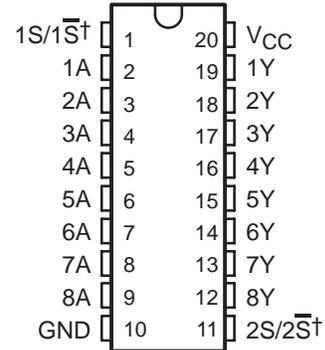


SN75128, SN75129 EIGHT-CHANNEL LINE RECEIVERS

SLLS076B – JANUARY 1977 – REVISED MAY 1995

- Meets or Exceeds the Requirements of IBM™ System 360/370 Input/Output Specification
- Input Resistance . . . 7 kΩ to 20 kΩ
- Output Compatible With TTL
- Schottky-Clamped Transistors
- Operates From a Single 5-V Supply
- High Speed . . . Low Propagation Delay
- Ratio Specification . . . t_{PLH}/t_{PHL}
- Common Strobe for Each Group of Four Receivers
- SN75128 . . . Active-High Strobes
SN75129 . . . Active-Low Strobes

N PACKAGE
(TOP VIEW)



† S and \bar{S} for SN75128 and SN75129, respectively

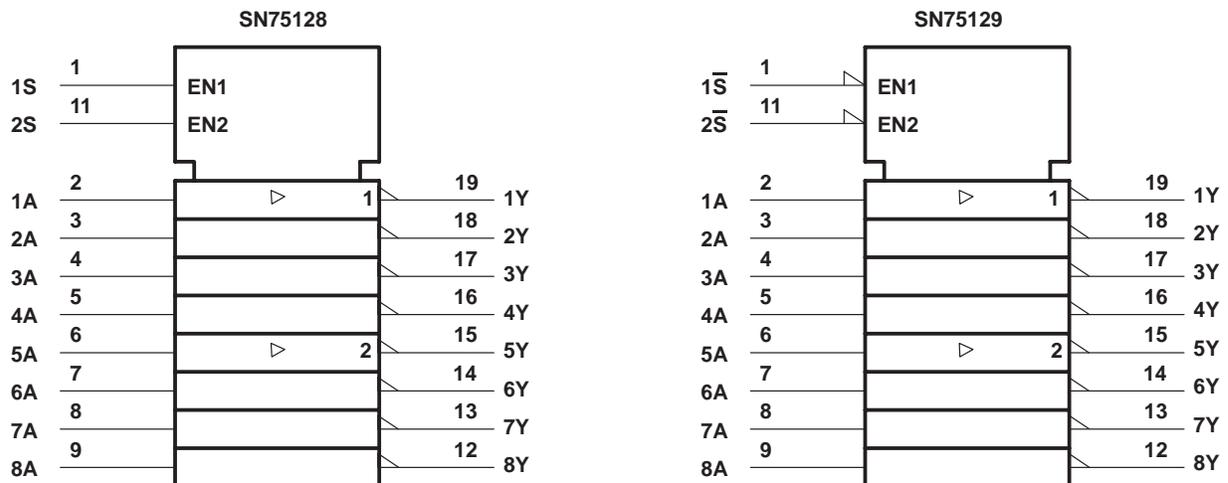
description

The SN75128 and SN75129 are eight-channel line receivers designed to satisfy the requirements of the input-output interface specification for IBM 360/370. Both devices feature common strobes for each group of four devices. The SN75128 has active-high strobes; the SN75129 has active-low strobes. Special low-power design and Schottky-diode-clamped transistors allow low supply-current requirements while maintaining fast switching speeds and high-current TTL outputs.

For new IBM 360/370 interface designs, see the SN751730.

The SN75128 and SN75129 are characterized for operation from 0°C to 70°C.

logic symbols†



† These symbols are in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.

IBM is a trademark of International Business Machines Corp.

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

 **TEXAS
INSTRUMENTS**

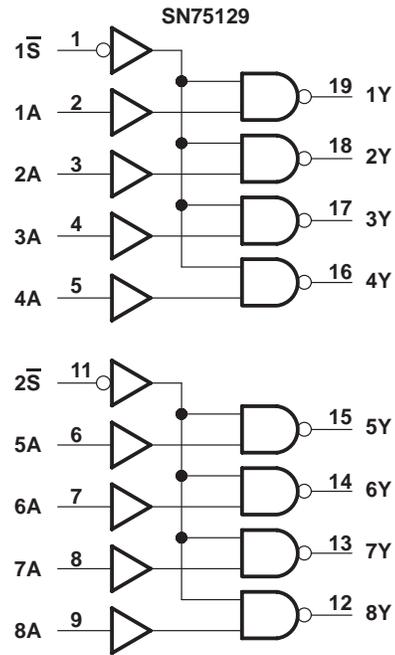
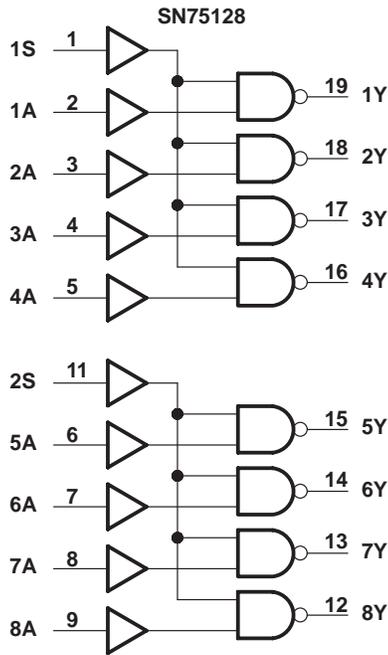
POST OFFICE BOX 655303 • DALLAS, TEXAS 75265
POST OFFICE BOX 1443 • HOUSTON, TEXAS 77251-1443

Copyright © 1995, Texas Instruments Incorporated

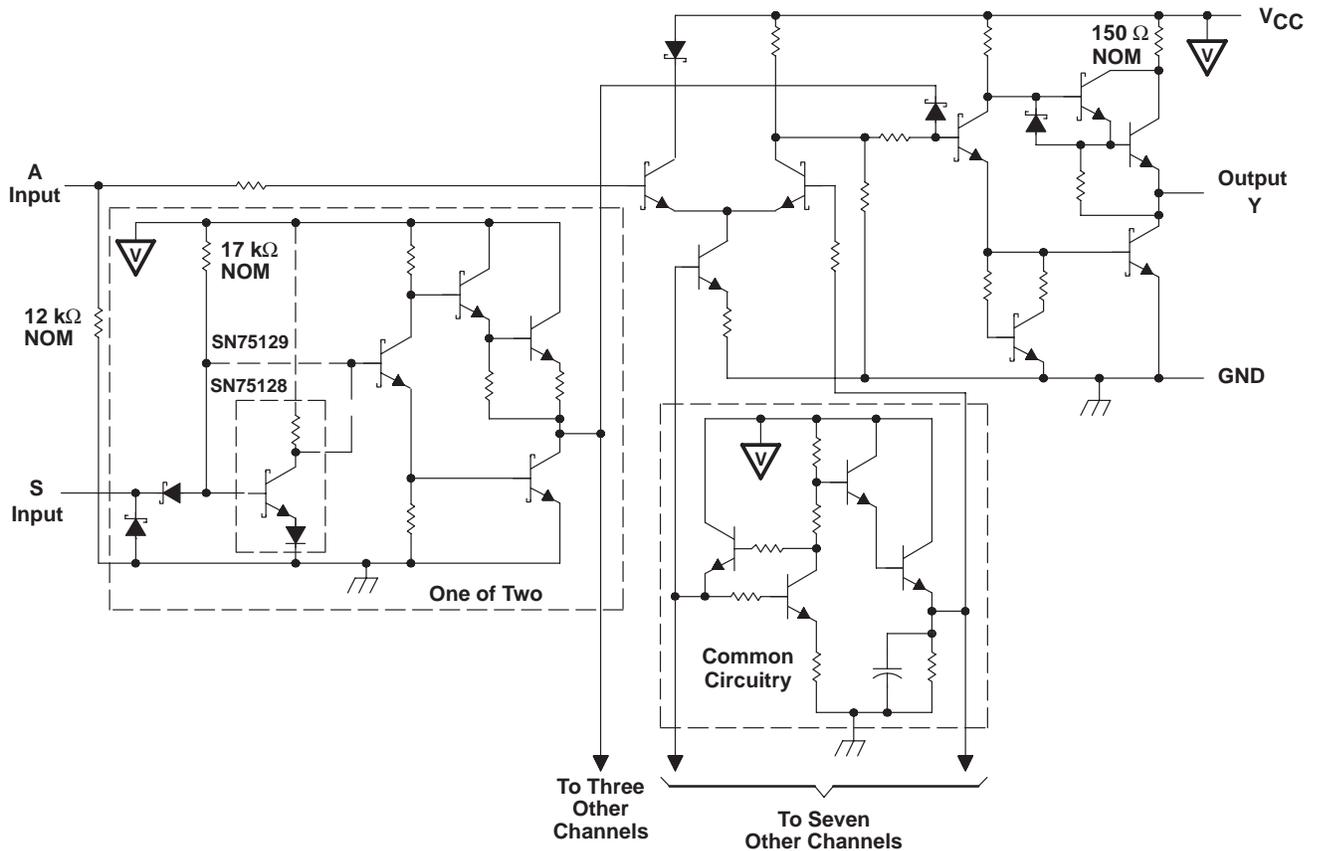
SN75128, SN75129 EIGHT-CHANNEL LINE RECEIVERS

SLLS076B – JANUARY 1977 – REVISED MAY 1995

logic diagrams (positive logic)



schematic (each driver)



POST OFFICE BOX 655303 • DALLAS, TEXAS 75265
POST OFFICE BOX 1443 • HOUSTON, TEXAS 77251-1443

SN75128, SN75129 EIGHT-CHANNEL LINE RECEIVERS

SLLS076B – JANUARY 1977 – REVISED MAY 1995

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

| | |
|--|------------------------------|
| Supply voltage, V_{CC} (see Note 1) | 7 V |
| Input voltage range, V_I (A) | –0.15 V to 7 V |
| Input voltage, V_I (S) | 7 V |
| Continuous total power dissipation | See Dissipation Rating Table |
| Operating free-air temperature range, T_A | 0°C to 70°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 network ground terminal.

DISSIPATION RATING TABLE

| PACKAGE | $T_A \leq 25^\circ\text{C}$ POWER RATING | DERATING FACTOR ABOVE $T_A = 25^\circ\text{C}$ | $T_A = 70^\circ\text{C}$ POWER RATING |
|---------|---|---|--|
| N | 1150 mW | 9.2 mW/°C | 736 mW |

recommended operating conditions

| | | MIN | NOM | MAX | UNIT |
|---------------------------------------|---|-----|-----|------|------|
| Supply voltage, V_{CC} | | 4.5 | 5 | 5.5 | V |
| High-level input voltage, V_{IH} | A | 1.7 | | | V |
| | S | 2 | | | |
| Low-level input voltage, V_{IL} | A | | | 0.7 | V |
| | S | | | 0.7 | |
| High-level output current, I_{OH} | | | | –0.4 | mA |
| Low-level output current, I_{OL} | | | | 16 | mA |
| Operating free-air temperature, T_A | | 0 | | 70 | °C |

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

| PARAMETER | | TEST CONDITIONS | | | MIN | TYP† | MAX | UNIT |
|-----------|-------------------------------|---------------------------|---------------------------|---|-----|------|------|------|
| V_{OH} | High-level output voltage | $V_{CC} = 4.5\text{ V}$, | $V_{IL} = 0.7\text{ V}$, | $I_{OH} = -0.4\text{ mA}$ | 2.4 | 3.1 | | V |
| V_{OL} | Low-level output voltage | $V_{CC} = 4.5\text{ V}$, | $V_{IH} = 1.7\text{ V}$, | $I_{OL} = 16\text{ mA}$ | | 0.4 | 0.5 | V |
| V_{IK} | Input clamp voltage | S | $V_{CC} = 4.5\text{ V}$, | $I_I = -18\text{ mA}$ | | | –1.5 | V |
| I_{IH} | High-level input current | A | $V_{CC} = 5.5\text{ V}$, | $V_I = 3.11\text{ V}$ | | 0.3 | 0.42 | mA |
| | | S | $V_{CC} = 5.5\text{ V}$, | $V_I = 2.7\text{ V}$ | | | 20 | µA |
| I_{IL} | Low-level input current | A | $V_{CC} = 5.5\text{ V}$, | $V_I = 0.15\text{ V}$ | | | 30 | µA |
| | | S | $V_{CC} = 5.5\text{ V}$, | $V_I = 0.4\text{ V}$ | | | –0.4 | mA |
| I_{OS} | Short-circuit output current‡ | | $V_{CC} = 5.5\text{ V}$, | $V_O = 0$ | –18 | | –60 | mA |
| r_I | Input resistance | | $V_{CC} = 4.5\text{ V}$, | 0 V or open, $\Delta V_I = 0.15\text{ V to } 4.15\text{ V}$ | 7 | | 20 | kΩ |
| I_{CC} | Supply current | SN75128 | $V_{CC} = 5.5\text{ V}$, | Strobe at 2.4 V, All A inputs at 0.7 V | | 19 | 31 | mA |
| | | SN75129 | $V_{CC} = 5.5\text{ V}$, | Strobe at 0.4 V, All A inputs at 0.7 V | | 19 | 31 | |
| | | SN75128 | $V_{CC} = 5.5\text{ V}$, | Strobe at 2.4 V, All A inputs at 4 V | | 32 | 53 | |
| | | SN75129 | $V_{CC} = 5.5\text{ V}$, | Strobe at 0.4 V, All A inputs at 4 V | | 32 | 53 | |

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

‡ Not more than one output should be shorted at a time.



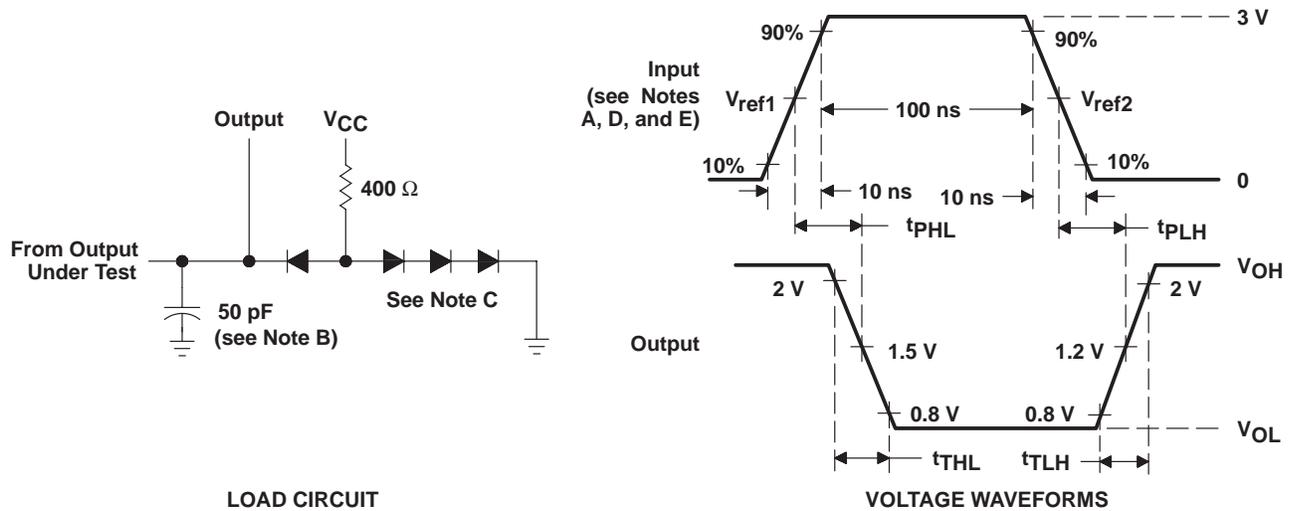
SN75128, SN75129 EIGHT-CHANNEL LINE RECEIVERS

SLLS076B – JANUARY 1977 – REVISED MAY 1995

switching characteristics, $V_{CC} = 5\text{ V}$, $T_A = 25^\circ\text{C}$

| PARAMETER | FROM | TEST CONDITIONS | SN75128 | | | SN75129 | | | UNIT |
|--|------|--|---------|-----|-----|---------|-----|-----|------|
| | | | MIN | TYP | MAX | MIN | TYP | MAX | |
| t_{PLH} Propagation delay time, low-to-high-level output | A | $R_L = 400\ \Omega$, $C_L = 50\ \text{pF}$, See Figure 1 | 7 | 14 | 25 | 7 | 14 | 25 | ns |
| t_{PHL} Propagation delay time, high-to-low-level output | | | 10 | 18 | 30 | 10 | 18 | 30 | ns |
| t_{PLH} Propagation delay time, low-to-high-level output | S | | 26 | 40 | | 20 | 35 | ns | |
| t_{PHL} Propagation delay time, high-to-low-level output | | | 22 | 35 | | 16 | 30 | ns | |
| $\frac{t_{PLH}}{t_{PHL}}$ Ratio of propagation delay times | A | | 0.5 | 0.8 | 1.3 | 0.5 | 0.8 | 1.3 | |
| t_{TLH} Transition time, low-to-high-level output | | | 1 | 7 | 12 | 1 | 7 | 12 | ns |
| t_{THL} Transition time, high-to-low-level output | | 1 | 3 | 12 | 1 | 3 | 12 | ns | |

PARAMETER MEASUREMENT INFORMATION



- NOTES: A. Input pulses are supplied by a generator having the following characteristics: $Z_O = 50\ \Omega$, $PRR \leq 5\ \text{MHz}$.
 B. Includes probe and jig capacitance
 C. All diodes are 1N3064 or equivalent.
 D. The strobe inputs of SN75129 are in phase with the output.
 E. $V_{ref1} = 0.7\ \text{V}$ and $V_{ref2} = 1.7\ \text{V}$ for testing data (A) inputs, $V_{ref1} = V_{ref2} = 1.3\ \text{V}$ for strobe inputs.

Figure 1. Load Circuit and Voltage Waveforms

TYPICAL CHARACTERISTICS

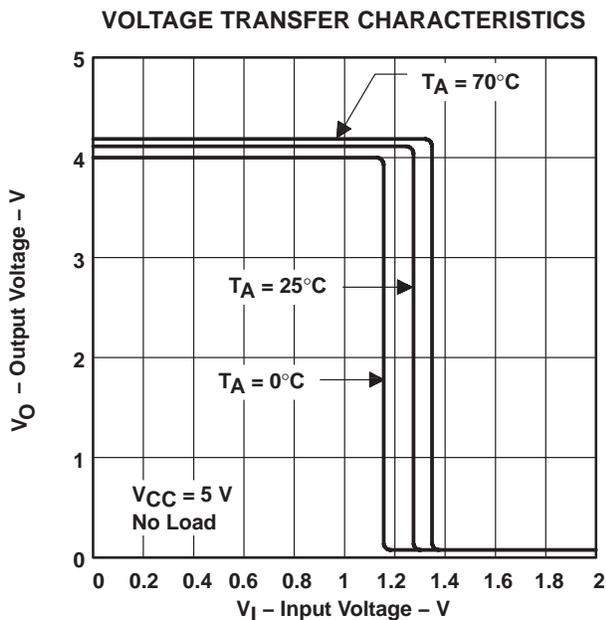


Figure 2

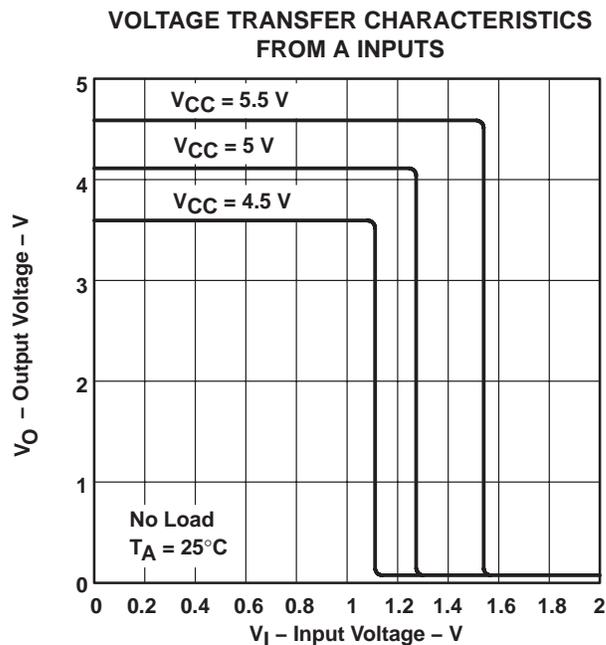


Figure 3

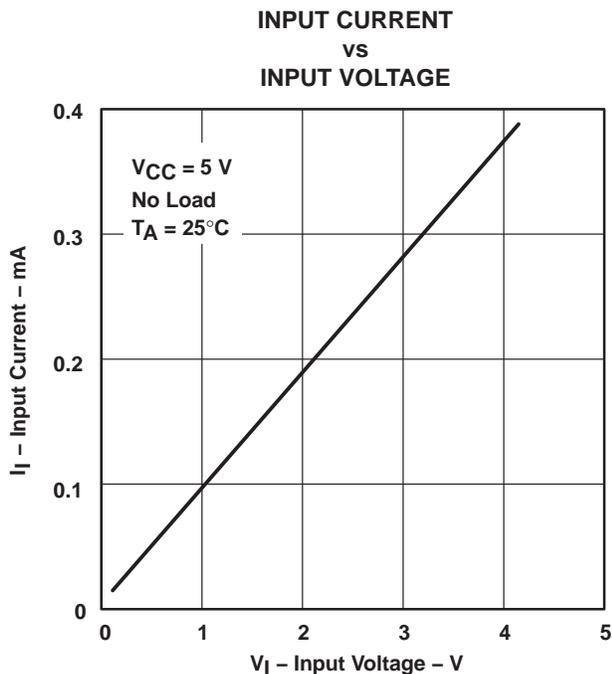


Figure 4

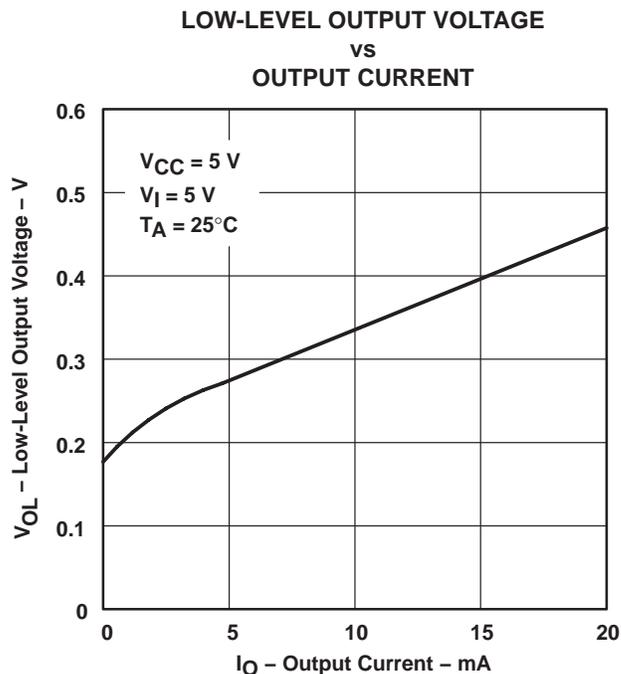


Figure 5

PACKAGING INFORMATION

| Orderable Device | Status ⁽¹⁾ | Package Type | Package Drawing | Pins | Package Qty | Eco Plan ⁽²⁾ | Lead/Ball Finish | MSL Peak Temp ⁽³⁾ |
|------------------|-----------------------|--------------|-----------------|------|-------------|-------------------------|------------------|------------------------------|
| SN75128N | OBSOLETE | PDIP | N | 20 | | TBD | Call TI | Call TI |
| SN75129DW | OBSOLETE | SOIC | DW | 20 | | TBD | Call TI | Call TI |
| SN75129N | OBSOLETE | PDIP | N | 20 | | 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) 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.

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)

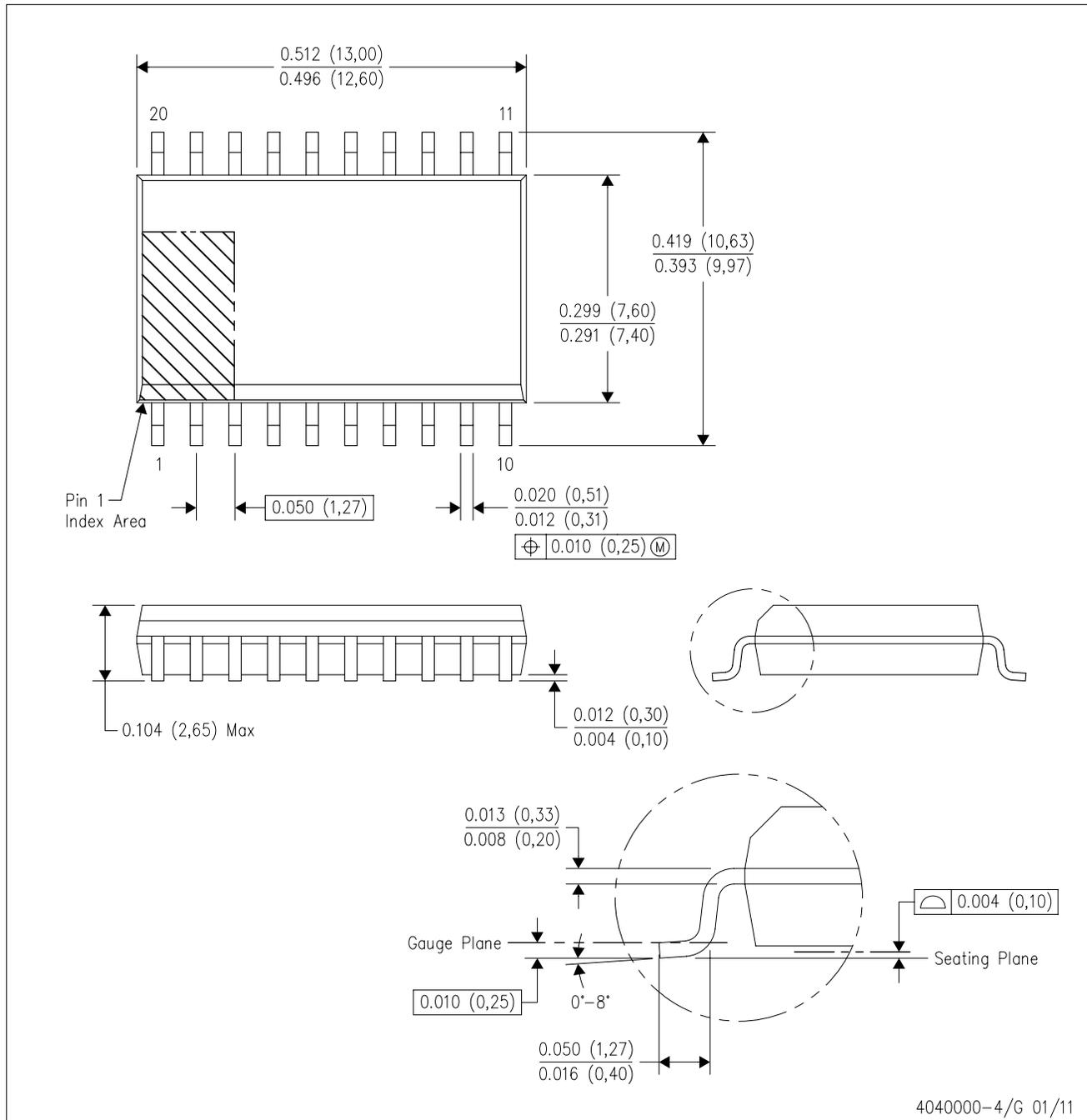
⁽³⁾ MSL, Peak Temp. -- The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

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.

DW (R-PDSO-G20)

PLASTIC SMALL OUTLINE



- NOTES:
- All linear dimensions are in inches (millimeters). Dimensioning and tolerancing per ASME Y14.5M-1994.
 - This drawing is subject to change without notice.
 - Body dimensions do not include mold flash or protrusion not to exceed 0.006 (0,15).
 - Falls within JEDEC MS-013 variation AC.

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

| | |
|-----------------------------|--|
| Audio | www.ti.com/audio |
| Amplifiers | amplifier.ti.com |
| Data Converters | dataconverter.ti.com |
| DLP® Products | www.dlp.com |
| DSP | dsp.ti.com |
| Clocks and Timers | www.ti.com/clocks |
| Interface | interface.ti.com |
| Logic | logic.ti.com |
| Power Mgmt | power.ti.com |
| Microcontrollers | microcontroller.ti.com |
| RFID | www.ti-rfid.com |
| RF/IF and ZigBee® Solutions | www.ti.com/lprf |

Applications

| | |
|-------------------------------|--|
| Communications and Telecom | www.ti.com/communications |
| Computers and Peripherals | www.ti.com/computers |
| Consumer Electronics | www.ti.com/consumer-apps |
| Energy and Lighting | www.ti.com/energy |
| Industrial | www.ti.com/industrial |
| Medical | www.ti.com/medical |
| Security | www.ti.com/security |
| Space, Avionics and Defense | www.ti.com/space-avionics-defense |
| Transportation and Automotive | www.ti.com/automotive |
| Video and Imaging | www.ti.com/video |
| Wireless | www.ti.com/wireless-apps |

TI E2E Community Home Page

e2e.ti.com

Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265
Copyright © 2011, Texas Instruments Incorporated