

**MN54ACT245-X REV 1C0**

 Original Creation Date: 07/02/96  
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**Octal Bidirectional Transceiver With TRI-State  
 Inputs/Outputs**
**General Description**

The ACT245 contains eight non-inverting bidirectional buffers with 3-state outputs and is intended for bus-oriented applications. Current sinking capability is 24 mA at the A ports and 24 mA at the B ports. The Transmit/Receiver (TR) input determines the direction of data flow through the bidirectional transceiver. Transmit (active HIGH) enables data from A ports to B ports. Receive (active LOW) enables data from B ports to A ports. The Output Enable input, when HIGH, disables both A and B ports by placing them in a HIGH Z condition.

**Industry Part Number**

54ACT245

**NS Part Numbers**

 54ACT245DMQB  
 54ACT245FMQB  
 54ACT245LMQB

**Prime Die**

J245

**Controlling Document**

5962-87663

**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**

- $I_{cc}$  and  $I_{oz}$  reduced by 50%
- Noninverting buffers
- Bidirectional data path
- A and B outputs source/sink 24 mA
- ACT245 has TTL-compatible inputs
- Standard Military Drawing (SMD)
- ACT245: 5962-87663

**(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 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, VINL=0.0V	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, VINH=5.5V	1, 2	INPUT		-0.1	uA	1
			1, 2	INPUT		-1.0	uA	2, 3
VOL	Low Level Output Voltage	VCC=4.5V, IOL=24.0mA, VIL=0.8V, VIH=2.0V	1, 2	OUTPUT		.36	V	1
			1, 2	OUTPUT		.50	V	2, 3
		VCC=4.5V, IOL=50.0uA, VIL=0.8V, VIH=2.0V	1, 2	OUTPUT		.10	V	1, 2, 3
			1, 2	OUTPUT		.36	V	1
		VCC=5.5V, IOL=24.0mA, VIL=0.8V, VIH=2.0V	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, VIH=2.0V, VIL=0.8V, IOH=-24.0mA	1, 2	OUTPUT	3.86		V	1
			1, 2	OUTPUT	3.70		V	2, 3
		VCC=4.5V, VIH=2.0V, VIL=0.8V, IOH=-50.0uA	1, 2	OUTPUT	4.40		V	1, 2, 3
			1, 2	OUTPUT	4.86		V	1
		VCC=5.5V, VIH=2.0V, VIL=0.8V, IOH=-24.0mA	1, 2	OUTPUT	4.86		V	1
1, 2	OUTPUT		4.70		V	2, 3		
VIOH	Dynamic output current HIGH	VCC=5.5V, VIH=2.0V, VIL=0.8V, IOH=-50.0mA	1, 2, 5	OUTPUT	3.85		V	1, 2, 3
IOZH	Maximum TRI-STATE	VCC=4.5V, VM=4.5V, VINH=4.5V, VINL=0.0V, VIH=2.0V	1, 2	OUTPUT		0.25	uA	1
			1, 2	OUTPUT		5.0	uA	2, 3
		VCC=5.5V, VM=5.5V, VINH=5.5V, VINL=0.0V, VIH=2.0V	1, 2	OUTPUT		0.25	uA	1
			1, 2	OUTPUT		5.0	uA	2, 3
IOZL	Maximum TRI-STATE	VCC=4.5V, VM=0.0V, VINH=4.5V, VINL=0.0V, VIH=2.0V	1, 2	OUTPUT		-0.25	uA	1
			1, 2	OUTPUT		-5.0	uA	2, 3
		VCC=5.5V, VM=0.0V, VINL=0.0V, VINH=5.5V, VIH=2.0V	1, 2	OUTPUT		-0.25	uA	1
			1, 2	OUTPUT		-5.0	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, VINH=5.5V, VINL=0.0V	1, 2	VCC		4.0	uA	1
			1, 2	VCC		80	uA	2, 3
ICCL	Supply Current Outputs LOW	VCC=5.5V, VINH=5.5V, VINL=0.0V	1, 2	VCC		4.0	uA	1
			1, 2	VCC		80	uA	2, 3
IC CZ	Supply Current Outputs Tri-State	VCC=5.5V, VINH=5.5V, VINL=0.0V	1, 2	VCC		4.0	uA	1
			1, 2	VCC		80	uA	2, 3
ICCT	Supply Current per Input	VCC=5.5V, VINH=5.5V, VINL=0.0V, 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, TRISE/TFALL=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	Propagation Delay	VCC=4.5V	3, 4, 7	An-Bn or Bn-An	1.5	7.5	ns	9
			3, 4, 7	An-Bn or Bn-An	1.5	9.0	ns	10, 11
tpHL	Propagation Delay	VCC=4.5V	3, 4, 7	An-Bn or Bn-An	1.5	8.0	ns	9
			3, 4, 7	An-Bn or Bn-An	1.5	10.0	ns	10, 11
tpZL	Output Enable	VCC=4.5V	3, 4, 7	OE to On	1.5	10.0	ns	9
			3, 4, 7	OE to On	1.5	13.0	ns	10, 11
tpZH	Output Enable	VCC=4.5V	3, 4, 7	OE to On	1.5	10.0	ns	9
			3, 4, 7	OE to On	1.5	12.0	ns	10, 11
tpHZ	Output Disable	VCC=4.5V	3, 4, 7	OE to On	1.5	10.0	ns	9
			3, 4, 7	OE to On	1.5	12.0	ns	10, 11
tpLZ	Output Disable	VCC=4.5V	3, 4, 7	OE to On	1.5	10.0	ns	9
			3, 4, 7	OE to On	1.5	12.0	ns	10, 11

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: NOT TESTED AT +125C & -55C TEMPERATURE (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
1C0	M0003264	03/09/99	Linda Collins	Added the SMD number.