

PART NUMBER**MM54C42JB-ROCV****Rochester Electronics****Manufactured Components**

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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.

MM54C42,MM74C42

MM54C42 MM74C42 BCD-to-Decimal Decoder



Literature Number: SNOS334A

MM54C42/MM74C42 BCD-to-Decimal Decoder

General Description

The MM54C42/MM74C42 one-of-ten decoder is a monolithic complementary MOS (CMOS) integrated circuit constructed with N- and P-channel enhancement transistors. This decoder produces a logical "0" at the output corresponding to a four bit binary input from zero to nine, and a logical "1" at the other outputs. For binary inputs from ten to fifteen all outputs are logical "1".

Features

- Supply voltage range
- Tenth power TTL compatible

3V to 15V
drive 2 LPTTL loads

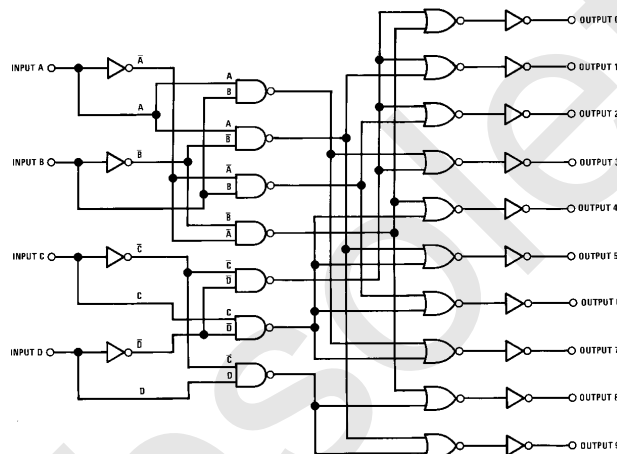
- High noise immunity
- Low power
- Medium speed operation

0.45 V_{CC} (typ.)
50 nW (typ.)
10 MHz (typ.)
with 10V V_{CC}

Applications

- Automotive
- Data terminals
- Instrumentation
- Medical electronics
- Alarm systems
- Industrial electronics
- Remote metering
- Computers

Schematic Diagram



TL/F/5882-1

Truth Table

| Inputs | | | | Outputs | | | | | | | | | |
|--------|---|---|---|---------|---|---|---|---|---|---|---|---|---|
| D | C | B | A | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 0 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 0 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 |
| 0 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 |
| 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 |
| 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 |
| 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 |
| 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 |
| 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 |
| 1 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

Absolute Maximum Ratings (Note 1)

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

| | |
|-----------------------------|--------------------------|
| Voltage at Any Pin (Note 1) | −0.3V to $V_{CC} + 0.3V$ |
| Operating Temperature Range | −55°C to +125°C |
| MM54C42 | −40°C to +85°C |
| MM74C42 | |

| | |
|-----------------------------|-----------------|
| Storage Temperature Range | −65°C to +150°C |
| Power Dissipation (P_D) | |
| Dual-In-Line | 700 mW |
| Small Outline | 500 mW |
| Operating V_{CC} Range | 3.0V to 15V |
| Absolute Maximum V_{CC} | 18V |
| Lead Temperature | |
| (Soldering, 10 seconds) | 260°C |

DC Electrical Characteristics

Min/Max limits apply across temperature range unless otherwise noted

| Symbol | Parameter | Conditions | Min | Typ | Max | Units |
|--|----------------------------|---|-----------------------|------|-----|-------|
| CMOS TO CMOS | | | | | | |
| V _{IN(1)} | Logical “1” Input Voltage | V _{CC} = 5.0V | 3.5 | | | V |
| | | V _{CC} = 10V | 8.0 | | | V |
| V _{IN(0)} | Logical “0” Input Voltage | V _{CC} = 5.0V | | | 1.5 | V |
| | | V _{CC} = 10V | | | 2.0 | V |
| V _{OUT(1)} | Logical “1” Output Voltage | V _{CC} = 5.0V, I _O = −10 μA | 4.5 | | | V |
| | | V _{CC} = 10V, I _O = −10 μA | 9.0 | | | V |
| V _{OUT(0)} | Logical “0” Output Voltage | V _{CC} = 5.0V, I _O = 10 μA | | | 0.5 | V |
| | | V _{CC} = 10V, I _O = 10 μA | | | 1.0 | V |
| I _{IN(1)} | Logical “1” Input Current | V _{CC} = 15V, V _{IN} = 15V | | | 1.0 | μA |
| I _{IN(0)} | Logical “0” Input Current | V _{CC} = 15V, V _{IN} = 0V | −1.0 | | | μA |
| I _{CC} | Supply Current | V _{CC} = 15V | | 0.05 | 300 | μA |
| CMOS/LPTTL INTERFACE | | | | | | |
| V _{IN(1)} | Logical “1” Input Voltage | 54C, V _{CC} = 4.5V | V _{CC} − 1.5 | | | V |
| | | 74C, V _{CC} = 4.75V | V _{CC} − 1.5 | | | V |
| V _{IN(0)} | Logical “0” Input Voltage | 54C, V _{CC} = 4.5V | | | 0.8 | V |
| | | 74C, V _{CC} = 4.75V | | | 0.8 | V |
| V _{OUT(1)} | Logical “1” Output Voltage | 54C, V _{CC} = 4.5V, I _O = −360 μA | 2.4 | | | V |
| | | 74C, V _{CC} = 4.75V, I _O = −360 μA | 2.4 | | | V |
| V _{OUT(0)} | Logical “0” Output Voltage | 54C, V _{CC} = 4.5V, I _O = 360 μA | | | 0.4 | V |
| | | 74C, V _{CC} = 4.75V, I _O = 360 μA | | | 0.4 | V |
| OUTPUT DRIVE (see 54C/74C Family Characteristics Data Sheet) T _A = 25°C (short circuit current) | | | | | | |
| I _{SOURCE} | Output Source Current | V _{CC} = 5.0V, V _{IN(0)} = 0V, V _{OUT} = 0V | −1.75 | | | mA |
| I _{SOURCE} | Output Source Current | V _{CC} = 10V, V _{IN(0)} = 0V, V _{OUT} = 0V | −8.0 | | | mA |
| I _{SINK} | Output Sink Current | V _{CC} = 5.0V, V _{IN(1)} = 5.0V, V _{OUT} = V _{CC} | 1.75 | | | mA |
| I _{SINK} | Output Sink Current | V _{CC} = 10V, V _{IN(1)} = 10V, V _{OUT} = V _{CC} | 8.0 | | | mA |

Note 1: “Absolute Maximum Ratings” are those values beyond which the safety of the device cannot be guaranteed. Except for “Operating Temperature Range” they are not meant to imply that the devices should be operated at these limits. The table of “Electrical Characteristics” provides conditions for actual device operation.

AC Electrical Characteristics* $T_A = 25^\circ\text{C}$, $C_L = 50\text{ pF}$, unless otherwise specified

| Symbol | Parameter | Conditions | Min | Typ | Max | Units |
|-----------------|--|------------------------|-----|-----|-----|-------|
| t _{pd} | Propagation Delay Time to Logical “0” or “1” | V _{CC} = 5.0V | | 200 | 300 | ns |
| | | V _{CC} = 10V | | 90 | 140 | ns |
| C _{IN} | Input Capacitance | (Note 2) | | 5 | | pF |
| C _{PD} | Power Dissipation Capacitance | (Note 3) | | 50 | | pF |

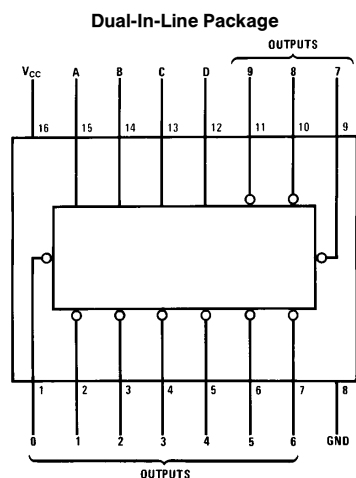
*AC Parameters are guaranteed by DC correlated testing.

Note 1: “Absolute Maximum Ratings” are those values beyond which the safety of the device cannot be guaranteed. Except for “Operating Temperature Range” they are not meant to imply that the devices should be operated at these limits. The table of “Electrical Characteristics” provides conditions for actual device operation.

Note 2: Capacitance is guaranteed by periodic testing.

Note 3: C_{PD} determines the no load AC power consumption of any CMOS device. For complete explanation see 54C/74C Family Characteristics Application Note—AN-90.

Connection Diagram

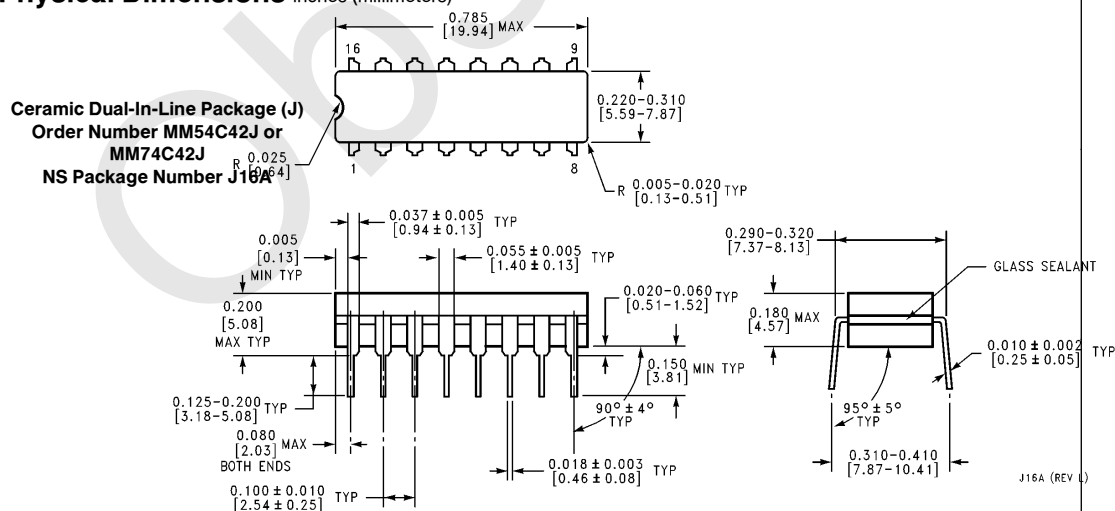


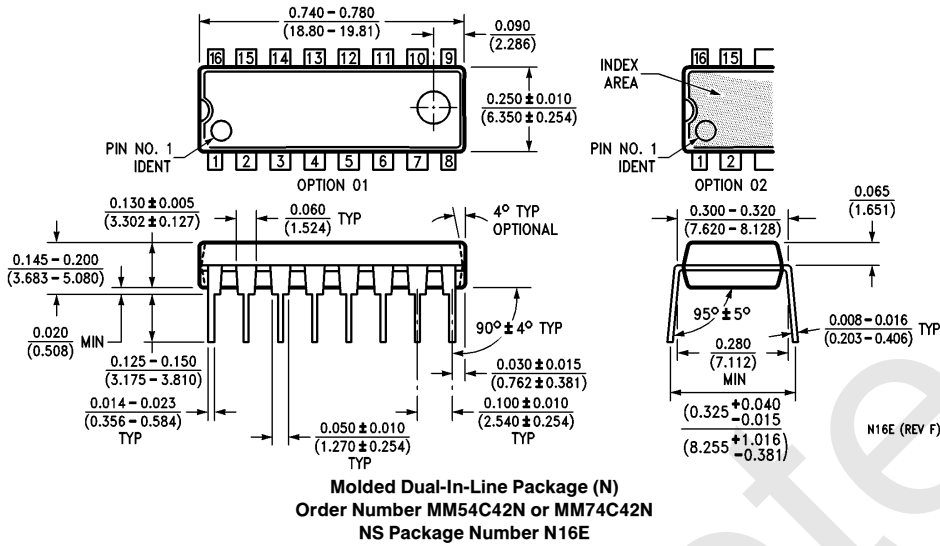
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Top View

Order Number MM54C42 or MM74C42

Physical Dimensions inches (millimeters)



Physical Dimensions inches (millimeters) (Continued)**LIFE SUPPORT POLICY**

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National Semiconductor Corporation
 1111 West Bardin Road
 Arlington, TX 76017
 Tel: 1(800) 272-9959
 Fax: 1(800) 737-7018

National Semiconductor Europe
 Fax: (+49) 0-180-530 85 86
 Email: onjwge@tevm2.nsc.com
 Deutsch Tel: (+49) 0-180-530 85 85
 English Tel: (+49) 0-180-532 78 32
 Français Tel: (+49) 0-180-532 93 58
 Italiano Tel: (+49) 0-180-534 16 80

National Semiconductor Hong Kong Ltd.
 13th Floor, Straight Block,
 Ocean Centre, 5 Canton Rd.
 Tsimshatsui, Kowloon
 Hong Kong
 Tel: (852) 2737-1600
 Fax: (852) 2736-9960

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Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265
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