3D PLUS

Memory Products Overview

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Technical presentations Day on
Microelectronic Packaging technologies

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3D PLUS Strategic Standard Products Lines

- Memory Modules
  - SDRAM
  - DDR SDRAM
  - FLASH
  - SRAM
  - DPRAM
  - EEPROM
  - Mixed Modules (SRAM + EEPROM)

- Computer Modules
  - DSP ATMEL TSC21020F
  - DSP Texas Instruments C6000 and C5500

- Camera Head and Sensors Modules

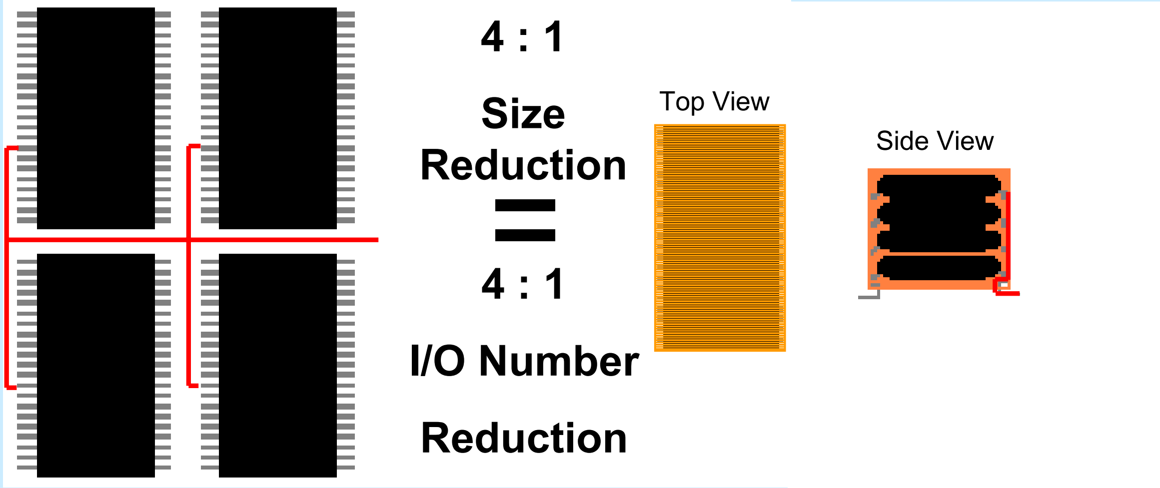
- DC/DC Converters Modules
  - 4W
  - 10W (in development)

3D PLUS Memory Modules Benefits Overview

- Miniaturization (Save up to 80 % Space in the design),
- Very High Density,
- Wide Bit Organization (x 32, x 48, x 64, x 72, … and more if needed),
- High Operating Speed,
- High Signal Integrity and Immunity to Noise and Ground Bounce,
- Low-Power Consumption,
- High Reliability – MTBF
- Space quality level Manufacturing & screening flow
- Characterization in terms of radiations tolerance (TID & SEE)

3D PLUS Concept & Technology for Memory Modules

A Technology for More Memory Performance in Smaller Spaces :



4 : 1

Size Reduction

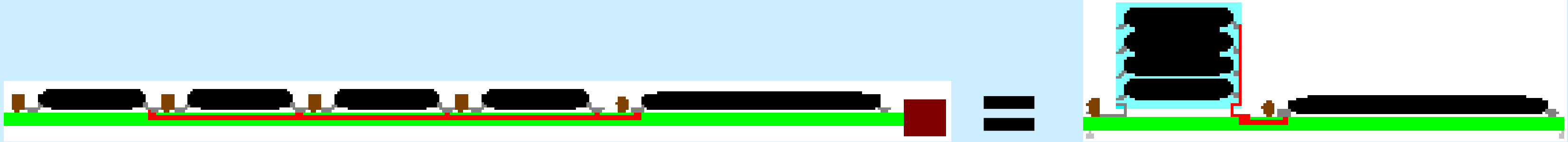
=

4 : 1

I/O Number Reduction

Four Memory Packages
(Die, CSP, TSOP, CSP, µBGA, …)

One 3D Memory Module

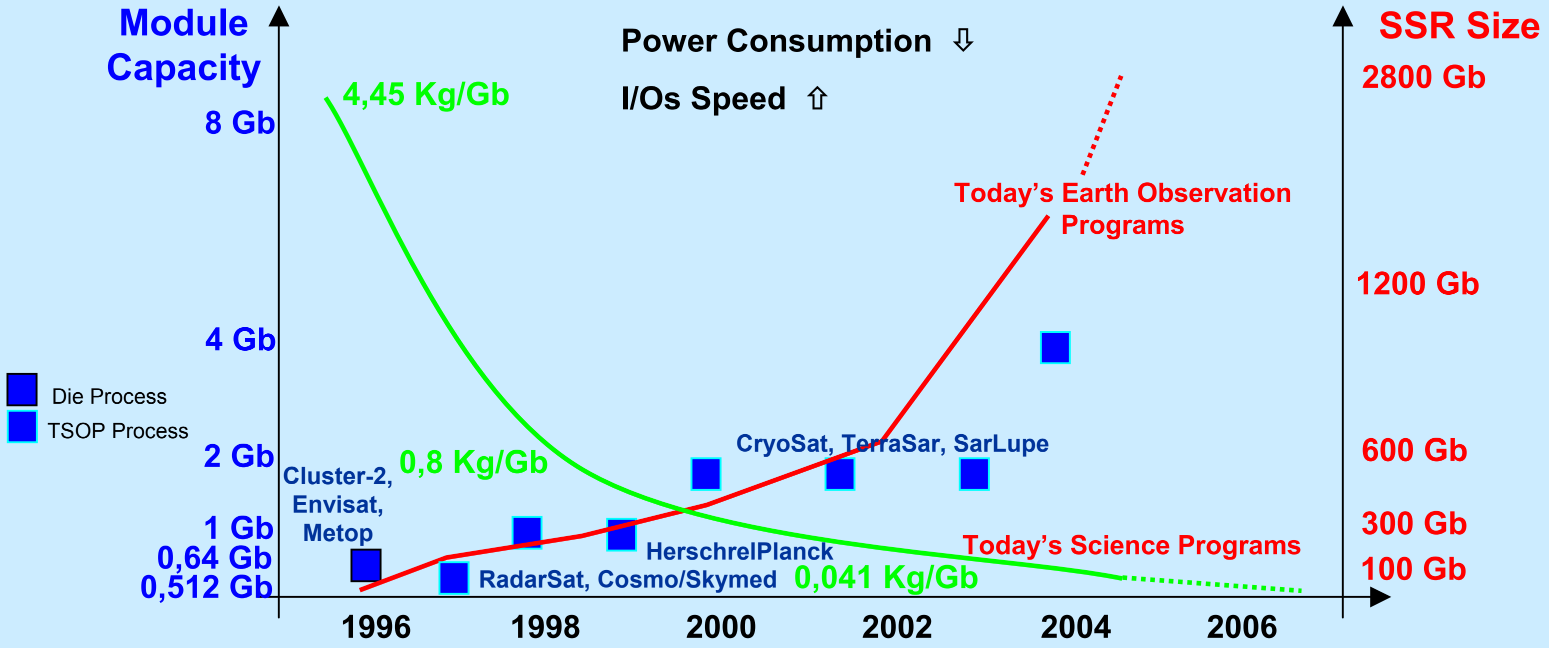


System board

System board embedding 3-D module

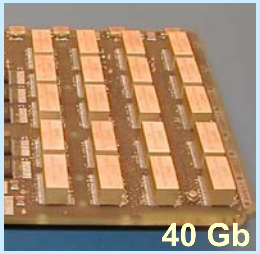
75 % Electrical Length and Parasitic elements Reduction

3D PLUS Heritage for Solid State Recorders



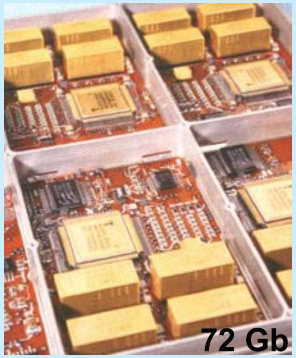
3,2 Gb

3,2 Gb



40 Gb

20 Gb

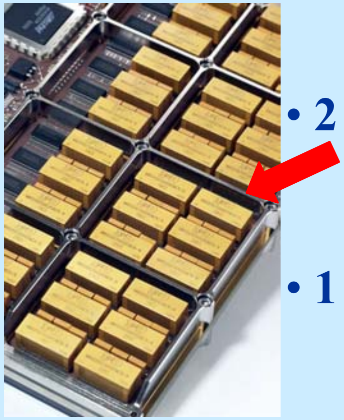


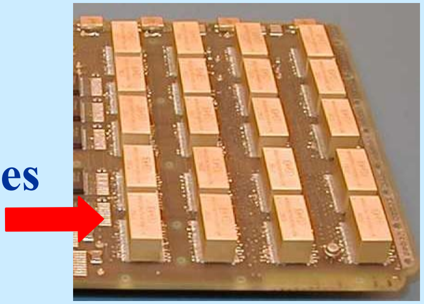
72 Gb

144 / 288 Gb

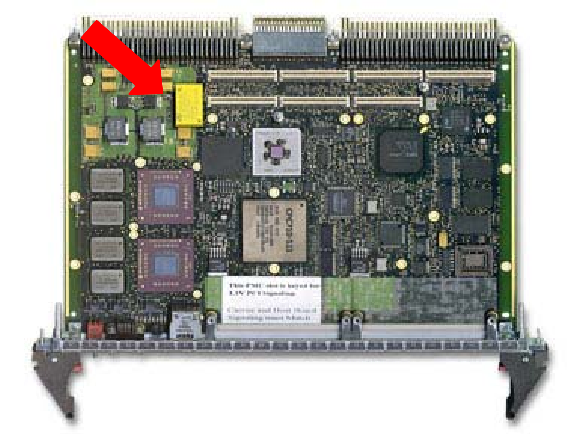
3D PLUS Memory Modules Highlights

Memory Solutions for Computer Boards, « Disc On Chip » and Mass Data Storage :

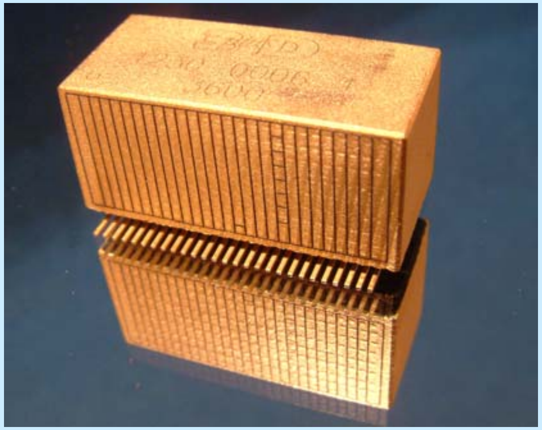




- 2 Gb to 8 Gb SDRAM Memory Modules
- 1 Gb to 2 Gb DDR SDRAM Memory Modules
- 8 Gb to 16 Gb FLASH Memory Modules
- 16 Mb to 64 Mb SRAM Memory Module
- 4 Mb to 8 Mb EEPROM Memory Modules



4 Gb SDRAM Memory Module



- **Description :**
  Stack of eight 512 Mb SDRAM

- **Part Number:**
  MMSD08512808S-E or MMSD04102408S-E

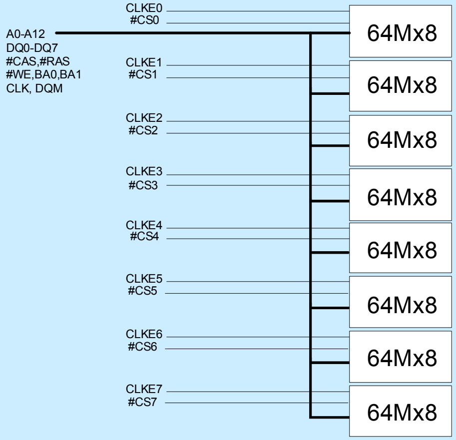
- **Memory Organization :**
  512M x 8 or 1G x 4 (other memory organization possible)

- **Packaging :**
  SOP 58-08 or SOP 54-08 (24 * 11 * 12 mm)

- **Features :**
  Targeted for Data Storage Systems
  Independent CS and CLKE for each SDRAM Die
  ⇒Total Power Consumption Management possibility

- **Basic Memory cell :**
  512 Mb DDP or Single Chip

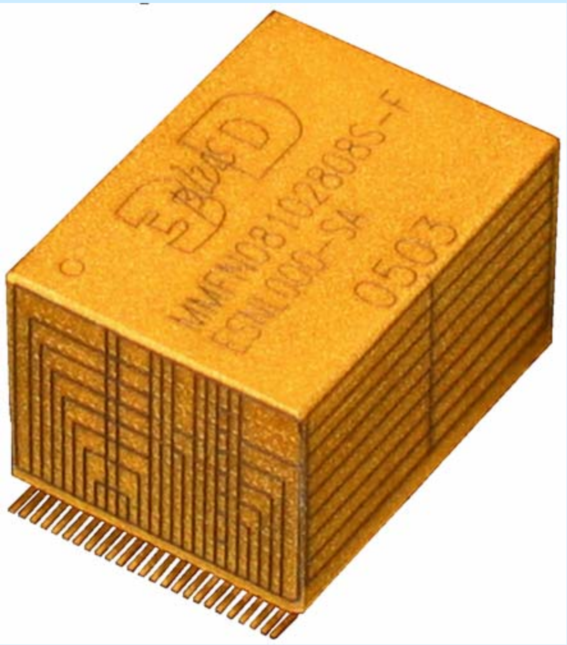
Block Diagram



- SDRAM Product Life Cycle Management under control of 3D PLUS

- Other New Products : 2 Gb SDRAM Memory Module (stack of four TSOPs only)

8 Gb FLASH Memory Module



- **Description :**
  Stack of eight 1 Gb FLASH

- **Part Number:**
  MMFN08102808S-F

- **Memory Organization :**
  1G x 8 (other memory organization possible)

- **Packaging :**
  SOP 50-05 or SOP 54-08 (18,7 * 13,5 * 12 mm)

- **Features :**
  Targeted for Mass Data Storage Application
  Independant control of each FLASH Memory integrated in the Module for High speed Access

- **Basic Memory cell :**
  1 Gb from SAMSUNG
  Other Memory Supplier can be used (TOSHIBA, AMD, …)

- **FLASH Product Life Cycle Management under control of 3D PLUS**

- **Other New Products : 4 Gb FLASH Memory Module (stack of four TSOPs only)**

16 Mb SRAM Memory Module

•Description :
Stack of four 4 Mb SRAM or sixteen 1Mb SRAM

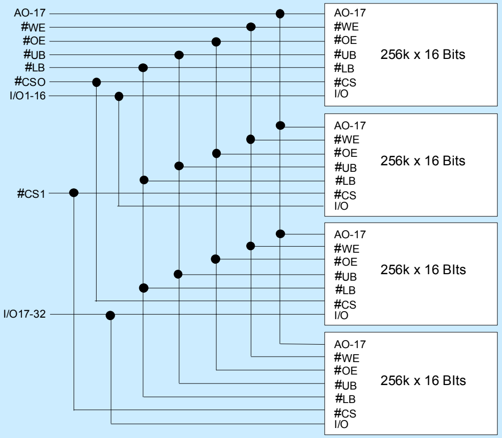
•Part Number:
MMSR32510604S-
MMSR16001808S-CR (Cooperation with ATMEL – PN: AT61162E)

•Memory Organization :
512k x 32, 1Mx16, 2Mx8

•Packaging :
SOP 64-08 (28 * 11 * H)

•Features : cf. block diagram for x32 organisation

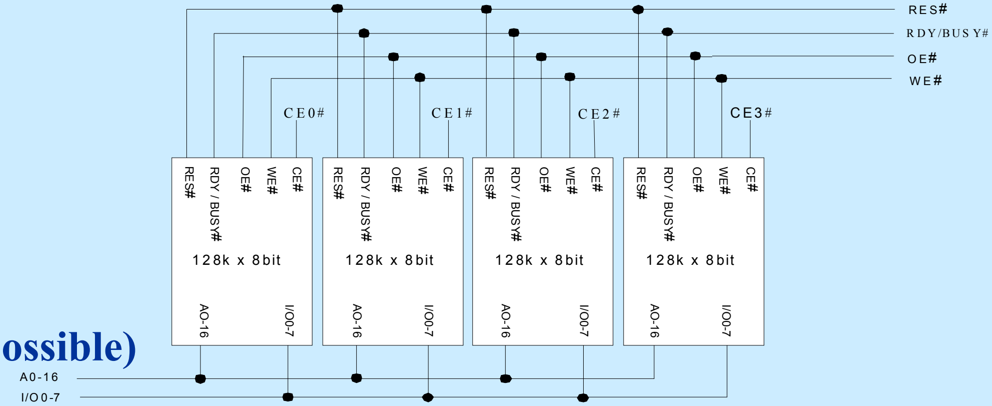
BLOCK DIAGRAM



•Basic Memory cell :
4 Mb SAMSUNG Rev. C, (TSOP)
1 Mb ATMEL 65609E, QML-Q (Die)
⇒Good behavior in the temperature range
⇒Good radiation tolerance performance

•Other Products : 32 Mb SRAM Memory Module (stack of eight TSOPs)

4 Mb EEPROM Memory Module

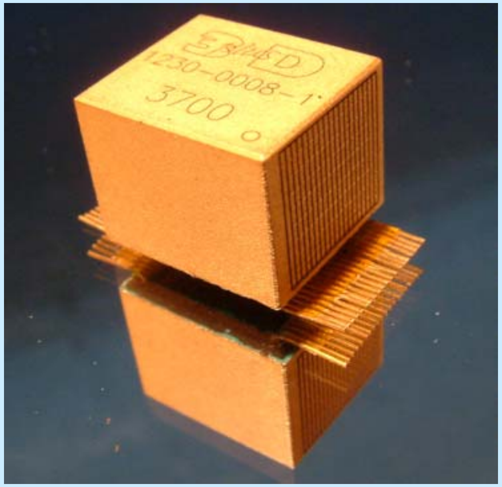


- **Description :**
  Stack of four 1 Mb EEPROM

- **Part Number:**
  MMEE08510804SCC

- **Memory Organization :**
  512K x 8 (x32 memory organization possible)

- **Packaging :**
  SOP 40-05 – Package G4 (13,2 * 11,7 * 7,5 mm)
  ⇒75 % Area Savings
  ⇒80 % weight Savings against other solutions



- **Features : cf. block diagram**

- **Basic Memory cell :**
  1 Mb EEPROM (128k x 8) ref. HN58C1001T-15 (TSOP)
  ⇒Good behavior in the temperature range
  ⇒Good radiation tolerance performance

- **EEPROM Product Life Cycle Management under control of 3D PLUS**

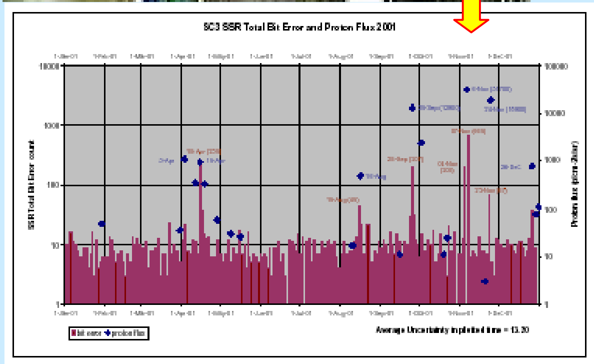
- **Other New Products : 8 Mb EEPROM Memory Module (stack of eight TSOPs only)**

3D PLUS Flight Proven Technology and Products

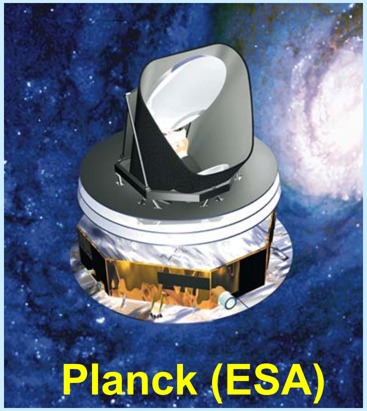

Envisat (ESA)


Rosetta (ESA)


Cluster II (ESA)




Mars Express (ESA)


Planck (ESA)


Corot (ESA)


Bay of Sydney


Proba (ESA)

3D PLUS Product Highlights for 2004

These Products are a short list of the 3D PLUS product range available on our Web Site :

www.3d-plus.com

Don’t hesitate to contact us to discuss your needs…in the 3rd Dimension

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