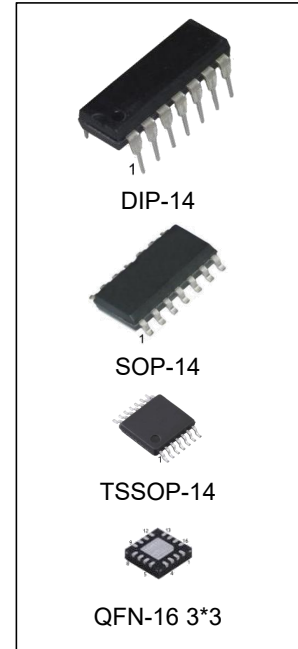


## Cmos And Gate High-Voltage Types

### Features

CD4073B and CD4082B AND Gates provide the system ed Inner with direct implementation of the AND function and supplement the existing family of CMOS gates.

- Medium-Speed Operation - $T_{PLH}$ ,  $T_{PHL}$ =60ns (tsp.) at  $V_{DD} = 10\text{ V}$
- 100% tested for quiescent current at 20V Maximum input current of 1 $\mu$ A at 18 V over full pack-temperature range, 100 nA at 18 V and 25°C
- Noise margin (full package-temperature range)
  - 1V at  $V_{DD}$ =5V
  - 2V at  $V_{DD}$ =10V
  - 2.5V at  $V_{DD}$ =15V
- Standardized,symmetrical ou taut characteristics
- 5V、 10Vand 15V parametric ratings
- Meets all requirements of JEDEC Tentative Tankard No.13B,Standard Specifications



### Ordering Information

| DEVICE                | Package Type | MARKING | Packing | Packing Qty  |
|-----------------------|--------------|---------|---------|--------------|
| CD4073BE/<br>CD4073BN | DIP-14       | CD4073B | TUBE    | 1000pcs/box  |
| CD4073BM/TR           | SOP-14       | CD4073B | REEL    | 2500pcs/reel |
| CD4073BMT/TR          | TSSOP-14     | CD4073B | REEL    | 2500pcs/reel |
| CD4073BLQ/TR          | QFN-16 3*3   | 4073B   | REEL    | 5000pcs/reel |
| CD4082BE/<br>CD4082BN | DIP-14       | CD4082B | TUBE    | 1000pcs/box  |
| CD4082BM/TR           | SOP-14       | CD4082B | REEL    | 2500pcs/reel |
| CD4082BMT/TR          | TSSOP-14     | CD4082B | REEL    | 2500pcs/reel |
| CD4082BLQ/TR          | QFN-16 3*3   | 4082B   | REEL    | 5000pcs/reel |

## Logic Diagram

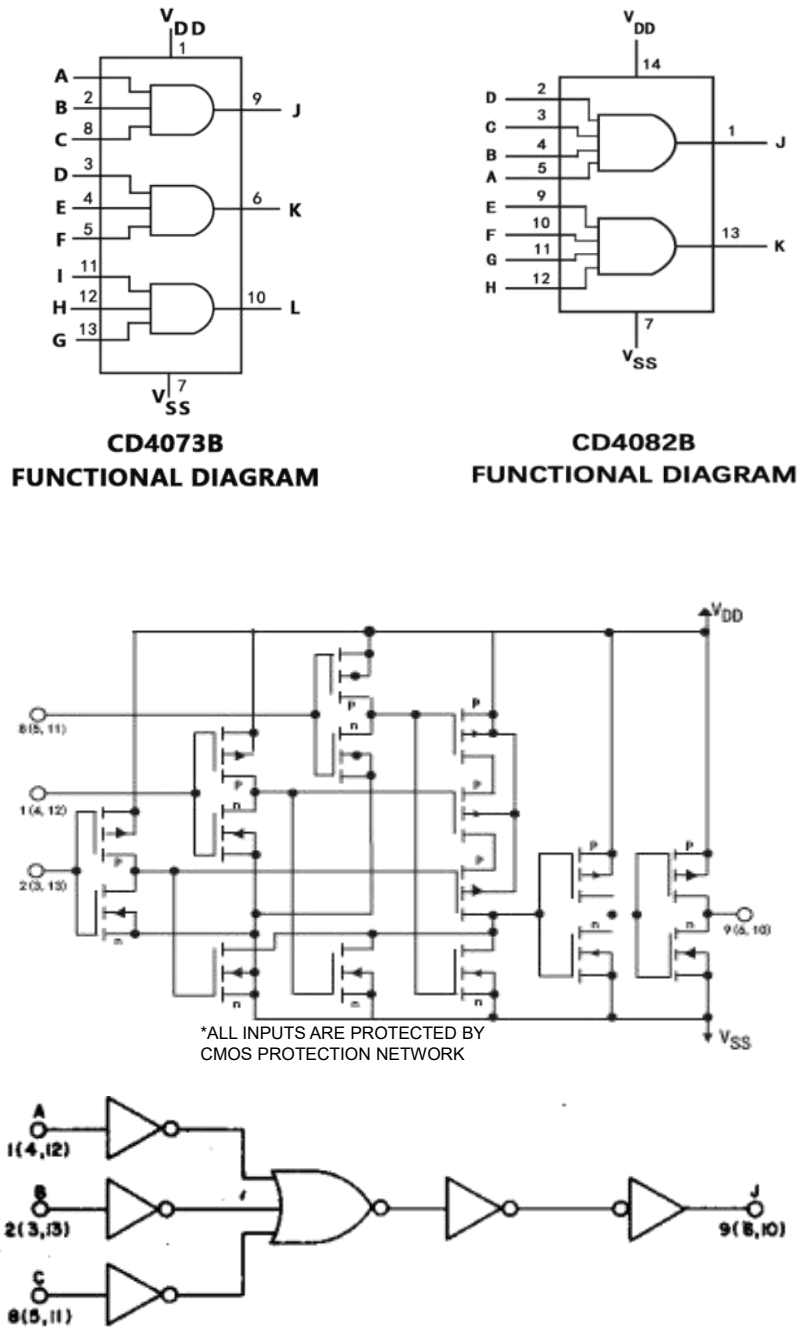


Fig.1 - Logic diagram for CD4073B(1 of 3 identical Gates).

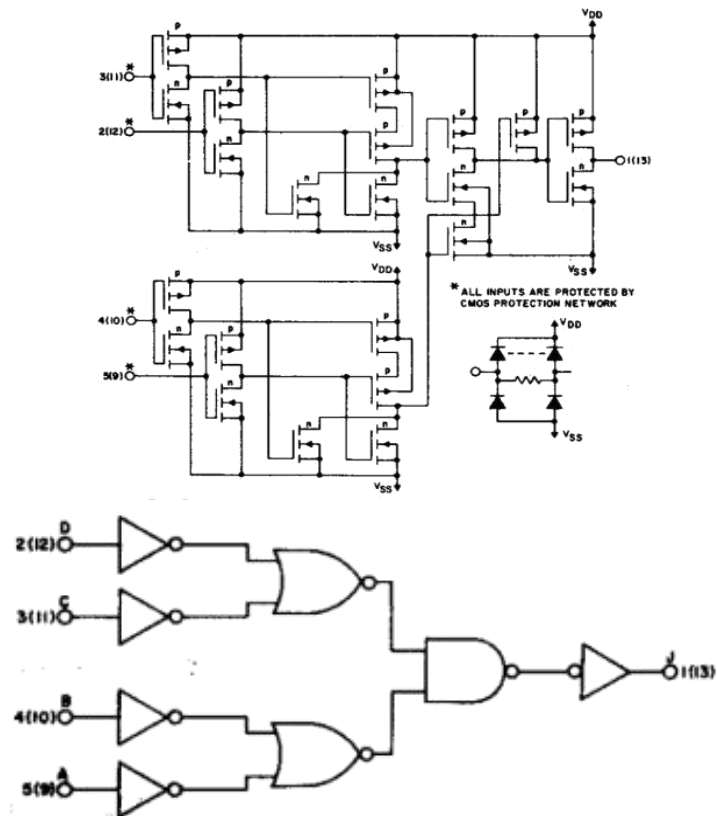
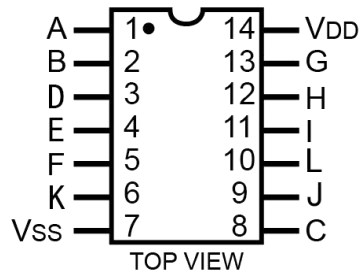


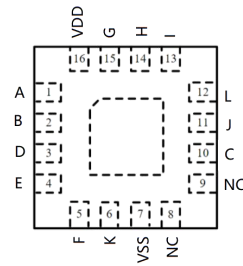
Fig.2 - Logic diagram for CD4082B (1 of 2 identical gates).

## Pin Configuration

### CD4073B

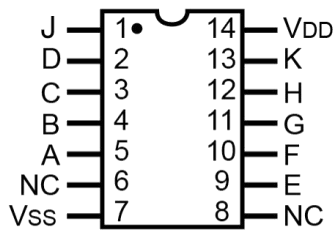


DIP/SOP/TSSOP



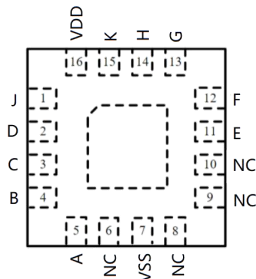
QFN-16

### CD4082B



NC-NO CONNECTION

DIP/SOP/TSSOP



QFN-16

## Maximum Ratings, Absolute-Maximum Values:

| Condition                                                   | Min  | Max  | Units |
|-------------------------------------------------------------|------|------|-------|
| DC SUPPLY-VOLTAGE RANGE,(VDD):                              |      |      |       |
| Voltages reference to VSS Terminal)                         | -0.5 | +20  | V     |
| INPUT VOLTAGE RANGE,ALLINPUTS                               | -0.5 | +0.5 | V     |
| DC INPUT CURRENTANY ONE INPUT                               | -    | +10  | mA    |
| POWER DISSIPATION PER PACKAG-(PD):                          |      |      |       |
| For TA=55°C to +100°C                                       | -    | 500  | mA    |
| For TA=+100°C to +125°C (Derate Lineairty at)               | 12   | 200  | mW    |
| DEVICE DISSIPATION PER OUTPUT TRANSISTOR:                   |      |      |       |
| FOR TA-FULL PACKAGE=TEMPERATURE RANGE(AI Pakage Types)      | -    | 100  | mW    |
| OPERATING-TEMPERATURE RANGE(TA)                             | -40  | +85  | °C    |
| STORAGE TEMPERATURE RANGE(stag)                             | -65  | +150 | °C    |
| At distance 1/16±1/32inch(1.59+0.79mm)from case for 10s max | -    | +260 | °C    |

Absolute Maximum Ratings indicate limits beyond which damage to the device may occur. Operating Ratings indicate conditions for which the device is intended to be functional, but specific performance is not ensured.

## Recommended operating conditions

For maximum reliability, nominal operating conditions should be selected so that operation is always within the following ranges:

| CHARACTERISTIC                                              | LIMITS |      | UNITS |
|-------------------------------------------------------------|--------|------|-------|
|                                                             | MIN.   | MAX. |       |
| Supply-Voltage Range (for T=Full Package Temperature Range) | 5      | 15   | V     |

## Dynaic Electrical Charactetistics

at TA=25°C, Input tr, ft=20ns, and CL=50 pf, RL=200KΩ

| CHARACTERISTIC                   | TEST CONDITIOS |           | ALL TYPES LIMITS |      | UNITS |
|----------------------------------|----------------|-----------|------------------|------|-------|
|                                  |                | VDD Volts | TYP.             | MAX. |       |
| Propagation Delay Time,TPHL,TPLH |                | 5         | 125              | 250  | NS    |
|                                  |                | 10        | 60               | 120  |       |
|                                  |                | 15        | 40               | 90   |       |
| Transition Time, TPHL,TPLH       |                | 5         | 100              | 200  | NS    |
|                                  |                | 10        | 50               | 100  |       |
|                                  |                | 15        | 40               | 80   |       |
| Input Capacitance,CIN            | Any Input      | -         | 5                | 7.5  | Pf    |

## Static Electrical Characteristics

| CHARACTER.<br>ISTIC                          | CONDITIONS |            |            | LIMITS AT INDICATED TEMPERATURES(℃) |       |       |                   |      | UNITS |
|----------------------------------------------|------------|------------|------------|-------------------------------------|-------|-------|-------------------|------|-------|
|                                              | VO<br>(V)  | VIN<br>(V) | VDD<br>(V) |                                     |       |       | +25               |      |       |
|                                              |            |            |            | -40                                 | +85   | Min   | TYP               | MAX  |       |
| Quiescent Device<br>Current,IDD Max.         | -          | 0.5        | 5          | 0.25                                | 7.5   | -     | 0.01              | 0.25 | μA    |
|                                              | -          | 0.10       | 10         | 0.5                                 | 15    | -     | 0.01              | 0.5  |       |
|                                              | -          | 0.15       | 15         | 1                                   | 30    | -     | 0.01              | 1    |       |
|                                              | -          | 0.20       | 20         | 5                                   | 150   | -     | 0.02              | 5    |       |
| Output Low<br>(Sink)Current IOL Min.         | 0.4        | 0.5        | 5          | 0.61                                | 0.42  | 0.51  | 1                 | -    | mA    |
|                                              | 0.5        | 0.10       | 10         | 1.5                                 | 1.1   | 1.3   | 2.6               | -    |       |
|                                              | 1.5        | 0.15       | 15         | 4                                   | 2.8   | 3.4   | 6.8               | -    |       |
| Output High (Source)<br>Current,<br>IOH Min. | 4.6        | 0.5        | 5          | -0.61                               | -0.42 | -0.51 | -1                | -    |       |
|                                              | 2.5        | 0.5        | 5          | -1.8                                | -1.3  | -1.6  | -3.2              | -    |       |
|                                              | 9.5        | 0.10       | 10         | -1.5                                | -1.1  | -1.3  | -2.6              | -    |       |
|                                              | 13.5       | 0.15       | 10         | -4                                  | -2.8  | -3.4  | -6.8              | -    |       |
| Output Voltage<br>Low-Level,<br>VOL Max.     | -          | 0.5        | 5          | 0.05                                |       | -     | 0                 | 0.05 | V     |
|                                              | -          | 0.10       | 10         | 0.05                                |       | -     | 0                 | 0.05 |       |
|                                              | -          | 0.15       | 15         | 0.05                                |       | -     | 0                 | 0.05 |       |
| Output Voltage<br>High-Level,<br>VOH Min.    | -          | 0.5        | 5          | 1.95                                |       | 4.95  | 5                 | -    |       |
|                                              | -          | 0.10       | 10         | 9.95                                |       | 9.95  | 10                | -    |       |
|                                              | -          | 0.15       | 15         | 14.95                               |       | 14.95 | 15                | -    |       |
| Input Low Voltage,<br>VIL Max.               | 0.5        | -          | 5          | 1.5                                 |       | -     | -                 | 1.5  | V     |
|                                              | 1          | -          | 10         | 3                                   |       | -     | -                 | 3    |       |
|                                              | 1.5        | -          | 15         | 4                                   |       | -     | -                 | 4    |       |
| Input High Voltage,<br>VIH Min.              | 0.5.4.5    | -          | 5          | 3.5                                 |       | 3.5   | -                 | -    |       |
|                                              | 1.9        | -          | 10         | 7                                   |       | 7     | -                 | -    |       |
|                                              | 1.5.13.5   | -          | 15         | 11                                  |       | 11    | -                 | -    |       |
| Input Current<br>VIN Max.                    |            | 0.18       | 18         | ±0.1                                | ±1    | -     | ±10 <sup>-5</sup> | ±0.1 | μA    |

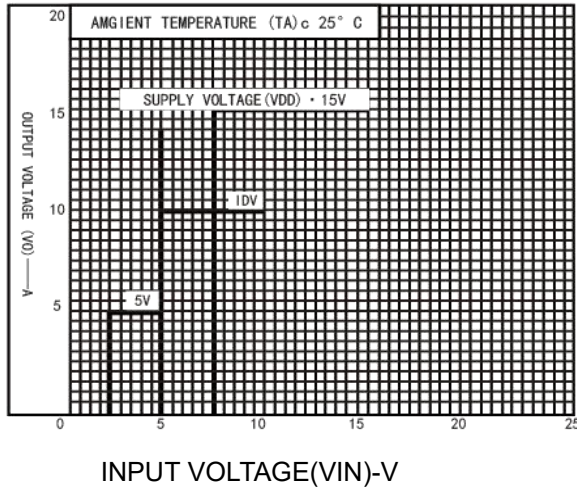


Fig.3-Typical voltage transfer characteristic.

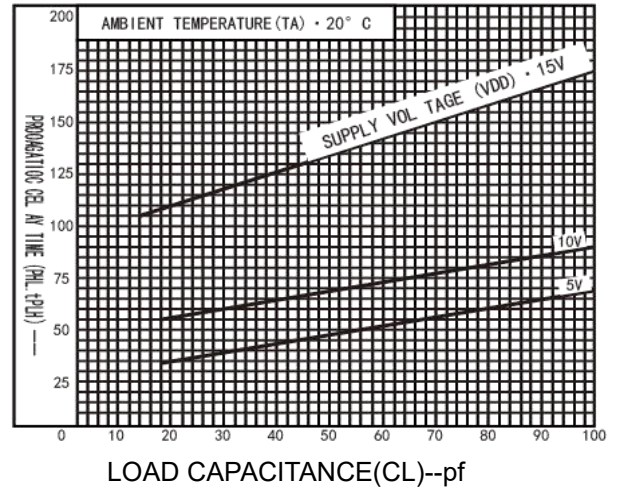


Fig.4 - Typical propagation delay time as a function of load capacitance.

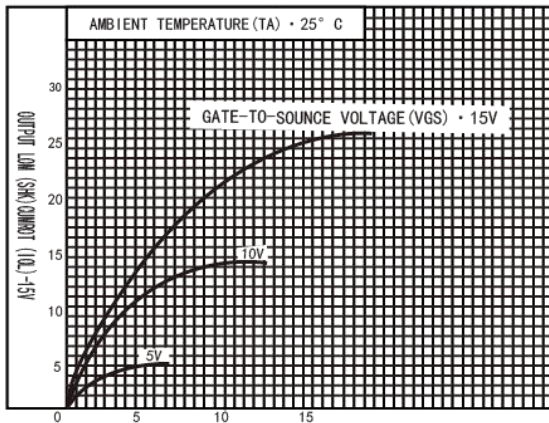


Fig.5 - Typical output low (sink) Current characteristics.

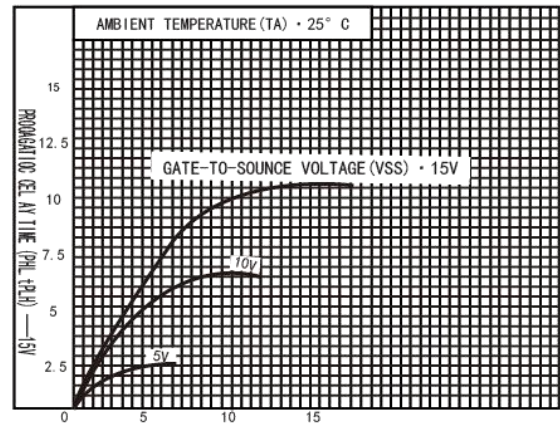


Fig.6 - Minimum output low (sink) Current characteristics.

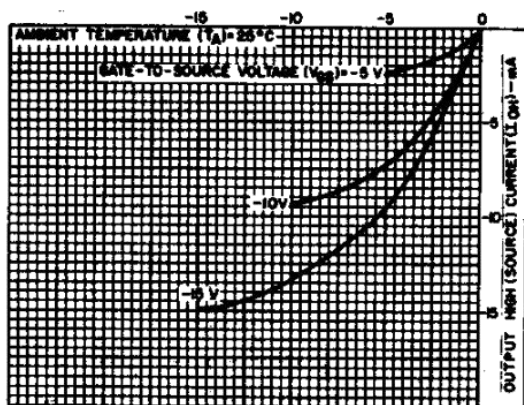


Fig.7 -Minimum output high (source) current characteristics

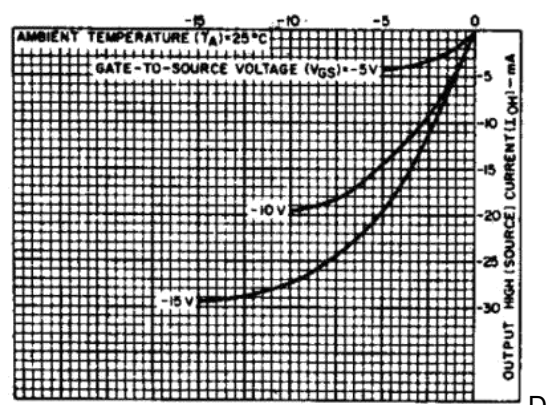


Fig.8 - Typical output high (source) current characteristics.

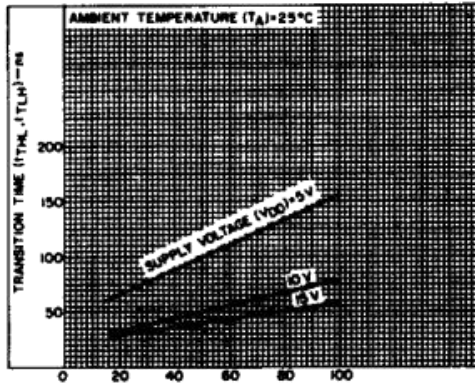


Fig.9 -Typical transition time as a function of load capacitance

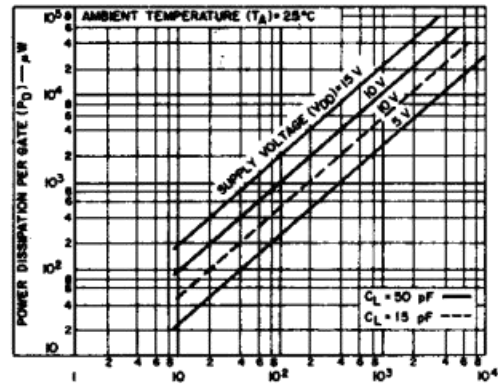


Fig.10 -Typical dynamic power dissipation per gate as a function of load capacitance

## Terminal Assignments

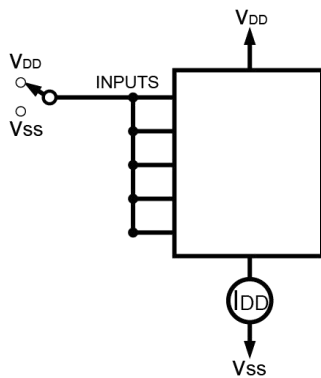


Fig.11 - Quiescent device current test circuit.

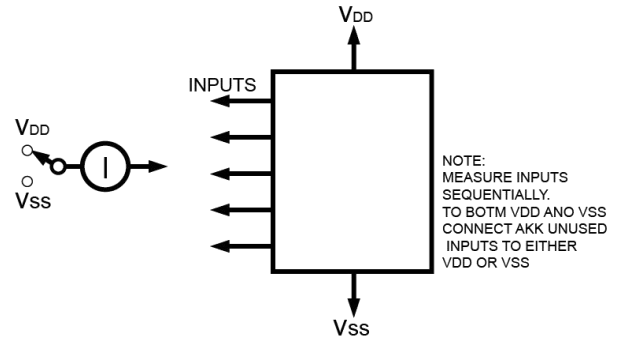


Fig.12 - Input current test circuit.

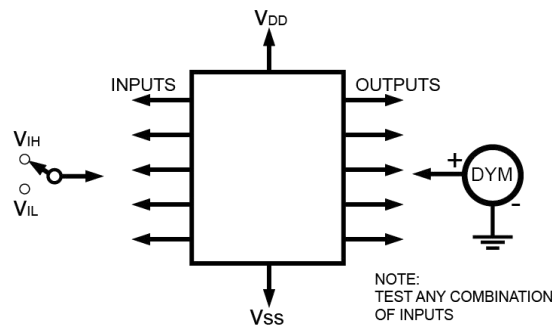
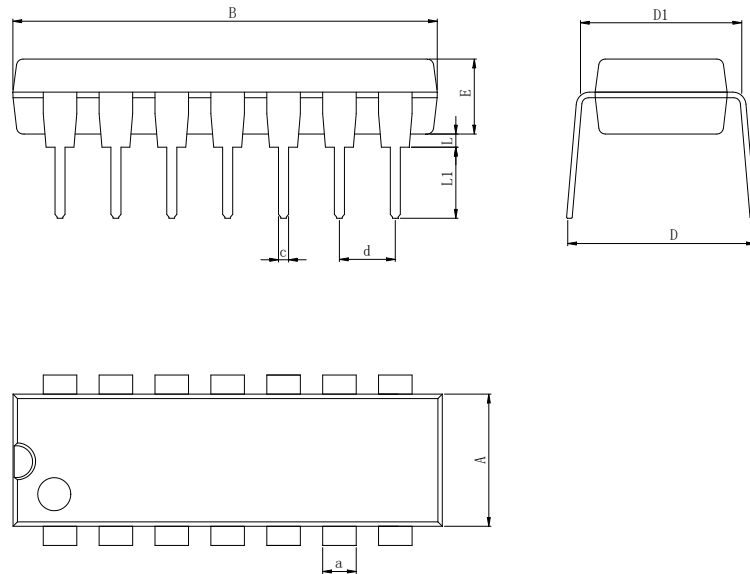


Fig.13 - Input-voltage test circuit.

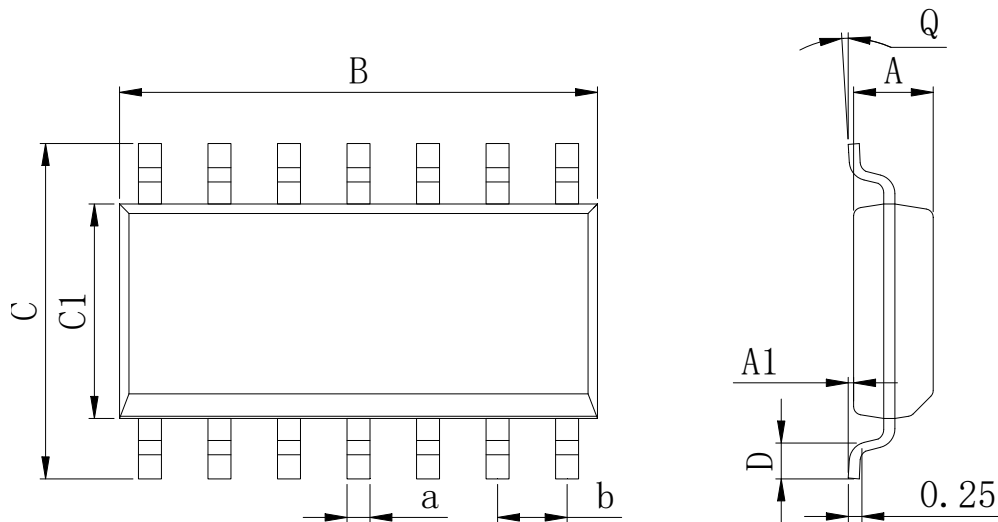
## Physical Dimensions

### DIP-14



| Dimensions In Millimeters(DIP-14) |      |       |      |      |      |      |      |      |      |          |
|-----------------------------------|------|-------|------|------|------|------|------|------|------|----------|
| Symbol:                           | A    | B     | D    | D1   | E    | L    | L1   | a    | c    | d        |
| Min:                              | 6.10 | 18.94 | 8.10 | 7.42 | 3.10 | 0.50 | 3.00 | 1.50 | 0.40 | 2.54 BSC |
| Max:                              | 6.68 | 19.56 | 10.9 | 7.82 | 3.55 | 0.70 | 3.60 | 1.55 | 0.50 |          |

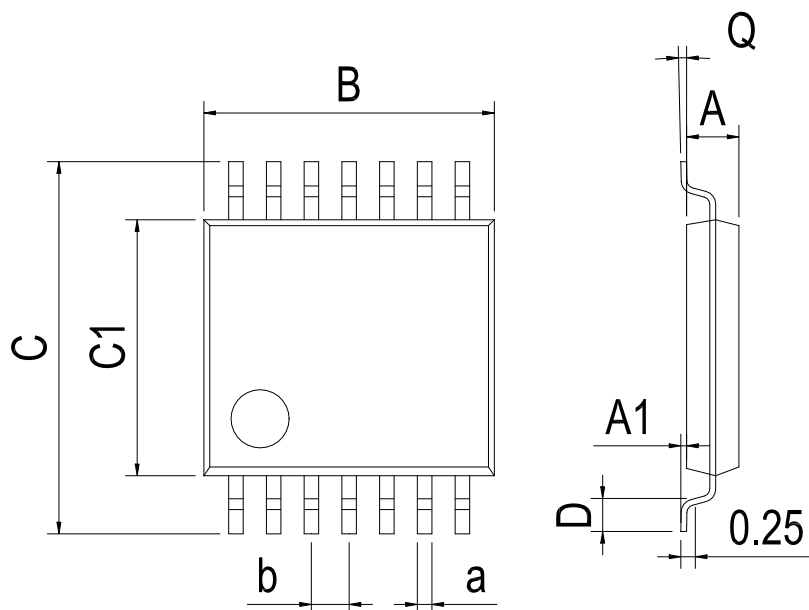
### SOP-14



| Dimensions In Millimeters(SOP-14) |      |      |      |      |      |      |    |      |          |
|-----------------------------------|------|------|------|------|------|------|----|------|----------|
| Symbol:                           | A    | A1   | B    | C    | C1   | D    | Q  | a    | b        |
| Min:                              | 1.35 | 0.05 | 8.55 | 5.80 | 3.80 | 0.40 | 0° | 0.35 | 1.27 BSC |
| Max:                              | 1.55 | 0.20 | 8.75 | 6.20 | 4.00 | 0.80 | 8° | 0.45 |          |

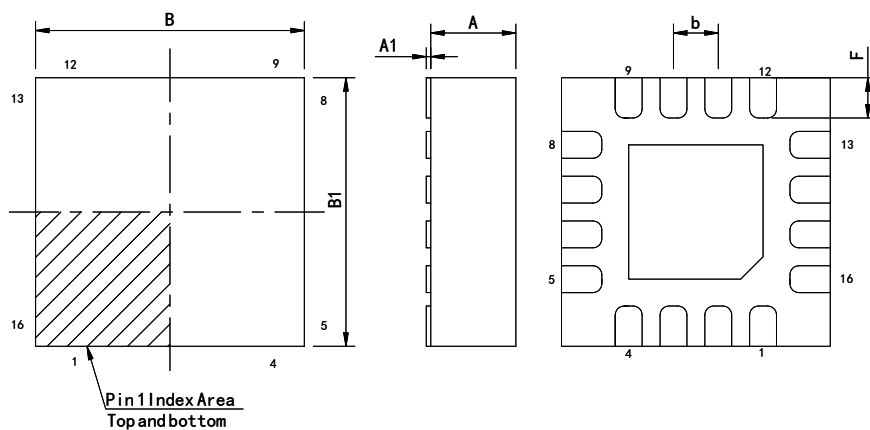
## Physical Dimensions

### TSSOP-14



| Dimensions In Millimeters(TSSOP-14) |      |      |      |      |      |      |    |      |          |
|-------------------------------------|------|------|------|------|------|------|----|------|----------|
| Symbol:                             | A    | A1   | B    | C    | C1   | D    | Q  | a    | b        |
| Min:                                | 0.85 | 0.05 | 4.90 | 6.20 | 4.30 | 0.40 | 0° | 0.20 | 0.65 BSC |
| Max:                                | 0.95 | 0.20 | 5.10 | 6.60 | 4.50 | 0.80 | 8° | 0.25 |          |

### QFN-16 3\*3



| Dimensions In Millimeters(QFN-16 3*3) |      |      |      |      |      |      |      |         |
|---------------------------------------|------|------|------|------|------|------|------|---------|
| Symbol:                               | A    | A1   | B    | B1   | E    | F    | a    | b       |
| Min:                                  | 0.85 | 0    | 2.90 | 2.90 | 0.15 | 0.25 | 0.18 | 0.50TYP |
| Max:                                  | 0.95 | 0.05 | 3.10 | 3.10 | 0.25 | 0.45 | 0.30 |         |

## Revision History

| REVISION<br>NUMBER | DATE    | REVISION                                                    | PAGE |
|--------------------|---------|-------------------------------------------------------------|------|
| V1.0               | 2019-12 | New                                                         | 1-11 |
| V1.1               | 2022-1  | Updated DIP-14 dimension、Add annotation for Maximum Ratings | 4、 8 |
| V1.2               | 2023-8  | Update encapsulation type、Update DIP Package New Model      | 1    |
| V1.3               | 2024-11 | Add the QFN-16 package device、Update Lead Temperature       | 1、 4 |

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