

Voltage comparator

527

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FEATURES

- 15ns propagation delay
- Complementary output gates
- TTL or ECL compatible outputs
- Wide common mode and differential voltage range
- Typical gain of 5000

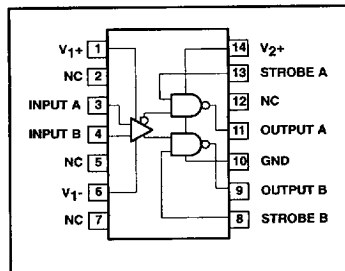
APPLICATIONS

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

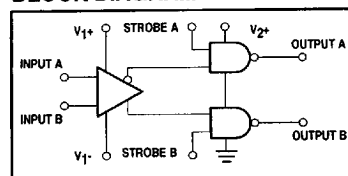
DESCRIPTION

The 527 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. The 527 is similar in design to the Philips 529 voltage comparator except that it incorporates an "Emitter Follower" input stage for extremely low input currents. This opens the door to a whole new range of applications for analog voltage comparators.

PIN CONFIGURATION



BLOCK DIAGRAM

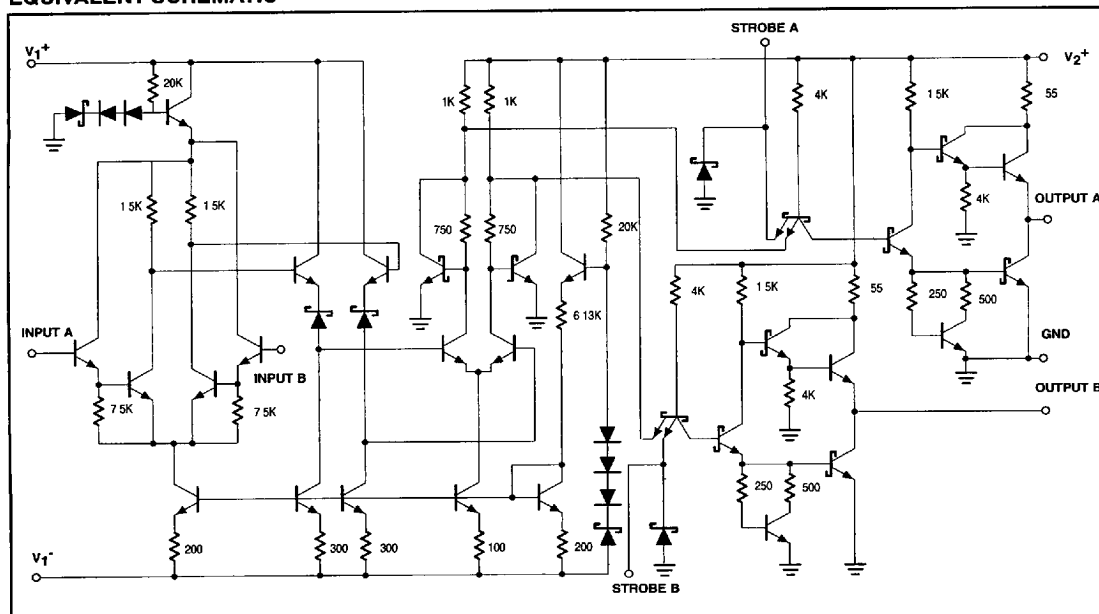


ORDERING INFORMATION

DESCRIPTION	ORDER CODE	PACKAGE DESIGNATOR*
14-Pin Ceramic DIP	527/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.

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
I _{IB}	Input bias current				2			4	μA
I _{IO}	Input offset current	V _I = 0V			0.5			1	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				-2			-2	mA
	Input current "0"	V ₂₊ = 5.5V, V _{STROBE} = 0.5V							
	Input current "1"	V ₂₊ = 5.5V, V _{STROBE} = 2.7V							
	Input voltage "0"	V ₂₊ = 4.5V							
V _{IH}	Input voltage "1"	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								
V ₁₋	Comparator		5		10	5		10	V
V ₂₊	Comparator		-6		-10	-6		-10	V
	Gate		4.5	5	5.5	4.5	5	5.5	V
I ₁₊	Supply current	V ₁₊ = 10V			5			5	mA
I ₁₋	Comparator	V ₁₋ = -10V			10			10	mA
I ₂₊	Gate	V ₂₊ = +5.5V			20			20	mA

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AC ELECTRICAL CHARACTERISTICS

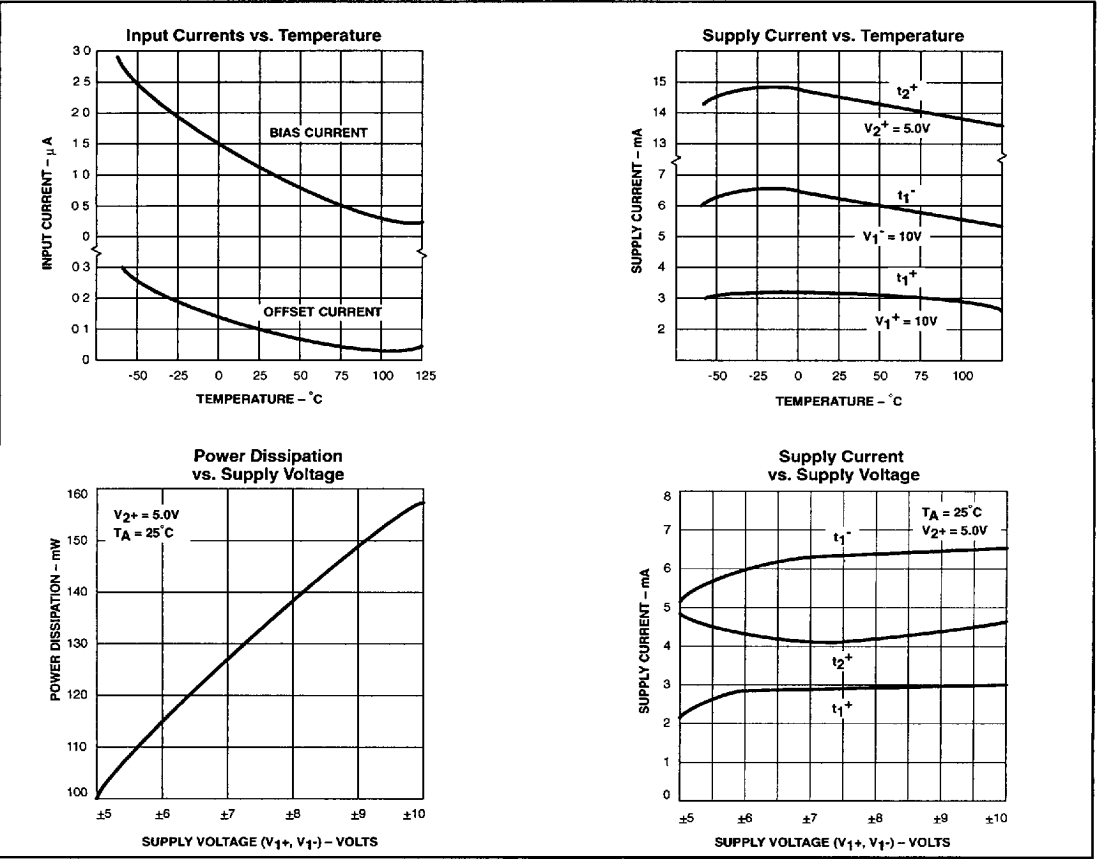
$V_{1+} = 10V$, $V_{1-} = -10V$, $V_{2+} = 5.0V$, unless otherwise specified.

SYMBOL	PARAMETER	TO	FROM	TEST CONDITIONS	T _{amb} = +25°C			T _{amb} = -55°C, +125°C			UNIT
					MIN	TYP	MAX	MIN	TYP	MAX	
t _{PLH}	Transient response propagation delay time Low-to-high	Output	Input	V ₁ = ±100mV step R _L = 390Ω C _L = 15pF		16	26				ns
t _{PHL}	High-to-low					14	24				ns
Δt	Delay between output A and B	Output	Output			2	5				ns
t _D	Strobe delay time	Output	Strobe			6					ns
t _{on}	Turn-on time					6					ns
t _{off}	Turn-off time										ns

NOTE:

1. Operation beyond the limit in this table may impair useful life of the device.

TYPICAL PERFORMANCE CHARACTERISTICS



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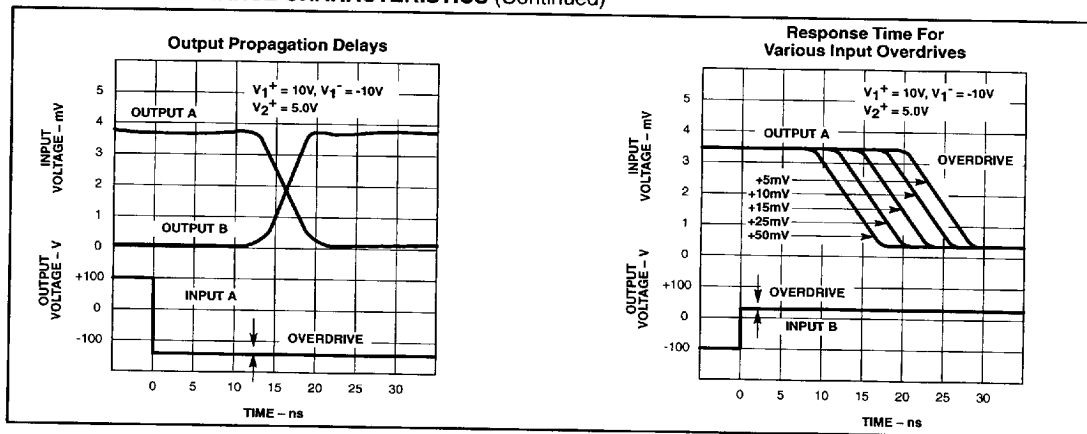
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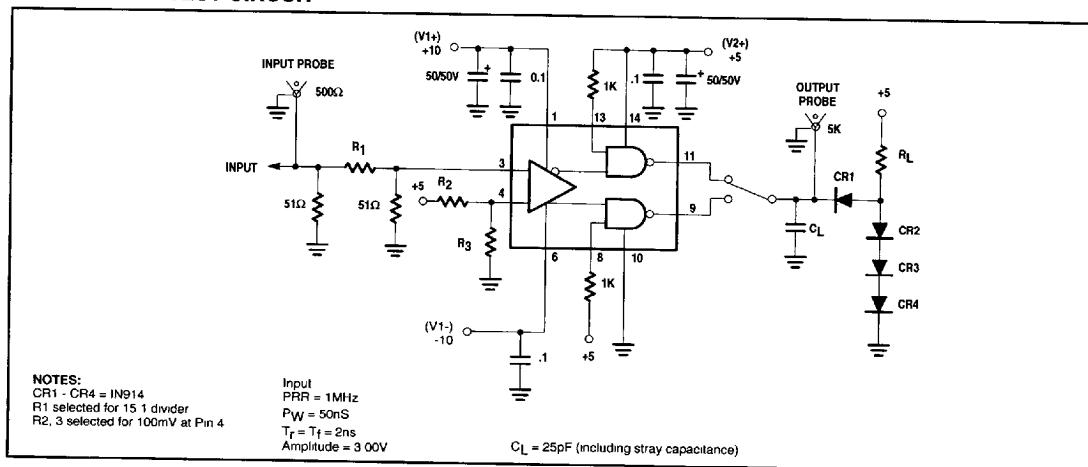
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TYPICAL PERFORMANCE CHARACTERISTICS (Continued)



TYPICAL TIME TEST CIRCUIT



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.

527 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

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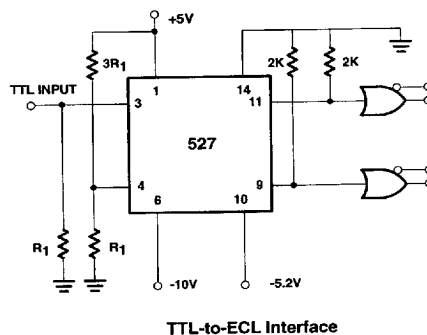
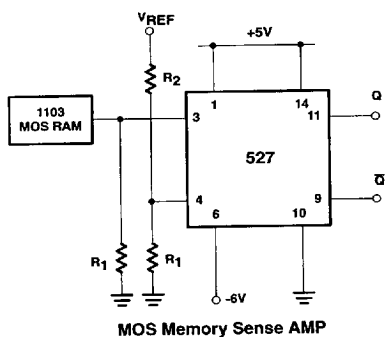
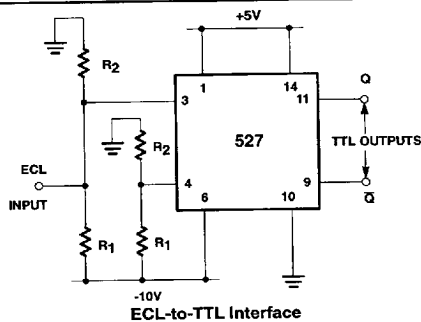
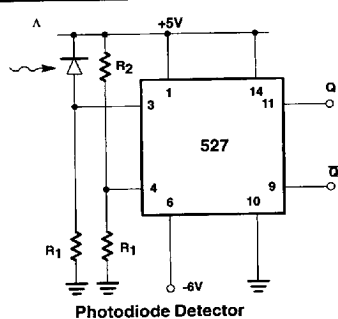
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TYPICAL APPLICATIONS



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