Rochester Electronics Manufactured Components

Rochester branded components are manufactured using either die/wafers purchased from the original suppliers or Rochester wafers recreated from the original IP. All recreations are done with the approval of the OCM.

Parts are tested using original factory test programs or Rochester developed test solutions to guarantee product meets or exceeds the OCM data sheet.

Quality Overview

- ISO-9001
- AS9120 certification
- Qualified Manufacturers List (QML) MIL-PRF-35835
    - Class Q Military
    - Class V Space Level
- Qualified Suppliers List of Distributors (QSLD)

    • Rochester is a critical supplier to DLA and meets all industry and DLA standards.

Rochester Electronics, LLC is committed to supplying products that satisfy customer expectations for quality and are equal to those originally supplied by industry manufacturers.

The original manufacturer's datasheet accompanying this document reflects the performance and specifications of the Rochester manufactured version of this device. Rochester Electronics guarantees the performance of its semiconductor products to the original OEM specifications. 'Typical' values are for reference purposes only. Certain minimum or maximum ratings may be based on product characterization, design, simulation, or sample testing.

To learn more, please visit www.rocelec.com

FAIRCHILD

SEMICONDUCTOR®

March 2007

74AC241, 74ACT241
Octal Buffer/Line Driver with 3-STATE Outputs

Features

- I_{CC} and I_{OZ} reduced by 50%
- Non-inverting 3-STATE outputs drive bus lines or buffer memory address registers
- Outputs source/sink 24mA
- ACT241 has TTL-compatible inputs

General Description

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

Ordering Information

Order Number	Package Number	Package Description
74AC241SC	M20B	20-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-013, 0.300" Wide
74AC241SJ	M20D	20-Lead Small Outline Package (SOP), EIAJ TYPE II, 5.3mm Wide
74AC241MTC	MTC20	20-Lead Thin Shrink Small Outline Package (TSSOP), JEDEC MO-153, 4.4mm Wide
74ACT241SC	M20B	20-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-013, 0.300" Wide
74ACT241SJ	M20D	20-Lead Small Outline Package (SOP), EIAJ TYPE II, 5.3mm Wide
74ACT241MTC	MTC20	20-Lead Thin Shrink Small Outline Package (TSSOP), JEDEC MO-153, 4.4mm Wide

Device also available in Tape and Reel. Specify by appending suffix letter "X" to the ordering number.
Pb-Free package per JEDEC J-STD-020B.

Logic Symbol
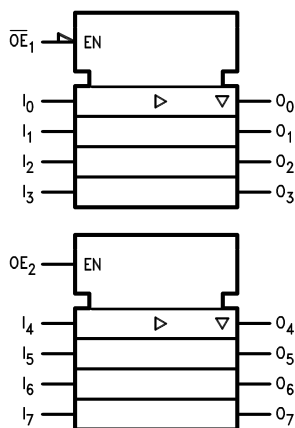
Connection Diagram
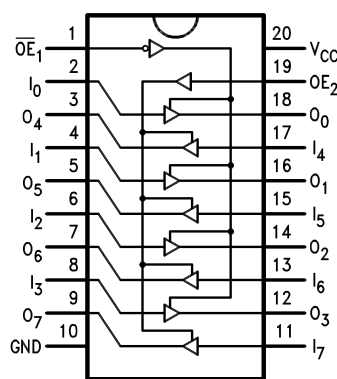
Pin Descriptions

Pin Names	Description
$\overline{OE}_1$	3-STATE Output Enable Input
OE_2	3-STATE Output Enable Input (Active HIGH)
I_0–I_7	Inputs
O_0–O_7	Outputs

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Truth Table

Inputs		Outputs
$\overline{OE}_1$	I_n	Pins 12, 14, 16, 18
L	L	L
L	H	H
H	X	Z

Inputs		Outputs
OE_2	I_n	Pins 3, 5, 7, 9
H	L	L
H	H	H
L	X	Z

H = HIGH Voltage Level   X = Immaterial
L = LOW Voltage Level   Z = High Impedance

Absolute Maximum Ratings

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only.

Symbol	Parameter	Rating
V_{CC}	Supply Voltage	−0.5V to +7.0V
I_{IK}	DC Input Diode Current	
	$V_I = -0.5V$	−20mA
	$V_I = V_{CC} + 0.5V$	+20mA
V_I	DC Input Voltage	−0.5V to V_{CC} + 0.5V
I_{OK}	DC Output Diode Current	
	$V_O = -0.5V$	−20mA
	$V_O = V_{CC} + 0.5V$	+20mA
V_O	DC Output Voltage	−0.5V to V_{CC} + 0.5V
I_O	DC Output Source or Sink Current	±50mA
I_{CC} or I_{GND}	DC V_{CC} or Ground Current per Output Pin	±50mA
T_{STG}	Storage Temperature	−65°C to +150°C
T_J	Junction Temperature	140°C

Recommended Operating Conditions

The Recommended Operating Conditions table defines the conditions for actual device operation. Recommended operating conditions are specified to ensure optimal performance to the datasheet specifications. Fairchild does not recommend exceeding them or designing to absolute maximum ratings.

Symbol	Parameter	Rating
V_{CC}	Supply Voltage	
	AC	2.0V to 6.0V
	ACT	4.5V to 5.5V
V_I	Input Voltage	0V to V_{CC}
V_O	Output Voltage	0V to V_{CC}
T_A	Operating Temperature	−40°C to +85°C
$\Delta V / \Delta t$	Minimum Input Edge Rate, AC Devices: V_{IN} from 30% to 70% of V_{CC}, V_{CC} @ 3.3V, 4.5V, 5.5V	125mV/ns
$\Delta V / \Delta t$	Minimum Input Edge Rate, ACT Devices: V_{IN} from 0.8V to 2.0V, V_{CC} @ 4.5V, 5.5V	125mV/ns

DC Electrical Characteristics for AC

Symbol	Parameter	V_CC (V)	Conditions	T_A = +25°C	T_A = −40°C to +85°C		Units
				Typ.	Guaranteed Limits		
V_{IH}	Minimum HIGH Level Input Voltage	3.0	$V_{OUT} = 0.1V$ or $V_{CC} - 0.1V$	1.5	2.1	2.1	V
		4.5		2.25	3.15	3.15	
		5.5		2.75	3.85	3.85	
V_{IL}	Maximum LOW Level Input Voltage	3.0	$V_{OUT} = 0.1V$ or $V_{CC} - 0.1V$	1.5	0.9	0.9	V
		4.5		2.25	1.35	1.35	
		5.5		2.75	1.65	1.65	
V_{OH}	Minimum HIGH Level Output Voltage	3.0	$I_{OUT} = -50\mu A$	2.99	2.9	2.9	V
		4.5		4.49	4.4	4.4	
		5.5		5.49	5.4	5.4	
		3.0	$V_{IN} = V_{IL}$ or V_{IH}: $I_{OH} = -12mA$		2.56	2.46	
		4.5	$I_{OH} = -24mA$		3.86	3.76	
		5.5	$I_{OH} = -24mA^{(1)}$		4.86	4.76	
V_{OL}	Maximum LOW Level Output Voltage	3.0	$I_{OUT} = 50\mu A$	0.002	0.1	0.1	V
		4.5		0.001	0.1	0.1	
		5.5		0.001	0.1	0.1	
		3.0	$V_{IN} = V_{IL}$ or V_{IH}: $I_{OL} = 12mA$		0.36	0.44	
		4.5	$I_{OL} = 24mA$		0.36	0.44	
		5.5	$I_{OL} = 24mA^{(1)}$		0.36	0.44	
$I_{IN}^{(3)}$	Maximum Input Leakage Current	5.5	$V_I = V_{CC}$, GND		±0.1	±0.1	µA
I_{OZ}	Maximum 3-STATE Leakage Current	5.5	V_I (OE) $= V_{IL}$, V_{IH}; $V_I = V_{CC}$, GND; $V_O = V_{CC}$, GND		±0.25	±2.5	µA
I_{OLD}	Minimum Dynamic Output Current[2]	5.5	$V_{OLD} = 1.65V$ Max.			75	mA
I_{OHD}			$V_{OHD} = 3.85V$ Min.			−75	mA
$I_{CC}^{(3)}$	Maximum Quiescent Supply Current	5.5	$V_{IN} = V_{CC}$ or GND		4.0	40.0	µA

Notes:

1. All outputs loaded; thresholds on input associated with output under test.

2. Maximum test duration 2.0ms, one output loaded at a time.

3. I_{IN} and I_{CC} @ 3.0V are guaranteed to be less than or equal to the respective limit @ 5.5V V_{CC}.

DC Electrical Characteristics for ACT

Symbol	Parameter	V$_{CC}$ (V)	Conditions	T$_A$ = +25°C Typ.	T$_A$ = –40°C to +85°C Guaranteed Limits		Units
V$_{IH}$	Minimum HIGH Level Input Voltage	4.5	V$_{OUT}$ = 0.1V or V$_{CC}$ – 0.1V	1.5	2.0	2.0	V
		5.5		1.5	2.0	2.0	
V$_{IL}$	Maximum LOW Level Input Voltage	4.5	V$_{OUT}$ = 0.1V or V$_{CC}$ – 0.1V	1.5	0.8	0.8	V
		5.5		1.5	0.8	0.8	
V$_{OH}$	Minimum HIGH Level Output Voltage	4.5	I$_{OUT}$ = –50µA	4.49	4.4	4.4	V
		5.5		5.49	5.4	5.4	
		4.5	V$_{IN}$ = V$_{IL}$ or V$_{IH}$: I$_{OH}$ = –24mA		3.86	3.76	
		5.5	I$_{OH}$ = –24mA[4]		4.86	4.76	
V$_{OL}$	Maximum LOW Level Output Voltage	4.5	I$_{OUT}$ = 50µA	0.001	0.1	0.1	V
		5.5		0.001	0.1	0.1	
		4.5	V$_{IN}$ = V$_{IL}$ or V$_{IH}$: I$_{OL}$ = 24mA		0.36	0.44	
		5.5	I$_{OL}$ = 24mA[4]		0.36	0.44	
I$_{IN}$	Maximum Input Leakage Current	5.5	V$_I$ = V$_{CC}$, GND		±0.1	± 1.0	µA
I$_{OZ}$	Maximum 3-STATE Leakage Current	5.5	V$_I$ = V$_{IL}$, V$_{IH}$; V$_O$ = V$_{CC}$, GND		±0.25	±2.5	µA
I$_{CCT}$	Maximum I$_{CC}$/Input	5.5	V$_I$ = V$_{CC}$ – 2.1V	0.6		1.5	mA
I$_{OLD}$	Minimum Dynamic Output Current[5]	5.5	V$_{OLD}$ = 1.65V Max.			75	mA
I$_{OHD}$			V$_{OHD}$ = 3.85V Min.			–75	mA
I$_{CC}$	Maximum Quiescent Supply Current	5.5	V$_{IN}$ = V$_{CC}$ or GND		4.0	40.0	µA

Notes:

4. All outputs loaded; thresholds on input associated with output under test.

5. Maximum test duration 2.0ms, one output loaded at a time.

AC Electrical Characteristics for AC

Symbol	Parameter	V$_{CC}$ (V)[6]	T$_A$ = +25°C, C$_L$ = 50pF			T$_A$ = −40°C to +85°C, C$_L$ = 50pF		Units
			Min.	Typ.	Max.	Min.	Max.	
t$_{PLH}$	Propagation Delay, Data to Output	3.3	1.5	6.0	9.0	1.5	10.0	ns
		5.0	1.5	5.0	7.0	1.0	7.5	
t$_{PHL}$	Propagation Delay, Data to Output	3.3	1.5	6.0	9.0	1.0	10.5	ns
		5.0	1.5	4.5	7.0	1.0	7.5	
t$_{PZH}$	Output Enable Time	3.3	1.5	6.5	12.5	1.0	13.0	ns
		5.0	1.5	5.5	9.0	1.0	9.5	
t$_{PZL}$	Output Enable Time	3.3	1.5	7.0	12.0	1.5	13.0	ns
		5.0	1.5	5.5	9.0	1.0	9.5	
t$_{PHZ}$	Output Disable Time	3.3	2.0	8.0	12.0	2.0	12.5	ns
		5.0	1.5	6.5	10.0	1.0	10.5	
t$_{PLZ}$	Output Disable Time	3.3	1.5	7.0	12.5	1.0	13.0	ns
		5.0	1.5	6.0	10.0	1.0	10.5	

Note:

6. Voltage range 3.3 is 3.3V ± 3.3V. Voltage range 5.0 is 5.0V ± 0.5V.

AC Electrical Characteristics for ACT

Symbol	Parameter	V$_{CC}$ (V)[7]	T$_A$ = +25°C, C$_L$ = 50pF			T$_A$ = −40°C to +85°C, C$_L$ = 50pF		Units
			Min.	Typ.	Max.	Min.	Max.	
t$_{PLH}$	Propagation Delay, Data to Output	5.0	1.5	6.5	9.0	1.5	10.0	ns
t$_{PHL}$	Propagation Delay, Data to Output	5.0	1.5	7.0	9.0	1.5	10.0	ns
t$_{PZH}$	Output Enable Time	5.0	1.5	6.0	9.0	1.0	10.0	ns
t$_{PZL}$	Output Enable Time	5.0	1.5	7.0	10.0	1.5	11.0	ns
t$_{PHZ}$	Output Disable Time	5.0	1.5	8.0	10.5	1.5	11.5	ns
t$_{PLZ}$	Output Disable Time	5.0	2.0	7.0	10.5	1.5	11.5	ns

Note:

7. Voltage range 5.0 is 5.0V ± 0.5V.

Capacitance

Symbol	Parameter	Conditions	Typ.	Units
C$_{IN}$	Input Capacitance	V$_{CC}$ = OPEN	4.5	pF
C$_{PD}$	Power Dissipation Capacitance	V$_{CC}$ = 5.0V	45.0	pF

Physical Dimensions

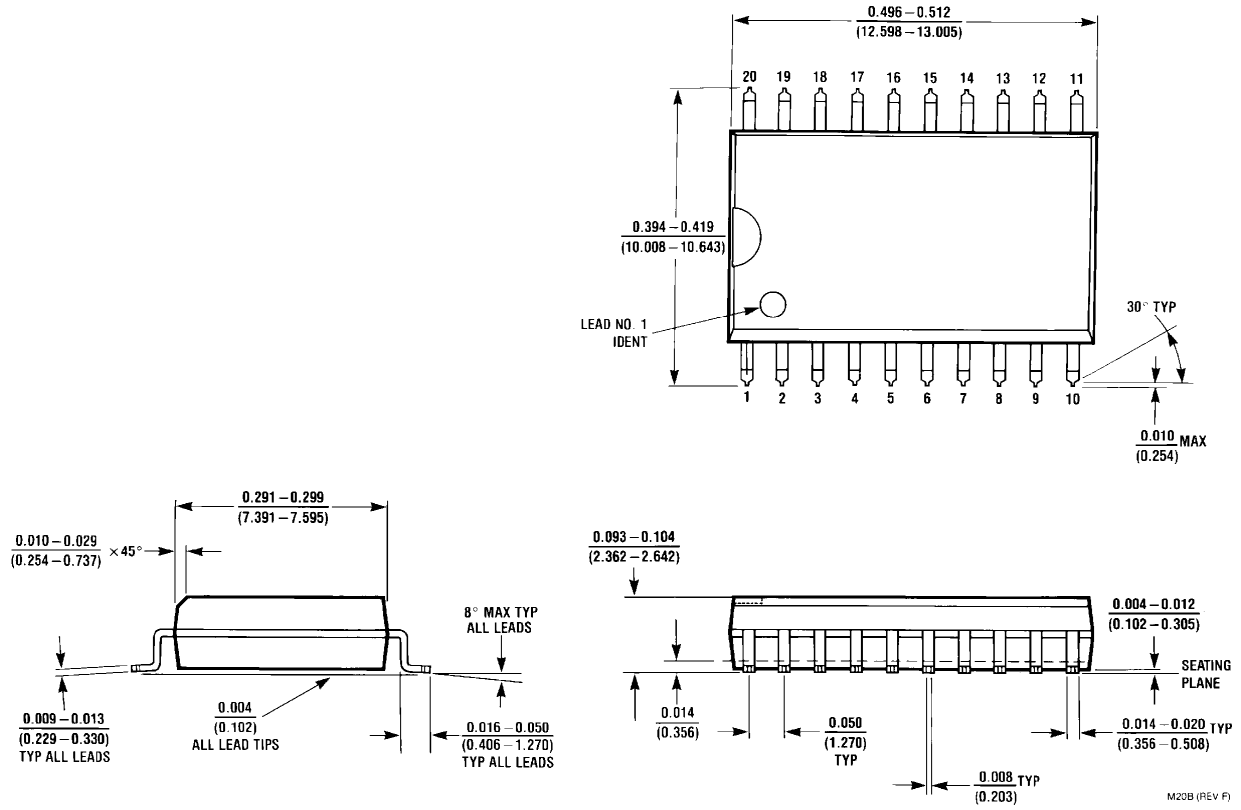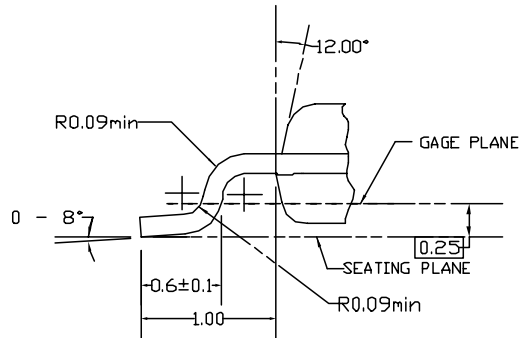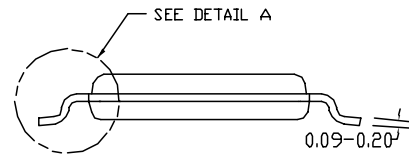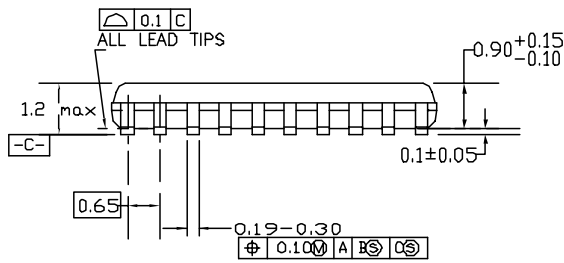Dimensions are in inches (millimeters) unless otherwise noted.

**Figure 1. 20-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-013, 0.300" Wide
Package Number M20B**

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Physical Dimensions (Continued)
Dimensions are in millimeters unless otherwise noted.

12.6±0.10
—A—

0.40 TYP

20   11

7.8

3.9

5.3±0.10
—B—

PIN #1 IDENT.   1   10

⌀ 0.2 C B A
ALL LEAD TIPS

20 19   12 11

5.01 TYP

9.27 TYP

1   2   9   10

(2.13 TYP)

1.27 TYP   0.6 TYP

LAND PATTERN RECOMMENDATION

ALL LEAD TIPS
⌀ 0.1 C

2.1 MAX.

—C—

1.27 TYP

1.8±0.1

0.15±0.05

0.35−0.51

� 0.12 Ⓜ C A
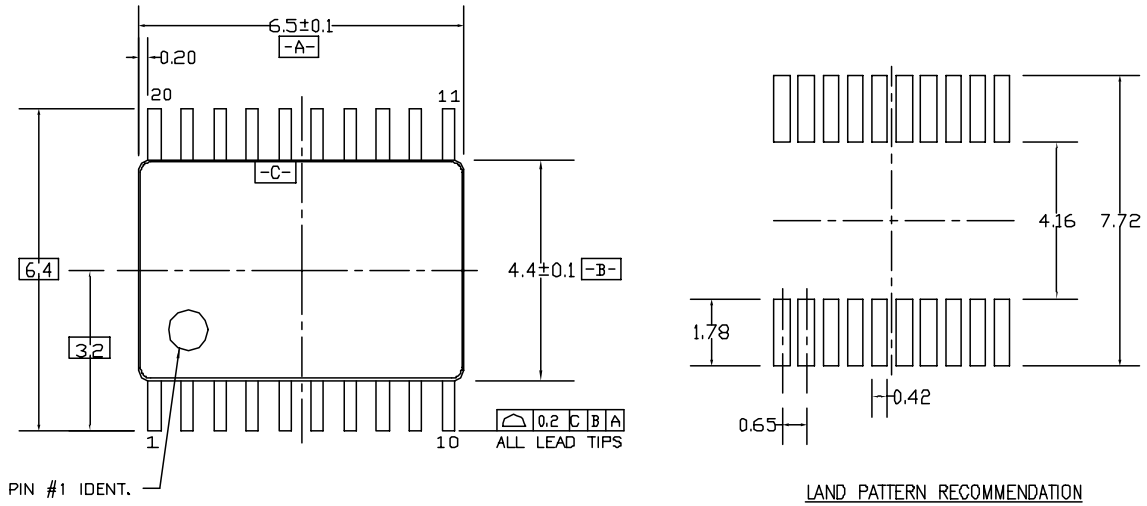
DIMENSIONS ARE IN MILLIMETERS

NOTES:
A. CONFORMS TO EIAJ EDR−7320 REGISTRATION,
   ESTABLISHED IN DECEMBER, 1998.
B. DIMENSIONS ARE IN MILLIMETERS.
C. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD
   FLASH, AND TIE BAR EXTRUSIONS.

M20DREVC

SEE DETAIL A

0.15−0.25

7° TYP

GAGE PLANE

0.25

0°−8° TYP

0.60±0.15

1.25

SEATING PLANE

DETAIL A

Figure 2. 20-Lead Small Outline Package (SOP), EIAJ TYPE II, 5.3mm Wide
Package Number M20D

Physical Dimensions (Continued)

Dimensions are in millimeters unless otherwise noted.

6.5±0.1
-A-
0.20
20
11
-C-
6.4
4.4±0.1 -B-
3.2
1
10
0.2 C B A
ALL LEAD TIPS
PIN #1 IDENT.

LAND PATTERN RECOMMENDATION

4.16   7.72
1.78
0.42
0.65

0.1 C
ALL LEAD TIPS
1.2 max
-C-
0.65
0.19-0.30
0.10 M A B⑤ C⑤

DIMENSIONS ARE IN MILLIMETERS

0.90 +0.15 -0.10
0.1±0.05

SEE DETAIL A
0.09-0.20

12.00°
R0.09min
GAGE PLANE
0 - 8°
0.25
SEATING PLANE
0.6±0.1
R0.09min
1.00

DETAIL A

NOTES:

A. CONFORMS TO JEDEC REGISTRATION MO-153, VARIATION AC,
   REF NOTE 6, DATE 7/93.

B. DIMENSIONS ARE IN MILLIMETERS.

C. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLDS FLASH,
   AND TIE BAR EXTRUSIONS.

D. DIMENSIONS AND TOLERANCES PER ANSI Y14.5M, 1982.

MTC20REVD1

Figure 3. 20-Lead Thin Shrink Small Outline Package (TSSOP), JEDEC MO-153, 4.4mm Wide
Package Number MTC20

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DOME™	MSXPro™	SPM®	Wire™
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GTO™	PowerTrench®	TinyBuck™	

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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.

PRODUCT STATUS DEFINITIONS

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Preliminary	First Production	This datasheet contains preliminary data; supplementary data will be published at a later date. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve design.
No Identification Needed	Full Production	This datasheet contains final specifications. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve design.
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