

## DM74AS27 Triple 3-Input NOR Gate

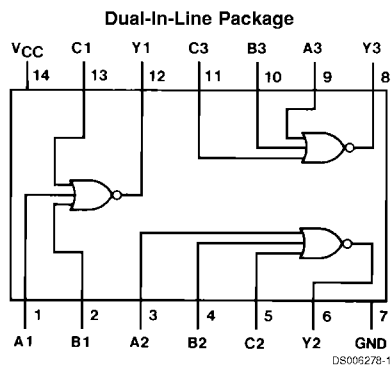
### General Description

This device contains three independent 3-input gates, each of which performs the logic NOR function.

### Features

- Switching specifications at 50 pF
- Switching specifications guaranteed over full temperature and  $V_{CC}$  range
- Advanced oxide-isolated, ion-implanted Schottky TTL process
- Functionally and pin for pin compatible with Schottky, low power Schottky, and advanced low power Schottky TTL counterpart
- Improved AC performance over Schottky, low power Schottky, and advanced low power Schottky counterparts

### Connection Diagram



Order Number DM74AS27M or DM74AS27N  
See Package Number M14A or N14A

### Function Table

$$Y = \overline{A + B + C}$$

Inputs			Output
A	B	C	Y
L	L	L	H
H	X	X	L
X	H	X	L
X	X	H	L

H = High Logic Level  
L = Low Logic Level  
X = Either Low or High Logic Level

**Absolute Maximum Ratings** (Note 1)

Supply Voltage	7V
Input Voltage	7V
Operating Free Air Temperature Range	0°C to +70°C

Storage Temperature Range

-65°C to +150°C

Typical  $\theta_{JA}$ 

N Package

84.0°C/W

M Package

114.0°C/W

**Recommended Operating Conditions**

Symbol	Parameter	Min	Nom	Max	Units
$V_{CC}$	Supply Voltage	4.5	5	5.5	V
$V_{IH}$	High Level Input Voltage	2			V
$V_{IL}$	Low Level Input Voltage			0.8	V
$I_{OH}$	High Level Output Current			-2	mA
$I_{OL}$	Low Level Output Current			20	mA
$T_A$	Free Air Operating Temperature	0		70	°C

**Note 1:** The "Absolute Maximum Ratings" are those values beyond which the safety of the device cannot be guaranteed. The device should not be operated at these limits. The parametric values defined in the "Electrical Characteristics" table are not guaranteed at the absolute maximum ratings. The "Recommended Operating Conditions" table will define the conditions for actual device operation.

**Electrical Characteristics**

over recommended operating free air temperature range. All typical values are measured at  $V_{CC} = 5V$ ,  $T_A = 25^\circ C$ .

Symbol	Parameter	Conditions	Min	Typ	Max	Units
$V_{IK}$	Input Clamp Voltage	$V_{CC} = 4.5V$ , $I_I = -18\text{ mA}$			-1.2	V
$V_{OH}$	High Level Output Voltage	$I_{OH} = -2\text{ mA}$ $V_{CC} = 4.5V$ to $5.5V$	$V_{CC} - 2$			V
$V_{OL}$	Low Level Output Voltage	$V_{CC} = 4.5V$ , $I_{OL} = 20\text{ mA}$		0.35	0.5	V
$I_I$	Input Current at Max Input Voltage	$V_{CC} = 5.5V$ , $V_{IH} = 7V$			0.1	mA
$I_{IH}$	High Level Input Current	$V_{CC} = 5.5V$ , $V_{IH} = 2.7V$			20	$\mu A$
$I_{IL}$	Low Level Input Current	$V_{CC} = 5.5V$ , $V_{IL} = 0.4V$			-0.5	mA
$I_O$	Output Drive Current	$V_{CC} = 5.5V$ , $V_O = 2.25V$	-30		-112	mA
$I_{CC}$	Supply Current	$V_{CC} = 5.5V$				
		Outputs High		4	6.4	mA
		Outputs Low		10.6	17.1	mA

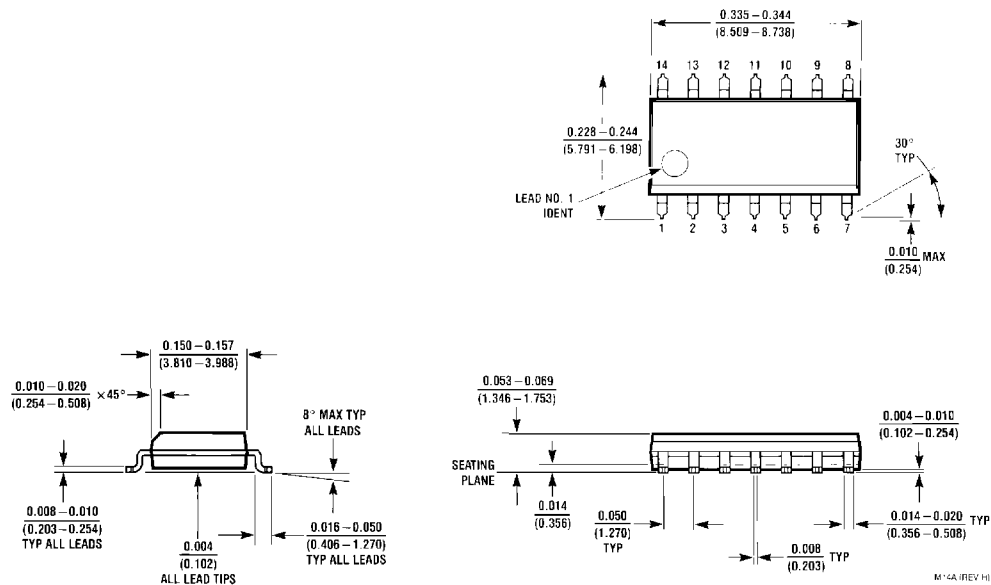
**Switching Characteristics**

over recommended operating free air temperature range (Note 2)

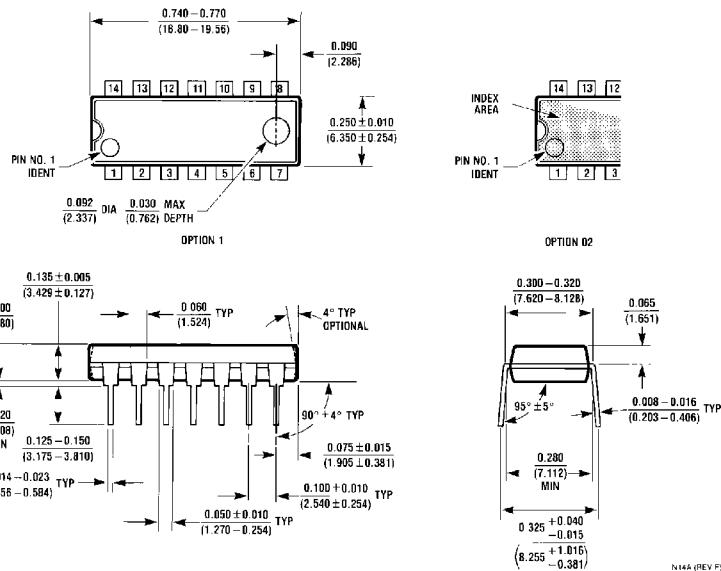
Symbol	Parameter	Conditions	Min	Max	Units
$t_{PLH}$	Propagation Delay Time Low to High Level Output	$V_{CC} = 4.5V$ to $5.5V$ $R_L = 500\Omega$	1	5.5	ns
$t_{PHL}$	Propagation Delay Time High to Low Level Output	$C_L = 50\text{ pF}$	1	4.5	ns

**Note 2:** See Section 1 for test waveforms and output load.

**Physical Dimensions** inches (millimeters) unless otherwise noted



**S.O. Package (M)**  
**Order Number DM74AS27M**  
**Package Number M14A**



**Molded Dual-In-Line Package (N)**  
**Order Number DM74AS27N**  
**Package Number N14A**

**LIFE SUPPORT POLICY**

FAIRCHILD'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF THE PRESIDENT OF FAIRCHILD SEMICONDUCTOR CORPORATION. As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury to the user.
2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

Fairchild Semiconductor  
Corporation  
Americas  
Customer Response Center  
Tel: 1-888-522-5372

[www.fairchildsemi.com](http://www.fairchildsemi.com)

Fairchild Semiconductor  
Europe  
Fax: +49 (0) 1 80-530 85 86  
Email: [europa.support@nsc.com](mailto:europa.support@nsc.com)  
Deutsch Tel: +49 (0) 8 141-35-0  
English Tel: +44 (0) 1 793-85-68-56  
Italy Tel: +39 (0) 2 57 5631

Fairchild Semiconductor  
Hong Kong Ltd.  
13th Floor, Straight Block,  
Ocean Centre, 5 Canton Rd.  
Tsimshatsui, Kowloon  
Hong Kong  
Tel: +852 2737-7200  
Fax: +852 2314-0061

National Semiconductor  
Japan Ltd.  
Tel: 81-3-5620-6175  
Fax: 81-3-5620-6179