National Semiconductor

MICROCIRCUIT DATA SHEET

CN54F258A-X REV 1A0

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QUAD 2-INPUT MULTIPLEXER WITH TRI-STATE OUTPUTS

General Description

The F258A is a quad 2-Input multiplexer with Tri-State outputs. Four bits of data from two sources can be selected using a Common Data Select Input. The four outputs present the selected data in the complement (Inverted) form. The outputs may be switched to a high impedance state with a HIGH on the common Output Enable ($\overline{OE}$) input, allowing the outputs to interface directly with bus-oriented systems.

Industry Part Number

54F258A

NS Part Numbers

54F258ADC

Prime Die

M258A

Processing

Quality Conformance Inspection

Subgrp	Description	Temp (°C)
1	Static tests at	+25
2	Static tests at	+70
3	Static tests at	0
4	Dynamic tests at	+25
5	Dynamic tests at	+70
6	Dynamic tests at	0
7	Functional tests at	+25
8A	Functional tests at	+70
8B	Functional tests at	0
9	Switching tests at	+25
10	Switching tests at	+70
11	Switching tests at	0

Features

- Multiplexer Expansion By Tying Outputs Together
- Inverting Tri-State Outputs
- Guaranteed 4000V minimum ESD protection

(Absolute Maximum Ratings)

(Note 1)

Storage Temperature	−65 C to +150 C
Ambient Temperature under Bias	−55 C to +125 C
Junction Temperature under Bias	−55 C to +175 C
Vcc Pin Potential to Ground Pin	−0.5V to +7.0V
Input Voltage (Note 2)	−0.5V to +7.0V
Input Current (Note 2)	−30mA to +5.0mA
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)
ESD Last Passing Voltage (Min)	4000V

Note 1: Absolute Maximum ratings are those 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
Supply Voltage	
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: 0C to +70C

SYMBOL	PARAMETER	CONDITIONS	NOTES	PIN-NAME	MIN	MAX	UNIT	SUB-GROUPS
VIH	Input HIGH Voltage	Recognized as a HIGH Signal	1	INPUTS	2.0		V	1, 2, 3
VIL	Input LOW Voltage	Recognized as a LOW Signal	1	INPUTS		0.8	V	1, 2, 3
VCD	Input Clamp Diode Voltage	VCC=4.5V, IIN=-18mA	2, 3	INPUTS		-1.2	V	1, 2, 3
VOH	Output HIGH Voltage	VCC=4.5V, IOH=-1.0mA	2, 3	OUTPUTS	2.5		V	1, 2, 3
		VCC=4.5V, IOH=-3.0mA	2, 3	OUTPUTS	2.4		V	1, 2, 3
		VCC=4.75V, IOH=-1.0mA	2, 3	OUTPUTS	2.7		V	1, 2, 3
		VCC=4.75V, IOH=-3.0mA	2, 3	OUTPUTS	2.7		V	1, 2, 3
VOL	Output LOW Voltage	VCC=4.5V, IOL=24mA	2, 3	OUTPUTS		0.5	V	1, 2, 3
IIH	Input HIGH Current	VCC=5.5V, VIN=2.7V	2, 3	INPUTS		5.0	uA	1, 2, 3
IBVI	Input HIGH Current Breakdown Test	VCC=5.5V, VIN=7.0V	2, 3	INPUTS		7.0	uA	1, 2, 3
ICEX	Output HIGH Leakage Current	VCC=5.5V, VOUT = VCC	2, 3	OUTPUTS		100	uA	1, 2, 3
VID	Input Leakage Test	VCC = 0.0V, IID = 1.9uA, All other pins grounded	2, 3	INPUTS	4.75		V	1, 2, 3
IOD	Output Leakage Circuit Current	VCC = 0.0V, VIOD = 150mV, All other pins grounded	2, 3	OUTPUTS		4.75	uA	1, 2, 3
IIL	Input LOW Current	VCC=5.5V, VIN=0.5V	2, 3	INPUTS		-0.6	mA	1, 2, 3
IOZH	Output Leakage Current	VCC=5.5V, VOUT=2.7V	2, 3	OUTPUTS		50	uA	1, 2, 3
IOZL	Output Leakage Current	VCC=5.5V, VOUT=0.5V	2, 3	OUTPUTS		-50	uA	1, 2, 3
IOS	Output Short Circuit Current	VCC=5.5V, VOUT = 0V	2, 3	OUTPUTS	-60	-150	mA	1, 2, 3
IZZ	Bus Drainage Test	VCC = 0.0V, VOUT = 5.25V	2, 3			500	uA	1, 2, 3
ICCH	Power Supply Current	VCC=5.5V, VO = HIGH	2, 3	VCC		9.5	mA	1, 2, 3
ICCL	Power Supply Current	VCC=5.5V, VO = LOW	2, 3	VCC		23	mA	1, 2, 3

Electrical Characteristics

DC PARAMETERS(Continued)

(The following conditions apply to all the following parameters, unless otherwise specified.)
DC: VCC 4.5V to 5.5V, Temp range: 0C to +70C

SYMBOL	PARAMETER	CONDITIONS	NOTES	PIN-NAME	MIN	MAX	UNIT	SUB-GROUPS
ICCZ	Power Supply Current	VCC=5.5V, VO = HIGH Z	2, 3	VCC		17	mA	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, Temp Range: 0C to +70C

tpLH(1)	Propagation Delay	VCC=+5.0V @ +25C, VCC=4.5V & 5.5V @ 0/+70C	2, 3	In to $\overline{Z}$n	2.5	5.3	ns	9
			2, 3	In to $\overline{Z}$n	2.0	7.0	ns	10, 11
tpHL(1)	Propagation Delay	VCC=+5.0V @ +25C, VCC=4.5V & 5.5V @ 0/+70C	2, 3	In to $\overline{Z}$n	1.0	4.0	ns	9
			2, 3	In to $\overline{Z}$n	1.0	5.0	ns	10, 11
tpLH(2)	Propagation Delay	VCC=+5.0V @ +25C, VCC=4.5V & 5.5V @ 0/+70C	2, 3	S to $\overline{Z}$n	3.0	7.5	ns	9
			2, 3	S to $\overline{Z}$n	3.0	8.5	ns	10, 11
tpHL(2)	Propagation Delay	VCC=+5.0V @ +25C, VCC=4.5V & 5.5V @ 0/+70C	2, 3	S to $\overline{Z}$n	2.5	7.0	ns	9
			2, 3	S to $\overline{Z}$n	2.5	8.0	ns	10, 11
tpZH	Output Enable Time	VCC=+5.0V @ +25C, VCC=4.5V & 5.5V @ 0/+70C	2, 3	$\overline{OE}$ to $\overline{Z}$n	2.0	6.0	ns	9
			2, 3	$\overline{OE}$ to $\overline{Z}$n	2.0	7.0	ns	10, 11
tpZL	Output Enable Time	VCC=+5.0V @ +25C, VCC=4.5V & 5.5V @ 0/+70C	2, 3	$\overline{OE}$ to $\overline{Z}$n	2.5	7.0	ns	9
			2, 3	$\overline{OE}$ to $\overline{Z}$n	2.5	8.0	ns	10, 11
tpHZ	Output Disable Time	VCC=+5.0V @ +25C, VCC=4.5V & 5.5V @ 0/+70C	2, 3	$\overline{OE}$ to $\overline{Z}$n	2.0	6.0	ns	9
			2, 3	$\overline{OE}$ to $\overline{Z}$n	2.0	7.0	ns	10, 11
tpLZ	Output Disable Time	VCC=+5.0V @ +25C, VCC=4.5V & 5.5V @ 0/+70C	2, 3	$\overline{OE}$ to $\overline{Z}$n	2.0	6.0	ns	9
			2, 3	$\overline{OE}$ to $\overline{Z}$n	2.0	7.0	ns	10, 11

Note 1: Guaranteed by applying specific input condition and testing VOL & VOH.
Note 2: Screen tested 100% on each device at +75C temperature only, subgroups A2, 8A & A10.

Note 3: Sample tested (Method 5005, Table 1) on each MFG. lot at +75C temperature only, subgroups A2, 8A & A10.

Revision History

Rev	ECN #	Rel Date	Originator	Changes
0A0	M0001739	02/10/98	Linda Collins	Initial MDS Release
1A0	M0002736	02/10/98	Donald B. Miller	1) Deleted "SEE AC FIGS" from the AC parameter conditions. 2) Changed tpLH(1) maximum limit at 0C and 70C from 6.0ns to 7.0ns. 3) Added subgroup 8A to notes 2 and 3.