UNLIMITED INGENUITY

INTELLIGENT MEMORY

MEMORY & STORAGE SOLUTIONS FOR INDUSTRIAL & EMBEDDED APPLICATIONS

WHO WE ARE

- Serving global embedded and industrial customers for over 30 years, offering a variety of interfaces, form factors, and capacities
- Your one-stop shop for memory solutions: From standard to special, legacy to mainstream
- Commercial and logistical support, reliability, and quality across the globe
- Complete in-house support: From design, to manufacturing and testing capabilities, through to applications
- A wide variety of unique, complex, and niche memory solutions
- Offering a comprehensive portfolio of DRAM components, DRAM modules, and NAND Flash products
- Long product lifetimes ensure longevity with continued support
- Locked BOMs and product lifecycle management with no surprises
- Customizable configurations and feature-rich products across a range of solutions
- Supply stability and availability through strategic partnerships

Alcom electronics
Singel 3 | B-2550 Kontich | Belgium | Tel. +32 (0)3 458 30 33 | info@alcom.be | www.alcom.be
Rivium 1e straat 52 | 2909 LE Capelle aan den Ijssel | The Netherlands | Tel. +31 (0)10 288 25 00 | info@alcom.nl | www.alcom.nl

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INDUSTRY SEGMENTS

NAND FLASH PRODUCTS

	eMMC	SD	SATA	PCIe	PATA	USB
Form Factors	100-ball 14x18mm 153-ball 11,5x13mm	SD microSD	M.2 (2242, 2280) 2.5" mSATA mSATA mini CFast BGA	M.2 (2242, 2280) U.2 CFX BGA	CompactFlash	USB Stick
Product Families	Silver Ruby Emerald	Silver Ruby Emerald	Silver Ruby Emerald	Silver Ruby Emerald	Emerald	Emerald
Temperature Ranges	Extended Commercial: -25°C to +85°C Industrial: -40°C to +85°C Auto. Grade 3: -40°C to +85°C Auto. Grade 2: -40°C to +105°C	Extended Commercial: -25°C to +85°C Industrial: -40°C to +85°C	Commercial: 0°C to +70°C Industrial: -40°C to +85°C	Commercial: 0°C to +70°C Industrial: -40°C to +85°C	Commercial: 0°C to +70°C Industrial: -40°C to +85°C	Commercial: 0°C to +70°C Industrial: -40°C to +85°C

NAND FLASH KEY FEATURES

- Available as removable media, embedded form factors and BGA components
- Equipped with high quality hardware and industrial grade firmware
- Developed and tested for demanding operating environments
- Offered in different grades and customized for specific applications to optimize performance, lifetime and reliability
  - IM's NAND line-up includes 3 family categories (classified by their endurance):
    - Emerald - The "SLC grade"
    - Ruby - The "pseudoSLC grade"
    - Silver - The "MLC/TLC grade"
- All product grades come with a full range of tools and technical support
  - Tools include workload generation, live performance evaluation, life time monitoring, etc.

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DRAM COMPONENTS & MODULES

DRAM Components	64Mb	128Mb	256Mb	512Mb	1Gb	2Gb	4Gb	8Gb	16Gb
SDRAM (3.3V)	✓✓	✓✓	✓✓✓	✓✓✓					
DDR (2.5V)			✓	✓	✓✓				
DDR2 (1.8V)				✓	✓✓	✓✓			
DDR3 (1.35V/1.5V)					✓✓	✓	✓	✓✓	✓
DDR4 (1.2V)							✓	✓	✓
LPDDR4 (1.1V)							✓	✓	✓

Features:

- ✓ Commercial & Industrial Temperature Grade, Leaded balls package option available
- ✓ x4 configuration available
- ✓ ECC – On-chip ECC option available (AEC-Q100 also available)
- ✓ x32 configuration and/or BGA package available
- ✓ under consideration

DRAM Modules	LRDIMM	RDIMM	UDIMM	RSODIMM	SODIMM	MINI-RDIMM	MINI-UDIMM
FPM/EDO (3.3V/5V, max: 50ns)			✓ Max: 256MB		✓ Max: 128MB		
SDRAM (3.3V, max: PC-166)			✓✓ Max: 512MB		✓✓ Max: 512MB		
DDR (2.5V, max: PC-3200)		✓ Max: 1GB	✓✓ Max: 1GB		✓✓ Max: 1GB		
DDR2 (1.8V, max: PC2-6400)		✓ Max: 8GB	✓✓ Max: 4GB		✓✓ Max: 4GB	✓✓ Max: 512MB	
DDR3 (1.35V/1.5V, max: PC3-12800)	✓ Max: 32GB	✓✓ Max: 32GB	✓✓✓ Max: 16GB	✓ Max: 16GB	✓✓✓ Max: 16GB	✓✓ Max: 16GB	✓✓ Max: 16GB
DDR4 (1.2V, max: PC4-25600)		✓✓ Max: 64GB	✓✓✓ Max: 32GB		✓✓✓ Max: 32GB	✓✓ Max: 16GB	✓✓ Max: 32GB
DDR5 (1.1V, max: PC5-44800)		✓ Max: 64GB	✓ Max: 32GB		✓ Max: 32GB		

Features:

- ✓ ECC or Non-ECC optional
- ✓ VLP / ULP (Very Low Profile / Ultra Low Profile) available
- ✓ I-Temp available

SDRAM Highlights

- Components with max. 512Mb, both TSOP and BGA
- 256Mb & 512Mb components with ECC feature, TSOP x8, x16 & x32
- UDIMM and SODIMM modules with up to 512MB

DDR Highlights

- Components with max. 1Gb, both TSOP and BGA
- 1Gb components with ECC feature, TSOP x8 and x16
- RDIMM, SODIMM and UDIMM modules with up to 1GB

DDR2 Highlights

- Components with max. 2Gb with Single Chip Select x4, x8 and x16
- 1Gb components with ECC feature, x8 and x16
- High density modules: E.g. 8GB RDIMM and 4GB UDIMM

DDR3 Highlights

- 16Gb components with Dual Chip Select x16
- 8Gb components with Single or Dual Chip Select, x4, x8 and x16
- 1Gb components with ECC feature, x8 and x16
- UDIMM and SODIMM modules with up to 16GB (optional ECC)

DDR4 Highlights

- Faster data transfer rates and low voltage operation
- Full configurations offered (8Gb and 4Gb with x8 and x16)
- Highest speed up to 3200Mbps
- Working temps in the range of -40°C to +95°C

LPDDR4 Component Highlights

- Low Voltage Power Supply 1.8V and I/O at 1.1V
- Mobile features for lower power
- ZQ Calibration
- Integrated ECC error correction
- 4Gb x32 and 8Gb x32 are available

DDR5 Module Highlights

- Multiple form factors:
  - UDIMM, SODIMM & RDIMM with ECC
  - UDIMM & SODIMM Non-ECC
- The use of original DRAM components to fulfill industrial standards
- Highest speed up to 5600MT/s (PC5-44800)
- Lower power requirements: Only 1.1V needed
- Capacity: 8GB to 64GB

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