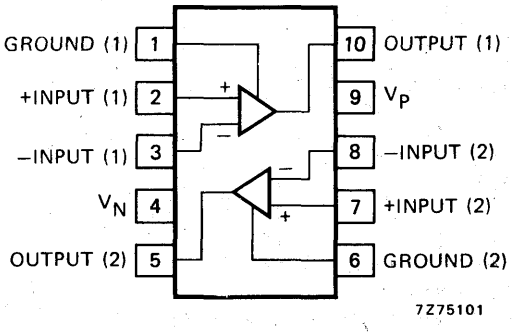
DUAL VOLTAGE COMPARATOR

The TDA0319D consists of two independent precision high-speed comparators. It is designed to operate over a wide range of supply voltages down to a single 5 V logic supply and ground.
The uncommitted collector of the output stage makes the device compatible with DTL, TTL and C-MOS as well as capable of driving lamps and relays at currents up to 25 mA. The circuit is equivalent to the LM319, however it is mounted in a miniature plastic package suitable for hybrid modules and for applications where small dimensions are important.

Features

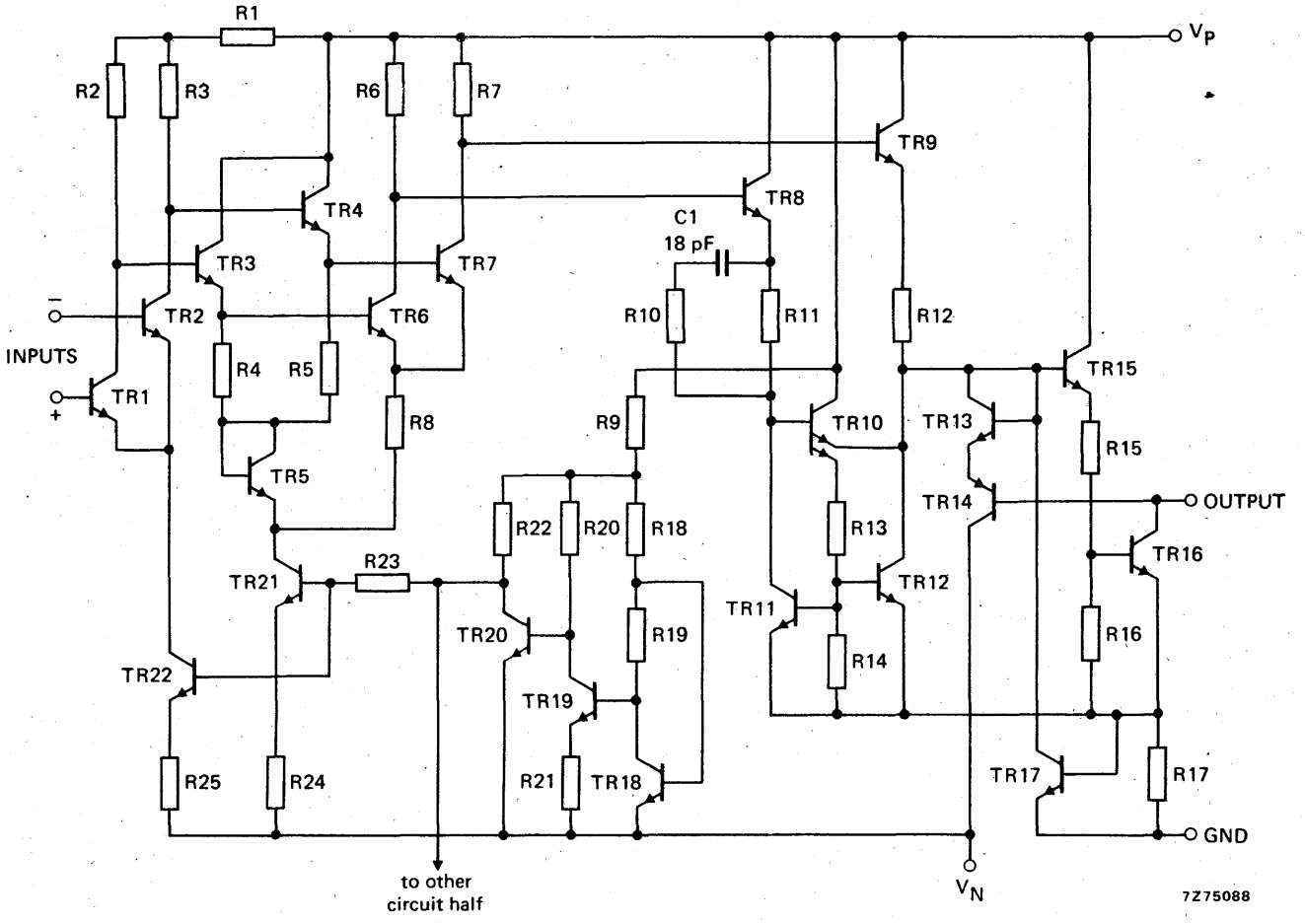
- Two independent comparators
- Operates from a single 5 V supply
- Typically 80 ns response time at ±15 V
- Minimum fan-out of 2 TTL gates (each side)
- Maximum input current: 1 μA
- Inputs and outputs can be insulated from system ground
- High common mode slew rate.

CONNECTION DIAGRAM



PACKAGE OUTLINE SO-10 (plastic 10-lead flat pack) (see general section).

CIRCUIT DIAGRAM (one comparator)



RATINGS Limiting values in accordance with the Absolute Maximum System (IEC 134)

Supply voltage	$V_P - V_N$	max.	36	V
Output to negative supply voltage	$V_O - V_N$	max.	36	V
Ground to negative supply voltage	$V_{GND} - V_N$	max.	25	V
Ground to positive supply voltage	$V_P - V_{GND}$	max.	18	V
Differential input voltage	$V_{I+} - V_{I-}$	max.	±5	V
Common mode input voltage	V_{I+}; V_{I-}	max.	±15	V [1]
Output short-circuit duration	t_{sc}	max.	10	s
Temperatures				
Operating ambient temperature	T_{amb}	−25 to +85		°C
Storage temperature	T_{stg}	−65 to +125		°C
Junction temperature	T_j	max.	125	°C
Power dissipation in free air; T_{amb} = 50 °C				
Mounted on a ceramic substrate of 4 cm^2	P_{tot}	max.	500	mW
derating factor for T_{amb} > 50 °C	$1/R_{th}$	=	6,7	mW/°C
Mounted on PC board of 4 cm^2	P_{tot}	max.	350	mW
derating factor for T_{amb} > 50 °C	$1/R_{th}$	=	4,7	mW/°C

[1] For supply voltages less than ±15 V, the absolute maximum input voltage is equal to the supply voltage.

CHARACTERISTICS at V_P = 15 V; $-V_N$ = 15 V; T_{amb} = 25 °C unless otherwise specified

Parameter	Conditions	Symbol	min.	typ.	max.	Unit
Input offset voltage	R_S < 5 kΩ [1] [2]	V_{io}	–	2,0	8,0	mV
Input offset current	[1] [2]	I_{io}	–	80	200	nA
Input bias current	[1]	I_i	–	250	1000	nA
Voltage gain		G_v	8	40	–	V/mV
Response time	[3]		–	80	–	ns
Saturation voltage	$-V_i$ < 10mV; I_O=25mA	V_{sat}	–	0,75	1,5	V
Output leakage current	V_i > 10mV; V_O=35V	I_O	–	0,2	10	μA
Positive supply current		I_P	–	8	12,5	mA
Negative supply current		I_N	–	3	5	mA
Positive supply current	V_P = 5 V; $-V_N$ = 0	I_P	–	4,3	–	mA

CHARACTERISTICS at V_P = 15 V; $-V_N$ = 15 V; T_{amb} = 0 to +70 °C

Parameter	Conditions	Symbol	min.	typ.	max.	Unit
Input offset voltage	R_S < 5 kΩ [1] [2]	V_{io}	–	–	10	V
Input offset current	[1] [2]	I_{io}	–	–	300	nA
Input bias current	[1]	I_i	–	–	1200	nA
Offset voltage range	$V_P = -V_N$ = 15 V	V_{io}	–	±13	–	V
	V_P = 5 V; $-V_N$ = 0	V_{io}	1	–	3	V
Saturation voltage	V_P > 4,5 V; $-V_N$ = 0 V_i < −10 mV; I_{sink} < 3,2 mA	V_{sat}	–	0,3	0,4	V
Differential input voltage		V_i	–	±5	–	V

[1] The offset voltage, offset current and bias current specifications apply for any supply voltage from a single 5 V supply up to ±15 V supplies.

[2] The offset voltages and offset currents given are the maximum values required to drive the output within 1 V of either supply with a 1 mA load. Thus these parameters define an error band and take into account the worst case effects of voltage gain and input impedance.

[3] The response time specified is for a 100 mV input step with 5 mV overdrive.