Octal Line Receiver

FEATURES

- Meets EIA 232E/423A/422A and CCITT V.10,V.11, V.28, X.26, X.27
- Single +5V Supply--TTL Compatible Outputs
- Differential Inputs Withstand ± 25V
- Low Open Circuit Voltage for Improved Failsafe Characteristic
- Reduced Supply Current--35 mA Max
- Input Noise Filter
- Internal Hysteresis

DESCRIPTION

The UC5180C is an octal line receiver designed to meet a wide range of digital communications requirements as outlined in EIA standards EIA232E, EIA423A, EIA422A, and CCITT V.10, V.11, V.28, X.26, and X.27. The UC5180C includes an input noise filter and is intended for applications employing data rates up to 200 KBPS. A failsafe function allows these devices to "fail" to a known state under a wide variety of fault conditions at the inputs.

ABSOLUTE MAXIMUM RATINGS (Note 1)

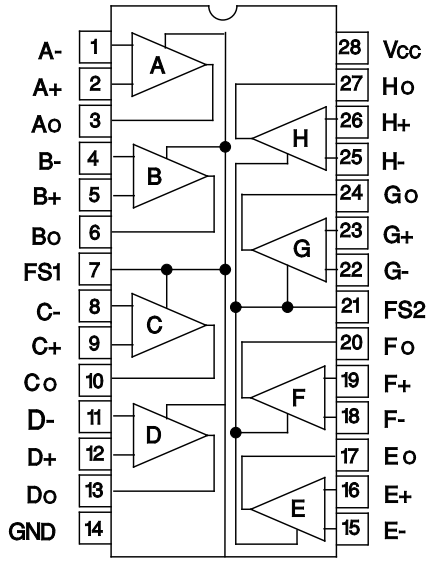
Supply Voltage, V_{CC}	7V
Output Sink Current	50 mA
Output Short Circuit Time	1 Sec
Common Mode Input Range	15V
Differential Input Range	25V
Failsafe Voltage	-0.3 to V_{CC}
PLCC Power Dissipation, T_A = 25°C (Note 2)	1000 mW
DIP Power Dissipation, T_A = 25°C (Note 2)	1200 mW
Storage Temperature Range	-65°C to +150°C
Lead Temperature (Soldering, 10 Seconds)	-300°C

Note 1: All voltages are with respect to ground, pin 14. Currents are positive into, negative out of the specified terminal

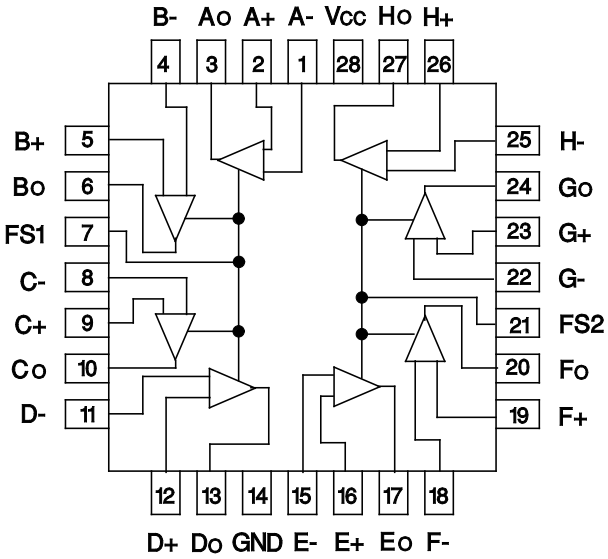
Note 2: Consult Packaging Section of Databook for thermal limitations and considerations of package.

CONNECTION DIAGRAMS

DIL-28 (TOP VIEW)



PLCC-28 (TOP VIEW)



DC ELECTRICAL CHARACTERISTICS: Unless otherwise stated these specifications apply for T_A = 0°C to +70°C, V_{CC} = 5V ± 5%, Input Common Mode Range ± 7V, T_A = T_J

PARAMETERS	SYMBOL	TEST CONDITIONS		UC5180C MIN	UC5180C MAX	UNITS
DC Input Resistance	R_{IN}	3V ≤ | V_{IN} | ≤ 25V		3	7	kΩ
Failsafe Output Voltage	V_{OFS}	Inputs Open or Shorted Together, or One Input Open and One Grounded	0 ≤ I_{OUT} ≤ 8mA, $V_{FAILSAFE}$ = 0V		0.45	V
			0 ≥ I_{OUT} ≥ - 400 µA, $V_{FAILSAFE}$ = V_{CC}	2.7		
Differential Input High Threshold	V_{TH}	V_{OUT} = 2.7V, I_{OUT} = 440 µA (See Figure 1)	R_S = 0 (Note 2)	50	200	mV
			R_S = 500 (Note 2)		400	
Differential Input Low Threshold	V_{TL}	V_{OUT} = 0.45V, I_{OUT} = 440 mA (See Figure 1)	R_S = 0 (Note 2)	-200	-50	mV
			R_S = 500 (Note 2)	-400		
Hysteresis	V_H	F_S = 0V or V_{CC} (See Figure 1)		50	140	mV
Open Circuit Input Voltage	V_{ICC}				75	mV
Input Capacitance	C_I				20	pF
High Level Output Voltage	V_{CH}	V_{ID} = 1V, I_{OUT} = - 440µA		2.7		V
Low Level Output Voltage	V_{OL}	V_{ID} = -1V (Note 3)	I_{OUT} = 4 mA		0.4	V
			I_{OUT} = 8 mA		0.45	
Short Circuit Output Current	I_{OS}	Note 4		20	100	mA
Supply Current	I_{CC}	4.75V ≤ V_{CC} ≤ 5.25V			35	mA
Input Current	I_{IN}	Other Inputs Grounded	V_{IN} = +10V		3.25	mA
			V_{IN} = -10V	-3.25		

Note 2: R_S is a resistor in series with each input.
Note 3: Measured after 100ms warm up (at 0°C)
Note 4: Only 1 output may be shorted at one time and then only for a maximum of 1 sec.

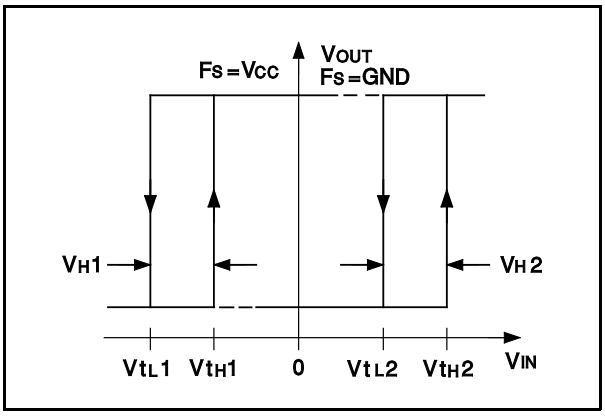


Figure 1. VtL, VtH, VH Definition

AC ELECTRICAL CHARACTERISTICS: V_{CC} = 5V ± 5%, T_A = 0°C to + 70°C, Figure 2, T_A = T_J.

PARAMETERS	SYMBOL	TEST CONDITIONS	UC5180C MIN	UC5180C MAX	UNITS
Propagation Delay - Low to High	t_{PLH}	C_L = 50pF, V_{IN} = ± 500mV		550	ns
Propagation Delay - High to Low	t_{PHL}	C_L = 50pF, V_{IN} = ± 500mV		550	ns
Acceptance Input Frequency	f_A	Unused Input Grounded, V_{IN} = ± 200mV		0.1	MHz
Rejectable Input Frequency	f_R	Unused Input Grounded, V_{IN} = ± 500mV	5.5		MHz

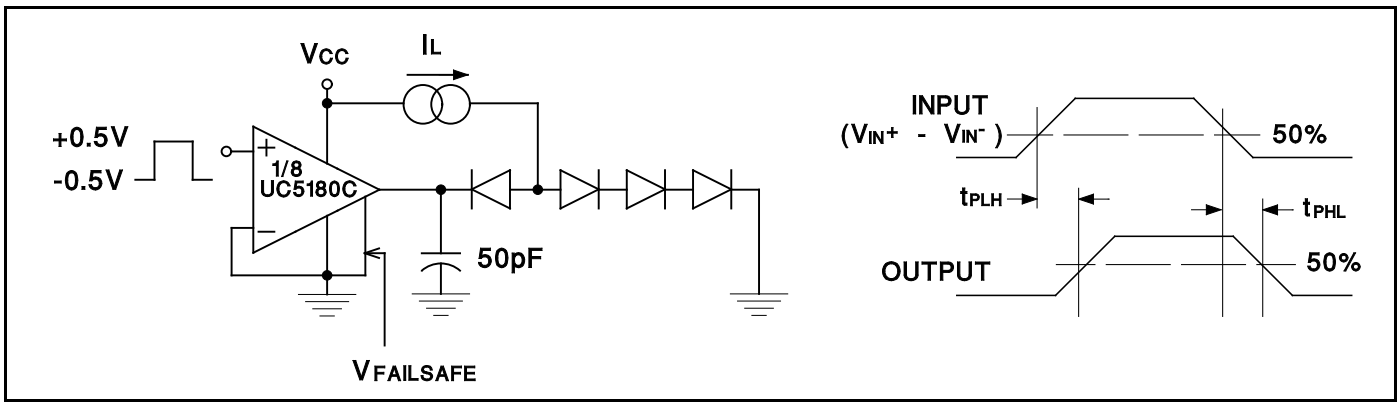


Figure 2. AC Test Circuit

APPLICATIONS INFORMATION

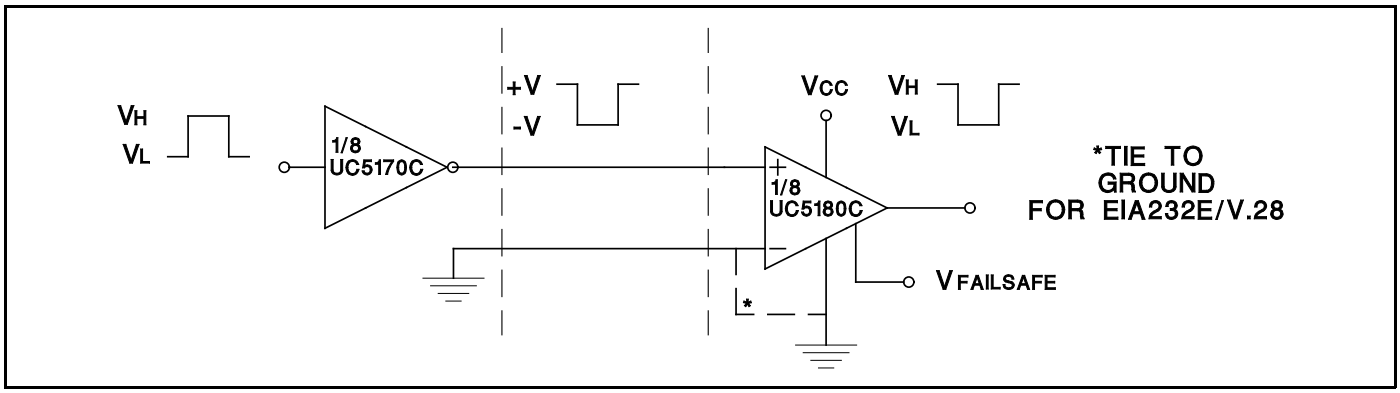
Failsafe Operation

These devices provide a failsafe operating mode to guard against input fault conditions as defined in EIA422A and EIA423A standards. These fault conditions are (1) drive in power-off condition, (2) receiver not interconnected with driver, (3) open-circuited interconnecting cable, and (4) short-circuited interconnecting cable. If one of these four fault conditions occurs at the inputs of a receiver, then the output of that receiver is driven to a known logic level. The receiver is programmed by connecting the failsafe input to VCC or ground. A connection to VCC provides a logic "1" output under fault conditions, while a connection to ground provides a logic "0". There are two failsafe pins (F_{S1} and F_{S2}) on the UC5180C where each provides common failsafe control for four receivers.

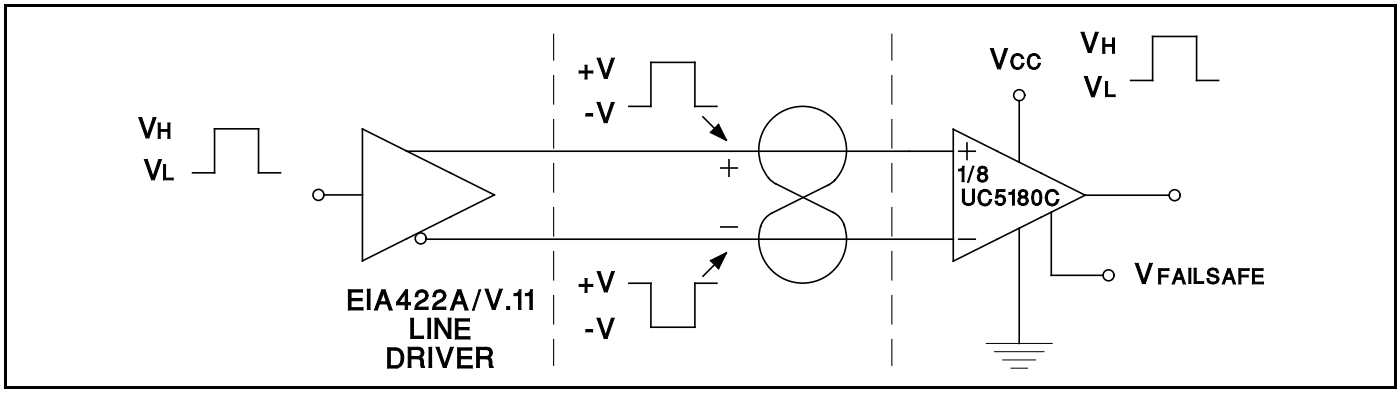
Input Filtering (UC5180C)

The UC5180C has input filtering for additional noise rejection. This filtering is a function of both signal level and frequency. For the specified input (5.5 MHz at ±500 mV) the input stage filter attenuates the signal such that the output stage threshold levels are not exceeded and no change of state occurs at the output.

EIA232E/V.28 / EIA423A/V.10 DATA TRANSMISSION



EIA422A/V.11 DATA TRANSMISSION



UNITRODE INTEGRATED CIRCUITS
7 CONTINENTAL BLVD. • MERRIMACK, NH 03054
TEL. (603) 424-2410 • FAX (603) 424-3410

PACKAGING INFORMATION

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish (6)	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
UC5180CJ	OBSOLETE		UTR			TBD	Call TI	Call TI			
UC5180CQ	OBSOLETE	PLCC	FN	28		TBD	Call TI	Call TI		UC5180CQ	
UC5180CQTR	OBSOLETE	PLCC	FN	28		TBD	Call TI	Call TI		UC5180CQ	

(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.

(4) There may be additional marking, which relates to the logo, the lot trace code information, or the environmental category on the device.

(5) Multiple Device Markings will be inside parentheses. Only one Device Marking contained in parentheses and separated by a "~" will appear on a device. If a line is indented then it is a continuation of the previous line and the two combined represent the entire Device Marking for that device.

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

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.

IMPORTANT NOTICE

Texas Instruments Incorporated and its subsidiaries (TI) reserve the right to make corrections, enhancements, improvements and other changes to its semiconductor products and services per JESD46, latest issue, and to discontinue any product or service per JESD48, latest issue. Buyers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. All semiconductor products (also referred to herein as “components”) are sold subject to TI’s terms and conditions of sale supplied at the time of order acknowledgment.

TI warrants performance of its components to the specifications applicable at the time of sale, in accordance with the warranty in TI’s terms and conditions of sale of semiconductor products. Testing and other quality control techniques are used to the extent TI deems necessary to support this warranty. Except where mandated by applicable law, testing of all parameters of each component is not necessarily performed.

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

TI does not warrant or represent that any license, either express or implied, is granted under any patent right, copyright, mask work right, or other intellectual property right relating to any combination, machine, or process in which TI components or services are used. Information published by TI regarding third-party products or services does not constitute a license 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 significant portions 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. TI is not responsible or liable for such altered documentation. Information of third parties may be subject to additional restrictions.

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

Buyer acknowledges and agrees that it is solely responsible for compliance with all legal, regulatory and safety-related requirements concerning its products, and any use of TI components in its applications, notwithstanding any applications-related information or support that may be provided by TI. Buyer represents and agrees that it has all the necessary expertise to create and implement safeguards which anticipate dangerous consequences of failures, monitor failures and their consequences, lessen the likelihood of failures that might cause harm and take appropriate remedial actions. Buyer will fully indemnify TI and its representatives against any damages arising out of the use of any TI components in safety-critical applications.

In some cases, TI components may be promoted specifically to facilitate safety-related applications. With such components, TI’s goal is to help enable customers to design and create their own end-product solutions that meet applicable functional safety standards and requirements. Nonetheless, such components are subject to these terms.

No TI components are authorized for use in FDA Class III (or similar life-critical medical equipment) unless authorized officers of the parties have executed a special agreement specifically governing such use.

Only those TI components which TI has specifically designated as military grade or “enhanced plastic” are designed and intended for use in military/aerospace applications or environments. Buyer acknowledges and agrees that any military or aerospace use of TI components which have ***not*** been so designated is solely at the Buyer's risk, and that Buyer is solely responsible for compliance with all legal and regulatory requirements in connection with such use.

TI has specifically designated certain components as meeting ISO/TS16949 requirements, mainly for automotive use. In any case of use of non-designated products, TI will not be responsible for any failure to meet ISO/TS16949.

Products		**Applications**	
Audio	www.ti.com/audio	Automotive and Transportation	www.ti.com/automotive
Amplifiers	amplifier.ti.com	Communications and Telecom	www.ti.com/communications
Data Converters	dataconverter.ti.com	Computers and Peripherals	www.ti.com/computers
DLP® Products	www.dlp.com	Consumer Electronics	www.ti.com/consumer-apps
DSP	dsp.ti.com	Energy and Lighting	www.ti.com/energy
Clocks and Timers	www.ti.com/clocks	Industrial	www.ti.com/industrial
Interface	interface.ti.com	Medical	www.ti.com/medical
Logic	logic.ti.com	Security	www.ti.com/security
Power Mgmt	power.ti.com	Space, Avionics and Defense	www.ti.com/space-avionics-defense
Microcontrollers	microcontroller.ti.com	Video and Imaging	www.ti.com/video
RFID	www.ti-rfid.com		
OMAP Applications Processors	www.ti.com/omap	**TI E2E Community**	e2e.ti.com
Wireless Connectivity	www.ti.com/wirelessconnectivity		

Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265