Introduction

As the world leader in logic, Texas Instruments (TI) offers a full spectrum of logic functions and technologies that range from the mature bipolar and bipolar complementary metal-oxide semiconductor (BiCMOS) families to the latest advanced-CMOS families. TI offers process technologies with the logic performance and features needed in today’s electronic markets while maintaining support for traditional logic products.

TI’s product offerings include the following process technologies or device families:

- AC, ACT, AHC, AHCT, ALVC, AUC, AUP, AVC, FCT, HC, HCT, LV-A, LV-AT, LVC, TVC
- ABT, ABTE, ALB, ALVT, BCT, HSTL, LVT, LV1T, LV4T
- FB, VME
- ALS, AS, F, LS, S, TTL

Today’s applications are evolving with greater functionality and smaller size. TI’s goal is to help designers easily find the ideal logic technology or function they need. Logic families are offered at every price/performance node along with benchmark delivery, reliability, and worldwide support. TI maintains a firm commitment to remain in the market with both leading-edge and mature logic lines.

Logic suppliers have historically focused on speed and low power as the priorities for product family improvement. As shown below, improved performance is offered by many new TI product technologies such as AUC (1.8 V) and ALVC (3.3 V) depending on operating voltage requirements. Other technologies such as AUP focus on delivering “best-in-class” low-power performance.

Data sheets can be downloaded from the TI Web site at www.ti.com or ordered through your local sales office or TI authorized distributor. (See back cover.)
Logic Overview
World of TI Logic

Some logic families have been in the marketplace for years, the oldest is well into its fifth decade. The following section gives the logic user a visual guide to the technology families that are available and their optimal voltage levels.

<table>
<thead>
<tr>
<th>Logic Family</th>
<th>Voltage Levels</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.8-V Logic</td>
<td>AUC, AUP</td>
</tr>
<tr>
<td>1.2-V Logic</td>
<td>AUC, AUP, AVC</td>
</tr>
<tr>
<td>1.5-V Logic</td>
<td>AUC, AUP, AVC</td>
</tr>
<tr>
<td>1.8-V Logic</td>
<td>ALVC, AUC, AUP, AVC, LVC, LV1T</td>
</tr>
<tr>
<td>2.5-V Logic</td>
<td>ALVC, ALVT, AUC, AUP, AVC, LV, LV1T, LV-A, LVC</td>
</tr>
<tr>
<td>3.3-V Logic</td>
<td>AC, AHC, ALB, ALVC, ALVT, AUP, AVC, LV, LV-A, LVC, LV1T, AUP1T</td>
</tr>
<tr>
<td>5-V Logic</td>
<td>ABT, AC/ACT, AHC, AHCT, ALS, AS, BCT, F, LV, LV1T, LV-A, LS, S, TTL, CD4000, FCT2</td>
</tr>
<tr>
<td>5-V+ Logic</td>
<td>CD4000</td>
</tr>
</tbody>
</table>
Logic Overview
IC Basics: Comparison of Switching Standards

Shown below are the switching input/output comparison table and graphic that illustrate $V_{IH}$ and $V_{IL}$, which are the minimum switching levels for guaranteed operation. $V_t$ is the approximate switching level and the $V_{OH}$ and $V_{OL}$ levels are the guaranteed outputs for the $V_{CC}$ specified.

<table>
<thead>
<tr>
<th>D</th>
<th>5 TTL</th>
<th>5 CMOS</th>
<th>3 LVTTL</th>
<th>2.5 CMOS</th>
<th>1.8 CMOS</th>
</tr>
</thead>
</table>
| 5 TTL | Yes | No | Yes | Yes | Yes*
| 5 CMOS | Yes | Yes | Yes | Yes | Yes*
| 3 LVTTL | Yes | No | Yes | Yes | Yes*
| 2.5 CMOS | Yes | No | Yes | Yes | Yes*
| 1.8 CMOS | No | No | No | No | Yes* |

* Requires $V_{IH}$ tolerance
Texas Instruments (TI) offers a vast portfolio of automotive logic products that are compliant to the AEC-Q100 standard. These devices are applicable for automotive, industrial, and high-reliability systems and come with world-class support.

**Breadth of Product Functions**

TI’s automotive logic products include a wide range in functionality in both standard logic and little logic functions such as single-, dual- and triple-gates. With more than 125 different standard gate functions and close to 40 little logic functions, TI has one of the most comprehensive portfolios for automotive logic in the industry. This gives automotive system designers the flexibility to choose the functions they need for their target systems.

**Package Offerings**

TI’s packaging options for logic products range from standard SOIC and TSSOP packages to small-form-factor SC70 and SOT-23 packages. These logic products are suitable for a wide spectrum of automotive applications.

**Benchmark Lead Times**

With a vast network of worldwide wafer fabs and assembly/test sites, TI supports automotive customers with benchmark product lead times. Most TI automotive logic product lead times are six weeks or less.

**Quality Control**

All logic products go through a tightly controlled manufacturing process that includes quality-control checks geared to achieve the zero-DPPM requirements of automotive OEMs.

**Reliability**

TI’s design-flow checks ensure that all automotive logic products meet or exceed long-term reliability expectations.

**Supply Continuity**

TI has a solid track record of supply continuity. TI’s first logic products were introduced in 1964 and are still in production and supported. Automotive grade products have been in production and supported since 1984.

For the full list of TI’s automotive logic products, please visit www.ti.com/logic

**Start Your Future Automotive Designs with TI Logic**
Logic Overview
Introducing the Next Generation QFN Packaging

New Packaging for Space-Constrained Applications

TI’s premier packaging portfolio allows for logic devices to be incorporated into small form factors such as the ever-shrinking wearables, mobile devices, home automation, as well as healthcare and fitness devices. Any customer planning to fit advanced logic functions into space constrained applications will find the X1QFN and X2SON packages to be a valuable resource for new designs.

X1QFN

X1QFN is a new advanced packaging series available for 14-, 16-, and 20-pin devices offered by Texas Instruments (TI) with a lower propagation delay and wider operating temperature than any other QFN package. The 14-pin X1QFN is just 2.5 x 2.1 x 0.5 mm with 0.4-mm pitch, a major revolution in the industry for small-scale packages. Such small package sizes were previously only offered for little logic functions such as single-, dual- and triple-gates, but with aggressive die shrinking, TI has brought multi-gate functions to this advanced small-scale package.

X2SON

TI is not only investing in standard logic space, but also in popular little logic functions. TI has released the newest and smallest next generation X2SON package (a.k.a. X2QFN) for 5-pin and 6-pin devices. The 5-pin DPW package is just 0.8 x 0.8 x 0.4 mm (0.5-mm pitch), whereas the 6-pin DTB package is only 0.8 x 1.0 x 0.4 mm (0.4-mm pitch).
## Logic Overview

### Technology Function Matrix

<table>
<thead>
<tr>
<th>Families</th>
<th>Voltage</th>
<th>Functions</th>
<th>Special Features</th>
<th>Process</th>
</tr>
</thead>
<tbody>
<tr>
<td>AHC</td>
<td>0.8, 1.8, 2.5</td>
<td>✓ ✓ ✓ ✓</td>
<td>✓ ✓ ✓ ✓ ✓ ✓ ✓</td>
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<tr>
<td>AUP</td>
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<td>✓ ✓ ✓ ✓</td>
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<tr>
<td>ALC</td>
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<td>✓ ✓ ✓ ✓ ✓ ✓ ✓</td>
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<td>LV1T</td>
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<td>LV-A</td>
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<tr>
<td>CD4000</td>
<td>5, 10, 12 to 18</td>
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<td>✓ ✓ ✓ ✓ ✓ ✓</td>
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</tbody>
</table>

*Also available in automotive grade

For product details, click this link for Quick search tab at [www.ti.com/logic](http://www.ti.com/logic)
Advanced Ultra-Low-Voltage CMOS

AUC

Key Features
- 1.8-V optimized performance
- \( V_{CC} \) specified at 2.5 V, 1.8 V, and 1.2 V
- 3.6-V I/O tolerance
- \( I_{off} \) spec for partial power down
- ESD protection
- Low noise

Applications
- Telecommunications equipment
- High-performance workstations
- PCs and networking servers
- Portable consumer electronics

Packaging Options
- BGA MicroStar Junior™
- DSBGA
- LFBGA
- SC70
- SM8
- SON
- SOT-23

AUC Device Examples

<table>
<thead>
<tr>
<th>Device</th>
<th>( V_{CC} ) (V)</th>
<th>Drive (mA)</th>
<th>( t_{pd(MAX)} ) (ns) at 1.8 V</th>
</tr>
</thead>
<tbody>
<tr>
<td>SN74AUC1G125</td>
<td>2.7</td>
<td>-9/9</td>
<td>1.5</td>
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<td>SN74AUC1G32</td>
<td>2.7</td>
<td>-9/9</td>
<td>1.5</td>
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<td>SN74AUC245</td>
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<td>-9/9</td>
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<td>SN74AUC964</td>
<td>2.7</td>
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<td>1.2</td>
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<tr>
<td>SN74AUC1G17</td>
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<td>-9/9</td>
<td>1.9</td>
</tr>
</tbody>
</table>

For full product matrix, click this link for Quick search tab at www.ti.com/logic

Advanced Ultra-Low-Power

AUP

Key Features
- Low static-/dynamic-power consumption
- Wide \( V_{CC} \) operating range: 0.8 to 3.6 V
- Input hysteresis allows for slow input transition
- Best in class for speed-power optimization
- \( I_{off} \) spec for partial power down
- ESD protection

Applications
- Mobile phones
- PDAs
- Digital and video cameras
- Digital photo frames
- Embedded PC
- Video communications system

Packaging Options
- DSBGA
- SC70
- SM8
- SON
- SOT-23
- SOT
- UQFN
- US8
- X2SON

AUP Device Examples

<table>
<thead>
<tr>
<th>Device</th>
<th>( V_{CC} ) (V)</th>
<th>Drive (mA)</th>
<th>( I_{CC} ) (( \mu A )) at 3.3 V</th>
<th>( t_{pd(MAX)} ) (ns) at 3.3 V</th>
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<tbody>
<tr>
<td>SN74AUP1G07</td>
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<td>-4/4</td>
<td>0.9</td>
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<td>SN74AUP1G08</td>
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<td>-4/4</td>
<td>0.9</td>
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<td>-4/4</td>
<td>0.9</td>
<td>4.8</td>
</tr>
</tbody>
</table>

For full product matrix, click this link for Quick search tab at www.ti.com/logic
Logic Families
ALVC, AUP1T and AVC

Advanced Low-Voltage CMOS

ALVC

Key Features
• $V_{CC}$ specified at 3.3 V, 2.5 V, and 1.8 V
• Balanced drive
• Bus-hold option
• Low noise
• Damping resistor options
• ESD protection

Applications
• Automotive
• Memory Interfaces
• Datapath communication

Packaging Options
• BGA MicroStar Junior™
• SSOP

ALVC Device Examples

<table>
<thead>
<tr>
<th>Device</th>
<th>$V_{CC}$ (V)</th>
<th>Drive (mA)</th>
<th>$t_{pd(MAX)}$ (ns) at 3.3 V</th>
</tr>
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<tbody>
<tr>
<td>SN74ALVC125</td>
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<td>–24/24</td>
<td>2.8</td>
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<tr>
<td>SN74ALVC1673</td>
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<td>3.6</td>
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<tr>
<td>SN74ALVC16245</td>
<td>6</td>
<td>–24/24</td>
<td>5.8</td>
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</tbody>
</table>

AUP1T

Key Features
• Low voltage input switching levels of 1.8 V and 2.5 V allows for low threshold level
• Accepts 1.8-V to 2.5-V logic level for high or low
• Only requires a single voltage to achieve level shifting function
• $V_{CC}$ of either 2.5 V or 3.3 V

Applications
• Portable electronics
• Automotive
• Signal conditioning

Packaging Options
• DSBGA
• SON
• SC70

AUP1T Device Examples

<table>
<thead>
<tr>
<th>Device</th>
<th>$V_{CC}$ (V)</th>
<th>Drive (mA)</th>
<th>$t_{pd(MAX)}$ (ns) at 1.8 V</th>
<th>$I_{CC}$ (µA)</th>
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<tbody>
<tr>
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<td>SN74AUP1T32</td>
<td>3.6</td>
<td>–4/4</td>
<td>10.8</td>
<td>0.9</td>
</tr>
</tbody>
</table>

AVC

Key Features
• $V_{CC}$ specified at 3.3 V, 2.5 V, and 1.8 V
• 3.3-V I/O tolerance
• Sub-2.0-ns max $t_{pd}$ at 2.5 V
• Bus-hold option
• $I_{OFF}$ for partial power down
• Dynamic output control

Applications
• High-performance workstations
• PCs
• Networking servers
• Telecommunication equipment

Packaging Options
• BGA MicroStar Junior™
• TSSOP

AVC Device Examples

<table>
<thead>
<tr>
<th>Device</th>
<th>$V_{CC}$ (V)</th>
<th>Drive (mA)</th>
<th>$t_{pd(MAX)}$ (ns) at 3.3 V</th>
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<td>–12/12</td>
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Logic Families
LV1T/LV4T and LVC/LVCxG

Low-Voltage CMOS Technology
LV1T/LV4T
Key Features
• Up/down translation with a single power rail
• Down translation from up to 5.5-V to \(V_{CC}\) level
• Optimized and balanced output drive (7 mA at 3.3-V \(V_{CC}\))
• No need for damping resistor
• Lowered switching threshold

Applications
• Computing
• Wearables
• Personal electronics
• Automotive and industrial
• Notebook

Packaging Options
• SC70
• SOT-23

LV1T/LV4T Device Examples

<table>
<thead>
<tr>
<th>Device</th>
<th>(V_{CC}) (V)</th>
<th>Drive (mA)</th>
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</table>

For full product matrix, click this link for Quick search tab at www.ti.com/logic

Low-Voltage CMOS
LVC/LVC1G
Key Features
• \(V_{CC}\) specified at 5.5 V, 3.3 V, 2.5 V, and 1.8 V
• 5-V I/O tolerance
• Series damping resistor option
• \(I_{OFF}\) spec for partial power down
• ESD protection

Applications
• Portable electronics
• Telecommunications equipment
• Networking servers
• Routing, clock buffering, and muxing
• Personal computing

Packaging Options
• BGA MicroStar Junior™
• CDIP
• CFP
• DSBGA
• LCCC
• LFGBGA
• PDIP
• SC70
• SM8
• SO
• VQFN

LVC/LVC1xG Device Examples

<table>
<thead>
<tr>
<th>Device</th>
<th>(V_{CC}) (V)</th>
<th>Drive (mA)</th>
<th>(t_{PD\text{MAX}}) (ns) at 3.3 V</th>
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<td>−32/32</td>
<td>3.6</td>
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</table>

For full product matrix, click this link for Quick search tab at www.ti.com/logic
Logic Families
AC/ACT, AHC/AHCT and HC/HCT

Advanced CMOS
AC/ACT
Key Features
• Balanced propagation delay
• Inputs are TTL-voltage compatible (ACT)
• Low power consumption
• ESD protection
• Center VCC pin and GND configurations minimize high-speed switching noise

Applications
• Buffer registers
• Defense, aerospace
• Working registers
• I/O ports

Packaging Options
• CDIP
• CFP
• CPGA
• LCCC
• SO

AC/ACT Device Examples

<table>
<thead>
<tr>
<th>Device</th>
<th>VCC (V)</th>
<th>Drive (mA)</th>
<th>tpd(MAX) (ns) at 5 V</th>
</tr>
</thead>
<tbody>
<tr>
<td>SN74ACT245</td>
<td>5.5</td>
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<td>SN74ACT373</td>
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<td>SN74ACT08</td>
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<td>–24/24</td>
<td>10</td>
</tr>
</tbody>
</table>

For full product matrix, click this link for Quick search tab at www.ti.com/logic

Advanced High-Speed CMOS
AHC/AHCT
Key Features
• Low noise without characteristic overshoot/undershoot
• Low power consumption
• Small propagation delay (5.5 ns)
• 5 V and input tolerance at 3.3 V
• Pin-for-pin compatibility

Applications
• Industrial
• Defense, aerospace
• Medical

Packaging Options
• CDIP
• CFP
• LCCC
• PDIP
• SC70
• SO
• SOIC

AHC/AHCT Device Examples

<table>
<thead>
<tr>
<th>Device</th>
<th>VCC (V)</th>
<th>Drive (mA)</th>
<th>tpd(MAX) (ns) at 5 V</th>
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<td>SN74AHC1608</td>
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</tbody>
</table>

For full product matrix, click this link for Quick search tab at www.ti.com/logic

High-Speed CMOS
HC/HCT
Key Features
• Low noise without characteristic overshoot/undershoot
• Low power consumption
• Small propagation delay (5.5 ns)
• TTL voltage-compatible inputs (HCT)
• Balanced propagation delay and transition times
• Wide operating temperature

Applications
• Automotive
• Buffer/storage registers
• Frequency synthesis and multiplication
• Shift registers
• Pattern generators

Packaging Options
• CDIP
• CFP
• TSSOP
• TVSOP
• PDIP
• X1QFN

HC/HCT Device Examples

<table>
<thead>
<tr>
<th>Device</th>
<th>VCC (V)</th>
<th>Drive (mA)</th>
<th>tpd(MAX) (ns) at 6 V</th>
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<tr>
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For full product matrix, click this link for Quick search tab at www.ti.com/logic
Logic Families
LV-A/LV-AT, ALB and ALVT

Low Voltage
LV-A/LV-AT

Key Features
• $V_{CC}$ specified at 5.0 V, 3.3 V, and 2.5 V
• Inputs are TTL voltage compatible (LV-AT)
• 5-V I/O tolerance
• $I_{off}$ spec for partial power down
• ESD protection
• Low noise

Applications
• Portable electronics
• Buffer memory address registers
• Bidirectional bus drivers
• I/O ports

Packaging Options
• BGA MicroStar Junior™
• SSOP
• PDIP
• SO
• SOIC

LV-A/LV-AT Device Examples

<table>
<thead>
<tr>
<th>Device</th>
<th>$V_{CC}$ (V)</th>
<th>Drive (mA)</th>
<th>$t_{pd(MAX)}$ (ns) at 5 V</th>
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</table>

For full product matrix, click this link for Quick search tab at www.ti.com/logic

Advanced Low-Voltage BiCMOS
ALB

Key Features
• State-of-the-art, advanced low-voltage BiCMOS technology design for 3.3-V operation
• Schottky diodes on all inputs to eliminate overshoot and undershoot
• Small high-speed switching noise
• Flow-through architecture that optimizes PCB layout

Applications
• Workstations
• Telecommunications equipment
• Advanced peripherals

Packaging Options
• SSOP
• TSSOP
• TVSOP

ALB Device Examples

<table>
<thead>
<tr>
<th>Device</th>
<th>$V_{CC}$ (V)</th>
<th>Drive (mA)</th>
<th>$t_{pd(MAX)}$ (ns) at 3.3 V</th>
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<td>SN74ALB16244</td>
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<td>–25/25</td>
<td>2.0</td>
</tr>
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</table>

For full product matrix, click this link for Quick search tab at www.ti.com/logic

Advanced Low-Voltage CMOS Technology
ALVT

Key Features
• $V_{CC}$ specified at 3.3 V and 2.5 V
• High-drive output: up to 64 mA
• 5-V I/O tolerance
• Power-up 3 state
• Partial power down ($I_{off}$)
• Hot insertion
• Bus hold

Applications
• Backplane
• Bus-driving
• Digital logic systems

Packaging Options
• BGA MicroStar Junior™
• TSSOP
• LFBGA
• SSOP

ALVT Device Examples

<table>
<thead>
<tr>
<th>Device</th>
<th>$V_{CC}$ (V)</th>
<th>Drive (mA)</th>
<th>$t_{pd(MAX)}$ (ns) at 2.5 V</th>
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<td>SN74ALVTH16274</td>
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<td>–32/64</td>
<td>4.2</td>
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</table>

For full product matrix, click this link for Quick search tab at www.ti.com/logic
Logic Families
LVT, ABT/ABTE and ALS/AS/S/LS

Low-Voltage BiCMOS Technology

LVT
Key Features
• 5.5-V maximum input voltage
• Specified 2.7-V to 3.6-V supply voltage
• I/O structures support live insertion
• Rail-to-rail switching for driving CMOS
• $t_{pd} < 4.6$ ns
• Allows mixed-signal operation
• Low-input leakage current

Applications
• Computing
• Wearables
• Personal electronics
• Automotive and industrial

Packaging Options
• MicroStar BGA™
• BGA MicroStar Junior™
• CDIP
• CFP
• LCCC
• LFBGA
• LQFP

LVT Device Examples

<table>
<thead>
<tr>
<th>Device</th>
<th>$V_{CC}$ (V)</th>
<th>Drive (mA)</th>
<th>$t_{pd(MAX)}$ (ns) at 3.3 V</th>
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<td>3.3</td>
</tr>
<tr>
<td>SN74LVTH245A</td>
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<td>–32/64</td>
<td>3.5</td>
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</table>

Advanced BiCMOS Technology

ABT/ABTE
Key Features
• Low power dissipation
• ESD protection
• Distributed $V_{CC}$ and GND pin configuration minimizes high-speed noise
• Bus hold on data inputs eliminates the need for external pullup/pulldown resistors

Applications
• Buffer registers
• I/O ports
• Working registers

Packaging Options
• CDIP
• CFP
• LCCC
• LQFP
• PDIP
• SO

ABT/ABTE Device Examples

<table>
<thead>
<tr>
<th>Device</th>
<th>$V_{CC}$ (V)</th>
<th>Drive (mA)</th>
<th>$t_{pd(MAX)}$ (ns) at 5 V</th>
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<td>SN74ABT125S</td>
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<td>–32/64</td>
<td>4.6</td>
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</table>

Schottky Logic

ALS/AS/S/LS
Key Features
• PNP inputs reduce DC loading
• Hysteresis at inputs improves noise margins
• Low power consumption
• Short propagation delays and high clock frequencies
• Fully compatible with most TTL circuits
• Wide operating temperature

Applications
• Test and measurement
• Three-state memory address drivers
• Bus-oriented receivers/transceivers
• Balanced transmission lines

Packaging Options
• CDIP
• CFP
• LCCC
• PDIP
• SO

ALS/AS/S/LS Device Examples

<table>
<thead>
<tr>
<th>Device</th>
<th>$V_{CC}$ (V)</th>
<th>Drive (mA)</th>
<th>$t_{pd(MAX)}$ (ns) at 5 V</th>
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<td>SN74AS373</td>
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<td>SN74LS07</td>
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</table>

For full product matrix, click this link for Quick search tab at www.ti.com/logic
Logic Families
BCT and F

BiCMOS Technology

BCT

Key Features
- Low power consumption
- ESD protection
- Distributed \( V_{CC} \) and GND pins minimize noise generated by simultaneous switching of outputs
- Designed to facilitate incident-wave switching for line impedances of 25 Ω or greater
- Controlled baseline

Applications
- Asynchronous data bus communication
- 3-state memory address drivers
- Clock drivers
- Bus-oriented receivers and transmitters

Packaging Options
- CDIP
- CFP
- LCCC
- PDIP
- SO
- SOIC
- SSOP
- TSSOP

BCT Device Examples

<table>
<thead>
<tr>
<th>Device</th>
<th>( V_{CC} ) (V)</th>
<th>Drive (mA)</th>
<th>( t_{pd} ) (MAX) (ns) at 5 V</th>
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<td>SN74BCT125A</td>
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<td>SN74BCT1245</td>
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<td>–12/12</td>
<td>7.8</td>
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<tr>
<td>SN74BCT1248</td>
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<td>–15/64</td>
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</tbody>
</table>

Fast Logic

F

Key Features
- Full-carry look-ahead across the four bits
- Systems achieve partial look-ahead performance with the economy of ripple carry
- Operational over the full military temperature range
- Fully synchronous operation for counting
- Fully independent clock circuit

Applications
- Stacked or pushdown registers
- Buffer storage
- Accumulator registers
- Asynchronous data bus communication

Packaging Options
- CDIP
- CFP
- LCCC
- PDIP
- SO
- SOIC
- SSOP

F Device Examples

<table>
<thead>
<tr>
<th>Device</th>
<th>( V_{CC} ) (V)</th>
<th>Drive (mA)</th>
<th>( t_{pd} ) (MAX) (ns) at 5 V</th>
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<tr>
<td>SN74F245</td>
<td>5.5</td>
<td>–15/64</td>
<td>7.0</td>
</tr>
<tr>
<td>SN74F273</td>
<td>5.5</td>
<td>–3/24</td>
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<tr>
<td>SN74F04</td>
<td>5.5</td>
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</table>

For full product matrix, click this link for Quick search tab at [www.ti.com/logic](http://www.ti.com/logic).
### Logic Families
#### FCT, TTL and CD4000

#### Fast CMOS Technology

**FCT**

**Key Features**
- Edge-rate control circuitry for significantly improved noise characteristics
- $I_{off}$ supports partial-power-down mode operation
- ESD protection
- Matched rise and fall times
- Fully compatible with TTL input and output logic levels

**Applications**
- Programmable dividers
- Transmission lines
- High-speed, low-power bus
- Bus interface

**Packaging Options**
- CDIP
- CFP
- LCC
- PDIP

**FCT Device Examples**

<table>
<thead>
<tr>
<th>Device</th>
<th>$V_{CC}$ (V)</th>
<th>Drive (mA)</th>
<th>$t_{pd(MAX)}$ (ns) at 5 V</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD74FCT273</td>
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<td>CD74FCT249</td>
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<td>–15/64</td>
<td>7.0</td>
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</tbody>
</table>

For full product matrix, click this link for Quick search tab at www.ti.com/logic.

#### Transistor-Transistor Logic

**TTL**

**Key Features**
- Synchronous operation
- Individual preset to each flip-flop
- Fully independent clear input
- Gated output-control lines for enabling or disabling the outputs
- Load control line
- Diode-clamped inputs
- High noise immunity
- Wide operating temperature

**Applications**
- High-speed counting designs
- Bus buffer register
- Interfacing with high-level circuits
- Driving high-current loads

**Packaging Options**
- CDIP
- CFP
- LCCC
- SOIC

**TTL Device Examples**

<table>
<thead>
<tr>
<th>Device</th>
<th>$V_{CC}$ (V)</th>
<th>Drive (mA)</th>
<th>$t_{pd(MAX)}$ (ns) at 5 V</th>
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<td>5.0</td>
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</tbody>
</table>

For full product matrix, click this link for Quick search tab at www.ti.com/logic.

#### CMOS Logic

**CD4000**

**Key Features**
- Medium-speed operation: $t_{PLH} = 60$ ns at $V_{DD} = 10$ V
- Standardized, symmetrical output characteristics
- Separate serial outputs synchronous to both positive and negative clock edges for cascading

**Applications**
- Logical comparators
- Adders/subtractors
- Parity generators and checkers
- Serial-to-parallel data conversion
- Remote control holding register

**Packaging Options**
- CDIP
- CDIP SB
- CFP
- PDIP
- SO
- SOIC
- TSSOP

**CD4000 Device Examples**

<table>
<thead>
<tr>
<th>Device</th>
<th>$V_{CC}$ (V)</th>
<th>Drive (mA)</th>
<th>$t_{pd(MAX)}$ (ns)</th>
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</thead>
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For full product matrix, click this link for Quick search tab at www.ti.com/logic.
### Resources

#### Package Options

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<th>PDIP</th>
<th>SOIC</th>
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## Resources

### Package Options

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