Rochester Electronics

Datasheet

PART NUMBER

54ACTQ32VDA-R-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.

National Semiconductor

OBSOLETE
January 2005

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 ACMOS performance.

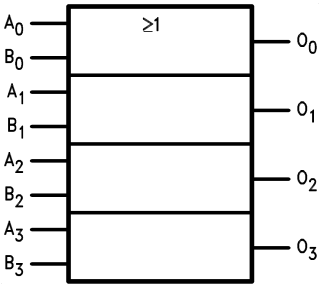
- Guaranteed simultaneous switching noise level and dynamic threshold performance
- Improved latch-up immunity
- Outputs source/sink 24 mA
- 'ACTQ32 has TTL-compatible inputs
- Standard Microcircuit Drawing (SMD) 5962-8973601

Features

- I_{CC} reduced by 50%

Logic Symbol

IEEE/IEC



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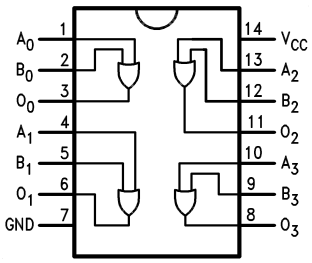
Connection Diagrams

Pin Assignment for DIP and Flatpak



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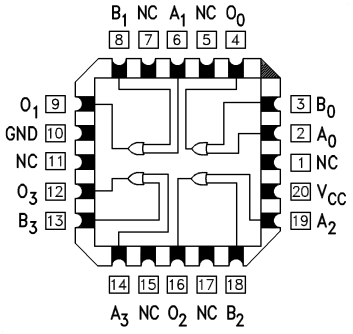
Pin Assignment for LCC



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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})	
'ACTQ	4.5V to 5.5V
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 T_A = −55˚C to +125˚C Guaranteed Limits	Units	Conditions
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 µA
		5.5	5.4		
					(Note 2) V_{IN} = V_{IL} or V_{IH}
		4.5	3.70	V	I_{OH} = −24 mA
		5.5	4.70		I_{OH} = −24 mA
V_{OL}	Maximum Low Level Output Voltage	4.5	0.1	V	I_{OUT} = 50 µA
		5.5	0.1		
					(Note 2) V_{IN} = V_{IL} or V_{IH}
		4.5	0.50	V	I_{OL} = 24 mA
		5.5	0.50		I_{OL} = 24 mA
I_{IN}	Maximum Input Leakage Current	5.5	±1.0	µA	V_I = V_{CC}, GND
I_{CCT}	Maximum I_{CC}/Input	5.5	1.6	mA	V_I = V_{CC} − 2.1V
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 (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_{CC} (V) (Note 4)	54ACTQ T_A = −55˚C to +125˚C C_L = 50 pF		Units	Fig. No.
			Min	Max		
t_{PLH}	Propagation Delay	5.0	1.5	7.5	ns	
t_{PHL}	Propagation Delay	5.0	1.5	7.5	ns	

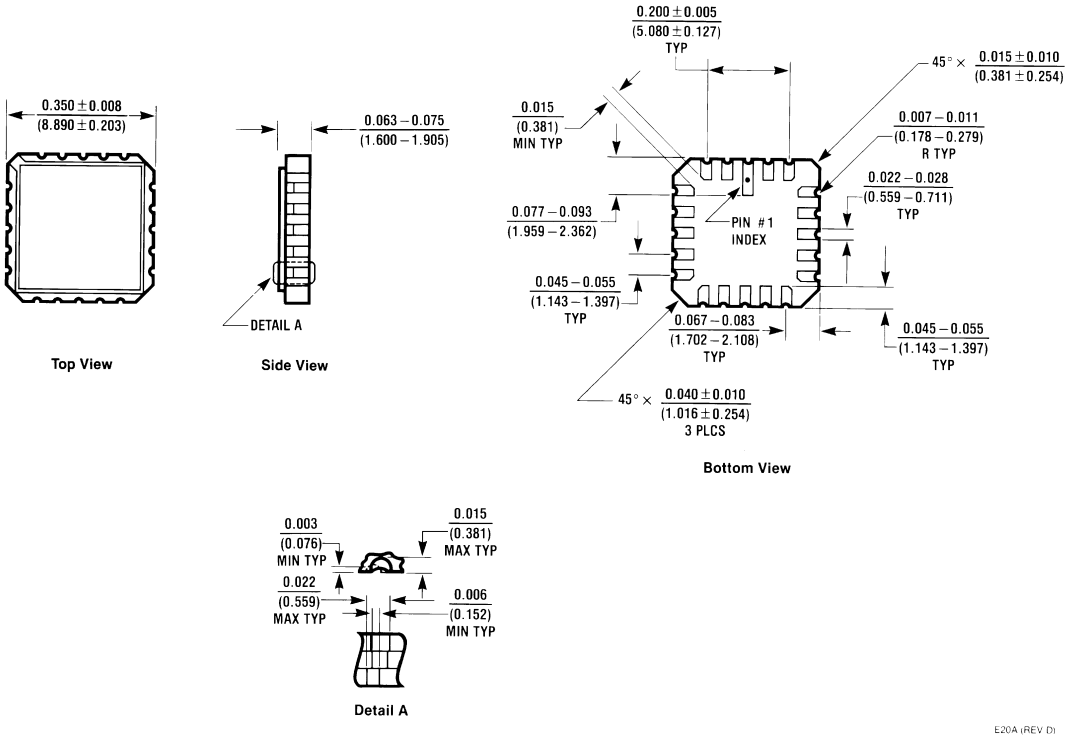
Note 4: Voltage Range 5.0 is 5.0V ±0.5V

Capacitance

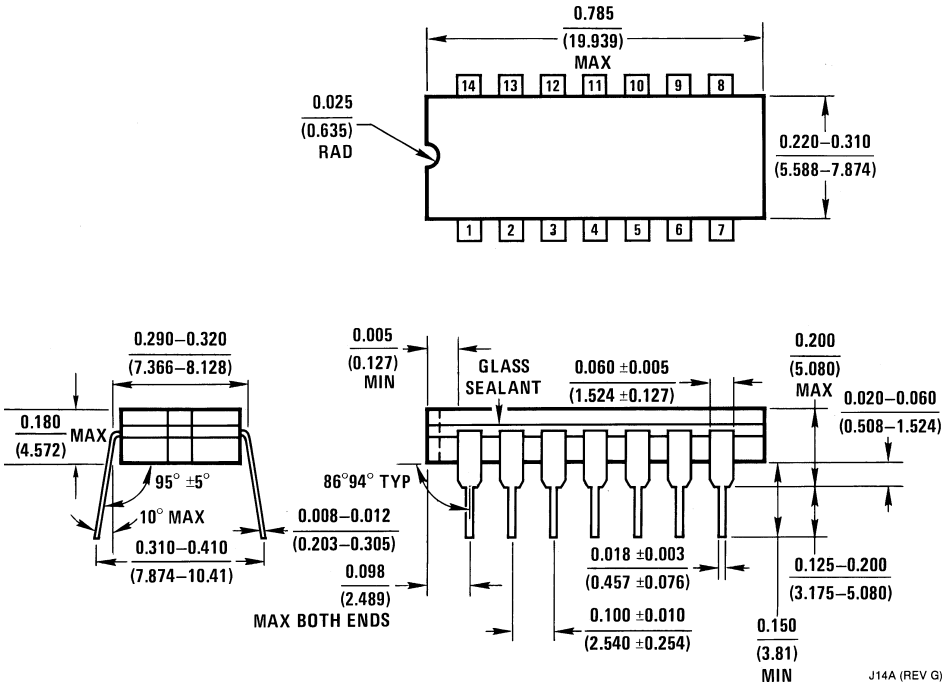
Symbol	Parameter	Max	Units	Conditions
C_{IN}	Input Capacitance	10.0	pF	V_{CC} = OPEN
C_{PD}	Power Dissipation Capacitance	72.0	pF	V_{CC} = 5.0V

Physical Dimensions inches (millimeters)

unless otherwise noted

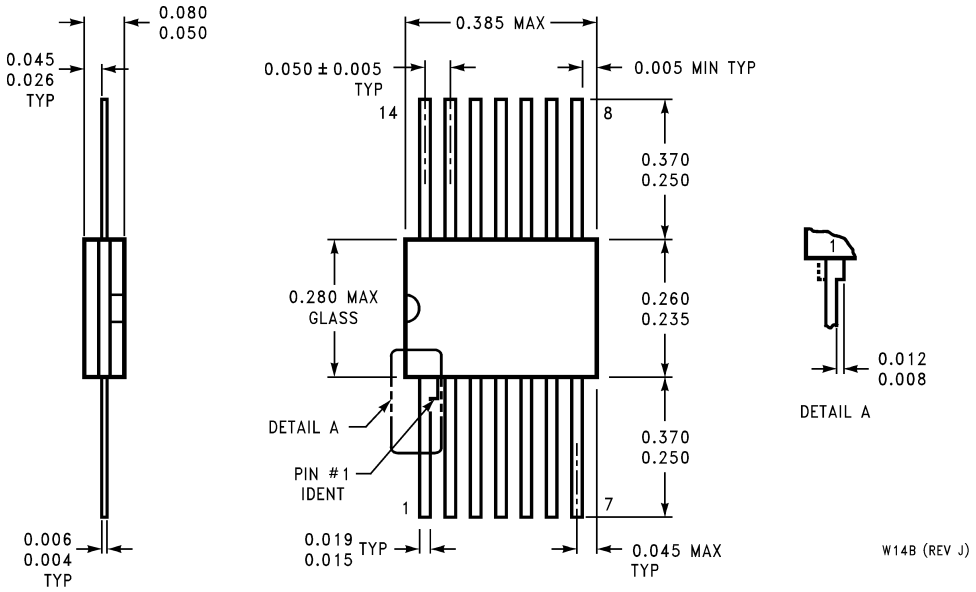


20 Terminal Ceramic Leadless Chip Carrier (L)
NS Package Number E20A



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

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



14-Lead Ceramic Flatpak (F)
NS Package Number W14B

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