National Semiconductor

MILITARY DATA SHEET

MN54F182-X REV 1A0

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CARRY LOOKAHEAD GENERATOR

General Description

The F182 is a high-speed carry lookahead generator. It is generally used with the F181, F381 or 29F91 4-bit arithmetic logic unit to provide high-speed lookahead over word lengths of more than four bits.

Industry Part Number

54F182

NS Part Numbers

54F182DMQB
54F182FMQB
54F182LMQB

Prime Die

M182

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

- Provides Lookahead Carries Across a Group of Four ALS's
- Multi-Level Lookahead High-Speed Arithmetic Operation over Long Word Lengths

(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
IIH	Input High Current	VCC=5.5V, VM=2.7V	1, 3	INPUTS		20	uA	1, 2, 3
IBVI	Input High Current	VCC=5.5V, VM=7.0V	1, 3	INPUTS		100	uA	1, 2, 3
IIL2	Input LOW Current	VCC=5.5V, VM=0.5V	1, 3	Cn		-1.2	mA	1, 2, 3
IIL4	Input LOW Current	VCC= 5.5V, VM=0.5V	1, 3	$\overline{P}3$		-2.4	mA	1, 2, 3
IIL6	Input LOW Current	VCC=5.5V, VM=0.5V	1, 3	$\overline{P}2$		-3.6	mA	1, 2, 3
IIL8	Input LOW Current	VCC=5.5V, VM=0.5V	1, 3	$\overline{P}0$, $\overline{P}1$, $\overline{G}3$		-4.8	mA	1, 2, 3
IIL14	Input LOW Current	VCC=5.5V, VM=0.5V	1, 3	$\overline{G}0$, $\overline{G}2$		-8.4	mA	1, 2, 3
IIL16	Input LOW Current	VCC=5.5V, VM=0.5V	1, 3	$\overline{G}1$		-9.6	mA	1, 2, 3
VOL	Output LOW Voltage	VCC=4.5V, VIH=2.0V, IOL=20mA, VIL=0.8V	1, 3	OUTPUTS		0.5	V	1, 2, 3
VOH	Output HIGH Voltage	VCC=4.5V, VIH=2.0V, VIL=0.8V, IOH=-1mA	1, 3	OUTPUTS	2.5		V	1, 2, 3
ICEX	Output HIGH Leakage Current	VCC=5.5V, VINL=0.0V, VM=5.5V, VINH=5.5V	1, 3	OUTPUTS		250	uA	1, 2, 3
IOS	Short Circuit Current	VCC=5.5V, VM=0.0V	1, 3	OUTPUTS	-60	-150	mA	1, 2, 3
VCD	Input Clamp Diode Voltage	VCC=4.5V, IM=-18mA	1, 3	INPUTS		-1.2	V	1, 2, 3
ICCH	Supply Current	VCC=5.5V	1, 3	VCC		28	mA	1, 2, 3
ICCL	Supply Current	VCC=5.5V	1, 3	VCC		36	mA	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	Cn to Cn+x, y, z	3.0	9.0	ns	9
			2, 4	Cn to Cn+x, y, z	3.0	12.0	ns	10, 11

Electrical Characteristics

AC PARAMETER(Continued)

(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

SYMBOL	PARAMETER	CONDITIONS	NOTES	PIN-NAME	MIN	MAX	UNIT	SUB-GROUPS
tpHL(1)	Propagation Delay	VCC= 5.0V @25C, VCC=4.5V & 5.5V @-55/125C	2, 4	Cn to Cn+x, y, z	3.0	9.0	ns	9
			2, 4	Cn to Cn+x, y, z	3.0	11.0	ns	10, 11
tpLH(2)	Propagation Delay	VCC= 5.0V @25C, VCC=4.5V & 5.5V @-55/125C	2, 4	$\overline{P}$n to Cn+x, y, z	2.5	8.5	ns	9
			2, 4	$\overline{P}$n to Cn+x, y, z	2.5	11.0	ns	10, 11
tpHL(2)	Propagation Delay	VCC= 5.0V @25C, VCC=4.5V & 5.5V @-55/125C	2, 4	$\overline{P}$n to Cn+X, y, z	1.0	5.0	ns	9
			2, 4	$\overline{P}$n to Cn+X, y, z	1.0	7.0	ns	10, 11
tpLH(3)	Propagation Delay $\overline{G}$n to Cn+x, Cn+y or Cn+z	VCC= 5.0V @25C, VCC=4.5V & 5.5V @-55/125C	2, 4		2.5	8.5	ns	9
tpLH(3)	Propagation Delay $\overline{G}$n to Cn+x, Cn+y or Cn+z	VCC= 5.0V @25C, VCC=4.5V & 5.5V @-55/125C	2, 4		2.5	11.0	ns	10, 11
tpHL(3)	Propagation Delay $\overline{G}$n to Cn+x, Cn+y or Cn+z	VCC= 5.0V @25C, VCC=4.5V & 5.5V @-55/125C	2, 4		1.0	5.2	ns	9
tpHL(3)	Propagation Delay $\overline{G}$n to Cn+x, Cn+y or Cn+z	VCC= 5.0V @25C, VCC=4.5V & 5.5V @-55/125C	2, 4		1.0	7.0	ns	10, 11
tpLH(4)	Propagation Delay	VCC= 5.0V @25C, VCC=4.5V & 5.5V @-55/125C	2, 4	$\overline{P}$n to $\overline{G}$	3.0	10.0	ns	9
			2, 4	$\overline{P}$n to $\overline{G}$	3.0	12.0	ns	10, 11
tpHL(4)	Propagation Delay	VCC= 5.0V @25C, VCC=4.5V & 5.5V @-55/125C	2, 4	$\overline{P}$n to $\overline{G}$	2.5	8.0	ns	9
			2, 4	$\overline{P}$n to $\overline{G}$	2.5	10.0	ns	10, 11
tpLH(5)	Propagation Delay	VCC= 5.0V @25C, VCC=4.5V & 5.5V @-55/125C	2, 4	$\overline{G}$n to $\overline{G}$	3.0	10.5	ns	9
			2, 4	$\overline{G}$n to $\overline{G}$	3.0	12.0	ns	10, 11
tpHL(5)	Propagation Delay	VCC= 5.0V @25C, VCC=4.5V & 5.5V @-55/125C	2, 4	$\overline{G}$n to $\overline{G}$	2.5	7.5	ns	9
			2, 4	$\overline{G}$n to $\overline{G}$	2.5	10.0	ns	10, 11
tpLH(6)	Propagation Delay	VCC= 5.0V @25C, VCC=4.5V & 5.5V @-55/125C	2, 4	$\overline{P}$n to $\overline{P}$	2.5	7.5	ns	9
			2, 4	$\overline{P}$n to $\overline{P}$	2.5	10.0	ns	10, 11

Electrical Characteristics

AC PARAMETER(Continued)

(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

SYMBOL	PARAMETER	CONDITIONS	NOTES	PIN-NAME	MIN	MAX	UNIT	SUB-GROUPS
tpHL(6)	Propagation Delay	VCC= 5.0V @25C, VCC=4.5V & 5.5V @-55/125C	2, 4	$\overline{P}$n to $\overline{P}$	2.5	5.5	ns	9
			2, 4	$\overline{P}$n to $\overline{P}$	2.5	8.0	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.

National Semiconductor was acquired by Texas Instruments.

http://www.ti.com/corp/docs/investor_relations/pr_09_23_2011_national_semiconductor.html

This file is the datasheet for the following electronic components:

54F182DMQB - http://www.ti.com/product/54f182dmqb?HQS=TI-null-null-dscatalog-df-pf-null-wwe

54F182FM-MLS - http://www.ti.com/product/54f182fm-mls?HQS=TI-null-null-dscatalog-df-pf-null-wwe

JM38510/33802B2A - http://www.ti.com/product/jm38510/33802b2a?HQS=TI-null-null-dscatalog-df-pf-null-wwe

JM38510/33802BEA - http://www.ti.com/product/jm38510/33802bea?HQS=TI-null-null-dscatalog-df-pf-null-wwe

JM38510/33802BFA - http://www.ti.com/product/jm38510/33802bfa?HQS=TI-null-null-dscatalog-df-pf-null-wwe

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