

MN54ACT573-X REV 3A0

Original Creation Date: 07/03/96
Last Update Date: 01/21/00
Last Major Revision Date: 01/06/00

Octal D-Type Latch With TRI-State Outputs

General Description

The ACT573 is a high speed octal latch with buffered common Latch Enable (LE) and buffered common Output Enable (\overline{OE}) inputs.

This device is functionally identical to the ACT373 but has inputs and outputs on opposite sides.

Industry Part Number

54ACT573

Prime Die

J573

NS Part Numbers

54ACT573DMQB*
54ACT573DMQB-RH*
54ACT573FMQB**
54ACT573FMQB-RH**
54ACT573LMQB***
54ACT573LMQB-RH***

Controlling Document

5962-87664

Processing

MIL-STD-883, Method 5004

Quality Conformance Inspection

MIL-STD-883, Method 5005

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

Features

- Icc and Ioz reduced by 50%
- Inputs and outputs on opposite sides of package allowing easy interface with microprocessors.
- Useful as input or output port for microprocessors
- Functionally identical to ACT373
- TRI-STATE outputs for bus interfacing
- Outputs source/sink 24 mA
- ACT573 has TTL-compatible inputs
- Standard Military Drawing (SMD)
 - ACT573: 5962-8766401RA*, SA**, 2A***
 - ACT573: 5962R8766401RA*, SA**, 2A***

(Absolute Maximum Ratings)

(Note 1)

Supply Voltage (Vcc)	-0.5V to +7.0V
DC Input Diode Current (Iik)	
Vi = -0.5V	-20 mA
Vi = Vcc +0.5V	+20 mA
DC Input Voltage (Vi)	-0.5V to Vcc +0.5V
DC Output Diode Current (Iok)	
Vo = -0.5V	-20 mA
Vo = Vcc +0.5V	+20 mA
DC Output Voltage (Vo)	-0.5V to Vcc +0.5V
DC Output Source or Sink Current (Io)	±50 mA
DC Vcc or Ground Current per Output Pin (Icc or Ignd)	±50 mA
Storage Temperature (Tstg)	-65 C to +150 C
Junction Temperature (Tj)	
CDIP	175 C

Note 1: Absolute maximum ratings are those values beyond which damage to the device may occur. The databook specifications should be met, without exception, to ensure that the system design is reliable over its power supply, temperature, and output/input loading variables. National does not recommend operation of FACT™ circuits outside databook specifications.

Recommended Operating Conditions

Supply Voltage (Vcc)	4.5V to 5.5V
Input Voltage (Vi)	0V to Vcc
Output Voltage (Vo)	0V to Vcc
Operating Temperature (Ta)	-55 C to + 125 C
Minimum Input Edge Rate (Delta V/ Delta t)	
ACT Devices	
Vin from 0.8V to 2.0V	
Vcc @ 4.5V, 5.5V	125 mV/ns

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. NOTE: -55C TEMPERATURE, SUBGROUP 3 IS GUARANTEED BUT NOT TESTED.

SYMBOL	PARAMETER	CONDITIONS	NOTES	PIN-NAME	MIN	MAX	UNIT	SUB-GROUPS
IIH	High Level Input Current	VCC=5.5V, VM=5.5V	1, 2	INPUT		0.1	uA	1
			1, 2	INPUT		1.0	uA	2, 3
IIL	Low Level Input Current	VCC=5.5V, VM=0.0V	1, 2	INPUT		-0.1	uA	1
			1, 2	INPUT		-1.0	uA	2, 3
VOL	Low Level Output Voltage	VCC=4.5V, VIL=0.8V, VIH=2.0V, IOL=50.0uA	1, 2	OUTPUT		.10	V	1, 2, 3
		VCC=5.5V, VIL=0.8V, VIH=2.0V, IOL=50.0uA	1, 2	OUTPUT		.10	V	1, 2, 3
		VCC=4.5V, VIL=0.8V, VIH=2.0V, IOL=24.0mA	1, 2	OUTPUT		.36	V	1
			1, 2	OUTPUT		.50	V	2, 3
		VCC=5.5V, VIL=0.8V, VIH=2.0V, IOL=24.0mA	1, 2	OUTPUT		.36	V	1
			1, 2	OUTPUT		.50	V	2, 3
VIOL	Dynamic output current Low	VCC=5.5V, VIL=0.8V, VIH=2.0V, IOL=50.0mA	1, 2, 5	OUTPUT		1.65	V	1, 2, 3
VOH	High Level Output Voltage	VCC=4.5V, VIL=0.8V, VIH=2.0V, IOH=-50.0uA	1, 2	OUTPUT	4.40		V	1, 2, 3
		VCC=5.5V, VIL=0.8V, VIH=2.0V, IOH=-50.0uA	1, 2	OUTPUT	5.40		V	1, 2, 3
		VCC=5.5V, VIL=0.8V, VIH=2.0V, IOH=-24.0mA	1, 2	OUTPUT	4.86		V	1
			1, 2	OUTPUT	4.70		V	2, 3
		VCC=4.5V, VIL=0.8V, VIH=2.0V, IOH=-24.0mA	1, 2	OUTPUT	3.86		V	1
			1, 2	OUTPUT	3.70		V	2, 3
VIOH	Dynamic output current High	VCC=5.5V, VIL=0.8V, VIH=2.0V, IOH=-50.0mA	1, 2, 5	OUTPUT	3.85		V	1, 2, 3
IOZH	Maximum TRI-STATE	VCC=4.5V, VIH=2.0V, VM=4.5V	1, 2	OUTPUT		0.25	uA	1
			1, 2	OUTPUT		5.0	uA	2, 3
		VCC=5.5V, VIH=2.0V, VM=5.5V	1, 2	OUTPUT		0.25	uA	1
			1, 2	OUTPUT		5.0	uA	2, 3
IOZL	Maximum TRI-STATE	VCC=4.5V, VIH=2.0V, VM=0.0V	1, 2	OUTPUT		-0.25	uA	1
			1, 2	OUTPUT		-5.0	uA	2, 3
		VCC=5.5V, VIH=2.0V, VM=0.0V	1, 2	OUTPUT		-0.25	uA	1
			1, 2	OUTPUT		-5.0V	uA	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: -55C to 125C. NOTE: -55C TEMPERATURE, SUBGROUP 3 IS GUARANTEED BUT NOT TESTED.

SYMBOL	PARAMETER	CONDITIONS	NOTES	PIN-NAME	MIN	MAX	UNIT	SUB-GROUPS
ICCH	Supply Current Outputs HIGH	VCC=5.5V	1, 2	VCC		4.0	uA	1
			1, 2	VCC		80	uA	2, 3
ICCL	Supply Current Outputs LOW	VCC=5.5V	1, 2	VCC		4.0	uA	1
			1, 2	VCC		80	uA	2, 3
IC CZ	Supply Current Outputs Tri-State	VCC=5.5V	1, 2	VCC		4.0	uA	1
			1, 2	VCC		80	uA	2, 3
ICCT	Supply Current per Input	VCC=5.5V, VIHT=VCC-2.1V	1, 2	VCC		1.0	mA	1
			1, 2	VCC		1.6	mA	2, 3

Electrical Characteristics

AC PARAMETERS

(The following conditions apply to all the following parameters, unless otherwise specified.)
 AC: CL=50pF, RL=500 OHMS, TR/TF=3.0ns, Temp range: -55C to +125C. NOTE: -55C TEMPERATURE, SUBGROUP 11 IS GUARANTEED BUT NOT TESTED.

SYMBOL	PARAMETER	CONDITIONS	NOTES	PIN-NAME	MIN	MAX	UNIT	SUB-GROUPS
tpLH(1)	Propagation Delay	VCC=4.5V	3, 4, 7	Dn to On	1.5	10.5	ns	9
			3, 4, 7	Dn to On	1.5	13.5	ns	10, 11
tpHL(1)	Propagation Delay	VCC=4.5V	3, 4, 7	Dn to On	1.5	10.5	ns	9
			3, 4, 7	Dn to On	1.5	13.5	ns	10, 11
tpLH(2)	Propagation Delay	VCC=4.5V	3, 4, 7	Le to On	1.5	10.5	ns	9
			3, 4, 7	Le to On	1.5	13.0	ns	10, 11
tpHL(2)	Propagation Delay	VCC=4.5V	3, 4, 7	Le to On	1.5	9.5	ns	9
			3, 4, 7	Le to On	1.5	12.0	ns	10, 11
tpZH	Output Enable Time	VCC=4.5V	3, 4, 7	\overline{OE} to On	1.5	10.0	ns	9
			3, 4, 7	\overline{OE} to On	1.5	11.5	ns	10, 11
tpZL	Output Enable Time	VCC=4.5V	3, 4, 7	\overline{OE} to On	1.5	9.5	ns	9
			3, 4, 7	\overline{OE} to On	1.5	11.0	ns	10, 11
tpHZ	Output Disable Time	VCC=4.5V	3, 4, 7	\overline{OE} to On	1.5	11.0	ns	9
			3, 4, 7	\overline{OE} to On	1.5	13.5	ns	10, 11
tpLZ	Output Disable Time	VCC=4.5V	3, 4, 7	\overline{OE} to On	1.5	8.5	ns	9
			3, 4, 7	\overline{OE} to On	1.5	10.5	ns	10, 11
ts(H/L)	Setup Time HIGH or LOW	VCC=4.5V	6	Dn to LE	4.0		ns	9
			6	Dn to LE	4.5		ns	10, 11
th(H/L)	Hold Time HIGH or LOW	VCC=4.5V	6	Dn to LE	0.5		ns	9
			6	Dn to LE	1.0		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/TF=3.0ns, Temp range: -55C to +125C. NOTE: -55C TEMPERATURE, SUBGROUP 11 IS GUARANTEED BUT NOT TESTED.

SYMBOL	PARAMETER	CONDITIONS	NOTES	PIN-NAME	MIN	MAX	UNIT	SUB-GROUPS
tw(H)	Pulse Width	VCC=4.5V	6	LE Pulse Width	5.0		ns	9, 10, 11

GROUP E POST IRRADIATION PARAMETRIC LIMITS

(The following conditions apply to all the following parameters, unless otherwise specified.)
 DC: The 100K RAD (Si) dose level includes a post irradiation 168 hour, 25 deg C biased anneal. All DC and AC subgroups 1, 7 and 9 electricals must be met with the following exceptions:

ICCH	Supply Current Outputs High	Dose Level = 3K RAD (Si), VCC=5.5V, VINL=0.0V, VINH=5.5V	VCC	100	uA	1
		Dose Level = 10K RAD (Si), VCC=5.5V, VINL=0.0V, VINH=5.5V	VCC	1.0	mA	1
		Dose Level = 30K, 50K, 100K RAD (Si), VCC=5.5V, VINL=0.0V, VINH=5.5V	VCC	3.5	mA	1
ICCL	Supply Current Outputs Low	Dose Level = 3K RAD (Si), VCC=5.5V, VINL=0.0V, VINH=5.5V	VCC	100	uA	1
		Dose Level = 10K RAD (Si), VCC=5.5V, VINL=0.0V, VINH=5.5V	VCC	1.0	mA	1
		Dose Level = 30K, 50K, 100K RAD (Si), VCC=5.5V, VINL=0.0V, VINH=5.5V	VCC	3.5	mA	1
IC CZ	Supply Current Outputs Tristated	Dose Level = 3K RAD (Si), VCC=5.5V, VINL=0.0V, VINH=5.5V	VCC	100	uA	1
		Dose Level = 10K RAD (Si), VCC=5.5V, VINL=0.0V, VINH=5.5V	VCC	1.0	mA	1
		Dose Level = 30K, 50K, 100K RAD (Si), VCC=5.5V, VINL=0.0V, VINH=5.5V	VCC	3.5	mA	1
ICCT	Supply Current Per Input	Dose Level = 3K, 10K RAD (Si), VCC=5.5V, VINL=0.0V, VIHT=VCC-2.1V	VCC	1.6	mA	1
		Dose Level = 30K, 50K, 100K RAD (Si), VCC=5.5V, VINL=0.0V, VIHT=VCC-2.1V	VCC	3.5	mA	1
IOZH	Maximum Tri-state Leakage Current	Dose Level = 3K, 10K, 30K, 50K, 100K RAD (Si), VCC=4.5V, VINL=0.0V, VINH=4.5V, VIH=2.0V, VM=4.5V	OUTPUTS	25	uA	1
		Dose Level = 3K, 10K, 30K, 50K, 100K RAD (Si), VCC=5.5V, VINL=0.0V, VINH=5.5V, VIH=2.0V, VM=5.5V	OUTPUTS	25	uA	1
IOZL	Maximum Tri-state Leakage Current	Dose Level = 3K, 10K, 30K, 50K, 100K RAD (Si), VCC=4.5V, VINL=0.0V, VINH=4.5V, VIH=2.0V, VM=0.0V	OUTPUTS	-25	uA	1
		Dose Level = 3K, 10K, 30K, 50K, 100K RAD (Si), VCC=5.5V, VINL=0.0V, VINH=5.5V, VIH=2.0V, VM=0.0V	OUTPUTS	-25	uA	1

- Note 1: SCREEN TESTED 100% ON EACH DEVICE AT +25C & +125C TEMPERATURE, SUBGROUPS 1, 2, 7, & 8.
- Note 2: SAMPLE TESTED (METHOD 5005, TABLE 1) ON EACH MFG. LOT AT +25C & +125C TEMPERATURE, SUBGROUPS A1, 2, 7, & 8.
- Note 3: SCREEN TESTED 100% ON EACH DEVICE AT +25C TEMPERATURE ONLY, SUBGROUP A9.
- Note 4: SAMPLE TESTED (METHOD 5005, TABLE 1) ON EACH MFG. LOT AT +25C & +125C TEMPERATURE, SUBGROUPS A9 & 10.
- Note 5: TRANSMISSION LINE DRIVING TEST, GUARDBAND LIMITS SET FOR +25C, 2 MSEC DURATION MAX.
- Note 6: GUARANTEED BUT NOT TESTED (DESIGN CHARACTERIZATION DATA).
- Note 7: +25C & +125C MIN LIMITS GUARANTEED FOR 5.5V BY GUARDBANDING 4.5V MINIMUM LIMITS.

Revision History

Rev	ECN #	Rel Date	Originator	Changes
2A0	M0003306	01/21/00	Linda Collins	Changed the tpLH room temp limit from 10.0nS to 10.5nS.
3A0	M0003618	01/21/00	Donald B. Miller	1) Added the RH ordering codes. 2) Added the Group E post irradiation parametric limits