National Semiconductor

MILITARY DATA SHEET

MN54F521-X REV 1A0

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8-BIT IDENTITY COMPARATOR

General Description

The F521 is an expandable 8-bit comparator. It compares two words of up to eight bits each and provides a LOW output when the two words match bit for bit. The expansion input $\overline{IA=B}$ also serves as an active LOW enable input.

Industry Part Number

54F521

NS Part Numbers

54F521DMQB
54F521FMQB
54F521LMQB

Prime Die

M521

Processing

MIL-STD-883, Method 5004

Quality Conformance Inspection

MIL-STD-883, Method 5005

Subgrp	Description	Temp (°C)
1	Static tests at	+25
2	Static tests at	+125
3	Static tests at	-55
4	Dynamic tests at	+25
5	Dynamic tests at	+125
6	Dynamic tests at	-55
7	Functional tests at	+25
8A	Functional tests at	+125
8B	Functional tests at	-55
9	Switching tests at	+25
10	Switching tests at	+125
11	Switching tests at	-55

Features

- Compares two 8-bit words in 6.5 ns typ
- Expandable to any word length
- 20-pin package

(Absolute Maximum Ratings)

(Note 1)

Storage Temperature	-65C to +150C
Ambient Temperature under Bias	-55V to +125C
Junction Temperature under Bias	-55C to +175C
Vcc Pin Potential to Ground Pin	-0.5V to +7.0V
Input Voltage (Note 2)	-0.5V to +7.0V
Input Current (Note 2)	-30 mA to +5.0 mA
Voltage Applied to Output in HIGH State (with Vcc=0V)	
Standard Output	-0.5V to Vcc
TRI-STATE Output	-0.5V to +5.5V
Current Applied to Output in LOW State (Max)	twice the rated Iol(mA)

Note 1: Absolute maximum ratings are values beyond which the device may be damaged or have its useful life impaired. Functional operation under these conditions is not implied.

Note 2: Either voltage limit or current limit is sufficient to protect inputs.

Recommended Operating Conditions

Free Air Ambient Temperature	
Commercial	0 C to +70 C
Military	-55 C to +125 C
Supply Voltage	
Military	+4.5V to +5.5V
Commercial	+4.5V to +5.5V

Electrical Characteristics

DC PARAMETERS

(The following conditions apply to all the following parameters, unless otherwise specified.)
DC: VCC 4.5V to 5.5V, Temp range: -55C to 125C

SYMBOL	PARAMETER	CONDITIONS	NOTES	PIN-NAME	MIN	MAX	UNIT	SUB-GROUPS
IIH	Input High Current	VCC=5.5V, VM=2.7V, VINH=5.5V	1, 3	INPUTS		20	uA	1, 2, 3
IBVI	Input High Current	VCC=5.5V, VM=7.0V, VINH=5.5V	1, 3	INPUTS		100	uA	1, 2, 3
IIL	Input LOW Current	VCC=5.5V, VM=0.5V, VINH=5.5V	1, 3	INPUTS		-0.6	mA	1, 2, 3
VOL	Output LOW Voltage	VCC=4.5V, VIL=0.8V, IOL=20mA, VIH=2.0V	1, 3	OUTPUTS		0.5	V	1, 2, 3
VOH	Output HIGH Voltage	VCC=4.5V, VIH=2.0V, IOH=-1.0mA, VIL=0.8V, VINL=0.0V, VINH=5.5	1, 3	OUTPUTS	2.5		V	1, 2, 3
IOS	Short-Circuit Current	VCC=5.5V, VINH=5.5V, VM=0.0V, VINL=0.0V	1, 3	OUTPUTS	-60	-150	mA	1, 2, 3
VCD	Input Clamp Diode Voltage	VCC=4.5V, IM=-18mA, VINH=5.5V	1, 3	INPUTS		-1.2	V	1, 2, 3
ICC	Supply Current	VCC=5.5V, VINH=5.5V, VINL=0.0V	1, 3	VCC		32	mA	1, 2, 3
ICEX	Output HIGH Leakage Current	VCC=5.5V, VINH=5.5V, VINL=0.0V, VM=5.5V	1, 3	OUTPUTS		250	uA	1, 2, 3

AC PARAMETERS

(The following conditions apply to all the following parameters, unless otherwise specified.)
AC: CL=50pf, RL=500 OHMS, TR=2.5ns, TF=2.5ns SEE AC FIGS

tpLH(1)	Propagation Delay An or Bn to OA=$\overline{B}$	VCC=5.0V @ 25C, VCC=4.5V & 5.5V @ -55/125C	2, 4		3.0	10.0	ns	9
tpLH(1)	Propagation Delay An or Bn to OA=$\overline{B}$	VCC=5.0V @ 25C, VCC=4.5V & 5.5V @ -55/125C	2, 4		3.0	14.0	ns	10, 11
tpHL(1)	Propagation Delay An or Bn to OA=$\overline{B}$	VCC=5.0V @ 25C, VCC=4.5V & 5.5V @ -55/125C	2, 4		4.5	10.0	ns	9
tpHL(1)	Propagation Delay An or Bn to OA=$\overline{B}$	VCC=5.0V @ 25C, VCC=4.5V & 5.5V @ -55/125C	2, 4		4.0	15.0	ns	10, 11
tpLH(2)	Propagation Delay IA=$\overline{B}$ to OA=$\overline{B}$	VCC=5.0V @ 25C, VCC=4.5V & 5.5V @ -55/125C	2, 4		3.0	6.5	ns	9
tpLH(2)	Propagation Delay IA=$\overline{B}$ to OA=$\overline{B}$	VCC=5.0V @ 25C, VCC=4.5V & 5.5V @ -55/125C	2, 4		3.0	8.5	ns	10, 11
tpHL(2)	Propagation Delay IA=$\overline{B}$ to OA=$\overline{B}$	VCC=5.0V @ 25C, VCC=4.5V & 5.5V @ -55/125C	2, 4		3.5	9.0	ns	9
tpHL(2)	Propagation Delay IA=$\overline{B}$ to OA=$\overline{B}$	VCC=5.0V @ 25C, VCC=4.5V & 5.5V @ -55/125C	2, 4		3.5	13.5	ns	10, 11

Note 1: Screen tested 100% on each device at -55 C, +25 C & +125 C temperature, Subgroups A1, 2, 3, 7 & 8.
Note 2: Screen tested 100% on each device at +25 C temperature only, Subgroup A9.

(Continued)

Note 3: Sample tested (Method 5005, Table 1) on each MFG. lot at +25 C, +125 C & -55 C temp., Subgroups A1, 2, 3, 7 & 8.
Note 4: Sample Tested (Method 5005, Table 1) on each MFG. lot at +25 C Subgroup A9, & periodically at +125 C & -55 C temp., Subgroups 10 & 11.