Advanced High-Speed CMOS Logic

AHC / AHCT

Description
Advanced High-Speed CMOS Logic (AHC and AHCT) provide the HCMOS user an excellent migration path to upgrade their speed performance in low power / low noise / low drive applications. AHC devices are fully compatible with CMOS switching levels while AHCT devices are TTL switching level compatible. These technologies have been fully qualified per the requirements of MIL-PRF-38535 (QML).

Performance
- **Speed**: With typical propagation delays of 6.0ns (octals), roughly 3 times faster than HC, AHC is the quick and quiet solution for higher speed operation.

- **Low Noise**: AHC allows designers who like the low noise characteristics of HCMOS to design at today’s performance levels without the overshoot/undershoot problems typical of higher drive devices usually required to achieve AHC speed levels.

- **Low Power**: AHC averages 40µA of static current, half that of HCMOS.

- **Drive**: Output current is ± 8mA at 5.0V Vcc and ± 4mA at 3.3V Vcc.

- **Technology**: EPIC™ - Enhanced-Performance Implanted CMOS process.

- **Latch-Up Immunity**: AHC and AHCT exceed 300mA per JEDEC Standard JESD-17.

- **Pricing**: AHC and AHCT are priced at parity with standard HC and HCT
Packaging

<table>
<thead>
<tr>
<th>Package</th>
<th>Ceramic Dual In-Line (CDIP) [J suffix]</th>
<th>Ceramic Leadless Chip Carrier (LCCC) [FK suffix]</th>
<th>Ceramic Flat Package (CFP) [W suffix]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pins</td>
<td>Weight</td>
<td>R_{\theta JA}</td>
<td>R_{\theta JC}</td>
</tr>
<tr>
<td>14</td>
<td>2.1</td>
<td>120</td>
<td>28</td>
</tr>
<tr>
<td>16</td>
<td>2.2</td>
<td>90</td>
<td>28</td>
</tr>
<tr>
<td>20</td>
<td>3.1</td>
<td>66</td>
<td>28</td>
</tr>
</tbody>
</table>

**Weight**........Typical weight value given is in grams.

**R_{\theta JA}** Thermal resistance of a package without a path for heat dissipation. This is specified at a zero linear feet per minute air flow. Value given is in °C/W.

**R_{\theta JC}**........ Thermal resistance of a package assuming an infinite path for heat dissipation. Value given is in °C/W.

(*) The smallest LCCC available is a 20-pad package.

Applications

AHC and AHCT are well suited for communications and hand-held (battery powered) equipment such as man-pack radios, hand-held FLIRs, helmet-mounted displays, smart munitions and hand-held SAMs.

Literature Information

1997 AHC/AHCT Logic Data Book — Literature Number SCLD003A
1997 SLL CD-ROM — Literature Number SCBC001A

Individual Data Sheets — Available from the TI Product Information Center at (972) 644-5580 or via TI’s internet site at

http://www.ti.com/sc

Visit the TI Military Semiconductors home page at

http://www.ti.com/sc/docs/military/welcome.htm
The chart below shows the various upgrade paths available to the military designer via TI’s Advanced Logic solutions:

**Logic Migration Chart**

- **TTL, S, LS, ALS** → **Lower Noise/Lower Power** → **AHC**
- **HC** → **Higher Speed/Lower Power** → **AHC** → **3.3V Solution** → **LVC**
- **AC** → **Lower Noise** → **AHC** → **Higher Speed/Lower Power** → **ABT** → **3.3V Solution** → **LVC**

**Support**

For more information on this and other TI logic products, please access our worldwide web site located at [www.ti.com](http://www.ti.com) or go directly to the URL for TI Military Semiconductors located at [www.ti.com/sc/docs/military/welcome.htm](http://www.ti.com/sc/docs/military/welcome.htm).

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