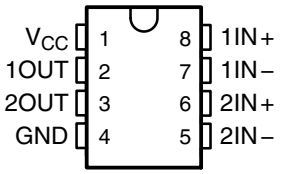
SLLS113C – OCTOBER 1986 – REVISED MARCH 1997

- **Operates From Single 5-V Power Supply**
- **Wide Common-Mode Voltage Range**
- **High Input Impedance**
- **TTL-Compatible Outputs**
- **High-Speed Schottky Circuitry**
- **8-Pin Dual-In-Line Packages**
- **Designed to Be Interchangeable With National DS9639AC**

P PACKAGE
(TOP VIEW)

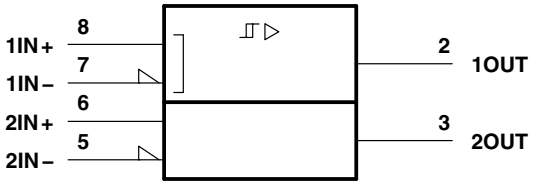


description

The uA9639C is a dual differential line receiver designed to meet ANSI Standards EIA/TIA-422-B and EIA/TIA-423-B and ITU Recommendations V.10 and V.11. It utilizes Schottky circuitry and has TTL-compatible outputs. The inputs are compatible with either a single-ended or a differential-line system. This device operates from a single 5-V power supply and is supplied in an 8-pin, dual-in-line package.

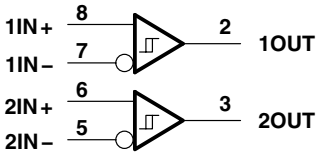
The uA9639C is characterized for operation from 0°C to 70°C.

logic symbol†

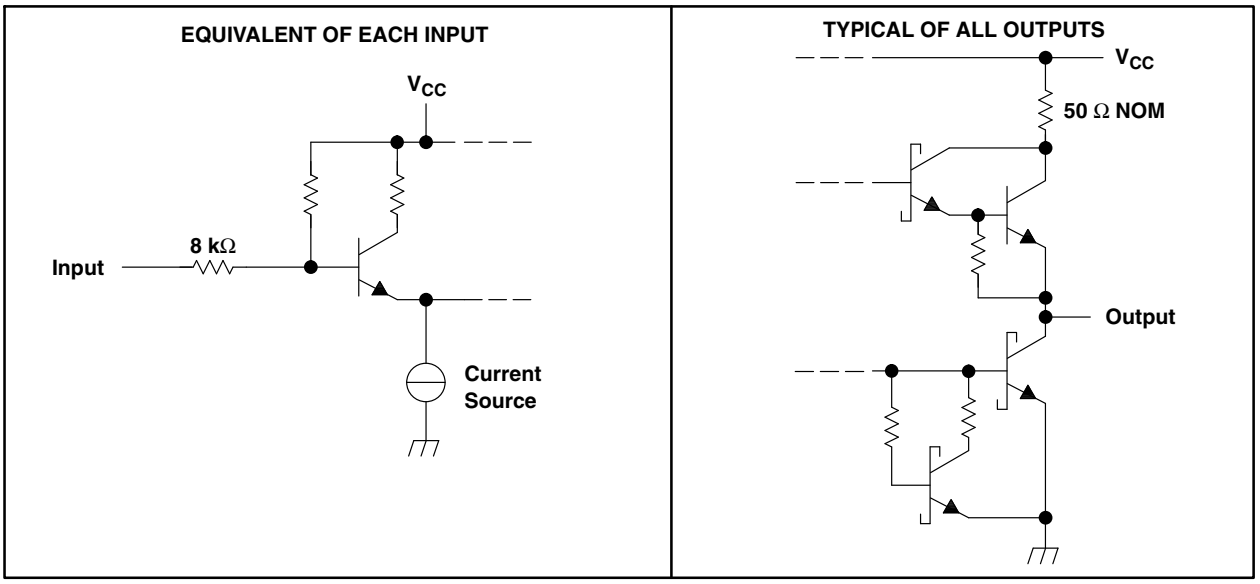


† This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.

logic diagram



schematics of inputs and outputs



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

Supply voltage range, V_{CC} (see Note 1) . . . . . −0.5 V to 7 V
Input voltage, V_I . . . . . ±15 V
Differential input voltage, V_{ID} (see Note 2) . . . . . ±15 V
Output voltage range, V_O (see Note 1) . . . . . −0.5 V to 5.5 V
Low-level output current, I_{OL} . . . . . 50 mA
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.

NOTES: 1. All voltage values, except differential input voltage, are with respect to the network ground terminal.
2. Differential input voltage is measured at the noninverting input with respect to the corresponding inverting input.

DISSIPATION RATING TABLE

PACKAGE	$T_A \le 25°C$ POWER RATING	OPERATING FACTOR ABOVE $T_A = 25°C$	$T_A = 70°C$ POWER RATING
P	1000 mW	8.0 mW/°C	640 mW

recommended operating conditions

	MIN	NOM	MAX	UNIT
Supply voltage, V_{CC}	4.75	5	5.25	V
Common-mode input voltage, V_{IC}			±7	V
Operating free-air temperature, T_A	0		70	°C

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

PARAMETER		TEST CONDITIONS		MIN	TYP†	MAX	UNIT
V_{IT+}	Positive-going input threshold voltage	See Note 3				0.2	V
						0.4	
V_{IT-}	Negative-going input threshold voltage	See Note 3		−0.2			V
				−0.4‡			
V_{hys}	Hysteresis voltage ($V_{IT+} - V_{IT-}$)				70		mV
V_{OH}	High-level output voltage	V_{ID} = 0.2 V,	I_O = −1 mA	2.5	3.5		V
V_{OL}	Low-level output voltage	V_{ID} = −0.2 V,	I_O = 20 mA		0.35	0.5	V
I_I	Input current	V_{CC} = 0 to 5.5 V, See Note 4	V_I = 10 V		1.1	3.25	mA
			V_I = −10 V		−1.6	−3.25	
I_{OS}	Short-circuit output current§	V_O = 0,	V_{ID} = 0.2 V	−40	−75	−100	mA
I_{CC}	Supply current	V_{ID} = −0.5 V,	No load		35	50	mA

† All typical values are at V_{CC} = 5 V, T_A = 25°C.

‡ The algebraic convention, in which the less positive (more negative) limit is designated as minimum, is used in this data sheet for threshold levels only.

§ Only one output should be shorted at a time, and duration of the short circuit should not exceed one second.

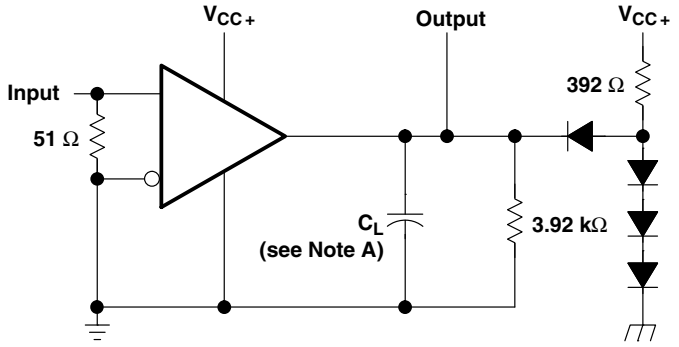
NOTES: 3. The expanded threshold parameter is tested with a 500-Ω resistor in series with each input.

4. The input not under test is grounded.

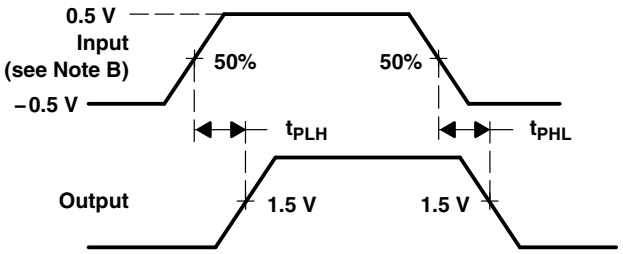
switching characteristics, V_{CC} = 5 V, T_A = 0°C to 70°C

PARAMETER		TEST CONDITIONS	MIN	MAX	UNIT
t_{PLH}	Propagation delay time, low- to high-level output	C_L = 50 pF, See Figure 1		85	ns
t_{PHL}	Propagation delay time, high- to low-level output			85	ns

PARAMETER MEASUREMENT INFORMATION



TEST CIRCUIT



VOLTAGE WAVEFORMS

NOTES: A. C_L includes probe and jig capacitance.
B. The input pulse is supplied by a generator having the following characteristics: $t_r \le 5$ ns, $t_f \le 5$ ns, PRR ≤ 5 MHz, duty cycle = 50%.

Figure 1. Test Circuit and Voltage Waveforms

TYPICAL CHARACTERISTICS

OUTPUT VOLTAGE vs DIFFERENTIAL INPUT VOLTAGE

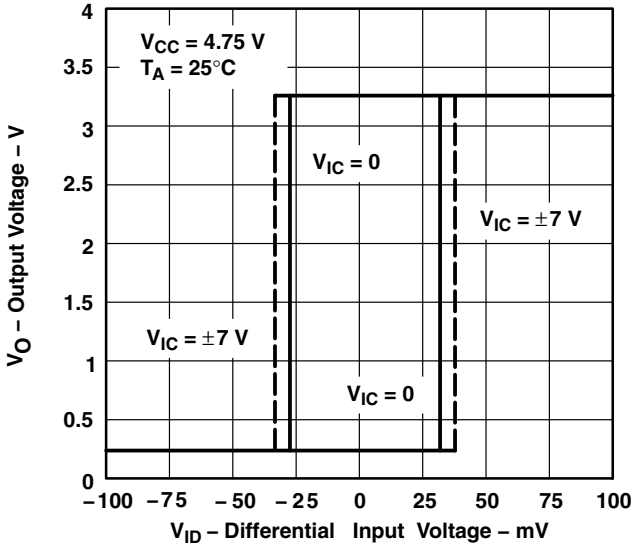


Figure 2

OUTPUT VOLTAGE vs DIFFERENTIAL INPUT VOLTAGE

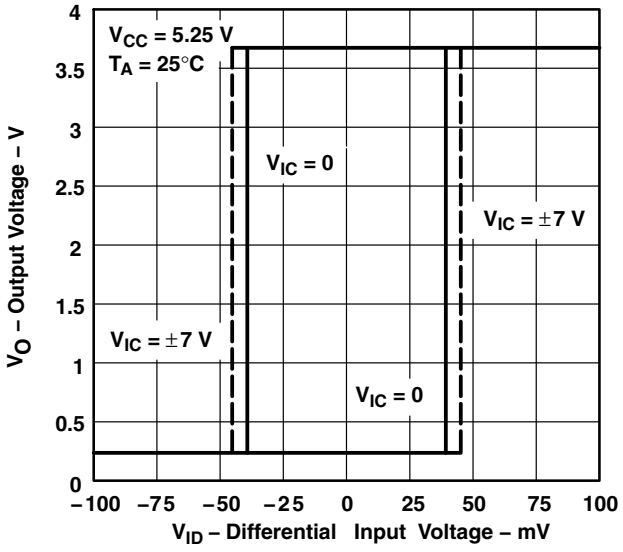


Figure 3

TYPICAL CHARACTERISTICS

HIGH-LEVEL OUTPUT VOLTAGE vs HIGH-LEVEL OUTPUT CURRENT

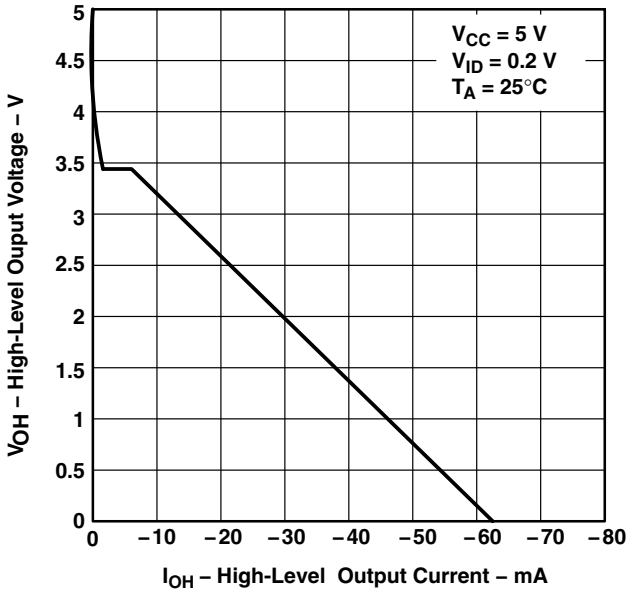


Figure 4

LOW-LEVEL OUTPUT VOLTAGE vs LOW-LEVEL OUTPUT CURRENT

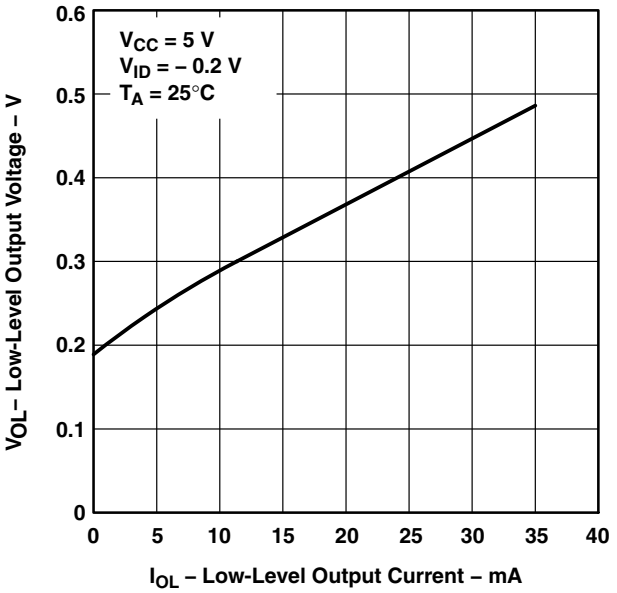


Figure 5

SUPPLY CURRENT vs SUPPLY VOLTAGE

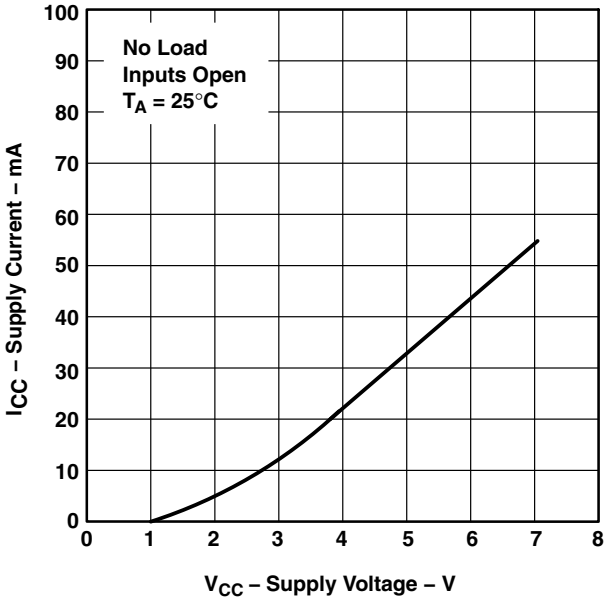


Figure 6

APPLICATION INFORMATION

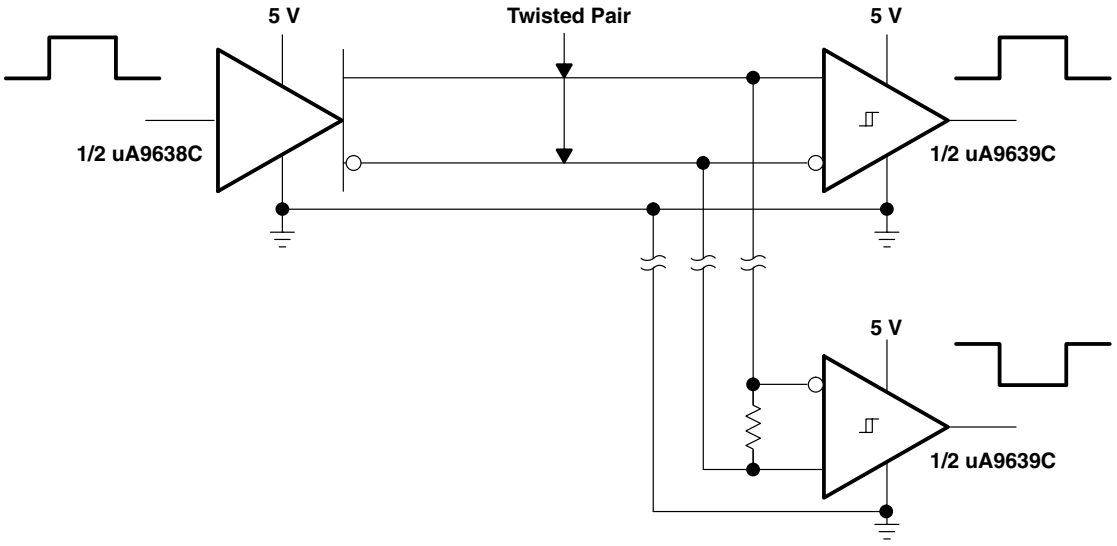


Figure 7. EIA/TIA-422-B System Applications

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)
UA9639CP	Active	Production	PDIP (P) | 8	50 | TUBE	Yes	NIPDAU	N/A for Pkg Type	0 to 70	UA9639CP
UA9639CP.A	Active	Production	PDIP (P) | 8	50 | TUBE	Yes	NIPDAU	N/A for Pkg Type	0 to 70	UA9639CP

(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.

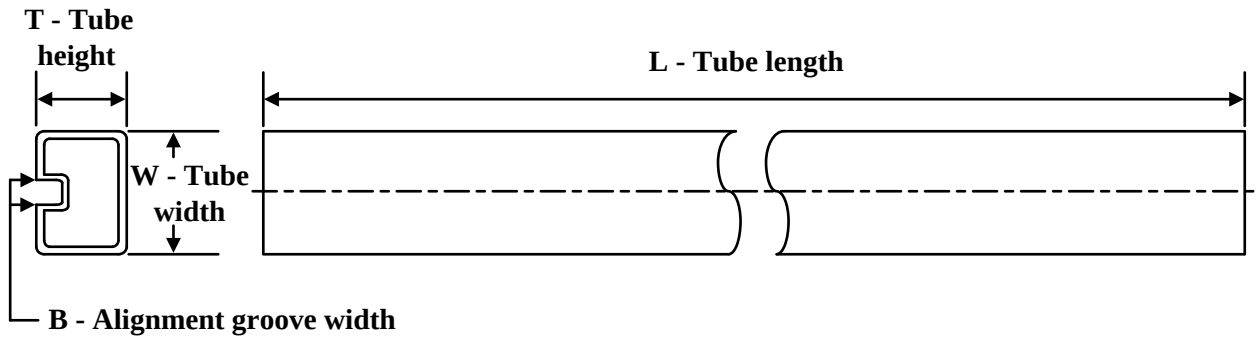
(4) **Lead finish/Ball material:** Parts may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead finish/Ball material values may wrap to two lines if the finish value exceeds the maximum column width.

(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.

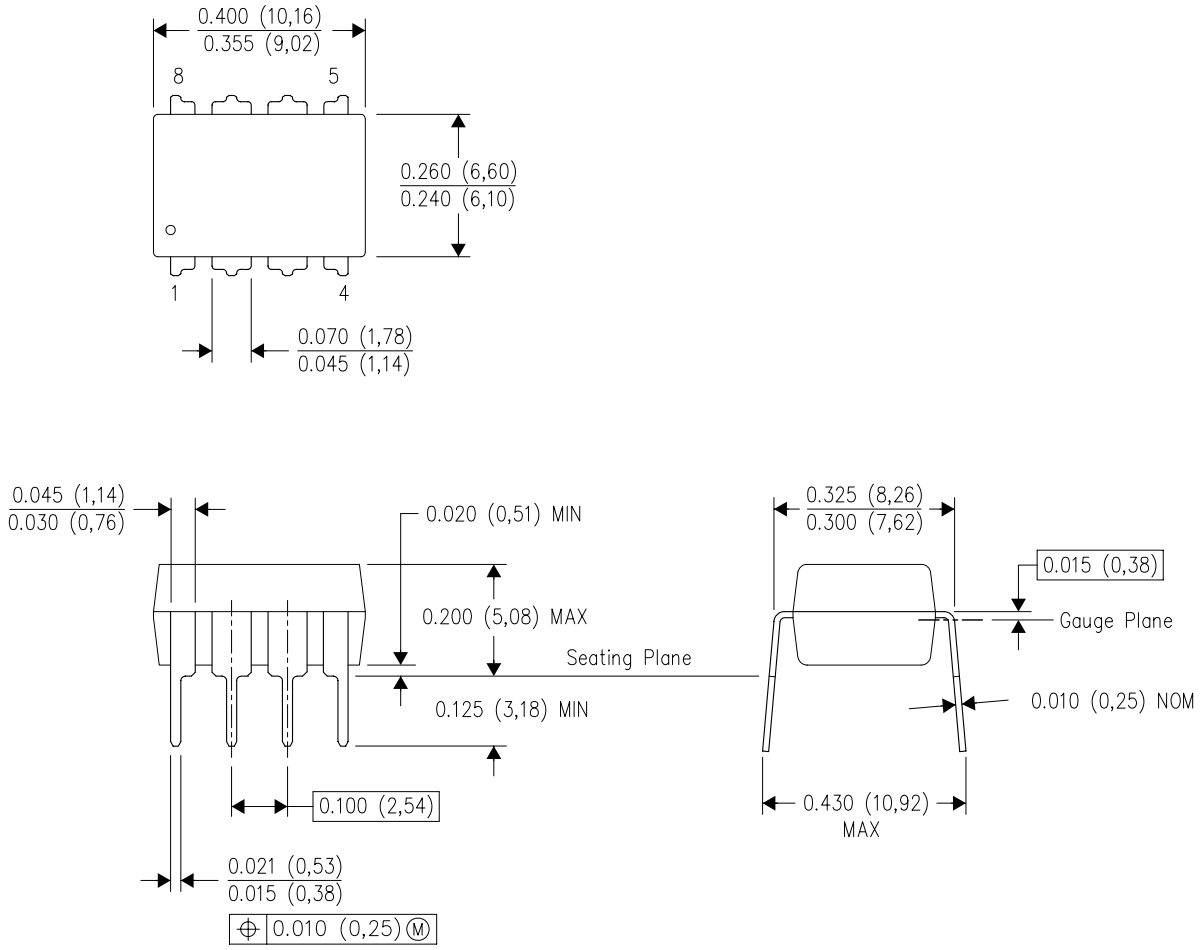
TUBE



*All dimensions are nominal

Device	Package Name	Package Type	Pins	SPQ	L (mm)	W (mm)	T (µm)	B (mm)
UA9639CP	P	PDIP	8	50	506	13.97	11230	4.32
UA9639CP.A	P	PDIP	8	50	506	13.97	11230	4.32

P (R–PDIP–T8) PLASTIC DUAL–IN–LINE PACKAGE



NOTES:
A. All linear dimensions are in inches (millimeters).
B. This drawing is subject to change without notice.
C. Falls within JEDEC MS–001 variation BA.

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Last updated 10/2025