National Semiconductor

MICROCIRCUIT DATA SHEET

MV54ACT241-X REV 1A0

Original Creation Date: 08/09/96
Last Update Date: 08/18/99
Last Major Revision Date: 05/12/99

Octal Buffers/Line Drivers With 3-State Outputs

General Description

The ACT241 is an octal buffer and line driver designed to be employed as a memory and address driver, clock driver and bus-oriented transmitter receiver which provides improved PC and board density.

Industry Part Number

54ACT241

NS Part Numbers

54ACT241E-QMLV *
54ACT241J-QMLV **
54ACT241W-QMLV ***

Prime Die

J241

Controlling Document

5962-89847

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

- Non-inverting TRI-STATE outputs drive bus lines or buffer memory address registers
- Outputs source/sink 24 mA
- ACT241 has TTL-compatible inputs
- Standard Military Drawing (SMD)
  - ACT241: 5962-8984701V2A*, VRA**, VSA***

(Absolute Maximum Ratings)

(Note 1, 2, 3)

Supply Voltage (Vcc)	-0.5V to +6.0V
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 Vcc or Ground Current per Pin (Icc or Ignd)	±100 mA
Storage Temperature (Tstg)	-65 C to +150 C
Junction Temperature (Tj)	
CDIP	175 C
DC Output Current (Iout) per Output Pin	±50 mA
Lead Temperature (soldering, 10 seconds)	+300 C
Thermal Resistance, junction-to-case (jc)	see MIL-STD 1835
Maximum Power Dissipation (pd)	500 mW

Note 1: Stresses above the absolute maximum rating may cause damage to the device. Extended operation at the maximum levels may degrade and affect reliability.
Note 2: Unless otherwise specified, all voltages are referenced to GND.
Note 3: The limits for the parameters specified herein shall apply over the full specified VCC range and case temperature range of -55C to +125C.

Recommended Operating Conditions

(Note 1, 2)

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)	
Vin from 0.8V to 2.0V or from 2.0V to 0.8V	
VCC 4.5V to 5.5V	125 mV/ns
Maximum Low Level Input Voltage (Vil)	0.8 V
Minimum High Level Input Voltage (Vih)	2.0 V
Maximum High Level Output Current (Ioh)	-24 mA
Maximum Low Level Output Current (Iol)	+24 mA

Note 1: Unless otherwise noted, all voltages are referenced to GND.
Note 2: The limits for the parameters specified herein shall apply over the full specified VCC range and case temperature range of -55C to +125C.

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	High Level Input Current	VCC=5.5V, VM=5.5V, VINL=0.0V, VINH=5.5V	1, 5	INPUT		0.1	uA	1
			1, 5	INPUT		1.0	uA	2
IIL	Low Level Input Current	VCC=5.5V, VM=0.0V, VINH=5.5V, VINL=0.0V	1, 5	INPUT		-0.1	uA	1
			1, 5	INPUT		-1.0	uA	2
VOL	Low Level Output Voltage	VCC=4.5V, VINH=4.5V, VINL=0.0V, IOL=50uA, VIH=2.0V, VIL=0.8V	1, 3	OUTPUT		0.1	V	1, 2, 3
		VCC=5.5V, IOL=50uA, VINL=0.0V, VINH=5.5V, VIH=2.0V, VIL=0.8V	1, 3	OUTPUT		0.1	V	1, 2, 3
		VCC=4.5V, IOL=24.0mA, VIL=0.8V, VIH=2.0V, VINL=0.0V, VINH=4.5V	1, 3	OUTPUT		0.4	V	1, 3
			1, 3	OUTPUT		0.5	V	2
		VCC=5.5V, VIH=2.0V, VIL=0.8V, IOL=24mA, VINL=0.0V, VINH=5.5V	1, 3	OUTPUT		0.4	V	1, 3
			1, 3	OUTPUT		0.5	V	2
VIOL	Dynamic output current LOW	VCC=5.5V, IOL=50.0mA, VINH=5.5V, VINL=0.0V	1, 3, 6	OUTPUT		1.65	V	1, 2, 3
VOH	High Level Output Voltage	VCC=4.5V, VIL=0.8V, VIH=2.0V, IOH=-50.0uA, VINH=4.5V, VINL=0.0V	1, 3	OUTPUT	4.40		V	1, 2, 3
		VCC=4.5V, VIL=0.8V, VIH=2.0V, IOH=-24.0mA, VINH=4.5V, VINL=0.0V	1, 3	OUTPUT	3.70		V	1, 2, 3
		VCC=5.5V, VIL=0.8V, VIH=2.0V, IOH=-24.0mA, VINH=5.5V, VINL=0.0V	1, 3	OUTPUT	4.70		V	1, 2, 3
		VCC=5.5V, VIL=0.8V, VIH=2.0V, IOH=-50.0uA, VINH=5.5V, VINL=0.0V	1, 3	OUTPUT	5.40		V	1, 2, 3
VIOH	Dynamic output current HIGH	VCC=5.5V, IOH=-50.0mA, VINH=5.5V, VINL=0.0V	1, 3, 6	OUTPUT	3.85		V	1, 2, 3
ICCH	Supply Current Outputs HIGH	VCC=5.5V, VINH=5.5V, VINL=0.0V	1, 5	VCC		100	nA	1
			1, 5	VCC		40.0	uA	2
ICCL	Supply Current Outputs LOW	VCC=5.5V, VINL=0.0V, VINH=5.5V	1, 5	VCC		100	nA	1
			1, 5	VCC		40.0	uA	2
ICCZ	Supply Current Outputs TRI-STATE	VCC=5.5V, VINL=0.0V, VINH=5.5V	1, 5	VCC		100	nA	1
			1, 5	VCC		40.0	uA	2
ICCF	Supply Current Functional	VCC=5.5V, VINL=0.0V, VINH=5.5V	1, 5	VCC		100	nA	1
			1, 5	VCC		40.0	uA	2
ICCT	Supply Current	VCC=5.5V, VIHT=VCC-2.1V, VINH=5.5V, VINL=0.0V	1, 3	VCC		1.0	mA	1, 2
			1, 3	VCC		1.6	mA	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.

SYMBOL	PARAMETER	CONDITIONS	NOTES	PIN-NAME	MIN	MAX	UNIT	SUB-GROUPS
IOZH	TRI-STATE Output Leakage Current HIGH	VCC=5.5V, VM=5.5V, VIH=2.0V, VIL=0.8V, VINH=5.5V, VINL=0.0V	1, 5	OUTPUT		0.50	uA	1
			1, 5	OUTPUT		10.0	uA	2
IOZL	TRI-STATE Output Leakage Current LOW	VCC=5.5V, VM=0.0V, VIH=2.0V, VIL=0.8V, VINH=5.5V, VINL=0.0V	1, 5	OUTPUT		-0.50	uA	1
			1, 5	OUTPUT		-10.0	uA	2
VIC+	Positive Input Clamp Voltage	VCC=0.0V, IM=1.0mA	8, 9	INPUT	0.40	1.50	V	1
VIC-	Negative Input Clamp Voltage	VCC=OPEN, IM=-1.0mA	8, 9	INPUT	-0.40	-1.50	V	1
VOLP	Low Level Ground Bounce	VLD=2.5V, IOL=+24mA, VCC=4.5V	7	OUTPUT		2.0	V	4
VOHV	High Level Ground Bounce	VLD=2.5V, IOH=-24mA, VCC=4.5V	7	OUTPUT		2.0	V	4
CIN	Input Capacitance	VCC=0.0V, Tc=+25C	7	INPUT		8.0	pF	4
COUT	Output Capacitance	VCC=5.5V, Tc=+25C	7	OUTPUT		15.0	pF	4
CPD	Power Dissipation Capacitance	VCC=5.0V, Tc=+25C	7	INPUT		70	pF	4

Electrical Characteristics

AC PARAMETERS

(The following conditions apply to all the following parameters, unless otherwise specified.)
AC: CL=50pF, RL=500 OHMS, Temp Range: -55C to 125C

SYMBOL	PARAMETER	CONDITIONS	NOTES	PIN-NAME	MIN	MAX	UNIT	SUB-GROUPS
tpLH	Propagation Delay	VCC=4.5V	2, 4	In to On	1.0	9.0	ns	9, 11
			2, 4	In to On	1.0	10.0	ns	10
tpHL	Propagation Delay	VCC=4.5V	2, 4	In to On	1.0	9.0	ns	9, 11
			2, 4	In to On	1.0	10.0	ns	10
tpZH	Output Enable	VCC=4.5V	2, 4	$\overline{OE}$ to On	1.0	9.0	ns	9, 11
			2, 4	$\overline{OE}$ to On	1.0	11.5	ns	10
tpZL	Output Enable	VCC=4.5V	2, 4	$\overline{OE}$ to On	1.0	10.0	ns	9, 11
			2, 4	$\overline{OE}$ to On	1.0	12.5	ns	10
tpHZ	Output Disable	VCC=4.5V	2, 4	$\overline{OE}$ to On	1.0	10.5	ns	9, 11
			2, 4	$\overline{OE}$ to On	1.0	12.5	ns	10
tpLZ	Output Disable	VCC=4.5V	2, 4	$\overline{OE}$ to On	1.0	10.5	ns	9, 11
			2, 4	$\overline{OE}$ to On	1.0	12.5	ns	10

Note 1: Screen tested 100% on each device at +25C & +125C temperature, subgroups A1, 2 & 7.
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, +125C & -55C temperature, subgroups A9, 10 & 11.
Note 5: Sample tested (Method 5005, Table 1) on each MFG. lot at +25C & +125C temperature, subgroups 1, 2, 7 & 8.
Note 6: Transmission line driving test, 2 MSEC duration MAX.
Note 7: GUARANTEED BUT NOT TESTED.
Note 8: Screen tested 100% on each device at +25C only.
Note 9: Sample tested (Method 5005, Table 1) at +25C only

Revision History

Rev	ECN #	Rel Date	Originator	Changes
1A0	M0003500	08/18/99	Linda Collins	1) Add ICCF to the DC electricals. 2) VOH test with VCC = 4.5V and IOH = -24mA, changed VIH from 2.2V to 2.0V.