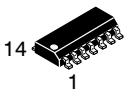
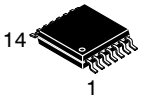
Hex Inverter (Open Drain)

MM74HCT05



SOIC-14
CASE 751EF



TSSOP-14 WB
CASE 948G

General Description

The MM74HCT05 is a logic function fabricated by using advanced silicon-gate CMOS technology, which provides the inherent benefits of CMOS-low quiescent power and wide power supply range. The device is also input and output characteristic and pinout compatible with standard DM74LS logic families. The MM74HCT05 open drain Hex Inverter requires the addition of an external resistor to perform a wire-NOR function.

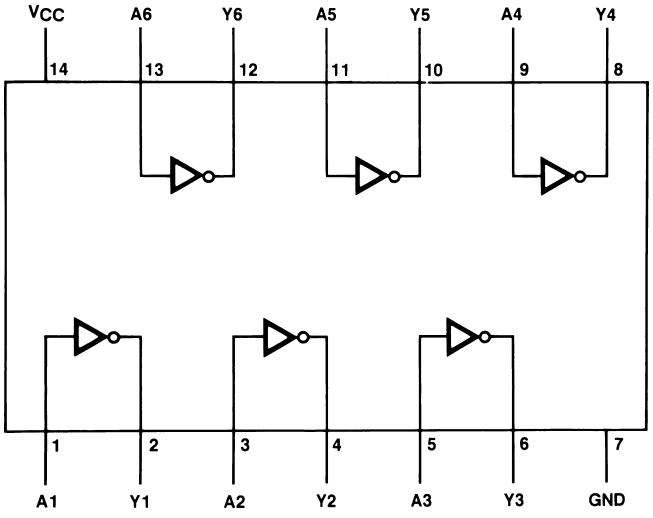
All inputs are protected from static discharge damage by internal diodes to V_{CC} and ground.

MM74HCT devices are intended to interface between TTL and NMOS components and standard CMOS devices. These parts are also plug-in replacements for LS-TTL devices and can be used to reduce power consumption in existing designs.

Features

- Open Drain for Wire-NOR Function
- LS-TTL Pinout and Threshold Compatible
- Fanout of 10 LS-TTL Loads
- Typical Propagation Delays:
  - t_{PZL} (with 1 kΩ Resistor) 10 ns
  - t_{PLZ} (with 1 kΩ Resistor) 12 ns
- These are Pb-Free Devices

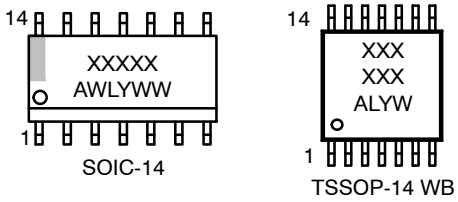
Connection Diagram



Top View

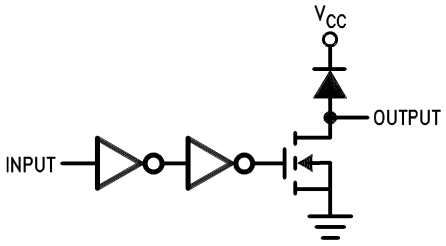
Figure 1. Connection Diagram

MARKING DIAGRAMS

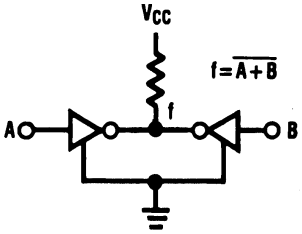


XXXXX = Specific Device Code
A = Assembly Location
WL, L = Wafer Lot
Y = Year
WW, W = Work Week

LOGIC DIAGRAM



TYPICAL APPLICATION



ORDERING INFORMATION

See detailed ordering and shipping information on page 4 of this data sheet.

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ABSOLUTE MAXIMUM RATINGS (Note 1)

Symbol	Parameter		Rating
V_{CC}	Supply Voltage		–0.5 to +6.5 V
V_{IN}	DC Input Voltage		–0.5 to V_{CC} + 0.5 V
V_{OUT}	DC Output Voltage		–0.5 to V_{CC} + 0.5 V
I_{IK}, I_{OK}	Clamp Diode Current		±20 mA
I_{OUT}	DC Output Current, per Pin		±25 mA
I_{CC}	DC V_{CC} or GND Current, per Pin		±50 mA
T_{STG}	Storage Temperature Range		–65 °C to +150 °C
P_D	Power Dissipation	SOIC	1077 mW
		TSSOP	833 mW
T_L	Lead Temperature (Soldering 10 Seconds)		260°C

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. Unless otherwise specified all voltages are referenced to ground.

RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter	Min	Max	Unit
V_{CC}	Supply Voltage	4.5	5.5	V
V_{IN}	DC Input Voltage	0	V_{CC}	V
V_{OUT}	DC Output Voltage	0	5.5	V
T_A	Operating Temperature Range	–40	+85	°C
t_r, t_f	Input Rise or Fall Times	–	500	ns

Functional operation above the stresses listed in the Recommended Operating Ranges is not implied. Extended exposure to stresses beyond the Recommended Operating Ranges limits may affect device reliability.

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DC ELECTRICAL CHARACTERISTICS

(V_{CC} = 5 V ±10% unless otherwise specified)

Symbol	Parameter	Conditions	T_A = 25 °C		T_A = −40 °C to 85 °C	Unit
			Typ	Guaranteed Limits		
V_{IH}	Minimum HIGH Level Input Voltage		–	2.0	2.0	V
V_{IL}	Maximum LOW Level Input Voltage		–	0.8	0.8	V
V_{OL}	Maximum LOW Level Output Voltage	V_{IN} = V_{IH} or V_{IL}, $\|I_{OUT}\| \le 20$ μA	0	0.1	0.1	V
		V_{IN} = V_{IH} or V_{IL}, $\|I_{OUT}\|$ = 4.0 mA, V_{CC} = 4.5 V	0.2	0.26	0.33	
		V_{IN} = V_{IH} or V_{IL}, $\|I_{OUT}\|$ = 4.8 mA, V_{CC} = 5.5 V	0.2	0.26	0.33	
I_{IN}	Maximum Input Current	V_{IN} = V_{CC} or GND, V_{IH} or V_{IL}	–	±0.1	±1.0	μA
I_{LKG}	Maximum HIGH Level Output Leakage Current	V_{IN} = V_{IH} or V_{IL}, V_{OUT} = V_{CC}	–	0.5	5.0	μA
I_{CC}	Maximum Quiescent Supply Current	V_{IN} = V_{CC} or GND, I_{OUT} = 0 μA	–	2.0	20	μA
		V_{IN} = 2.4 V or 0.5 V (Note 2)	–	1.2	1.4	mA
I_{OHZ}	Off State Current	V_{CC} = 4.5 V–5.5 V, V_O = 5.5 V	–	–	10	μA

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

2. This is measured per input with all other inputs held at V_{CC} or ground.

AC ELECTRICAL CHARACTERISTICS

(V_{CC} = 5 V, T_A = 25 °C, C_L = 15 pF, t_r = t_f = 6 ns unless otherwise specified)

Symbol	Parameter	Conditions	Typ	Guaranteed Limit	Unit
t_{PZL}	Maximum Propagation Delay	R_L = 1 kΩ	8	15	ns
t_{PLZ}	Maximum Propagation Delay	R_L = 1 kΩ	9	16	ns

AC ELECTRICAL CHARACTERISTICS

(V_{CC} = 5 V ±10%, C_L = 50 pF, t_r = t_f = 6 ns unless otherwise specified)

Symbol	Parameter	Conditions	T_A = 25 °C		T_A = −40 °C to 85 °C	Unit
			Typ	Guaranteed Limits		
t_{PZL}	Maximum Propagation Delay	R_L = 1 kΩ	10	22	28	ns
t_{PLZ}	Maximum Propagation Delay	R_L = 1 kΩ	12	20	25	ns
t_{THL}	Maximum Output Fall Time		10	15	19	ns
C_{PD}	Power Dissipation Capacitance	(per gate) R_L = ∞ (Note 3)	–	20	–	pF
C_{IN}	Maximum Input Capacitance		–	5	10	pF

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

3. C_{PD} determines the no load dynamic power consumption, $P_D = C_{PD} V_{CC}^2 f + I_{CC} V_{CC}$, and the no load dynamic current consumption, $I_S = C_{PD} V_{CC} f + I_{CC}$.

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ORDERING INFORMATION

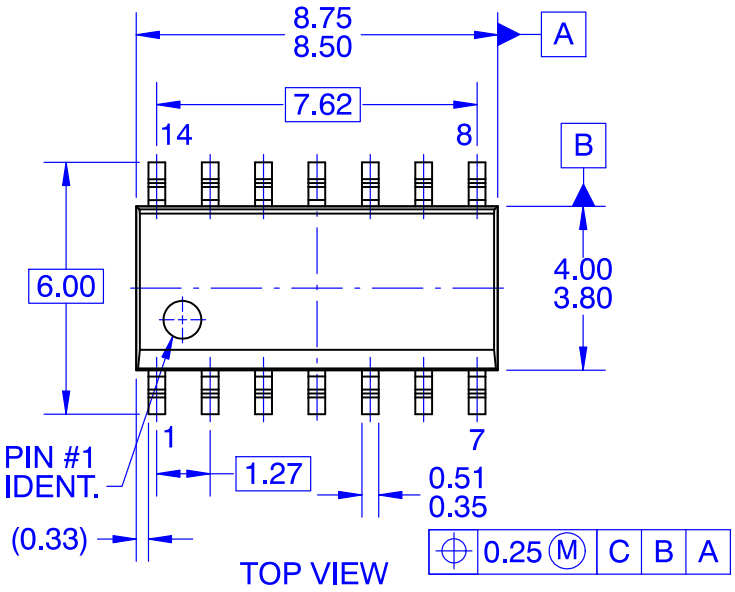
Part Number	Marking	Package	Shipping†
MM74HCT05MX	HCT05A	SOIC-14, Case 751EF (Pb-Free, Halide-Free)	2500 Units / Tape & Reel
MM74HCT05MTCX	HCT 05A	TSSOP-14 WB, Case 948G (Pb-Free, Halide Free)	2500 Units / Tape & Reel

† For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

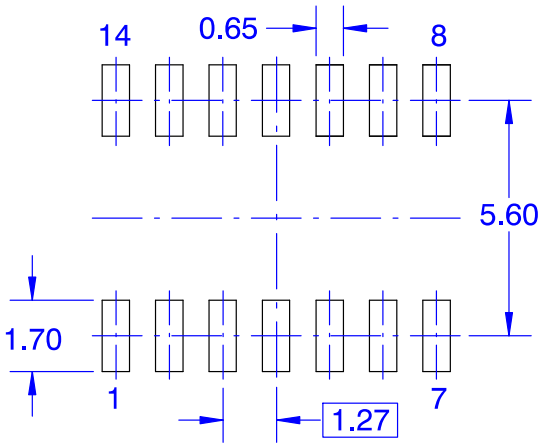
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SOIC14
CASE 751EF
ISSUE O

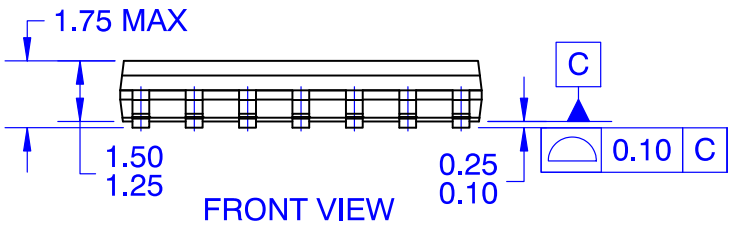
DATE 30 SEP 2016



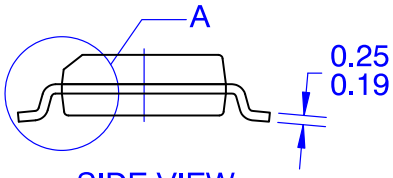
TOP VIEW



LAND PATTERN RECOMMENDATION

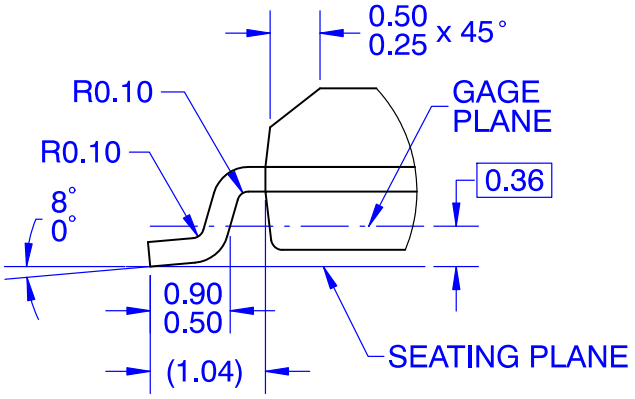


FRONT VIEW



SIDE VIEW

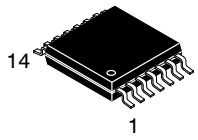
NOTES:
A. CONFORMS TO JEDEC MS−012, VARIATION AB, ISSUE C
B. ALL DIMENSIONS ARE IN MILLIMETERS
C. DIMENSIONS DO NOT INCLUDE MOLD FLASH OR BURRS
D. LAND PATTERN STANDARD: SOIC127P600X145−14M
E. CONFORMS TO ASME Y14.5M, 2009



DETAIL A
SCALE 16 : 1

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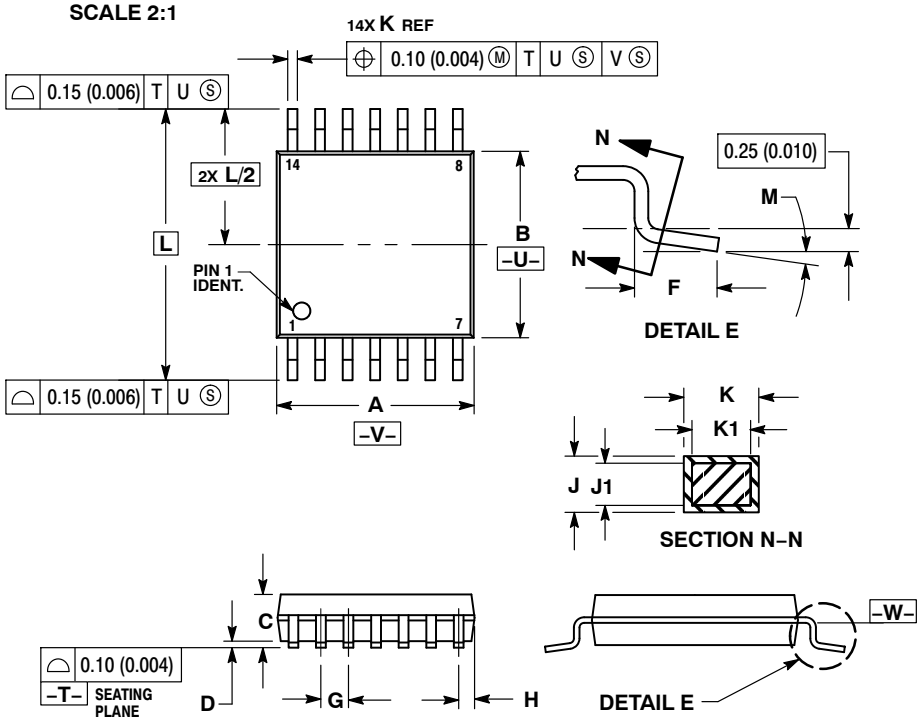
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SCALE 2:1

TSSOP−14 WB
CASE 948G
ISSUE C

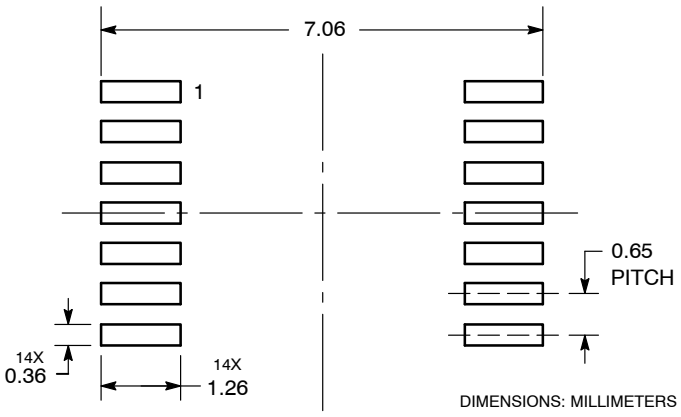
DATE 17 FEB 2016



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSION A DOES NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS. MOLD FLASH OR GATE BURRS SHALL NOT EXCEED 0.15 (0.006) PER SIDE.
4. DIMENSION B DOES NOT INCLUDE INTERLEAD FLASH OR PROTRUSION. INTERLEAD FLASH OR PROTRUSION SHALL NOT EXCEED 0.25 (0.010) PER SIDE.
5. DIMENSION K DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.08 (0.003) TOTAL IN EXCESS OF THE K DIMENSION AT MAXIMUM MATERIAL CONDITION.
6. TERMINAL NUMBERS ARE SHOWN FOR REFERENCE ONLY.
7. DIMENSION A AND B ARE TO BE DETERMINED AT DATUM PLANE −W−.

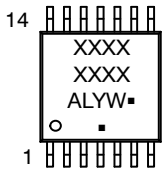
	MILLIMETERS		INCHES	
DIM	MIN	MAX	MIN	MAX
A	4.90	5.10	0.193	0.200
B	4.30	4.50	0.169	0.177
C	−−−	1.20	−−−	0.047
D	0.05	0.15	0.002	0.006
F	0.50	0.75	0.020	0.030
G	0.65 BSC		0.026 BSC	
H	0.50	0.60	0.020	0.024
J	0.09	0.20	0.004	0.008
J1	0.09	0.16	0.004	0.006
K	0.19	0.30	0.007	0.012
K1	0.19	0.25	0.007	0.010
L	6.40 BSC		0.252 BSC	
M	0 °	8 °	0 °	8 °

RECOMMENDED SOLDERING FOOTPRINT*



*For additional information on our Pb−Free strategy and soldering details, please download the **onsemi** Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

GENERIC MARKING DIAGRAM*



A	= Assembly Location
L	= Wafer Lot
Y	= Year
W	= Work Week
▪	= Pb−Free Package

(Note: Microdot may be in either location)

*This information is generic. Please refer to device data sheet for actual part marking. Pb−Free indicator, “G” or microdot “▪”, may or may not be present. Some products may not follow the Generic Marking.

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