

August 1998

54AC240 • 54ACT240 Octal Buffer/Line Driver with TRI-STATE® Outputs

General Description

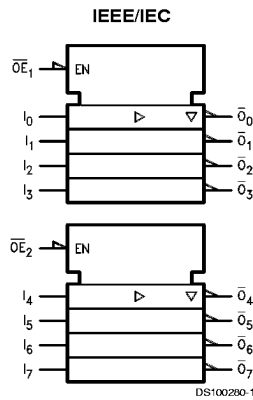
The 'AC/'ACT240 is an octal buffer and line driver designed to be employed as a memory address driver, clock driver and bus oriented transmitter or receiver which provides improved PC board density.

- Inverting TRI-STATE outputs drive bus lines or buffer memory address registers
- Outputs source/sink 24 mA
- 'ACT240 has TTL-compatible inputs
- Standard Microcircuit Drawing (SMD)
 - 'AC240: 5962-87550
 - 'ACT240: 5962-87759

Features

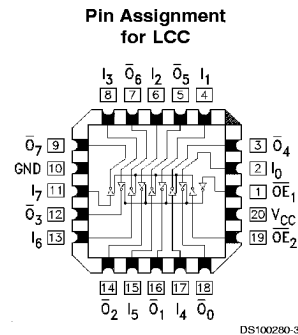
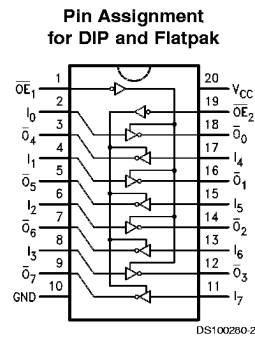
- I_{CC} and I_{OZ} reduced by 50%

Logic Symbol



Pin Names	Description
$\overline{OE}_1, \overline{OE}_2$	TRI-STATE Output Enable Inputs
I_0-I_7	Inputs
$\overline{O}_0-\overline{O}_7$	Outputs

Connection Diagrams



TRI-STATE® is a registered trademark of National Semiconductor Corporation.
FACT® is a registered trademark of Fairchild Semiconductor Corporation.

Truth Tables

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

Inputs		Outputs (Pins 3, 5, 7, 9)
\overline{OE}_2	I_n	
L	L	H
L	H	L
H	X	Z

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

Absolute Maximum Ratings (Note 1)			Recommended Operating Conditions			
<p>If Military/Aerospace specified devices are required, please contact the National Semiconductor Sales Office/Distributors for availability and specifications.</p>			<p>Supply Voltage (V_{CC})</p>			
Supply Voltage (V_{CC})		-0.5V to +7.0V	'AC		2.0V to 6.0V	
DC Input Diode Current (I_{IK})			'ACT		4.5V to 5.5V	
$V_I = -0.5V$		-20 mA	Input Voltage (V_I)		0V to V_{CC}	
$V_I = V_{CC} + 0.5V$		+20 mA	Output Voltage (V_O)		0V to V_{CC}	
DC Input Voltage (V_I)		-0.5V to $V_{CC} + 0.5V$	Operating Temperature (T_A)		54AC/ACT	
DC Output Diode Current (I_{OK})					-55°C to +125°C	
$V_O = -0.5V$		-20 mA	Minimum Input Edge Rate ($\Delta V/\Delta t$)			
$V_O = V_{CC} + 0.5V$		+20 mA	'AC Devices			
DC Output Voltage (V_O)		-0.5V to $V_{CC} + 0.5V$	V_{IN} from 30% to 70% of V_{CC}			
DC Output Source			V_{CC} @ 3.3V, 4.5V, 5.5V		125 mV/ns	
or Sink Current (I_O)		± 50 mA	Minimum Input Edge Rate ($\Delta V/\Delta t$)			
DC V_{CC} or Ground Current			'ACT Devices			
per Output Pin (I_{CC} or I_{GND})		± 50 mA	V_{IN} from 0.8V to 2.0V			
Storage Temperature (T_{STG})		-65°C to +150°C	V_{CC} @ 4.5V, 5.5V		125 mV/ns	
Junction Temperature (T_J)			<p>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.</p>			
CDIP		175°C				
DC Characteristics for 'AC Family Devices						
Symbol	Parameter	V_{CC} (V)	54AC	Units	Conditions	
			$T_A =$ -55°C to +125°C			
			Guaranteed Limits			
V_{IH}	Minimum High Level Input Voltage	3.0	2.1	V	$V_{OUT} = 0.1V$ or $V_{CC} - 0.1V$	
		4.5	3.15			
		5.5	3.85			
V_{IL}	Maximum Low Level Input Voltage	3.0	0.9	V	$V_{OUT} = 0.1V$ or $V_{CC} - 0.1V$	
		4.5	1.35			
		5.5	1.65			
V_{OH}	Minimum High Level Output Voltage	3.0	2.9	V	$I_{OUT} = -50 \mu A$	
		4.5	4.4			
		5.5	5.4			
			3.0	2.4	V	(Note 2) $V_{IN} = V_{IL}$ or V_{IH} $I_{OH} = -12$ mA $I_{OH} = -24$ mA $I_{OH} = -24$ mA
			4.5	3.7		
			5.5	4.7		
V_{OL}	Maximum Low Level Output Voltage	3.0	0.1	V	$I_{OUT} = 50 \mu A$	
		4.5	0.1			
		5.5	0.1			
			3.0	0.50	V	(Note 2) $V_{IN} = V_{IL}$ or V_{IH} $I_{OL} = 12$ mA $I_{OL} = 24$ mA $I_{OL} = 24$ mA
			4.5	0.50		
			5.5	0.50		
I_{IN}	Maximum Input Leakage Current	5.5	± 1.0	μA	$V_I = V_{CC}, GND$	

DC Characteristics for 'AC Family Devices (Continued)					
Symbol	Parameter	V _{CC} (V)	54AC	Units	Conditions
			T _A = -55° C to +125° C		
			Guaranteed Limits		
I _{OZ}	Maximum TRI-STATE Leakage Current	5.5	±5.0	µA	V _I (OE) = V _{IL} , V _{IH} V _I = V _{CC} , GND V _O = V _{CC} , GND
I _{OLD}	Minimum Dynamic Output Current (Note 3)	5.5	50	mA	V _{OLD} = 1.65V Max
I _{OHD}		5.5	-50	mA	V _{OHD} = 3.85V Min
I _{CC}	Maximum Quiescent Supply Current	5.5	80.0	µA	V _{IN} = V _{CC} or GND
<p>Note 2: All outputs loaded; thresholds on input associated with output under test. Note 3: Maximum test duration 2.0 ms, one output loaded at a time. Note 4: I_{IN} and I_{CC} @ 3.0V are guaranteed to be less than or equal to the respective limit @ 5.5V V_{CC}. I_{CC} for 54AC @ 25°C is identical to 74AC @ 25°C.</p>					
DC Characteristics for 'ACT Family Devices					
Symbol	Parameter	V _{CC} (V)	54ACT	Units	Conditions
			T _A = -55° C to +125° C		
			Guaranteed Limits		
V _{IH}	Minimum High Level Input Voltage	4.5 5.5	2.0 2.0	V	V _{OUT} = 0.1V or V _{CC} - 0.1V
V _{IL}	Maximum Low Level Input Voltage	4.5 5.5	0.8 0.8	V	V _{OUT} = 0.1V or V _{CC} - 0.1V
V _{OH}	Minimum High Level Output Voltage	4.5	4.4	V	I _{OUT} = -50 µA
		5.5	5.4		
		4.5 5.5	3.70 4.70	V	(Note 5) V _{IN} = V _{IL} or V _{IH} I _{OH} = -24 mA I _{OH} = -24 mA
V _{OL}	Maximum Low Level Output Voltage	4.5	0.1	V	I _{OUT} = 50 µA
		5.5	0.1		
		4.5 5.5	0.50 0.50	V	(Note 5) V _{IN} = V _{IL} or V _{IH} I _{OL} = 24 mA I _{OL} = 24 mA
I _{IN}	Maximum Input Leakage Current	5.5	±1.0	µA	V _I = V _{CC} , GND
I _{OZ}	Maximum TRI-STATE Leakage Current	5.5	±5.0	µA	V _I = V _{IL} , V _{IH} V _O = V _{CC} , GND
I _{CC(T)}	Maximum I _{CC} /Input	5.5	1.6	mA	V _I = V _{CC} - 2.1V
I _{OLD}	Minimum Dynamic Output Current (Note 6)	5.5	50	mA	V _{OLD} = 1.65V Max
I _{OHD}		5.5	-50	mA	V _{OHD} = 3.85V Min
I _{CC}	Maximum Quiescent Supply Current	5.5	80.0	µA	V _{IN} = V _{CC} or GND
<p>Note 5: All outputs loaded; thresholds on input associated with output under test. Note 6: Maximum test duration 2.0 ms, one output loaded at a time. Note 7: I_{CC} for 54ACT @ 25°C is identical to 74ACT @ 25°C.</p>					

AC Electrical Characteristics					
Symbol	Parameter	V _{CC} (V) (Note 8)	54AC		Units
			T _A = -55°C to +125°C C _L = 50 pF		
			Min	Max	
t _{PLH}	Propagation Delay	3.3	1.0	11.0	ns
	Data to Output	5.0	1.0	8.5	
t _{PHL}	Propagation Delay	3.3	1.0	10.5	ns
	Data to Output	5.0	1.0	8.0	
t _{PZH}	Output Enable Time	3.3	1.0	11.5	ns
		5.0	1.0	9.0	
t _{PZL}	Output Enable Time	3.3	1.0	13.0	ns
		5.0	1.0	10.5	
t _{PHZ}	Output Disable Time	3.3	1.0	12.5	ns
		5.0	1.0	10.5	
t _{PLZ}	Output Disable Time	3.3	1.0	13.5	ns
		5.0	1.0	11.0	

Note 8: Voltage Range 3.3 is 3.3V ±0.3V
Voltage Range 5.0 is 5.0V ±0.5V

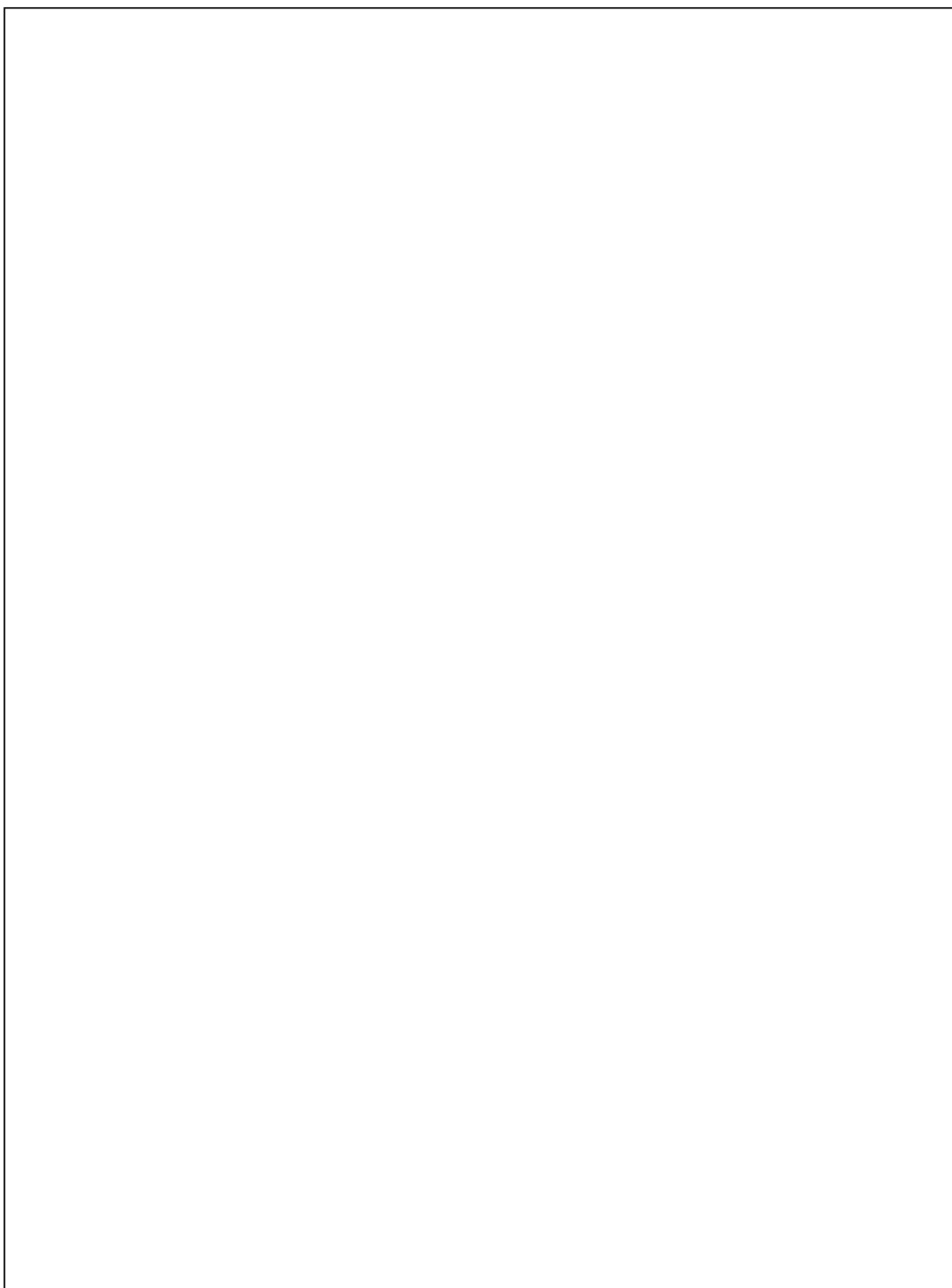
AC Electrical Characteristics					
Symbol	Parameter	V _{CC} (V) (Note 9)	54ACT		Units
			T _A = -55°C to +125°C C _L = 50 pF		
			Min	Max	
t _{PLH}	Propagation Delay	5.0	1.0	9.5	ns
	Data to Output				
t _{PHL}	Propagation Delay	5.0	1.0	9.0	ns
	Data to Output				
t _{PZH}	Output Enable Time	5.0	1.0	10.0	ns
t _{PZL}	Output Enable Time	5.0	1.0	11.5	ns
t _{PHZ}	Output Disable Time	5.0	1.0	11.0	ns
t _{PLZ}	Output Disable Time	5.0	1.0	11.5	ns

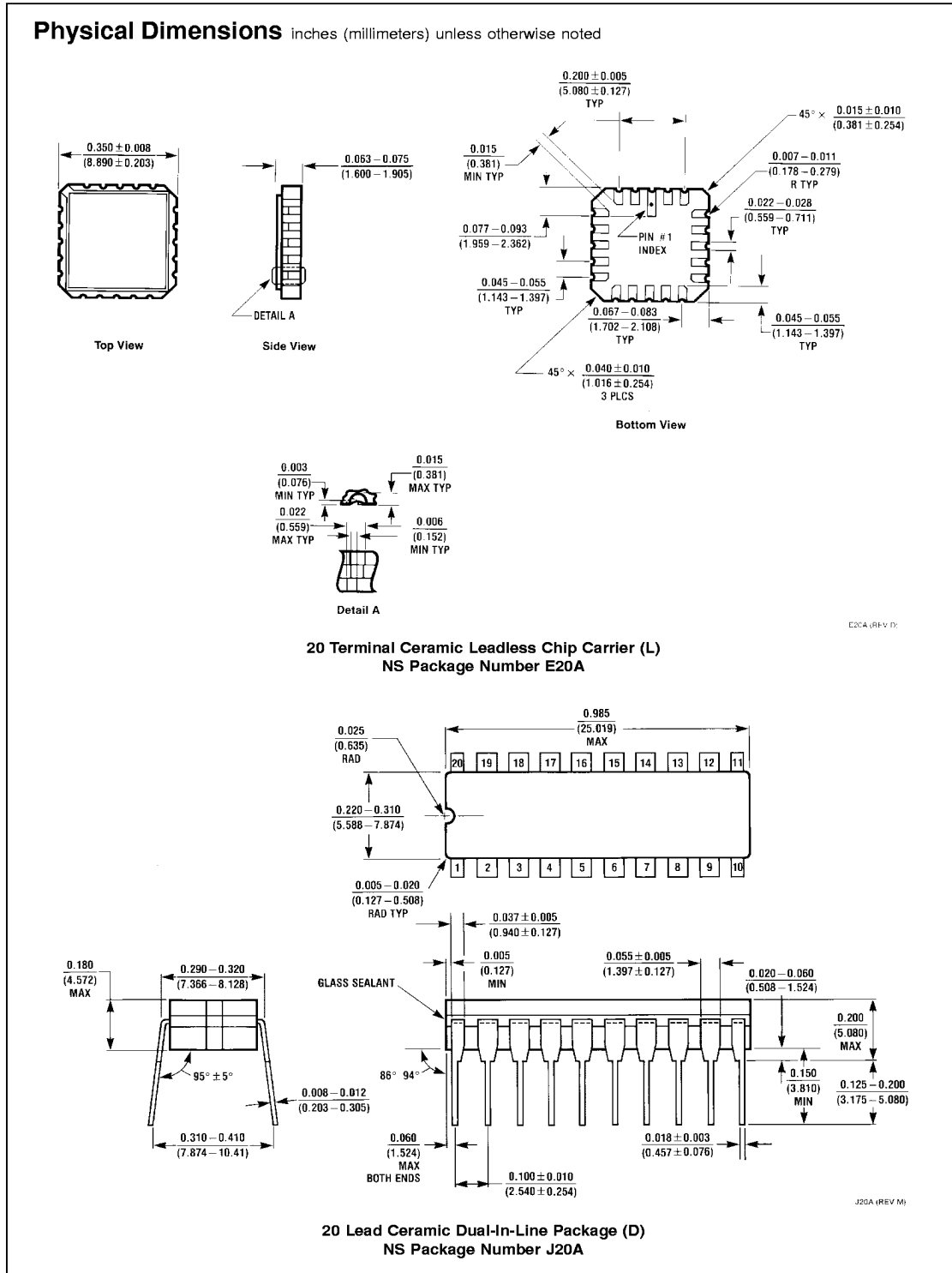
Note 9: Voltage Range 5.0 is 5.0V ±0.5V

Capacitance

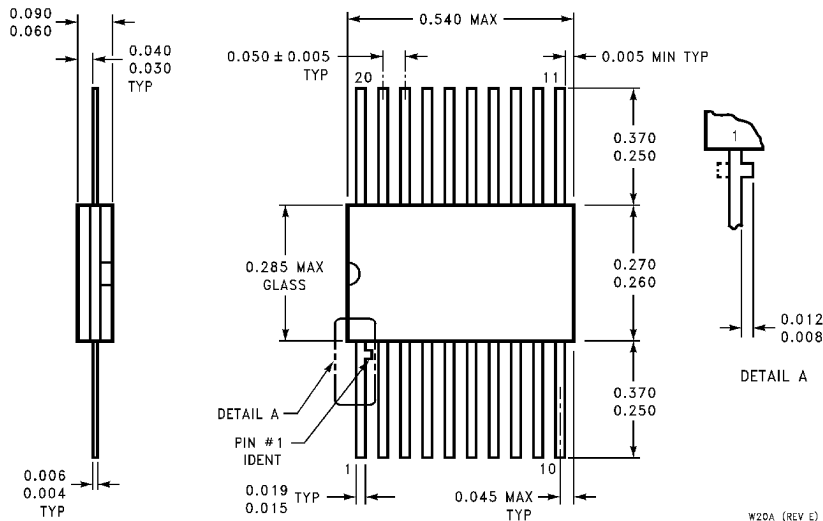
Symbol	Parameter	Typ	Units	Conditions
C _{IN}	Input Capacitance	4.5	pF	V _{CC} = OPEN
C _{PD}	Power Dissipation Capacitance	45.0	pF	V _{CC} = 5.0V

[查询"54AC240LMQB"供应商](#)





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



**20 Lead Ceramic Flatpak (F)
NS Package Number W20A**

LIFE SUPPORT POLICY

NATIONAL'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 NATIONAL 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 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.



National Semiconductor Corporation
Americas
Tel: 1-800-272-9959
Fax: 1-800-737-7018
Email: support@nsc.com

National Semiconductor Europe
Fax: +49 (0) 1 80-530 85 86
Email: europe.support@nsc.com
Deutsch Tel: +49 (0) 1 80-530 85 85
English Tel: +49 (0) 1 80-532 78 32
Français Tel: +49 (0) 1 80-532 93 58
Italiano Tel: +49 (0) 1 80-534 16 80

National Semiconductor Asia Pacific Customer Response Group
Tel: 65-2544466
Fax: 65-2504466
Email: sea.support@nsc.com

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

www.national.com

National does not assume any responsibility for use of any circuitry described, no circuit patent licenses are implied and National reserves the right at any time without notice to change said circuitry and specifications.