

MN54F158A-X REV 1A0

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QUAD 2-INPUT Multiplexer
General Description

The F158A is a high-speed quad 2-Input multiplexer. It selects four bits of data from two sources using the common Select and Enable inputs. The four buffered outputs present the selected data in the inverted form. The F158A can also be used to generate any four of the 16 different functions to two variables.

Industry Part Number

54F158A

NS Part Numbers

 54F158ADMQB
 54F158AFMQB
 54F158ALMQB

Prime Die

M158A

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

- 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)	-30 mA 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
Military	-55 C to +125 C
Supply Voltage	
Military	+4.5V to +5.5V
Commercial	+4.5V to +5.5V

Electrical Characteristics

DC PARAMETER

(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
I _{IH}	Input High Current	VCC=5.5V, V _M =2.7V, V _{INH} =5.5V	1, 3	INPUTS		20	uA	1, 2, 3
I _{BVI}	Input High Current	VCC=5.5V, V _M =7.0V, V _{INH} =5.5V	1, 3	INPUTS		100	uA	1, 2, 3
I _{IL}	Input LOW Current	VCC=5.5V, V _M =0.5V, V _{INH} =5.5V, V _{INL} =0.0V	1, 3	OTHER		-0.6	mA	1, 2, 3
V _{OL}	Output LOW Voltage	VCC=4.5V, V _{IH} =2.0V, I _{OL} =20mA, V _{INH} =5.5V, V _{IL} =0.8V, V _{INL} =0.0V	1, 3	OUTPUTS		0.5	V	1, 2, 3
V _{OH}	Output HIGH Voltage	VCC=4.5V, V _{IL} =0.8V, I _{OH} =-1.0mA, V _{INH} =5.5V, V _{INL} =0.0V	1, 3	OUTPUTS	2.5		V	1, 2, 3
I _{OS}	Short Circuit Current	VCC=5.5V, V _{INH} =5.5V, V _M =0.0V, V _{INL} =0.0V	1, 3	OUTPUTS	-60	-150	mA	1, 2, 3
V _{CD}	Input Clamp Diode Voltage	VCC=4.5V, I _M =-18mA, V _{INH} =5.5V	1, 3	INPUTS		-1.2	V	1, 2, 3
I _{CC}	Supply Current	VCC=5.5V, V _{INH} =5.5V	1, 3	VCC		15	mA	1, 2, 3
I _{CEX}	Output HIGH Leakage Current	VCC=5.5V, V _{INH} =5.5V, V _M =5.5V, V _{INL} =0.0V	1, 3	OUTPUTS		250	uA	1, 2, 3

AC PARAMETER

(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	VCC=5.0V @25C, VCC=4.5V & 5.5V @-55/125C	2, 4	In to \bar{Z}_n	2.5	5.9	ns	9
			2, 4	In to \bar{Z}_n	2.5	8.5	ns	10, 11
tpHL(1)	Propagation Delay	VCC=5.0V @25C, VCC=4.5V & 5.5V @-55/125C	2, 4	In to \bar{Z}_n	1.0	4.0	ns	9
			2, 4	In to \bar{Z}_n	1.0	5.0	ns	10, 11
tpLH(2)	Propagation Delay	VCC=5.0V @25C, VCC=4.5V & 5.5V @-55/125C	2, 4	S to \bar{Z}_n	3.0	8.5	ns	9
			2, 4	S to \bar{Z}_n	3.0	10.5	ns	10, 11
tpHL(2)	Propagation Delay	VCC=5.0V @25C, VCC=4.5V & 5.5V @-55/125C	2, 4	S to \bar{Z}_n	2.5	6.5	ns	9
			2, 4	S to \bar{Z}_n	2.5	8.0	ns	10, 11
tpLH(3)	Propagation Delay	VCC=5.0V @25C, VCC=4.5V & 5.5V @-55/125C	2, 4	\bar{E} to \bar{Z}_n	2.5	6.0	ns	9
			2, 4	\bar{E} to \bar{Z}_n	2.5	8.0	ns	10, 11
tpHL(3)	Propagation Delay	VCC=5.0V @25C, VCC=4.5V & 5.5V @-55/125C	2, 4	\bar{E} to \bar{Z}_n	2.0	6.0	ns	9
			2, 4	\bar{E} to \bar{Z}_n	2.0	7.0	ns	10, 11

- Note 1: Screen tested 100% on each device at +25C, +125C & -55C temperature, subgroups A1, 2, 3, 7 & 8.
- Note 2: Screen tested 100% on each device at +25C temperature only, subgroup A9.
- Note 3: Sample tested (Method 5005, Table 1) on each MFG. lot at +25C, +125C & -55C temperature, subgroups A1, 2, 3, 7 & 8.
- Note 4: Sample tested (Method 5005, Table 1) on each MFG. lot at +25C subgroup A9, and periodically at +125C & -55C temperature, subgroups 10 & 11.