128 Megabit Single Operating Voltage Serial Flash Memory with 4Kbyte Uniform Sector

FEATURES
• Single power supply operation
  - Full voltage range: 2.70-3.60V
• 128 M-bit Serial Flash
  - 128 M-bit/16,384 K-byte/65,536 pages
  - 256 bytes per programmable page
• Serial Interface Architecture
  - SPI Compatible: Mode 0 and Mode 3
  - Standard, Dual or Quad SPI
  - Standard SPI: CLK, CS#, DI, DO, WP#
  - Dual SPI: CLK, CS#, DQ0, DQ1, WP#
  - Quad SPI: CLK, CS#, DQ0, DQ1, DQ2, DQ3
• High performance
  - 104MHz clock rate for one data bit
  - 80MHz clock rate for two data bits
  - 50MHz clock rate for four data bits
• Memory Organization
  - 16,777,216 bytes
  - Uniform Sector Architecture
  - 256 blocks of 64-Kbyte
  - 4,096 sectors of 4-Kbyte
  - 65,536 pages (256 bytes each)
• Low power consumption
  - 12 mA typical active current
  - 1 µA typical power down current
• Uniform Sector Architecture:
  - 2048 sectors of 4-Kbyte
  - 128 blocks of 64-Kbyte
  - Any sector or block can be erased individually

GENERAL DESCRIPTION
The IS25CQ128 is a 128 Megabit (16,384K-byte) Serial Flash memory, with advanced write protection mechanisms. The IS25CQ128 supports the standard Serial Peripheral Interface (SPI), and a high performance Dual output as well as Quad I/O using SPI pins: Serial Clock, Chip Select, Serial DQ0(DI), DQ1(DO), DQ2(WP#) and DQ3(NC). SPI clock frequencies of up to 80MHz are supported allowing equivalent clock rates of 160MHz for Dual Output when using the Dual Output Fast Read instructions, and SPI clock frequencies of up to 50MHz are supported allowing equivalent clock rates of 200MHz for Quad Output when using the Quad Output Fast Read instructions. The memory can be programmed 1 to 256 bytes at a time, using the Page Program instruction.

The IS25CQ128 is designed to allow either single Sector/Block at a time or full chip erase operation. The IS25CQ128 can be configured to protect part of the memory as the software protected mode. The device can sustain a minimum of 100K program/erase cycles on each sector or block.
Figure 1. CONNECTION DIAGRAMS

8-Pin WSON

16-Pin SOIC
24 - Ball BGA
### Ordering Information

<table>
<thead>
<tr>
<th>Density</th>
<th>Frequency</th>
<th>Order Part Number</th>
<th>Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>128 Mb</td>
<td>104 MHz</td>
<td>IS25CQ128-JMLE</td>
<td>16 Pin SOIC 300mil</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IS25CQ128-JKLE</td>
<td>8 Pin WSON (5x6 mm)</td>
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<td>IS25CQ128-JLLE</td>
<td>8 Pin WSON (6x8 mm)</td>
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<tr>
<td></td>
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<td>IS25CQ128-JGLE</td>
<td>24-ball BGA (6x8 mm)</td>
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<td>IS25CQ128-JMLA*</td>
<td>16 Pin SOIC 300mil (Call Factory)</td>
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<td>IS25CQ128-JGLA*</td>
<td>24-ball BGA (6x8 mm) (Call Factory)</td>
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<td>IS25CQ128-JWLE</td>
<td>KGD (Call Factory)</td>
</tr>
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A* = A1, A2, A3 Automotive Temperature Range