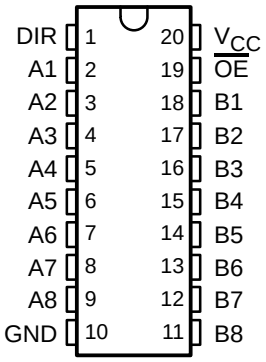
- **Controlled Baseline**
  - **One Assembly/Test Site, One Fabrication Site**
- **Extended Temperature Performance of –55°C to 125°C**
- **Enhanced Diminishing Manufacturing Sources (DMS) Support**
- **Enhanced Product-Change Notification**
- **Qualification Pedigree†**
- **Operating Range 2-V to 5.5-V $V_{CC}$**
- **Latch-Up Performance Exceeds 250 mA Per JESD 17**
- **ESD Protection Exceeds 1000 V Per MIL-STD-833, Method 3015; Exceeds 100 V Using Machine Model (C = 200 pF, R = 0)**

† Component qualification in accordance with JEDEC and industry standards to ensure reliable operation over an extended temperature range. This includes, but is not limited to, Highly Accelerated Stress Test (HAST) or biased 85/85, temperature cycle, autoclave or unbiased HAST, electromigration, bond intermetallic life, and mold compound life. Such qualification testing should not be viewed as justifying use of this component beyond specified performance and environmental limits.

**DW OR PW PACKAGE**
**(TOP VIEW)**




## description/ordering information

The SN74AHC245 octal bus transceiver is designed for asynchronous two-way communication between data buses. The control-function implementation minimizes external timing requirements.

This device allows data transmission from the A bus to the B bus or from the B bus to the A bus, depending on the logic level at the direction-control (DIR) input. The output-enable ($\overline{OE}$) input can be used to disable the device so that the buses effectively are isolated.

To ensure the high-impedance state during power up or power down, $\overline{OE}$ should be tied to $V_{CC}$ through a pullup resistor; the minimum value of the resistor is determined by the current-sinking capability of the driver.

**ORDERING INFORMATION**

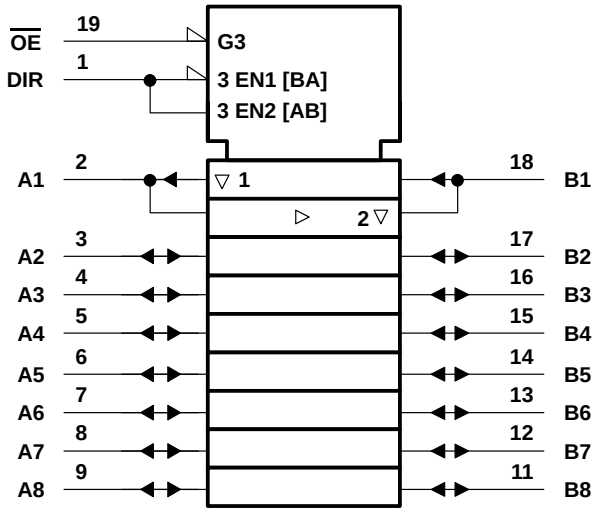
| $T_A$ | PACKAGE‡ | | ORDERABLE PART NUMBER | TOP-SIDE MARKING |
|---|---|---|---|---|
| –55°C to 125°C | SOIC – DW | Tape and reel | SN74AHC245MDWREP | AHC245MEP |
| | TSSOP – PW | Tape and reel | SN74AHC245MPWREP | AHC245EP |

‡ Package drawings, standard packing quantities, thermal data, symbolization, and PCB design guidelines are available at www.ti.com/sc/package.

**FUNCTION TABLE**
**(each transceiver)**

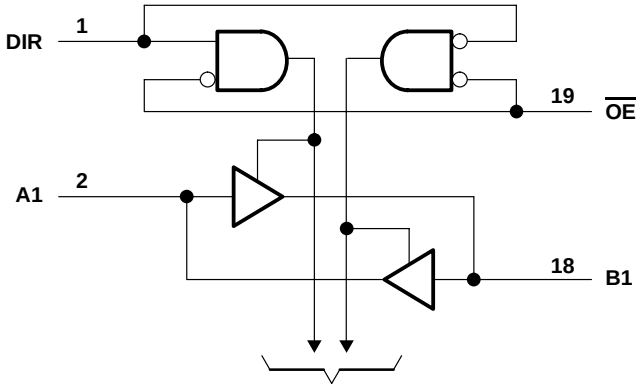
| INPUTS | | OPERATION |
|---|---|---|
| $\overline{OE}$ | DIR | |
| L | L | B data to A bus |
| L | H | A data to B bus |
| H | X | Isolation |

## logic symbol†




† This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.

## logic diagram (positive logic)



### absolute maximum ratings over operating free-air temperature range (unless otherwise noted)†

Supply voltage range, $V_{CC}$ . . . . . –0.5 V to 7 V
Input voltage range, $V_I$ (see Note 1): Control inputs . . . . . –0.5 V to 7 V
I/O, output voltage range, $V_O$ (see Note 1) . . . . . –0.5 V to $V_{CC}$ + 0.5 V
Input clamp current, $I_{IK}$ ($V_I$ < 0): Control inputs . . . . . –20 mA
I/O, output clamp current, $I_{OK}$ ($V_O$ < 0 or $V_O$ > $V_{CC}$) . . . . . ±20 mA
Continuous output current, $I_O$ ($V_O$ = 0 to $V_{CC}$) . . . . . ±25 mA
Continuous current through $V_{CC}$ or GND . . . . . ±75 mA
Package thermal impedance, $\theta_{JA}$ (see Note 2): DW package . . . . . 58°C/W
PW package . . . . . 83°C/W
Storage temperature range, $T_{stg}$ . . . . . –65°C to 150°C

† Stresses beyond those listed under “absolute maximum ratings” may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under “recommended operating conditions” is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

NOTES: 1. The input and output voltage ratings may be exceeded if the input and output current ratings are observed.
2. The package thermal impedance is calculated in accordance with JESD 51-7.

### recommended operating conditions (see Note 3)

| | | | MIN | MAX | UNIT |
|---|---|---|---|---|---|
| $V_{CC}$ | Supply voltage | | 2 | 5.5 | V |
| $V_{IH}$ | High-level input voltage | $V_{CC}$ = 2 V | 1.5 | | V |
| | | $V_{CC}$ = 3 V | 2.1 | | |
| | | $V_{CC}$ = 5.5 V | 3.85 | | |
| $V_{IL}$ | Low-level input voltage | $V_{CC}$ = 2 V | | 0.5 | V |
| | | $V_{CC}$ = 3 V | | 0.9 | |
| | | $V_{CC}$ = 5.5 V | | 1.65 | |
| $V_I$ | Input voltage | $\overline{OE}$ or DIR | 0 | 5.5 | V |
| $V_O$ | Output voltage | A or B | 0 | $V_{CC}$ | V |
| $I_{OH}$ | High-level output current | $V_{CC}$ = 2 V | | –50 | μA |
| | | $V_{CC}$ = 3.3 V ± 0.3 V | | –4 | mA |
| | | $V_{CC}$ = 5 V ± 0.5 V | | –8 | |
| $I_{OL}$ | Low-level output current | $V_{CC}$ = 2 V | | 50 | μA |
| | | $V_{CC}$ = 3.3 V ± 0.3 V | | 4 | mA |
| | | $V_{CC}$ = 5 V ± 0.5 V | | 8 | |
| $\Delta t/\Delta v$ | Input transition rise or fall rate | $V_{CC}$ = 3.3 V ± 0.3 V | | 100 | ns/V |
| | | $V_{CC}$ = 5 V ± 0.5 V | | 20 | |
| $T_A$ | Operating free-air temperature | | –55 | 125 | °C |

NOTE 3: All unused inputs of the device must be held at $V_{CC}$ or GND to ensure proper device operation. Refer to the TI application report, *Implications of Slow or Floating CMOS Inputs*, literature number SCBA004.

### electrical characteristics over recommended operating free-air temperature range (unless otherwise noted)

| PARAMETER | | TEST CONDITIONS | $V_{CC}$ | $T_A$ = 25°C | | | MIN | MAX | UNIT |
|---|---|---|---|---|---|---|---|---|---|
| | | | | MIN | TYP | MAX | | | |
| $V_{OH}$ | | $I_{OH}$ = –50 μA | 2 V | 1.9 | 2 | | 1.9 | | V |
| | | | 3 V | 2.9 | 3 | | 2.9 | | |
| | | | 4.5 V | 4.4 | 4.5 | | 4.4 | | |
| | | $I_{OH}$ = –4 mA | 3 V | 2.58 | | | 2.48 | | |
| | | $I_{OH}$ = –8 mA | 4.5 V | 3.94 | | | 3.8 | | |
| $V_{OL}$ | | $I_{OL}$ = 50 μA | 2 V | | | 0.1 | | 0.1 | V |
| | | | 3 V | | | 0.1 | | 0.1 | |
| | | | 4.5 V | | | 0.1 | | 0.1 | |
| | | $I_{OL}$ = 4 mA | 3 V | | | 0.36 | | 0.5 | |
| | | $I_{OL}$ = 8 mA | 4.5 V | | | 0.36 | | 0.5 | |
| $I_I$ | A or B inputs | $V_I$ = 5.5 V or GND | 5.5 V | | | ±0.1 | | ±1 | μA |
| | $\overline{OE}$ or DIR | | 0 V to 5.5 V | | | ±0.1 | | ±1 | |
| $I_{OZ}$† | | $V_O = V_{CC}$ or GND, $V_I$ ($\overline{OE}$) = $V_{IL}$ or $V_{IH}$ | 5.5 V | | | ±0.25 | | ±2.5 | μA |
| $I_{CC}$ | | $V_I = V_{CC}$ or GND, $I_O$ = 0 | 5.5 V | | | 4 | | 40 | μA |
| $C_i$ | $\overline{OE}$ or DIR | $V_I = V_{CC}$ or GND | 5 V | | 2.5 | 10 | | | pF |
| $C_{io}$ | A or B inputs | $V_I = V_{CC}$ or GND | 5 V | | 4 | | | | pF |

† The parameter $I_{OZ}$ includes the input leakage current.

### switching characteristics over recommended operating free-air temperature range, $V_{CC}$ = 3.3 V ± 0.3 V (unless otherwise noted) (see Figure 1)

| PARAMETER | FROM (INPUT) | TO (OUTPUT) | LOAD CAPACITANCE | $T_A$ = 25°C | | | MIN | MAX | UNIT |
|---|---|---|---|---|---|---|---|---|---|
| | | | | MIN | TYP | MAX | | | |
| $t_{PLH}$ | A or B | B or A | $C_L$ = 15 pF | | 5.8 | 8.4 | 1 | 10 | ns |
| $t_{PHL}$ | | | | | 5.8 | 8.4 | 1 | 10 | |
| $t_{PZH}$ | $\overline{OE}$ | A or B | $C_L$ = 15 pF | | 8.5 | 13.2 | 1 | 15.5 | ns |
| $t_{PZL}$ | | | | | 8.5 | 13.2 | 1 | 15.5 | |
| $t_{PHZ}$ | $\overline{OE}$ | A or B | $C_L$ = 15 pF | | 8.9 | 12.5 | 1 | 15.5 | ns |
| $t_{PLZ}$ | | | | | 8.9 | 12.5 | 1 | 15.5 | |
| $t_{PLH}$ | A or B | B or A | $C_L$ = 50 pF | | 8.3 | 11.9 | 1 | 13.5 | ns |
| $t_{PHL}$ | | | | | 8.3 | 11.9 | 1 | 13.5 | |
| $t_{PZH}$ | $\overline{OE}$ | A or B | $C_L$ = 50 pF | | 11 | 16.7 | 1 | 19 | ns |
| $t_{PZL}$ | | | | | 11 | 16.7 | 1 | 19 | |
| $t_{PHZ}$ | $\overline{OE}$ | A or B | $C_L$ = 50 pF | | 11.5 | 15.8 | 1 | 18 | ns |
| $t_{PLZ}$ | | | | | 11.5 | 15.8 | 1 | 18 | |

**switching characteristics over recommended operating free-air temperature range, $V_{CC}$ = 5 V ± 0.5 V (unless otherwise noted) (see Figure 1)**

| PARAMETER | FROM (INPUT) | TO (OUTPUT) | LOAD CAPACITANCE | $T_A$ = 25°C | | | MIN | MAX | UNIT |
|---|---|---|---|---|---|---|---|---|---|
| | | | | MIN | TYP | MAX | | | |
| $t_{PLH}$ | A or B | B or A | $C_L$ = 15 pF | | 4 | 5.5 | 1 | 6.5 | ns |
| $t_{PHL}$ | | | | | 4 | 5.5 | 1 | 6.5 | |
| $t_{PZH}$ | $\overline{OE}$ | A or B | $C_L$ = 15 pF | | 5.8 | 8.5 | 1 | 10 | ns |
| $t_{PZL}$ | | | | | 5.8 | 8.5 | 1 | 10 | |
| $t_{PHZ}$ | $\overline{OE}$ | A or B | $C_L$ = 15 pF | | 5.6 | 7.8 | 1 | 9.2 | ns |
| $t_{PLZ}$ | | | | | 5.6 | 7.8 | 1 | 9.2 | |
| $t_{PLH}$ | A or B | B or A | $C_L$ = 50 pF | | 5.5 | 7.5 | 1 | 8.5 | ns |
| $t_{PHL}$ | | | | | 5.5 | 7.5 | 1 | 8.5 | |
| $t_{PZH}$ | $\overline{OE}$ | A or B | $C_L$ = 50 pF | | 7.3 | 10.6 | 1 | 12 | ns |
| $t_{PZL}$ | | | | | 7.3 | 10.6 | 1 | 12 | |
| $t_{PHZ}$ | $\overline{OE}$ | A or B | $C_L$ = 50 pF | | 7 | 9.7 | 1 | 11 | ns |
| $t_{PLZ}$ | | | | | 7 | 9.7 | 1 | 11 | |

**noise characteristics, $V_{CC}$ = 5 V, $C_L$ = 50 pF, $T_A$ = 25°C (see Note 4)**

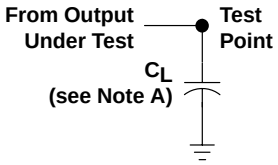
| PARAMETER | | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|
| $V_{OL(P)}$ | Quiet output, maximum dynamic $V_{OL}$ | | 0.9 | | V |
| $V_{OL(V)}$ | Quiet output, minimum dynamic $V_{OL}$ | | –0.9 | | V |
| $V_{OH(V)}$ | Quiet output, minimum dynamic $V_{OH}$ | | 4.3 | | V |
| $V_{IH(D)}$ | High-level dynamic input voltage | 3.5 | | | V |
| $V_{IL(D)}$ | Low-level dynamic input voltage | | | 1.5 | V |

NOTE 4: Characteristics are for surface-mount packages only.

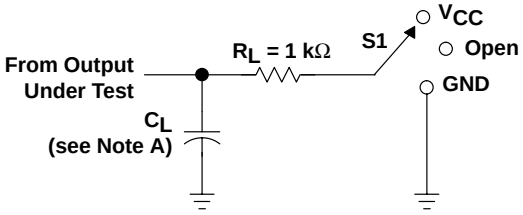
**operating characteristics, $V_{CC}$ = 5 V, $T_A$ = 25°C**

| PARAMETER | | TEST CONDITIONS | TYP | UNIT |
|---|---|---|---|---|
| $C_{pd}$ | Power dissipation capacitance | No load, f = 1 MHz | 14 | pF |

## PARAMETER MEASUREMENT INFORMATION

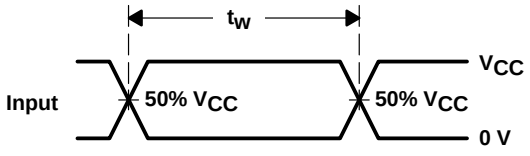



**LOAD CIRCUIT FOR TOTEM-POLE OUTPUTS**

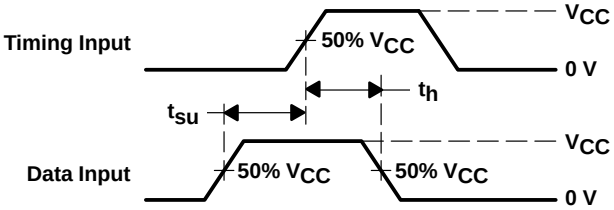



**LOAD CIRCUIT FOR 3-STATE AND OPEN-DRAIN OUTPUTS**

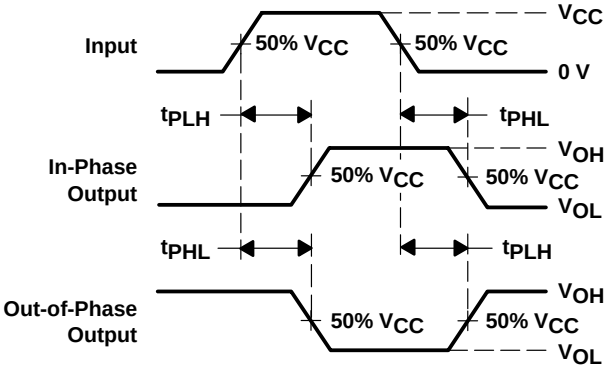
| TEST | S1 |
|---|---|
| $t_{PLH}/t_{PHL}$ | Open |
| $t_{PLZ}/t_{PZL}$ | $V_{CC}$ |
| $t_{PHZ}/t_{PZH}$ | GND |
| Open Drain | $V_{CC}$ |



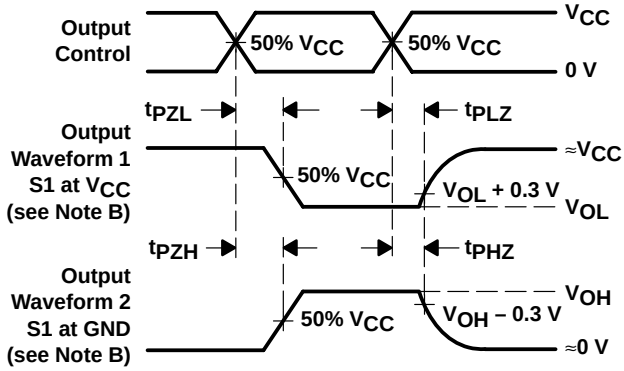

**VOLTAGE WAVEFORMS PULSE DURATION**




**VOLTAGE WAVEFORMS SETUP AND HOLD TIMES**




**VOLTAGE WAVEFORMS PROPAGATION DELAY TIMES INVERTING AND NONINVERTING OUTPUTS**




**VOLTAGE WAVEFORMS ENABLE AND DISABLE TIMES LOW- AND HIGH-LEVEL ENABLING**

NOTES: A. $C_L$ includes probe and jig capacitance.
B. Waveform 1 is for an output with internal conditions such that the output is low except when disabled by the output control. Waveform 2 is for an output with internal conditions such that the output is high except when disabled by the output control.
C. All input pulses are supplied by generators having the following characteristics: PRR ≤ 1 MHz, $Z_O$ = 50 Ω, $t_r$ ≤ 3 ns, $t_f$ ≤ 3 ns.
D. The outputs are measured one at a time with one input transition per measurement.

**Figure 1. Load Circuit and Voltage Waveforms**

## PACKAGING INFORMATION

| Orderable Device | Status (1) | Package Type | Package Drawing | Pins | Package Qty | Eco Plan (2) | Lead/Ball Finish (6) | MSL Peak Temp (3) | Op Temp (°C) | Device Marking (4/5) | Samples |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SN74AHC245MDWREP | ACTIVE | SOIC | DW | 20 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | AHC245MEP | Samples |
| SN74AHC245MPWREP | ACTIVE | TSSOP | PW | 20 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | AHC245EP | Samples |
| V62/03650-01XE | ACTIVE | TSSOP | PW | 20 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | AHC245EP | Samples |
| V62/03650-01YE | ACTIVE | SOIC | DW | 20 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | -55 to 125 | AHC245MEP | Samples |

(1) The marketing status values are defined as follows:
**ACTIVE:** Product device recommended for new designs.
**LIFEBUY:** TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.
**NRND:** Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.
**PREVIEW:** Device has been announced but is not in production. Samples may or may not be available.
**OBSOLETE:** TI has discontinued the production of the device.

(2) Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS), Pb-Free (RoHS Exempt), or Green (RoHS & no Sb/Br) - please check http://www.ti.com/productcontent for the latest availability information and additional product content details.
**TBD:** The Pb-Free/Green conversion plan has not been defined.
**Pb-Free (RoHS):** TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.
**Pb-Free (RoHS Exempt):** This component has a RoHS exemption for either 1) lead-based flip-chip solder bumps used between the die and package, or 2) lead-based die adhesive used between the die and leadframe. The component is otherwise considered Pb-Free (RoHS compatible) as defined above.
**Green (RoHS & no Sb/Br):** TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

(3) MSL, Peak Temp. - The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

(4) There may be additional marking, which relates to the logo, the lot trace code information, or the environmental category on the device.

(5) Multiple Device Markings will be inside parentheses. Only one Device Marking contained in parentheses and separated by a "~" will appear on a device. If a line is indented then it is a continuation of the previous line and the two combined represent the entire Device Marking for that device.

(6) Lead/Ball Finish - Orderable Devices may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead/Ball Finish values may wrap to two lines if the finish value exceeds the maximum column width.

**OTHER QUALIFIED VERSIONS OF SN74AHC245-EP :**

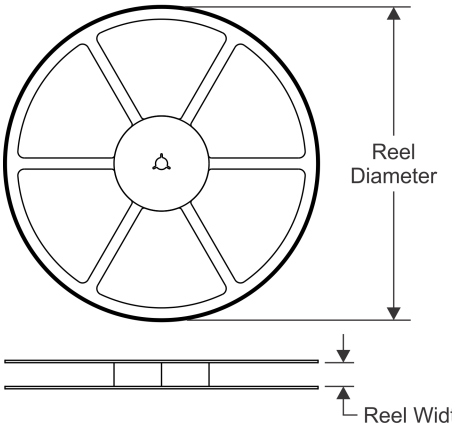
- Catalog: SN74AHC245
- Automotive: SN74AHC245-Q1
- Military: SN54AHC245

NOTE: Qualified Version Definitions:

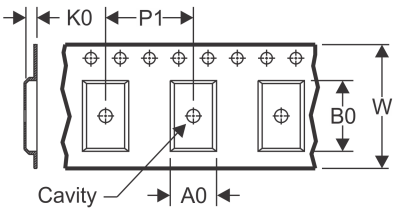
- Catalog - TI's standard catalog product
- Automotive - Q100 devices qualified for high-reliability automotive applications targeting zero defects
- Military - QML certified for Military and Defense Applications

## TAPE AND REEL INFORMATION

**REEL DIMENSIONS**

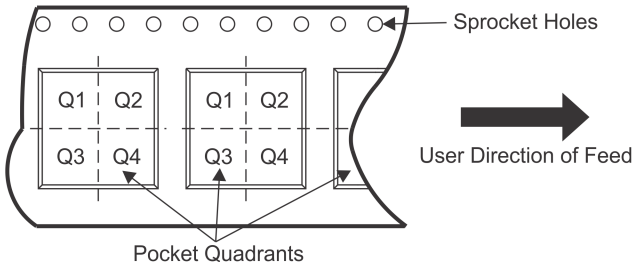



**TAPE DIMENSIONS**




| | |
|---|---|
| A0 | Dimension designed to accommodate the component width |
| B0 | Dimension designed to accommodate the component length |
| K0 | Dimension designed to accommodate the component thickness |
| W | Overall width of the carrier tape |
| P1 | Pitch between successive cavity centers |

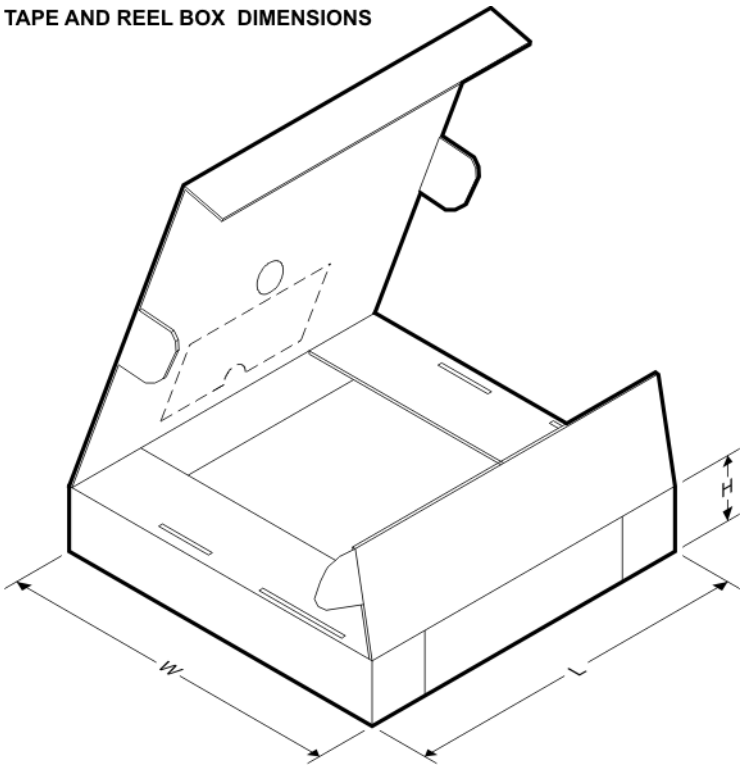
**QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE**




*All dimensions are nominal

| Device | Package Type | Package Drawing | Pins | SPQ | Reel Diameter (mm) | Reel Width W1 (mm) | A0 (mm) | B0 (mm) | K0 (mm) | P1 (mm) | W (mm) | Pin1 Quadrant |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SN74AHC245MDWREP | SOIC | DW | 20 | 2000 | 330.0 | 24.4 | 10.8 | 13.3 | 2.7 | 12.0 | 24.0 | Q1 |
| SN74AHC245MPWREP | TSSOP | PW | 20 | 2000 | 330.0 | 16.4 | 6.95 | 7.1 | 1.6 | 8.0 | 16.0 | Q1 |

TAPE AND REEL BOX DIMENSIONS




*All dimensions are nominal

| Device | Package Type | Package Drawing | Pins | SPQ | Length (mm) | Width (mm) | Height (mm) |
|---|---|---|---|---|---|---|---|
| SN74AHC245MDWREP | SOIC | DW | 20 | 2000 | 367.0 | 367.0 | 45.0 |
| SN74AHC245MPWREP | TSSOP | PW | 20 | 2000 | 367.0 | 367.0 | 38.0 |

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# OCEAN CHIPS
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Наши преимущества:

- Поставка оригинальных импортных электронных компонентов напрямую с производств Америки, Европы и Азии, а так же с крупнейших складов мира;
- Широкая линейка поставок активных и пассивных импортных электронных компонентов (более 30 млн. наименований);
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Помощь Конструкторского Отдела и консультации квалифицированных инженеров;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Компания «Океан Электроники» является официальным дистрибьютором и эксклюзивным представителем в России одного из крупнейших производителей разъемов военного и аэрокосмического назначения «**JONHON**», а так же официальным дистрибьютором и эксклюзивным представителем в России производителя высокотехнологичных и надежных решений для передачи СВЧ сигналов «**FORSTAR**».

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