

Voltage comparator

529

FEATURES

- 10ns propagation delay
- Complementary output gates
- TTL or ECL compatible outputs
- Wide common-mode and differential voltage range
- Typical gain of 5000

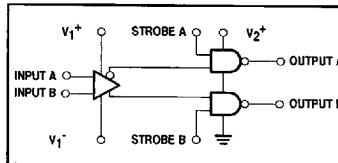
APPLICATIONS

- A/D conversion
- ECL-to-TTL interface
- TTL-to-ECL interface
- Memory sensing
- Optical data coupling

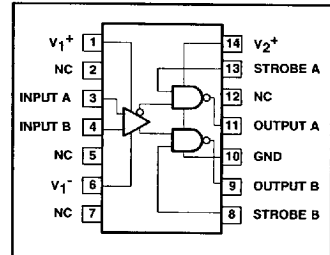
DESCRIPTION

The 529 is a high-speed analog voltage comparator which, for the first time, mates state-of-the-art Schottky diode technology with the conventional linear process. This allows simultaneous fabrication of high-speed T²L gates with a precision linear amplifier on a single monolithic chip.

BLOCK DIAGRAM



PIN CONFIGURATION

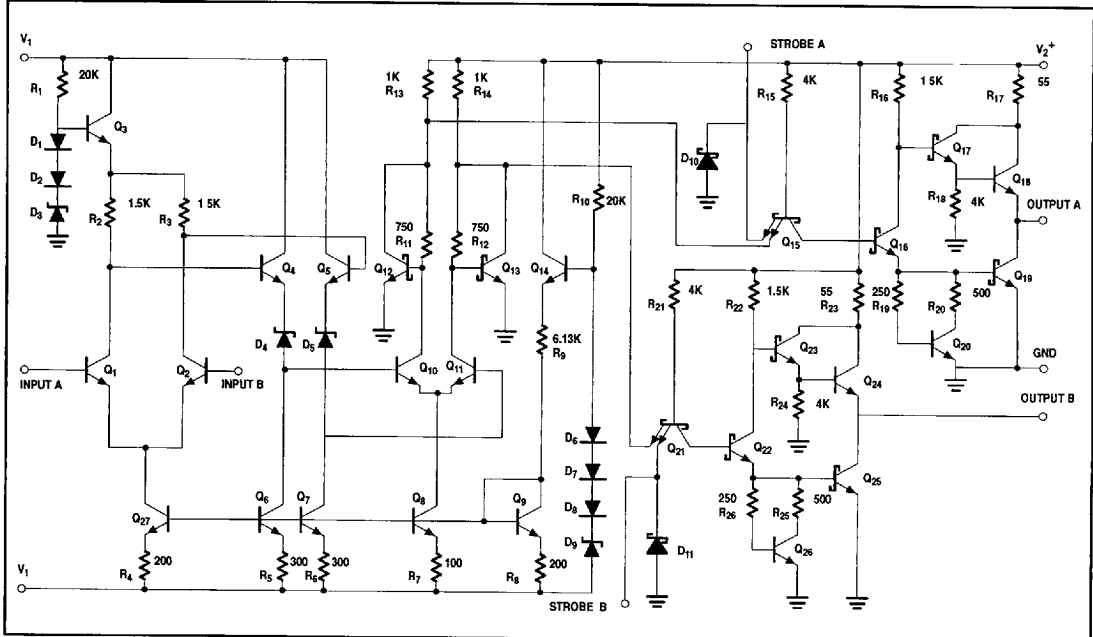


ORDERING INFORMATION

DESCRIPTION	ORDER CODE	PACKAGE DESIGNATOR*
14-Pin Ceramic DIP	529/BCA	GDIP1-T14

* MIL-STD 1835 or Appendix A of 1995 Military Data Handbook

EQUIVALENT SCHEMATIC



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ABSOLUTE MAXIMUM RATINGS

SYMBOL	PARAMETER	RATING ¹	UNIT
V ₁₊	Positive supply voltage	+15	V
V ₁₋	Negative supply voltage	-15	V
V ₂₊	Gate supply voltage	+7	V
V _O	Output voltage	+7	V
V _{ID}	Differential input voltage	±5	V
V _{ICR}	Input common mode voltage	±6	V
P _D	Power dissipation	600	mW
T _{STG}	Storage temperature range	-65 to +150	°C

DC ELECTRICAL CHARACTERISTICS

V₁₊ = +10V, V₁₋ = -10V, V₂₊ = +5.0V, unless otherwise specified.

V ₁₊ = +10V, V ₁₋ = -10V, V ₂₊ = +5.5V, unless otherwise specified.									
SYMBOL	PARAMETER	TEST CONDITIONS	T _{amb} = +25°C			T _{amb} = -55°C, +125°C			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
Input Characteristics									
V _{IO}	Input offset voltage				4			6	mV
V _{IB}	Input bias current	V ₁ = 0V		5	12			36	μA
I _{IO}	Input offset current	V ₁ = 0V		2	3			9	μA
V _{ICR}	Common mode voltage range		±5			±5			V
Gate Characteristics									
V _{OH}	Output voltage "1" State	V ₂₊ = 4.5V, I _{OH} = -1mA	2.5	3.3		2.5			V
V _{OL}	Output voltage "0" State	V ₂₊ = 4.5V, I _{OL} = 10mA			0.5			0.5	V
V _{IK}	Input clamp voltage	I _{IK} = -18mA, V ₂₊ = 4.5V			-1.5			-1.5	V
I _{IL}	Strobe inputs "0" current ²	V ₂₊ = 5.5V, V _{STROBE} = 0.5V			-2			-2	mA
I _{IH}	Strobe inputs "1" current	V ₂₊ = 5.5V, V _{STROBE} = 2.7V			50			200	μA
V _{IL}	Strobe inputs "0" voltage	V ₂₊ = 4.5V			0.8			0.8	V
V _{IH}	Strobe inputs "1" voltage	V ₂₊ = 4.5V	2.0			2.0			V
I _{SC}	Short-circuit output current	V ₂₊ = 5.5V, V _O = 0V	-18		-70	-18		-70	mA
Power Supply Requirements									
V ₁₊	Supply voltage comparator		5		10	5		10	V
V ₁₋	Supply voltage comparator		-6		-10	-6		-10	V
v ₂₊	Supply voltage gate		4.5	5	5.5	4.5	5	5.5	V
V ₁₊	Supply current comparator	V ₁₊ = 10V			5			5	mA
I ₁₋	Supply current comparator	V ₁₋ = -10V			10			10	mA
I ₂₊	Supply current gate	V ₂₊ = +5.5V			20			20	mA

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AC ELECTRICAL CHARACTERISTICS

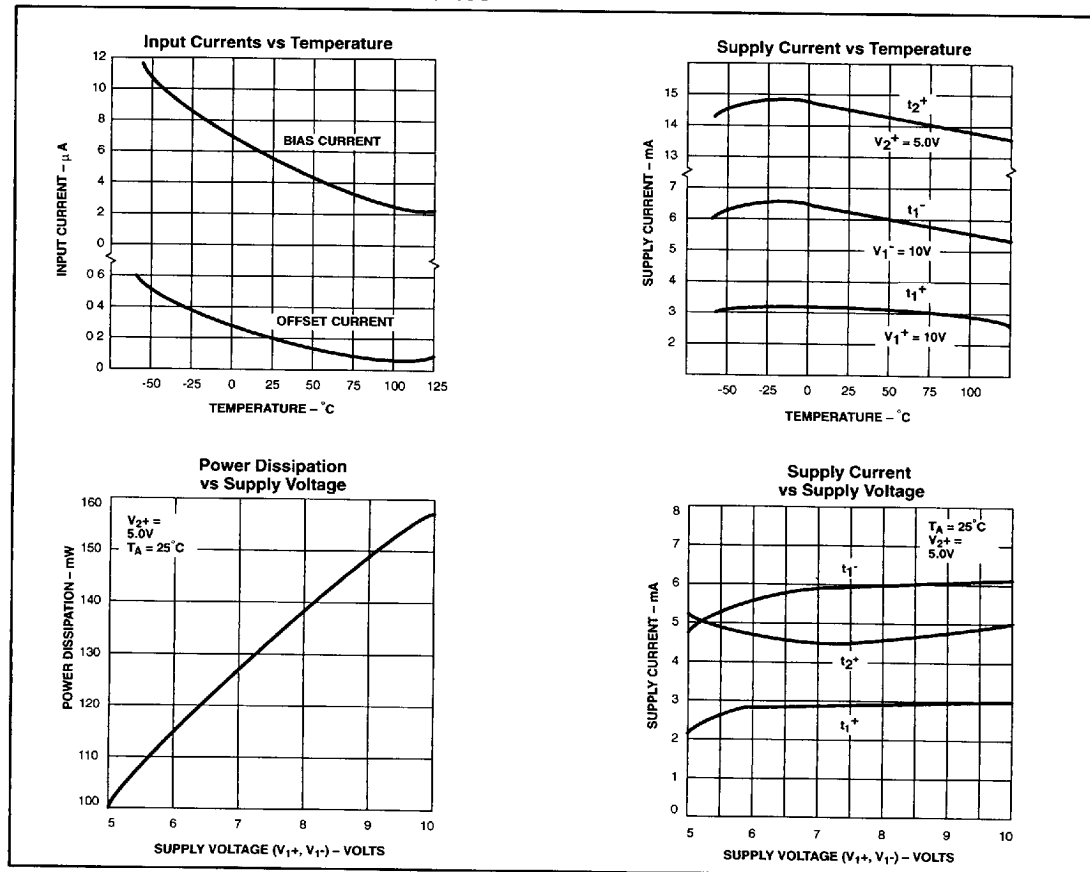
 $V_{1+} = +10V$, $V_{1-} = -10V$, $V_{2+} = +5.0V$, unless otherwise specified.

SYMBOL	PARAMETER	TO	FROM	TEST CONDITIONS	$T_{amb} = +25^{\circ}C$			$T_{amb} = -55^{\circ}C, +125^{\circ}C$			UNIT
					MIN	TYP	MAX	MIN	TYP	MAX	
t_{PLH}	Transient response propagation delay time Low-to-High	Output	Input	$V_1 = \pm 100mV$ step		12	22				ns
t_{PHL}	High-to-Low					10	20				ns
Δt	Delay between output A and B	Output	Output	$R_L = 390\Omega$		2	5				ns
t_D	Strobe delay time	Output	Strobe	$C_L = 15pF$							ns
t_{on}	Turn-on time					6					ns
t_{off}	Turn-off time					6					ns

NOTES:

- Operation beyond the limit in this table may impair useful life of the device.
- See logic function table.

TYPICAL PERFORMANCE CHARACTERISTICS



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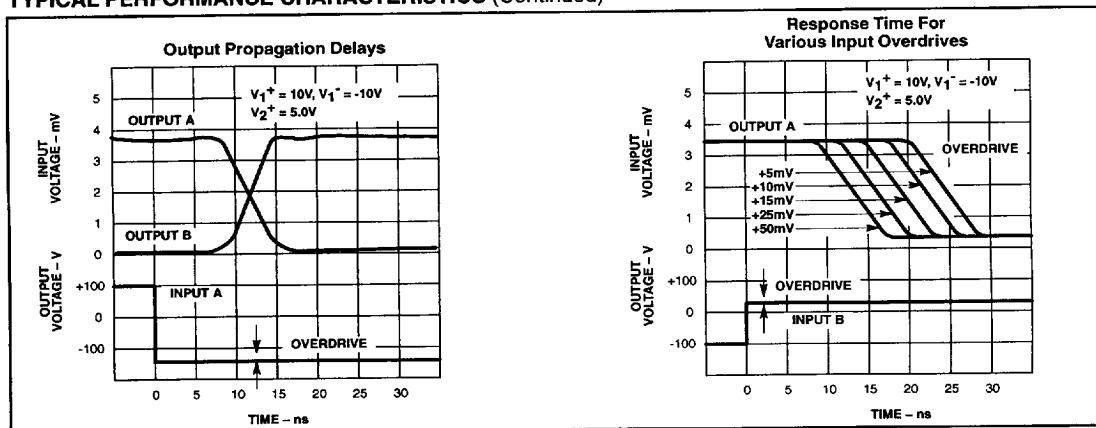
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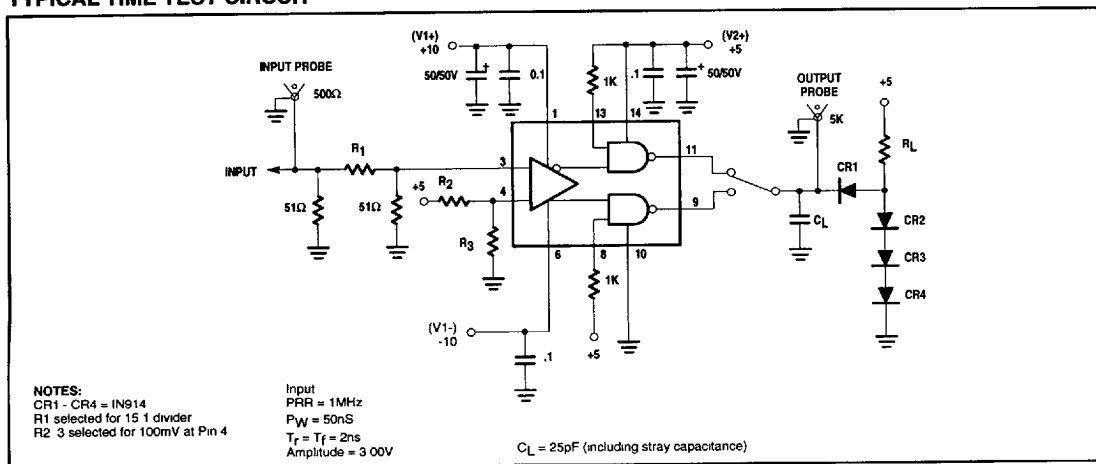
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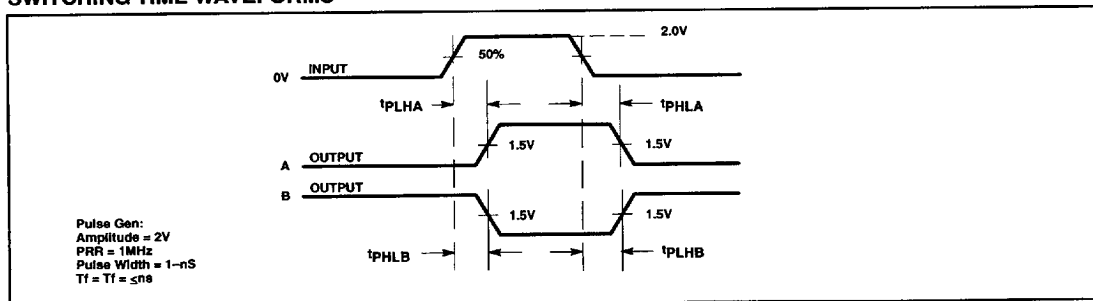
TYPICAL PERFORMANCE CHARACTERISTICS (Continued)



TYPICAL TIME TEST CIRCUIT



SWITCHING TIME WAVEFORMS



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529 LOGIC FUNCTION

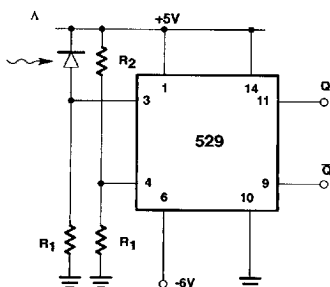
V_i (A ⁺ , B ⁻)	STROBE A	STROBE B	OUTPUT A	OUTPUT B
$> V_O$	X	h/l	H	l/h
$< -V_O$	h/l	X	l/h	H

APPLICATIONS

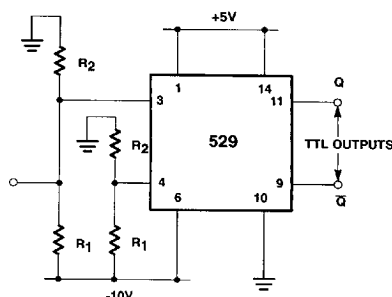
One of the main features of the device is that supply voltages (V_+ , V_-) need not be balanced, as in the following diagrams. For proper operation, however, negative supply (V_-) should always be at least 6V more than the ground terminal (Pin 6). Input Common-Mode range should be limited to values of 2V less than the supply voltages (V_+ and V_-) up to a maximum of $\pm 6V$ as supply voltages are increased.

It is also important to note that Output A is in phase with Input A and Output B is in phase with Input B.

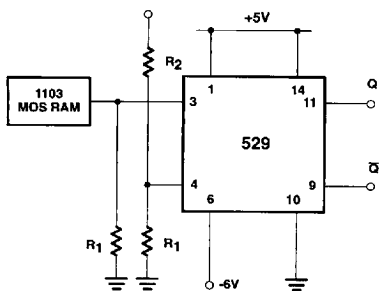
TYPICAL APPLICATIONS



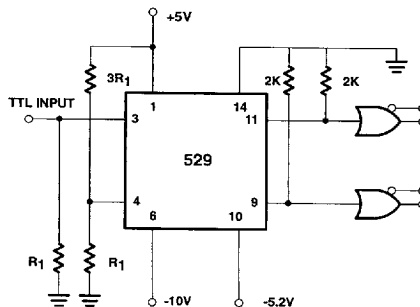
Photodiode Detector



ECL-to-TTL Interface



MOS Memory Sense AMP



TTL-to-ECL Interface

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