

Micron® Flash Memory Support for Intel® FPGA Platforms

Save yourself time and money—Micron memory comes *validated* on Intel FPGA platforms

| Micron Flash | | Code and Data Storage | | | | | Passive Config ¹ | | |
|-------------------|-----------------------------|------------------------|-----------|-----------|------|--|-----------------------------|--------------|----------------|
| | | SPI NOR | | NAND | | e.MMC | SPI NOR | Parallel NOR | NAND |
| | Family | MT25QL | MT25QU | MT29F | | MTFC | MT25Q | MT28EW | MT29F |
| | Density | 128Mb-1Gb | 512Mb-2Gb | 1Gb–32Gb | | 4GB–128GB | 128Mb–2Gb | 128Mb–1Gb | 1Gb |
| | Voltage | 3V | 1.8V | 3V | 1.8V | 3V | 1.8V or 3V | 1.8V, 3V | 1.8V, 3V |
| | Read Speed | Up to 133 MHz | 166 MHz | Asynch | | 4.41/4.51/5.0 SDR/DDR 52 MHz, HS200, HS400 | 166/133 MHz | Asynch | |
| | Width | x1, x2, x4 | | x8 | | x1, x4, x8 | x1, x2, x4 | x8, x16 | x8 |
| | Temperature/Grade | Industrial, Automotive | | | | Automotive, Industrial, Wireless | Industrial, Automotive | | |
| | Packages | S08W, S016, DFN, BGA | | TSOP, BGA | | 100/153/169-ball BGA | S08W, S016, DFN, BGA | TSOP, BGA | |
| Intel FPGA Family | Intel SoC Family | | | | | | | | |
| | Stratix® 10 | | ✓ | | Ⓟ | ✓ | | | ✓ ² |
| | Arria® 10 | ✓ | ✓ | | ✓ | ✓ | | | |
| | Arria V | ✓ | | ✓ | ✓ | ✓ | | | |
| | Cyclone® V | ✓ | | ✓ | ✓ | ✓ | | | |
| | Intel High-End FPGA Family | | | | | | | | |
| | Stratix 10 | | | | | | ✓ | ✓ | ✓ |
| | Stratix V | | | | | | ✓ | ✓ | ✓ |
| | Stratix IV | | | | | | ✓ | ✓ | ✓ |
| | Stratix III | | | | | | ✓ | ✓ | ✓ |
| | Intel Mid-Range FPGA Family | | | | | | | | |
| | Arria 10 | | | | | | ✓ | ✓ | ✓ |
| | Arria V | | | | | | ✓ | ✓ | ✓ |
| | Arria II | | | | | | ✓ | ✓ | ✓ |
| | Intel Low-Cost FPGA Family | | | | | | | | |
| | Cyclone 10 | | | | | | Ⓟ | ✓ | |
| | Cyclone V | | | | | | ✓ | ✓ | ✓ |
| Cyclone IV FPGA | | | | | | ✓ | ✓ | ✓ | |
| Cyclone III | | | | | | ✓ | ✓ | ✓ | |

Please verify exact configuration and specification with your Intel or Micron representative. **P** Pending validation. 1. Intel PFL + CPLDs (MAX® II and MAX V devices) enables Micron Quad SPI, parallel NOR and NAND to interface with any Arria, Cyclone or Stratix series FPGAs for extended capacity and performance. 2. Also supports x16.

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Micron® DRAM Memory Support for Intel® FPGA Platforms

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| Micron DRAM | | DDR4 | DDR3 | DDR3L ¹ | DDR2 | DDR | SDRAM | LPDDR2 | LPDDR3 | RLDRAM®3 | RLDRAM®2 | HMC | |
|-------------------|-------------------------------|------------------------------------|----------------|--------------------|-------------|--------------|--------------------|---------------------------------|--------------------------|--------------|------------------------|---------|------------|
| | Family | MT40A | MT41J | MT41K | MT47 | MT46 | MT48 | MT42 | MT52 | MT44 | MT49 | MT43 | |
| | Density | 4Gb, 8Gb | 1Gb, 2Gb, 4Gb | 1Gb, 2Gb, 4Gb | 1Gb, 2Gb | 256Mb, 512Mb | 64Mb, 128Mb, 256Mb | 512Mb, 1Gb, 2Gb, 4Gb, 8Gb, 16Gb | 8Gb, 16Gb, 32Gb | 576Mb, 1Gb | 288Mb, 576Mb | 2GB | |
| | Voltage (Core) | 1.2V | 1.5V | 1.35V/1.5V | 1.5V | 2.5V | 3.3V | 1.2V | | 1.35V | 1.8V | 1.2V | |
| | Speed ² | 625–1333 MHz | 400–1066 MHz | 400–1066 MHz | 200–533 MHz | 167–200 MHz | 133–167 MHz | 333–400 MHz | 800–933 MHz | 800–1066 MHz | 300–533 MHz | 15 Gb/s | |
| | Width | x8, x16 | | | | | x8, x16, x32 | x32 | | x18, x36 | | x64 | |
| | Temperature/Grade | Commercial, Industrial, Automotive | | | | | | | Wireless (-30°C to 85°C) | | Commercial, Industrial | | Commercial |
| | Packages/Modules | UDIMM, RDIMM, LRDIMM, SODIMM, BGA | | | | | TSOP, BGA | | BGA, PoP | | BGA | | BGA |
| Intel FPGA Family | Intel FPGA SoC | | | | | | | | | | | | |
| | Stratix® 10 | ✓ | ✓ | ✓ | | | | | | ✓ | | ✓ | |
| | Arria® 10 | ✓ | ✓ | ✓ | | | | | | ✓ | | ✓ | |
| | Arria V | | | ✓ | ✓ | | | ✓ | | | | | |
| | Cyclone® V | | | ✓ | ✓ | | | | | | | | |
| | Intel High-End FPGA Family | | | | | | | | | | | | |
| | Stratix 10 | ✓ ³ | ✓ ³ | ✓ ³ | | | | | | ✓ | | ✓ | |
| | Stratix V | | ✓ | ✓ | ✓ | | | | | ✓ | ✓ | ✓ | |
| | Stratix IV | | ✓ | ✓ | ✓ | ✓ | | | | | ✓ | | |
| | Intel Mid-Range FPGA Family | | | | | | | | | | | | |
| | Arria 10 | ✓ ³ | ✓ ³ | ✓ ³ | | | | ✓ | ✓ | ✓ | | ✓ | |
| | Arria V | | ✓ | | ✓ | | | ✓ | | | ✓ | | |
| | Intel Low-Cost FPGA Family | | | | | | | | | | | | |
| | Cyclone 10 GX | | ✓ | ✓ | | | | | ✓ | | | | |
| | Cyclone V | | ✓ | ✓ | ✓ | | | ✓ | | | | | |
| | Cyclone IV | | | | ✓ | ✓ | | | | | | | |
| | Intel Nonvolatile FPGA Family | | | | | | | | | | | | |
| | MAX® 10 | | ✓ | ✓ | ✓ | | | ✓ | | | | | |

Please verify exact configuration and specification with your Intel or Micron representative. ^P Pending validation. 1. DDR3L is compatible with operation at 1.5V.

Note that some density and speed combinations may be available only as 1.35V part numbers, but these meet the specification for operation at 1.5V.

2. The maximum memory speed is dependent on the maximum frequency supported by the FPGA family. See the FPGA family data sheet for the maximum speeds.

3. x4 width supported.

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