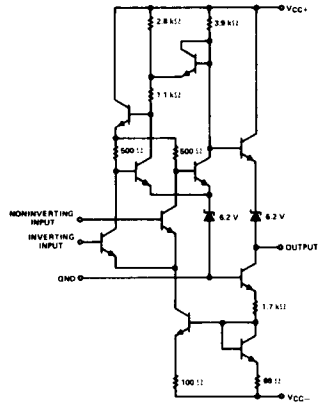
TYPE TL720C
DUAL DIFFERENTIAL COMPARATOR

BULLETIN NO. DL-S 11440, MARCH 1971 – REVISED JUNE 1976

NOT RECOMMENDED FOR NEW DESIGN

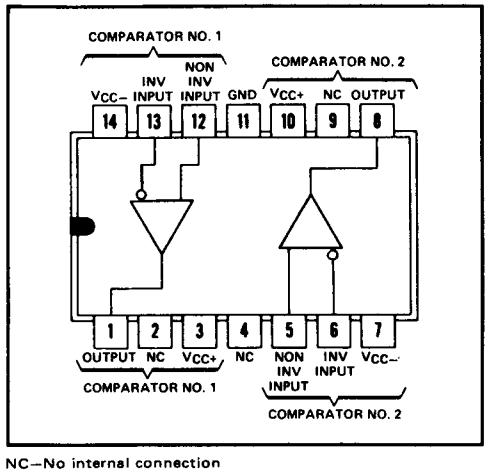
FOR NEW DESIGN, USE TL820C

schematic (each comparator)



Component values shown are nominal.

J OR N
DUAL-IN-LINE PACKAGE (TOP VIEW)



NC—No internal connection

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description

The TL720 is two high-speed comparators in a single package, each electrically identical to the TL710 and having differential inputs and a low-impedance output. Component matching, inherent in silicon monolithic circuit fabrication techniques, produces a comparator with low-drift and low-offset characteristics. This circuit is especially useful for applications requiring an amplitude discriminator, memory sense amplifier, or a high-speed voltage comparator. The TL720C is characterized for operation from 0°C to 70°C.

absolute maximum ratings over operating temperature range (unless otherwise noted)

Supply voltage V_{CC+} (see Note 1)	14 V
Supply voltage V_{CC-} (see Note 1)	–7 V
Differential input voltage (see Note 2)	±5 V
Input voltage (any input, see Note 1)	±7 V
Peak output current, each comparator ($t_w \leq 1$ s)	10 mA
Continuous total power dissipation: each comparator	300 mW
total package	600 mW
Operating free-air temperature range	0°C to 70°C
Lead temperature 1/16 inch (1,6 mm) from case for 60 seconds: J package	300°C
Lead temperature 1/16 inch (1,6 mm) from case for 10 seconds: N package	260°C

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

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electrical characteristics at specified free-air temperature, V_{CC+} = 12 V, V_{CC-} = −6 V (unless otherwise noted)

PARAMETER		TEST CONDITIONS		MIN	TYP	MAX	UNIT
V_{IO}	Input offset voltage	$R_S \leq 200\ \Omega$, See Note 3	25°C		2	7.5	mV
			0°C to 70°C			10	
α_{VIO}	Average temperature coefficient of input offset voltage	$R_S \leq 200\ \Omega$, See Note 3	0°C to 70°C		7.5		μV/°C
I_{IO}	Input offset current	See Note 3	25°C		1	15	μA
			0°C to 70°C			25	
I_{IB}	Input bias current	See Note 3	25°C		25	100	μA
			0°C to 70°C			150	
V_{ICR}	Common-mode input voltage range	V_{CC-} = −7 V	25°C	±5			V
V_{ID}	Differential input voltage range		25°C	±5			V
A_{VD}	Large-signal differential voltage amplification	No load, See Note 3	25°C	700	1500		
			0°C to 70°C	500			
V_{OH}	High-level output voltage	V_{ID} = 15 mV, I_{OH} = −0.5 mA	25°C	2.5	3.2	4	V
V_{OL}	Low-level output voltage	V_{ID} = −15 mV, I_{OL} = 0	25°C	−1	−0.5	0‡	V
r_o	Output resistance	V_O = 1.4 V	25°C		200		Ω
CMRR	Common-mode rejection ratio	$R_S \leq 200\ \Omega$	25°C	65	90		dB
I_{CC+}	Supply current from V_{CC+} (each comparator)	V_{ID} = −5 V to 5 V (−10 mV for typ), No load	25°C		5.4		mA
I_{CC-}	Supply current from V_{CC-} (each comparator)		25°C		−3.8		mA
P_D	Total power dissipation (each comparator)		25°C		88		mW

NOTE 3: These characteristics are verified by measurements at the following temperatures and output voltage levels: V_O = 1.5 V at T_A = 0°C, V_O = 1.4 V at T_A = 25°C, and V_O = 1.2 V at T_A = 70°C. These output voltage levels were selected to approximate the logic threshold voltages of the types of digital logic circuits these comparators are intended to drive.

‡The algebraic convention where the most-positive (least-negative) limit is designated as maximum is used in this data sheet for logic levels only, e.g., when 0 V is the maximum, the minimum limit is a more-negative voltage.

switching characteristics, V_{CC+} = 12 V, V_{CC-} = −6 V, T_A = 25°C

PARAMETER	TEST CONDITIONS	TYP	UNIT
Response time	No load, See Note 4	40	ns

NOTE 4: The response time specified is for a 100-mV input step with 5-mV overdrive and is the interval between the input step function and the instant when the output crosses 1.4 V.