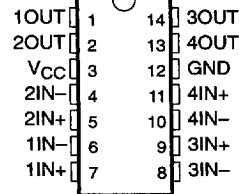


LM3302 QUADRUPLE DIFFERENTIAL COMPARATOR

SLCS014—OCTOBER 1977—REVISED APRIL 1988

- Single Supply or Dual Supplies
- Wide Range of Supply Voltage
2 V to 28 V
- Low Supply Current Drain Independent of Supply Voltage . . . 0.8 mA Typ
- Low Input Bias Current . . . 25 nA Typ
- Low Input Offset Current . . . 3 nA Typ
- Low Input Offset Voltage . . . 3 mV Typ
- Common-Mode Input Voltage Range Includes Ground
- Differential Input Voltage Range Equal to Maximum-Rated Supply Voltage . . . ± 28 V
- Low Output Saturation Voltage
- Output Compatible With TTL, MOS, and CMOS

D, J, OR N PACKAGE
(TOP VIEW)



description

This device consists of four independent voltage comparators that are designed to operate from a single power supply over a wide range of voltages. Operation from dual supplies is also possible so long as the difference between the two supplies is 2 V to 28 V and V_{CC} is at least 1.5 V more positive than the input common-mode voltage. Current drain is independent of the supply voltage. The outputs can be connected to other open-collector outputs to achieve wired-AND relationships.

AVAILABLE OPTIONS

T _A	V _{IOMax} at 25°C	PACKAGE		
		SMALL OUTLINE (D) [†]	CERAMIC DIP (J)	PLASTIC DIP (N)
-40°C to 85°C	20 mV	LM3302D	LM3302J	LM3302N

[†] The D packages are available taped and reeled. Add the suffix R to the device type, when ordering (i.e., LM3302DR).

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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.

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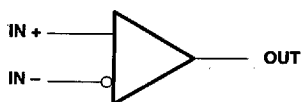
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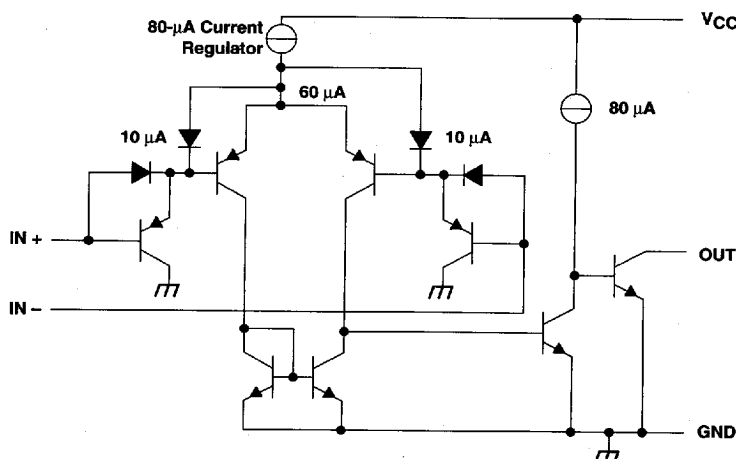
LM3302 QUADRUPLE DIFFERENTIAL COMPARATOR

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symbol (each comparator)



schematic



Current values shown are nominal.

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

Supply voltage, V_{CC} (see Note 1)	28 V
Differential input voltage, V_{ID} (see Note 2)	± 28 V
Input voltage range, V_I (either input), V_I	-0.3 V to 28 V
Output voltage, V_O	28 V
Output current, I_O	20 mA
Duration of output short-circuit to ground (see Note 3)	unlimited
Continuous total dissipation	See Dissipation Rating Table
Operating free-air temperature range, T_A	-40°C to 85°C
Storage temperature range	-65°C to 150°C
Lead temperature range 1,6 mm (1/16 inch) from case for 60 seconds: J package	300°C
Lead temperature range 1,6 mm (1/16 inch) from case for 10 seconds: D or N package	260°C

[†] Stresses beyond those listed under absolute maximum ratings may cause permanent damage to the device. There are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the recommended operating conditions section of this specification is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

- NOTES:
1. All voltage values, except differential voltages, are with respect to the network ground.
 2. Differential voltages are at $IN+$ with respect to $IN-$.
 3. Short circuits from the output to V_{CC} can cause excessive heating and eventual destruction.

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QUADRUPLE DIFFERENTIAL COMPARATOR

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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	$T_A = 85^\circ\text{C}$ POWER RATING
D	950 mW	7.6 mW/ $^\circ\text{C}$	608 mW	494 mW
J	1025 mW	8.2 mW/ $^\circ\text{C}$	656 mW	533 mW
N	1150 mW	9.2 mW/ $^\circ\text{C}$	736 mW	598 mW

electrical characteristics at specified free-air temperature, $V_{CC} = 5\text{ V}$ (unless otherwise noted)

PARAMETER	TEST CONDITIONS†	T_A	MIN	TYP	MAX	UNIT
V_{IO} Input offset voltage	$V_{CC} = 5\text{ V to } 28\text{ V}$, $V_{IC} = V_{ICR\text{ min}}$, $V_O = 1.4\text{ V}$	25 $^\circ\text{C}$ – 40 $^\circ\text{C}$ to 85 $^\circ\text{C}$		3	20 40	mV
I_{IO} Input offset current	$V_O = 1.4\text{ V}$	25 $^\circ\text{C}$ – 40 $^\circ\text{C}$ to 85 $^\circ\text{C}$		3	100 300	nA
I_{IB} Input bias current		25 $^\circ\text{C}$ – 40 $^\circ\text{C}$ to 85 $^\circ\text{C}$		– 25	– 500 – 1000	nA
V_{ICR} Common-mode input voltage range		25 $^\circ\text{C}$ – 40 $^\circ\text{C}$ to 85 $^\circ\text{C}$	0 to $V_{CC} - 1.5$			V
AVD Large-signal differential voltage amplification	$V_{CC} = 15\text{ V}$, $V_O = 1.4\text{ V to } 11.4\text{ V}$, $R_L = 15\ \Omega$ to V_{CC}	25 $^\circ\text{C}$	2	30		V/mV
I_{OH} High-level output current	$V_{ID} = 1\text{ V}$, $V_{OH} = 5\text{ V}$	25 $^\circ\text{C}$ – 40 $^\circ\text{C}$ to 85 $^\circ\text{C}$		0.1	1	nA μA
V_{OL} Low-level output voltage	$V_{ID} = 1\text{ V}$, $V_{OH} = 5\text{ V}$	25 $^\circ\text{C}$ – 40 $^\circ\text{C}$ to 85 $^\circ\text{C}$		150	500 700	mV
I_{OL} Low-level output current	$V_{ID} = 1\text{ V}$, $V_{OL} = 1.5\text{ V}$	25 $^\circ\text{C}$	6	16		mA
I_{CC} Supply current (four comparators)	$V_O = 2.5\text{ V}$, No load	25 $^\circ\text{C}$		0.8		mA

† All characteristics are measured with zero common-mode input voltage unless otherwise specified.

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

PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Response time	$R_L = 5.1\text{ k}\Omega$ to 5 V, $C_L = 15\text{ pF}$ †, See Note 4		1.3		μs
	100-mV input step with 5-mV overdrive TTL-level input step		0.3		

† C_L includes probe and jig capacitance.

NOTE 4: The response time specified is the interval between the input step function and the instant when the output crosses 1.4 V.

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