NE521

High-Speed Dual-Differential Comparator/Sense Amp

Features

- TTL-Compatible Strobes and Outputs
- Large Common-Mode Input Voltage Range
- Operates from Standard Supply Voltages
- Pb–Free Packages are Available

Applications

- MOS Memory Sense Amp
- A-to-D Conversion
- High-Speed Line Receiver

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Supply Voltage Positive Negative	V+ V-	+7.0 -7.0	V
Differential Input Voltage	V _{IDR}	±6.0	V
Input Voltage Common Mode Strobe/Gate	V _{IN}	±5.0 +5.25	V
Maximum Power Dissipation (Note 1) T _A = 25°C (Still–Air) N Package D Package	PD	1420 1040	mW
Thermal Resistance, Junction-to-Ambient N Package D Package	R _{θJA}	100 145	°C/W
Operating Temperature Range	T _A	0 to 70	°C
Storage Temperature Range	T _{stg}	-65 to +150	°C
Operating Junction Temperature	TJ	150	°C
Lead Soldering Temperature (10 sec max)	T _{sld}	+230	°C

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

1. Derate above 25°C at the following rates:

N package at 10 mW/°C

D package at 6.9 mW/°C.



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MARKING DIAGRAMS





	- / loconing Location	
WL	= Wafer Lot	
Y, YY	= Year	
WW	= Work Week	
G	= Pb-Free Package	

PIN CONNECTIONS



ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 5 of this data sheet.

LOGIC FUNCTION TABLE

V _{ID} (A+, B)	Strobe S	Strobe G	Output (Y)
$V_{ID} \leq -V_{OS}$	Н	Н	L
$-V_{OS} < V_{ID} < V_{OS}$	Н	Н	Undefined
$V_{ID} \ge V_{OS}$	Н	Н	Н
Х	L	Х	Н
Х	Х	L	Н







Figure 2. Equivalent Schematic

NE521

				Limits		
Characteristic	Test Conditions	Symbol	Min	Тур	Max	Unit
Input Offset Voltage At 25°C Overtemperature Range	V+ = +4.75 V; V- = -4.75 V	V _{OS}		6.0 _	7.5 10	mV
Input Bias Current At 25°C Overtemperature Range	V+ = +5.25 V; V- = -5.25 V	I _{BIAS}		7.5 -	20 40	μΑ
Input Offset Current At 25°C Overtemperature Range	V+ = +5.25 V; V- = -5.25 V	l _{os}		1.0 -	5.0 12	μΑ
Common-Mode Voltage Range	V+ = +4.75 V; V- = -4.75 V	V _{CM}	-3.0	-	+3.0	V
Input Current High	$V_{+} = +5.25 V; V_{-} = -5.25 V$ $V_{ H} = 2.7 V$ $1G \text{ or } 2G \text{ Strobe}$ Common Strobe S	l _{iH}			50 100	μΑ
Input Current Low	V _{IL} = 0.5 V 1G or 2G Strobe Common Strobe S	Ι _{ΙL}		-	-2.0 -4.0	mA
Output Voltage High Low	$V_{I(S)} = 2.0 V$ $V + = +4.75 V; V - = -4.75 V;$ $I_{LOAD} = -1.0 mA$ $V + = +5.25 V; V - = -5.25 V;$ $I_{LOAD} = 20 mA$	V _{OH} V _{OL}	2.7	3.4	0.5	V
Supply Voltage Positive Negative	-	V+ V-	4.75 -4.75	5.0 -5.0	5.25 -5.25	V
Supply Current Positive Negative	V+ = +5.25 V; V- = -5.25 V; T _A = 25°C	I _{CC+} I _{CC-}		27 -15	35 -28	mA
Short-Circuit Output Current	-	I _{SC}	-40	-	-100	mA

DC ELECTRICAL CHARACTERISTICS (V+ = +5.0 V; V- = -5.0 V, T_A = 0°C to +70°C, unless otherwise noted.)

AC ELECTRICAL CHARACTERISTICS (T_A = 25°C; R_L = 280 Ω ; C_L = 15 pF, V+ = 5.0 V; V- = 5.0 V, guaranteed by characterization)

				Limits			
Characteristic	From Input	To Output	Symbol	Min	Тур	Max	Unit

Large-Signal Switching Speed

Propagation Delay							ns
Low to High (Note 2)	Amp	Output	t _{PLH(D)}	-	9.6	12	
High to Low (Note 2)	Amp	Output	t _{PHL(D)}	-	8.2	9.0	
Low to High (Note 3)	Strobe	Output	t _{PLH(S)}	-	4.8	10	
High to Low (Note 3)	Strobe	Output	t _{PHL(S)}	-	3.9	6.0	
Max. Operating Frequency	-	-	f _{MAX}	40	55	-	MHz

2. Response time measured from 0 V point of $\pm 100 \text{ mV}_{P-P}$ 10 MHz square wave to the 1.5 V point of the output. 3. Response time measured from 1.5 V point of input to 1.5 V point of the output.

NE521

TYPICAL PERFORMANCE CHARACTERISTICS



ORDERING INFORMATION

Device	Temperature Range	Package	Shipping [†]
NE521D		SOIC-14	
NE521DG		SOIC-14 (Pb-Free)	55 Units/Rail
NE521DR2		SOIC-14	
NE521DR2G	0 to +70°C	SOIC-14 (Pb-Free)	2500/Tape & Reel
NE521N	-	PDIP-14	
NE521NG		PDIP-14 (Pb-Free)	25 Units/Rail

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification Brochure, BRD8011/D.



STYLES ON PAGE 2

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- NOTES:
 DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
 CONTROLLING DIMENSION: INCHES.
 DIMENSIONS A, A1 AND L ARE MEASURED WITH THE PACK-AGE SEATED IN JEDEC SEATING PLANE GAUGE GS-3.
 DIMENSIONS D, D1 AND E1 DO NOT INCLUDE MOLD FLASH OR PROTRUSIONS. MOLD FLASH OR PROTRUSIONS ARE NOT DE VICE DA 10 INCH. NOT TO EXCEED 0.10 INCH. DIMENSION E IS MEASURED AT A POINT 0.015 BELOW DATUM
- 5. PLANE H WITH THE LEADS CONSTRAINED PERPENDICULAR TO DATUM C.
- 6.
- DIMENSION & BIS MEASURED AT THE LEAD TIPS WITH THE LEADS UNCONSTRAINED. DATUM PLANE H IS COINCIDENT WITH THE BOTTOM OF THE LEADS, WHERE THE LEADS EXIT THE BODY. PACKAGE CONTOUR IS OPTIONAL (ROUNDED OR SQUARE CODNEPS) 7.
- 8. CORNERS).

	INCHES MILLIME		ETERS	
DIM	MIN	MAX	MIN	MAX
Α		0.210		5.33
A1	0.015		0.38	
A2	0.115	0.195	2.92	4.95
b	0.014	0.022	0.35	0.56
b2	0.060	0.060 TYP		TYP
С	0.008	0.014	0.20	0.36
D	0.735	0.775	18.67	19.69
D1	0.005		0.13	
Е	0.300	0.325	7.62	8.26
E1	0.240	0.280	6.10	7.11
е	0.100	BSC	2.54 BSC	
eВ		0.430		10.92
L	0.115	0.150	2.92	3.81
М		10°		10°

GENERIC **MARKING DIAGRAM***



XXXXX = Specific Device Code

- = Assembly Location
- WL = Wafer Lot
- YY = Year

А

G

- ww = Work Week
 - = Pb-Free Package

*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot " .", may or may not be present.

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STYLE 1: PIN 1. COLLECTOR 2. BASE 3. EMITTER 4. NO CONNECTION 5. EMITTER 6. BASE 7. COLLECTOR 8. COLLECTOR 9. BASE 10. EMITTER 11. NO CONNECTION 12. EMITTER 13. BASE 14. COLLECTOR	STYLE 2: CANCELLED	STYLE 3: CANCELLED	STYLE 4: PIN 1. DRAIN 2. SOURCE 3. GATE 4. NO CONNECTION 5. GATE 6. SOURCE 7. DRAIN 8. DRAIN 9. SOURCE 10. GATE 11. NO CONNECTION 12. GATE 13. SOURCE 14. DRAIN
STYLE 5: PIN 1. GATE 2. DRAIN 3. SOURCE 4. NO CONNECTION 5. SOURCE 6. DRAIN 7. GATE 8. GATE 9. DRAIN 10. SOURCE 11. NO CONNECTION 12. SOURCE 13. DRAIN 14. GATE	STYLE 6: PIN 1. COMMON CATHODE 2. ANODE/CATHODE 3. ANODE/CATHODE 4. NO CONNECTION 5. ANODE/CATHODE 6. NO CONNECTION 7. ANODE/CATHODE 8. ANODE/CATHODE 9. ANODE/CATHODE 10. NO CONNECTION 11. ANODE/CATHODE 12. ANODE/CATHODE 13. NO CONNECTION 14. COMMON ANODE	STYLE 7: PIN 1. NO CONNECTION 2. ANODE 3. ANODE 4. NO CONNECTION 5. ANODE 6. NO CONNECTION 7. ANODE 8. ANODE 9. ANODE 10. NO CONNECTION 11. ANODE 12. ANODE 13. NO CONNECTION 14. COMMON CATHODE	STYLE 8: PIN 1. NO CONNECTION 2. CATHODE 3. CATHODE 4. NO CONNECTION 5. CATHODE 6. NO CONNECTION 7. CATHODE 8. CATHODE 10. NO CONNECTION 11. CATHODE 12. CATHODE 13. NO CONNECTION 14. COMMON ANODE
STYLE 9: PIN 1. COMMON CATHODE 2. ANODE/CATHODE 3. ANODE/CATHODE 4. NO CONNECTION 5. ANODE/CATHODE 6. ANODE/CATHODE 7. COMMON ANODE 8. COMMON ANODE 9. ANODE/CATHODE 10. ANODE/CATHODE 11. NO CONNECTION 12. ANODE/CATHODE 13. ANODE/CATHODE 14. COMMON CATHODE	STYLE 10: PIN 1. COMMON CATHODE 2. ANODE/CATHODE 3. ANODE/CATHODE 4. ANODE/CATHODE 5. ANODE/CATHODE 6. NO CONNECTION 7. COMMON ANODE 8. COMMON CATHODE 9. ANODE/CATHODE 10. ANODE/CATHODE 11. ANODE/CATHODE 12. ANODE/CATHODE 13. NO CONNECTION 14. COMMON ANODE	STYLE 11: PIN 1. CATHODE 2. CATHODE 3. CATHODE 4. CATHODE 5. CATHODE 6. CATHODE 7. CATHODE 8. ANODE 9. ANODE 10. ANODE 11. ANODE 12. ANODE 13. ANODE 14. ANODE	STYLE 12: PIN 1. COMMON CATHODE 2. COMMON ANODE 3. ANODE/CATHODE 4. ANODE/CATHODE 5. ANODE/CATHODE 6. COMMON ANODE 7. COMMON CATHODE 9. ANODE/CATHODE 10. ANODE/CATHODE 11. ANODE/CATHODE 12. ANODE/CATHODE 13. ANODE/CATHODE 14. ANODE/CATHODE

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DUSEM

0.068

0.019

0.344

0.244



DIMENSIONS: MILLIMETERS

*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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