

## PART NUMBER

# 54ACTQ32Q2A-ROCA

### 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 re-creations are done with the approval of the Original Component Manufacturer. (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-38535
  - 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 OCM specifications. 'Typical' values are for reference purposes only. Certain minimum or maximum ratings may be based on product characterization, design, simulation, or sample testing.*

## 54ACTQ32

### Quiet Series Quad 2-Input OR Gate

#### General Description

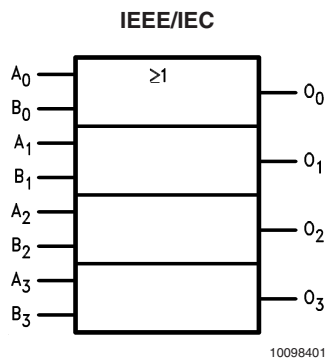
The 'ACTQ32 contains four, 2-input OR gates and utilizes NSC Quiet Series technology to guarantee quiet output switching and improved dynamic threshold performance. FACT Quiet Series™ features GTO™ output control and undershoot corrector in addition to a split ground bus for superior AC MOS performance.

- Guaranteed simultaneous switching noise level and dynamic threshold performance
- Improved latch-up immunity
- Outputs source/sink 24 mA
- 'ACTQ32 has TTL-compatible inputs
- Standard Microcircuit Drawing (SMD) 5962-8973601

#### Features

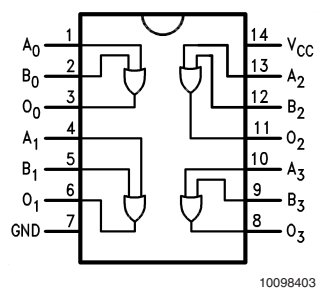
- $I_{CC}$  reduced by 50%

#### Logic Symbol

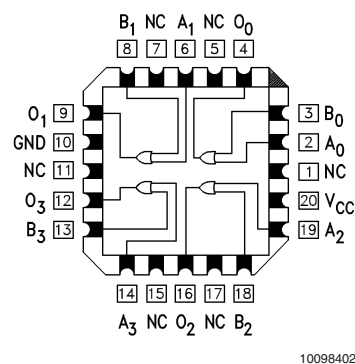


#### Connection Diagrams

Pin Assignment for DIP and Flatpak



Pin Assignment for LCC



Pin Names	Description
$A_n, B_n$	Inputs
$O_n$	Outputs

GTO™ is a trademark of National Semiconductor Corporation.

FACT™ and FACT Quiet Series™ are trademarks of Fairchild Semiconductor Corporation.

**Absolute Maximum Ratings** (Note 1)

If Military/Aerospace specified devices are required, please contact the National Semiconductor Sales Office/Distributors for availability and specifications.

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

Junction Temperature ( $T_J$ )

CDIP

175°C

**Recommended Operating Conditions**

Supply Voltage ( $V_{CC}$ )	4.5V to 5.5V
'ACTQ	
Input Voltage ( $V_I$ )	0V to $V_{CC}$
Output Voltage ( $V_O$ )	0V to $V_{CC}$
Operating Temperature ( $T_A$ )	
54ACTQ	-55°C to +125°C
Minimum Input Edge Rate ( $\Delta V/\Delta t$ )	
'ACTQ Devices	
$V_{IN}$ from 0.8V to 2.0V	
$V_{CC}$ @ 4.5V, 5.5V	125 mV/ns

**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.

**DC Characteristics for 'ACTQ Family Devices**

Symbol	Parameter	$V_{CC}$ (V)	54ACTQ	Units	Conditions
			$T_A =$ -55°C to +125°C		
			Guaranteed Limits		
$V_{IH}$	Minimum High Level Input Voltage	4.5	2.0	V	$V_{OUT} = 0.1V$ or $V_{CC} - 0.1V$
		5.5	2.0		
$V_{IL}$	Maximum Low Level Input Voltage	4.5	0.8	V	$V_{OUT} = 0.1V$ or $V_{CC} - 0.1V$
		5.5	0.8		
$V_{OH}$	Minimum High Level Output Voltage	4.5	4.4	V	$I_{OUT} = -50 \mu A$
		5.5	5.4		
		4.5	3.70	V	(Note 2) $V_{IN} = V_{IL}$ or $V_{IH}$ $I_{OH} = -24 \text{ mA}$ $I_{OH} = -24 \text{ mA}$
		5.5	4.70		
$V_{OL}$	Maximum Low Level Output Voltage	4.5	0.1	V	$I_{OUT} = 50 \mu A$
		5.5	0.1		
		4.5	0.50	V	(Note 2) $V_{IN} = V_{IL}$ or $V_{IH}$ $I_{OL} = 24 \text{ mA}$ $I_{OL} = 24 \text{ mA}$
		5.5	0.50		
$I_{IN}$	Maximum Input Leakage Current	5.5	±1.0	μA	$V_I = V_{CC}, \text{ GND}$
$I_{CCT}$	Maximum $I_{CC}/\text{Input}$	5.5	1.6	mA	$V_I = V_{CC} - 2.1V$
$I_{OLD}$	Minimum Dynamic	5.5	50	mA	$V_{OLD} = 1.65V \text{ Max}$
$I_{OHD}$	Output Current (Note 3)	5.5	-50	mA	$V_{OHD} = 3.85V \text{ Min}$
$I_{CC}$	Maximum Quiescent Supply Current	5.5	80.0	μA	$V_{IN} = V_{CC}$ or GND (Note 3)

**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.

## AC Electrical Characteristics

Symbol	Parameter	V <sub>CC</sub> (V) (Note 4)	54ACTQ		Units	Fig. No.
			T <sub>A</sub> = −55°C to +125°C C <sub>L</sub> = 50 pF			
			Min	Max		
t <sub>PLH</sub>	Propagation Delay	5.0	1.5	7.5	ns	
t <sub>PHL</sub>	Propagation Delay	5.0	1.5	7.5	ns	

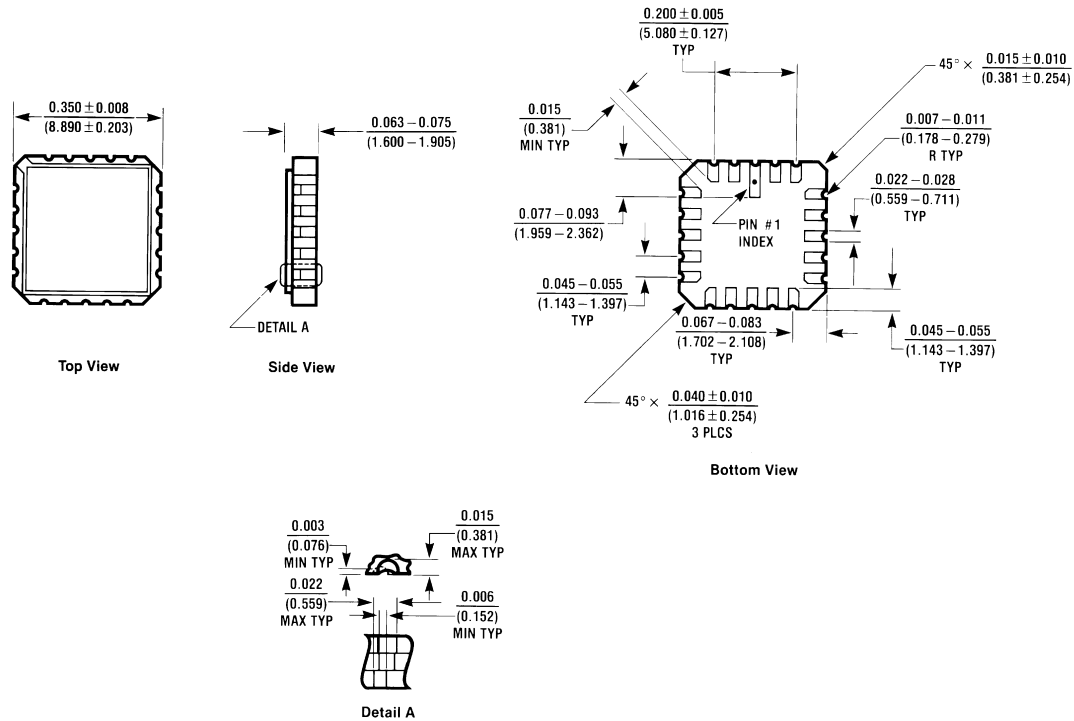
**Note 4:** Voltage Range 5.0 is 5.0V ±0.5V

## Capacitance

Symbol	Parameter	Max	Units	Conditions
C <sub>IN</sub>	Input Capacitance	10.0	pF	V <sub>CC</sub> = OPEN
C <sub>PD</sub>	Power Dissipation Capacitance	72.0	pF	V <sub>CC</sub> = 5.0V

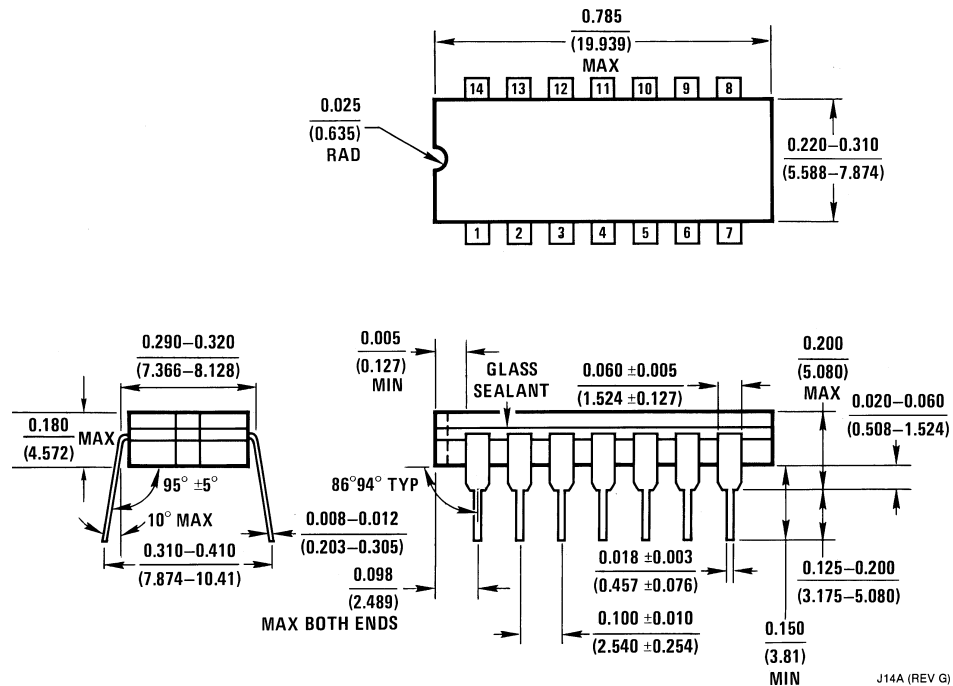
# Physical Dimensions inches (millimeters)

unless otherwise noted



E20A (REV D)

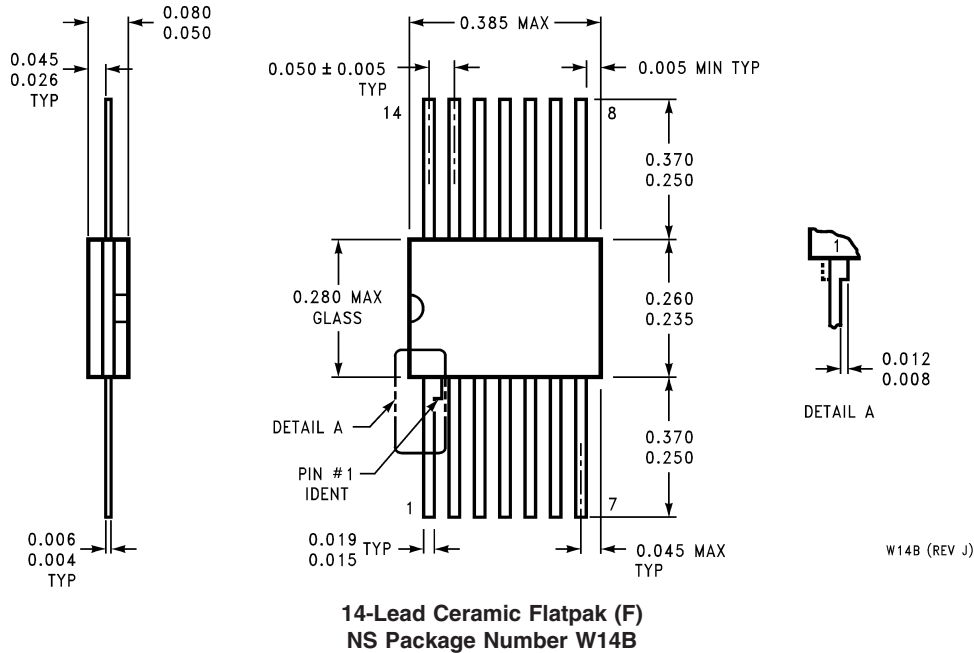
**20 Terminal Ceramic Leadless Chip Carrier (L)**  
**NS Package Number E20A**



J14A (REV G)

**14-Lead Ceramic Dual-In-Line Package (D)**  
**NS Package Number J14A**

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



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2. A critical component is 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.

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