Samsung’s leading-edge eMMC™ solution continues to transform the industry in high-performance, low power, and reliability for performance and power sensitive mobile computing devices; from smartphones, tablets and e-readers to Smart TVs, set-top boxes and digital video cameras.

**eMMC Overview**

eMMC is an embedded storage solution with an MMC interface, flash memory and controller, all in a small BGA package. It is based upon the JEDEC industry-standard MMC System Specification v4.41/4.5 and JEDEC BGA packaging standards. With interface speeds of up to 200 MB per second, eMMC provides fast scalable performance.

eMMC provides a flexible, industry-standard architecture that simplifies mass storage designs for portable consumer electronics products. With eMMC, a host system can now gain access to all major classes of mass-storage memory subsystems, including embedded memory (eMMC), memory cards or even hard disk drives (via ATA-on-MMC specification) with one common MMC Interface Protocol Bus.

**Featuring Samsung eMMC**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacities</td>
<td>From 2GB to 64GB in MP (128GB — Coming soon!)</td>
</tr>
<tr>
<td>MMC Version</td>
<td>MMC v4.41/4.5</td>
</tr>
<tr>
<td>MLC NAND</td>
<td>32Gb &amp; 64Gb</td>
</tr>
<tr>
<td>Small FBGA Package (JEDEC standard)</td>
<td>11.5x13mm/12x16mm</td>
</tr>
<tr>
<td>Sequential R/W</td>
<td>Up to 150/60 MB/s</td>
</tr>
<tr>
<td>Random R/W</td>
<td>Up to 3500/1500 IOPS</td>
</tr>
</tbody>
</table>

**Easy to Use**

- Simple read/write memory using JEDEC-standard eMMC interface
- Fully managed NAND solution

**Cost-Effective Solution**

- Faster product development & TTM
- Common solution for embedded & external flash memory
- Backwards compatibility with older MMC versions
- Unified solution for boot & mass storage
- High-density, compact packaging ideal for sleek & thin mobile designs
Samsung’s new 64GB eMMC provides the industry’s highest performance and thinnest profile available, utilizing leading-edge 64Gb NAND with a Toggle DDR 2.0 interface and the company’s latest 20nm-class process technology.

The standardized eMMC protocol interface offers designers high performance and makes technology complexity, such as NAND Flash functional differences among suppliers, invisible to the host. This differs from the conventional architecture, where a host system must contend with generational process geometry shrinks and technical complexities such as Multi-Level Cell (MLC) technology while supporting the company-specific functions of individual flash memory suppliers to achieve the necessary performance.

The benefits of eMMC to host manufacturers are a simpler product design and qualification process and shorter time-to-market solution.

### eMMC Features

<table>
<thead>
<tr>
<th>Feature</th>
<th>eMMC4.41</th>
<th>eMMC4.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bus Width</td>
<td>x1/x4/x8</td>
<td>x1/x4/x8</td>
</tr>
<tr>
<td>Clock Frequency</td>
<td>~52MHz</td>
<td>~200MHz</td>
</tr>
<tr>
<td>Alternative Boot</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Max bandwidth</td>
<td>104MB/s</td>
<td>200MB/s</td>
</tr>
<tr>
<td>H/W reset</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>DDR Interface</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Multi-Partition</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Enhanced mode (SLC + MLC)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Security feature (Trim, RPMB, Secure Erase, Secure Trim)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Secure Trim Refinement</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>High Priority Interrupt</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Back Ground Operation</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Packed Command</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Cache Handling</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Discard</td>
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<td>Yes</td>
</tr>
<tr>
<td>Dynamic Capacity</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Sanitize</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

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