or B inputs	- 14	14	V
		G or \bar{G} inputs	- 0.5	6	
V _{ID}	Differential input voltage ⁽⁴⁾	- 14	14	V	
V _O	Output voltage	- 0.5	6	V	
I _O	Output current		±20	mA	
I _{IK}	Input clamp current	V _I < 0	-20	mA	
I _{OK}	Output clamp current	V _O < 0	-20	mA	
T _J	Operating virtual junction temperature		150	°C	
T _{stg}	Storage temperature	- 65	150	°C	

- (1) Stresses beyond those listed under *Absolute Maximum Ratings* may cause permanent damage to the device. These are stress ratings only, which do not imply functional operation of the device at these or any other conditions beyond those indicated under *Recommended Operating Conditions*. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.
- (2) All voltage values except differential input voltage are with respect to the network GND.
- (3) This device is designed to meet TIA/EIA-422-B and ITU.
- (4) Differential input voltage is measured at the non-inverting input with respect to the corresponding inverting input.

6.2 ESD Ratings

		VALUE	UNIT
V _(ESD)	Electrostatic discharge	Human body model (HBM), per ANSI/ESDA/JEDEC JS-001 ⁽¹⁾	±15000
		IEC61000-4-2, Contact Gap Discharge	±8000
		IEC61000-4-2, Air Gap Discharge	±15000

- (1) JEDEC document JEP155 states that 500-V HBM allows safe manufacturing with a standard ESD control process. Manufacturing with less than 500-V HBM is possible with the necessary precautions. Pins listed as ±15000 V may actually have higher performance.

6.3 Recommended Operating Conditions

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

		MIN	NOM	MAX	UNIT
V _{CC}	Supply voltage	3	3.3	3.6	V
V _{IH}	High-level input voltage	2		5.5	V
V _{IL}	Low-level input voltage	0		0.8	V
V _{IC}	Common-mode input voltage	- 7		7	V
V _{ID}	Differential input voltage	- 7		7	V
I _{OH}	High-level output current			- 5	mA
I _{OL}	Low-level output current			5	mA
T _A	Operating free-air temperature	- 40		85	°C

6.4 Thermal Information

THERMAL METRIC ⁽¹⁾	AM26LV32E								UNIT
	D (SOIC)	DR (SOIC-Reel)	PW (TSSOP)	PWR (TSSOP-Reel)	NS (SOP)	NSR (SOP-Reel)	RGY (VQFN)	RGY (VQFN)	
	16 PINS	16 PINS	16 PINS	16 PINS	16 PINS	16 PINS	16 PINS	16 PINS	
$R_{\theta JA}$ Junction-to-ambient thermal resistance	73.1	84.6	109	107.5	69	88.5	92	48.4	°C/W
$R_{\theta JC(top)}$ Junction-to-case (top) thermal resistance	38.4	43.5	34	38.4	34	46.2	40	46.4	°C/W
$R_{\theta JB}$ Junction-to-board thermal resistance	N/A	43.2	N/A	53.7	N/A	50.7	N/A	24.6	°C/W
Ψ_{JT} Junction-to-top characterization parameter	N/A	10.4	N/A	3.2	N/A	13.5	N/A	2.3	°C/W
Ψ_{JB} Junction-to-board characterization parameter	N/A	42.8	N/A	53.1	N/A	50.3	N/A	24.5	°C/W
$R_{\theta JC(bottom)}$ Junction-to-case (bottom) thermal resistance	N/A	N/A	N/A	N/A	N/A	N/A	N/A	8.5	°C/W

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

6.5 Electrical Characteristics

over recommended ranges of common-mode input, supply voltage, and operating free-air temperature (unless otherwise noted)

PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
V_{IT+} Positive-going input threshold voltage, differential input				0.2	V
V_{IT-} Negative-going input threshold voltage, differential input		- 0.2			V
V_{hys} Input hysteresis ($V_{IT+} - V_{IT-}$)			35		mV
V_{IK} Input clamp voltage, G and \bar{G}	$I_I = - 18$ mA			- 1.5	V
V_{OH} High-level output voltage	$V_{ID} = 200$ mV, $I_{OH} = - 5$ mA	2.4	3.2		V
	$V_{ID} = 200$ mV, $I_{OH} = - 100$ μ A	$V_{CC} - 0.1$			
V_{OL} Low-level output voltage	$V_{ID} = - 200$ mV, $I_{OL} = 5$ mA		0.17	0.5	V
	$V_{ID} = - 200$ mV, $I_{OL} = 100$ μ A			0.1	
I_{OZ} High-impedance state output current	$V_O = V_{CC}$ or GND			± 50	μ A
I_{off} Output current with power off	$V_{CC} = 0$ V, $V_O = 0$ or 5.5 V			± 100	μ A
I_I Line input current	Other input at 0 V	$V_I = 10$ V		1.5	mA
		$V_I = - 10$ V		- 2.5	
I_I Enable input current, G and \bar{G}	$V_I = V_{CC}$ or GND			± 1	μ A
r_i Input resistance	$V_{IC} = - 7$ V to 7 V, Other input at 0 V	4	17		k Ω
I_{CC} Supply current (total package)	G, $\bar{G} = V_{CC}$ or GND, No load, Line inputs open		8	17	mA
C_{pd} Power dissipation capacitance	One channel		150		pF

6.6 Switching Characteristics

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

PARAMETER		TEST CONDITIONS	MIN	TYP ⁽¹⁾	MAX	UNIT
t_{PLH}	Propagation delay time, low- to high-level output	See 图 7-1	8	16	26	ns
t_{PHL}	Propagation delay time, high- to low-level output		8	16	26	ns
t_t	Transition time	See 图 7-1		5		ns
t_{PZH}	Output-enable time to high-level	See 图 7-2		17	40	ns
t_{PZL}	Output-enable time to low-level	See 图 7-2		10	40	ns
t_{PHZ}	Output-disable time from high-level	See 图 7-2		20	40	ns
t_{PLZ}	Output-disable time from low-level	See 图 7-2		16	40	ns
$t_{sk(p)}$	Pulse skew	See 图 7-1 图 7-2		4	6	ns
$t_{sk(o)}$	Pulse skew	See 图 7-1 图 7-2		4	6	ns
$t_{sk(pp)}$	Pulse skew (device to device)	See 图 7-1 图 7-2		6	9	ns
$f_{(max)}$	Maximum operating frequency	See 图 7-1		32		MHz

(1) All typical values are at $V_{CC} = 3.3\text{ V}$, $T_A = 25^\circ\text{C}$.

6.7 Typical Characteristics

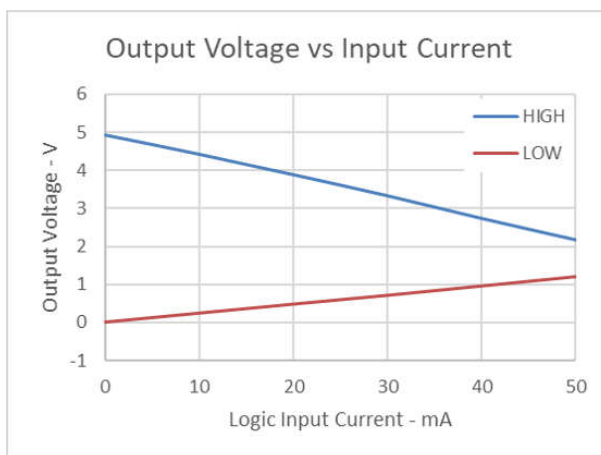
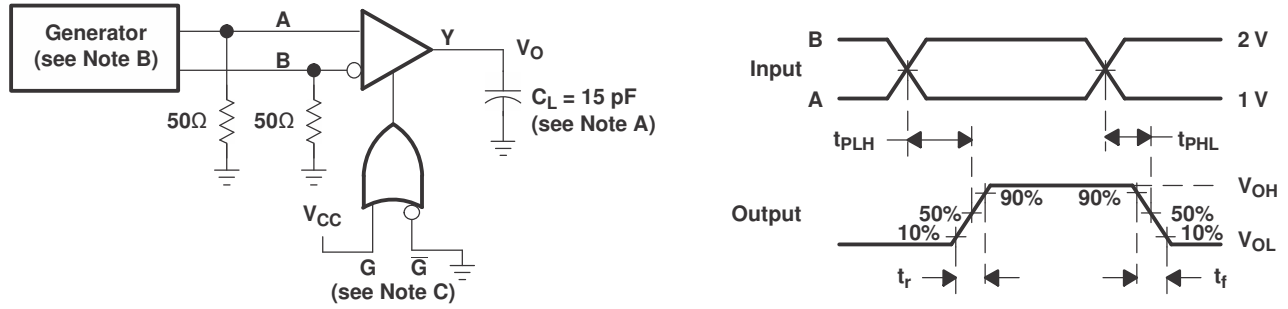


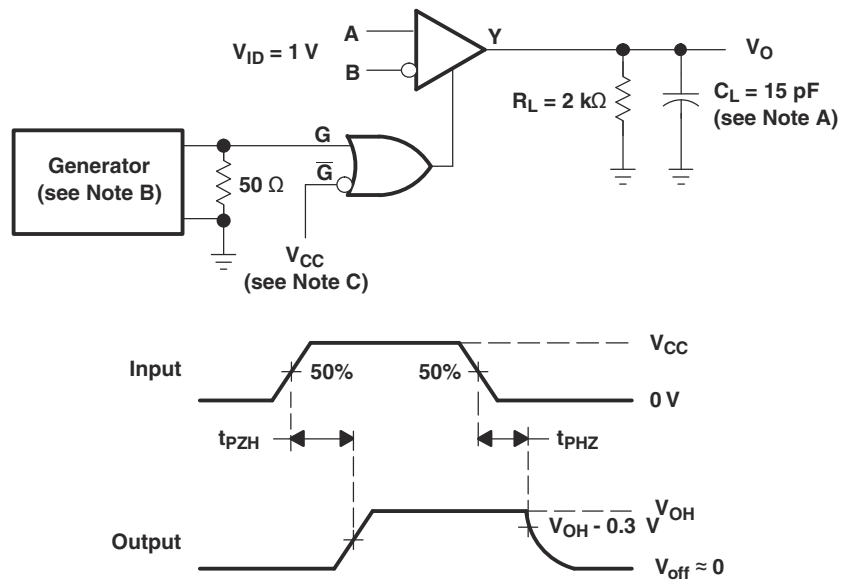
图 6-1. Output Voltage vs Input Current

7 Parameter Measurement Information



A. C_L includes probe and jig capacitance.

图 7-1. Switching Test Circuit and Voltage Waveforms



A. C_L includes probe and jig capacitance.

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

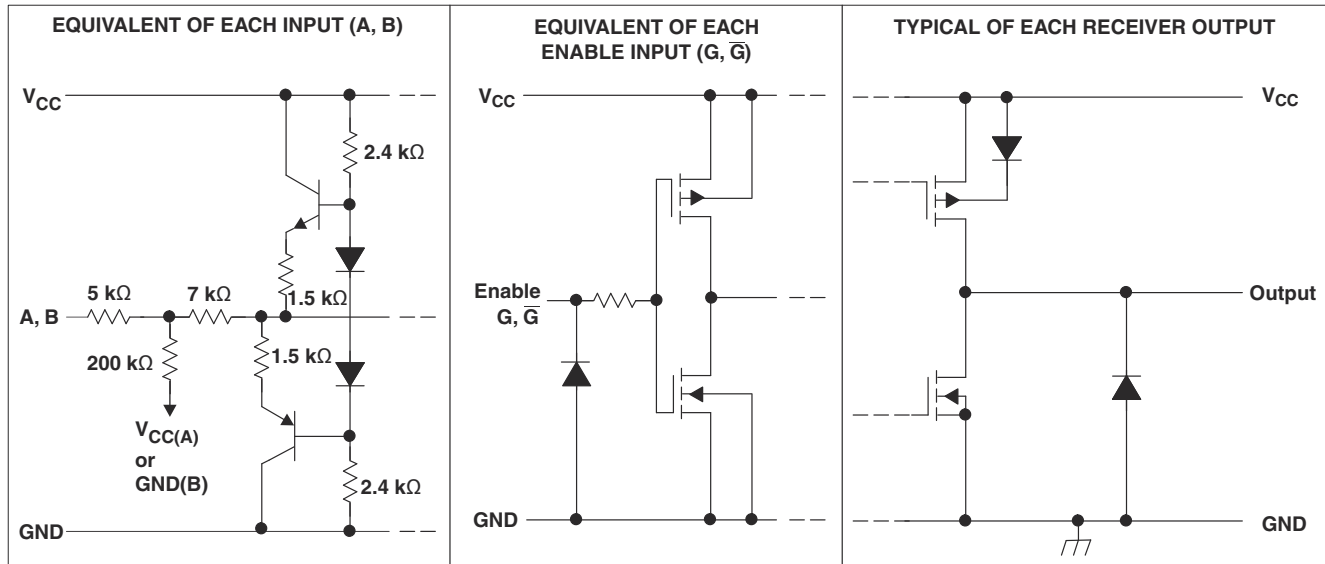
图 7-2. Enable/Disable Time Test Circuit and Output Voltage Waveforms

8 Detailed Description

8.1 Overview

The AM26LV32E is a low-voltage, quadruple-differential line receiver that meets the necessary requirements for NSI TIA/EIA-422-B, TIA/EIA-423-B, and ITU Recommendation V.10 and V.11. This device allows a low power or low voltage MCU to interface with heavy machinery, subsystems and other devices through long wires of up to 1000 m, giving any design a reliable and easy to use connection. As with any RS422 interface, the AM26LV32E works in a differential voltage range, which enables very good signal integrity.

8.2 Functional Block Diagram



8.3 Feature Description

8.3.1 ± 7 -V Common-Mode Range With ± 200 -mV Sensitivity

For a common-mode voltage varying from -7 V to 7 V, the input voltage is acceptable in low ranges greater than 200 mV as a standard.

8.3.2 Input Fail-Safe Circuitry

RS-485 specifies that the receiver output state should be logic high for differential input voltages of $V_{AB} \geq +200$ mV and logic low for $V_{AB} \leq -200$ mV. For input voltages in between these limits, a receiver's output state is not defined and can randomly assume high or low. Removing the uncertainty of random output states, modern transceiver designs include internal biasing circuits that put the receiver output into a defined state (typically high) in the absence of a valid input signal. A loss of input signal can be caused by:

- an open circuit caused by a wire break or the unintentional disconnection of a transceiver from the bus
- a short circuit due to an insulation fault, connecting both conductors of a differential pair to one another
- an idle bus when none of the bus transceivers are active.

An open circuit caused by a wire break or the unintentional disconnection of a transceiver from the bus. The AM26LV32E has an internal circuit that ensures functionality during an open failure.

8.3.3 Active-High and Active-Low

The device can be configured using the G and \bar{G} logic inputs to select receiver output. The high voltage or logic 1 on the G pin, allows the device to operate on an active-high and having a low voltage or logic 0 on the \bar{G} enables active low operation. These are simply a way to configure the logic to match that of the receiving or transmitting controller or microprocessor.

8.4 Device Functional Modes

8.4.1 Enable and Disable

The receivers implemented in these RS422 devices can be configured using the G and \bar{G} pins to be enabled or disabled. This allows users to ignore or filter out transmissions as desired.

表 8-1. Function Table (Each Driver)

DIFFERENTIAL INPUT	ENABLES ⁽¹⁾		OUTPUT
	G	\bar{G}	
$V_{ID} \geq 0.2\text{ V}$	H	X	H
	X	L	H
$-0.2\text{ V} < V_{ID} < 0.2\text{ V}$	H	X	?
	X	L	?
$V_{ID} \leq -0.2\text{ V}$	H	X	L
	X	L	L
Open	H	X	H
	X	L	H
X	L	H	Z

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

9 Application Information Disclaimer

备注

以下应用部分中的信息不属于 TI 器件规格的范围，TI 不担保其准确性和完整性。TI 的客户应负责确定器件是否适用于其应用。客户应验证并测试其设计，以确保系统功能。

9.1 Application Information

When designing a system that uses drivers, receivers, and transceivers that comply with RS-422 or RS-485, proper cable termination is essential for highly reliable applications with reduced reflections in the transmission line. Because RS-422 allows only one driver on the bus, if termination is used, it is placed only at the end of the cable near the last receiver. In general, RS-485 requires termination at both ends of the cable. Factors to consider when determining the type of termination usually are performance requirements of the application and the ever-present factor, cost. The different types of termination techniques discussed are unterminated lines, parallel termination, ac termination, and multipoint termination. Laboratory waveforms for each termination technique (except multipoint termination) illustrate the usefulness and robustness of RS-422 (and, indirectly, RS-485). Similar results can be obtained if 485-compliant devices and termination techniques are used. For laboratory experiments, 100 feet of 100- Ω , 24-AWG, twisted-pair cable (Bertek) was used. A single driver and receiver, TI AM26LV31E and AM26LV32E, respectively, were tested at room temperature with a 3.3-V supply voltage. Two plots per termination technique are shown. In each plot, the top waveform is the driver input and the bottom waveform is the receiver output. To show voltage waveforms related to transmission-line reflections, the first plot shows output waveforms from the driver at the start of the cable; the second plot shows input waveforms to the receiver at the far end of the cable.

9.2 Typical Application

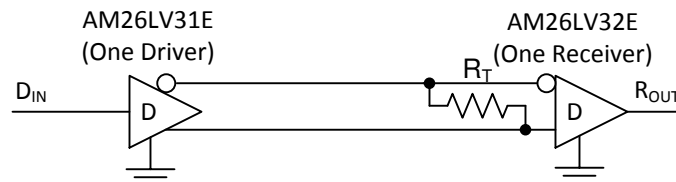


图 9-1. Differential Terminated Configuration

9.2.1 Design Requirements

Resistor and capacitor (if used) termination values are shown for each laboratory experiment, but vary from system to system. For example, the termination resistor, R_T , must be within 20% of the characteristic impedance, R_{OUT} , of the cable and can vary from about 80 Ω to 120 Ω .

9.2.2 Detailed Design Procedure

图 9-1 shows a configuration with R_T as termination. Although reflections are present at the receiver inputs at a data signaling rate of 200 kbps with no termination, the RS-422-compliant receiver reads only the input differential voltage and produces a clean signal at the output.

9.2.3 Application Curve

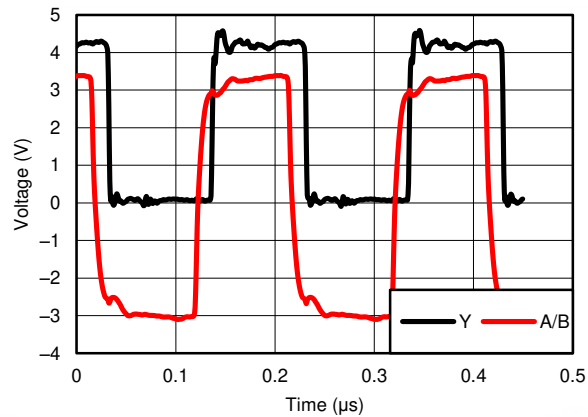


图 9-2. Differential 120- Ω Terminated Output Waveforms (CAT 5E Cable)

10 Power Supply Recommendations

Place 0.1- μ F bypass capacitors close to the power-supply pins to reduce errors coupling in from noisy or high-impedance power supplies.

11 Layout

11.1 Layout Guidelines

For best operational performance of the device, use good PCB layout practices, including:

- Noise can propagate into analog circuitry through the power pins of the circuit as a whole, as well as the operational amplifier. Bypass capacitors are used to reduce the coupled noise by providing low impedance power sources local to the analog circuitry.
 - Connect low-ESR, 0.1- μ F ceramic bypass capacitors between each supply pin and ground, placed as close to the device as possible. A single bypass capacitor from V+ to ground is applicable for single supply applications.
- Separate grounding for analog and digital portions of circuitry is one of the simplest and most-effective methods of noise suppression. One or more layers on multilayer PCBs are usually devoted to ground planes. A ground plane helps distribute heat and reduces EMI noise pickup. Make sure to physically separate digital and analog grounds, paying attention to the flow of the ground current.
- To reduce parasitic coupling, run the input traces as far away from the supply or output traces as possible. If it is not possible to keep them separate, it is much better to cross the sensitive trace perpendicular as opposed to in parallel with the noisy trace.
- Place the external components as close to the device as possible. Keeping RF and RG close to the inverting input minimizes parasitic capacitance.
- Keep the length of input traces as short as possible. Always remember that the input traces are the most sensitive part of the circuit.
- Consider a driven, low-impedance guard ring around the critical traces. A guard ring can significantly reduce leakage currents from nearby traces that are at different potentials.

11.2 Layout Example

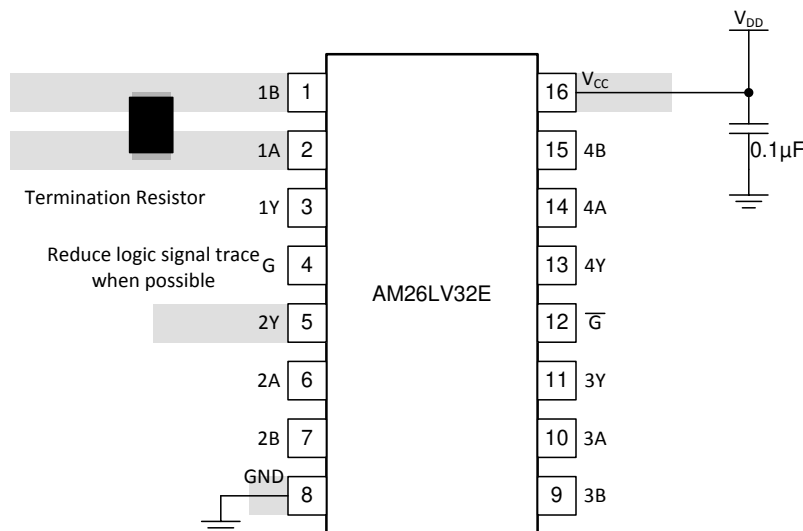


图 11-1. Trace Layout on PCB and Recommendations

12 Device and Documentation Support

12.1 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。

12.2 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](#)》。

12.3 商标

TI E2E™ is a trademark of Texas Instruments.

所有商标均为其各自所有者的财产。

12.4 静电放电警告



静电放电 (ESD) 会损坏这个集成电路。德州仪器 (TI) 建议通过适当的预防措施处理所有集成电路。如果不遵守正确的处理和安装程序，可能会损坏集成电路。

ESD 的损坏小至导致微小的性能降级，大至整个器件故障。精密的集成电路可能更容易受到损坏，这是因为非常细微的参数更改都可能会导致器件与其发布的规格不相符。

12.5 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。

13 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)
AM26LV32EIDR	Active	Production	SOIC (D) 16	2500 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	AM26LV32EI
AM26LV32EINSR	Active	Production	SOP (NS) 16	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	26LV32EI
AM26LV32EIPWR	Active	Production	TSSOP (PW) 16	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	SB32
AM26LV32EIRGYR	Active	Production	VQFN (RGY) 16	3000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	SB32

(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.

OTHER QUALIFIED VERSIONS OF AM26LV32E :

- Enhanced Product : [AM26LV32E-EP](#)

NOTE: Qualified Version Definitions:

- Enhanced Product - Supports Defense, Aerospace and Medical Applications

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
AM26LV32EIDR	SOIC	D	16	2500	330.0	16.4	6.5	10.3	2.1	8.0	16.0	Q1
AM26LV32EIDR	SOIC	D	16	2500	330.0	16.4	6.5	10.3	2.1	8.0	16.0	Q1
AM26LV32EINSR	SOP	NS	16	2000	330.0	16.4	8.2	10.5	2.5	12.0	16.0	Q1
AM26LV32EINSR	SOP	NS	16	2000	330.0	16.4	8.2	10.5	2.5	12.0	16.0	Q1
AM26LV32EIPWR	TSSOP	PW	16	2000	330.0	12.4	6.9	5.6	1.6	8.0	12.0	Q1
AM26LV32EIPWR	TSSOP	PW	16	2000	330.0	12.4	6.9	5.6	1.6	8.0	12.0	Q1
AM26LV32EIRGYR	VQFN	RGY	16	3000	330.0	12.4	3.8	4.3	1.5	8.0	12.0	Q1

TAPE AND REEL BOX DIMENSIONS



*All dimensions are nominal



Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
AM26LV32EIDR	SOIC	D	16	2500	356.0	356.0	35.0
AM26LV32EIDR	SOIC	D	16	2500	353.0	353.0	32.0
AM26LV32EINSR	SOP	NS	16	2000	356.0	356.0	35.0
AM26LV32EINSR	SOP	NS	16	2000	353.0	353.0	32.0
AM26LV32EIPWR	TSSOP	PW	16	2000	367.0	367.0	35.0
AM26LV32EIPWR	TSSOP	PW	16	2000	353.0	353.0	32.0
AM26LV32EIRGYR	VQFN	RGY	16	3000	360.0	360.0	36.0

D (R-PDSO-G16)

PLASTIC SMALL OUTLINE



4040047-6/M 06/11

- 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 0.006 (0,15) each side.
 -  D. Body width does not include interlead flash. Interlead flash shall not exceed 0.017 (0,43) each side.
 - E. Reference JEDEC MS-012 variation AC.



4220204/A 02/2017

NOTES:

1. All linear dimensions are in millimeters. Any 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 0.25 mm per side.
5. Reference JEDEC registration MO-153.

EXAMPLE BOARD LAYOUT

PW0016A

TSSOP - 1.2 mm max height

SMALL OUTLINE PACKAGE



LAND PATTERN EXAMPLE
EXPOSED METAL SHOWN
SCALE: 10X



SOLDER MASK DETAILS

4220204/A 02/2017

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

PW0016A

TSSOP - 1.2 mm max height

SMALL OUTLINE PACKAGE



SOLDER PASTE EXAMPLE
BASED ON 0.125 mm THICK STENCIL
SCALE: 10X

4220204/A 02/2017

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.

MECHANICAL DATA

NS (R-PDSO-G)**

PLASTIC SMALL-OUTLINE PACKAGE

14-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.

RGY (R-PVQFN-N16)

PLASTIC QUAD FLATPACK NO-LEAD



- NOTES:
- A. All linear dimensions are in millimeters. Dimensioning and tolerancing per ASME Y14.5M-1994.
 - B. This drawing is subject to change without notice.
 - C. QFN (Quad Flatpack No-Lead) package configuration.
 - D. The package thermal pad must be soldered to the board for thermal and mechanical performance.
 - E. See the additional figure in the Product Data Sheet for details regarding the exposed thermal pad features and dimensions.
 - F. Pin 1 identifiers are located on both top and bottom of the package and within the zone indicated. The Pin 1 identifiers are either a molded, marked, or metal feature.
 - G. Package complies to JEDEC MO-241 variation BA.



PACKAGE OUTLINE

NS0016A

SOP - 2.00 mm max height

SOP



4220735/A 12/2021

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 0.25 mm, per side.

EXAMPLE BOARD LAYOUT

NS0016A

SOP - 2.00 mm max height

SOP



4220735/A 12/2021

NOTES: (continued)

5. Publication IPC-7351 may have alternate designs.

6. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

EXAMPLE STENCIL DESIGN

NS0016A

SOP - 2.00 mm max height

SOP



SOLDER PASTE EXAMPLE
BASED ON 0.125 mm THICK STENCIL
SCALE:7X

4220735/A 12/2021

NOTES: (continued)

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

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、某特定用途方面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功能安全、信息安全、监管或其他要求。

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。您应全额赔偿因在这些资源的使用中对 TI 及其代表造成的任何索赔、损害、成本、损失和债务，TI 对此概不负责。

TI 提供的产品受 [TI 的销售条款](#) 或 [ti.com](#) 上其他适用条款/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。

TI 反对并拒绝您可能提出的任何其他或不同的条款。

邮寄地址：Texas Instruments, Post Office Box 655303, Dallas, Texas 75265
版权所有 © 2025，德州仪器 (TI) 公司