



## 512Mb NAND FLASH + 1Gb DDR2 SDRAM MCP Product

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### Multi-Chip Package MEMORY

### 512M Bit(64Mx8) NAND Flash / 1G Bit (8Mx16x8Banks) DDR2 SDRAM

Revision No.	History	Draft Date	Remark
Rev 00	Initial Draft	May. 2010	Preliminary
Rev 01	Generate 9x9mm 104ball FBGA Product	Jul. 2010	
Rev 02	Remove Sequential row read function	Sep. 2010	
Rev 03	Add product code with DDR800	Dec. 2010	
Rev 04	1. Changed Operating Temperature at standard grade : From : 0°C ~ 85°C To : 0°C ~ 95°C 2. Updated IDD parameter	Jun.2011	



### Multi-Chip Package MEMORY

512M Bit (64Mx8) NAND Flash / 1G Bit (8Mx16x8Banks) DDR2 SDRAM

#### <MCP Features>

- Operating Temperature : 0°C ~ 70°C
- 119-ball FBGA Type - 10mm x 13mm, 0.8mm pitch
- 104-ball FBGA Type - 9.0mm x 9.0mm, 065mm pitch

#### <NAND Features>

- **Power Supply Voltage**
  - 2.7V ~ 3.6V
- **Organization**
  - Memory Cell Array : (64M + 2M)bit x 8 bit
- **Data Register : (512 + 16)bit x 8 bit**
- **Automatic Program and Erase**
  - Page Program : (512 + 16)Byte
  - Block Erase : (16K + 512)Byte
- **Page Read Operation**
  - Page Size : (512 + 16)Byte
  - Random Access : 12μs (Max.)
  - Serial Page Access : 30ns(Min.)
- **Fast Write Cycle Time**
  - Program time : 200μs (Typ.)
  - Block Erase Time : 2ms(Typ.)
- **Command/Address/Data Multiplexed I/O Port**
- **Hardware Data Protection**
  - Program/Erase Lockout During Power Transitions
- **Data Integrity**
  - Endurance : 100K Program/Erase Cycles
  - Data Retention : 10 Years
- **Command Register Operation**

#### <DDR2 SDR Features>

- **Density:** 1G bits
- **Organization :** 8M × 16 bits × 8 banks
- **Power supply:** 1.8V ± 0.1V
- **Data rate:** 667/800 (max.)
- **8 internal memory banks**
- **Programmable CAS Latency:** 3,4,5
- **Programmable Additive Latency :** 0,1,2,3,4,5
- **Write Latency =** Read Latency -1
- **Programmable Burst Length :**
  - 4 and 8 Programmable Sequential / Interleave Burst
- **OCD (Off-chip Driver Impedance Adjustment)**
- **ODT (On-Die Termination)**
- **4n-bit prefetch architecture**
- **Data-Strobes :** Bidirectional, Differential
- **Auto-Refresh and Self-Refresh**
- **Strong and Weak Strength Data-Output Driver**
- **2KB Page Size**
- **7.8us max. Average Periodic Refresh Interval**



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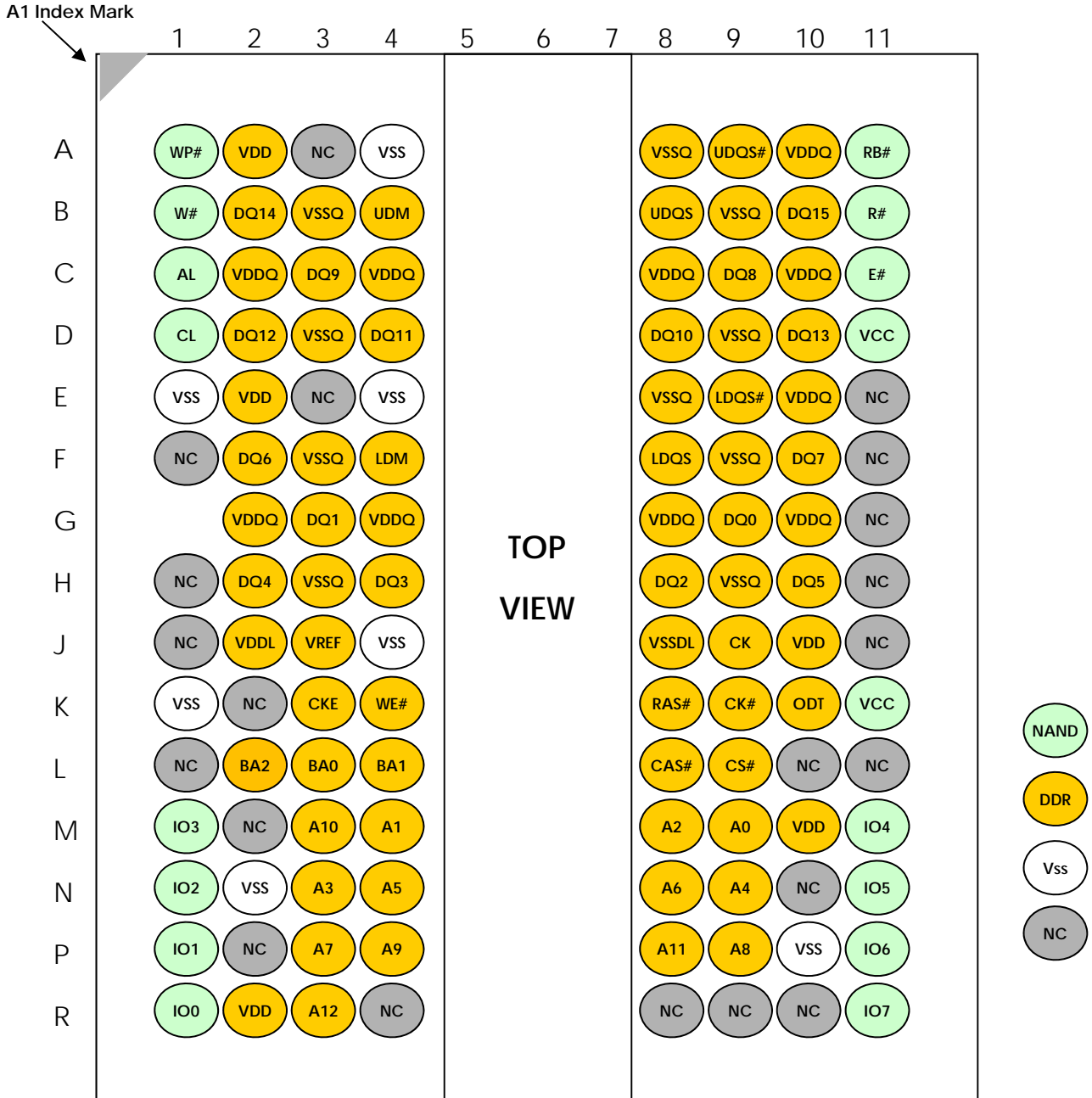
### MCP Product Information

Part number	NAND Flash	DDR2 SDRAM	Package (FBGA)
MST7B08F16DMH-366	512 Mbit(x8) – 3.0V	1Gbit(x16) – 1.8V	10x13mm 119 ball
MST7B08F16DMHC-366	512 Mbit(x8) – 3.0V	1Gbit(x16) – 1.8V	9x9mm 104 ball
MST7B08F16DMHC-380	512 Mbit(x8) – 3.0V	1Gbit(x16) – 1.8V	9x9mm 104 ball



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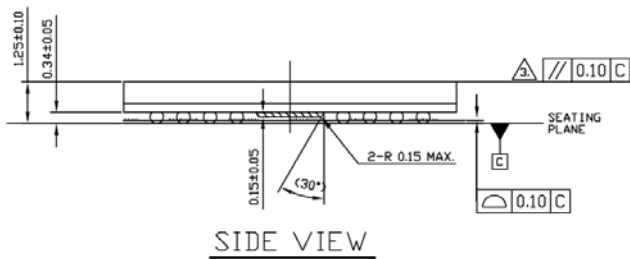
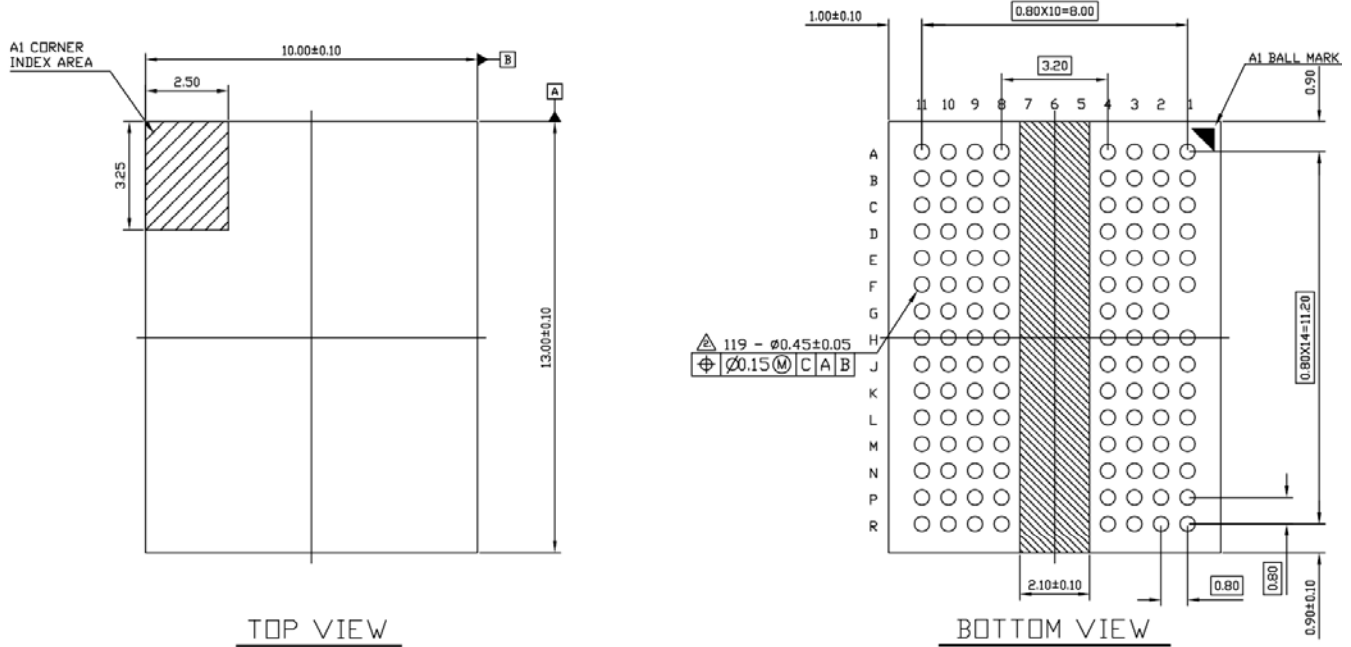
## PIN CONFIGURATION(10.0x13.0mm, 119-FBGA)





## 512Mb NAND FLASH + 1Gb DDR2 SDRAM MCP Product

### Package Drawing(10.0x13.0mm, 119-FBGA)



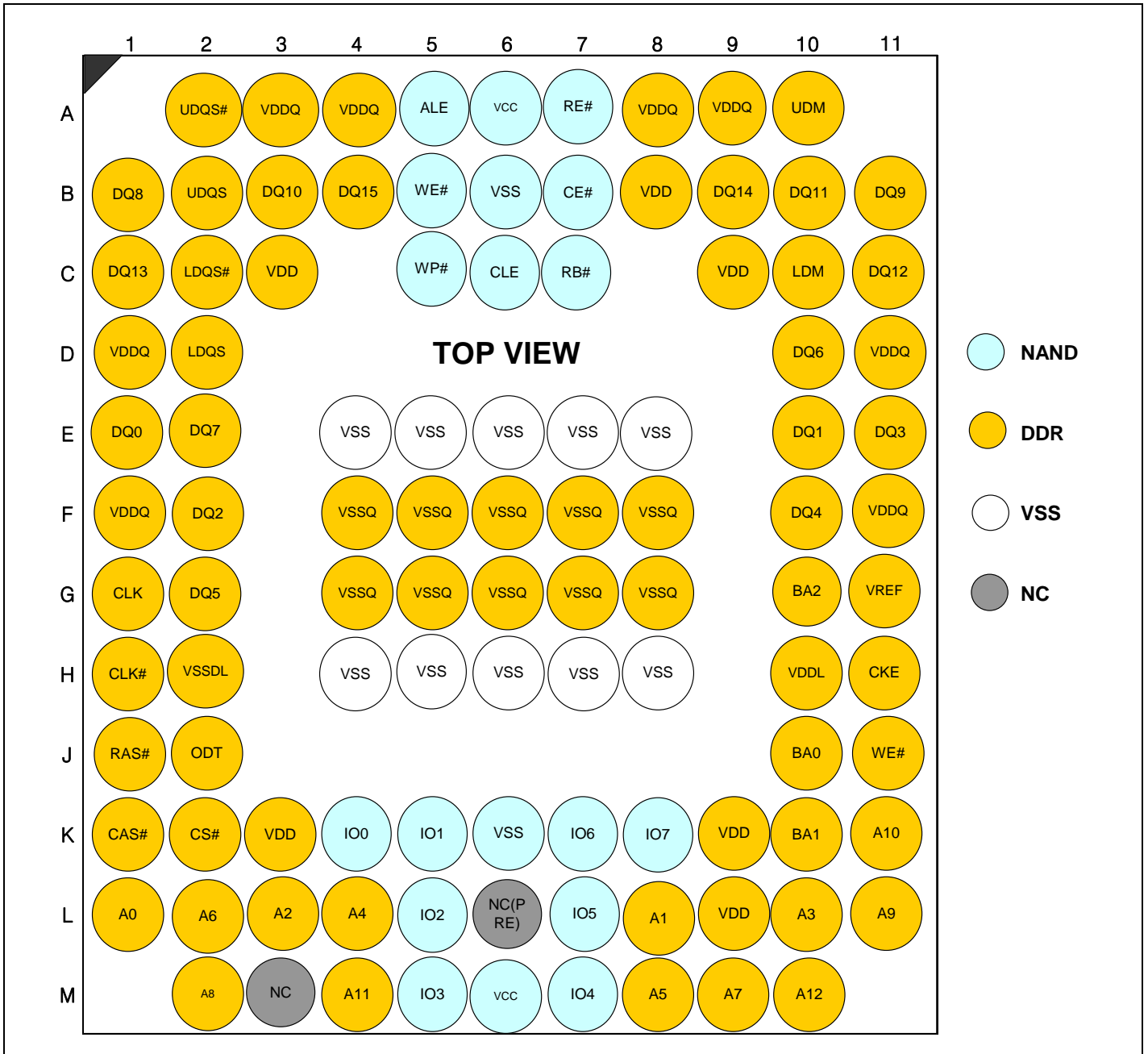
<b>Description</b>
FBGA 119BALL
<b>Dimension</b>
10.0mm x 13.0mm x 1.25mm

1. ALL DIMENSIONS are in Millimeters.
2. POST REFLOW SOLDER BALL DIAMETER.  
(Pre Reflow diameter :  $\varnothing 0.45 \pm 0.02$ )
3. TOLARENCE INCLUDES WARPAGE.



# 512Mb NAND FLASH + 1Gb DDR2 SDRAM MCP Product

## PIN CONFIGURATION(9.0x9.0mm, 104-FBGA)







**PIN DESCRIPTION**

Pin Name	Function (DDR2 SDRAM)
A0~A12	Address Inputs
BA0, BA1, BA2	Block Select Address
DQ0~DQ15	Data Input/Output
LDQS, $\overline{\text{LDQS}}$	Low Data Strobe
UDQS, $\overline{\text{UDQS}}$	Up Data Strobe
$\overline{\text{CS}}$	Chip Select
$\overline{\text{RAS}}$	Row Address Strobe Command
$\overline{\text{CAS}}$	Column Address Strobe Command
$\overline{\text{WE}}$	Write Enable
LDM, UDM	Input Mask
CLK	Clock Input
CLK#	Clock Input
CKE	Clock Enable
VREF	Input Reference Voltage
VDD	Power Supply
VDDQ	Power for DQ Circuit
VSSQ	Ground for DQ Circuit
VDDL	Power for DLL
VSSDL	Ground for DLL
ODT	On-Die Terminal Control

Pin Name	Function (NAND Flash)
IO0~IO7	Input and Output
$\overline{\text{CE}}$	Chip Enable
$\overline{\text{WE}}$	Write Enable
$\overline{\text{RE}}$	Read Enable
ALE	Address Latch Enable
CLE	Command Latch Enable
$\overline{\text{WP}}$	Write Protect
R/ $\overline{\text{B}}$	Ready/Busy
VCC	Power Supply

Pin Name	Function
VSS	Ground
NC	No Connection





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### Ordering Information

