



## MILITARY DATA SHEET

**MN54F823-X REV 1A0**

Original Creation Date: 05/10/96  
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### 9-BIT D-TYPE FLIP-FLOP

#### General Description

The F823 is a 9-bit buffered register. It features Clock Enable and Clear which are ideal for parity bus interfacing in high performance microprogramming systems.

The F823 is functionally and pin compatible with AMDs AM29823.

#### Industry Part Number

54F823

#### NS Part Numbers

54F823DMQB  
54F823FMQB  
54F823LMQB

#### Prime Die

M823

#### 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**

- TRI-STATE outputs
- Clock Enable and Clear
- Direct replacement for AMD's Am29823

**(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 Outpu in HIGH State (with Vcc=0V)	
Standard Output	-0.5V to Vcc
TRI-STATE Output	-0.5V to + 5.5V

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	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
IIL	Input LOW Current (OE, CLR, EN)	VCC=5.5V, VM=0.5V	1, 3	INPUTS		-0.6	mA	1, 2, 3
IIL2	Input LOW Current	VCC=5.5V, VM=0.5V	1, 3	CP INPUTS		-1.2	mA	1, 2, 3
VOL	Output LOW Voltage	VCC=4.5V, VIH=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	1, 3	OUTPUTS	2.5		V	1, 2, 3
VOH3	Output HIGH Voltage	VCC=4.5V, VIH=2.0V, IOH=-3.0mA, VIL=0.8V	1, 3	OUTPUTS	2.4		V	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
IC CZ	Supply Current	VCC=5.5V	1, 3	VCC		100	mA	1, 2, 3
IC EX	Output HIGH Leakage Current	VCC=5.5V, VINL=0.0V, VM=5.5V, VINH=5.5V	1, 3	OUTPUTS		250	uA	1, 2, 3
IOZH	Output Leakage Current	VCC=5.5V, VM=2.7V, VIH=2.0V	1, 3	OUTPUTS		50	uA	1, 2, 3
IOZL	Output Leakage Current	VCC=5.5V, VM=0.5V, VIH=2.0V	1, 3	OUTPUTS		-50	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	VCC=5.0V @ 25C, VCC=4.5V & 5.5V @ -55/125C	2, 4	CP to On	2.0	9.5	ns	9
			2, 4	CP to On	2.0	10.5	ns	10, 11
tpHL(1)	Propagation Delay	VCC=5.0V @ 25C, VCC=4.5V & 5.5V @ -55/125C	2, 4	CP to On	2.0	9.5	ns	9
			2, 4	CP to On	2.0	10.5	ns	10, 11

## Electrical Characteristics

### AC PARAMETERS (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 (2)	Propagation Delay	VCC=5.0V @ 25C, VCC=4.5V & 5.5V @ -55/125C	2, 4	$\overline{\text{CLR}}$ to On	4.0	12.0	ns	9
			2, 4	$\overline{\text{CLR}}$ to On	4.0	13.0	ns	10, 11
tpZH	Output Enable Time	VCC=5.0V @ 25C, VCC=4.5V & 5.5V @ -55/125C	2, 4	$\overline{\text{OE}}$ to On	2.0	10.5	ns	9
			2, 4	$\overline{\text{OE}}$ to On	2.0	13.0	ns	10, 11
tpZL	Output Enable Time	VCC=5.0V @ 25C, VCC=4.5V & 5.5V @ -55/125C	2, 4	$\overline{\text{OE}}$ to On	2.0	10.5	ns	9
			2, 4	$\overline{\text{OE}}$ to On	2.0	13.0	ns	10, 11
tpHZ	Output Disable Time	VCC=5.0V @ 25C, VCC=4.5V & 5.5V @ -55/125C	2, 4	$\overline{\text{OE}}$ to On	1.5	7.0	ns	9
			2, 4	$\overline{\text{OE}}$ to On	1.0	7.5	ns	10, 11
tpLZ	Output Disable Time	VCC=5.0V @ 25C, VCC=4.5V & 5.5V @ -55/125C	2, 4	$\overline{\text{OE}}$ to On	1.5	7.0	ns	9
			2, 4	$\overline{\text{OE}}$ to On	1.0	7.5	ns	10, 11
ts(H/L) (1)	Setup Time HIGH or LOW	VCC=5.0V @ 25C, VCC=4.5V & 5.5V @ -55/125C	5	Dn to CP	3.0		ns	9
			5	Dn to CP	4.0		ns	10, 11
th(H/L) (1)	Hold Time HIGH or LOW	VCC=5.0V @ 25C, VCC=4.5V & 5.5V @ -55/125C	5	Dn to CP	2.5		ns	9, 10, 11
tw(H/L)	Pulse Width	VCC=5.0V @ 25C, VCC=4.5V & 5.5V @ -55/125C TR/TF=1.0ns	5	CP	5.0		ns	9
			5	CP	6.0		ns	10, 11
ts(H) (2)	Setup Time	VCC=5.0V @ 25C, VCC=4.5V & 5.5V @ -55/125C	5	$\overline{\text{En}}$ to CP	4.5		ns	9
			5	$\overline{\text{En}}$ to CP	5.0		ns	10, 11
ts(L) (2)	Setup Time	VCC=5.0V @ 25C, VCC=4.5V & 5.5V @ -55/125C	5	$\overline{\text{En}}$ to CP	2.5		ns	9
			5	$\overline{\text{En}}$ to CP	3.0		ns	10, 11
th(H) (2)	Hold Time	VCC=5.0V @ 25C, VCC=4.5V & 5.5V @ -55/125C	5	$\overline{\text{En}}$ to CP	2.0		ns	9
			5	$\overline{\text{En}}$ to CP	3.0		ns	10, 11

## Electrical Characteristics

### AC PARAMETERS (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
th(L) (2)	Hold Time	VCC=5.0V @ 25C, VCC=4.5V & 5.5V @ -55/125C	5	$\overline{E_n}$ to CP	0.0		ns	9
			5	$\overline{E_n}$ to CP	1.0		ns	10, 11
trec	Recovery Time	VCC=5.0V @ 25C, VCC=4.5V & 5.5V @ -55/125C	5	$\overline{CLR}$	5.0		ns	9, 10, 11
tw (L)	Pulse Width	VCC=5.0V @ 25C, VCC=4.5V & 5.5V @ -55/125C TR/TF=1.0ns	5	$\overline{CLR}$	5.0		ns	9, 10, 11
Fmax	Maximum Clock Frequency	VCC=5.0V @ 25C, VCC=4.5V & 5.5V @ -55/125C TR/TF=1.0ns	5		100		MHz	9
			5		60		MHz	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.

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.

Note 5: Not tested at +25 C, +125 C or -55 C temperature (DESIGN CHARACTERIZATION DATA).