SuperFlash® Technology

Product Description

SuperFlash is SST’s patented and proprietary NOR flash technology. SuperFlash technology has a number of distinct advantages for designing and manufacturing standalone flash and embedded flash products. SuperFlash technology is fully CMOS compatible and does not impact existing logic design rules and electrical parameters. This technology has been in high-volume production for more than sixteen years and is the non-volatile memory of choice for embedded applications.

Key Features

- High reliability
  - Automotive grade reliability
  - No SILC
  - More than 100K cycle endurance
  - 100 years data retention
- Low cost
  - CMOS logic process compatible
  - Area efficient Flash macro
- Low power
  - Energy efficient SSI program operation
  - Low power poly to poly FN tunneling for erase operation
  - Low power read operation
- High performance
  - Fast program operation
  - Fast read access

Three Generations of SuperFlash Technology

1st Generation
1.2–0.13 μm technology
Non-self-aligned cell
Erase towards WL poly

2nd Generation
0.25–0.13 μm technology
Triple self-aligned cell
Erase towards WL poly

3rd Generation
0.12 μm and below
Triple poly process
Dedicated erase and coupling gates
Thin WL oxide

Availability

<table>
<thead>
<tr>
<th>SuperFlash® Availability</th>
<th>Foundry Partners–Licensees</th>
<th>Major IDM Licensees &amp; Users</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technology Node</td>
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<tr>
<td>350 nm</td>
<td>TSMC</td>
<td>freescale</td>
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<tr>
<td>250 nm</td>
<td>TSMC</td>
<td>EPSON, EXCEED YOUR VISION</td>
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<td></td>
<td>HNNEC</td>
<td>TOSHIBA</td>
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<tr>
<td></td>
<td>Grace</td>
<td>INSIDEX, INSIDE</td>
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<td>OKI</td>
<td>MICROCHIP, MICROCHIP</td>
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<td>XFAB</td>
<td>Intel, Intel</td>
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<td>180 nm</td>
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<td>Grace</td>
<td>Samsung</td>
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<td>150/130 nm</td>
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<td>110 nm</td>
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<td>90 nm</td>
<td>TSMC</td>
<td>National Semiconductor</td>
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<td>SMIC</td>
<td>Renesas</td>
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Applications

The Most Widely Used Embedded Flash
- Over 25 active licensees
- In production from 500 nm to 90 nm
- On-chip Flash macro densities up to 64 Mb
- Flexible platform and design from 800 nm to 55 nm

More Than 23 Billion SuperFlash® Enabled Devices Shipped

Reliability

SuperFlash® vs. Conventional Flash

- No stress-induced leakage current (SILC) in SuperFlash → excellent reliability
- SuperFlash cell technology is qualified for automotive applications
- No overerase issue

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