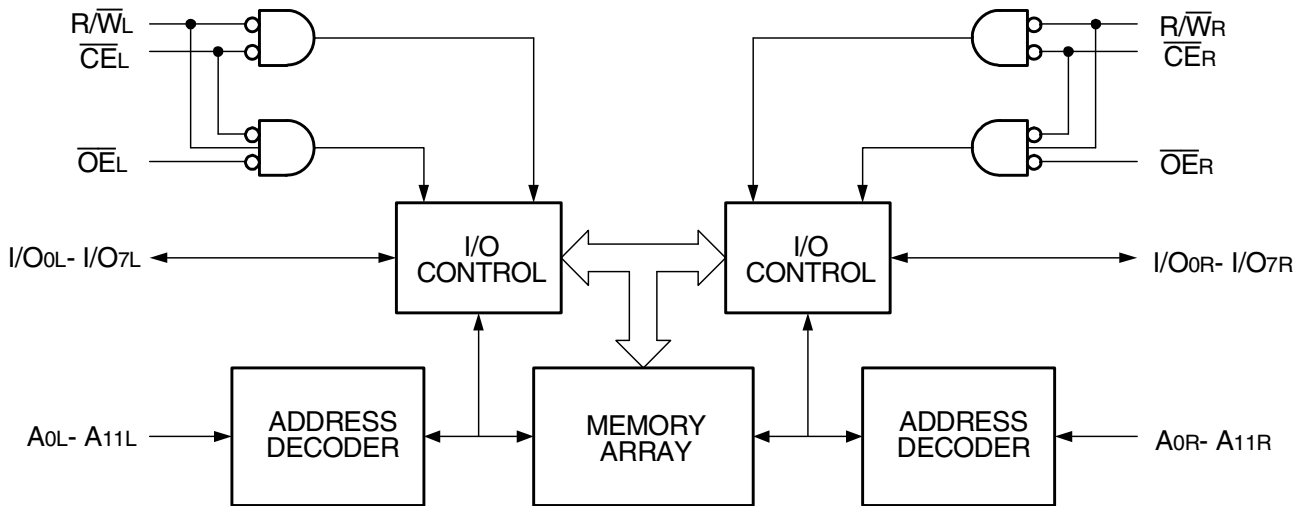


Features

- ◆ High-speed access
 - Commercial: 20/55ns (max.)
 - Industrial: 25ns (max.)
 - Military: 35/45/55/70ns (max.)
- ◆ Low-power operation
 - IDT7134SA
 - Active: 700mW (typ.)
 - Standby: 5mW (typ.)
 - IDT7134LA
 - Active: 700mW (typ.)
 - Standby: 1mW (typ.)
- ◆ Fully asynchronous operation from either port
- ◆ Battery backup operation—2V data retention (LA only)
- ◆ TTL-compatible; single 5V ($\pm 10\%$) power supply
- ◆ Available in 48-pin DIP, LCC, Flatpack and 52-pin PLCC
- ◆ Military product compliant to MIL-PRF-38535 QML
- ◆ Industrial temperature range (-40°C to $+85^{\circ}\text{C}$) is available for selected speeds
- ◆ Green parts available, see ordering information

Functional Block Diagram



2720 drw 01

Description

The IDT7134 is a high-speed 4K x 8 Dual-Port Static RAM designed to be used in systems where on-chip hardware port arbitration is not needed. This part lends itself to those systems which cannot tolerate wait states or are designed to be able to externally arbitrate or withstand contention when both sides simultaneously access the same Dual-Port RAM location.

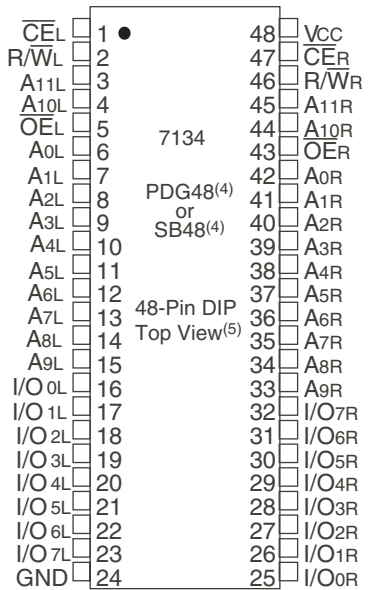
The IDT7134 provides two independent ports with separate control, address, and I/O pins that permit independent, asynchronous access for reads or writes to any location in memory. It is the user's responsibility to ensure data integrity when simultaneously accessing the same memory location from both ports. An automatic power down feature,

controlled by \overline{CE} , permits the on-chip circuitry of each port to enter a very low standby power mode.

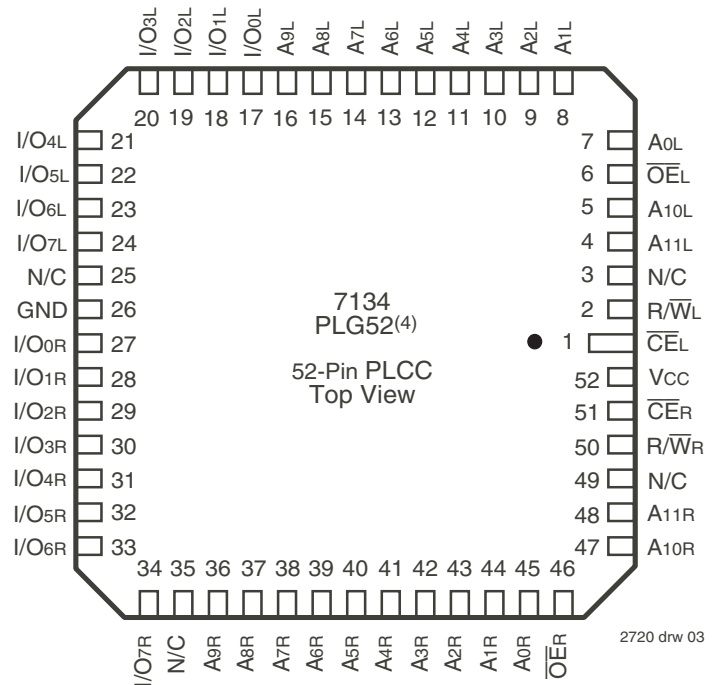
Fabricated using CMOS high-performance technology, these Dual-Ports typically operate on only 700mW of power. Low-power (LA) versions offer battery backup data retention capability, with each port typically consuming 200 μ W from a 2V battery.

The IDT7134 is packaged in either a sidebraze or plastic 48-pin DIP, 48-pin LCC, 52-pin PLCC and 48-pin Flatpack. Military grade product is manufactured in compliance with MIL-PRF-38535 QML, making it ideally suited to military temperature applications demanding the highest level of performance and reliability.

Pin Configurations^(1,2,3)



2720 drw 02a

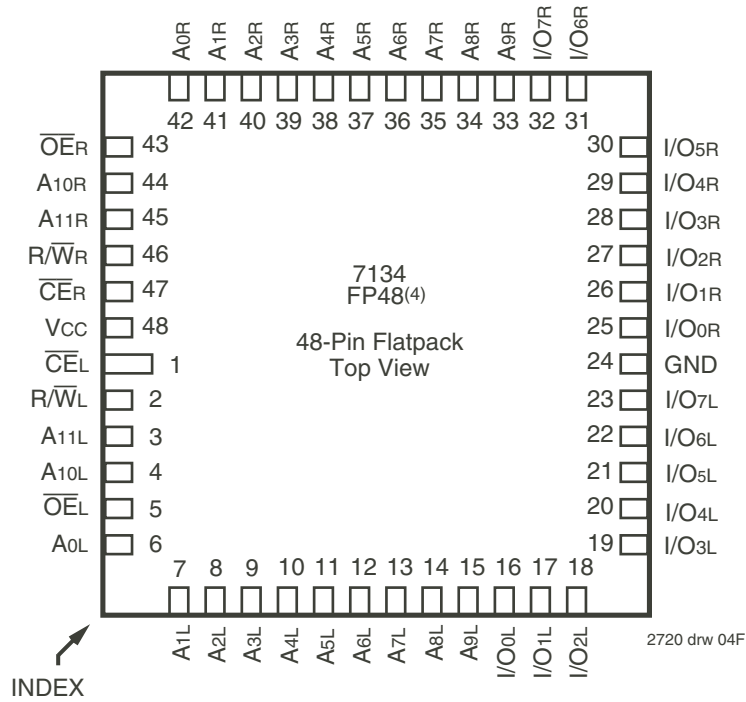


2720 drw 03

NOTES:

1. All Vcc pins must be connected to the power supply.
2. All GND pins must be connected to the ground supply.
3. PDG48 package body is approximately .55 in x 2.43 in x .18 in.
SB48 package body is approximately .62 in x 2.43 in x .15 in.
PLG52 package body is approximately .75 in x .75 in x .17 in.
4. This package code is used to reference the package diagram.
5. This text does not indicate orientation of actual part-marking.

Pin Configurations ^(1,2,3)(con't.)



INDEX

2720 drw 04F

7134
LC48(4)
48-Pin LCC
Top View

2720 drw 04L

NOTES:

1. All Vcc pins must be connected to the power supply.
2. All GND pins must be connected to the ground supply.
3. LC48 package body is approximately .57 in x .57 in x .68 in.
FP48 package body is approximately .75 in x .75 in x .11 in.
4. This package code is used to reference the package diagram.

Absolute Maximum Ratings⁽¹⁾

| Symbol | Rating | Commercial & Industrial | Military | Unit |
|----------------------------------|--------------------------------------|-------------------------|--------------|------|
| V _{TERM} ⁽²⁾ | Terminal Voltage with Respect to GND | -0.5 to +7.0 | -0.5 to +7.0 | V |
| T _{BIAS} | Temperature Under Bias | -55 to +125 | -65 to +135 | °C |
| T _{STG} | Storage Temperature | -65 to +150 | -65 to +150 | °C |
| P _T ⁽³⁾ | Power Dissipation | 1.5 | 1.5 | W |
| I _{OUT} | DC Output Current | 50 | 50 | mA |

2720 tbl 01

NOTES:

- Stresses greater than those listed under ABSOLUTE MAXIMUM RATINGS may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect reliability.
- V_{TERM} must not exceed V_{CC} + 10% for more than 25% of the cycle time or 10 ns maximum, and is limited to ≤ 20mA for the period of V_{TERM} ≥ V_{CC} + 10%.
- V_{TERM} = 5.5V.

Capacitance⁽¹⁾ (T_A = +25°C, f = 1.0MHz)

| Symbol | Parameter | Conditions ⁽²⁾ | Max. | Unit |
|------------------|--------------------|---------------------------|------|------|
| C _{IN} | Input Capacitance | V _{IN} = 3dV | 11 | pF |
| C _{OUT} | Output Capacitance | V _{OUT} = 3dV | 11 | pF |

2720 tbl 02

NOTES:

- This parameter is determined by device characterization but is not production tested.
- 3dV references the interpolated capacitance when the input and output signals switch from 0V to 3V and from 3V to 0V.

DC Electrical Characteristics Over the Operating Temperature and Supply Voltage Range (V_{CC} = 5V ± 10%)

| Symbol | Parameter | Test Conditions | 7134SA | | 7134LA | | Unit |
|-----------------|--------------------------------------|--|--------|------|--------|------|------|
| | | | Min. | Max. | Min. | Max. | |
| I _L | Input Leakage Current ⁽¹⁾ | V _{CC} = 5.5V, V _{IN} = 0V to V _{CC} | — | 10 | — | 5 | μA |
| I _{LO} | Output Leakage Current | \overline{CE} - V _{IH} , V _{OUT} = 0V to V _{CC} | — | 10 | — | 5 | μA |
| V _{OL} | Output Low Voltage | I _{OL} = 6mA | — | 0.4 | — | 0.4 | V |
| | | I _{OL} = 8mA | — | 0.5 | — | 0.5 | V |
| V _{OH} | Output High Voltage | I _{OH} = -4mA | 2.4 | — | 2.4 | — | V |

2720 tbl 05

NOTES:

- At V_{CC} ≤ 2.0V input leakages are undefined.

Recommended Operating Temperature and Supply Voltage^(1,2)

| Grade | Ambient Temperature | GND | V _{CC} |
|------------|---------------------|-----|-----------------|
| Military | -55°C to +125°C | 0V | 5.0V ± 10% |
| Commercial | 0°C to +70°C | 0V | 5.0V ± 10% |
| Industrial | -40°C to +85°C | 0V | 5.0V ± 10% |

2720 tbl 03

NOTES:

- This is the parameter T_A. This is the "instant on" case temperature.

Recommended DC Operating Conditions

| Symbol | Parameter | Min. | Typ. | Max. | Unit |
|-----------------|--------------------|---------------------|------|--------------------|------|
| V _{CC} | Supply Voltage | 4.5 | 5.0 | 5.5 | V |
| GND | Ground | 0 | 0 | 0 | V |
| V _{IH} | Input High Voltage | 2.2 | — | 6.0 ⁽²⁾ | V |
| V _{IL} | Input Low Voltage | -0.5 ⁽¹⁾ | — | 0.8 | V |

2720 tbl 04

NOTES:

- V_{IL} (min.) ≥ -1.5V for pulse width less than 10ns.
- V_{TERM} must not exceed V_{CC} + 10%.

DC Electrical Characteristics Over the Operating Temperature and Supply Voltage Range^(1,2) ($V_{CC} = 5.0V \pm 10\%$)

| Symbol | Parameter | Test Condition | Version | | 7134X20 Com'l Only | | 7134X25 Com'l & Ind | | 7134X35 Com'l & Military | | Unit |
|------------------|---|--|-----------|----|-----------------------|------|------------------------|------|--------------------------------|------|------|
| | | | | | Typ. | Max. | Typ. | Max. | Typ. | Max. | |
| I _{CC} | Dynamic Operating Current (Both Ports Active) | $\overline{CE} = V_{IL}$ Outputs Disabled $f = f_{MAX}^{(3)}$ | COM'L | SA | 170 | 280 | 160 | 280 | 150 | 260 | mA |
| | | | | LA | 170 | 240 | 160 | 220 | 150 | 210 | |
| I _{SB1} | Standby Current (Both Ports - TTL Level Inputs) | \overline{CE}_L and $\overline{CE}_R = V_{IH}$ $f = f_{MAX}^{(3)}$ | COM'L | SA | 25 | 100 | 25 | 80 | 25 | 75 | mA |
| | | | | LA | 25 | 80 | 25 | 50 | 25 | 45 | |
| I _{SB2} | Standby Current (One Port - TTL Level Inputs) | $\overline{CE}^A = V_{IL}$ and $\overline{CE}^B = V_{IH}$ Active Port Outputs Disabled, $f = f_{MAX}^{(3)}$ | COM'L | SA | 105 | 180 | 95 | 180 | 85 | 170 | mA |
| | | | | LA | 105 | 150 | 95 | 140 | 85 | 130 | |
| I _{SB3} | Full Standby Current (Both Ports - CMOS Level Inputs) | Both Ports \overline{CE}_L and $\overline{CE}_R \geq V_{CC} - 0.2V$ $V_{IN} \geq V_{CC} - 0.2V$ or $V_{IN} \leq 0.2V$, $f = 0^{(3)}$ | COM'L | SA | 1.0 | 15 | 1.0 | 15 | 1.0 | 15 | mA |
| | | | | LA | 0.2 | 4.5 | 0.2 | 4.0 | 0.2 | 4.0 | |
| I _{SB4} | Full Standby Current (One Port - CMOS Level Inputs) | One Port \overline{CE}^A or $\overline{CE}^B \geq V_{CC} - 0.2V$ $V_{IN} \geq V_{CC} - 0.2V$ or $V_{IN} \leq 0.2V$ Active Port Outputs Disabled, $f = f_{MAX}^{(3)}$ | COM'L | SA | 105 | 170 | 95 | 170 | 85 | 160 | mA |
| | | | | LA | 105 | 130 | 95 | 120 | 85 | 110 | |
| | | | MIL & IND | SA | — | — | 160 | 310 | 150 | 300 | |
| | | | | LA | — | — | 160 | 260 | 150 | 250 | |
| | | | MIL & IND | SA | — | — | 25 | 100 | 25 | 75 | |
| | | | | LA | — | — | 25 | 80 | 25 | 55 | |
| | | | MIL & IND | SA | — | — | 95 | 210 | 85 | 200 | |
| | | | | LA | — | — | 95 | 170 | 85 | 160 | |
| | | | MIL & IND | SA | — | — | 1.0 | 30 | 1.0 | 30 | |
| | | | | LA | — | — | 0.2 | 10 | 0.2 | 10 | |
| | | | MIL & IND | SA | — | — | 75 | 160 | 75 | 160 | |
| | | | | LA | — | — | 75 | 130 | 75 | 130 | |
| | | | MIL & IND | SA | — | — | 75 | 190 | 75 | 180 | |
| | | | | LA | — | — | 75 | 150 | 75 | 150 | |
| | | | MIL & IND | SA | — | — | 1.0 | 30 | 1.0 | 30 | |
| | | | | LA | — | — | 0.2 | 10 | 0.2 | 10 | |
| | | | MIL & IND | SA | — | — | 75 | 150 | 75 | 150 | |
| | | | | LA | — | — | 75 | 100 | 75 | 100 | |
| | | | MIL & IND | SA | — | — | 75 | 180 | 75 | 170 | |
| | | | | LA | — | — | 75 | 120 | 75 | 120 | |

2720 tbl 06a

| Symbol | Parameter | Test Condition | Version | | 7134X45 Com'l & Military | | 7134X55 Com'l, Ind & Military | | 7134X70 Com'l & Military | | Unit |
|------------------|---|--|-----------|----|-----------------------------|------|-------------------------------------|------|-----------------------------|------|------|
| | | | | | Typ. | Max. | Typ. | Max. | Typ. | Max. | |
| I _{CC} | Dynamic Operating Current (Both Ports Active) | $\overline{CE} = V_{IL}$ Outputs Disabled $f = f_{MAX}^{(3)}$ | COM'L | SA | 140 | 240 | 140 | 240 | 140 | 240 | mA |
| | | | | LA | 140 | 200 | 140 | 200 | 140 | 200 | |
| I _{SB1} | Standby Current (Both Ports - TTL Level Inputs) | \overline{CE}_L and $\overline{CE}_R = V_{IH}$ $f = f_{MAX}^{(3)}$ | COM'L | SA | 25 | 70 | 25 | 70 | 25 | 70 | mA |
| | | | | LA | 25 | 40 | 25 | 40 | 25 | 40 | |
| I _{SB2} | Standby Current (One Port - TTL Level Inputs) | $\overline{CE}^A = V_{IL}$ and $\overline{CE}^B = V_{IH}$ Active Port Outputs Disabled, $f = f_{MAX}^{(3)}$ | COM'L | SA | 75 | 160 | 75 | 160 | 75 | 160 | mA |
| | | | | LA | 75 | 130 | 75 | 130 | 75 | 130 | |
| I _{SB3} | Full Standby Current (Both Ports - CMOS Level Inputs) | Both Ports \overline{CE}_L and $\overline{CE}_R \geq V_{CC} - 0.2V$ $V_{IN} \geq V_{CC} - 0.2V$ or $V_{IN} \leq 0.2V$, $f = 0^{(3)}$ | COM'L | SA | 1.0 | 15 | 1.0 | 15 | 1.0 | 15 | mA |
| | | | | LA | 0.2 | 4.0 | 0.2 | 4.0 | 0.2 | 4.0 | |
| I _{SB4} | Full Standby Current (One Port - CMOS Level Inputs) | One Port \overline{CE}^A or $\overline{CE}^B \geq V_{CC} - 0.2V$ $V_{IN} \geq V_{CC} - 0.2V$ or $V_{IN} \leq 0.2V$ Active Port Outputs Disabled, $f = f_{MAX}^{(3)}$ | COM'L | SA | 75 | 150 | 75 | 150 | 75 | 150 | mA |
| | | | | LA | 75 | 100 | 75 | 100 | 75 | 100 | |
| | | | MIL & IND | SA | 140 | 280 | 140 | 270 | 140 | 270 | |
| | | | | LA | 140 | 240 | 140 | 220 | 140 | 220 | |
| | | | MIL & IND | SA | 25 | 70 | 25 | 70 | 25 | 70 | |
| | | | | LA | 25 | 40 | 25 | 40 | 25 | 40 | |
| | | | MIL & IND | SA | 25 | 70 | 25 | 70 | 25 | 70 | |
| | | | | LA | 25 | 50 | 25 | 50 | 25 | 50 | |
| | | | MIL & IND | SA | 75 | 160 | 75 | 160 | 75 | 160 | |
| | | | | LA | 75 | 130 | 75 | 130 | 75 | 130 | |
| | | | MIL & IND | SA | 75 | 190 | 75 | 180 | 75 | 180 | |
| | | | | LA | 75 | 150 | 75 | 150 | 75 | 150 | |
| | | | MIL & IND | SA | 1.0 | 30 | 1.0 | 30 | 1.0 | 30 | |
| | | | | LA | 0.2 | 10 | 0.2 | 10 | 0.2 | 10 | |
| | | | MIL & IND | SA | 75 | 150 | 75 | 150 | 75 | 150 | |
| | | | | LA | 75 | 100 | 75 | 100 | 75 | 100 | |
| | | | MIL & IND | SA | 75 | 180 | 75 | 170 | 75 | 170 | |
| | | | | LA | 75 | 120 | 75 | 120 | 75 | 120 | |

2720 tbl 06b

NOTES:

- 'X' in part number indicates power rating (SA or LA).
- $V_{CC} = 5V$, $T_A = +25^\circ C$ for typical, and parameters are not production tested.
- $f_{MAX} = 1/Trc =$ All inputs cycling at $f = 1/Trc$ (except Output Enable). $f = 0$ means no address or control lines change. Applies only to inputs at CMOS level standby I_{SB3}.

Data Retention Characteristics Over All Temperature Ranges

(LA Version Only) $V_{LC} = 0.2V$, $V_{HC} = V_{CC} - 0.2V$

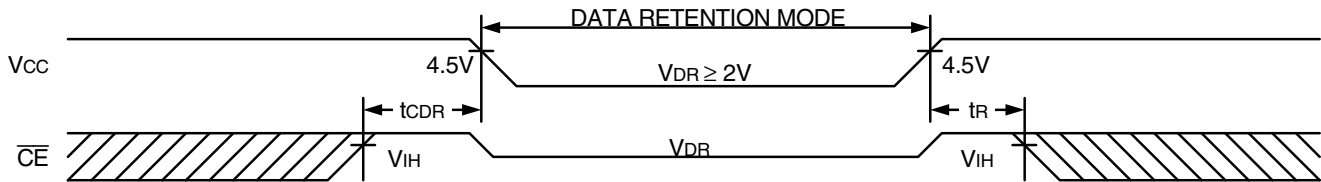
| Symbol | Parameter | Test Condition | Min. | Typ. ⁽¹⁾ | Max. | Unit |
|---------------------------------|--------------------------------------|--|--------------------------------|---------------------|------|------|
| V _{DR} | V _{CC} for Data Retention | V _{CC} = 2V | 2.0 | — | — | V |
| I _{CCDR} | Data Retention Current | $\overline{CE} \geq V_{HC}$ $V_{IN} \geq V_{HC}$ or $\leq V_{LC}$ | MIL. & IND. — | 100 | 4000 | μA |
| | | | COM'L. — | 100 | 1500 | |
| t _{CDR} ⁽³⁾ | Chip Deselect to Data Retention Time | | 0 | — | — | ns |
| t _R ⁽³⁾ | Operation Recovery Time | | t _{RC} ⁽²⁾ | — | — | ns |

2720 tbl 07

NOTES:

- V_{CC} = 2V, T_A = +25°C, and are not production tested.
- t_{RC} = Read Cycle Time.
- This parameter is guaranteed by device characterization, but not production tested.

Data Retention Waveform



2720 drw 05

AC Test Conditions

| | |
|-------------------------------|-----------------|
| Input Pulse Levels | GND to 3.0V |
| Input Rise/Fall Times | 5ns |
| Input Timing Reference Levels | 1.5V |
| Output Reference Levels | 1.5V |
| Output Load | Figures 1 and 2 |

2720 tbl 08

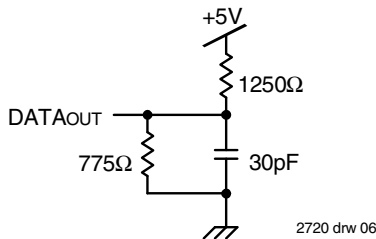


Figure 1. AC Output Test Load

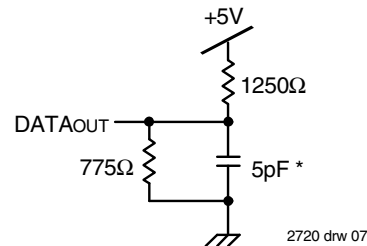


Figure 2. Output Test Load
(for t_{LZ}, t_{HZ}, t_{wz}, t_{ow})
*Including scope and jig

AC Electrical Characteristics Over the Operating Temperature and Supply Voltage⁽³⁾

| Symbol | Parameter | 7134X20 Com'l Only | | 7134X25 Com'l & Ind | | 7134X35 Com'l & Military | | Unit |
|-------------------|--|-----------------------|------|------------------------|------|--------------------------------|------|------|
| | | Min. | Max. | Min. | Max. | Min. | Max. | |
| READ CYCLE | | | | | | | | |
| t _{RC} | Read Cycle Time | 20 | — | 25 | — | 35 | — | ns |
| t _{AA} | Address Access Time | — | 20 | — | 25 | — | 35 | ns |
| t _{ACE} | Chip Enable Access Time | — | 20 | — | 25 | — | 35 | ns |
| t _{AOE} | Output Enable Access Time | — | 15 | — | 15 | — | 20 | ns |
| t _{OH} | Output Hold from Address Change | 0 | — | 0 | — | 0 | — | ns |
| t _{LZ} | Output Low-Z Time ^(1,2) | 0 | — | 0 | — | 0 | — | ns |
| t _{HZ} | Output High-Z Time ^(1,2) | — | 15 | — | 15 | — | 20 | ns |
| t _{PU} | Chip Enable to Power Up Time ⁽²⁾ | 0 | — | 0 | — | 0 | — | ns |
| t _{PD} | Chip Disable to Power Down Time ⁽²⁾ | — | 20 | — | 25 | — | 35 | ns |

2720 tbl 09a

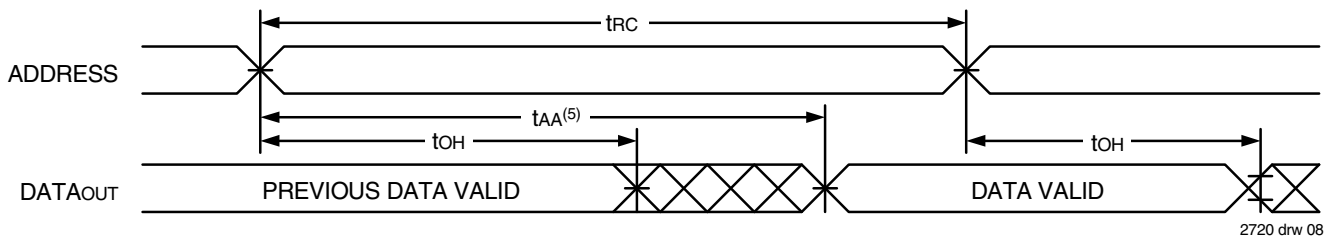
| Symbol | Parameter | 7134X45 Com'l & Military | | 7134X55 Com'l, Ind & Military | | 7134X70 Com'l & Military | | Unit |
|-------------------|--|--------------------------------|------|-------------------------------------|------|--------------------------------|------|------|
| | | Min. | Max. | Min. | Max. | Min. | Max. | |
| READ CYCLE | | | | | | | | |
| t _{RC} | Read Cycle Time | 45 | — | 55 | — | 70 | — | ns |
| t _{AA} | Address Access Time | — | 45 | — | 55 | — | 70 | ns |
| t _{ACE} | Chip Enable Access Time | — | 45 | — | 55 | — | 70 | ns |
| t _{AOE} | Output Enable Access Time | — | 25 | — | 30 | — | 40 | ns |
| t _{OH} | Output Hold from Address Change | 0 | — | 0 | — | 0 | — | ns |
| t _{LZ} | Output Low-Z Time ^(1,2) | 5 | — | 5 | — | 5 | — | ns |
| t _{HZ} | Output High-Z Time ^(1,2) | — | 20 | — | 25 | — | 30 | ns |
| t _{PU} | Chip Enable to Power Up Time ⁽²⁾ | 0 | — | 0 | — | 0 | — | ns |
| t _{PD} | Chip Disable to Power Down Time ⁽²⁾ | — | 45 | — | 50 | — | 50 | ns |

2720 tbl 09b

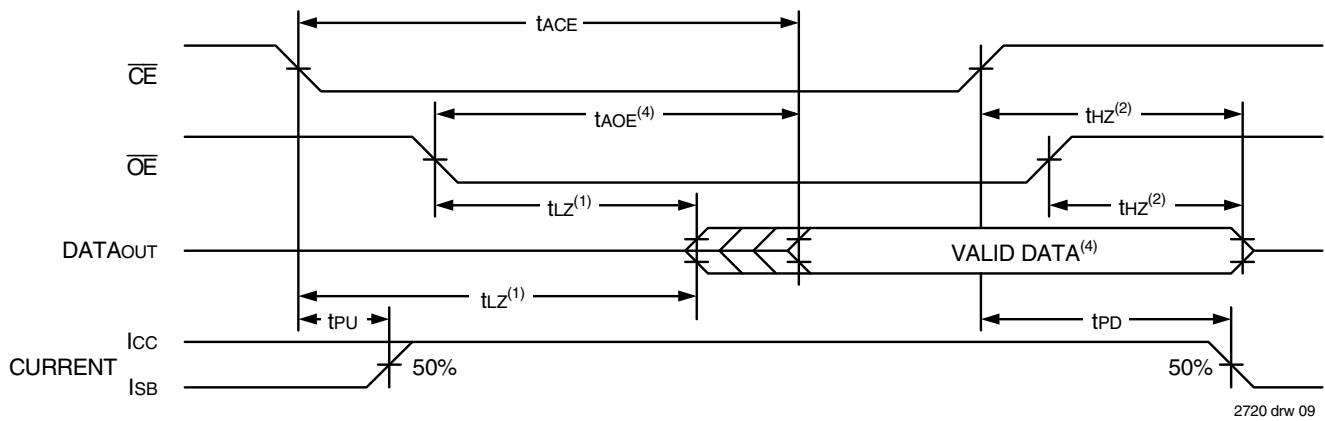
NOTES:

1. Transition is measured 0mV from Low or High-impedance voltage with the Output Test Load (Figure 2).
2. This parameter is guaranteed by device characterization, but is not production tested.
3. 'X' in part number indicates power rating (SA or LA).

Timing Waveform of Read Cycle No. 1, Either Side^(1,2,4)



Timing Waveform of Read Cycle No. 2, Either Side^(1,3)



NOTES:

1. Timing depends on which signal is asserted last, \overline{OE} or \overline{CE} .
2. Timing depends on which signal is de-asserted first, \overline{OE} or \overline{CE} .
3. $R/\overline{W} = V_{IH}$.
4. Start of valid data depends on which timing becomes effective, t_{AOE} , t_{ACE} or t_{AA} .
5. t_{AA} for RAM Address Access and t_{SAA} for Semaphore Address Access.

AC Electrical Characteristics Over the
Operating Temperature and Supply Voltage⁽⁵⁾

| Symbol | Parameter | 7134X20 Com'l Only | | 7134X25 Com'l & Ind | | 7134X35 Com'l & Military | | Unit |
|--------------------|--|-----------------------|------|------------------------|------|--------------------------------|------|------|
| | | Min. | Max. | Min. | Max. | Min. | Max. | |
| WRITE CYCLE | | | | | | | | |
| t _{WC} | Write Cycle Time | 20 | — | 25 | — | 35 | — | ns |
| t _{EW} | Chip Enable to End-of-Write | 15 | — | 20 | — | 30 | — | ns |
| t _{AW} | Address Valid to End-of-Write | 15 | — | 20 | — | 30 | — | ns |
| t _{AS} | Address Set-up Time | 0 | — | 0 | — | 0 | — | ns |
| t _{WP} | Write Pulse Width | 15 | — | 20 | — | 25 | — | ns |
| t _{WR} | Write Recovery Time | 0 | — | 0 | — | 0 | — | ns |
| t _{DW} | Data Valid to End-of-Write | 15 | — | 15 | — | 20 | — | ns |
| t _{HZ} | Output High-Z Time ^(1,2) | — | 15 | — | 15 | — | 20 | ns |
| t _{DH} | Data Hold Time ⁽³⁾ | 0 | — | 0 | — | 3 | — | ns |
| t _{WZ} | Write Enable to Output in High-Z ^(1,2) | — | 15 | — | 15 | — | 20 | ns |
| t _{OW} | Output Active from End-of-Write ^(1,2,3) | 3 | — | 3 | — | 3 | — | ns |
| t _{WDD} | Write Pulse to Data Delay ⁽⁴⁾ | — | 40 | — | 50 | — | 60 | ns |
| t _{DDD} | Write Data Valid to Read Data Delay ⁽⁴⁾ | — | 30 | — | 30 | — | 35 | ns |

2720 tbl 10a

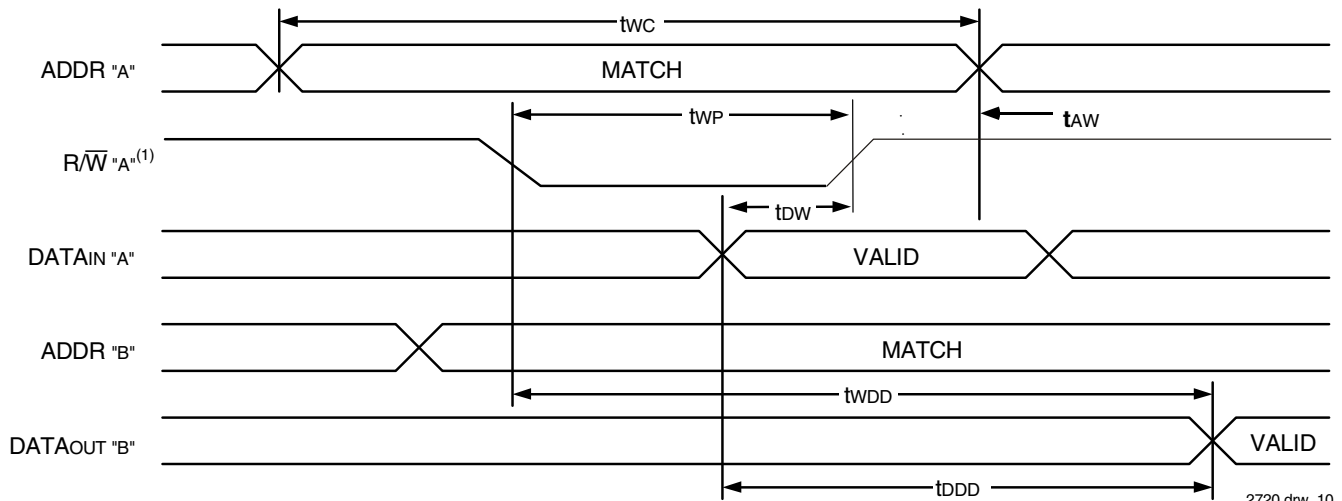
| Symbol | Parameter | 7134X45 Com'l & Military | | 7134X55 Com'l, Ind & Military | | 7134X70 Com'l & Military | | Unit |
|--------------------|--|--------------------------------|------|-------------------------------------|------|--------------------------------|------|------|
| | | Min. | Max. | Min. | Max. | Min. | Max. | |
| WRITE CYCLE | | | | | | | | |
| t _{WC} | Write Cycle Time | 45 | — | 55 | — | 70 | — | ns |
| t _{EW} | Chip Enable to End-of-Write | 40 | — | 50 | — | 60 | — | ns |
| t _{AW} | Address Valid to End-of-Write | 40 | — | 50 | — | 60 | — | ns |
| t _{AS} | Address Set-up Time | 0 | — | 0 | — | 0 | — | ns |
| t _{WP} | Write Pulse Width | 40 | — | 50 | — | 60 | — | ns |
| t _{WR} | Write Recovery Time | 0 | — | 0 | — | 0 | — | ns |
| t _{DW} | Data Valid to End-of-Write | 20 | — | 25 | — | 30 | — | ns |
| t _{HZ} | Output High-Z Time ^(1,2) | — | 20 | — | 25 | — | 30 | ns |
| t _{DH} | Data Hold Time ⁽³⁾ | 3 | — | 3 | — | 3 | — | ns |
| t _{WZ} | Write Enable to Output in High-Z ^(1,2) | — | 20 | — | 25 | — | 30 | ns |
| t _{OW} | Output Active from End-of-Write ^(1,2,3) | 3 | — | 3 | — | 3 | — | ns |
| t _{WDD} | Write Pulse to Data Delay ⁽⁴⁾ | — | 70 | — | 80 | — | 90 | ns |
| t _{DDD} | Write Data Valid to Read Data Delay ⁽⁴⁾ | — | 45 | — | 55 | — | 70 | ns |

2720 tbl 10b

NOTES:

1. Transition is measured 0mV from Low or High-impedance voltage with Output Test Load (Figure 2).
2. This parameter is guaranteed by device characterization, but is not production tested.
3. The specification for t_{DH} must be met by the device supplying write data to the RAM under all operating conditions. Although t_{DH} and t_{OW} values will vary over voltage and temperature, the actual t_{DH} will always be smaller than the actual t_{OW}.
4. Port-to-port delay through RAM cells from writing port to reading port, refer to "Timing Waveform of Write with Port-to-Port Read".
5. 'X' in part number indicates power rating (SA or LA).

Timing Waveform of Write with Port-to-Port Read^(1,2,3)

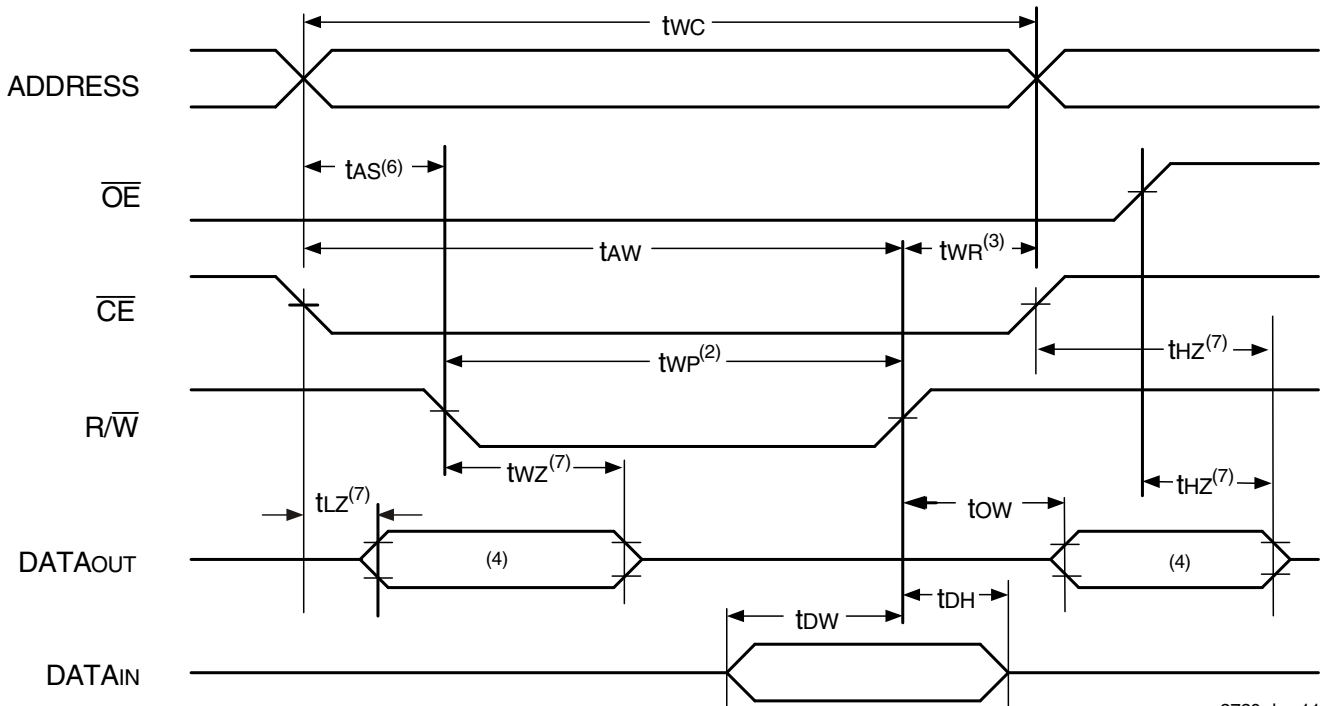


NOTES:

1. Write cycle parameters should be adhered to, in order to ensure proper writing.
2. $\overline{CE}_L = \overline{CE}_R = V_{IL}$, $\overline{OE}_B = V_{IL}$.
3. Port "A" may be either left or right port. Port "B" is the opposite from port "A".

2720 drw 10

Timing Waveform of Write Cycle No. 1, R/\overline{W} Controlled Timing^(1,5,8)

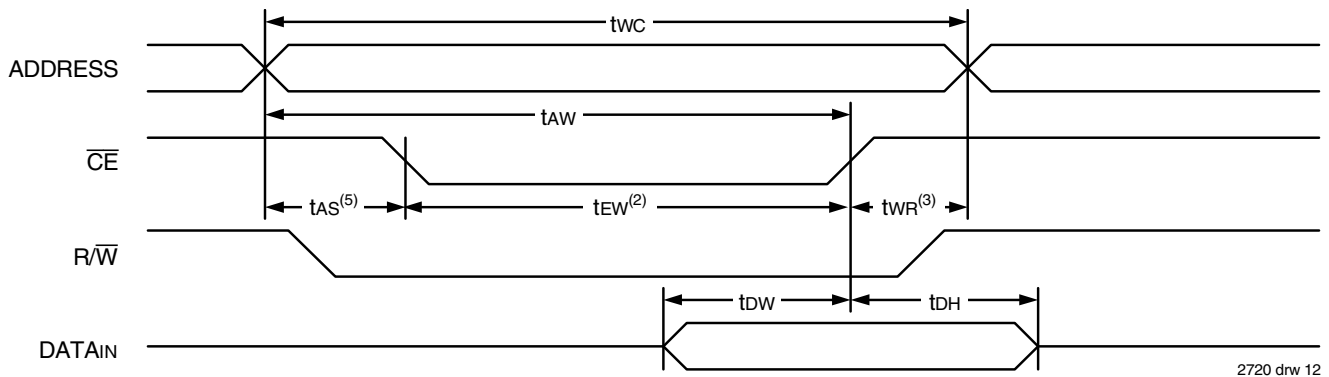


NOTES:

1. R/\overline{W} or \overline{CE} must be HIGH during all address transitions.
2. A write occurs during the overlap (t_{EW} or t_{WP}) of a $\overline{CE} = V_{IL}$ and $R/\overline{W} = V_{IL}$.
3. t_{WR} is measured from the earlier of \overline{CE} or R/\overline{W} going to V_{IH} to the end-of-write cycle.
4. During this period, the I/O pins are in the output state, and input signals must not be applied.
5. If the $\overline{CE} = V_{IL}$ transition occurs simultaneously with or after the $R/\overline{W} = V_{IL}$ transition, the outputs remain in the High-impedance state.
6. Timing depends on which enable signal (\overline{CE} or R/\overline{W}) is asserted last.
7. This parameter is guaranteed by device characterization, but is not production tested. Transition is measured 0mV from steady state with the Output Test Load (Figure 2).
8. If $\overline{OE} = V_{IL}$ during a R/\overline{W} controlled write cycle, the write pulse width must be the larger of t_{WP} or $(t_{WZ} + t_{OW})$ to allow the I/O drivers to turn off data to be placed on the bus for the required t_{OW} . If $\overline{OE} = V_{IH}$ during an R/\overline{W} controlled write cycle, this requirement does not apply and the write pulse can be as short as the specified t_{WP} .

2720 drw 11

Timing Waveform of Write Cycle No. 2, $\overline{\text{CE}}$ Controlled Timing^(1,4)



2720 drw 12

NOTES:

1. R/W or $\overline{\text{CE}}$ must be HIGH during all address transitions.
2. A write occurs during the overlap (tew or twp) of a $\overline{\text{CE}} = \text{VIL}$ and R/W = VIL.
3. twr is measured from the earlier of $\overline{\text{CE}}$ or R/W going HIGH to the end-of-write cycle.
4. If the $\overline{\text{CE}}$ LOW transition occurs simultaneously with or after the R/W LOW transition, the outputs remain in the High-impedance state.
5. Timing depends on which enable signal ($\overline{\text{CE}}$ or R/W) is asserted last.

Functional Description

The IDT7134 provides two ports with separate control, address, and I/O pins that permit independent access for reads or writes to any location in memory. These devices have an automatic power down feature controlled by $\overline{\text{CE}}$. The $\overline{\text{CE}}$ controls on-chip power down circuitry that permits the respective port to go into standby mode when not selected ($\overline{\text{CE}}$ HIGH). When a port is enabled, access to the entire memory array is permitted. Each port has its own Output Enable control ($\overline{\text{OE}}$). In the read mode, the port's $\overline{\text{OE}}$ turns on the output drivers when set LOW. Non-contention READ/WRITE conditions are illustrated in Truth Table I.

Truth Table I – Read/Write Control

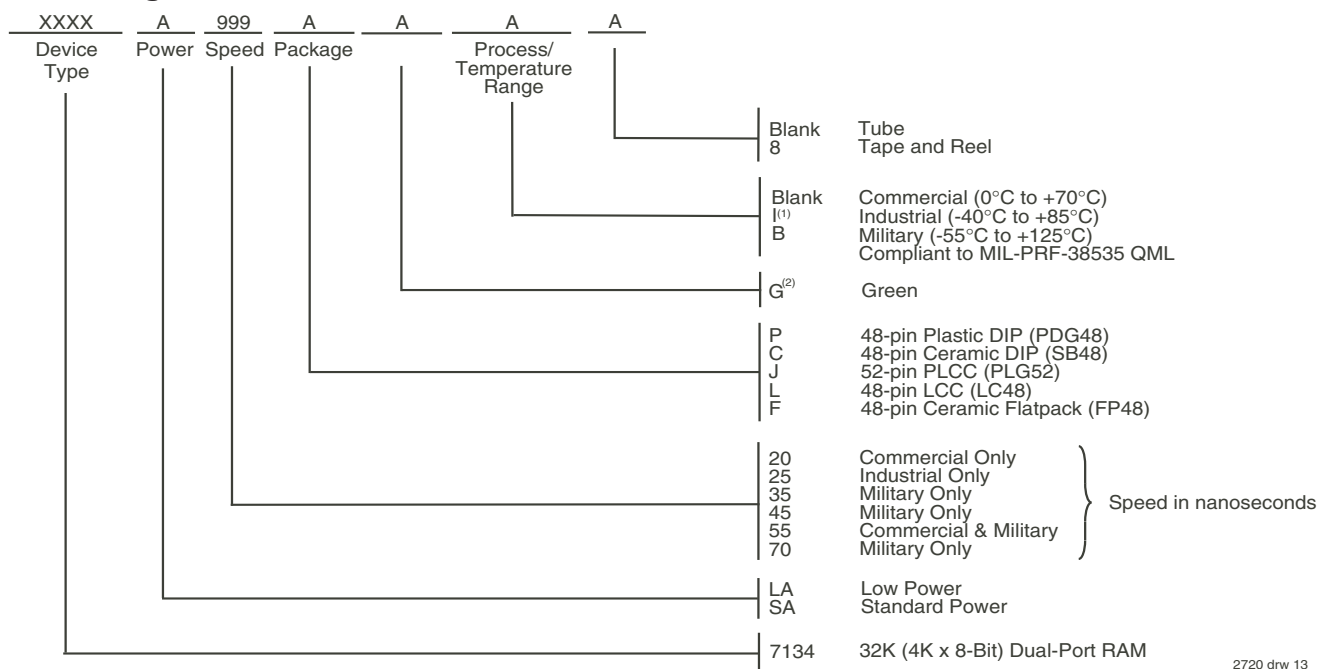
| Left or Right Port ⁽¹⁾ | | | | |
|-----------------------------------|------------------------|------------------------|---------|---|
| R/W | $\overline{\text{CE}}$ | $\overline{\text{OE}}$ | D0-7 | Function |
| X | H | X | Z | Port Deselected and in Power-Down Mode, ISB2 or ISB4 |
| X | H | X | Z | $\overline{\text{CE}}_{\text{R}} = \overline{\text{CE}}_{\text{L}} = \text{H}$, Power Down Mode ISB1 or ISB3 |
| L | L | X | DATAin | Data on port written into memory |
| H | L | L | DATAout | Data in memory output on port |
| X | X | H | Z | High impedance outputs |

2720 tbl 11

NOTE:

1. A0L - A11L \neq A0R - A11R
"H" = VIH, "L" = VIL, "X" = Don't Care, and "Z" = High Impedance

Ordering Information



NOTES:

- Contact your local sales office for industrial temp. range for other speeds, packages and powers.
 - Green parts available. For specific speeds, packages and powers contact your local sales office.
- LEAD FINISH (SnPb) parts are Obsolete excluding FP48, LC48 & SB48. Product Discontinuation Notice - PDN# SP-17-02
Note that information regarding recently obsoleted parts are included in this datasheet for customer convenience.

Orderable Part Information

| Speed (ns) | Orderable Part ID | Pkg. Code | Pkg. Type | Temp. Grade |
|------------|-------------------|-----------|-----------|-------------|
| 20 | 7134LA20JG | PLG52 | PLCC | C |
| | 7134LA20JG8 | PLG52 | PLCC | C |
| | 7134LA20PDG | PDG48 | PDIP | C |
| 25 | 7134LA25JGI | PLG52 | PLCC | I |
| | 7134LA25JGI8 | PLG52 | PLCC | I |
| | 7134LA25PDGI | PDG48 | PDIP | I |
| 35 | 7134LA35CB | SB48 | SB | M |
| | 7134LA35FB | FP48 | FPACK | M |
| | 7134LA35L48B | LC48 | LCC | M |
| 45 | 7134LA45CB | SB48 | SB | M |
| 55 | 7134LA55CB | SB48 | SB | M |
| | 7134LA55L48B | LC48 | LCC | M |
| 70 | 7134LA70CB | SB48 | SB | M |
| | 7134LA70L48B | LC48 | LCC | M |

| Speed (ns) | Orderable Part ID | Pkg. Code | Pkg. Type | Temp. Grade |
|------------|-------------------|-----------|-----------|-------------|
| 35 | 7134SA35CB | SB48 | SB | M |
| | 7134SA35L48B | LC48 | LCC | M |
| 45 | 7134SA45CB | SB48 | SB | M |
| 55 | 7134SA55CB | SB48 | SB | M |
| | 7134SA55JG | PLG52 | PLCC | C |
| | 7134SA55JG8 | PLG52 | PLCC | C |
| | 7134SA55L48B | LC48 | LCC | M |
| 70 | 7134SA70CB | SB48 | SB | M |
| | 7134SA70L48B | LC48 | LCC | M |

Datasheet Document History

| | | |
|-----------|------------------|--|
| 03/25/99: | | Initiated datasheet document history Converted to new format Cosmetic and typographical corrections |
| | Pages 2 | Added additional notes to pin configurations |
| 06/09/99: | | Changed drawing format |
| 10/01/99: | | Added Industrial Temperature Ranges and removed corresponding notes |
| 11/10/99: | | Replaced IDT logo |
| 12/22/99: | Page 1 | Made corrections to drawing |
| 03/03/00: | | Corrected block diagram and pin configurations Changed $\pm 500\text{mV}$ to 0mV |
| 01/12/00: | Pages 1 2 | Moved "Description to page 2 and adjusted page layout |
| | Page 1 | Added "LA only)" to paragraph |
| | Page 2 | Fixed P48-1 package description |
| | Page 3 | Increased storage temperature parameters Clarified T _A parameter |
| | Page 4 | DC Electrical parameters—changed wording from "open" to "disabled" |
| | Page 10 | Fixed Truth Table specification in "Functional Description" paragraph |
| 01/17/06: | Page 1 | Added green availability to features |
| | Page 11 | Added green indicator to ordering information |
| | Page 1 & 11 | Replaced old IDT™ with new IDT™ logo |
| 08/12/08: | Page 11 | Corrected typo in the ordering information |
| 10/21/08: | Page 11 | Removed "IDT" from orderable part number |
| 01/16/13: | Page 1, 4, 6 & 8 | Removed Military 25ns & Industrial 35ns speed grades from Features and corrected the headers of the DC Chars and AC Chars tables to indicate this change |
| | Page 11 | Added T & R indicator to and removed Military 25ns & Industrial 35ns speed grades from the ordering information |
| 10/21/08: | Page 11 | Removed "IDT" from orderable part number |
| 02/04/13: | Page 1, 4, 6 & 8 | Removed Military 25ns & Industrial 35ns speed grades from Features and corrected the headers of the DC Chars and AC Chars tables to indicate this change |
| | Page 11 | Added T & R indicator to and removed Military 25ns & Industrial 35ns speed grades from the ordering information |
| | Page 2 | Typo/correction |
| 01/11/18: | | Product Discontinuation Notice - PDN# SP-17-02 Last time buy expires June 15, 2018 |
| 05/10/21: | Pages 1 - 14 | Rebranded as Renesas datasheet |
| | Page 2 & 3 | Rotated LC48 LCC, FP48 Flatpack & PLG52 PLCC to accurately reflect pin 1 orientation |
| | Page 2, 3 & 12 | Updated package codes |
| | Page 12 | Added Orderable Part Information tables |

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