



**SMART**semi®  
A PENGUIN SOLUTIONS® BRAND

# Memory Components & Cards Catalog

November 2025

REV 11042025

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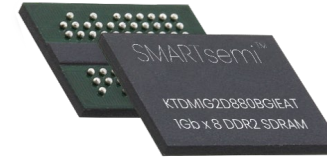
# OPERATING RANGES & TESTING

| PRODUCT FAMILY  | PRODUCT LINE*                 | OPERATING TEMPERATURE RANGE |                |            |                |                   |                 | TESTING                       |                 |
|-----------------|-------------------------------|-----------------------------|----------------|------------|----------------|-------------------|-----------------|-------------------------------|-----------------|
|                 |                               | COMMERICAL                  |                | INDUSTRIAL |                | WIDE (AUTOMOTIVE) |                 | AUTOMOTIVE (AEC-Q100 GRADE 2) |                 |
| DRAM Components | <a href="#">DDR2 SDRAM</a>    | ●                           | 0°C to +95°C   | ●          | -40°C to +95°C | ●                 | -40°C to +105°C |                               |                 |
|                 | <a href="#">DDR3(L) SDRAM</a> | ●                           | 0°C to +85°C   | ●          | -40°C to +85°C | ●                 | -40°C to +105°C | ●                             | -40°C to +105°C |
|                 | <a href="#">DDR4 SDRAM</a>    | ●                           | 0°C to +85°C   | ●          | -40°C to +85°C |                   |                 |                               |                 |
| FLASH Storage   | <a href="#">eMMC 5.0</a>      |                             |                |            |                | ●                 | -40°C to +105°C | ●                             | -40°C to +105°C |
|                 | <a href="#">eMMC 5.1</a>      | ●                           | -25°C to +85°C | ●          | -40°C to +85°C | ●                 | -40°C to +105°C |                               |                 |
| FLASH Cards     | <a href="#">SD Cards</a>      |                             |                | ●          | -40°C to +85°C |                   |                 |                               |                 |
|                 | <a href="#">microSD Cards</a> |                             |                | ●          | -40°C to +85°C |                   |                 |                               |                 |

\* Check Product Line page online or in this catalog for specific devices in each family that comply with temperature ranges and testing.

# DDR2 SDRAM

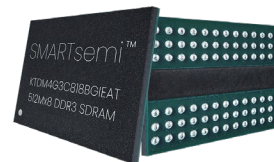
Wide, Industrial, & Commercial Temperature Ranges



| SMARTSEMI<br>PART NUMBER          | TEMP RANGE      | TESTING    | DENSITY | ORGANIZATION | CLOCK  | DATA RATE | VOLTAGE | PACKAGE      | PACKING | MOQ    | INCREMENT | DATA<br>SHEET        | REL.<br>REPORT       |
|-----------------------------------|-----------------|------------|---------|--------------|--------|-----------|---------|--------------|---------|--------|-----------|----------------------|----------------------|
| Filter                            | Filter          | Filter     | Filter  | Filter       | Filter | Filter    | Filter  | Filter       | Filter  | Filter | Filter    | Filter               | Filter               |
| <a href="#">KTDM522D680BGCEAT</a> | 0°C to +95°C    | Commercial | 512Mb   | 32Mbx16      | 400MHz | 800Mbps   | 1.8V    | 84-ball FBGA | Tray    | 210    | 210       | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">KTDM522D680BGIEAT</a> | -40°C to +95°C  | Industrial | 512Mb   | 32Mbx16      | 400MHz | 800Mbps   | 1.8V    | 84-ball FBGA | Tray    | 210    | 210       | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">KTDM522D680BGAEAT</a> | -40°C to +105°C | Wide       | 512Mb   | 32Mbx16      | 400MHz | 800Mbps   | 1.8V    | 84-ball FBGA | Tray    | 210    | 210       | <a href="#">Link</a> | Link                 |
| <a href="#">KTDM1G2D680BGCEAT</a> | 0°C to +95°C    | Commercial | 1Gb     | 64Mbx16      | 400MHz | 800Mbps   | 1.8V    | 84-ball FBGA | Tray    | 210    | 210       | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">KTDM1G2D680BGIEAT</a> | -40°C to +95°C  | Industrial | 1Gb     | 64Mbx16      | 400MHz | 800Mbps   | 1.8V    | 84-ball FBGA | Tray    | 210    | 210       | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">KTDM1G2D680BGAEAT</a> | -40°C to +105°C | Wide       | 1Gb     | 64Mbx16      | 400MHz | 800Mbps   | 1.8V    | 84-ball FBGA | Tray    | 210    | 210       | <a href="#">Link</a> | Link                 |
| <a href="#">KTDM1G2D880BGCEAT</a> | 0°C to +95°C    | Commercial | 1Gb     | 128Mbx8      | 400MHz | 800Mbps   | 1.8V    | 60-ball FBGA | Tray    | 209    | 209       | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">KTDM1G2D880BGIEAT</a> | -40°C to +95°C  | Industrial | 1Gb     | 128Mbx8      | 400MHz | 800Mbps   | 1.8V    | 60-ball FBGA | Tray    | 209    | 209       | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">KTDM1G2D880BGAEAT</a> | -40°C to +105°C | Wide       | 1Gb     | 128Mbx8      | 400MHz | 800Mbps   | 1.8V    | 60-ball FBGA | Tray    | 209    | 209       | <a href="#">Link</a> | Link                 |

# DDR3(L) SDRAM

Automotive, Industrial, & Commercial Temperature Ranges  
AEC-Q100 Grade 2 Automotive Tested



| SMARTSEMI<br>PART NUMBER          | TEMP RANGE      | TESTING                        | DENSITY | ORGANIZATION | CLOCK  | DATA RATE | VOLTAGE    | PACKAGE      | PACKING | MOQ    | INCREMENT | DATA<br>SHEET        | REL.<br>REPORT       |
|-----------------------------------|-----------------|--------------------------------|---------|--------------|--------|-----------|------------|--------------|---------|--------|-----------|----------------------|----------------------|
| Filter                            | Filter          | Filter                         | Filter  | Filter       | Filter | Filter    | Filter     | Filter       | Filter  | Filter | Filter    | Filter               | Filter               |
| <a href="#">KTDM1G3C618BGCEAT</a> | 0°C to +85°C    | Commercial                     | 1Gb     | 64Mbx16      | 933MHz | 1866Mbps  | 1.35V/1.5V | 96-ball FBGA | Tray    | 198    | 198       | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">KTDM1G3C618BGIEAT</a> | -40°C to +85°C  | Industrial                     | 1Gb     | 64Mbx16      | 933MHz | 1866Mbps  | 1.35V/1.5V | 96-ball FBGA | Tray    | 198    | 198       | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">KTDM1G3C818BGCEAT</a> | 0°C to +85°C    | Commercial                     | 1Gb     | 128Mbx8      | 933MHz | 1866Mbps  | 1.35V/1.5V | 78-ball FBGA | Tray    | 210    | 210       | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">KTDM1G3C818BGIEAT</a> | -40°C to +85°C  | Industrial                     | 1Gb     | 128Mbx8      | 933MHz | 1866Mbps  | 1.35V/1.5V | 78-ball FBGA | Tray    | 210    | 210       | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">KTDM2G3C618BGCEAT</a> | 0°C to +85°C    | Commercial                     | 2Gb     | 128Mbx16     | 933MHz | 1866Mbps  | 1.35V/1.5V | 96-ball FBGA | Tray    | 198    | 198       | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">KTDM2G3C618BGIEAT</a> | -40°C to +85°C  | Industrial                     | 2Gb     | 128Mbx16     | 933MHz | 1866Mbps  | 1.35V/1.5V | 96-ball FBGA | Tray    | 198    | 198       | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">KTDM2G3C618BGAEAT</a> | -40°C to +105°C | Automotive<br>AEC-Q100 Grade 2 | 2Gb     | 128Mbx16     | 933MHz | 1866Mbps  | 1.35V/1.5V | 96-ball FBGA | Tray    | 198    | 198       | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">KTDM2G3C818BGCEAT</a> | 0°C to +85°C    | Commercial                     | 2Gb     | 256Mbx8      | 933MHz | 1866Mbps  | 1.35V/1.5V | 78-ball FBGA | Tray    | 210    | 210       | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">KTDM2G3C818BGIEAT</a> | -40°C to +85°C  | Industrial                     | 2Gb     | 256Mbx8      | 933MHz | 1866Mbps  | 1.35V/1.5V | 78-ball FBGA | Tray    | 210    | 210       | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">KTDM2G3C818BGAEAT</a> | -40°C to +105°C | Automotive<br>AEC-Q100 Grade 2 | 2Gb     | 256Mbx8      | 933MHz | 1866Mbps  | 1.35V/1.5V | 78-ball FBGA | Tray    | 210    | 210       | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">KTDM4G3C618BGCEAT</a> | 0°C to +85°C    | Commercial                     | 4Gb     | 256Mbx16     | 933MHz | 1866Mbps  | 1.35V/1.5V | 96-ball FBGA | Tray    | 198    | 198       | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">KTDM4G3C618BGIEAT</a> | -40°C to +85°C  | Industrial                     | 4Gb     | 256Mbx16     | 933MHz | 1866Mbps  | 1.35V/1.5V | 96-ball FBGA | Tray    | 198    | 198       | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">KTDM4G3C618BGAEAT</a> | -40°C to +85°C  | Automotive<br>AEC-Q100 Grade 2 | 4Gb     | 256Mbx16     | 933MHz | 1866Mbps  | 1.35V/1.5V | 96-ball FBGA | Tray    | 198    | 198       | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">KTDM4G3C818BGCEAT</a> | 0°C to +85°C    | Commercial                     | 4Gb     | 512Mbx8      | 933MHz | 1866Mbps  | 1.35V/1.5V | 78-ball FBGA | Tray    | 210    | 210       | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">KTDM4G3C818BGIEAT</a> | -40°C to +85°C  | Industrial                     | 4Gb     | 512Mbx8      | 933MHz | 1866Mbps  | 1.35V/1.5V | 78-ball FBGA | Tray    | 210    | 210       | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">KTDM4G3C818BGAEAT</a> | -40°C to +85°C  | Automotive<br>AEC-Q100 Grade 2 | 4Gb     | 512Mbx8      | 933MHz | 1866Mbps  | 1.35V/1.5V | 78-ball FBGA | Tray    | 210    | 210       | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">KTDM8G3C618BGCEAT</a> | 0°C to +85°C    | Commercial                     | 8Gb     | 512Mbx16     | 933MHz | 1866Mbps  | 1.35V/1.5V | 96-ball FBGA | Tray    | 198    | 198       | <a href="#">Link</a> | Link                 |
| <a href="#">KTDM8G3C618BGIEAT</a> | -40°C to +85°C  | Industrial                     | 8Gb     | 512Mbx16     | 933MHz | 1866Mbps  | 1.35V/1.5V | 96-ball FBGA | Tray    | 198    | 198       | <a href="#">Link</a> | Link                 |

# DDR4 SDRAM

## Industrial & Commercial Temperature Ranges



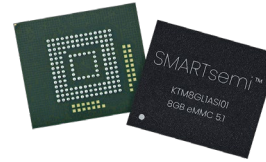
■ *New Addition!*

| SMARTSEMI<br>PART NUMBER         | TEMP<br>RANGE  | TESTING    | DENSITY | ORGANIZATION | CLOCK   | DATA RATE | VOLTAGE | PACKAGE      | PACKING | MOQ    | INCREMENT | DATA<br>SHEET        | REL.<br>REPORT       |
|----------------------------------|----------------|------------|---------|--------------|---------|-----------|---------|--------------|---------|--------|-----------|----------------------|----------------------|
| Filter                           | Filter         | Filter     | Filter  | Filter       | Filter  | Filter    | Filter  | Filter       | Filter  | Filter | Filter    | Filter               | Filter               |
| <a href="#">KTD4G4B632BGCEAT</a> | 0°C to +85°C   | Commercial | 4Gb     | 256Mbx16     | 1600MHz | 3200Mbps  | 1.2V    | 96-ball FBGA | Tray    | 198    | 198       | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">KTD4G4B632BGIEAT</a> | -40°C to +85°C | Industrial | 4Gb     | 256Mbx16     | 1600MHz | 3200Mbps  | 1.2V    | 96-ball FBGA | Tray    | 198    | 198       | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">KTD4G4B626BGCEAT</a> | 0°C to +85°C   | Commercial | 4Gb     | 256Mbx16     | 1333MHz | 2666Mbps  | 1.2V    | 96-ball FBGA | Tray    | 198    | 198       | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">KTD4G4B626BGIEAT</a> | -40°C to +85°C | Industrial | 4Gb     | 256Mbx16     | 1333MHz | 2666Mbps  | 1.2V    | 96-ball FBGA | Tray    | 198    | 198       | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">KTD4G4B826BGCEAT</a> | 0°C to +85°C   | Commercial | 4Gb     | 512Mbx8      | 1333MHz | 2666Mbps  | 1.2V    | 78-ball FBGA | Tray    | 210    | 210       | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">KTD4G4B826BGIEAT</a> | -40°C to +85°C | Industrial | 4Gb     | 512Mbx8      | 1333MHz | 2666Mbps  | 1.2V    | 78-ball FBGA | Tray    | 210    | 210       | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">NT5AD512M16H4-JR</a> | -0°C to +95°C  | Commercial | 8Gb     | 512Mbx16     | 1600MHz | 3200Mbps  | 1.2V    | 96-ball FBGA | Tray    | 198    | 198       | <a href="#">Link</a> | <a href="#">Link</a> |



# FLASH EMMC 5.1

Wide, Industrial & Commercial Temperature Range

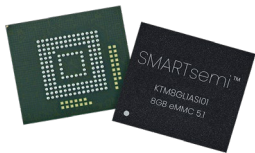


■ New Addition!

| SMARTSEMI<br>PART NUMBER        | TEMP<br>RANGE   | TESTING    | CAPACITY | PROG.<br>BUS WIDTH | FLASH<br>TYPE | SEQ.<br>READ | SEQ.<br>WRITE | RNDM.<br>READ | RNDM.<br>WRITE | VOLTAGE<br>(NAND/IO) | PACKAGE  | PACKING   | MOQ    | INCR.  | DATA<br>SHEET        | REL.<br>REPORT       |
|---------------------------------|-----------------|------------|----------|--------------------|---------------|--------------|---------------|---------------|----------------|----------------------|----------|-----------|--------|--------|----------------------|----------------------|
| Filter                          | Filter          | Filter     | Filter   | Filter             | Filter        | Filter       | Filter        | Filter        | Filter         | Filter               | Filter   | Filter    | Filter | Filter | Filter               | Filter               |
| <a href="#">SP9M4GH1AH111</a>   | -40°C to +85°C  | Industrial | 2GB      | x1/x4/x8           | pSLC NAND     | 170MB/s      | 25MB/s        | 5345 IOPS     | 980 IOPS       | 3.3V/1.8V            | 153-FBGA | Tray      | 152    | 152    | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">SPM8GH2AH111</a>    | -40°C to +85°C  | Industrial | 4GB      | x1/x4/x8           | MLC NAND      | 250MB/s      | 65MB/s        | 10000 IOPS    | 2000 IOPS      | 3.3V/1.8V            | 153-FBGA | Tray      | 152    | 152    | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">SPM8GH2AHW11</a>    | -40°C to +105°C | Wide       | 4GB      | x1/x4/x8           | pSLC NAND     | 259MB/s      | 65MB/s        | 10000 IOPS    | 2000 IOPS      | 3.3V/1.8V            | 153-FBGA | Tray      | 152    | 152    | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">SPQ8GH2AH111</a>    | -40°C to +85°C  | Industrial | 4GB      | x1/x4/x8           | pSLC NAND     | 259MB/s      | 65MB/s        | 10000 IOPS    | 2000 IOPS      | 3.3V/1.8V            | 100-FBGA | Tray      | 152    | 152    | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">KTM4GH1AH101</a>    | -40°C to +85°C  | Industrial | 4GB      | x1/x4/x8           | MLC NAND      | 170MB/s      | 15MB/s        | 5345 IOPS     | 980 IOPS       | 3.3V/1.8V            | 153-FBGA | Tray      | 152    | 152    | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">KTM4GH1AH101-TR</a> | -40°C to +85°C  | Industrial | 4GB      | x1/x4/x8           | MLC NAND      | 170MB/s      | 15MB/s        | 5345 IOPS     | 980 IOPS       | 3.3V/1.8V            | 153-FBGA | Tape&Reel | 152    | 152    | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">SPQ8GH2AH101</a>    | -40°C to +85°C  | Industrial | 8GB      | x1/x4/x8           | MLC NAND      | 265MB/s      | 65MB/s        | 10000 IOPS    | 2000 IOPS      | 3.3V/1.8V            | 100-FBGA | Tray      | 152    | 152    | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">SP9Q8GH2AHW01</a>   | -40°C to +105°C | Wide       | 8GB      | x1/x4/x8           | MLC NAND      | 265MB/s      | 68MB/s        | 6290 IOPS     | 1873 IOPS      | 3.3V/1.8V            | 100-FBGA | Tray      | 152    | 152    | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">KTM8GH2AH101</a>    | -40°C to +85°C  | Industrial | 8GB      | x1/x4/x8           | MLC NAND      | 250MB/s      | 65MB/s        | 10000 IOPS    | 2000 IOPS      | 3.3V/1.8V            | 153-FBGA | Tray      | 152    | 152    | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">KTM8GH2AH101-TR</a> | -40°C to +85°C  | Industrial | 8GB      | x1/x4/x8           | MLC NAND      | 250MB/s      | 65MB/s        | 10000 IOPS    | 2000 IOPS      | 3.3V/1.8V            | 153-FBGA | Tape&Reel | 152    | 152    | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">KTM8GH2AHW01</a>    | -40°C to +105°C | Wide       | 8GB      | x1/x4/x8           | MLC NAND      | 250MB/s      | 65MB/s        | 6290 IOPS     | 1873 IOPS      | 3.3V/1.8V            | 153-FBGA | Tray      | 152    | 152    | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">SP9QAGH2AHW01</a>   | -40°C to +105°C | Wide       | 16GB     | x1/x4/x8           | MLC NAND      | 275MB/s      | 94MB/s        | 7290 IOPS     | 1886 IOPS      | 3.3V/1.8V            | 100-FBGA | Tray      | 152    | 152    | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">KTMAGH2AHW01</a>    | -25°C to +85°C  | Wide       | 16GB     | x1/x4/x8           | MLC NAND      | 275MB/s      | 94MB/s        | 7290 IOPS     | 1866 IOPS      | 3.3V/1.8V            | 153-FBGA | Tray      | 152    | 152    | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">KTMAGP3BMI01</a>    | -40°C to +85°C  | Industrial | 16GB     | x1/x4/x8           | TLC NAND      | 320MB/s      | 135MB/s       | 21000 IOPS    | 20000 IOPS     | 3.3V/1.8V            | 153-FBGA | Tray      | 152    | 152    | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">KTMGBP3DTW01</a>    | -40°C to +105°C | Wide       | 32GB     | x1/x4/x8           | TLC NAND      | 265MB/s      | 98MB/s        | 9244 IOPS     | 2469 IOPS      | 3.3V/1.8V            | 153-FBGA | Tray      | 152    | 152    | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">KTMGBH2AH101</a>    | -40°C to +85°C  | Industrial | 32GB     | x1/x4/x8           | TLC NAND      | 325MB/s      | 300MB/s       | 9528 IOPS     | 4792 IOPS      | 3.3V/1.8V            | 153-FBGA | Tray      | 152    | 152    | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">KTMCGP4ATE01</a>    | -40°C to +85°C  | Extended   | 64GB     | x1/x4/x8           | TLC NAND      | 330MB/s      | 230MB/s       | 13400 IOPS    | 4300 IOPS      | 3.3V/1.8V            | 153-FBGA | Tray      | 152    | 152    | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">KTMCGP3CTW01</a>    | -40°C to +85°C  | Industrial | 64GB     | x1/x4/x8           | TLC NAND      | 330MB/s      | 190MB/s       | 16000 IOPS    | 6500 IOPS      | 3.3V/1.8V            | 153-FBGA | Tray      | 152    | 152    | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">KTM DGP3CTW01</a>   | -40°C to +105°C | Wide       | 128GB    | x1/x4/x8           | TLC NAND      | 330MB/s      | 140MB/s       | 10615 IOPS    | 3879 IOPS      | 3.3V/1.8V            | 153-FBGA | Tray      | 152    | 152    | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">KTM DGP4ATE01</a>   | -25°C to +85°C  | Extended   | 128GB    | x1/x4/x8           | TLC NAND      | 330MB/s      | 200MB/s       | 9547 IOPS     | 2374 IOPS      | 3.3V/1.8V            | 153-FBGA | Tray      | 152    | 152    | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">KTM DGP3CTI01</a>   | -40°C to +85°C  | Industrial | 128GB    | x1/x4/x8           | TLC NAND      | 330MB/s      | 169MB/s       | 10661 IOPS    | 4300 IOPS      | 3.3V/1.8V            | 153-FBGA | Tray      | 152    | 152    | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">KTM EGP3CTW01</a>   | -40°C to +105°C | Wide       | 256GB    | x1/x4/x8           | TLC NAND      | 330MB/s      | 190MB/s       | 10531 IOPS    | 4492 IOPS      | 3.3V/1.8V            | 153-FBGA | Tray      | 152    | 152    | <a href="#">Link</a> | <a href="#">Link</a> |

# FLASH EMMC 5.0

Automotive Temperature Ranges  
AEC-Q100 Grade 2 Automotive Tested



| SMARTSEMI<br>PART NUMBER     | TEMP<br>RANGE   | TESTING                           | CAPACITY | PROG.<br>BUS WIDTH | FLASH<br>TYPE | SEQ.<br>READ | SEQ.<br>WRITE | RNDM.<br>READ | RNDM.<br>WRITE | VOLTAGE<br>(NAND/IO) | PACKAGE  | PACKING | MOQ    | INCR.  | DATA<br>SHEET        | REL.<br>REPORT       |
|------------------------------|-----------------|-----------------------------------|----------|--------------------|---------------|--------------|---------------|---------------|----------------|----------------------|----------|---------|--------|--------|----------------------|----------------------|
| Filter                       | Filter          | Filter                            | Filter   | Filter             | Filter        | Filter       | Filter        | Filter        | Filter         | Filter               | Filter   | Filter  | Filter | Filter | Filter               | Filter               |
| <a href="#">KTM8GP1CWV01</a> | -40°C to +105°C | Automotive<br>AEC-Q100<br>Grade 2 | 8GB      | x1                 | MLC NAND      | 260MB/s      | 85MB/s        | 5800 IOPS     | 2100 IOPS      | 3.3V/1.8V            | 153-FBGA | Tray    | 152    | 152    | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">KTMAGP1CWV01</a> | -40°C to +105°C | Automotive<br>AEC-Q100<br>Grade 2 | 16GB     | x2                 | MLC NAND      | 260MB/s      | 130MB/s       | 6000 IOPS     | 2200 IOPS      | 3.3V/1.8V            | 153-FBGA | Tray    | 152    | 152    | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">KTM8GP1CWV01</a> | -40°C to +105°C | Automotive<br>AEC-Q100<br>Grade 2 | 32GB     | x4                 | MLC NAND      | 260MB/s      | 130MB/s       | 6000 IOPS     | 2200 IOPS      | 3.3V/1.8V            | 153-FBGA | Tray    | 152    | 152    | <a href="#">Link</a> | <a href="#">Link</a> |

# FLASH SD™ Card 3.01/SDR104

Industrial Temperature Range



■ *New Addition!*

| SMARTSEMI<br>PART NUMBER      | TEMP<br>RANGE  | TYPE   | CAPACITY | FLASH<br>TYPE | UHS<br>CLASS | SPEED<br>CLASS | VIDEO<br>CLASS | ENDURANCE | SEQ.<br>READ | SEQ.<br>WRITE | PACKAGE     | PACKING | MOQ    | INCR.  | DATA<br>SHEET        | REL.<br>REPORT       |
|-------------------------------|----------------|--------|----------|---------------|--------------|----------------|----------------|-----------|--------------|---------------|-------------|---------|--------|--------|----------------------|----------------------|
| Filter                        | Filter         | Filter | Filter   | Filter        | Filter       | Filter         | Filter         | Filter    | Filter       | Filter        | Filter      | Filter  | Filter | Filter | Filter               | Filter               |
| <a href="#">KTSDFGA1AWIT1</a> | -40°C to +85°C | SDXC   | 512GB    | TLC NAND      | U3           | C10            | V60            | 880 TBW   | 93MB/s       | 84MB/s        | 32x24x2.1mm | Tray    | 400    | 400    | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">KTSDDGP2AKIT1</a> | -40°C to +85°C | SDXC   | 128GB    | TLC NAND      | U3           | C10            | V60            | 366 TBW   | 100MB/s      | 85MB/s        | 32x24x2.1mm | Tray    | 400    | 400    | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">KTSDCGP2AKIT1</a> | -40°C to +85°C | SDXC   | 64GB     | TLC NAND      | U3           | C10            | V30            | 183 TBW   | 100MB/s      | 50MB/s        | 32x24x2.1mm | Tray    | 400    | 400    | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">KTSDBGP1AMIT1</a> | -40°C to +85°C | SDHC   | 32GB     | TLC NAND      | U1           | C10            | V10            | 91 TBW    | 100MB/s      | 15MB/s        | 32x24x2.1mm | Tray    | 400    | 400    | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">KTSDAGP2AKIU1</a> | -40°C to +85°C | SDHC   | 16GB     | pSLC NAND     | U3           | C10            | V60            | 460 TBW   | 100MB/s      | 85MB/s        | 32x24x2.1mm | Tray    | 400    | 400    | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">KTSD8GP3ASIM1</a> | -40°C to +85°C | SDHC   | 8GB      | MLC NAND      | U3           | C10            | V30            | 23 TBW    | 95MB/s       | 35MB/s        | 32x24x2.1mm | Tray    | 400    | 400    | <a href="#">Link</a> | <a href="#">Link</a> |

Performance Classification

| Minimum<br>Sequential Write<br>Speed | Suggested<br>Maximum<br>Bit Rate | Speed Class |           |                     | Video Format        |        |    |    |
|--------------------------------------|----------------------------------|-------------|-----------|---------------------|---------------------|--------|----|----|
|                                      |                                  | Speed Class | UHS Class | Video Class         | SD                  | HD/FHD | 4K | 8K |
| 2 MB/s                               | 15 Mbit/s                        | Class 2     | Ⓢ         |                     |                     |        |    |    |
| 4 MB/s                               | 30 Mbit/s                        | Class 4     | Ⓢ         |                     |                     |        |    |    |
| 6 MB/s                               | 45 Mbit/s                        | Class 6     | Ⓢ         |                     |                     |        |    |    |
| 10 MB/s                              | 75 Mbit/s                        | Class 10    | Ⓢ         | Class 6 <b>V6</b>   |                     |        |    |    |
| 30 MB/s                              | 220 Mbit/s                       | Class 10    | Ⓢ         | Class 1 <b>U1</b>   | Class 10 <b>V10</b> |        |    |    |
| 60 MB/s                              | 460 Mbit/s                       | Class 10    | Ⓢ         | Class 3 <b>U3</b>   | Class 30 <b>V30</b> |        |    |    |
| 90 MB/s                              | 700 Mbit/s                       | Class 10    | Ⓢ         | Class 3 <b>U3</b>   | Class 60 <b>V60</b> |        |    |    |
|                                      |                                  |             |           | Class 90 <b>V90</b> |                     |        |    |    |

Physical Attributes

| Capacity                                                                            |                                                                                     |                                                                                     |                                                                                     |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| SD                                                                                  | SDHC                                                                                | SDXC                                                                                | SDUC                                                                                |
| Up to 2GB                                                                           | >2GB to 32GB                                                                        | >32GB to 2TB                                                                        | >2TB to 128TB                                                                       |
|  |  |  |  |
|  |  |  |  |

| Form Factor                                                                         |                                                                                     |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| SD                                                                                  | microSD                                                                             |
| 32x24x2.1mm                                                                         | 11x15x1xmm                                                                          |
|  |  |



# FLASH microSD™ Cards 6.1

Industrial Temperature Range



■ New Addition!

| SMARTSEMI<br>PART NUMBER      | TEMP<br>RANGE  | TYPE      | CAPACITY | FLASH<br>TYPE | UHS<br>CLASS | SPEED<br>CLASS | VIDEO<br>CLASS | APPLICATION<br>PERFORMANCE | SEQ.<br>READ | SEQ.<br>WRITE | PACKAGE   | PACKING | MOQ    | INCR.  | DATA<br>SHEET        | REL.<br>REPORT       |
|-------------------------------|----------------|-----------|----------|---------------|--------------|----------------|----------------|----------------------------|--------------|---------------|-----------|---------|--------|--------|----------------------|----------------------|
| Filter                        | Filter         | Filter    | Filter   | Filter        | Filter       | Filter         | Filter         | Filter                     | Filter       | Filter        | Filter    | Filter  | Filter | Filter | Filter               | Filter               |
| <a href="#">KTUDFGA1AWIT1</a> | -40°C to +85°C | microSDXC | 512GB    | TLC NAND      | U3           | C10            | V60            | A2                         | 97MB/s       | 80MB/s        | 11x15x1mm | Tray    | 120    | 120    | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">KTUDFGA1AWET1</a> | -25°C to +85°C | microSDXC | 512GB    | TLC NAND      | U3           | C10            | V60            | A2                         | 97MB/s       | 80MB/s        | 11x15x1mm | Tray    | 120    | 120    | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">KTUDEGA1AWIT1</a> | -40°C to +85°C | microSDXC | 256GB    | TLC NAND      | U3           | C10            | V60            | A2                         | 97MB/s       | 83MB/s        | 11x15x1mm | Tray    | 120    | 120    | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">KTUDEGA1AWET1</a> | -25°C to +85°C | microSDXC | 256GB    | TLC NAND      | U3           | C10            | V30            | A2                         | 97MB/s       | 83MB/s        | 11x15x1mm | Tray    | 120    | 120    | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">KTUDDGA1AWIT1</a> | -40°C to +85°C | microSDXC | 128GB    | TLC NAND      | U3           | C10            | V30            | A2                         | 95MB/s       | 50MB/s        | 11x15x1mm | Tray    | 120    | 120    | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">KTUDDGA1AWET1</a> | -25°C to +85°C | microSDXC | 128GB    | TLC NAND      | U3           | C10            | V30            | A2                         | 95MB/s       | 50MB/s        | 11x15x1mm | Tray    | 120    | 120    | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">KTUDCGA1AWIT1</a> | -40°C to +85°C | microSDXC | 64GB     | TLC NAND      | U3           | C10            | V30            | A2                         | 97MB/s       | 80MB/s        | 11x15x1mm | Tray    | 120    | 120    | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">KTUDCGA1AWET1</a> | -25°C to +85°C | microSDXC | 64GB     | TLC NAND      | U3           | C10            | V30            | A2                         | 97MB/s       | 80MB/s        | 11x15x1mm | Tray    | 120    | 120    | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">KTUDCGP2AKIT1</a> | -40°C to +85°C | microSDXC | 64GB     | TLC NAND      | U3           | C10            | V30            |                            | 95MB/s       | 50MB/s        | 11x15x1mm | Tray    | 120    | 120    | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">KTSDBGP1AMIT1</a> | -40°C to +85°C | microSDHC | 32GB     | TLC NAND      | U1           | C10            | V10            |                            | 100MB/s      | 15MB/s        | 11x15x1mm | Tray    | 120    | 120    | <a href="#">Link</a> | <a href="#">Link</a> |
| <a href="#">KTUDAGP2AKIU1</a> | -40°C to +85°C | microSDHC | 16GB     | pSLC NAND     | U3           | C10            | V60            |                            | 100MB/s      | 85MB/s        | 11x15x1mm | Tray    | 120    | 120    | <a href="#">Link</a> | <a href="#">Link</a> |

## Performance Classification

| Minimum<br>Sequential Write<br>Speed | Suggested<br>Maximum<br>Bit Rate | Speed Class |            |              | Video Format |        |    |    |
|--------------------------------------|----------------------------------|-------------|------------|--------------|--------------|--------|----|----|
|                                      |                                  | Speed Class | UHS Class  | Video Class  | SD           | HD/FHD | 4K | 8K |
| 2 MB/s                               | 15 Mbit/s                        | Class 2     |            |              |              |        |    |    |
| 4 MB/s                               | 30 Mbit/s                        | Class 4     |            |              |              |        |    |    |
| 6 MB/s                               | 45 Mbit/s                        | Class 6     |            |              |              |        |    |    |
| 10 MB/s                              | 75 Mbit/s                        | Class 10    |            | Class 6 V6   |              |        |    |    |
| 30 MB/s                              | 220 Mbit/s                       | Class 10    | Class 1 U1 | Class 10 V10 |              |        |    |    |
| 60 MB/s                              | 460 Mbit/s                       | Class 10    | Class 3 U3 | Class 30 V30 |              |        |    |    |
| 90 MB/s                              | 700 Mbit/s                       | Class 10    | Class 3 U3 | Class 60 V60 |              |        |    |    |
|                                      |                                  |             |            | Class 90 V90 |              |        |    |    |

## Physical Attributes

| Capacity  |              |              |               |
|-----------|--------------|--------------|---------------|
| SD        | SDHC         | SDX          | SDUC          |
| Up to 2GB | >2GB to 32GB | >32GB to 2TB | >2TB to 128TB |
|           |              |              |               |
|           |              |              |               |

| Form Factor |            |
|-------------|------------|
| SD          | microSD    |
| 32x24x2.1mm | 11x15x1xmm |
|             |            |