Cypress HyperRAM 2.0 is a high-speed, low-pin-count self-refresh Dynamic RAM (DRAM) for high-performance embedded systems requiring expansion memory. HyperRAM 2.0 offers HyperBus and Octal SPI interfaces and provides a read/write bandwidth of up to 400 MBps in DDR mode. It comes in the industry’s smallest 6 mm x 8 mm 24-ball BGA package and offers an extended operating temperature range (-40°C to +105°C). Industrial, Industrial Plus, Auto-Grade 3 and Auto-Grade 2 temperature grades are available and it is AEC-Q100 qualified.

**FEATURES**

- **Clock Rate (DDR)**
  - 200 MHz (KS)
  - 200 MHz/166 MHz (KL)
- **READ/WRITE Bandwidth**
  - 400 MBps (KS)
  - 400 MBps/333 MBps (KL)
- **Temperature Ranges**
  - Industrial: -40°C to +85°C
  - Industrial Plus: -40°C to +105°C
  - Auto Grade 3: -40°C to +85°C
  - Auto Grade 2: -40°C to +105°C
- **Supply Voltage**
  - 1.7-V to 2.0-V Supply Voltage (KS)
  - 2.7-V to 3.6-V Supply Voltage (KL)
- **Automotive Support**
  - AEC-Q100 Qualification

**HYPERBUS & OCTAL SPI INTERFACE**

- HyperRAM 2.0 supports JEDEC Expanded SPI (xSPI) standard compliant HyperBus and Octal interfaces
- High-bandwidth, 12-pin interface transfers information at double data rate (DDR)
- Shares a common footprint with xSPI flash (HyperBus and Octal interfaces)
- Supported by a wide ecosystem of host controllers and memories

**HIGH RELIABILITY**

- An Industrial Plus and Auto-Grade 2 temperature range of -40°C to +105°C is offered
- AEC-Q100-qualified parts

**HIGH PERFORMANCE, LOW POWER**

- Bandwidth of up to 400 MBps (3,200 Mbps)
- Hybrid Sleep Mode and Deep Power Down Mode
- Partial Memory Array Refresh feature to optimize battery performance
- Small 48-mm² 24-ball BGA package

**TARGET APPLICATIONS**

- Automotive instrument clusters
- Industrial HMI
- Industrial machine vision
- Display systems for consumer electronics

www.cypress.com/HyperRAM2
PROBLEM:
The AUTOMOTIVE CLUSTER

I have limited RAM on my MCU and require seamless, high-speed expansion for smooth graphics rendering.

SOLUTION:
Cypress’ HyperRAM provides automotive-grade, 400 MBps, low pin-count expansion RAM that meets your MCU performance requirements.

PROBLEM:
The DISPLAYS; CONSUMER & INDUSTRIAL HMI

My MCU has limited frame buffer and working memory capacity and my board space and available power are severely limited.

SOLUTION:
Cypress’ HyperRAM provides low pin-count, small footprint expansion RAM capable of low-power, high-bandwidth operation.

Operating on a Single HyperBus Simplifies Designs and Reduces Pin Count

<table>
<thead>
<tr>
<th>MPN Family*</th>
<th>Interface</th>
<th>Density</th>
<th>Voltage</th>
<th>Speed (DDR)</th>
<th>Bandwidth</th>
<th>Package</th>
<th>Temperature Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>S27KL0642</td>
<td>HyperBus</td>
<td>64 Mbit</td>
<td>3.0-V</td>
<td>166/200 MHz</td>
<td>333/400 MBps</td>
<td>24-ball BGA</td>
<td>I = Industrial (−40°C to +85°C)</td>
</tr>
<tr>
<td>S70KL1282</td>
<td>Octal SPI</td>
<td>128 Mbit</td>
<td>1.8-V</td>
<td>200 MHz</td>
<td>400 MBps</td>
<td>160 balls</td>
<td>V = Industrial Plus (−40°C to +105°C)</td>
</tr>
<tr>
<td>S70KS1283</td>
<td>Octal SPI</td>
<td>128 Mbit</td>
<td>1.8-V</td>
<td>200 MHz</td>
<td>400 MBps</td>
<td>16 pins</td>
<td>A = Automotive Grade 3 (−40°C to +85°C)</td>
</tr>
</tbody>
</table>

* refer to datasheet for complete part numbers

To learn more about HyperRAM Memory products, visit [http://www.cypress.com/HyperRAM](http://www.cypress.com/HyperRAM)