

MN54AC05-X REV 1B0

Original Creation Date: 06/27/96
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Hex Inverter with Open Collector Outputs

General Description

The AC05 contains six inverters, with open drain outputs.

Industry Part Number

54AC05

NS Part Numbers

54AC05DMQB
 54AC05FMQB
 54AC05LMQB

Prime Die

Z005

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	+125C
3	Static tests at	-55 C
4	Dynamic tests at	+25 C
5	Dynamic tests at	+125C
6	Dynamic tests at	-55 C
7	Functional tests at	+25 C
8A	Functional tests at	+125C
8B	Functional tests at	-55 C
9	Switching tests at	+25 C
10	Switching tests at	+125C
11	Switching tests at	-55 C

Features

- Outputs sink 24 mA
- Open drain for wired NOR function
- Radiation tolerant FACT tm process
- Standard Military Drawing 5962-90590

(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 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 rating are those values beyond which damage to the device may occur. The databook specification 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)	2.0V to 6.0V
Minimum Input Edge Rate (Delta v/ Delta t)	
AC Devices	
Vin from 30% to 70% of Vcc	
Vcc @ 3.0V, 4.5V, 5.5V	125mV/ns
Operating Temperature (TA)	-55 C to +125 C
Input Voltage (Vi)	0V to Vcc
Output Voltage (Vo)	0V to Vcc

Electrical Characteristics

DC PARAMETER

(The following conditions apply to all the following parameters, unless otherwise specified.)
 DC: VCC=3.0V 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	VCC=5.5V, VIH=5.5V	1, 2	VCC		4.0	uA	1
			1, 2	VCC		80	uA	2, 3
ICCL	Supply Current	VCC=5.5V, VIL=0.0V	1, 2	VCC		4.0	uA	1
			1, 2	VCC		80	uA	2, 3
IIH	High level input current	VCC=5.5V, VIH=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, VIL=0.0V	1, 2	INPUT		-0.1	uA	1
			1, 2	INPUT		-1.0	uA	2, 3
ILKG	High Level Output Leakage Current	VCC=5.5V, VIN=1.65V	1, 2	OUTPUT		0.5	uA	1
			1, 2	OUTPUT		10	uA	2, 3
VIOL	Dynamic Output Current LOW	VCC=5.5V, IOL=50.0mA, VIL=0.0V, VIH=5.5V	1, 2, 6	OUTPUT		1.65	V	1, 2, 3
VOL	Low level output voltage	VCC=3.0V, IOL=50.0uA, VIL=0.9V, VIH=2.1V	1, 2	OUTPUT		.10	V	1, 2
		VCC=3.0V, IOL=12.0mA, VIL=0.9V, VIH=2.1V	1, 2	OUTPUT		.36	V	1
		VCC=3.0V, IOL=12.0mA, VIL=0.9V, VIH=2.1V	1, 2	OUTPUT		.50	V	2, 3
		VCC=4.5V, IOL=50.0uA, VIL=1.35V, VIH=3.15V	1, 2	OUTPUT		.10	V	1, 2, 3
		VCC=5.5V, IOL=50.0uA, VIL=1.65V, VIH=3.85V	1, 2	OUTPUT		.10	V	1, 2, 3
		VCC=4.5V, IOL=24.0mA, VIL=1.35V, VIH=3.15V	1, 2	OUTPUT		.36	V	1
		VCC=4.5V, IOL=24.0mA, VIL=1.35V, VIH=3.15V	1, 2	OUTPUT		.50	V	2, 3
		VCC=5.5V, IOL=24.0mA, VIL=1.65V, VIH=3.85V	1, 2	OUTPUT		.36	V	1
VCC=5.5V, IOL=24.0mA, VIL=1.65V, VIH=3.85V	1, 2	OUTPUT		.50	V	2, 3		

Electrical Characteristics

AC PARAMETER

(The following conditions apply to all the following parameters, unless otherwise specified.)
 AC: Temp Range: -55C to 125C, CL=50pF, RL=500 OHMS, TRISE/TFALL = 3.0ns. 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=3.0V	3, 4, 5	An to \bar{O}	1.5	15.0	ns	9
				An to \bar{O}	1.5	15.5	ns	10, 11
		VCC=4.5V	3, 4, 5	An to \bar{O}	1.5	14.5	ns	9
				An to \bar{O}	1.5	15.0	ns	10, 11
tpHL	Propagation Delay	VCC=3.0V	3, 4, 5	An to \bar{O}	1.5	7.5	ns	9
				An to \bar{O}	1.5	8.0	ns	10, 11
		VCC=4.5V	3, 4, 5	An to \bar{O}	1.5	5.5	ns	9
				An to \bar{O}	1.5	6.0	ns	10, 11

Note 1: SCREEN TESTED 100% ON EACH DEVICE AT +25C & +125C TEMPERATURE, SUBGROUPS 1, 2, 7 & 8.

Note 2: SAMPLE TESTED (METHODS 5005, TABLE I) 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 I) ON EACH MFG. LOT AT +25C & +125C TEMPERATURE, SUBGROUP A9 & 10.

Note 5: +25C & +125C MIN LIMITS GUARANTEED FOR 5.5V BY GUARDBANDING 4.5V MINIMUM LIMITS.

Note 6: TRANSMISSION LINE DRIVING TEST, GUARDBAND LIMITS SET FOR +25C, 2 MSEC DURATION MAX.